

**United States Army
Corps of Engineers**

Alaska District
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Chemical Data Report

Stockpile Sampling

Nome Sheet Pile Expansion
(08-018)
Nome, Alaska



**Materials Section
Engineering Services Branch**

June 2009

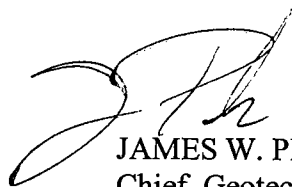
29 June 2009

MEMORANDUM FOR CEPOA-PM-C (Julie Anderson)

SUBJECT: Chemical Data Report, Nome Sheet Pile Expansion Soil Sampling and Analysis, Nome, Alaska (08-018)

1. Reference Memorandum, CEPOA-EN-ES-M (Thomas Oh), 30 November 2007, Subject: Meeting Notes for November 29 Conference Call, Nome sheet Pile Expansion.
2. Attached is the Chemical Data Report for this project.
3. Questions should be directed to Sean Benjamin, ext. 5514.

Encl



JAMES W. PEKAR, P.E.
Chief, Geotechnical Services

Executive Summary

The U.S. Army Corps of Engineers (USACE), Alaska District, Materials Section (CEPOA-EN-ES-M), prepared this report at the request of the USACE Project Management Branch (CEPOA-PM-C). This report presents the analytical results of soil samples collected during the limited stock pile investigation for the Nome Sheet Pile Expansion project in Nome, Alaska. The soil samples were collected from 26 July through 29 November 2008. The results were compared against the most conservative Alaska Department of Environmental Conservation (ADEC) soil cleanup levels.

A total of 26 samples were collected on the Nome Sheet Pile Expansion project, beginning 26 July through 29 November 2008. Grab samples were taken from each of four test pits dug with an excavator. Four multi-increment samples were taken in triplicate from the stockpiles of excavated soil. The remaining 10 samples were taken of the ground surface beneath the temporary stockpile cells pre and post stockpile construction.

Based on the results of this sampling, the soil samples revealed the presence of the following contaminants:

1. DRO was detected in the three multi-increment samples of Stockpile #3 at an average concentration of 13800 mg/kg with a 95% Upper Confidence Limit (UCL) of 15000 mg/kg, both of which are greater than the agreed upon landfill disposal level of 7000 mg/kg.
2. DRO was detected above the ADEC cleanup level of 250 milligrams per kilogram (mg/kg) in three of the four test pits (samples 08NOME-05SL, -06SL, and -13SL from Test Pits #1, #2, and #4 respectively). Benzene was detected above the ADEC cleanup limit in two test pit samples, 08NOME-06SL and 08NOME-13SL (Test Pits #2 and #4 respectively). 1-Methylnaphthalene and 2-Methylnaphthalene in sample 08NOME-13SL were also above ADEC cleanup criteria. These levels are indicative of weathered fuels.

The results for the last sampling event when Stockpile #3 was sampled were delayed due to laboratory capacity issues. With the advent of winter, the Corps of Engineers Project Manager and the City of Nome representative agreed to allow the transport of Stockpile #3 to a holding area at the landfill prior to receipt of analytical results.

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Chemical Data Report

1. Introduction

This report presents the analytical results of soil samples collected during the installation of new sheet piles at the Crowley Dock Bulkhead Wall in Nome, Alaska. The Materials Section of the U.S. Army Corps of Engineers, Alaska District (CEPOA-EN-ES-M), prepared this report at the request of the Alaska District Project Civil Works Branch (CEPOA-EN-CW).

2. Site Background Information

2.1 Location

The project sampling site is located in Nome, Alaska (Figure 1). The site is bounded on the north by River Street, on the east by West F Street, on the south by Gold Avenue, and the west by the Snake River.

2.2 Site History and Known Contamination

The proposed construction area for the new sheet pile installation occurs near areas that are known to have elevated levels of diesel range organics (DRO). In 2003, the USACE conducted an investigation of surface and subsurface soils at the Crowley Marine dock in Nome. The investigation revealed widespread fuel contamination of site soils from the ground surface to 7-9 feet below the ground surface (bgs). Fuel staining and a strong fuel odor were noted in most borings, although free product was not reported. Laboratory chemical analyses indicated that the primary contaminant was weathered diesel fuel. Analyses also revealed localized areas of gasoline range organics (GRO) contamination. The source of the GRO contamination is not known, but it was generally collocated with much higher levels of DRO and is attributable to the presence of lighter fractions of diesel fuel contamination.

2.3 Limitations

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

3. Field Activities and Observations

3.1 Summary of Field Activities

A total of 26 samples were collected on the Nome Sheet Pile Expansion project, beginning 26 July through 29 November 2008. Grab samples were taken from four test pits dug with an excavator. Four multi-increment samples were taken in triplicate from the stockpiles of excavated soil. The remaining 10 samples were grab samples taken of the ground surface beneath the temporary stockpile location.

The field crew over the course of the study consisted of chemist Mark Harvison (CEPOA-EN-ES-M), Karl Harvey (Project QAR), and Ruel Binonwangon (CEPOA-EN DA Intern).

3.2 Sampling Activities

Chemical sampling was performed in a manner consistent with the project Sampling and Analysis Plan (SAP, ref. 7.7). Twenty six (26) soil samples (including four duplicates and four triplicates) were submitted to the laboratory for chemical analysis. See Table 3-1 below.

Parameter	Analytical Method	Target Contaminant	Number of Samples Submitted¹
Diesel Range Organics (DRO)	AK102	Diesel and other medium-weight fuels	26
Gasoline Range Organics (GRO)	AK101	Gasoline and other light fuels, some solvents	4
Residual Range Organics (RRO)	AK103	Lubricant oils, asphalts, tars	4
BTEX	SW846 8260B	Fuel constituent and solvent compounds	4
Polycyclic Aromatic Hydrocarbons (PAHs)	SW846 8270C SIM	Fuel constituent compounds and various additional non-volatile chemicals	4

1. Numbers include duplicate samples.

3.3 Observations

All four of the test pits had visible soil staining and an odor of diesel fuel. Various waste debris, such as railroad ties and other lumber, was encountered while excavating some of the test pits. For each multi-increment sample, at least 50 increments were collected; these were collected from each of the four stockpiles at random intervals and depths. Duplicate and triplicate increments were also taken at the same depth, but one foot to the right and left respectively of the original sample. Samples were also taken of the surface soil beneath the stockpile location before the temporary stockpiles were created. Staining of the soil beneath

the temporary stockpile was not observed prior to construction or after the stockpile was removed.

3.4 Investigation Derived Waste

All soil samples from the test pits and stockpiles exceeded the field-screening criterion for contamination. All excavated soils were put into the soil stockpiles for testing and disposal at the local landfill, as described in the SAP. Solid waste (i.e., disposable sampling equipment and other trash) was disposed of in facility trash receptacles.

4. Results of Chemical Analyses

4.1 Overview

The samples collected from the project sites were analyzed by SGS Laboratories of Anchorage, Alaska. SGS was contracted through the City of Nome. The laboratory work is compliant with the Department of Defense Quality System Manual (QSM, ref. 7.5). The results of the chemical analyses are summarized in the sections below. Comprehensive data tables and 95% Upper Confidence Limits (UCLs) for multi-incremental samples are presented in Appendix B.

4.2 Chemicals Detected

The results of the chemical analyses for the test pits were screened against State of Alaska soil cleanup levels under 18 AAC 75, Oil and Hazardous Substances Pollution Control (ref. 7.4). The most stringent Method Two cleanup levels for the Under 40 Inch Zone were used as evaluation criteria.

DRO contaminated soil poses disposal issues at remote locations such as Nome, Alaska. These issues include a significant increase in disposal costs, logistics of transport (as there are no treatment systems available in Nome), and the impact that the disposal would have on this project. Because the Nome site is known to have gross DRO contamination, the ADEC and the City of Nome agreed to an upper action limit of 7000 mg/kg for landfill disposal.

Table 4-1 summarizes those chemicals that were detected at concentrations above ADEC cleanup levels.

Table 4-1A: Summary of Detected Chemicals Above Project Cleanup Limits

Chemical Parameter	Units	Highest Concentration Reported	ADEC Soil Cleanup Level ¹	Samples with Concs. Exceeding Cleanup Level
Benzene	mg/kg	0.311	0.025	2
1-Methylnaphthalene	mg/kg	11.6	6.2	1
2-Methylnaphthalene	mg/kg	15.6	6.1	1
DRO	mg/kg	14600²	7000 ³	3

1. Soil cleanup levels cited are the most stringent Method 2 levels for the "Under 40 Inch Zone", from 18 AAC 75.
 2. The 95% UCL calculated from triplicate multi-incremental samples collected from this location is 15000 mg/kg..
 3. The DRO cleanup limit is based on a landfill disposal criteria agreed upon between ADEC and the city of Nome. The ADEC cleanup level for site evaluation, based on 18 AAC 75, is 250 mg/kg.

4.2.1 Fuels: DRO was detected in all of the multi-increment samples in Stockpile #3 at concentrations between 13400 and 14600 mg/kg, with a 95% upper confidence level (UCL) of 15000 mg/kg. This is above the project action limit of 7000 mg/kg. See Table 4-1B below:

Table 4-1B: 95% UCL Results for Multi-Incremental Samples

Identifier	Sample ID	DRO Results (mg/kg)	95% UCL ¹	Cleanup Level ²
Stockpile - Clean	08NOME-08SLA	323	330	7000
	08NOME-08SLB	315		
	08NOME-08SLC	305		
Stockpile #1	08NOME-09SLA	788	1540	7000
	08NOME-09SLB	1160		
	08NOME-09SLC	1310		
Stockpile #2	08NOME-10SLA	911	925	7000
	08NOME-10SLB	869		
	08NOME-10SLC	887		
Stockpile #3	08NOME-14SLA	14600	15000	7000
	08NOME-15SLB	13400		
	08NOME-16SLC	13500		

1. The 95% UCL were calculated according to ADEC Guidance (Ref. 7.1)
 2. The Cleanup Level for DRO is based on a landfill disposal criterion agreed upon by ADEC and the City of Nome.

DRO was also detected in all four test pit samples that were collected; three of the four test pit samples (08NOME-05SL, -06SL, and -13SL from Test Pits #1, #2, and #4) exceeded the ADEC cleanup level of 250 mg/kg. GRO and RRO were found at low concentrations in the four samples analyzed.

4.2.2 BTEX: Benzene was detected at concentrations above ADEC cleanup levels in two samples, 08NOME-06SL (Test Pit #2) and 08NOME-13SL (Test Pit #4). Benzene and other fuel-like constituents would normally be detected in samples with a significant level of DRO.

4.2.3 Polycyclic Aromatic Hydrocarbons (PAHs): 1-Methylnaphthalene and 2-Methylnaphthalene were found at concentrations above ADEC cleanup levels in sample

08NOME-13SL (Test Pit #4). Due to the high concentrations of fuels and weathered fuel distillates in samples from this test pit, this is not to be unexpected.

4.3 Deviations from the Work Plan

There were two notable deviations from the Work Plan. First, post construction samples were not collected from the footprint of the temporary cell after Stockpile #3 had been removed from the site. Consequently, there was no way to confirm that the site was not further contaminated by temporarily storing soils in that stockpile. Secondly, the DRO results indicate that soil from Stockpile #3 exceeded the landfill disposal requirements. Disposition of this soil was the City's responsibility once delivered to the landfill.

5. Data Quality Review and Usability Assessment

After analysis at the project laboratories, the project data was reviewed for deviations to the requirements presented in the Sampling and Analysis Plan (ref 7.7), the ADEC Technical Memo 06-002 (ref 7.2), and the Department of Defense (DoD) Quality Systems Manual (QSM, ref 7.5) in the following areas – precision, accuracy, representativeness, comparability, completeness, and sensitivity (PARCCS). Elements reviewed include sample handling, holding times, method and trip blanks, laboratory control sample (LCS) recoveries and relative percent differences (RPDs), matrix spikes and matrix spike duplicates (MS/MSD) recoveries and RPDs, surrogate recovery, and field duplicate comparability. Reporting limits were screened against the most stringent 18AAC75 Method 2 Under 40 Inch criteria for soils. Calibration curves and continuing calibration standard recoveries were not reviewed. Quality control deviations which do not impact data quality (e.g. a high LCS recovery associated with a nondetect result) are not discussed.

The following qualifiers, listed below in order of increasing severity, are used in the data tables to indicate quality control deficiencies:

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

When the use of more than one qualifier is required, the most severe flag will be used.

All samples were sent to SGS Environmental Services, Inc in four Sample Delivery Groups (SDGs). SGS is validated by the State of Alaska through the Contaminated Sites

Program and is approved through the National Environmental Laboratory Assessment Program. The laboratory has a Self Declaration Letter on file at the Alaska District indicating adherence to the policies and procedures outlined in the QSM. Details of the data review are presented below:

5.1. SDG 1083869

5.1.1. Sample Handling: Five soil samples were received in sample delivery group 1083869 by the laboratory. All sample receiving criteria were met for analyses requested, cooler temperatures, and chain of custody.

5.1.2. Holding Times: All samples were analyzed within the method specified holding times.

5.1.3. Blanks: Method blanks were analyzed at the proper frequency. Target analytes were not detected in any method blank. There was no trip blank associated with SDG 1083869, either accompanying the sample shipment or listed on the chain of custody. GRO (AK101) results were well below the project action limits and BTEX (SW8260B) were not detected; therefore, data usability for these results is not impacted due to this deviation. Results are not qualified.

5.1.4. Laboratory Control Samples: Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD) were analyzed at the required frequency. Recoveries were within the QSM acceptance limits or any deviations do not impact data usability.

5.1.5. Laboratory Control Sample Precision: The LCS precision as measured by the RPD was within the QSM acceptance limits or any deviations do not impact data usability. LCSDs were performed for methods AK101, AK102, and AK103.

5.1.6. Surrogates: Surrogate recoveries for all samples were within the QSM acceptance limits or deviations do not impact data quality except for the following:

- The 4-bromofluorobenzene surrogate for GRO in sample 08NOME-05SL was above laboratory control limits. The result for this sample is qualified as biased high and flagged "MH." Data usability is not impacted as the GRO result for this sample is well below the ADEC cleanup level.

5.1.7. Matrix spikes: Matrix Spike/Matrix Spike Duplicate (MS/MSD) were performed but were not performed on samples from this project. As such, matrix effects could not be evaluated.

5.1.8. Matrix Spike precision: Neither LCSDs nor MSDs were performed for BTEX by SW8260B or PAHSIM by SW8270C-SIM. Therefore, precision could not be evaluated for these methods.

5.2. SDG 1084352

5.2.1. Sample Handling: Five soil samples were received in sample delivery group 1084352 by the laboratory. Three of the samples were analyzed and reported multiple times as directed by the USACE. All sample receiving criteria were met except the following:

- The cooler and temperature blank exceeded the QSM required sample receipt temperature range of 0-6°C, at 8.0 and 7.5 degrees Celsius, respectively. DRO data may be biased low, and are qualified “QL.”
- Multi-incremental samples were logged incorrectly on the Chain of Custody. MI duplicate and triplicate samples were given identical Sample IDs, causing the laboratory to treat each jar as the same sample. Once this was discovered, the laboratory was notified that they should process each sample jar as an independent sample. The Chain of Custody was changed by laboratory to account for this miscommunication. Data usability was not impacted.

5.2.2. Holding Times: All samples were analyzed within the method specified holding times.

5.2.3. Blanks: Method blanks were analyzed at the proper frequency. Target analytes were not detected in any method blank. A trip blank was not required for this SDG.

5.2.4. Laboratory Control Samples: Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD) were analyzed at the required frequency. Recoveries were within the QSM acceptance limits or any deviations do not impact data usability.

5.2.5. Laboratory Control Sample Precision: The LCS precision as measured by the RPD was within the QSM acceptance limits or any deviations do not impact data usability.

5.2.6. Surrogates: Surrogate recoveries for all samples were within the QSM acceptance limits or deviations do not impact data usability.

5.2.7. Matrix spikes: Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples were analyzed at the required frequency and recoveries were within QSM acceptance limits or deviations do not impact data quality except for the following:

- The matrix spike and/or matrix spike duplicate recoveries for DRO in the spikes of sample 08NOME-09SL were above QSM acceptance criteria. The spike concentrations in MS/MSD samples were less than the DRO concentration in the parent sample, and therefore, MS/MSD recovery criteria are not applicable. Data usability is not impacted as the affected result in sample 08NOME-09SL is well below the project action level (as agreed to by ADEC and the City of Nome).

5.2.8. Matrix Spike precision: The reported MS/MSD precision was within QSM acceptance limits.

5.3. SDG 1084377

5.3.1. Sample Handling: Three soil samples were received in sample delivery group 1084377 by the laboratory. All sample receiving criteria were met.

5.3.2. Holding Times: All samples were analyzed within the method specified holding times.

5.3.3. Blanks: Method blanks and trip blanks were analyzed at the proper frequency. Target analytes were not detected in any method or trip blank.

5.3.4. Laboratory Control Samples: Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD) were analyzed at the required frequency. Recoveries were within the QSM acceptance limits or any deviations do not impact data.

5.3.5. Laboratory Control Sample Precision: The LCS precision as measured by the RPD was within the QSM acceptance limits or any deviations do not impact data usability.

5.3.6. Surrogates: Surrogate recoveries for all samples were within the QSM acceptance limits or deviations do not impact data quality except for the following:

- The surrogate recoveries for sample 08NOME-06SL for 8270C SIM, AK101, and AK103 were above laboratory control limits. The results for this sample are qualified as biased high and flagged “QH.” Data usability is not impacted since all of these results for this sample are well below the project action limit.

5.3.7. Matrix spikes: Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples were analyzed at the required frequency and recoveries were within QSM acceptance limits or deviations do not impact data quality except for the following:

- MS/MSD recoveries on sample 08NOME-06SL for analytes Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Chrysene, Fluoranthene, Indeno(1,2,3-cd)pyrene, and Pyrene were below QSM acceptance criteria. These results are flagged “ML.” Data usability is not impacted as all of these results are well below ADEC cleanup levels.
- The matrix spike recovery for GRO in the spike of sample 08NOME-06SL was just above QSM acceptance criteria. The result for GRO in the primary sample is flagged “MH”. Data usability is not impacted as the result is well below the ADEC cleanup levels.

5.3.8. Matrix Spike precision: The reported MS/MSD precision was within QSM acceptance limits except for the following:

- The MS/MSD RPD does not meet QC criteria for acenaphthylene, acenaphthene, and anthracene. The results were previously qualified due to Section 5.3.8 above, the flag was changed from “ML” to “MN” to account for the increased variability as indicated by the RPD failure. Data usability is not impacted as the results are well below the project action limits.

5.4. SDG 1085377

5.4.1. Sample Handling: Eight soil samples (including one duplicate/triplicate) were received in sample delivery group 1085377 by the laboratory. All sample receiving criteria were met except the following:

- Sample 08NOME-13SL had nothing written on the label. The jar lid was labeled "TP-4." The field chemist was called, and the appropriate information was obtained. Data usability was not impacted.
- A rapid turnaround time was requested by phone and subsequent e-mail by the field chemist. The laboratory response stated that due to workload, rush analyses were not available.

5.4.2. Holding Times: All samples were analyzed within the method specified holding times.

5.4.3. Blanks: Method blanks were analyzed at the proper frequency. Target analytes were not detected in any method blank. A trip blank was not submitted with these samples. Consequently, GRO and VOC results may be biased high. However, the associated results are consistent with weathered fuel, and are typical of these sample types.

5.4.4. Laboratory Control Samples: Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD) were analyzed at the required frequency. Recoveries were within the QSM acceptance limits or any deviations do not impact data usability.

5.4.5. Laboratory Control Sample Precision: The LCS precision as measured by the RPD was within the QSM acceptance limits or any deviations do not impact data usability.

5.4.6. Surrogates: Surrogate recoveries for all samples were within the QSM acceptance limits or deviations do not impact data quality except for the following: The surrogate recoveries of 5a-Androstane in DRO samples 08NOME-13SL through 08NOME-16SL and 4-Bromofluorobenzene in GRO sample 08NOME-13SL were above control limits. The DRO and GRO results for these samples are qualified as biased high and flagged "QH." Data usability is not impacted, as surrogate results for contaminated samples are typically biased high due to method analytical requirements.

5.4.7. Matrix spikes: Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples were analyzed at the required frequency and recoveries were within QSM acceptance limits or deviations do not impact data quality except for the following:

- The matrix spike/matrix spike duplicate recoveries for most of the PAH compounds in the spikes of sample 08NOME-13SL were below QSM acceptance criteria. The results for these analytes in the primary sample are flagged "ML." Data usability is not impacted as the results are well below ADEC cleanup levels.

- The recoveries for Fluorene, Naphthalene, Phenanthrene, and Pyrene in sample 08NOME-13SL were both above and below QSM acceptance criteria (one in the spike and the other in the spike duplicate). However, since the concentration of each of these analytes in the parent sample is greater than the spike concentration, matrix spike recovery criteria are not applicable. Data usability is not impacted as the results are well below ADEC cleanup levels.

5.4.8. Matrix Spike precision: The reported MS/MSD precision was within QSM acceptance limits.

5.5. Field Duplicates/Triplicates

Four field duplicates and four triplicates were collected and submitted to the laboratory during this field effort. These are applicable only to the multi-increment DRO sampling of the stock piles. A field duplicate was not submitted for the PAH, GRO, RRO, and BTEX analyses. A total of eighteen primary samples were submitted, thus the required 10% duplicate frequency was met for DRO, but was not met for the other analyses. Field duplicate results are compliant with the criteria specified in ADEC Tech Memo 06-002 except as noted below:

- A field duplicate was not submitted with the samples in SDG 1083869. Sampling precision cannot be evaluated due to this deviation.
- For multi-incremental duplicates/triplicates in SGD 1084352, the samples were labeled with the same sample number. The laboratory was notified after the samples were received to run the extra sample jars as separate samples. These samples were not blind to the laboratory. However, multi-incremental sampling does not require blind laboratory analyses. Results are usable as qualified.
- A field duplicate was not submitted for SDG 1084377. Sampling precision cannot be evaluated due to this deviation.
- A field duplicate was not submitted for SDG 1085377 for GRO, BTEX, and PAHs. Sampling precision cannot be evaluated due to this deviation.

5.6. Multi-Incremental Sample Assessment

Multi-incremental samples were collected in accordance with ADEC's Draft Guidance on Multi-Incremental Soil Sampling (ref. 7.1). ADEC guidance for multi-incremental sampling specifies that fundamental error be less than 15% and that the relative standard deviation (RSD) for primary, duplicate, and triplicate analyses be less than 30%. These criteria were met for DRO samples in all four stockpile samples as shown in Table 5-1 below.

Table 5-1: Fundamental Error and Relative Standard Deviation Results				
Location	Minimum Sample Size (grams)	Fundamental Error	DRO Results (mg/kg)	RSD
MI SP-Clean	25.873	7.9%	323 QL 315 QL 305 QL	3
MI SP-1	25.820	7.9%	788 QL 1160 QL 1310 QL	25
MI-SP-2	15.521	10%	911 QL 869 QL 887 QL	2
MI-SP-3	30.091	7.3%	14600 QH 13400 QH 13500 QH	5

5.7. Reporting Limit Assessment

The laboratory reporting limits are defined as practical quantification limits (PQLs) and are based on the lowest level calibration standard corrected for sample preparation, dilution, and moisture (if applicable). The MDL is defined as the limit at which an analyte has a 99% chance of being greater than zero (i.e. “detected”). This limit must be less than the PQL and represents the very least that the laboratory can detect. Consequently, any non-detect result with an MDL greater than the ADEC cleanup level cannot be used to prove the absence of that analyte. Benzene was the only analyte to have its PQL greater than the applicable ADEC cleanup levels in five samples. However, all analytes had MDLs lower than applicable ADEC cleanup criteria.

5.8. Overall Assessment

All results for these SDGs are usable as reported and flagged.

6. Summary and Recommendations

6.1 Summary

The 95% UCL calculated for DRO in Stockpile #3 was 15,000 mg/kg, which is greater than agreed disposal level of 7000 mg/kg. In addition, DRO exceeded the ADEC cleanup level of 250 mg/kg in three of four test pit samples (08NOME05SL, -06SL, and -13SL from Test Pits #1, #2, and #4, respectively).

Benzene was detected above ADEC cleanup limits in two test pit samples, 08NOME06SL from Test Pit #2 and 08NOME-13SL from Test Pit #4. 1-Methylnaphthalene and 2-Methylnaphthalene in sample 08NOME-13SL were also above ADEC cleanup criteria. These levels are indicative of weathered fuels.

6.2 Recommendations

Based on the information from the chemical data analysis, soil from Stockpile #3 should not have been mixed with soil placed in the landfill from earlier stockpiles. However, the last sampling event was subject to laboratory capacity issues and the results were delayed. With the advent of winter, the Corps of Engineers Project Manager and the City of Nome representative elected to transport Stockpile #3 to a temporary holding area at the landfill. Disposition of this soil was the City's responsibility once delivered to the landfill.

7. References

7.1 Alaska Department of Environmental Conservation, Draft Guidance on Multi-Increment Soil Sampling, March 2007.

7.2 Alaska Department of Environmental Conservation, Technical Memorandum 06-002, Environmental Laboratory Data and Quality Assurance Requirements, March 2009.

7.3 Alaska Department of Environmental Conservation, Guidance No. SPAR 2002-1, Off-Site Disposal of Soil Not Requiring Institutional Controls, 11 January 2003.

7.4 Alaska Department of Environmental Conservation, 18 AAC 75, Oil and Hazardous Substances Pollution Control, October 2008.

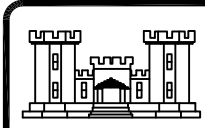
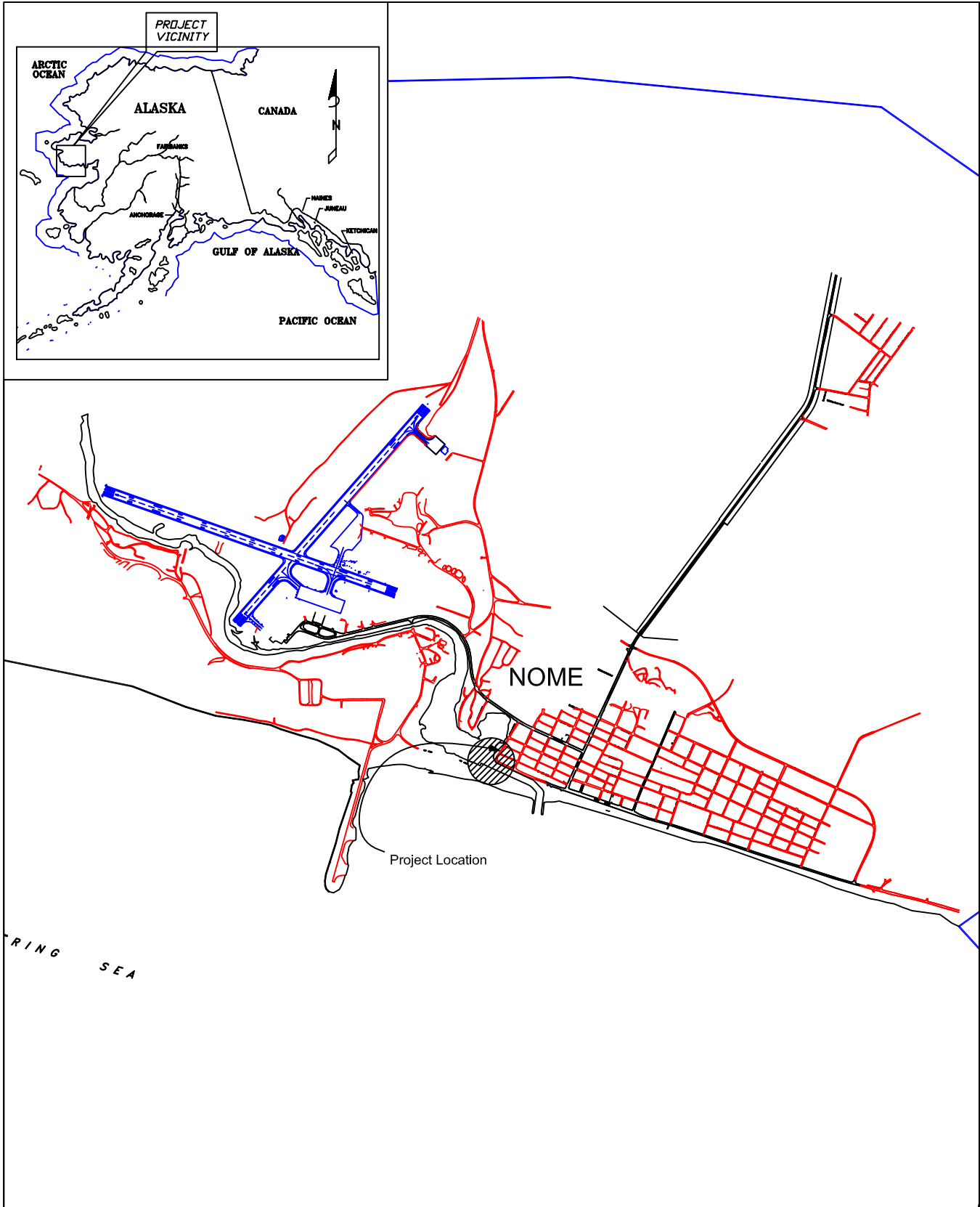
7.5 Department of Defense, Quality Systems Manual for Environmental Laboratories, Final Version 3, January 2006.

7.6 SGS Laboratories, Laboratory Analytical Reports 1083869, 1084352, 1084377, and 1085377, Nome Harbor Sheetpile Expnsn., 9/6/2008, 10/10/2008, 10/15/2008, and 11/9/2008.

7.7 U.S. Army Corps of Engineers, Sample and Analysis Plan, Nome Harbor Sheetpile Replacement, HTRW Soil Sampling and Analysis, Nome, Alaska (08-018), June 2008.

Appendix A

Figures and Site Photographs



ALASKA DISTRICT
CORPS OF ENGINEERS
SOILS AND GEOLOGY

LOCATION AND VICINITY MAP
NOME HARBOR SHEET PILE
REPLACEMENT (NOM005)
NOME, ALASKA

SCALE: NTS
DATE: MAY 2006
DRAWN/RVW: RVP/CRW
FIGURE 1



Figure 2: Laying foundation plastic for the soil stockpile.



Figure 3: A tarp over the black plastic for the soil stockpile.



Figure 4: Test Pit #2.



Figure 5: Test Pit #3.

Appendix B

Chemical Data and 95% UCL Tables

Nome Harbor Data Table

		Sample ID		08NOME-05SL	08NOME-06SL	08NOME-07SL	08NOME-13SL	08NOME-08SL	08NOME-08SL
		Location ID, Depth		TEST PIT 1	TEST PIT 2	TEST PIT 3	TEST PIT 4	MI SP-CLEAN A	MI SP-CLEAN B
		Collection Date		7/28/2008	8/15/2008	8/15/2008	9/29/2008	8/17/2008	8/17/2008
		Sample Del. Group		1083869	1084377	1084377	1085377	1084352	1084352
Method	ANALYTE	UNITS	ADEC						
8270SIM	1-Methylnaphthalene	mg/kg	6.2	1.71 [0.288]	0.303 [0.068] QH	0.0242 [0.0595] J	11.6 [1.17]		
8270SIM	2-Methylnaphthalene	mg/kg	6.1	ND [0.0577]	ND [0.068] QH	ND [0.0595]	15.6 [1.17]		
8270SIM	Acenaphthene	mg/kg	180	ND [0.0577]	ND [0.068] MN J QH	ND [0.0595]	ND [0.292] ML		
8270SIM	Acenaphthylene	mg/kg	180	ND [0.0577]	ND [0.068] MN J QH	ND [0.0595]	ND [0.292] ML		
8270SIM	Anthracene	mg/kg	3000	ND [0.0577]	ND [0.068] MN J QH	ND [0.0595]	ND [0.292] ML		
8270SIM	Benzo(a)anthracene	mg/kg	3.6	ND [0.0577]	0.0635 [0.068] ML J QH	ND [0.0595]	ND [0.292] ML		
8270SIM	Benzo(a)pyrene	mg/kg	0.49	ND [0.0577]	0.0838 [0.068] ML QH	ND [0.0595]	ND [0.292] ML		
8270SIM	Benzo(b)fluoranthene	mg/kg	4.9	ND [0.0577]	ND [0.068] ML QH	ND [0.0595]	ND [0.292] ML		
8270SIM	Benzo(g,h,i)perylene	mg/kg	1400	ND [0.0577]	0.0394 [0.068] ML J QH	ND [0.0595]	ND [0.292] ML		
8270SIM	Benzo(k)fluoranthene	mg/kg	49	ND [0.0577]	ND [0.068] ML QH	ND [0.0595]	ND [0.292] ML		
8270SIM	Chrysene	mg/kg	360	ND [0.0577]	0.0745 [0.068] QH	ND [0.0595]	ND [0.292] ML		
8270SIM	Dibenzo(a,h)anthracene	mg/kg	0.49	ND [0.0577]	ND [0.068] QH	ND [0.0595]	ND [0.292] ML		
8270SIM	Fluoranthene	mg/kg	1400	ND [0.0577]	0.053 [0.068] ML J QH	ND [0.0595]	ND [0.292] MN		
8270SIM	Fluorene	mg/kg	220	0.137 [0.0577]	0.0829 [0.068] QH	ND [0.0595]	1.58 [0.292]		
8270SIM	Indeno(1,2,3-cd)pyrene	mg/kg	4.9	ND [0.0577]	0.0413 [0.068] ML J QH	ND [0.0595]	ND [0.292] ML		
8270SIM	Naphthalene	mg/kg	20	0.122 [0.0577]	ND [0.068] QH	ND [0.0595]	5.87 [0.292]		
8270SIM	Phenanthrene	mg/kg	3000	0.0556 [0.0577] J	0.104 [0.068] QH	ND [0.0595]	1.07 [0.292]		
8270SIM	Pyrene	mg/kg	1000	ND [0.0577]	0.0567 [0.068] ML J QH	ND [0.0595]	0.113 [0.292] J		
A2540G	Total Solids	PERCENT		86.3 []	72.8 []	82.8 []	84.9 []	91.3 []	91.3 []
AK101	Gasoline Range Organics	mg/kg	300	17.7 [7.16] QH	50 [6.04] MH ,QH	ND [4.15]	141 [39.1] QH		
AK102	Diesel Range Organics	mg/kg	250	2230 [113]	686 [108]	96.3 [95.6]	4880 [232] QH	323 [92.9] QL	315 [102] QL
AK103	Residual Range Organics	mg/kg	10000	272 [22.5]	1460 [108] QH	676 [95.6]	640 [93]		
SW8260B	Benzene	mg/kg	0.025	ND [0.0215]	0.0435 [0.0362]	ND [0.0303]	0.311 [0.0235]		
SW8260B	Ethylbenzene	mg/kg	6.9	ND [0.0358]	ND [0.0604]	ND [0.0505]	2.54 [0.0391]		
SW8260B	o-Xylene	mg/kg	63	ND [0.0716]	ND [0.121]	ND [0.101]	1.16 [0.0782]		
SW8260B	Toluene	mg/kg	6.5	ND [0.0716]	ND [0.121]	ND [0.101]	0.0438 [0.0782] J		
SW8260B	Xylene, Isomers m & p	mg/kg	63	ND [0.0716]	ND [0.121]	ND [0.101]	5.57 [0.0782]		

ADEC - most stringent of 18 AAC 75 Method 2 Table B1/B2 Cleanup Level for Under 40 Inches

Yellow shading is ADEC exceedance; Red shading is Landfill agreement exceedance

[] - Lab PQL

Data flags are defined at the end of the table

Nome Harbor Data Table

				Sample ID Location ID, Depth Collection Date Sample Del. Group	08NOME-08SL MI SP-CLEAN C 8/17/2008 1084352	08NOME-09SL MI SP-1 A 8/17/2008 1084352	08NOME-09SL MI SP-1 B 8/17/2008 1084352	08NOME-09SL MI SP-1 C 8/17/2008 1084352	08NOME-10SL MI SP-2 A 8/18/2008 1084352	08NOME-10SL MI SP-2 B 8/18/2008 1084352	08NOME-10SL MI SP-2 C 8/18/2008 1084352
Method	ANALYTE	UNITS	ADEC								
8270SIM	1-Methylnaphthalene	mg/kg	6.2								
8270SIM	2-Methylnaphthalene	mg/kg	6.1								
8270SIM	Acenaphthene	mg/kg	180								
8270SIM	Acenaphthylene	mg/kg	180								
8270SIM	Anthracene	mg/kg	3000								
8270SIM	Benzo(a)anthracene	mg/kg	3.6								
8270SIM	Benzo(a)pyrene	mg/kg	0.49								
8270SIM	Benzo(b)fluoranthene	mg/kg	4.9								
8270SIM	Benzo(g,h,i)perylene	mg/kg	1400								
8270SIM	Benzo(k)fluoranthene	mg/kg	49								
8270SIM	Chrysene	mg/kg	360								
8270SIM	Dibenzo(a,h)anthracene	mg/kg	0.49								
8270SIM	Fluoranthene	mg/kg	1400								
8270SIM	Fluorene	mg/kg	220								
8270SIM	Indeno(1,2,3-cd)pyrene	mg/kg	4.9								
8270SIM	Naphthalene	mg/kg	20								
8270SIM	Phenanthrene	mg/kg	3000								
8270SIM	Pyrene	mg/kg	1000								
A2540G	Total Solids	PERCENT		91.3 []	96.5 []	96.5 []	96.5 []	89.2 []	89.2 []	89.2 []	
AK101	Gasoline Range Organics	mg/kg	300								
AK102	Diesel Range Organics	mg/kg	250	305 [98.7] QL	788 [96.3] QL	1160 [91.4] QL	1310 [87.3] QL	911 [95.4] QL	869 [173] QL	887 [92.4] QL	
AK103	Residual Range Organics	mg/kg	10000								
SW8260B	Benzene	mg/kg	0.025								
SW8260B	Ethylbenzene	mg/kg	6.9								
SW8260B	o-Xylene	mg/kg	63								
SW8260B	Toluene	mg/kg	6.5								
SW8260B	Xylene, Isomers m & p	mg/kg	63								

ADEC - most stringent of 18 AAC 75 Method 2 Table B1/B2 Cleanup Level for Under 40 Inches

Yellow shading is ADEC exceedance; Red shading is Landfill agreement exceedance

[] - Lab PQL

Data flags are defined at the end of the table

Nome Harbor Data Table

		Sample ID	08NOME-14SL	08NOME-15SL	08NOME-16SL	08NOME-01SL	08NOME-02SL	08NOME-17SL	
		Location ID, Depth	MI SP-3 A	MI SP-3 B	MI SP-3 C	PRE SP-1	PRE SP-1	POST SP-1	
		Collection Date	9/29/2008	9/29/2008	9/29/2008	7/26/2008	7/26/2008	9/29/2008	
		Sample Del. Group	1085377	1085377	1085377	1083869	1083869	1085377	
Method	ANALYTE	UNITS	ADEC						
8270SIM	1-Methylnaphthalene	mg/kg	6.2						
8270SIM	2-Methylnaphthalene	mg/kg	6.1						
8270SIM	Acenaphthene	mg/kg	180						
8270SIM	Acenaphthylene	mg/kg	180						
8270SIM	Anthracene	mg/kg	3000						
8270SIM	Benzo(a)anthracene	mg/kg	3.6						
8270SIM	Benzo(a)pyrene	mg/kg	0.49						
8270SIM	Benzo(b)fluoranthene	mg/kg	4.9						
8270SIM	Benzo(g,h,i)perylene	mg/kg	1400						
8270SIM	Benzo(k)fluoranthene	mg/kg	49						
8270SIM	Chrysene	mg/kg	360						
8270SIM	Dibenzo(a,h)anthracene	mg/kg	0.49						
8270SIM	Fluoranthene	mg/kg	1400						
8270SIM	Fluorene	mg/kg	220						
8270SIM	Indeno(1,2,3-cd)pyrene	mg/kg	4.9						
8270SIM	Naphthalene	mg/kg	20						
8270SIM	Phenanthrene	mg/kg	3000						
8270SIM	Pyrene	mg/kg	1000						
A2540G	Total Solids	PERCENT		86.2 []	86.2 []	86.2 []	93.8 []	95.3 []	95.7 []
AK101	Gasoline Range Organics	mg/kg	300						
AK102	Diesel Range Organics	mg/kg	250	14600 [1150] QH	13400 [1230] QH	13500 [1210] QH	2.3 [21] J	2.29 [20.8] J	3.37 [20.5] J
AK103	Residual Range Organics	mg/kg	10000						
SW8260B	Benzene	mg/kg	0.025						
SW8260B	Ethylbenzene	mg/kg	6.9						
SW8260B	o-Xylene	mg/kg	63						
SW8260B	Toluene	mg/kg	6.5						
SW8260B	Xylene, Isomers m & p	mg/kg	63						

ADEC - most stringent of 18 AAC 75 Method 2 Table B1/B2 Cleanup Level for Under 40 Inches

Yellow shading is ADEC exceedance; Red shading is Landfill agreement exceedance

[] - Lab PQL

Data flags are defined at the end of the table

Nome Harbor Data Table

				Sample ID	08NOME-18SL	08NOME-03SL	08NOME-04SL	08NOME-19SL	08NOME-20SL	08NOME-11SL	08NOME-12SL
				Location ID, Depth	POST SP-1	PRE SP-2	PRE SP-2	POST SP-2	POST SP-2	PRE SP-3	PRE SP-3
				Collection Date	9/29/2008	7/26/2008	7/26/2008	9/29/2008	9/29/2008	8/9/2008	8/9/2008
				Sample Del. Group	1085377	1083869	1083869	1085377	1085377	1084352	1084352
Method	ANALYTE	UNITS	ADEC								
8270SIM	1-Methylnaphthalene	mg/kg	6.2								
8270SIM	2-Methylnaphthalene	mg/kg	6.1								
8270SIM	Acenaphthene	mg/kg	180								
8270SIM	Acenaphthylene	mg/kg	180								
8270SIM	Anthracene	mg/kg	3000								
8270SIM	Benzo(a)anthracene	mg/kg	3.6								
8270SIM	Benzo(a)pyrene	mg/kg	0.49								
8270SIM	Benzo(b)fluoranthene	mg/kg	4.9								
8270SIM	Benzo(g,h,i)perylene	mg/kg	1400								
8270SIM	Benzo(k)fluoranthene	mg/kg	49								
8270SIM	Chrysene	mg/kg	360								
8270SIM	Dibenzo(a,h)anthracene	mg/kg	0.49								
8270SIM	Fluoranthene	mg/kg	1400								
8270SIM	Fluorene	mg/kg	220								
8270SIM	Indeno(1,2,3-cd)pyrene	mg/kg	4.9								
8270SIM	Naphthalene	mg/kg	20								
8270SIM	Phenanthrene	mg/kg	3000								
8270SIM	Pyrene	mg/kg	1000								
A2540G	Total Solids	PERCENT		96.9 []	84.6 []	88.2 []	98 []	98 []	96.4 []	95.6 []	
AK101	Gasoline Range Organics	mg/kg	300								
AK102	Diesel Range Organics	mg/kg	250	8.52 [20.5] J	ND [23.5]	2.34 [22.5] J	10.2 [20.1] J	2.82 [20.3] J	4.49 [20.7] J,QL	ND [20.8] QL	
AK103	Residual Range Organics	mg/kg	10000								
SW8260B	Benzene	mg/kg	0.025								
SW8260B	Ethylbenzene	mg/kg	6.9								
SW8260B	o-Xylene	mg/kg	63								
SW8260B	Toluene	mg/kg	6.5								
SW8260B	Xylene, Isomers m & p	mg/kg	63								

ADEC - most stringent of 18 AAC 75 Method 2 Table B1/B2 Cleanup Level for Under 40 Inches

Yellow shading is ADEC exceedance; Red shading is Landfill agreement exceedance

[] - Lab PQL

Data flags are defined at the end of the table

Nome Harbor Data Table

				Sample ID 08NOME-02TB
				Location ID, Depth TRIP BLANK
				Collection Date 8/15/2008
				Sample Del. Group 1084377
Method	ANALYTE	UNITS	ADEC	
8270SIM	1-Methylnaphthalene	mg/kg	6.2	
8270SIM	2-Methylnaphthalene	mg/kg	6.1	
8270SIM	Acenaphthene	mg/kg	180	
8270SIM	Acenaphthylene	mg/kg	180	
8270SIM	Anthracene	mg/kg	3000	
8270SIM	Benzo(a)anthracene	mg/kg	3.6	
8270SIM	Benzo(a)pyrene	mg/kg	0.49	
8270SIM	Benzo(b)fluoranthene	mg/kg	4.9	
8270SIM	Benzo(g,h,i)perylene	mg/kg	1400	
8270SIM	Benzo(k)fluoranthene	mg/kg	49	
8270SIM	Chrysene	mg/kg	360	
8270SIM	Dibenzo(a,h)anthracene	mg/kg	0.49	
8270SIM	Fluoranthene	mg/kg	1400	
8270SIM	Fluorene	mg/kg	220	
8270SIM	Indeno(1,2,3-cd)pyrene	mg/kg	4.9	
8270SIM	Naphthalene	mg/kg	20	
8270SIM	Phenanthrene	mg/kg	3000	
8270SIM	Pyrene	mg/kg	1000	
A2540G	Total Solids	PERCENT		
AK101	Gasoline Range Organics	mg/kg	300	ND [2.9]
AK102	Diesel Range Organics	mg/kg	250	
AK103	Residual Range Organics	mg/kg	10000	
SW8260B	Benzene	mg/kg	0.025	ND [0.0174]
SW8260B	Ethylbenzene	mg/kg	6.9	ND [0.029]
SW8260B	o-Xylene	mg/kg	63	ND [0.0581]
SW8260B	Toluene	mg/kg	6.5	ND [0.0581]
SW8260B	Xylene, Isomers m & p	mg/kg	63	ND [0.0581]

ADEC - most stringent of 18 AAC 75 Method 2 Table B1/B2 Cleanup Level for Under 40 Inches

Yellow shading is ADEC exceedance; Red shading is Landfill agreement exceedance

[] - Lab PQL

Data flags are defined at the end of the table

95% UCL Results for Multi-Incremental Samples

Stockpile	DRO Results (mg/kg)	95% UCL¹	Cleanup Level²
SP-CLEAN	323 ML	330	7000
	315 ML		
	305 ML		
SP-1	788 ML	1540	7000
	1160 ML		
	1310 ML		
SP-2	911 ML	925	7000
	869 ML		
	887 ML		
SP-3	14600 QH	15000	7000
	13400 QH		
	13500 QH		

1. The 95% upper confidence limits (UCLs) were calculated according to ADEC Guidance (Ref. 7.2).

2. DRO Limits are based on a landfill disposal criteria agreed upon by ADEC and the City of Nome.

Data Flag Explanations

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

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

Appendix C

ADEC Laboratory Data Review Checklist

Laboratory Data Review Checklist

Completed by:

Title:

Date:

CS Report Name:

Report Date:

Consultant Firm:

Laboratory Name:

Laboratory Report Number:

ADEC File Number:

ADEC RecKey Number:

1. Laboratory

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

Yes No

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 ($4^{\circ} \pm 2^{\circ} \text{C}$)?

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:

No trip blank was on the chain of custody or in the cooler.

e. Data quality or usability affected? Explain.

Comments:

Blank data will be verified with laboratory blanks only.

4. Case Narrative

a. Present and understandable?

Yes No

Comments:

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

Yes No

Comments:

c. Were all corrective actions documented?

Yes No

Comments:

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

Comments:

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

5. Samples 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.

Comments:

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?

Comments:

Not applicable

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

Yes No Comments:

Not applicable.

v. Data quality or usability affected? Explain.

Comments:

Not applicable.

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:

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

Yes No Comments:

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

Yes No Comments:

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

Comments:

Not applicable.

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

Yes No Comments:

Not applicable.

vii. Data quality or usability affected? Explain.

Comments:

Not applicable.

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? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes No Comments:

The 4-bromofluorobenzene surrogate for GRO in sample 08NOME-05SL was above laboratory control limits.

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

Yes No Comments:

The result for this sample is qualified biased high and flagged "MH".

iv. Data quality or usability affected? Explain.

Comments:

Data usability is not impacted as the GRO result for this sample is well below the ADEC cleanup level.

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:

No trip blank was in the sample shipment.

ii. All results less than PQL?

Yes No

Comments:

Not applicable.

iii. If above PQL, what samples are affected?

Comments:

Not applicable.

iv. Data quality or usability affected? Explain.

Comments:

Data usability is not impacted as the GRO and BTEX result for this sample are well below the ADEC cleanup level.

e. Field Duplicate

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

Yes No

Comments:

There was no field duplicate for this sample shipment.

ii. Submitted blind to lab?

Yes No

Comments:

Not applicable.

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

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

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes No Comments:

Not applicable.

iv. Data quality or usability affected? Explain.

Comments:

Laboratory precision can not be determined by duplicate data in this sample batch. Precision will be ascertained with MS/MSD and LCS/LCSD reproducibility data instead. Data usability is not affected as the other quality control parameters can substitute for precision verification.

f. Decontamination or Equipment Blank (if applicable)

Yes No Not Applicable

i. All results less than PQL?

Yes No Comments:

ii. If above PQL, what samples are affected?

Comments:

iii. Data quality or usability affected? Explain.

Comments:

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

a. Defined and appropriate?

Yes No

Comments:

Laboratory Data Review Checklist

Completed by:

Title:

Date:

CS Report Name:

Report Date:

Consultant Firm:

Laboratory Name:

Laboratory Report Number:

ADEC File Number:

ADEC RecKey Number:

1. Laboratory

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

Yes No

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:

Multi-incremental samples were logged incorrectly on the Chain of Custody. The field chemist should have labeled the MI samples in the same way as blind duplicate samples instead of one sample in four jars. The laboratory was later notified to process the samples three times to get the duplicate and triplicate data (chain of custody changed by laboratory to account for this).

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt ($4^{\circ} \pm 2^{\circ} \text{C}$)?

Yes No

Comments:

Cooler and temperature blank were out of range, 8.0 and 7.5 degrees Celsius, respectively.

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:

e. Data quality or usability affected? Explain.

Comments:

DRO data may be biased low, and will be qualified with "ML.". The data are usable.

4. Case Narrative

a. Present and understandable?

Yes No

Comments:

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

Yes No

Comments:

c. Were all corrective actions documented?

Yes No

Comments:

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

Comments:

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

5. Samples 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.

Comments:

Not applicable.

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?

Comments:

Not applicable

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

Yes No Comments:

Not applicable.

v. Data quality or usability affected? Explain.

Comments:

Not applicable.

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:

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

Yes No Comments:

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

Yes No Comments:

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

Comments:

Not applicable.

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

Yes No Comments:

Not applicable.

vii. Data quality or usability affected? Explain.

Comments:

Not applicable.

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? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes No Comments:

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

Yes No Comments:

iv. Data quality or usability affected? Explain.

Comments:

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:

Not applicable.

ii. All results less than PQL?

Yes No Comments:

Not applicable.

iii. If above PQL, what samples are affected?

Comments:

Not applicable.

iv. Data quality or usability affected? Explain.

Comments:

Not applicable.

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:

The multi-increment sample duplicates and triplicates were labeled with the same sample number. The laboratory was notified after the samples were received to run the extra sample jars as separate samples.

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

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

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes No Comments:

iv. Data quality or usability affected? Explain.

Comments:

Due to the varying results within the sample duplicates and triplicates, data usability and quality are not affected.

f. Decontamination or Equipment Blank (if applicable)

Yes No Not Applicable

i. All results less than PQL?

Yes No Comments:

ii. If above PQL, what samples are affected?

Comments:

iii. Data quality or usability affected? Explain.

Comments:

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

a. Defined and appropriate?

Yes No Comments:

Laboratory Data Review Checklist

Completed by:

Title:

Date:

CS Report Name:

Report Date:

Consultant Firm:

Laboratory Name:

Laboratory Report Number:

ADEC File Number:

ADEC RecKey Number:

1. Laboratory

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

Yes No

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 ($4^{\circ} \pm 2^{\circ} \text{C}$)?

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:

e. Data quality or usability affected? Explain.

Comments:

4. Case Narrative

a. Present and understandable?

Yes No

Comments:

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

Yes No

Comments:

c. Were all corrective actions documented?

Yes No

Comments:

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

Comments:

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

5. Samples 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:

The PQL for Benzene was above the cleanup level in both samples (not the trip blank).

e. Data quality or usability affected? Explain.

Comments:

Data usability is not affected as the MDL will be used as the lower screening limit, which is below the ADEC cleanup level.

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?

Comments:

Not applicable

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

Yes No Comments:

Not applicable.

v. Data quality or usability affected? Explain.

Comments:

Not applicable.

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:

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

Yes No Comments:

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

Yes No Comments:

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

Comments:

Not applicable.

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

Yes No Comments:

Not applicable.

vii. Data quality or usability affected? Explain.

Comments:

Not applicable.

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? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes No Comments:

The surrogate recoveries for sample 08NOME-06SL for 8270C SIM, AK101, and AK103 were above laboratory control limits.

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

Yes No Comments:

The AK101, AK103, and 8270C SIM results for this sample are qualified biased high and flagged “QH”.

iv. Data quality or usability affected? Explain.

Comments:

Data usability is not impacted since all of these results for this sample are well below the ADEC cleanup level.

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:

Not applicable.

ii. All results less than PQL?

Yes No

Comments:

Not applicable.

iii. If above PQL, what samples are affected?

Comments:

Not applicable.

iv. Data quality or usability affected? Explain.

Comments:

Not applicable.

e. Field Duplicate

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

Yes No

Comments:

No field duplicate was submitted with this sample batch.

ii. Submitted blind to lab?

Yes No

Comments:

Not applicable.

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

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

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes No Comments:

Not applicable.

iv. Data quality or usability affected? Explain.

Comments:

Data will be qualified using the LCS - LCSD and MS - MSD duplicate pairs, data usability are not affected.

f. Decontamination or Equipment Blank (if applicable)

Yes No Not Applicable

i. All results less than PQL?

Yes No Comments:

ii. If above PQL, what samples are affected?

Comments:

iii. Data quality or usability affected? Explain.

Comments:

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

a. Defined and appropriate?

Yes No Comments:

Laboratory Data Review Checklist

Completed by:

Title:

Date:

CS Report Name:

Report Date:

Consultant Firm:

Laboratory Name:

Laboratory Report Number:

ADEC File Number:

ADEC RecKey Number:

1. Laboratory

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

Yes No

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 ($4^{\circ} \pm 2^{\circ} \text{C}$)?

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:

Sample 08NOME-13SL had no pertinent label information associated with it. The jar lid had the marks "TP-4." Through deduction (comparing labeled samples with the COC) and a call to the field chemist, the laboratory was able to get the correct information off of the COC.

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:

The RUSH analysis was requested by phone and subsequent e-mail. Laboratory documentation stated that due to workload, RUSH analyses was not an option.

e. Data quality or usability affected? Explain.

Comments:

Data quality and usability are not affected.

4. Case Narrative

a. Present and understandable?

Yes No

Comments:

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

Yes No

Comments:

c. Were all corrective actions documented?

Yes No

Comments:

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

Comments:

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

5. Samples 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.

Comments:

Not applicable.

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?

Comments:

Not applicable

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

Yes No Comments:

Not applicable.

v. Data quality or usability affected? Explain.

Comments:

Not applicable.

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:

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

Yes No Comments:

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

Yes No Comments:

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

Comments:

Not applicable.

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

Yes No Comments:

Not applicable.

vii. Data quality or usability affected? Explain.

Comments:

Not applicable.

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? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes No Comments:

The surrogate recoveries of 5a-Androstane in DRO samples 08NOME-13SL through 08NOME-16SL and 4-Bromofluorobenzene in GRO for sample 08NOME-13SL were above laboratory control limits.

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

Yes No Comments:

The DRO and GRO results for these samples are qualified biased high and flagged “QH”.

iv. Data quality or usability affected? Explain.

Comments:

Data usability is not impacted since all of these results for this sample are well above the agreed ADEC cleanup level.

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:

No trip blank was sent with this cooler shipment.

ii. All results less than PQL?

Yes No

Comments:

Not applicable.

iii. If above PQL, what samples are affected?

Comments:

Not applicable.

iv. Data quality or usability affected? Explain.

Comments:

Not applicable.

e. Field Duplicate

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

Yes No

Comments:

No field duplicate was submitted for BTEX, AK101, and PAHs.

ii. Submitted blind to lab?

Yes No

Comments:

Not applicable.

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

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

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes No Comments:

Duplicate and triplicate data for DRO were within specifications.

iv. Data quality or usability affected? Explain.

Comments:

Data for GRO, BTEX, and PAHs will be qualified using the LCS - LCSD and MS - MSD duplicate pairs, data usability are not affected.

f. Decontamination or Equipment Blank (if applicable)

Yes No Not Applicable

i. All results less than PQL?

Yes No Comments:

ii. If above PQL, what samples are affected?

Comments:

iii. Data quality or usability affected? Explain.

Comments:

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

a. Defined and appropriate?

Yes No Comments:

Appendix D
Field Notebook

"Outdoor writing products for outdoor writing people."

NOME HARBOR
SHEET PILE EXPANSION



RECYCLABLE

"Rite in the Rain" - A unique All-Weather Writing paper created to shed water and enhance the written image. It is widely used throughout the world for recording critical field data in all kinds of weather.

Available in a variety of standard and custom printed case-bound field books, loose leaf, spiral and stapled notebooks, multi-copy sets and copier paper.

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LEVEL
No. 311

"*Rite in the Rain*"
ALL-WEATHER WRITING PAPER



Name _____

Address _____

Phone _____

Project _____

INCHES

1

2

3

4

5

6

CONTENTS

PAGE	REFERENCE	DATE

Clear Vinyl Protective Slipcovers (Item No. 30) are available for this style of notebook.
Helps protect your notebook from wear & tear. Contact your dealer or the J. L. Darling Corporation

7/28/08 45°F LIGHT RAIN, WINDY
ON SITE: HARVISON, HARVEY, BINONWANAN
MLB PERSONNEL.
SITE SAFETY DISCUSSED

TEST PIT 1 1545 0 MLLW

LOCATION - TBD BY KARL HARVEY

1x 4oz BTEX/GRO (127.95g)

1x 8oz DRG/RRO

1x 4oz PAH

08NOME-05SL

SOME VISIBLE STAINING OF SOIL, ODOR OF
DIESEL FUEL AS DIG DEEPER

COLD PID 20ppm

WARM PID 50ppm

SOIL SAT'D WITH WHAT APPEARS TO BE
A PETROLEUM PRODUCT.

Maurice Harvison

7/29/08

40°F VERY WINDY

MAY NOT BE ABLE TO DIG OTHER 3
TEST PITS DUE TO IMPACT TO SHEET PILING.
TO BE DETERMINED.

STOCKPILE SAMPLES COLLECTED ON 7/26/08
BY RUEL BINONWANAN

AREA OF STOCKPILES WERE SCRAPPED ^{MAN}
DOWN 2' TO REMOVE THE UPPER SOIL LAYER.
2 SOIL SAMPLES THEN COLLECTED FROM
EACH STOCK PILE. MAP OF SAMPLE LOCATIONS
IN PROJECT FOLDER.

STOCKPILE #1 - "CLEAN" MATERIAL
#1A ^{MAN} 08NOME-01SL 1600 @ 7/26/08
#2A ^{MAN} 08NOME-02SL 1615 @ 7/26/08
1B

STOCKPILE #2 - "DIRTY" MATERIAL
#2A 08NOME-03SL 1630 @ 7/26/08
#1B 08NOME-04SL 1645 @ 7/26/08
Maurice Harvison

8-15-08 55° wind
10mph West
no rain
overcast

ONSITE: HARVEY; ACORE
BURGRAFF; MKB Constructors

TP#2: TOOK PHOTOS
Location

	JAR ID
1-4oz BTFX/GRO 129.4gms	129.41
1-8oz DRO/RRO @ 1000	
1-4oz PAH	
OSNOME-06SL	

TP#2 Duplicate

1-4oz BTFX/GRO (128.3)	128.27
MS/MSD	

TP#3

FIELD Scale

1-4oz BTFX/GRO (128.80) 128.7
~~1-4oz BTFX/GRO~~
 1-8oz DRO/RRO @ 1100
 1-4oz PAH

OSNOME-06SL MAN

OSNOME-09SL

TRIP BLANK

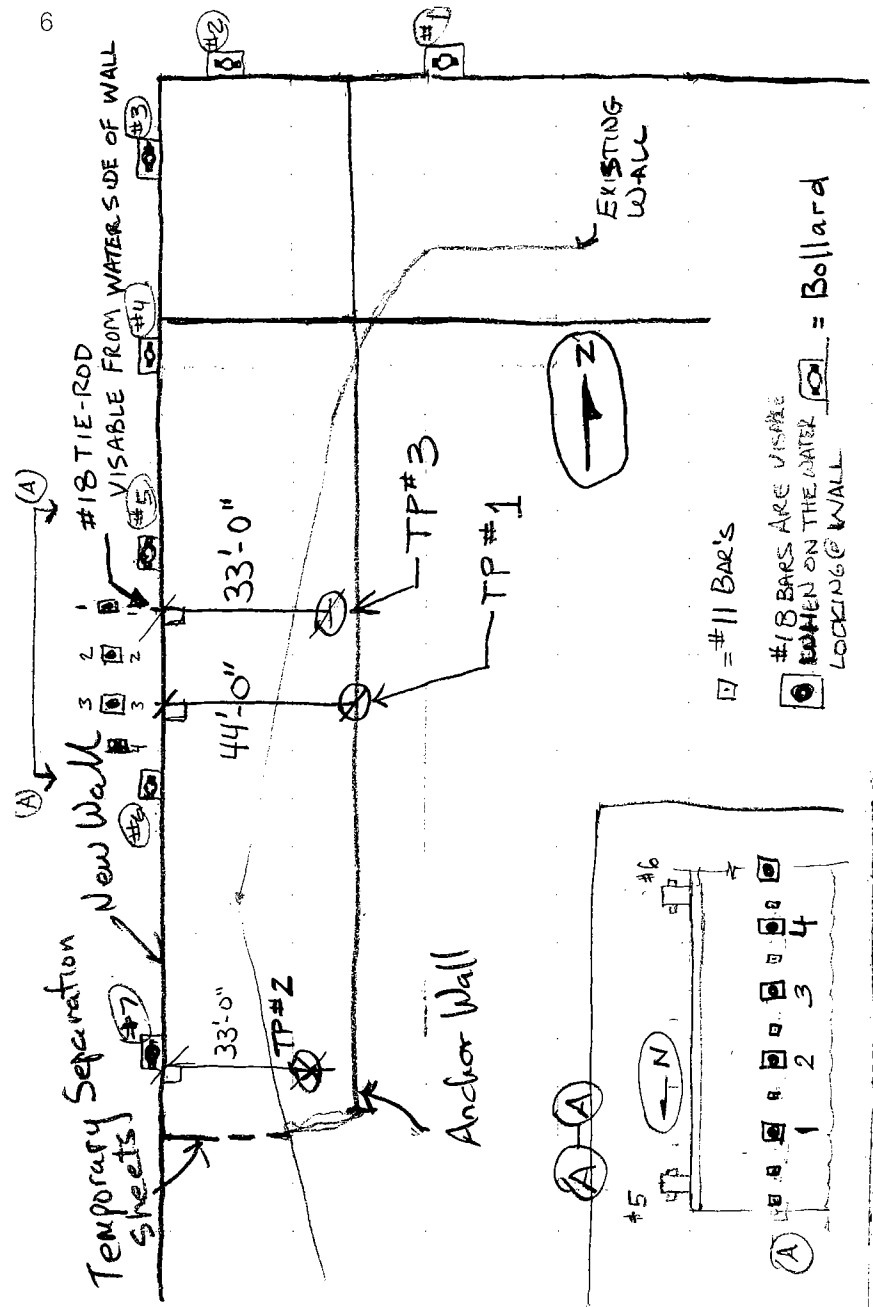
OSNOME-02TB

8/18/08

~~TP#3 Duplicate~~

~~1-4oz BTFX/GRO (127.43) 127.3~~ Field
 SAMPLE NOT TAKEN. ONLY NEEDED
 1 DOUBLE (OR DUPLICATE) FOR
 A TEST PIT. DUPLICATES COLLECTED
 ON TEST PIT #2.

Kalbfay



17 AUG 08
 ON SITE: KARL HARVEY, MARK HARNISON
 SUNNY 60°F STOCKPILE #3
 "CLEAN" STOCKPILE INI SAMPLING
 STOCKPILE DIMENSIONS

50 SAMPLE INCREMENTS COLLECTED FROM
 RANDOM POINTS OVER STOCKPILE AT VARYING
 DEPTHS.

SAMPLE COLLECTED IN TRIPLICATE
 1600 3X 4oz DRU 1X4oz % MOISTURE
 ~ 30g in each jar.

OB NOME - 08SL

"DIRTY" STOCKPILE 2/3 #1
 DIMENSIONS

OB NOME - 09SL

JACK FROM MCB USED LOADER TO
 FLATTEN STOCKPILE AND SAMPLE AT VARIOUS
 DEPTHS. 50 INCREMENTS COLLECTED

SAMPLE COLLECTED IN TRIPLICATE
 + MS (MSD)

1930

5X 4oz DRU 1X4oz % MOISTURE
 ~ 30g each jar

Mark Harnison

18 AUG 08

ONSITE: HARVEY, HARVISON

P. Cloudy 55°F

STOCKPILE #2 "DIRTY"

DIMENSIONS:

100 INCREMENTS COLLECTED

SAMPLE COLLECTED IN TRIPLICATE @ 1200

3x 4oz DRG 1x4oz % MOISTURE

OSNOME-10SL

PRECONSTRUCTION SAMPLES TAKEN FROM STOCKPILE

#3 BY JOE LOCKE ON 9 AUG 08 @ 1200

3A 1x4oz DRG #1 OSNOME-11SL

3B 1x4oz DRG #2 OSNOME-12SL

BOTH JARS N 1/4 FULL.

Mason

29 SEP 08

SUNNY, WINDY 25°F

ONSITE: HARVISON, LOUIE

TEST PIT 4 @ 1416

1x BTEX / CRU 128.68g

1x DRG / REV

1x PAH

OSNOME-13SL

STOCKPILE 3A @ 1600

REFUSE OF STOCKPILE 3

50 INCREMENTS COLLECTED

3A-1 2x 4oz DRG OSNOME-14SL

1605 3A-2 2x 4oz DRG OSNOME-15SL

1610 3A-3 2x 4oz DRG OSNOME-16SL

3A-7 1x4oz % MOISTURE

STOCKPILE #1 - POST CONSTRUCTION

1A-P 1605 M~~A~~ 1615 OSNOME-17SL1B-P 1610 M~~A~~ 1620 OSNOME-18SL

STOCKPILE #2 - POST CONSTRUCTION

2A-P 1625 OSNOME-19SL

2B-P 1630 OSNOME-20SL

Mason