How to conduct a site inspection and review a technical report

Erin Gleason, ADEC Contaminated Sites Program

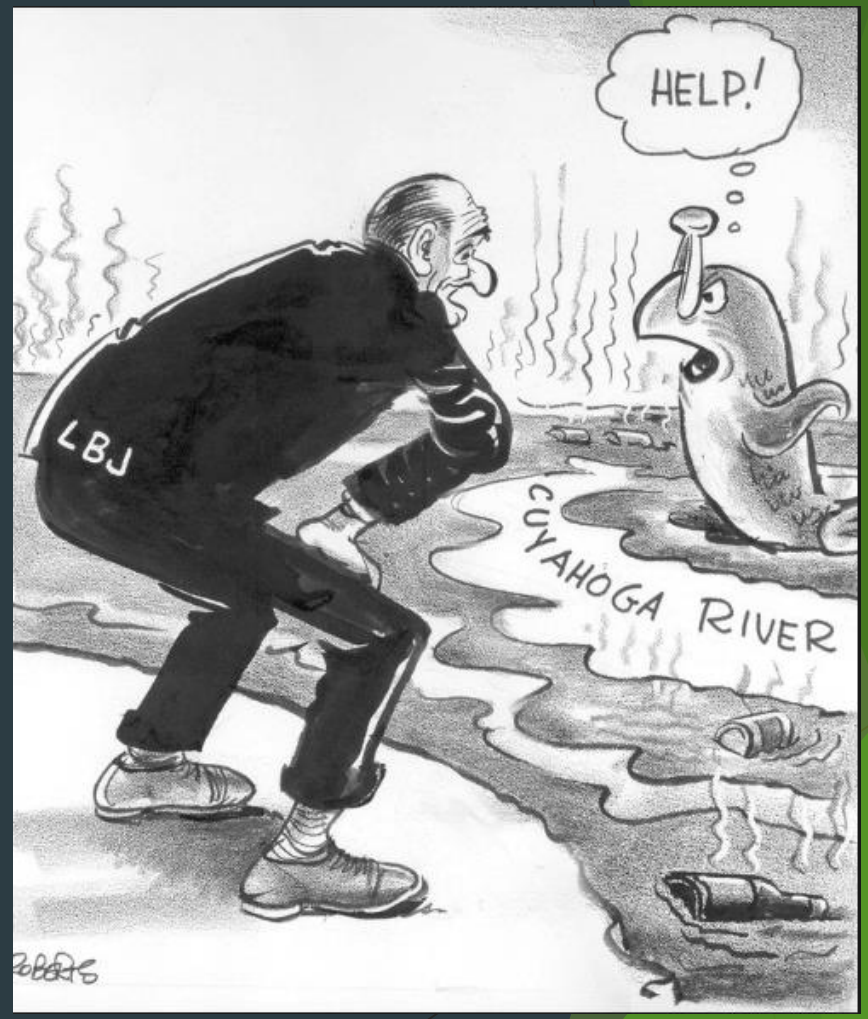
About me!

- Born and raised in Fairbanks Alaska. Received a BS in chemistry from Western Washington University in 2009, received a MS in environmental chemistry from UAF in 2014.
- I was the Department of Natural Resources intern in 2007 and 2014. I have been with ADEC contaminated sites program since 2016.
- I work on State and privately owned contaminated sites throughout Alaska.
- Dream- clean up all rural schools

About contaminated sites!

- Alaska Department of Environmental Conservation (ADEC)
  - Division of Spill Prevention and Response
    - Contaminated Sites Program

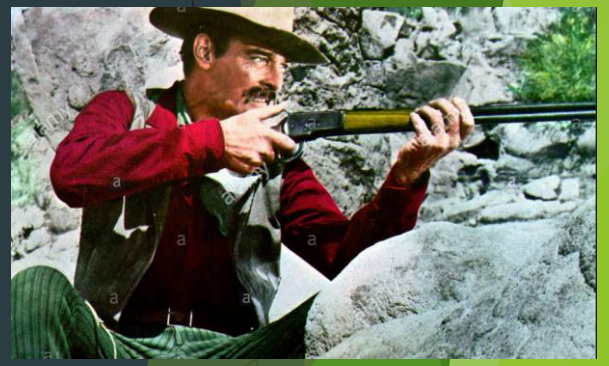
- Contaminated sites program protects human health and the environment by managing the cleanup of contaminated soil and groundwater in Alaska.



Prepare for your inspection

- Pack a copy of the work plan, ADEC Field Sampling Guidance, regulations, and notebook with you.

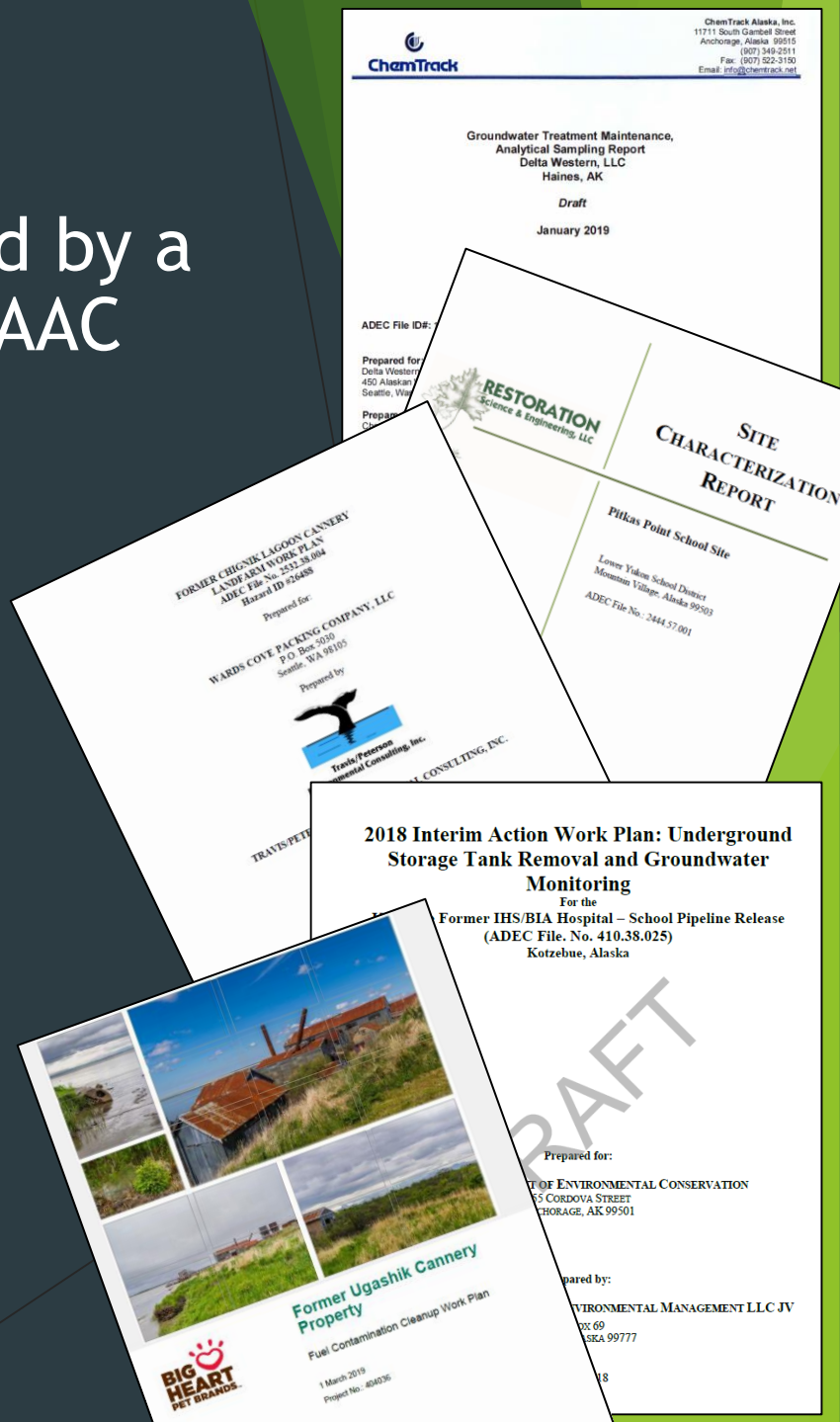
- Think about safety! Contaminated sites can be a hazardous place. Research the hazards before you go and prepare.
  - Do I need any personal protection equipment?
  - Will there be any heavy machinery?
  - Will there be any hostile people?
  - Do I need bear protection?
  - If staying overnight, where can I get food and shelter?



All work must be done by a QEP

- All contaminated sites work must be supervised by a qualified environmental professional (QEP) 18 AAC 75.333(b)
  - Write work plans
  - Write reports
  - Take samples
  - Work with ADEC to make a pathway to closure

- Samples may be taken by a qualified environmental sampler (QES) 18AAC75.333 (c)



Contaminated Sites Program

Fact Sheet

Our mission: "Protecting human health and the environment by managing the cleanup of contaminated soil and groundwater in Alaska"

(Current as of July 2015)

Selecting an Environmental Consultant

Investigating and cleaning up a release of petroleum or other hazardous substances can be expensive. Selecting an unqualified or inexperienced environmental consultant to do the work, however, may end up costing even more.

Asking questions and checking references is essential. A competent consultant will help you define the problem and develop solutions that are protective, in compliance with environmental regulations, and cost-effective.

Your consulting team should have:

- A thorough understanding of Alaska's environmental cleanup regulations, related laws, and guidance documents.
- Experience in projects that are similar to yours in scope and nature.
- Excellent communication skills, both oral and written.

1. Where to Begin

After a hazardous substance discharge is discovered and reported, the first step is to compile all the information you can about the property, including the history of operations at the site, potential sources of contamination, and any company or personal records on where and how hazardous substances have been used or stored.

Prepare a brief, written description of the site, including current use, the problem as you understand it, and the potential work that may need to be done. Providing as much information as you can will enable consulting firms to give you more consistent and accurate estimates. This can save you time and money.

DEC cannot recommend specific consultants, but we can refer you to other parties that have participated

Lead paint is removed from concrete prior to demolition at a site in King Salmon, Alaska

in cleanup projects who may be willing to share their experiences with you.

2. Initial Contacts

Next, put together a list of companies that perform contaminated site characterization or cleanup work in that area. Companies can be found in the yellow pages under headings such as "Engineers - Environmental," or "Environmental and Ecological Services."

Contact several of the companies and inquire about their experience, training, fees, and insurance coverage to determine which company best suits your needs.

The firm you select should demonstrate that it is capable and has qualified staff on board who will be available when you want the work done.

Ask the consulting firm to estimate the time needed to complete the work required and how they might phase the work to fit your budget and your plans for the site.

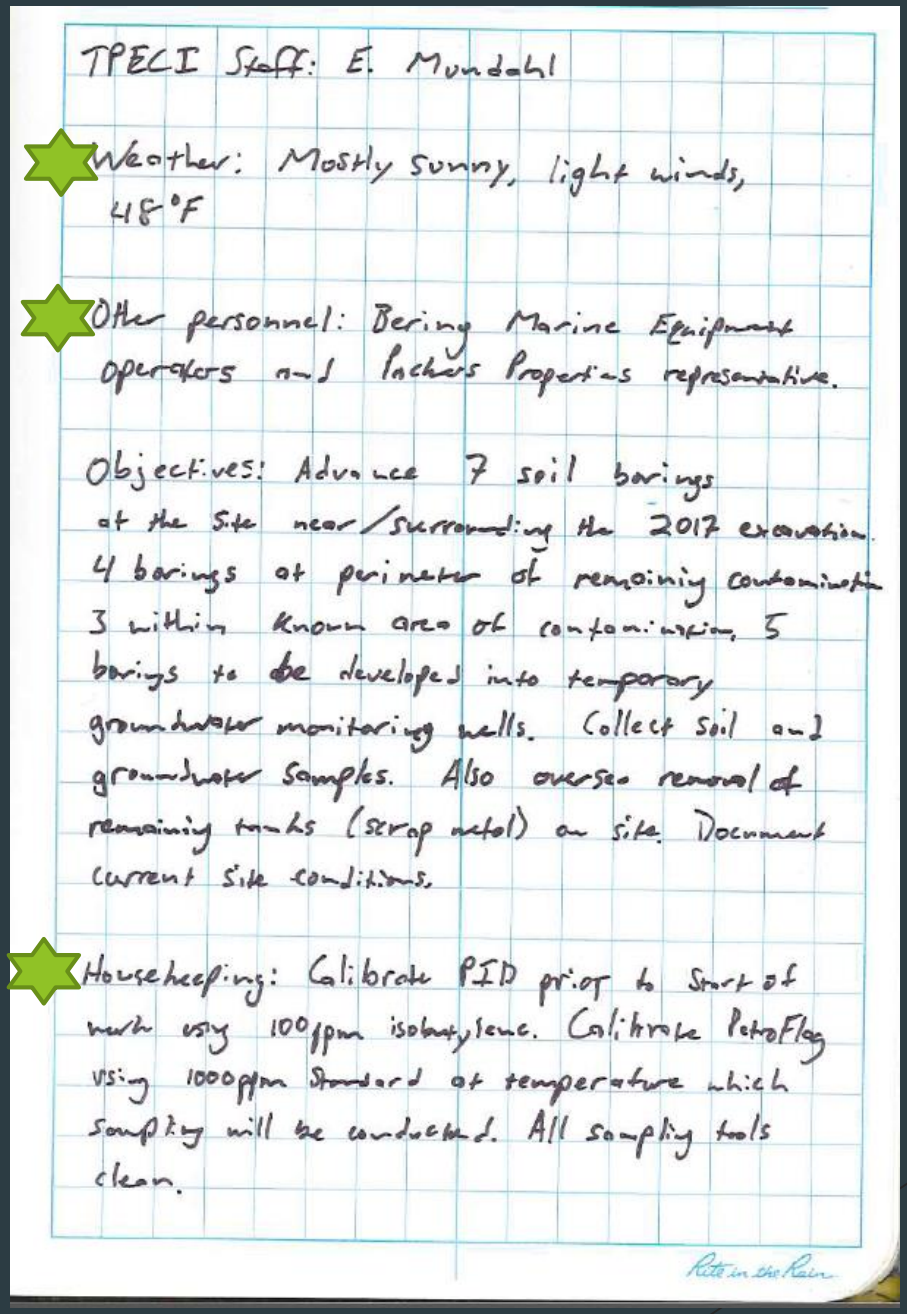
Keep in mind that environmental investigations often turn up new information that may change the scope, adding both cost and time to the project.

http://dec.alaska.gov/spar/csp/qualified-professionals/

Arriving at the site for your inspection

- If work is actively taking place, check in with the onsite project manager
- Take notes about when you arrive, who is there, what the weather is like, any weird things you see
- Take photographs!

Example field notes from a QEP



TPECI Staff: E. Mundahl

Weather: Mostly sunny, light winds, 48°F

Other personnel: Bering Marine Equipment operators and Packers Properties representative.

Objectives: Advance 7 soil borings at the site near/surrounding the 2017 excavation. 4 borings at perimeter of remaining contamination 3 within known area of contamination. 5 borings to be developed into temporary groundwater monitoring wells. Collect soil and groundwater samples. Also oversee removal of remaining tanks (scrap metal) on site. Document current site conditions.

Housekeeping: Calibrate PID prior to start of work using 100ppm isobutylene. Calibrate PetroFlag using 1000ppm Standard at temperature which sampling will be conducted. All sampling tools clean.

Rite in the Rain

Location Ivanof Bay, Ak Date 10/19/18

Project / Client Packers Properties

Arrives on site 10/19/18

Soil Borings and Soil Samples

Sample ID	Depth (ft)	PIDppm	PFppm	Time
MW1-1	1.0	0.3	2	13:12
MW1-W	1.5	0.2	0	17:17
MW2-1	1.0	0.1	0	13:41
MW2-W	5.0	0.2	0	13:43
MW3-1	1.0	0.5	0	13:58
MW3-W	3.0	0.2	2	14:02
MW4-1	1.0	0.1	0	14:17
MW4-W	2.5	1.2	2	14:21
MW5-1	1.0	71.5	1,111	14:30
MW5-W	1.5	97.4	>2,500	14:35
SB6-1	1.0	127.7	1,351	14:51
SB6-W	2.5	85.4	1,703	14:54
SB7-1	1.0	3.2	746	15:06
SB7-W	2.0	1.4	17	15:10

Sample SB100S is a field duplicate of SB6-W @ 14:54

Location Ivanof Bay, Ak Date 10/19/18

Project / Client Packers Properties

- Soil Samples MW1-1, MW2-W, MW3-W, MW4-W, MW5-W, SB6-W, SB7-1 selected for laboratory analysis. Only MW2-W, MW4-W, and SB6-W selected for PAH analysis as are suitable to characterize contaminant source PAH.
- No visual or olfactory indications of contamination in MW1, MW2, MW3, or MW4 on perimeter of area of known contamination.
- Strong diesel odor and light sheen visible on groundwater in MW5 and SB6.
- Light hydrocarbon odor, light sheen present in SB7 on groundwater.
- MW5, SB6, SB7 all located in area of known remaining contamination.

Ahtna Engineering

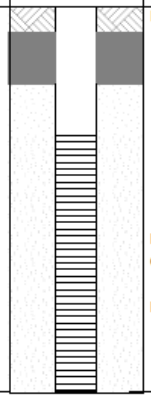
MONITORING WELL CONSTRUCTION LOG

Project Number	Well Number	Sheet
20125.038	MW-17	1

Project Name Gustavus RI and RA
Client Federal Aviation Administration
Date 6/12/2012
Drilling Company Midnight Son Drilling
Boring Size 8"
Sample Method 8-inch hollow stem auger
Total Depth 15 feet bgs
X/Y Coordinates 2290304.6/2402035.48

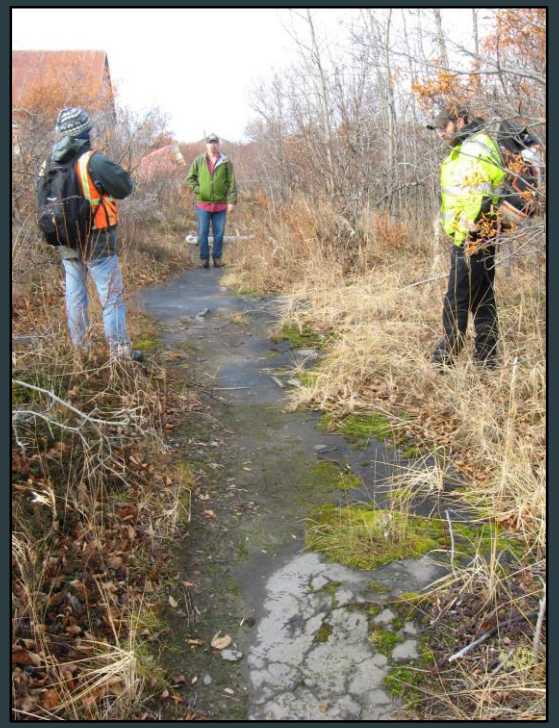
Site Former Tank Farm
Field Scientist/Engineer MOakley
Weather Rain, 48 degrees F
Rig Type
Hammer Drop
# of Samples 1
Depth to GW
Elevation 18.58 feet

Extra Field Notes:

DEPTH (ft)	WELL DESCRIPTION	WELL GRAPHIC	SOIL DESCRIPTION AND NOTES (color, soil type, moisture, lithology notes)
0	Flushmount monument set in concrete apron		Direct drill to 8' bgs.
	Bentonite seal		
5			
10	10/20 Silica sand filter pack 2-Inch ID, Schedule 40 PVC 0.010 Slotted well screen		Brown fine to coarse sand with trace silt; medium dense; wet. GST12SSMW17-01(8-10) Direct drill to 15' bgs.
15			

Bottom of borehole at 15.0 feet.

Take three photographs of each item of interest



Far away

Near

Up close

Example- forgot far away photo ☹

Near

Up close

Make Observations

- Do you see any spills or stains? Are there any fuel odors?
  - Can you find the source of the leak/stain just by looking?
- Are there tanks, drums, pipes onsite?
  - Are they contained?
  - Are they leaking?
  - Are they old?
- Stockpile, landfarm or landspread soil?
  - Do they have liners and covers?
  - Berms?
  - Signs?

Practice making site observations!

*Photo credit-WHPacific

Observing Characterization

- Characterization could be the QEP/QES taking samples of groundwater, surface water, sediment, soil or air.
- They should have a copy of the approved work plan with them onsite and be following it.
- Things to check for:
  - Are they sampling according to the work plan?
  - Are they following the ADEC Field Sampling Guidance (August 2017)?
  - Are they managing their waste correctly?

Practice making observation of characterization!

Groundwater sampling

Decontamination of sampling equipment

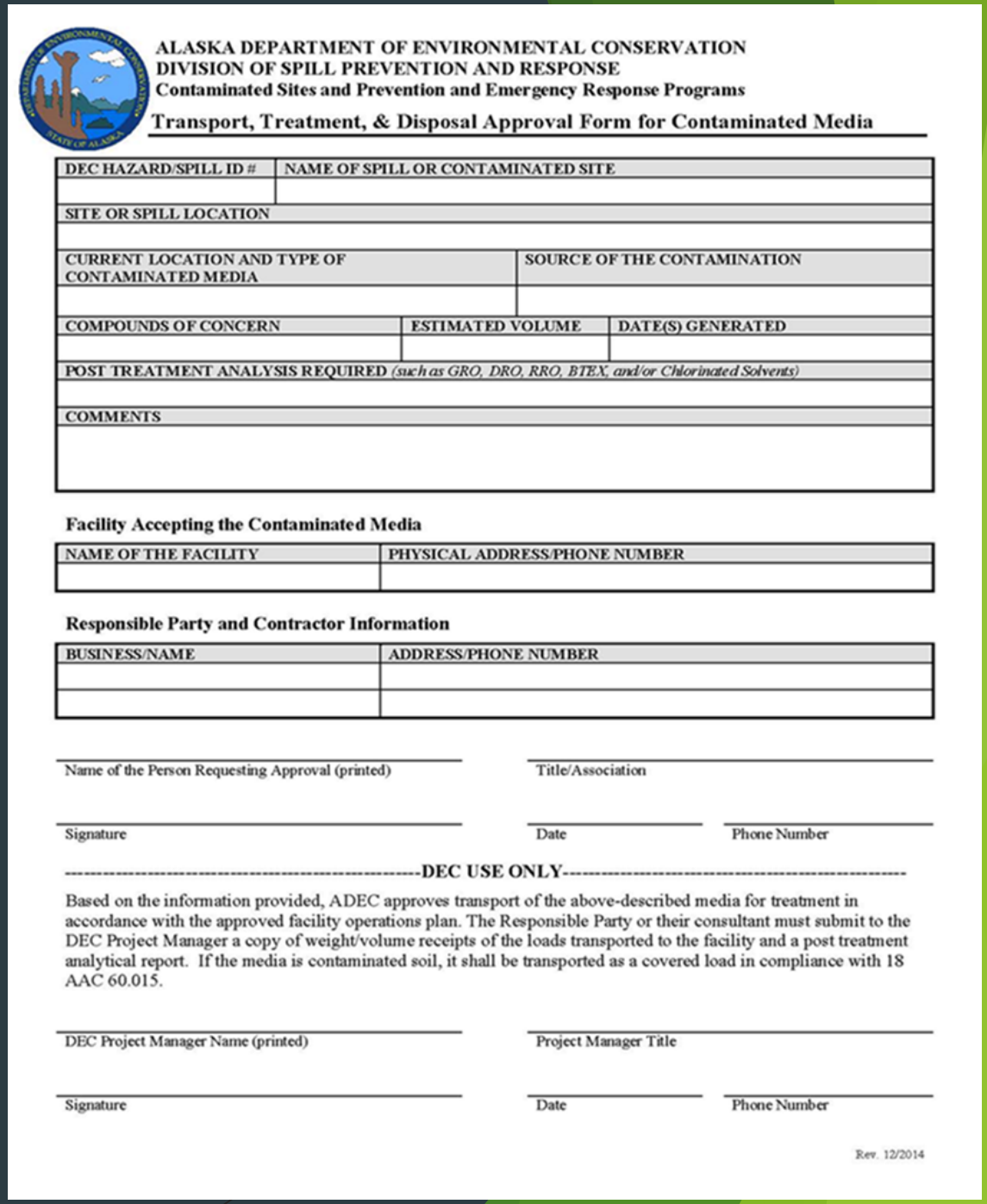
Installing a temporary groundwater well

Observing Cleanup

- Clean up could be excavation of soil, landfarming, in-situ treatment like air sparging or bioremediation.
- They should have a copy of the approved work plan with them onsite and be following it.
- Things to check for:
  - Are they following the ADEC Field Sampling Guidance (August 2017)?
  - Are they managing their waste correctly?
  - Are they taking field notes?

Transport, Treatment and Disposal Form

- Anytime contaminated media is moved offsite a TTD form must be completed!
- If soil or water is being moved at the site, make sure they have TTD
- This includes landfarms, landspreads, and stockpiles



ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites and Prevention and Emergency Response Programs

Transport, Treatment, & Disposal Approval Form for Contaminated Media

DEC HAZARD/SPILL ID #	NAME OF SPILL OR CONTAMINATED SITE	
SITE OR SPILL LOCATION		
CURRENT LOCATION AND TYPE OF CONTAMINATED MEDIA	SOURCE OF THE CONTAMINATION	
COMPOUNDS OF CONCERN	ESTIMATED VOLUME	DATE(S) GENERATED
POST TREATMENT ANALYSIS REQUIRED *(such as GRO, DRO, RRO, BTEX, and/or Chlorinated Solvents)*		
COMMENTS		

Facility Accepting the Contaminated Media

NAME OF THE FACILITY	PHYSICAL ADDRESS/PHONE NUMBER

Responsible Party and Contractor Information

BUSINESS/NAME	ADDRESS/PHONE NUMBER

Name of the Person Requesting Approval (printed) — Title/Association

Signature — Date — Phone Number

----------**DEC USE ONLY**----------

Based on the information provided, ADEC approves transport of the above-described media for treatment in accordance with the approved facility operations plan. The Responsible Party or their consultant must submit to the DEC Project Manager a copy of weight/volume receipts of the loads transported to the facility and a post treatment analytical report. If the media is contaminated soil, it shall be transported as a covered load in compliance with 18 AAC 60.015.

DEC Project Manager Name (printed) — Project Manager Title

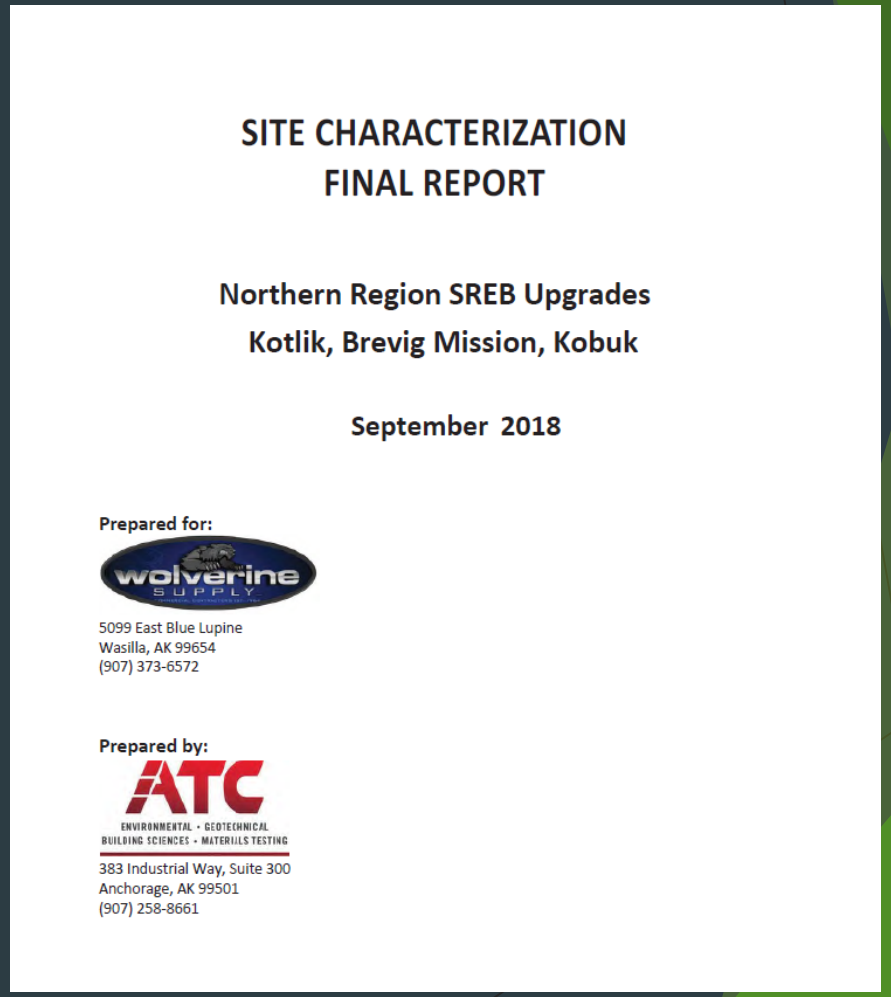
Signature — Date — Phone Number

Rev. 12/2014

Questions on inspections?

Reviewing a Report

- After the site work is complete, the QEP will write a report. Depending on how long it takes to receive lab data, it may take them 60-120 days to write the report
- ADEC does not have a deadline for report submittal
- ADEC likes to have reports during the winter so the group has time to plan for work the following summer if needed



SITE CHARACTERIZATION
FINAL REPORT

Northern Region SREB Upgrades
Kotlik, Brevig Mission, Kobuk

September 2018

Prepared for:

wolverine SUPPLY

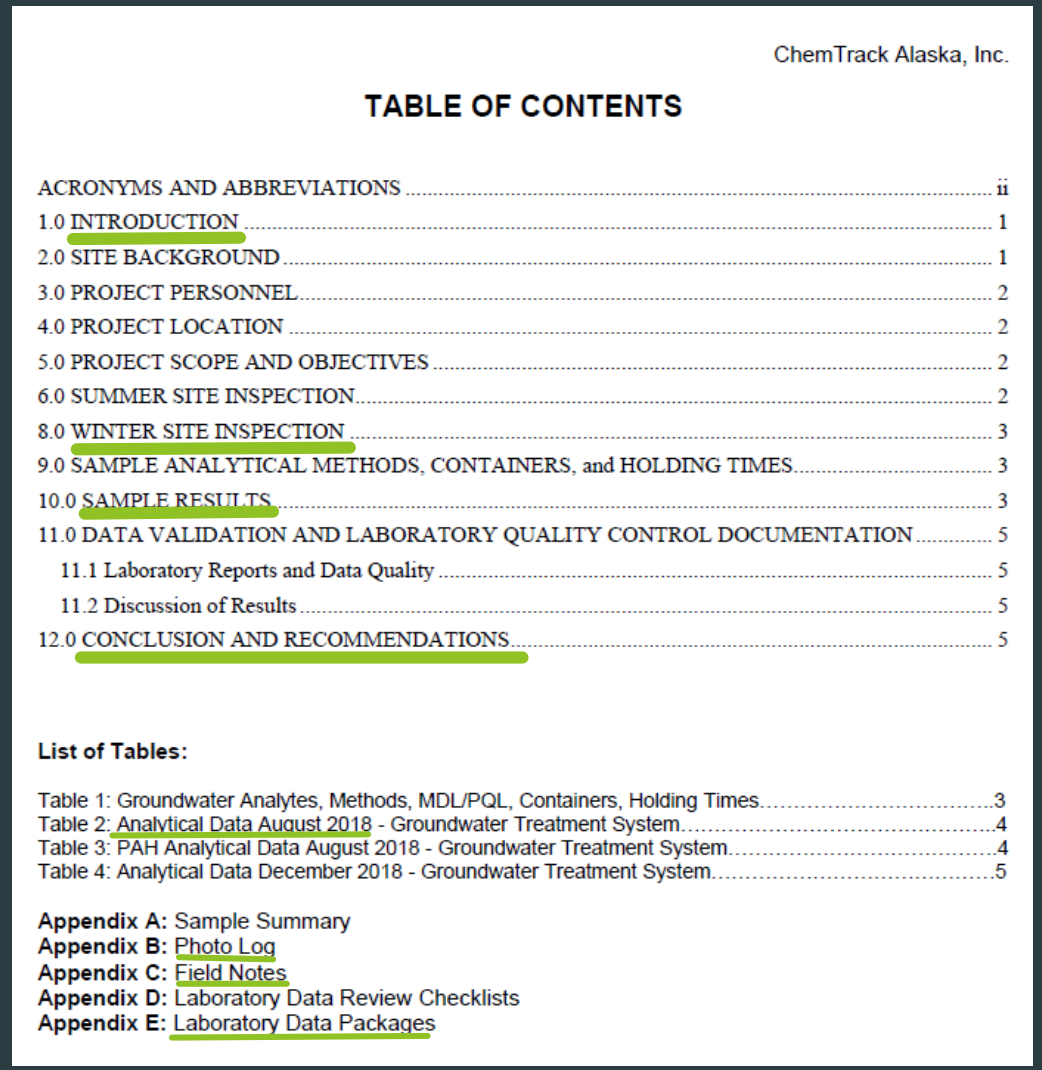
5099 East Blue Lupine
Wasilla, AK 99654
(907) 373-6572

Prepared by:

ATC
ENVIRONMENTAL • GEOTECHNICAL
BUILDING SCIENCES • MATERIALS TESTING

383 Industrial Way, Suite 300
Anchorage, AK 99501
(907) 258-8661

What sections should I find in my report?



ChemTrack Alaska, Inc.

TABLE OF CONTENTS

List of Tables:

1. Abstract/Executive Summary
2. Introduction
3. Field Work
4. Results
5. Data Quality
6. Conclusion
7. References
8. Conceptual Site Model (CSM)
9. Lab Data
10. Photographs
11. Resumes of QEP
12. TTD Form(s)
13. Field notes-originals!

EXECUTIVE SUMMARY

This report details the groundwater sampling activities performed at the former Tank Farm in Gustavus, Alaska on June 4 and 5, 2018 under Contract No. DTFASA-17-P-01024. Alaska Department of Environmental Conservation (ADEC) approval of the final work plan (WP) was obtained prior to commencing fieldwork. The ADEC comments and response to comments is included in Appendix A. The ADEC File and Hazard Identification numbers for the former Tank Farm are 1507.38.011 and 4368, respectively.

Water samples were collected from nine viable monitoring wells at the site (MW-1, MW-2, MW-3R, MW-8, MW-10, MW-11, MW-16, MW-17, and MW-18) and analyzed for gasoline range organics (GRO); diesel range organics (DRO); residual range organics (RRO); benzene, ethylbenzene, tolune, and xylenes (BTEX) and polycyclic aromatic hydrocarbons (PAHs). Although MW-6 has always been sampled in the past as part of the groundwater monitoring at this site, it was found damaged and unsamplable during the 2018 field event. MW-4 was not sampled because free product was measured in the well, and it contained a limited volume of water. The free product was removed from MW-4 and properly disposed of and processed through the Glacier Bay National Park Service oil-water seperator.

DRO and RRO were detected at concentrations exceeding the ADEC 18 Alaska Administrative Code (AAC) 75.345, Table C groundwater cleanup levels in MW-1 and MW-2. Benzene, ethylbenzene, and naphthalene were also detected at concentrations exceeding the ADEC groundwater cleanup levels in MW-2, and the total aromatic hydrocarbon (TAH) and total aqueous hydrocarbon (TAqH) values calculated from the MW-2 sample exceeded the ADEC surface water quality criteria (18 AAC 70.020).

Monitored natural attenuation (MNA) parameters were also collected from eight of the monitoring wells that were sampled. MNA parameters for MW-2 were not collected due to the limited volume of water present in the well, and parameters for MW-6 could not be collected because it was unsampleable. MNA parameter results were largely inconclusive due to the lack of information at MW-6 and MW-2, which are source wells, and inconsistent parameter data at wells that did have parameters recorded. Overall, results suggest that some wells are in an aerobic state, some are in an anaerobic state, some contain groundwater from more than one aquifer. Overall, DO is the only parameter that is clearly degrading in groundwater across the site.

Pre- and post-high tide depth to water measurements were recorded in all eleven wells on June 4, 2018 to determine which wells are impacted by the tide. Groundwater elevation was higher before the high tide and lower after the high tide in all wells, with the exception of MW-4 and MW-8, which remained the same during both measurements.

- Read executive summary first
- Erin doesn’t always read reports in order cover to cover

Photographs-worth 1000 words!

House Drum #1 excavation.

House Drum #1 excavation.

Power generation building site after demolition.

Beginning soil excavation at power generation building.

1.0 INTRODUCTION

Ahtna Environmental, Inc. (Ahtna), has developed this report to document the debris removal and site investigation (SI) to assess the potential for contamination at the Federal Aviation Administration (FAA) Lake Hood Storage Yard, located at Lake Hood, Anchorage, Alaska (figures 1 and 2). Nine areas of concern (AOCs) were investigated under this SI: Areas 3, 4, 5, 7, 8, 9, and 11; a 100-square-foot oil stain (OS); and a 4-square-foot stain area called the CP-1/CP-2 Area (Figure 3).

Work for this project was performed under contract DTFASA-17-P-00811. The activities detailed in this report were conducted in accordance with the following:

- FAA Scope of Work (SOW) received March 14, 2017
- FAA Standard Operating Procedures
- Alaska Department of Environmental Conservation (ADEC) *Guidance on Developing Conceptual Site Models* (ADEC, 2017a)
- ADEC *Oil and Other Hazardous Substances Pollution Control* (ADEC, 2017b)
- ADEC *Field Sampling Guidance* (ADEC, 2017c)
- ADEC *Solid Waste Management* (ADEC, 2017d)
- ADEC *Data Quality Objectives, Checklists, Quality Assurance Requirements for Laboratory Data, and Sample Handling* (ADEC, 2017e)

This report includes a summary of field activities conducted, work plan deviations, analytical results, and quality assurance/quality control (QA/QC) procedures followed.

1.1 Site Background

The FAA Lake Hood Storage Yard is located on the south shore of Lake Hood, off Lear Court, at approximately 61.177074°N, -149.964238°W. The property is approximately 3.5 acres in size. It formerly contained the Lake Hood air traffic control tower, communications building, and subsequent support facilities before they were decommissioned in the 1970s–80s. Petroleum and polychlorinated biphenyl (PCB) contamination from historical operations was identified during a 1990 Preliminary Assessment (PA). Subsequent investigative and remediation activities addressed the bulk of this contamination; however, as of the last remedial action activity conducted at the site (1997), it was assumed that some contamination still remained on the property. For the last two decades, the site has served as a secured storage yard for project materials for the FAA. The FAA has plans to relinquish its ownership of the property in the near future.

Multiple AOCs have been identified at the site. Several reports have been generated regarding site conditions. During the fiscal year 1990 (FY90) Preliminary Assessment, seven AOCs (areas 3, 4, 5, 7, 8, 9, and 11) were identified. Additionally, two separate, small oil-stained areas were observed: one measuring approximately 100 square feet and another measuring approximately 4 square feet. The subsequent site histories have been developed from the following reports, listed in chronological order:

- Provides site history
- Timeline of work that has already taken place Ownership history
- What spilled?
- Contaminants of concern

7. CONCLUSIONS

Based on field observations, field screening readings, and analytical results from soil samples collected at the UST replacement site, petroleum soil contamination is not present at the limits of Excavation 1, the UST excavation, and the vent line.

The final excavation depth of Excavation 1 extended to approximately 7 feet below grade. Water infiltrating into the UST excavation began once the mass of soil was removed down to a depth of approximately 12 feet below grade. Analytical results collected from the base of Excavation 1 indicate petroleum contamination did not extend to the groundwater table estimated at approximately 12-15 feet below grade.

Four field screening readings collected from the smaller potentially impacted stockpile, estimated at less than 15 CY, ranged from 334 ppm to 397 ppm. This soil was transported to Alaska Soil Recycling for treatment.

Additionally, field observations, field screening readings, and analytical results from samples collected from the large potentially clean stockpile indicate no petroleum contamination was present. The stockpile was transported to the Anchorage Regional Landfill for disposal.

The Excavation 1 and UST Excavation were backfilled with clean, imported fill.

Based on these conclusions, North Wind recommends no further action at the 15,000-gallon UST site.

- Give you the important data
- Summarize what was done
- Recommend next steps

Results

- What was sampled
- How many samples taken
- Which cleanup levels are they using?
- What samples were above ADEC cleanup levels
- Data tables
- Graphs

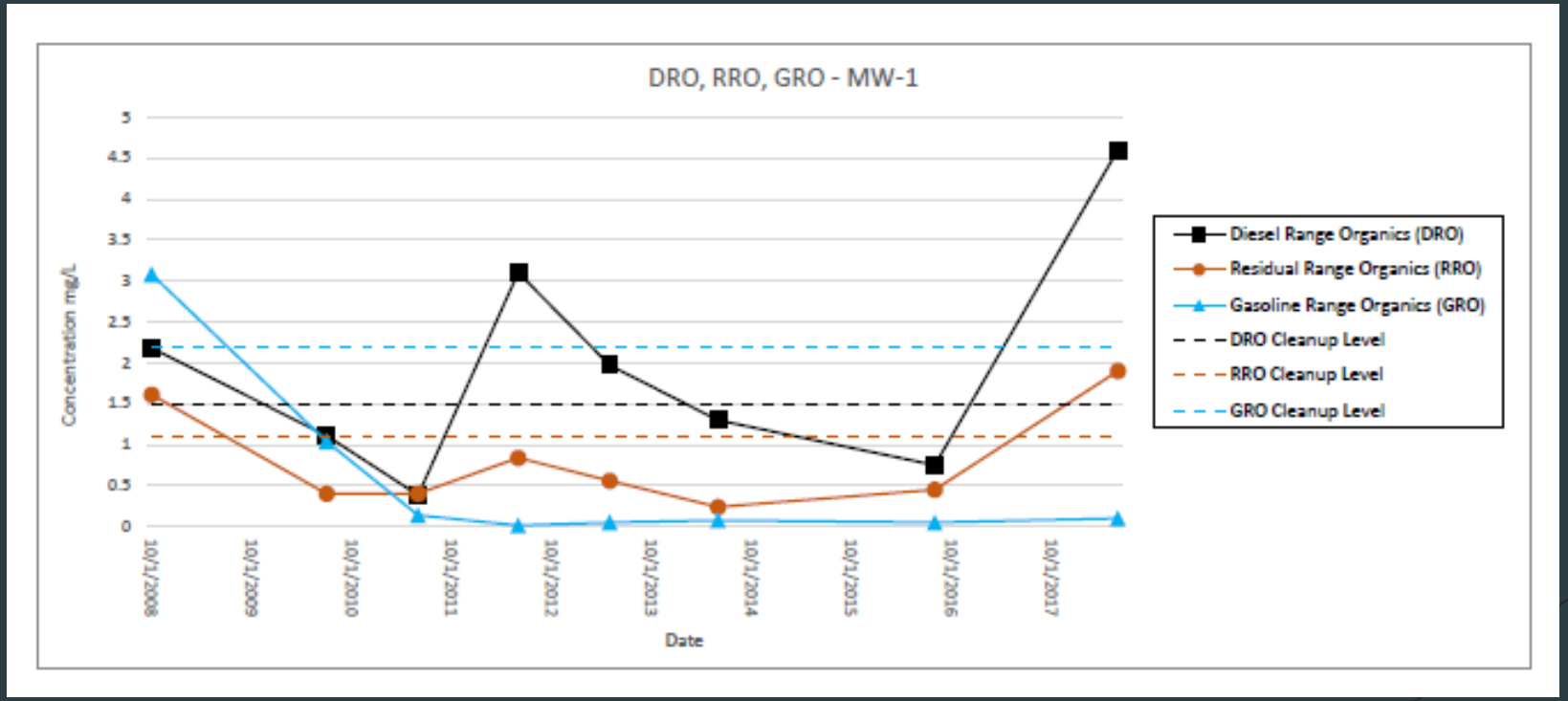


Table 4-2 PAH Soils Data
Former Tank Farm, Gustavus, Alaska

Boring or Well Number		B1	B1	B1	B2	B3	B4	MW-3R	MW-3R	MW-8	MW-10	MW-11	MW-16	MW-17	MW-18	ADEC Method Two, Over 40-Inch Zone Cleanup Levels (18 AAC 75.341, Table B1)
Location Description		North End of TF	North End of TF	Dup of B1T-02(15-17)	East End of TF	West End of TF	South end of TF	West of TF	Dup of MW3R-01(10-12)	North of TF	Southeast of TF	West-southwest of TF	Southwest of TF	Northwest of TF	Southwest of TF	
Sample Depth (ft)		10-12	15-17	15-17	10-12	10-12	10-12	10-12	10-12	6-8	5-7	8-10	6-8	8-10	5-7	
Sample Date		6/11/2012	6/11/2012	6/11/2012	6/11/2012	6/11/2012	6/11/2012	6/11/2012	6/11/2012	6/13/2012	6/12/2012	6/11/2012	6/12/2012	6/12/2012	6/12/2012	
Sample Name		GST12SSB1T-04(10-12)	GST12SSB1T-02(15-17)	GST12SSB1T-03(15-17)	GST12SSB2T-02(10-12)	GST12SSB3T-02(10-12)	GST12SSB4T-02(10-12)	GST12SSMW3R-01(10-12)	GST12SSMW3R-02(10-12)	GST12SSMW8-01(6-8)	GST12SSMW10-01(5-7)	GST12SSMW11-01(8-10)	GST12SSMW16-01(6-8)	GST12SSMW17-01(8-10)	GST12SSMW18-01(5-7)	
Acenaphthene	Lab Result (mg/kg)	0.138	ND(0.00121)	ND(0.00122)	ND(0.00107)	0.0205	ND(0.00109)	ND(0.00172)	ND(0.00163)	ND(0.0016)	ND(0.0016)	ND(0.00158)	ND(0.00155)	ND(0.0017)	ND(0.00175)	2,300.
Acenaphthylene	Lab Result (mg/kg)	ND(0.0115)	ND(0.00121)	ND(0.00122)	ND(0.00107)	ND(0.00114)	ND(0.00109)	ND(0.00172)	ND(0.00163)	ND(0.0016)	ND(0.0016)	ND(0.00158)	ND(0.00155)	ND(0.0017)	ND(0.00175)	2,300.
Anthracene	Lab Result (mg/kg)	0.277	ND(0.00121)	ND(0.00122)	ND(0.00107)	0.0448	ND(0.00109)	ND(0.00172)	ND(0.00163)	ND(0.0016)	ND(0.0016)	ND(0.00158)	ND(0.00155)	ND(0.0017)	ND(0.00175)	16,800.
Benzo (a) anthracene	Lab Result (mg/kg)	ND(0.0115)	ND(0.00121)	ND(0.00122)	ND(0.00107)	ND(0.00114)	ND(0.00109)	ND(0.00172)	ND(0.00163)	ND(0.0016)	ND(0.0016)	ND(0.00158)	ND(0.00155)	ND(0.0017)	ND(0.00175)	4.
Benzo (a) pyrene	Lab Result (mg/kg)	ND(0.0115)	ND(0.00121)	ND(0.00122)	ND(0.00107)	ND(0.00114)	ND(0.00109)	ND(0.00172)	ND(0.00163)	ND(0.0016)	ND(0.0016)	ND(0.00158)	ND(0.00155)	ND(0.0017)	ND(0.00175)	0.4
Benzo (b) fluoranthene	Lab Result (mg/kg)	ND(0.0231)	ND(0.00242)	ND(0.00245)	ND(0.00213)	ND(0.00228)	ND(0.00217)	ND(0.00343)	ND(0.00326)	ND(0.0016)	ND(0.0016)	ND(0.00317)	ND(0.0031)	ND(0.0017)	ND(0.0035)	4.
Benzo (g,h,i) perylene	Lab Result (mg/kg)	ND(0.0346)	ND(0.00364)	ND(0.00367)	ND(0.0032)	ND(0.00342)	ND(0.00326)	ND(0.00515)	ND(0.00489)	ND(0.0016)	ND(0.0016)	ND(0.00475)	ND(0.00465)	ND(0.0017)	ND(0.00525)	1,100.
Benzo (k) fluoranthene	Lab Result (mg/kg)	ND(0.0115)	ND(0.00121)	ND(0.00122)	ND(0.00107)	ND(0.00114)	ND(0.00109)	ND(0.00172)	ND(0.00163)	ND(0.0016)	ND(0.0016)	ND(0.00158)	ND(0.00155)	ND(0.0017)	ND(0.00175)	40.
Chrysene	Lab Result (mg/kg)	ND(0.0115)	ND(0.00121)	ND(0.00122)	ND(0.00107)	ND(0.00114)	ND(0.00109)	ND(0.00172)	ND(0.00163)	ND(0.0016)	ND(0.0016)	ND(0.00158)	ND(0.00155)	ND(0.0017)	ND(0.00175)	400.
Dibenz (a,h) anthracene	Lab Result (mg/kg)	ND(0.0231)	ND(0.00242)	ND(0.00245)	ND(0.00213)	ND(0.00228)	ND(0.00217)	ND(0.00343)	ND(0.00326)	ND(0.0016)	ND(0.0016)	ND(0.00317)	ND(0.0031)	ND(0.0017)	ND(0.0035)	0.4
Fluoranthene	Lab Result (mg/kg)	ND(0.0115)	ND(0.00121)	ND(0.00122)	ND(0.00107)	ND(0.00114)	ND(0.00109)	ND(0.00172)	ND(0.00163)	ND(0.0016)	ND(0.0016)	ND(0.00158)	ND(0.00155)	ND(0.0017)	ND(0.00175)	1,500.
Fluorene	Lab Result (mg/kg)	0.915	ND(0.00121)	ND(0.00122)	ND(0.00107)	ND(0.00114)	ND(0.00109)	ND(0.00172)	ND(0.00163)	ND(0.0016)	ND(0.0016)	ND(0.00158)	ND(0.00155)	ND(0.0017)	ND(0.00175)	1,900.
Indeno (1,2,3-cd) pyrene	Lab Result (mg/kg)	ND(0.0346)	ND(0.00364)	ND(0.00367)	ND(0.0032)	ND(0.00342)	ND(0.00326)	ND(0.00515)	ND(0.00489)	ND(0.0016)	ND(0.0016)	ND(0.00475)	ND(0.00465)	ND(0.0017)	ND(0.00525)	4.
Naphthalene	Lab Result (mg/kg)	4.74	ND(0.00242)	ND(0.00245)	0.0114	0.755	ND(0.00217)	ND(0.00343)	ND(0.00326)	ND(0.0022)	ND(0.0021)	ND(0.00317)	ND(0.0031)	ND(0.0017)	ND(0.0035)	21.
Phenanthrene	Lab Result (mg/kg)	1.29	ND(0.00121)	ND(0.00122)	ND(0.00107)	0.228	ND(0.00109)	ND(0.00172)	ND(0.00163)	ND(0.0016)	ND(0.0016)	ND(0.00158)	ND(0.00155)	ND(0.0017)	ND(0.00175)	16,800.
Pyrene	Lab Result (mg/kg)	ND(0.0115)	ND(0.00121)	ND(0.00122)	ND(0.00107)	0.0121	ND(0.00109)	ND(0.00172)	ND(0.00163)	ND(0.0016)	ND(0.0016)	ND(0.00158)	ND(0.00155)	ND(0.0017)	ND(0.00175)	1,100.
1-Methylnaphthalene	Lab Result (mg/kg)	5.67	ND(0.00121)	ND(0.00122)	ND(0.00107)	0.823	ND(0.00109)	ND(0.00172)	ND(0.00163)	ND(0.0016)	ND(0.0016)	ND(0.00158)	ND(0.00155)	ND(0.0017)	ND(0.00175)	230.
2-Methylnaphthalene	Lab Result (mg/kg)	9.13	0.0137	ND(0.00122)	ND(0.00107)	1.36	ND(0.00109)	ND(0.00172)	ND(0.00163)	ND(0.0022)	ND(0.0021)	ND(0.00158)	ND(0.00155)	ND(0.0023)	ND(0.00175)	230.

Notes:
AAC = Alaska Administrative Code
ADEC = Alaska Department of Environmental Conservation
Dup = duplicate
ft = feet
MDL = Method Detection Limit)
mg/kg = milligrams per kilogram
ND(0.00121) = not detected at a concentration greater than the MDL shown in parentheses
RRO = residual range organics
TF = Tank Farm
PAH = polynuclear aromatic hydrocarbons

Field Notes-aka the truth

[redacted] During the soil investigation, [redacted] also discovered some liquids remaining in the fuel lines. Out of an abundancy of caution, absorbent pads were placed to collect the liquids (see Appendix C). Based on field observations, the liquids were primarily water, likely from condensation or groundwater leaking into the joints after the cessation of the cannery operation.

Notes Powerhouse

- 46 supersacks removed from powerhouse excavation @ 1.5 yd³/sack. Bags 2-45
- Contaminant concentrations increased with depth. Maximum reach of 16' bgs was highest hits.
- Old fuel lines intercepted at rear of building in line w/ 12'x12' concrete pad. Lines still contained fuel. Joints in lines located just behind building. Followed lines - fuel headers 40-50' uphill of site - likely tank farm spot. No excavations or sampling at top end of fuel lines.

The report says the pipes were clean
the field notes say they contained fuel…

7.0 REFERENCES

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Interstate Technology & Regulatory Council (ITRC), 2009. Phytotechnology Technical and Regulatory Guidance and Decision Trees, Revised, February 2009.

OASIS Environmental, Inc. (OASIS), 2011a. *2010 Site Activities Report, Gustavus Old Tank Farm Site, Gustavus, Alaska*, July 21, 2011.

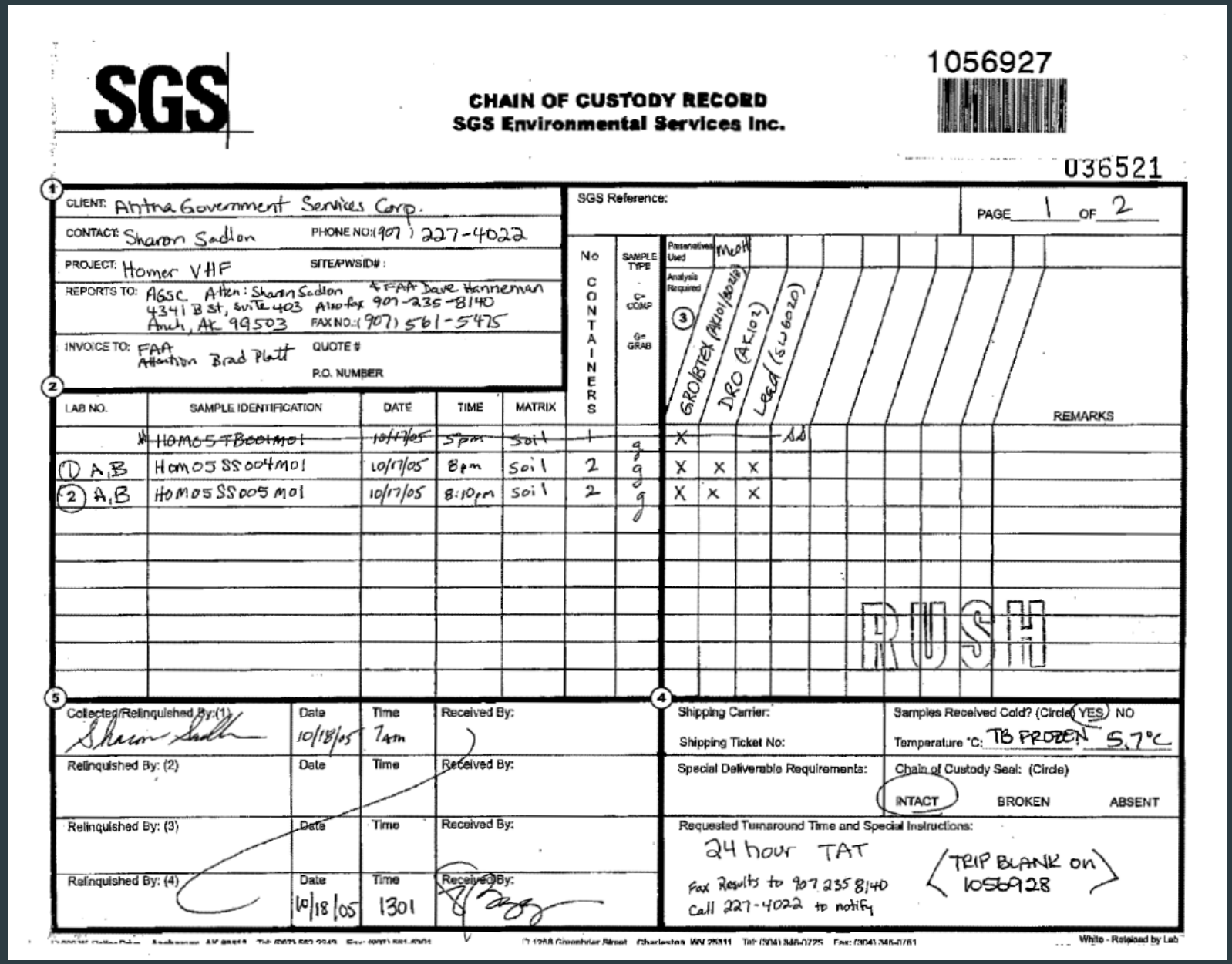
OASIS, 2011b. 2011 *Site Activities Report, Gustavus Old Tank Farm Site, Gustavus, Alaska*, December 29, 2011.

Shannon & Wilson, Inc., 2008. *Gustavus Tank Farm Site Characterization Report, Gustavus, Alaska*. December 2008.

- Make sure they are current, accurate, and appropriate

Data quality: very important but hard to understand!

- They should have duplicate samples
- They should have blanks
- The limit of detection (LOD) for the lab should be less than the cleanup level
- Chain of custody forms and laboratory checklist should be included



SGS

CHAIN OF CUSTODY RECORD
SGS Environmental Services Inc.

1056927

036521

1 CLIENT: Arctna Government Services Corp.
CONTACT: Sharon Sadlon PHONE NO: (907) 227-4022
PROJECT: Homer VHF SITE/PWSID#:
REPORTS TO: AGSC Attn: Sharon Sadlon 4341 B St, suite 403 Anch, AK 99503 Also fax 907-235-8140 FAX NO.: (907) 561-5475 + FAA Dave Hanneman
INVOICE TO: FAA Attention Brad Platt QUOTE # P.O. NUMBER

SGS Reference:

PAGE 1 OF 2

2

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE C=COMP G=GRAB	GRO/BTEX (AK101/8021B)	DRO (AK102)	Lead (SW6020)	REMARKS
	~~HOM05TB001M01~~	~~10/17/05~~	~~5pm~~	~~Soil~~	~~1~~	~~g~~	~~X~~			~~DO~~
(1) A,B	HOM05SS004M01	10/17/05	8pm	soil	2	g g	X	X	X	
(2) A,B	HOM05SS005M01	10/17/05	8:10pm	soil	2	g g	X	X	X	

RUSH

5

Collected/Relinquished By: (1)	Date	Time	Received By:
Sharon Sadlon	10/18/05	7am	
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	10/18/05	1301	Received By:

4

Shipping Carrier:
Shipping Ticket No:
Special Deliverable Requirements:

Samples Received Cold? (Circle) YES NO
Temperature °C: TB FROZEN 5.7°C
Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions:
24 hour TAT
Fax Results to 907 235 8140
Call 227-4022 to notify

(TRIP BLANK on 1056928)

White - Returned by Lab

http://dec.alaska.gov/spar/csp/guidance-forms/

Laboratory Data Review Checklist

Completed By:

Title:

Date:

CS Report Name:

Report Date:

Consultant Firm:

Laboratory Name:

Laboratory Report Number:

ADEC File Number:

Hazard Identification Number:

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:

2. Chain of Custody (CoC)

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

      ○ Yes ○ No Comments:

   b. Correct Analyses requested?

      ○ Yes ○ No Comments:

3. Laboratory Sample Receipt Documentation

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

      ○ Yes ○ No Comments:

   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 acceptable range, insufficient or missing samples, etc.?

      ○ Yes ○ No Comments:

2.0 SITE CHARACTERIZATION METHODS

2.1 FIELD METHODS

RSE site characterization activities occurred between October 9 and 15, 2017 with qualified environmental professionals Neil Waggoner, PE and Qualified Sampler Marc Boas performing environmental sampling during the excavation of hydrocarbon impacted soil surrounding AST4 and installation of twenty (20) test pits (Test Pit A through Test Pit S) at the site. RSE worked in conjunction with John Carolan with Northern Petroleum & Testing Services, Inc. (NPT) and LYSD maintenance personnel. NPT transferred heating oil from fuel tanks and pipelines at the facility into a single tank for removal from the site and to minimize the risk of additional fuel spills. Approximately 400 gallons of heating oil was removed from tanks and piping and hauled away for offsite use. Approximately 60 cubic yards of impacted soil was excavated in the area of AST4 and placed in super sacks for future transport to a proposed LYSD landspread area on LYSD owned land in Mountain Village. Test pits were installed around the facility adjacent to fuel tanks and piping, at the extents of the former flexible coupling excavation, at locations identified in the Shannon & Wilson report as having soil above MTG soil cleanup levels, and other suspect

- What they actually did!
- Any deviations from the work plan
- Calibration of the instruments
- Decontamination of equipment

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: FAA Former Tank Farm Gustavus, Alaska
1507.38.011

Completed By: Ahtna Environmental, Inc.
Date Completed: November 2018

***Instructions*: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.**

(1) *Check the media that could be directly affected by the release.*

(2) *For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.*

Media	Transport Mechanisms
☐ Surface Soil (0-2 ft bgs)	☐ Direct release to surface soil → check soil ☐ Migration to subsurface → check soil ☐ Migration to groundwater → check groundwater ☐ Volatilization → check air ☐ Runoff or erosion → check surface water ☐ Uptake by plants or animals → check biota ☐ Other (list):
☐ Subsurface Soil (2-15 ft bgs)	☐ Direct release to subsurface soil → check soil ☐ Migration to groundwater → check groundwater ☐ Volatilization → check air ☐ Uptake by plants or animals → check biota ☐ Other (list):
☑ Ground-water	☑ Direct release to groundwater → check groundwater ☑ Volatilization → check air ☑ Flow to surface water body → check surface water ☐ Flow to sediment → check sediment ☐ Uptake by plants or animals → check biota ☐ Other (list):
☐ Surface Water	☐ Direct release to surface water → check surface water ☐ Volatilization → check air ☐ Sedimentation → check sediment ☐ Uptake by plants or animals → check biota ☐ Other (list):
☐ Sediment	☐ Direct release to sediment → check sediment ☐ Resuspension, runoff, or erosion → check surface water ☐ Uptake by plants or animals → check biota ☐ Other (list):

(3) *Check all exposure media identified in (2).*

(4) *Check all pathways that could be complete. The pathways identified in this column must agree with Sections 2 and 3 of the Human Health CSM Scoping Form.*

(5) *Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.*

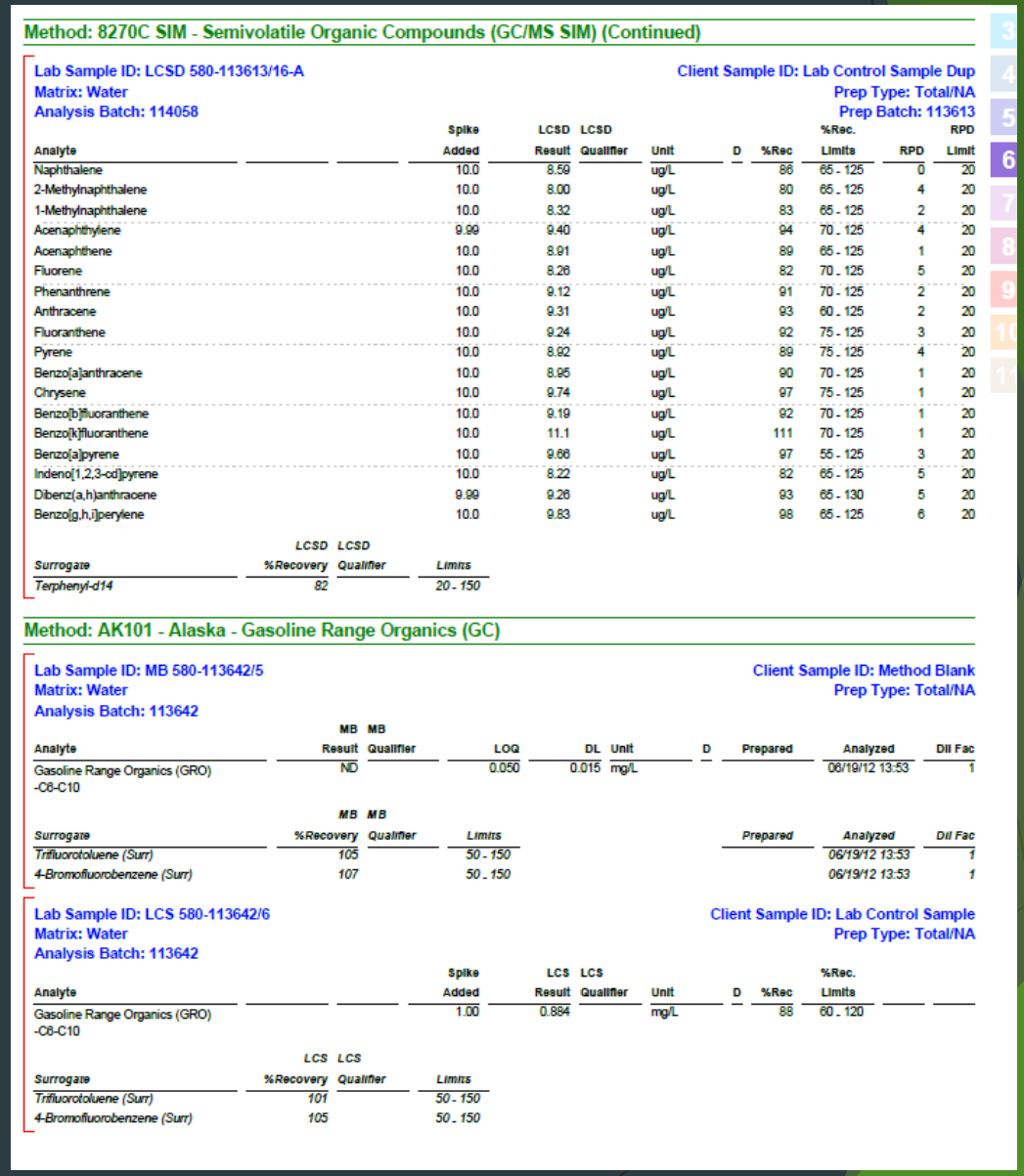
Current & Future Receptors

Exposure Media	Exposure Pathway/Route	Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☐ soil	☐ Incidental Soil Ingestion							
	☐ Dermal Absorption of Contaminants from Soil							
	☐ Inhalation of Fugitive Dust							
☑ groundwater	☑ Ingestion of Groundwater		C/F	C/F	F	I	I	
	☑ Dermal Absorption of Contaminants in Groundwater		C/F	C/F	F	I	I	
	☑ Inhalation of Volatile Compounds in Tap Water		F	F	F	I	I	
☐ air	☐ Inhalation of Outdoor Air							
	☐ Inhalation of Indoor Air							
	☐ Inhalation of Fugitive Dust							
☑ surface water	☑ Ingestion of Surface Water		C/F	C/F	F	I	I	
	☑ Dermal Absorption of Contaminants in Surface Water		C/F	C/F	F	I	I	
	☑ Inhalation of Volatile Compounds in Tap Water		F	F	F	I	I	
☐ sediment	☐ Direct Contact with Sediment							
☐ biota	☐ Ingestion of Wild or Farmed Foods							

Revised, 10/01/2010

Other good stuff!

- Double check to make sure all resumes are included. Sometimes bigger companies will send many people out. They all need to be qualified!
- The raw lab data should be included. This is good to review if you have questions on their data tables
- Copies of TTD forms
- Maps



Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCSD 580-113613/16-A
Matrix: Water
Analysis Batch: 114058

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 113613

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Naphthalene			10.0	8.59		ug/L		86	65 - 125	0	20
2-Methylnaphthalene			10.0	8.00		ug/L		80	65 - 125	4	20
1-Methylnaphthalene			10.0	8.32		ug/L		83	65 - 125	2	20
Acenaphthylene			9.99	9.40		ug/L		94	70 - 125	4	20
Acenaphthene			10.0	8.91		ug/L		89	65 - 125	1	20
Fluorene			10.0	8.26		ug/L		82	70 - 125	5	20
Phenanthrene			10.0	9.12		ug/L		91	70 - 125	2	20
Anthracene			10.0	9.31		ug/L		93	60 - 125	2	20
Fluoranthene			10.0	9.24		ug/L		92	75 - 125	3	20
Pyrene			10.0	8.92		ug/L		89	75 - 125	4	20
Benzo[a]anthracene			10.0	8.95		ug/L		90	70 - 125	1	20
Chrysene			10.0	9.74		ug/L		97	75 - 125	1	20
Benzo[b]fluoranthene			10.0	9.19		ug/L		92	70 - 125	1	20
Benzo[k]fluoranthene			10.0	11.1		ug/L		111	70 - 125	1	20
Benzo[a]pyrene			10.0	9.66		ug/L		97	55 - 125	3	20
Indeno[1,2,3-cd]pyrene			10.0	8.22		ug/L		82	65 - 125	5	20
Dibenz(a,h)anthracene			9.99	9.26		ug/L		93	65 - 130	5	20
Benzo[g,h,i]perylene			10.0	9.83		ug/L		98	65 - 125	6	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Terphenyl-d14	82		20 - 150

Method: AK101 - Alaska - Gasoline Range Organics (GC)

Lab Sample ID: MB 580-113642/5
Matrix: Water
Analysis Batch: 113642

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	ND		0.050	0.015	mg/L			06/19/12 13:53	1

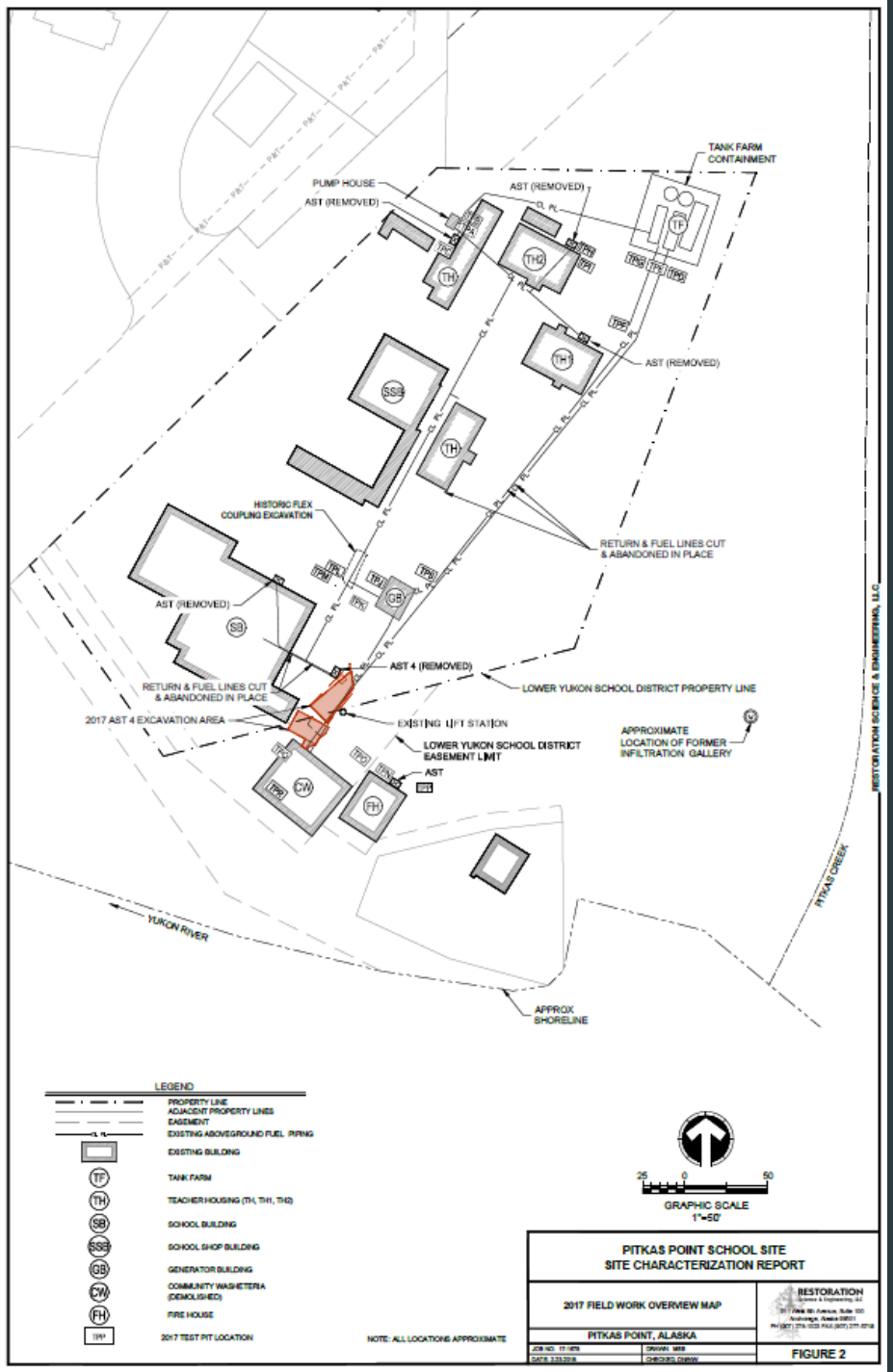
Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	105		50 - 150		06/19/12 13:53	1
4-Bromofluorobenzene (Surr)	107		50 - 150		06/19/12 13:53	1

Lab Sample ID: LCS 580-113642/6
Matrix: Water
Analysis Batch: 113642

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (GRO) -C6-C10			1.00	0.884		mg/L		88	60 - 120		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Trifluorotoluene (Surr)	101		50 - 150
4-Bromofluorobenzene (Surr)	105		50 - 150



Maps can show you many things about a site!

Summary

- Be safe during your site inspections
- Take notes and photos
- Ask questions if you can do so in a safe manner

- Read the executive summary and conclusions first
- Make sure all work is done by a QEP
- Feel free to call ADEC anytime with questions on the report

Have questions? Need help? Give ADEC a call!

- 907-269-7503 (Anchorage)
- 907-451-2143 (Fairbanks)
- 907-465-5390 (Juneau)
- 907-262-5210 (Soldotna)