May 10, 2007

Mr. Kurt Steinert
Municipality of Anchorage
Department of Project Management and Engineering
4700 South Bragaw St., 2nd Floor
Anchorage, Alaska 99508

Re: Remedial Action Report for AFD Station Number 4
Anchorage, Alaska
ADEC RecKey No. 19942100024503,
ADEC Event No. 00407
8397-13

Dear Mr. Steinert:

This letter presents a summary of the work performed, observations, and laboratory results of the remedial action work conducted at the Municipality of Anchorage Fire Department Station No. 4 (AFD-4) located at 4350 MacInnes Street in Anchorage, Alaska (Figure 1). The work conducted in general accordance with our December 2007 Remedial Action Plan (RAP) that was approved by the Alaska Department of Environmental Conservation (ADEC) in a letter dated December 6, 2007. The purpose of the remedial action was to address potential vapor intrusion from contaminated soil, groundwater, and free-phase hydrocarbons into a future addition to the AFD-4 structure being constructed at the site. The contamination is related to underground storage tanks (USTs) removed form the site in 1994. The ADEC RecKey Number for the site is 19942100024503, and the ADEC Event Number is 00407.

INTRODUCTION

At this time the AFD-4 fire station structure is being expanded such that an apparatus bay will be located above the former UST excavation area (Figure 2). A dormitory area will be located north of the apparatus bays. The primary exposure pathway of concern at the site is upward migration of fuel vapors from the free-phase hydrocarbons and contaminated soil and groundwater from the subsurface into the building.

PROJECT BACKGROUND

Past Activities

The address of Fire Station No. 4 (FS-4) is 4350 MacInnes Street, Anchorage, Alaska. The station is situated at the corner of Tudor Road and MacInnes Street (Figure 1). The legal description of the property is Lot 1, Herring Subdivision, and it is located in the SE 1/4 of Section 29, T13N, R3W, Seward Meridian. In June 1994, one, 500-gallon diesel UST (No. 1336*1) and one, 1,000-gallon gasoline UST (No. 1336*2) were removed from the site. In the samples collected from the excavation, gasoline-range organics (GRO) were detected as high as 10,000 milligrams per kilogram (mg/kg), diesel-range organics (DRO) as high as 8,500 mg/kg, and benzene and total benzene, toluene, ethylbenzene, and xylenes (BTEX) as high as 16 mg/kg and 2,416 mg/kg, respectively (Hart Crowser 1994a). The soils within the excavation (and the subsequent backfill material) consisted of primarily sands and gravels. The walls of the excavation appeared to be silty sand to sandy silt. Impacted soils remained on the south wall of the excavation but could not be excavated without compromising the integrity of the northeast corner of the building.

In July 1994, Hart Crowser performed a remedial investigation at the site. Monitoring wells MW-1 through MW-4 were installed at the site (Figure 2). In MW-2 through MW-4, the boring soils consisted of fill underlain by silty sands. In MW-1, located within the former excavation, up to 1.85 feet of free-phase hydrocarbons were measured. No, or only very low, detections of BTEX, GRO, and DRO were identified in the groundwater samples collected from MW-2 through MW-4. Groundwater flow was determined to range from the north-northeast to the northeast (Hart Crowser 1994b).

In October 1994, a Corrective Action Plan (CAP) was prepared for the site that included installation of recovery wells and free-phase hydrocarbons recovery using passive skimmers. The plan also addressed periodic (quarterly) groundwater monitoring and the findings of a 180-degree, half-mile radius well search that was conducted to the north of the station. The search showed that there were no drinking water wells of concern in this area (Hart Crowser 1994c).

From approximately 1994 through 1997, groundwater monitoring continued to show a groundwater flow to the north-northeast to northeast and no migration of groundwater contaminants away from the former excavation area. Approximately 27 gallons of free-phase hydrocarbons were recovered in that time. Groundwater monitoring continued through October 1998. At that time, 0.75 feet of free-phase hydrocarbons was observed in MW-1 (Hart Crowser, 1998).

Between 1998 and 2004, no groundwater sampling was performed. In May 2004 the site monitoring wells were sampled. A free-phase hydrocarbons thickness of 0.07 feet was measured in MW-1. No petroleum contaminants were detected in monitoring wells MW-2 through MW-4.

In September 2006 the site wells were measured (except MW-3 that was under a large puddle) and MW-2 was sampled. No petroleum contaminants were detected in MW-2. No measurable free-phase hydrocarbons were measured in MW-1. MW-1 was sampled in October 2006; a very heavy sheen was noted on the purge water from this well. All BTEX, GRO, and DRO concentrations in the sample from this well were above the ADEC groundwater cleanup levels (18 AAC 75.345). Due to the contaminant levels in MW-1 and the very heavy sheen observed during purging, it was concluded that some free-phase hydrocarbons likely remain in former excavation area. It is assumed that the above average rainfall in August 2006 caused the groundwater table to rapidly rise resulting in a thinning of the free-phase hydrocarbons thickness within MW-1 (Hart Crowser, 2006).

REMEDIAL ACTION OBJECTIVES

The goal of this remedial action is to minimize potential upward migration of petroleum contaminants within the former UST excavation into the new AFD-4 building. Therefore the remedial action objectives are as follows:

- Reduce the potential for the upward migration of petroleum vapors into the new building extension from the residual free-phase hydrocarbons and soil/groundwater petroleum contaminants related to the former USTs.

- Abandon all site monitoring and recovery wells.

WORK PERFOMED

The following sections outline the work that was conducted on the site on April 30, May 1, and May 9, 2007 to accomplish the remedial objectives. All work was conducted in accordance with 18 AAC 75 and 18 AAC 78. A qualified person, as defined in 18 AAC 75, conducted all fieldwork. Field procedures are provided in Attachment 1.

Soil Excavation and Free-phase Hydrocarbons Removal

The soil in the area of MW-1, RW-1, and RW-2 was excavated to expose the groundwater and free-phase hydrocarbons located with in the former UST excavation. MW-1, RW-1, and RW-2 were

removed during this process. Using a calibrated photoionization detector (PID), excavated soil was segregated during excavation. Soil samples were taken from the backhoe bucket and placed in a Zip-lock-style plastic bag. Soil with PID readings less than 15 parts per million, volumetric (ppmV) were placed into a clean stockpile for reuse in the excavation. Soils with PID readings greater than 15 mg/kg were placed on a liner. Due to weight restrictions for trucking, these soils will be transported in trucks to Alaska Soil Recycling (ASR) for thermal remediation as soon as road restrictions are lifted.

Sufficient soil was removed to allow an opening with a depth of several feet into the groundwater. Fill materials were observed to a depth of 7.5 feet bgs, and then gray sandy silt was present to the total depth of the excavation (12 feet bgs). At 7.5 feet bgs, PID readings were below 15 ppmV. At 8.5 feet bgs, PID readings increased to between 200 ppmV and 580 ppmV. At 8.5 feet bgs, one soil sample was collected from the smear zone for laboratory analysis to assess the soil for concentrations of BTEX, GRO, and DRO. This result will be provided to Alaska Soil Recycling (ASR) to allow for their calculation of sufficient thermal remediation time for the soil in their kiln.

The approximate depth to groundwater, as measured in MW-1 prior to excavation, was 8.5 feet below ground surface (bgs). When the excavation was completed at bgs, the dimensions were 34 feet long by 18 feet wide by 12 feet deep (Figure 3 Photograph A2-1). Approximately 275 cubic yards (cy) were removed from the excavation of which 45 cy were placed on the containment liner and covered.

Water and free-phase hydrocarbons were observed to be entering the excavation very slowly, therefore and additional “sump” was dug on the east end of the excavation to a depth of 14 feet bgs. While waiting for water to enter the excavation, six soil samples were collected from the sidewalls at 8 to 8.5 feet bgs for laboratory analysis of BTEX, GRO, and DRO to assess remaining hydrocarbon levels in the excavation. The water was then allowed to accumulate overnight.

On May 1, 2007, 250 gallons of free-phase hydrocarbons and groundwater emulsion were pumped into an on-site storage tank (Photograph A2-2). The excavation was allowed to sit an additional hour and another 25 gallons was then pumped into the tank. Emerald Services subsequently pumped this tank out for disposal.

After completion of pumping, 100 pounds of Oxygen Releasing Compound Advanced® (ORC-A) was placed into the groundwater within the excavation (Photograph A2-3). After backfilling with clean soils to just above the groundwater interface, an additional 50 pounds of ORC-A was placed in the smear zone prior to backfilling. The remainder of the excavation was then backfilled with clean soils and the area graded and compacted as required by the construction plans for this area.

Laboratory Methods

All soil samples submitted to Test America Laboratory (TAL) were analyzed by the following methods:

- BTEX by Environmental Protection Agency [EPA] Method 8021B,
- GRO by Alaska Method (AK) 101; and
- DRO by Alaska Method AK.

Well Abandonment

As stated above, MW-1, RW-1, and RW-2 were removed during excavation of the former UST area. MW-3a was located beneath the future building extension footprint (Figure 2). It was decommissioned on April 30, 2007. Using a backhoe, the well monument was removed followed by pulling of the screen and casing from the subsurface (Photograph A2-4). Following removal of the casing and screen, bentonite chips were poured into the remaining void space to within 1 foot of the surface and hydrated with approximately 10 gallons of water.

On May 9, 2007, MW-2 and MW-4 were decommissioned as described for MW-3a above. Photographs A2-5 through A2-8 document decommissioning activities for these wells.

LABORATORY RESULTS

Table 1 presents the results of soil sampling at the site. Laboratory reports are provided in Attachment 3 along with and ADEC Data Review Checklist. In the sample collected from the smear zone, BTEX and GRO were detected but below ADEC soil cleanup levels (18 AAC 75.341, Table B1and B2, under 40-inch rainfall zone, migration to groundwater criteria). DRO was detected at 7,160 mg/kg (ADEC cleanup level 250 mg/kg).

No BTEX compounds or GRO were detected in the excavation samples that exceed ADEC soil cleanup levels except for the ethylbenzene concentration in sample S5-SW. Likewise the only location where DRO exceeded the soil cleanup level was at sample location S5-SW where the DRO concentration was 2,350 mg/kg. Sample location S5-SW is underneath the building foundation (Figure 3) where no further soil could be removed.

DISCUSSION

Soil sampling showed that the excavation was cleaned except under the building foundation (sample location S5-SW). The volume of impacted soil remaining is likely small, and the primary contaminant is DRO, and all levels are below inhalation criteria levels.

A 15-ml vapor barrier will be placed beneath the foundation for apparatus bay section of the new building to minimize or eliminate upward migration of petroleum vapors from residual hydrocarbons that may remain in the subsurface. This barrier will be sealed to the current building's north wall footer (south wall of the new apparatus bay). On the west side of the new extension (beyond the current west wall), the 15-mil barrier it will be taped to the 6-mil vapor barrier specified for that area. Air-scrubbers are to be installed in the apparatus bays to further enhance air quality in the interior of the building. These will aid in mitigating any petroleum vapors that may migrate into the apparatus bay from residual subsurface contamination.

Observations suggest that the free-phase hydrocarbons on the groundwater at the site have been removed. The ORC-A placed in the groundwater and smear zone should further reduce dissolved phase and soil petroleum contaminant levels in that area.

The result of the smear zone sample collected in the excavation will be provided to Alaska Soil Recycling (ASR) to allow them to asses proper burning time for thermal desorption of the impacted soil at the site.

LIMITATIONS

All ADEC soil and groundwater cleanup levels included in this report are based on our estimate of site characteristics using the ADEC Soil and Other Hazardous Substances Pollution Control (18 AAC 75), dated December 30, 2006. These cleanup levels do not represent ADEC interpretations and are presented only for comparison with your results. By using them, we are not implying that remedial actions at this site are required by ADEC. Specific ADEC interpretations may involve consideration of other factors upon which a range of cleanup standards may be established.

We trust this report meets your needs. If we may provide additional information or clarification please call us at 276-7475.

Sincerely,

HART CROWSER, INC.

HERMINIO R. MUNIZ, R.P.G.
Sr. Associate Hydrogeologist

BRUCE A REAM, R.P.A.
Manager, Alaska Operations

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REFERENCES

Hart Crowser, 1994a. *Fire Station No. 4 Gasoline and Diesel UST Closure, ADEC Facility No. 1336.* July 14, 1994.

Hart Crowser, 1994b. *Remedial Site Investigation Fire Station No. 4, Anchorage, Alaska.* September, 1994.

Hart Crowser, 1994c. *Corrective Action Plan for Hydrocarbon Impacted Soils and Groundwater Fire Station No. 4, Anchorage, Alaska, ADEC Facility No. 1336.* October 14, 1994.

Hart Crowser, 1998. *Groundwater Monitoring Anchorage Fire Department Station No. 4, ADEC Release No. 94-2-1-00-245-03.* November 23, 1998.

Hart Crowser, 2006. *Groundwater Monitoring Anchorage Fire Department Station No. 4, ADEC Release No. 94-2-1-00-245-03.* November 22, 2006.

Table 1 - Excavation Soil Analytical Results
Anchorage Fire Department Station No. 4
Anchorage, Alaska

Sample Name	Location	EPA Method 8021b				GRO Alaska Method AK 101	DRO Alaska Method AK 102
		Benzene in mg/kg	Toluene in mg/kg	Ethyl-benzene in mg/kg	Total Xylenes in mg/kg	in mg/kg	in mg/kg
EX-1	Smear Zone	0.014 U	0.038 U	3.33	18.3	144	**7160 J**
Dupe	Field Duplicate	0.015 U	0.206	3.09	14.0	132	**3940 J**
S1-W	West End Wall	0.018 J	0.034 U	0.502	2.10	82.2	96.9 J
S2-SW	Southwest Wall	0.016 U	1.06	**7.49**	54.8	297	**2350 J**
S3-NW	Northwest Wall	0.019 U	0.037 U	0.099	0.596	14.1	224 J
S4-NE	Northeast Wall	0.018 U	0.036 U	0.036 U	0.053 U	3.56 U	20 U
S5-E	East Wall	0.015 U	0.029 U	0.385	2.06	18.5	31 J
S6-SE	Southeast Wall	0.014 U	0.029 U	0.054	0.122	3.83	23.4 J
Trip Blank		0.016 U	0.033 U	0.033 U	0.050 U	3.33 U	-------
ADEC Migration to Groundwater Cleanup Level in mg/kg [1]		*0.020*	*5.4*	*5.5*	*78*	*300*	*250*
ADEC Inhalation Cleanup Level in mg/kg [1]		*9.0*	*180.0*	*89.0*	*81*	*1400*	*12,500*

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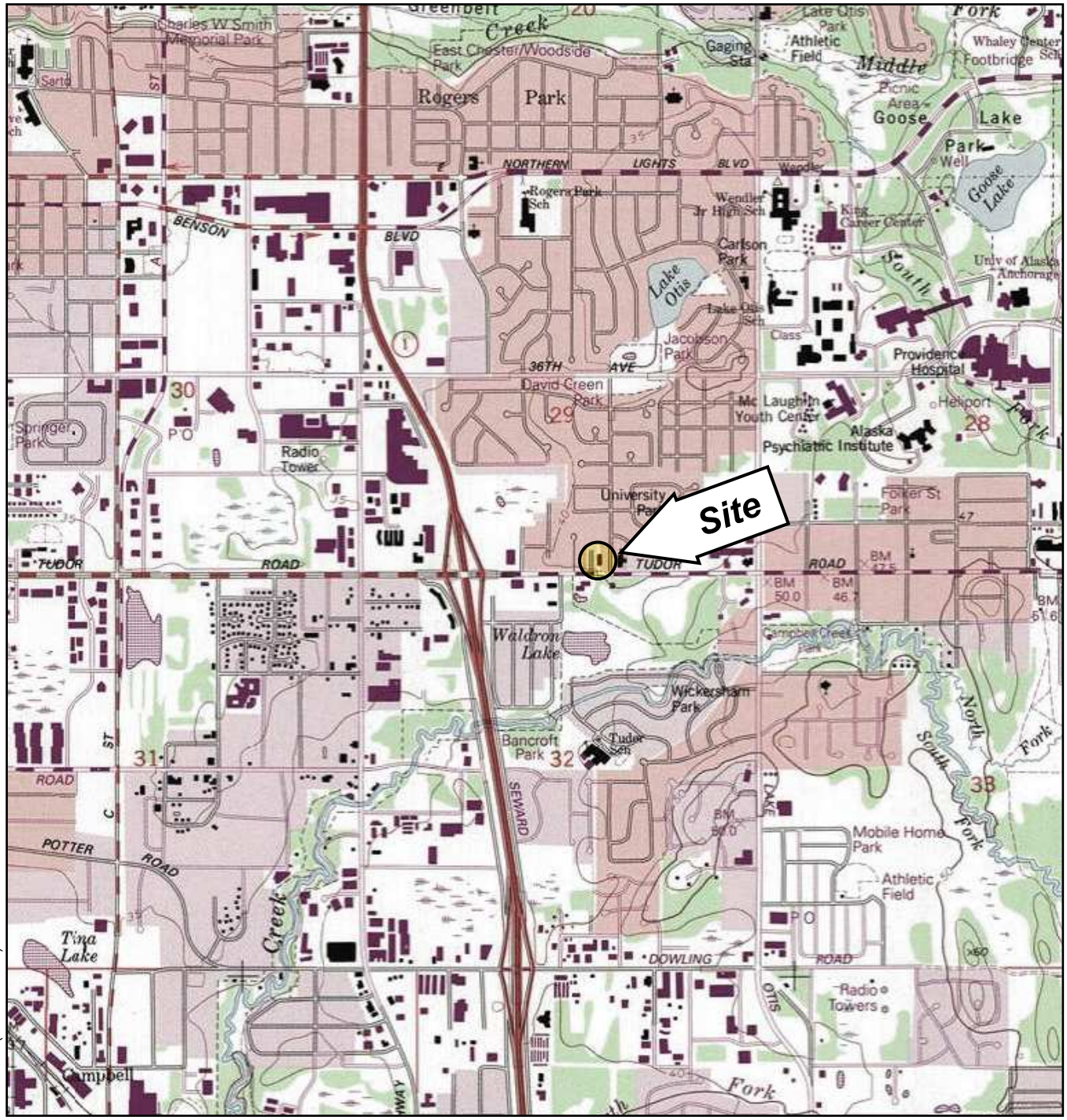
Notes:
Results may be rounded
[1] Soil cleanup levels per 18 AAC 75.341, Tables B1 and B2, under 40-inch rainfall zone.
Bolded results above soil cleanup level.
ADEC - Alaska Department of Environmental Conservation.
EPA - U.S. Environmental Protection Agency.
J - Estimated value.
mg/kg - Milligrams per kilogram.
U - Below detection limit at concentration shown.

Site Location Map
AFD-4
Anchorage, Alaska



8397I3 01 (Site Location).cdr

Source: USGS 7.5-minute quadrangle.

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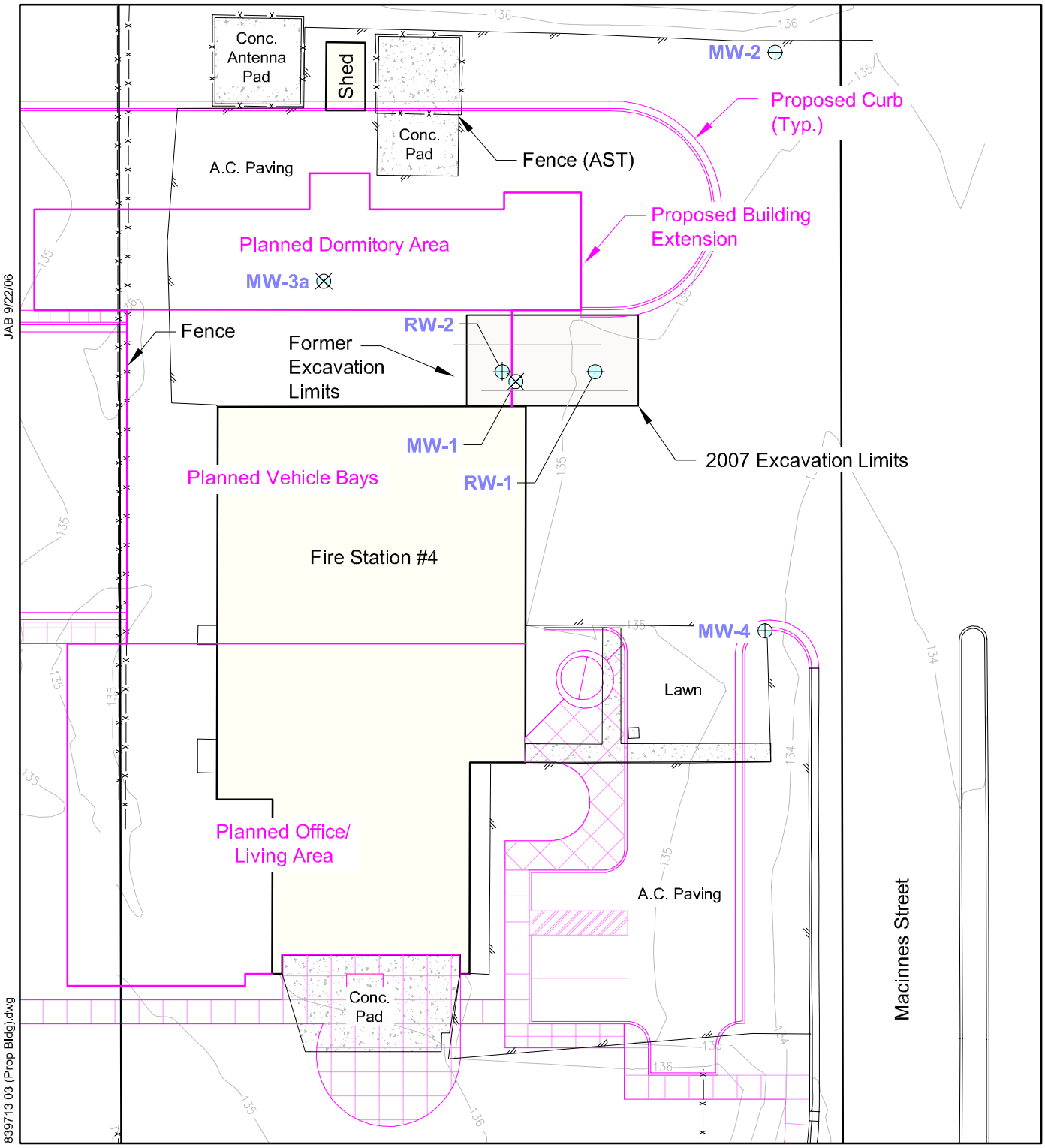
Figure 1

Site Plan with Building Extension Detail
AFD-4
Anchorage, Alsaka



0 30 60

Scale in Feet

MW-3a ⊠ Former Monitoring Well Location and Number (Decommissioned on 4/30/07)

RW-2 ⊕ Former Recovery Well Location and Number (Decommissioned on 4/30/07)

MW-2 ⊕ Former Monitoring Well Location and Number (Decommissioned on 5/9/07)

N

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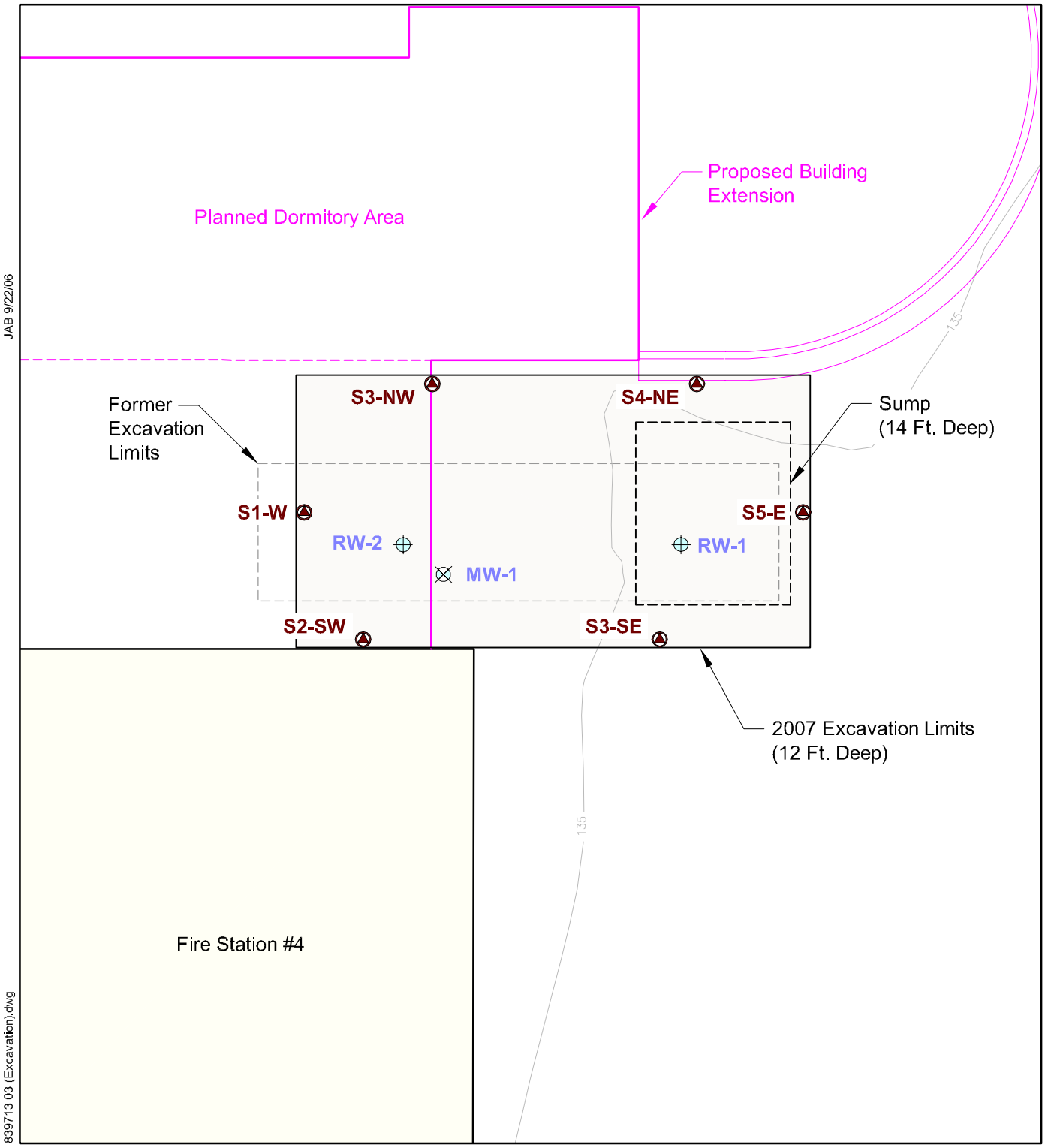
Figure 2

Excavation with Sample Locations
AFD-4
Anchorage, Alsaka



MW-1 ⊠ Former Monitoring Well Location and Number

RW-2 ⊕ Former Recovery Well Location and Number

S1-W ▲ Laboratory Soil Sample Location and Number; all samples collected from 8 to 8.5 Feet

N

0 10 20

Scale in Feet

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Figure 3

ATTACHMENT 1
FIELD METHODS

ATTACHMENT 1
FIELD METHODS

All fieldwork was conducted, and all field and laboratory quality assurance for this project were performed in accordance with sample collection procedures contained in Title 18 of the Alaska Administrative Code, Chapter 75 (18 AAC 75), *Oil and Other Hazardous Substances Pollution Control*, dated December 30, 2006, and 18 AAC 78, *Underground Storage Tanks*, dated January 30, 2003. All work was conducted by qualified field scientists as defined in 18 AAC 75

Soil Sampling

Soil samples for laboratory or field screening were hand-collected using a disposable, single-use sampling scoop from the backhoe bucket. Recovered soil samples were field classified and placed in appropriate sample containers for field screening or laboratory analyses. Immediately after collection, soil for laboratory analyses of benzene, toluene, ethylbenzene, xylenes (BTEX), and gasoline-range organics (GRO) were placed in pre-weighed sample jars and field preserved with methanol, in accordance with the method procedures. The remaining sample jars (for diesel-range organics [DRO] analysis) were then filled. One duplicate sample was collected. All laboratory samples were labeled and placed in a cooler with "blue-ice" for storage until delivery to the laboratory under standard chain-of-custody procedures. A methanol trip blank accompanied the cooler containing samples to be analyzed for BTEX and GRO.

Field Screening

Photoionization Detector (PID)

Soil samples were placed in 1-quart self-sealing plastic bags and screened in the field for concentrations of volatile organics using a PID equipped with a 10.0 electronic volt (eV) lamp. Samples were warmed to approximately 65 degrees Fahrenheit (°F), for a minimum of 15 minutes prior to screening. The headspace vapors within the sample bag were then measured.

Field Documentation Procedures

The Hart Crowser field representative maintained a record of field activities in a on standard field report forms (chain-of-custody forms). All field report forms were dated and signed. Activities and observations noted on the field reports logbook included weather, excavation observations, PID readings, etc. Representative photographs were taken to maintain a visual record of sampling locations and field activities.

Decontamination Procedures

Excavation equipment was cleaned with a pressure wash steam cleaner prior to mobilization to the site.

Investigation-Derived Wastes (IDW)

IDW are wastes generated during field investigations. The IDW from the soils excavation activities consisted of the following waste streams:

- Personal protective equipment (PPE); and
- General debris.

PPE and debris were placed in plastic bags and disposed of at an on-site dumpster.

ATTACHMENT 2
SITE PHOTOGRAPHS

Photograph A2-1: Final excavation on 5/1/07 with groundwater and free-phase hydrocarbons prior to pumping

Photograph A2-2: Pumping hydrocarbon and groundwater emulsion.

Photograph A2-3: Placing ORC-A in excavation.

Photograph A2-2: Removal of casing and screen from MW-3a.

Photograph A2-5: Removal of casing and screen from MW-2.

Photograph A2-6: Placing bentonite chips in hole, MW-2.

Photograph A2-7: Removal of casing and screen from MW-4.

Photograph A2-8: Placing bentonite chips in hole, MW-4.

ATTACHMENT 3
DATA QUALITY REVIEW AND LABORATORY REPORTS

ATTACHMENT 3
DATA QUALITY REVIEW AND LABORATORY REPORTS

DATA QUALITY REVIEW

The analytical data provided by TestAmerica, Inc. (TA), for soil samples collected at Former Anchorage Fire Department Station Number 4 (AFD-4), Anchorage, Alaska, was reviewed for quality. Based on the review, the analytical data is of sufficient quality for the purposes of this project. All data quality assurance/quality control data provided by TA for the soil samples collected at AFD No. 4, Anchorage, Alaska, meet the data quality objectives site forth in 18 AAC 75 and 18 AAC 78. The data is accepted for the purposes of this report.

The data review procedures, calculations, and qualifications used for this project are based on the Alaska Department of Environmental Conservation (ADEC) guidance document *Technical Memorandum – 06-002 Environmental Laboratory Data and Quality Assurance Requirements* (dated October 9, 2006). The data were found to be complete with the precision and accuracy determined to be acceptable as qualified.

Analytical results summarizing the analysis of soil samples collected from the AFD-4 site were submitted in TA Work Order AQE0008. Samples consisting of soil were collected and analyzed in accordance with Environmental Protection Agency (EPA) methods found in SW846 (Revision 5, dated January 1998).

LABORATORY DATA REVIEW CHECKLIST

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
      ■ Yes ☐ No 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 Comments: N/A

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ■ Yes ☐ No Comments:

   b. Correct analyses requested?
      ■ Yes ☐ No Comments:

3. Laboratory Sample receipt documentation
    a. Sample/cooler temperature documented and within range at receipt ($4^{o} \pm 2^{o}$ C)?
    ☐ Yes ■ No Comments: Samples were received at a temperature of 0.9 ^{o}C, which is below the recommended temperature range.

    b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?
    ■ Yes ☐ No Comments:

    c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
    ■ Yes ☐ No Comments:

    d. If there were any discrepancies, were they documented? – For example, incorrect sample containers/preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?
    ■ Yes ☐ No Comments:

    e. Data quality or usability affected? Explain: None of the sample containers were compromised by the low temperature, and thus qualification of the data is not necessary.

4. Case Narrative
    a. Present and understandable?
    ■ Yes ☐ No Comments:

    b. Discrepancies, errors or QC failures identified by the lab?
    ☐ Yes ☐ No Comments: It was noted on Work Order AQA0031 that the duplicate RPD calculation for the laboratory duplicate sample for DRO does not provide useful information due to the low levels of analyte in the sample.

    c. Were all corrective actions documented?
    ■ Yes ☐ No Comments:

    d. What is the effect on data quality/usability according to the case narrative? There is no effect on data quality or usability according to the case narrative.

5. Sample Results
    a. Correct analyses performed/reported as requested on COC?
    ■ Yes ☐ No Comments:

    b. All applicable holding times met?
    ■ Yes ☐ No Comments:

    c. All soils reported on a dry weight basis?

■ Yes ☐ No Comments:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?
■ Yes ☐ No Comments:

e. Data quality or usability affected? Explain: N/A

6. QC Samples
   a. Method Blank
      i. One method blank reported per matrix, analysis and 20 samples?
      ■ Yes ☐ No Comments:

      ii. All method blank results less than PQL?
      ■ Yes ☐ No Comments:

      iii. If above PQL, what samples are affected? N/A

      iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
      ☐ Yes ☐ No Comments: N/A

      v. Data quality or usability affected? Explain: N/A

   b. Laboratory Control Sample/Duplicate (LCS/LCSD)
      i. Organics - One LCS/LCSD reported per matrix, analysis and 20 samples?
      ■ Yes ☐ No Comments:

      ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples?
      ☐ Yes ☐ No Comments: N/A

      iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? Or project specified DQOs? (AK Petroleum methods 75-125 %R; all other analyses see the laboratory QC pages)
      ■ Yes ☐ No Comments:

      iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? Or project specified DQOs? (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
      ■ Yes ☐ No Comments:

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

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

☐ Yes ☐ No Comments: N/A

vii. Data quality or usability affected? Explain: N/A

c. Surrogates – Organics only

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

■ Yes ☐ No Comments:

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

☐ Yes ■ No Comments: The sample EX-1 required dilution for DRO analysis due to the nature of the sample matrix. Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation did not provide useful information.

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

■ Yes ☐ No Comments: The sample was flagged "J" to indicate that the value is estimated.

iv. Data quality or usability affected? Explain: The data quality and usability were not affected by the failed surrogate recovery.

d. Trip Blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): water and soil

i. One trip blank reported per matrix, analysis and cooler?

■ Yes ☐ No Comments:

ii. All results less than PQL?

■ Yes ☐ No Comments:

iii. If above PQL, what samples are affected? N/A

iv. Data quality or usability affected? Explain: N/A

e. Field Duplicate

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

■ Yes ☐ No Comments:

ii. Submitted blind to lab?

■ Yes ☐ No Comments:

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

☐ Yes ■ No Comments: The RPD for the parent sample (EX-1) and it's duplicate sample (DUPE) was 58% for DRO analysis, which is above the acceptable limit for soil samples.

iv. Data quality or usability affected? Explain: All reported concentrations for DRO were flagged "J" to indicate estimated values.

f. Decontamination or Equipment Blank (if applicable)

☐ Yes ☐ No ■ Not Applicable

i. All results less than PQL?

☐ Yes ☐ No Comments: N/A

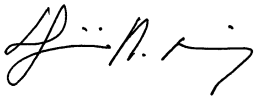
ii. If above PQL, what samples are affected? N/A

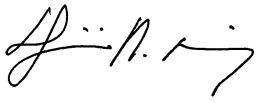
iii. Data quality or usability affected? Explain: N/A

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

a. Defined and appropriate

■ Yes ☐ No Comments: RPDs for the laboratory matrix spike duplicate sample for total xylenes and the laboratory duplicate sample for DRO were noted by the laboratory as exceeding the acceptance limit and as not providing useful information. Several of the project samples required dilution for analysis and this was noted in the case narrative. The RPD between the primary and confirmatory analysis for benzene for sample S1-W exceeded 40%. Per method 8000B, the lower value was reported by the laboratory due to apparent chromatographic problems. The benzene result for this sample was flagged "J" to indicate that the value is an estimate.

Project Manager:  Date: 5/10/07

Supervisor:  Date: 5/10/07

TestAmerica
ANALYTICAL TESTING CORPORATION

ANCHORAGE, AK 2000 W INTERNATIONAL AIRPORT ROAD, SUITE A-10
ANCHORAGE, AK 99502-1119
ph: (907) 563.9200 fax: (907) 563.9210

May 08, 2007

Nino Muniz
Hart Crowser, Inc.
2600 Cordova, Suite 210
Anchorage, AK/USA 99503

RE: AFD#4

Enclosed are the results of analyses for samples received by the laboratory on 05/01/07 12:40. The following list is a summary of the Work Orders contained in this report, generated on 05/08/07 16:22.

If you have any questions concerning this report, please feel free to contact me.

Work Order	Project	ProjectNumber
AQE0008	AFD#4	8397-13

Rachel J James For Troy J. Engstrom, Manager

TestAmerica
ANALYTICAL TESTING CORPORATION

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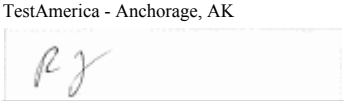
Hart Crowser, Inc.	Project Name:	**AFD#4**	
2600 Cordova, Suite 210	Project Number:	8397-13	Report Created:
Anchorage, AK/USA 99503	Project Manager:	Nino Muniz	05/08/07 16:22

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S1-W	AQE0008-01	Soil	04/30/07 14:30	05/01/07 12:40
S2-SW	AQE0008-02	Soil	04/30/07 14:35	05/01/07 12:40
S3-NW	AQE0008-03	Soil	04/30/07 14:40	05/01/07 12:40
S4-NE	AQE0008-04	Soil	04/30/07 15:00	05/01/07 12:40
S5-E	AQE0008-05	Soil	04/30/07 15:10	05/01/07 12:40
S6-SE	AQE0008-06	Soil	04/30/07 15:20	05/01/07 12:40
EX-1	AQE0008-07	Soil	04/30/07 13:30	05/01/07 12:40
Dupe	AQE0008-08	Soil	04/30/07 00:00	05/01/07 12:40
Trip Blank	AQE0008-09	Soil	04/30/07 00:00	05/01/07 12:40



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Hart Crowser, Inc.	Project Name: **AFD#4**	
2600 Cordova, Suite 210	Project Number: 8397-13	Report Created:
Anchorage, AK/USA 99503	Project Manager: Nino Muniz	05/08/07 16:22

Gasoline Range Organics (C6-C10) and BTEX per AK101

TestAmerica - Anchorage, AK

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
AQE0008-01 (S1-W)		**Soil**			**Sampled: 04/30/07 14:30**					
Gasoline Range Organics	AK101 GRO/BTEX	**82.2**	-----	3.43	mg/kg dry	2.25x	7050021	05/07/07 09:38	05/08/07 00:54	
Benzene	"	**0.0177**	-----	0.0172	"	"	"	"	"	**R10**
Toluene	"	ND	-----	0.0343	"	"	"	"	"	
Ethylbenzene	"	**0.502**	-----	0.0343	"	"	"	"	"	
Xylenes (total)	"	**2.10**	-----	0.0515	"	"	"	"	"	
Surrogate(s): a,a,a-TFT (FID)			*112%*		*50 - 150 %*	"			"	
a,a,a-TFT (PID)			*70.3%*		*50 - 150 %*	"			"	
AQE0008-02 (S2-SW)		**Soil**			**Sampled: 04/30/07 14:35**					
Benzene	AK101 GRO/BTEX	ND	-----	0.0156	mg/kg dry	2.25x	7050016	05/04/07 08:29	05/05/07 02:20	
Surrogate(s): a,a,a-TFT (PID)			*97.3%*		*50 - 150 %*	"			"	
AQE0008-02RE1 (S2-SW)		**Soil**			**Sampled: 04/30/07 14:35**					**RL7**
Gasoline Range Organics	AK101 GRO/BTEX	**297**	-----	41.6	mg/kg dry	30x	7050021	05/07/07 09:38	05/07/07 22:41	
Toluene	"	**1.06**	-----	0.416	"	"	"	"	"	
Ethylbenzene	"	**7.49**	-----	0.416	"	"	"	"	"	
Xylenes (total)	"	**54.8**	-----	0.624	"	"	"	"	"	
Surrogate(s): a,a,a-TFT (FID)			*128%*		*50 - 150 %*	"			"	
a,a,a-TFT (PID)			*76.9%*		*50 - 150 %*	"			"	
AQE0008-03 (S3-NW)		**Soil**			**Sampled: 04/30/07 14:40**					
Gasoline Range Organics	AK101 GRO/BTEX	**14.1**	-----	3.72	mg/kg dry	2.25x	7050021	05/07/07 09:38	05/07/07 23:48	
Benzene	"	ND	-----	0.0186	"	"	"	"	"	
Toluene	"	ND	-----	0.0372	"	"	"	"	"	
Ethylbenzene	"	**0.0994**	-----	0.0372	"	"	"	"	"	
Xylenes (total)	"	**0.596**	-----	0.0559	"	"	"	"	"	
Surrogate(s): a,a,a-TFT (FID)			*71.3%*		*50 - 150 %*	"			"	
a,a,a-TFT (PID)			*50.8%*		*50 - 150 %*	"			"	
AQE0008-04RE1 (S4-NE)		**Soil**			**Sampled: 04/30/07 15:00**					
Gasoline Range Organics	AK101 GRO/BTEX	ND	-----	3.56	mg/kg dry	1.5x	7050021	05/07/07 09:38	05/08/07 05:19	
Benzene	"	ND	-----	0.0178	"	"	"	"	"	
Toluene	"	ND	-----	0.0356	"	"	"	"	"	
Ethylbenzene	"	ND	-----	0.0356	"	"	"	"	"	
Xylenes (total)	"	ND	-----	0.0534	"	"	"	"	"	

TestAmerica - Anchorage, AK

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Hart Crowser, Inc.	Project Name: **AFD#4**	
2600 Cordova, Suite 210	Project Number: 8397-13	Report Created:
Anchorage, AK/USA 99503	Project Manager: Nino Muniz	05/08/07 16:22

Gasoline Range Organics (C6-C10) and BTEX per AK101

TestAmerica - Anchorage, AK

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
AQE0008-04RE1 (S4-NE)		**Soil**			**Sampled: 04/30/07 15:00**					
Surrogate(s): a,a,a-TFT (FID)			*70.2%*		*50 - 150 %*	*1.5x*			*05/08/07 05:19*	
a,a,a-TFT (PID)			*53.0%*		*50 - 150 %*	"			"	
AQE0008-05 (S5-E)		**Soil**			**Sampled: 04/30/07 15:10**					
Gasoline Range Organics	AK101 GRO/BTEX	**18.5**	-----	2.90	mg/kg dry	1.5x	7050021	05/07/07 09:38	05/08/07 00:21	
Benzene	"	ND	-----	0.0145	"	"	"	"	"	
Toluene	"	ND	-----	0.0290	"	"	"	"	"	
Ethylbenzene	"	**0.385**	-----	0.0290	"	"	"	"	"	
Xylenes (total)	"	**2.06**	-----	0.0436	"	"	"	"	"	
Surrogate(s): a,a,a-TFT (FID)			*85.3%*		*50 - 150 %*	"			"	
a,a,a-TFT (PID)			*61.2%*		*50 - 150 %*	"			"	
AQE0008-06 (S6-SE)		**Soil**			**Sampled: 04/30/07 15:20**					
Gasoline Range Organics	AK101 GRO/BTEX	**3.83**	-----	2.85	mg/kg dry	1.5x	7050021	05/07/07 09:38	05/07/07 19:21	
Benzene	"	ND	-----	0.0143	"	"	"	"	"	
Toluene	"	ND	-----	0.0285	"	"	"	"	"	
Ethylbenzene	"	**0.0542**	-----	0.0285	"	"	"	"	"	
Xylenes (total)	"	**0.122**	-----	0.0428	"	"	"	"	"	
Surrogate(s): a,a,a-TFT (FID)			*81.5%*		*50 - 150 %*	"			"	
a,a,a-TFT (PID)			*64.2%*		*50 - 150 %*	"			"	
AQE0008-07 (EX-1)		**Soil**			**Sampled: 04/30/07 13:30**					
Benzene	AK101 GRO/BTEX	ND	-----	0.0142	mg/kg dry	2.25x	7050016	05/04/07 08:29	05/05/07 06:46	
Surrogate(s): a,a,a-TFT (PID)			*77.5%*		*50 - 150 %*	"			"	
AQE0008-07RE1 (EX-1)		**Soil**			**Sampled: 04/30/07 13:30**					
Gasoline Range Organics	AK101 GRO/BTEX	**144**	-----	37.9	mg/kg dry	30x	7050021	05/07/07 09:38	05/07/07 23:14	**RL7**
Toluene	"	ND	-----	0.379	"	"	"	"	"	
Ethylbenzene	"	**3.33**	-----	0.379	"	"	"	"	"	
Xylenes (total)	"	**18.3**	-----	0.569	"	"	"	"	"	
Surrogate(s): a,a,a-TFT (FID)			*102%*		*50 - 150 %*	"			"	
a,a,a-TFT (PID)			*60.6%*		*50 - 150 %*	"			"	

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2600 Cordova, Suite 210	Project Number:	8397-13	Report Created:
Anchorage, AK/USA 99503	Project Manager:	Nino Muniz	05/08/07 16:22

Gasoline Range Organics (C6-C10) and BTEX per AK101

TestAmerica - Anchorage, AK

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
AQE0008-08 (Dupe)		**Soil**			**Sampled: 04/30/07 00:00**					
Gasoline Range Organics	AK101 GRO/BTEX	**132**	-----	3.04	mg/kg dry	2.7x	7050021	05/07/07 09:38	05/08/07 02:00	
Benzene	"	ND	-----	0.0152	"	"	"	"	"	
Toluene	"	**0.206**	-----	0.0304	"	"	"	"	"	
Ethylbenzene	"	**3.09**	-----	0.0304	"	"	"	"	"	
Xylenes (total)	"	**14.0**	-----	0.0457	"	"	"	"	"	
Surrogate(s): a,a,a-TFT (FID)			*96.2%*		*50 - 150 %*	"			"	
a,a,a-TFT (PID)			*62.0%*		*50 - 150 %*	"			"	
AQE0008-09 (Trip Blank)		**Soil**			**Sampled: 04/30/07 00:00**					
Gasoline Range Organics	AK101 GRO/BTEX	ND	-----	3.33	mg/kg wet	1x	7050021	05/07/07 09:38	05/08/07 04:46	
Benzene	"	ND	-----	0.0166	"	"	"	"	"	
Toluene	"	ND	-----	0.0333	"	"	"	"	"	
Ethylbenzene	"	ND	-----	0.0333	"	"	"	"	"	
Xylenes (total)	"	ND	-----	0.0500	"	"	"	"	"	
Surrogate(s): a,a,a-TFT (FID)			*115%*		*50 - 150 %*	"			"	
a,a,a-TFT (PID)			*90.4%*		*50 - 150 %*	"			"	

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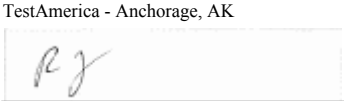

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Hart Crowser, Inc.	Project Name:	**AFD#4**	
2600 Cordova, Suite 210	Project Number:	8397-13	Report Created:
Anchorage, AK/USA 99503	Project Manager:	Nino Muniz	05/08/07 16:22

Diesel Range Organics (C10-C25) per AK102

TestAmerica - Anchorage, AK

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
AQE0008-01 (S1-W)		**Soil**			**Sampled: 04/30/07 14:30**					
Diesel Range Organics	AK 102	**96.9**	-----	20.0	mg/kg dry	1x	7050018	05/04/07 13:49	05/07/07 18:53	
Surrogate(s): 1-Chlorooctadecane			*92.8%*		*50 - 150 %*	"			"	
AQE0008-02 (S2-SW)		**Soil**			**Sampled: 04/30/07 14:35**					
Diesel Range Organics	AK 102	**2350**	-----	20.0	mg/kg dry	1x	7050018	05/04/07 13:49	05/07/07 18:53	
Surrogate(s): 1-Chlorooctadecane			*131%*		*50 - 150 %*	"			"	
AQE0008-03 (S3-NW)		**Soil**			**Sampled: 04/30/07 14:40**					
Diesel Range Organics	AK 102	**224**	-----	20.0	mg/kg dry	1x	7050018	05/04/07 13:49	05/07/07 19:25	
Surrogate(s): 1-Chlorooctadecane			*96.6%*		*50 - 150 %*	"			"	
AQE0008-04 (S4-NE)		**Soil**			**Sampled: 04/30/07 15:00**					
Diesel Range Organics	AK 102	ND	-----	20.0	mg/kg dry	1x	7050018	05/04/07 13:49	05/07/07 19:25	
Surrogate(s): 1-Chlorooctadecane			*92.9%*		*50 - 150 %*	"			"	
AQE0008-05 (S5-E)		**Soil**			**Sampled: 04/30/07 15:10**					
Diesel Range Organics	AK 102	**31.0**	-----	20.0	mg/kg dry	1x	7050018	05/04/07 13:49	05/07/07 19:58	
Surrogate(s): 1-Chlorooctadecane			*92.2%*		*50 - 150 %*	"			"	
AQE0008-06 (S6-SE)		**Soil**			**Sampled: 04/30/07 15:20**					
Diesel Range Organics	AK 102	**23.4**	-----	20.0	mg/kg dry	1x	7050018	05/04/07 13:49	05/07/07 19:58	
Surrogate(s): 1-Chlorooctadecane			*95.6%*		*50 - 150 %*	"			"	
AQE0008-07 (EX-1)		**Soil**			**Sampled: 04/30/07 13:30**					
Diesel Range Organics	AK 102	**7160**	-----	2000	mg/kg dry	100x	7050018	05/04/07 13:49	05/08/07 10:25	**RL7**
Surrogate(s): 1-Chlorooctadecane			*29.9%*		*50 - 150 %*	"			"	***Z3***
AQE0008-08 (Dupe)		**Soil**			**Sampled: 04/30/07 00:00**					
Diesel Range Organics	AK 102	**3940**	-----	200	mg/kg dry	10x	7050018	05/04/07 13:49	05/08/07 10:25	**RL7**
Surrogate(s): 1-Chlorooctadecane			*117%*		*50 - 150 %*	"			"	

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2600 Cordova, Suite 210	Project Number: 8397-13	Report Created:
Anchorage, AK/USA 99503	Project Manager: Nino Muniz	05/08/07 16:22

Physical Parameters by APHA/ASTM/EPA Methods

TestAmerica - Anchorage, AK

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
AQE0008-01 (S1-W)		**Soil**				**Sampled: 04/30/07 14:30**				
Dry Weight	TA-SOP	**81.6**	-----	1.00	%	1x	7050019	05/04/07 15:43	05/07/07 12:15	
AQE0008-02 (S2-SW)		**Soil**				**Sampled: 04/30/07 14:35**				
Dry Weight	TA-SOP	**88.7**	-----	1.00	%	1x	7050019	05/04/07 15:43	05/07/07 12:15	
AQE0008-03 (S3-NW)		**Soil**				**Sampled: 04/30/07 14:40**				
Dry Weight	TA-SOP	**83.3**	-----	1.00	%	1x	7050019	05/04/07 15:43	05/07/07 12:15	
AQE0008-04 (S4-NE)		**Soil**				**Sampled: 04/30/07 15:00**				
Dry Weight	TA-SOP	**79.4**	-----	1.00	%	1x	7050019	05/04/07 15:43	05/07/07 12:15	
AQE0008-05 (S5-E)		**Soil**				**Sampled: 04/30/07 15:10**				
Dry Weight	TA-SOP	**82.1**	-----	1.00	%	1x	7050019	05/04/07 15:43	05/07/07 12:15	
AQE0008-06 (S6-SE)		**Soil**				**Sampled: 04/30/07 15:20**				
Dry Weight	TA-SOP	**79.0**	-----	1.00	%	1x	7050019	05/04/07 15:43	05/07/07 12:15	
AQE0008-07 (EX-1)		**Soil**				**Sampled: 04/30/07 13:30**				
Dry Weight	TA-SOP	**84.1**	-----	1.00	%	1x	7050019	05/04/07 15:43	05/07/07 12:15	
AQE0008-08 (Dupe)		**Soil**				**Sampled: 04/30/07 00:00**				
Dry Weight	TA-SOP	**83.0**	-----	1.00	%	1x	7050019	05/04/07 15:43	05/07/07 12:15	

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Anchorage, AK/USA 99503	Project Manager:	Nino Muniz	05/08/07 16:22

Gasoline Range Organics (C6-C10) and BTEX per AK101 - Laboratory Quality Control Results

TestAmerica - Anchorage, AK

QC Batch: 7050016 **Soil Preparation Method: AK101 Field Prep**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7050016-BLK1)									**Extracted: 05/04/07 08:29**					
Benzene	AK101 GRO/BTEX	ND	---	0.0166	mg/kg wet	1x	--	--	--	--	--	--	05/04/07 22:31	
Toluene	"	ND	---	0.0333	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	0.0333	"	"	--	--	--	--	--	--	"	
Xylenes (total)	"	ND	---	0.0500	"	"	--	--	--	--	--	--	"	
Surrogate(s): a,a,a-TFT (PID)		*Recovery: 92.5%*			*Limits: 50-150%*	"							*05/04/07 22:31*	
LCS (7050016-BS1)									**Extracted: 05/04/07 08:29**					
Benzene	AK101 GRO/BTEX	0.288	---	0.0166	mg/kg wet	1x	--	0.328	87.8%	(73.5-120)	--	--	05/04/07 21:25	
Toluene	"	1.44	---	0.0333	"	"	--	1.66	86.7%	(76.3-120)	--	--	"	
Ethylbenzene	"	0.347	---	0.0333	"	"	--	0.388	89.4%	(80-122)	--	--	"	
Xylenes (total)	"	1.89	---	0.0500	"	"	--	1.91	99.0%	(80-120)	--	--	"	
Surrogate(s): a,a,a-TFT (PID)		*Recovery: 97.9%*			*Limits: 60-120%*	"							*05/04/07 21:25*	
LCS Dup (7050016-BSD1)									**Extracted: 05/04/07 08:29**					
Benzene	AK101 GRO/BTEX	0.294	---	0.0166	mg/kg wet	1x	--	0.328	89.6%	(73.5-120)	2.06%	(13)	05/04/07 21:58	
Toluene	"	1.47	---	0.0333	"	"	--	1.66	88.6%	(76.3-120)	2.06%	(12.3)	"	
Ethylbenzene	"	0.360	---	0.0333	"	"	--	0.388	92.8%	(80-122)	3.68%	(10.1)	"	
Xylenes (total)	"	1.90	---	0.0500	"	"	--	1.91	99.5%	(80-120)	0.528%	(11.6)	"	
Surrogate(s): a,a,a-TFT (PID)		*Recovery: 97.5%*			*Limits: 60-120%*	"							*05/04/07 21:58*	
Matrix Spike (7050016-MS1)							**QC Source: AQE0008-04**		**Extracted: 05/04/07 08:29**					
Benzene	AK101 GRO/BTEX	0.963	---	0.0178	mg/kg dry	1.5x	ND	0.923	104%	(80-125)	--	--	05/05/07 04:33	
Toluene	"	0.955	---	0.0356	"	"	0.0220	0.883	106%	(80-130)	--	--	"	
Ethylbenzene	"	0.942	---	0.0356	"	"	0.00394	0.888	106%	(80-138)	--	--	"	
Xylenes (total)	"	3.08	---	0.0534	"	"	0.0286	2.67	114%	(80-141)	--	--	"	
Surrogate(s): a,a,a-TFT (PID)		*Recovery: 65.6%*			*Limits: 50-150%*	"							*05/05/07 04:33*	
Matrix Spike Dup (7050016-MSD1)							**QC Source: AQE0008-04**		**Extracted: 05/04/07 08:29**					
Benzene	AK101 GRO/BTEX	0.818	---	0.0178	mg/kg dry	1.5x	ND	0.923	88.6%	(80-125)	16.3%	(18.4)	05/05/07 05:06	
Toluene	"	0.814	---	0.0356	"	"	0.0220	0.883	89.7%	(80-130)	15.9%	(18)	"	
Ethylbenzene	"	0.810	---	0.0356	"	"	0.00394	0.888	90.8%	(80-138)	15.1%	(15.3)	"	
Xylenes (total)	"	2.66	---	0.0534	"	"	0.0286	2.67	98.6%	(80-141)	14.6%	(14.2)	"	R2
Surrogate(s): a,a,a-TFT (PID)		*Recovery: 63.7%*			*Limits: 50-150%*	"							*05/05/07 05:06*	

TestAmerica - Anchorage, AK

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Rachel J James For Troy J. Engstrom, Manager

TestAmerica
ANALYTICAL TESTING CORPORATION

ANCHORAGE, AK 2000 W. INTERNATIONAL AIRPORT ROAD, SUITE A-10
ANCHORAGE, AK 99502-1119
ph: (907) 563.9200 fax: (907) 563.9210

Hart Crowser, Inc.	Project Name: **AFD#4**	
2600 Cordova, Suite 210	Project Number: 8397-13	Report Created:
Anchorage, AK/USA 99503	Project Manager: Nino Muniz	05/08/07 16:22

Gasoline Range Organics (C6-C10) and BTEX per AK101 - Laboratory Quality Control Results

TestAmerica - Anchorage, AK

QC Batch: 7050021 **Soil Preparation Method: AK101 Field Prep**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7050021-BLK1)							**Extracted: 05/07/07 09:38**							
Gasoline Range Organics	AK101 GRO/BTEX	ND	---	3.33	mg/kg wet	1x	--	--	--	--	--	--	05/07/07 18:15	
Benzene	"	ND	---	0.0166	"	"	--	--	--	--	--	--	"	
Toluene	"	ND	---	0.0333	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	0.0333	"	"	--	--	--	--	--	--	"	
Xylenes (total)	"	ND	---	0.0500	"	"	--	--	--	--	--	--	"	
Surrogate(s): a,a,a-TFT (FID)		*Recovery: 111%*			*Limits: 50-150%*	"							*05/07/07 18:15*	
a,a,a-TFT (PID)		*92.5%*			*50-150%*	"							"	
LCS (7050021-BS1)							**Extracted: 05/07/07 09:38**							
Gasoline Range Organics	AK101 GRO/BTEX	21.7	---	3.33	mg/kg wet	1x	--	22.0	98.6%	(60-120)	--	--	05/07/07 17:08	
Benzene	"	0.283	---	0.0166	"	"	--	0.328	86.3%	(73.5-120)	--	--	"	
Toluene	"	1.44	---	0.0333	"	"	--	1.66	86.7%	(76.3-120)	--	--	"	
Ethylbenzene	"	0.359	---	0.0333	"	"	--	0.388	92.5%	(80-122)	--	--	"	
Xylenes (total)	"	1.88	---	0.0500	"	"	--	1.91	98.4%	(80-120)	--	--	"	
Surrogate(s): a,a,a-TFT (FID)		*Recovery: 115%*			*Limits: 60-120%*	"							*05/07/07 17:08*	
a,a,a-TFT (PID)		*97.9%*			*60-120%*	"							"	
LCS Dup (7050021-BSD1)							**Extracted: 05/07/07 09:38**							
Gasoline Range Organics	AK101 GRO/BTEX	21.7	---	3.33	mg/kg wet	1x	--	22.0	98.6%	(60-120)	0.00%	(20)	05/07/07 17:41	
Benzene	"	0.283	---	0.0166	"	"	--	0.328	86.3%	(73.5-120)	0.00%	(13)	"	
Toluene	"	1.44	---	0.0333	"	"	--	1.66	86.7%	(76.3-120)	0.00%	(12.3)	"	
Ethylbenzene	"	0.341	---	0.0333	"	"	--	0.388	87.9%	(80-122)	5.14%	(10.1)	"	
Xylenes (total)	"	1.88	---	0.0500	"	"	--	1.91	98.4%	(80-120)	0.00%	(11.6)	"	
Surrogate(s): a,a,a-TFT (FID)		*Recovery: 115%*			*Limits: 60-120%*	"							*05/07/07 17:41*	
a,a,a-TFT (PID)		*97.5%*			*60-120%*	"							"	
Duplicate (7050021-DUP1)							**QC Source: AQE0008-06** **Extracted: 05/07/07 09:38**							
Gasoline Range Organics	AK101 GRO/BTEX	3.89	---	2.85	mg/kg dry	1.5x	3.83	--	--	--	1.55%	(35.8)	05/07/07 19:55	
Surrogate(s): a,a,a-TFT (FID)		*Recovery: 79.8%*			*Limits: 50-150%*	"							*05/07/07 19:55*	
Matrix Spike (7050021-MS1)							**QC Source: AQE0008-06** **Extracted: 05/07/07 09:38**							
Benzene	AK101 GRO/BTEX	0.701	---	0.0143	mg/kg dry	1.5x	0.0114	0.744	92.7%	(80-125)	--	--	05/07/07 21:34	
Toluene	"	0.724	---	0.0285	"	"	0.0223	0.711	98.7%	(80-130)	--	--	"	
Ethylbenzene	"	0.735	---	0.0285	"	"	0.0542	0.715	95.2%	(80-138)	--	--	"	
Xylenes (total)	"	2.24	---	0.0428	"	"	0.122	2.15	98.5%	(80-141)	--	--	"	
Surrogate(s): a,a,a-TFT (PID)		*Recovery: 67.6%*			*Limits: 50-150%*	"							*05/07/07 21:34*	

TestAmerica - Anchorage, AK

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Hart Crowser, Inc.	Project Name:	**AFD#4**	
2600 Cordova, Suite 210	Project Number:	8397-13	Report Created:
Anchorage, AK/USA 99503	Project Manager:	Nino Muniz	05/08/07 16:22

Gasoline Range Organics (C6-C10) and BTEX per AK101 - Laboratory Quality Control Results

TestAmerica - Anchorage, AK

QC Batch: 7050021 **Soil Preparation Method: AK101 Field Prep**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike Dup (7050021-MSD1)					**QC Source: AQE0008-06**				**Extracted: 05/07/07 09:38**					
Benzene	AK101 GRO/BTEX	0.727	---	0.0143	mg/kg dry	1.5x	0.0114	0.744	96.2%	(80-125)	3.64%	(18.4)	05/07/07 22:08	
Toluene	"	0.749	---	0.0285	"	"	0.0223	0.711	102%	(80-130)	3.39%	(18)	"	
Ethylbenzene	"	0.770	---	0.0285	"	"	0.0542	0.715	100%	(80-138)	4.65%	(15.3)	"	
Xylenes (total)	"	2.45	---	0.0428	"	"	0.122	2.15	108%	(80-141)	8.96%	(14.2)	"	
Surrogate(s): a,a,a-TFT (PID)		*Recovery: 67.1%*			*Limits: 50-150%*	"							*05/07/07 22:08*	

TestAmerica - Anchorage, AK

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Hart Crowser, Inc.	Project Name:	**AFD#4**	
2600 Cordova, Suite 210	Project Number:	8397-13	Report Created:
Anchorage, AK/USA 99503	Project Manager:	Nino Muniz	05/08/07 16:22

Diesel Range Organics (C10-C25) per AK102 - Laboratory Quality Control Results

TestAmerica - Anchorage, AK

QC Batch: 7050018 **Soil Preparation Method: EPA 3545**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7050018-BLK1)								**Extracted: 05/04/07 13:49**						
Diesel Range Organics	AK 102	ND	---	20.0	mg/kg wet	1x	--	--	--	--	--	--	05/06/07 12:41	
Surrogate(s): 1-Chlorooctadecane		*Recovery: 86.8%*			*Limits: 50-150%*	"							*05/06/07 12:41*	
LCS (7050018-BS1)								**Extracted: 05/04/07 13:49**						
Diesel Range Organics	AK 102	118	---	20.0	mg/kg wet	1x	--	129	91.5%	(75-125)	--	--	05/06/07 13:14	
Surrogate(s): 1-Chlorooctadecane		*Recovery: 91.5%*			*Limits: 60-120%*	"							*05/06/07 13:14*	
LCS Dup (7050018-BSD1)								**Extracted: 05/04/07 13:49**						
Diesel Range Organics	AK 102	125	---	20.0	mg/kg wet	1x	--	129	96.9%	(75-125)	5.76%	(20)	05/06/07 13:47	
Surrogate(s): 1-Chlorooctadecane		*Recovery: 93.8%*			*Limits: 60-120%*	"							*05/06/07 13:47*	
Duplicate (7050018-DUP1)							**QC Source: AQD0072-03**			**Extracted: 05/04/07 13:49**				
Diesel Range Organics	AK 102	ND	---	20.0	mg/kg dry	1x	ND	--	--	--	42.6%	(20)	05/06/07 12:41	R4
Surrogate(s): 1-Chlorooctadecane		*Recovery: 86.0%*			*Limits: 50-150%*	"							*05/06/07 12:41*	
Matrix Spike (7050018-MS1)							**QC Source: AQD0072-03**			**Extracted: 05/04/07 13:49**				
Diesel Range Organics	AK 102	121	---	20.0	mg/kg dry	1x	3.38	132	89.1%	(75-125)	--	--	05/06/07 13:47	
Surrogate(s): 1-Chlorooctadecane		*Recovery: 91.7%*			*Limits: 50-150%*	"							*05/06/07 13:47*	
Matrix Spike Dup (7050018-MSD1)							**QC Source: AQD0072-03**			**Extracted: 05/04/07 13:49**				
Diesel Range Organics	AK 102	123	---	20.0	mg/kg dry	1x	3.38	131	91.3%	(75-125)	1.64%	(25)	05/06/07 14:20	
Surrogate(s): 1-Chlorooctadecane		*Recovery: 93.1%*			*Limits: 50-150%*	"							*05/06/07 14:20*	

TestAmerica - Anchorage, AK

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2600 Cordova, Suite 210	Project Number:	8397-13	Report Created:
Anchorage, AK/USA 99503	Project Manager:	Nino Muniz	05/08/07 16:22

Physical Parameters by APHA/ASTM/EPA Methods - Laboratory Quality Control Results

TestAmerica - Anchorage, AK

QC Batch: 7050019 **Soil Preparation Method: *** DEFAULT PREP**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Duplicate (7050019-DUP1)					**QC Source: AQD0072-01**				**Extracted: 05/04/07 15:43**					
Dry Weight	TA-SOP	97.5	---	1.00	%	1x	97.2	--	--	--	0.308%	(25)	05/07/07 12:15	

Rachel J James For Troy J. Engstrom, Manager

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Hart Crowser, Inc.	Project Name:	**AFD#4**	
2600 Cordova, Suite 210	Project Number:	8397-13	Report Created:
Anchorage, AK/USA 99503	Project Manager:	Nino Muniz	05/08/07 16:22

Notes and Definitions

Report Specific Notes:

R10	-	The RPD between the primary and confirmatory analysis exceeded 40%. Per method 8000B, the lower value was reported due to apparent chromatographic problems.
R2	-	The RPD exceeded the acceptance limit.
R4	-	Due to the low levels of analyte in the sample, the duplicate RPD calculation does not provide useful information.
RL7	-	Sample required dilution due to high concentrations of target analyte.
Z3	-	The sample required a dilution due to the nature of the sample matrix. Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

Laboratory Reporting Conventions:

DET	-	Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
ND	-	Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
NR/NA	-	Not Reported / Not Available
dry	-	Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
wet	-	Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
RPD	-	RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
MRL	-	METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
MDL*	-	METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
Dil	-	Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
Reporting Limits	-	Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
Electronic Signature	-	Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Rachel J James For Troy J. Engstrom, Manager

Sample Custody Record

Samples Shipped To: Test America

HART CROWSER

☐ 1910 Fairview Ave., E., Seattle WA 98102
☐ 2250 Denali St., #705, Anchorage, AK 99503
☐ Five Centerpointe Dr., Lake Oswego, OR 97035
☐ 301 E. Ocean Blvd., #1950, Long Beach CA 90802
☐ 120 3rd Ave S., #110, Edmonds, WA 98020
☐ 811 Church Hill Rd., # 236, Cherry Hill, NJ 08002

JOB 8397-13 LAB NUMBER AQE0008

PROJECT NAME AFD # 4

HART CROWSER CONTACT Nino Muniz

SAMPLED BY: R Grandel

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	EPA BTEX 8021	AK101 GRO	AK102 DRO	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
1	S1-W		4/30/07	1430	Soil	X	X	X	2	
2	S2-SW		"	1435					2	
3	S3-NW		"	1440					2	
4	S4-NE		"	1500					2	
5	S5-E		"	1510					2	
6	S6-SE		"	1520					2	
7	Ex-1		"	1330					2	
8	Dup		"	—					2	
9	Trip					X	X		1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Russell Grandel	5/1/07	Johanna Dreher	5/1/07
SIGNATURE		SIGNATURE	
Russell Grandel	TIME	Johanna Dreher	TIME
PRINT NAME		PRINT NAME	
Hart Crowser	1240	TA-Ak	1240
COMPANY		COMPANY	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS

17 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS ☐ YES ☒ NO ☐ N/A
GOOD CONDITION ☒ YES ☐ NO
TEMPERATURE 0.9° C
SHIPMENT METHOD ☒ HAND ☐ COURIER ☐ OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Test America Cooler Receipt Form

(Army Corps. Compliant)

WORK ORDER # AQE0008 CLIENT: Hart Crowser PROJECT: AFD#4

Date, Time Cooler Arrived 05 01 07 12:40 Cooler signed for by: Johanna Dreher
(Print name)

Preliminary Examination Phase:

Date cooler opened: ☒ same as date received *or* ____

Cooler opened by (print) Johanna Dreher (sign) Johanna Dreher

1. Delivered by ☐ ALASKA AIRLINES ☐ Fed-Ex ☐ UPS ☐ NAC ☐ LYNDEN ☒ CLIENT ☐ Other

Shipment Tracking # if applicable ____ (include copy of shipping papers in file)

2. Number of Custody Seals 0 Signed by ____ Date __/__/__

Were custody seals unbroken and intact on arrival? ☐ Yes ☐ No

3. Were custody papers sealed in a plastic bag? ☒ Yes ☐ No

4. Were custody papers filled out properly (ink, signed, etc.)? ☐ Yes ☐ No

5. Did you sign the custody papers in the appropriate place? ☐ Yes ☐ No

6. Was ice used? ☒ Yes ☐ No Type of ice: ☐ blue ice ☒ gel ice ☐ real ice ☐ dry ice Condition of ice: Soft

Temperature by Digi-Thermo Probe 0.9 °C Thermometer # rec# 3

7. Packing in Cooler: ☒ bubble wrap ☐ styrofoam ☒ cardboard ☐ Other: ____

8. Did samples arrive in plastic bags? ☐ Yes ☒ No

9. Did all bottles arrive unbroken, and with labels in good condition? ☒ Yes ☐ No

10. Are all bottle labels complete (ID, date, time, etc.) ☒ Yes ☐ No

11. Do bottle labels and Chain of Custody agree? ☒ Yes ☐ No

12. Are the containers and preservatives correct for the tests indicated? ☒ Yes ☐ No

13. Is there adequate volume for the tests requested? ☒ Yes ☐ No

14. Were VOA vials free of bubbles? ☒ N/A ☐ Yes ☐ No

If "NO" which containers contained "head space" or bubbles? ____

Log-in Phase:

Date of sample log-in 5 01 07

Samples logged in by (print) DAVID SUMMERVILLE (sign) David Summerville

1. Was project identifiable from custody papers? ☒ Yes ☐ No

2. Do Turn Around Times and Due Dates agree? ☒ Yes ☐ No

3. Was the Project Manager notified of status? ☒ Yes ☐ No

4. Was the Lab notified of status? ☒ Yes ☐ No

5. Was the COC scanned and copied? ☒ Yes ☐ No