# SITE INFORMATION

## Report Type: Work Plan

| General Site Information: | | | | | | |
|---|---|---|---|---|---|---|
| ***Site:*** | **Cowtown Unit #202** | | | | | |
| ***Company:*** | **Alamo** | | | | | |
| ***Section, Township and Range*** | **Unit** | **Sec 13** | **T18S** | **R26E** | | |
| ***Lease Number:*** | **(API#) 30-015-41018** | | | | | |
| ***County:*** | **Eddy County** | | | | | |
| ***GPS:*** | **32.742999° N** | | | **104.135830° W** | | |
| ***Surface Owner:*** | State | | | | | |
| ***Mineral Owner:*** | | | | | | |
| ***Directions:*** | From Hwy 82 and Hwy 360 travel south on Hwy 360 for approximatly 4.74 miles. Turn West on lease road and travel for 1.7 miles. Turn North for approximatly 0.25 miles to the tank battery. | | | | | |

| Release Data: | |
|---|---|
| *Date Released:* | 11/12/2013 |
| *Type Release:* | Oil |
| *Source of Contamination:* | Overflow of Frac Tank |
| *Fluid Released:* | 15 bbls |
| *Fluids Recovered:* | 11 bbls |

| Official Communication: | | | |
|---|---|---|---|
| *Name:* | Carie Stoker | | Tom Elliott |
| *Company:* | Alamo Permian Resources | | Tetra Tech |
| *Address:* | 907 Woodland Park Ave. | | 4000 North Big Spring Suite 401 |
| | | | |
| *City:* | Midland, Texas 79705 | | Midland, Texas |
| *Phone number:* | 432-685-3599 | | (432) 682-4559 |
| *Fax:* | 432-685-3577 | | |
| *Email:* | carie@stokeroilfield.com | | tom.elliott@tetratech.com |

| Ranking Criteria | | |
|---|---|---|
| ***Depth to Groundwater:*** | ***Ranking Score*** | ***Site Data*** |
| *<50 ft* | 20 | 20 |
| *50-99 ft* | 10 | |
| *>100 ft.* | 0 | |
| ***WellHead Protection:*** | ***Ranking Score*** | ***Site Data*** |
| *Water Source <1,000 ft., Private <200 ft.* | *20* | |
| *Water Source >1,000 ft., Private >200 ft.* | 0 | 0 |
| ***Surface Body of Water:*** | ***Ranking Score*** | ***Site Data*** |
| *<200 ft.* | *20* | |
| *200 ft - 1,000 ft.* | 10 | |
| *>1,000 ft.* | 0 | 0 |
| ***Total Ranking Score:*** | **20** | |

| Acceptable Soil RRAL (mg/kg) | | |
|---|---|---|
| ***Benzene*** | ***Total BTEX*** | ***TPH*** |
| 10 | 50 | 100 |

TETRA TECH

March 4, 2014

Mr. Mike Bratcher
Environmental Engineer Specialist
Oil Conservation Division, District 2
811 S. First Street
Artesia, New Mexico 88210

**Re: Work Plan for the Alamo Permian Resources, LLC., Cowtown Unit # 202 site, Unit E, Section 13, Township 18 South, Range 26 East, Eddy County, New Mexico.**

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by Alamo Permian Resources, LLC (Alamo) to assess a spill location at the Cowtown Unit #202 Site located Unit E, Section 13, Township 18 South, Range 26 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.742999°, W 104.1358307°. The site location is shown on Figures 1 and 2.

**Background**

According to the State of New Mexico C-141 Initial Report, the leak was discovered on November 12, 2013, and released approximately fifteen (15) barrels of oil from overfilling a frac tank temporarily used as a storage tank. Eleven (11) barrels of oil were recovered. The release was contained on the pad and measured 30' x 90'. The initial C-141 form is enclosed in Appendix A.

**Groundwater**

No water wells were listed within Section 13. The NMOCD groundwater map shows an average depth to groundwater ranging from 10' to 50.0' in this area. The groundwater data is shown in Appendix B.

Tetra Tech
4000 North Big Spring Suite 401, Midland, TX 79705
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com

## Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 100 mg/kg.

## Soil Assessment

On February 5, 2014, Tetra Tech personnel inspected and sampled the spill area. Three (3) auger holes (AH-1, AH-2 and AH-3) were installed using a stainless steel hand auger to assess the impacted soils. Select samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The results of the sampling are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, AH-1 and AH-2 were above the RRAL for total BTEX at 150 mg/kg in AH-1 at 0-1.0' and 105 mg/kg in AH-2 at 0-1.0' below ground surface (bgs). The total BTEX was not vertically defined in AH-1 and AH-2. Auger holes (AH-1, AH-2 and AH-3) were above the RRAL for TPH at 10,320 mg/kg in AH-1 at 0-1.0', 17,780 mg/kg in AH-2 at 0-1.0' and 9,274 mg/kg in AH-3 at 0-1.0' bgs. All of the auger holes were vertically undefined for TPH. Deeper Samples were not collected due to the dense formation.

Elevated chloride concentrations were also detected in AH-1, AH-2 and AH-3 at a depth of approximately 0-1.0' bgs, with chloride levels of 2,890 mg/kg, 6,350 mg/kg and 5,150 mg/kg were observed at 0-1.0' bgs in AH-1, AH-2 and AH-3, respectively. The chloride impacts were not vertically defined.

**Work Plan**

Alamo proposes remove impacted material as highlighted (green) in Table 1 and shown on Figure 4. The areas of AH-1, AH-2 and AH-3 will be excavated to a depth of approximately 1.0' below surface. Trenches will also be installed to delineate the hydrocarbons and chloride extents. Based on the trench data the impacted material will be removed properly addressed to below the RRAL. Once excavated to the appropriate depth, confirmation samples will be collected and the excavated areas will be backfilled with clean backfilled material to grade. The excavated material will be transported to proper disposal.

The proposed excavation depths may not be reached due to wall cave ins and safety concerns for onsite personnel. In addition, impacted soil around oil and gas equipment, structures or lines may not be feasible or practicable to be removed due to safely concerns for onsite personnel. As such, Tetra Tech will excavate the impacted soils to the maximum extent practicable. If the excavation depth is not achieved Alamo proposes to install a liner to cap the remaining impact.

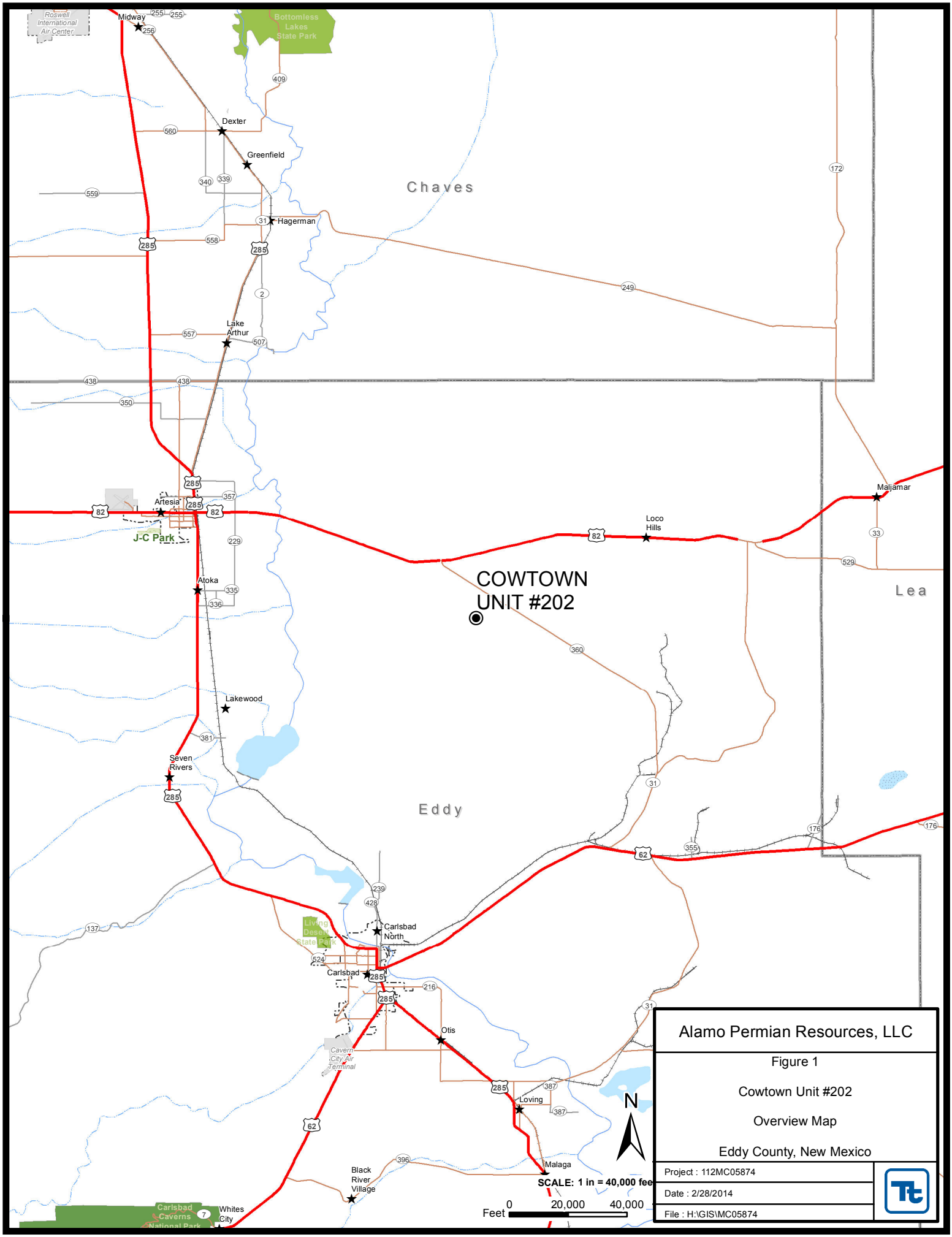
Upon completion, a final report will be submitted to the NMOCD. If you have any questions or comments concerning the assessment or the proposed remediation activities for this site, please call me at (432) 682-4559.

Respectfully submitted,
TETRA TECH

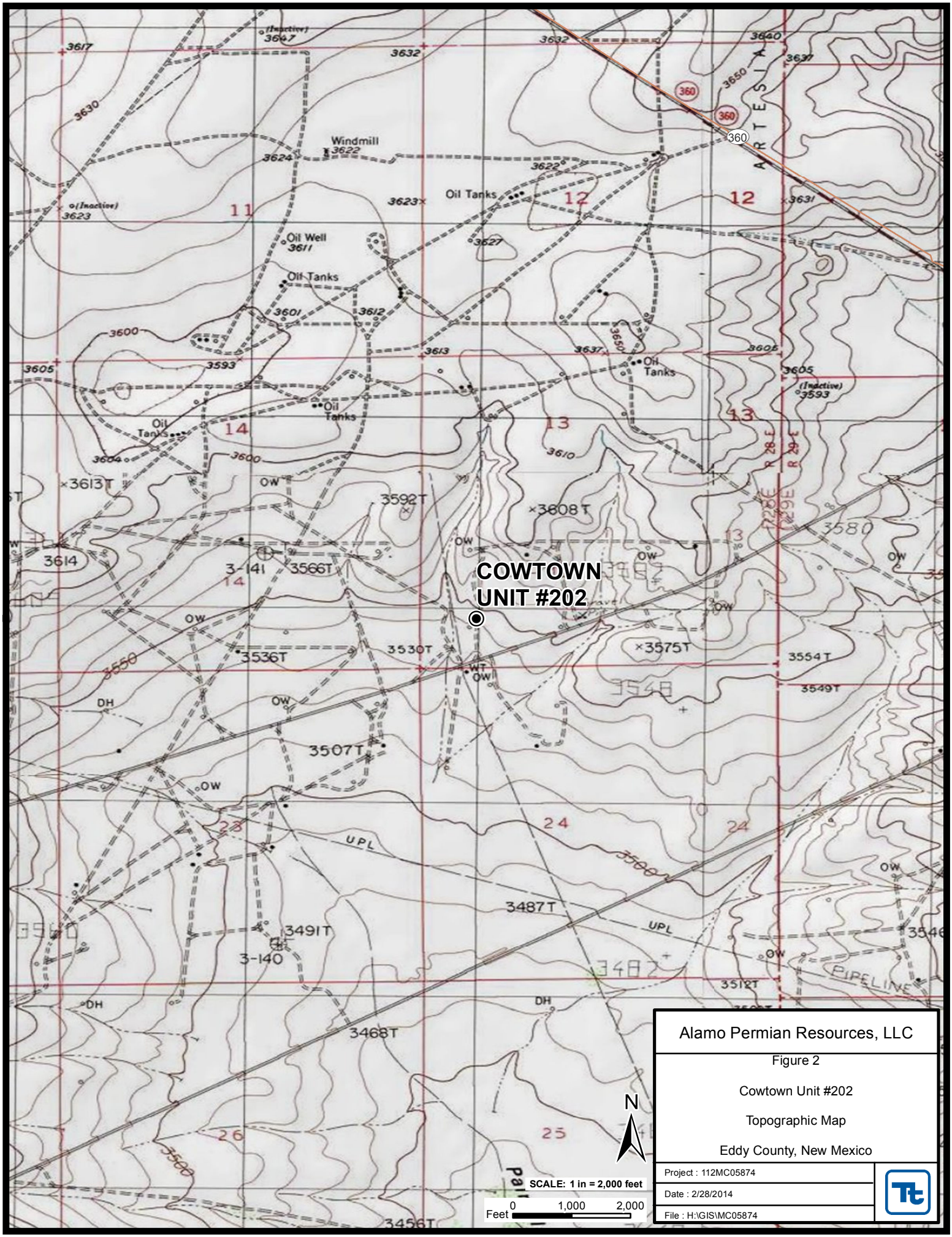
Tom Elliott
Project Manager

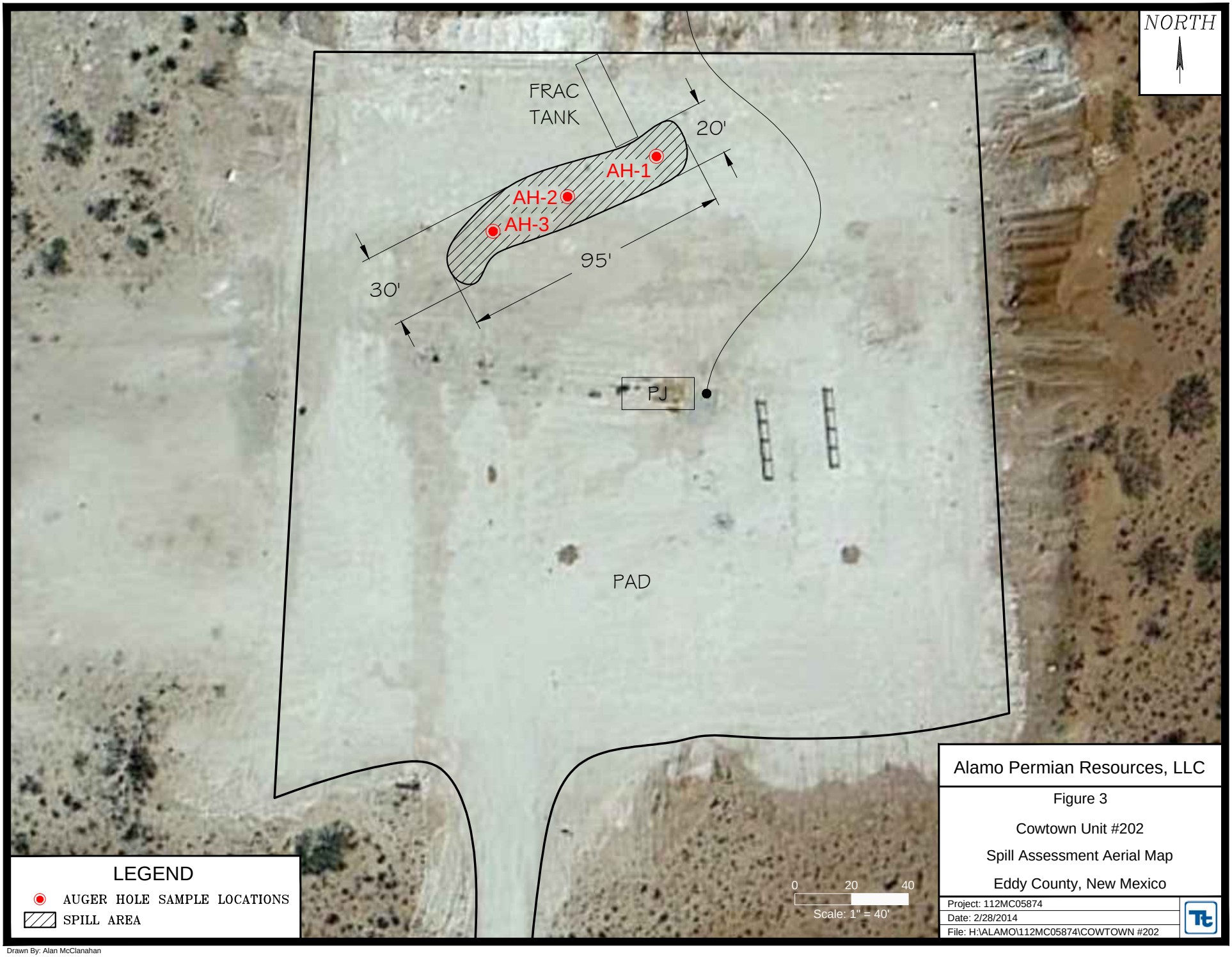
cc: Stoker Oilfield Services – Carie Stoker

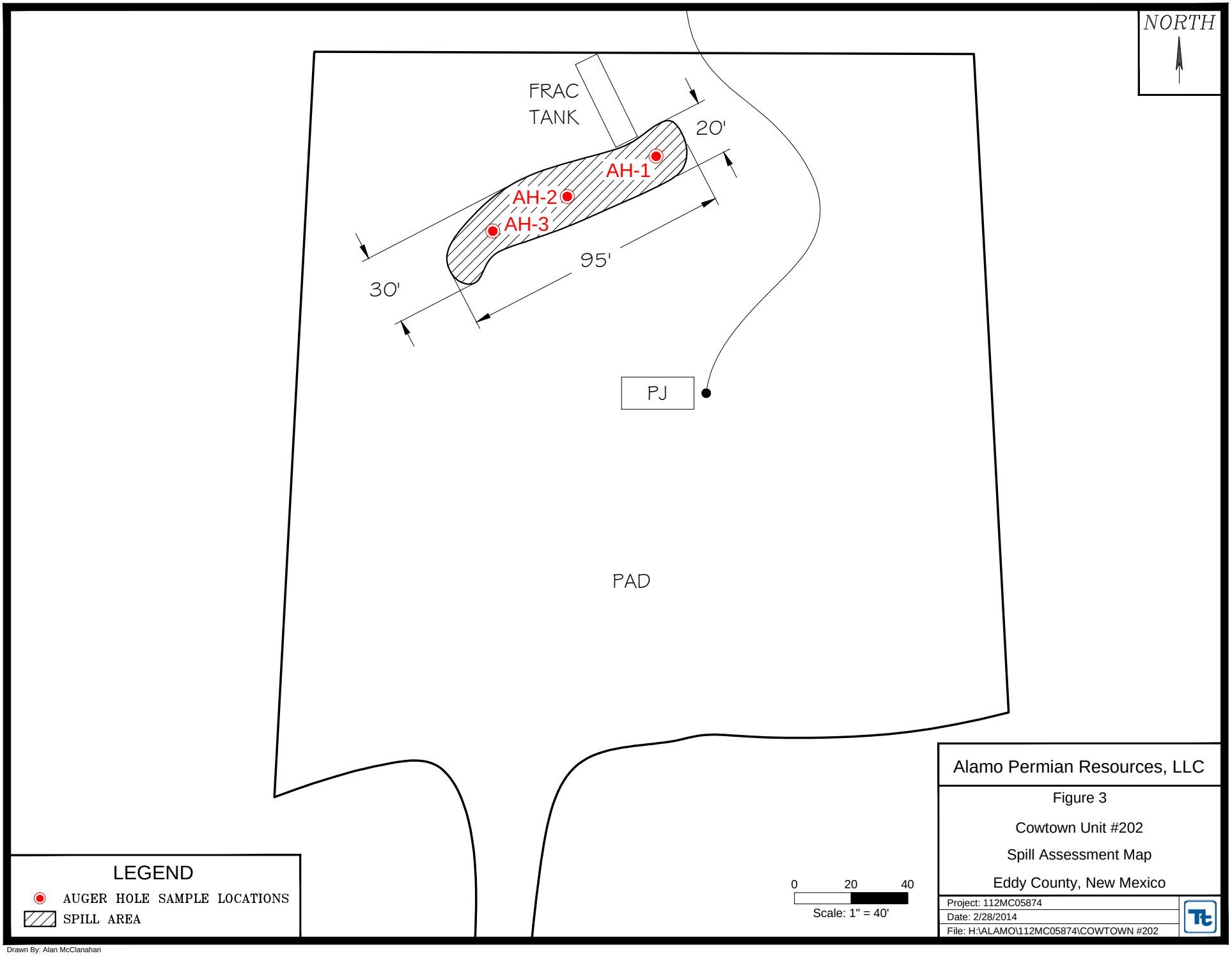
# FIGURES

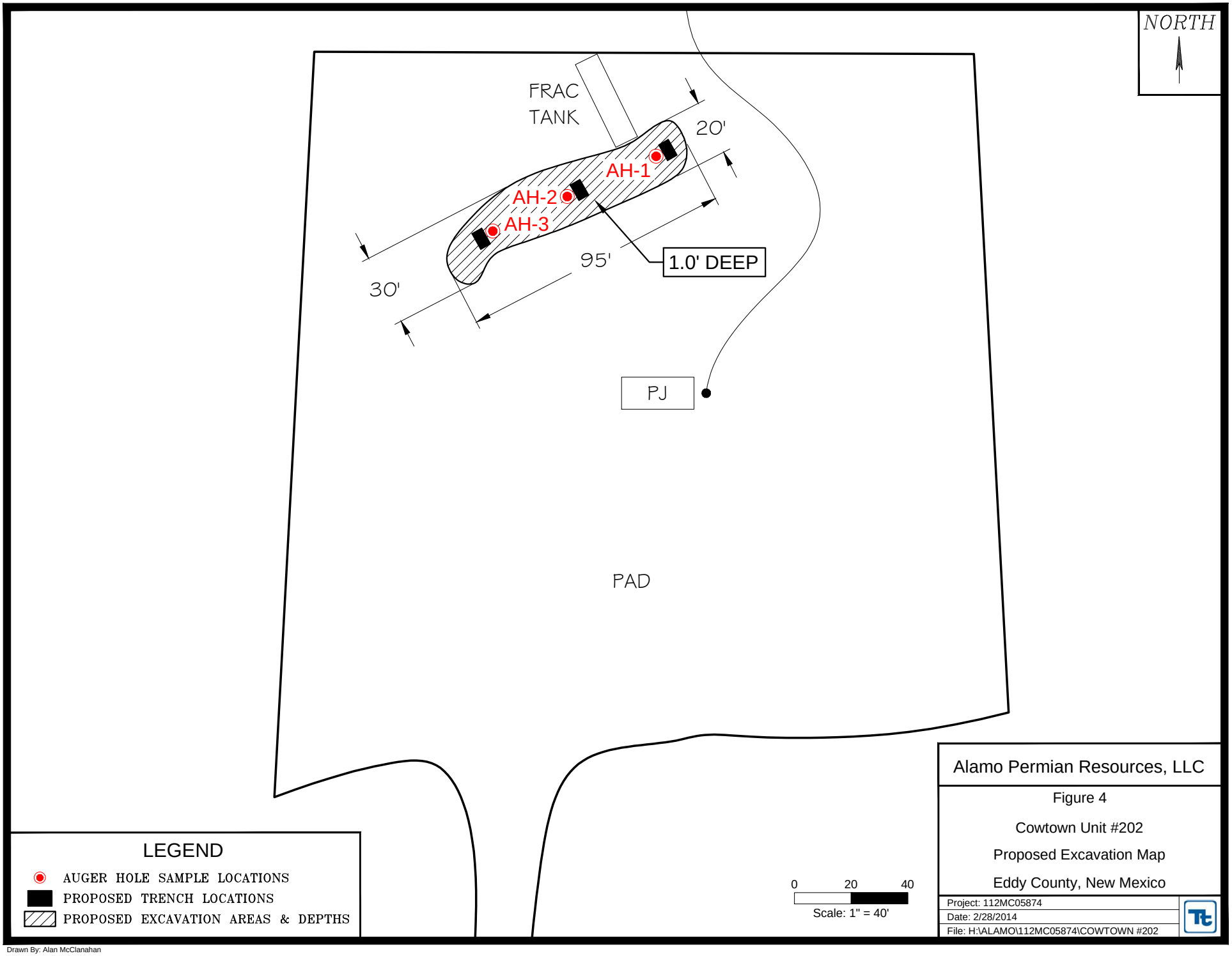



Drawn By: Alan McClanahan


COWTOWN
UNIT #202
N
SCALE: 1 in = 2,000 feet
0 1,000 2,000
Feet
Alamo Permian Resources, LLC
Figure 2
Cowtown Unit #202
Topographic Map
Eddy County, New Mexico
Project : 112MC05874
Date : 2/28/2014
File : H:\GIS\MC05874
Drawn By: Alan McClanahan


NORTH
FRAC
TANK
20'
AH-1
AH-2
AH-3
95'
30'
PJ
PAD
LEGEND
AUGER HOLE SAMPLE LOCATIONS
SPILL AREA
0
20
40
Scale: 1" = 40'
Alamo Permian Resources, LLC
Figure 3
Cowtown Unit #202
Spill Assessment Aerial Map
Eddy County, New Mexico
Project: 112MC05874
Date: 2/28/2014
File: H:\ALAMO\112MC05874\COWTOWN #202
Drawn By: Alan McClanahan


NORTH
FRAC
TANK
20'
AH-1
AH-2
AH-3
95'
30'
PJ
PAD
LEGEND
AUGER HOLE SAMPLE LOCATIONS
SPILL AREA
0
20
40
Scale: 1" = 40'
Alamo Permian Resources, LLC
Figure 3
Cowtown Unit #202
Spill Assessment Map
Eddy County, New Mexico
Project: 112MC05874
Date: 2/28/2014
File: H:\ALAMO\112MC05874\COWTOWN #202
Drawn By: Alan McClanahan


NORTH
FRAC
TANK
20'
AH-1
AH-2
AH-3
95'
30'
1.0' DEEP
PJ
PAD
LEGEND
AUGER HOLE SAMPLE LOCATIONS
PROPOSED TRENCH LOCATIONS
PROPOSED EXCAVATION AREAS & DEPTHS
0
20
40
Scale: 1" = 40'
Alamo Permian Resources, LLC
Figure 4
Cowtown Unit #202
Proposed Excavation Map
Eddy County, New Mexico
Project: 112MC05874
Date: 2/28/2014
File: H:\ALAMO\112MC05874\COWTOWN #202
Drawn By: Alan McClanahan

# PHOTOGRAPHS

**PHOTOGRAPHIC DOCUMENTATION**
Alamo Permian Resources, LLC
Cowtown Unit # 202
Eddy County, New Mexico

Photo 1. View of AH-2 and AH-3.

Photo 2. View of AH-1.

# TABLES

# Table 1
# Alamo
# Cowtown Unit #202
# Eddy County, New Mexico

| Sample ID | Sample Date | BEB Sample Depth (ft) | Excavation Bottom Depth (ft) | Soil Status | | TPH (mg/kg) | | | Benzene (mg/kg) | Toluene (mg/kg) | Ethlybenzene (mg/kg) | Xylene (mg/kg) | Total BTEX (mg/kg) | Chloride (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | In-Situ | Removed | GRO | DRO | Total | | | | | | |
| **AH-1** Trench | 2/5/2014 | 0-1 | 0 | X | | 2,120 | 8,200 | 10,320 | 0.622 | 21.5 | 44.1 | 84.0 | 150 | 2,890 |
| **AH-2** Trench | 2/5/2014 | 0-1 | 0 | X | | 1,680 | 16,100 | 17,780 | <0.400 | 11.6 | 28.2 | 65.5 | 105 | 6,350 |
| **AH-3** Trench | 2/5/2014 | 0-1 | 0 | X | | 874 | 8,400 | 9,274 | <0.200 | 1.30 | 4.29 | 16.5 | 22.1 | 5,150 |

| | |
|---|---|
| ( - ) | Not Analyzed |
| (BEB) | Below Excavation Bottom |
| Trench | Proposed Trench Location |
| | Proposed Excavation Depths |

# APPENDIX A

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

RECEIVED
NOV 12 2013
NMOCD ARTESIA

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

# Release Notification and Corrective Action

nJMW1331842147 27984/OPERATOR ☒ Initial Report ☐ Final Report

| | |
|---|---|
| Name of Company ALAMO PERMIAN RESOURCES, LLC | Contact RICKY RODRIGUEZ |
| Address 415 W. WALL ST. SUITE 500 | Telephone No. 575 703 6425 |
| Facility Name COWTOWN UNIT 202 | Facility Type: Oil Well |

| | | |
|---|---|---|
| Surface Owner STATE | Mineral Owner | API No. 30-015-41018 |

## LOCATION OF RELEASE

| | Section | Township | Range | Feet from the | North/South Line | Feet from the | East/West Line | County |
|---|---|---|---|---|---|---|---|---|
| | 13 | 18S | 26E | 700 | S | 810 | W | EDDY |

**Latitude** 32.7429997421485
**Longitude** -104.135830720785

## NATURE OF RELEASE

| | | |
|---|---|---|
| Type of Release: OIL | Volume of Release: 15 BBLS | Volume Recovered: 11 BBLS |
| Source of Release: FRAC TANK | Date and Hour of Occurrence: NOV 12, 2013 | Date and Hour of Discovery NOV 12, 2013 |
| Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required | If YES, To Whom? MIKE BRATCHER via phone call | |
| By Whom? Carie Stoker | Date and Hour Nov 12, 2013 , 2:52 P.M. | |
| Was a Watercourse Reached? ☐ Yes ☒ No | If YES, Volume Impacting the Watercourse. | |

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*
Frac Tank overflow (temporarily producing into frac tank while awaiting installation of new heater treater); vacuum truck dispatched to recover standing oil

Describe Area Affected and Cleanup Action Taken.*

Clean up action: A backhoe was dispatched to scrape up leak affected earth, which will be hauled to a disposal facility.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: Carie Stoker

Printed Name: CARIE STOKER

Title: REGULATORY AFFAIRS COORDINATOR

E-mail Address: carie@stokeroilfield.com

Date: 11/12/2013 Phone: 432 664 7659

OIL CONSERVATION DIVISION

Approved by Environmental Specialist: Signed By Mike Bratcher

Approval Date: NOV 14 2013 Expiration Date:

Conditions of Approval:
Remediation per OCD Rule & Guidelines. **SUBMIT REMEDIATION PROPOSAL NO LATER THAN:** December 14, 2013

Attached ☐

2RP-2063

* Attach Additional Sheets If Necessary

# APPENDIX B

# Water Well Data
## Average Depth to Groundwater (ft)
## Alamo - Cowtown Unit #202
## Eddy County, New Mexico

**17 South 25 East**

| | | | | | |
|---|---|---|---|---|---|
| 6 | 5 | 4 | 3 | 2 | 1 |
| 7 | 8 | 9 | 10 | 11 | 12 |
| 18 | 17 | 16 | 15 | 14 | 13 |
| 19 | 20 | 21 | 22 | 23 | 24 |
| 30 | 29 | 28 | 27 | 26 | 25 |
| 31 | 32 | 33 | 34 | 35 | 36 |

**17 South 26 East**

| | | | | | |
|---|---|---|---|---|---|
| 6 | 5 | 4 80 | 3 | 2 | 1 |
| 7 | 8 | 9 | 10 71 | 11 | 12 |
| 18 | 17 | 16 | 15 80 | 14 | 13 |
| 19 | 20 90 | 21 120 | 22 | 23 | 24 |
| 30 | 29 | 28 | 27 | 26 40 | 25 |
| 31 98 | 32 80 | 33 150 | 34 | 35 25 | 36 |

**17 South 27 East**

| | | | | | |
|---|---|---|---|---|---|
| 6 | 5 30 | 4 | 3 | 2 | 1 |
| 7 14 | 8 | 9 | 10 | 11 54 50 | 12 |
| 18 111 | 17 90 | 16 175 | 15 | 14 | 13 |
| 19 | 20 | 21 | 22 | 23 40 | 24 |
| 30 | 29 | 28 | 27 | 26 | 25 |
| 31 | 32 140 | 33 | 34 | 35 | 36 |

**18 South 25 East**

| | | | | | |
|---|---|---|---|---|---|
| 6 | 5 | 4 155 | 3 184 | 2 175 | 1 187 |
| 7 | 8 | 9 | 10 168 | 11 | 12 |
| 18 230 | 17 | 16 | 15 | 14 | 13 |
| 19 | 20 | 21 | 22 | 23 117 | 24 158 |
| 30 | 29 | 28 | 27 | 26 200 | 25 |
| 31 | 32 | 33 | 34 | 35 | 36 270 |

**18 South 26 East**

| | | | | | |
|---|---|---|---|---|---|
| 6 200 | 5 95 | 4 24 | 3 65 | 2 50 14 | 1 |
| 7 | 8 | 9 70 | 10 8 40 | 11 | 12 |
| 18 56 | 17 | 16 51 | 15 | 14 | 13 Site |
| 19 | 20 | 21 | 22 98 | 23 | 24 19 |
| 30 | 29 | 28 85 | 27 | 26 | 25 |
| 31 | 32 | 33 | 34 | 35 | 36 |

**18 South 27 East**

| | | | | | |
|---|---|---|---|---|---|
| 6 | 5 | 4 | 3 | 2 | 1 |
| 7 | 8 | 9 | 10 50 | 11 | 12 |
| 18 | 17 | 16 | 15 | 14 | 13 |
| 19 | 20 | 21 | 22 | 23 | 24 |
| 30 | 29 | 28 100 | 27 | 26 | 25 |
| 31 65 | 32 | 33 145 | 34 | 35 | 36 |

**19 South 25 East**

| | | | | | |
|---|---|---|---|---|---|
| 6 | 5 305 | 4 | 3 | 2 100 | 1 172 |
| 7 | 8 | 9 260 | 10 | 11 | 12 |
| 18 | 17 83 | 16 | 15 59 | 14 | 13 |
| 19 310 | 20 | 21 | 22 130 | 23 | 24 |
| 30 222 | 29 | 28 | 27 60 | 26 | 25 60 |
| 31 140 | 32 | 33 | 34 | 35 | 36 |

**19 South 26 East**

| | | | | | |
|---|---|---|---|---|---|
| 6 | 5 | 4 70 | 3 | 2 | 1 70 |
| 7 | 8 | 9 | 10 50 | 11 | 12 24 |
| 18 69 | 17 | 16 | 15 | 14 67 | 13 |
| 19 | 20 52 | 21 | 22 | 23 80 | 24 |
| 30 105 | 29 | 28 | 27 49 | 26 | 25 |
| 31 95 | 32 95 | 33 | 34 | 35 | 36 |

**19 South 27 East**

| | | | | | |
|---|---|---|---|---|---|
| 6 | 5 20 | 4 | 3 | 2 | 1 |
| 7 | 8 50 | 9 | 10 | 11 | 12 |
| 18 | 17 | 16 18 | 15 | 14 82.4 107.7 | 13 60.7 |
| 19 | 20 | 21 | 22 | 23 | 24 |
| 30 | 29 | 28 | 27 | 26 | 25 |
| 31 | 32 | 33 | 34 | 35 | 36 |

New Mexico State Engineers Well Reports

USGS Well Reports

Geology and Groundwater Conditions in Southern Eddy, County, NM

NMOCD - Groundwater Data

Field water level

New Mexico Water and Infrastructure Data System

# APPENDIX C

# Summary Report

Tom Elliott
Tetra Tech
1910 N. Big Spring Street
Midland, TX 79705

Report Date: February 18, 2014

Work Order: 14021002

Project Location: Eddy Co, NM
Project Name: Alamo/Cowtown Unit #202
Project Number: 112MC05874

| Sample | Description | Matrix | Date Taken | Time Taken | Date Received |
|---|---|---|---|---|---|
| 354211 | AH-1 0-1' | soil | 2014-02-05 | 00:00 | 2014-02-07 |
| 354212 | AH-2 0-1' | soil | 2014-02-05 | 00:00 | 2014-02-07 |
| 354213 | AH-3 0-1' | soil | 2014-02-05 | 00:00 | 2014-02-07 |

| | BTEX | | | | TPH DRO - NEW | TPH GRO |
|---|---|---|---|---|---|---|
| Sample - Field Code | Benzene (mg/Kg) | Toluene (mg/Kg) | Ethylbenzene (mg/Kg) | Xylene (mg/Kg) | DRO (mg/Kg) | GRO (mg/Kg) |
| **354211 - AH-1 0-1'** | **0.622** | **21.5** | **44.1** | **84.0** | **8200** | **2120** Je |
| **354212 - AH-2 0-1'** | <0.400 [1] | **11.6** | **28.2** | **65.5** | **16100** | **1680** |
| **354213 - AH-3 0-1'** | <0.200 [2] Qs | **1.30** | **4.29** | **16.5** Qr,Qs | **8400** | **874** Qs |

**Sample: 354211 - AH-1 0-1'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **2890** | mg/Kg | 4 |

**Sample: 354212 - AH-2 0-1'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **6350** | mg/Kg | 4 |

**Sample: 354213 - AH-3 0-1'**

[1] Dilution due to hydrocarbons.
[2] Dilution due to hydrocarbons.

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **5150** | mg/Kg | 4 |

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
200 East Sunset Road, Suite E El Paso, Texas 79922 915•585•3443 FAX 915•585•4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432•689•6301 FAX 432•689•6313
(BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972•242•7750
E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

## Certifications

**WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025**

# Analytical and Quality Control Report

Tom Elliott
Tetra Tech
1910 N. Big Spring Street
Midland, TX, 79705

Report Date: February 18, 2014

Work Order: 14021002

Project Location: Eddy Co, NM
Project Name: Alamo/Cowtown Unit #202
Project Number: 112MC05874

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

| Sample | Description | Matrix | Date Taken | Time Taken | Date Received |
|---|---|---|---|---|---|
| 354211 | AH-1 0-1' | soil | 2014-02-05 | 00:00 | 2014-02-07 |
| 354212 | AH-2 0-1' | soil | 2014-02-05 | 00:00 | 2014-02-07 |
| 354213 | AH-3 0-1' | soil | 2014-02-05 | 00:00 | 2014-02-07 |

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.



Dr. Blair Leftwich, Director
Dr. Michael Abel, Project Manager

# Report Contents

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Sample 354212 (AH-2 0-1') . . . 6
Sample 354213 (AH-3 0-1') . . . 7

**Method Blanks** **10**
QC Batch 109182 - Method Blank (1) . . . 10
QC Batch 109260 - Method Blank (1) . . . 10
QC Batch 109324 - Method Blank (1) . . . 10
QC Batch 109325 - Method Blank (1) . . . 11
QC Batch 109346 - Method Blank (1) . . . 11
QC Batch 109347 - Method Blank (1) . . . 11

**Laboratory Control Spikes** **13**
QC Batch 109182 - LCS (1) . . . 13
QC Batch 109260 - LCS (1) . . . 13
QC Batch 109324 - LCS (1) . . . 13
QC Batch 109325 - LCS (1) . . . 14
QC Batch 109346 - LCS (1) . . . 15
QC Batch 109347 - LCS (1) . . . 15
QC Batch 109182 - MS (1) . . . 16
QC Batch 109260 - MS (1) . . . 16
QC Batch 109324 - MS (1) . . . 17
QC Batch 109325 - MS (1) . . . 17
QC Batch 109346 - MS (1) . . . 18
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QC Batch 109260 - CCV (1) . . . 20
QC Batch 109260 - CCV (2) . . . 20
QC Batch 109324 - CCV (1) . . . 21
QC Batch 109324 - CCV (2) . . . 21
QC Batch 109324 - CCV (3) . . . 21
QC Batch 109325 - CCV (1) . . . 22
QC Batch 109325 - CCV (2) . . . 22
QC Batch 109325 - CCV (3) . . . 22
QC Batch 109346 - CCV (1) . . . 22
QC Batch 109346 - CCV (2) . . . 23
QC Batch 109346 - CCV (3) . . . 23
QC Batch 109347 - CCV (1) . . . 23
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# Case Narrative

Samples for project Alamo/Cowtown Unit #202 were received by TraceAnalysis, Inc. on 2014-02-07 and assigned to work order 14021002. Samples for work order 14021002 were received intact at a temperature of 2.3 C.

Samples were analyzed for the following tests using their respective methods.

| Test | Method | Prep Batch | Prep Date | QC Batch | Analysis Date |
|---|---|---|---|---|---|
| BTEX | S 8021B | 92348 | 2014-02-12 at 12:30 | 109324 | 2014-02-15 at 10:21 |
| BTEX | S 8021B | 92440 | 2014-02-14 at 12:23 | 109346 | 2014-02-16 at 14:19 |
| Chloride (Titration) | SM 4500-Cl B | 92355 | 2014-02-12 at 14:36 | 109260 | 2014-02-13 at 15:09 |
| TPH DRO - NEW | S 8015 D | 92334 | 2014-02-11 at 18:00 | 109182 | 2014-02-12 at 09:15 |
| TPH GRO | S 8015 D | 92348 | 2014-02-12 at 12:30 | 109325 | 2014-02-15 at 10:24 |
| TPH GRO | S 8015 D | 92440 | 2014-02-14 at 12:23 | 109347 | 2014-02-16 at 16:30 |

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 14021002 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

# Analytical Report

**Sample: 354211 - AH-1 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | BTEX | Analytical Method: | S 8021B | Prep Method: | S 5035 |
| QC Batch: | 109324 | Date Analyzed: | 2014-02-15 | Analyzed By: | AK |
| Prep Batch: | 92348 | Sample Preparation: | 2014-02-12 | Prepared By: | AK |

| Parameter | Flag | Cert | Result | RL Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Benzene | | 1 | **0.622** | mg/Kg | 10 | 0.0200 |
| Toluene | | 1 | **21.5** | mg/Kg | 10 | 0.0200 |
| Ethylbenzene | | 1 | **44.1** | mg/Kg | 10 | 0.0200 |
| Xylene | | 1 | **84.0** | mg/Kg | 10 | 0.0200 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.46 | mg/Kg | 10 | 2.00 | 73 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | Qsr | Qsr | 21.4 | mg/Kg | 10 | 2.00 | 1070 | 70 - 130 |

**Sample: 354211 - AH-1 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 109260 | Date Analyzed: | 2014-02-13 | Analyzed By: | AR |
| Prep Batch: | 92355 | Sample Preparation: | 2014-02-12 | Prepared By: | AR |

| Parameter | Flag | Cert | Result | RL Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **2890** | mg/Kg | 10 | 4.00 |

**Sample: 354211 - AH-1 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH DRO - NEW | Analytical Method: | S 8015 D | Prep Method: | N/A |
| QC Batch: | 109182 | Date Analyzed: | 2014-02-12 | Analyzed By: | RG |
| Prep Batch: | 92334 | Sample Preparation: | 2014-02-11 | Prepared By: | RG |

| Parameter | Flag | Cert | Result | RL Units | Dilution | RL |
|---|---|---|---|---|---|---|
| DRO | | 1 | **8200** | mg/Kg | 5 | 50.0 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | Qsr | Qsr | 246 | mg/Kg | 5 | 100 | 246 | 70 - 130 |

**Sample: 354211 - AH-1 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH GRO | Analytical Method: | S 8015 D | Prep Method: | S 5035 |
| QC Batch: | 109325 | Date Analyzed: | 2014-02-15 | Analyzed By: | AK |
| Prep Batch: | 92348 | Sample Preparation: | 2014-02-12 | Prepared By: | AK |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| GRO | Je | 1 | **2120** | mg/Kg | 10 | 4.00 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.41 | mg/Kg | 10 | 2.00 | 70 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | Qsr | Qsr | 52.4 | mg/Kg | 10 | 2.00 | 2620 | 70 - 130 |

**Sample: 354212 - AH-2 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | BTEX | Analytical Method: | S 8021B | Prep Method: | S 5035 |
| QC Batch: | 109324 | Date Analyzed: | 2014-02-15 | Analyzed By: | AK |
| Prep Batch: | 92348 | Sample Preparation: | 2014-02-12 | Prepared By: | AK |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Benzene [1] | U | 1 | <0.400 | mg/Kg | 20 | 0.0200 |
| Toluene | | 1 | **11.6** | mg/Kg | 20 | 0.0200 |
| Ethylbenzene | | 1 | **28.2** | mg/Kg | 20 | 0.0200 |
| Xylene | | 1 | **65.5** | mg/Kg | 20 | 0.0200 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.53 | mg/Kg | 20 | 2.00 | 76 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | Qsr | Qsr | 20.8 | mg/Kg | 20 | 2.00 | 1040 | 70 - 130 |

**Sample: 354212 - AH-2 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 109260 | Date Analyzed: | 2014-02-13 | Analyzed By: | AR |
| Prep Batch: | 92355 | Sample Preparation: | 2014-02-12 | Prepared By: | AR |

| Parameter | Flag | Cert | Result | RL Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **6350** | mg/Kg | 10 | 4.00 |

**Sample: 354212 - AH-2 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH DRO - NEW | Analytical Method: | S 8015 D | Prep Method: | N/A |
| QC Batch: | 109182 | Date Analyzed: | 2014-02-12 | Analyzed By: | RG |
| Prep Batch: | 92334 | Sample Preparation: | 2014-02-11 | Prepared By: | RG |

| Parameter | Flag | Cert | Result | RL Units | Dilution | RL |
|---|---|---|---|---|---|---|
| DRO | | 1 | **16100** | mg/Kg | 5 | 50.0 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | Qsr | Qsr | 536 | mg/Kg | 5 | 100 | 536 | 70 - 130 |

**Sample: 354212 - AH-2 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH GRO | Analytical Method: | S 8015 D | Prep Method: | S 5035 |
| QC Batch: | 109325 | Date Analyzed: | 2014-02-15 | Analyzed By: | AK |
| Prep Batch: | 92348 | Sample Preparation: | 2014-02-12 | Prepared By: | AK |

| Parameter | Flag | Cert | Result | RL Units | Dilution | RL |
|---|---|---|---|---|---|---|
| GRO | | 1 | **1680** | mg/Kg | 20 | 4.00 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.63 | mg/Kg | 20 | 2.00 | 82 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | Qsr | Qsr | 58.4 | mg/Kg | 20 | 2.00 | 2920 | 70 - 130 |

**Sample: 354213 - AH-3 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | BTEX | Analytical Method: | S 8021B | Prep Method: | S 5035 |
| QC Batch: | 109346 | Date Analyzed: | 2014-02-16 | Analyzed By: | AK |
| Prep Batch: | 92440 | Sample Preparation: | 2014-02-14 | Prepared By: | AK |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Benzene [2] | Qs | 1 | <0.200 | mg/Kg | 10 | 0.0200 |
| Toluene | | 1 | **1.30** | mg/Kg | 10 | 0.0200 |
| Ethylbenzene | | 1 | **4.29** | mg/Kg | 10 | 0.0200 |
| Xylene | Qr,Qs | 1 | **16.5** | mg/Kg | 10 | 0.0200 |

| Surrogate | | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | Qsr | Qsr | | 1.15 | mg/Kg | 10 | 2.00 | 58 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | Qsr | Qsr | | 9.48 | mg/Kg | 10 | 2.00 | 474 | 70 - 130 |

**Sample: 354213 - AH-3 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 109260 | Date Analyzed: | 2014-02-13 | Analyzed By: | AR |
| Prep Batch: | 92355 | Sample Preparation: | 2014-02-12 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **5150** | mg/Kg | 10 | 4.00 |

**Sample: 354213 - AH-3 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH DRO - NEW | Analytical Method: | S 8015 D | Prep Method: | N/A |
| QC Batch: | 109182 | Date Analyzed: | 2014-02-12 | Analyzed By: | RG |
| Prep Batch: | 92334 | Sample Preparation: | 2014-02-11 | Prepared By: | RG |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| DRO | | 1 | **8400** | mg/Kg | 5 | 50.0 |

| Surrogate | | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|---|
| n-Tricosane | Qsr | Qsr | | 331 | mg/Kg | 5 | 100 | 331 | 70 - 130 |

**Sample: 354213 - AH-3 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH GRO | Analytical Method: | S 8015 D | Prep Method: | S 5035 |
| QC Batch: | 109347 | Date Analyzed: | 2014-02-16 | Analyzed By: | AK |
| Prep Batch: | 92440 | Sample Preparation: | 2014-02-14 | Prepared By: | AK |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| GRO | Qs | 1 | **874** | mg/Kg | 10 | 4.00 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.54 | mg/Kg | 10 | 2.00 | 77 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | Qsr | Qsr | 21.7 | mg/Kg | 10 | 2.00 | 1085 | 70 - 130 |

# Method Blanks

**Method Blank (1)** QC Batch: 109182

| | | | | | |
|---|---|---|---|---|---|
| QC Batch: | 109182 | Date Analyzed: | 2014-02-12 | Analyzed By: | RG |
| Prep Batch: | 92334 | QC Preparation: | 2014-02-11 | Prepared By: | RG |

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| DRO | | 1 | 9.16 | mg/Kg | 50 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | | | 96.7 | mg/Kg | 1 | 100 | 97 | 70 - 130 |

**Method Blank (1)** QC Batch: 109260

| | | | | | |
|---|---|---|---|---|---|
| QC Batch: | 109260 | Date Analyzed: | 2014-02-13 | Analyzed By: | AR |
| Prep Batch: | 92355 | QC Preparation: | 2014-02-12 | Prepared By: | AR |

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| Chloride | | | <3.85 | mg/Kg | 4 |

**Method Blank (1)** QC Batch: 109324

| | | | | | |
|---|---|---|---|---|---|
| QC Batch: | 109324 | Date Analyzed: | 2014-02-15 | Analyzed By: | AK |
| Prep Batch: | 92348 | QC Preparation: | 2014-02-12 | Prepared By: | AK |

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| Benzene | | 1 | <0.00533 | mg/Kg | 0.02 |
| Toluene | | 1 | <0.00645 | mg/Kg | 0.02 |
| Ethylbenzene | | 1 | <0.0116 | mg/Kg | 0.02 |
| Xylene | | 1 | <0.00874 | mg/Kg | 0.02 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.60 | mg/Kg | 1 | 2.00 | 80 | 70 - 130 |

*continued ...*

*method blank continued ...*

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene (4-BFB) | | | 1.73 | mg/Kg | 1 | 2.00 | 86 | 70 - 130 |

**Method Blank (1)** QC Batch: 109325

| | | | | | |
|---|---|---|---|---|---|
| QC Batch: | 109325 | Date Analyzed: | 2014-02-15 | Analyzed By: | AK |
| Prep Batch: | 92348 | QC Preparation: | 2014-02-12 | Prepared By: | AK |

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| GRO | | 1 | <2.32 | mg/Kg | 4 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.74 | mg/Kg | 1 | 2.00 | 87 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | | | 1.66 | mg/Kg | 1 | 2.00 | 83 | 70 - 130 |

**Method Blank (1)** QC Batch: 109346

| | | | | | |
|---|---|---|---|---|---|
| QC Batch: | 109346 | Date Analyzed: | 2014-02-16 | Analyzed By: | AK |
| Prep Batch: | 92440 | QC Preparation: | 2014-02-14 | Prepared By: | AK |

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| Benzene | | 1 | <0.00533 | mg/Kg | 0.02 |
| Toluene | | 1 | <0.00645 | mg/Kg | 0.02 |
| Ethylbenzene | | 1 | <0.0116 | mg/Kg | 0.02 |
| Xylene | | 1 | <0.00874 | mg/Kg | 0.02 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.57 | mg/Kg | 1 | 2.00 | 78 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | | | 1.51 | mg/Kg | 1 | 2.00 | 76 | 70 - 130 |

**Method Blank (1)** QC Batch: 109347

| | | | | | |
|---|---|---|---|---|---|
| QC Batch: | 109347 | Date Analyzed: | 2014-02-16 | Analyzed By: | AK |
| Prep Batch: | 92440 | QC Preparation: | 2014-02-14 | Prepared By: | AK |

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| GRO | | 1 | <2.32 | mg/Kg | 4 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.66 | mg/Kg | 1 | 2.00 | 83 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | | | 1.49 | mg/Kg | 1 | 2.00 | 74 | 70 - 130 |

# Laboratory Control Spikes

**Laboratory Control Spike (LCS-1)**

QC Batch: 109182 | Date Analyzed: 2014-02-12 | Analyzed By: RG
Prep Batch: 92334 | QC Preparation: 2014-02-11 | Prepared By: RG

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| DRO | | [1] | 237 | mg/Kg | 1 | 250 | 9.16 | 91 | 70 - 130 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DRO | | [1] | 236 | mg/Kg | 1 | 250 | 9.16 | 91 | 70 - 130 | 0 | 20 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Surrogate | LCS Result | LCSD Result | Units | Dil. | Spike Amount | LCS Rec. | LCSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | 91.4 | 91.2 | mg/Kg | 1 | 100 | 91 | 91 | 70 - 130 |

**Laboratory Control Spike (LCS-1)**

QC Batch: 109260 | Date Analyzed: 2014-02-13 | Analyzed By: AR
Prep Batch: 92355 | QC Preparation: 2014-02-12 | Prepared By: AR

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2400 | mg/Kg | 1 | 2500 | <3.85 | 96 | 89.7 - 115.9 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2490 | mg/Kg | 1 | 2500 | <3.85 | 100 | 89.7 - 115.9 | 4 | 20 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Laboratory Control Spike (LCS-1)**

QC Batch: 109324 | Date Analyzed: 2014-02-15 | Analyzed By: AK
Prep Batch: 92348 | QC Preparation: 2014-02-12 | Prepared By: AK

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | 1.62 | mg/Kg | 1 | 2.00 | <0.00533 | 81 | 70 - 130 |
| Toluene | | 1 | 1.81 | mg/Kg | 1 | 2.00 | <0.00645 | 90 | 70 - 130 |
| Ethylbenzene | | 1 | 1.92 | mg/Kg | 1 | 2.00 | <0.0116 | 96 | 70 - 130 |
| Xylene | | 1 | 5.84 | mg/Kg | 1 | 6.00 | <0.00874 | 97 | 70 - 130 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | 1.75 | mg/Kg | 1 | 2.00 | <0.00533 | 88 | 70 - 130 | 8 | 20 |
| Toluene | | 1 | 1.87 | mg/Kg | 1 | 2.00 | <0.00645 | 94 | 70 - 130 | 3 | 20 |
| Ethylbenzene | | 1 | 1.98 | mg/Kg | 1 | 2.00 | <0.0116 | 99 | 70 - 130 | 3 | 20 |
| Xylene | | 1 | 6.04 | mg/Kg | 1 | 6.00 | <0.00874 | 101 | 70 - 130 | 3 | 20 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Surrogate | LCS Result | LCSD Result | Units | Dil. | Spike Amount | LCS Rec. | LCSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | 1.63 | 1.71 | mg/Kg | 1 | 2.00 | 82 | 86 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | 1.91 | 1.74 | mg/Kg | 1 | 2.00 | 96 | 87 | 70 - 130 |

**Laboratory Control Spike (LCS-1)**

QC Batch: 109325 | Date Analyzed: 2014-02-15 | Analyzed By: AK
Prep Batch: 92348 | QC Preparation: 2014-02-12 | Prepared By: AK

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| GRO | | 1 | 16.7 | mg/Kg | 1 | 20.0 | <2.32 | 84 | 70 - 130 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GRO | | 1 | 17.1 | mg/Kg | 1 | 20.0 | <2.32 | 86 | 70 - 130 | 2 | 20 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

*continued ...*

*control spikes continued ...*

| Surrogate | LCS Result | LCSD Result | Units | Dil. | Spike Amount | LCS Rec. | LCSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | 1.66 | 1.72 | mg/Kg | 1 | 2.00 | 83 | 86 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | 1.98 | 2.06 | mg/Kg | 1 | 2.00 | 99 | 103 | 70 - 130 |

**Laboratory Control Spike (LCS-1)**

QC Batch: 109346 | Date Analyzed: 2014-02-16 | Analyzed By: AK
Prep Batch: 92440 | QC Preparation: 2014-02-14 | Prepared By: AK

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | 1.40 | mg/Kg | 1 | 2.00 | <0.00533 | 70 | 70 - 130 |
| Toluene | | 1 | 1.44 | mg/Kg | 1 | 2.00 | <0.00645 | 72 | 70 - 130 |
| Ethylbenzene | | 1 | 1.52 | mg/Kg | 1 | 2.00 | <0.0116 | 76 | 70 - 130 |
| Xylene | | 1 | 4.67 | mg/Kg | 1 | 6.00 | <0.00874 | 78 | 70 - 130 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | 1.46 | mg/Kg | 1 | 2.00 | <0.00533 | 73 | 70 - 130 | 4 | 20 |
| Toluene | | 1 | 1.62 | mg/Kg | 1 | 2.00 | <0.00645 | 81 | 70 - 130 | 12 | 20 |
| Ethylbenzene | | 1 | 1.70 | mg/Kg | 1 | 2.00 | <0.0116 | 85 | 70 - 130 | 11 | 20 |
| Xylene | | 1 | 5.17 | mg/Kg | 1 | 6.00 | <0.00874 | 86 | 70 - 130 | 10 | 20 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Surrogate | | | LCS Result | LCSD Result | Units | Dil. | Spike Amount | LCS Rec. | LCSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.46 | 1.50 | mg/Kg | 1 | 2.00 | 73 | 75 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | Qsr | Qsr | 1.39 | 1.46 | mg/Kg | 1 | 2.00 | 70 | 73 | 70 - 130 |

**Laboratory Control Spike (LCS-1)**

QC Batch: 109347 | Date Analyzed: 2014-02-16 | Analyzed By: AK
Prep Batch: 92440 | QC Preparation: 2014-02-14 | Prepared By: AK

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| GRO | | 1 | 18.4 | mg/Kg | 1 | 20.0 | <2.32 | 92 | 70 - 130 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GRO | | 1 | 18.4 | mg/Kg | 1 | 20.0 | <2.32 | 92 | 70 - 130 | 0 | 20 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Surrogate | LCS Result | LCSD Result | Units | Dil. | Spike Amount | LCS Rec. | LCSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | 1.80 | 1.72 | mg/Kg | 1 | 2.00 | 90 | 86 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | 1.74 | 1.73 | mg/Kg | 1 | 2.00 | 87 | 86 | 70 - 130 |

**Matrix Spike (MS-1)** Spiked Sample: 354106

QC Batch: 109182 | Date Analyzed: 2014-02-12 | Analyzed By: RG
Prep Batch: 92334 | QC Preparation: 2014-02-11 | Prepared By: RG

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | 285 | mg/Kg | 1 | 250 | 35.8 | 100 | 70 - 130 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | 300 | mg/Kg | 1 | 250 | 35.8 | 106 | 70 - 130 | 5 | 20 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Surrogate | MS Result | MSD Result | Units | Dil. | Spike Amount | MS Rec. | MSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | 94.3 | 95.4 | mg/Kg | 1 | 100 | 94 | 95 | 70 - 130 |

**Matrix Spike (MS-1)** Spiked Sample: 354213

QC Batch: 109260 | Date Analyzed: 2014-02-13 | Analyzed By: AR
Prep Batch: 92355 | QC Preparation: 2014-02-12 | Prepared By: AR

*continued ...*

*matrix spikes continued ...*

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
| Chloride | | | 7450 | mg/Kg | 10 | 2500 | 5150 | 92 | 78.9 - 121 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 7190 | mg/Kg | 10 | 2500 | 5150 | 82 | 78.9 - 121 | 4 | 20 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Matrix Spike (MS-1)** Spiked Sample: 354102

QC Batch: 109324 | Date Analyzed: 2014-02-15 | Analyzed By: AK
Prep Batch: 92348 | QC Preparation: 2014-02-12 | Prepared By: AK

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | 1.58 | mg/Kg | 1 | 2.00 | <0.00533 | 79 | 70 - 130 |
| Toluene | | 1 | 1.72 | mg/Kg | 1 | 2.00 | <0.00645 | 86 | 70 - 130 |
| Ethylbenzene | | 1 | 1.90 | mg/Kg | 1 | 2.00 | <0.0116 | 95 | 70 - 130 |
| Xylene | | 1 | 5.81 | mg/Kg | 1 | 6.00 | <0.00874 | 97 | 70 - 130 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | 1.49 | mg/Kg | 1 | 2.00 | <0.00533 | 74 | 70 - 130 | 6 | 20 |
| Toluene | | 1 | 1.66 | mg/Kg | 1 | 2.00 | <0.00645 | 83 | 70 - 130 | 4 | 20 |
| Ethylbenzene | | 1 | 1.82 | mg/Kg | 1 | 2.00 | <0.0116 | 91 | 70 - 130 | 4 | 20 |
| Xylene | | 1 | 5.57 | mg/Kg | 1 | 6.00 | <0.00874 | 93 | 70 - 130 | 4 | 20 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Surrogate | MS Result | MSD Result | Units | Dil. | Spike Amount | MS Rec. | MSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | 1.60 | 1.51 | mg/Kg | 1 | 2 | 80 | 76 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | 1.90 | 1.84 | mg/Kg | 1 | 2 | 95 | 92 | 70 - 130 |

**Matrix Spike (MS-1)** Spiked Sample: 354102

QC Batch: 109325 | Date Analyzed: 2014-02-15 | Analyzed By: AK
Prep Batch: 92348 | QC Preparation: 2014-02-12 | Prepared By: AK

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| GRO | | [1] | 19.0 | mg/Kg | 1 | 20.0 | <2.32 | 95 | 70 - 130 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GRO | | [1] | 18.3 | mg/Kg | 1 | 20.0 | <2.32 | 92 | 70 - 130 | 4 | 20 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Surrogate | MS Result | MSD Result | Units | Dil. | Spike Amount | MS Rec. | MSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | 1.50 | 1.70 | mg/Kg | 1 | 2 | 75 | 85 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | 1.89 | 2.02 | mg/Kg | 1 | 2 | 94 | 101 | 70 - 130 |

**Matrix Spike (MS-1)** Spiked Sample: 354239

QC Batch: 109346 | Date Analyzed: 2014-02-16 | Analyzed By: AK
Prep Batch: 92440 | QC Preparation: 2014-02-14 | Prepared By: AK

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Benzene | [3] [Qs] | [Qs] | [1] | 1.39 | mg/Kg | 10 | 2.00 | <0.0533 | 70 | 70 - 130 |
| Toluene | | | [1] | 1.52 | mg/Kg | 10 | 2.00 | <0.0645 | 76 | 70 - 130 |
| Ethylbenzene | | | [1] | 1.60 | mg/Kg | 10 | 2.00 | <0.116 | 80 | 70 - 130 |
| Xylene | | | [1] | 4.74 | mg/Kg | 10 | 6.00 | <0.0874 | 79 | 70 - 130 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | | [1] | 1.46 | mg/Kg | 10 | 2.00 | <0.0533 | 73 | 70 - 130 | 5 | 20 |
| Toluene | | [1] | 1.59 | mg/Kg | 10 | 2.00 | <0.0645 | 80 | 70 - 130 | 4 | 20 |
| Ethylbenzene | | [1] | 1.55 | mg/Kg | 10 | 2.00 | <0.116 | 78 | 70 - 130 | 3 | 20 |
| Xylene | [Qr,Qs] | [Qr,Qs] | [1] | 3.35 | mg/Kg | 10 | 6.00 | <0.0874 | 56 | 70 - 130 | 34 | 20 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

*continued ...*

*matrix spikes continued ...*

| Surrogate | MS Result | MSD Result | Units | Dil. | Spike Amount | MS Rec. | MSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| Surrogate | MS Result | MSD Result | Units | Dil. | Spike Amount | MS Rec. | MSD Rec. | Rec. Limit |
| Trifluorotoluene (TFT) Qsr Qsr | 1.33 | 1.41 | mg/Kg | 10 | 2 | 66 | 70 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | 1.73 | 1.66 | mg/Kg | 10 | 2 | 86 | 83 | 70 - 130 |

**Matrix Spike (MS-1)** Spiked Sample: 354239

QC Batch: 109347 | Date Analyzed: 2014-02-16 | Analyzed By: AK
Prep Batch: 92440 | QC Preparation: 2014-02-14 | Prepared By: AK

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| GRO [4] Qs | Qs | 1 | <23.2 | mg/Kg | 10 | 20.0 | <23.2 | 0 | 70 - 130 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GRO [5] Qs | Qs | 1 | <23.2 | mg/Kg | 10 | 20.0 | <23.2 | 0 | 70 - 130 | 0 | 20 |

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

| Surrogate | MS Result | MSD Result | Units | Dil. | Spike Amount | MS Rec. | MSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | 1.60 | 1.59 | mg/Kg | 10 | 2 | 80 | 80 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | 1.84 | 1.87 | mg/Kg | 10 | 2 | 92 | 94 | 70 - 130 |

# Calibration Standards

**Standard (CCV-1)**

QC Batch: 109182 | Date Analyzed: 2014-02-12 | Analyzed By: RG

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | mg/Kg | 250 | 262 | 105 | 80 - 120 | 2014-02-12 |

**Standard (CCV-2)**

QC Batch: 109182 | Date Analyzed: 2014-02-12 | Analyzed By: RG

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | mg/Kg | 250 | 254 | 102 | 80 - 120 | 2014-02-12 |

**Standard (CCV-3)**

QC Batch: 109182 | Date Analyzed: 2014-02-12 | Analyzed By: RG

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | mg/Kg | 250 | 250 | 100 | 80 - 120 | 2014-02-12 |

**Standard (CCV-1)**

QC Batch: 109260 | Date Analyzed: 2014-02-13 | Analyzed By: AR

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Chloride | | | mg/Kg | 100 | 99.4 | 99 | 85 - 115 | 2014-02-13 |

**Standard (CCV-2)**

QC Batch: 109260 | Date Analyzed: 2014-02-13 | Analyzed By: AR

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Chloride | | | mg/Kg | 100 | 101 | 101 | 85 - 115 | 2014-02-13 |

**Standard (CCV-1)**

QC Batch: 109324 | Date Analyzed: 2014-02-15 | Analyzed By: AK

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | mg/kg | 0.100 | 0.0949 | 95 | 80 - 120 | 2014-02-15 |
| Toluene | | 1 | mg/kg | 0.100 | 0.0995 | 100 | 80 - 120 | 2014-02-15 |
| Ethylbenzene | | 1 | mg/kg | 0.100 | 0.0996 | 100 | 80 - 120 | 2014-02-15 |
| Xylene | | 1 | mg/kg | 0.300 | 0.302 | 101 | 80 - 120 | 2014-02-15 |

**Standard (CCV-2)**

QC Batch: 109324 | Date Analyzed: 2014-02-15 | Analyzed By: AK

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | mg/kg | 0.100 | 0.0892 | 89 | 80 - 120 | 2014-02-15 |
| Toluene | | 1 | mg/kg | 0.100 | 0.0945 | 94 | 80 - 120 | 2014-02-15 |
| Ethylbenzene | | 1 | mg/kg | 0.100 | 0.0944 | 94 | 80 - 120 | 2014-02-15 |
| Xylene | | 1 | mg/kg | 0.300 | 0.286 | 95 | 80 - 120 | 2014-02-15 |

**Standard (CCV-3)**

QC Batch: 109324 | Date Analyzed: 2014-02-15 | Analyzed By: AK

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | mg/kg | 0.100 | 0.0887 | 89 | 80 - 120 | 2014-02-15 |

*continued ...*

*standard continued ...*

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Toluene | | 1 | mg/kg | 0.100 | 0.0954 | 95 | 80 - 120 | 2014-02-15 |
| Ethylbenzene | | 1 | mg/kg | 0.100 | 0.0958 | 96 | 80 - 120 | 2014-02-15 |
| Xylene | | 1 | mg/kg | 0.300 | 0.290 | 97 | 80 - 120 | 2014-02-15 |

**Standard (CCV-1)**

QC Batch: 109325 Date Analyzed: 2014-02-15 Analyzed By: AK

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| GRO | | 1 | mg/Kg | 1.00 | 0.924 | 92 | 80 - 120 | 2014-02-15 |

**Standard (CCV-2)**

QC Batch: 109325 Date Analyzed: 2014-02-15 Analyzed By: AK

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| GRO | | 1 | mg/Kg | 1.00 | 0.834 | 83 | 80 - 120 | 2014-02-15 |

**Standard (CCV-3)**

QC Batch: 109325 Date Analyzed: 2014-02-15 Analyzed By: AK

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| GRO | | 1 | mg/Kg | 1.00 | 0.849 | 85 | 80 - 120 | 2014-02-15 |

**Standard (CCV-1)**

QC Batch: 109346 Date Analyzed: 2014-02-16 Analyzed By: AK

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | mg/kg | 0.100 | 0.0796 | 80 | 80 - 120 | 2014-02-16 |
| Toluene | | 1 | mg/kg | 0.100 | 0.0846 | 85 | 80 - 120 | 2014-02-16 |
| Ethylbenzene | | 1 | mg/kg | 0.100 | 0.0841 | 84 | 80 - 120 | 2014-02-16 |
| Xylene | | 1 | mg/kg | 0.300 | 0.258 | 86 | 80 - 120 | 2014-02-16 |

**Standard (CCV-2)**

QC Batch: 109346 Date Analyzed: 2014-02-16 Analyzed By: AK

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | mg/kg | 0.100 | 0.0796 | 80 | 80 - 120 | 2014-02-16 |
| Toluene | | 1 | mg/kg | 0.00 | 0.0850 | 85 | 80 - 120 | 2014-02-16 |
| Ethylbenzene | | 1 | mg/kg | 0.00 | 0.0840 | 84 | 80 - 120 | 2014-02-16 |
| Xylene | | 1 | mg/kg | 0.00 | 0.256 | 85 | 80 - 120 | 2014-02-16 |

**Standard (CCV-3)**

QC Batch: 109346 Date Analyzed: 2014-02-16 Analyzed By: AK

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | mg/kg | 0.100 | 0.0926 | 93 | 80 - 120 | 2014-02-16 |
| Toluene | | 1 | mg/kg | 0.100 | 0.0962 | 96 | 80 - 120 | 2014-02-16 |
| Ethylbenzene | | 1 | mg/kg | 0.100 | 0.0943 | 94 | 80 - 120 | 2014-02-16 |
| Xylene | | 1 | mg/kg | 0.300 | 0.287 | 96 | 80 - 120 | 2014-02-16 |

**Standard (CCV-1)**

QC Batch: 109347 Date Analyzed: 2014-02-16 Analyzed By: AK

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| GRO | | 1 | mg/Kg | 1.00 | 0.935 | 94 | 80 - 120 | 2014-02-16 |

**Standard (CCV-2)**

QC Batch: 109347 Date Analyzed: 2014-02-16 Analyzed By: AK

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| GRO | | 1 | mg/Kg | 1.00 | 0.897 | 90 | 80 - 120 | 2014-02-16 |

**Standard (CCV-3)**

QC Batch: 109347 Date Analyzed: 2014-02-16 Analyzed By: AK

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| GRO | | 1 | mg/Kg | 1.00 | 0.840 | 84 | 80 - 120 | 2014-02-16 |

# Appendix

## Report Definitions

| Name | Definition |
|---|---|
| MDL | Method Detection Limit |
| MQL | Minimum Quantitation Limit |
| SDL | Sample Detection Limit |

## Laboratory Certifications

| C | Certifying Authority | Certification Number | Laboratory Location |
|---|---|---|---|
| - | NCTRCA | WFWB384444Y0909 | TraceAnalysis |
| - | DBE | VN 20657 | TraceAnalysis |
| - | HUB | 1752439743100-86536 | TraceAnalysis |
| - | WBE | 237019 | TraceAnalysis |
| 1 | NELAP | T104704392-13-7 | Midland |

## Standard Flags

| F | Description |
|---|---|
| B | Analyte detected in the corresponding method blank above the method detection limit |
| H | Analyzed out of hold time |
| J | Estimated concentration |
| Jb | The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL. |
| Je | Estimated concentration exceeding calibration range. |
| MI1 | Split peak or shoulder peak |
| MI2 | Instrument software did not integrate |
| MI3 | Instrument software misidentified the peak |
| MI4 | Instrument software integrated improperly |
| MI5 | Baseline correction |
| Qc | Calibration check outside of laboratory limits. |
| Qr | RPD outside of laboratory limits |
| Qs | Spike recovery outside of laboratory limits. |
| Qsr | Surrogate recovery outside of laboratory limits. |
| U | The analyte is not detected above the SDL |

## Result Comments

1 Dilution due to hydrocarbons.
2 Dilution due to hydrocarbons.
3 Dilution due to surfactants.
4 Dilution due to surfactants.
5 Dilution due to surfactants.

## Attachments

The scanned attachments will follow this page.
Please note, each attachment may consist of more than one page.

14021002

# Analysis Request of Chain of Custody Record

PAGE: 1 OF: 1


**TETRA TECH**
1910 N. Big Spring St.
Midland, Texas 79705
(432) 682-4559 • Fax (432) 682-3946


ANALYSIS REQUEST
*(Circle or Specify Method No.)*

| CLIENT NAME: | SITE MANAGER: |
|---|---|
| ALAMO | Tom Elliott |

| PROJECT NO.: | PROJECT NAME: |
|---|---|
| 112mc05874 | Allro - Cowden Unit #202 |

| LAB I.D. NUMBER | DATE 2014 | TIME | MATRIX | COMP. | GRAB | SAMPLE IDENTIFICATION | NUMBER OF CONTAINERS | FILTERED (Y/N) | PRESERVATIVE METHOD: HCL | HNO3 | ICE | NONE | BTEX 8021B | TPH 8015 MOD. TX1005 (Ext. to C35) | PAH 8270 | RCRA Metals Ag As Ba Cd Cr Pb Hg Se | TCLP Metals Ag As Ba Cd Vr Pd Hg Se | TCLP Volatiles | TCLP Semi Volatiles | RCI | GC.MS Vol. 8240/8260/624 | GC.MS Semi. Vol. 8270/625 | PCB's 8080/608 | Pest. 808/608 | Chloride | Gamma Spec. | Alpha Beta (Air) | PLM (Asbestos) | Major Anions/Cations, pH, TDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 354211 | 4/5 | | S | | X | AH-1 0-1 | 1 | | | | X | | X | X | | | | | | | | | | | X | | | | |
| 212 | | | ↓ | | ↓ | AH-2 0-1 | 1 | | | | X | | X | X | | | | | | | | | | | X | | | | |
| 213 | | | ↓ | | ↓ | AH-3 0-1 | 1 | | | | X | | X | X | | | | | | | | | | | X | | | | |

| | | | |
|---|---|---|---|
| RELINQUISHED BY: (Signature) | Date: 2-7-14 Time: 1120 | RECEIVED BY: (Signature) | Date: 2/7/14 Time: 1120 |
| RELINQUISHED BY: (Signature) | Date: Time: | RECEIVED BY: (Signature) | Date: Time: |
| RELINQUISHED BY: (Signature) | Date: Time: | RECEIVED BY: (Signature) | Date: Time: |

SAMPLED BY: (Print & Initial) MK PAG — Date: Time:

SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS — AIRBILL #: OTHER:

RECEIVING LABORATORY: TRACE
ADDRESS:
CITY: MIDLAND STATE: TX ZIP:
CONTACT: PHONE: DATE: TIME:
RECEIVED BY: (Signature)

TETRA TECH CONTACT PERSON: Tom Elliott

Results by:

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 2.3°

REMARKS: Midland - all

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.