
# Tanana FAA Facility Groundwater Monitoring, February 2000

**Fuel Storage Tank Management Program and Expanded Site Investigation/ Interim Cleanup**
**Tanana, Alaska**

RECEIVED
SEP 10 2001
DEPT. OF ENVIRONMENTAL CONSERVATION

Contract No.
**DTFA04-96-D-10002**

Delivery Order
**DTFA04-97-F-C0027**

*Prepared for*

**Federal Aviation Administration**

*Prepared by*

**CH2-OH**

301 West Northern Lights Boulevard
Suite 601
Anchorage, Alaska 99503

**April 2000**


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# Tanana FAA Facility Groundwater Monitoring, February 2000: Delivery Order 27

**PREPARED FOR:** Lillian Demoski/FAA

**PREPARED BY:** CH2-OH of Alaska

**DATE:** April 27, 2000

CH2-OH of Alaska conducted groundwater sampling of 21 monitoring probes and 20 monitoring wells (Figure 1) at the Federal Aviation Administration (FAA) former Living Quarters Facility in Tanana, Alaska from February 1 to February 3, 2000. CH2-OH prepared this Technical Memorandum (TM) to summarize the field activities and report the results related to the February 2000 sampling event. Sampling results, conclusions, and recommendations are included in this TM.

## Water Depth Measurements

Groundwater measurements were collected on February 1, 2000. An electronic water level indicator was used to measure the depth to groundwater from the top of the polyvinyl chloride (PVC) riser cap at each well. These depth measurements have been converted to groundwater elevations and are presented in Table 1. Measurements from October 18, 1999 are presented for comparison.

**TABLE 1**
Tanana FAA Facility Groundwater Elevations (feet)

| Well Number | October 18, 1999 | February 1, 2000 |
|---|---|---|
| MP001 | 77.15 | Frozen |
| MP002 | 76.98 | Frozen |
| MP003 | 74.4 | 72.8 |
| MP006 | 93.43 | Frozen |
| MP007 | 75.31 | Frozen |
| MP008 | 75.43 | 74.92 |
| MP009 | 75.09 | 72.71 |
| MP010 | 75.37 | 73.08 |
| MP011 | Dry | Frozen |
| MP012 | 75.59 | 73.09 |
| MP013 | 74.81 | 72.98 |
| MP014 | 75.43 | Frozen |
| MP015 | 75.61 | 73.09 |
| MP016 | 74.66 | Dry |

**TABLE 1**
Tanana FAA Facility Groundwater Elevations (feet)

| Well Number | October 18, 1999 | February 1, 2000 |
|---|---|---|
| MP017 | 75.35 | 73 |
| MP018 | 75.43 | 73.06 |
| MP023 | 75.58 | 73.09 |
| MP024 | 75.34 | 73 |
| MP025 | 75.43 | 72.98 |
| MP028 | 75.44 | 73.08 |
| MP029 | 74.85 | 72.38 |
| MW001 | 74.89 | 73.2 |
| MW002 | 74.86 | 73.14 |
| MW003 | 74.26 | 73.14 |
| MW004 | 73.76 | 73.15 |
| MW005 | 74.16 | 73.12 |
| MW006 | 74.12 | 73.08 |
| MW007 | 73.99 | 73.08 |
| MW008 | 73.97 | 73.08 |
| MW009 | 74.36 | 73.14 |
| MW010 | 74.36 | 73.13 |
| MW011 | 74.2 | 73.15 |
| MW012 | 74.67 | 73.14 |
| MW013 | 74.68 | Dry |
| MW014 | 74.13 | 73.15 |
| MW015 | 77.19 | 75.14 |
| MW016 | 73.94 | 73.08 |
| MW017 | 73.84 | 73.08 |
| MW018 | 73.95 | 73.14 |
| MW019 | 77.08 | 75.12 |
| MW020 | Dry | Dry |

## Sampling of Monitoring Wells and Probes

Fifteen of 20 existing wells were sampled from February 1 to February 3, 2000. Three wells were not sampled due to the presence of floating product and two were dry. Monitoring probes were not sampled during the February 2000 fieldwork due to an insufficient volume of water present in all probes. CH2-OH collected, packed, and shipped the samples to Analytica, Alaska, for analysis. All purge water generated was filtered through a granular activated carbon filter and discharged on the ground.

## Well Purging and Field Screening

All sampled wells were field screened for temperature, pH, conductance, turbidity, redox potential (ORP), and dissolved oxygen (DO) before sampling. Table 2 lists the volume of water purged and final field screening results after purging.

**TABLE 2**
Tanana FAA Facility Water Quality Field Screening Data
*February 1-3, 2000*

| Well Number | Volume Purged (gallons) | Temperature (°C) | pH | Conductance (ms/m) | Turbidity (NTU) | ORP (mV) | DO (mg/L) | Floating Hydrocarbon Product |
|---|---|---|---|---|---|---|---|---|
| MW001 | 3.5 | 0.95 | 6.99 | 105 | 110 | 103 | 3.9 | No |
| MW002 | 4 | 0.68 | 7.27 | 88 | 520 | 158 | 4.3 | No |
| MW003 | 3 | 0.91 | 7.52 | 69.7 | 320 | 148 | 4.6 | No |
| MW004 | 4 | 0.78 | 7.7 | 26.8 | 990 | 158 | 3.4 | No |
| MW005 | 0.03′ floating product present. Well not sampled. | | | | | | | Yes |
| MW006 | 0.02′ floating product present. Well not sampled. | | | | | | | Yes |
| MW007 | 4 | 0.38 | 8.44 | - | 990 | -95 | 4.8 | No |
| MW008 | 4 | 0.68 | 7.08 | 168 | 990 | 208 | 4.2 | No |
| MW009 | 5 | 1.58 | 7.12 | 55.6 | 990 | 174 | 7.1 | No |
| MW010 | 4.5 | 1.12 | 7.48 | 73.2 | 990 | 200 | 8.2 | No |
| MW011 | 3 | 0.86 | 7.56 | 33.2 | 990 | 212 | 2 | No |
| MW012 | 6 | 1.12 | 6.47 | 47.8 | 990 | 170 | 5.2 | No |
| MW013 | Well Not Sampled - Dry | | | | | | | No |
| MW014 | 4 | 0.58 | 7.79 | 16.2 | 990 | -18 | 1.5 | No |
| MW015 | 2.75 | 0.26 | 6.87 | 109 | 990 | -45 | 4.6 | No |
| MW016 | 4 | 0.86 | 7.68 | - | 990 | -14 | 5.8 | No |
| MW017 | 0.02′ floating product present. Well not sampled. | | | | | | | Yes |
| MW018 | 4 | 0.64 | 7.06 | 117 | 990 | -40 | 4.8 | No |
| MW019 | 3.5 | 0.71 | 7.28 | 98.6 | 990 | -86 | 4.2 | No |
| MW020 | Well Not Sampled - Dry | | | | | | | No |

## Sample Collection and Analysis

All wells were sampled following procedures outlined in the *Pre-Field Planning Document, Addendum No. 3 to Tanana FAA Station Release Investigation Plan and Quality Assurance Project Plan (CH2-OH, August 1998), Fuel Storage Tank Management Program and Expanded Site Investigation/Interim Cleanup, Tanana, Alaska*, CH2-OH, October 1999. Groundwater samples

were submitted to Analytica Alaska in Anchorage, Alaska, for the analysis of gasoline-range organics, benzene, toluene, ethylbenzene, and total xylenes (GRO/BTEX) by GC (State of Alaska [AK] Method AK101/8021), and for diesel-range organics and residual-range organics (DRO/RRO) by GC (AK102/103).

Quality assurance and quality control (QA/QC) measures outlined in the *Pre-Field Planning Document, Addendum No. 3 to Tanana FAA Station Release Investigation Plan and Quality Assurance Project Plan (CH2-OH, August 1998), Fuel Storage Tank Management Program and Expanded Site Investigation/Interim Cleanup, Tanana, Alaska,* CH2-OH, October 1999 were followed. One trip blank, prepared by Analytica, was shipped back to the laboratory and analyzed for GRO/BTEX analysis by AK101/8021. One duplicate sample and one equipment blank were also collected by CH2M HILL and submitted for analysis.

## Analytical Results

Table 3 summarizes laboratory analysis results for monitoring well samples. Attachment 1 contains laboratory data.

**TABLE 3**
Tanana FAA Facility Groundwater Monitoring Analytical Results
*February 1-3 2000*

| Well Number | Sample Number | Benzene | Toluene | Ethylbenzene | Total Xylenes | GRO | DRO | RRO |
|---|---|---|---|---|---|---|---|---|
| MW001 | TAL00MW001Q01 | ND | ND | ND | ND | ND | 150 | ND |
| MW002 | TAL00MW002Q01 | ND | ND | ND | ND | ND | 350 | ND |
| MW003 | TAL00MW003Q01 | ND | ND | ND | ND | ND | 400 | 220 |
| MW004 | TAL00MW004Q01 | ND | ND | ND | ND | ND | 140 | ND |
| MW005 | - | Floating product present - Not sampled | | | | | | |
| MW006 | - | Floating product present - Not sampled | | | | | | |
| MW007 | TAL00MW007Q01 | ND | ND | ND | ND | ND | 350 | 280 |
| MW008 | TAL00MW008Q01 | ND | ND | 15 | 44 | 1,200 | 210 | 260 |
| MW009 | TAL00MW009Q01 | ND | ND | ND | ND | ND | 140 | 380 |
| MW010 | TAL00MW010Q01 | ND | ND | ND | ND | ND | 180 | ND |
| MW011 | TAL00MW011Q01 | ND | ND | ND | ND | ND | 170 | ND |
| MW012 | TAL00MW012Q01 | ND | ND | ND | ND | ND | 210 | ND |
| MW013 | - | Well was dry - Not sampled | | | | | | |
| MW014 | TAL00MW014Q01 | ND | ND | ND | ND | ND | 11,000 | 1,300 |
| MW015 | TAL00MW015Q01 | ND | ND | ND | ND | ND | 1,200 | 290 |

**TABLE 3**
Tanana FAA Facility Groundwater Monitoring Analytical Results
*February 1-3 2000*

| Well Number | Sample Number | Benzene | Toluene | Ethylbenzene | Total Xylenes | GRO | DRO | RRO |
|---|---|---|---|---|---|---|---|---|
| MW016 | TAL00MW016Q01 | ND | ND | ND | ND | ND | **34,000** | **2,500** |
| MW017 | - | Floating product present - Not sampled | | | | | | |
| MW018 | TAL00MW018Q01 | **5.5** | ND | ND | ND | ND | **7,200** | 930 |
| MW019 | TAL00MW019Q01 | ND | ND | ND | ND | ND | 200 | ND |
| MW020 | - | Well was dry - Not sampled | | | | | | |
| ADEC Groundwater Cleanup Levels (Table C) | | 5 | 700 | 2,000 | 10,000 | 1,300 | 1,500 | 1,100 |
| MRL | | 0.001 | 0.001 | 0.001 | 0.001 | 100 | 100 | 210 |

Notes:
1. All results are reported in micrograms per liter (µg/L).
2. MRL = Method reporting limit.
3. ND = Concentrations not detected above the method reporting limit.
4. ADEC Groundwater Cleanup Levels = Maximum contaminant levels determined by the ADEC according to Title 18, Chapter 75, Article 3, Table C, of the *Alaska Administrative Code* (18 AAC 75).
5. Bold numbers = Analytical result above MCL highlighted for comparison.
6. NE = MCL not established.
7. All analysis by EPA Method 8020
8. A duplicate sample was collected from MW018 and the highest values from the field sample, and the duplicate have been recorded.

Benzene was detected above its cleanup level in the sample collected from MW018 and its duplicate sample (5.2 µg/L and 5.5 µg/L respectively). DRO was detected above its cleanup level in samples collected from MW014 (11,000 µg/L), MW016 (34,000 µg/L) and in MW018 and its duplicate sample (7,200 µg/L and 6,600 µg/L respectively). RRO was detected above its cleanup level in samples collected from MW014 (1,300 µg/L) and MW016 (2,500 µg/L).

All other analytes remain below the respective cleanup levels established by the Alaska Department of Environmental Conservation (ADEC). Trace benzene, ethylbenzene, total xylenes, GRO, DRO and RRO were also detected in groundwater samples collected from the Tanana FAA facility.

## Data Validation Results

CH2-OH performed the data review and validation for groundwater samples collected. Attachment 2 contains a chemical QA report.

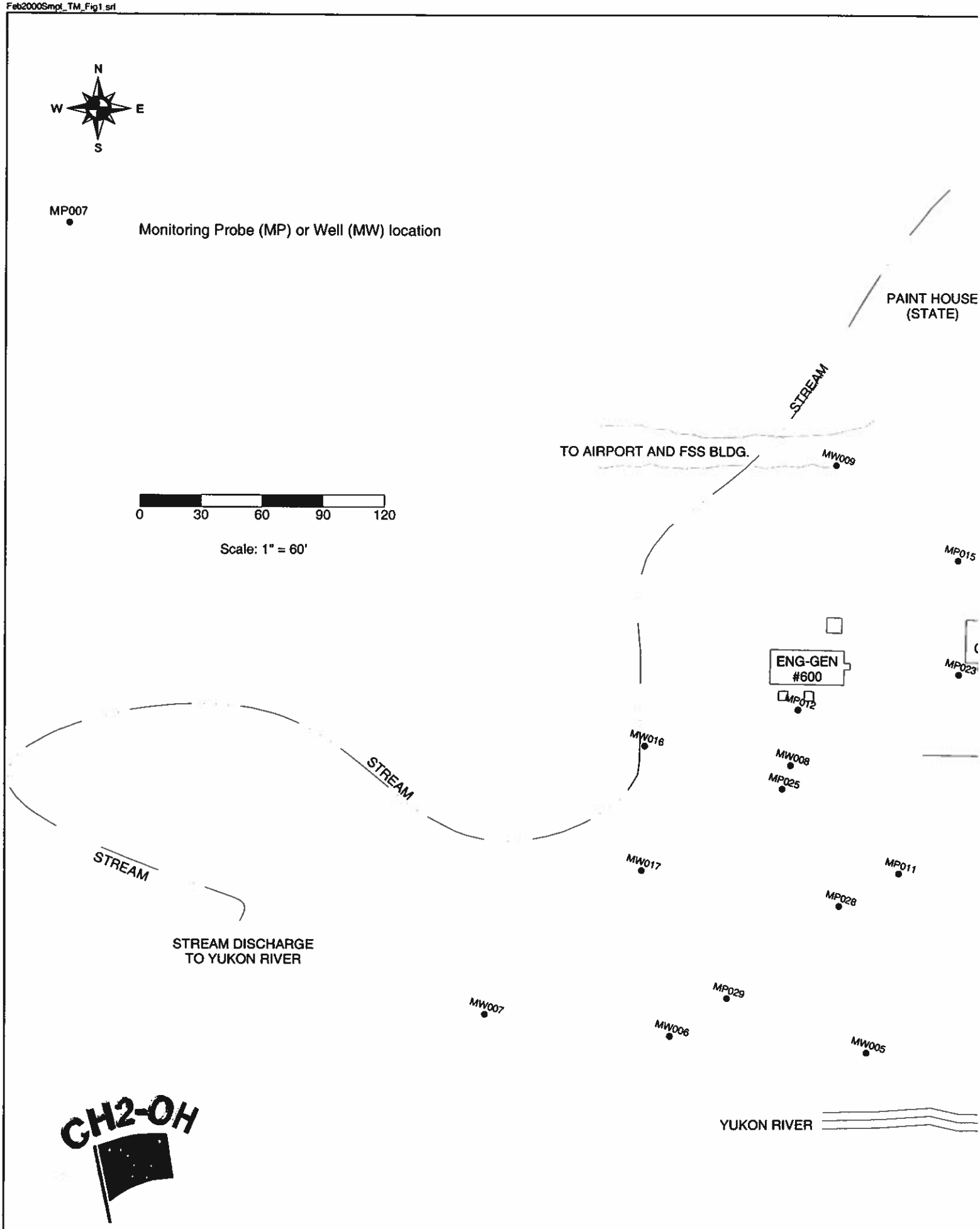
The data quality for this quarterly groundwater sampling event at the Tanana FAA facility is acceptable; no problems were encountered.

## Conclusions and Recommendations

Floating product was encountered in MW005, MW006 and MW017. The thicknesses of these product layers were 0.03 feet, 0.02 feet and 0.02 feet, respectively. Additionally, groundwater sampling results indicate that benzene is present above its cleanup level in MW018; DRO is present above its cleanup level in MW014, MW016, and MW018; and RRO is present above its cleanup level in MW014 and MW016. It is recommended that another groundwater monitoring event be performed at the site in late April 2000.

# Figures

Feb2000Smpt_TM_Fig1.srl



# Attachment 1
# Laboratory Data

RECEIVED BY
CH2M HILL AK
FEB 16 2000

ANALYTICA
ALASKA INC.
811 W. 8th Avenue, Anchorage, AK 99501 • (907) 258-2155 • FAX (907) 258-6634

**CH2M HILL of ALASKA**
301 W. NORTHERN LIGHTS, #601
ANCHORAGE, AK 99503

Attn: **MR. ANTHONY PENNINO**

Order #: **X0-02-005**
Date Reported: 02/10/00 17:17
Project Name: **FAA-TANANA**
Date Received: 02/04/00

COELT EDF WITH EXCEL SPREADSHEET

**SAMPLE IDENTIFICATION**

| Sample Number | Client Description |
|---|---|
| 01 | TAL00MW012Q01 |
| 02 | TAL00MW009Q01 |
| 03 | TAL00MW010Q01 |
| 04 | TAL00MW015Q01 |
| 05 | TAL00MW019Q01 |
| 06 | TAL00MW014Q01 |
| 07 | TAL00MW001Q01 |
| 08 | TAL00MW002Q01 |
| 09 | TAL00MW003Q01 |
| 10 | TAL00MW004Q01 |
| 11 | TAL00MW011Q01 |
| 12 | TAL00MW008Q01 |
| 13 | TAL00MW018Q01 |
| 14 | TAL00MW007Q01 |
| 15 | TAL00MW016Q01 |
| 16 | TAL00MW018Q01D |
| 17 | TRIP BLANK |

Enclosed are the analytical results for the submitted samples. All analyses met quality assurance objectives, except where noted in the case narratives. If you have any questions regarding the analyses, please feel free to call.

Sheldon Stone
Technical Manager

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**Analytica Alaska, Inc.**

811 W. 8th Ave. Anchorage, AK 99501 Phone-(907)258-2155 FAX-(907)258-6634

# tabular sample report - fuels

AAI Project ID: **X002005**

Client: **CH2M HILL of ALASKA**

*11-Feb-00*

Project Name: **FAA-TANANA**

| Sample ID | Client Sample ID | Matrix | Benzene | Toluene | Ethylbenzene | Xylenes, Total | GRO | Units | DRO | RRO | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X002005-01 | TAL00MW012Q01 | WATER | U (1.0) | U (1.0) | U (1.0) | U (1.0) | U (100) | µg/L | 0.21 (0.10) | U (0.21) | µg/mL |
| X002005-02 | TAL00MW009Q01 | WATER | U (1.0) | U (1.0) | U (1.0) | U (1.0) | U (100) | µg/L | 0.14 (0.10) | 0.38 (0.21) | µg/mL |
| X002005-03 | TAL00MW010Q01 | WATER | U (1.0) | U (1.0) | U (1.0) | U (1.0) | U (100) | µg/L | 0.18 (0.10) | U (0.21) | µg/mL |
| X002005-04 | TAL00MW015Q01 | WATER | U (1.0) | U (1.0) | U (1.0) | U (1.0) | U (100) | µg/L | 1.2 (0.11) | 0.29 (0.21) | µg/mL |
| X002005-05 | TAL00MW019Q01 | WATER | U (1.0) | U (1.0) | U (1.0) | U (1.0) | U (100) | µg/L | 0.20 (0.10) | U (0.21) | µg/mL |
| X002005-06 | TAL00MW014Q01 | WATER | U (1.0) | U (1.0) | U (1.0) | U (1.0) | U (100) | µg/L | 11 (0.10) | 1.3 (0.21) | µg/mL |
| X002005-07 | TAL00MW001Q01 | WATER | U (1.0) | U (1.0) | U (1.0) | U (1.0) | U (100) | µg/L | 0.15 (0.10) | U (0.21) | µg/mL |
| X002005-08 | TAL00MW002Q01 | WATER | U (1.0) | U (1.0) | U (1.0) | U (1.0) | U (100) | µg/L | 0.35 (0.10) | U (0.21) | µg/mL |
| X002005-09 | TAL00MW003Q01 | WATER | U (1.0) | U (1.0) | U (1.0) | U (1.0) | U (100) | µg/L | 0.40 (0.10) | 0.22 (0.21) | µg/mL |
| X002005-10 | TAL00MW004Q01 | WATER | U (1.0) | U (1.0) | U (1.0) | U (1.0) | U (100) | µg/L | 0.14 (0.11) | U (0.22) | µg/mL |
| X002005-11 | TAL00MW011Q01 | WATER | U (1.0) | U (1.0) | U (1.0) | U (1.0) | U (100) | µg/L | 0.17 (0.10) | U (0.20) | µg/mL |
| X002005-12 | TAL00MW008Q01 | WATER | U (1.0) | U (1.0) | 15 (1.0) | 44 (1.0) | 1200 (100) | µg/L | 0.21 (0.10) | 0.26 (0.21) | µg/mL |
| X002005-13 | TAL00MW018Q01 | WATER | 5.2 (1.0) | U (1.0) | U (1.0) | U (1.0) | U (100) | µg/L | 7.2 (0.11) | 0.93 (0.22) | µg/mL |
| X002005-14 | TAL00MW007Q01 | WATER | U (1.0) | U (1.0) | U (1.0) | U (1.0) | U (100) | µg/L | 0.35 (0.10) | 0.28 (0.21) | µg/mL |
| X002005-15 | TAL00MW016Q01 | WATER | U (1.0) | U (1.0) | U (1.0) | U (1.0) | U (100) | µg/L | 34 (1.0) | 2.5 (2.1) | µg/mL |
| X002005-16 | TAL00MW018Q01D | WATER | 5.5 (1.0) | U (1.0) | U (1.0) | U (1.0) | U (100) | µg/L | 6.6 (0.11) | 0.93 (0.22) | µg/mL |
| X002005-17 | TRIP BLANK | WATER | U (1.0) | U (1.0) | U (1.0) | U (1.0) | U (100) | µg/L | | | µg/mL |

The number in parentheses is the reporting limit. "U" Indicates analyte was not detected. "()" Indicates analyte was not analyzed for. "J" indicates value is estimated.

ADEC Laboratory Approval Number: UST-014
LGN NUMBER: X002005

The samples were received properly packed in two coolers at 5.5°C and 5.1°C and were refrigerated upon receipt.

QUALITY CONTROL

Except as noted below, all quality control objectives were met for this project.

Data Flag Definitions:

U - Indicates this analyte was analyzed for and not detected at the reporting limits listed.

D - Indicates the surrogate was diluted out of the sample due to high levels of organics native to the samples.

M - Indicates matrix effects are responsible for surrogate recoveries which are out of limits.

NC - Indicates analyte was detected in original analysis but not confirmed in secondary analysis.

DR - Indicates result is from secondary analysis at dilution.

S - Indicates corrective action did not accomplish desired results or corrective action not performed for cause. See QC Evaluation Summary for details.

B - Indicates analyte was found in Method Blank. Result should be considered as potentially biased high. See QC Evaluation Summary for details.

< - Indicates sample not preserved according to AK101 requirements. True value is greater than or equal to the reported value.

W - Sample reported on a wet weight basis due to missing percent moisture aliquot.

J - Sample result is estimated. See QC Evaluation Summary for details.

Analyst: _____ Date: 02/14/2000

Analyst: _____ Date: 02/14/00

Client ID: TAL00MW012Q01 Lab ID: 01A
Test Description: BTEXG in water by 101/8021 Method: AK101/8021B
Collected: 02/01/00 Matrix: WATER

ANALYSIS DATE: 02/08/00 FILE ID: N0020807.D
ANALYST: SG UNITS: µg/L
INSTRUMENT ID: NAT DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | U | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | U | 1.0 | |
| Xylenes, Total | 1330-20-7 | U | 1.0 | |
| Gasoline Range Organics | VPH | U | 100 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| 1,4-Difluorobenzene(PID) | 99 % | 60 - 120 |
| p-Bromofluorobenzene(PID) | 113 % | 60 - 120 |
| 1,4-Difluorobenzene(FID) | 105 % | 60 - 120 |
| p-Bromofluorobenzene(FID) | 105 % | 60 - 120 |

Client ID: TAL00MW012Q01 Lab ID: 01B
Test Description: DRO/RRO in water AK102&103 Method: 3510/AK102/3
Collected: 02/01/00 Matrix: WATER

EXTRACTION DATE: 02/08/00 FILE ID: R0020907.D
ANALYSIS DATE: 02/09/00 UNITS: µg/ml
ANALYST: JKG DILUTION: 1
INSTRUMENT ID: ROO

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Diesel Range Organics | DRO | 0.21 | 0.10 | |
| Residual Range Organics | RRO | U | 0.21 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| o-Terphenyl | 95 % | 60 - 120 |
| Squalane | 85 % | 60 - 120 |

Client ID: TAL00MW009Q01 Lab ID: 02A
Test Description: BTEXG in water by 101/8021 Method: AK101/8021B
Collected: 02/01/00 Matrix: WATER

ANALYSIS DATE: 02/08/00 FILE ID: N0020808.D
ANALYST: SG UNITS: µg/L
INSTRUMENT ID: NAT DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | U | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | U | 1.0 | |
| Xylenes, Total | 1330-20-7 | U | 1.0 | |
| Gasoline Range Organics | VPH | U | 100 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| 1,4-Difluorobenzene(PID) | 100 % | 60 - 120 |
| p-Bromofluorobenzene(PID) | 120 % | 60 - 120 |
| 1,4-Difluorobenzene(FID) | 101 % | 60 - 120 |
| p-Bromofluorobenzene(FID) | 107 % | 60 - 120 |

Client ID: TAL00MW009Q01 Lab ID: 02B
Test Description: DRO/RRO in water AK102&103 Method: 3510/AK102/3
Collected: 02/01/00 Matrix: WATER

EXTRACTION DATE: 02/08/00 FILE ID: R0020908.D
ANALYSIS DATE: 02/09/00 UNITS: µg/ml
ANALYST: JKG DILUTION: 1
INSTRUMENT ID: ROO

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Diesel Range Organics | DRO | **0.14** | 0.10 | |
| Residual Range Organics | RRO | **0.38** | 0.21 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| o-Terphenyl | 102 % | 60 - 120 |
| Squalane | 93 % | 60 - 120 |

Client ID: TAL00MW010Q01 Lab ID: 03A
Test Description: BTEXG in water by 101/8021 Method: AK101/8021B
Collected: 02/01/00 Matrix: WATER

ANALYSIS DATE: 02/08/00 FILE ID: N0020809.D
ANALYST: SG UNITS: µg/L
INSTRUMENT ID: NAT DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | U | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | U | 1.0 | |
| Xylenes, Total | 1330-20-7 | U | 1.0 | |
| Gasoline Range Organics | VPH | U | 100 | |

| SURROGATE | %RECOVERY | LIMITS | | |
|---|---|---|---|---|
| 1,4-Difluorobenzene(PID) | 99 % | 60 | - | 120 |
| p-Bromofluorobenzene(PID) | 114 % | 60 | - | 120 |
| 1,4-Difluorobenzene(FID) | 103 % | 60 | - | 120 |
| p-Bromofluorobenzene(FID) | 105 % | 60 | - | 120 |

Client ID: TAL00MW010Q01 Lab ID: 03B
Test Description: DRO/RRO in water AK102&103 Method: 3510/AK102/3
Collected: 02/01/00 Matrix: WATER

EXTRACTION DATE: 02/08/00 FILE ID: R0020909.D
ANALYSIS DATE: 02/09/00 UNITS: µg/ml
ANALYST: JKG DILUTION: 1
INSTRUMENT ID: ROO

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Diesel Range Organics | DRO | 0.18 | 0.10 | |
| Residual Range Organics | RRO | U | 0.21 | |

| SURROGATE | %RECOVERY | LIMITS | | |
|---|---|---|---|---|
| o-Terphenyl | 100 % | 60 | - | 120 |
| Squalane | 91 % | 60 | - | 120 |

Client ID: **TAL00MW015Q01** Lab ID: **04A**
Test Description: BTEXG in water by 101/8021 Method: AK101/8021B
Collected: 02/02/00 Matrix: **WATER**

ANALYSIS DATE: 02/08/00 FILE ID: N0020810.D
ANALYST: SG UNITS: µg/L
INSTRUMENT ID: NAT DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | U | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | U | 1.0 | |
| Xylenes, Total | 1330-20-7 | U | 1.0 | |
| Gasoline Range Organics | VPH | U | 100 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| 1,4-Difluorobenzene(PID) | 99 % | 60 - 120 |
| p-Bromofluorobenzene(PID) | 117 % | 60 - 120 |
| 1,4-Difluorobenzene(FID) | 102 % | 60 - 120 |
| p-Bromofluorobenzene(FID) | 105 % | 60 - 120 |

Client ID: **TAL00MW015Q01** Lab ID: **04B**
Test Description: DRO/RRO in water AK102&103 Method: 3510/AK102/3
Collected: 02/02/00 Matrix: **WATER**

EXTRACTION DATE: 02/08/00 FILE ID: R0020910.D
ANALYSIS DATE: 02/09/00 UNITS: µg/ml
ANALYST: JKG DILUTION: 1
INSTRUMENT ID: ROO

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Diesel Range Organics | DRO | **1.2** | 0.11 | |
| Residual Range Organics | RRO | **0.29** | 0.21 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| o-Terphenyl | 98 % | 60 - 120 |
| Squalane | 96 % | 60 - 120 |

Client ID: TAL00MW019Q01 Lab ID: 05A
Test Description: BTEXG in water by 101/8021 Method: AK101/8021B
Collected: 02/02/00 Matrix: WATER

ANALYSIS DATE: 02/08/00 FILE ID: N0020811.D
ANALYST: SG UNITS: µg/L
INSTRUMENT ID: NAT DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | U | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | U | 1.0 | |
| Xylenes, Total | 1330-20-7 | U | 1.0 | |
| Gasoline Range Organics | VPH | U | 100 | |

| SURROGATE | %RECOVERY | LIMITS | | |
|---|---|---|---|---|
| 1,4-Difluorobenzene(PID) | 101 % | 60 | - | 120 |
| p-Bromofluorobenzene(PID) | 120 % | 60 | - | 120 |
| 1,4-Difluorobenzene(FID) | 102 % | 60 | - | 120 |
| p-Bromofluorobenzene(FID) | 104 % | 60 | - | 120 |

Client ID: TAL00MW019Q01 Lab ID: 05B
Test Description: DRO/RRO in water AK102&103 Method: 3510/AK102/3
Collected: 02/02/00 Matrix: WATER

EXTRACTION DATE: 02/08/00 FILE ID: R0020911.D
ANALYSIS DATE: 02/09/00 UNITS: µg/ml
ANALYST: JKG DILUTION: 1
INSTRUMENT ID: ROO

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Diesel Range Organics | DRO | 0.20 | 0.10 | |
| Residual Range Organics | RRO | U | 0.21 | |

| SURROGATE | %RECOVERY | LIMITS | | |
|---|---|---|---|---|
| o-Terphenyl | 94 % | 60 | - | 120 |
| Squalane | 88 % | 60 | - | 120 |

Client ID: **TAL00MW014Q01** Lab ID: **06A**
Test Description: BTEXG in water by 101/8021 Method: AK101/8021B
Collected: 02/02/00 Matrix: **WATER**

ANALYSIS DATE: 02/08/00 FILE ID: N0020812.D
ANALYST: SG UNITS: **µg/L**
INSTRUMENT ID: NAT DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | U | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | U | 1.0 | |
| Xylenes, Total | 1330-20-7 | U | 1.0 | |
| Gasoline Range Organics | VPH | U | 100 | |

| SURROGATE | %RECOVERY | LIMITS | | |
|---|---|---|---|---|
| 1,4-Difluorobenzene(PID) | 98 % | 60 | - | 120 |
| p-Bromofluorobenzene(PID) | 113 % | 60 | - | 120 |
| 1,4-Difluorobenzene(FID) | 101 % | 60 | - | 120 |
| p-Bromofluorobenzene(FID) | 104 % | 60 | - | 120 |

Client ID: **TAL00MW014Q01** Lab ID: **06B**
Test Description: DRO/RRO in water AK102&103 Method: 3510/AK102/3
Collected: 02/02/00 Matrix: **WATER**

EXTRACTION DATE: 02/08/00 FILE ID: R0020923.D
ANALYSIS DATE: 02/09/00 UNITS: **µg/ml**
ANALYST: JKG DILUTION: 1
INSTRUMENT ID: ROO

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Diesel Range Organics | DRO | 11 | 0.10 | |
| Residual Range Organics | RRO | 1.3 | 0.21 | |

| SURROGATE | %RECOVERY | LIMITS | | |
|---|---|---|---|---|
| o-Terphenyl | 92 % | 60 | - | 120 |
| Squalane | 93 % | 60 | - | 120 |

Client ID: **TAL00MW001Q01** Lab ID: **07A**
Test Description: BTEXG in water by 101/8021 Method: AK101/8021B
Collected: 02/02/00 Matrix: **WATER**

ANALYSIS DATE: 02/08/00 FILE ID: N0020813.D
ANALYST: SG UNITS: µg/L
INSTRUMENT ID: NAT DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | U | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | U | 1.0 | |
| Xylenes, Total | 1330-20-7 | U | 1.0 | |
| Gasoline Range Organics | VPH | U | 100 | |

| SURROGATE | %RECOVERY | LIMITS | | |
|---|---|---|---|---|
| 1,4-Difluorobenzene(PID) | 101 % | 60 | - | 120 |
| p-Bromofluorobenzene(PID) | 80 % | 60 | - | 120 |
| 1,4-Difluorobenzene(FID) | 99 % | 60 | - | 120 |
| p-Bromofluorobenzene(FID) | 105 % | 60 | - | 120 |

Client ID: **TAL00MW001Q01** Lab ID: **07B**
Test Description: DRO/RRO in water AK102&103 Method: 3510/AK102/3
Collected: 02/02/00 Matrix: **WATER**

EXTRACTION DATE: 02/08/00 FILE ID: R0020914.D
ANALYSIS DATE: 02/09/00 UNITS: µg/ml
ANALYST: JKG DILUTION: 1
INSTRUMENT ID: ROO

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Diesel Range Organics | DRO | 0.15 | 0.10 | |
| Residual Range Organics | RRO | U | 0.21 | |

| SURROGATE | %RECOVERY | LIMITS | | |
|---|---|---|---|---|
| o-Terphenyl | 100 % | 60 | - | 120 |
| Squalane | 89 % | 60 | - | 120 |

Client ID: TAL00MW002Q01 Lab ID: 08A
Test Description: BTEXG in water by 101/8021 Method: AK101/8021B
Collected: 02/02/00 Matrix: WATER

ANALYSIS DATE: 02/08/00 FILE ID: N0020816.D
ANALYST: SG UNITS: µg/L
INSTRUMENT ID: NAT DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | U | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | U | 1.0 | |
| Xylenes, Total | 1330-20-7 | U | 1.0 | |
| Gasoline Range Organics | VPH | U | 100 | |

| SURROGATE | %RECOVERY | LIMITS | | |
|---|---|---|---|---|
| 1,4-Difluorobenzene(PID) | 101 % | 60 | - | 120 |
| p-Bromofluorobenzene(PID) | 79 % | 60 | - | 120 |
| 1,4-Difluorobenzene(FID) | 95 % | 60 | - | 120 |
| p-Bromofluorobenzene(FID) | 98 % | 60 | - | 120 |

Client ID: TAL00MW002Q01 Lab ID: 08B
Test Description: DRO/RRO in water AK102&103 Method: 3510/AK102/3
Collected: 02/02/00 Matrix: WATER

EXTRACTION DATE: 02/08/00 FILE ID: R0020915.D
ANALYSIS DATE: 02/09/00 UNITS: µg/ml
ANALYST: JKG DILUTION: 1
INSTRUMENT ID: ROO

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Diesel Range Organics | DRO | 0.35 | 0.10 | |
| Residual Range Organics | RRO | U | 0.21 | |

| SURROGATE | %RECOVERY | LIMITS | | |
|---|---|---|---|---|
| o-Terphenyl | 99 % | 60 | - | 120 |
| Squalane | 88 % | 60 | - | 120 |

Client ID: **TAL00MW003Q01** Lab ID: **09A**
Test Description: BTEXG in water by 101/8021 Method: AK101/8021B
Collected: 02/02/00 Matrix: **WATER**

ANALYSIS DATE: 02/08/00 FILE ID: N0020817.D
ANALYST: SG UNITS: µg/L
INSTRUMENT ID: NAT DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | U | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | U | 1.0 | |
| Xylenes, Total | 1330-20-7 | U | 1.0 | |
| Gasoline Range Organics | VPH | U | 100 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| 1,4-Difluorobenzene(PID) | 99 % | 60 - 120 |
| p-Bromofluorobenzene(PID) | 111 % | 60 - 120 |
| 1,4-Difluorobenzene(FID) | 101 % | 60 - 120 |
| p-Bromofluorobenzene(FID) | 99 % | 60 - 120 |

Client ID: **TAL00MW003Q01** Lab ID: **09B**
Test Description: DRO/RRO in water AK102&103 Method: 3510/AK102/3
Collected: 02/02/00 Matrix: **WATER**

EXTRACTION DATE: 02/08/00 FILE ID: R0020916.D
ANALYSIS DATE: 02/09/00 UNITS: µg/ml
ANALYST: JKG DILUTION: 1
INSTRUMENT ID: ROO

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Diesel Range Organics | DRO | **0.40** | 0.10 | |
| Residual Range Organics | RRO | **0.22** | 0.21 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| o-Terphenyl | 100 % | 60 - 120 |
| Squalane | 87 % | 60 - 120 |

Client ID: **TAL00MW004Q01** Lab ID: **10A**
Test Description: BTEXG in water by 101/8021 Method: AK101/8021B
Collected: 02/02/00 Matrix: **WATER**

ANALYSIS DATE: 02/08/00 FILE ID: N0020818.D
ANALYST: SG UNITS: **µg/L**
INSTRUMENT ID: NAT DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | U | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | U | 1.0 | |
| Xylenes, Total | 1330-20-7 | U | 1.0 | |
| Gasoline Range Organics | VPH | U | 100 | |

| SURROGATE | %RECOVERY | LIMITS | | |
|---|---|---|---|---|
| 1,4-Difluorobenzene(PID) | 99 % | 60 | - | 120 |
| p-Bromofluorobenzene(PID) | 115 % | 60 | - | 120 |
| 1,4-Difluorobenzene(FID) | 100 % | 60 | - | 120 |
| p-Bromofluorobenzene(FID) | 100 % | 60 | - | 120 |

Client ID: **TAL00MW004Q01** Lab ID: **10B**
Test Description: DRO/RRO in water AK102&103 Method: 3510/AK102/3
Collected: 02/02/00 Matrix: **WATER**

EXTRACTION DATE: 02/08/00 FILE ID: R0020917.D
ANALYSIS DATE: 02/09/00 UNITS: **µg/ml**
ANALYST: JKG DILUTION: 1
INSTRUMENT ID: ROO

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Diesel Range Organics | DRO | **0.14** | 0.11 | |
| Residual Range Organics | RRO | U | 0.22 | |

| SURROGATE | %RECOVERY | LIMITS | | |
|---|---|---|---|---|
| o-Terphenyl | 100 % | 60 | - | 120 |
| Squalane | 88 % | 60 | - | 120 |

Client ID: **TAL00MW011Q01** Lab ID: **11A**
Test Description: BTEXG in water by 101/8021 Method: AK101/8021B
Collected: 02/02/00 Matrix: **WATER**

ANALYSIS DATE: 02/08/00 FILE ID: N0020819.D
ANALYST: SG UNITS: µg/L
INSTRUMENT ID: NAT DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | U | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | U | 1.0 | |
| Xylenes, Total | 1330-20-7 | U | 1.0 | |
| Gasoline Range Organics | VPH | U | 100 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| 1,4-Difluorobenzene(PID) | 100 % | 60 - 120 |
| p-Bromofluorobenzene(PID) | 117 % | 60 - 120 |
| 1,4-Difluorobenzene(FID) | 100 % | 60 - 120 |
| p-Bromofluorobenzene(FID) | 99 % | 60 - 120 |

Client ID: **TAL00MW011Q01** Lab ID: **11B**
Test Description: DRO/RRO in water AK102&103 Method: 3510/AK102/3
Collected: 02/02/00 Matrix: **WATER**

EXTRACTION DATE: 02/08/00 FILE ID: R0020918.D
ANALYSIS DATE: 02/09/00 UNITS: µg/ml
ANALYST: JKG DILUTION: 1
INSTRUMENT ID: ROO

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Diesel Range Organics | DRO | 0.17 | 0.10 | |
| Residual Range Organics | RRO | U | 0.20 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| o-Terphenyl | 97 % | 60 - 120 |
| Squalane | 89 % | 60 - 120 |

Client ID: TAL00MW008Q01 Lab ID: 12A
Test Description: BTEXG in water by 101/8021 Method: AK101/8021B
Collected: 02/02/00 Matrix: WATER

ANALYSIS DATE: 02/08/00 FILE ID: N0020820.D
ANALYST: SG UNITS: µg/L
INSTRUMENT ID: NAT DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | U | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | 15 | 1.0 | |
| Xylenes, Total | 1330-20-7 | 44 | 1.0 | |
| Gasoline Range Organics | VPH | 1200 | 100 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| 1,4-Difluorobenzene(PID) | 100 % | 60 - 120 |
| p-Bromofluorobenzene(PID) | 97 % | 60 - 120 |
| 1,4-Difluorobenzene(FID) | 107 % | 60 - 120 |
| p-Bromofluorobenzene(FID) | 110 % | 60 - 120 |

Client ID: TAL00MW008Q01 Lab ID: 12B
Test Description: DRO/RRO in water AK102&103 Method: 3510/AK102/3
Collected: 02/02/00 Matrix: WATER

EXTRACTION DATE: 02/08/00 FILE ID: R0020919.D
ANALYSIS DATE: 02/09/00 UNITS: µg/ml
ANALYST: JKG DILUTION: 1
INSTRUMENT ID: ROO

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Diesel Range Organics | DRO | 0.21 | 0.10 | |
| Residual Range Organics | RRO | 0.26 | 0.21 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| o-Terphenyl | 97 % | 60 - 120 |
| Squalane | 85 % | 60 - 120 |

Client ID: **TAL00MW018Q01** Lab ID: **13A**
Test Description: BTEXG in water by 101/8021 Method: AK101/8021B
Collected: 02/03/00 Matrix: **WATER**

ANALYSIS DATE: 02/08/00 FILE ID: N0020821.D
ANALYST: SG UNITS: µg/L
INSTRUMENT ID: NAT DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | 5.2 | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | U | 1.0 | |
| Xylenes, Total | 1330-20-7 | U | 1.0 | |
| Gasoline Range Organics | VPH | U | 100 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| 1,4-Difluorobenzene(PID) | 99 % | 60 - 120 |
| p-Bromofluorobenzene(PID) | 114 % | 60 - 120 |
| 1,4-Difluorobenzene(FID) | 95 % | 60 - 120 |
| p-Bromofluorobenzene(FID) | 95 % | 60 - 120 |

Client ID: **TAL00MW018Q01** Lab ID: **13B**
Test Description: DRO/RRO in water AK102&103 Method: 3510/AK102/3
Collected: 02/03/00 Matrix: **WATER**

EXTRACTION DATE: 02/08/00 FILE ID: R0020924.D
ANALYSIS DATE: 02/09/00 UNITS: µg/ml
ANALYST: JKG DILUTION: 1
INSTRUMENT ID: ROO

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Diesel Range Organics | DRO | 7.2 | 0.11 | |
| Residual Range Organics | RRO | 0.93 | 0.22 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| o-Terphenyl | 99 % | 60 - 120 |
| Squalane | 92 % | 60 - 120 |

Client ID: **TAL00MW007Q01** Lab ID: **14A**
Test Description: BTEXG in water by 101/8021 Method: AK101/8021B
Collected: 02/03/00 Matrix: **WATER**

ANALYSIS DATE: 02/08/00 FILE ID: N0020822.D
ANALYST: SG UNITS: µg/L
INSTRUMENT ID: NAT DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | U | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | U | 1.0 | |
| Xylenes, Total | 1330-20-7 | U | 1.0 | |
| Gasoline Range Organics | VPH | U | 100 | |

| SURROGATE | %RECOVERY | LIMITS | | |
|---|---|---|---|---|
| 1,4-Difluorobenzene(PID) | 99 % | 60 | - | 120 |
| p-Bromofluorobenzene(PID) | 116 % | 60 | - | 120 |
| 1,4-Difluorobenzene(FID) | 99 % | 60 | - | 120 |
| p-Bromofluorobenzene(FID) | 101 % | 60 | - | 120 |

Client ID: **TAL00MW007Q01** Lab ID: **14B**
Test Description: DRO/RRO in water AK102&103 Method: 3510/AK102/3
Collected: 02/03/00 Matrix: **WATER**

EXTRACTION DATE: 02/08/00 FILE ID: R0020920.D
ANALYSIS DATE: 02/09/00 UNITS: µg/ml
ANALYST: JKG DILUTION: 1
INSTRUMENT ID: ROO

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Diesel Range Organics | DRO | **0.35** | 0.10 | |
| Residual Range Organics | RRO | **0.28** | 0.21 | |

| SURROGATE | %RECOVERY | LIMITS | | |
|---|---|---|---|---|
| o-Terphenyl | 103 % | 60 | - | 120 |
| Squalane | 97 % | 60 | - | 120 |

Client ID: TAL00MW016Q01 Lab ID: 15A
Test Description: BTEXG in water by 101/8021 Method: AK101/8021B
Collected: 02/03/00 Matrix: WATER

ANALYSIS DATE: 02/08/00 FILE ID: N0020823.D
ANALYST: SG UNITS: µg/L
INSTRUMENT ID: NAT DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | U | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | U | 1.0 | |
| Xylenes, Total | 1330-20-7 | U | 1.0 | |
| Gasoline Range Organics | VPH | U | 100 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| 1,4-Difluorobenzene(PID) | 99 % | 60 - 120 |
| p-Bromofluorobenzene(PID) | 116 % | 60 - 120 |
| 1,4-Difluorobenzene(FID) | 102 % | 60 - 120 |
| p-Bromofluorobenzene(FID) | 104 % | 60 - 120 |

Client ID: TAL00MW016Q01 Lab ID: 15B
Test Description: DRO/RRO in water AK102&103 Method: 3510/AK102/3
Collected: 02/03/00 Matrix: WATER

EXTRACTION DATE: 02/08/00 FILE ID: R0020931.D
ANALYSIS DATE: 02/09/00 UNITS: µg/ml
ANALYST: JKG DILUTION: 10
INSTRUMENT ID: ROO

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Diesel Range Organics | DRO | 34 | 1.0 | |
| Residual Range Organics | RRO | 2.5 | 2.1 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| o-Terphenyl | D % | 60 - 120 |
| Squalane | D % | 60 - 120 |

Client ID: **TAL00MW018Q01D** Lab ID: **16A**
Test Description: BTEXG in water by 101/8021 Method: AK101/8021B
Collected: 02/03/00 Matrix: **WATER**

ANALYSIS DATE: 02/08/00 FILE ID: N0020824.D
ANALYST: SG UNITS: **µg/L**
INSTRUMENT ID: NAT DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | 5.5 | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | U | 1.0 | |
| Xylenes, Total | 1330-20-7 | U | 1.0 | |
| Gasoline Range Organics | VPH | U | 100 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| 1,4-Difluorobenzene(PID) | 100 % | 60 - 120 |
| p-Bromofluorobenzene(PID) | 112 % | 60 - 120 |
| 1,4-Difluorobenzene(FID) | 101 % | 60 - 120 |
| p-Bromofluorobenzene(FID) | 101 % | 60 - 120 |

Client ID: **TAL00MW018Q01D** Lab ID: **16B**
Test Description: DRO/RRO in water AK102&103 Method: 3510/AK102/3
Collected: 02/03/00 Matrix: **WATER**

EXTRACTION DATE: 02/08/00 FILE ID: R0020926.D
ANALYSIS DATE: 02/09/00 UNITS: **µg/ml**
ANALYST: JKG DILUTION: 1
INSTRUMENT ID: ROO

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Diesel Range Organics | DRO | 6.6 | 0.11 | |
| Residual Range Organics | RRO | 0.93 | 0.22 | |

| SURROGATE | %RECOVERY | LIMITS |
|---|---|---|
| o-Terphenyl | 102 % | 60 - 120 |
| Squalane | 86 % | 60 - 120 |

Client ID: TRIP BLANK
Test Description: BTEXG in water by 101/8021
Collected: 02/03/00

Lab ID: 17A
Method: AK101/8021B
Matrix: WATER

ANALYSIS DATE: 02/08/00
ANALYST: SG
INSTRUMENT ID: NAT

FILE ID: N0020825.D
UNITS: µg/L
DILUTION: 1

| PARAMETER | CAS # or ID | RESULT | LIMIT | Q |
|---|---|---|---|---|
| Benzene | 71-43-2 | U | 1.0 | |
| Toluene | 108-88-3 | U | 1.0 | |
| Ethylbenzene | 100-41-4 | U | 1.0 | |
| Xylenes, Total | 1330-20-7 | U | 1.0 | |
| Gasoline Range Organics | VPH | U | 100 | |

| SURROGATE | %RECOVERY | | LIMITS | | |
|---|---|---|---|---|---|
| 1,4-Difluorobenzene(PID) | 98 | % | 60 | - | 120 |
| p-Bromofluorobenzene(PID) | 113 | % | 60 | - | 120 |
| 1,4-Difluorobenzene(FID) | 100 | % | 60 | - | 120 |
| p-Bromofluorobenzene(FID) | 100 | % | 60 | - | 120 |

Method 8021 from Test Methods for Evaluating Solid Waste, USEPA SW-846, third edition, December 1996, is used for the analysis of volatile organics; benzene, toluene, ethylbenzene, xylenes (BTEX) in a water matrix.

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Method AK101 from the State of Alaska Department of Environmental Conservation (ADEC), Storage Tank Program, Underground Storage Tanks Procedures Manual, 18 AAC 78, as amended through January 31, 1996; is referenced for the analysis of gasoline range organics (GRO).

The quantitation range extends from the beginnning of C6 to the beginning of C10.

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Methods AK102 & AK103
from the State of Alaska Department of Environmental Conservation (ADEC), Storage Tank Program, Underground Storage Tanks Procedures Manual, 18 AAC 78, as amended through January 31, 1996; is referenced for the analysis of diesel range organics (DRO).

The quantitation range for AK102 extends from the beginning of C10 to the beginning of C25.
The standard used is a 1:1:1 mixture of Kerosene, DF1, and DF2.

The quantitation range for AK103 extends from the beginning of C25 to the end of C36. A mixture of 1:1 SAE 30 & SAE 40 motor oils are used for instrument calibration.

Waters are prepared via liquid/liquid extraction per AK102/AK103.

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ANALYTICA
ALASKA INC.

# QA
# Summary

*"The Science of Analysis, The Art of Service"*

Work Order: X002005 Client: CH2M_HILL

CONTROL

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GAS CCV | AK101W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | SG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 1045.3340 | 1000 | 100.0000 | | 105 | 75 | 125 | Y |
| α,α,α-Trifluorotoluene | 50.5470 | 50 | 1.0000 | 50.0000 | 101 | 60 | 120 | Y |
| p-Bromofluorobenzene-2 | 105.5570 | 100 | 1.0000 | 100.0000 | 106 | 60 | 120 | Y |

CONTROL

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13 | GAS CCV | AK101W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | SG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 1032.3970 | 1000 | 100.0000 | | 103 | 75 | 125 | Y |
| α,α,α-Trifluorotoluene | 49.2900 | 50 | 1.0000 | 50.0000 | 98.6 | 60 | 120 | Y |
| p-Bromofluorobenzene-2 | 114.8140 | 100 | 1.0000 | 100.0000 | 115 | 60 | 120 | Y |

CONTROL

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | GAS CCV | AK101W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | SG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 1032.4370 | 1000 | 100.0000 | | 103 | 75 | 125 | Y |
| α,α,α-Trifluorotoluene | 49.1830 | 50 | 1.0000 | 50.0000 | 98.4 | 60 | 120 | Y |
| p-Bromofluorobenzene-2 | 113.7580 | 100 | 1.0000 | 100.0000 | 114 | 60 | 120 | Y |

CONTROL

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 102 CCV | AK102W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | JKG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 912.4610 | 1000.0000 | 100.0000 | 1000.000 | 91.2 | 75 | 125 | Y |
| o-Terphenyl | 54.0910 | 50.0000 | 10.0000 | 50.0000 | 108 | 60 | 120 | Y |

CONTROL

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 102 CCV | AK102W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | JKG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 1059.4950 | 1000.0000 | 100.0000 | 1000.000 | 106 | 75 | 125 | Y |
| o-Terphenyl | 51.9120 | 50.0000 | 10.0000 | 50.0000 | 104 | 60 | 120 | Y |

CONTROL

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 102 CCV | AK102W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | JKG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 968.2810 | 1000.0000 | 100.0000 | 1000.000 | 96.8 | 75 | 125 | Y |
| o-Terphenyl | 47.1080 | 50.0000 | 10.0000 | 50.0000 | 94.2 | 60 | 120 | Y |

CONTROL

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 102 CCV | AK102W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | JKG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 1069.3300 | 1000.0000 | 100.0000 | 1000.000 | 107 | 75 | 125 | Y |
| o-Terphenyl | 53.2020 | 50.0000 | 10.0000 | 50.0000 | 106 | 60 | 120 | Y |

CONTROL

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 28 | 102 CCV | AK102W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | JKG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 1046.2740 | 1000.0000 | 100.0000 | 1000.000 | 105 | 75 | 125 | Y |
| o-Terphenyl | 53.7920 | 50.0000 | 10.0000 | 50.0000 | 108 | 60 | 120 | Y |

Work Order: X002005 Client: CH2M_HILL

## SPIKE

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | LCS 0208-1 | BTXG8W | K S | W | 3 | | 1 | 1.0 | 1.0 | 1.0 | | SG |

| Analytes | Result | Unspiked Result | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | | |
|---|---|---|---|---|---|---|---|---|---|
| Benzene | 12.0450 | U | 1.0000 | 13.0400 | 92.4 | 85 | 115 | | Y |
| Toluene | 70.6070 | U | 1.0000 | 79.6000 | 88.7 | 85 | 115 | | Y |
| Ethylbenzene | 19.3810 | U | 1.0000 | 17.8000 | 109 | 85 | 115 | | Y |
| Xylenes, Total | 92.0880 | U | 1.0000 | 93.4000 | 98.6 | 85 | 115 | | Y |
| Gasoline Range Organics | 1007.9790 | U | 100.0000 | 1100.000 | 91.6 | 75 | 125 | | Y |
| 1,4-Difluorobenzene | 47.4050 | 50.0370 | 1.0000 | 50.0000 | 94.8 | 60 | 120 | | Y |
| p-Bromofluorobenzene | 113.5630 | 68.6740 | 1.0000 | 100.0000 | 114 | 60 | 120 | | Y |
| 1,4-Difluorobenzene-2 | 49.9190 | 50.8110 | 1.0000 | 50.0000 | 99.8 | 60 | 120 | | Y |
| p-Bromofluorobenzene-2 | 116.2550 | 105.7350 | 1.0000 | 100.0000 | 116 | 60 | 120 | | Y |

## SPIKE DUPLICATE

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | LCS 0208-2 | BTXG8W | K S D | W | 3 | 4 | 1 | 1.0 | 1.0 | 1.0 | | SG |

| Analytes | Result | Unspiked Result | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | RPD Specs Low | RPD Specs High | Reference Recovery | RPD | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 12.1870 | U | 1.0000 | 13.0400 | 93.5 | 85 | 115 | | 20 | 92.4 | 1.18 | Y |
| Toluene | 70.7760 | U | 1.0000 | 79.6000 | 88.9 | 85 | 115 | | 20 | 88.7 | 0.225 | Y |
| Ethylbenzene | 19.5730 | U | 1.0000 | 17.8000 | 110 | 85 | 115 | | 20 | 109 | 0.913 | Y |
| Xylenes, Total | 92.5750 | U | 1.0000 | 93.4000 | 99.1 | 85 | 115 | | 20 | 98.6 | 0.506 | Y |
| Gasoline Range Organics | 1015.8460 | U | 100.0000 | 1100.000 | 92.3 | 75 | 125 | | 20 | 91.6 | 0.761 | Y |
| 1,4-Difluorobenzene | 48.8440 | 50.0370 | 1.0000 | 50.0000 | 97.7 | 60 | 120 | | 20 | 94.8 | 3.01 | Y |
| p-Bromofluorobenzene | 114.6900 | 68.6740 | 1.0000 | 100.0000 | 115 | 60 | 120 | | 20 | 114 | 0.873 | Y |
| 1,4-Difluorobenzene-2 | 52.1050 | 50.8110 | 1.0000 | 50.0000 | 104 | 60 | 120 | | 20 | 99.8 | 4.12 | Y |
| p-Bromofluorobenzene-2 | 103.6760 | 105.7350 | 1.0000 | 100.0000 | 104 | 60 | 120 | | 20 | 116 | 10.9 | Y |

## CONTROL

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | 8020 CCV | BTX_8W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | SG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | | |
|---|---|---|---|---|---|---|---|---|---|
| Benzene | 48.6730 | 50.0000 | 1.0000 | | 97.3 | 85 | 115 | | Y |
| Toluene | 46.3940 | 50.0000 | 1.0000 | | 92.8 | 85 | 115 | | Y |
| Ethylbenzene | 45.6160 | 50.0000 | 1.0000 | | 91.2 | 85 | 115 | | Y |
| Xylenes, Total | 136.2030 | 150.0000 | 1.0000 | | 90.8 | 85 | 115 | | Y |
| 1,4-Difluorobenzene | 50.2710 | 50.0000 | 1.0000 | 50.0000 | 101 | 60 | 120 | | Y |
| p-Bromofluorobenzene | 115.9930 | 100.0000 | 1.0000 | 100.0000 | 116 | 60 | 120 | | Y |

CONTROL

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 8020 CCV | BTX_8W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | SG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Benzene | 50.3610 | 50.0000 | 1.0000 | | 101 | 85 | 115 | Y |
| Toluene | 48.0780 | 50.0000 | 1.0000 | | 96.2 | 85 | 115 | Y |
| Ethylbenzene | 47.2680 | 50.0000 | 1.0000 | | 94.5 | 85 | 115 | Y |
| Xylenes, Total | 141.4070 | 150.0000 | 1.0000 | | 94.3 | 85 | 115 | Y |
| 1,4-Difluorobenzene | 51.3440 | 50.0000 | 1.0000 | 50.0000 | 103 | 60 | 120 | Y |
| p-Bromofluorobenzene | 71.6790 | 100.0000 | 1.0000 | 100.0000 | 71.7 | 60 | 120 | Y |

CONTROL

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | 8020 CCV | BTX_8W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | SG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Benzene | 49.7460 | 50.0000 | 1.0000 | | 99.5 | 85 | 115 | Y |
| Toluene | 47.6540 | 50.0000 | 1.0000 | | 95.3 | 85 | 115 | Y |
| Ethylbenzene | 46.6720 | 50.0000 | 1.0000 | | 93.3 | 85 | 115 | Y |
| Xylenes, Total | 139.2140 | 150.0000 | 1.0000 | | 92.8 | 85 | 115 | Y |
| 1,4-Difluorobenzene | 50.8510 | 50.0000 | 1.0000 | 50.0000 | 102 | 60 | 120 | Y |
| p-Bromofluorobenzene | 115.8600 | 100.0000 | 1.0000 | 100.0000 | 116 | 60 | 120 | Y |

BLANK

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | MB 0208-1 | BTX_8W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | SG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Benzene | U | | 1.0000 | | | | | Y |
| Toluene | U | | 1.0000 | | | | | Y |
| Ethylbenzene | U | | 1.0000 | | | | | Y |
| Xylenes, Total | U | | 1.0000 | | | | | Y |
| Gasoline Range Organics | U | | 100.0000 | | | | | Y |
| 1,4-Difluorobenzene | 50.8110 | 50.0000 | 1.0000 | 50.0000 | 102 | 60 | 120 | Y |
| p-Bromofluorobenzene | 105.7300 | 100.0000 | 1.0000 | 100.0000 | 106 | 60 | 120 | Y |

BLANK

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | MB1 0208 | DRRROW | B P | W | | | 1.0 | 1.0 | 1000 | 1.0 | | JKG |

| Analytes | Result | Detection Limit | | | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | U | 0.1000 | | | | | Y |
| Residual Range Organics | U | 0.2000 | | | | | Y |
| o-Terphenyl | 0.0480 | 0.0100 | 0.0500 | 96.0 | 60 | 120 | Y |
| Squalane | 0.0426 | 0.0100 | 0.0500 | 85.2 | 60 | 120 | Y |

Work Order: X002005 Client: CH2M_HILL

SPIKE

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | LCS1 0208 | DRRROW | K S | W | 3 | | 1.0 | 1.0 | 1000 | 1.0 | | JKG |

| Analytes | Result | Unspiked Result | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 1.9829 | U | 0.1000 | 2.0000 | 99.1 | 60 | 120 | Y |
| Residual Range Organics | 2.1074 | U | 0.2000 | 2.0000 | 105 | 60 | 120 | Y |
| o-Terphenyl | 0.0505 | 0.0480 | 0.0100 | 0.0500 | 101 | 60 | 120 | Y |
| Squalane | 0.0466 | 0.0426 | 0.0100 | 0.0500 | 93.2 | 60 | 120 | Y |

SPIKE DUPLICATE

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | LCSD1 0208 | DRRROW | K S D | W | 3 | 4 | 1.0 | 1.0 | 1000 | 1.0 | | JKG |

| Analytes | Result | Unspiked Result | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | RPD Specs Low | RPD Specs High | Reference Recovery | RPD | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 1.9279 | U | 0.1000 | 2.0000 | 96.4 | 60 | 120 | | 20 | 99.1 | 2.76 | Y |
| Residual Range Organics | 2.0508 | U | 0.2000 | 2.0000 | 103 | 60 | 120 | | 20 | 105 | 1.92 | Y |
| o-Terphenyl | 0.0515 | 0.0480 | 0.0100 | 0.0500 | 103 | 60 | 120 | | | 101 | 1.96 | Y |
| Squalane | 0.0465 | 0.0426 | 0.0100 | 0.0500 | 93.0 | 60 | 120 | | | 93.2 | 0.215 | Y |

CONTROL

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 103 CCV | RRO_W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | JKG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Residual Range Organics | 1113.4040 | 1000.0000 | 200.0000 | 1000.000 | 111 | 75 | 125 | Y |
| Squalane | 49.8650 | 50.0000 | 10.0000 | 60.0000 | 99.7 | 60 | 120 | Y |

CONTROL

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 103 CCV | RRO_W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | JKG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Residual Range Organics | 1059.9720 | 1000.0000 | 200.0000 | 1000.000 | 106 | 75 | 125 | Y |
| Squalane | 46.4220 | 50.0000 | 10.0000 | 60.0000 | 92.8 | 60 | 120 | Y |

Work Order: X002005 Client: CH2M_HILL

CONTROL

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | 103 CCV | RRO_W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | JKG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Residual Range Organics | 1041.9400 | 1000.0000 | 200.0000 | 1000.000 | 104 | 75 | 125 | Y |
| Squalane | 47.8220 | 50.0000 | 10.0000 | 60.0000 | 95.6 | 60 | 120 | Y |

CONTROL

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | 103 CCV | RRO_W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | JKG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Residual Range Organics | 936.9060 | 1000.0000 | 200.0000 | 1000.000 | 93.7 | 75 | 125 | Y |
| Squalane | 48.3810 | 50.0000 | 10.0000 | 60.0000 | 96.8 | 60 | 120 | Y |

CONTROL

| Seq. | Sample ID | Test Code | Class/ Sub/Dup | Matrix/ Sub | Ref Seq | Spk Seq | Dilution | Weight | Volume | Conv. Factor | Flag | Ver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 29 | 103 CCV | RRO_W | T I | W | | | 1.0 | 1.0 | 1.0 | 1.0 | | JKG |

| Analytes | Result | Theoretical Value | Detection Limit | Spike Value | Rec-overy | Specs Low | Specs High | |
|---|---|---|---|---|---|---|---|---|
| Residual Range Organics | 1053.3740 | 1000.0000 | 200.0000 | 1000.000 | 105 | 75 | 125 | Y |
| Squalane | 49.4350 | 50.0000 | 10.0000 | 60.0000 | 98.9 | 60 | 120 | Y |

ANALYTICA
ALASKA INC.

# Support Documentation

*"The Science of Analysis, The Art of Service"*

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325 Interlocken, Pkwy. Ste. 200
Broomfield, Colorado 80021
(303) 469-8868
FAX: (303) 469-5254

LGN: X002005
Quote:

# Chain of Custody Record / Analysis Request

Company Name: CH2M Hill
Company Address: 301 N. N. Lights Bld.
Telephone: 278-2551
FAX: 277-9736

Project Name: FAA Tanana
Report To: Tony Wagner
Invoice To: SAME
P.O. Number: 141360

| Sample ID | Date Collected | Time Collected | Matrix | # Containers 40 mL | # Containers 1 L | BTEX by EPA 5030/8021B | TAH by EPA 602 | TAqH by EPA 610/602 | GRO by AK101 | DRO by AK102 | RRO by AK103 | A+A by AK 101AA | A+A by AK 102AA/AK103AA | Other (Specify) | PH<2 | Hold for Further Analysis | LAB ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TAL00MW012Q01 | 2/1/00 | 1605 | W | 2 | 1 | X | | | X | X | X | | | | | | 01 |
| -009Q01 | | 1645 | | | | | | | | | | | | | | | 02 |
| -010Q01 | | 1810 | | | | | | | | | | | | | | | 03 |
| -015Q01 | 2/2/00 | 1020 | | | | | | | | | | | | | | | 04 |
| -019Q01 | | 1110 | | | | | | | | | | | | | | | 05 |
| -014Q01 | | 1210 | | | | | | | | | | | | | | | 06 |
| -001Q01 | | 1355 | | | | | | | | | | | | | | | 07 |
| -002Q01 | | 1440 | | | | | | | | | | | | | | | 08 |
| -003Q01 | | 1530 | | | | | | | | | | | | | | | 09 |
| -004Q01 | | 1625 | | | | | | | | | | | | | | | 10 |
| -011Q01 | | 1725 | | | | | | | | | | | | | | | 11 |
| -008Q01 | | 1815 | | | | | | | | | | | | | | | 12 |

COMMENTS

DELIVERABLES
- ☐ Level I
- ☒ ADEC
- ☐ ACOE
- ☐ Chromatogroms

EDD
- ☐ COELT
- ☐ STD

TURNAROUND
- ☐ 2 Business Days
- ☐ 5 Business Days
- ☒ 10-15 Business Days
- ☐ other: _____ #Business Days

| RELINQUISHED BY SAMPLER: | RECEIVED BY: | RELINQUISHED BY: | RECEIVED BY: |
|---|---|---|---|
| Signature: [signature] | Signature: [signature] | Signature: | Signature: |
| Printed Name: Anthony Lanniho | Printed Name: Tara Drennan | Printed Name: | Printed Name: |
| Firm: CH2M Hill | Firm: AAI | Firm: | Firm: |
| Date/Time: 2/4/00 245 | Date/Time: 2/4/00 1445 | Date/Time: | Date/Time: |

Cooler Receipt Information
- Temp Received: 5.5 °C
- Temp Received: 5.1 °C
- # of Coolers: two
- Seals: hand delivered
- Courier Fee: $ N/A
- Airbill #

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FAX: (907) 780-6670

325 Interlocken, Pkwy. Ste. 200
Broomfield, Colorado 80021
(303) 469-8868
FAX: (303) 469-5254

LGN: X002005
Quote:

# Chain of Custody Record / Analysis Request

Company Name: CH2M Hill
Company Address: 301 W. Northern Lights
Telephone: 278-2551
FAX: 277-9736

Project Name: FAA Tanana
Report To: Tony Wagner
Invoice To: Same
P.O. Number: 141360

| Sample ID | Date Collected | Time Collected | Matrix | # Containers 40ml | # Containers 1-L | BTEX by EPA 5030/8021B | TAH by EPA 602 | TAqH by EPA 610/602 | GRO by AK101 | DRO by AK102 | RRO by AK103 | A+A by AK 101AA | A+A by AK 102AA/AK103AA | Other (Specify) | PH<2 | Hold for Further Analysis | LAB ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TA200MW018Q01 | 2/3/00 | 940 | W | 2 | 1 | X | | | X | X | X | | | | | | 13 |
| -007Q01 | ↓ | 1040 | ↓ | ↓ | ↓ | ↓ | | | ↓ | ↓ | ↓ | | | | | | 14 |
| -016Q01 | ↓ | 1200 | ↓ | ↓ | ↓ | ↓ | | | ↓ | ↓ | ↓ | | | | | | 15 |
| TA200MW018Q01D | ↓ | 950 | ↓ | ↓ | ↓ | ↓ | | | ↓ | ↓ | ↓ | | | | | | 16 |
| TRIP Blank | | | | 1 | | X | | X | | | | | | | | | 17 |

COMMENTS

DELIVERABLES
- ☐ Level I
- ☒ ADEC
- ☐ ACOE
- ☐ Chromatogroms

EDD
- ☐ COELT
- ☐ STD

TURNAROUND
- ☐ 2 Business Days
- ☐ 5 Business Days
- ☒ 10-15 Business Days
- ☐ other: _____ #Business Days

| RELINQUISHED BY SAMPLER: | RECEIVED BY: | RELINQUISHED BY: | RECEIVED BY: |
|---|---|---|---|
| Signature: [signature] | Signature: [signature] | Signature: | Signature: |
| Printed Name: Anthony Pennino | Printed Name: Tara Drenner | Printed Name: | Printed Name: |
| Firm: CH2M Hill | Firm: AAI | Firm: | Firm: |
| Date/Time: 2/4/00 245 | Date/Time: 2/4/00 1445 | Date/Time: | Date/Time: |

Cooler Receipt Information
- Temp Received: 5.5 °C
- Temp Received: 5.1 °C
- # of Coolers: two
- Seals: hand delivered
- Courier Fee: $ N/A
- Airbill #

**Analytica Alaska Inc.**
811 W. 8th Ave Anchorage, Alaska 99501 (907) 258-2155 (907) 258-6634 fx (ADEC UST-014)

# Sample Cooler Receipt Form

| | |
|---|---|
| Laboratory Group Number (LGN): | X002005 |
| Date Cooler Opened: | 2/4/00 |
| Recipients Initials: | TD |
| Client Name: | CH2MHill |
| Project Name: | FAA - Tanana |

| | Cooler #1 | | | Cooler #2 | | | Cooler #3 | | |
|---|---|---|---|---|---|---|---|---|---|
| ***Cooler Exam*** | Yes | No | Specify Temp. (4°C'/-2°C): | Yes | No | Specify Temp. (4°C'/-2°C): | Yes | No | Specify Temp. (4°C'/-2°C): |
| Cooler Temperature Acceptable? | ✓ | | 5.5 | ✓ | | 5.1 | | | |
| Custody Seals Acceptable? | ✓ | | | ✓ | | | | | |
| Airbills / Delivery Acceptable? | ✓ | | | ✓ | | | | | |
| CoC Included With Cooler? | ✓ | | | ✓ | | | | | |
| ***Sample Containers Exam*** | Yes | No | | Yes | No | | Yes | No | |
| Sample Condition Acceptable? | ✓ | | | ✓ | | | | | |
| Correct Sampling Containers? | ✓ | | | ✓ | | | | | |
| Correct Sampling Preservative? | ✓ | | | ✓ | | | | | |
| Sufficient Sample Volume? | ✓ | | | ✓ | | | | | |
| Containers Identified Correctly? | ✓ | | | ✓ | | | | | |
| ***Chain of Custody (CoC) Exam*** | Yes | No | | Yes | No | | Yes | No | |
| Project Identifiable From CoC? | ✓ | | | ✓ | | | | | |
| Signatures/Dates/Times Correct? | ✓ | | | ✓ | | | | | |
| Sample Bottles/CoC Correspond? | ✓ | | | ✓ | | | | | |

| ***Discrepancy Resolution*** | |
|---|---|
| Client Contact & Company: | |
| Date Contacted: | |
| Discrepancy: | |
| Resolution: | |

ANALYTICA ALASKA INC.
www.analyticagroup.com

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FAX: (907) 258-6634

5438 Shaune Drive
Juneau, AK 99801
(907) 780-6666
FAX: (907) 780-6670

325 Interlocken, Pkwy. Ste. 200
Broomfield, Colorado 80021
(303) 469-8868
FAX: (303) 469-5254

LGN: X002005
Quote:

# Chain of Custody Record / Analysis Request

Company Name: CH2M Hill
Company Address: 301 N. N. Lights Bld.
Telephone: 278-2551
FAX: 277-9736

Project Name: FAA Tanana
Report To: Tony Wagner
Invoice To: SAME
P.O. Number: 141360

| Sample ID | Date Collected | Time Collected | Matrix | # Containers 40 ml | # Containers 1L | BTEX by EPA 5030/8021B | TAH by EPA 602 | $TA_qH$ by EPA 610/602 | GRO by AK101 | DRO by AK102 | RRO by AK103 | A+A by AK 101AA | A+A by AK 102AA/AK103AA | Other (Specify) | PH<2 | Hold for Further Analysis | LAB ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TAL00MW012Q01 | 2/1/00 | 1605 | W | 2 | 1 | X | | | X | X | X | | | | | | 01 |
| -009Q01 | | 1645 | | | | | | | | | | | | | | | 02 |
| -010Q01 | | 1810 | | | | | | | | | | | | | | | 03 |
| -015Q01 | 2/2/00 | 1020 | | | | | | | | | | | | | | | 04 |
| -019Q01 | | 1110 | | | | | | | | | | | | | | | 05 |
| -014Q01 | | 1210 | | | | | | | | | | | | | | | 06 |
| -001Q01 | | 1355 | | | | | | | | | | | | | | | 07 |
| -002Q01 | | 1440 | | | | | | | | | | | | | | | 08 |
| -003Q01 | | 1530 | | | | | | | | | | | | | | | 09 |
| -004Q01 | | 1625 | | | | | | | | | | | | | | | 10 |
| -011Q01 | | 1725 | | | | | | | | | | | | | | | 11 |
| -008Q01 | | 1815 | | | | | | | | | | | | | | | 12 |

COMMENTS

DELIVERABLES
- ☐ Level I
- ☒ ADEC
- ☐ ACOE
- ☐ Chromatograms

EDD
- ☐ COELT
- ☐ STD

TURNAROUND
- ☐ 2 Business Days
- ☐ 5 Business Days
- ☒ 10-15 Business Days
- ☐ other: _____ #Business Days

| RELINQUISHED BY SAMPLER: | RECEIVED BY: | RELINQUISHED BY: | RECEIVED BY: |
|---|---|---|---|
| Signature: [signature] | Signature: [signature] | Signature: | Signature: |
| Printed Name: Anthony Fannito | Printed Name: Tara Drennan | Printed Name: | Printed Name: |
| Firm: CH2M Hill | Firm: AAI | Firm: | Firm: |
| Date/Time: 2/4/00 245 | Date/Time: 2/4/00 1445 | Date/Time: | Date/Time: |

Cooler Receipt Information
Temp Received: 5.5 °C
Temp Received: 5.1 °C
# of Coolers: two
Seals: hand delivered
Courier Fee: $ N/A
Airbill #



2- 4-00; 5:37PM;ANALYTICA ALASKA INC CH2M HILL :907 276 5393 # 2/ 3

ANALYTICA ALASKA INC.
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(907) 780-6668
FAX: (907) 780-6670

325 Interlocken, Pkwy. Ste. 200
Broomfield, Colorado 80021
(303) 469-8868
FAX: (303) 469-5254

LGN: X002005
Quote:

# Chain of Custody Record / Analysis Request

Company Name: CH2M Hill
Company Address: 301 W. Northern Lights
Telephone: 278-2551
FAX: 277-9736

Project Name: FAA Tanana
Report To: Tony Wagner
Invoice To: Same
P.O. Number: 141360

| Sample ID | Date Collected | Time Collected | Matrix | # Containers 40 ml | # Containers 1-L | BTEX by EPA 5030/8021B | TAH by EPA 602 | TAqH by EPA 610/602 | GRO by AK101 | DRO by AK102 | RRO by AK103 | A+A by AK 101AA | A+A by AK 102AA/AK103AA | Other (Specify) | PH<2 | Hold for Further Analysis | LAB ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TA200MW018Q01 | 2/3/00 | 940 | W | 2 | 1 | X | | | X | X | X | | | | | | 13 |
| -007Q01 | | 1040 | | | | | | | | | | | | | | | 14 |
| -016Q01 | | 1200 | | | | | | | | | | | | | | | 15 |
| TA200MW018Q01D | | 950 | | | | | | | | | | | | | | | 16 |
| TRIP Blank | | | | | | X | | X | X | | | | | | | | 17 |

COMMENTS

DELIVERABLES
- ☐ Level I
- ☒ ADEC
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- ☐ Chromatograms

EDD
- ☐ COELT
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TURNAROUND
- ☐ 2 Business Days
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- ☐ other: _____ #Business Days

| RELINQUISHED BY SAMPLER: | RECEIVED BY: | RELINQUISHED BY: | RECEIVED BY: |
|---|---|---|---|
| Signature: [signature] | Signature: [signature] | Signature: | Signature: |
| Printed Name: Anthony Pennino | Printed Name: Tara Drennen | Printed Name: | Printed Name: |
| Firm: CH2M Hill | Firm: AAI | Firm: | Firm: |
| Date/Time: 2/4/00 245 | Date/Time: 2/4/00 1445 | Date/Time: | Date/Time: |

Cooler Receipt Information
Temp Received: 5.5 °C
Temp Received: 5.1 °C
# of Coolers: two
Seals: hand delivered
Courier Fee: $ N/A
Airbill #



2- 4-00; 5:37PM;ANALYTICA ALASKA INC ;907 276 5393 CH2M HILL # 3/ 3

# Attachment 2
# Chemical QA Report

ATTACHMENT 2

# Chemical QA Report

## Summary

Overall, the data are usable for the purpose of the *Tanana FAA Facility February 2000 Groundwater Monitoring* report. Non-conformances are identified and discussed in this report.

### Introduction

A review has been conducted on data submitted for the quarterly monitoring of the Tanana FAA facility in Tanana, Alaska. This report summarizes the results of the quality assurance/quality control (QA/QC) data associated with the analysis of gasoline-range organics and benzene, toluene, ethylbenzene, and total xylenes (GRO/BTEX) and diesel-range organics and residual-range organics (DRO/RRO) in groundwater samples.

Groundwater samples were collected from February 1 to February 3, 2000. This review focuses on criteria for the following QA/QC parameters and their overall effect on the data:

- Holding times
- Sample handling (chain-of-custody)
- Method blanks
- Sensitivity
- Surrogate spike recovery
- Spike/spike recovery
- Field QA/QC (trip blanks and field duplicates)

A total of nineteen groundwater samples, one field duplicate, and one trip blank were analyzed for GRO/BTEX and DRO/RRO. Groundwater samples were delivered to Analytica, Alaska, and submitted for analysis. Samples were analyzed for GRO/BTEX by GC (State of Alaska [AK] Method AK101/8021) and for DRO/RRO by GC (AK102/103) in Anchorage, Alaska.

All groundwater samples were analyzed in accordance with the EPA *Test Methods for Evaluating Solid Waste,* (USEPA SW-846, September 1986, Third Edition, Update 1, July 1992).

The QA/QC criteria were taken from SW-846 and the Quality Assurance Program Plan (QAPP) for the investigation of spill sites prepared by CH2M HILL (dated May 1993, and on file at the Alaska Department of Environmental Conservation). EPA Laboratory Program *National Functional Guidelines for Organic Data Review* (February 1994) provided guidelines for data qualification, where applicable.

The level of reporting from Analytica was Level I; which includes sample and method blank results, field QC sample results, and surrogate recoveries. Other quality control data (such

as spike recoveries), chromatograms, and quantitation reports were not required in the data deliverable and were not requested. Consequently, results of spike recovery results were not reviewed and calculations from raw data were not verified.

The report also did not include instrument performance check results or calibration data. These data were not required in the Level I deliverable. The laboratory case narrative stated that all acceptance criteria for calibrations, method blanks, surrogates, spikes, and samples were met and that all analyses proceeded normally.

## Holding Times

Holding time criteria monitor sample integrity that may be compromised over time. All GRO/BTEX and DRO/RRO groundwater samples were extracted within their respective holding times.

## Sample Handling

Proper sample handling and chain-of-custody procedures help monitor the integrity of the samples.

The chain-of-custody and laboratory case narrative were reviewed to determine if any sample handling procedures might affect the integrity of the samples and the quality of the resulting data.

Samples sent to Analytica were shipped in two coolers. The temperatures inside the coolers were 5.5°C and 5.1°C. These temperatures are within the acceptable limits of 4°C +\- 2°C.

## Method Blanks

Method blank criteria monitor the existence and magnitude of contamination resulting from sample handling processes and/or instrument carryover.

No analytes of interest were detected above their reporting limit in the method blanks associated with these samples.

## Sensitivity

Sensitivity criteria monitor achievement of method reporting limits.

All samples met their respective method reporting limits.

## Surrogate Spike Recovery

Surrogate spike recovery monitors instrument specificity and accuracy.

No discrepancies were noted in which surrogate recovery values were outside the higher or lower acceptance levels.

## Field QA/QC

Field QA/QC monitors for sample contamination and overall sampling and analytical precision. A trip blank and a field duplicate were the field QA/QC samples.

## Trip Blanks

Trip blanks are shipped in a cooler containing samples for volatiles analysis. Trip blanks should not contain analytes of interest above the method reporting limit.

A trip blank was supplied by the laboratory for GRO/BTEX analysis. No GRO/BTEX analytes were detected in the trip blank.

## Field Duplicates

One field duplicate for groundwater samples for GRO/BTEX and DRO/RRO was collected. The field sample was TAL00MW018Q01, and its field duplicate was TAL00MW018Q01D. This frequency does not meet the QA/QC requirement of one duplicate sample per ten field samples collected.