PACIFIC AIR FORCES
REGIONAL SUPPORT CENTER

JOINT BASE ELMENDORF-RICHARDSON, ALASKA

WEST NOME TANK FARM

PROJECT SUMMARY REPORT

NOME, ALASKA

FINAL
JANUARY 2017

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ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ACM	asbestos-containing material
ADEC	Alaska Department of Environmental Conservation
AFCEC	U.S. Air Force Civil Engineer Center
bgs	below ground surface
BSNC	Bering Straits Native Corporation
BTEX	benzene, toluene, ethylbenzene, and xylenes
CCC	criterion continuous concentration
CMC	criterion maximum concentration
DRO	diesel-range organics
EPA	U.S. Environmental Protection Agency
FRAE	focused remedial alternative evaluation
GCI	General Communication, Inc.
GPS	global positioning system
GRO	gasoline-range organics
Jacobs	Jacobs Engineering Group Inc.
LBP	lead-based paint
LUC	land-use control
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NOAA	National Oceanic and Atmospheric Administration
PAH	polycyclic aromatic hydrocarbon
PAL	project action level
PEL	probable effects level
POL	petroleum, oil, and lubricants
SOP	standard operating procedure
SQuiRT	screening quick reference tables
TAH	total aromatic hydrocarbon
TAqH	total aqueous hydrocarbon
TEL	threshold effects level
U.S.	United States
USAF	U.S. Air Force
WNTF	West Nome Tank Farm

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EXECUTIVE SUMMARY

This Project Summary Report was prepared by Eagle Eye Electric and its prime subcontractor, Jacobs Engineering Group, Inc. (Jacobs), under U.S. Air Force Civil Engineer Center (AFCEC) Contract FA8903-15-C-0020. This report details the remedial design activities conducted at the former West Nome Tank Farm (WNTF) site in Nome, Alaska, in 2015 and 2016. The fieldwork, conducted over two field seasons, included the following activities:

- Site preparation and fence construction
- Pumphouse abatement and demolition
- Monitoring well decommissioning
- Cap construction
- Soil boring drilling
- Monitoring well installation and development
- Soil, groundwater, sediment, and pore water sample collection
- Survey
- Waste management

The remedial design fieldwork was conducted in accordance with the *Remedial Design Work Plan* (U.S. Air Force [USAF] 2015) and *West Nome Tank Farm Well Decommissioning, Well Installation, and Sample Collection Work Plan* (USAF 2016). As part of this site work, the site was prepared, graded, and a fence was erected in 2015. To continue site preparation activities in 2016, the former pumphouse was abated and demolished, and 30 wells were decommissioned within the cap construction footprint.

As part of the remedial design sampling activities, 10 soil borings were drilled east of the location of the soil cap to investigate previous diesel-range organics (DRO) exceedances. Two soil samples were collected from each boring and analytical results were compared to the Alaska Department of Environmental Conservation (ADEC) Method Two cleanup levels as defined in Title 18 of the Alaska Administrative Code, Section 75 (ADEC 2016b), project cleanup levels determined by the *Remedial Design Work Plan* (USAF 2015), and *Well*

Decommissioning, Well Installation, and Sample Collection Work Plan (USAF 2016). Concentrations of DRO exceeded the ADEC cleanup level in nine soil samples collected from six borings (maximum of 42,000 milligrams per kilogram [mg/kg]) and concentrations of 1-methylnaphthalene and naphthalene exceeded the ADEC cleanup levels in two soil samples collected from one boring (maximum detections of 89 mg/kg and 38 mg/kg, respectively).

Two new monitoring wells, W-36 and W-37, were installed, developed, and sampled; these new monitoring wells will be included in the long-term monitoring program. Samples collected from both monitoring wells contained concentrations of DRO that exceeded the ADEC Method Two Table C groundwater cleanup level (1.5 milligrams per liter [mg/L]) with concentrations of 1.7 mg/L at Monitoring Well W-36 and 3.3 mg/L at Monitoring Well W-37. The polycyclic aromatic hydrocarbon (PAH) dibenzo(a,h)anthracene also exceeded the ADEC Method Two Table C groundwater cleanup level (0.000034 mg/L) with a concentration of 0.000093 mg/L at Monitoring Well W-36.

Collocated pore water and sediment samples were collected from six locations near the banks of the Snake River to assess the potential impact of contamination from the WNTF along the Snake River. Concentrations of PAHs in sediment samples collected from four locations and pore water from two of those locations exceeded National Oceanic and Atmospheric Administration screening quick reference table standards (Buchman 2008).

Positions of the newly installed monitoring wells, maintained monitoring wells, soil borings, and sample locations were recorded using a sub-meter accuracy global positioning system. Monitoring well casing elevations were recorded using optical-level-loop surveying methods.

Following completion of site work in 2016, all of the waste generated during the 2015 and 2016 site activities were consolidated and shipped offsite for disposal.

1.0 INTRODUCTION

This Project Summary Report summarizes the field activities and analytical results from the site work conducted in 2015 and 2016 at the former West Nome Tank Farm (WNTF) site located in Nome, Alaska. Site work was conducted by Eagle Eye Electric and its teaming partner, Jacobs Engineering Group Inc. (Jacobs), under U.S. (United States) Air Force Civil Engineer Center (AFCEC) Contract No. FA8903-15-C-0020.

Site work was designed based on a Focused Remedial Alternative Evaluation (FRAE) conducted by Arcadis, Inc., on behalf of Chevron, in 2012. The FRAE determined the most appropriate method to achieve the remedial action objectives for petroleum contamination at WNTF (Arcadis 2012). Using the FRAE as the basis, a remedial design work plan was prepared in 2015 that outlined the design approach and execution for: capping petroleum-contaminated soil; collecting analytical samples from site soil, groundwater, surface water, and sediment; and installing and maintaining land-use controls (LUCs) at the site (U.S. Air Force [USAF] 2015). The activities outlined in the work plan were to be conducted in stages:

- Stage I – Site preparation, cap installation, remedial design sampling, and monitoring well installation
- Stage II – Ongoing monitoring of groundwater wells and LUC inspections

Implementation of Stage I, stockpile fence removal, perimeter fence installation, and site preparation were started in the fall of 2015. In June 2016, pumphouse demolition, monitoring well decommissioning, monitoring well installation, remedial design sampling, and cap construction activities were completed.

1.1 PROJECT OBJECTIVES AND REPORT ORGANIZATION

Project objectives were outlined in the *Remedial Design Work Plan* (USAF 2015) and the *West Nome Tank Farm Well Decommissioning, Well Installation, and Sample Collection Work Plan* (USAF 2016), and include the following:

- Decommission of monitoring wells

- Installation and development of two new monitoring wells
- Remedial design sampling
- Installation of soil cap
- Management of all waste generated during the field activities

Figures A-1 and A-2 present the former WNTF site location and conditions at the conclusion of the 2016 field effort.

This report is organized as follows:

- Section 1.0 introduces the objectives for the fieldwork.
- Section 2.0 presents the deviations from the work plans.
- Section 3.0 discusses the activities and presents the analytical results from soil, groundwater, sediment, and pore water samples.
- Section 4.0 summarizes the activities and presents the recommendations for future actions.
- Section 5.0 lists the references cited throughout this report.
- Appendices A through I present the field and post-field documentation used to compile this report.

1.2 PROJECT ACTION LEVELS

Investigative and long-term monitoring activities conducted between 1983 and 2014 indicate that the historical storage and distribution of petroleum, oil, and lubricants (POL) at WNTF has contaminated subsurface soil and shallow groundwater with petroleum hydrocarbons. Chemicals of concern include diesel-range organics (DRO) in soil, DRO and benzene in groundwater, and total aromatic hydrocarbons (TAH) and total aqueous aromatic hydrocarbons (TAqH) in the surface water of the Snake River estuary.

In 2012, the USAF requested a Groundwater Use Determination (350 Determination) under Title 18, Alaska Administrative Code, Part 75.350 (18 AAC 75.350) for the site (Alaska Department of Environmental Conservation [ADEC] 2012) specifying that the shallow aquifer underlying the WNTF is not a suitable source for drinking water. ADEC approved the 350 Determination and confirmed the underlying aquifer of the WNTF and downgradient

properties were not suitable for drinking water. The 350 Determination eliminated the migration-to-groundwater soil cleanup levels at the WNTF (i.e., the USAF property).

All sample results were compared to the project action levels (PALs) presented in the work plan (USAF 2016). As all soil samples collected were off USAF property, soil sample results were compared to the ADEC Method Two under 40-inch human health cleanup levels (ADEC 2016b). Groundwater results were compared to groundwater cleanup levels in 18 AAC 75, Table C (ADEC 2016b), and TAH and TAqH values were compared with surface water quality standards in 18 AAC 70 (ADEC 2016a).

Sediment and pore water samples were collected to assess the potential impact of contamination along the Snake River. Sediment sample results were compared to the National Oceanic and Atmospheric Administration (NOAA) screening quick reference tables (SQuiRT) freshwater threshold effects levels (TELs) (Buchman 2008). Pore water samples were compared to the NOAA SQuiRT freshwater levels most conservative of criteria continuous concentration (CCC) and criteria maximum concentration (CMC) values (Buchman 2008).

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2.0 WORK PLAN DEVIATIONS

This section describes the deviations from the *Remedial Design Work Plan* (USAF 2015) and the *West Nome Tank Farm Well Decommissioning, Well Installation, and Sample Collection Work Plan* (USAF 2016) that occurred during the fieldwork. Deviations from these plans were minor and did not materially affect project goals.

2.1 WELL DECOMMISSIONING

Originally, 21 monitoring wells were identified for decommissioning in the work plans (USAF 2015, 2016). The field crew was unable to locate Monitoring Well W-2, most likely due to a previous identification and labeling error. Monitoring Well W-2R was successfully located and decommissioned. It is assumed that W-2R replaced W-2 in the past. Another of the original 21 monitoring wells, W-10, was heavily damaged and was not further decommissioned (refer to the photograph log in Appendix B). The material was removed from this monitoring well, but a well decommissioning form was not completed. An additional 10 monitoring wells were located and decommissioned, as they would have interfered with cap construction. A total of 30 monitoring wells were removed and decommissioned as part of the field effort.

2.2 WELL INSTALLATION

There were several changes to the installation plan for the two new monitoring wells involving location and well completion.

When clearing the area for drilling, Alaska Digline was contacted. The field crew was notified that both AlaskaTel and General Communication, Inc. (GCI) had utilities in the location originally designated for Monitoring Well W-36. AlaskaTel cleared activities in the area. The planned location for Monitoring Well W-36 was next to several large satellite dishes, and GCI indicated the equipment used microwaves. After further discussion, GCI recommended the well location be moved for safety reasons. Monitoring Well W-36 was relocated to a nearby location adjacent to a residential deck. This location was close to the originally planned site and fulfilled the same purpose as the original site. The location of Monitoring Well W-37 was

slightly adjusted for property access purposes. Both locations were communicated with ADEC on 1 June 2015 and ADEC provided its concurrence with the revised location via email on the same date (refer to the email communication in Appendix H).

The work plan stated that 5-foot screens would be installed in the new monitoring wells (USAF 2016). Upon further review, it was determined that 5-foot screens were not specifically necessary and were likely a typographical error in the work plan. A 10-foot prepack was used to complete the monitoring wells. This screened length is more appropriate due to tidal influence of water levels in wells.

2.3 SAMPLE LOCATIONS

After initial observation of the site, it was determined that some of the proposed locations for sample locations and soil borings needed relocation due to potential buried utilities in the area. After initial screening, utility locates were performed to reconfirm the need to move sample locations. Soil Boring SB02 was relocated due to conflict with a sewer line, Soil Boring SB04 was relocated for property access purposes, and Pore Water Sample SP04 was relocated closer to the shoreline.

2.4 SEDIMENT SAMPLE ANALYSIS

Sediment samples were collected on 21 June 2016 for analysis of gasoline-range organics (GRO); DRO; benzene, toluene, ethylbenzene, and xylenes (BTEX); and polycyclic aromatic hydrocarbon (PAHs). The analytical laboratory did not run GRO analysis from this batch of samples, so sediment samples were re-collected on 26 August 2016 and submitted for GRO analysis. Global positioning system (GPS) survey coordinates were used to relocate the locations of the samples collected in June; the GRO sediment samples were collected from the same locations. This deviation does not affect the quality of the data.

3.0 REMEDIAL ACTIONS

This section describes the remedial design activities conducted at the WNTF in 2015 and 2016. Prior to mobilization, AFCEC received signed rights-of-entry for access to remedial design sample locations.

3.1 SITE PREPARATION

Site preparation activities were initiated in the fall of 2015 to prepare the site for the cap construction. The fence surrounding the prior stockpile was removed, the fencing right of way was cleared of brush, and a new fence was erected around the cap footprint. In 2016, additional site preparation activities included a site walk and inspection, materials inventory, equipment inspections, and notification of homeowners of the drilling and well installation activities to occur in the area. Alaska Digline was notified on 17 June 2016 that subsurface work would be conducted at the site. Alaska Digline informed the field crew that both AlaskaTel and GCI had utilities in the area (Section 2.2).

3.2 PUMPHOUSE ABATEMENT AND DEMOLITION

In the fall of 2015, Central Environmental, Inc. removed pipes and gaskets coated with suspected lead-based paint (LBP) and asbestos-containing material (ACM) identified in the roofing material as described in the *West Nome Tank Farm Fuel Pump House Hazardous Building Materials Survey* (USAF 2011). A sample of the suspected LBP was collected and submitted to White Laboratories for toxicity characteristic leaching procedure analysis for lead. The results were less than the reporting limit, and the gaskets and piping were transported to the Nome Municipal Landfill for disposal. The ACM was also bagged and disposed of in the Nome Municipal Landfill, which is operating under Permit No. SW2A012-20. Waste disposal information is included in Appendix G.

In 2016, Tumet Industries, LLC demolished the pumphouse. Materials were transported to the Nome Municipal Landfill for disposal. Following removal of the pumphouse and other components, including exposed piping and headers, the site was graded and compacted in

preparation for the cap. No residual fuels were observed in the piping or headers prior to removal.

3.3 WELL DECOMISSIONING

A preliminary site assessment was conducted on 15 June 2016. A total of 21 monitoring wells were identified in the work plans to be decommissioned. Also, 10 additional monitoring wells were located within the proposed cap footprint. As these additional monitoring wells would have hindered cap construction and were no longer needed, they were also decommissioned. One of the monitoring wells identified in the work plans, W-2, could not be located and was therefore not decommissioned. It is suspected that the "W-2" specified in the work plan was actually Monitoring Well W-2R, which was found and decommissioned. Monitoring Well W-10 was so damaged that decommissioning could not fully be completed (refer to the photograph log in Appendix B). The following monitoring wells identified in the work plans were decommissioned:

ML-1C	ML-6C	W-4R	W-25	W-31
ML-2C	ML-7C	W-5R	W-26	W-32
ML-3C	ML-8C	W-10	W-27	W-33
ML-4C	W-2R	W-16R2	W-29	W-34

The 10 additional monitoring wells also located in the cap footprint and decommissioned were as follows:

AI-1	BV-1	CMW-35	MW-6R	W-28
AI-2	BV-2	ML-5C	W-24	W-30

Completed well decommissioning forms are included in Appendix D.

3.4 DRILLING AND WELL INSTALLATION AND DEVELOPMENT

Drilling and well installation occurred on 18 and 19 June 2016. Soil borings were advanced to either 10 or 15 feet below ground surface (bgs). Groundwater was encountered (between 6.2 to 14.5 feet bgs) at all locations during drilling activities. Groundwater depth varied based on tidal influence and ground elevation for each boring. A total of 10 soil borings were completed and two soil samples were collected from each boring. Two of the borings were completed as Monitoring Wells W-36 and W-37. Completed boring logs are included in Appendix D.

Installation of two characterization wells was conducted after completion of decommissioning activities. Two lots were identified for the location of these wells, but the location proposed for Monitoring Well W-36 in the work plan was directly in front of several microwave satellite dishes. After contacting the utilities owner and receiving USAF and ADEC approval, the location of W-36 was moved. The two monitoring wells (W-36 and W-37) were installed on Lots 6 and 1, respectively (Figure A-2).

Monitoring well installation and development were conducted in accordance with the standard operating procedures (SOPs) in the work plan (USAF 2016). Wells were constructed of 2-inch Schedule-40 polyvinyl chloride piping with 10-foot pre-packed screens. The work plan specified 5-foot pre-packed screens across the water table; however, 10-foot pre-packed screens were used because the 5-foot screens were determined to be unnecessary and likely a typographical error in the 2016 work plan. The annular seal was set using a cement-bentonite grout. The wells have flush-mount completions. Completed well installation forms are included in Appendix D.

Monitoring Well W-36 was completed on 18 June and developed on 20 June, and Monitoring Well W-37 was completed on 19 June and developed on 21 June; both wells were sampled on 22 June, per ADEC's *Monitoring Well Guidance* (ADEC 2013). Water parameters were collected for temperature, conductivity, dissolved oxygen, pH, oxidation-reduction potential, and turbidity. Completed well development forms are included in Appendix D.

3.5 REMEDIAL DESIGN SAMPLING

Soil, groundwater, sediment, and pore water sampling were conducted to characterize materials downgradient of the WNTF proposed cap area.

3.5.1 Soil Sampling

Jacobs, along with Discovery Drilling, advanced and sampled 10 soil borings (refer to Figure A-2 for boring locations). Two samples were collected from each soil boring: one from the inferred smear zone, based on the core log, and one from within the vadose zone, based on the highest photoionization detector reading, or from observed odor or staining. When no evidence of contamination was observed, the finest-grained material was sampled. Soil samples were analyzed for DRO (AK102), BTEX (SW8260), and PAHs (SW8270C SIM).

Monitoring Well W-17R: Four soil borings, SB01 through SB04, were advanced near Monitoring Well W-17R, located adjacent to Lot 4, to delineate petroleum-contaminated soil. These step-out borings were located approximately 15 feet in each of the cardinal directions (north, south, east, and west) from the 2008 soil boring location, 08B-17R-05. Soil Boring SB02 had to be relocated due to the presence of utility lines and was located approximately 12 feet southwest of Monitoring Well W-17R.

Lot 5: Four soil borings, SB05 through SB08, were advanced near 2010 Soil Boring SB10-03 to delineate the extent of petroleum-contaminated soil. The step-out borings were located approximately 15 feet in each of the cardinal directions (north, south, east, and west) from Soil Boring SB10-03.

Monitoring Wells W-36 and W-37: One soil boring was advanced in each of these locations prior to well installation.

3.5.1.1 Soil Sample Results and Exceedances

Nine soil samples contained concentrations of DRO that exceeded the ADEC Method Two ingestion cleanup level, and two soil samples contained concentrations of 1-methylnaphthalene and naphthalene that exceeded the ADEC Method Two human health cleanup levels. Soil sample exceedances are presented in Table 3-1.

Table 3-1
Soil Sample Exceedances

Soil Boring ID	Sample ID	Analyte	PAL[1] (mg/kg)	ADEC Method Two Cleanup Levels[2] (mg/kg)	Results (mg/kg)
SB01	16WNTF-SB01-06-SO	DRO	10,250	10,250	19,000
	16WNTF-SB01-08-SO	DRO	10,250	10,250	14,000
SB02	16WNTF-SB02-06-SO	DRO	10,250	10,250	33,000
		1-Methylnaphthalene	280	68	81
		Naphthalene	28	29	36
	16WNTF-SB02-08-SO	DRO	10,250	10,250	42,000
		1-Methylnaphthalene	280	68	89
		Naphthalene	28	29	38
SB03	16WNTF-SB03-06-SO	DRO	10,250	10,250	11,000
	16WNTF-SB03-08-SO	DRO	10,250	10,250	13,000
SB04	16WNTF-SB04-06-SO	DRO	10,250	10,250	18,000
SB05	16WNTF-SB05-10-SO	DRO	10,250	10,250	14,000
SB07	16WNTF-SB07-10-SO	DRO	10,250	10,250	18,000

Notes:
[1] *WNTF Well Decommissioning, Well Installation, and Sample Collection Work Plan* (USAF 2016)
[2] ADEC Method Two Soil Cleanup Levels, Tables B1 and B2, under 40-inch zone (ADEC 2016b)
The last two numbers in the sample ID reflect the sample depth in feet bgs.
For definitions, refer to the Acronyms and Abbreviations section.

DRO concentrations in the 2016 borings adjacent to Lot 4 ranged from 8,000 to 42,000 milligrams per kilogram (mg/kg). DRO exceedances were present in all soil borings and were present at both 6 and 8 feet bgs in Soil Borings SB01, SB02, and SB03, while Soil Boring SB04 only had a sample exceedance at 6 feet bgs. DRO at 8 feet bgs in Soil Boring SB04 was below the cleanup level, at 9,800 mg/kg. Exceedances of

1-methylnaphthalane and naphthalene were also measured in Soil Boring SB02 at 6 and 8 feet bgs.

DRO concentration in the soil borings completed in Lot 5 ranged from 430 to 18,000 mg/kg. Exceedances were observed in Soil Borings SB05 and SB07 at 10 feet bgs.

Fuel staining was present in the soil boring at Monitoring Well W-36 (Photograph No. 7 in Appendix B); however, DRO concentrations at Monitoring Well W-36 were 6.6 and 190 mg/kg in the soil boring samples while DRO concentrations at Monitoring Well W-37 were 89 and 910 mg/kg in the soil boring samples. All of these concentrations were below the ADEC Method Two cleanup level of 10,250 mg/kg (ADEC 2016b).

3.5.2 Groundwater Sampling

Two monitoring wells (W-36 and W-37) were installed on Lots 6 and 1, respectively (Figure A-2). After installation and development, each new well was sampled. Groundwater samples were analyzed for DRO (AK102), BTEX (SW8260), and PAHs (SW8270C SIM).

3.5.2.1 Groundwater Sample Results and Exceedances

Groundwater from both wells contained concentrations of DRO that exceeded the ADEC Method Two Table C cleanup level in the primary and duplicate samples. Dibenzo(a,h)anthracene also exceeded the ADEC Method Two Table C cleanup level at Monitoring Well W-36 in the duplicate sample only. Groundwater sample exceedances are presented in Table 3-2.

Table 3-2
Groundwater Sample Exceedances

Monitoring Well ID	Sample ID	Analyte	PAL[1] (mg/L)	ADEC Table C Cleanup Levels[2] (mg/L)	Results (mg/L)
W-36	16WNTF-MW36-GW-9	DRO	1.5	1.5	1.7 JL-
		Dibenzo(a,h)anthracene	0.00012	0.000034	0.000093
W-37	16WNTF-MW37-GW	DRO	1.5	1.5	3.3 JL-

Notes:
[1] *WNTF Well Decommissioning, Well Installation, and Sample Collection Work Plan* (USAF 2016).
[2] ADEC Groundwater Cleanup Levels, Table C (ADEC 2016b)
JL- = The result was an estimated value because the analyte failed recovery criteria in the laboratory control sample or laboratory control sample duplicate, or both; results were biased low because the recovery was less than the lower control limit.
For definitions, refer to the Acronyms and Abbreviations section.

The new wells were added to the monitoring network for incorporation into the long-term monitoring program.

3.5.3 Pore Water and Sediment Sampling

Pore water and sediment samples were collected to assess the potential impact of contamination from WNTF along the Snake River. In accordance with the SOP in the work plan (USAF 2016), pore water samples were obtained by using pore water probes that were installed with a slide hammer to 2 feet bgs during falling tide. Pore water samples were collected in general accordance with U.S. Environmental Protection Agency (EPA) technical manual *Methods for Collection, Storage, and Manipulation of Sediments for Chemical and Toxicological Analyses* (EPA 2001) as outlined in JE-SOP-8100 *Pore Water Sampling*. In accordance with the SOP in the work plan (USAF 2016), collocated sediment samples were obtained using a hand shovel from the littoral zone during low tide. Sediment samples were collected in general accordance with *California Field Sampling Guidance Document #1215*; *Sediment Sampling* (EPA 1999) as outlined in JE-SOP-5300 *Sediment Sampling*.

Pore water and sediment samples were collected from the bank of the Snake River on the centerline of Lots 1, 2, 3, 4, 5, and 6 (Figure A-2). Pore water samples were collected prior to

sediment samples and one collocated sediment sample was collected at each of the six pore water sample locations. Pore water samples were analyzed for DRO (AK102), BTEX (SW8260), and PAHs (SW8270C SIM). Sediment samples were analyzed for GRO (AK101), DRO (AK102), BTEX (SW8260), and PAHs (SW8270C SIM).

3.5.3.1 Pore Water Results and Exceedances

Pore water from two locations contained concentrations of PAHs that exceeded the NOAA SQuiRT standards. Pore water sample standard exceedances are presented in Table 3-3. Calculated TAH and TAqH concentrations did not exceed cleanup levels in any of the pore water samples.

Table 3-3
Pore Water Sample Exceedances

Sample Location ID	Sample ID	Analyte	PAL[1] (mg/L)	Results (mg/L)
SP01	16WNTF-SP01-PW	Benzo(a)pyrene	0.000014	0.000023
		Fluoranthene	0.00004	0.000065
SP03	16WNTF-SP03-PW	Benzo(a)pyrene	0.000014	0.000018 J
		Fluoranthene	0.00004	0.000041

Notes:
[1] Surface water criteria from NOAA SQuiRT freshwater, most conservative of CCC and CMC values (Buchman 2008).
J = The analyte was positively identified; however, the associated result was less than the limit of quantitation but greater than or equal to the detection limit.
For definitions, refer to the Acronyms and Abbreviations section.

3.5.3.2 Sediment Sample Results and Exceedances

Sediment from four locations (SP01, SP02, SP03, and SP04) contained concentrations of PAHs that exceeded the NOAA SQuiRT TELs. Sediment from just one location (SP03) contained concentrations of PAHs that exceeded the NOAA SQuiRT probable effects levels (PELs). The TELs are lower-threshold values, which suggest that contaminant concentrations below these levels have a low probability of being toxic. Comparison to higher toxicity thresholds, such as PELs, identifies compounds that are more probably present at elevated, toxic levels (Buchman 2008).

Sediment sample exceedances of TELs are presented in Table 3-4. Sample results that also exceeded PELs are bolded.

Table 3-4
Sediment Sample Exceedances

Sample Location ID	Sample ID	Analyte	NOAA SQuiRT TEL[1] (mg/kg)	NOAA SQuiRT PEL[2] (mg/kg)	Results (mg/kg)
SP01	16WNTF-SP01-SD	Phenanthrene	0.0419	0.515	0.084
		Pyrene	0.053	0.875	0.066
SP02	16WNTF-SP02-SD	Acenaphthene	0.00671	0.0889	0.042
		Anthracene	0.0469	0.245	0.082
		Benzo(a)anthracene	0.0317	0.385	0.14
		Benzo(a)pyrene	0.0319	0.782	0.14
		Chrysene	0.0571	0.862	0.17
		Dibenzo(a,h)anthracene	0.00622	0.135	0.023
		Fluoranthene	0.111	2.355	0.28
		Fluorene	0.0212	0.144	0.057
		Phenanthrene	0.0419	0.515	0.51
		Pyrene	0.053	0.875	0.38
SP03	16WNTF-SP03-SD	Acenaphthene	0.00671	0.0889	0.069 JD
		Acenaphthylene	0.00587	0.128	0.0079
		Anthracene	0.0469	0.245	0.087 JD
		Benzo(a)anthracene	0.0317	0.385	0.2 JD
		Benzo(a)pyrene	0.0319	0.782	0.21 JD
		Chrysene	0.0571	0.862	0.3 JD
		Dibenzo(a,h)anthracene	0.00622	0.135	0.035 JD
		Fluoranthene	0.111	2.355	0.5 JD
		Fluorene	0.0212	0.144	0.081 JD
		Naphthalene	0.0346	0.391	0.057
		Phenanthrene	0.0419	0.515	**0.96 JD**
		Pyrene	0.053	0.875	0.65 JD
	16WNTF-SP03-SD-9	Acenaphthene	0.00671	0.0889	**0.15 JD**
		Anthracene	0.0469	0.245	**0.32 JD**
		Benzo(a)anthracene	0.0317	0.385	**0.5 JD**
		Benzo(a)pyrene	0.0319	0.782	0.43 JD
		Benzo(g,h,i)perylene	0.17	0.17	**0.22 JD**
		Chrysene	0.0571	0.862	0.56 JD
		Dibenzo(a,h)anthracene	0.00622	0.135	0.088 JD
		Fluoranthene	0.111	2.355	1.1 JD
		Fluorene	0.0212	0.144	**0.18 JD**

Table 3-4
Sediment Sample Exceedances (Continued)

Sample Location ID	Sample ID	Analyte	NOAA SQuiRT TEL[1] (mg/kg)	NOAA SQuiRT PEL[2] (mg/kg)	Results (mg/kg)
		Indeno(1,2,3-cd)pyrene	0.2	0.2	**0.26 JD**
		Naphthalene	0.0346	0.391	0.039
		Phenanthrene	0.0419	0.515	**1.6 JD**
		Pyrene	0.053	0.875	**1.1 JD**
SP04	16WNTF-SP04-SD	Phenanthrene	0.0419	0.515	0.053

Notes:
[1] Sediment criteria from NOAA SQuiRT freshwater TEL (Buchman 2008).
[2] Sediment criteria from NOAA SQuiRT freshwater PEL (Buchman 2008).
Bold indicates an exceedance of the NOAA SQuiRT freshwater PEL (Buchman 2008).
JD = The result was qualified because the relative percent difference between the primary sample and the field duplicate sample exceeded 50 percent for soil/sediment and/or the relative percent difference between the matrix spike and matrix spike duplicate exceeded the quality control criteria.
For definitions, refer to the Acronyms and Abbreviations section.

3.6 CAP CONSTRUCTION

Cap construction activities proceeded as described in the *Remedial Design Work Plan* (USAF 2015). Following the demolition of the pumphouse and its components, the site was graded to blend into the surrounding terrain using a dozer and compactor. Permeable geotextile fabric was laid down initially in the middle of the site and then additional material was rolled out as material was added, working towards the outside perimeter of the cap. The geotextile fabric was overlapped a minimum of 2 feet to ensure coverage after soil placement. Material was placed in 6-inch lifts, graded, and compacted with a vibratory roller. A water truck sprayed water on the material during construction to achieve maximum compression. The soil cap installation consisted of the following:

- Approximately 7,497 cubic yards of silty sand mixture to approximately 22 inches thickness
- Approximately 2,484 cubic yards of 2-inch minus gravel to approximately 6 inches thickness

Following construction of the cap, the fence was repaired and locked.

3.7 SURVEY

Prior to beginning work, proposed monitoring wells, soil boring, sediment, and pore water sample locations were survey-located using a sub-meter accuracy GPS. Positions of monitoring wells, soil borings, samples, and other relevant site features were recorded using sub-meter horizontal accuracy GPS following procedures detailed in JE-SOP-1001 *Differential GPS Surveying*.

The newly installed monitoring wells, W-36 and W-37, were surveyed by Edge Surveying who recorded the elevation of the tops of monitoring well casings using optical-level-loop surveying methods in accordance with ADEC's *Monitoring Well Guidance* (ADEC 2013) and procedures. As detailed in JE-SOP-1010 *Differential Level Loop Surveying*, Monitoring Wells W-7R, W-20, and W-21 tops of casings were also surveyed to acquire updated elevations following trimming or repair from frost-jacking. Edge Surveying also located the perimeter for the cap footprint and shot in the elevation to support cap construction activities. Survey data are presented in Appendix E.

3.8 WASTE MANAGEMENT

Soil cuttings, investigation-derived waste, and decommissioned well components were disposed of as POL-contaminated waste according to procedures identified in JE-SOP-2100 *Waste Management*. Soil cuttings and sampling waste from well installation were containerized in two Super Sacks and shipped to an approved landfill. Approximately 100 gallons of groundwater extracted during well installation, development, and sampling were containerized in 55-gallon drums and accepted by National Response Corporation Alaska, LLC for treatment. Analytical samples collected from soil and groundwater were used to characterize waste and confirm treatment and disposal activities. Nonhazardous waste manifests and certificates of disposal are presented in Appendix G.

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4.0 SUMMARY AND RECOMMENDATIONS

Between 15 June and 27 August 2016, the following project objectives were completed at WNTF:

- Decommission of 30 monitoring wells
- Installation and development of two monitoring wells
- Remedial design sampling
- Installation of soil cap
- Removal or treatment of all waste generated as part of the field activities

Following decommission activities, 10 soil borings were drilled east of the location of the soil cap to investigate previous DRO exceedances. Soil samples were collected from each boring and two soil boring locations were used to install monitoring wells. Soil and groundwater samples were collected to assess potential DRO contamination. Sediment and pore water sampling were conducted to assess the potential impact of contamination along the Snake River. Contamination was observed in soil, groundwater, sediment, and pore water samples. Nine soil samples exhibited DRO exceedances (up to 42,000 mg/kg) and two soil samples exhibited 1-methylnaphthalene and naphthalene exceedances (up to 89 mg/kg and 38 mg/kg, respectively) of the ADEC Method Two cleanup levels. Both wells exhibited DRO exceedances of the Method Two Table C cleanup level, with DRO levels of 1.7 mg/L at Monitoring Well W-36 and 3.3 mg/L at Monitoring Well W-37. Monitoring Well W-36 also exhibited a dibenzo(a,h)anthracene exceedance of 0.000093 mg/L in the duplicate sample. Sediment from four locations and pore water from two of those locations exhibited PAH exceedances of the NOAA SQuiRT standards.

Based on the sampling results from the 2016 field effort, adding Monitoring Wells W-36 and W-37 to the long-term monitoring schedule for continued monitoring of DRO is recommended.

Sediment and surface water data were collected along the Snake River for information purposes only. Although concentrations of contaminants from 2009 and 2016 indicated that fuel contamination in sediments is present upstream, cross-gradient, and downstream of the

site, no further investigation of sediment contamination in the vicinity of presumed groundwater discharge from the WNTF is recommended. The concentrations of contaminants detected in river sediments could be a reflection of the maritime use of the estuary and harbor along with onshore industrial activities fuel. Making a definitive determination of the source of contaminations, if possible, would require a more comprehensive estuary-wide investigation.

5.0 REFERENCES

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USAF. 2015 (April). *Remedial Design Work Plan. West Nome Tank Farm, Nome, Alaska*. Prepared by Jacobs Engineering Group Inc.

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APPENDIX A
Figures

Former West Nome Tank Farm

All Locations Are Approximate

0 500 1,000 1,500 2,000

Feet

AK SP Zone 8

N

LOCATION AND VICINITY MAP

SITE ST001, FORMER WEST NOME TANK FARM

NOME, ALASKA

JACOBS	DATE: 06 OCT 2016	PROJECT MANAGER: N. MCKAY	FIGURE NO: A-1

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- Long-Term Monitoring Well - Installed 2016 (2)
- Monitoring Well (3)
- Sediment (6)
- Porewater (6)
- Soil Boring (8)
- Decommissioned Well (22)
- Historical Monitoring Well (6)
- Long-Term Monitoring Network Well - Historical (12)
- Historical Soil Boring (1)
- Former Tank Farm
- Abandoned Piping (apparent)
- Abandoned Piping (known)
- Interceptor Trench
- Fence
- Property Line
- Permeable Cap
- Former AST
- Residential Building

N

All Locations Are Approximate

1 inch = 100 feet

0 50 100 150 200

Feet

NAD 1983 AK State Plane Zone 8

2016 SOIL, GROUNDWATER, SEDIMENT, AND PORE WATER SAMPLE LOCATIONS

FORMER WEST NOME TANK FARM
NOME, ALASKA

JACOBS	DATE:	PROJECT MANAGER:	FIGURE NO:
	14 NOV 2016	N. MCKAY	A-2

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Monitoring Well ID	Sample ID	Analyte	Project Action Level (mg/L)	Groundwater Exceedances (mg/L)
MW36	16WNTF-MW36-GW-9	DRO	1.5	1.7 JL-
		Dibenzo(a,h)anthracene	0.000034	0.000093
MW37	16WNTF-MW37-GW	DRO	1.5	3.3 JL-

Note:
JL- = The result was an estimated value because the analyte failed recovery criteria in the laboratory control sample or laboratory control sample duplicate, or both; results were biased low because the recovery was less than the lower control limit.

Soil Boring ID	Sample ID	Analyte	Project Action Level (mg/kg)	Soil Exceedances (mg/kg)	Sample Depth (feet bgs)
SB01	16WNTF-SB01-06-SO	DRO	10,250	19,000	6
	16WNTF-SB01-08-SO	DRO	10,250	14,000	8
SB02	16WNTF-SB02-06-SO	DRO	10,250	33,000	6
		1-Methylnaphthalene	68	81	
		Naphthalene	29	36	
	16WNTF-SB02-08-SO	DRO	10,250	42,000	8
		1-Methylnaphthalene	68	89	
		Naphthalene	29	38	
SB03	16WNTF-SB03-06-SO	DRO	10,250	11,000	6
	16WNTF-SB03-08-SO	DRO	10,250	13,000	8
SB04	16WNTF-SB04-06-SO	DRO	10,250	18,000	6
SB05	16WNTF-SB05-10-SO	DRO	10,250	14,000	10
SB07	16WNTF-SB07-10-SO	DRO	10,250	18,000	10

- Monitoring Well - Long term Monitoring Network Well - Installed 2016 (Exceedance) (2)
- Porewater, Detection (4)
- Porewater, Exceedance (2)
- Sediment, Detection (2)
- Sediment, Exceedance TEL (3)
- Sediment, Exceedance TEL & PEL (1)
- Soil Boring, Detection (2)
- Soil Boring, Exceedance (6)
- Long-Term Monitoring Network Well - Historical (1)
- Historical Soil Boring (1)

N

All Locations Are Approximate

1 inch = 100 feet

0 50 100 150 200

Feet

NAD 1983 AK State Plane Zone 8

2016 SOIL AND GROUNDWATER SAMPLE EXCEEDANCES

FORMER WEST NOME TANK FARM
NOME, ALASKA

JACOBS

DATE:	PROJECT MANAGER:	FIGURE NO:
10 NOV 2016	N. MCKAY	A-3

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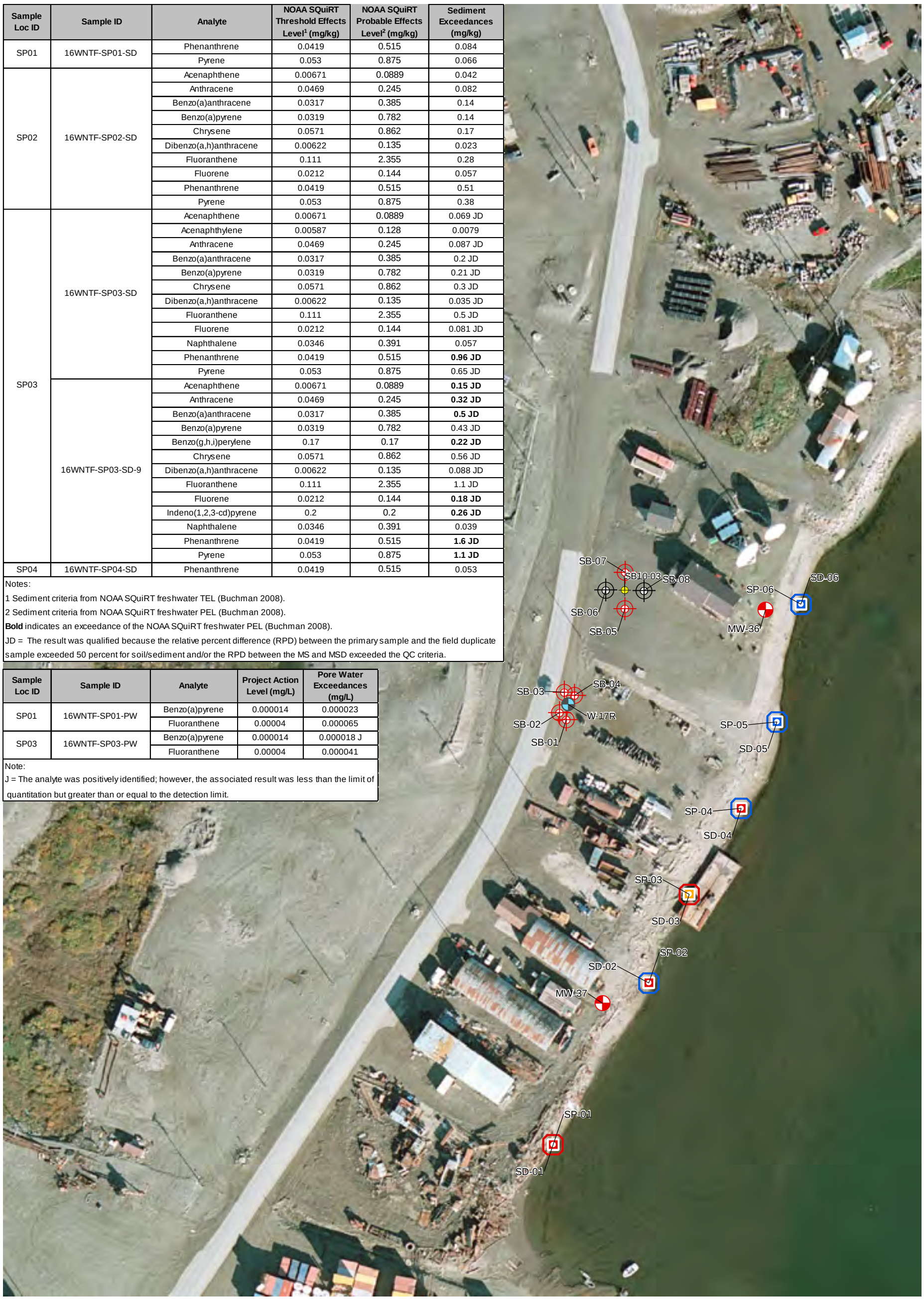
Sample Loc ID	Sample ID	Analyte	NOAA SQuiRT Threshold Effects Level[1] (mg/kg)	NOAA SQuiRT Probable Effects Level[2] (mg/kg)	Sediment Exceedances (mg/kg)
SP01	16WNTF-SP01-SD	Phenanthrene	0.0419	0.515	0.084
		Pyrene	0.053	0.875	0.066
SP02	16WNTF-SP02-SD	Acenaphthene	0.00671	0.0889	0.042
		Anthracene	0.0469	0.245	0.082
		Benzo(a)anthracene	0.0317	0.385	0.14
		Benzo(a)pyrene	0.0319	0.782	0.14
		Chrysene	0.0571	0.862	0.17
		Dibenzo(a,h)anthracene	0.00622	0.135	0.023
		Fluoranthene	0.111	2.355	0.28
		Fluorene	0.0212	0.144	0.057
		Phenanthrene	0.0419	0.515	0.51
		Pyrene	0.053	0.875	0.38
SP03	16WNTF-SP03-SD	Acenaphthene	0.00671	0.0889	0.069 JD
		Acenaphthylene	0.00587	0.128	0.0079
		Anthracene	0.0469	0.245	0.087 JD
		Benzo(a)anthracene	0.0317	0.385	0.2 JD
		Benzo(a)pyrene	0.0319	0.782	0.21 JD
		Chrysene	0.0571	0.862	0.3 JD
		Dibenzo(a,h)anthracene	0.00622	0.135	0.035 JD
		Fluoranthene	0.111	2.355	0.5 JD
		Fluorene	0.0212	0.144	0.081 JD
		Naphthalene	0.0346	0.391	0.057
		Phenanthrene	0.0419	0.515	**0.96 JD**
		Pyrene	0.053	0.875	0.65 JD
	16WNTF-SP03-SD-9	Acenaphthene	0.00671	0.0889	**0.15 JD**
		Anthracene	0.0469	0.245	**0.32 JD**
		Benzo(a)anthracene	0.0317	0.385	**0.5 JD**
		Benzo(a)pyrene	0.0319	0.782	0.43 JD
		Benzo(g,h,i)perylene	0.17	0.17	**0.22 JD**
		Chrysene	0.0571	0.862	0.56 JD
		Dibenzo(a,h)anthracene	0.00622	0.135	0.088 JD
		Fluoranthene	0.111	2.355	1.1 JD
		Fluorene	0.0212	0.144	**0.18 JD**
		Indeno(1,2,3-cd)pyrene	0.2	0.2	**0.26 JD**
		Naphthalene	0.0346	0.391	0.039
		Phenanthrene	0.0419	0.515	**1.6 JD**
		Pyrene	0.053	0.875	**1.1 JD**
SP04	16WNTF-SP04-SD	Phenanthrene	0.0419	0.515	0.053

Notes:
1 Sediment criteria from NOAA SQuiRT freshwater TEL (Buchman 2008).
2 Sediment criteria from NOAA SQuiRT freshwater PEL (Buchman 2008).
Bold indicates an exceedance of the NOAA SQuiRT freshwater PEL (Buchman 2008).
JD = The result was qualified because the relative percent difference (RPD) between the primary sample and the field duplicate sample exceeded 50 percent for soil/sediment and/or the RPD between the MS and MSD exceeded the QC criteria.

Sample Loc ID	Sample ID	Analyte	Project Action Level (mg/L)	Pore Water Exceedances (mg/L)
SP01	16WNTF-SP01-PW	Benzo(a)pyrene	0.000014	0.000023
		Fluoranthene	0.00004	0.000065
SP03	16WNTF-SP03-PW	Benzo(a)pyrene	0.000014	0.000018 J
		Fluoranthene	0.00004	0.000041

Note:
J = The analyte was positively identified; however, the associated result was less than the limit of quantitation but greater than or equal to the detection limit.



- Monitoring Well - Long term Monitoring Network Well - Installed 2016 (Exceedance) (2)
- Porewater, Detection (4)
- Porewater, Exceedance (2)
- Sediment, Detection (2)
- Sediment, Exceedance TEL (3)
- Sediment, Exceedance TEL & PEL (1)
- Soil Boring, Detection (2)
- Soil Boring, Exceedance (6)
- Long-Term Monitoring Network Well - Historical (1)
- Historical Soil Boring (1)

N

All Locations Are Approximate

1 inch = 100 feet

0 50 100 150 200

Feet

NAD 1983 AK State Plane Zone 8

2016 SEDIMENT AND PORE WATER SAMPLE EXCEEDANCES

FORMER WEST NOME TANK FARM
NOME, ALASKA

JACOBS	DATE:	PROJECT MANAGER:	FIGURE NO:
	23 JAN 2017	N. MCKAY	A-4

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APPENDIX B
Photograph Log

PHOTOGRAPH LOG
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Photo Number **Page**

PHOTOGRAPH LOG
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Photo Number **Page**

Photo No. 1 – 2 October 2015
Installation of fencing at the site. Looking southwest.

Photo No. 2 – 2 October 2015
New signage posted at the site. Looking west.

Photo No. 3 – 15 June 2016
Northern group of monitoring wells decommissioned in support of cap construction project. Looking southeast.

Photo No. 4 – 16 June 2016
Monitoring well decommissioning in progress, pulling riser after knocking bottom of well out. Looking south.

Photo No. 5 – 16 June 2016
Discovery pouring Bentonite chips down hole left from decommissioned well.

Photo No. 6 – 17 June 2016
Monitoring well W-10 destroyed during previous construction activities. Casing was placed with waste from other decommissioned wells. Looking east.

Photo No. 7 – 18 June 2016
Soil recovered from W-36. Note fuel staining present in soil.

Photo No. 8 – 18 June 2016
Hollow-stem augers used during installation of W-36; well was relocated due to microwave dish shown in background. Looking north.

Photo No. 9 – 18 June 2016
W-36 completed as flush-mount monitoring well. Looking north.

Photo No. 10 – 19 June 2016
Drilling step-out borings (B01 – B04) around W-17R. Looking north.

Photo No. 11 – 19 June 2016
Installing monitoring well W-37. Looking east.

Photo No. 12 – 21 June 2016
Pore water sampling at location SP05. Pore water probes were installed with a slide hammer to 2 feet below ground surface during falling tide. Looking southwest.

Photo No. 13 – 21 June 2016
Sediment samples were obtained by shovel from the littoral zone during low tide.

Photo No. 14 – 20 June 2016
Stainless steel drive point used to obtain pore water samples.

Photo No. 15 – 26 June 2016
Demolition of the old pumphouse. Looking northeast.

Photo No. 16 – 20 June 2016
Demolition material being loaded for transport to the landfill. Looking northeast.

Photo No. 17 – 26 June 2016
Site preparation and compaction of cap footprint. Looking south.

Photo No. 18 – 30 June 2016
Delivery of silty-sand base on top of geotextile liner. Looking south.

Photo No. 19 – 14 July 2016
Watering cap for compaction. Looking east.

Photo No. 20 – 14 July 2016
Addition of two-inch minus gravel layer. Looking southeast.

Photo No. 21 – 14 July 2016
Spreading and compaction of top layer of cap. Looking east.

Photo No. 22 – 19 July 2016
Reinstallation of fencing. Looking southeast.

APPENDIX C
Data Quality Assessment

PACIFIC AIR FORCES
REGIONAL SUPPORT CENTER

JOINT BASE ELMENDORF-RICHARDSON, ALASKA

WEST NOME TANK FARM

PROJECT SUMMARY REPORT

APPENDIX C
DATA QUALITY ASSESSMENT

NOME, ALASKA

FINAL
JANUARY 2017

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SECTION **PAGE**

TABLE

ATTACHMENTS

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ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
ADEC	Alaska Department of Environmental Conservation
ALS	ALS Environmental
BTEX	benzene, toluene, ethylbenzene, and xylenes
DL	detection limit
DoD	U.S. Department of Defense
DQA	data quality assessment
DQO	data quality objective
DRO	diesel-range organics
EPA	U.S. Environmental Protection Agency
FD	field duplicate
GRO	gasoline-range organics
Jacobs	Jacobs Engineering Group Inc.
LCL	lower control limit
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LOD	limit of detection
LOQ	limit of quantitation
MS	matrix spike
MSD	matrix spike duplicate
PAH	polycyclic aromatic hydrocarbon
PAL	project action limit
QC	quality control
QSM	Quality Systems Manual
RPD	relative percent difference
SIM	selective ion monitoring
USAF	U.S. Air Force

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1.0 INTRODUCTION

The following data quality assessment (DQA) and Alaska Department of Environmental Conservation (ADEC) laboratory data review checklists (Attachment C-3) assess the overall quality and usability of data from the 2016 remedial design report for the former West Nome Tank Farm Site at Nome, Alaska.

Samples were collected in June and August 2016. ALS Environmental (ALS) of Kelso, Washington provided analytical services. The samples types, grouped by matrix, are summarized in Table C-1.

Table C-1
Field Quality Control Sample Quantities

Method	Variable	Primary Samples	Field Duplicate Samples	MS/MSD Samples[1]
Soil Samples				
AK102	DRO	20	2	1
SW8260C	BTEX	20	2	1
SW8270SIM	PAH	20	2	1
Sediment Samples				
AK101	GRO	6	1	1
AK102	DRO	6	1	1
SW8260C	BTEX	6	1	1
SW8270SIM	PAH	6	1	1
Groundwater Samples				
AK102	DRO	2	1	1
SW8260C	BTEX	2	1	1
SW8270SIM	PAH	2	1	1
Pore Water Samples				
AK102	DRO	6	1	1
SW8260C	BTEX	6	1	1
SW8270SIM	PAH	6	1	1

Notes:
[1] An MS/MSD pair is counted as one sample.
For definitions, refer to the Acronyms and Abbreviations section.

The attachments to this DQA contain the sample summary table and analytical data tables (Attachment C-1), tables of sample results that did not meet the project data quality objectives (DQOs) (Attachment C-2), ADEC laboratory data review checklists (Attachment C-3), and laboratory deliverables (Attachment C-4).

1.1 QUALITY CONTROL CRITERIA

Jacobs Engineering Group Inc. (Jacobs) performed this DQA and completed ADEC laboratory data review checklists for records associated with the analytical data, as per the *West Nome Tank Farm Remedial Design Well Decommissioning, Well Installation and Sample Collection Work Plan* (U.S. Air Force [USAF] 2016). Data quality was evaluated against the following requirements: U.S. Department of Defense (DoD) Quality Systems Manual (QSM), version 5.0 (DoD 2013); ADEC and U.S. Environmental Protection Agency (EPA) analytical methods (ADEC 2009, 2014; EPA 2014); and laboratory limits.

The Jacobs project chemist performed a completeness check of the hardcopy and electronic data to verify that data packages and electronic files included all of the requested information. All analytical data were reviewed, including the chain-of-custody and sample receipt records, laboratory case narratives, and laboratory data. Analytical data were reviewed for methodology, sample holding times, laboratory blanks, limits of quantitation (LOQs), limits of detection (LODs), detection limits (DLs), surrogate recoveries, laboratory control sample (LCS) and LCS duplicate (LCSD) recoveries, matrix spike (MS) and MS duplicate (MSD) recoveries, and precision. Other quality control (QC) parameters (initial calibration, continuing calibration, tuning, internal standards, interference check solutions, post-digestion spikes, and serial dilutions) were reviewed on a limited basis. These QC parameters met acceptance criteria; any sample results outside QC parameters are listed in Section 1.2 or in the associated ADEC laboratory data review checklist (Attachment C-3). Analytical DQOs were considered met when the quality of the sample data met precision, accuracy, representativeness, completeness, comparability, and sensitivity requirements. The overall quality of the data was acceptable as qualified. Flagged data are considered usable but estimated.

No formal trend or bias analysis was conducted during the DQA. The data validation for this project focused on identifying exceedances of laboratory QC goals. While reviewing QC parameters, no significant bias or trend was noted.

The following data qualifiers are applicable to the report:

J The analyte was positively identified; however, the associated result was less than the LOQ but greater than or equal to the DL.

B The analyte was detected in the method blank or the trip blank above the DL, and the concentration in the sample did not exceed the blank concentration by a factor of 5.

JL- The result was an estimated value because the analyte failed recovery criteria in the LCS or LCSD sample, or both; results were biased low because the recovery was less than the lower control limit (LCL). The qualifier was applied to all sample results in the associated laboratory batch.

JD The result was qualified because the relative percent difference (RPD) between the primary sample and the field duplicate (FD) sample exceeded 30 percent for water, 50 percent for soil/sediment and/or the RPD between the MS and MSD exceeded the QC criteria. The qualifier was applied to the sample and FD, the parent sample for MS/MSD.

Qualification was not required in the following circumstances:

- Surrogate or MS/MSD recoveries were outside QC limits, and the sample was diluted by a factor of 5 or greater.
- MS/MSD recoveries were outside QC limits, and the spiked concentration was less than that of the parent sample.
- An analyte was detected in the method blank, but there was no detection in the sample.
- MS or LCS recoveries exceeded upper control limits (UCLs), and there was no detection in the sample(s).

1.2 DATA QUALITY SUMMARY

In general, the overall quality of project data was acceptable. All analytical results were 100 percent complete (no results were rejected), and for all parameters the completeness goal of 95 percent was met. Complete details of the evaluation and associated samples are provided in the ADEC laboratory review checklists (Attachment C-3). The tables in

Attachment C-2 include analytical results that did not meet project DQOs and required qualification.

The following anomalies were identified during the data review process as follows:

- Sample handling/preservation
- Method blank and trip blank contamination
- LCS accuracy and precision
- MS accuracy and precision
- FD precision

Sections 1.2.1 through 1.2.5 describe anomalies and their effects on data quality and usability.

1.2.1 Sample Handling/Preservation

Nine coolers were shipped to ALS over the course of the 2016 field effort. Sample temperatures of 4 ± 2 degrees Celsius (°C) were considered acceptable. Several coolers were received at the laboratory with a sample temperature below 2°C. The laboratory did not identify any frozen samples in any of the coolers received below the acceptable temperature range and no results were qualified.

1.2.2 Method Blank and Trip Blank Contamination

The work plan (USAF 2016) specified that method blank and trip blank contamination would be evaluated to one-half of the LOQ; however, all method blanks and trip blanks were evaluated to the DL. Sample results that were within five times of the concentration detected in the method blank and/or trip blank were qualified B. Results that were qualified B may be false positives or biased high.

The following analytes were detected above the DL in method blanks or trip blanks that resulted in the qualification of sample results:

- AK102: diesel-range organics (DRO)

- SW8260B: toluene
- SW8270SIM: acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzofuran, fluoranthene fluorene, indeno(1,2,3-cd)pyrene, naphthalene and pyrene

Data usability was minimally affected because all results that were qualified B were less than the project action limits, specified in Worksheet #15 in the work plan (USAF 2016).

Table C-2-1 (Attachment C-2) summarizes the sample results that were qualified due to method blank contamination and Table C-2-2 (Attachment C-2) summarizes the sample results that were qualified due to trip blank contamination. These tables also provide concentrations that were detected in the associated blanks.

1.2.3 Laboratory Control Sample Accuracy and Precision

The DRO LCS recovery for water batch KWG1605351 was less than the LCL of 75 percent at 69 percent recovery. The LCSD recovery was within criteria at 81 percent. DRO results for the samples associated with this extraction batch were qualified JL- and are considered biased low. The data quality for the groundwater samples, 16WNTF-MW36-GW, 16WNTF-MW36-GW-9, and 16WNTF-MW37-GW was minimally affected because the DRO results were greater than the project action limit (PAL) at 1.5 milligrams per liter. The remaining pore water samples were all significantly less than the PALs.

Table C-2-3 (Attachment C-2) provides a summary of the LCS and/or LCSD recovery outliers and the affected sample results.

The LCS/LCSD RPD was acceptable for all methods.

1.2.4 Matrix Spike Accuracy and Precision

MS/MSDs were collected to evaluate the accuracy and precision of matrix and/or laboratory procedures. Table C-1 provides a summary of the MS/MSD quantities, summarized by analytical method. The MS/MSD recoveries and RPDs for several analytes and analyses were

outside of the QC criteria. Sample results with MS/MSD recoveries that were outside of QC criteria were qualified as estimated except in the following cases: nondetect samples with high recoveries, samples where the spiked concentration was less than that of the parent sample, or samples with a dilution factor of 5 or greater. All MS/MSD recoveries were considered acceptable for this project.

Sample 16WNTF-SB08-06-SO MS/MSD RPD was outside of QC criteria (greater than 20 percent RPD) for 2-methylnaphthalene at 22 percent RPD. The sample result was flagged JD to indicate an estimated result due to MS/MSD precision outliers. The impact was minimal since the qualified parent sample result was detected below the PAL.

Table C-2-4 (Attachment C-2) provides a summary of the MS/MSD RPD outliers and the affected sample results.

1.2.5 Field Duplicate Precision

FDs were collected to evaluate the precision of matrix and/or laboratory procedures. Table C-1 provides a summary of the FD quantities, summarized by analytical method.

The frequency criterion of at least one FD per 10 primary samples was met for this project. FD precision was evaluated against the recommended RPD limit of 50 percent for soil and 30 percent for water, as stated in the ADEC laboratory data review checklists (ADEC 2009). RPD values for sample pair results, where one was nondetect and the other was detected, were calculated using the DL value for the nondetect result. Results were qualified as estimated (JD) in several samples, due to high FD RPD values. The high RPD values can likely be attributed to the sample matrix. The higher value between the sample and the FD will be used for reporting. Data usability was minimally affected because all results that were qualified JD were less than the PAL, with the exception of the sediment sample/duplicate 16WNTF-SP03-SD/16WNTF-SP03-SD-9 for polycyclic aromatic hydrocarbons (PAHs).

Table C-2-5 (Attachment C-2) provides a summary of sample results that were qualified JD, due to high FD RPD values.

1.3 CONCLUSION

In general, the overall quality of project data was acceptable. The completeness goal of 95 percent for all parameters was met; no sample results were rejected. All reported data were considered usable for this project; limitations are discussed in this DQA and ADEC laboratory data review checklists (Attachment C-3). The qualifications applied during data validation did not adversely affect data usability.

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2.0 REFERENCES

ADEC (Alaska Department of Environmental Conservation). 2009 (March). *Environmental Laboratory Data and Quality Assurance Requirements; Technical Memorandum.* Division of Spill Prevention and Response. Contaminated Sites Program.

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ATTACHMENT C-1

Sample Summary Table and Analytical Data Tables

Included with document PDF on CD

Table C-1-1
West Nome Tank Farm Sample Summary

COC SampleID	Location ID	Collection Date	Collection Time	Sampler	Qty	Container Type	Container Vol	Preservative	Matrix	Analytical Method Requested	QC Type	TAT	Notes	COC Number	Cooler Name	Cooler Date	Lab	SDG	Start Depth (feet)	End Depth (feet)
16WNTF-SB08-06-SO	SB08	18-Jun-16	1101	LA/CE	2	Amber Jar	4 oz	4C, MeOH	SO	SW8260	MS/MSD	30	BTEX	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	6.00	8.00
16WNTF-SB08-06-SO	SB08	18-Jun-16	1101	LA/CE	2	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM	MS/MSD	30	DRO, PAH	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	6.00	8.00
16WNTF-SB08-12-SO	SB08	18-Jun-16	1108	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	12.00	14.00
16WNTF-SB08-12-SO	SB08	18-Jun-16	1108	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	12.00	14.00
16WNTF-SB08-12-SO-9	SB08	18-Jun-16	1108	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260	DUP	30	BTEX	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	12.00	14.00
16WNTF-SB08-12-SO-9	SB08	18-Jun-16	1108	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM	DUP	30	DRO, PAH	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	12.00	14.00
16WNTF-SB07-08-SO	SB07	18-Jun-16	1208	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	8.00	10.00
16WNTF-SB07-08-SO	SB07	18-Jun-16	1208	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	8.00	10.00
16WNTF-SB07-10-SO	SB07	18-Jun-16	1211	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	10.00	12.00
16WNTF-SB07-10-SO	SB07	18-Jun-16	1211	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	10.00	12.00
16WNTF-SB06-06-SO	SB06	18-Jun-16	1242	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	6.00	8.00
16WNTF-SB06-06-SO	SB06	18-Jun-16	1242	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	6.00	8.00
16WNTF-SB06-08-SO	SB06	18-Jun-16	1245	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	8.00	10.00
16WNTF-SB06-08-SO	SB06	18-Jun-16	1245	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	8.00	10.00
16WNTF-SB05-08-SO	SB05	18-Jun-16	1317	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	8.00	10.00
16WNTF-SB05-08-SO	SB05	18-Jun-16	1317	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	8.00	10.00
16WNTF-SB05-10-SO	SB05	18-Jun-16	1321	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	10.00	12.00
16WNTF-SB05-10-SO	SB05	18-Jun-16	1321	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	10.00	12.00
16WNTF-MW36-12-SO	MW36	18-Jun-16	1613	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	12.00	14.00
16WNTF-MW36-12-SO	MW36	18-Jun-16	1613	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	12.00	14.00
16WNTF-MW36-14-SO	MW36	18-Jun-16	1617	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	14.00	15.00
16WNTF-MW36-14-SO	MW36	18-Jun-16	1617	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	14.00	15.00
16WNTF-TB01-SO	TB01SO	18-Jun-16	0900	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260	TB	30	BTEX	2016WNTF01	Fort Knox	22-Jun-16	ALS	K1606998	0.00	0.00
16WNTF-SB04-06-SO	SB04	19-Jun-16	1029	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	6.00	8.00
16WNTF-SB04-06-SO	SB04	19-Jun-16	1029	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	6.00	8.00
16WNTF-SB04-08-SO	SB04	19-Jun-16	1033	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	8.00	10.00
16WNTF-SB04-08-SO	SB04	19-Jun-16	1033	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	8.00	10.00
16WNTF-SB04-08-SO-9	SB04	19-Jun-16	1033	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260	DUP	30	BTEX	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	8.00	10.00
16WNTF-SB04-08-SO-9	SB04	19-Jun-16	1033	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM	DUP	30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	8.00	10.00
16WNTF-SB03-06-SO	SB03	19-Jun-16	1059	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	6.00	8.00
16WNTF-SB03-06-SO	SB03	19-Jun-16	1059	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	6.00	8.00
16WNTF-SB03-08-SO	SB03	19-Jun-16	1103	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	8.00	10.00
16WNTF-SB03-08-SO	SB03	19-Jun-16	1103	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	8.00	10.00
16WNTF-SB02-06-SO	SB02	19-Jun-16	1129	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	6.00	8.00
16WNTF-SB02-06-SO	SB02	19-Jun-16	1129	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	6.00	8.00
16WNTF-SB02-08-SO	SB02	19-Jun-16	1132	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	8.00	10.00
16WNTF-SB02-08-SO	SB02	19-Jun-16	1132	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	8.00	10.00
16WNTF-SB01-06-SO	SB01	19-Jun-16	1152	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	6.00	8.00
16WNTF-SB01-06-SO	SB01	19-Jun-16	1152	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	6.00	8.00
16WNTF-SB01-08-SO	SB01	19-Jun-16	1156	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	8.00	10.00
16WNTF-SB01-08-SO	SB01	19-Jun-16	1156	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	8.00	10.00
16WNTF-MW37-00-SO	MW37	19-Jun-16	1417	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	0.00	2.00
16WNTF-MW37-00-SO	MW37	19-Jun-16	1417	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	0.00	2.00
16WNTF-MW37-04-SO	MW37	19-Jun-16	1410	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260		30	BTEX	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	4.00	6.00
16WNTF-MW37-04-SO	MW37	19-Jun-16	1410	LA/CE	1	Amber Jar	8 oz	4C	SO	AK102, SW8270SIM		30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999	4.00	6.00
16WNTF-SP02-PW	SP02	20-Jun-16	1018	LA/CE	9	VOA Vial	40 mL	4C, HCl	PW	SW8260	MS/MSD	30	BTEX	2016WNTF06	Veladero	22-Jun-16	ALS	K1606928		
16WNTF-SP02-PW	SP02	20-Jun-16	1018	LA/CE	6	Amber	1 L	4C, HCl	PW	AK102	MS/MSD	30	DRO	2016WNTF03	Cortez	22-Jun-16	ALS	K1606928		
16WNTF-SP02-PW	SP02	20-Jun-16	1018	LA/CE	6	Amber	1 L	4C	PW	SW8270SIM	MS/MSD	30	PAH	2016WNTF04	Kensington	22-Jun-16	ALS	K1606928		
16WNTF-SP04-PW	SP04	21-Jun-16	0856	LA/CE	3	VOA Vial	40 mL	4C, HCl	PW	SW8260		30	BTEX	2016WNTF06	Veladero	22-Jun-16	ALS	K1606928		
16WNTF-SP04-PW	SP04	21-Jun-16	0856	LA/CE	2	Amber	1 L	4C, HCl	PW	AK102		30	DRO	2016WNTF03	Cortez	22-Jun-16	ALS	K1606928		
16WNTF-SP04-PW	SP04	21-Jun-16	0856	LA/CE	2	Amber	1 L	4C	PW	SW8270SIM		30	PAH	2016WNTF04	Kensington	22-Jun-16	ALS	K1606928		
16WNTF-SP04-PW-9	SP04	21-Jun-16	0856	LA/CE	3	VOA Vial	40 mL	4C, HCl	PW	SW8260	DUP	30	BTEX	2016WNTF06	Veladero	22-Jun-16	ALS	K1606928		
16WNTF-SP04-PW-9	SP04	21-Jun-16	0856	LA/CE	2	Amber	1 L	4C, HCl	PW	AK102	DUP	30	DRO	2016WNTF03	Cortez	22-Jun-16	ALS	K1606928		
16WNTF-SP04-PW-9	SP04	21-Jun-16	0856	LA/CE	2	Amber	1 L	4C	PW	SW8270SIM	DUP	30	PAH	2016WNTF04	Kensington	22-Jun-16	ALS	K1606928		
16WNTF-SP05-PW	SP05	21-Jun-16	0940	LA/CE	3	VOA Vial	40 mL	4C, HCl	PW	SW8260		30	BTEX	2016WNTF06	Veladero	22-Jun-16	ALS	K1606928		
16WNTF-SP05-PW	SP05	21-Jun-16	0940	LA/CE	2	Amber	1 L	4C, HCl	PW	AK102		30	DRO	2016WNTF05	Rock Creek	22-Jun-16	ALS	K1606928		
16WNTF-SP05-PW	SP05	21-Jun-16	0940	LA/CE	2	Amber	1 L	4C	PW	SW8270SIM		30	PAH	2016WNTF05	Rock Creek	22-Jun-16	ALS	K1606928		
16WNTF-SP06-PW	SP06	21-Jun-16	1023	LA/CE	3	VOA Vial	40 mL	4C, HCl	PW	SW8260		30	BTEX	2016WNTF06	Veladero	22-Jun-16	ALS	K1606928		
16WNTF-SP06-PW	SP06	21-Jun-16	1023	LA/CE	2	Amber	1 L	4C, HCl	PW	AK102		30	DRO	2016WNTF05	Rock Creek	22-Jun-16	ALS	K1606928		
16WNTF-SP06-PW	SP06	21-Jun-16	1023	LA/CE	2	Amber	1 L	4C	PW	SW8270SIM		30	PAH	2016WNTF05	Rock Creek	22-Jun-16	ALS	K1606928		
16WNTF-SP03-PW	SP03	21-Jun-16	1617	LA/CE	3	VOA Vial	40 mL	4C, HCl	PW	SW8260		30	BTEX	2016WNTF06	Veladero	22-Jun-16	ALS	K1606928		
16WNTF-SP03-PW	SP03	21-Jun-16	1617	LA/CE	1	Amber	1 L	4C, HCl	PW	AK102		30	DRO, Limited Volume	2016WNTF06	Veladero	22-Jun-16	ALS	K1606928		
16WNTF-SP03-PW	SP03	21-Jun-16	1617	LA/CE	2	Amber	1 L	4C	PW	SW8270SIM		30	PAH, Limited Volume Use full bottle first.	2016WNTF05	Rock Creek	22-Jun-16	ALS	K1606928		
16WNTF-SP01-PW	SP01	21-Jun-16	1617	LA/CE	3	VOA Vial	40 mL	4C, HCl	PW	SW8260		30	BTEX	2016WNTF06	Veladero	22-Jun-16	ALS	K1606928		
16WNTF-SP01-PW	SP01	21-Jun-16	1617	LA/CE	1	Amber	1 L	4C, HCl	PW	AK102		30	DRO, Limited Volume	2016WNTF06	Veladero	22-Jun-16	ALS	K1606928		
16WNTF-SP01-PW	SP01	21-Jun-16	1617	LA/CE	1	Amber	1 L	4C	PW	SW8270SIM		30	PAH, Limited Volume	2016WNTF06	Veladero	22-Jun-16	ALS	K1606928		
16WNTF-SP01-SD	SP01	21-Jun-16	1732	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SD	SW8260, ~~AK101~~		30	BTEX, ~~GRO~~	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999		
16WNTF-SP01-SD	SP01	21-Jun-16	1732	LA/CE	1	Amber Jar	8 oz	4C	SD	AK102, SW8270SIM		30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999		
16WNTF-SP02-SD	SP02	21-Jun-16	1632	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SD	SW8260, ~~AK101~~		30	BTEX, ~~GRO~~	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999		

Table C-1-1
West Nome Tank Farm Sample Summary

COC SampleID	Location ID	Collection Date	Collection Time	Sampler	Qty	Container Type	Container Vol	Preservative	Matrix	Analytical Method Requested	QC Type	TAT	Notes	COC Number	Cooler Name	Cooler Date	Lab	SDG	Start Depth (feet)	End Depth (feet)
16WNTF-SP02-SD	SP02	21-Jun-16	1632	LA/CE	1	Amber Jar	8 oz	4C	SD	AK102, SW8270SIM		30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999		
16WNTF-SP03-SD	SP03	21-Jun-16	1647	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SD	SW8260, ~~AK101~~		30	BTEX, ~~GRO~~	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999		
16WNTF-SP03-SD	SP03	21-Jun-16	1647	LA/CE	1	Amber Jar	8 oz	4C	SD	AK102, SW8270SIM		30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999		
16WNTF-SP03-SD-9	SP03	21-Jun-16	1647	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SD	SW8260, ~~AK101~~	DUP	30	BTEX, ~~GRO~~	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999		
16WNTF-SP03-SD-9	SP03	21-Jun-16	1647	LA/CE	1	Amber Jar	8 oz	4C	SD	AK102, SW8270SIM	DUP	30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999		
16WNTF-SP04-SD	SP04	21-Jun-16	1601	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SD	SW8260, ~~AK101~~		30	BTEX, ~~GRO~~	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999		
16WNTF-SP04-SD	SP04	21-Jun-16	1601	LA/CE	1	Amber Jar	8 oz	4C	SD	AK102, SW8270SIM		30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999		
16WNTF-SP05-SD	SP05	21-Jun-16	1551	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SD	SW8260, ~~AK101~~		30	BTEX, ~~GRO~~	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999		
16WNTF-SP05-SD	SP05	21-Jun-16	1551	LA/CE	1	Amber Jar	8 oz	4C	SD	AK102, SW8270SIM		30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999		
16WNTF-SP06-SD	SP06	21-Jun-16	1541	LA/CE	2	Amber Jar	4 oz	4C, MeOH	SD	SW8260, ~~AK101~~	MS/MSD	30	BTEX, ~~GRO~~	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999		
16WNTF-SP06-SD	SP06	21-Jun-16	1541	LA/CE	2	Amber Jar	8 oz	4C	SD	AK102, SW8270SIM	MS/MSD	30	DRO, PAH	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999		
16WNTF-MW36-GW	MW36	22-Jun-16	1003	LA/CE	9	VOA Vial	40 mL	4C, HCl	GW	SW8260	MS/MSD	30	BTEX	2016WNTF06	Veladero	22-Jun-16	ALS	K1606928		
16WNTF-MW36-GW	MW36	22-Jun-16	1003	LA/CE	4	Amber	1 L	4C, HCl	GW	AK102	MS/MSD	30	DRO, Limited Volume	2016WNTF07	Nixon Fork	22-Jun-16	ALS	K1606928		
16WNTF-MW36-GW	MW36	22-Jun-16	1003	LA/CE	6	Amber	1 L	4C	GW	SW8270SIM	MS/MSD	30	PAH	2016WNTF08	Kalgoorlie	22-Jun-16	ALS	K1606928		
16WNTF-MW36-GW-9	MW36	22-Jun-16	1003	LA/CE	3	VOA Vial	40 mL	4C, HCl	GW	SW8260	DUP	30	BTEX	2016WNTF06	Veladero	22-Jun-16	ALS	K1606928		
16WNTF-MW36-GW-9	MW36	22-Jun-16	1003	LA/CE	2	Amber	1 L	4C, HCl	GW	AK102	DUP	30	DRO	2016WNTF07	Nixon Fork	22-Jun-16	ALS	K1606928		
16WNTF-MW36-GW-9	MW36	22-Jun-16	1003	LA/CE	2	Amber	1 L	4C	GW	SW8270SIM	DUP	30	PAH	2016WNTF08	Kalgoorlie	22-Jun-16	ALS	K1606928		
16WNTF-MW37-GW	MW37	22-Jun-16	1656	LA/CE	3	VOA Vial	40 mL	4C, HCl	GW	SW8260		30	BTEX	2016WNTF06	Veladero	22-Jun-16	ALS	K1606928		
16WNTF-MW37-GW	MW37	22-Jun-16	1656	LA/CE	2	Amber	1 L	4C, HCl	GW	AK102		30	DRO	2016WNTF07	Nixon Fork	22-Jun-16	ALS	K1606928		
16WNTF-MW37-GW	MW37	22-Jun-16	1656	LA/CE	2	Amber	1 L	4C	GW	SW8270SIM		30	PAH	2016WNTF08	Kalgoorlie	22-Jun-16	ALS	K1606928		
16WNTF-TB02-SO	TB02SO	19-Jun-16	0900	LA/CE	1	Amber Jar	4 oz	4C, MeOH	SO	SW8260, ~~AK101~~	TB	30	BTEX, ~~GRO~~	2016WNTF02	Pogo	22-Jun-16	ALS	K1606999		
16WNTF-TB03-GW	TB03W	20-Jun-16	0900	LA/CE	3	VOA Vial	40 mL	4C, HCl	GW	SW8260	TB	30	BTEX	2016WNTF06	Veladero	22-Jun-16	ALS	K1606928		
16WNTF-SP01-SD	SP01	26-Aug-16	1317	BR/CE	1	Amber Jar	4 oz	4C, MeOH	SD	AK101		3	GRO	2016WNTF09	Muruntau	26-Aug-16	ALS	K1610186		
16WNTF-SP01-SD	SP01	26-Aug-16	1317	BR/CE	1	Amber Jar	2 oz	4C	SD	160.3		3	Percent Moisture	2016WNTF09	Muruntau	26-Aug-16	ALS	K1610186		
16WNTF-SP02-SD	SP02	26-Aug-16	1323	BR/CE	1	Amber Jar	4 oz	4C, MeOH	SD	AK101		3	GRO	2016WNTF09	Muruntau	26-Aug-16	ALS	K1610186		
16WNTF-SP02-SD	SP02	26-Aug-16	1323	BR/CE	1	Amber Jar	2 oz	4C	SD	160.3		3	Percent Moisture	2016WNTF09	Muruntau	26-Aug-16	ALS	K1610186		
16WNTF-SP02-SD-9	SP02	26-Aug-16	1323	BR/CE	1	Amber Jar	4 oz	4C, MeOH	SD	AK101		3	GRO	2016WNTF09	Muruntau	26-Aug-16	ALS	K1610186		
16WNTF-SP02-SD-9	SP02	26-Aug-16	1323	BR/CE	1	Amber Jar	2 oz	4C	SD	160.3		3	Percent Moisture	2016WNTF09	Muruntau	26-Aug-16	ALS	K1610186		
16WNTF-SP03-SD	SP03	26-Aug-16	1331	BR/CE	2	Amber Jar	4 oz	4C, MeOH	SD	AK101	MS/MSD	3	GRO	2016WNTF09	Muruntau	26-Aug-16	ALS	K1610186		
16WNTF-SP03-SD	SP03	26-Aug-16	1331	BR/CE	2	Amber Jar	2 oz	4C	SD	160.3	MS/MSD	3	Percent Moisture	2016WNTF09	Muruntau	26-Aug-16	ALS	K1610186		
16WNTF-SP04-SD	SP04	26-Aug-16	1340	BR/CE	1	Amber Jar	4 oz	4C, MeOH	SD	AK101		3	GRO	2016WNTF09	Muruntau	26-Aug-16	ALS	K1610186		
16WNTF-SP04-SD	SP04	26-Aug-16	1340	BR/CE	1	Amber Jar	2 oz	4C	SD	160.3		3	Percent Moisture	2016WNTF09	Muruntau	26-Aug-16	ALS	K1610186		
16WNTF-SP05-SD	SP05	26-Aug-16	1346	BR/CE	1	Amber Jar	4 oz	4C, MeOH	SD	AK101		3	GRO	2016WNTF09	Muruntau	26-Aug-16	ALS	K1610186		
16WNTF-SP05-SD	SP05	26-Aug-16	1346	BR/CE	1	Amber Jar	2 oz	4C	SD	160.3		3	Percent Moisture	2016WNTF09	Muruntau	26-Aug-16	ALS	K1610186		
16WNTF-SP06-SD	SP06	26-Aug-16	1352	BR/CE	1	Amber Jar	4 oz	4C, MeOH	SD	AK101		3	GRO	2016WNTF09	Muruntau	26-Aug-16	ALS	K1610186		
16WNTF-SP06-SD	SP06	26-Aug-16	1352	BR/CE	1	Amber Jar	2 oz	4C	SD	160.3		3	Percent Moisture	2016WNTF09	Muruntau	26-Aug-16	ALS	K1610186		
16WNTF-TB03-SO	TB03S	26-Aug-16	1000	BR/CE	1	Amber Jar	4 oz	4C, MeOH	SD	AK101		3	GRO	2016WNTF09	Muruntau	26-Aug-16	ALS	K1610186		

Table C-1-2
WNTF Soil Results

			Location ID	MW36	MW36	MW37	MW37
			Sample ID	16WNTF-MW36-12-SO	16WNTF-MW36-14-SO	16WNTF-MW37-00-SO	16WNTF-MW37-04-SO
			Lab Sample ID	K160699810	K160699811	K160699910	K160699911
			SDG	K1606998	K1606998	K1606999	K1606999
			Collection Date	6/18/2016	6/18/2016	6/19/2016	6/19/2016
			Matrix	SO	SO	SO	SO
			Laboratory	ALGK	ALGK	ALGK	ALGK
			QA/QC	Primary	Primary	Primary	Primary
Method	**Analyte**	**Units**	**Project Action Limit[1]**				
E160.3M	Total Solids	PERCENT	-	95	83.2	93	87
AK101	Gasoline Range Organics (C6-C10)	mg/kg	1400*	-	-	-	-
AK102	Diesel Range Organics (C10-C25)	mg/kg	10250*	6.6 [21] J, B	190 [24]	910 [22]	89 [23]
SW8260C	Benzene	mg/kg	0.27*	ND [0.056]	ND [0.049]	ND [0.028]	ND [0.035]
SW8260C	Ethylbenzene	mg/kg	49	ND [0.056]	ND [0.049]	ND [0.028]	ND [0.035]
SW8260C	o-Xylene	mg/kg	57	ND [0.056]	ND [0.049]	ND [0.028]	ND [0.035]
SW8260C	Toluene	mg/kg		ND [0.056]	ND [0.049]	ND [0.028]	ND [0.035]
SW8260C	Xylene, Isomers m & p	mg/kg	57	ND [0.056]	ND [0.049]	ND [0.028]	ND [0.035]
8270SIM	1-Methylnaphthalene	mg/kg	68	0.046 [0.0035]	0.016 [0.004]	0.011 [0.0035]	0.0061 [0.0038]
8270SIM	2-Methylnaphthalene	mg/kg	310	0.11 [0.0035]	0.0061 [0.004]	0.018 [0.0035]	0.0092 [0.0038]
8270SIM	Acenaphthene	mg/kg	4600	ND [0.0035]	0.001 [0.004] J	0.0045 [0.0035]	ND [0.0038]
8270SIM	Acenaphthylene	mg/kg	2300	0.0009 [0.0035] J, B	ND [0.004]	0.003 [0.0035] J	ND [0.0038]
8270SIM	Anthracene	mg/kg	23000	ND [0.0035]	0.001 [0.004] J, B	0.01 [0.0035]	0.0009 [0.0038] J
8270SIM	Benzo(a)anthracene	mg/kg	2	0.0014 [0.0035] J, B	0.0029 [0.004] J, B	0.023 [0.0035]	0.002 [0.0038] J
8270SIM	Benzo(a)pyrene	mg/kg	0.2	0.0025 [0.0035] J, B	0.014 [0.004]	0.025 [0.0035]	0.0017 [0.0038] J
8270SIM	Benzo(b)fluoranthene	mg/kg	2	0.003 [0.0035] J, B	0.0049 [0.004] B	0.044 [0.0035]	0.002 [0.0038] J
8270SIM	Benzo(g,h,i)perylene	mg/kg	2300	0.0014 [0.0035] J, B	0.0023 [0.004] J, B	0.017 [0.0035]	0.0018 [0.0038] J
8270SIM	Benzo(k)fluoranthene	mg/kg	20	0.00089 [0.0035] J	0.0013 [0.004] J	0.014 [0.0035]	ND [0.0038]
8270SIM	Chrysene	mg/kg	200	0.0016 [0.0035] J, B	0.0044 [0.004] B	0.035 [0.0035]	0.0025 [0.0038] J
8270SIM	Dibenzo(a,h)anthracene	mg/kg	0.2	ND [0.0035]	ND [0.004]	0.0053 [0.0035]	ND [0.0038]
8270SIM	Dibenzofuran	mg/kg	95	0.00086 [0.0035] J, B	0.0012 [0.004] J, B	-	-
8270SIM	Fluoranthene	mg/kg	3100	0.0029 [0.0035] J, B	0.0073 [0.004]	0.039 [0.0035]	0.003 [0.0038] J
8270SIM	Fluorene	mg/kg	3100	0.001 [0.0035] J, B	0.0023 [0.004] J, B	0.01 [0.0035]	0.001 [0.0038] J
8270SIM	Indeno(1,2,3-cd)pyrene	mg/kg	2	0.0017 [0.0035] J	0.0025 [0.004] J	0.018 [0.0035]	0.0014 [0.0038] J
8270SIM	Naphthalene	mg/kg	29	0.082 [0.0035]	0.0027 [0.004] J, B	0.018 [0.0035]	0.0053 [0.0038]
8270SIM	Phenanthrene	mg/kg	2300	0.003 [0.0035] J	0.0068 [0.004]	0.047 [0.0035]	0.0052 [0.0038]
8270SIM	Pyrene	mg/kg	2300	0.0035 [0.0035] B	0.008 [0.004]	0.11 [0.0035]	0.0052 [0.0038]

Notes:

[1] 18 AAC 75 Table B1. Method Two, Over 40-inch zone human health (ADEC 2016).

* Criteria from WNTF QAPP (USAF 2016)

– = not analyzed

[ ] = limit of detection

Bold = The result exceeds the project action limit.

mg/kg = milligrams per kilogram

ND = nondetect

SDG = sample delivery group

SD = sediment

SO = soil

ALGK = ALS Environmental of Kelso, WA.

QA/QC = quality assurance / quality control

For data qualifier definitions, refer to the Data Quality Assessment.

Table C-1-2
WNTF Soil Results

			Location ID	SB01	SB01	SB02	SB02
			Sample ID	16WNTF-SB01-06-SO	16WNTF-SB01-08-SO	16WNTF-SB02-06-SO	16WNTF-SB02-08-SO
			Lab Sample ID	K160699908	K160699909	K160699906	K160699907
			SDG	K1606999	K1606999	K1606999	K1606999
			Collection Date	6/19/2016	6/19/2016	6/19/2016	6/19/2016
			Matrix	SO	SO	SO	SO
			Laboratory	ALGK	ALGK	ALGK	ALGK
			QA/QC	Primary	Primary	Primary	Primary
Method	**Analyte**	**Units**	**Project Action Limit[1]**				
E160.3M	Total Solids	PERCENT	-	78.6	82.5	80.5	71.9
AK101	Gasoline Range Organics (C6-C10)	mg/kg	1400*	-	-	-	-
AK102	Diesel Range Organics (C10-C25)	mg/kg	10250*	**19000 [50]**	**14000 [48]**	**33000 [49]**	**42000 [55]**
SW8260C	Benzene	mg/kg	0.27*	ND [0.049]	ND [0.039]	ND [0.038]	ND [0.053]
SW8260C	Ethylbenzene	mg/kg	49	0.21 [0.13]	0.14 [0.098]	1.1 [0.038]	2.3 [0.11]
SW8260C	o-Xylene	mg/kg	57	0.056 [0.13] J	0.035 [0.098] J	0.044 [0.038]	0.071 [0.11] J
SW8260C	Toluene	mg/kg		ND [0.049]	ND [0.039]	ND [0.038]	0.0063 [0.053] J
SW8260C	Xylene, Isomers m & p	mg/kg	57	0.71 [0.13]	0.42 [0.098]	3.5 [0.038]	7.5 [0.11]
8270SIM	1-Methylnaphthalene	mg/kg	68	40 [0.21]	36 [0.2]	**81 [1.1]**	**89 [1.2]**
8270SIM	2-Methylnaphthalene	mg/kg	310	50 [0.21]	37 [0.2]	120 [1.1]	130 [1.2]
8270SIM	Acenaphthene	mg/kg	4600	0.98 [0.21]	1 [0.2]	2.1 [1.1]	2.3 [1.2]
8270SIM	Acenaphthylene	mg/kg	2300	ND [0.45]	ND [0.55]	ND [1.2]	ND [1.5]
8270SIM	Anthracene	mg/kg	23000	0.52 [0.021]	0.41 [0.02]	0.98 [1.1] J	1.2 [1.2]
8270SIM	Benzo(a)anthracene	mg/kg	2	0.017 [0.021] J	0.02 [0.02]	0.015 [0.021] J	0.014 [0.023] J
8270SIM	Benzo(a)pyrene	mg/kg	0.2	0.012 [0.021] J	0.014 [0.02] J	0.0078 [0.021] J	0.0065 [0.023] J
8270SIM	Benzo(b)fluoranthene	mg/kg	2	0.013 [0.021] J	0.012 [0.02] J	0.013 [0.021] J	0.0091 [0.023] J
8270SIM	Benzo(g,h,i)perylene	mg/kg	2300	0.007 [0.021] J	0.0059 [0.02] J	0.0067 [0.021] J	0.0043 [0.023] J
8270SIM	Benzo(k)fluoranthene	mg/kg	20	ND [0.021]	ND [0.02]	ND [0.021]	ND [0.023]
8270SIM	Chrysene	mg/kg	200	0.024 [0.021]	0.027 [0.02]	0.04 [0.021]	0.023 [0.023]
8270SIM	Dibenzo(a,h)anthracene	mg/kg	0.2	ND [0.021]	ND [0.02]	ND [0.021]	ND [0.023]
8270SIM	Dibenzofuran	mg/kg	95	-	-	-	-
8270SIM	Fluoranthene	mg/kg	3100	0.067 [0.021]	0.055 [0.02]	ND [1.1]	ND [1.2]
8270SIM	Fluorene	mg/kg	3100	3.8 [0.21]	3.2 [0.2]	7.4 [1.1]	7.3 [1.2]
8270SIM	Indeno(1,2,3-cd)pyrene	mg/kg	2	0.0054 [0.021] J	0.0056 [0.02] J	0.0058 [0.021] J	ND [0.023]
8270SIM	Naphthalene	mg/kg	29	10 [0.21]	7.6 [0.2]	**36 [1.1]**	**38 [1.2]**
8270SIM	Phenanthrene	mg/kg	2300	1.9 [0.021]	2.2 [0.02]	5 [1.1]	5.1 [1.2]
8270SIM	Pyrene	mg/kg	2300	0.077 [0.021]	0.09 [0.02]	0.14 [0.021]	0.15 [0.023]

Notes:

[1] 18 AAC 75 Table B1. Method Two, Over 40-inch zone human health (ADEC 2016).

* Criteria from WNTF QAPP (USAF 2016)

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Bold = The result exceeds the project action limit.

mg/kg = milligrams per kilogram

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SD = sediment

SO = soil

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QA/QC = quality assurance / quality control

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Table C-1-2
WNTF Soil Results

			Location ID	SB03	SB03	SB04	SB04
			Sample ID	16WNTF-SB03-06-SO	16WNTF-SB03-08-SO	16WNTF-SB04-06-SO	16WNTF-SB04-08-SO
			Lab Sample ID	K160699904	K160699905	K160699901	K160699902
			SDG	K1606999	K1606999	K1606999	K1606999
			Collection Date	6/19/2016	6/19/2016	6/19/2016	6/19/2016
			Matrix	SO	SO	SO	SO
			Laboratory	ALGK	ALGK	ALGK	ALGK
			QA/QC	Primary	Primary	Primary	Primary
Method	**Analyte**	**Units**	**Project Action Limit[1]**				
E160.3M	Total Solids	PERCENT	-	79.3	80.5	75.3	79.5
AK101	Gasoline Range Organics (C6-C10)	mg/kg	1400*	-	-	-	-
AK102	Diesel Range Organics (C10-C25)	mg/kg	10250*	**11000 [51]**	**13000 [50]**	**18000 [52]**	9800 [50]
SW8260C	Benzene	mg/kg	0.27*	ND [0.042]	ND [0.065]	ND [0.075]	ND [0.095]
SW8260C	Ethylbenzene	mg/kg	49	0.044 [0.11] J	0.8 [0.13]	0.6 [0.19]	1.4 [0.24]
SW8260C	o-Xylene	mg/kg	57	0.017 [0.11] J	0.028 [0.13] J	0.2 [0.19]	0.061 [0.24] J
SW8260C	Toluene	mg/kg		ND [0.042]	ND [0.065]	ND [0.075]	ND [0.095]
SW8260C	Xylene, Isomers m & p	mg/kg	57	0.31 [0.11]	1.9 [0.13]	2.6 [0.19]	4.6 [0.24]
8270SIM	1-Methylnaphthalene	mg/kg	68	31 [0.21]	25 [0.21]	47 [1.1]	23 [0.21]
8270SIM	2-Methylnaphthalene	mg/kg	310	37 [0.21]	35 [0.21]	66 [1.1]	33 [0.21]
8270SIM	Acenaphthene	mg/kg	4600	0.86 [0.21]	0.76 [0.21]	1.3 [1.1]	0.71 [0.21]
8270SIM	Acenaphthylene	mg/kg	2300	ND [0.44]	ND [0.44]	ND [1.3]	ND [0.43]
8270SIM	Anthracene	mg/kg	23000	0.27 [0.021]	0.37 [0.021]	0.55 [0.022]	0.28 [0.021]
8270SIM	Benzo(a)anthracene	mg/kg	2	0.011 [0.021] J	0.0079 [0.021] J	0.014 [0.022] J	0.007 [0.021] J
8270SIM	Benzo(a)pyrene	mg/kg	0.2	0.0055 [0.021] J	ND [0.021]	0.0087 [0.022] J	ND [0.021]
8270SIM	Benzo(b)fluoranthene	mg/kg	2	0.0093 [0.021] J	0.0049 [0.021] J	0.0094 [0.022] J	ND [0.021]
8270SIM	Benzo(g,h,i)perylene	mg/kg	2300	0.0046 [0.021] J	ND [0.021]	0.0055 [0.022] J	ND [0.021]
8270SIM	Benzo(k)fluoranthene	mg/kg	20	ND [0.021]	ND [0.021]	ND [0.022]	ND [0.021]
8270SIM	Chrysene	mg/kg	200	0.022 [0.021]	0.0083 [0.021] J	0.014 [0.022] J	0.0062 [0.021] J
8270SIM	Dibenzo(a,h)anthracene	mg/kg	0.2	ND [0.021]	ND [0.021]	ND [0.022]	ND [0.021]
8270SIM	Dibenzofuran	mg/kg	95	-	-	-	-
8270SIM	Fluoranthene	mg/kg	3100	0.048 [0.021]	0.03 [0.021]	0.052 [0.022]	0.027 [0.021]
8270SIM	Fluorene	mg/kg	3100	2.7 [0.21]	1.9 [0.21]	3.8 [1.1]	1.9 [0.21]
8270SIM	Indeno(1,2,3-cd)pyrene	mg/kg	2	0.0045 [0.021] J	ND [0.021]	0.0049 [0.022] J	ND [0.021]
8270SIM	Naphthalene	mg/kg	29	6.4 [0.21]	11 [0.21]	13 [1.1]	8.2 [0.21]
8270SIM	Phenanthrene	mg/kg	2300	1.8 [0.021]	1.4 [0.021]	2.5 [0.022]	1.4 [0.021]
8270SIM	Pyrene	mg/kg	2300	0.06 [0.021]	0.054 [0.021]	0.084 [0.022]	0.042 [0.021]

Notes:

[1] 18 AAC 75 Table B1. Method Two, Over 40-inch zone human health (ADEC 2016).

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– = not analyzed

[ ] = limit of detection

Bold = The result exceeds the project action limit.

mg/kg = milligrams per kilogram

ND = nondetect

SDG = sample delivery group

SD = sediment

SO = soil

ALGK = ALS Environmental of Kelso, WA.

QA/QC = quality assurance / quality control

For data qualifier definitions, refer to the Data Quality Assessment.

Table C-1-2
WNTF Soil Results

			Location ID	SB04	SB05	SB05	SB06
			Sample ID	16WNTF-SB04-08-SO-9	16WNTF-SB05-08-SO	16WNTF-SB05-10-SO	16WNTF-SB06-06-SO
			Lab Sample ID	K160699903	K160699808	K160699809	K160699806
			SDG	K1606999	K1606998	K1606998	K1606998
			Collection Date	6/19/2016	6/18/2016	6/18/2016	6/18/2016
			Matrix	SO	SO	SO	SO
			Laboratory	ALGK	ALGK	ALGK	ALGK
			QA/QC	Duplicate	Primary	Primary	Primary
Method	**Analyte**	**Units**	**Project Action Limit[1]**				
E160.3M	Total Solids	PERCENT	-	79.2	96.1	82.3	97.4
AK101	Gasoline Range Organics (C6-C10)	mg/kg	1400*	-	-	-	-
AK102	Diesel Range Organics (C10-C25)	mg/kg	10250*	8000 [50]	3100 [21]	**14000 [48]**	5800 [21]
SW8260C	Benzene	mg/kg	0.27*	ND [0.076]	ND [0.03]	ND [0.057]	ND [0.041]
SW8260C	Ethylbenzene	mg/kg	49	2 [0.38]	ND [0.074]	ND [0.15]	ND [0.041]
SW8260C	o-Xylene	mg/kg	57	0.083 [0.38] J	ND [0.074]	ND [0.15]	ND [0.041]
SW8260C	Toluene	mg/kg		ND [0.076]	ND [0.03]	ND [0.057]	ND [0.041]
SW8260C	Xylene, Isomers m & p	mg/kg	57	6 [0.38]	ND [0.074]	0.045 [0.15] J	0.017 [0.041] J
8270SIM	1-Methylnaphthalene	mg/kg	68	25 [0.21]	0.74 [0.017]	15 [0.099]	2 [0.017]
8270SIM	2-Methylnaphthalene	mg/kg	310	36 [0.21]	0.088 [0.017]	10 [0.099]	0.37 [0.017]
8270SIM	Acenaphthene	mg/kg	4600	0.77 [0.21]	ND [0.017]	0.39 [0.02]	0.19 [0.017]
8270SIM	Acenaphthylene	mg/kg	2300	ND [0.45]	0.098 [0.017]	0.27 [0.02]	0.1 [0.017]
8270SIM	Anthracene	mg/kg	23000	0.28 [0.021]	0.012 [0.0034]	0.48 [0.004]	ND [0.017]
8270SIM	Benzo(a)anthracene	mg/kg	2	0.0063 [0.021] J	0.02 [0.0034]	0.022 [0.004]	0.0064 [0.0034]
8270SIM	Benzo(a)pyrene	mg/kg	0.2	ND [0.021]	0.02 [0.0034]	0.019 [0.004]	0.0051 [0.0034] B
8270SIM	Benzo(b)fluoranthene	mg/kg	2	ND [0.021]	0.024 [0.0034]	0.027 [0.004]	0.0073 [0.0034]
8270SIM	Benzo(g,h,i)perylene	mg/kg	2300	ND [0.021]	0.017 [0.0034]	0.01 [0.004]	0.0011 [0.0034] J, B
8270SIM	Benzo(k)fluoranthene	mg/kg	20	ND [0.021]	0.0096 [0.0034]	0.0087 [0.004]	0.002 [0.0034] J
8270SIM	Chrysene	mg/kg	200	0.0072 [0.021] J	0.029 [0.0034]	0.045 [0.004]	0.0088 [0.0034]
8270SIM	Dibenzo(a,h)anthracene	mg/kg	0.2	ND [0.021]	0.0026 [0.0034] J	0.0023 [0.004] J	ND [0.0034]
8270SIM	Dibenzofuran	mg/kg	95	-	0.09 [0.017]	0.49 [0.02]	0.084 [0.017]
8270SIM	Fluoranthene	mg/kg	3100	0.027 [0.021]	0.058 [0.0034]	0.09 [0.004]	0.044 [0.017]
8270SIM	Fluorene	mg/kg	3100	2.1 [0.21]	0.066 [0.017]	1.5 [0.02]	0.26 [0.017]
8270SIM	Indeno(1,2,3-cd)pyrene	mg/kg	2	ND [0.021]	0.018 [0.0034]	0.01 [0.004]	0.0013 [0.0034] J
8270SIM	Naphthalene	mg/kg	29	8.8 [0.21]	0.16 [0.017]	2.1 [0.02]	0.43 [0.017]
8270SIM	Phenanthrene	mg/kg	2300	1.5 [0.021]	0.1 [0.0034]	1.3 [0.004]	0.14 [0.017]
8270SIM	Pyrene	mg/kg	2300	0.048 [0.021]	0.064 [0.0034]	0.12 [0.004]	0.055 [0.0034]

Notes:

[1] 18 AAC 75 Table B1. Method Two, Over 40-inch zone human health (ADEC 2016).

* Criteria from WNTF QAPP (USAF 2016)

– = not analyzed

[ ] = limit of detection

Bold = The result exceeds the project action limit.

mg/kg = milligrams per kilogram

ND = nondetect

SDG = sample delivery group

SD = sediment

SO = soil

ALGK = ALS Environmental of Kelso, WA.

QA/QC = quality assurance / quality control

For data qualifier definitions, refer to the Data Quality Assessment.

Table C-1-2
WNTF Soil Results

			Location ID	SB06	SB07	SB07	SB08
			Sample ID	16WNTF-SB06-08-SO	16WNTF-SB07-08-SO	16WNTF-SB07-10-SO	16WNTF-SB08-06-SO
			Lab Sample ID	K160699807	K160699804	K160699805	K160699801
			SDG	K1606998	K1606998	K1606998	K1606998
			Collection Date	6/18/2016	6/18/2016	6/18/2016	6/18/2016
			Matrix	SO	SO	SO	SO
			Laboratory	ALGK	ALGK	ALGK	ALGK
			QA/QC	Primary	Primary	Primary	Primary
Method	**Analyte**	**Units**	**Project Action Limit[1]**				
E160.3M	Total Solids	PERCENT	-	91.1	95.6	81.7	92.9
AK101	Gasoline Range Organics (C6-C10)	mg/kg	1400*	-	-	-	-
AK102	Diesel Range Organics (C10-C25)	mg/kg	10250*	5000 [43]	820 [21]	**18000 [49]**	430 [22]
SW8260C	Benzene	mg/kg	0.27*	ND [0.034]	ND [0.05]	ND [0.079]	ND [0.046]
SW8260C	Ethylbenzene	mg/kg	49	0.015 [0.085] J	0.006 [0.05] J	1.4 [0.2]	0.0072 [0.046] J
SW8260C	o-Xylene	mg/kg	57	ND [0.085]	ND [0.05]	0.059 [0.2] J	ND [0.046]
SW8260C	Toluene	mg/kg		ND [0.034]	ND [0.05]	0.017 [0.079] J, B	0.0063 [0.046] J, B
SW8260C	Xylene, Isomers m & p	mg/kg	57	0.056 [0.085] J	0.016 [0.05] J	6.2 [0.2]	ND [0.046]
8270SIM	1-Methylnaphthalene	mg/kg	68	12 [0.089]	0.03 [0.017]	45 [0.4]	0.77 [0.0036]
8270SIM	2-Methylnaphthalene	mg/kg	310	6.5 [0.018]	0.027 [0.017]	64 [0.4]	0.51 [0.0036] JD
8270SIM	Acenaphthene	mg/kg	4600	0.37 [0.018]	ND [0.017]	1.3 [0.4]	0.022 [0.0036]
8270SIM	Acenaphthylene	mg/kg	2300	0.29 [0.018]	0.013 [0.017] J	ND [1.1]	ND [0.024]
8270SIM	Anthracene	mg/kg	23000	ND [0.018]	ND [0.017]	0.32 [0.02]	0.0062 [0.0036]
8270SIM	Benzo(a)anthracene	mg/kg	2	0.0081 [0.018] J	0.0022 [0.0034] J, B	0.026 [0.02]	0.0068 [0.0036]
8270SIM	Benzo(a)pyrene	mg/kg	0.2	0.0034 [0.0036] J, B	0.0014 [0.0034] J, B	0.022 [0.004]	0.0089 [0.0036]
8270SIM	Benzo(b)fluoranthene	mg/kg	2	0.006 [0.0036]	0.0022 [0.0034] J, B	0.023 [0.004]	0.0071 [0.0036]
8270SIM	Benzo(g,h,i)perylene	mg/kg	2300	0.0016 [0.0036] J, B	0.00095 [0.0034] J, B	0.0099 [0.004]	0.0053 [0.0036] B
8270SIM	Benzo(k)fluoranthene	mg/kg	20	0.0017 [0.0036] J	ND [0.0034]	0.0083 [0.004]	0.0031 [0.0036] J
8270SIM	Chrysene	mg/kg	200	0.015 [0.018] J	0.0027 [0.0034] J, B	0.046 [0.02]	0.0091 [0.0036]
8270SIM	Dibenzo(a,h)anthracene	mg/kg	0.2	ND [0.0036]	ND [0.0034]	0.0025 [0.004] J	0.0013 [0.0036] J
8270SIM	Dibenzofuran	mg/kg	95	0.35 [0.018]	0.018 [0.017]	1.4 [0.4]	0.039 [0.0036]
8270SIM	Fluoranthene	mg/kg	3100	0.046 [0.018]	0.0094 [0.017] J	0.12 [0.02]	0.015 [0.0036]
8270SIM	Fluorene	mg/kg	3100	0.96 [0.018]	ND [0.017]	2.8 [0.4]	0.11 [0.0036]
8270SIM	Indeno(1,2,3-cd)pyrene	mg/kg	2	0.0015 [0.0036] J	ND [0.0034]	0.0097 [0.004]	0.0043 [0.0036]
8270SIM	Naphthalene	mg/kg	29	1.3 [0.018]	0.024 [0.017]	16 [0.4]	0.054 [0.0036]
8270SIM	Phenanthrene	mg/kg	2300	0.78 [0.018]	ND [0.017]	2.1 [0.02]	0.084 [0.0036]
8270SIM	Pyrene	mg/kg	2300	0.038 [0.018]	0.0096 [0.0034]	0.1 [0.02]	0.019 [0.0036]

Notes:

[1] 18 AAC 75 Table B1. Method Two, Over 40-inch zone human health (ADEC 2016).

* Criteria from WNTF QAPP (USAF 2016)

– = not analyzed

[ ] = limit of detection

Bold = The result exceeds the project action limit.

mg/kg = milligrams per kilogram

ND = nondetect

SDG = sample delivery group

SD = sediment

SO = soil

ALGK = ALS Environmental of Kelso, WA.

QA/QC = quality assurance / quality control

For data qualifier definitions, refer to the Data Quality Assessment.

Table C-1-2
WNTF Soil Results

			Location ID	SB08	SB08	TB01	TB02	TB03S
			Sample ID	16WNTF-SB08-12-SO	16WNTF-SB08-12-SO-9	16WNTF-TB01-SO	16WNTF-TB02-SO	16WNTF-TB03-SO
			Lab Sample ID	K160699802	K160699803	K160699812	K160699919	K161018608
			SDG	K1606998	K1606998	K1606998	K1606999	K1610186
			Collection Date	6/18/2016	6/18/2016	6/18/2016	6/19/2016	8/26/2016
			Matrix	SO	SO	SO	SO	SO
			Laboratory	ALGK	ALGK	ALGK	ALGK	ALGK
			QA/QC	Primary	Duplicate	Trip Blank	Trip Blank	Trip Blank
Method	**Analyte**	**Units**	**Project Action Limit[1]**					
E160.3M	Total Solids	PERCENT	-	62.5	66.2	-	-	-
AK101	Gasoline Range Organics (C6-C10)	mg/kg	1400*	-	-	-	-	ND [20]
AK102	Diesel Range Organics (C10-C25)	mg/kg	10250*	510 [32] JD	1100 [30] JD	-	-	-
SW8260C	Benzene	mg/kg	0.27*	ND [0.092]	ND [0.12]	ND [0.05]	ND [0.05]	-
SW8260C	Ethylbenzene	mg/kg	49	0.026 [0.092] J	0.028 [0.12] J	ND [0.05]	ND [0.05]	-
SW8260C	o-Xylene	mg/kg	57	ND [0.092]	ND [0.12]	ND [0.05]	ND [0.05]	-
SW8260C	Toluene	mg/kg		ND [0.092]	0.021 [0.12] J, B	0.027 [0.05] J	ND [0.05]	-
SW8260C	Xylene, Isomers m & p	mg/kg	57	0.064 [0.092] J	0.076 [0.12] J	ND [0.05]	ND [0.05]	-
8270SIM	1-Methylnaphthalene	mg/kg	68	2.5 [0.026]	2.8 [0.025]	-	-	-
8270SIM	2-Methylnaphthalene	mg/kg	310	2.1 [0.026]	2.7 [0.025]	-	-	-
8270SIM	Acenaphthene	mg/kg	4600	0.058 [0.0052]	0.064 [0.0049]	-	-	-
8270SIM	Acenaphthylene	mg/kg	2300	0.03 [0.0052]	ND [0.023]	-	-	-
8270SIM	Anthracene	mg/kg	23000	0.008 [0.0052]	0.0097 [0.0049]	-	-	-
8270SIM	Benzo(a)anthracene	mg/kg	2	0.0034 [0.0052] J, B	0.0045 [0.0049] J, B	-	-	-
8270SIM	Benzo(a)pyrene	mg/kg	0.2	0.015 [0.0052]	0.019 [0.0049]	-	-	-
8270SIM	Benzo(b)fluoranthene	mg/kg	2	0.0045 [0.0052] J, B	0.0042 [0.0049] J, B	-	-	-
8270SIM	Benzo(g,h,i)perylene	mg/kg	2300	0.0033 [0.0052] J, B	0.0022 [0.0049] J, B	-	-	-
8270SIM	Benzo(k)fluoranthene	mg/kg	20	0.0016 [0.0052] J	0.0017 [0.0049] J	-	-	-
8270SIM	Chrysene	mg/kg	200	0.0049 [0.0052] J, B	0.0057 [0.0049]	-	-	-
8270SIM	Dibenzo(a,h)anthracene	mg/kg	0.2	ND [0.0052]	ND [0.0049]	-	-	-
8270SIM	Dibenzofuran	mg/kg	95	0.039 [0.0052]	0.038 [0.0049]	-	-	-
8270SIM	Fluoranthene	mg/kg	3100	0.014 [0.0052]	0.017 [0.0049]	-	-	-
8270SIM	Fluorene	mg/kg	3100	0.12 [0.0052]	0.12 [0.0049]	-	-	-
8270SIM	Indeno(1,2,3-cd)pyrene	mg/kg	2	0.0029 [0.0052] J	0.0025 [0.0049] J	-	-	-
8270SIM	Naphthalene	mg/kg	29	0.26 [0.0052]	0.27 [0.0049]	-	-	-
8270SIM	Phenanthrene	mg/kg	2300	0.029 [0.0052]	0.021 [0.0049]	-	-	-
8270SIM	Pyrene	mg/kg	2300	0.0093 [0.0052] JD	0.016 [0.0049] JD	-	-	-

Notes:

[1] 18 AAC 75 Table B1. Method Two, Over 40-inch zone human health (ADEC 2016).

* Criteria from WNTF QAPP (USAF 2016)

– = not analyzed

[ ] = limit of detection

Bold = The result exceeds the project action limit.

mg/kg = milligrams per kilogram

ND = nondetect

SDG = sample delivery group

SD = sediment

SO = soil

ALGK = ALS Environmental of Kelso, WA.

QA/QC = quality assurance / quality control

For data qualifier definitions, refer to the Data Quality Assessment.

Table C-1-3
WNTF Groundwater Results

			Location ID	MW36	MW36	MW37	TB03W
			Sample ID	16WNTF-MW36-GW	16WNTF-MW36-GW-9	16WNTF-MW37-GW	16WNTF-TB03-GW
			Lab Sample ID	K160692808	K160692809	K160692810	K160692811
			SDG	K1606928	K1606928	K1606928	K1606928
			Collection Date	6/22/2016	6/22/2016	6/22/2016	6/20/2016
			Matrix	WG	WG	WG	WG
			Laboratory	ALGK	ALGK	ALGK	ALGK
			QA/QC	Primary	Duplicate	Primary	Trip Blank
Method	**Analyte**	**Units**	**Project Action Limit[1]**				
AK102	Diesel Range Organics (C10-C25)	mg/L	1.5	**1.7 [0.78] JL-**	**1.7 [0.83] JL-**	**3.3 [0.77] JL-**	-
SW8260C	Benzene	mg/L	0.0046	0.00052 [0.0005]	0.00051 [0.0005]	0.0012 [0.0005]	ND [0.0005]
SW8260C	Ethylbenzene	mg/L	0.015	0.00032 [0.0005] J	0.00029 [0.0005] J	0.0011 [0.0005]	ND [0.0005]
SW8260C	o-Xylene	mg/L	0.19	0.00021 [0.0005] J	0.0002 [0.0005] J	ND [0.0005]	ND [0.0005]
SW8260C	Toluene	mg/L	1.1	0.00011 [0.0005] J	0.00012 [0.0005] J	ND [0.0005]	ND [0.0005]
SW8260C	Xylene, Isomers m & p	mg/L	0.19	0.00011 [0.0005] J, JD	ND [0.0005] JD	0.00012 [0.0005] J	ND [0.0005]
8270SIM	1-Methylnaphthalene	mg/L	0.011	0.00019 [0.00002]	0.00018 [0.00002]	0.003 [0.00002]	-
8270SIM	2-Methylnaphthalene	mg/L	0.036	0.00017 [0.00002]	0.00016 [0.00002]	0.00017 [0.00002]	-
8270SIM	Acenaphthene	mg/L	0.53	0.000029 [0.00002] JD	ND [0.00002] JD	0.000054 [0.00002]	-
8270SIM	Acenaphthylene	mg/L	0.26	ND [0.00002]	ND [0.00002]	0.00002 [0.00002]	-
8270SIM	Anthracene	mg/L	0.043	0.000052 [0.00002]	0.000049 [0.00002]	ND [0.00002]	-
8270SIM	Benzo(a)anthracene	mg/L	0.00012	ND [0.00002]	ND [0.00002]	ND [0.00002]	-
8270SIM	Benzo(a)pyrene	mg/L	0.000034	ND [0.00002]	ND [0.00002]	ND [0.00002]	-
8270SIM	Benzo(b)fluoranthene	mg/L	0.00034	ND [0.00002]	ND [0.00002]	ND [0.00002]	-
8270SIM	Benzo(g,h,i)perylene	mg/L	0.00026	ND [0.00002]	ND [0.00002]	ND [0.00002]	-
8270SIM	Benzo(k)fluoranthene	mg/L	0.0008	ND [0.00002]	ND [0.00002]	ND [0.00002]	-
8270SIM	Chrysene	mg/L	0.002	ND [0.00002]	ND [0.00002]	ND [0.00002]	-
8270SIM	Dibenzo(a,h)anthracene	mg/L	0.000034	0.000089 [0.00002]	0.000093 [0.00002]	ND [0.00002]	-
8270SIM	Dibenzofuran	mg/L	0.0079	0.000038 [0.00002]	0.000039 [0.00002]	0.000062 [0.00002]	-
8270SIM	Fluoranthene	mg/L	0.26	ND [0.00002]	ND [0.00002]	ND [0.00002]	-
8270SIM	Fluorene	mg/L	0.29	0.000047 [0.00002] JD	0.000031 [0.00002] JD	0.00002 [0.00002]	-
8270SIM	Indeno(1,2,3-cd)pyrene	mg/L	0.00019	ND [0.00002]	ND [0.00002]	ND [0.00002]	-
8270SIM	Naphthalene	mg/L	0.0017	0.00029 [0.00002]	0.00034 [0.00002]	0.00078 [0.00002]	-
8270SIM	Phenanthrene	mg/L	0.17	0.000082 [0.00002] JD	0.000041 [0.00002] JD	ND [0.00002]	-
8270SIM	Pyrene	mg/L	0.12	ND [0.00002]	ND [0.00002]	ND [0.00002]	-

Notes:

1 18 AAC 75 Table C. Groundwater Human Health Cleanup Level (ADEC 2016)

– = not analyzed

[ ] = limit of detection

Bold = The result exceeds the project action limit.

mg/L = milligrams per liter

ND = nondetect

SDG = sample delivery group

WG = groundwater

ALGK = ALS Environmental of Kelso, WA.

QA/QC = quality assurance / quality control

For data qualifier definitions, refer to the Data Quality Assessment.

Table C-1-4
WNTF Porewater Results

			Location ID	SP01	SP02	SP03	SP04	SP04
			Sample ID	16WNTF-SP01-PW	16WNTF-SP02-PW	16WNTF-SP03-PW	16WNTF-SP04-PW	16WNTF-SP04-PW-9
			Lab Sample ID	K160692807	K160692801	K160692806	K160692802	K160692803
			SDG	K1606928	K1606928	K1606928	K1606928	K1606928
			Collection Date	6/21/2016	6/20/2016	6/21/2016	6/21/2016	6/21/2016
			Matrix	WP	WP	WP	WP	WP
			Laboratory	ALGK	ALGK	ALGK	ALGK	ALGK
			QA/QC	Primary	Primary	Primary	Primary	Duplicate
Method	**Analyte**	**Units**	**Project Action Limit[1]**					
AK102	Diesel Range Organics (C10-C25)	mg/L	-	0.056 [0.02] J, JL-, B	0.1 [0.02] J, JL-	0.059 [0.02] J, JL-, B	0.24 [0.02] J, JL-	0.23 [0.02] J, JL-
SW8260C	Benzene	mg/L	0.046	ND [0.0001]	ND [0.0001]	ND [0.0001]	ND [0.0001]	ND [0.0001]
SW8260C	Ethylbenzene	mg/L	0.0073	ND [0.0001]	ND [0.0001]	ND [0.0001]	ND [0.0001]	ND [0.0001]
SW8260C	o-Xylene	mg/L	0.013	ND [0.0002]	ND [0.0002]	ND [0.0002]	ND [0.0002]	ND [0.0002]
SW8260C	Toluene	mg/L	0.0098	0.00006 [0.0001] J	ND [0.0001]	ND [0.0001]	0.00006 [0.0001] J, JD	ND [0.0001] JD
SW8260C	Xylene, Isomers m & p	mg/L	0.013	ND [0.0002]	ND [0.0002]	ND [0.0002]	ND [0.0002]	ND [0.0002]
8270SIM	1-Methylnaphthalene	mg/L	0.0021	0.0000076 [0.0000051] J	ND [0.000005]	0.000005 [0.000005] J	ND [0.000005]	ND [0.000005]
8270SIM	2-Methylnaphthalene	mg/L	0.33	0.000006 [0.0000051] J	0.0000039 [0.000005] J	0.0000054 [0.000005] J	ND [0.000005]	ND [0.000005]
8270SIM	Acenaphthene	mg/L	0.0058	0.0000046 [0.0000051] J	ND [0.000005]	0.0000067 [0.000005] J	ND [0.000005]	ND [0.000005]
8270SIM	Acenaphthylene	mg/L	4.84	0.0000076 [0.0000051] J	0.0000036 [0.000005] J	0.0000054 [0.000005] J	0.0000049 [0.000005] J	0.0000055 [0.000005] J
8270SIM	Anthracene	mg/L	0.000012	0.000007 [0.0000051] J	ND [0.000005]	0.0000095 [0.000005] J	ND [0.000005]	ND [0.000005]
8270SIM	Benzo(a)anthracene	mg/L	0.000027	0.000026 [0.0000051]	ND [0.000005]	0.000021 [0.000005] B	ND [0.000005]	ND [0.000005]
8270SIM	Benzo(a)pyrene	mg/L	0.000014	**0.000023 [0.0000051]**	ND [0.000005]	**0.000018 [0.000005] J**	ND [0.000005]	ND [0.000005]
8270SIM	Benzo(b)fluoranthene	mg/L	0.00907	0.000049 [0.0000051]	ND [0.000005]	0.000022 [0.000005]	ND [0.000005]	ND [0.000005]
8270SIM	Benzo(g,h,i)perylene	mg/L	0.00764	0.000017 [0.0000051] J, B	ND [0.000005]	0.000011 [0.000005] J, B	ND [0.000005]	ND [0.000005]
8270SIM	Benzo(k)fluoranthene	mg/L	-	0.000018 [0.0000051] J	ND [0.000005]	0.0000063 [0.000005] J	ND [0.000005]	ND [0.000005]
8270SIM	Chrysene	mg/L	-	0.000053 [0.0000051]	ND [0.000005]	0.000025 [0.000005]	ND [0.000005]	ND [0.000005]
8270SIM	Dibenzo(a,h)anthracene	mg/L	-	ND [0.0000051]	ND [0.000005]	ND [0.000005]	ND [0.000005]	ND [0.000005]
8270SIM	Dibenzofuran	mg/L	0.0037	ND [0.0000051]	ND [0.000005]	ND [0.000005]	ND [0.000005]	ND [0.000005]
8270SIM	Fluoranthene	mg/L	0.00004	**0.000065 [0.000021]**	ND [0.00002]	**0.000041 [0.00002]**	ND [0.00002]	ND [0.00002]
8270SIM	Fluorene	mg/L	0.0039	0.0000042 [0.0000051] J	ND [0.000005]	0.0000066 [0.000005] J	ND [0.000005]	ND [0.000005]
8270SIM	Indeno(1,2,3-cd)pyrene	mg/L	0.00431	0.000015 [0.0000051] J, B	ND [0.000005]	0.0000089 [0.000005] J, B	ND [0.000005]	ND [0.000005]
8270SIM	Naphthalene	mg/L	0.0011	0.00001 [0.0000051] J	ND [0.000005]	0.0000073 [0.000005] J	ND [0.000005]	ND [0.000005]
8270SIM	Phenanthrene	mg/L	0.0036	0.000032 [0.0000051]	ND [0.000005]	0.000056 [0.000005]	ND [0.000005]	ND [0.000005]
8270SIM	Pyrene	mg/L	-	0.000077 [0.000011]	ND [0.00001]	0.000053 [0.00001]	ND [0.00001]	ND [0.00001]
SW8260C	TAH[2]	mg/L	0.01	0.00066	0.0007	0.0007	0.00066	0.0007
SW8260C/ SW8270SIM	TAqH[2]	mg/L	0.015	0.0010922	0.0008125	0.0010181	0.0007749	0.0008155

Notes:

[1] Surface water criteria from NOAA SQuiRT Freshwater NOAA, most conservative of CCC and CMC values (Buchman 2008).

[2] Total aromatic hydrocarbons (TAH) is the sum of the SW8260 BTEX concentrations. Total aqueous hydrocarbons (TAqH) is the sum of the SW8260 BTEX and 8270 SIM PAH concentrations. If the analyte was ND, the LOD was used for the analyte concentration.

– = not analyzed
[ ] = limit of detection
Bold = The result exceeds the project action limit.
mg/L = milligrams per liter
ND = nondetect
SDG = sample delivery group
W = water
ALGK = ALS Environmental of Kelso, WA.
QA/QC = quality assurance / quality control
For data qualifier definitions, refer to the Data Quality Assessment.

Table C-1-4
WNTF Porewater Results

			Location ID	SP05	SP06
			Sample ID	16WNTF-SP05-PW	16WNTF-SP06-PW
			Lab Sample ID	K160692804	K160692805
			SDG	K1606928	K1606928
			Collection Date	6/21/2016	6/21/2016
			Matrix	WP	WP
			Laboratory	ALGK	ALGK
			QA/QC	Primary	Primary
Method	**Analyte**	**Units**	**Project Action Limit[1]**		
AK102	Diesel Range Organics (C10-C25)	mg/L	-	0.15 [0.02] J, JL-	0.05 [0.02] J, JL-, B
SW8260C	Benzene	mg/L	0.046	ND [0.0001]	ND [0.0001]
SW8260C	Ethylbenzene	mg/L	0.0073	ND [0.0001]	ND [0.0001]
SW8260C	o-Xylene	mg/L	0.013	ND [0.0002]	ND [0.0002]
SW8260C	Toluene	mg/L	0.0098	ND [0.0001]	ND [0.0001]
SW8260C	Xylene, Isomers m & p	mg/L	0.013	ND [0.0002]	ND [0.0002]
8270SIM	1-Methylnaphthalene	mg/L	0.0021	ND [0.000005]	ND [0.000005]
8270SIM	2-Methylnaphthalene	mg/L	0.33	ND [0.000005]	0.0000036 [0.000005] J
8270SIM	Acenaphthene	mg/L	0.0058	ND [0.000005]	ND [0.000005]
8270SIM	Acenaphthylene	mg/L	4.84	0.0000037 [0.000005] J	0.0000035 [0.000005] J
8270SIM	Anthracene	mg/L	0.000012	ND [0.000005]	0.0000057 [0.000005] J
8270SIM	Benzo(a)anthracene	mg/L	0.000027	ND [0.000005]	0.0000067 [0.000005] J, B
8270SIM	Benzo(a)pyrene	mg/L	0.000014	ND [0.000005]	0.0000048 [0.000005] J
8270SIM	Benzo(b)fluoranthene	mg/L	0.00907	ND [0.000005]	0.0000082 [0.000005] J
8270SIM	Benzo(g,h,i)perylene	mg/L	0.00764	ND [0.000005]	ND [0.000005]
8270SIM	Benzo(k)fluoranthene	mg/L	-	ND [0.000005]	ND [0.000005]
8270SIM	Chrysene	mg/L	-	ND [0.000005]	0.0000078 [0.000005] J
8270SIM	Dibenzo(a,h)anthracene	mg/L	-	ND [0.000005]	ND [0.000005]
8270SIM	Dibenzofuran	mg/L	0.0037	ND [0.000005]	ND [0.000005]
8270SIM	Fluoranthene	mg/L	0.00004	ND [0.00002]	0.000022 [0.00002]
8270SIM	Fluorene	mg/L	0.0039	ND [0.000005]	ND [0.000005]
8270SIM	Indeno(1,2,3-cd)pyrene	mg/L	0.00431	ND [0.000005]	ND [0.000005]
8270SIM	Naphthalene	mg/L	0.0011	ND [0.000005]	0.0000043 [0.000005] J
8270SIM	Phenanthrene	mg/L	0.0036	ND [0.000005]	0.0000054 [0.000005] J
8270SIM	Pyrene	mg/L	-	ND [0.00001]	0.00002 [0.00001]
SW8260C	TAH[2]	mg/L	0.01	0.0007	0.0007
SW8260C/ SW8270SIM	TAqH[2]	mg/L	0.015	0.0008137	0.000832

Notes:

[1] Surface water criteria from NOAA SQuiRT Freshwater NOAA, most conservative of CCC and CMC values (Buchman 2008).

[2] Total aromatic hydrocarbons (TAH) is the sum of the SW8260 BTEX concentrations. Total aqueous hydrocarbons (TAqH) is the sum of the SW8260 BTEX and 8270 SIM PAH concentrations. If the analyte was ND, the LOD was used for the analyte concentration.

– = not analyzed
[ ] = limit of detection
Bold = The result exceeds the project action limit.
mg/L = milligrams per liter
ND = nondetect
SDG = sample delivery group
W = water
ALGK = ALS Environmental of Kelso, WA.
QA/QC = quality assurance / quality control
For data qualifier definitions, refer to the Data Quality Assessment.

Table C-1-5
WNTF Sediment Results

			Location ID	SP01	SP01	SP02	SP02	SP02
			Sample ID	16WNTF-SP01-SD	16WNTF-SP01-SD	16WNTF-SP02-SD	16WNTF-SP02-SD	16WNTF-SP02-SD-9
			Lab Sample ID	K160699912	K161018601	K160699913	K161018602	K161018607
			SDG	K1606999	K1610186	K1606999	K1610186	K1610186
			Collection Date	6/21/2016	8/26/2016	6/21/2016	8/26/2016	8/26/2016
			Matrix	SE	SO	SE	SO	SO
			Laboratory	ALGK	ALGK	ALGK	ALGK	ALGK
			QA/QC	Primary	Primary	Primary	Primary	Duplicate
Method	**Analyte**	**Units**	**Project Action Limit[1]**					
E160.3M	Total Solids	PERCENT	-	85.8	85.4	85.9	84.1	81.2
AK101	Gasoline Range Organics (C6-C10)	mg/kg	-	-	ND [2.5]	-	ND [2.5]	ND [2.5]
AK102	Diesel Range Organics (C10-C25)	mg/kg	-	41 [3.9]	-	23 [3.8]	-	-
SW8260C	Benzene	mg/kg	-	ND [0.01]	-	ND [0.01]	-	-
SW8260C	Ethylbenzene	mg/kg	-	ND [0.01]	-	ND [0.01]	-	-
SW8260C	o-Xylene	mg/kg	-	ND [0.02]	-	ND [0.02]	-	-
SW8260C	Toluene	mg/kg	-	ND [0.01]	-	ND [0.01]	-	-
SW8260C	Xylene, Isomers m & p	mg/kg	-	ND [0.02]	-	ND [0.02]	-	-
8270SIM	1-Methylnaphthalene	mg/kg	-	0.009 [0.001]	-	0.049 [0.001]	-	-
8270SIM	2-Methylnaphthalene	mg/kg	-	0.011 [0.001]	-	0.056 [0.001]	-	-
8270SIM	Acenaphthene	mg/kg	0.00671	0.0061 [0.001]	-	**0.042 [0.001]**	-	-
8270SIM	Acenaphthylene	mg/kg	0.00587	0.0018 [0.001] J	-	0.0047 [0.001]	-	-
8270SIM	Anthracene	mg/kg	0.0469	0.015 [0.001]	-	**0.082 [0.001]**	-	-
8270SIM	Benzo(a)anthracene	mg/kg	0.0317	0.022 [0.001]	-	**0.14 [0.001]**	-	-
8270SIM	Benzo(a)pyrene	mg/kg	0.0319	0.021 [0.001]	-	**0.14 [0.001]**	-	-
8270SIM	Benzo(b)fluoranthene	mg/kg	-	0.018 [0.001]	-	0.13 [0.001]	-	-
8270SIM	Benzo(g,h,i)perylene	mg/kg	0.17	0.011 [0.001]	-	0.073 [0.001]	-	-
8270SIM	Benzo(k)fluoranthene	mg/kg	0.24	0.0065 [0.001]	-	0.044 [0.001]	-	-
8270SIM	Chrysene	mg/kg	0.0571	0.028 [0.001]	-	**0.17 [0.001]**	-	-
8270SIM	Dibenzo(a,h)anthracene	mg/kg	0.00622	0.0031 [0.001] J	-	**0.023 [0.001]**	-	-
8270SIM	Fluoranthene	mg/kg	0.111	0.046 [0.001]	-	**0.28 [0.001]**	-	-
8270SIM	Fluorene	mg/kg	0.0212	0.0082 [0.001]	-	**0.057 [0.001]**	-	-
8270SIM	Indeno(1,2,3-cd)pyrene	mg/kg	0.2	0.01 [0.001]	-	0.073 [0.001]	-	-
8270SIM	Naphthalene	mg/kg	0.0346	0.0061 [0.001]	-	0.026 [0.001]	-	-
8270SIM	Phenanthrene	mg/kg	0.0419	**0.084 [0.002]**	-	**0.51 [0.002]**	-	-
8270SIM	Pyrene	mg/kg	0.053	**0.066 [0.001]**	-	**0.38 [0.001]**	-	-

Notes:

[1] Sediment criteria from NOAA SQuiRT Freshwater NOAA TEL (Buchman 2008).

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mg/kg = milligrams per kilogram
ND = nondetect
SDG = sample delivery group
SE = sediment
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QA/QC = quality assurance / quality control
For data qualifier definitions, refer to the Data Quality Assessment.

Table C-1-5
WNTF Sediment Results

			Location ID	SP03	SP03	SP03	SP04	SP04
			Sample ID	16WNTF-SP03-SD	16WNTF-SP03-SD	16WNTF-SP03-SD-9	16WNTF-SP04-SD	16WNTF-SP04-SD
			Lab Sample ID	K161018603	K160699914	K160699915	K160699916	K161018604
			SDG	K1610186	K1606999	K1606999	K1606999	K1610186
			Collection Date	8/26/2016	6/21/2016	6/21/2016	6/21/2016	8/26/2016
			Matrix	SO	SE	SE	SE	SE
			Laboratory	ALGK	ALGK	ALGK	ALGK	ALGK
			QA/QC	Primary	Primary	Duplicate	Primary	Primary
Method	**Analyte**	**Units**	**Project Action Limit[1]**					
E160.3M	Total Solids	PERCENT	-	78.4	89.2	89.1	82.7	80
AK101	Gasoline Range Organics (C6-C10)	mg/kg	-	ND [2.5]	-	-	-	ND [2.5]
AK102	Diesel Range Organics (C10-C25)	mg/kg	-	-	30 [3.7]	33 [3.7]	16 [4] J, B	-
SW8260C	Benzene	mg/kg	-	-	ND [0.01]	ND [0.01]	ND [0.01]	-
SW8260C	Ethylbenzene	mg/kg	-	-	ND [0.01]	ND [0.01]	ND [0.01]	-
SW8260C	o-Xylene	mg/kg	-	-	ND [0.02]	ND [0.02]	ND [0.02]	-
SW8260C	Toluene	mg/kg	-	-	ND [0.01]	ND [0.01]	ND [0.01]	-
SW8260C	Xylene, Isomers m & p	mg/kg	-	-	ND [0.02]	ND [0.02]	ND [0.02]	-
8270SIM	1-Methylnaphthalene	mg/kg	-	-	0.089 [0.001]	0.07 [0.001]	0.0048 [0.001]	-
8270SIM	2-Methylnaphthalene	mg/kg	-	-	0.1 [0.001]	0.079 [0.001]	0.0052 [0.001]	-
8270SIM	Acenaphthene	mg/kg	0.00671	-	**0.069 [0.001] JD**	**0.15 [0.001] JD**	0.0045 [0.001]	-
8270SIM	Acenaphthylene	mg/kg	0.00587	-	**0.0079 [0.001]**	0.0055 [0.001]	0.0012 [0.001] J	-
8270SIM	Anthracene	mg/kg	0.0469	-	**0.087 [0.001] JD**	**0.32 [0.001] JD**	0.011 [0.001]	-
8270SIM	Benzo(a)anthracene	mg/kg	0.0317	-	**0.2 [0.001] JD**	**0.5 [0.001] JD**	0.021 [0.001]	-
8270SIM	Benzo(a)pyrene	mg/kg	0.0319	-	**0.21 [0.001] JD**	**0.43 [0.001] JD**	0.022 [0.001]	-
8270SIM	Benzo(b)fluoranthene	mg/kg	-	-	0.21 [0.001] JD	0.49 [0.001] JD	0.022 [0.001]	-
8270SIM	Benzo(g,h,i)perylene	mg/kg	0.17	-	0.11 [0.001] JD	**0.22 [0.001] JD**	0.012 [0.001]	-
8270SIM	Benzo(k)fluoranthene	mg/kg	0.24	-	0.072 [0.001] JD	0.17 [0.001] JD	0.0074 [0.001]	-
8270SIM	Chrysene	mg/kg	0.0571	-	**0.3 [0.001] JD**	**0.56 [0.001] JD**	0.026 [0.001]	-
8270SIM	Dibenzo(a,h)anthracene	mg/kg	0.00622	-	**0.035 [0.001] JD**	**0.088 [0.001] JD**	0.0035 [0.001] J	-
8270SIM	Fluoranthene	mg/kg	0.111	-	**0.5 [0.001] JD**	**1.1 [0.001] JD**	0.042 [0.001]	-
8270SIM	Fluorene	mg/kg	0.0212	-	**0.081 [0.001] JD**	**0.18 [0.001] JD**	0.005 [0.001]	-
8270SIM	Indeno(1,2,3-cd)pyrene	mg/kg	0.2	-	0.12 [0.001] JD	**0.26 [0.001] JD**	0.012 [0.001]	-
8270SIM	Naphthalene	mg/kg	0.0346	-	**0.057 [0.001]**	**0.039 [0.001]**	0.0034 [0.001] J	-
8270SIM	Phenanthrene	mg/kg	0.0419	-	**0.96 [0.002] JD**	**1.6 [0.004] JD**	**0.053 [0.002]**	-
8270SIM	Pyrene	mg/kg	0.053	-	**0.65 [0.001] JD**	**1.1 [0.001] JD**	0.051 [0.001]	-

Notes:

[1] Sediment criteria from NOAA SQuiRT Freshwater NOAA TEL (Buchman 2008).

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mg/kg = milligrams per kilogram
ND = nondetect
SDG = sample delivery group
SE = sediment
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QA/QC = quality assurance / quality control
For data qualifier definitions, refer to the Data Quality Assessment.

Table C-1-5
WNTF Sediment Results

			Location ID	SP05	SP05	SP06	SP06
			Sample ID	16WNTF-SP05-SD	16WNTF-SP05-SD	16WNTF-SP06-SD	16WNTF-SP06-SD
			Lab Sample ID	K160699917	K161018605	K160699918	K161018606
			SDG	K1606999	K1610186	K1606999	K1610186
			Collection Date	6/21/2016	8/26/2016	6/21/2016	8/26/2016
			Matrix	SE	SE	SE	SE
			Laboratory	ALGK	ALGK	ALGK	ALGK
			QA/QC	Primary	Primary	Primary	Primary
Method	**Analyte**	**Units**	**Project Action Limit[1]**				
E160.3M	Total Solids	PERCENT	-	81.1	78.4	86.9	79.6
AK101	Gasoline Range Organics (C6-C10)	mg/kg	-	-	ND [2.5]	-	ND [2.5]
AK102	Diesel Range Organics (C10-C25)	mg/kg	-	13 [4.1] J, B	-	8.4 [3.8] J, B	-
SW8260C	Benzene	mg/kg	-	ND [0.01]	-	ND [0.01]	-
SW8260C	Ethylbenzene	mg/kg	-	ND [0.01]	-	ND [0.01]	-
SW8260C	o-Xylene	mg/kg	-	ND [0.02]	-	ND [0.02]	-
SW8260C	Toluene	mg/kg	-	ND [0.01]	-	ND [0.01]	-
SW8260C	Xylene, Isomers m & p	mg/kg	-	ND [0.02]	-	ND [0.02]	-
8270SIM	1-Methylnaphthalene	mg/kg	-	0.018 [0.001]	-	0.007 [0.001]	-
8270SIM	2-Methylnaphthalene	mg/kg	-	0.023 [0.001]	-	0.0097 [0.001]	-
8270SIM	Acenaphthene	mg/kg	0.00671	0.0026 [0.001] J	-	ND [0.001]	-
8270SIM	Acenaphthylene	mg/kg	0.00587	0.00066 [0.001] J	-	ND [0.001]	-
8270SIM	Anthracene	mg/kg	0.0469	0.0045 [0.001]	-	ND [0.001]	-
8270SIM	Benzo(a)anthracene	mg/kg	0.0317	0.014 [0.001]	-	0.0017 [0.001] J	-
8270SIM	Benzo(a)pyrene	mg/kg	0.0319	0.015 [0.001]	-	0.0018 [0.001] J	-
8270SIM	Benzo(b)fluoranthene	mg/kg	-	0.016 [0.001]	-	0.0027 [0.001] J	-
8270SIM	Benzo(g,h,i)perylene	mg/kg	0.17	0.0087 [0.001]	-	0.0023 [0.001] J	-
8270SIM	Benzo(k)fluoranthene	mg/kg	0.24	0.0059 [0.001]	-	0.00097 [0.001] J	-
8270SIM	Chrysene	mg/kg	0.0571	0.018 [0.001]	-	0.0016 [0.001] J	-
8270SIM	Dibenzo(a,h)anthracene	mg/kg	0.00622	0.0028 [0.001] J	-	ND [0.001]	-
8270SIM	Fluoranthene	mg/kg	0.111	0.028 [0.001]	-	0.0028 [0.001] J	-
8270SIM	Fluorene	mg/kg	0.0212	0.0034 [0.001] J	-	0.00064 [0.001] J	-
8270SIM	Indeno(1,2,3-cd)pyrene	mg/kg	0.2	0.0087 [0.001]	-	0.0016 [0.001] J	-
8270SIM	Naphthalene	mg/kg	0.0346	0.0072 [0.001]	-	0.003 [0.001] J	-
8270SIM	Phenanthrene	mg/kg	0.0419	0.029 [0.002]	-	0.0024 [0.002] J	-
8270SIM	Pyrene	mg/kg	0.053	0.033 [0.001]	-	0.0031 [0.001] J	-

Notes:

[1] Sediment criteria from NOAA SQuiRT Freshwater NOAA TEL (Buchman 2008).

– = not analyzed
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Bold = The result exceeds the project action limit.
mg/kg = milligrams per kilogram
ND = nondetect
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SE = sediment
ALGK = ALS Environmental of Kelso, WA.
QA/QC = quality assurance / quality control
For data qualifier definitions, refer to the Data Quality Assessment.

ATTACHMENT C-2

Qualified Sample Results Tables

Included with document PDF on CD

Table C-2-1
Results Qualified B Due to Method Blank Contamination

SDG	Sample ID	Lab Sample ID	Method	Analyte	Result	LOD	LOQ	Units	Lab Lot Number	Qualifier
-	Method Blank	KWG16052335	AK102	Diesel Range Organics (C10-C25)	3.2	3.3	20	mg/kg	KWG1605233	-
K1606998	16WNTF-MW36-12-SO	K160699810	AK102	Diesel Range Organics (C10-C25)	6.6	3.5	21	mg/kg	KWG1605233	J, B
-	Method Blank	KWG16052515	AK102	Diesel Range Organics (C10-C25)	3.6	3.3	20	mg/kg	KWG1605251	-
K1606999	16WNTF-SP04-SD	K160699916	AK102	Diesel Range Organics (C10-C25)	16	4	24	mg/kg	KWG1605251	J, B
K1606999	16WNTF-SP05-SD	K160699917	AK102	Diesel Range Organics (C10-C25)	13	4.1	25	mg/kg	KWG1605251	J, B
K1606999	16WNTF-SP06-SD	K160699918	AK102	Diesel Range Organics (C10-C25)	8.4	3.8	23	mg/kg	KWG1605251	J, B
-	Method Blank	KWG16053517	AK102	Diesel Range Organics (C10-C25)	0.013	0.02	0.76	mg/L	KWG1605351	-
K1606928	16WNTF-SP06-PW	K160692805	AK102	Diesel Range Organics (C10-C25)	0.05	0.02	0.8	mg/L	KWG1605351	J, JL-, B
K1606928	16WNTF-SP03-PW	K160692806	AK102	Diesel Range Organics (C10-C25)	0.059	0.02	0.77	mg/L	KWG1605351	J, JL-, B
K1606928	16WNTF-SP01-PW	K160692807	AK102	Diesel Range Organics (C10-C25)	0.056	0.02	0.8	mg/L	KWG1605351	J, JL-, B
-	Method Blank	KWG16051835	8270SIM	Acenaphthylene	0.00061	0.001	0.0025	mg/kg	KWG1605183	-
K1606998	16WNTF-MW36-12-SO	K160699810	8270SIM	Acenaphthylene	0.0009	0.001	0.0035	mg/kg	KWG1605183	J, B
-	Method Blank	KWG16051835	8270SIM	Anthracene	0.00063	0.001	0.0025	mg/kg	KWG1605183	-
K1606998	16WNTF-MW36-14-SO	K160699811	8270SIM	Anthracene	0.001	0.001	0.004	mg/kg	KWG1605183	J, B
-	Method Blank	KWG16051835	8270SIM	Benzo(a)anthracene	0.0012	0.001	0.0025	mg/kg	KWG1605183	-
K1606998	16WNTF-SB08-12-SO	K160699802	8270SIM	Benzo(a)anthracene	0.0034	0.0011	0.0052	mg/kg	KWG1605183	J, B
K1606998	16WNTF-SB08-12-SO-9	K160699803	8270SIM	Benzo(a)anthracene	0.0045	0.001	0.0049	mg/kg	KWG1605183	J, B
K1606998	16WNTF-SB07-08-SO	K160699804	8270SIM	Benzo(a)anthracene	0.0022	0.001	0.0034	mg/kg	KWG1605183	J, B
K1606998	16WNTF-MW36-12-SO	K160699810	8270SIM	Benzo(a)anthracene	0.0014	0.001	0.0035	mg/kg	KWG1605183	J, B
K1606998	16WNTF-MW36-14-SO	K160699811	8270SIM	Benzo(a)anthracene	0.0029	0.001	0.004	mg/kg	KWG1605183	J, B
-	Method Blank	KWG16051835	8270SIM	Benzo(a)pyrene	0.0011	0.001	0.0025	mg/kg	KWG1605183	-
K1606998	16WNTF-SB07-08-SO	K160699804	8270SIM	Benzo(a)pyrene	0.0014	0.001	0.0034	mg/kg	KWG1605183	J, B
K1606998	16WNTF-SB06-06-SO	K160699806	8270SIM	Benzo(a)pyrene	0.0051	0.001	0.0034	mg/kg	KWG1605183	B
K1606998	16WNTF-SB06-08-SO	K160699807	8270SIM	Benzo(a)pyrene	0.0034	0.001	0.0036	mg/kg	KWG1605183	J, B
K1606998	16WNTF-MW36-12-SO	K160699810	8270SIM	Benzo(a)pyrene	0.0025	0.001	0.0035	mg/kg	KWG1605183	J, B
-	Method Blank	KWG16051835	8270SIM	Benzo(b)fluoranthene	0.00099	0.001	0.0025	mg/kg	KWG1605183	-
K1606998	16WNTF-SB08-12-SO	K160699802	8270SIM	Benzo(b)fluoranthene	0.0045	0.0011	0.0052	mg/kg	KWG1605183	J, B
K1606998	16WNTF-SB08-12-SO-9	K160699803	8270SIM	Benzo(b)fluoranthene	0.0042	0.001	0.0049	mg/kg	KWG1605183	J, B
K1606998	16WNTF-SB07-08-SO	K160699804	8270SIM	Benzo(b)fluoranthene	0.0022	0.001	0.0034	mg/kg	KWG1605183	J, B
K1606998	16WNTF-MW36-12-SO	K160699810	8270SIM	Benzo(b)fluoranthene	0.003	0.001	0.0035	mg/kg	KWG1605183	J, B
K1606998	16WNTF-MW36-14-SO	K160699811	8270SIM	Benzo(b)fluoranthene	0.0049	0.001	0.004	mg/kg	KWG1605183	B
-	Method Blank	KWG16051835	8270SIM	Benzo(g,h,i)perylene	0.0011	0.001	0.0025	mg/kg	KWG1605183	-
K1606998	16WNTF-SB08-06-SO	K160699801	8270SIM	Benzo(g,h,i)perylene	0.0053	0.001	0.0036	mg/kg	KWG1605183	B
K1606998	16WNTF-SB08-12-SO	K160699802	8270SIM	Benzo(g,h,i)perylene	0.0033	0.0011	0.0052	mg/kg	KWG1605183	J, B
K1606998	16WNTF-SB08-12-SO-9	K160699803	8270SIM	Benzo(g,h,i)perylene	0.0022	0.001	0.0049	mg/kg	KWG1605183	J, B
K1606998	16WNTF-SB07-08-SO	K160699804	8270SIM	Benzo(g,h,i)perylene	0.00095	0.001	0.0034	mg/kg	KWG1605183	J, B
K1606998	16WNTF-SB06-06-SO	K160699806	8270SIM	Benzo(g,h,i)perylene	0.0011	0.001	0.0034	mg/kg	KWG1605183	J, B
K1606998	16WNTF-SB06-08-SO	K160699807	8270SIM	Benzo(g,h,i)perylene	0.0016	0.001	0.0036	mg/kg	KWG1605183	J, B
K1606998	16WNTF-MW36-12-SO	K160699810	8270SIM	Benzo(g,h,i)perylene	0.0014	0.001	0.0035	mg/kg	KWG1605183	J, B
K1606998	16WNTF-MW36-14-SO	K160699811	8270SIM	Benzo(g,h,i)perylene	0.0023	0.001	0.004	mg/kg	KWG1605183	J, B
-	Method Blank	KWG16051835	8270SIM	Chrysene	0.001	0.001	0.0025	mg/kg	KWG1605183	-
K1606998	16WNTF-SB08-12-SO	K160699802	8270SIM	Chrysene	0.0049	0.0011	0.0052	mg/kg	KWG1605183	J, B
K1606998	16WNTF-SB07-08-SO	K160699804	8270SIM	Chrysene	0.0027	0.001	0.0034	mg/kg	KWG1605183	J, B
K1606998	16WNTF-MW36-12-SO	K160699810	8270SIM	Chrysene	0.0016	0.001	0.0035	mg/kg	KWG1605183	J, B
K1606998	16WNTF-MW36-14-SO	K160699811	8270SIM	Chrysene	0.0044	0.001	0.004	mg/kg	KWG1605183	B
-	Method Blank	KWG16051835	8270SIM	Dibenzofuran	0.00071	0.001	0.0025	mg/kg	KWG1605183	-

Table C-2-1
Results Qualified B Due to Method Blank Contamination

SDG	Sample ID	Lab Sample ID	Method	Analyte	Result	LOD	LOQ	Units	Lab Lot Number	Qualifier
K1606998	16WNTF-MW36-12-SO	K160699810	8270SIM	Dibenzofuran	0.00086	0.001	0.0035	mg/kg	KWG1605183	J, B
K1606998	16WNTF-MW36-14-SO	K160699811	8270SIM	Dibenzofuran	0.0012	0.001	0.004	mg/kg	KWG1605183	J, B
-	Method Blank	KWG16051835	8270SIM	Fluoranthene	0.0011	0.001	0.0025	mg/kg	KWG1605183	-
K1606998	16WNTF-MW36-12-SO	K160699810	8270SIM	Fluoranthene	0.0029	0.001	0.0035	mg/kg	KWG1605183	J, B
-	Method Blank	KWG16051835	8270SIM	Fluorene	0.00063	0.001	0.0025	mg/kg	KWG1605183	-
K1606998	16WNTF-MW36-12-SO	K160699810	8270SIM	Fluorene	0.001	0.001	0.0035	mg/kg	KWG1605183	J, B
K1606998	16WNTF-MW36-14-SO	K160699811	8270SIM	Fluorene	0.0023	0.001	0.004	mg/kg	KWG1605183	J, B
-	Method Blank	KWG16051835	8270SIM	Naphthalene	0.001	0.001	0.0025	mg/kg	KWG1605183	-
K1606998	16WNTF-MW36-14-SO	K160699811	8270SIM	Naphthalene	0.0027	0.001	0.004	mg/kg	KWG1605183	J, B
-	Method Blank	KWG16051835	8270SIM	Pyrene	0.001	0.001	0.0025	mg/kg	KWG1605183	-
K1606998	16WNTF-MW36-12-SO	K160699810	8270SIM	Pyrene	0.0035	0.001	0.0035	mg/kg	KWG1605183	B
-	Method Blank	KWG16051897	8270SIM	Benzo(a)anthracene	0.0000045	0.000005	0.000019	mg/L	KWG1605189	-
K1606928	16WNTF-SP06-PW	K160692805	8270SIM	Benzo(a)anthracene	0.0000067	0.000005	0.00002	mg/L	KWG1605189	J, B
K1606928	16WNTF-SP03-PW	K160692806	8270SIM	Benzo(a)anthracene	0.000021	0.000005	0.000019	mg/L	KWG1605189	B
-	Method Blank	KWG16051897	8270SIM	Benzo(g,h,i)perylene	0.000007	0.000005	0.000019	mg/L	KWG1605189	-
K1606928	16WNTF-SP03-PW	K160692806	8270SIM	Benzo(g,h,i)perylene	0.000011	0.000005	0.000019	mg/L	KWG1605189	J, B
K1606928	16WNTF-SP01-PW	K160692807	8270SIM	Benzo(g,h,i)perylene	0.000017	0.0000051	0.000021	mg/L	KWG1605189	J, B
-	Method Blank	KWG16051897	8270SIM	Indeno(1,2,3-cd)pyrene	0.0000049	0.000005	0.000019	mg/L	KWG1605189	-
K1606928	16WNTF-SP03-PW	K160692806	8270SIM	Indeno(1,2,3-cd)pyrene	0.0000089	0.000005	0.000019	mg/L	KWG1605189	J, B
K1606928	16WNTF-SP01-PW	K160692807	8270SIM	Indeno(1,2,3-cd)pyrene	0.000015	0.0000051	0.000021	mg/L	KWG1605189	J, B

Notes:

LOD = limit of detection
LOQ = limit of quantitation
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
SDG = sample delivery group
See the Data Quality Assessment for data qualifier definitions.

Table C-2-2
Results Qualified B Due to Trip Blank Contamination

SDG	Sample ID	Lab Sample ID	Method	Analyte	Result	LOD	LOQ	Units	CoC Number	Qualifier
K1606998	16WNTF-TB01-SO (Trip Blank)	K160699812	SW8260C	Toluene	0.027	0.01	0.05	mg/kg	2016WNTF01	J
K1606998	16WNTF-SB08-06-SO	K160699801	SW8260C	Toluene	0.0063	0.01	0.046	mg/kg	2016WNTF01	J, B
K1606998	16WNTF-SB08-12-SO-9	K160699803	SW8260C	Toluene	0.021	0.023	0.12	mg/kg	2016WNTF01	J, B
K1606998	16WNTF-SB07-10-SO	K160699805	SW8260C	Toluene	0.017	0.016	0.079	mg/kg	2016WNTF01	J, B

Notes:

CoC = chain-of-custody
LOD = limit of detection
LOQ = limit of quantitation
mg/kg = milligrams per kilogram
SDG = sample delivery group
See the Data Quality Assessment for data qualifier definitions.

Table C-2-3
Results Qualified JL- due to LCS Recovery Outliers

SDG	Sample ID	Lab Sample ID	Method	Analyte	Result	LOD	LOQ	Recovery (%)	LCL	UCL	Units	Lab Lot Number	Qualifier
-	LCS	KWG16053515	AK102	Diesel Range Organics (C10-C25)	1.11	0.02	0.8	69	75	125	mg/L	KWG1605351	-
-	LCSD	KWG16053516	AK102	Diesel Range Organics (C10-C25)	1.29	0.02	0.8	81	75	125	mg/L	KWG1605351	-
K1606928	16WNTF-SP02-PW	K160692801	AK102	Diesel Range Organics (C10-C25)	0.1	0.02	0.78	-	-	-	mg/L	KWG1605351	J, JL-
K1606928	16WNTF-SP04-PW	K160692802	AK102	Diesel Range Organics (C10-C25)	0.24	0.02	0.77	-	-	-	mg/L	KWG1605351	J, JL-
K1606928	16WNTF-SP04-PW-9	K160692803	AK102	Diesel Range Organics (C10-C25)	0.23	0.02	0.78	-	-	-	mg/L	KWG1605351	J, JL-
K1606928	16WNTF-SP05-PW	K160692804	AK102	Diesel Range Organics (C10-C25)	0.15	0.02	0.77	-	-	-	mg/L	KWG1605351	J, JL-
K1606928	16WNTF-SP06-PW	K160692805	AK102	Diesel Range Organics (C10-C25)	0.05	0.02	0.8	-	-	-	mg/L	KWG1605351	J, JL-
K1606928	16WNTF-SP03-PW	K160692806	AK102	Diesel Range Organics (C10-C25)	0.059	0.02	0.77	-	-	-	mg/L	KWG1605351	J, JL-
K1606928	16WNTF-SP01-PW	K160692807	AK102	Diesel Range Organics (C10-C25)	0.056	0.02	0.8	-	-	-	mg/L	KWG1605351	J, JL-
K1606928	16WNTF-MW36-GW	K160692808	AK102	Diesel Range Organics (C10-C25)	1.7	0.02	0.78	-	-	-	mg/L	KWG1605351	JL-
K1606928	16WNTF-MW36-GW-9	K160692809	AK102	Diesel Range Organics (C10-C25)	1.7	0.021	0.83	-	-	-	mg/L	KWG1605351	JL-
K1606928	16WNTF-MW37-GW	K160692810	AK102	Diesel Range Organics (C10-C25)	3.3	0.02	0.77	-	-	-	mg/L	KWG1605351	JL-

Notes:

LCL = lower control limit

LCS/LCSD = laboratory control sample/laboratory control sample duplicate

LOD = limit of detection

LOQ = limit of quantitation

mg/L = milligrams per liter

ND = nondetect

SDG = sample delivery group

UCL = upper control limit

See the Data Quality Assessment for data qualifier definitions.

Table C-2-4
Results Qualified JD due to MS/MSD RPD Outliers

SDG	Sample ID	Lab Sample ID	Method	Analyte	Parent Sample Result	MS Result	MSD Result	RPD (%)	Units	Lab Lot Number	Qualifier
K1606998	16WNTF-SB08-06-SO	K160699801	8270SIM	2-Methylnaphthalene	0.51	0.647	0.804	22	mg/kg	KWG1605183	JD

Notes:

mg/kg = milligrams per kilogram

MS/MSD = matrix spike/matrix spike duplicate

RPD = relative percent difference

SDG = sample delivery group

See the Data Quality Assessment for data qualifier definitions.

Table C-2-5
Results Qualified JD Due to Sample/Field Duplicate RPD Outliers

Sample ID	Lab Sample ID	Duplicate Sample ID	Duplicate Lab Sample ID	Method	Analyte	Result	Duplicate Result	Units	RPD (%)
16WNTF-MW36-GW	K160692808	16WNTF-MW36-GW-9	K160692809	8270SIM	Fluorene	0.000047	0.000031	mg/L	41
16WNTF-MW36-GW	K160692808	16WNTF-MW36-GW-9	K160692809	SW8260C	Xylene, Isomers m & p	0.00011	*0.0002*	mg/L	58
16WNTF-MW36-GW	K160692808	16WNTF-MW36-GW-9	K160692809	8270SIM	Phenanthrene	0.000082	0.000041	mg/L	67
16WNTF-MW36-GW	K160692808	16WNTF-MW36-GW-9	K160692809	8270SIM	Acenaphthene	0.000029	*0.000005*	mg/L	141
16WNTF-SP03-SD	K160699914	16WNTF-SP03-SD-9	K160699915	8270SIM	Acenaphthene	0.069	0.15	mg/kg	74
16WNTF-SP03-SD	K160699914	16WNTF-SP03-SD-9	K160699915	8270SIM	Anthracene	0.087	0.32	mg/kg	114
16WNTF-SP03-SD	K160699914	16WNTF-SP03-SD-9	K160699915	8270SIM	Benzo(a)anthracene	0.2	0.5	mg/kg	86
16WNTF-SP03-SD	K160699914	16WNTF-SP03-SD-9	K160699915	8270SIM	Benzo(a)pyrene	0.21	0.43	mg/kg	69
16WNTF-SP03-SD	K160699914	16WNTF-SP03-SD-9	K160699915	8270SIM	Benzo(b)fluoranthene	0.21	0.49	mg/kg	80
16WNTF-SP03-SD	K160699914	16WNTF-SP03-SD-9	K160699915	8270SIM	Benzo(g,h,i)perylene	0.11	0.22	mg/kg	67
16WNTF-SP03-SD	K160699914	16WNTF-SP03-SD-9	K160699915	8270SIM	Benzo(k)fluoranthene	0.072	0.17	mg/kg	81
16WNTF-SP03-SD	K160699914	16WNTF-SP03-SD-9	K160699915	8270SIM	Chrysene	0.3	0.56	mg/kg	60
16WNTF-SP03-SD	K160699914	16WNTF-SP03-SD-9	K160699915	8270SIM	Dibenzo(a,h)anthracene	0.035	0.088	mg/kg	86
16WNTF-SP03-SD	K160699914	16WNTF-SP03-SD-9	K160699915	8270SIM	Fluoranthene	0.5	1.1	mg/kg	75
16WNTF-SP03-SD	K160699914	16WNTF-SP03-SD-9	K160699915	8270SIM	Fluorene	0.081	0.18	mg/kg	76
16WNTF-SP03-SD	K160699914	16WNTF-SP03-SD-9	K160699915	8270SIM	Indeno(1,2,3-cd)pyrene	0.12	0.26	mg/kg	74
16WNTF-SP03-SD	K160699914	16WNTF-SP03-SD-9	K160699915	8270SIM	Phenanthrene	0.96	1.6	mg/kg	50
16WNTF-SP03-SD	K160699914	16WNTF-SP03-SD-9	K160699915	8270SIM	Pyrene	0.65	1.1	mg/kg	51
16WNTF-SB08-12-SO	K160699802	16WNTF-SB08-12-SO-9	K160699803	8270SIM	Pyrene	0.0093	0.016	mg/kg	53
16WNTF-SB08-12-SO	K160699802	16WNTF-SB08-12-SO-9	K160699803	AK102	Diesel Range Organics (C10-C25)	510	1100	mg/kg	73
16WNTF-SP04-PW	K160692802	16WNTF-SP04-PW-9	K160692803	SW8260C	Toluene	0.00006	*0.0001*	mg/L	50

Notes:

mg/kg = milligrams per kilogram

mg/L = milligrams per liter

RPD = relative percent difference

Italics - The LOD was used in place of the ND sample result in the RPD calculation.

See the Data Quality Assessment for data qualifier definitions.

ATTACHMENT C-3

ADEC Laboratory Data Review Checklists

Included with document PDF on CD

Laboratory Data Review Checklist

Completed by:	Candace Ede		
Title:	Chemist	**Date:**	09-07-2016
CS Report Name:	West Nome Tank Farm Report	**Report Date:**	September 2016
Consultant Firm:	Jacobs Engineering Group Inc.		
Laboratory Name:	ALS	**Laboratory Report Number:**	K1606928
ADEC File Number:	400.38.002	**ADEC Hazard ID:**	575

1. Laboratory

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

All samples were analyzed by ALS Environmental of Kelso, WA.

2. Chain of Custody (CoC)

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

b. Correct Analyses requested?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation

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

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

The sample/cooler temperature was:

Cooler Veladero: 2.5° C /1.3° C
Cooler Cortez: 4.2° C /1.2° C
Cooler Kensignton: 3.0° C /2.4° C
Cooler Rock Creek: 1.5° C /1.6° C
Cooler Kalgoorlie: 2.6° C /4.5° C
Cooler Nixon Fork: 1.5° C /4.6° C

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

Samples 16WNTF-SP03-PW, 16WNTF-SP01-PW, and 16WNTF-MW36-GW were submitted with limited sample volume.

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

Comments:

The cooler that was received with temperatures below 2° C had no indication of frozen samples and the data quality and usability was not affected.

4. Case Narrative

a. Present and understandable?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

QC failures are discussed in the relevant sections of this checklist.

c. Were all corrective actions documented?

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

There were no corrective actions documented.

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

Comments:

The data quality and usability were not affected.

5. Samples Results

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

b. All applicable holding times met?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

c. All soils reported on a dry weight basis?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

All LODs were reported less than the respective cleanup level for this project.

e. Data quality or usability affected?

Comments:

The data quality and usability were not affected.

6. QC Samples

a. Method Blank

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

ii. All method blank results less than PQL?

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

AK102 – DRO was detected in the method blank for batch KWG1605351 at 0.013 mg/L.

SW8270SIM - Benzo(a)anthracene, Benzo(g,h,i)perylene and Indeno(1,2,3-cd)pyrene were detected in the method blank for batch KWG1605189.

iii. If above PQL, what samples are affected?

Comments:

16WNTF-SP06-PW, 16WNTF-SP03-PW, 16WNTF-SP01-PW

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

Results for associated samples within five times the method blank contamination were qualified B.

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

Comments:

Results qualified B are considered estimated and biased high. The data quality for these samples was minimally affected since all results were below ADEC screening criteria.

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

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

An LCS/LCSD and MS/MSD (DoD QSM required) was analyzed for all methods.

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

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

There were no inorganics submitted with this SDG.

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

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

AK102 - The 16WNTF-MW36-GW MSD recovery was outside of QC criteria (biased low, 72%) for DRO in batch KWG1605351. The LCS recovery was outside of QC criteria (biased low, 69%) for DRO in batch KWG1605351.

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

Comments:

AK102 - 16WNTF-SP02-PW, 16WNTF-SP04-PW, 16WNTF-SP04-PW-9, 16WNTF-SP05-PW, 16WNTF-SP06-PW, 16WNTF-SP03-PW, 16WNTF-SP01-PW, 16WNTF-MW36-GW, 16WNTF-MW36-GW-9, 16WNTF-MW37-GW

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

AK102 – All DRO results (associated with batch KWG1605351) were qualified "JL-"due to low LCS recovery. Sample 16WNTF-MW36-GW was not qualified due to low MSD recovery because the sample concentration was greater than the spike amount.

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

Comments:

Results qualified JL- are considered estimated and biased low. The data quality was minimally affected for samples 16WNTF-MW36-GW, 16WNTF-MW36-GW-9 and 16WNTF-MW37-GW because the results were greater than the cleanup criteria at 1.5 mg/L. The remaining samples qualified JL- are less than the cleanup level with the highest result of 0.24 mg/L (JL-).

c. Surrogates – Organics Only

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

SW8260 – The Toluene-d8 surrogate recovery for samples 16WNTF-SP02-PW, 16WNTF-SP06-PW, 16WNTF-SP01-PW and 16WNTF-TB03-GW was outside of QC criteria (biased high).

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

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

SW8260 – All associated sample results were non-detect; therefore no flag is required for a surrogate recovery with a high bias.

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

Comments:

The data quality and usability were not affected.

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

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

One water trip blank 16WNTF-TB03-GW was submitted in cooler “Veladero”.

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. All results less than PQL?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

All results were non-detect for trip blank 16WNTF-TB03-GW.

iv. If above PQL, what samples are affected?

Comments:

NA

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

Comments:

The data quality and usability were not affected.

e. Field Duplicate

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

Two field duplicates were submitted with eight primary samples.

ii. Submitted blind to lab?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

Sample ID/ Duplicate ID: 16WNTF-SP04-PW/ 16WNTF-SP04-PW-9 and 16WNTF-MW36-GW/ 16WNTF-MW36-GW-9.

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

The water field duplicates were evaluated using the RPD limit of 30%. When one result was ND and the other was detected the LOD was used in place of the ND result. The following analyte had a RPD greater than 30% in sample/duplicate 16WNTF-MW36-GW/ 16WNTF-MW36-GW-9: Fluorene (41%), Xylene, Isomers m & p (58%), Phenanthrene (67%), Acenaphthene (141%).

The following analytes had a RPD greater than 30% in sample/duplicate 16WNTF-SP04-PW/ 16WNTF-SP04-PW-9: Toluene (50%).

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

The data quality was minimally affected. The sample/duplicate results with RPDs greater than 30% were qualified JD. The higher or detected value will be used for reporting purposes. The results were all well below the respective ADEC cleanup levels.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

There were no equipment blanks reported for this project.

i. All results less than PQL?

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

NA

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

NA

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

The data quality and usability were not affected.

7. <u>Other Data Flags/Qualifiers (ACOE, AFCEE, Lab-Specific, etc.)</u>

a. Defined and appropriate?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

Qualifiers applied are defined in the Data Quality Assessment appendix of the report.

Laboratory Data Review Checklist

Completed by:	Candace Ede		
Title:	Chemist	**Date:**	09-08-2016
CS Report Name:	West Nome Tank Farm Report	**Report Date:**	September 2016
Consultant Firm:	Jacobs Engineering Group Inc.		
Laboratory Name:	ALS	**Laboratory Report Number:**	K1606998
ADEC File Number:	400.38.002	**ADEC Hazard ID:**	575

1. Laboratory

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

All samples were analyzed by ALS Environmental of Kelso, WA.

2. Chain of Custody (CoC)

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

b. Correct Analyses requested?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

The sample/cooler temperature was:

Cooler Fort Knox: 3.9° C /3.9° C

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

There were no discrepancies noted on the cooler receipt form.

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

Comments:

The data quality and usability were not affected.

4. Case Narrative

a. Present and understandable?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

QC failures are discussed in the relevant sections of this checklist.

SW8260: The internal standard recovery of Chlorobenzene-d5 (analyzed on 6/27/16) in samples 16WNTF-SB07-10-SO and 16WNTF-SB06-08-SO, 16WNTF-SB05-08-SO, and 16WNTF-SB05-10-SO was outside control criteria because of suspected matrix interference. The results quantified using this internal standard are reported from a dilution analysis with acceptable internal standard recovery (re-analyzed on 7/01/16).

SW8270SIM: The internal standard recoveries of Naphthalene-d8, Acenapathene-d10 and Phenanthrene-d10 (analyzed on 7/7/16) in numerous samples were outside control criteria because of matrix interferences. These samples were reanalyzed and reported at dilution for the compounds associate with the internal standard in question. The results quantified using this internal standard are reported from a dilution analysis with acceptable internal standard recovery (re-analyzed on 7/7/16 and 7/9/16).

c. Were all corrective actions documented?

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

There were no corrective actions documented.

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

Comments:

The data quality and usability were not affected.

5. Samples Results

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

b. All applicable holding times met?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

c. All soils reported on a dry weight basis?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

All LODs were reported less than the respective cleanup level for this project.

e. Data quality or usability affected?

Comments:

The data quality and usability were not affected.

6. <u>QC Samples</u>

a. Method Blank

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

ii. All method blank results less than PQL?

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

AK102 – DRO was detected in the method blank for batch KWG1605233 at 3.2 mg/kg.

SW8270SIM – The method blank for batch KWG1605183 had detections for the following analytes: 1-Methylnaphthalene, 2-Methylnaphthalene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Chrysene, Dibenzofuran, Fluoranthene, Fluorene, Naphthalene and Pyrene.

iii. If above PQL, what samples are affected?

Comments:

16WNTF-SB08-06-SO, 16WNTF-SB08-12-SO, 16WNTF-SB08-12-SO-9, 16WNTF-SB07-08-SO, 16WNTF-SB06-06-SO, 16WNTF-SB06-08-SO, 16WNTF-MW36-12-SO, 16WNTF-MW36-14-SO

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

Results for associated samples within five times the method blank contamination were qualified B. Results for 1-methylnaphthalene and 2-methylnaphthelene were not qualified for any samples because the sample concentration was greater than five times the method blank for all samples.

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

Comments:

Results qualified B are considered estimated and biased high. The data quality for these samples was minimally affected since all results were below ADEC screening criteria.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)
   i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

An LCS/LCSD and MS/MSD (DoD QSM required) was analyzed for all methods.

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

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

There were no inorganics submitted with this SDG.

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

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

SW8270SIM - The 16WNTF-SB08-06-SO MS recovery for 1-Methylnaphthalene was outside of QC criteria (biased low, 38%) in batch KWG1605183.

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

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

SW8270SIM – The 16WNTF-SB08-06-SO MS/MSD RPDs for 2-methylnaphthalene was greater than 20% at 22%.

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

Comments:

16WNTF-SB08-06-SO

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

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

AK102 – Sample 16WNTF-SB08-06-SO was not qualified due to low MS recovery because the sample concentration was greater than the spike amount for 1-methylnaphthalene. The 16WNTF-SB08-06-SO results for 2-methylnaphthalene was flagged JD due to MS/MSD RPDs greater than criteria.

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

Comments:

The data quality was minimally affected. All qualified results are significantly less than the ADEC cleanup criteria.

c. Surrogates – Organics Only
   i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

SW8260 – The 4-bromofluorobenzene surrogate recovery for 16WNTF-SB07-10-SO was outside of QC criteria (biased low, 70%).

SW8270SIM - The fluorene-d10 surrogate recovery for samples 16WNTF-SB07-10-SO. 16WNTF-SB06-06-SO, and 16WNTF-SB06-08-SO was outside of QC criteria (biased high).

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

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

SW8260: For sample 16WNTF-SB07-10-SO results were not qualified because only one surrogate was outside of QC criteria. The other three surrogates were in control.

SW8270SIM – All associated sample results were analyzed at a dilution factor of five or greater; therefore no flag is required for surrogate recovery outliers.

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

Comments:

The data quality and usability were not affected.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.):
<u>Water and Soil</u>

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

One soil trip blank 16WNTF-TB01-SO was submitted in cooler " Fort Knox ".

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. All results less than PQL?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

SW8260 - Toluene was detected in the trip blank, 16WNTF-TB01-SO, at 0.027 mg/kg.

iv. If above PQL, what samples are affected?

Comments:

Sample results within five times the method blank contamination:16WNTF-SB08-06-SO, 16WNTF-SB08-12-SO-9, 16WNTF-SB07-10-SO

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

Comments:

Toluene results for the associated samples were qualified B are considered estimated and biased high. The data quality for these samples was minimally affected since all results were below ADEC screening criteria.

e. Field Duplicate

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

One field duplicates were submitted with 10 primary samples.

ii. Submitted blind to lab?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

Sample ID/ Duplicate ID: 16WNTF-SB08-12-SO/ 16WNTF-SB08-12-SO-9.

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

The soil field duplicates were evaluated using the RPD limit of 50%. When one result was ND and the other was detected the LOD was used in place of the ND result. The following analyte had a RPD greater than 50% in sample/duplicate 16WNTF-SB08-12-SO/ 16WNTF-SB08-12-SO-9: Pyrene (53%), DRO (73%).

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

Comments:

The data quality was minimally affected. The sample/duplicate results with RPDs greater than 50% were qualified JD. The higher or detected value will be used for reporting purposes. The results were all well below the respective ADEC cleanup levels.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

There were no equipment blanks reported for this project.

i. All results less than PQL?

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

NA

ii. If above PQL, what samples are affected?

Comments:

NA

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

Comments:

The data quality and usability were not affected.

7. <u>Other Data Flags/Qualifiers (ACOE, AFCEE, Lab-Specific, etc.)</u>

a. Defined and appropriate?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

Qualifiers applied are defined in the Data Quality Assessment appendix of the report.

Laboratory Data Review Checklist

Completed by:	Candace Ede		
Title:	Chemist	**Date:**	09-07-2016
CS Report Name:	West Nome Tank Farm Report	**Report Date:**	September 2016
Consultant Firm:	Jacobs Engineering Group Inc.		
Laboratory Name:	ALS	**Laboratory Report Number:**	K1606999
ADEC File Number:	400.38.002	**ADEC Hazard ID:**	575

1. Laboratory

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

All samples were analyzed by ALS Environmental of Kelso, WA.

2. Chain of Custody (CoC)

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

b. Correct Analyses requested?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

The sample/cooler temperature was:

Cooler Pogo: 2.7° C /3.3° C

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

There were no discrepancies noted on the cooler receipt form. The lab did not analyze for AK101 (GRO analysis) for the sediment samples. These samples were re-collected and analyzed with SDG K1610186.

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

Comments:

The data quality and usability were not affected.

4. Case Narrative

a. Present and understandable?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

QC failures are discussed in the relevant sections of this checklist.

SW8260: The internal standard recovery of Chlorobenzene-d5 (analyzed on 6/27/16) in samples 16WNTF-SB04-06-SO, 16WNTF-SB04-08-SO, 16WNTF-SB04-08-SO-9, and 16WNTF-SB03-06-SO was outside control criteria because of suspected matrix interference. The results quantified using this internal standard are reported from a dilution analysis with acceptable internal standard recovery (re-analyzed on 6/30/16).

SW8270SIM: The internal standard recoveries of Naphthalene-d8, Acenapathene-d10 and Phenanthrene-d10 (analyzed on 7/15/16) in numerous samples were outside control criteria because of matrix interferences. These samples were reanalyzed and reported at dilution for the compounds associate with the internal standard in question. The results quantified using this internal standard are reported from a dilution analysis with acceptable internal standard recovery (re-analyzed on 7/16/16).

c. Were all corrective actions documented?

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

There were no corrective actions documented.

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

Comments:

The data quality and usability were not affected.

5. Samples Results

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

b. All applicable holding times met?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

c. All soils reported on a dry weight basis?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

All LODs were reported less than the respective cleanup level for this project.

e. Data quality or usability affected?

Comments:

The data quality and usability were not affected.

6. QC Samples

a. Method Blank

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

ii. All method blank results less than PQL?

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

AK102 – DRO was detected in the method blank for batch KWG1605251 at 3.6 mg/kg.

iii. If above PQL, what samples are affected?

Comments:

16WNTF-SP04-SD, 16WNTF-SP05-SD, 16WNTF-SP06-SD

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

Results for associated samples within five times the method blank contamination were qualified B.

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

Comments:

Results qualified B are considered estimated and biased high. The data quality for these samples was minimally affected since all results were below ADEC screening criteria.

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

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

An LCS/LCSD and MS/MSD (DoD QSM required) was analyzed for all methods.

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

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

There were no inorganics submitted with this SDG.

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

Comments:

NA

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

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

NA

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

Comments:

The data quality and usability were not affected.

c. Surrogates – Organics Only

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

SW8270SIM - The fluorene-d10 surrogate recovery for samples 16WNTF-SB04-06-SO, 16WNTF-SB04-08-SO, 16WNTF-SB04-08-SO-9, 16WNTF-SB03-06-SO, 16WNTF-SB03-08-SO, 16WNTF-SB02-06-SO, 16WNTF-SB02-08-SO, 16WNTF-SB01-06-SO, and 16WNTF-SB01-08-SO was outside of QC criteria (biased low).

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

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

SW8270SIM – All associated sample results were analyzed at a dilution factor of five or greater; therefore no flag is required for surrogate recovery outliers.

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

Comments:

The data quality and usability were not affected.

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

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

One soil trip blank 16WNTF-TB02-SO was submitted in cooler “Pogo”.

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. All results less than PQL?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

All results were non-detect for trip blank 16WNTF-TB02-SO.

iv. If above PQL, what samples are affected?

Comments:

NA

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

Comments:

The data quality and usability were not affected.

e. Field Duplicate

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

Two field duplicates were submitted with 16 primary samples.

ii. Submitted blind to lab?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

Sample ID/ Duplicate ID: 16WNTF-SB04-08-SO/ 16WNTF-SB04-08-SO-9 and 16WNTF-SP03-SD/ 16WNTF-SP03-SD-9.

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☐ Yes ☑ No ☐ NA (Please explain.) Comments:

The soil field duplicates were evaluated using the RPD limit of 50%. When one result was ND and the other was detected the LOD was used in place of the ND result. The following analyte had a RPD greater than 50% in sample/duplicate 16WNTF-SP03-SD/ 16WNTF-SP03-SD-9: Acenaphthene (74%), Anthracene (114%), Benzo(a)anthracene (86%), Benzo(a)pyrene (69%), Benzo(b)fluoranthene (80%), Benzo(g,h,i)perylene (67%), Benzo(k)fluoranthene (81%), Chrysene (60%), Dibenzo(a,h)anthracene (86%), Fluoranthene (75%), Fluorene (76%), Indeno(1,2,3-cd)pyrene (74%), Phenanthrene (50%) and Pyrene (51%).

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

The data quality was minimally affected. The sample/duplicate results with RPDs greater than 50% were qualified JD. The higher or detected value will be used for reporting purposes. The results were all well below the respective ADEC cleanup levels.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

There were no equipment blanks reported for this project.

i. All results less than PQL?

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

NA

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

NA

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

The data quality and usability were not affected.

7. <u>Other Data Flags/Qualifiers (ACOE, AFCEE, Lab-Specific, etc.)</u>

a. Defined and appropriate?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

Qualifiers applied are defined in the Data Quality Assessment appendix of the report.

Laboratory Data Review Checklist

Completed by:	Candace Ede		
Title:	Chemist	**Date:**	09-08-2016
CS Report Name:	West Nome Tank Farm Report	**Report Date:**	September 2016
Consultant Firm:	Jacobs Engineering Group Inc.		
Laboratory Name:	ALS	**Laboratory Report Number:**	K1610186
ADEC File Number:	400.38.002	**ADEC Hazard ID:**	575

1. Laboratory

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

All samples were analyzed by ALS Environmental of Kelso, WA.

2. Chain of Custody (CoC)

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

b. Correct Analyses requested?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

The sample/cooler temperature was:

Cooler Muruntau: 0.1° C /-0.7° C

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

The sample temperatures below acceptable range were noted on the sample receipt form.

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

Comments:

The data quality and usability were not affected. The samples were received in good condition and there was no note of frozen samples.

4. Case Narrative

a. Present and understandable?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

QC failures are discussed in the relevant sections of this checklist.

c. Were all corrective actions documented?

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

There were no corrective actions documented.

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

Comments:

The data quality and usability were not affected.

5. Samples Results

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

b. All applicable holding times met?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

c. All soils reported on a dry weight basis?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

All LODs were reported less than the respective cleanup level for this project.

e. Data quality or usability affected?

Comments:

The data quality and usability were not affected.

6. <u>QC Samples</u>

a. Method Blank

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

ii. All method blank results less than PQL?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

All results were non-detect in the method blank.

iii. If above PQL, what samples are affected?

Comments:

NA

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

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

NA

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

Comments:

The data quality and usability were not affected.

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

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

An LCS/LCSD and MS/MSD (DoD QSM required) was analyzed for all methods.

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

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

There were no inorganics submitted with this SDG.

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

Comments:

NA

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

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

NA

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

Comments:

The data quality and usability were not affected.

c. Surrogates – Organics Only

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

NA

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

Comments:

The data quality and usability were not affected.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.):
<u>Water and Soil</u>

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

One soil trip blank 16WNTF-TB03-SO was submitted in cooler " Muruntau ".

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. All results less than PQL?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

All results were non-detect in the trip blank.

iv. If above PQL, what samples are affected?

Comments:

NA

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

Comments:

The data quality and usability were not affected.

e. Field Duplicate

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

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

One field duplicates were submitted with six primary samples.

ii. Submitted blind to lab?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

Sample ID/ Duplicate ID: 16WNTF-SP02-SD/ 16WNTF-SP02-SD-9.

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

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

Comments:

The data quality and usability were not affected.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

There were no equipment blanks reported for this project.

i. All results less than PQL?

☐ Yes ☐ No ☑ NA (Please explain.) Comments:

NA

ii. If above PQL, what samples are affected?

Comments:

NA

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

Comments:

The data quality and usability were not affected.

7. <u>Other Data Flags/Qualifiers (ACOE, AFCEE, Lab-Specific, etc.)</u>

a. Defined and appropriate?

☑ Yes ☐ No ☐ NA (Please explain.) Comments:

Qualifiers applied are defined in the Data Quality Assessment appendix of the report.

ATTACHMENT C-4

Laboratory Deliverables

Provided electronically on CD

APPENDIX D
Field Documentation

Summer 2016

per diem on expense report - Mondays

> All programs
> VPN client
> VPN client
> connect BSNC

- hard hat etc. ? Yes
- vests Yes
- safety glasses - Yes

NOME AK 2:30 P.M. 6/18/16

Joe, Darren } Discovery 12

Larry & Candice - Jacobs
David Sanders - TITLE II (COTR) NORTHWIND
CONTRACTOR FROM USAF

DRO - lower lim. + 10,250 ppm
Diesel Range Organics

Sunday 6/19

9 AM - MUSTER POINT - Safety meeting
SOUTH WEST END of cap AREA

TO DO
- develop monitoring wells THURS FRI
- demo on pump house; Turnet - initial
June 23-27 - surveyor will shoot in cap(pad) perimeter
- grade site & elev. Mon. 27
- Also GPS 2 NEW MONITORING Wells
Aaron Burmeister - 907 460 8229

- geo textile fabric BSPS - for a couple laborers - box of staples to pin down fabric

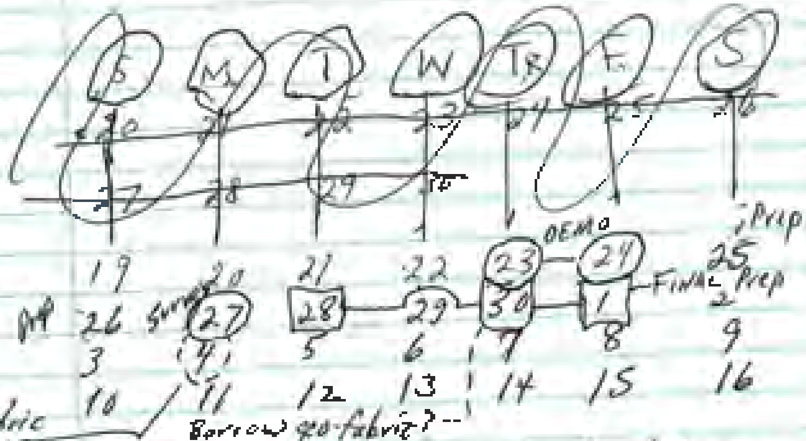
password @ BSNC - frontstreet
office in Nome
gate comb. 8-7-2-3 for Air Force

office - 110 Front Str 332!

> Larry Amskold - Jacobs Engineering
- 907. 280. 8862

field screening - potential contaminated soil placed in baggie; after ~10 min. PID instrument used to get PPM of DRO
samples - soil collected & put in glass containers & sent to lab for precise lab analysis.

- START HAULING IN sand (22") for cap
- 6" of 2" minus over sand



Tues/Wed. - Develop 2 wells; hand drive pipe @ tide line (6) & sample H2O & sediment
- 24 HRS. - sample 2 wells

23rd 29th 2 side dumps to monofill
0800

Jeff 434.0593 shop by the hospital

Kim n Cal
- Cal Foreman for Stampede

June 20 Monday

Ak Marine Lines
* 577073 voyage # W1606N
- booking # for 250 GEO-textile fabric - 40 ROLLS 12.5' x 360'
> left Seattle on June 10

- Get 2 laborers from BSDC - we'll do an interco billing - they do a reg time sheet & we will handle internally - It is DB wage, BSDC keeps the fringe if they are full time employee w/ benefits.
May also need a laborer

Monday Porewater sample

0800 - Safety meeting
- pore H2O sampling -

- 0845 Larry Pederson BSNC Geo-tec fabric | Rob Bensin Elec Const. Mgr. BSDC | Nicholai works w/ BSNC | Gerald Wind energy guy

16

~~0845~~ 0900 Tumet Industries
@ WWTF SITE
NE CNR. 20' from fire hydrant

Bench mark #15 → C2 LS 2016 7323-S

AARON & Ken Bendz - Site Supt. for Aaron

WEDNESDAY
City of Nome - get key to Monofill

Ext. fill permit is in front cover of 3 ring binder

Nome Emergency # 907.443.5262

1115 - Nick to Airport
1125 Call Keo B. 907.351.8702
to get Jeff's # w/ Stampede

✓ Call Jeff Sutton (907.434.0593) - set up 2 side dump trucks for 0800 on the 23rd & 24th. To remove demo'd building - former Pump House ✓

- after survey, final grade prep. before fabric.... if it is fast; borrow fabric from Larry & Aaron & get 2-3 laborers from BSOC ready for 1 or 2 days labor.
- Once fabric is set - start hauling sand

1300 - 1930 - @ SITE, observe well development
surge - pump the well to the bottom with 1" plastic hose w/ small filter on end; to get all sediments of the walls & floor of well.
purge - after surging, siphoning out 5-10 G of H_2O; after 3-5 clarity improves
3 full cycles of surge/purge to develop monitoring well.

1700 - cont. developing well.
1835 - STOP; Well developed... End day
5½ HRS. TO DEVELOP

Dan into Nome @ 1930

Tuesday 6/21

0715 - Brkfst Dan - Progress Report - Day Activities

Tuesday 6/21 43° - 46° cloudy
7-10 mph

0800 - safety meeting w/ Jacobs & Davis Sandals
- will do 5 porewater samples @ remaining bts
- to start about 15 min after high tide
- Then; develop 2nd monitoring well (W-36)

1030 - middle of 3rd porewater sample

1040 - With Dan, Larry, Aaron Burmeister

↓

1500 -
- If we need geo-fabric - call Aaron Burmeister
(**) Make sure the spec. matches what Aaron has (250)

1600 - Truck Yard - met Cal (Stampede) & Jeff Sutton (Stampede)

- Turnet wire feed there & own equip. when on site; we will fuel D-9 when it is pushing up sand at dredge #6 - send it for fill @ site (WNTF) West Nome Tank Farm

End of Day

Jason W. House in MO - @ - call him

WED. June 22 — 45° Low clouds 8-10 mph

✓ - PIC of fence for AAA
✓ - To city offices; key for Monofill on Center creek rd. - p.up key tomorrow @ 8:30 a.m.

0800 - Safety mtng. w/ Jacobs & North Wind SOTR David Sanders

0845 - visit w/ observe barge - conveyor belt rock being loaded.

0900 - pics for AAA fence
0930-1000 observe Jacobs sampling a monitoring well behind (east side) of lot 6.
1030 - City Hall - arrange for access to mono fill on Ctr. Ck. rd.

NEED TO CHECK ON FABRIC w/ AARON B. (250). Fabric needed on the 29th ± (Wednesday)

Shaunstad metal detector

1300-1430 - emails, reports

1500 - Tumet Industries - Geo-textile fabric on hand is WINFAB 315W
-315 - Tensile strength
Spec is 350 or equivalent

1600 - OBSERVE FINAL SAMPLE FROM W-37

1800 - LOAD REF. @ WITH LARRY (JACOBS)

443.6587 → Nome joint utilities

cell 907.304.5646 → John Handeland
443.6302 office
907. [illegible]

✓ Outsiders

84/1 252/4 63

Sat — Arrive 18th
75% of 84 = $63

~~19 20 21 22~~

Sun.	M	T	W	Tr	F	S
19 DRILL SAMPLE →	20 DE-MOB DRILL →	21 JACOBS →	22 MOB EQUIP. FINISH → FLY OUT	23 DEMO —	24 Pump house	25 DG grade
26 DG grade	27 Survey site →	28 DAY ← 2-SS. Rob	29 lay fabric?	30	1	2
3	4 FABRIC ON BARGE	5	6	7	8	9
10						

cell (907) 304-1642

443-5254

→ Rob - BSDC - 2/3 laborers for Tues. & Wed. ←
- Larry Pederson -
Kim n Cal

- Sherpa - 28th

- Mike Christian - Monday 2 flights into Nome
- To St. Lawrence on Tues.

Staging @

THURS. June 23 46° CALM/DRIZZLE

0700 - Safety mtg. - S. Young - EEE
Brian Balmer
Ken Bendz } Tumet
Kris Erickson
David Sanders - N. Wind USAF

Equip. on SITE
- Cat 345C Exc.
- Cat 583 comp.
- Cat D6 DOZER

30 0830 - leave site w/1st load (side dump)
0845 - dump 1st load @ monofill
0900 - leave site 2nd load
21 0908 - dump load 2
0921 - leave site load 3
19 0932 - return to site
0940 - leave site load 4
20 0951 - return to site
1000 - leave site load 5
20 1011 - return to site
1020 - leave site #6
19 1032 - return to site
1039 - leave site load #7
19 1050 - return to site
1058 - leave site load #8
19 1110 - Return
1117 - leave site load #9
22 1130 - Return
1139 - leave site load #10
25 1151 - Return
1204 - leave site load #11 - finish Demo

03 25
2015
7323-5) Monument
C

1400 - 1700 R&R @ MASTER

Friday 6/24 48° partly sunny mostly calm

0700 - Safety mtg. - S. Young - EGE
Brian Balmer - Tumet
Kris Erickson - TumA
David Sanders - USAF

0900 - To BSNC office
- Nick
- e-mail safety mtg. sheet
- Yes for overnight stay
- found monument, but not other one... surveyors locating 5 wells for Jacobs

- See Rob on Monday - to remind about fabric.... suite 204 - BSPC

- Fabric - John Handelin - Nome joint Util.
Toby S - 443-6330

1140 - @ SITE; observe site grading BSNC

282 116 166 3 498 166 427 $116.00 PER DIEM 282.00 L&M, Inc.

Agg. 2" minus 10 cy 180.00 x 267 = 98,060.00
= 18" cy for 2" ←
2670 cy x 18 = 48,060 2" minus

7840 cy x 12.50 = $98,000.00 SAND

48,060
98,000
$146,000.00

COST OF CAP MATERIAL
Total Contract - $952,704.07

1430 - OBSERVE @ SITE. Met Lucas Stotts - Harbor-master - making sure heavy equip. not in way @ south end.

2015

SAT 6/25 Sunny 50°

0700 - Safety mtg BRIAN Balmer
KRIS Erickson
SONNY
DAVID Sanders

- 0730 - pull up 6" old with excavator, bend over & bury

0800 - To Jim West rock operation on ASNC land
2"- w/ silt - looks very good

0900 - OBSERVE EQUIP. FINISH GRADING SITE

0930 - Call Jeff Sutton - touch base on starting to haul silty sand on Wed or Thur.
- he does have loader for operation
- Tumet (DL) will spread sand when dropped by side-dump

1100 - Mark w/ Edge surveying called: Mike n Mike will be in on Sunday flight @ 11:30. I will pick-up - to Aurora Hotel

1200-1300 - 25 rolls geo-tech to site

DIRECT TV - 800.531.5000

Sun 6/26 Cloudy 50°

0800 - office dailies
1100 - job site
1130 - airport - p.up surveyors
- job site - review work plans

Monday 6/27 CLDY. 46°

- Edge Survey

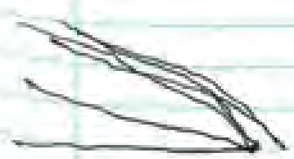
0800 - Safety meeting - Mike Wilson } Edge Survey
Mike MacDonald
David Sanders Me

Burgh 18 - July 3

Q's for Nick K

- Entry/Exit point 3:1 YES 3:1 T steep

crown? 2% ± YES



NICK
- 3:1 toe @ both ends YES
- 7' @ sent. A-A; really
@ 33' mound YES

CLICKSAFETY: Syoung-username
4600-password

0915 - Ken, Mike, I discuss construction parameters.

0920 Ken wants to start hauling tomorrow
- Barge is in today to load up

1100 - Jeff Sutton
1/3 → 4 DRIVERS

THUR. - Tumet - loader
Tues. Wed. - 4 trucks for us
THURS. - Fri - try to find 5th driver, so we can have 2 side dumps here. BUT, Tumet will need loader @ beach where sand is because their loader will be at their site loading big rock for KNIK

KNIK has 27 more trips to make @ 5 days /trip = 27×5 = 135 days
= NOV. 15 = NO CHANCE

Cecil (514) 251 0465

8 HR

syoung
4600

save 43 deaths save 475.2M
prevent 585 cost save 32.2M
1983 first HCS
16 sections
MSDS → NOW KNOWN as SDS
GHS - Globally Harmonized System
Warning } Danger is for most severe hazard
Danger }
PEL - permissable exposure levels
TLV - Threshold Limit Values

GPS coordinates
Top of casing
(plastic 2" PVC)

9/
3 27/16
5
135
days
4½

1350 - Met Jeff Sutton - look @ sand

1430 - @ SITE - OBSERVE survey crew
CALL OFFICE: RE - Elev. coordinates for LTM wells put in by Jacobs

1545 - Request 2 trucks moved by

1800 - LEAVE SITE - TO AIRPORT P.UP CHRISTIAN

227
4
11 8 days

1845 - BACK TO SITE; SURVEYING SMALL SECTION (PITCHERS MOUND)

1900 - OFF SITE

8 HR Refresher

NEW
- fatalities reported w/in 8 hrs
- hosp./amp./eye loss w/in 24 hrs
3 ways to report
> call office
> OSHA hotline
> online

form 300A
(job related illnesses/injuries
Feb March April
3 mo it must be posted

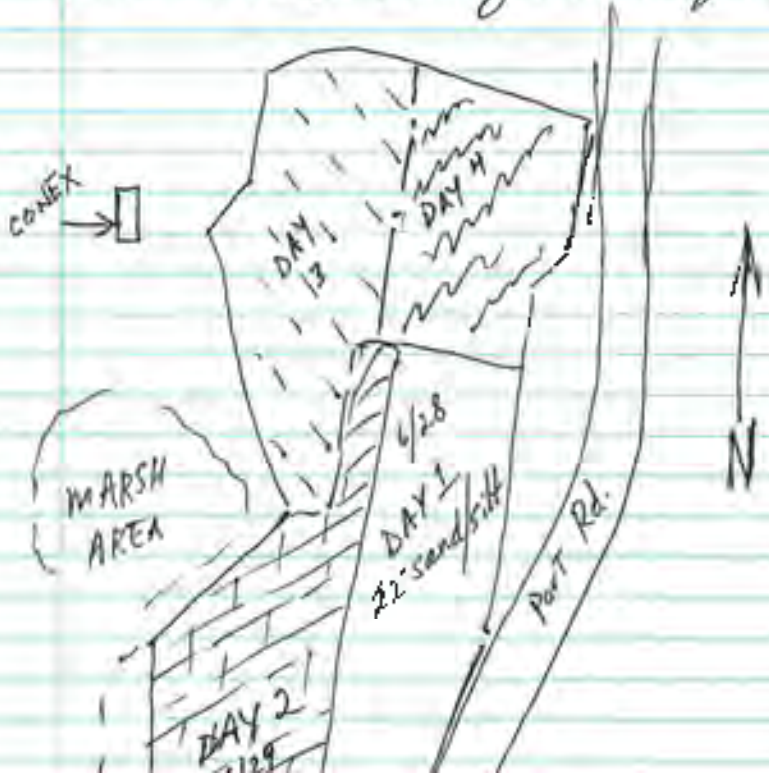
200
15
Noise-induced hearing loss is most common work related

WED. 6/29 49° PRTLY. CLDY.

0700 - Safety meeting
Kenny Harry - BSDC
Roland Randall - BSDC
Kris Ericsson - Tumet
Brian Palmer - Tumet
David Sanders - North Wind
S. Young - EEE

0708 - 1st load hits the ground
0709 - AT SITE - OBSERVE, help laborers w/ 1st roll of Geofabric

0930 - LEAVE SITE - to camp, check status of Sherpa
1000 - @ SITE - OBSERVE; go out to pit @ dredge 6 - a dozer pushing sand down & a loader filling Leda dumps - just 3 trucks running, - a 4th pulled up @ 1015 - 4 trucks running now as of 1015...



1100 - Trucks running

1300 - @ SITE - observe trucks hauling

1400 - Mike & Christian to Ryan Air - arrange to fly cargo loads to Gambell - still too weathered in (400 clg.) to get Sherpa

1500 - Mike w/ Fly w/ Sherpa @ 4:15 & Ryan will cargo drill @ 4:30

1600 - Jeff S. - NO HAUL tomorrow or Fri. Friday
Kenny w/ Tumet - NOT HAPPY

1630 - @ SITE - collect truck haul invoices

1700 - End of Day @ WNTF

1830 - Take Christian back to airport - Sherpa arrives & says no more trips (clg @ 200-400') AND they are going back to ANCHORAGE — I called DAN immediately & said WTF - these guys are out!

1930 @ Camp End of Day

Northwind
Stewart Williford - 417.631.9376
med @ 10-10:30 -

29 + 30 + 27 + 31 = 117
117 Trips = 1989 cy

6700 cy TOTAL

RUNNING TOTALS

	Trk 1	Trk 2	Trk 3	Trk 4	day Tot.	Tot. cy
Tues 28	24	25	28	28	1785	1785
Wed 29	29	30	27	31	1989	3774
Sat 7/2	30	29	29	10+11	1853	5627
7/5						

THUR. 6/30 8-3:15h

- 0745 - PHONE w/NICK; update on yesterday
- 0800 - Christian to Ryan - make arrangements to cargo final load to Gambell.
- 0830 - Christian to Bering Sea for last flight
- 0900 - Back to Ryan - confirm were all set to go ✓

→ Call Jeff - Firm Sat.? → YES — 7 am.

Call Ken - Yes Sat 0700

Call Rob - laborers 1 day
443. 5254

- Kenny 434 - 2701
- Roland 434 - 2730

Call Toby w/NJU
RE - 5 ROLLS GEO FABRIC 443-6330.

FRIDAY 7/1 Sunny 50°-

116 x .75 = 87.00 Personal

Expense Report sent 6/18 — 7/1
per-diem - $1,595.00

DRONES ← → Self Service
→ Payroll & Benefits

Fisher 49
Bank acct.:

John 6 ✓ Colorado
Woods Lake - Dolores Pk.
Dallas Pass
Ridgeway - Ouray
Peadre River - 20m W. of Pagosa Springs

float
Fri - camp - Sat

SAT July 2 Sunny 50° 15mph Wind ↑ 69°

0700 - Safety Mtng. @ SITE — Stewart Williford North Wind
Kenny Harry - BSDC
Late 15min. — Roland Randall - BSDC
Brian Balmer - Tumet
Kris Erickson - Tumet
S. Young - EEE

0703 - 1st load - hits the ground
0720 - l. up pilots for Sherpa
0730 @ SITE OBSERVE
0950 - Sherpa ← OUT OF NOME

Mike Helms | St. Lawrence Island
(907) 242.9441 | JOB
Magnometer - tubing | AK airlines
2-56 gal bottles - Gold Streak

1052
CALL - Jennifer
- (907) 382.0146 - AWB for Gold Streak - left msg.
± 1110 - Stampede pulls 2 trucks
OSITE ↓ 1180
1127 - spoke w/ Ed, VP of Stampede
had called him @ 0830 this a.m. - stated a 2nd barge would be in @ 1730 today
They will keep 3 trucks running for us today, then haul 6 side dumps to barge Sunday on Sunday & Monday the 4th. Should get back to us, NO problem, on Tuesday & then hopefully all week.

other driver 10 trips 10 + 11 - Jeff 11 trips 7-11

1200 @ SITE OBSERVE
1300 - 1330 Airport: set Gold Streak for Lambert
1400 - 1430 @ SITE - then Mike Helms - waiting to see if Sherpa would make it back

1610 - @ SITE OBSERVE — OFF SITE @ 1100
1714 - last load
36 + 29 + 29 + 10 + 11 = 109
= 1853 cy
= 5627 TOTAL for 3 days

1800 End of Duty

Tues. 7/5 CLDY 55°

0700 - Safety mtng. Brian Balmer } 5-7 mph
Kris Erickson } Tunet

ON SITE late 1HR. - Kenny Harry BSDC
Roland Randall, BSDC
Stewart Williford - N.Whid
S. Young EEE

1st load 0705

0830 - To Jim West pit; check out 2" minus
Dimension 100' × 50' × 20' = 3,300 - 3,500 cy

0900 - ON SITE

0915 - To AK Marine/Northland
- looking for 40 rolls geo-textile fabric
- delivered to barge line on 6/19
- Booking # 577073
- Voyage # W1606N
Mike Dunsmore; AIH

2" — 2700-2800 cy

4/16 Mike after bypass Rd. take R
- left of convoy - to J. West pit area
- under Stampede Ventures
- Inter Change agreement
July 28th - must have CAN back

0930 - To camp ✓ e-mail

1000 - ON SITE

1100 - light rain

1250 - last 300-400 cy to go (Estimate)

1400 - 'PITCHERS MOUND' - 6 trucks × 17 cy = 102 cy

1503 - SAND COMPLETE

1515 - TO J. WEST PIT w/ Ed & 3 Trucks
~~155~~ - Jim loading first few trucks until loader from barge 6 arrives

→ 1535 - 1st LOAD of 2" minus hits the cap.
Timing of 2nd load.
26 ½ min.

13 ¾
3 ½

· EST for 2 TRIPS/HR. × 6 TRUCKS

← wed 7/6

EST. FINISH 2" - tomorrow @ 6pm

265 acres

DAY Totals

Sand
21 + 23 + 23 + 21 + 22
= 110 × 17
1870 cy
7497 Total cy sand

2"
8 + 8 + 9 + 9 + 8 + 6
= 48 × 17
816 cy
= 29% complete
3 ½ HRS

wed → 7 HRS = 1600 } if 6 trucks
7 = 2 o'clock -2400 } 30

5 trucks
34 × 5 = 170 cy/hr
2400
2674
1859 cy / 170 cy/hr = 10.9 HR.

7 : 6 o'clock

1900 - last load 2" - for day
1930 - to Stampede to get all invoices

WED. 7/6 225 PRTLY. CLDY. 46° - to sunshine 58° 8-10 mph

0700 - Safety meeting Brian Kris

Sonny

507 713 0656 - Don Scott - Noon

0715 - 1st Truck

0720 - BSDC - 2 laborers show up ← No Work for laborers

0730 - To N. Land to get 40 rolls of geo-fabric.
- Don't open until 0800. Gave them instructions to come back @ 0800 & get rolls to Tumet.

0745 - P-up Mike - take samples to NAC for shipping back to ANC.

0815 - @ SITE - OBSERVE

0845 - Mike to camp

~~0900~~ 1000 @ SITE

Santa Claus
Paul Kudla

1045 - Back to camp - take Mike to AK Airlines for 1215 flight

1100 - @ SITE - 1115 - Spoke w/ Ken about laborers

→ 1155 - Don Scott w/ NorthWind @ site

1235 - OFF SITE / ON SITE 1330

1335 : 7844 cy - Total Silty Sand, per contract
2674 cy - 2" - per contract
SIZE OF CAP 115,500 sf

1400 - DISCUSSION w/ Don

loads/HR

1500 - Closing IN on 6" coverage of 2" - Daisy (driver for Stampede) had 18 loads @ 1500. I had estimated 2/HR. so anticipated she would have 16. Pace has picked up. RE-estimate and conclude we are around 2400 cy; I am having 4-5 loads placed in middle to increase crown slightly. Figured 11 more loads to hit 2600. - CALLED [illegible]

Coast Guard ~~[illegible]~~ JayHawk helicopter

stipulated in contract by Air Force. I get Jeff's (Stampede foreman) attention & inform him we are at full coverage - STOP trucks @ 1515.

1530 - We get 3 more trucks - ones that were loaded & headed to site.

1600 - To Stampede to ~~[illegible]~~ collect invoice from Ed to get final numbers

1645 - 104 Total Trips x 17 cy
= 1768 cy
+ 816 cy yesterday
2584 total

1705 - End of day →

x \$20.00 cy
\$51,680.00

Jim West - W-9
→ e-mail

270

THURSDAY 7/7 PRTLY CLDY 46° calm

0700 Safety mtg. Brian Balmer
Kris Erickson
Don Scott - N. Wind
S. Young
complete final dressing & compacting of SITE

0830 - Ken B. @ SITE - meets Don Scott

0845 - To Northland - Tumet will p-up
Geo fabric
36 from Tumet } USED
→ 10 returned } 26
- We got 40 barged in - All to Tumet
40 - 26 = 14 belong to EEE
- All stored @ TUMET

0900 - @ SITE - finishing Grading & compaction

1300 - Done w/ civil

- Jim West W-9
AAA Fence Co - Arrive 12th 7:50AM
→ Cable locates - 270 W. Polar Bear Ave
Little Diomede 907.686.3051
joint utilities

Friday 7/8 CLOUDY 50°

0815 @ SITE - let Jacobs know - 2 drums
Don Scott - 1 bag
(509) 713-0656 90days

1000 - Satelite & port - nearest intersection for cable locates
907.686.3051 - NO - little Diomede

Toby - Nome Joint Utilities
power, water, & sewer ✓ OK

- Non-hazardous

1100 - To Monofill - very small amt. of trash from site

1130 - replace 1 'POSTED' sign. need a rock bar; don't think the first one is going to withstand much wind

Unalakleet Crew
- Christian Reuben
- Quinn
- George Wood
- Larry? Ivanoff

Leave
417.724.8020
Larson Heating, Air, & Plumbing
$49.99 ↔ 10th Aug. 10 – 8-10am

OSHA – continue

- 1910.120 (h) – monitoring
  - " . " (j) – handling drums & containers
  - " . " (k) – Decontamination & other topics
  - " . " (o) – New technologies
  - (l) – Emer. Response @ Haz. Waste site
  - (p) – Certain Ops @ RCRA 1976

TSD – treatment, Storage, & Disposal
(q) Emer. Response to Haz. Substance

FIRST RESPONDER – initiate emerg. response sequence → notify authorities of release 8HR
- operations level – secure, & more defensive

HAZMAT TECH. – 24 HR.
- more aggressive – stop the release

HAZMAT SPECIALIST 24 HR.
- support HAZMAT tech.; but greater understanding

1910.120 (q) Emer. Response program

OSHA Respirator Protection Standard 1910.134
2 MAIN TYPES
- AIR PURIFYING (APR)
- Atmosphere Supplying – for IDLH environs.

APF – Assigned Protection Factor; >#, >protection
PAPR – Powered Air Pur. Resp. – can be loose or tight
Elastomeric – rubber or silicone
SCBA – self contained breath. app. – Highest level
Filter Classification (first part)
- N – Not resistant to oil
- R – somewhat resistant
- P – strongly resistant to oil

95 – 95% of particles removed
99 – 99% " " "

INT. RATE 2.6%?

200k home down pmt	15 yr. MTG. PMT.	TOT. Pd.	TOT. INT. Pd
10k	1600	288 k	98K
20k	1501	270 k	90K
30k	1408	253K	89.4K
→ 40 K	1290	232 k	72.2K
50K	1211	217.9K	68K
60K	1155	207.9K	67.9K

Title 29 CFR Part 1926 Construction Subpart AA
Confined Spaces
- prevents over 800 serious injuries annually
Permit Required – 1 or more
1. has or potential to have hazardous atmosphere
2. contains material that can engulf occupant
3. inwardly converging walls or floor sloping floor tapers down
4. serious safety or health hazard

Permit – 1 list authorizing entry

Noise MAX
28/40 TO PASS (70%) 85dbA – 8 HRS

Soil Analysis & Classification

.65% of 60 = 39 min. 39/40 Final

Air force Radar Station HAG00 Voyager Pro - short wave radio

Monday 7/11/16

Q's for Nick

① - fire ext., safety (1st aid kit) - Conex
② - pull survey stakes ? YES

Tuesday 7/12   50° foggy cldy.

0800 - Roger Channing - AAA fence
907.244.1412   8:50am
Mike Brist ~~Jamie Anderson~~ AAA
Eugene Carlin - AAA
1030 Safety mtng. Don Scott - N. Wind
S. Young - EEE

- OBSERVE -
- ABSORBANT PADS
- FABRIC PINS (1 3/4 BOX)
- 1st AID KIT } KEEP @ SITE FOR NOW
- FIRE EXT.

To B.S.D.C. TOOL ROOM 3-5-1

1. STRING LINE - layout every 10'
2. START DRIVING POSTS @ 1105

- PPE for Unalakleet
- MOB 25th ⟷
= PPE, house keeping
- driving

Expectations for the company + this job

→ 25 - 5 6 7 8
- Deltek for all Employees in Unalakleet, 4 guys

Quinn
Christian
George
Larry
} maybe 2 diff codes depending on tasks

1110 - OBSERVE

1530 - fence complete

1600 - To Nome City offices - monofill key
- last trip - refuse - survey stakes, fence posts tops

~1630 - Discovery Drilling - drill rig attachment, tool trailer. AWB# 027-17025621

Kathleen & Ralph - Dan Vogt - 196 lb. halibut

7/14 - ~~Wed~~ THURSDAY

Back in Anchorage Office

- Wells Fargo
- SD card - Thumb drive
- fishing license

1 1/2 × base = OT   Jennifer
Si $350   Seindit

Ida & Erika - Jacobs
= Peace on Earth - like EEE same as last yr.
* - SITE ORIENTATION ⟷ WHAT IF'S -
- SAFETY - DRY RUN - WHAT IF'S 1/2 day
vests
gloves, glasses, hearing aid, HARD HATS

210' × 80' - footprint

corps spec. EM-385
- site security

6 mil - top of stockpile
geo fabric - bottom of " "

- REVIEW - SSP - site safety plan
- Work plan

DCN FED-707-05DK630-1404-0001

Eag & Eyo Electric

Logbook 1 of 1

WNTF

Rite in the Rain®
ALL-WEATHER
FIELD BOOK
№ 350

Field Observations

L Amskold 6/15/16-
C Ede 8/27/16
B Ramsay

CONTENTS

PAGE	REFERENCE	DATE

Rite in the Rain®
ALL-WEATHER WRITING PAPER

ALL-WEATHER
FIELD BOOK

JACOBS ENGINEERING

Name LARRY AMSKOLD
CANDACE EDE

Address 4300 B STREET, SUITE 600
ANCHORAGE, AK 99503

Phone 907-563-3322 / 907-280-8824

Project WEST NOME TANK FARM

Rite in the Rain — A patented, environmentally responsible, all-weather writing paper that sheds water and enables you to write anywhere, in any weather. Using a pencil or all-weather pen, *Rite in the Rain* ensures that your notes survive the rigors of the field, regardless of the conditions.

Specifications for this book:

Page Pattern		Cover Options	
Left Page	Right Page	Polydura Cover	Fabrikoid Cover
Columnar	1/4" Grid	Item No. 350	Item No. 350F

RiteintheRain.com

Made in the USA
US Pat No. 6,863,940

6/15/16 OSDK6302 (1)

EAGLE EYE ELECTRIC / USAF

6/15/16

1130 LARRY AMSWOOD - CANDACE EDE ARRIVED IN NOME.

↳ PICKED UP RENTAL VEHICLE

↳ MET W/ DISCOVERY AT WNTF SITE. THEY WILL COMPLETE STAGING SUPPLIES ADJACENT TO PRIOR JOB TRAILERS.

↳ CALLED N. KUHLMANN (EEE) HE INDICATED HE WILL MEET AT SITE ON 06/16 ~~AM~~ 0800 FOR TAILGATE

1500 LA + CE PERFORMED PRELIMINARY SITE WALK

* THERE ARE 8 WELLS IN SOUTHERN CLUSTER

* THERE ARE 17 WELLS IN NORTHERN CLUSTER

6/15/16 WNTF USAF/EEE OSDK6302

(2)

THERE ARE 29 WELLS TOTAL IN FOOTPRINT ON SITE
VERSUS 21 IN WORK PLAN

STOPPED BY CLINIC. EMERGENCY RESPONSE
IS ON THE BACKSIDE.
(NORTON SOUND HOSPITAL)

911 MAY NOT WORK IN TOWN.

EMERGENCY DISPATCH 907-443-5262

PROCEEDED TO GEORGE'S HOUSE TO
UNLOAD COOLERS AND INVENTORY
MATERIALS THAT HAVE MADE IT TO
SITE.

END OF DAY

[signature]

OSDK6302

6/16/16 WNTF USAF/EEE (3)

LARRY AMSIN[illegible]
CANDACE EDE
NICK KUHLMANN
DARREN
TU

60S → 70'S PARTLY CLOUDY

MODIFIED LEVEL D

OBJECTIVES - HEALTH AND SAFETY [illegible],
SITE WALK, WELL DECOMMISSIONING

EQUIPMENT ON SITE
• GEOPROBE 6712 DT

0800 PHONE CALL W/ NICK MCKAY
REGARDING ADDITIONAL WELLS.
↳ AUTHORIZED TO DECOMMISSION
WELLS THAT ARE IN THE FOOTPRINT,
NTA WILL COMMUNICATE W/ [illegible]
+ USACE CUE.

0815 TAILGATE AND HEALTH AND SAFETY
[illegible]. ([illegible] - [illegible])

↻

6/14/16 USAF/EEE OSDK6302 WHITE (4)

0930 Began decommissioning wells in Southern cluster

~15 minutes per well to decommission

↳ Decommissioning details are captured in separate sheet

1150 GA picking up supplies, groundwater logistics

1130 Breaking for 2-hr lunch, checking [illegible] location for fridge/freezer

1400 Began decommissioning Northern cluster

1600 Met Toby from Nome Joint Utility

↳ He indicated that BOY is in conflict w/ sewer line. Advised to stay south of cut pavement.

1630 Dropped fridge/freezer at BSNC warehouse

1730 Finished on site

↳ GA & CE dropped off GEL ice + prepped for soil sampling

06/14/16 USAF/EEE OSDK6302 WHITE (5)

6/14/16 Well Decommissioning Summary

Southern Cluster:

- W-24
- W-24
- W-30
- W-31
- W-32
- W-35
- W-34

(1) Unlabeled ↳ W-20 (out of scope)

Figure, not text

↳ W-24 and W-30 are on figure but not in text

★ W-2 + W-10 are in text but not on figure

Northern Cluster:

In-scope	Out-of-scope
✓ ML-1C	ML-5C
✓ ML-2C	AI-2
✓ ML-3C	BU-2
✓ ML-6C	(MW-35
✓ ML-7C	
✓ ML-8C	
✓ W-25	
✓ W-26	
✓ W-27	
✓ ML-4C	

(10)

05DKG6S.2

6/17/16 WNTE USAF/EEG

(6)

LARRY AMSKOLD GEOLOGIST } JACOBS
CANDACE ROE CHEMIST }
NICK KUHLMANN PROJECT MANAGER - EEG
DARREN DRILLER } DISCOVERY
TJ HELPER }
DAVID SANDERS TIME I OVERSIGHT - NORTHWIND

WEATHER - 60's, light rain

PPE - modified level D

OBJECTIVES - (1) COMPLETE DECOMMISSIONING MONITORING WELLS IN SUPPORT OF EEG CAP CONSTRUCTION

(2) DIG PERMIT FOR GROUND PENETRATIONS
↳ managed out of Anchorage office

(3) SOIL BORINGS PENDING DIG PERMIT PROCESS

6/17/16 05DKG6S.2

WNTE USAF/EEG

(7)

WELL DECOMMISSIONING

↳ WE WILL COMPLETE IN-SCOPE WELLS BEFORE OUT-OF-SCOPE

- W-5R }
- W-4R } DECOMMISSIONED
- W-16RZ } (IN SCOPE)
- W-2R }
- W-10 →

ALASKA DIGLINE HAS BEEN NOTIFIED
↳ GCI + ALASKATEL HAVE UTILITIES IN THE AREA.

| AK DIGLINE # 2016251027 |

↳ ALASKATEL CALLED, NO CONFLICTS
S. OF GCI
↳ STOPPED BY GCI, NO CONFLICTS W/ SATELLITE DISHES NEAR ~~W-37~~ W-36
ARE MICROWAVES. THEY WOULD PREFER WE STAY AWAY

↳ DISHES MAY CAUSE US TO FEEL WARM!

GA

6/17/16 OSDK 6302

WNTP USAF/EEE

(8)

INSTRUCTED DISCOVERY TO BE ON SITE 6/18 @ 0800. COMMUNICATED PLAN TO N. MCKAY, N. KUHLMANN + TITLE II REPRESENTATIVE.

LA + CE MARKED BORING AND WELL LOCATIONS.

LA SPOKE TO HOMEOWNERS AT LOT 6

↳ INFORMED THEM WE WILL BE DRILLING IN AREA 6/18 AM

↳ THEY APPROVED WELL INSTALLATION ON PROPERTY PROVIDED IT DIDN'T LIMIT BOAT ACCESS. THEY WERE ALSO CONCERNED ABOUT WELL BEING SECURE (CHILDREN ON SITE).

↳ REVIEWED RATIONALE FOR WELL INSTALLATIONS W-3 IS NOT LOCATED IN AN AREA W/ POTENTIALLY HIGH TRAFFIC.

OFF-SITE

[signature]

6/18/16 OSDK 6302

WNTP USAF/EEE

(9)

CAREY ARNOLD	GEOLOGIST	JACOBS
CANDACE ESC	SAMPLER	JACOBS
NICK KUHLMANN	CONSTRUCTION MANAGER - EEE	
DARRIN	DRILLER	DISCOVERY
TJ	HELPER	DISCOVERY
DAVID SANDERS	TITLE II REP - NORTHWIND	

WEATHER: 40's, light rain

PPE: hearing protection, safety glasses, high-vis, hard hat, steel toes, task appropriate gloves

EQUIPMENT ON SITE

- GEOPROBE 6712 DT
- MINIRAE PID # 910757

PID CALIBRATION

FRESH AIR: 0.0 PPM

100 ppm ISOBUTYLENE: 100.0 ppm

OBJECTIVES

6 SOIL BORINGS

2 MONITORING WELLS

6/18/16 OSDK6302

(10) WNTE USAF/EEE

SAMPLE ID: 16WNTE-EFR-##-SO

→ ADD A "1" AT END OF SAMPLE FOR DUPLICATES

ANALYSES: DRO (AK 102) } 8 oz AMBER
PAH (SW 8270 SIM) }
BTEX (SW 8260) } 4 oz AMBER w/ MeOH

SAMPLE INTERVALS WILL BE DOCUMENTED ON LOGGING SHEETS AND TABULATED AT END OF DAY.

→ WE WILL SAMPLE SMEAR ZONE AND HIGHEST PID OR FINEST-GRAINED MATERIAL

SGS - 6 Bus ~~1400~~ 1030 - 1330

MeOH: Lot # 6-060-005

6/19/16 OSDK6302

WNTE USAF/EEE (11)

MW36 - MACRO CORE TO 15' BGS

↳ DISCOVERY BEGAN AUGERING, GW NOT PRESENT AT 15' BGS.

↳ DRILLED TO 20' BGS

- 5' WATER PRESENT ON TOOLING.

- GOING TO ALLOW WATER IN CASING TIME TO EQUILIBRATE

1600 MEASURED WATER LEVEL IN CASING
16.59 - 1.82 = 14.77

1615 WORK PLAN INDICATES WE WILL INSTALL 5' SCREENS.

↳ CALLED NEIL. WE WILL INSTALL 10' PREPACK AT THIS LOCATION AND DETERMINE IF THERE WAS SPECIFIC REASON WE INSTALLED 5' SCREEN

1630 BEGAN WELL INSTALLATION

1830 OFF SITE, SITE SECURE

[signature] WHM

(12)

SAMPLE SUMMARY

SAMPLE ID	TARE WT	TIME	NOTES
16WNTF-SB08-06-50	126.79	1101	
16WNTF-SB08-06-50	126.88	1101	MS/MSD
16WNTF-SB08-12-50	126.48	1108	
16WNTF-SB08-12-509	126.45	1108	DUPLICATE
16WNTF-SB07-06-50	126.42	1208	
16WNTF-SB07-10-50	126.68	1211	
16WNTF-SB06-06-50	126.42	1242	
16WNTF-SB06-08-50	126.82	1245	
16WNTF-SB05-08-50	126.67	1317	
16WNTF-SB05-10-50	126.84	1321	
16WNTF-MW36-12-50	126.55	1615	
16WNTF-MW36-14-50	126.44	1617	

10 PRIMARY
1 DUPLICATE
1 MS/MSD

ALL SAMPLES 1 8oz AND 1402 w/ MeOH

(13)

WASTE SUMMARY

6/18/16 16WNTF-SS001
1 Gy drill cuttings + IDW
B05-08, MW36

16WNTF-DK001
10 gallons decon water
6/19/16 14 gallons TOTAL
6/20/16 + 2 gallons decon
+ 24 gallons development MW-36
6/20/16 50 gallons total
6/21/16 53 gallons TOTAL

16WNTF-SS002
½ Gy drill cuttings + IDW
B01-04, MW37

6/21/16 16WNTF-DK002

(14)

6/14/16 WNTF 05DKG302 USAF/EEE

LARRY AMSLUND	GEOLOGIST	} JACOBS
CANDACE EDE	SAMPLER	
NICK KUHLMANN	CONSTRUCTION MANAGER	} EEE
SCOTT YOUNG	SITE MANAGER	
DARREN	DRILLER	} DISCOVERY
TV	HELPER	
DAVID SANDERS	TITLE II [illegible] - [illegible]	

WEATHER: 80's, PARTLY CLOUDY

PPE - MODIFIED LEVEL D

OBSERVED: DRILL RETAINING 4 SOIL BORINGS
DRILL RIG AT INSTALLED [illegible] [illegible]
WELL.

RELOCATED SB- DUE TO CONFLICT W/
SEWER

1320 BEGAN DRILLING MW37 BORING
GW WATER @ 8.2' bgs

TARGET SCREENED INTERVAL 3'-13' bgs
1" RISER TO HAVE [illegible] RISER
+ BENTONITE SEAL

6/14/16 WNTF 05DKG302 USAF/EEE (15)

1430 MW-37 COMPLETED

WASTE GENERATED - 4 gallons drum
water
1/2 drum soil

SOIL SAMPLES
8 oz Amber (PEST, PAH.)
4 oz Amber w/ AcOH (BTEX)

SAMPLE ID	TARE WT	TIME	NOTES
16WNTF-SB04-06-SO	126.63	1029	
SB04-08-SO	126.88	1033	
SB04-08-SO9	126.64	1033	duplicate
SB03-06	126.91	1059	
SB03-08	126.67	1103	
SB02-06	126.61	1129	
SB02-08	126.17	1132	
SB01-06	127.00	1152	
SB01-08	126.36	1156	
MW37-00	126.70	1417	
MW37-04	126.64	1420	

6/24/16 WNTF

LARRY AMBROSE — GEOLOGIST / SAMPLER } JACOBS
CAMBACK BE
NICK KUHLMANN — CONSTRUCTION MANAGER } EEC
SONNY YOUNG — SITE MANAGER
DAVID SANDERS — TIGER 8 - NUREMBERG

WEATHER = 60's, SUNNY, WIND IN AFTERNOON

OBJECTIVES: PIEZOMETER - SEDIMENT SAMPLING
DEVELOP HOLES

EQUIPMENT:

PID 100ppm Isobutylene = 100.5 ppm

YSI - S/N = Ø6H1223AK
CALIBRATION

pH	4.01	=	4.01
pH	7.00	=	7.00
pH	10.01	=	10.01
Cond	1.413 mS/cm @25°C	=	1.413 mS/cm
ORP	240 mV	=	240.1 mV
DO	100%	=	100.1 %

0950 - INSTALLED FIRST PIEZOMETER SAMPLER.
↳ DEPLOYED PIEZOMETER TO 2' BGS. SCREEN INTERVAL =

STAINLESS PIEZOMETER TIP LENGTH TOTALS 1.2'. SAMPLE TUBING INLET SET @ 0.6'

Porewater Parameters

1012 Start Purging SPØ2

	1st Reading		2nd Reading
Turbidity	218.8	NTU	9.37 NTU
Temp	9.68	°C	9.52 °C
Conductivity	1237	µS/cm	1226 µS/cm
DO	6.33	mg/L	7.10 mg/L
pH	7.30	pH units	7.44
ORP	144.9	mV	164.6 mV

1018 Start Sampling
Sample ID: 16WNTF-SPØ2-PW
QC Type: MS/MSD

Sample Bottle / Analysis
for Porewater Sampling

3x 40mL VOAs, HCl SW8260 BTEX
2x 1 L amber, HCl AK102 DRO
2x 1 L amber, unpres. SW8270SIM PAH

1054 Finished Sampling

1112 Start purging SP01
Slow producing tidal probe.

Turbidity 635.4 NTU

Need to re-install probe
at next low tide.

1300 Set-up to develop MW-36
1306 Start Purging well *
- See Groundwater Development
Form for details.
1835 Finished developing (Stability)
* Initial observation: black fines
w/ lots of sediment.

END OF DAY ______

Larry Amskold	Geologist	Jacobs
Cascade Ede	Sampler	
David Sanders	Title & Key - Monitoring	

Weather: 40's light rain, calm
↳ cloudy @ 10 Am

PPE Modified Level D

Objectives: Porewater Sampling
Develop MW-37
Porewater/Sediment Sampling
Survey

SP04 ce 6/21/16
Re-located ~~SP03~~ to east closer to
shore line, need to survey in.
847 Start purging ~~SP03~~ ce 6/21/16
SP04

6/21/16 WNTF OSDK6302 OSAMEE

(20) Water Parameters

	1st Reading	2nd Reading	Units
Turbidity	16.69	12.33	NTU
Temp	8.55	8.26	°C
Conductivity	1520	1594 6.05	µS/cm
DO	7.43	~~7.46~~	mg/L
pH	6.97	7.17	pH units
ORP	151.3	140.6	mV

0856 Start Sampling

→ Sample ID: ~~16WNTF-SP03-PW~~

Duplicate ID: ~~16WNTF-SP03-PW9~~

Sample Name CORRECTION

→ Sample ID: 16WNTF-SP04-PW

Duplicate ID: 16WNTF-SP04-PW9

0935 Start purging SP05

	1st Reading	2nd Reading	Units
Turbidity	4.93	0.15	NTU
Temp	8.31	8.26	°C
Cond	3160	3659	µS/cm
DO	8.25	8.47	mg/L
pH	7.08	7.08	pH units
ORP	237.0	221.0	mV

0945 Finished Sampling.

Cocoa Break! Thanks Sonny"

6/21/16 OSDK6302

WNTF/GEE

21

1015 Set-up at SP06

Water Parameters

	1st Reading	2nd Reading	Units
Turbidity	12.10	0.19	NTU
Temp	8.47	8.30	°C
Cond	5350	5464	µS/cm
DO	8.79	10.26	mg/L
pH	7.30	7.40	pH units
ORP	205.5	200.5	mV

1023 Start Sampling

→ Sample ID: 16WNTF-SP06-PW

1055 Finished Samplings

1110 Set-up at Well MW-37 for well development

1124 Start Purging

*see Well Development Data Sheet for Details

1540 Sediment Sampling at SP06, SP05 & SP04

1610 Start Purging SP03

Water Parameters

	1st Reading	2nd Reading	Units
Turbidity	61.19	47.77	NTU
Temp	9.60	9.41	°C
Cond	2414	2254	µS/cm
DO	10.42	10.67	mg/L
pH	7.88	7.97	pH units
ORP	1.1	26.5	mV

1617 Start Sampling
→ Sample ID: 16WNTF-SP03-PW

Poor Producing well. Only filled 1/2 DRO Bottle (Limited Volume for Lab)

1708 Start Purging SP01

1710 Start Sampling
→ Sample ID: 16WNTF-SP01-PW
Limited Volume for DRO (1L) and PAH (1L)
Note for lab.

Water Parameters for SP01

	Reading	Units
Turbidity	20.10	NTU
Temp	9.52	°C
Cond	4561	µS/cm
DO	10.23	mg/L
pH	7.88	pH Units
ORP	117.8	mV

All Water Samples were collected for the following analyses:
3x 40mL VOA, HCl SW8260BTEX
2x 1 L amber, HCl AK102 DRO
2x 1 L amber, unpres SW8270SIM PAH

Sediment Samples:

			Tare
16WNTF	-SP01-SD	1732	126.51
	-SP02-SD	1632	126.31
	-SP03-SD	1647	126.08
DUP	-SP03-SD-9	1647	125.99
	-SP04-SD	1601	126.67
	-SP05-SD	1551	126.53
	-SP06-SD	1541	125.85
MS MSD	-SP06-SD	1541	126.53

6/21/16 WNTF
USAF/EEE
OSDK6302

24

6/22/16 WNTF
USAF/EEE
OSDK6302

25

LARRY ANDREWS — LOGISTICS
CANDACE COE — SAMPLING
SONNY YUNG — SITE MANAGER - EARLE CNT
DAVID SANDERS — TITLE 2 - MUNITIONS

PPE - LEVEL D

WEATHER - 40's light rain clearing to 50's
partly cloudy in afternoon

OBJECTIVES - ① SAMPLE MW 36
② DUP DUMP
③ SAMPLE MW 37
④ DUP WATER
→ BEGIN GROUND AND SURFACES

MW36, MAX PUMP VOLUME. BEGIN
SAMPLING ⑤ 1051
↳ SAMPLING PRIMARY, DUPLICATE -
MS/MSD
⊠ ONLY SUBMITTING 6 ORG
1 L AMBERS

(end)

GROUNDWATER SAMPLING / ANALYSES:

w/ HCl

2 x 2 L AMBER - AK 102 (DRO)

2 x 1 L AMBER - SW 8270 (PAH)

3 x 40 mL VOA - SW 8260 (BTEX)

6/23/16 UNTE BSNC / EEE / USAF

(27)

LARRY ANSKOLD GEOLOGIST } JACOBS
CANDACE EDE SAMPLER

WEATHER: HOT & LIGHT RAIN

PPE: LEVEL D, STEEL TOES, TASK SPECIFIC GLOVES

ON SITE → HIGH VIS, HARD HAT, SAFETY GLASSES

OBJECTIVES - DEMOBILIZATION
- WELL MAINTENANCE
- SURVEY

BIS - CREATED BUNKER LIST FOR DEMOBILIZATION ACTIVITIES

1550 SITE DEMOBILIZATION ACTIVITIES COMPLETE.

W-7R - NO MAINTENANCE REQUIRED
SECURED W/ LOCK AND REFLECTIVE TAPE

(28)

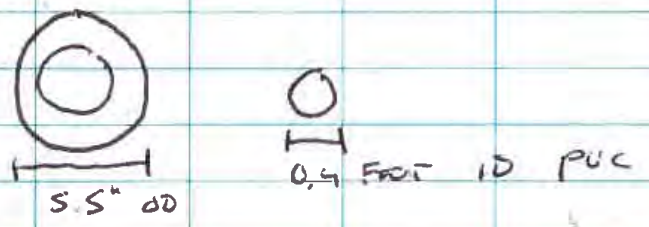
STICKS

W-20 COMPRESSION PLUG LOCKED IN MONUMENT

NEEDS

MONUMENT CAP

COMPRESSION PLUG



W-21 PVC needs to be cut down further

9" MONUMENT CAP

new 6" compression plug

WMF 05DX 6302

(29)

6/25/16

Personnel: Brad Ramsay
Candace Ede

0900 Arrive at Anchorage Airport to depart to Nome, AK. 737-400 Combi

1130 Arrive in Nome.

1200 Took Mr. Kab to Aurora Inn to pick up rental truck.

1215 Vehicle inspection (see Form)

1230 Check-in at George's "Old Alaska Rooms"

1300 Scout out site. Found comex

1400 Pick-up Supplies from Ak Air Cargo, Grizzlies and Morgan's (Generator)

8/25/16

1500 Re-fueled Generator. Stored in Connex. Strapped Drums to pallets.

1530 Purchased ice from Norton Sound Seafood.

1600 Tried well Cap Replacement, Determined measurement was ~~[illegible]~~ 22 9/25 recorded in RIGHT logbook incorrectly pg 28. → 0.55' vs. 5.5" ← WRONG
Called Neil and requested cap with new dimensions.

1630 Waiting for GPS file UTM 3N from Surveyor's Exchange.

1730 Sit-Rep. End of Day

8/26/16

Personnel: Brad Ramsay
Candace Ede

0900 Tailgate and SPA Review for Waste Loadout

1000 Meet Shane O'Neill from NRCC at site.
Q-Trucking is No-Show.
Q-Trucking gave Shane Boom Lift 1KW and permission to operate.

1030 Moved two Supersacks and two drums to NAC via Shane's Truck.

1100 Finished Waste Loadout, Signed final paperwork at NAC.

1130 SPA for well-Maintence.

8/26/16

1135 Cut PVC from Frost-Jacked Well W-21 with drill and PVC saw bit.

1200 Returned Generator to Morgan's.

1215 On-site to ~~Survey~~ DGPS Sample locs. SPA for sediment sampling.

1230 Begin ~~Survey~~ DGPS and sediment collection → USE LEICA VIVA UNO SOFTWARE FROM JUNE 2016 COMPLES AS UTM 3N WGS 84

Sample ID	Date/Time	Analysis / Jars *
16WNTF-SP01-SD	8/26 1317	AK101, 160.3
16WNTF-SP02-SD	1323	
16WNTF-SP02-SD-9	DUP 1323	
16WNTF-SP03-SD	MS MSD 1331	2x Vol.
16WNTF-SP04-SD	1340	
16WNTF-SP05-SD	1346 ~~1352~~ cc 8/26	
16WNTF-SP06-SD	1352	

* AK101: 4 oz Tare w/ 25mL MeOH (BFB)
160.3: 2 oz amber

8/26/16

(33)

1400 Finished sediment sampling. Packed & shipped cooler via NAC.

1430 Lunch Break

1530 Return to site to begin Level-looping. USE PLS DETERMINED HT OF 38.79 FT FOR 0 MW-36 AS LAUNCH PT. USING LEICA LS10 ELEC. LEVEL & BARCODE STAFF

Point ID	BS	Elev	FS	Elev
MW-36				35.7
TS1	2.849	38.549		
TP1 (well)			7.081	31.468
TS2	6.489	37.957		
TP2 (well) MW-20			4.616	33.341
TS3	4.137	37.478		
W21 (well)			1.203	36.275
TS4	1.300	37.575		
TP2 (well) MW-20			4.230	33.345
TS5	4.732	38.077		
TP1 (rock)			6.610	31.467
TS6	6.980	38.447		
MW-36			2.745	35.702

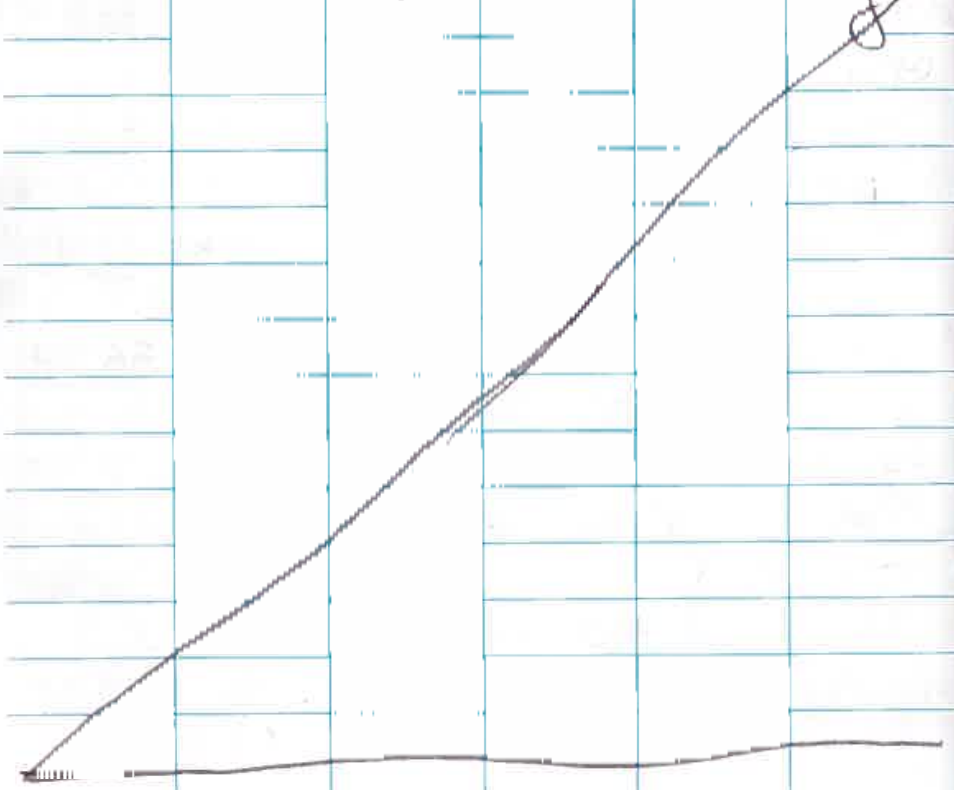
WNTF 05DK6302

1640 FINISHED LOOPING. GOOD CLOSURE @ 0.002 ft YAY!

OFF TO GREELEY TO FIND LOCKS THAT WILL FIT IN W-36 & W-37.

1700 Placed locks on flush mount wells W-36 & W-37. Combination: 0911

1730 Sit-Rep & End of Day



WNTF 05DK6302

8/27/16

BASE CAMP, CATOOSE EDE (JEG)

PURPOSE - NEW LOCKING CAPS ON WELLS W-20 AND W-21 AND SECURE

PAX - LAUGHED

WX - OVC, HIGH ~50F, WINDS SW @ 10-15 OCNL DRIZZLE

ACTIVITIES - 1100- BREAKFAST & TAILGATE SIGHTSEEING AFTER, CLEANOUT TRUCK, PACK GEAR

1530- GO TO BASE CAMP TO PICK UP PARTS

1540- ON SITE. INSTALL CAPS AND LOCK

1600- COMPLETE,

1700, SIGHTSEEING

CHECK BACK

1900- AT AIRPORT FOR

1915 - DROP TRUCK BACK @ AURORA

2030 - WHEELS UP → ANC

2145 - LAND @ ANC

EOD

8/27/16

6/22/16

Calibration Log

YSI S/N:

pH	4.01	= 4.01	pH units
	7.00	= 7.00	pH units
	10.01	= 10.02	pH units
Cond	1020 µs/cm	= 1019	µs/cm
ORP	240 mV	= 240	mV
DO	100 %	= 100.3	%
PID	100 ppm Isobutylene	= 101.0	ppm

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
ML-2	USAF	320K6302	06/16/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
West Nome Tank Farm	Nome, AK	_____ east / long _____ north / lat _____ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: Larry Amskold	Discovery Drilling

Well Dimensions

Type of Construction	Stickup (ft agbl)	Total Depth As Built (ft btoc)	Total Depth As-Is (ft btoc)	Depth to Water (ft btoc)
Flush Mount	n/a			16.30

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Remove monument. Knock out bottom. Push Riser. Backfill with bentonite.	Riser broke at 4'. Fill in place w/ bentonite.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
4' Riser	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
ML-3	USAF	05DK6302	06/16/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
West Nome Tank Farm	Nome, AK	________ east / long ________ north / lat ________ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: Larry Amstuld	Discovery Drilling

Well Dimensions

Type of Construction	[illegible]	[illegible]	[illegible]	[illegible]
Flush Mount				15.52

Decommissioning Details

Decommissioning Procedure	[illegible]
Knock out ~~fis~~ bottom. CE 6/16 Pull out riser. Backfill with bentonite chips.	Riser pulled up in one 10' piece.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
10' Riser.	

Well Decommissioning Report | **JACOBS**

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
ML-4	USAF	OSDK6302	6/16/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
WNTF	NOME, AK	______ east - long ______ north - lat ______ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
CAP CONSTRUCTION	Jacobs Engineering 4300 B St. Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead ______	

Well Dimensions

Type of Construction	Stickup (ft ags)	Total Depth As Built (ft btoc)	Total Depth As-is (ft btoc)	Depth to Water (ft btoc)
FLUSH MOUNT	N/A			15.56

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
BREAK CUT [illegible] PULL RISER BACKFILL w/ BENTONITE CHIPS	* RISER BROKE @ 4' BGS ↳ BACKFILL w/ BENTONITE CHIPS

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" CHIPS

Waste Handling

Waste Generated	Waste Disposition
4' RISER	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
ML-5	USAF	050K6302	06/16/16
Site Name	**Location (e.g., city, state)**	**Geographical Coordinates**	
West Nome Tank Farm	Nome, AK	_____ east / org _____ north / at _____ system, units	

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St. Suite 600 Anchorage, AK 99503 907-562-3322 Field Lead: Larry Amskoid	Discovery Drilling

Well Dimensions

Type of Construction	Stickup (Feet)	Total Depth As Built (Feet)	Total Depth As-Is (Feet)	Depth to Water (Feet)
Flush Mount	n/a			

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Knock out Bottom. Pull out riser. Backfill with Bentonite chips.	Blockage at 7.90'. Removed blockage with rods.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
10' Riser	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
ML-6	USAF	05DK6302	06/16/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
West Nome Tank Farm	Nome, AK	______ east long ______ north lat ______ system units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: Larry Amskold	Discovery Drilling

Well Dimensions

Type of Construction	Stickup (feet)	Total Depth As Built (feet)	Total Depth Meas. (feet)	Depth to Water (feet)
Flush Mount	n/a			15.10

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Knock out bottom. Pull out riser & screen.	

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
10' Riser 5' Screen	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
ML-7	USAF	050K6302	06/16/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
West Nome Tank Farm	Nome, AK	______ east / long ______ north / lat ______ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead Larry Amskold	Discovery Drilling

Well Dimensions

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Flush Mount	[illegible]			15.15

Decommissioning Details

Decommissioning Procedure	[illegible]
Knockout bottom. Pull out Riser.	

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
10' Riser	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
ML-8	USAF	0SDK6302	06/16/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
West Nome Tank Farm	Nome, AK	______ east / long ______ north / lat ______ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: Lorn Amskold	Discovery Drilling

Well Dimensions

Type of Completion	[illegible]	[illegible]	[illegible]	[illegible]
Flush Mount	n/a			13.69

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Knock out bottom. Pull out riser & Screen.	

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
16' Riser 5' Screen	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
W-2R	USAF	05DK0302	06/17/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
West Nome Tank Farm	Nome, AK	_____ east / long _____ north / lat _____ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: Larry Amskoid	Discovery Drilling

Well Dimensions

Type of Construction	Stickup (ft agl)	Total Depth As Built (ft bloc)	Total Depth As-Is (ft bloc)	Depth to Water (ft bloc)
Flush Mount	n/a			6.32

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Remove Monument. Knock out bottom, with rods. Pull out riser. Backfill with bentonite chips.	Riser broke at 5'. Fill in place with bentonite.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
5' Riser	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
W-4R	USAF	250K6302	06/17/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
West Nome Tank Farm	Nome, AK	_____ east / long _____ north / lat _____ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: Larry Amstold	Discovery Drilling

Well Dimensions

Type of Construction	Stickup (ft agl)	Total Depth As Built (ft btoc)	Total Depth As-Is (ft btoc)	Depth to Water (ft btoc)
Flush Mount	n/a			11.12

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Remove Monument. Knock out bottom with rods. Pull out riser. Backfill with Bentonite chips.	Well came out in one piece with pre-pack.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1 bag	3/8" chips ~~bent~~

CE 6/17/16

Waste Handling

Waste Generated	Waste Disposition
10' Riser 2 x 5' pre-pack	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
W-5R	USAF	Ø50K6392	06/17/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
West Nome Tank Farm	Nome, AK	______ east - long ______ north - lat ______ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: Larry Amskoid	Discovery Drilling

Well Dimensions

Type of Construction	Stickup (ft ags)	Total Depth As Built (ft btoc)	Total Depth As-is (ft btoc)	Depth to Water (ft btoc)
Flush Mount	n/a			6.57

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Remove monument. Knock out bottom with rods. Pull out riser. Backfill with bentonite.	Riser broke at 5'. Fill in place with bentonite chips.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
5' Riser	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
W-16R2	USAF		

Site Name	Location (e.g., city, state)	Geographical Coordinates
West Nome Tank Farm	Nome, AK	_____ east / long _____ north / lat _____ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St. Suite 502 Anchorage, AK 99503 907-563-3322 Field Lead: Larry Amsicold	Discovery Drilling

Well Dimensions

Type of Construction	Stick-up Height	Total Depth As Built (ft bgs)	Total Depth As Drilled (ft bgs)	Depth to Water (ft bgs)
Flush Mount	n/a			

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Removed Monument. Removed blockage and knocked out bottom with rods. Pull out riser. Backfill with bentonite chips.	Riser head utility hazard. Blockage at 55'. Riser broke at 9'. Backfill in place.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
4' Riser	

Well Decommissioning Report

JACOBS

Well ID, Data, Location

Well ID	Well Owner	Project Number	Date of Work
n/a W-25	USAF	050K6302	06/16/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
West Nome Tank Farm	Nome, AK	_____ east / long _____ north / lat _____ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St. Suite 600 Anchorage AK 99503 907-563-3322 Field Lead Larry Amskold	Discovery Drilling

Well Dimensions

Type of Construction	Stickup ("agl)	Total Depth As Built ("bgs)	Total Depth As-is ("bgs)	Depth to Water ("bgs)
Flush Mount	n/a			15.49

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Knock out Bottom. Pull Riser. Backfill with Bentonite.	Riser broke at 3'. Backfill in place. Well in between ML-4 and ML-5.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
3' riser	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
W-24	USAF	05DK6302	06/16/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
West Nome Tank Farm	Nome, AK	_____ east / long _____ north / lat _____ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction.	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: Larry Amskold	Discovery Drilling

Well Dimensions

Type of Construction	Stickup (ft ags)	Total Depth As Built (ft btoc)	Total Depth As-Is (ft btoc)	Depth to Water (ft btoc)
Flush Mount	n/a			15.85

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Knock out bottom with rods. Pull out riser. Backfill with Bentonite chips.	Unlabeled well south east of ML-5. Riser broke @ 2'. Fill with Bentonite chips in place.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
2' Riser.	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
N/A W-27	USAF	0SOK6302	6/16/16
Site Name	**Location (e.g., city, state)**	**Geographical Coordinates**	
INNTF	NOME, AK	_____ east / long _____ north / lat _____ system, units	

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
COVER CONSTRUCTION	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: L. AMSKOLD	DISCOVERY

Well Dimensions

Type of Construction	Stickup (ft ags)	Total Depth As Built (ft btoc)	Total Depth As-Is (ft btoc)	Depth to Water (ft btoc)
FLUSH MOUNT	N/A			14.55

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Unable to pull riser. Knocked out bottom.	FLUSH MOUNT SW OF SW CORNER OF PUMPHOUSE

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
1' riser	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
W-29	USAF	05DK0302	6/16/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
West Nome Tank Farm	Nome, AK	_____ east / long _____ north / lat _____ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: Larry Amskold	Discovery Drilling

Well Dimensions

Type of Construction	Stickup (ft ags)	Total Depth As Built (ft btoc)	Total Depth As-Is (ft btoc)	Depth to Water (ft btoc)
Flush Mount	n/a			10.96

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Knock out bottom. Pull Riser.	Tubing Removed.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" Chips

Waste Handling

Waste Generated	Waste Disposition
10' Riser	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
W-31	USAF	05DK6502	6/16/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
WEST NOME TANK FARM	NOME, AK	_____ east / long _____ north / lat _____ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
CAP CONSTRUCTION	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: L. AMSKOLD	DISCOVERY

Well Dimensions

Type of Construction	Stickup (ft ags)	Total Depth As Built (ft btoc)	Total Depth As-Is (ft btoc)	Depth to Water (ft btoc)
FLUSH MOUNT	N/A			11.03

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Knock out bottom. Pull Riser.	NO TO RECOVER (CONTAMINATED)

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" Chips

Waste Handling

Waste Generated	Waste Disposition
10' Riser	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
W-32	USAF	05DK6302	6/16/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
WEST NOME TANK FARM	NOME, AK	_____ east / long _____ north / lat _____ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
CAP CONSTRUCTION	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: LARRY AMSKOLD	DISCOVERY

Well Dimensions

Type of Construction	Stickup (ft ags)	Total Depth As Built (ft btoc)	Total Depth As-Is (ft btoc)	Depth to Water (ft btoc)
FLUSH MOUNT	N/A		18.85	10.85

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
• ATTEMPTED TO KNOCK OUT BOTTOM • PULLED RISER • BACKFILLED W/ BENTONITE	

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
N/A		1/3 cc BAG	3/8" CHIPS

Waste Handling

Waste Generated	Waste Disposition
10' RISER TUBING	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
U-33	USAF	OSDIC 6302	6/16/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
WEST NOME TANK FARM	NOME, AK	_____ east / long _____ north / lat _____ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
CAP CONSTRUCTION	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: L ANSTEAD	DISCOVERY

Well Dimensions

Type of Construction	Stickup (ft ags)	Total Depth As Built (ft btoc)	Total Depth As-Is (ft btoc)	Depth to Water (ft btoc)
FLUSH MOUNT	N/A			16.75

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
	FUEL PRESENT IN ADJACENT WELL. DID NOT MEASURE TD.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 BAG	3/8" CHIPS

Waste Handling

Waste Generated	Waste Disposition
10' RISER PVC	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
W-34	USAF	05DK6302	6/16/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
WNTF	NOME, AK	_____ east / long _____ north / lat _____ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
CAP CONSTRUCTION	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead L. ANSTEAD	DISCOVERY

Well Dimensions

Type of Construction	Stickup (ft ags)	Total Depth As Built (ft btoc)	Total Depth As-Is (ft btoc)	Depth to Water (ft btoc)
FLUSH MOUNT	N/A			10.83

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
KNOCK OUT BOTTOM PULL RISER	CONTAMINATED WELL. NO TD.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 BAG	3/8" CHIPS

Waste Handling

Waste Generated	Waste Disposition
10' RISER	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
AI-1	USAF	05DK6302	06/17/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
West Nome Tank Farm	Nome, Ak	_____ east / long _____ north / lat _____ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: Larry Amskold	

Well Dimensions

Type of Construction	Stickup (ft ags)	Total Depth As Built (ft btoc)	Total Depth As-Is (ft btoc)	Depth to Water (ft btoc)
Flush Mount				16.46

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Remove mounument. Knock out bottom w/ rods. Pull out riser. Backfill with Bentonite.	Riser broke @ 7'. Fill in place w/ Bentonite chips.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
7' Riser	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
A1-2	USAF	05DK6302	06/16/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
West Nome Tank Farm	Nome, AK	_____ east / long _____ north / lat _____ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: Larry Amskold	Discovery Drilling

Well Dimensions

Type of Construction	Stickup (ft ags)	Total Depth As Built (ft btoc)	Total Depth As-Is (ft btoc)	Depth to Water (ft btoc)
Flush Mount, ~~Stainless Steel~~ PVC CE 6/16				14.92

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Knock out bottom Pull out Riser.	

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
20' Riser	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
BV-1	USAF	[illegible]	06/17/16

Site Name	Location (e.g. city, state)	Geographic Coordinates
West Nome Tank Farm	Nome, AK	______ east, long ______ north, lat ______ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St. Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: Larry Arnold	Discovery Drilling

Well Dimensions

Type of Construction	Stickup (ft ags)	Total Depth As Built (ft btoc)	Total Depth As-is (ft btoc)	Depth to Water (ft btoc)
Flush Mount	n/a			15.82

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Remove monument. Knock out bottom with rods. Pull out riser. Backfill with bentonite.	Riser removed in one 10' piece.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag.	3/8 chips

Waste Handling

Waste Generated	Waste Disposition
10' Riser	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
BV-2	USAF	05DK6302	06/16/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
West Nome Tank Farm	Nome, AK	______ east / long ______ north / lat ______ system / NAD

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St. Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: Larry Amstead	Discovery Drilling

Well Dimensions

Type of Construction	Stickup (feet)	[illegible]	[illegible]	Depth to Water (ft btoc)
Flush Mount	[illegible]			15.18

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Knock out bottom.	Riser broke in hole. Chip it in place.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
1' riser.	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
CMW-35	USAF	05DK6302	06/16/16

Site Name	Location (City, State)	Geographical Coordinates
West Nome Tank Farm	Nome, AK	_____ east / long _____ north / lat _____ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St, Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: Larry Amsicold	Discovery Drilling

Well Dimensions

Type of Construction	Stick up (ft agl)	Total Depth As Built (ft bgs)	Total Depth As-Is (ft bgs)	Depth to Water (ft bgs)
Stickup	2.40		~~13.68~~ CE 6/16	13.68

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Pull Riser Knock out bottom.	Chain broke when pulling out outer casing Stickup well directly south of ~~in front of~~ pumphouse ~~entrance~~, southern wall. 2 cross-outs CE 6/16.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
10' Riser	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
MW-6R	USAF	[illegible]	

Site Name	Location (e.g., city, state)	Geographical Coordinates
West Nome Tank Farm	Nome, AK	_____ east long _____ north lat _____ system info

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
Cap Construction	Jacobs Engineering 4300 B St. Suite 500 Anchorage AK 99503 907-563-3022 Field rep: Larry Amskold	Discovery Drilling

Well Dimensions

Type of Construction	Stickup (ft agbs)	Total Depth As Built (ft bgs)	Total Depth As Drilled (ft bgs)	Depth to Water (ft bgs)
Stick-up	3.0			17.67

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Remove surrounding outer casing. Knock out bottom with Rods. Pull Riser. Backfill with Bentonite.	Riser removed in one 10' piece.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" chips

Waste Handling

Waste Generated	Waste Disposition
Outer casing 10' Riser	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
W-24	USAF	05DK0502	

Site Name	Location (e.g., city, state)	Geographical Coordinates
LUNTA	NOME, AK	_____ east / long _____ north / lat _____ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
CAP CONSTRUCTION	Jacobs Engineering 4300 B St. Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead _____	

Well Dimensions

Type of Construction	Stickup (ft agl)	Total Depth As Built (ft bloc)	Total Depth As-Is (ft bloc)	Depth to Water (ft bloc)
STICKUP	3.5			13.20

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite

Waste Handling

Waste Generated	Waste Disposition

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
W-28	USAF	05DK6302	6/16/16

Site Name	Location (e.g., city, state)	Geographical Coordinates
WNTF	NOME, AK	_____ east / long _____ north / lat _____ system, units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
CAP CONSTRUCTION	Jacobs Engineering 4300 B St. Suite 600 Anchorage, AK 99503 907-563-3322 Field Lead: _____	DISCOVERY

Well Dimensions

Type of Construction	Stickup (ft ags)	Total Depth As Built (ft bloc)	Total Depth As-Is (ft bloc)	Depth to Water (ft bloc)
STAINLESS	1.75		11.69	

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
	WELL COLLAPSED, SAND TO SURFACE.

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		0	0

Waste Handling

Waste Generated	Waste Disposition
4×3' STAINLESS RISER 2×3' STAINLESS SCREEN	

Well Decommissioning Report

JACOBS

Well ID, Date, Location

Well ID	Well Owner	Project Number	Date of Work
U-38	USAF	USTK 6302	6/16/16

Site Name	Location (e.g., City, State)	Geographical Coordinates
WNTF	NOME, AK	_____ east / long _____ north / lat _____ system units

Rationale, Contractors

Reason for Decommissioning	Decommissioning Oversight	Drilling Subcontractor
CAP CONSTRUCTION	Jacobs Engineering 4300 B St. Suite 500 Anchorage AK 99503 907-563-3322 Fed Lead L. AMSICOLO	DISCOVERY

Well Dimensions

Type of Construction	Casing Diameter (Inches)	Total Depth As Built (Feet bgs)	Total Depth As-is (Feet bgs)	Depth to Water (Feet bgs)
FLUSH MOUNT	N/A		9.95	N/A

Decommissioning Details

Decommissioning Procedure	Decommissioning Notes
Knockout bottom. Pull Riser.	BLOCKAGE AT 9.45 ↳ ROD BROKE THROUGH

Qty of Sand	Type of Sand	Qty of Bentonite	Type of Bentonite
		1/3 Bag	3/8" Chips

Waste Handling

Waste Generated	Waste Disposition
10' Riser	

JACOBS
CORE LOG

PROJECT [illegible] TANK FARM

LOCATION: SB01

DRILLER [illegible]

DATE 6/19/16

PAGE __ OF __

EQUIPMENT [illegible]

GEOLOGIST

PLUNGE

EASTING

NORTHING

SYSTEM UNITS

ELEVATION, UNITS, DATUM

Core, Time	Moisture	Product	Depth (ft)	USCS, Boundaries	PID (ppm)	Sample Int.	Description (lithology, color, USCS, sample ID)
1115			0		7.9		0' FILL AS PREVIOUSLY DESCRIBED
			2				4' DARK GRAY FUEL SANDY PEBBLY GRAVEL SILTY SAND AS PREVIOUSLY DESCRIBED
				SW	3.0		
1137			4		15.10		
			6				16WNTF-SB01-06-S4 GA/GE 1152
				SP-SM	(651.5)		
			8				16WNTF-SB01-08-S0 GA/GE 1156
					(607.0)		
			10				
				End			

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JACOBS

[illegible]	WEST NINE TANK FARM
[illegible]	SB02
[illegible]	DISCOVERY DRILLING
DATE	6/19/16
[illegible]	GEOPROBE 6712 DT w/ MCS MACROCORE TOOLING
[illegible]	LARRY AMSWOLD
PLUNGE	
[illegible]	
[illegible]	
SYSTEM UNITS	
ELEVATION, UNITS, DATUM	

Core Time	Moisture	Product	Depth (ft)	USCS Soil Classes	PID (ppm)	Sample Int.	Description (lithology, color, USCS, sample ID)
1043			0				4' FILL AS PREVIOUSLY DESCRIBED
					[illegible]		
			2				
				SW	378.2		
			4				
					207.4		
1116							1' FILL
			6				4' DARK GRAY FUEL STAINED [illegible] LOADED SILTY SAND
	▼			SP-SM	513.1		
			8				16WNTF - SB02 - 08 - SO CA/CO 1124
							16WNTF - SB02 - 08 - SO CA/CO 1132
	✶				596.5		
			10				
				EOH			

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JACOBS
CORE LOG

PROJECT: [illegible] [illegible] TANK FARM

LOCATION: SB 03

DRILLER: [illegible]

DATE: 6/19/16

PAGE 1 OF 1

EQUIPMENT:

GEOLOGIST: [illegible]

PLUNGE:

EASTING: NORTHING: SYSTEM, UNITS: ELEVATION, UNITS, DATUM:

Core, Time	Moisture	Product	Depth (ft)	USCS, Boundaries	PID (ppm)	Sample Int.	Description (lithology, color, USCS, sample ID)
1005			0				4' Fill, dry, medium gray, slight fuel odor
					0.6		
			2				
				SW	0.5		
			4				
					208.2		
1035							5-6' wet, well graded, medium gray fill as described on SB01, fuel odor
			6				
	▼				(491.2)		
				SW-SM			7-[illegible]' dark gray, fuel stained, clay and silty layers, silty sand, trace gravel, organic material
			8				sand fine to medium to coarse, layer segments ~0.5'
					(592.5)		
			10				
				EOB			[illegible]- SB03-06-SO [illegible] 1129
							[illegible]- SB03-08-SO [illegible] [illegible]

JACOBS CORE LOG

PROJECT WNTF LOCATION: SB04

DRILLER Discovery Drilling DATE 6/19/16 PAGE 1 OF 1

EQUIPMENT Geoprobe 6712DT w/ MCS Macrocore Tooling

GEOLOGIST Larry Anskis PLUNGE

EASTING NORTHING SYSTEM, UNITS ELEVATION, UNITS, DATUM

Core, Time	Moisture	Product	Depth (ft)	USCS, Boundaries	PID (ppm)	Sample Int.	Description (lithology, color, USCS, sample ID)
1003			0		4.6		MEDIUM BROWN/GRAY FILL AS DESCRIBED PREVIOUSLY. - FUEL ODOR
			1				3.6' RECOVERED
				FILL	8.4		
					1274		
1010							1' FILL AS PREVIOUS
			6	LP			
	W				446.9		0.5' POORLY LAYERED DARK GREY SAND COARSE >> MEDIUM > FINE
			8	SC			3' POORLY GRADED, SATURATED DARK GREY CLAYEY SAND, TRACE SILT, TRACE GRAVEL. W/ SOME STAINED CREAMY MATERIAL THROUGHOUT
					534.5		
			13	FILL			

16WNTF-SB04-06-SO LA/CE 1029

16WNTF-SB04-08-SO LA/CE 1033

16WNTF-SB04-08-SO-9 LA/CE 1033 DUPLICATE

JACOBS

PROJECT: WEST NOYME TANK FARM

LOCATION: SB05

DRILLER: DISCOVERY DRILLING

DATE: 6/18/16

PAGE 1 OF 1

EQUIPMENT: GEOPROBE 6712 DT w/ MACROCORE TOOLING (MCS)

GEOLOGIST: LARRY ANSCOTT

SYSTEM UNITS

Core Time	Moisture	Product	Depth (ft)	USCS, Boundaries	PID (ppm)	Sample Int.	Description (lithology, color, USCS, sample ID)
1245			0	SW	19.2		3.6' well-graded sandy gravelly-sand fill as described previously
			2		7.2		
			4	SP	7.0		
1303			6		31.7		3' medium grayish brown, poorly graded SAND with gravel as described previously
			8		600.2		2' material as above. DK gray, moist, fuel odor. 16WNTF-SB05-08-SO GA/GE 1312 1x 4oz w/ MeOH (AMBER) 1x 8oz (AMBER)
1305			10	CL	419.0		0.8' SAND AS ABOVE
	▼						5.2' PLASTIC SILTY CLAY AS DESCRIBED PREVIOUSLY w/ DK GRAY, FUEL-STAINED AND FUEL ODOR
			12				16WNTF-SB05-10-SO GA/GE 1321 1x 4oz AMBER w/ MeOH 1x 8oz AMBER
			14				
			16				

JACOBS

CORE LOG

PROJECT: [illegible]

LOCATION: SB06

DRILLER: [illegible] Drilling

DATE: 6/18/16

PAGE 1 OF 1

EQUIPMENT: Geoprobe 6712 DT w/ MCS Macrocore Tooling

GEOLOGIST: [illegible] A[illegible]

PLUNGE:

EASTING: NORTHING: SYSTEM UNITS: ELEVATION, UNITS, DATUM:

Core, Time	Moisture	Product	Depth (ft)	USCS, Boundaries	PID (ppm)	Sample Int.	Description (lithology, color, USCS, sample ID)
1200			0				3.4' recovery
					7.0		Damp well graded fill as described previously
			2	SW			
					6.4		
			4				2.4' Damp poorly graded sand with gravel as described previously
1206					70.1		
			6	SP			16WWTF-SB06-C6-8.0 MS/CE 1242 1 x 4oz Amber w/ MeOH Sealed 1 x 8oz Amber [illegible]
					507.0		
			8				0.9' Dark gray fine saturated poorly graded sand with gravel
	▼				522.8		
			10	ML			0.5' Poorly graded, fine saturated dark gray plastic clayey silt
				EOH			
							16WWTF-SB06-C[illegible] MS/CE 1243 1 x 4oz Amber w/ MeOH 1 x 8oz Amber

JACOBS
CORE LOG

PROJECT: WEST NOME TANK FARM
LOCATION: SB07

DRILLER: DISCOVERY DRILLING
DATE: 6/1/2016
PAGE 1 OF 1

EQUIPMENT: GEOPROBE 6712 DT w/ MCS MACROCORE [illegible]

GEOLOGIST: LARRY AMSTUTZ

PLUNGE:

EASTING:
NORTHING:
SYSTEM UNITS:
ELEVATION UNITS, DATUM:

Core, Time	Moisture	Product	Depth (ft)	USCS, Boundaries	PID (ppm)	Sample Int	Description (lithology, color, USCS, sample ID)
1115			0				WELL GRADED BROWNISH-GRAY WELL GRADED GRAVELLY SAND LITTLE SILT TRACE COBBLES AS PULVERIZED ANGULAR ROCK FRAGMENTS (FILL) 3.6
					1.6		GRAVEL SUBANGULAR → SUBROUNDED
			2	SW	4.1		SAND MEDIUM → COARSE → FINE
			4				3.2' MATERIAL AS PREVIOUS
1130					2.3		↳ FUEL STAINING AND ODOR 6.6 → 7.3' bgs
			6	SW			2.8' POORLY GRADED SAND, LITTLE GRAVEL, TRACE SILT GRAYISH BROWN → MEDIUM GRAY @ BASE
					53.8		SAND COARSE → MEDIUM → FINE
			8				gravel ~0.25" poorly subangular → subrounded
				SP	346.8		2.3' POORLY GRADED SAND AS ABOVE
1140			10				2.7' POORLY GRADED DARK GRAY FUEL STAINED FUEL ODOR, POORLY GRADED PLASTIC CLAYEY
					312.1		SILT SOME FINE SAND. DECAYING ORGANIC MATTER AND ROOT HAIRS. ~[illegible]
	▼ 11.4		12	ML			
					271.2		16WNTF-SB07-6D-SO 6A/CF 1208
			14				16WNTF-SB07-10-SO 6A/CF 1211
			16	EOB			

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JACOBS

CORE LOG

PROJECT: WEST NOME TANK FARM

LOCATION: SB08

DRILLER: DISCOVERY DRILLING

DATE: 6/18/16

PAGE 1 OF 1

EQUIPMENT: GEOPROBE 6712DT WITH MCS TOOLING

GEOLOGIST: LARRY AMSKOLD

PLUNGE:

EASTING: NORTHING: SYSTEM UNITS: ELEVATION UNITS, DATUM:

Core, Time	Moisture	Product	Depth (ft)	USCS, Boundaries	PID (ppm)	Sample Int.	Description (lithology, color, USCS, sample ID)
			0				0.8' dry light brown, well graded 3.8' recovered
0950				SW	4.1		sand with gravel, some silt. No odor
							SAND fine to medium to coarse
			2				gravel ~ 0.5" subrounded to rounded
					4.0		0.6' dry light gray [illegible] rock fragments
			4				2.1' damp, poorly graded, gravelly sand gray to medium
							<1" subangular to angular rock fragments
					3.8		
1015							2' medium gray to grayish brown poorly graded
			6				SAND w/ gravel. Some dark gray staining
				SP	224 / 325		
					46.4 (circled)		3' POORLY GRADED SAND W/ SILT LITTLE GRAVEL medium grayish brown
							DARK GRAY FUEL STAINING AND FUEL ODOR @
			8				7.5'
					22.3		
			10				
1025							2.5' light grayish brown SAND, little gravel, little SILT
					42.6		SAND COARSE? medium to fine. [illegible]
			12				2.5' DARK GRAY, POORLY GRADED PLASTIC CLAYEY
	▼				58.4 (circled)		SILT, LITTLE FINE GRAINED SAND, MOTTLED[illegible]
							FUEL STAINS AND FUEL ODOR.
				ML			
			14				16WNTF-SB08-06-SO 1101 [illegible]
							[illegible] MS/MSD
				EOH			16WNTF-SB08-12-SO [illegible] [illegible]
			16				16WNTF-SB08-12-SO-D [illegible] [illegible] [illegible] DUP

JACOBS CORE LOG

PROJECT: WEST MOAB TANK FARM | LOCATION: MW 36

DRILLER: DISCOVERY DRILLING | DATE: 9/6/12/16 | PAGE 1 OF 1

EQUIPMENT: GEOPROBE 6712 DT w/ MCS MACROCORE TOOLING

GEOLOGIST: LARRY AMSKOLD | PLUNGE:

EASTING: | NORTHING: | SYSTEM, UNITS: | ELEVATION UNITS, DATUM:

Core, Time	Moisture	Product	Depth (ft)	USCS, Boundaries	PID (ppm)	Sample Int.	Description (lithology, color, USCS, sample ID)
1513			0	SW			3.6' WELL GRADED GRAVELLY SAND AS DESCRIBED PREVIOUSLY (FILL)
					4.4		
			2				
					3.7		
			4				
					1.7		
1535							1.4' MATERIAL AS ABOVE
			6				
					5.7		BRITISH BROWN, POORLY GRADED MEDIUM SAND, LITTLE GRAVEL, TRACE WOODY DEBRIS, TRACE SILT
			8	SP			SAND MEDIUM > COARSE > FINE
					5.5		GRAVEL SUBROUNDED TO SUBANGULAR ~0.5"
1545			10				
					5.7		1.7' DAMP WELL GRADED LIGHT BRITISH BROWN SAND
							SOME GRAVEL
							GRAVEL ~1" SUBANGULAR
			12				SAND MEDIUM COARSE > FINE
					(6.2)		1' MIXED DEBRIS (FILL)
							5.7' MATERIAL AS ABOVE
			14				6.6' POORLY GRADED WET SAND
							COARSE MEDIUM > FINE
					2.9		0.6' MEDIUM GRAY, PLASTIC CLAY, WET > SATURATED
			16	EOH			
							16WATER-MW36-12-50 1615 LAKE
							16WATER-MW36-12-51 1617 LAKE

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JACOBS
CORE LOG

PROJECT: West Nine Tank Farm
LOCATION: W37
DRILLER: Discovery
DATE: 6/14/16
PAGE ___ OF ___
EQUIPMENT: Geoprobe 6712 DT w/ MCS Macrocore Tooling
GEOLOGIST: Larry Answeld
PLUNGE:
EASTING:
NORTHING:
SYSTEM UNITS:
ELEVATION UNITS DATUM:

Core Time	Moisture	Product	Depth (ft)	USCS Boundaries	PID (ppm)	Sample Int.	Description (lithology, color, USCS, sample ID)
1330			0		12.8	▨	3' recovery
				SW		▨	1' wet brown gravelly sand trace silt
			2			▨	wet, sand coarse medium > fine, gravel ~1/2" subrounded to subangular
					5.1		
							1' medium brownish gray silty clay, some fine sand
			4			▨	medium plasticity.
					6.4	▨	
1345				SP-SM		▨	2.2' dark grayish brown silty sand w/ clay trace organics. sand coarse, fairly loose, wet
	▼		6				
					5.6		Sand fine >> medium > coarse
			8				1.5' saturated, poorly graded sand medium > coarse > fine
				SP	4.2		
							Between 0.4' dark gray staining, faint fuel odor.
			10				
				EOH			
							16WNTF-MW37-00-SO 1417 LA/CE
							16WNTF-MW37-04-SO 1410 LA/CE

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JACOBS

Well Construction

PROJECT: West Nome Tank Farm

WELL ID: MW 36

DRILLER: Discovery Drilling

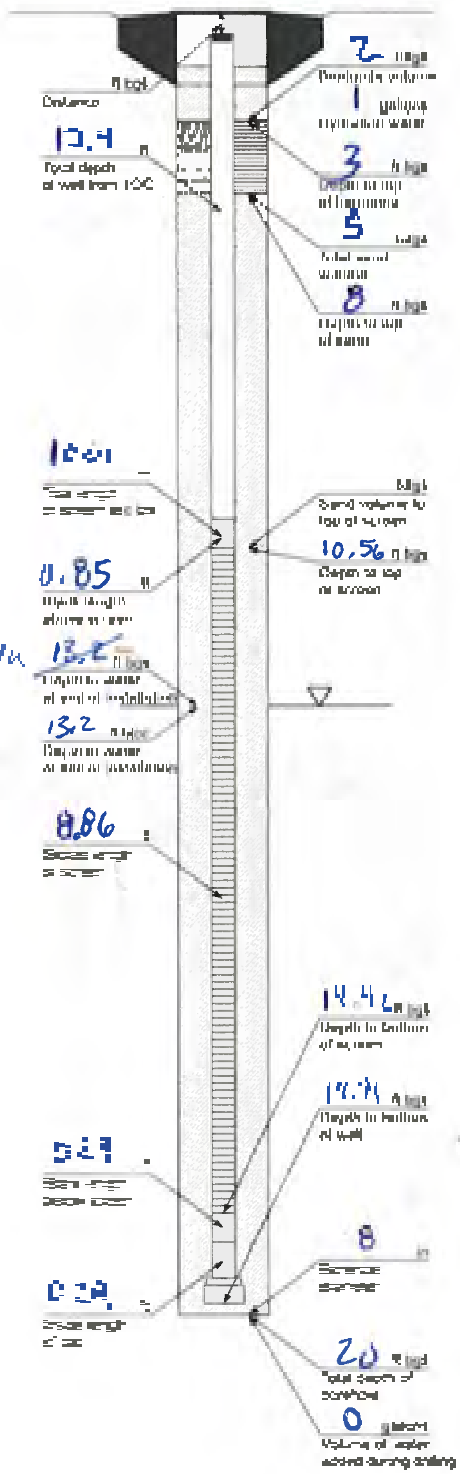
DATE(S) INSTALLED: 6/16/16

DRILLING METHOD: Geoprobe 6712 DT, w/ Augers 8.25" OD, 4.25" ID

GEOLOGIST: Larry Amskov

BOREHOLE ID: MW 36

EASTING ______ NORTHING ______ SYSTEM UNITS UTM 6N meters ELEVATION UNITS DATUM ______ NAVD88



Vault
Size: ______
Manufacturer: ______

Concrete around Vault
Type: ______
Manufacturer: ______

Well Riser
Size: 2-inch Sch 40, ASTM F480 flush threads
Material: PVC
Manufacturer: ______

Well Screen
Size: 0.020-inch slotted, 2-inch Sch 40, ASTM F480 flush threads
Material: PVC
Manufacturer: ______

End Cap
______

Bentonite (medium)
Size: 3/8-inch chips, 50 lb bag
Manufacturer: Time Permaplug

Sand
Size: ______, 50-lb bag
Manufacturer: Colorado Silica

Sand Utilization for 100% Open Hole (No Collapse)

Borehole Diameter		Sand Volume (2-Inch Well)		
Inches	Feet	Bags/ft	Bags/10 ft	ft/Bag
4.5	0.38	0.18	1.9	5.7
6	0.50	0.35	3.8	2.9
8	0.67	0.65	7.1	1.5

Note:
[illegible]

Other Notes

[illegible]

JACOBS

Well Construction
Flush Mount, Water Table Screen

PROJECT: WTF

WELL ID: W37

DRILLER: DISCOVERY DRILLING

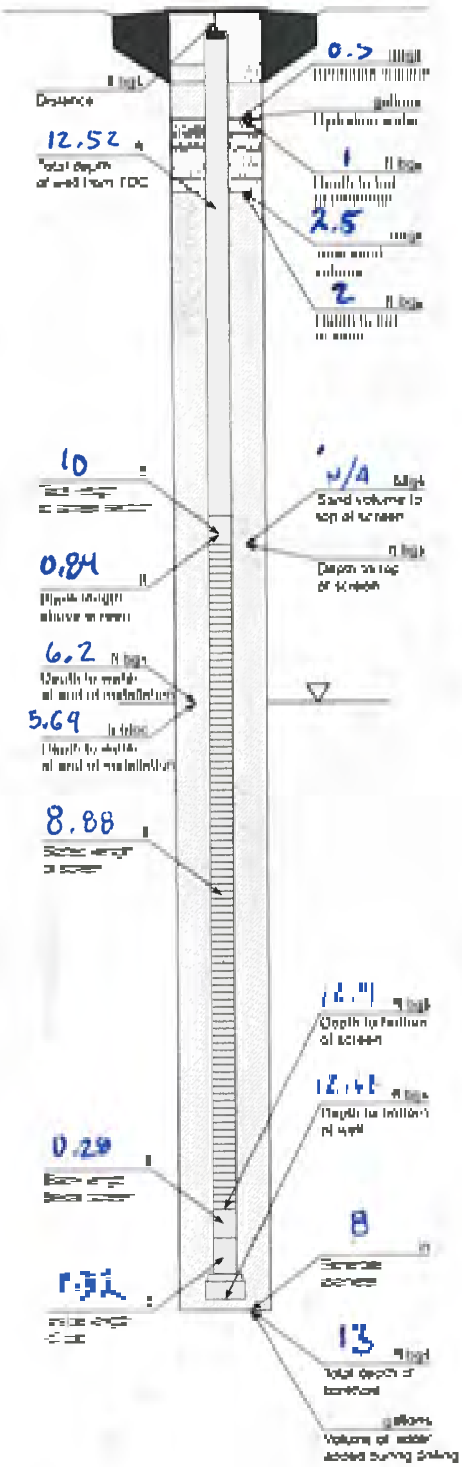
DATE(S) INSTALLED: 6/19/16

EQUIPMENT: Geoprobe 6712 DT w/ augers 8.25" OD 4.25" ID

GEOLOGIST:

BOREHOLE: W37

EASTING: ______ NORTHING: ______ SYSTEM UNITS UTM 6N meters ELEVATION UNITS DATUM ______ NAVD88



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Vault
Size: ______
Manufacturer: ______

Concrete around Vault
Type: ______
Manufacturer: ______

Well Riser
Size: 2-inch Sch 40, ASTM F480 flush threads
Material: PVC
Manufacturer: ______

Well Screen
Size: 0.020-inch slotted, 2-inch Sch 40, ASTM F480 flush threads
Material: PVC
Manufacturer: ______

End Cap

Bentonite (sodium)
Size: 3/8-inch chips, 50 lb bag
Manufacturer: TNT Pureplug

Sand
Size: 10-20, 50-lb bag
Manufacturer: Colorado Silica

Sand Utilization for 100% Open Hole (No Collapse)

Borehole Diameter		Sand Volume (2-inch Well)		
Inches	Feet	Bags/ft	Bags/10 ft	ft/Bag
4.5	0.38	0.18	1.8	5.7
6	0.50	0.35	3.5	2.9
8	0.67	0.65	7.1	1.5

Note:
50 lb bag = 0.504 ft³ based on a porosity of 0.4, corresponding to a bulk density of 99.2 lb/ft³

Other Notes

Water @ 6.2' bgs

Constructed screen target 3-13 in order to hit ground depth for a 5ft of bentonite

→ Section of 0.61 ... 5 ...

Well Development Data Sheet

JACOBS

Site Name	Event	Well ID	Project Number
West Nome Tank Farm	Well Development	MW-36	650166.02
Weather Conditions	**PID Readings of Total VOCs (ppm)**	**Date**	**Developer Initials**
Sunny, windy, 43°F	Ambient 2.2 Breathing Zone 2.2 In Well 54.5	06/30/16	LF/CE

Well Information

Well Material / Size (in)	Drilling Water Added (gal)	As-Built TD of Casing (ft)	Borehole Diameter (in) / Gallons per linear foot (gal/ft)
(PVC/2) SS/2 ___/___	0	20	4.5 / 0.362 6 / 0.555 (8 / 0.898) 10 / 1.34 (filter pack porosity = 0.3)
Depth to Product (ft TOC)	**Depth to GW (ft TOC)**	**Initial TD of Casing (ft)**	**Product Thickness (ft) and Volume Recovered (mL)**
none	13.46	16.91	n/a

Borehole Vol. (BV) water table well = (TD of casing − depth to water) × gal/ft; submerged well = (TD of casing − Depth Top Filter Pack) gal/ft

Min Purge Vol. = 2 * Added Water + 3 * BV   Max Purge Vol. = 2 * Added Water + 10 * BV

BV = (16.91 ft − 13.16 ft) × 0.898 gal/ft = 3.37 gal (* 3.785 L/gal = 12.75 L)

Min Purge Vol. = 2 * 0 gal + 3 * 3.37 gal = 10.12 gal (* 3.785 L/gal = 38.33 L)

Max Purge Vol. = 2 * 0 gal + 10 * 3.37 gal = 33.69 gal (* 3.785 L/gal = 127.5 L)

Well Purging Information

Start Time	Finish Time	Final TD of Casing (ft)	Equipment Used for Purging
1306	1835	17.4	(Sprinkler pump w/ surge block) — Waterra Foot valve; submersible pump; (peristaltic pump)
Color	**Odor** (Fuel)	**Sheen** / **Purged Dry**	**Stabilization Meters** / **Pump Intake Depth (ft btoc)**
(Clear) (Cloudy) Brown Other	None (Moderate) Faint Strong	Sheen: Yes (No) / Purged Dry: Yes (No)	(YSI Multi Meter) (Hach Turbidimeter) / 16.5 (during stabilization)

Purging reached: (Stability) Max Vol   Purge water was: Treated (Stored) Other None

Time (HH:mm)	Volume (Gallons or Liters) Change	Volume Total	Temperature (°C) ± 1.0°C	Conductivity (µS/cm) ± 3%	DO (mg/L) ± 10% or 0.3 mg/L whichever is greater	pH (std units) ± 0.1	ORP (mV) ± 10 mV	Turbidity (NTU) ± 10% or ± 1 NTU	Water Level (feet btoc)
~~1306~~	3.0	~~12.0~~ 3.0	Used Waterra Foot Valve to remove sediment						
1346		CE 6/30	and well shavings. Tubing w/ foot valve						
			clogged twice. Hooked up peri-pump						
1405	3.0	6.0	~~Peri-Pump~~. Start to surge, with surge						
1415	0.5	6.5	block attachment.						
1437	2.5	8.0	Peri-Pump	—	—	—	—	—	
1440	—	—	Surge #2	—	—	—	—	—	
1505	2.5	10.5	Peri-Pump	—	—	—	—	—	13.48
1510	—	—	Surge #3	—	—	—	—	—	
1536	2.5	13.0	Peri-Pump	—	—	—	—	—	
1540	—	—	Surge #4	—	—	—	—	—	
1615	2.5	15.5	Peri-Pump	—	—	—	—	—	
1620	—	—	Surge #5	—	—	—	—	—	
1625	2.0	17.5	Peri-Pump, Hook up YSI			—	—	204.1	13.48
1710	2.0	19.5	4.00	2704 ✓	5.10	6.30	41.4	159.0	13.51
1715	0.25	19.75	2.91 ✓	2616 ✓	1.91	6.25 ✓	19.4	177.5	13.51
1720	0.25	20.0	2.57 ✓	2563 ✓	1.54	6.31 ✓	8.3	183.7	13.51
1725	0.25	20.25	2.64 ✓	2607 ✓	1.19	6.34 ✓	3.4	133.8	13.51
1730	0.25	20.5	2.77 ✓	2609 ✓	0.92	6.40 ✓	-3.0	133.8	13.51

Suggested Notation

"——" = not measured   "✓" = stable   "+" = rising   "-" = falling   "*" = all parameters stable

✓ Additional observations on back

Well Development Data Sheet

JACOBS

Site Name	Test	Well ID	Project Number
West Dome Tank Farm	Well Development	MW36	05DK6302
		Date: 06/20/16	Personnel: LA / CE

Time (HH mm)	Volume (Gallons or Liters)		Acceptable Range to Demonstrate Stability						Water Level (feet btoc)
			± 1 0 °C	± 3%	± 10% or 0 2 mg/L (whichever is greater)	± 0.2	± 10 mV	± 10% or ±1 NTU	
	Change	Total	Temperature (°C)	Conductivity (µS/cm)	DO (mg/L)	pH (std units)	ORP (mV)	Turbidity (NTU)	
1735	0.25	20.75	2.93	2627	[illegible]	6.43	-[illegible]	[illegible]4	13.51
1740	0.25	21.0	2.78	2618	0.78	6.47	-[illegible]5	[illegible]3.9	13.51
1745	0.25	21.25	2.84	[illegible]11	0.73	6.[illegible]	-13.3	[illegible]2.3	13.51
1750	0.25	21.50	2.88	26[illegible]	0.63	6.52	-15.4	75.[illegible]	13.51
1755	0.25	21.75	2.99	2652	0.64	6.[illegible]4	-18.0	[illegible]7.4	13.51
1800	0.25	22.0	2.93	2647	0.59	6.55	-19.1	44.97	13.51
1805	0.25	22.25	3.01	2643	0.54	6.54	-19.9	3[illegible].87	13.51
1810	0.25	22.5	[illegible]28	2631	0.49	6.55	-21.1	26.10	13.51
1815	0.25	22.75	3.16	2636	0.49	6.55	-[illegible]22	17.75	13.51
1820	0.25	23.0	3.36	2645	0.45	6.57	-2236	1.50	13.51
1825	0.25	23.25	3.56	2667	[illegible]	6.64	-25.3	8.65	13.61
1830	0.25	23.5	4.04	2689	0.45	6.75	-28.0	7.89	13.5
1835	0.25	23.75	3.79	2685	0.41	6.77	-28.2	7.24	13.51

Well Development Data Sheet **JACOBS**

Site Name	Event	Well ID	Project Number
[illegible]	Well Development	MW-37	[illegible]
Weather Conditions	**PID Readings of Total VOCs (ppm)**	**Date**	**Developer Initials**
Cloudy, 40s [illegible]	Ambient [illegible] Breathing Zone [illegible] In Well [illegible]	[illegible]	LA / [illegible]

Well Information

Well Material / Size (in)	Drilling Water Added (gal)	As-Built TD of Casing (ft)	Borehole Diameter (in) / Gallons per linear foot (gal/ft)
PVC / 2 SS / 2 ___/___	0	13	4.5 / 0.362 5 / 0.555 (8 / 0.898) 10 / 1.34 (filter pack porosity = 0.3)
Depth to Product (ft TOC)	**Depth to GW (ft TOC)**	**Initial TD of Casing (ft)**	**Product Thickness (ft) and Volume Recovered (mL)**
none	5.69	12.7	n/a

Borehole Vol. (BV) water table well = (TD of casing – depth to water) × gal/ft; submerged well = (TD of casing – Depth Top Filter Pack) *gal/ft

Min Purge Vol. = 2 * Added Water + 3 * BV Max Purge Vol. = 2 * Added Water + 10 * BV

BV = (13 ft – 5.69 ft) × 0.898 gal/ft = 6.6 gal (* 3.785 L/gal = [illegible] L)

Min. Purge Vol. = 2 * 0 gal + 3 * 6.6 gal = 9.7 gal (* 3.785 L/gal = [illegible] L)

Max Purge Vol. = 2 * 0 gal + 10 * 6.6 gal = [illegible] gal (* 3.785 L/gal = 25[illegible] L)

Well Purging Information

Start Time	Finish Time	Final TD of Casing (ft)	Equipment Used for Purging
1125	1505	12.52	sprinkler pump w/ surge block; submersible pump; (peristaltic pump) (waterra foot valve w/ surge block)
Color	**Odor**	**Sheen**	**Purged Dry**
(Clear) Cloudy Brown Other	None Moderate (Faint) Strong	Yes (No)	Yes (No)

Stabilization Meters: (YSI Multi Meter, Hach Turbidimeter) Pump Intake Depth (ft btoc) (during stabilization):

Purging reached: (Stability) Max Vol Purge water was: Treated (Stored) Other Note

Time (HH:mm)	Volume (Gallons or Liters) Change	Total	Temperature (°C) ± 0.2 °C	Conductivity (µS/cm) ± 3%	DO (mg/L) ± 10% or 0.2 mg/L (whichever is greater)	pH (std units) ± 0.1	ORP (mV) ± 10 mV	Turbidity (NTU) ± 10% or ± 1 NTU	Water Level (feet btoc)
1128	1.0	1.0	Purge w/ Waterra foot value						
	—		Surge #1						
1138	0.75	1.75	Purge w/ Waterra foot value						10.60
1215	3.0	4.75	Peri Pump						11.70
1220	—		Surge #2						
12[illegible]	[illegible].5	[illegible].25							
12[illegible]	→		Surge #3		(5 minutes)				
[illegible]	→		Peri	Pump					[illegible]
1330	2.5	9.75	Surge #4		(5 mins)				
1420	~~2.5~~ 0.5	~~[illegible]~~ 12.75	1.27	1166	1.30	6.36	-2.0	1.52	10.08
1425	0.5	13.25	1.12	1176	1.33	6.48	-37.5	0.76	10.12
1430	0.5	13.75	1.12	1192	1.43	6.55	-45.6	0.87	10.18
1435	0.5	14.25	1.01	1161	1.42	6.60	-53.3	0.08	10.31
1440	0.5	14.75	1.03	1142	1.45	6.66	-61.0	0.97	10.45
1445	0.5	15.25	1.03	1145	1.42	6.68	-64.1	0.00	10.55
1450	0.5	15.75	1.06	1158	1.47	6.71	-69.6	0.00	10.50
1455	0.5	16.25	1.05 ✓	1142 ✓	1.30 ✓	6.74 ✓	-73.3 ✓	1.19 ✓	10.48 ✓
1500	0.5	16.75	1.02 ✓	1145 ✓	1.34 ✓	6.74 ✓	-73.7 ✓	0.19 ✓	10.55 ✓
1505	0.5	17.25	1.04 ✓	1154 ✓	1.24 ✓	6.76 ✓	-75.3 ✓	0.28 ✓	10.40 ✓

(Margin notes: "* Fill 3rd 5-gal bucket →" beside 1420; "see note →" beside 1505)

Suggested Notation:

— = not measured S = stable R = rising F = falling ** = all parameters stable ___ Additional observations on back.

* Under estimated flow rate. At 1420, Filled 3rd 5-gal bucket. Total volume = 14.5 gallons @ 1430.

Total Purge Vol @ 1505 = 20.0 gallons. Reached Stability

Well Development Data Sheet

JACOBS

Site Name	Event	Well ID	Project Number
		Date	Developer Initials

Time (HH:mm)	Volume (Gallons or Liters)		Acceptable Range to Demonstrate Stability						Water Level (feet btoc)
			± 1.0 °C	± 3%	± 10% or 0.2 mg/L (whichever is greater)	± 0.2	± 10 mV	± 10% or ±1 NTU	
	Change	Total	Temperature (°C)	Conductivity (µS/cm)	DO (mg/L)	pH (std units)	ORP (mV)	Turbidity (NTU)	

Groundwater Sampling Data Sheet

JACOBS

Site Name	Event	Well ID	Project Number
West Nome Tank Farm	Well Sampling	MW-36	05DK6302
Weather Conditions	**PID Readings of Total VOCs (ppm)**	**Date**	**Sampler Initials**
Cloudy, 40's °F	Ambient 0.0 Breathing Zone 0.0 In Well 4.9	06/22/16	LA/CE

Well Information

Well Integrity	TOC Stickup (ft agl)	Well Casing Material	Casing Diameter (in) Gallons per linear foot (gal/ft)
(Good) Fair Poor	Flush Mount	(PVC) SS	1.0 in: 0.041 (2.0 in) 0.163 4.0 in: 0.653 6.0 in: 1.469
Depth to Product (ft)	**Depth to Water (ft btoc)**	**Total Depth of Casing (ft btoc)**	**Product Thickness (ft) and Volume Recovered (mL)**
n/a	13.59	17.20 (final)	n/a

Max purge volume (3 well casing volumes) = (previous total depth of casing (ft) − (depth to water (DW once well or top of filter pack submerged well, ft)) × gallons per linear foot of casing) × # 3

SHOW WORK: Max Purge Volume = (16.91 ft − 13.59 ft) × 0.163 gal/ft × # 3 = 1.62 gal × 3.785 L/gal = 6.14 L

Well Purging Information

Start Time	Finish Time	Depth of Tubing (ft btoc)	Equipment Used for Purging
0913	1003	15	Bailer (Peristaltic Pump) Submersible Pump

Color	Odor	Sheen	Purged Dry	Meter Used During Purging
Clear Cloudy Brown Other	None Moderate Faint Strong	Yes (No)	Yes No	(YSI Multi Meter) (Hach Turbidimeter)

Purging reached Stability (Multi Var) Purge water was: Treated (Stored) Other Note:

Time (24-hour)	Volume (Gallons or Liters) Change	Volume Total	Acceptable Range to Demonstrate Stability: ±0.2°C Temperature (°C)	±3% Conductivity (µS/cm)	±3% or ±0.2 mg/L (whichever is greater) DO (mg/L)	±0.1 pH (std units)	±10 mV ORP (mV)	±10% or ±5 NTU Turbidity (NTU)	Drawdown < 0.3 ft Water Level (feet btoc)
0918	0.0	0.0	Highly Turbid w/ Sediment						13.73
0923	0.8	0.8						30.54	13.73
0933	0.2	1.0	Hook up YSI						13.75
0938	0.8	1.8	2.64	2565	2.11	6.13	10.3	248.9	13.75
0943	0.8	3.6	2.67	2587	1.57	6.18	-5.2	74.35	13.78
0948	0.8	4.4	2.85	2604 ✓	1.20 ✓	6.22 ✓	-12.5 ✓	54.87	13.75
0953	0.8	5.2	3.14	2618 ✓	1.10 ✓	6.26 ✓	-18.4 ✓	42.45	13.78
0958	0.8	6.0	3.13	2623 ✓	1.16 ✓	6.28 ✓	-22.1 ✓	23.61	13.78
1003	0.8	6.8	3.04	2638	1.01	6.28	-24.1	21.56	13.78

Sample Collection Information

Start Time	Finish Time / Date	Depth of Tubing (ft btoc)	Equipment Used for Sampling
1003		15	(Peristaltic Pump) Submersible Pump
SAMPLE ID: 16WNTF-MW36-GW-4		QC: (Dup) (MS/MSD)	Ferrous Iron (Fe^{2+}) (mg/L) = —

CE 6/22/16

Container/Preservative	Analysis Requested	Notes
~~3x~~ 4x 3x 40 mL VOA, HCl	SW8260	BTEX
MS/MSD 2x 1 L amber, HC	AK102	DRO
+ DUP 2x 1 L amber, unpres.	SW8270SIM	PAH

Suggested Notation:

"——" = not measured "✓" = stable "+" = rising "-" = falling "*" = all parameters stable

Groundwater Sampling Data Sheet

JACOBS

Site Name	Event	Well ID	Project Number
		Date	**Sampler Initials**

Time (HH:mm)	Volume (Gallons or Liters)		Acceptable Range to Demonstrate Stability						
			± 0.2 °C	± 3%	± 10% or 0.2 mg/L (whichever is greater)	± 0.1	± 10 mV	± 10% or ±1 NTU	Drawdown < 0.3 ft
	Change	Total	Temperature (°C)	Conductivity (µS/cm)	DO (mg/L)	pH (std units)	ORP (mV)	Turbidity (NTU)	Water Level (feet btoc)

Groundwater Sampling Data Sheet

JACOBS

Site Name	Event	Well ID	Project Number
WLS: Nine Tank Farm	Sampling	MW-37	[illegible]
Weather Conditions	**PID Readings of Total VOCs (ppm)**	**Date**	**Sampler Initials**
Cloudy, 50 s °F	Ambient 0.0 Breathing Zone 0.2 In Well 12.7	[illegible]	LA / CE

Well Information

Well Integrity	TOC Stickup (ft ags)	Well Casing Material	Casing Diameter (in) / Gallons per linear foot (gal/ft)
(Good) Fair Poor	Flush Mount	(PVC) SS	1/0.041 (2/0.163) 4/0.653 6/1.469
Depth to Product (ft)	**Depth to GW (ft btoc)**	**Total Depth of Casing (ft btoc)**	**Product Thickness (ft) and Volume Recovered (mL)**
none	5.92	12.52 (final)	n/a

Max purge volume (3 well casing volumes) = [(previous) total depth of casing (ft) − (depth to water)(GW table well) or top of filter pack(submerged well) (ft)] × gallons per linear foot of casing × 3

SHOW WORK: Max Purge Volume = (12.52 ft − 5.92 ft) × 0.163 gal/ft × 3 = 3.2 gal × 3.785 L/gal = 12.2 L

Well Purging Information

Start Time	Finish Time	Depth of Tubing (ft btoc)	Equipment Used for Purging
1604	1649	7.0	Bailer (Peristaltic Pump) Submersible Pump
Color	**Odor**	**Sheen** / **Purged Dry**	**Meter Used During Purging**
(Clear) Cloudy Brown Other	(None) Moderate Faint Strong	Yes (No) / Yes No	(YSI Multi Meter) (Hach Turbidimeter)

Purging reached: (Stability) (Max Vol) Purge water was: Treated (Stored) Other Note:

Time (HH:mm)	Volume (Gallons or (Liters)) Change	Volume Total	Temperature (°C) ±0.2 °C	Conductivity (µS/cm) ±3%	DO (mg/L) ±10% or ±0.2 mg/L (whichever is greater)	pH (std units) ±0.1	ORP (mV) ±10 mV	Turbidity (NTU) ±10% or ±1 NTU	Water Level (feet btoc) Drawdown < 0.3 ft
1609	2.0	2.0	Hook up YSI	—	—	—	—	—	7.40 *Lowered Tubing
1614	2.0	4.0	2.61	1422	2.83	6.67	10.0	16.43	7.50
1619	2.0	6.0	3.26	1306	1.65	6.76	-33.1	11.91	6.80
1624	1.5	7.5	3.86	1253	1.17	6.87	-62.1	7.36	6.80
1629	1.25	8.75	4.63 ✓	1247 ✓	0.98	6.94 ✓	-82.8	4.36 ✓	6.68 ✓
1634	1.25	10.0	4.72 ✓	1235 ✓	0.86	6.98 ✓	-96.4	2.51 ✓	6.70 ✓
1639	1.25	11.25	4.71 ✓	1228 ✓	0.68 ✓	6.98 ✓	-100.3 ✓	2.25 ✓	6.70 ✓
1644	1.25	12.50	4.66	1221	0.69 ✓	6.97 ✓	-104.4 ✓	1.56 ✓	6.70 ✓
1649	1.25	13.75	4.52	1217	0.65 ✓	6.96 ✓	-106.5 ✓	1.82 ✓	6.70 ✓

Sample Collection Information

Start Time	Finish Time / Date	Depth of Tubing (ft btoc)	Equipment Used for Sampling
1656	1712	7.0	(Peristaltic Pump) Submersible Pump
SAMPLE ID: 16WNTF-MW37-GW		QC: ~~Dup~~ ~~MS/MSD~~	Ferrous Iron (Fe^{2+}) (mg/L) = —

Container/Preservative	Analysis Requested	Notes
3x 40mL VOA, HCl	SW8260	BTEX
2x 1L amber, HCl	AK102	DRO
2x 1L amber, unpres	SW8270SIM	PAH

Suggested Notation:

"——" = not measured "✓" = stable "+" = rising "-" = falling "*" = all parameters stable

Groundwater Sampling Data Sheet

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Site Name	Event	Well ID	Project Number
		Date	Sampler Initials

Time (HH:mm)	Volume (Gallons or Liters)		Acceptable Range to Demonstrate Stability						
			± 0.2 °C	± 3%	± 10% or 0.2 mg/L (whichever is greater)	± 0.1	± 10 mV	± 10% or ±1 NTU	Drawdown < 0.3 ft
	Change	Total	Temperature (°C)	Conductivity (µS/cm)	DO (mg/L)	pH (std units)	ORP (mV)	Turbidity (NTU)	Water Level (feet btoc)

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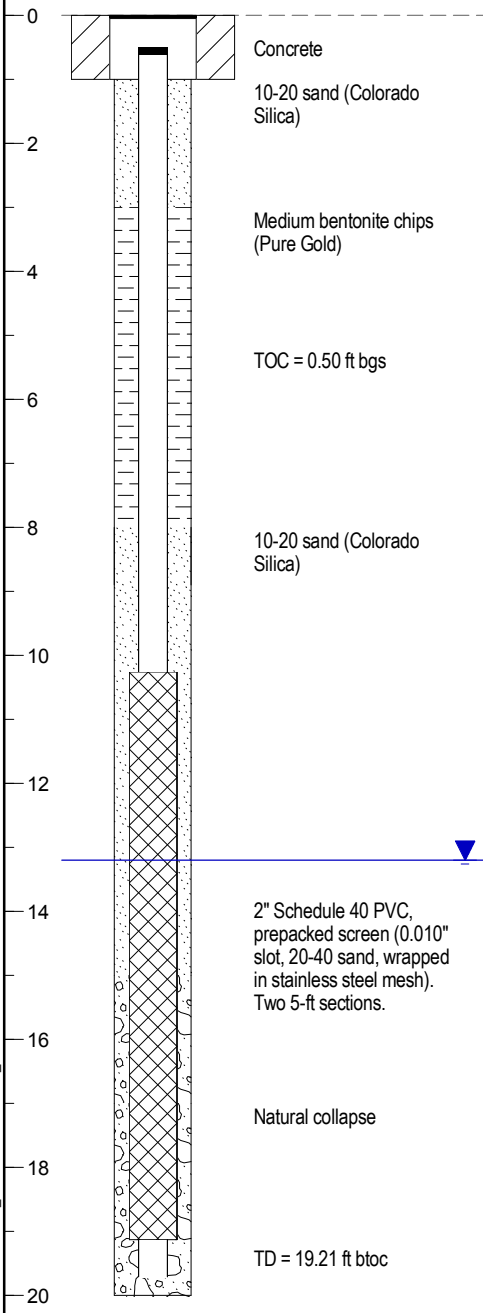
BORING & WELL LOG

Project: **2016 Remedial Design Sampling WNTF, Nome, Alaska**		ID: **WNTF MW36**
Client: **USAF**		Surface Elev. (m) / Elev. Datum: **NAVD 88**
Easting (m): **1,730,615.7**	Northing (m): **3,838,854.9**	Projection (Ellipsoid): **UTM Zone 3N (NAD83)**
Date Constructed: **18 Jun 2016**	Driller: **Discovery Drilling**	Geologist: **Larry Amskold**
Type of Hole: **Soil Boring**	Depth to Groundwater: **13.2 ft bgs ()**	
Drill Rig: **Geoprobe 6712 DT**	Tooling: **MC5 Macro Core**	Total Depth: **20.0 ft**

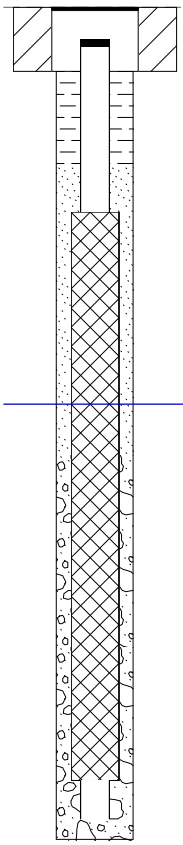


Depth (ft)	USCS Symbol	Rcvr (%)	PID (ppm)	Description
0	SW		4.4	3.6' well graded gravelly sand as described previously (fill). 1.4' material as above
2			3.7	
4			1.7	
6	SP		5.7	greyish brown, poorly graded moist sand, little gravel, trace woody debris, trace silt, sand medium> coarse>fine, gravel subrounded to subangular ~0.5". 1.7' damp well graded light greyish brown soand some gravel, gravel ~1" subangular, sand medium=coarse
8			3.5	
10			5.7	
12			6.2	16WNTF-MW36-12-SO
14				16WNTF-MW36-14-SO
16				
18				
20				

JACOBS

BORING & WELL LOG

Project: **2016 Remedial Design Sampling WNTF, Nome, Alaska**		ID: **WNTF MW36**
Client: **USAF**		Surface Elev. (m) / Elev. Datum: **NAVD 88**
Easting (m): **1,730,445.1**	Northing (m): **3,838,443.3**	Projection (Ellipsoid): **UTM Zone 3N (NAD83)**
Date Constructed: **19 Jun 2016**	Driller: **Discovery Drilling**	Geologist: **Larry Amskold**
Type of Hole: **Soil Boring**	Depth to Groundwater: **6.2 ft bgs ()**	
Drill Rig: **GeoProbe 6712 DT**	Tooling: **MC5 Macrocore**	Total Depth: **13.0 ft**



Depth (ft)	USCS Symbol	PID (ppm)	Description
0	SW	12.8	3' recovery, 2' well graded gravelly sand trace silt, wet sand coarse=medium> fine, gravel ~0.5" subrounded to subangular. 1' medium brownish grey silty clay, some fine sand, medium plasticity
			16WNTF-MW37-00-SO
2		5.1	
4			16WNTF-MW37-04-SO
	SP-SM	6.4	2.0' dark greyish brown silty sand with low trace organics, some gravel, poorly graded, wet, sand fine>>medium> coarse
6			
	SP	5.6	1.3' saturated, poorly graded sand medium>coarse> fine, bottom 0.4' dark grey staining, faint fuel odor
8		4.2	
10			
12			
14			
16			
18			
20			

BORING AND WELL LOG 2014 WNTF2016_PROJ.GPJ DEV2014_TMPLT.GDT 2016/10/05

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BORING & WELL LOG

Project: **2016 Remedial Design Sampling WNTF, Nome, Alaska**		ID: **WNTF SB01**
Client: **USAF**		Surface Elev. (m) / Elev. Datum: **NAVD 88**
Easting (m): **1,730,407.1**	Northing (m): **3,838,739.7**	Projection (Ellipsoid): **UTM Zone 3N (NAD83)**
Date Constructed: **19 Jun 2016**	Driller: **Discovery Drilling**	Geologist: **Larry Amskold**
Type of Hole: **Soil Boring**	Depth to Groundwater: **7.5 ft bgs ()**	
Drill Rig: **GeoProbe 6712 DT**	Tooling: **MC5 Macrocore**	Total Depth: **10.0 ft**

Depth (ft)	Construction Diagram	Construction Description	USCS Symbol	Lithology, Samples	Rcvr (%)	PID (ppm)	Description
0			SW				6' fill as previously described
						7.9	
2							
						3.0	
4							
						15.6	
6			SP-SM				4' dark grey fuel, sandy poorly graded silty sand as previously described
							16WNTF-SB01-06-SO
						652	
8							16WNTF-SB01-08-SO
						607	
10							
12							
14							
16							
18							
20							

BORING AND WELL LOG 2014 WNTF2016_PROJ.GPJ DEV2014_TMPLT.GDT 2016/10/05

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BORING & WELL LOG

Project: **2016 Remedial Design Sampling WNTF, Nome, Alaska**		ID: **WNTF SB02**
Client: **USAF**		Surface Elev. (m) / Elev. Datum: **NAVD 88**
Easting (m): **1,730,400.1**	Northing (m): **3,838,747.3**	Projection (Ellipsoid): **UTM Zone 3N (NAD83)**
Date Constructed: **19 Jun 2016**	Driller: **Discovery Drilling**	Geologist: **Larry Amskold**
Type of Hole: **Soil Boring**	Depth to Groundwater: **7.0 ft bgs ()**	
Drill Rig: **GeoProbe 6712 DT**	Tooling: **MC5 Macrocore**	Total Depth: **10.0 ft**

Depth (ft)	Construction Diagram	Construction Description	USCS Symbol	Lithology, Samples	Rcvr (%)	PID (ppm)	Description
0			SW				4' fill as previously described
						253	
2							
						378	
4							
			SP-SM			207	1' fill, 4' dark grey fuel stained poorly graded silty sand
6							16WNTF-SB02-06-SO
						513	
8							16WNTF-SB02-08-SO
						600	
10							
12							
14							
16							
18							
20							

BORING AND WELL LOG 2014 WNTF2016_PROJ.GPJ DEV2014_TMPLT.GDT 2016/10/05

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BORING & WELL LOG

Project: **2016 Remedial Design Sampling WNTF, Nome, Alaska**		ID: **WNTF SB03**
Client: **USAF**		Surface Elev. (m) / Elev. Datum: **NAVD 88**
Easting (m): **1,730,405.2**	Northing (m): **3,838,768.6**	Projection (Ellipsoid): **UTM Zone 3N (NAD83)**
Date Constructed: **19 Jun 2016**	Driller: **Discovery Drilling**	Geologist: **Larry Amskold**
Type of Hole: **Soil Boring**	Depth to Groundwater: **7.0 ft bgs ()**	
Drill Rig: **GeoProbe 6712 DT**	Tooling: **MC5 Macrocore**	Total Depth: **10.0 ft**

Depth (ft)	Construction Diagram	Construction Description	USCS Symbol	Lithology, Samples	Rcvr (%)	PID (ppm)	Description
0			SW				4' fill, dry, medium grey, slight fuel odor, 1.6' wet, well graded, medium grey fill as described on SB04, fuel odor
						0.6	
2						0.5	
4							
						208	
6			SP-SM				2.4' dark grey, fuel stained, fuel odor, poorly graded silty sand, trace gravel, organic material, sand fine> medium>> coarse, gravel subrounded ~0.5"
							16WNTF-SB03-06-SO
						491	
8							16WNTF-SB03-08-SO
						592	
10							
12							
14							
16							
18							
20							

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BORING & WELL LOG

Project: 731b RvmvdDal FvsDne UamplDen WN2S, Nomv, Alaska		ID: **WNTF SB04**
Client: t UAS		Surface Elev. (m) / Elev. Datum: NAVF 88
Easting (m): 1,643,51T.8	Northing (m): 4,848,6bT.4	Projection (Ellipsoid): t 2M Zoev 4N (NAF84)
Date Constructed: 19 Jue 731b	Driller: FBi ocvry FrDlDen	Geologist: Larry Amskold
Type of Hole: UoDgorDen	Depth to Groundwater: b.T Of Pns ()	
Drill Rig: BvoGroPv b617 F2	Tooling: MCT Mai roi orv	Total Depth: 13.3 Of

Depth (ft)	Construction Diagram	Construction Description	USCS Symbol	Lithology, Samples	Rcvr (%)	PID (ppm)	Description
0			SW				3.6' recovered, medium brownish grey fill as described previously, 1' fill as previous
						4.6	
2							
						8.4	
4							
						123	
			SP				0.5' Poorly graded dark grey, fine>medium>>coarse
6			SC				3' poorly graded, saturated dark grey, clayey sand, trace silt, trace gravel. Some degraded organic material throughout
						447	16WNTF-SB04-06-SO
8							16WNTF-SB04-08-SO
							16WNTF-SB04-08-SO-9 (Duplicate)
						535	
10							
12							
14							
16							
18							
20							

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BORING AND WELL LOG 2014 WNTF2016_PROJ.GPJ DEV2014_TMPLT.GDT 2016/10/05

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BORING & WELL LOG

Project: **2016 Remedial Design Sampling WNTF, Nome, Alaska**		ID: **WNTF SB05**
Client: **USAF**		Surface Elev. (m) / Elev. Datum: **NAVD 88**
Easting (m)	Northing (m)	Projection (Ellipsoid): **UTM Zone 3N (NAD83)**
Date Constructed: **18 Jun 2016**	Driller: **Discovery Drilling**	Geologist: **Larry Amskold**
Type of Hole: **Soil Boring**	Depth to Groundwater: **11.5 ft bgs ()**	
Drill Rig: **GeoProbe 6712 DT**	Tooling: **MC5 Macrocore**	Total Depth: **12.0 ft**

Depth (ft)	Construction Diagram	Construction Description	USCS Symbol	Lithology, Samples	Rcvr (%)	PID (ppm)	Description
0			SW				3.6' well-graded gravelly-sand fill as described previously
						19.2	
2							
						7.2	
			SP				3' medium greyish brown, poorly graded sand with gravel as described previously, 2' material as above, dark grey moist, fuel odor
4							
						7.0	
6							
						31.7	
8							16WNTF-SB05-08-SO 1x 4oz w/MeO4 Amber, 1x8oz Amber
						600	
10							0.8' same as above, 3.2' plastic silty clay as described previously, dark grey, fuel-stained and fuel odor
						419	16WNTF-SB05-10-SO 1x 4oz Amber w/MeO4 , 1x8oz Amber
12							
14							
16							
18							
20							

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BORING & WELL LOG

Project: **2016 Remedial Design Sampling WNTF, Nome, Alaska**		ID: **WNTF SB06**
Client: **USAF**		Surface Elev. (m) / Elev. Datum: **NAVD 88**
Easting (m)	Northing (m)	Projection (Ellipsoid): **UTM Zone 3N (NAD83)**
Date Constructed: **18 Jun 2016**	Driller: **Discovery Drilling**	Geologist: **Larry Amskold**
Type of Hole: **Soil Boring**	Depth to Groundwater: **9.5 ft bgs ()**	
Drill Rig: **GeoProbe 6712 DT**	Tooling: **MC5 Macrocore**	Total Depth: **10.0 ft**

Depth (ft)	Construction Diagram	Construction Description	USCS Symbol	Lithology, Samples	Rcvr (%)	PID (ppm)	Description
0			SW				3.4' recovered, damp well graded fill as described previously
						7.0	
2							
						6.4	
			SP				2.4' damp poorly graded sand with gravel as described previously, 0.8' dark grey fuel saturated, poorly graded sand with gravel
4							
						70.1	
6							16WNTF-SB06-06-SO 1x4oz Amber w/Meo4, 1x8oz Amber
						507	
8							16WNTF-SB06-08-SO 1x4oz Amber w/Meo4, 1x8oz Amber
						523	
			ML				0.8' poorly graded, fuel saturated, dark grey plastic clayey silt
10							
12							
14							
16							
18							
20							

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BORING & WELL LOG

Project: **2016 Remedial Design Sampling WNTF, Nome, Alaska**		ID: **WNTF SB07**
Client: **USAF**	Surface Elev. (m) **35.80**	Elev. Datum **NAVD 88**
Easting (m) **1,730,615.7**	Northing (m) **3,838,854.9**	Projection (Ellipsoid) **UTM Zone 3N (NAD83)**
Date Constructed: **18 Jun 2016**	Driller: **Discovery Drilling**	Geologist: **Larry Amskold**
Type of Hole: **Monitoring Well**	Depth to Groundwater: **11.4 ft bgs ()**	
Drill Rig: **GeoProbe 6712 DT**	Tooling: **MC5 Macrocore**	Total Depth: **15.0 ft**

Depth (ft)	Construction Diagram	Construction Description	USCS Symbol	Lithology, Samples	Rcvr (%)	PID (ppm)	Description
0			SW			1.6	Well graded brownish-grey well graded gravelly sand, little silt trace cobbles as pulverized angular (fill) rock fragments, gravel subangular to subrounded, same medium>coarse>fine, 2.2' material as previous, fuel staining and odor 6.6-7.3' bgs, 2.8' poor
2						4.1	
4						2.3	
6						58.9	
8			SP			347	pooorly graded sand as above, poorly graded dark grey fuel stained, fuel odor, poorly graded plastic clayey silt some fine sand. Decaying organic matter and root debris. Wet to saturated 16WNTF-SB07-08-SO
10			ML			312	16WNTF-SB07-010-SO
12						271	
14							
16							
18							
20							

BORING AND WELL LOG 2014 WNTF2016_PROJ.GPJ DEV2014_TMPLT.GDT 2016/10/05

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BORING & WELL LOG

Project: **2016 Remedial Design Sampling WNTF, Nome, Alaska**		ID: **WNTF SB08**
Client: **USAF**		Surface Elev. (m) **28.10** / Elev. Datum **NAVD 88**
Easting (m) **1,730,445.1**	Northing (m) **3,838,443.3**	Projection (Ellipsoid) **UTM Zone 3N (NAD83)**
Date Constructed: **18 Jun 2016**	Driller: **Discovery Drilling**	Geologist: **Larry Amskold**
Type of Hole: **Monitoring Well**	Depth to Groundwater: **12.5 ft bgs ()**	
Drill Rig: **GeoProbe 6712 DT**	Tooling: **MC5 Macrocore**	Total Depth: **15.0 ft**

Depth (ft)	Construction Diagram	Construction Description	USCS Symbol	Lithology, Samples	Rcvr (%)	PID (ppm)	Description
0			SW			4.1	0.8' dry, light brown, well graded sand with gravel, some silt, no odor, sand finse> medium> coarse, gravel ~0.5" subangular to subrounded.
2			SP			4.0	0.6' dry light gray pulverized rock fragments. 2.1, damo, poorly graded, gravelly sand gray to medium, ~1" subangular to angular rock fragments, 2' medium grey to greyish brown poorly graded sand w/ gravel. Some dark grey staining. 3' poorly graded sand w
4						3.8	
6						46.4	16WNTF-SB08-06-SO
8						22.3	
10						42.6	
12			ML			352	16WNTF-SB08-12-SO 16WNTF-SB08-12-SO (duplicate)
14							
16							
18							
20							

BORING AND WELL LOG 2014 WNTF2016_PROJ.GPJ DEV2014_TMPLT.GDT 2016/10/05

APPENDIX E
Survey Data

West Nome Tank Farm
Survey Results

LocID	N_NAD83	E_NAD83	HtEll	QualXY	Description	DateTime	SrvyMthd	SrvyEquip	SrvyDtm	Vert_Prec	Horz_Prec
SP-03	3838647.29	1730590.37	—	0.10	SurfaceSoilPt	42542.33	PPCF-GPS	Trimble GeoXH 6000	NAD83	0.10	0.10
SB-04	3838765.32	1730415.84	—	0.10	Borehole	42542.34	PPCF-GPS	Trimble GeoXH 6000	NAD83	0.10	0.10
SB-01	3838739.73	1730407.11	—	0.10	Borehole	42542.34	PPCF-GPS	Trimble GeoXH 6000	NAD83	0.10	0.10
SB-03	3838768.64	1730405.22	—	0.10	Borehole	42542.34	PPCF-GPS	Trimble GeoXH 6000	NAD83	0.10	0.10
SB-02	3838747.28	1730400.09	—	0.10	Borehole	42542.34	PPCF-GPS	Trimble GeoXH 6000	NAD83	0.10	0.10
SP-04	3838737.64	1730627.65	—	0.10	Borehole	42542.34	PPCF-GPS	Trimble GeoXH 6000	NAD83	0.10	0.10
SP-06 (porewater)	3838862.18	1730649.69	—	0.10	SurfaceWaterPt	42542.61	PPCF-GPS	Trimble GeoXH 6000	NAD83	0.10	0.10
SP-06 (sediment)	3838860.55	1730652.60	—	0.10	SurfaceSoilPt	42542.61	PPCF-GPS	Trimble GeoXH 6000	NAD83	0.10	0.10
SP-05	3838737.51	1730627.83	—	0.10	SurfaceSoilPt	42542.62	PPCF-GPS	Trimble GeoXH 6000	NAD83	0.10	0.10
SP-04	3838646.25	1730591.10	—	0.10	SurfaceSoilPt	42542.63	PPCF-GPS	Trimble GeoXH 6000	NAD83	0.10	0.10
SP-03	3838557.22	1730535.76	—	0.10	SurfaceSoilPt	42542.63	PPCF-GPS	Trimble GeoXH 6000	NAD83	0.11	0.10
SP-02	3838464.60	1730493.53	—	0.10	SurfaceSoilPt	42542.64	PPCF-GPS	Trimble GeoXH 6000	NAD83	0.10	0.10
SP-01	3838295.50	1730393.66	—	0.22	SurfaceSoilPt	42542.68	PPCF-GPS	Trimble GeoXH 6000	NAD83	0.21	0.22
MW-R7	3839027.50	1730461.10	—	0.00	MonWell	42637.00		Trimble GeoXH 6000	NAD83		
MW-36	3838854.90	1730615.70	—	0.00	MonWell	42637.00		Trimble GeoXH 6000	NAD83		
MW-37	3838443.30	1730445.10	—	0.00	MonWell	42637.00		Trimble GeoXH 6000	NAD83		
MW-20	3839238.90	1730508.50	—	0.00	MonWell	42637.00		Trimble GeoXH 6000	NAD83		
MW-21	3839292.40	1730525.40	—	0.00	MonWell	42637.00		Trimble GeoXH 6000	NAD83		

EDGE
SURVEY AND DESIGN, LLC

A MBE COMPANY OFFERING A FULL RANGE OF LAND, CONSTRUCTION AND HYDROGRAPHIC SURVEYS AS WELL AS MACHINE CONTROL AND DESIGN SERVICES

8-24-16

Nick Kuhlmann
Environmental & Construction Operations Manager
Eagle Eye Electric, LLC A Bering Straits Company
4600 Debarr Road, Suite 200 | Anchorage, AK 99508

PROJECT: NOME TANK FARM MONITOR WELL COORDINATES

Mr. Kuhlmann:

Below are the coordinates of the monitor wells at the Nome tank farm. The locations were derived by GPS and are based on the control shown below.

If I can answer any questions please let me know.

Sincerely,
Tony Wilson, PLS

Tony Wilson

Edge Survey and Design

Nome Tank Farm Monitor Well Locations

Coordinates and Elevations based on NGS SACS point designated 8756-K

NAD 83		US Survey
Meters		Feet
North	1,170,493.8670	3,840,195.2950
East	527,379.9500	1,730,245.7190

NAVD 88 Ortho Height 13.2’ GPS observed

Nome Tank Farm Monitor Well Coordinates in US Survey Feet

	ASPC AK ZONE 8			
	Northing	Easting	Elevation of Ground at well	
201	3,838,443.3	1,730,445.1	28.1	MONITORING WELL W-37
202	3,838,854.9	1,730,615.7	35.7	MONITORING WELL W-36
203	3,839,027.5	1,730,461.1	28.8	MONITORING WELL W-7R
204	3,839,238.9	1,730,508.5	34.4	MONITORING WELL W-20
205	3,839,292.4	1,730,525.4	32.2	MONITORING WELL W-21

Note: The elevations are ground elevations at the well pipe.

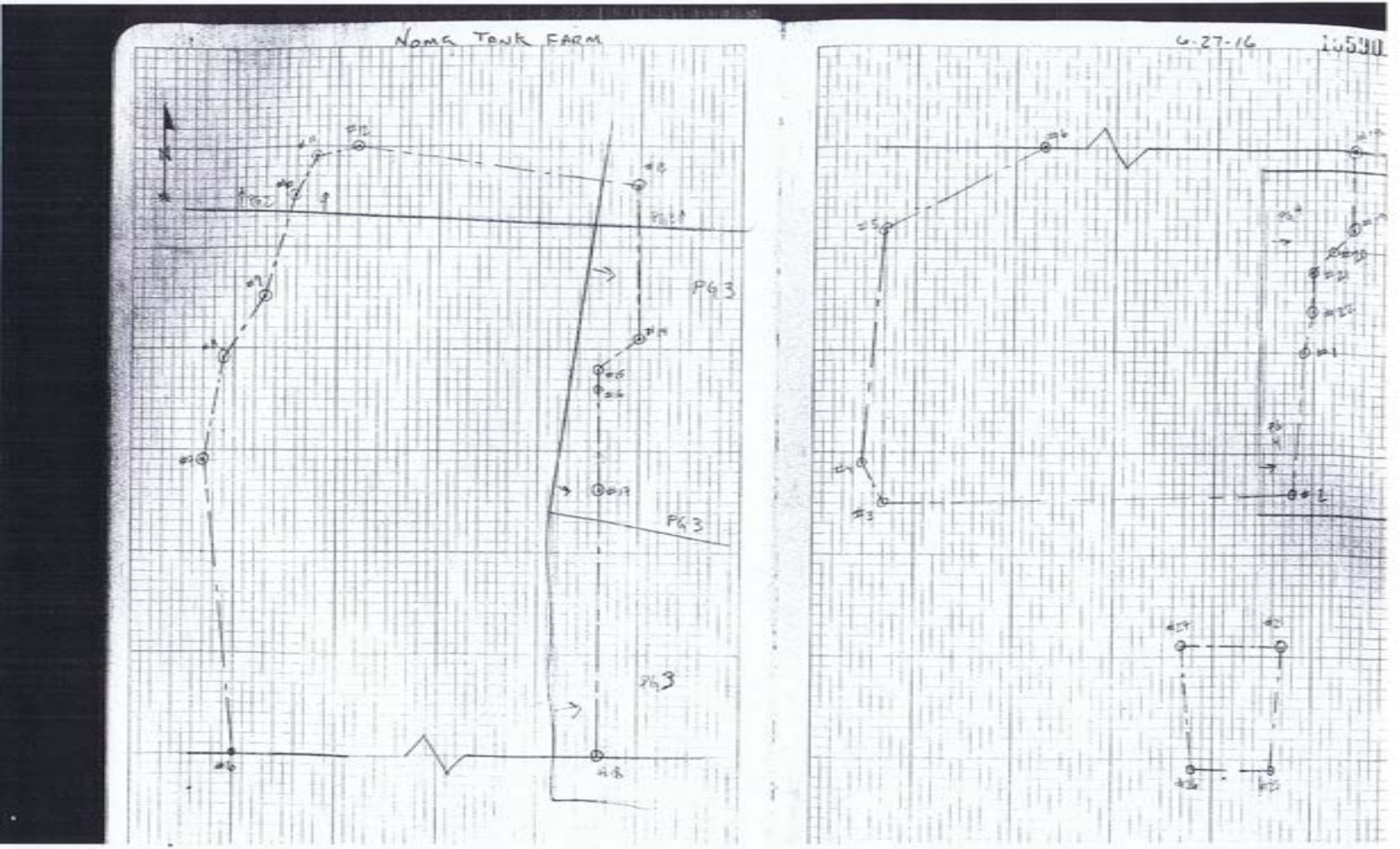
Sep-16

Nome Tank Farm Monitor well locations

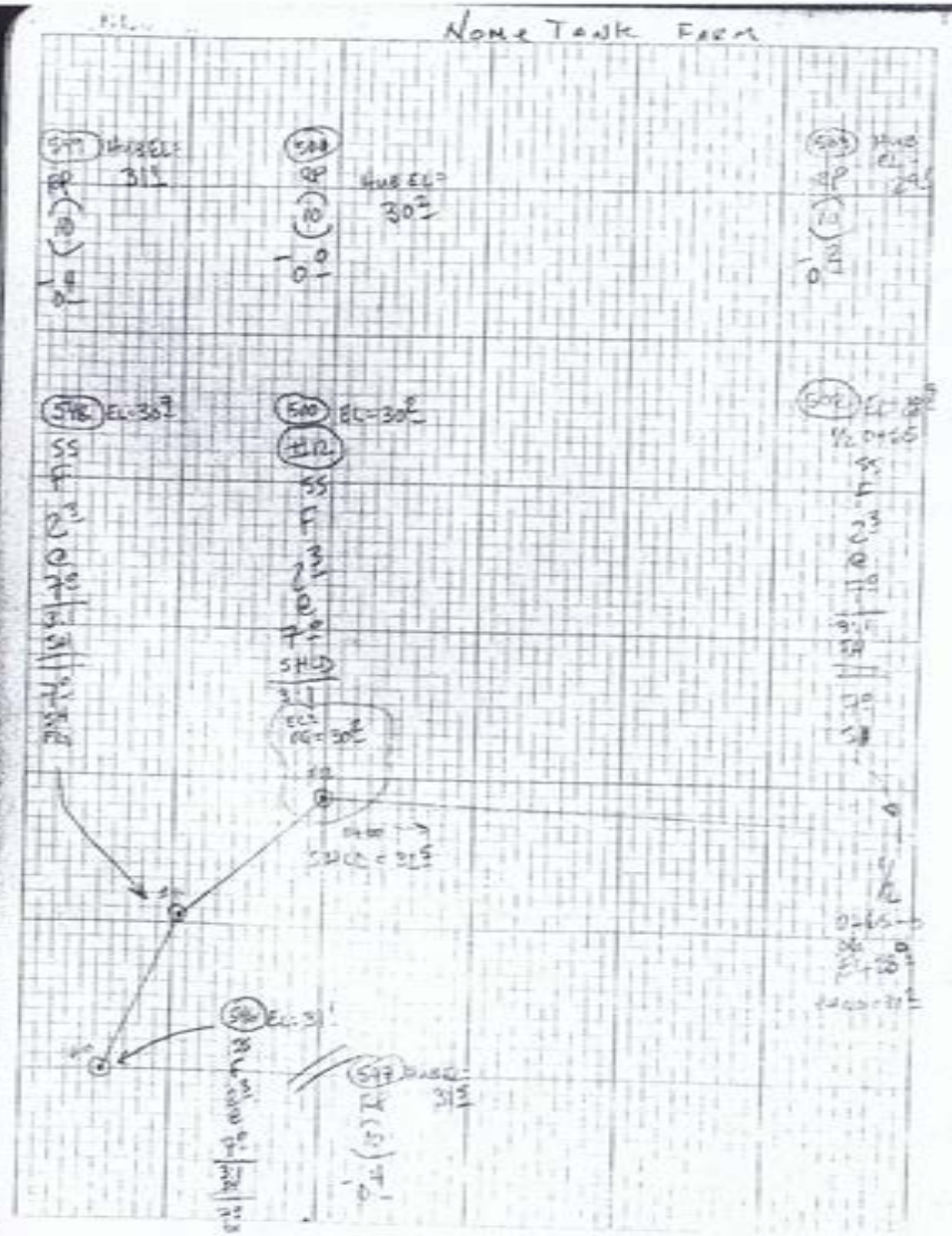
Edge Survey and Design
344-5990
FB 15-59

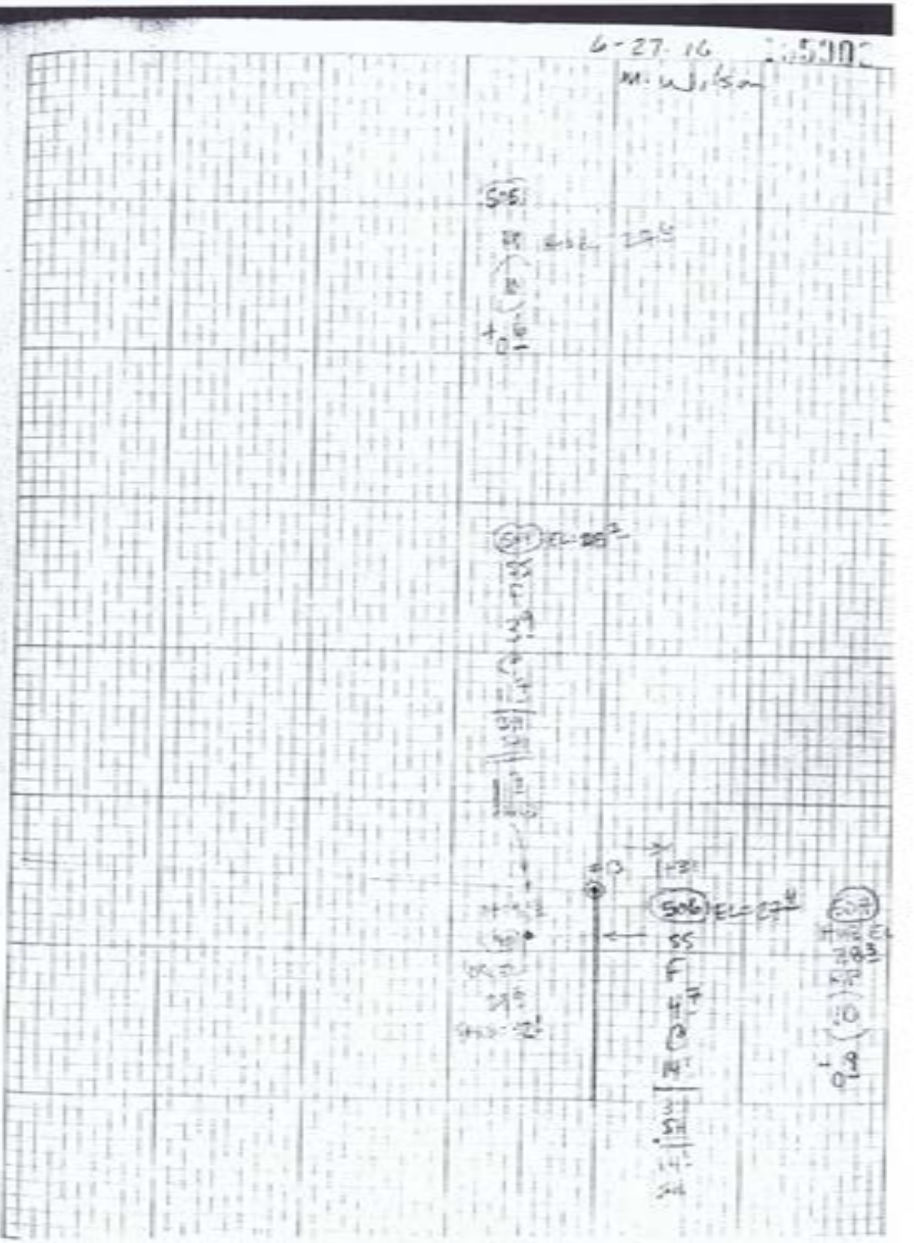
Elevations based on CP 102 elevation 29.66

Monitor well	Northing	Easting	Ground Elevation	Top PVC in well	Top Concrete around well	Top of Well cap
W-R7	3,839,027.50	1,730,461.10	28.8	28.74	28.88	No well cap present
W-36	3,838,854.90	1,730,615.70	35.8	35.30	35.72	35.78
W-37	3,838,443.30	1,730,445.10	28.1	27.77	28.07	28.14
W-20	3,839,238.90	1,730,508.50	34.4	At base of well casing, casing was locked and no key available. Casing is at a slant		
W-21	3,839,292.40	1,730,525.40	32.2	At base of well casing, casing was locked and no key available. Casing is at a slant		



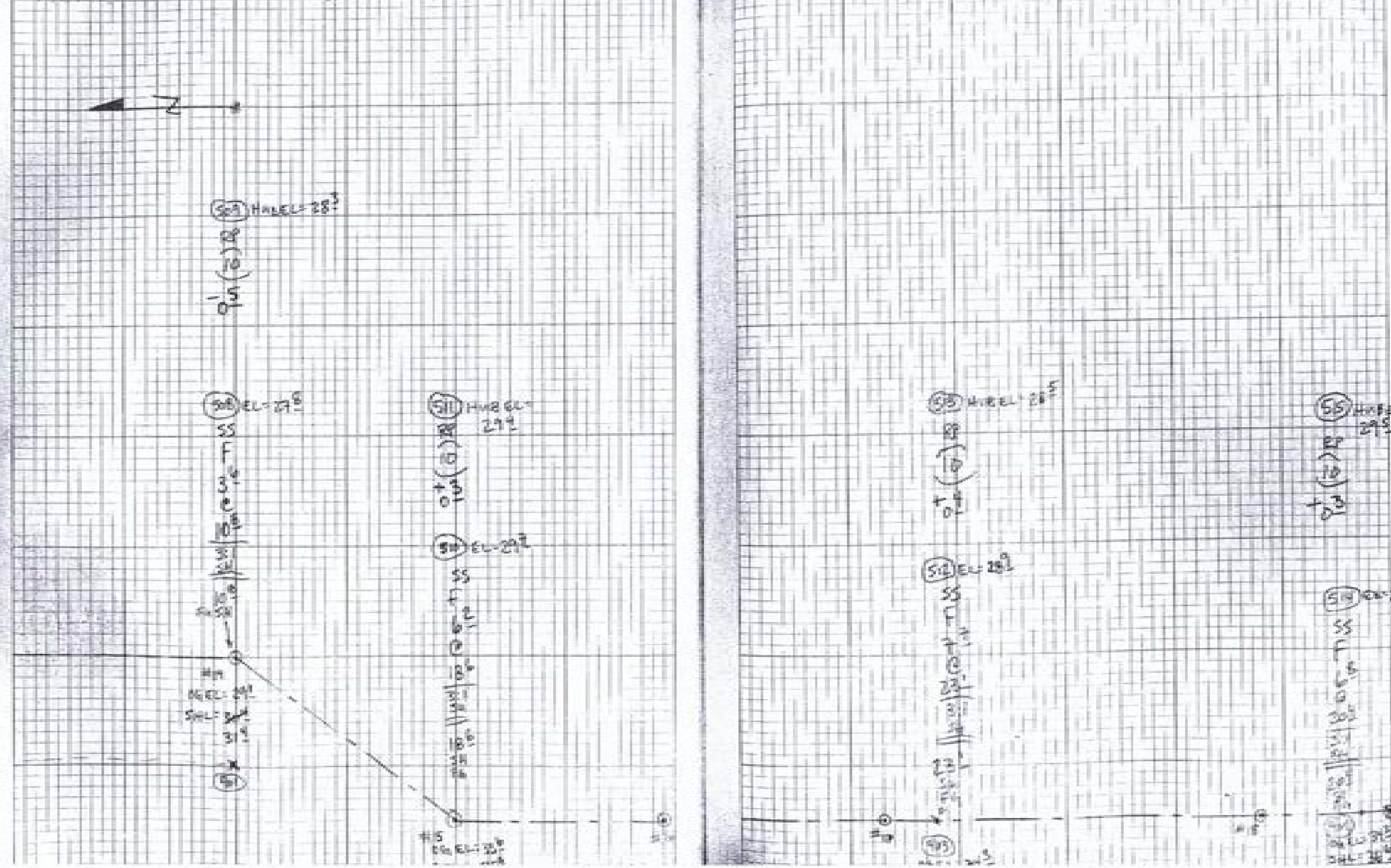
P. #00 – #11


NOME TANK FARM


6-27-16
M. Wilson

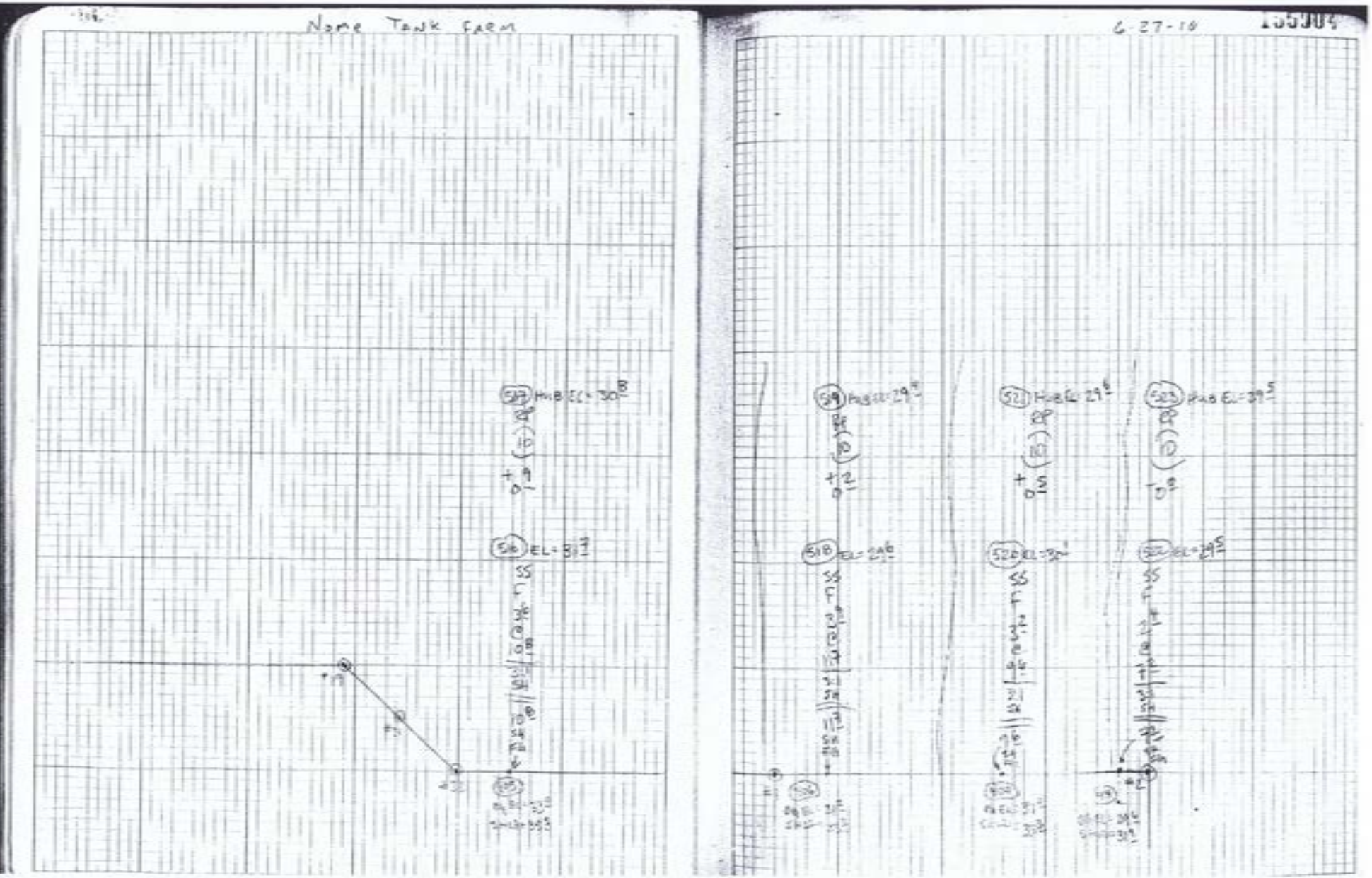
Nome Tank

6-27-11



Name Tank Farm

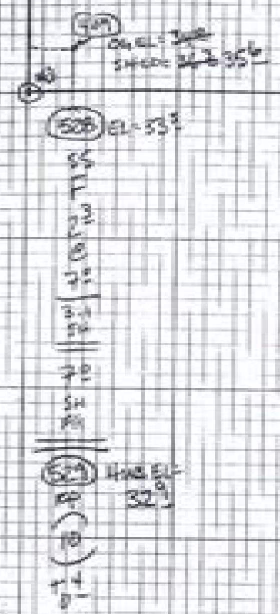
6-27-18

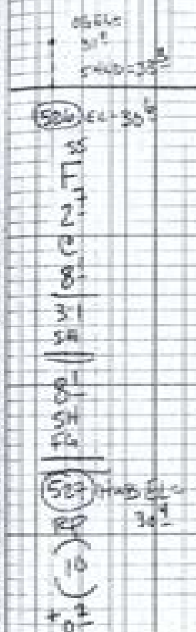


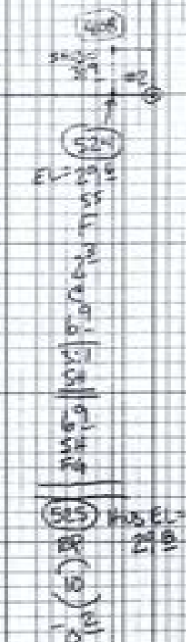
NOMO TANK

6-27-16

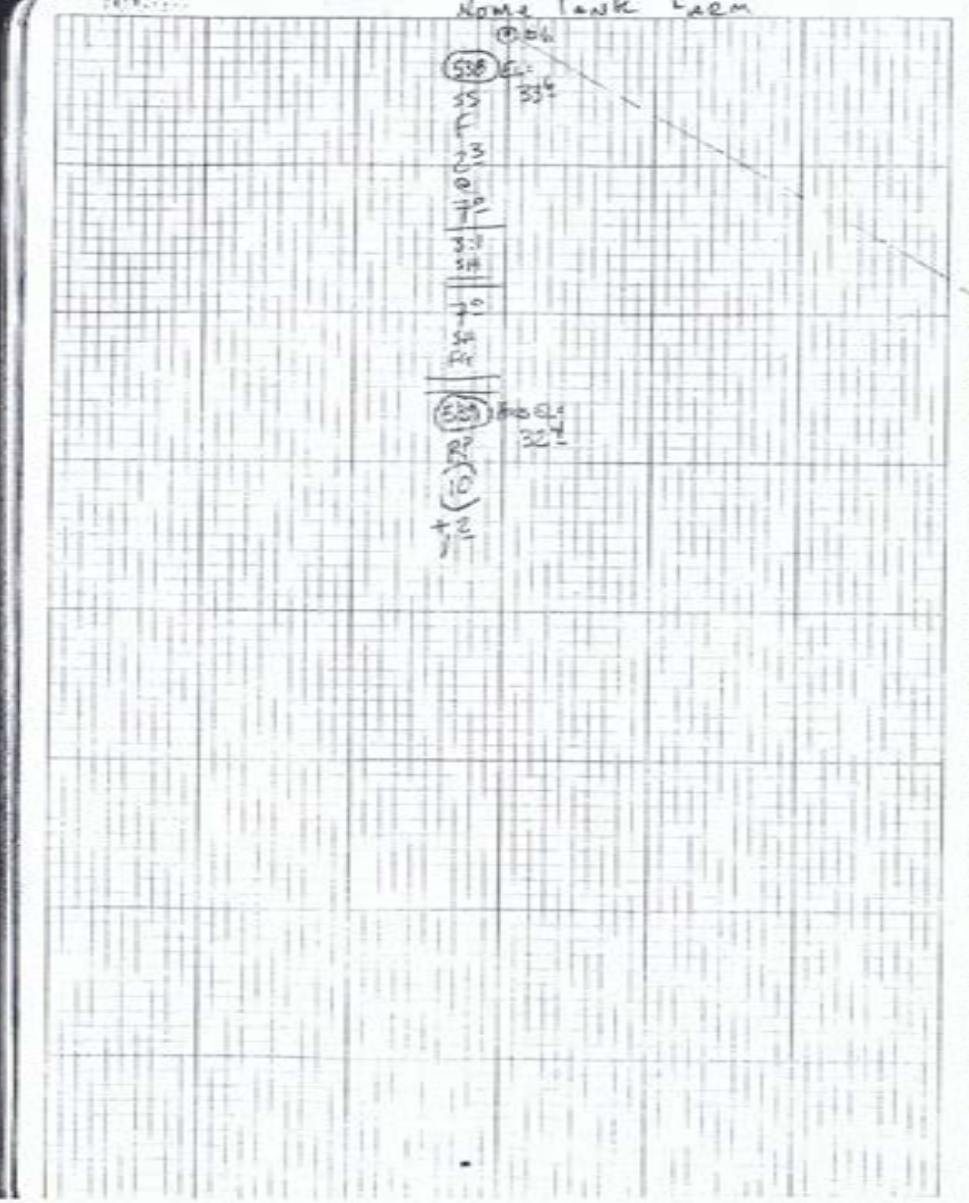
15590



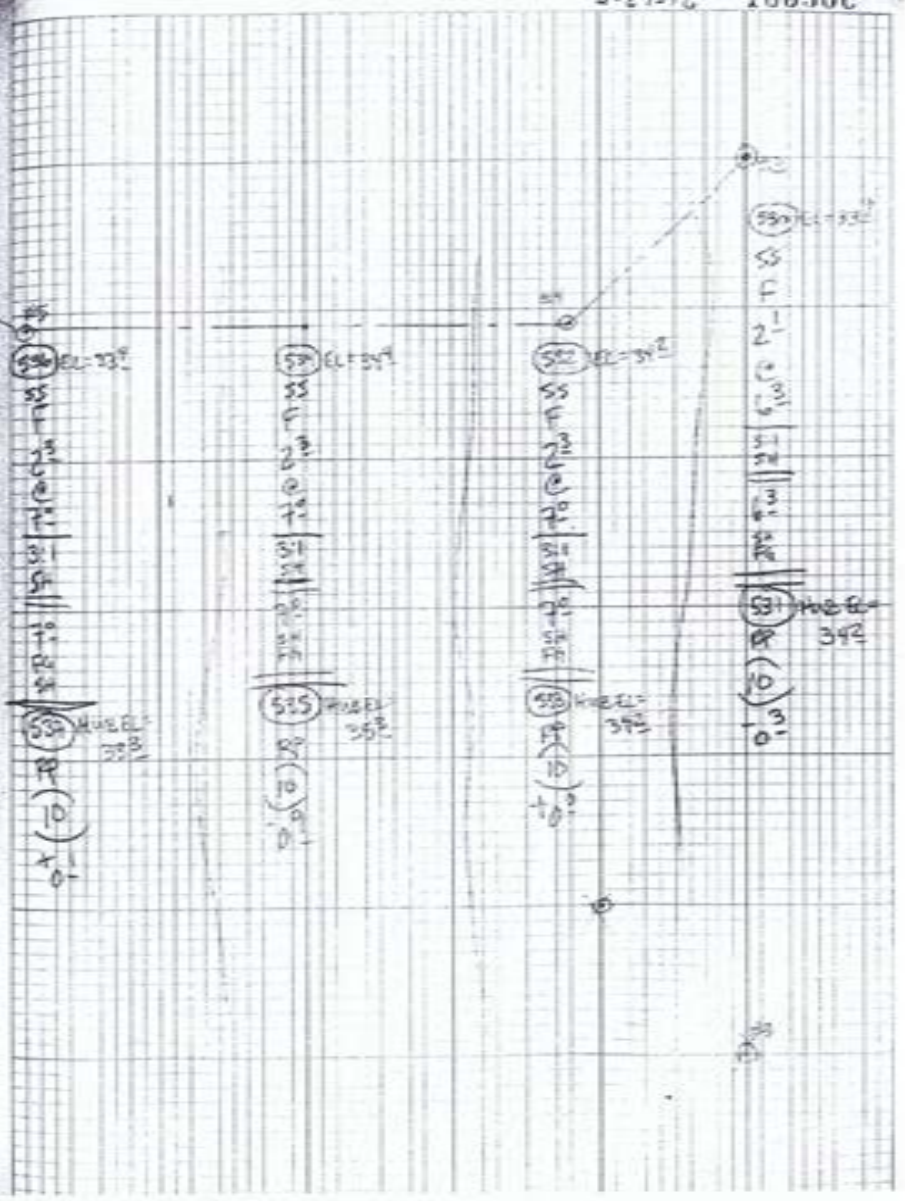




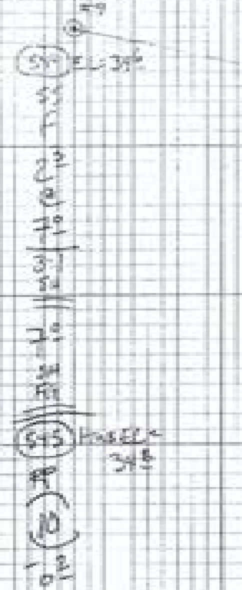
Nome Tank Farm



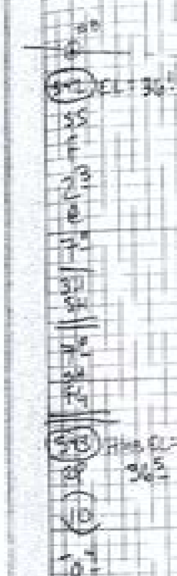
4-27-16

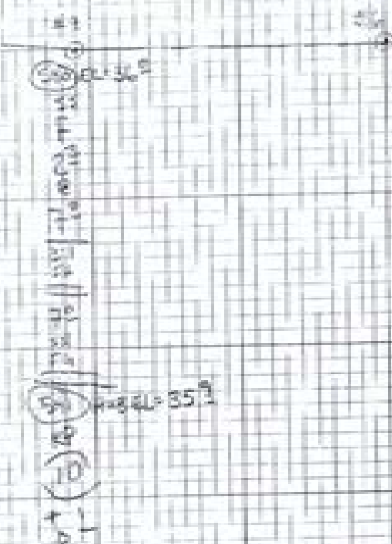


Home Tank Farm



6-27-16 15307

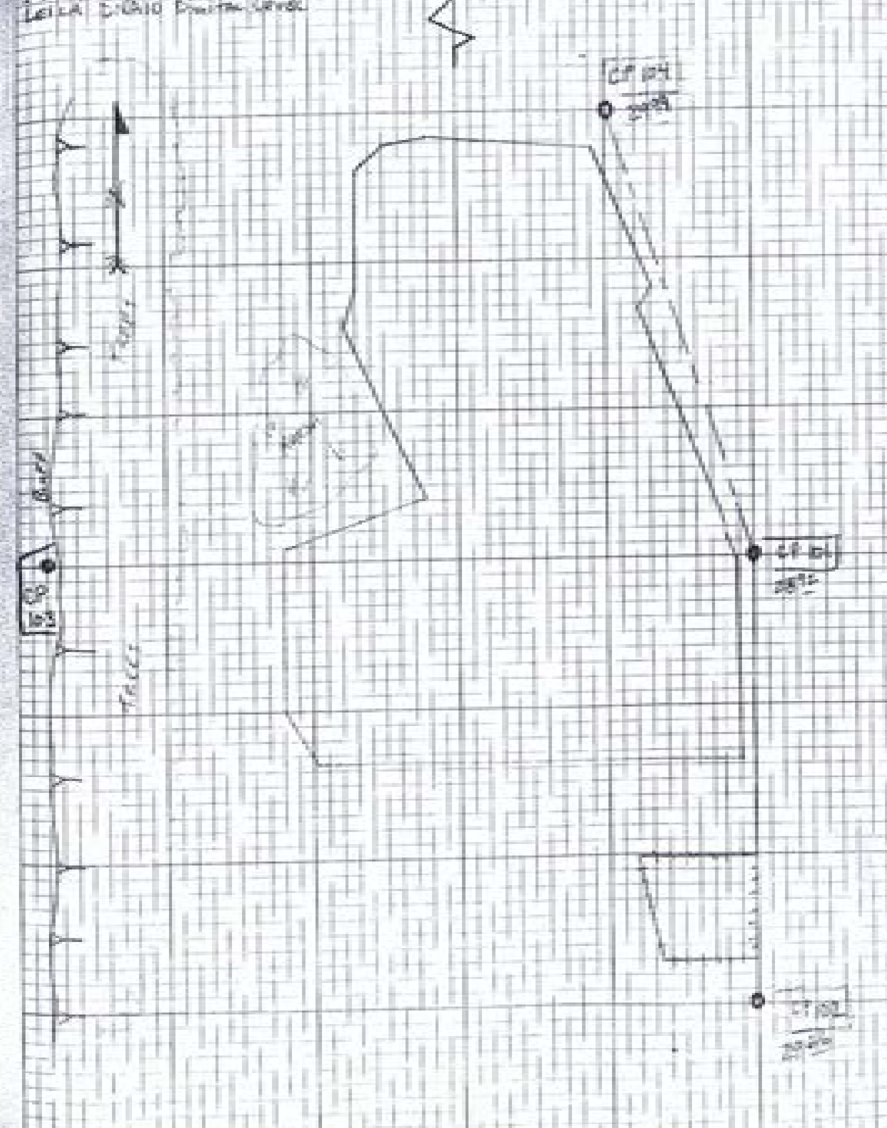




West Nome Tank Farm
Level Loop

+	HI	−	ELEV	STA/DESC
5.026			~~28.92~~ 29.66	~~CP 70~~ CP 102 Brass Bld
	34.686			
		5.805	28.881	CP 101
5.493				
	34.374			
		4.351	30.023	CP 104
4.546				
	34.569			
		5.688	28.881	CP 101
5.782				
	34.663			
		5.003	29.662	CP 102
			28.88	CP 101
6.352				
	35.232			
		7.467	27.765	PVC High Point (W-37)
		7.463	28.??	Conc (W-37)
		7.172	28.060	OG (W-37)
		7.092	28.140	Well Cap
7.612				
	35.753			
		6.126	29.627	TP Rock
11.531				
	41.158			
		5.847	35.309	PVC High Point (W-36)
		5.445	35.712	Conc (W-36)
		5.281	35.883	OG (W-36)
		?.?86	?.???	CAP

6/27/16
+45°F Overcast – Calm
Leica DNA10 Digital Level



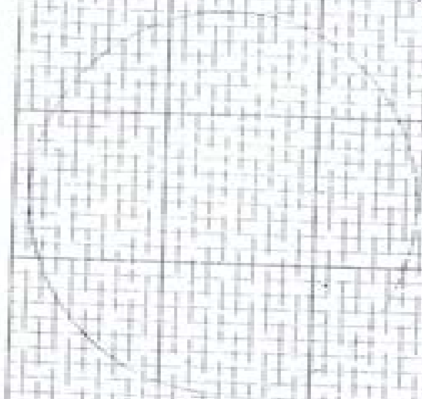
West Mesa Tank Farm

PVC MAY HAVE BEEN MODIFIED IN FIELD BY INSPECTOR

WEST NOME TANK FARM

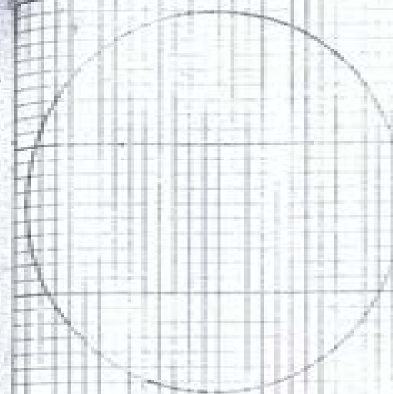
RECOVERED MONUMENTS

CP 100

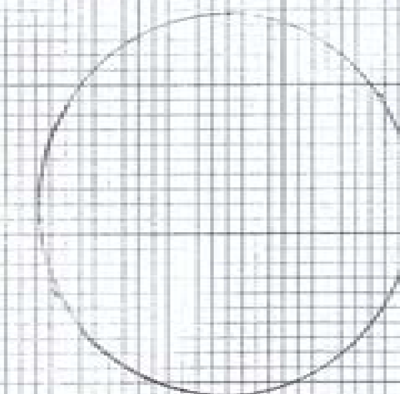


CP 101

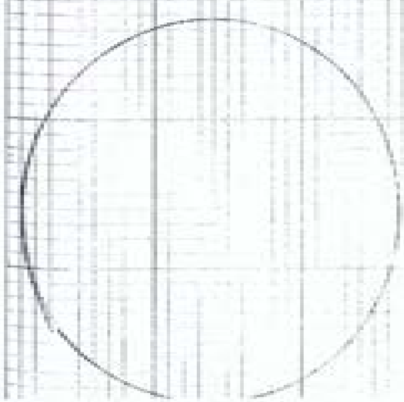
CP 102



CP 103



CT 104



APPENDIX F
Notifications and Permits

RECEIVED

DATE RECEIVED: APR 04 2016

CITY OF NOME CLERKS DEPARTMENT

CITY OF NOME

Demolition Permit Application

Permit No. 2016-01D

NCO 5.10.010 Special definitions

"STRUCTURE" means anything artificially built up or composed of parts joined together in some definite manner which requires location on the ground or attachment to something located on the ground. Structures include building, radio, T.V. and cellular telephone towers, storage vans, connex vans, sheds, water, sewer or fuel tanks and permanent signs.

NCO 5.10.050 Permit required.

(a) No person may construct, improve, remodel, enlarge, alter, repair, move, demolish or change the occupancy of a building or structure, or erect, install, enlarge, alter, repair, remove, convert or replace any electrical, gas, mechanical or plumbing system, boiler, furnace, water heater, breaker panel, oil tank, stationary propane tank, wood burning stove or fireplace or excavate or place fill on any property without first obtaining the required permits therefore.

(b) (2) A demolition permit is required for any demolition of any existing structure.

(c) Applications for any required permit shall be on a form prescribed by and filed with the building official, shall contain all information required by the building official, or required by NCO 11.50.020(b), and shall be signed by either the owner of the property or the structure, or by the owner's contractor responsible for accomplishing the work for which the permit is requested.

(d) The applicable fee shall be paid at the time any permit application is issued. The building official shall not begin to review any submitted application until such time as the certification of compliance with tax and licensing provisions required by NCO 5.10.020 has been issued by the city clerk. (Ord. 01-12-1 § 1 (part), 2001)

5.10.070 Permit standards.

(f) Demolition Permit. No application for a demolition permit shall be approved unless all of the following requirements to the extent applicable to the project are satisfied:

(1) A demolition plan is submitted and approved by the building official. (Ord. 01-12-1 § 1 (part), 2001)

Applicant: Eagle Eye Electric, LLC (BSNC) Date: 4-4-16

Mailing Address: 4600 DeBarr Rd. Ste 200, ANC, AK Street Address: _____

Phone #: (907) 334-8300

Demolition Debris From: USAF Tank Farm Site (West Nome Tank Farm), Port Road Industrial Park

Block #: 141 Lot #: _____ Tax Lot #: 001.481.491

Description of Debris and Waste Material:

Former West Nome Tank Farm Pump House structure. C&D waste.

Permissible Landfill Site:

The Applicant and Person Primarily Responsible further agree, represent and warrant that the entire demolition site shall be adequately protected, restricted and barricaded in the best public interests of health, safety and welfare, with visible and stable BARRIERS, flashing yellow WARNING LIGHTS in good working order, understandable large-print WARNING SIGNS, and such other precautionary equipment and measures as the City may require.

O-96-6-6 Fee Structure:

Pickup Truck.....	$ 15.00/visit	covered
	$ 25.00/visit	uncovered
Flat Bed Truck.....	$ 40.00/visit	covered
	$ 80.00/visit	uncovered
Dump Truck.....	$100.00/visit	covered
	$150.00/visit	uncovered

O-98-8-2 Fee Structure:

Contractor/Project.....Negotiated with base rate of $90/ton

Wooden Structures:

Single Family.....	$ 750	less than 2,000 sq. ft
Duplex.....	$1,000	greater than 2,000 sq. ft

PERMIT FEE CHARGED: _____

Inert Debris Landfill/Salvage Yard Center Creek Road Site

Acceptable Wastes

* construction/demolition debris
* scrap metal
* tires
* white goods (w/ CFC removed)
* vehicles (w/fluids & battery removed)
* scrap wood
* empty drums/tanks

Unacceptable Wastes

* hazardous wastes including: waste oil, greases, paints
* lead-acid batteries
* asbestos
* domestic refuse
* sewage sludge & honey buckets
* animal carcasses or by-products

Permit Approval:

_____ 4-7-16 _____

BUILDING INSPECTOR **DATE** **OWNER** **DATE**

TAX COMPLIANCE (NCO 5.10.020): YES ✓ MH 4-7-16 NO _____

COMMENTS: _____

_____ 5/3/16

CITY CLERK'S OFFICE **DATE**

-01-12-01
Revised 10/15/2009

Date Paid/Amount _____

Receipt # _____

RECEIVED
DATE RECEIVED: APR 04 2016
CITY OF NOME
CLERK'S DEPARTMENT

CITY OF NOME

Excavation/Fill Permit FEE $25.00

Permit No. 2016-03E

Note: An Excavation/Fill permit is required for any excavation or fill of land that materially alters runoff from the property to be excavated or filled.

Check application type (✔): _____ **Excavation** X **Fill**

Applicant: Eagle eye Electric, LLC (BSNC) **Phone #:** (907) 334-8300

Person Primarily Responsible: Nick Kuhlmann- Operations Manager

Mailing Address: 4600 DeBarr Rd, Ste 200, ANC **Street Address:** _____

Location of Excavation: USAF Tank Farm Site (West Nome Tank Farm), Port Road
Block # : 141 **Lot #:** _____ **Tax Lot #:** 001.481.491

Detailed Description of Excavation/Fill Activities (Include here or attach a plan indicating the dimensions, depth, equipment being used, purpose of excavation/fill, etc. Attach any plans, drawings or sketches showing the location of proposed activity.): Any proposed driveway or access road shall be clearly defined on the permit drawing. Access to city streets of ROWs must be approved by the City Engineer. Access to State of Alaska maintained roads or state-owned ROWs must be approved by the AK Dot & PF Regional Engineer, and must have an approved state driveway or access road permit as a condition to City approval.

Land Cap Construction (see attached drawings). Equipment to include, but not limited to, loader, dozer, excavator, roller, trucks. Approximately 10,500 CY of material will be imported for cap construction. SWPPP is under construction and current CESCL will be on site for inspections and re-inspections.

CAUTION – NO EXCAVATION PERMIT SHALL BE ISSUED FOR A PERIOD IN EXCESS OF 72 HOURS.
NO EXCAVATION PERMIT SHALL BE ISSUED WITHOUT REQUIRED INSURANCE (SEE NOTE 5).

1) The Applicant and Person Primary Responsible hereby certify under oath that the above information is an accurate and complete description of all excavation activity to be performed by them on dedicated right of ways or property of the City of Nome.

2) The Applicant and Person Primarily Responsible hereby represent and warrant that all excavation/fill activities will occur only as described above.

3) **The Applicant and Person Primarily Responsible further agree, represent and warrant that the entire excavation site shall be adequately protected, restricted and barricaded in the best public interests of health, safety and welfare, with visible and stable BARRIERS, flashing yellow WARNING LIGHTS in good working order, understandable large-print WARNING SIGNS, and such other precautionary equipment and measures as the City may require.**

4) The Applicant and Person Primarily Responsible further agree, represent and warrant that all dedicated right of ways and property of the City of Nome shall be fully and completely restored on or before the Completion date to the original condition, including but not limited to soil mixes, compaction and surfacing.

5) The Applicant and Person Primarily Responsible hereby represent and warrant that at all times during the excavation activities permitted pursuant to this Application, there shall remain in full force and effect general liability insurance covering any and all claims of injury or damage to any person or property caused by or resulting from the excavation/fill activities, in an amount no less than $500,000 per person and $1,000,000 per occurrence, naming the City of Nome as an additional insured party without right of subrogation. CURRENT BOND MUST BE ON FILE IN CLERK'S OFFICE.

6) The Applicant and Person Primarily Responsible hereby agree to hold harmless and indemnify the City of Nome from and against any and all costs, claims, damages and losses, including reasonable costs of defense, caused by or resulting from the acts or omissions of the Applicant, Person Primarily Responsible, their agents, partners, subcontractors, employees, guests or invitees, occurring during the course of or as a result of any and all excavation/fill activities on dedicated right of ways or property of the City of Nome.

7) This Permit shall not be assigned or transferred except pursuant to a new application completed accurately by the assignee and approved in writing by the City of Nome.

8) APPLICANT/CONTRACTOR MUST BE IN COMPLIANCE WITH NCO 5.10.020 (Tax Compliance Certification).

Application certified as accurate and complete this 4th **day of** April, **20** 16.

Nick Kuhlmann

Signature of Applicant

Signature of Clerk Attesting to Bond & Tax Compliance

STATE OF ALASKA
SECOND JUDICIAL DISTRICT

SIGNED and sworn before me this _____ day of _____, 20____.

Notary Public for Alaska

My Commission Expires:_____ *seal*

Nick Kuhlmann

Signature of Person Primarily Responsible

PERMIT APPOVED this 10th **day of** May, **20** 16

Nathan Lawrence 5/3/16

Public Works Director **Date**

4/18/16

Authorized Signature for Nome Joint Utilities **Date**

Receipt#:_____, Date paid: _____($25.00)

NOTIFICATION OF DEMOLITION AND RENOVATION

Operator Project #	Postmark	Date Received	Notification #

I. Type of Notification (O=Original R=Revised C=Canceled) O

II. FACILITY INFORMATION (Identify owner, removal contractor, and other operator)

OWNER NAME: USAF		
Address: 2281 HUGHES AVE STE 183		
City: JBSA LACKLAND	**State:** Texas	**Zip:** 78236
Contact: ERIN M. FlANIGAN		**Tel:** 210-395-3157
REMOVAL CONTRACTOR: Tumet Construction		
Address: 602 W 2nd Ave		
City: Nome	**State:** Alaska	**Zip:** 99762
Contact: Aaron Burmeister		**Tel:** 907-387-0630
OTHER OPERATOR: Eagle Eye Electric, LLC		
Address: 4600 Debarr Road, Ste 200		
City: Anchorage	**State:** Alaska	**Zip:** 99508
Contact: Nick Kuhlmann		**Tel:** 907-334-8353

III. TYPE OF OPERATION (D=Demo O= Ordered Demo R=Renovation E=Emer. Renovation) D

IV. IS ASBESTOS PRESENT? (Yes/No) NO

V. FACILITY DESCRIPTION (Include building name, number and floor or room number)

Bldg. Name: West Nome Tank Farm Pump House		
Address: Block 141		
City: Nome	**State:** Alaska	**County:**
Site Location: West Nome Tank Farm		
Building Size: 400 SF	**# of Floors:** 1	**Age in Years:** 30+
Present Use: Vacant	**Prior Use:** Tank Farm Pump House	

VI. PROCEDURE, INCLUDING ANALYTICAL METHOD, IF APPROPRIATE, USED TO DETECT THE PRESENCE OF ASBESTOS MATERIAL:

VII. APPROXIMATE AMOUNT OF ASBESTOS INCLUDING: 1. Regulated ACM to be Removed 2. Category I ACM Not Removed 3. Category II ACM Not Removed	**RACM To Be Removed**	**Nonfriable Asbestos Material Not To Be Removed**		**Indicate Unit of Measurement Below**	
		Category I	**Category II**	**UNIT**	
Pipes				**LnFt:**	**Ln M:**
Surface Area				**SqFt:**	**Sq M:**
Vol RACM Off Facility Component				**CuFt:**	**Cu M:**

VIII. SCHEDULED DATES ASBESTOS REMOVAL (MM/DD/YY) Start: **Complete:**

IX. SCHEDULED DATES DEMO/RENOVATION (MM/DD/YY) Start: **Complete:**

X. DESCRIPTION OF PLANNED DEMOLITION OR RENOVATION WORK, AND METHOD(S) TO BE USED:

Mechanical demolition by use of hydraulic excavator.

XI. DESCRIPTION OF WORK PRACTICES AND ENGINEERING CONTROLS TO BE USED TO PREVENT EMISSIONS OF ASBESTOS AT THE DEMOLITION OR RENOVATION SITE:

N/A

XII. WASTE TRANSPORTER #1

Name: Stampede Ventures, Inc.		
Address: 110 Front St., Ste. 300		
City: Nome	**State:** Alaska	**Zip:** 99762
Contact Person: Dan Graham		**Tel:** 907-334-8376

WASTE TRANSPORTER #2

Name:		
Address:		
City:	**State:**	**Zip:**
Contact Person:		**Tel:**

XIII. WASTE DISPOSAL SITE

Name: Nome Municipal Landfill		
Address: Center Creek Rd.		
City: Nome	**State:** Alaska	**Zip:** 99762
Tel: (907) 443-6603		

XIV. IF DEMOLITION ORDERED BY A GOVERNMENT AGENCY, PLEASE IDENTIFY THE AGENCY BELOW:

Name:	**Title:**
Authority:	
Date of Order (MM/DD/YY):	**Date Ordered to Begin (MM/DD/YY):**

XV. FOR EMERGENCY RENOVATIONS:

Date and Hour of Emergency (MM/DD/YY):

Description of the sudden unexpected event:

Explanation of how the event caused unsafe conditions or would cause equipment damage or an unreasonable financial burden:

XVI. DESCRIPTION OF PROCEDURES TO BE FOLLOWED IN THE EVENT THAT UNEXPECTED ASBESTOS IS FOUND OR PREVIOUSLY NONFRIABLE ASTESTOS MATERIAL BECOMES CRUMBLED, PULVERIZED, OR REDUCED TO POWDER:

N/A

XVII. I CERTIFY THAT AN INDIVIDUAL TRAINED IN THE PROVISIONS OF THIS REGULATION (40 CFR PART 61, SUBPART M) WILL BE ON-SITE DURING THE DEMOLITION OR RENOVATION, AND EVIDENCE THAT THE REQUIRED TRAINING HAS BEEN ACCOMPLISHED BY THIS PERSON WILL BE AVAILABLE FOR INSPECTION DURING NORMAL BUSINESS HOURS.

(Signature of Owner/Operator)	**(Date)**

XVIII. I CERTIFY THAT THE ABOVE INFORMATION IS CORRECT:

Nick Kuhlmann

Digitally signed by Nick Kuhlmann
DN: cn=Nick Kuhlmann, o=Bering Straits Native Corporation, ou=Eagle Eye, email=nkuhlmann@beringstraits.com, c=US
Date: 2016.06.09 14:54:33 -08'00'

06/09/16

(Signature of Owner/Operator)	**(Date)**

DATE RECEIVED:	**CITY OF NOME**	Permit No.
	Excavation/Fill Permit FEE $25.00	

NCO 5.10.050 (b)(vi) an Excavation/Fill permit is required for any excavation or fill of land that materially alters runoff from the property to be excavated or filled.

Check application type (✔): _____**Excavation** X **Fill**

Applicant: Eagle eye Electric, LLC (BSNC) **Phone #:** (907) 334-8300

Person Primarily Responsible: Nick Kuhlmann- Operations Manager

Mailing Address: 4600 DeBarr Rd, Ste 200, ANC **, Street Address:** _____

Location of Excavation: USAF Tank Farm Site (West Nome Tank Farm), Port Road
Block # :_____ **Lot #:**_____ **Tax Lot #:** _____

Detailed Description of Excavation/Fill Activities (Include here or attach a plan indicating the dimensions, depth, equipment being used, purpose of excavation/fill, etc. Attach any plans, drawings or sketches showing the location of proposed activity.): Any proposed driveway or access road shall be clearly defined on the permit drawing. Access to city streets of ROWs must be approved by the City Engineer. Access to State of Alaska maintained roads or state-owned ROWs must be approved by the AK Dot & PF Regional Engineer, and must have an approved state driveway or access road permit as a condition to City approval.

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7) This Permit shall not be assigned or transferred except pursuant to a new application completed accurately by the assignee and approved in writing by the City of Nome.

8) APPLICANT/CONTRACTOR MUST BE IN COMPLIANCE WITH NCO 5.10.020 (Tax Compliance Certification).

Application certified as accurate and complete this 4th **day of** April**, 20**16**.**

Nick Kuhlmann Digitally signed by Nick Kuhlmann DN: cn=Nick Kuhlmann, o=Bering Straits Native Corporation, ou=Eagle Eye, email=nkuhlmann@beringstraits.com, c=US Date: 2016.04.04 14:55:57 -08'00'

Signature of Applicant

Nick Kuhlmann Digitally signed by Nick Kuhlmann DN: cn=Nick Kuhlmann, o=Bering Straits Native Corporation, ou=Eagle Eye, email=nkuhlmann@beringstraits.com, c=US Date: 2016.04.04 14:55:38 -08'00'

Signature of Person Primarily Responsible

Signature of Clerk Attesting to Bond & Tax Compliance

PERMIT APPOVED this ___day of _____, 20____

STATE OF ALASKA
SECOND JUDICIAL DISTRICT

Public Works Director **Date**

SIGNED and sworn before me this _____ day of _____, 20_____.

Authorized Signature for Nome Joint Utilities **Date**

Notary Public for Alaska

Receipt#:_____, Date paid: _____($25.00)

My Commission Expires:_____ *seal*

OPERATOR PLAN AUTHORIZATION/CERTIFICATION/DELEGATION

(To be signed by Responsible Corporate Officer)

I state that based on my review this SWPPP meets the minimum requirements of the Construction General Permit and that Eagle Eye Electric, LLC. (Eagle Eye) has day-to-day operational control of the project site. Eagle Eye is responsible for the maintenance and implementation of the SWPPP including inspections, documentation, and application of the Best Management Practices at the site. Eagle Eye will notify all subcontractors of the requirement of this SWPPP. Eagle Eye has operational control over the project specifications, including the ability to make changes to the project specifications.

I hereby designate Nick Kuhlmann SWPPP Administrator as my authorized representative. This designee is responsible for the overall operations of the site and will be responsible for the implementation of the Storm Water Pollution Prevention Plan, compliance with the Construction General Permit, selecting and implementing additional Best Management Practices as conditions warrant, and signing all inspection reports required.

I certify under penalty of law that this document and all attachments were prepared under direction of Eagle Eye in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Eagle Eye Electric, LLC

Signature

6/14/2016

Date

E. Daniel Graham

Printed Name

President

Title

THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Environmental Conservation

DIVISION OF WATER
Wastewater Discharge Authorization Program

555 Cordova St
Anchorage, Alaska 99501-2617
Main: 907.269.6285
Fax: 907.334.2415

Thank you for using the ADEC eNOI system. This Signature Page NOI must be signed by:

Dan Graham

Eagle Eye Electric, LLC.

Please sign on the appropriate line in the Certification Information Section (Section VIII, page 3 of 5) of this Signature NOI.

In order to complete the certification of your electronic Notice of Intent (eNOI) application, submit all pages of this Signature Page NOI via mail, fax, or email to:

Attn: Storm Water Program
Division of Water
Alaska Department of Environmental Conservation
555 Cordova Street
Anchorage, AK 99501
Fax Number: (907) 269-3487
Phone Number: (907) 269-8117
Email Address: DEC.Water.OPAHelp@alaska.gov

If you have any questions regarding this signature page or other questions concerning the eNOI System, please call ADEC at: (907) 269-8117.

Thank you for using the ADEC eNOI system.

(For Agency Use) Permit Authorization #: AKR10FJ72

Notice of Intent (NOI)
for Storm Water Discharges Associated with Construction Activity under an APDES Construction General Permit

Submission of this Notice of Intent (NOI) constitutes notice that the party identified in Section II of this form requests authorization to discharge pursuant to the APDES Construction General Permit (CGP, AKR100000). Submission of this NOI also constitutes notice that the party identified in Section II of this form meets the eligibility requirements of the CGP for the project identified in Section IV of this form. Permit authorization is required prior to commencement of construction activity until you are eligible to terminate coverage as detailed in the CGP. To obtain authorization, you must submit a complete and accurate NOI form. Refer to the instructions at the end of this form.

I. Single/Multiple NOI Project

Is this NOI for a project with a single NOI? ☑ Yes ☐ No

If "No," then your project has multiple NOIs, will the fee be paid with this NOI? ☐ Yes ☐ No

If "No," then enter the name of the operator paying the fee:

II. Operator Information

Organization:	Name:	Title:
Eagle Eye Electric, LLC.	Nick Kuhlmann	Project Manager

Phone:	Fax (optional):	Email:
(907) 563-8316		

Mailing Address:	Street (PO Box):		
	4600 DEBARR RD STE 200		
	City: ANCHORAGE	State: AK	Zip: 99508-3103

III. Billing Contact Information

Organization:	Name:	Title:
Eagle Eye Electric, LLC.	Nick Kuhlmann	Project Manager

Phone:	Fax (optional):	Email:
(907) 563-8316		

Mailing Address: ☐ Check if same as Operator Information	Street (PO Box):		
	4600 DEBARR RD STE 200		
	City: ANCHORAGE	State: AK	Zip: 99508-3103

IV. Project / Site Information

Project Name:	Estimated Start Date:	Estimated End Date:
West Nome Tank Farm	06/15/2016	07/31/2016

Brief Description of Project:

Estimated Area to be Disturbed *(nearest tenth acre)*: 3

The project is located at the site of a former tank farm. Known contamination from the tank farm exists at the site. This project will construct a cap over top the contamination.

Is your project / site less than one-acre, but part of a common plan of development? ☐ Yes ☑ No

If "Yes", provide the Permit Authorization Number and name of the common plan of development: Number: Name:

Have storm water discharges from your project / site been authorized previously by a DEC permit? ☐ Yes ☑ No

If "Yes," provide the Permit Authorization Number for the previous DEC permit? Select

If "Yes," have you updated your SWPPP according to the most recently issued CGP? ☑ Yes ☐ No

Location Address:	Street:		Borough or similar government subdivision:	
	Port Road		Nome	
	City: Nome		State: Alaska	Zip: 99762
	Latitude (decimal degree, 5 places):	Longitude (decimal degree, 5 places):	Determined By:	Internet - Google Maps
	64.50444	-165.4297	☐ USGS Topographic Map, scale:	
			☐ Other: Google Earth	

(For Agency Use) Permit Authorization #: AKR10FJ72

V. SWPPP (Storm Water Pollution Prevention Plan)

Has the SWPPP been prepared in advance of filing this NOI? ☑ Yes ☐ No

For projects with 5 or more acres of disturbance, has a SWPPP been submitted to DEC? ☐ Yes ☑ No, ≤ 5 acres

Location of SWPPP for Viewing: ☐ Address in Section II ☑ Address in Section IV ☐ Other

If other:	Street:		
	City:	State: AK	Zip:

SWPPP Contact Information (if different than that in Section II):

Organization:	Name:	Title:
Eagle Eye Electric, LLC.	Nick Kuhlmann	Project Manager

Phone:	Fax (optional):	Email:
(907) 563-8316		

Mailing Address: ☐ Check if same as Operator Information	Street (PO Box): 4600 DEBARR RD STE 200		
	City: ANCHORAGE	State: AK	Zip: 99508-3103

VI. Permanent Storm Water Controls

Will you construct a permanent storm water management control measure at the project site (Part 4.11)? ☐ Yes ☑ No

If "Yes", indicate the type of measure to be installed:

☐ Pond ☐ Oil/Water/Grit Separator ☐ Proprietary Storm Water Sedimentation Device

☐ Other:

VII. Discharge Information

Does your project discharge into a Municipal Separate Storm Sewer System (MS4)? ☐ Yes ☑ No

If yes, name of the MS4 Operator:

Receiving Water and Wetlands Information: (if additional space is needed for this question, attach separate sheet or annotate in Section XI.)

Impaired waters/303d Listed waters:
(see http://dec.alaska.gov/water/wqsar/Docs/impairedwaters.pdf or http://dec.alaska.gov/water/wqsar/map.html, and http://dec.alaska.gov/water/tmdl/tmdl_index.htm.

a. Identify the name(s) of waterbodies or wetlands to which you discharge.	b. Are any of your discharges directly into any segment of a 303d Listed Water, i.e. "Impaired" Water?		c. If you answered YES to question b, then answer the following three questions:				
			i. What pollutant(s) are causing the impairment?	ii. Are the pollutant(s) causing the impairment present in your discharge?		iii. Is the discharge consistent with the assumptions and requirements of applicable EPA approved or established Total Maximum Daily Load (TMDL(s))?	
	Yes	No		Yes	No	Yes	No
Snake River	☐	☑		☐	☑	☐	☑
	☐	☐		☐	☐	☐	☐
	☐	☐		☐	☐	☐	☐
	☐	☐		☐	☐	☐	☐
	☐	☐		☐	☐	☐	☐

VIII. Treatment Chemicals

Will you use control measures such as polymers, flocculants or other treatment chemicals at your construction site? ☐ Yes ☑ No

NOTE: If you are unsure at the filing of the NOI, check "No" and then if you use treatment chemicals file an NOI Modification form indicating "Yes."

If "Yes", indicate the following polymers, flocculants, or other treatment chemicals that will be used at your construction site:

☐ Alum ☐ Gypsum

☐ Polyacrylamide (PAM) ☐ Polyaluminum Chloride

☐ Other:

(For Agency Use) Permit Authorization #: AKR10FJ72

IX. Certification Information

An Alaska Pollutant Discharge Elimination System (APDES) permit application or report must be signed by an individual with the appropriate authority per 18 AAC 83.385. For additional information, please refer to 18 AAC 83.385 at the following link: http://www.legis.state.ak.us/basis/aac.asp#18.83.385.

Corporate Executive Officer 18 AAC 83.385 (a)(1)(A)	For a corporation, a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation.
Corporate Operations Manager 18 AAC 83.385 (a)(1)(B)	For a corporation, the manager of one or more manufacturing, production, or operating facilities, if (i) the manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental statutes and regulations; (ii) the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and (iii) authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
Sole Proprietor or General Partner 18 AAC 83.385 (a)(2)	For a partnership or sole proprietorship, the general partner or the proprietor respectively.
Public Agency, Chief Executive Officer 18 AAC 83.385 (a)(3)(A)	For a municipality, state, or other public agency, the chief executive officer of the agency.
Public Agency, Senior Executive Officer 18 AAC 83.385 (a)(3)(B)	For a municipality, state, or other public agency, a senior executive officer having responsibility for the overall operations of a principal geographic unit or division of the agency.
**For Delegated Authority: the delegation must be made in writing and submitted to the DEC.* *An Example of written authorization delegating authority can be found on the Division of Water website:* *http://dec.alaska.gov/Water/OASysHelp/attachments/Delegation_Authorization_Form.pdf*	
Operations Manager *(Delegated Authority)** 18 AAC 83.385 (b)(2)(A)	For a duly authorized representative, an individual or a position having responsibility for the overall operation of the regulated facility or activity, including the position of plant manager, operator of a well or a well field, superintendent or position of equivalent responsibility.
Environmental Manager *(Delegated Authority)** 18 AAC 83.385 (b)(2)(B)	For a duly authorized representative, an individual or position having overall responsibility for environmental matters for the company.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Organization:	Name:	Title:
Eagle Eye Electric, LLC.	Dan Graham	President

Phone:	Fax (optional):	Email:
(907) 563-8316		

Mailing Address: ☐ Check if same as Operator Information	Street (PO Box): 4600 DEBARR RD STE 200		
	City: ANCHORAGE	State: AK	Zip: 99508-3103

Signature: [signature] Date: 6/14/2016

X. NOI Preparer *(Complete if NOI was prepared by someone other than the certifier.)*

Organization:	Name:	Title:
Environmental Management, Inc.	Glenn Hasburgh	Environmental Scientist

Phone:	Fax (optional):	Email:
(907) 272-9336		

Mailing Address: ☐ Check if same as Operator Information	Street (PO Box): 206 E FIREWEED LN STE 201		
	City: ANCHORAGE	State: AK	Zip: 99503-2733

XI. Document Attachments and Supplemental Information

Attachment 1. (Fill in as necessary if more space is required for Receiving water and Wetlands Information.)

a. What is the name(s) of your receiving water(s) that receive storm water directly and/or through a MS4? If your receiving water is impaired, then identify the name of the impaired segment, if applicable, in parenthesis following the receiving water name.	b. Are any of your discharges directly into any segment of an "impaired" water?		c. If you answered yes to question b, then answer the following three questions:				
			i. What pollutant(s) are causing the impairment?	ii. Are the pollutant(s) causing the impairment present in your discharge?		iii. Has the TMDL been completed for the pollutant(s) causing the impairment?	
	Yes	No		Yes	No	Yes	No
	☐	☐		☐	☐	☐	☐
	☐	☐		☐	☐	☐	☐
	☐	☐		☐	☐	☐	☐
	☐	☐		☐	☐	☐	☐
	☐	☐		☐	☐	☐	☐
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	☐	☐		☐	☐	☐	☐
	☐	☐		☐	☐	☐	☐
	☐	☐		☐	☐	☐	☐
	☐	☐		☐	☐	☐	☐

APPENDIX G
Waste Documentation and Disposal Certificates

*** IN CASE OF EMERGENCY CALL 1-800-899-4672 ***

101813 (RF

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. CESQG

Manifest Document No. 101813

2. Page 1 of 2

3a. Generator's Name and Mailing Address
USAF - AFCEC/CLAR
10471 20TH STREET, SUITE 348
JBER, AK 99506-2200

3b. Generator's Site Address (if different than mailing address)
USAF - AFCEC/CLAR
100 PORT ROAD
NOME, AK 99762

4. Generator's Phone ( )

5. Transporter 1 Company Name
Q TRUCKING

6. US EPA ID Number
AKR000203604

A. State Transporter's ID (907) 443-2388

B. Transporter 1 Phone

7. Transporter 2 Company Name
NORTHERN AIR CARGO, INC.

8. US EPA ID Number
AKR0003845526

C. State Transporter's ID (800) 478-3330

D. Transporter 2 Phone

9. Designated Facility Name and Site Address
NRC ALASKA LLC
2020 VIKING DRIVE
ANCHORAGE, AK 99501

10. US EPA ID Number
AKR000004184

E. State Facility's ID

F. Facility's Phone (907) 258-1558

GENERATOR

	11. WASTE DESCRIPTION (HM)	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a.	MATERIAL NOT REGULATED BY D.O.T.		2 DM		P
b.	MATERIAL NOT REGULATED BY D.O.T.		2 CF		P
c.					
d.					

G. Additional Descriptions for Materials Listed Above
1) EA0301 OILY WATER
2) EA0710 POL CONTAMAINATED SOIL AND DEBRIS

H. Handling Codes for Wastes Listed Above
D4518

15. Special Handling Instructions and Additional Information
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name | Signature | Date: Month Day Year

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name | Signature | Date: Month Day Year

NON-HAZARDOUS WASTE

SOLID WASTE

Regulated by EPA or a State / Local Agency

Generator: USAF - AFCEC/CLAR

Address: 100 PORT ROAD

NOME AK 99762

CE&QG

Phone:

Manifest: 101813

MATERIAL NOT REGULATED BY D.O.T.

Profile #: EAC001 Document #: D4518 Manifest Line: 1

ACCUMULATION START DATE: _____

SOLID WASTE

Regulated by EPA or a State / Local Agency

Generator: USAF - AFCEC/CLAR

Address: 100 PORT ROAD

NOME AK 99762

CESCG

Phone:

Manifest: 101313

MATERIAL NOT REGULATED BY D.O.T.

Profile #: EA0710 Document #: D4516 Manifest Line: 2

ACCUMULATION START DATE: _____

425 Outer Springer Loop Rd, Palmer, AK, 99645
Phone: (907) 258-1558, **Fax:** (907) 746-3651

PLEASE REMIT ACH PAYMENT TO:
NRC Alaska, LLC
Bank of America Merrill Lynch
ABA 0210 0032 2
A/C# 483043670250
A/C Name: NRC Alaska, LLC

PLEASE REMIT CHECK PAYMENT TO:
NRC Alaska, LLC
P.O. Box 740027
Los Angeles, CA 90074-0027

Customer:	JACOBS ENGINEERING GROUP INC 4300 B ST STE 600 Anchorage, AK, 99503	**Invoice #:**	644424
		NRC Job #:	101813
		Customer PO#:	05DK6302-P15-0003
		Reference #:	USAF - AFCEC/OLAR
Invoice Date:	20-SEP-16	**Contact:**	DERRICK, JILL
Job Description:	WASTE DISPOSAL.	**Phone:**	1-907-751-3365
		Fax:	
		E-Mail:	JILL.DERRICK@JACOBS.COM
		Terms:	30 NET
Job Location:	NOME TANK FARMS NOME, AK, 99762	**Job Date (s):**	08/03/16 - 08/23/16
		Progress Billing:	No
		Final Billing:	Yes

Description(See Attached Details)	EXTENDED PRICE
LABOR	2,558.50
MATERIALS	360.00
DISPOSAL - INTERNAL	1,225.00
OTHER NRC	2,776.63
TRANSPORTATION	130.00
LABOR	258.00
INVOICE SUBTOTAL	7,308.13
SALES TAX	0.00
INVOICE TOTAL	7,308.13

Currency: USD

THANK YOU FOR YOUR BUSINESS

Direct Phone: For billing questions, please contact
Email: Amy Durgeloh at (907) 761-6677

FED ID #: 26-0025054
A 1.5% per month finance charge will be assessed for all past due invoices to include the flat late fee amount.

09-22-16P12:50 RCVD

INVOICE DETAILS SHEET

JOB NO 101813 INVOICE NO 644424 Page No 2/2

MATERIALS

Date	Name/Item(s)	Description	Billing Code	UOM	Qty	Rate	Amount
26-AUG-16	AM-09000 MISC SUPPLIES	4.2.3 - TRUCK RENTAL - PER DAY		Each	2	180.00	360.00

Sub Total 360.00

DISPOSAL - INTERNAL

Date	Name/Item(s)	Description	Billing Code	UOM	Qty	Rate	Amount
26-AUG-16	AD-10035 WATER WITH <5% SOLIDS	3.2 - POL CONTAMINATED WATER / 101813.1		DRUM-550	2	108.50	217.00
26-AUG-16	AD-42100 POL CONTAM SOLIDS	3.1 - POL CONTAMINATED SOIL AND DEBRIS / 101813.2		Yard	2	504.00	1,008.00

Sub Total 1,225.00

OTHER NRC

Date	Name/Item(s)	Description	Billing Code	UOM	Qty	Rate	Amount
26-AUG-16	AT-90214 TRANSPORTATION	2.2 - PREPARE & SUBMIT COMPLETE MANIFEST PACKAGE		Each	1	220.00	220.00
26-AUG-16	AT-75000 SHIPPING CHARGE	4.1.1 - AIR TRANSPORT NOME TO ANCHORAGE		Each	1	1,027.21	1,027.21
26-AUG-16	AT-75000 PER DIEM	4.2.6 - PER DIEM		Each	1	282.00	282.00
26-AUG-16	AT-75002 TRAVEL-OPERATION AL	4.2.7 - AIRFARE		Each	1	817.53	817.53
26-AUG-16	EGC FEE			Each	1	429.69	429.69

Sub Total 2,776.43

TRANSPORTATION

Date	Name/Item(s)	Description	Billing Code	UOM	Qty	Rate	Amount
26-AUG-16	AT-90202 TRANSPORTATION.	2.1 - PRE-SHIPPING PREPARATION & SUBMITTALS		Each	1	65.00	65.00
26-AUG-16	AT-90202 TRANSPORTATION.	2.3 - WASTE CONTAINER MANAGEMENT & TRACKING		Each	1	65.00	65.00

Sub Total 130.00

LABOR

Date	Name/Item(s)	Description	Billing Code	UOM	Qty	Rate	Amount
03-AUG-16				Each	1	50.00	250.00
25-AUG-16	Bookhout ONeill, Shane F	Over Time	HAZ-WASTE SPECIALIST	Hours	3.5	129.00	451.50
26-AUG-16	Bookhout ONeill, Shane F	Over Time	HAZ-WASTE SPECIALIST	Hours	3.5	129.00	451.50
26-AUG-16	Bookhout ONeill, Shane F	Regular Time	HAZ-WASTE SPECIALIST	Hours	8	86.00	688.00
26-AUG-16	Bookhout ONeill, Shane F	Over Time	HAZ-WASTE SPECIALIST	Hours	7.5	129.00	967.50

Sub Total 2,818.50

Grand Total 7,308.13

*** IN CASE OF EMERGENCY CALL 1-800-899-4672 *** 101813 (RF

NON-HAZARDOUS WASTE MANIFEST

Please print or type. (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. CESCG	Manifest Document No. 101813	2. Page 1 of 2

3. Generator's Name and Mailing Address: USAF - AFCEC/CIOAR, 10471 20TH STREET, SUITE 348, JBER, AK 99506-2200
Site: USAF - AFCEC/CIOAR, 100 PORT ROAD, NOME, AK 99762

4. Generator's Phone ( )

Transporter	US EPA ID Number	State Transporter's ID / Phone
5. Transporter 1 Company Name: ~~[illegible]~~ NRC Alaska LLC	6. ~~AKR000203604~~ AKR000001181	A. State Transporter's ID (907) 443-2366 258-1558; B. Transporter 1 Phone
7. NORTHERN AIR CARGO, INC.	8. AKD009846529	C. State Transporter's ID (800) 478-3330; D. Transporter 2 Phone

9. Designated Facility Name and Site Address: NRC ALASKA LLC, 2020 VIKING DRIVE, ANCHORAGE, AK 99501
10. US EPA ID Number: AKR000004184
E. State Facility's ID
F. Facility's Phone (907) 258-1558

11. WASTE DESCRIPTION	Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.
a. MATERIAL NOT REGULATED BY D.O.T.	2	~~2~~ DM	800	P
b. MATERIAL NOT REGULATED BY D.O.T.	2	~~2~~ CF	1500 ~~3000~~	P
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1) EA0301 OILY WATER
2) EA0710 POL CONTAMAINATED SOIL AND DEBRIS

H. Handling Codes for Wastes Listed Above
D4518

15. Special Handling Instructions and Additional Information
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name	Signature	Date (Month Day Year)
Shane O'Ceil	[signature]	8 25 16
17. Transporter 1 Acknowledgement of Receipt of Materials: BRAD RAMSAY	[signature]	08 26 16
18. Transporter 2 Acknowledgement of Receipt of Materials: Sipha Dixon	[signature]	08 30 16

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
Patricia L Beasley	Patricia L Beasley	09 08 16

NON-HAZARDOUS WASTE — GENERATOR — TRANSPORTER — FACILITY

*** IN CASE OF EMERGENCY CALL 1-800-899-4672 ***

101813 (RF

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. CESQG	Manifest Document No. 101813	2. Page 1 of 2

3. Generator's Name and Mailing Address: USAF
10471 20TH STREET, SUITE 348
JBER, AK 99506-2200

USAF - AFCEC/CLAR
100 PORT ROAD
NOME, AK 99762

4. Generator's Phone ( )

5. Transporter 1 Company Name: NRC Alaska LLC — 6. US EPA ID Number: AKR 000 011 1511

A. State Transporter's ID (907) 258-1558

B. Transporter 1 Phone

7. Transporter 2 Company Name: NORTHERN AIR CARGO, INC. — 8. AKD 0 8045526

C. State Transporter's ID (800) 478-3330

D. Transporter 2 Phone

9. Designated Facility Name and Site Address: NRC ALASKA LLC, 2020 VIKING DRIVE, ANCHORAGE, AK 99501 — 10. US EPA ID Number: AKR000004104

E. State Facility's ID

F. Facility's Phone (907) 258-1558

11. WASTE DESCRIPTION	HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.
a. MATERIAL NOT REGULATED BY D.O.T.		2	DM	800	P
b. MATERIAL NOT REGULATED BY D.O.T.		2	CF	1500 ~~3000~~	P
c.					
d.					

G. Additional Descriptions for Materials Listed Above
1) EA0301 OILY WATER
2) EA0710 POL CONTAMAINATED SOIL AND DEBRIS

H. Handling Codes for Wastes Listed Above
D4518

15. Special Handling Instructions and Additional Information
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name	Signature	Month	Day	Year
Shane Craig	[signature]	8	25	16

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
BRAD RAMSAY	[signature]	08	26	16

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Sydna Dixon	[signature]	08	26	16

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Patricia L Beasley	Patricia L Beasley	09	08	16

Drum Tracking Log for Manifest Number 101813

Manifest 101813 **Arrived** 29-AUG-16 **Gen** USAF - AFCEC/OLAR **Tsdf** NRC ALASKA LLC

Document	Item	Line	Profile	Type	Size	Oil Fuel	Water	Antifreeze	Sludge	Solids	Location
D4518	1	1	EA0301	DM	55	0	55	0	0	0	PAD1: 458.98 P, 55.00 GAL
D4518	2	1	EA0301	DM	55	0	55	0	0	0	PAD1: 458.98 P, 55.00 GAL
D4518	3	2	EA0710	CF	250	0	0	0	0	89	PAD2: 742.71 P, 89.00 G
D4518	4	2	EA0710	CF	250	0	0	0	0	89	PAD2: 742.71 P, 89.00 G
				Totals:		0	110	0	0	178	

CERTIFICATE OF DISPOSAL/RECYCLE

GENERATOR: USAF - AFCEC/CIOLAR
100 PORT ROAD
NOME, AK 99762

DISPOSAL FACILITY: NRC ALASKA LLC
2020 VIKING DRIVE
ANCHORAGE, AK 99501

EPA ID NUMBER: CESQG
MANIFEST/DOCUMENT #: 101613
DATE OF DISPOSAL/RECYCLE: AUG-29-2016

LINE	WASTE DESCRIPTION	CONTAINERS	TYPE	QUANTITY	UOM
1	OILY WATER	2	DM	800	P
2	POL CONTAMAINATED SOIL AND DEBRIS	2	CF	1500	P

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

PREPARED BY: PLB

SIGNATURE: Patricia S Beasley **DATE:** SEP 08 2016

425 Outer Springer Loop Road - Palmer, AK 99645 - (907) 258-1558 - Fax (907) 746-3651 - Toll Free (877) 375-5040

Table of Contents

West Nome Tank Farm CEI Job# 13794

2837

CENTRAL ENVIRONMENTAL, INC.
311 N. SITKA STREET, ANCHORAGE, ALASKA 99501 PHONE: (907) 561-0125 FAX: (907) 561-0178

DISPOSAL LOG AND WASTE SHIPMENT RECORD

1. **Facility / Project Name:** West Nome tank farm **Project No.:** 13794
   Physical Address: Fort Road
2. **Facility Operator Name:** USAF
   Operator Address: same as above Phone No.:
3. **Facility Owner Name:**
   Operator Address: Phone No.:
4. **Waste Disposal Site Name:** Nome municipality land fill **Phone No.:** 907-304-3703
   Mailing Address:
   Physical Address: 3 mile beam road Nome AK 99855
5. **Governing Agencies:** ADEC, Central Region, 3601 C Street, Suite 1334, Anchorage, AK 99503
   ADEC, 610 University Avenue, Fairbanks, Alaska 99709-3643
   USEPA, Region 10, 1200 6th Avenue, Seattle, WA 98101

IN CASE OF EMERGENCY OR SPILL CALL (907) 561-0125

6. Description of Materials: (i.e., Asbestos, POL, Soils, Liquids)	Containers No.	Type	Total Estimated Volume	Total Estimated Weight
Asbestos 9NA 2212 III RQ	5		1 cyb	400 lb
Asbestos 9NA 2212	14	bags	1 cyb	150 lb

7. **Special Handling Instructions or Additional Information:**

8. **Operator's Certification:** I hereby declare that the contents of this consignment are fully and accurately described by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper conditions for transport by highway according to applicable international and government regulations.
   Casey Dresnek / Foreman — Signature — 9-19-15
   Name/Title (Print or Type) — Signature — Date

9. **Transporter #1:** (Acknowledgement of receipt of materials) 311 N Sitka St
   Company Name: CET Address: Anchorage AK 99501 Phone: 907-561-0125
   Destination: 3 mile beach road Vehicle Description: P/U
   Casey Dresnek / Foreman — Signature — 9-19-15
   Name/Title (Print or Type) — Signature — Date
   Transporter #2: (Acknowledgement of receipt of materials)
   Company Name: Address: Phone:
   Destination: Vehicle Description:
   Name/Title (Print or Type) — Signature — Date
   Transporter #3: (Acknowledgement of receipt of materials)
   Company Name: Address: Phone:
   Destination: Vehicle Description:
   Name/Title (Print or Type) — Signature — Date

10. **Landfill Discrepancy:** (A list of all discrepancies to be filled out by the landfill operator)
11. **Weigh Scale:** Weight
    Clock Type of Weight tons (pounds) Attached weight scale receipt
12. **Waste Disposal Site (WDS) Certification of Acceptance:** I hereby certify acceptance of the materials covered by this record and I am in agreement with statements on this record, except as noted in Item 10. The WDS must retain a completed copy of this form and forward completed copy to the operator/owner in Item 2 and Item 3.
    Glenn Jones operator — Signature — 9-19-15
    Name/Title (Print or Type) — Signature — Date

CITY OF NOME
ASBESTOS WASTE SHIPMENT RECORD

GENERATOR

1. Work Site Name & Mailing Address:	Owner's Name	Owner's Phone
West Nome Tank Farm	**USAF**	**210-395-8637**
2. Operator's Name & Address:		Operator's Phone
Central Environmental Inc., 311 N. Sitka Street, Anchorage, AK 99501		**907 561-0126**
3. Waste Disposal Site: **CITY OF NOME NOME MUNICIPAL LANDFILL, MP 3 TAYLOR HIWAY NOME, ALASKA 99762 TELE 907-443-6663 FAX 907-443-5349** 3 mile Beam Road	Authorization **AS# 15021001 expires 1600 hrs 09/30/15**	Contact Phone **(907) 304-3223**
4. Name & Address of Responsible Agency: **EPA REGION 10, ASBESTOS PROGRAM 1200 Sixth Avenue, Seattle, WA 98101 1-800-424-4372**		

5. Description of Materials:	6. Containers No.	Type	7. Total Quantity (Cubic Yards)
Roofing Material	2	CYD	1
Gaskets/PPE	14	BAGS	1
	5	VALVE	

9. Special Handling Instructions & Additional Information: Hand will care.

8. Operator's Certification: I HEREBY DECLARE THAT THE CONTENTS OF THIS CONSIGNMENT ARE FULLY AND ACCURATELY DESCRIBED ABOVE BY PROPER SHIPPING NAME & ARE CLASSIFIED, PACKED, MARKED, AND LABELED AND ARE IN ALL RESPECTS IN PROPER CONDITION FOR TRANSPORT BY HIGHWAY ACCORDING TO APPLICABLE INTERNATIONAL & GOVERNMENTAL REGULATIONS.

Printed/Typed Name & Title	Signature	Date
Casey Dresnek / Foreman		9-19-15

TRANSPORTER

10. **Transporter 1** (Acknowledgment of Receipt of Materials) Central Environmental, Inc., 311 N. Sitka Street, Anchorage, AK 99501

Printed/Typed Name & Title	Signature	Date
Casey Dresnek (CEI) foreman		9-19-15
Address & Telephone: 311 N Sitka Anchorage AK 9950		

11. **Transporter 2** (Acknowledgment of Receipt of Materials)

Printed/Typed Name & Title	Signature	Date
Address & Telephone		

DISPOSAL SITE

12. Discrepancies Noted:

13. Waste Disposal Site Owner or Operator:
I certify that I have received the asbestos materials noted in Section 5 except as noted in Section 12, Discrepancies.

Arrival Time: 2:40 Departure Time: 2:45 Total Time: 5

Printed/Typed Names & Title	Signature	Date	City Landfill Invoice #
Glenn Jones Operator		9-19-15	

WHITE LABORATORIES LLC.
563 INDUSTRIAL WAY ANCHORAGE, AK 99501 PH (907) 258-6681

TCLP (Lead)

WL Project #: LA-015099

Client Project #: 13794

Report #: 613789
Report By: R. Briggs
Report Date: 09/29/2015

Client: Central Environmental Inc.
311 N Sitka St
Anchorage,AK 99501

Billing Number 24580

TAT: 72 Hour **Sample Count:** 1

Project Name/Location: West Nome Tank Farm

Collected By: Client
Collection Date: 09/19/2015
Analysis By: G. Caudill
Analysis Date: 09/29/2015
Received By: R. Briggs
Received Date: 09/25/2015

Client ID	WLSample	Ext Fld by Ph test	Weight (g)	Ext Fld Vol (l)	mg/l Lead
13794-TCLP-01	AL15-2435	1	100	2	<RL

Grant Caudill, Lab Analyst — 09/29/2015 Date

09/29/2015 Date

Reporting Limit is 0.40 milligrams per liter (mg/L). Analysis is performed by flame atomic absorption spectroscopy NIOSH 7082, preparation method SW846-1311. The Reporting Limit is twice that of the Method Detection Limit (MDL_x) which is the minimum concentration of analyte that can be reported with 99% confidence that the analyte's concentration is greater than zero, and is determined from statistical analysis of replicate samples in a given matrix containing the analyte as defined in 40CFR Part 136, Appendix B. Any modifications that have been made to the previously referenced test methods are documented in WL LLC's Standard Operating Procedures Manual. Supporting Laboratory Documentation is available upon request. WL LLC is a current proficiency participant in the AIHA ELPAT program (Lab ID# 102739). Test reports must not be reproduced without the approval of WL LLC, and are subject to WL LLC General Terms and Conditions (available upon request).

LA- 015099

CENTRAL ENVIRONMENTAL, INC.
311 N Sitka Street, Anchorage, Alaska 9951
Phone: (907) 561-0125 Fax: (907) 561-0178

CHAIN OF CUSTODY RECORD PAGE 1 OF 1

PROJECT NAME: West Nome tank farm
PROJECT NUMBER: 13794

CLIENT REQUESTS ANALYZED SAMPLES TO BE:

- ✓ PROPERLY SEALED CONTAINERS?
- ✓ SUFFICIENT SAMPLE QUANTITY?
- ✓ NO VISIBLE LEAKAGE TO CONTAMINATION?
- ✓ FIELD SAMPLED ID. NO. LEGIBLE?

___ RETURNED TO CLIENT
___ DISPOSED
___ ARCHIVED

72 Hr T.A.T.

ESTIMATED COMPLETION DATE: [redacted]
SAMPLES COLLECTED BY: Casey Dresnek DATE: 9-19-15 TIME: 3:00 pm
LAB DELIVERED TO: W.E.C.
SAMPLES ARRIVED TO LAB BY: ✓ CEI'S EXPEDITER ___ COURIER SERVICE
___ AIR EXPRESS ___ LAB PICKED UP ___ LAB'S DROP BOX
___ CEI'S DROP BOX ___ OTHER
SAMPLES SUBMITTED BY: Mike Montoya DATE: 9-25-15 TIME: 11:57 AM
SAMPLES RECEIVED BY: VB DATE: 9/25/15 TIME: 11:37 AM
COMMENTS: 72 Hr T.A.T.

13794-

FIELD SAMPLE ID#	LAB#	AIR	BULK	ANALYSIS
TCLP-01			✓	Lead TCLP

FIELD SAMPLE ID#	LAB#	AIR	BULK	ANALYSIS

LAB - CONFIRMATION OF RECEIPT OF SAMPLES MUST BE FAXED BACK TO 907-561-0178!!!! IMMEDIATELY

LA- 015099

Central Environmental, Inc.
LBP Sample Profile Sheet

Building Name:	West Nome tank farm
Building No	N/A
Location	POCT Road Nome AK
Brief Description of LBP Abatement:	N/A
Date of Sample Collection:	9-19-15
Sample ID No	~~TCLP-01~~ 13794 - TCLP-01
Description of Waste Stream Sample:	Steel pipe with Lead containg Paint

Analysis To Be Performed Lead TCLP

Check Type of Sample	
Composite Type Sample:	✓
Single Material Sample:	

Waste Stream breakdown by Material Type and Percent of Waste

Material Description	% of Waste	Material Description	% of Waste
Walls		**Floors**	
Wood		Wood	
Concrete		Concrete	
CMU		CMU	
Steel		Steel	
Other		Other	
Interior Wall Finishes		**Floor Finishes**	
Gypsumboard		Wood	
Plaster		Ceramic Tile	
Wood Panel		VCT	
Metal		Concrete	
Exterior Wall Finishes		Paint	
Gypsumboard		**Other Components**	
Plaster		Boiler	
Wood Panel		Ductwork	
Metal		Piping	
Ceiling		Furniture	
Wood		**List any Non-Listed Items Here**	
Concrete		Steel pipe w/ Lead	100 %
CMU		Containing Paint	
Steel			
Other			
Ceiling Finish			
Gypsumboard			
Plaster			
Wood Panel			
Metal			
Trim			
Window			
Doors			
Casing Material			
Total Must Equal 100%			100 %

WHITE LABORATORIES LLC.
3883 INDUSTRIAL WAY ANCHORAGE, AK 99501 PH (907) 258-8651

Lead Air Analysis

WL Project #: LA-015061
Client Project #: 13794

Report #: 613735
Report By: R Briggs
Report Date: 09/25/2015

Client: Central Environmental Inc.
311 N Sitka
Anchorage,AK,99501-1841

TAT: 48 Hour Sample Count: 2
Project Name/Location: West Nome Tank Farm

Collected By: Client
Collection Date: 09/19/2015
Analysis By: G. Caudill
Analysis Date: 09/25/2015
Received By: R Briggs
Received Date: 09/24/2015

Client ID	WLSample	Sample Type	Result	Result Units	Reporting Limit (ug/m3)
13794-PM-01	AL15-2425	Personal	9	ug/M3	2
13794-EM-01	AL15-2426	ENV	<2	ug/M3	2

Worker TWA

Worker	Sample Date	SSN	PPE	TWA
Jared Menadelook	09/19/2015		Boots Glasses Hard Hat Tyvek	8

Grant Caudill, Lab Analyst — 09/25/2015 Date

09/25/2015 Date

Preparation and analysis performed according to NIOSH Method 7082 (M), analysis by flame atomic absorption spectroscopy. The reporting limit is at least twice that of the Method Detection Limit (MDL). The MDL (defined as the minimum concentration of an analyte that can be reported with 99% confidence to have a concentration greater than zero) is determined from statistical analysis of replicate samples in a given matrix containing the analyte, as defined in 40CFR Part 136, Appendix B. Unless otherwise stated, all quality control samples were acceptable. Modifications made to the previously referenced test methods are documented in WL, LLC's Standard Operating Procedures Manual. Field and laboratory blanks are used to assess possible contamination and sensitivity of analysis, and no blank corrections made. Supporting laboratory documentation is available upon request. Unless otherwise stated, samples are received in acceptable condition. Results relate only to the items tested. WL, LLC Anchorage is a current proficient participant in the AIHA ELPAT program (Lab #102739). Test reports must not be reproduced without the approval of WL, LLC and are subject to WL, LLC General Terms and Conditions (available upon request).

LA- 015081

CENTRAL ENVIRONMENTAL, INC.

311 N Sitka Street • Anchorage, AK 99501-1841 • Phone (907) 561-0125 • Fax (907) 561-0178

Standard Field Air Monitoring Data Sampling Sheet

Project Name: West Nome tank Farm Job Number: 13794

Sample Data	Sample Number	Sample Type	Pump Number & Type	Pump Flow Rate (Lpm)	Sample Time		Total Sample Time (minutes)	Sample Total Volume (L)	Sample By	Lab Sample #	
					Start Time	StopTime					
9-19-15	13794-PM-01	Personal	LO-VOL-15-02	2.0	9:00Am	4:00pm			Casey Dresnek		
Work by Jared Menadelook. Demo pipe containing Lead paint. pick up and clean area. PPE: Hardhat, safty glasses, Disposable Suits, Steel toe boots.											
9-19-15	13794-EM-01	Environmental	LO-VOL-15-03	3.0	9:00Am	4:00pm			Casey Dresnek		
out side area down wind south west of Shack Regulated											

White - Lab Copy Canary - File Copy Pink - Field Copy

LA- 015081

CENTRAL ENVIRONMENTAL, INC.

311 N Sitka Street, Anchorage, Alaska 9951
Phone: (907) 561-0125 Fax: (907) 561-0178

CHAIN OF CUSTODY RECORD PAGE 1 OF 1

PROJECT NAME: West Nome tank farm
PROJECT NUMBER: 13794

CLIENT REQUESTS ANALYZED SAMPLES TO BE:

- ✓ PROPERLY SEALED CONTAINERS?
- ✓ SUFFICIENT SAMPLE QUANTITY?
- ✓ NO VISIBLE LEAKAGE TO CONTAMINATION?
- ✓ FIELD SAMPLED ID. NO. LEGIBLE?

___ RETURNED TO CLIENT
___ DISPOSED
___ ARCHIVED

ESTIMATED COMPLETION DATE: 48 hr T.A.T
SAMPLES COLLECTED BY: Casey Dresnek DATE: 9-18 – 9-19 TIME: 4:00 pm
LAB DELIVERED TO: W. E. C.
SAMPLES ARRIVED TO LAB BY: ✓ CEI'S EXPEDITER ___ COURIER SERVICE
___ AIR EXPRESS ___ LAB PICKED UP ___ LAB'S DROP BOX
___ CEI'S DROP BOX ___ OTHER
SAMPLES SUBMITTED BY: Casey Dresnek DATE: 9-24-15 TIME:
SAMPLES RECEIVED BY: DATE: 9/24/15 TIME: 11:00 am
COMMENTS:

FIELD SAMPLE ID#	LAB#	AIR	BULK	ANALYSIS
13794 - EX-01		✓		PEM
PM-02		✓		↓
EM-03		✓		
FB-04		✓		
FB-05		✓		
13794 - PM-01		✓		FAA Lead
EM-02		✓		

FIELD SAMPLE ID#	LAB#	AIR	BULK	ANALYSIS

LAB - CONFIRMATION OF RECEIPT OF SAMPLES MUST BE FAXED BACK TO 907-561-0178!!!! IMMEDIATELY

APPENDIX H
Project Communications

From: Shepard, Dennis (DEC) <dennis.shepard@alaska.gov>
Sent: Wednesday, June 01, 2016 3:38 PM
To: McKay, Neil
Cc: AFCEC - Peyton, Charley; Nickolas Kuhlmann (nkuhlmann@beringstraits.com) (nkuhlmann@beringstraits.com); Amskold, Larry; Hadden, Sara
Subject: RE: WNTF proposed sample locations update

All:

The Alaska Department of Environmental Conservation (DEC) has reviewed the proposed well /sampling location changes for B04, W-36 and W-37. These changes are acceptable and approved. A copy of the Figure A-2 has been saved to the project file.

If you have any questions, please do not hesitate to contact me at (907) 451-2180, or by email at dennis.shepard@alaska.gov

Sincerely, Dennis

Dennis Shepard
Environmental Program Specialist
Contaminated Sites Program
Spill Prevention and Response Division
Alaska Department of Environmental Conservation

Phone: 907-451-2180

From: McKay, Neil [mailto:Neil.McKay@jacobs.com]
Sent: Wednesday, June 01, 2016 3:11 PM
To: Shepard, Dennis (DEC) <dennis.shepard@alaska.gov>
Cc: AFCEC - Peyton, Charley <charley.peyton@us.af.mil>; Nickolas Kuhlmann (nkuhlmann@beringstraits.com) (nkuhlmann@beringstraits.com) <nkuhlmann@beringstraits.com>; Amskold, Larry <Larry.Amskold@jacobs.com>; Hadden, Sara <Sara.Hadden@jacobs.com>
Subject: WNTF proposed sample locations update

Mr. Dennis Shepard,

Please find attached to this email an updated sample location figure for the West Nome Tank Farm Well Decommissioning, Well Installation, and Sample Collection Work Plan.
Three changes of nominal distance are proposed.
Proposed locations for B04 and W-37 have been moved for property access purposes.
The proposed location for W-36 has been moved for drill rig access considerations.
New locations are shown in Blue and White. Previous locations shown in the final work plan, are shown in grey on the attached updated figure.

Well Decommissioning, Well Installation, and Sample Collection Field work is scheduled for June 15-25, 2016.

Sincerely,
Neil McKay

Neil McKay, R.G., P.G.
JACOBS
Senior Geophysicist
Phone: 907-751-3337
Mobile: 541-740-9578

Neil.McKay@jacobs.com

4300 B Street, Suite 600
Anchorage, Alaska 99503
www.jacobs.com

APPENDIX I
Responses to Comments

REVIEW **PROJECT:** **West Nome Tank Farm**
DOCUMENT: **Draft West Nome Tank Farm Summary Report December 2016**
LOCATION: **Nome, Alaska**
PROJECT NO.: **400.38 002**

USAF/ADEC	**Date: December 22, 2016** **ADEC Reviewer: Joy Whitsel / Dennis Shepard**	**DATE:** **RESPONSES BY: Jacobs Engineering Group Inc.** **FOR: AFCEC, USAF** **DATE: 11 January 2017**

Item No.	Section, Page No.	ADEC COMMENTS	RESPONSIBLE PARTY RESPONSE A – Agree D- Disagree	REVIEWER ACCEPTANCE (A-Agree) (D-Disagree)
1.	Sec 3.5.3.2, p 3-8	The statement regarding TELs should be clarified to state that below TELs, contaminants have a low probability of toxicity.	Agree. The statement will be revised as follows: "The TELs are lower-threshold values, which suggest that contaminant concentrations below these levels have a low probability of being toxic."	A
2.	Table 3-4	It would be helpful if columns specifying both the TEL and PEL values were added, so that TEL exceedances may be judged in relation to the corresponding PEL. Same comment applies for the table in Fig A-4	Agree. Table 3-4 and Figure A-4 will be updated to include both the TEL and PEL values.	A
3.	Sec 4.0	Please include a recommendation as a result of the NOAA SQuiRT exceedances for 4 of 6 sample locations.	Agree. The data collected in 2016 were for informational purposes only. The State does not currently have cleanup criteria for sediment. The comparison to NOAA SQuiRTs is for screening comparison only. The 2009 and 2016 sediment sampling events depict the widespread presence of fuel contaminants (DRO, naphthalene, and in 2016 other PAHs). These occurrences extend beyond the areas of suspected groundwater discharge from the WNTF and likely reflect inputs to the estuary from marine traffic and perhaps other industrial activities along the Snake River or in the Nome harbor. For example, some of the small boats and gold dredges that use the estuary are probably powered by two-cycle outboards, which discharge exhaust laden with incompletely combusted gasoline and lubricating oil directly into the water. Larger vessels have also released fuel in the area. In 2011, a towing vessel lost power and grounded on harbor-channel rocks, spilling up to 1,000 gallons of diesel. Heavy weather quickly dispersed the spill, but some of it was likely driven into the estuary. Additional sampling focusing on likely areas of groundwater discharge from the WNTF would	A

Item No.	Section, Page No.	ADEC COMMENTS	RESPONSIBLE PARTY RESPONSE A – Agree D- Disagree	REVIEWER ACCEPTANCE (A-Agree) (D-Disagree)
			not discern the contributions from the various potential sources. Based on this information, the following text & recommendation will be added to Section 4.0: "Sediment and surface water data were collected along the Snake River for information purposes only. Although concentrations of contaminants from 2009 and 2016 indicated that fuel contamination in sediments is present upstream, cross-gradient, and downstream of the site, no further investigation of sediment contamination in the vicinity of presumed groundwater discharge from the WNTF is recommended. The concentrations of contaminants detected in river sediments could be a reflection of the maritime use of the estuary and harbor along with onshore industrial activities fuel. Making a definitive determination of the source of contaminations, if possible, would require a more comprehensive estuary-wide investigation."	
4.	General	The Remedial Design Work plan discusses the procedures for getting an easement on private property to allow for LUCs. Please include a discussion on the status of this; or refer to the appropriate report where this information can be found if it will not be discussed in this report.	The Air Force Real Estate section, 611 CES/CEI, is managing the negotiation of easements in accordance with the work plan. Further details will be provided separately by AFCEC.	A
5.		- End of comments -		