DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
P.O. BOX 6898
JBER, ALASKA 99506-0898

REPLY TO
ATTENTION OF:

CEPOA-EN-GES-GIH 1 JUN 2011

MEMORANDUM THRU CEPOA-EN-GES
CEPOA-EN-GES-CIH

FOR CEPOA-PM-M (Chouinard)

SUBJECT: Report of Chemical Findings and Employee Exposure Monitoring, FTR271B (PN72270) Maneuver Enhancement Brigade-Phase II Tactical Equipment Maintenance Facility (TEMF) Maintenance Facility, Joint Base Elmendorf Richardson, Alaska (11-023).

1. **References:**
   a. Sampling and Analysis Plan: Joint Base, Elmendorf Richardson Headquarters Facility (FTR271, 11-022), Joint base Elmendorf Richardson, Alaska
   b. EM 385-1-1 US Army Corps of Engineers Safety and Health Requirements Manual, 15 September 2008.
   c. ACGIH Threshold Limit Values for Chemical Substances and Physical Agents, 2011.
   d. 29 CFR 1910.1000 General Industry Regulation, Sub-Part Z Toxic and Hazardous Substances, Tables Z-1 and Z-2 Limits for Air Contaminants, Updated 1 February 2010.
   e. Testamerica Report Number 580-24219
   f. Galson Laboratories Report Number 687645
   g. Reference e-mail: 26 October 2010, Pekar, James Subject: FTR271A & B Budgets are due by COB 26 Oct

2. **Objective:** The U.S. Army Corps of Engineers (USACE), Alaska District, Geotechnical and Engineering Services Branch, Chemistry and Industrial Hygiene Section (CEPOA-EN-GES-CIH) was tasked by the Project Management Branch (CEPOA-PM-M) to provide technical assistance with three borings on the FTR271B project, Maneuver Enhancement Brigade-Phase II TEMF Maintenance Facility, Joint Base Elmendorf Richardson, Alaska. The project location is presented in Figure 1 and the boring locations are presented in Figure 2.

   Twenty-one borings were completed during the geotechnical investigation on the FTR271B project site. Samples from three of the twenty-one borings were collected and analyzed for contamination. The objectives of the project were to conduct exposure monitoring for evaluation of employee exposure and to collect soil samples for analyses to ensure proper disposal of investigative derived waste.

3. **Site History and known Contamination:** The northern portion of the proposed site is currently a recreational vehicle storage lot and a fueling point consisting of Bldg 992, while USTs, AST, fuel canopies, tank slabs, and fuel dispensers are located on the southern portion of the site.

   According to the historical aerial photographs, the existing Fueling Point (Building 992) site has been a fueling point since at least 1954. The Preconstruction Environmental Survey report also indicates that historically, the subject site had been used for bulk oil storage since 1954 through at least 1984. Prior to that, the site was partially developed and used for parking as far back as 1947 (the earliest aerial photograph available). The Existing Fueling Point is located near a former railroad offloading point where old, historical spills were noted. The existing Fuel Point site contains both UST and AST fuel tanks, thus the possibility of leaking tanks and associated piping exists. The existing fueling point and associated tanks are scheduled to be removed as part of MEB Phase 1, FTR269 (PN55695). While this site has not been comprehensively investigated, evidence of subsurface fuel contamination was noted during a natural gas pipeline installation along Warehouse Street (at the south boundary of the South RV Lot) in 2003. Workers were forced to evacuate the construction trench when strong fuel hydrocarbon vapors filled the trench. In addition, the Existing Fuel Point is documented as a hazardous waste generator including fluorescent tubes, absorbents, aerosol cans, etc. However, according to the Preconstruction Environmental Survey report, the proposed TEMF Maintenance Facility site has no record of leaking UST/AST's, Hazardous Waste Generation, or known contamination (DERA). Due to the current and historic use of the land, hazards associated with possible petroleum, lubricants, and oils exist at this site location. Recently, Jacob's Engineering was contracted by DPW to perform a site investigation at the subject site. Although the final report had not been received to date, preliminary results indicate the following contaminants above state clean up limits are present on site in association with the present fueling area: 1,2,3-trichloropropane and benzene .

4. **Summary of Field Activities:** Soil samples were collected from twenty-one borings during the foundation study performed from the 28th of February 2011 to 17 March 2011 at the FTR271A project site. All borings were screened using a photoionization detector (PID). USACE chemist Teresa Lee (CEPOA-EN-GES-CIH) and geotechnical engineers Inocencio Roman and Pam Lovasz (CEPOA-EN-ES-GM) performed the field screening activities. All soil samples were collected from borings drilled by USACE drill equipment operators Lyle Cain and Christopher Bean using hollow stem augers and split-spoon samplers. Soil samples were collected from a decontaminated split-spoon sampler after the auger had been advanced to designated sample depth. Samples were screened with a photo-ionization detector (PID) as specified in the Sampling and Exposure Analysis Plan (SAP, ref 1.a). Readings above background were not observed at any test boring locations evaluated by CEPOA-EN-GES-CIH. USACE chemist Teresa Lee performed all sampling activities. All samples were collected as described in the Sampling and Analysis Plan (Ref. 1.a).

5. **Investigation Derived Waste:** Investigation-derived waste consisting of plastic bags, nitrile gloves, and sampling spoons were disposed in facility trash receptacles.

6. **Laboratory Assignment:** Samples were hand delivered to Testamerica, Inc. in Anchorage, Alaska on 17 March 2011. The samples were subsequently shipped to Testamerica, Inc. in Tacoma, Washington for analysis. Analytical methods utilized for this effort include AK101, AK102, AK103, SW8260B, SW8081A, SW8270B SIM, SW6020/747, SW7471A and SW8082.

7. **Results:** The results indicate that analyte concentrations were not detected at levels which are above 18AAC75 Method 2 Under 40 Inch criteria for soils in the borings that were sampled for project site FTR271C, with the exception of arsenic and chromium. Arsenic was present in TB-10 (AP-5669 at 7.2 mg/Kg), TB-11 (AP-5670 at 7.4 mg/Kg), and TB-16 (AP-5675 at 6.8 mg/Kg and a duplicate at 5.2 mg/Kg). Chromium was present in TB-10 (AP-5669 at 36 mg/Kg), TB-11 (AP-5670 at 41 mg/Kg), and TB-16 (AP-5675 at 29 mg/Kg and a duplicate at 25 mg/Kg). Arsenic and chromium are above ADEC criteria but are within background levels for the installation (ref. 1.d). In addition, the clean up level for chromium is based on the presence of the more toxic hexavalent chromium. Site history does not indicate the presence of the more toxic hexavalent chromium species. A separate analysis was run for hexavalent chromium and no exceedances were noted.

The 8-hour time-weighted averages (8-hr TWA) for both field samples were as follows:

PARAMETER	SAMPLE HE1769 441 minutes RESULT (ppm)	SAMPLE HE2218 440 minutes RESULT (ppm)	SAMPLE HE2124 444 minutes RESULT (ppm)	OSHA PEL (ppm)	ACGIH TLV (ppm)
Benzene	<0.04	<0.04	<0.04	1	0.5
Ethylbenzene	<0.09	<0.09	<0.09	100	100
Toluene	<0.09	<0.09	<0.09	200	20
Xylene	<0.30	<0.30	<0.29	100	100

PEL- Permissible Exposure Limit
TLV- Threshold Limit Value
* Results denoted with < indicate results below the laboratory detection limits.

These results indicate that for the site where the sampling was performed and the task being monitored the employee exposure was less than 1/10th of the TLV and 1/100th the PEL for benzene.

8. **Limitations:** This project was not intended to be a comprehensive environmental investigation of the site, and changes in the condition of the site may occur with time due to natural processes or human activities. The findings presented in this report are based on the soil boring data gathered at the time of the investigation.

9. **Data Quality Assessment:** The project data was reviewed for deviations to the requirements presented in the Sampling and Analysis Plan and the DOD-QSM (Version 4.2) in the following areas – precision, accuracy, representativeness, comparability, completeness, and sensitivity (PARCCS). Elements reviewed include sample handling, holding times, method and trip blanks, laboratory control sample (LCS) recoveries and relative percent differences (RPDs), matrix spikes and matrix spike duplicates (MS/MSD) recoveries and RPDs, surrogate recovery, and field duplicate comparability. Reporting limits were screened against the most stringent 18AAC75 Method 2 Under 40 Inch criteria for soils. Calibration curves and continuing calibration standard recoveries were not specifically reviewed, however, laboratory narratives were reviewed for quality control deficiencies. The data review is summarized in the ADEC checklists in Attachment 5. Appropriate qualifiers were added if data quality or usability was impacted. All data is usable as flagged.

10. **Conclusions:** The results indicate that analyte concentrations were not detected at levels which are above 18AAC75 Method 2 Under 40 Inch criteria for soils in the borings that were sampled for project site FTR271C, with the exception of arsenic and chromium. Arsenic was present in TB-10 (AP-5669 at 7.2 mg/Kg), TB-11 (AP-5670 at 7.4 mg/Kg), and TB-16 (AP-5675 at 6.8 mg/Kg and a duplicate at 5.2 mg/Kg). Chromium was present in TB-10 (AP-5669 at 36 mg/Kg), TB-11 (AP-5670 at 41 mg/Kg), and TB-16 (AP-5675 at 29 mg/Kg and a duplicate at 25 mg/Kg). Arsenic and chromium are above ADEC criteria but are within background levels for the installation (ref. 1.d). In addition, the clean up level for chromium is based on the presence of the more toxic hexavalent chromium. Site history does not indicate the presence of the more toxic hexavalent chromium species and results for hexavalent chromium analysis were below state clean-up limits. However, due to the current and historic use of the land, hazards associated with possible petroleum, lubricants, and oils exist at this site location. Employees should continue to use proper work practices for dust control and consistently use PPE to limit the effects of chemical exposure.

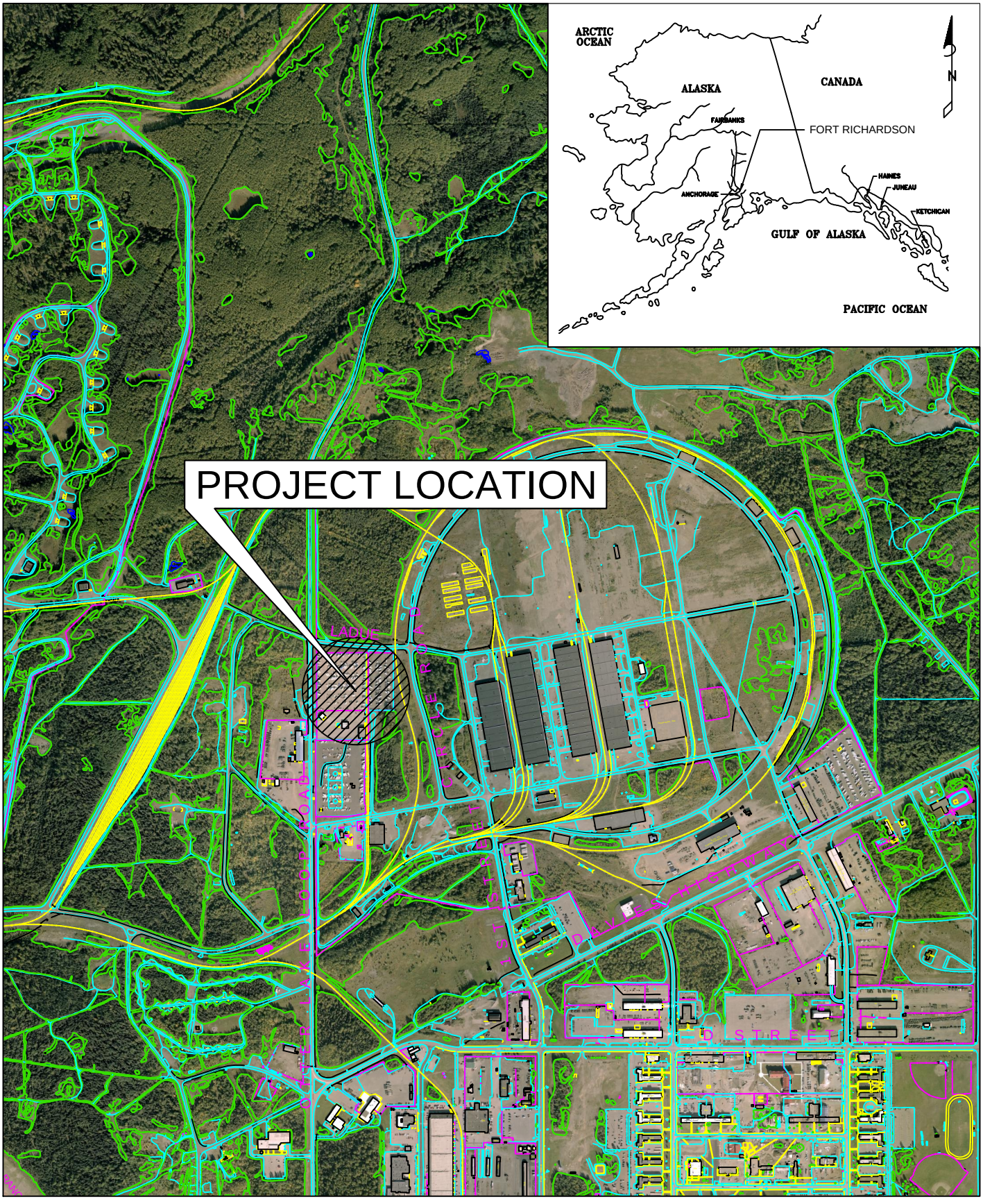
11. **Recommendations:** Due to current and historic use of the site, further environmental site investigation is recommended. Based on the employee chemical exposure data, continue utilizing established work practices and established safety protocols. Should site conditions or processes change, additional evaluations should be performed.

12. Questions and comments should be addressed to Teresa Lee (907-753-2788).

Teresa Lee
Chemist

Attachment 1: Figures
Attachment 2: Photographs
Attachment 3: Analytical Data Tables
Attachment 4: Field Notebook
Attachment 5: ADEC Laboratory Data Review Checklist

Attachment 1
Figures



ALASKA DISTRICT
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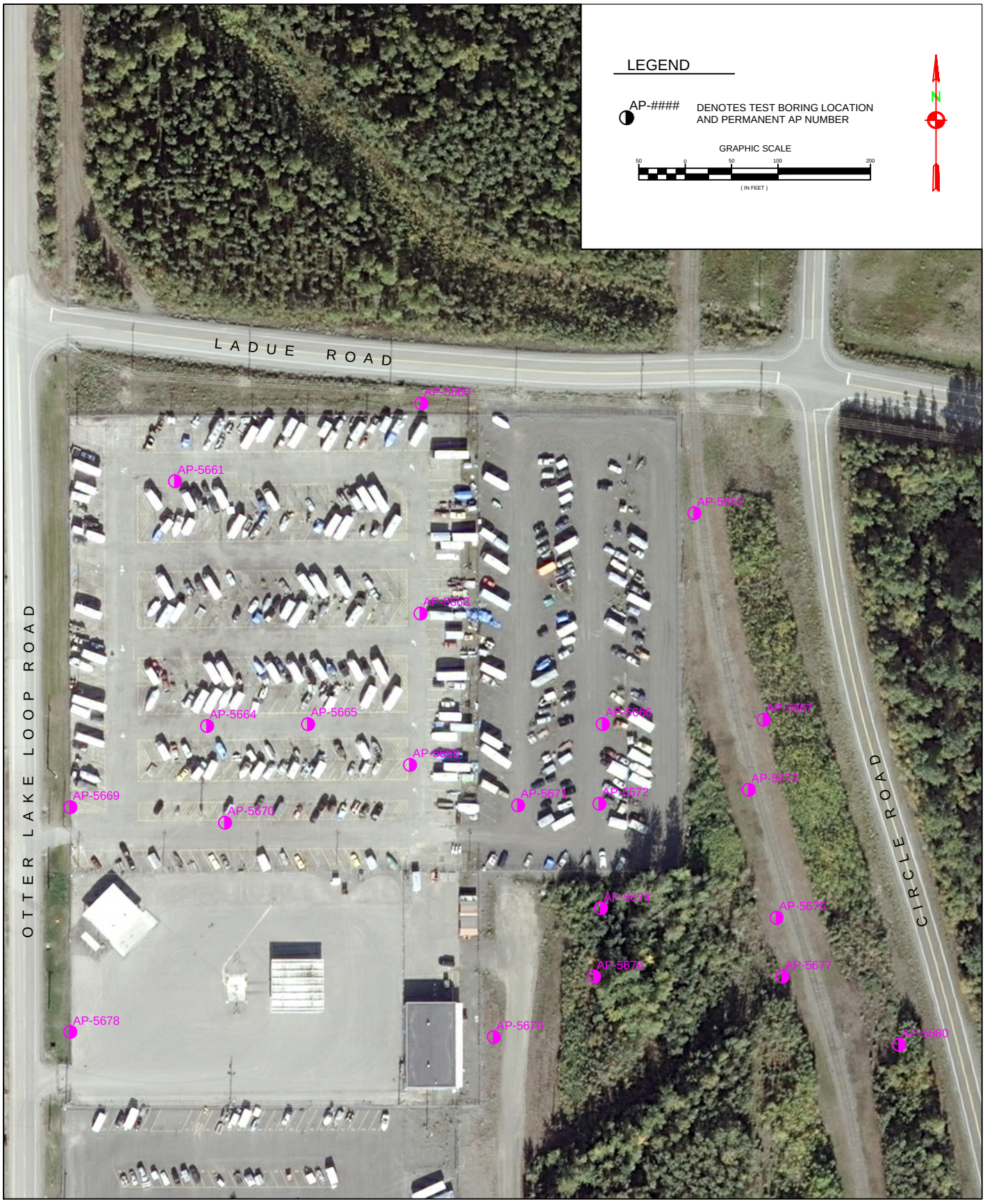
PROJECT LOCATION AND VICINITY MAP
TEMF (FTR271B)
FORT RICHARDSON, ALASKA

SCALE: NTS
DATE: MAY 2011
DRAWN/RVW: IJR/MDP
FIGURE 1



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TEST BORING LOCATION MAP
W/ 2009 AERIAL PHOTOGRAPH OVERLAY
TEMF (FTW271B)
FORT RICHARDSON, ALASKA

SCALE: GRAPHICAL
DATE: MAY 2011
DRAWN/RVW: IJR/MDP
FIGURE 2

Attachment 2
Photographs

Photograph 1: A view looking north of drilling activities at T-16.

Photograph 2: View looking west of engineer Pam Lovasz consulting her field book at TB-16.

Photograph 3: View to the north of drill rig setting up at TB-10.

Photograph 4: View looking south from TB-10 of present fueling station.

Attachment 3
Analytical Data Tables

FTR271B MEB Phase II TEMF Maintenance Facility

				Sample ID	11FTR271B-10A	11FTR271B-10B	11FTR271B-11A	11FTR271B-11B	11FTR271B-16A
				Location ID, Depth	TB-10 AP-5669	TB-10 AP-5669	TB-11 AP-5670	TB-11 AP-5670	TB-16 AP-5675
				Sample Del Group	580-25095-1	580-25095-1	580-25095-1	580-25095-1	580-25095-1
				Collection Date	3/16/2011	3/16/2011	3/9/2011	3/9/2011	3/9/2011
Method	**ANALYTE**	**UNITS**	**ADEC**						
8270SIM	2-Methylnaphthalene	MG/KG	6.1		ND [0.005]		ND [0.0048]		ND [0.0051]
8270SIM	Acenaphthene	MG/KG	180		0.0015 [0.005] J		ND [0.0048]		ND [0.0051]
8270SIM	Acenaphthylene	MG/KG	180		ND [0.005]		ND [0.0048] J		ND [0.0051]
8270SIM	Anthracene	MG/KG	3000		0.0018 [0.005] J, QH		ND [0.0048]		ND [0.0051]
8270SIM	Benzo(a)anthracene	MG/KG	3.6		0.0024 [0.005] J, QH		ND [0.0048] J		ND [0.0051]
8270SIM	Benzo(a)pyrene	MG/KG	0.66		0.0017 [0.005] J,QH		ND [0.0048] J		ND [0.0051]
8270SIM	Benzo(b)fluoranthene	MG/KG	6.6		0.0023 [0.005] J,QH		ND [0.0048] J		ND [0.0051]
8270SIM	Benzo(g,h,i)perylene	MG/KG	1900		0.0017 [0.005] J		ND [0.0048]		ND [0.0051]
8270SIM	Benzo(k)fluoranthene	MG/KG	66		ND [0.005]		ND [0.0048]		ND [0.0051]
8270SIM	Chrysene	MG/KG	360		ND [0.005]		ND [0.0048] J		ND [0.0051]
8270SIM	Dibenzo(a,h)anthracene	MG/KG	0.66		ND [0.005]		ND [0.0048]		ND [0.0051]
8270SIM	Fluoranthene	MG/KG	1400		0.0053 [0.005]		ND [0.0048]		ND [0.0051]
8270SIM	Fluorene	MG/KG	220		ND [0.005]		ND [0.0048]		ND [0.0051]
8270SIM	Indeno(1,2,3-cd)pyrene	MG/KG	6.6		ND [0.005]		ND [0.0048]		ND [0.0051]
8270SIM	Naphthalene	MG/KG	20		ND [0.005]		ND [0.0048]		ND [0.0051]
8270SIM	Phenanthrene	MG/KG	3000		0.0066 [0.005]		ND [0.0048] J		ND [0.0051]
8270SIM	Pyrene	MG/KG	1000		0.0054 [0.005]		ND [0.0048]		ND [0.0051]
AK101	Gasoline Range Organics (C6-C10)	MG/KG	1400		1.9 [4.2] J,B		0.99 [4.1] J,B		4.2 [5.2] J,B
AK102	Diesel Range Organics (C10-C25)	MG/KG	12500		2.1 [20] J	ND [20] QL	ND [19]	ND [21]	ND [19]
AK103	Residual Range Organics (C25-C36)	MG/KG	13700		24 [49] J,B	16 [51] J,QL	24 [48] J,B	15 [51] J,B	11 [49] J,B
E160.3M	Percent Moisture	PERCENT	NA		3.7 [0.1]	2.6 [0.1]	2.7 [0.1]	7 [0.1]	3.4 [0.1]
E160.3M	Solids, Percent	PERCENT	NA		96 [0.1]	97 [0.1]	97 [0.1]	93 [0.1]	97 [0.1]
SW6020	Arsenic	MG/KG	3.9		**7.2 [0.43]**		**7.4 [0.47]**		**6.8 [0.38]**
SW6020	Barium	MG/KG	1100		37 [0.17]		33 [0.19]		55 [0.15]
SW6020	Cadmium	MG/KG	5		ND [0.17]		0.016 [0.19] J		ND [0.15]
SW6020	Chromium	MG/KG	25		**36 [0.17]**		**41 [0.19] J, ML**		**29 [0.15]**
SW6020	Lead	MG/KG	400		6.9 [0.17]		6.3 [0.19]		6.9 [0.15]
SW6020	Selenium	MG/KG	3.4		ND [0.6]		ND [0.66]		ND [0.53]
SW6020	Silver	MG/KG	11.2		0.095 [0.17] J		0.11 [0.19] J		0.099 [0.15] J
SW7196A	Chromium, Hexavalent	MG/KG	25		ND [0.052]		ND [0.051]		ND [0.052]
SW7471A	Mercury	MG/KG	1.4		0.039 [0.014]		0.053 [0.015] J, ML		0.048 [0.015]

ADEC - most stringent of 18 AAC 75 Method 2 Table B1 and B2 Cleanup Level

[ ] - Laboratory LOQ

Solid shade indicates screening value exceedance

Data Flags are defined at the end of the table

FTR271B MEB Phase II TEMF Maintenance Facility

		Sample ID		11FTR271B-10A	11FTR271B-10B	11FTR271B-11A	11FTR271B-11B	11FTR271B-16A
		Location ID, Depth		TB-10 AP-5669	TB-10 AP-5669	TB-11 AP-5670	TB-11 AP-5670	TB-16 AP-5675
		Sample Del Group		580-25095-1	580-25095-1	580-25095-1	580-25095-1	580-25095-1
		Collection Date		3/16/2011	3/16/2011	3/9/2011	3/9/2011	3/9/2011
Method	**ANALYTE**	**UNITS**	**ADEC**					
SW8081	4,4'-DDD	MG/KG	7.2	ND [0.002]		ND [0.002]		ND [0.0021]
SW8081	4,4'-DDE	MG/KG	5.1	ND [0.002]		ND [0.002]		ND [0.0021]
SW8081	4,4'-DDT	MG/KG	7.3	ND [0.002]		ND [0.002]		ND [0.0021]
SW8081	Aldrin	MG/KG	0.07	ND [0.00099]		ND [0.001]		ND [0.001]
SW8081	alpha-BHC	MG/KG	0.0064	ND [0.00099]		ND [0.001]		ND [0.001]
SW8081	alpha-Chlordane	MG/KG	2.3	ND [0.00099]		ND [0.001]		ND [0.001]
SW8081	beta-BHC	MG/KG	0.022	ND [0.00099]		ND [0.001]		ND [0.001]
SW8081	Chlordane	MG/KG	2.3	ND [0.0099]		ND [0.01]		ND [0.01]
SW8081	delta-BHC	MG/KG	NA	ND [0.00099]		ND [0.001]		ND [0.001]
SW8081	Dieldrin	MG/KG	0.0076	ND [0.002]		ND [0.002]		ND [0.0021]
SW8081	Endosulfan I	MG/KG	64	ND [0.00099]		ND [0.001]		ND [0.001]
SW8081	Endosulfan II	MG/KG	64	ND [0.002]		ND [0.002]		ND [0.0021]
SW8081	Endosulfan sulfate	MG/KG	64	ND [0.002]		ND [0.002]		ND [0.0021]
SW8081	Endrin	MG/KG	0.29	ND [0.002]		ND [0.002]		ND [0.0021]
SW8081	Endrin aldehyde	MG/KG	NA	ND [0.002]		ND [0.002]		ND [0.0021]
SW8081	Endrin ketone	MG/KG	NA	ND [0.002]		ND [0.002]		ND [0.0021]
SW8081	gamma-BHC (Lindane)	MG/KG	0.0095	ND [0.00099]		ND [0.001]		ND [0.001]
SW8081	gamma-Chlordane	MG/KG	2.3	ND [0.00099]		ND [0.001]		ND [0.001]
SW8081	Heptachlor	MG/KG	0.28	ND [0.00099]		ND [0.001]		ND [0.001]
SW8081	Heptachlor epoxide	MG/KG	0.014	ND [0.00099]		ND [0.001]		ND [0.001]
SW8081	Methoxychlor	MG/KG	23	ND [0.0099]		ND [0.01]		ND [0.01]
SW8081	Toxaphene	MG/KG	3.9	ND [0.099]		ND [0.1]		ND [0.1]
SW8082	PCB-1016 (Aroclor 1016)	MG/KG	1	ND [0.0099]		ND [0.01]		ND [0.01]
SW8082	PCB-1221 (Aroclor 1221)	MG/KG	1	ND [0.0099]		ND [0.01]		ND [0.01]
SW8082	PCB-1232 (Aroclor 1232)	MG/KG	1	ND [0.0099]		ND [0.01]		ND [0.01]
SW8082	PCB-1242 (Aroclor 1242)	MG/KG	1	ND [0.0099]		ND [0.01]		ND [0.01]
SW8082	PCB-1248 (Aroclor 1248)	MG/KG	1	ND [0.0099]		ND [0.01]		ND [0.01]
SW8082	PCB-1254 (Aroclor 1254)	MG/KG	1	ND [0.0099]		ND [0.01]		ND [0.01]
SW8082	PCB-1260 (Aroclor 1260)	MG/KG	1	ND [0.0099]		ND [0.01]		ND [0.01]
SW8260	1,1,1,2-Tetrachloroethane	MG/KG	NA	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	1,1,1-Trichloroethane	MG/KG	200	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	1,1,2,2-Tetrachloroethane	MG/KG	4.3	ND [0.011]		ND [0.01]		ND [0.013]
SW8260	1,1,2-Trichloroethane	MG/KG	0.018	ND [0.013]		ND [0.012]		ND [0.015]
SW8260	1,1-Dichloroethane	MG/KG	25	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	1,1-Dichloroethene	MG/KG	0.03	ND [0.021]		ND [0.021]		ND [0.026]
SW8260	1,1-Dichloropropene	MG/KG	NA	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	1,2,3-Trichlorobenzene	MG/KG	NA	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	1,2,3-Trichloropropane	MG/KG	0.00053	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	1,2,4-Trichlorobenzene	MG/KG	0.85	ND [0.042]		ND [0.041]		ND [0.052]

ADEC - most stringent of 18 AAC 75 Method 2 Table B1 and B2 Cleanup Level

[ ] - Laboratory LOQ

Solid shade indicates screening value exceedance

Data Flags are defined at the end of the table

FTR271B MEB Phase II TEMF Maintenance Facility

		Sample ID		11FTR271B-10A	11FTR271B-10B	11FTR271B-11A	11FTR271B-11B	11FTR271B-16A
		Location ID, Depth		TB-10 AP-5669	TB-10 AP-5669	TB-11 AP-5670	TB-11 AP-5670	TB-16 AP-5675
		Sample Del Group		580-25095-1	580-25095-1	580-25095-1	580-25095-1	580-25095-1
		Collection Date		3/16/2011	3/16/2011	3/9/2011	3/9/2011	3/9/2011
Method	**ANALYTE**	**UNITS**	**ADEC**					
SW8260	1,2,4-Trimethylbenzene	MG/KG	23	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	1,2-Dibromo-3-chloropropane	MG/KG	NA	ND [0.21]		ND [0.21] J,M		ND [0.26]
SW8260	1,2-Dibromoethane	MG/KG	0.00016	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	1,2-Dichlorobenzene	MG/KG	5.1	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	1,2-Dichloroethane	MG/KG	0.016	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	1,2-Dichloropropane	MG/KG	0.018	ND [0.013]		ND [0.012]		ND [0.015]
SW8260	1,3,5-Trimethylbenzene	MG/KG	23	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	1,3-Dichlorobenzene	MG/KG	28	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	1,3-Dichloropropane	MG/KG	NA	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	1,4-Dichlorobenzene	MG/KG	0.64	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	2,2-Dichloropropane	MG/KG	NA	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	2-Butanone	MG/KG	59	ND [0.42]		0.12 [0.41] J,B		0.2 [0.52] J,B
SW8260	2-Chlorotoluene	MG/KG	NA	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	2-Hexanone	MG/KG	NA	ND [0.21]		ND [0.21]		ND [0.26]
SW8260	4-Chlorotoluene	MG/KG	NA	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	4-Isopropyltoluene	MG/KG	NA	ND [0.042]		ND [0.041] J,ML		ND [0.052]
SW8260	4-Methyl-2-pentanone	MG/KG	8.1	ND [0.21]		ND [0.21]		ND [0.26]
SW8260	Acetone	MG/KG	88	0.12 [0.42] J, B		0.11 [0.41] J, B		0.19 [0.52] J,B
SW8260	Benzene	MG/KG	0.025	ND [0.017]		ND [0.017]		ND [0.021]
SW8260	Bromobenzene	MG/KG	NA	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	Bromoform	MG/KG	0.34	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	Bromomethane	MG/KG	0.16	ND [0.15]		ND [0.14]		ND [0.18]
SW8260	Carbon disulfide	MG/KG	12	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	Carbon tetrachloride	MG/KG	0.023	ND [0.021]		ND [0.021]		ND [0.026]
SW8260	Chlorobenzene	MG/KG	0.63	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	Chloroethane	MG/KG	34	ND [0.42]		ND [0.41] J		ND [0.52]
SW8260	Chloroform	MG/KG	0.46	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	Chloromethane	MG/KG	0.21	ND [0.42]		ND [0.41]		ND [0.52]
SW8260	cis-1,2-Dichloroethene	MG/KG	0.24	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	cis-1,3-Dichloropropene	MG/KG	0.033	ND [0.017]		ND [0.017]		ND [0.021]
SW8260	Dibromochloromethane	MG/KG	0.032	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	Dibromomethane	MG/KG	1.1	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	Dichlorodifluoromethane	MG/KG	140	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	Ethylbenzene	MG/KG	6.9	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	Hexachlorobutadiene	MG/KG	0.12	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	Isopropylbenzene	MG/KG	51	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	Methylene chloride	MG/KG	0.016	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	Methyl-tert-butyl ether (MTBE)	MG/KG	1.3	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	Naphthalene	MG/KG	20	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	n-Butylbenzene	MG/KG	15	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	n-Propylbenzene	MG/KG	15	ND [0.042]		ND [0.041]		ND [0.052]

ADEC - most stringent of 18 AAC 75 Method 2 Table B1 and B2 Cleanup Level

[ ] - Laboratory LOQ

Solid shade indicates screening value exceedance

Data Flags are defined at the end of the table

FTR271B MEB Phase II TEMF Maintenance Facility

			Sample ID	11FTR271B-10A	11FTR271B-10B	11FTR271B-11A	11FTR271B-11B	11FTR271B-16A
			Location ID, Depth	TB-10 AP-5669	TB-10 AP-5669	TB-11 AP-5670	TB-11 AP-5670	TB-16 AP-5675
			Sample Del Group	580-25095-1	580-25095-1	580-25095-1	580-25095-1	580-25095-1
			Collection Date	3/16/2011	3/16/2011	3/9/2011	3/9/2011	3/9/2011
Method	**ANALYTE**	**UNITS**	**ADEC**					
SW8260	o-Xylene	MG/KG	63	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	sec-Butylbenzene	MG/KG	12	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	Styrene	MG/KG	0.96	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	tert-Butylbenzene	MG/KG	12	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	Tetrachloroethene (PCE)	MG/KG	0.024	ND [0.021]		ND [0.021] J		ND [0.026]
SW8260	Toluene	MG/KG	6.5	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	trans-1,2-Dichloroethene	MG/KG	0.37	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	trans-1,3-Dichloropropene	MG/KG	0.033	ND [0.017]		ND [0.017]		ND [0.021]
SW8260	Trichloroethene (TCE)	MG/KG	0.02	ND [0.017]		ND [0.017]		ND [0.021]
SW8260	Trichlorofluoromethane	MG/KG	86	ND [0.042]		ND [0.041]		ND [0.052]
SW8260	Vinyl chloride	MG/KG	0.0085	ND [0.0085]		ND [0.0083]		ND [0.01]
SW8260	Xylene, Isomers m & p	MG/KG	63	ND [0.042]		ND [0.041]		ND [0.052]

ADEC - most stringent of 18 AAC 75 Method 2 Table B1 and B2 Cleanup Level
[ ] - Laboratory LOQ
Solid shade indicates screening value exceedance
Data Flags are defined at the end of the table

FTR271B MEB Phase II TEMF Maintenance Facility

				Sample ID Location ID, Depth Sample Del Group Collection Date	11FTR271B-16B TB-16 AP-5675 580-25095-1 3/9/2011	11FTR271B-017A TB-17 AP-5675 580-25095-1 3/9/2011	11FTR271B-TB Trip Blank 580-25095-1 3/16/2011
Method	**ANALYTE**	**UNITS**	**ADEC**			**Dup of -16A**	**Trip Blank**
8270SIM	2-Methylnaphthalene	MG/KG	6.1			ND [0.0049]	
8270SIM	Acenaphthene	MG/KG	180			ND [0.0049]	
8270SIM	Acenaphthylene	MG/KG	180			ND [0.0049]	
8270SIM	Anthracene	MG/KG	3000			ND [0.0049]	
8270SIM	Benzo(a)anthracene	MG/KG	3.6			ND [0.0049]	
8270SIM	Benzo(a)pyrene	MG/KG	0.66			ND [0.0049]	
8270SIM	Benzo(b)fluoranthene	MG/KG	6.6			ND [0.0049]	
8270SIM	Benzo(g,h,i)perylene	MG/KG	1900			ND [0.0049]	
8270SIM	Benzo(k)fluoranthene	MG/KG	66			ND [0.0049]	
8270SIM	Chrysene	MG/KG	360			ND [0.0049]	
8270SIM	Dibenzo(a,h)anthracene	MG/KG	0.66			ND [0.0049]	
8270SIM	Fluoranthene	MG/KG	1400			ND [0.0049]	
8270SIM	Fluorene	MG/KG	220			ND [0.0049]	
8270SIM	Indeno(1,2,3-cd)pyrene	MG/KG	6.6			ND [0.0049]	
8270SIM	Naphthalene	MG/KG	20			ND [0.0049]	
8270SIM	Phenanthrene	MG/KG	3000			ND [0.0049]	
8270SIM	Pyrene	MG/KG	1000			ND [0.0049]	
AK101	Gasoline Range Organics (C6-C10)	MG/KG	1400			1.4 [4.3] J,B	1.2 [4] J,B
AK102	Diesel Range Organics (C10-C25)	MG/KG	12500		ND [20]	2.8 [20] J	
AK103	Residual Range Organics (C25-C36)	MG/KG	13700		12 [50] J,B	17 [49] J,B	
E160.3M	Percent Moisture	PERCENT	NA		4.5 [0.1]	3.5 [0.1]	
E160.3M	Solids, Percent	PERCENT	NA		95 [0.1]	96 [0.1]	
SW6020	Arsenic	MG/KG	3.9			**5.2 [0.36]**	
SW6020	Barium	MG/KG	1100			37 [0.14]	
SW6020	Cadmium	MG/KG	5			ND [0.14]	
SW6020	Chromium	MG/KG	25			**25 [0.14]**	
SW6020	Lead	MG/KG	400			5.2 [0.14]	
SW6020	Selenium	MG/KG	3.4			ND [0.5]	
SW6020	Silver	MG/KG	11.2			0.067 [0.14] J	
SW7196A	Chromium, Hexavalent	MG/KG	25			ND [0.052]	
SW7471A	Mercury	MG/KG	1.4			0.051 [0.016]	

ADEC - most stringent of 18 AAC 75 Method 2 Table B1 and B2 Cleanup Level
[ ] - Laboratory LOQ
Solid shade indicates screening value exceedance
Data Flags are defined at the end of the table

FTR271B MEB Phase II TEMF Maintenance Facility

				Sample ID Location ID, Depth Sample Del Group Collection Date	11FTR271B-16B TB-16 AP-5675 580-25095-1 3/9/2011	11FTR271B-017A TB-17 AP-5675 580-25095-1 3/9/2011	11FTR271B-TB Trip Blank 580-25095-1 3/16/2011
Method	**ANALYTE**	**UNITS**	**ADEC**			**Dup of -16A**	**Trip Blank**
SW8081	4,4'-DDD	MG/KG	7.2			ND [0.0021]	
SW8081	4,4'-DDE	MG/KG	5.1			ND [0.0021]	
SW8081	4,4'-DDT	MG/KG	7.3			ND [0.0021]	
SW8081	Aldrin	MG/KG	0.07			ND [0.001]	
SW8081	alpha-BHC	MG/KG	0.0064			ND [0.001]	
SW8081	alpha-Chlordane	MG/KG	2.3			ND [0.001]	
SW8081	beta-BHC	MG/KG	0.022			ND [0.001]	
SW8081	Chlordane	MG/KG	2.3			ND [0.01]	
SW8081	delta-BHC	MG/KG	NA			ND [0.001]	
SW8081	Dieldrin	MG/KG	0.0076			ND [0.0021]	
SW8081	Endosulfan I	MG/KG	64			ND [0.001]	
SW8081	Endosulfan II	MG/KG	64			ND [0.0021]	
SW8081	Endosulfan sulfate	MG/KG	64			ND [0.0021]	
SW8081	Endrin	MG/KG	0.29			ND [0.0021]	
SW8081	Endrin aldehyde	MG/KG	NA			ND [0.0021]	
SW8081	Endrin ketone	MG/KG	NA			ND [0.0021]	
SW8081	gamma-BHC (Lindane)	MG/KG	0.0095			ND [0.001]	
SW8081	gamma-Chlordane	MG/KG	2.3			ND [0.001]	
SW8081	Heptachlor	MG/KG	0.28			ND [0.001]	
SW8081	Heptachlor epoxide	MG/KG	0.014			ND [0.001]	
SW8081	Methoxychlor	MG/KG	23			ND [0.01]	
SW8081	Toxaphene	MG/KG	3.9			ND [0.1]	
SW8082	PCB-1016 (Aroclor 1016)	MG/KG	1			ND [0.01]	
SW8082	PCB-1221 (Aroclor 1221)	MG/KG	1			ND [0.01]	
SW8082	PCB-1232 (Aroclor 1232)	MG/KG	1			ND [0.01]	
SW8082	PCB-1242 (Aroclor 1242)	MG/KG	1			ND [0.01]	
SW8082	PCB-1248 (Aroclor 1248)	MG/KG	1			ND [0.01]	
SW8082	PCB-1254 (Aroclor 1254)	MG/KG	1			ND [0.01]	
SW8082	PCB-1260 (Aroclor 1260)	MG/KG	1			ND [0.01]	
SW8260	1,1,1,2-Tetrachloroethane	MG/KG	NA			ND [0.043]	ND [0.04]
SW8260	1,1,1-Trichloroethane	MG/KG	200			ND [0.043]	ND [0.04]
SW8260	1,1,2,2-Tetrachloroethane	MG/KG	4.3			ND [0.011]	ND [0.01]
SW8260	1,1,2-Trichloroethane	MG/KG	0.018			ND [0.013]	ND [0.012]
SW8260	1,1-Dichloroethane	MG/KG	25			ND [0.043]	ND [0.04]
SW8260	1,1-Dichloroethene	MG/KG	0.03			ND [0.022]	ND [0.02]
SW8260	1,1-Dichloropropene	MG/KG	NA			ND [0.043]	ND [0.04]
SW8260	1,2,3-Trichlorobenzene	MG/KG	NA			ND [0.043]	ND [0.04]
SW8260	1,2,3-Trichloropropane	MG/KG	0.00053			ND [0.043]	ND [0.04]
SW8260	1,2,4-Trichlorobenzene	MG/KG	0.85			ND [0.043]	ND [0.04]

ADEC - most stringent of 18 AAC 75 Method 2 Table B1 and B2 Cleanup Level
[ ] - Laboratory LOQ
Solid shade indicates screening value exceedance
Data Flags are defined at the end of the table

FTR271B MEB Phase II TEMF Maintenance Facility

				Sample ID Location ID, Depth Sample Del Group Collection Date	11FTR271B-16B TB-16 AP-5675 580-25095-1 3/9/2011	11FTR271B-017A TB-17 AP-5675 580-25095-1 3/9/2011	11FTR271B-TB Trip Blank 580-25095-1 3/16/2011
Method	**ANALYTE**	**UNITS**	**ADEC**			**Dup of -16A**	**Trip Blank**
SW8260	1,2,4-Trimethylbenzene	MG/KG	23			ND [0.043]	ND [0.04]
SW8260	1,2-Dibromo-3-chloropropane	MG/KG	NA			ND [0.22]	ND [0.2]
SW8260	1,2-Dibromoethane	MG/KG	0.00016			ND [0.043]	ND [0.04]
SW8260	1,2-Dichlorobenzene	MG/KG	5.1			ND [0.043]	ND [0.04]
SW8260	1,2-Dichloroethane	MG/KG	0.016			ND [0.043]	ND [0.04]
SW8260	1,2-Dichloropropane	MG/KG	0.018			ND [0.013]	ND [0.012]
SW8260	1,3,5-Trimethylbenzene	MG/KG	23			ND [0.043]	ND [0.04]
SW8260	1,3-Dichlorobenzene	MG/KG	28			ND [0.043]	ND [0.04]
SW8260	1,3-Dichloropropane	MG/KG	NA			ND [0.043]	ND [0.04]
SW8260	1,4-Dichlorobenzene	MG/KG	0.64			ND [0.043]	ND [0.04]
SW8260	2,2-Dichloropropane	MG/KG	NA			ND [0.043]	ND [0.04]
SW8260	2-Butanone	MG/KG	59			ND [0.43]	0.12 [0.4] J,B
SW8260	2-Chlorotoluene	MG/KG	NA			ND [0.043]	ND [0.04]
SW8260	2-Hexanone	MG/KG	NA			ND [0.22]	ND [0.2]
SW8260	4-Chlorotoluene	MG/KG	NA			ND [0.043]	ND [0.04]
SW8260	4-Isopropyltoluene	MG/KG	NA			ND [0.043]	ND [0.04]
SW8260	4-Methyl-2-pentanone	MG/KG	8.1			ND [0.22]	ND [0.2]
SW8260	Acetone	MG/KG	88			ND [0.43]	0.13 [0.4] J
SW8260	Benzene	MG/KG	0.025			ND [0.017]	ND [0.016]
SW8260	Bromobenzene	MG/KG	NA			ND [0.043]	ND [0.04]
SW8260	Bromoform	MG/KG	0.34			ND [0.043]	ND [0.04]
SW8260	Bromomethane	MG/KG	0.16			ND [0.15]	ND [0.14]
SW8260	Carbon disulfide	MG/KG	12			ND [0.043]	ND [0.04]
SW8260	Carbon tetrachloride	MG/KG	0.023			ND [0.022]	ND [0.02]
SW8260	Chlorobenzene	MG/KG	0.63			ND [0.043]	ND [0.04]
SW8260	Chloroethane	MG/KG	34			ND [0.43]	ND [0.4]
SW8260	Chloroform	MG/KG	0.46			ND [0.043]	ND [0.04]
SW8260	Chloromethane	MG/KG	0.21			ND [0.43]	ND [0.4]
SW8260	cis-1,2-Dichloroethene	MG/KG	0.24			ND [0.043]	ND [0.04]
SW8260	cis-1,3-Dichloropropene	MG/KG	0.033			ND [0.017]	ND [0.016]
SW8260	Dibromochloromethane	MG/KG	0.032			ND [0.043]	ND [0.04]
SW8260	Dibromomethane	MG/KG	1.1			ND [0.043]	ND [0.04]
SW8260	Dichlorodifluoromethane	MG/KG	140			ND [0.043]	ND [0.04]
SW8260	Ethylbenzene	MG/KG	6.9			ND [0.043]	ND [0.04]
SW8260	Hexachlorobutadiene	MG/KG	0.12			ND [0.043]	ND [0.04]
SW8260	Isopropylbenzene	MG/KG	51			ND [0.043]	ND [0.04]
SW8260	Methylene chloride	MG/KG	0.016			ND [0.043]	**0.05 [0.04] J, B**
SW8260	Methyl-tert-butyl ether (MTBE)	MG/KG	1.3			ND [0.043]	ND [0.04]
SW8260	Naphthalene	MG/KG	20			ND [0.043]	ND [0.04]
SW8260	n-Butylbenzene	MG/KG	15			ND [0.043]	ND [0.04]
SW8260	n-Propylbenzene	MG/KG	15			ND [0.043]	ND [0.04]

ADEC - most stringent of 18 AAC 75 Method 2 Table B1 and B2 Cleanup Level
[ ] - Laboratory LOQ
Solid shade indicates screening value exceedance
Data Flags are defined at the end of the table

FTR271B MEB Phase II TEMF Maintenance Facility

				Sample ID Location ID, Depth Sample Del Group Collection Date	11FTR271B-16B TB-16 AP-5675 580-25095-1 3/9/2011	11FTR271B-017A TB-17 AP-5675 580-25095-1 3/9/2011	11FTR271B-TB Trip Blank 580-25095-1 3/16/2011
Method	**ANALYTE**	**UNITS**	**ADEC**			**Dup of -16A**	**Trip Blank**
SW8260	o-Xylene	MG/KG	63			ND [0.043]	ND [0.04]
SW8260	sec-Butylbenzene	MG/KG	12			ND [0.043]	ND [0.04]
SW8260	Styrene	MG/KG	0.96			ND [0.043]	ND [0.04]
SW8260	tert-Butylbenzene	MG/KG	12			ND [0.043]	ND [0.04]
SW8260	Tetrachloroethene (PCE)	MG/KG	0.024			ND [0.022]	ND [0.02]
SW8260	Toluene	MG/KG	6.5			ND [0.043]	ND [0.04]
SW8260	trans-1,2-Dichloroethene	MG/KG	0.37			ND [0.043]	ND [0.04]
SW8260	trans-1,3-Dichloropropene	MG/KG	0.033			ND [0.017]	ND [0.016]
SW8260	Trichloroethene (TCE)	MG/KG	0.02			ND [0.017]	ND [0.016]
SW8260	Trichlorofluoromethane	MG/KG	86			ND [0.043]	ND [0.04]
SW8260	Vinyl chloride	MG/KG	0.0085			ND [0.0086]	ND [0.008]
SW8260	Xylene, Isomers m & p	MG/KG	63			ND [0.043]	ND [0.04]

ADEC - most stringent of 18 AAC 75 Method 2 Table B1 and B2 Cleanup Level
[ ] - Laboratory LOQ
Solid shade indicates screening value exceedance
Data Flags are defined at the end of the table

Data Flag Explanations

ND - Analyte is not detected; [ ] - Laboratory Limit of Quantification

Qualifier	Definition
J	Analyte result is considered an estimated value because the level is below the laboratory LOQ but above the LOD.
MH, ML, MN	Analyte result is considered an estimated value biased high, low or uncertain due to matrix effects.
B	Analyte result is considered a high estimated value due to contamination present in the method blank.
QH, QL, QN	Analyte result is considered an estimated value biased high, low or uncertain due to a quality control failure.
R	Analyte result is rejected - result is not usable.

Attachment 4
Field Notebook

a product of

J. L. DARLING CORPORATION

TACOMA, WASHINGTON 98421 U.S.A.

"Rite in the Rain"
WEATHERPROOF

LEVEL

NOTEBOOK NO. 311

FTR 271B

NPDL# 11-023

TEMF Maintenance Facility

3 March 2011 - 16 March 2011

March 9 2010   weather: clear   4°F warming to
arrived on-site 9:00 A.M.
Rig had moved to TB-16, refueling in process
present on-site
Lim   engineer
Teesa Lee   Chemist
Lyle Cahe   Drill Rig operator
Chris Beau   Drill helper
Tailgate safety meeting: Cold weather hazards
Slips trips falls
Known contamination
Site history

TB-16

Depth	time	PID	description	Samples
0-2	10:00	0/0	Br Si Gr	—
~~2½-4½~~				
8½-4½	10:10	0/0	Br Si Gr	
Samp ID 11FTR27TB-16A			Pest, PCB, PAH, Rcra Metals, VOC	2 4oz Samp w/ Meth, 4 1L VOC, 3 8oz Amber Pest, PCB, 4 4oz Amber
Duplicate samp ID 11FTR27TB-17A				
6½-8	10:20	0/0	Br Si Gr	—
9½-16	10:30	0/0	Br Si Gr	1 8oz Amber DRO
Samp ID 11FTR27TB-16B				
14½-16	10:41	0/0	Br Si Gr	—
~~19-21~~	10:55	0/0	Br Si Gr Some Cobbles	—
24-26	11:05	0/0	Br Si Gr	—
29½-31	11:14	0/0	Br Si Gr	—

Lyle and Chris fixed loader for snow removal.
moved to TB, power line in vicinity and utility locates were non-visible due to new snow. Decided to move to TB-11 instead.

TB-11

Depth	time	PID	description	Samples
0-1½	14:10	0/0	Br Si Sa some Gravel (Fill)	—
2½-4	14:19	0/0	Br Si Sa some gravel	3 32oz amber, 4 4oz amber, 2 4oz amber, 1 4oz Cr
ID: 11FTR27TB-11A			Alum, VOC, VOC, Pest, PCB, PAH, Rcra Metals, Hex Cr	
4½-6	14:34	0/0	Br Si Sa (Fill)	—
9½-11	14:49	0/NR	Several Cobbles, low recovery	—
14½-16	14:58	0/0	Br Si Gr	1 8oz Amber DRO RRO
ID: 11FTR27TB-11B				
14½-21	15:04	NR/NR	No recovery	—
24½-26	15:32	0/0	Brown, uffsade brown Silt, top gravel	—
29½-31	15:44	NR/NR	No recovery	—

16 March 2011 Sunshine 30°F

arrived on-site @ 14:00. Some water on-site
drilling had commenced on TB-05

depth	time	PID	Description	Sample
19.5-21	13:50	0/0	Br Si Gr	NA
24.5-26	14:00	0/0	Br Si Sa	NA
29.5-31	14:15	0/0	Br Si Gr	NA

moved to TB-10

depth	time			
0-1.5'	15:23	0/0	Br Si Sa	—
2.5 [illegible]'	15:38	0/0	Br Si Sa some gr	1 4oz amber w/ Meth; 2 4oz amber 1 8oz amb
4.5 [illegible]'	15:49	0/0	Br Si Gr some cobbles	1 4oz Ans; ORO DRO
9.5-11'	15:51	0/0	Br Si Gr some cobbles	—
14.5-16'	16:10	0/0	Br Si Gr some cobbles	—

Attachment 5
ADEC Laboratory Data Review Checklist

Laboratory Data Review Checklist

Completed by: Teresa Lee

Title: Chemist Date: 24 May 2011

CS Report Name: FTR27B Report Date:

Consultant Firm: U.S. Army Corps of Engineers

Laboratory Name: Test America - Tacoma Laboratory Report Number: 580-25095-1

ADEC File Number: ADEC RecKey Number:

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
      ☒Yes ☐No ☐NA (Please explain.) Comments:

      Test America, Inc. Tacoma, Washington completed a majority of the analysis and is ADEC and ELAP certified.

   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:

      Samples were transferred to Test America, Inc. West Sacramento, California for the Hexavalent Chromium analysis. Test America, Inc. West Sacramento, California is ADEC and ELAP certified.

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:

      Temperature of the coolers upon arrival was documented as 2.5 degrees celcius.

   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:

No discrepancies noted.

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 container label for the following sample did not match the information listed on the Chain-of-Custody (COC): The container labels list 11FTR271B-17A and the COC lists 11FTR271B-017A. Sample was logged in per COC.

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

The samples arrived in good condition and properly preserved on ice. The container label for 11FTR271A-17A did not match the COC which listed 11FTR271B-017A. These are the same sample. No other discrepancies were noted. There is no affect on data quality or usability.

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:

c. Were all corrective actions documented?
☒Yes ☐No ☐NA (Please explain.) Comments:

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

The case narrative only describes qualifications made to the data based on problems encountered during the sample analysis.

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:

Sample 11FTR271B-10B (580-25095-7) was reprepared out of hold time during the AK102/103 anaysis. The original preparation was within holding time; however, due to an error during the extraction procedure, the surrogate recoveries were below the acceptance limits and required the sample to be re-extracted.

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:

The following analytes have LOQs above their respective ADEC cleanup levels: 1,2,3-trichloropropane, 1,2-dibromoethane, 1,2-dichloroethane, bromomethane, carbon tetrachloride, chloromethane, dibromochloromethane, methylene chloride, tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride. The following analytes have LODs above their respective ADEC cleanup levels: 1,2,3-trichloropropane, 1,2-dibromoethane, 1,2-dichloroethane, chloromethane, dibromochloromethane, and methylene chloride.

e. Data quality or usability affected?
Comments:

Data quality/usability is affected for these analytes and their presence onsite at levels above ADEC cleanup levels cannot be negated for those analytes whose LODs exceed the ADEC cleanup levels. In addition, results below the LOQ are considered qualitatively acceptable but quantitatively unreliable due to the uncertainty in precision near the limit of detection. Data quality/usability is also affected for method AK102/103 in association with sample 11FTR271B-10B (580-25095-7) and have been qualified "QL" and are estimated biased low due to exceeding hold time.

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 LOQ?

Methylene chloride was detected in the method blank MB 580-82748/1-A at a level above the LOQ. None of the samples associated with this method blank contained methylene chloride. Only the trip blank was affected.

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

iii. If above PQL, what samples are affected?

Comments:

Gasoline range organics (GRO) and residual range organics (RRO) were detected in method blank MB 580-82748/1-A at levels that were above the detection limit but below ½ the limit of quantitation. Methyl ethyl ketone, 4-isopropyltoluene, and 2-butanone was detected in method blank MB 580-82748/1-A at levels that were above the detection limit but below ½ the limit of quantitation. In addition, the method blank in association with the hexavalent chromium analysis indicated levels above the detection limit but below ½ the limit of quantitation. Samples with concentrations less than 10 times the method blank concentration for these analytes are considered to be affected. Affected samples include 11FTR271B-017A, 10A, 11A, 16Aand RRO and the TB as well for GRO analysis while 11FTR271B-11A, 16A, and TB are affected for 2-butanone analysis .

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

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

Detections found for the analytes listed above that were found to be less than 10 times the blank concentration are to be considered biased high, and have been flagged "B".

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

Comments:

Data is usable as qualified. All affected samples are well below ADEC limits.

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

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

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

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

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

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:

For SW8260, the laboratory control sample (LCS) for batch 580-82748 exceeded the upper control limit for chloroethane and 1,2 dichloropropane. For SW8270 SIM, the laboratory control sample (LCS) for batch 580-82701/2a failed the recovery criteria(high) for acenaphthylene, benzo[a]pyrene, benzo[b]flouranthrene, chrysene, and indeno[1,2,3-cd]pyrene.

MS/MSD of sample 11FTR271B-11A (580-25095-4) percent recoveries were outside advisory QC limits for chromium, mercury, phenanthrene, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fouranthracene, 2-methylnaphthalene, chrysene, 4-isopropyltoluene, chloroethane, and tetrachloroethene. RRO failed the recovery criteria in the matrix spike of sample 11FTR271B-017A in batch 580-25095-1.

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:

The RPD for 1,2 dibromo-3-chloropropane was 2.8 percent over the recommended difference between the MS and MSD sample for 11FTR271B-11AMSD (580-25095-4) in batch 580-82788.

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

Comments:

For SW8260, the laboratory control sample (LCS) for batch 580-82748 exceeded the upper control limit for chloroethane and 1,2 dichloropropane. These analytes were biased high and were not detected in the associated samples. As such, no samples are affected.

For SW8270 SIM, the laboratory control sample (LCS) for batch 580-82701/2a failed the recovery criteria(high) for acenaphthylene, benzo[a]pyrene, benzo[b]flouranthrene, chrysene, and indeno[1,2,3-cd]pyrene. These analytes were biased high in the LCS and were not detected in the associated sample 11FTR271B-10A above half the limit of quantitation.

Recovery values in the matrix spike and/or matrix spike duplicate of sample 11FTR271B-11A were outside advisory QC limits for the analytes chromium, mercury, and 4-isobutyltoluene with low recovery while phenanthrene, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fouranthracene, 2-methylnaphthalene, chrysene, chloroethane, and tetrachloroethene had high recoveries. Matrix interference is indicated due to acceptable LCS/LCSD for most analytes while those with LCS recoveries biased high as well, there were no associated detections.

The RPD for 1,2 dibromo-3-chloropropane is outside of acceptable limits. Sample 11FTR271B-11 is affected.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
☒Yes ☐No ☐NA (Please explain.) Comments:

For SW8270 SIM, the laboratory control sample (LCS) for batch 580-82701/2a failed the recovery criteria(high) for acenaphthylene, benzo[a]pyrene, benzo[b]flouranthrene, chrysene, and indeno[1,2,3-cd]pyrene. These analytes were biased high in the LCS and reaults associated with 11FTR271B-10A were qualifired "QH" for quality control failure estimated value biased high. Chromium, mercury, and 4-isobutyltoluene results for samples associated with 11FTR27CA-04A had percent recoveries on the MS/MSD that were below limits and are qualified "ML". These analyte results are considered an estimated value biased low due to matrix interference.
The RPD for 1,2 dibromo-3-chloropropane is outside of acceptable limits and the associated result has been flagged "M" for estimated value due to matrix interference.

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

Data is usable as qualified. All affected data reported were well below ADEC limits.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒Yes ☐No ☐NA (Please explain.) Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
☐Yes ☒No ☐NA (Please explain.) Comments:

Surrogate recovery for toluene-d8 was below QC limits for sample 11FTR271B-10A (580-25095-6).

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:

Associated result was non detect for toluene-d8. The laboratory has qualified affected data associated with this QC failure wth a "J" and should be considered an estimated value. All other surrogate recoveries associated with SW8260 were within QC limits. As such, data usability is not impacted.

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

Data is usable as qualified. All affected data reported were well below ADEC limits.

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

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)
☒Yes ☐No ☐NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)
☒Yes ☐No ☐NA (Please explain.) Comments:

iii. All results less than PQL?
☒Yes ☐No ☐NA (Please explain.) Comments:

Gasoline range organics (GRO), 2-butanone, acetone, and methylene chloride were detected in the trip blank at levels that were above the detection limit but below ½ the limit of quantitation. Gasoline range organics (GRO), 2-butanone, and methylene chloride were found to be due to method blank contamination.

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

Samples 11FTR271B-10A, 11A, and 16A are affected. Detections found of acetone that were found to be less than 10 times the blank concentration are to be considered biased high, and have been flagged "B".

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

Data is usable as qualified. All affected data reported were well below ADEC limits.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
☒Yes ☐No ☐NA (Please explain.) Comments:

Sample 11FTR271B-17A is the duplicate of 11FTR271B-16A.

ii. Submitted blind to lab?

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

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

RPD (%) = 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 RPDs for GRO, DRO, RRO, arsenic, barium, cadmium, chromium, and lead were high (greater than 50%) in duplicate pair -016A/-17A because low concentrations were detected in one-half of the duplicate pair, but not the other, likely due to heterogeneity of the sample.

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

Comments:

Data quality/usability not affected.

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

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

i. All results less than PQL?

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

ii. If above PQL, what samples are affected?

Comments:

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

Comments:

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
   a. Defined and appropriate?

The continueing calibration verification for analytical batch 580-82741 was above the upper control limit for chloroethane. The samples associated with this CCV were non-detect for the affected analyte, and have been qualified "Q".

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