AP - 37

# STAGE 2 REPORT

Date 10-2-12

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ENVIRONMENTAL CONSULTING
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Toll Free: 866.742.0742
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# MOBILE DUAL PHASE EXTRACTION REPORT
# LOVINGTON DEEP 6 PIPELINE RELEASE
# LEA COUNTY, NEW MEXICO
# SRS # 2002-10312
# NMOCD# AP-037

**PREPARED FOR:**

**PLAINS MARKETING, L.P.**
**333 CLAY STREET**
**SUITE 1600**
**HOUSTON, TEXAS 77002**

RECEIVED OCD
2012 NOV 15 P 1:52

**PREPARED BY:**

**TALON/LPE**
**921 N. BIVINS**
**AMARILLO, TEXAS 79107**

**DISTRIBUTION:**

COPY 1 - PLAINS MARKETING, L.P. – DENVER CITY
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STATE OF TEXAS
PAUL A. SANTOS
95526
LICENSED
PROFESSIONAL ENGINEER
10/2/12
TALON/LPE
F-6802

OCTOBER 2, 2012

# TABLE OF CONTENTS

Section Page



**Attachments:**

# I. MDPE SUMMARY REPORT AND WASTE DISPOSITION

## A. MDPE Results

The following report summarizes data collected during the 12-hour High Vacuum Multi-Phase Extraction (MDPE) event conducted from August 2 to August 3, 2012 at the Lovington Deep 6 Pipeline release site, located in Lea County, New Mexico. The objective of the MDPE treatment was to remove both vapor and liquid phase separated hydrocarbons (PSH) from onsite groundwater wells. Talon/LPE utilized an MDPE unit which consisted of an SVE extraction pump capable of generating vacuum up to 25" hg. Off gas vapors extracted from the extraction wells were destroyed using a propane-fired 1000-SCFM thermal oxidizer capable of processing 172.96 lbs/hr of gasoline.

A total of 12 hours (0.5 days) of PSH recovery was performed. MW2 & MW17 for 12 hours.

Prior to and immediately following the event, the groundwater wells were gauged for groundwater elevation and PSH. Depth to groundwater ranges were measured in feet below the top of casing. Refer to Attachment 1 for a summary of data collected during the MDPE event.

The volume of PSH removed during the MDPE event is shown to reflect the portions of PSH in the liquid phase and as off-gas vapor. Air removal rates were calculated from velocity measurements recorded at the influent manifold prior to entry into the MDPE unit. PSH recovery and air flow data has been detailed and is contained in Table 1. Two influent air samples were collected over the course of the event. These samples were submitted for laboratory testing in order to compare the predicted vapor concentrations (based on field-screening or calculated based on fuel consumption) to the actual vapor concentrations. Both influent samples were tested for Total-Gas Analysis (Hydrocarbon Composition) by ASTM method D 1945. Laboratory analytical results can be found in Attachment 2.

Based on a combination of field vapor screening and collected laboratory samples, a combined estimated total of **182.91 equivalent gallons of hydrocarbons (Total)** were removed during the event. The combined volume of hydrocarbons were comprised of approximately **137 gallons of PSH (liquid phase)** and approximately **45.91 gallons as off-gas vapor**. The calculations used to estimate the off-gas vapor mass recovered reflect the mass of total hydrocarbons recovered and does not necessarily equate to an equal mass of the product released. The mass recovery calculations may be affected by variations in the type of product released, age of release, activity of aerobic and/or anaerobic processes, and site specific geochemical factors.

The cumulative air flow measurements for the MDPE event were calculated using a combination of field data measurements and Preso® B+ manufacturer provided formulas. **Air flow rates extracted from the recovery wells averaged 189.68 SCFM** during the event.

A portion of the extracted air flow rates measured is attributable to compressed air, which was "injected" into the extraction wells. This "injected" air is introduced into the extraction wells for the purpose of enhancing liquid recovery rates.

**B. Air Quality**

Two influent air samples were collected during the event. These samples were submitted for laboratory testing in order to compare the predicted vapor concentrations (based on field-screening or calculated based on fuel consumption) to the actual vapor concentrations. The maximum concentration in air influent was recorded as 19,777 ppmv for Hydrocarbon Composition. Laboratory analytical results can be found in Attachment 2.

**C. Waste Management and Disposition**

A cumulative total of 1,134 gallons of fluid were generated during this event. The fluids were temporarily transferred to an on-site storage tank prior to being transferred to an authorized disposal facility. A copy of the waste ticket can be found in Attachment 4.

## II. SYSTEM OPERATION DATA AND MASS RECOVERY CALCULATIONS

**Formulae:**

$$\text{Concentration (C\_mg/l)} = \frac{\text{C\_ppmv x Mol. wt. in mg(estimated) x 1000 x 0.000001}}{\text{0.0821 x Temp (K)}}$$

$$\text{Recovery Rate (lbs/hr)} = \frac{\text{(C\_mg/l) x 2.2 x (Flowrate) x 60 x 28.32}}{\text{1,000,000}}$$

$$\text{Recovery (lbs)} = \text{(lbs/hr) x (hrs)}$$

$$\text{Correction Factor (CF)} = \frac{\text{PID Reading(ppm)}}{\text{PID Reading at Time of Laboratory Analysis}}$$

$$\frac{\text{8.34 lbs}}{\text{gallon water}} \times \text{0.66 average specific gravity of light crude (estimated)} = \frac{\text{5.5 lbs light crude}}{\text{gallon}}$$

# Table 1
## System Operation Data and Mass Recovery Calculations

| Time | Period (hours) | Influent Temp. (°F) | Vacuum (In. hg) | Vacuum (In. h20) | Differential pressure (In. h20) | Flow (SCFM) | PID Readings (ppm) | Lab Result (ppmv) | Assigned Lab Result (ppmv) | Correction Factor (CF) | Adjusted Lab Result (ppmv) | Adjusted Lab Result (mg/L) | Recovery (lbs/hr) | Recovery in Period (lbs) | Total Recovery (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11:45 | 0.5 | 100 | 16 | 217.74 | 74.3 | 200.08 | 700.3 | - | 11892.00 | 0.97 | 11544 | 26.99 | 20.18 | 10.09 | 10.09 |
| 12:15 | 0.5 | 102 | 16 | 217.74 | 75.2 | 200.93 | 721.4 | 11892.00 | 11892.00 | 1.00 | 11892 | 27.70 | 20.81 | 10.40 | 20.50 |
| 13:15 | 1 | 102 | 16 | 217.74 | 69.3 | 192.88 | 580.4 | - | 11892.00 | 0.80 | 9568 | 22.29 | 16.07 | 16.07 | 36.57 |
| 14:15 | 1 | 103 | 16 | 217.74 | 70.2 | 193.96 | 300.2 | - | 11892.00 | 0.42 | 4949 | 11.51 | 8.34 | 8.34 | 44.91 |
| 15:15 | 1 | 103 | 16 | 217.74 | 70.1 | 193.82 | 304.6 | - | 11892.00 | 0.42 | 5021 | 11.68 | 8.46 | 8.46 | 53.37 |
| 16:15 | 1 | 104 | 16 | 217.74 | 50.3 | 164.04 | 283.5 | - | 11892.00 | 0.39 | 4673 | 10.85 | 6.65 | 6.65 | 60.02 |
| 17:15 | 1 | 102 | 16.5 | 224.55 | 69.4 | 189.53 | 300 | - | 11892.00 | 0.42 | 4945 | 11.52 | 8.16 | 8.16 | 68.18 |
| 18:15 | 1 | 96 | 16.5 | 224.55 | 64.1 | 183.13 | 356.7 | - | 19777.00 | 0.58 | 11514 | 33.94 | 23.24 | 23.24 | 91.42 |
| 19:15 | 1 | 93 | 16 | 217.74 | 64.6 | 187.74 | 381.1 | - | 19777.00 | 0.62 | 12301 | 36.46 | 25.59 | 25.59 | 117.01 |
| 20:15 | 1 | 85 | 16 | 217.74 | 65.9 | 191.00 | 400.1 | - | 19777.00 | 0.65 | 12915 | 38.84 | 27.73 | 27.73 | 144.74 |
| 21:15 | 1 | 84 | 16 | 217.74 | 67.9 | 194.06 | 366.9 | - | 19777.00 | 0.60 | 11843 | 35.69 | 25.89 | 25.89 | 170.63 |
| 22:15 | 1 | 82 | 16.5 | 224.55 | 65.1 | 186.92 | 612.7 | 19777.00 | 19777.00 | 1.00 | 19777 | 59.81 | 41.80 | 41.80 | 212.43 |
| 23:15 | 1 | 82 | 16.5 | 224.55 | 65.7 | 187.78 | 585.2 | - | 19777.00 | 0.96 | 18889 | 57.13 | 40.10 | 40.10 | 252.53 |
| Averages: | | 95.23 | 16.15 | 219.84 | 67.08 | 189.68 | 453.32 | | | | | | Total | 252.53 | |

PSH Mass Recovered in Vapor Phase = 45.91 gallons

PID maximum Concentration = 15,000 PPM

**Ex: Conversion from ppmv to mg/L (influent 1)**

| Measured Conc. | Molecular Wt. | Pressure | Gas Constant | Temp. | Temp. | Conc. |
|---|---|---|---|---|---|---|
| (C_ppmv) | (Grams) | (atm) | (atm.liter/K.mole) | (F) | (K) | ( C_mg/l) |
| 11544 | 59.64654726 | 1 | 0.0821 | 100 | 310.7777778 | 26.9870295 |

Inputs are the green values.
Calculated values are yellow.
Constants are purple values.
Outpus are the blue values.

### Total Hydrocarbon Recovery

| | | |
|---|---|---|
| PSH Mass Recovered in Vapor Phase = | 252.53 | lbs |
| | 45.91 | gallons |
| PSH Mass Recovered in Liquid Phase = | 753.50 | lbs |
| | 137.00 | galons |
| TOTAL = | 1006.03 | lbs |
| | 182.91 | gallons |

**Gallons removed determined at time of pick up**

| | |
|---|---|
| PSH Volume in Gallons= | 137 |
| PSH Mass in Pounds= | 753.5 |

**% Total Hydrocarbon to mg/m³ to ppmv - Influent 1**

| Compound | Molecular Weight (g/mol) | % total | = | ppmv |
|---|---|---|---|---|
| Methane (CH4) | 16.04 | 0.3698 | | 3698.00 |
| Ethane (C2H6) | 30.07 | 0.0192 | | 192.00 |
| Propane (C3H8) | 44.10 | 0.0207 | | 207.00 |
| Iso-Butane (C4H10) | 58.12 | 0.007 | | 70.00 |
| N-Butane (C4H10) | 58.12 | 0.0346 | | 346.00 |
| Iso-Pentane (C4H12) | 72.15 | 0.0589 | | 589.00 |
| N-Pentane (C5H12) | 72.15 | 0.1193 | | 1193.00 |
| Hexane+ (C6H14) | 86.18 | 0.5597 | | 5597.00 |
| | | | Total | 11892.00 |

**Molecular Weight Calculations**

| | |
|---|---|
| Total Hydrocarbon %= | 1.1892 |
| g of Methane (CH4) = | 4.987884292 |
| g of Ethane (C2H6) = | 0.485489405 |
| g of Propane (C3H8) = | 0.767633703 |
| g of Iso-Butane (C4H10) = | 0.342112344 |
| g of N-Butane (C4H10) = | 1.691012445 |
| g of Iso-Pentane (C4H12) = | 3.573524218 |
| g of N-Pentane (C5H12) = | 7.238054995 |
| g of Hexane+ (C6H14) = | 40.56083586 |
| **Calculated MW (Grams)** | **59.64654726** |

**% Total Hydrocarbon to mg/m³ to ppmv - Influent 2**

| Compound | Molecular Weight (g/mol) | % total | = | ppmv |
|---|---|---|---|---|
| Methane (CH4) | 16.04 | 0.2329 | | 2329.00 |
| Ethane (C2H6) | 30.07 | 0.0013 | | 13.00 |
| Propane (C3H8) | 44.10 | 0.0018 | | 18.00 |
| Iso-Butane (C4H10) | 58.12 | 0.0199 | | 199.00 |
| N-Butane (C4H10) | 58.12 | 0.0355 | | 355.00 |
| Iso-Pentane (C4H12) | 72.15 | 0.136 | | 1360.00 |
| N-Pentane (C5H12) | 72.15 | 0.1989 | | 1989.00 |
| Hexane+ (C6H14) | 86.18 | 1.3514 | | 13514.00 |
| | | | Total | 19777.00 |

**Molecular Weight Calculations**

| | |
|---|---|
| Total Hydrocarbon %= | 1.9777 |
| g of Methane (CH4) = | 1.888919452 |
| g of Ethane (C2H6) = | 0.01976589 |
| g of Propane (C3H8) = | 0.040137533 |
| g of Iso-Butane (C4H10) = | 0.584814684 |
| g of N-Butane (C4H10) = | 1.043262375 |
| g of Iso-Pentane (C4H12) = | 4.961520959 |
| g of N-Pentane (C5H12) = | 7.256224402 |
| g of Hexane+ (C6H14) = | 58.88843202 |
| **Calculated MW (Grams)** | **74.68307731** |

# ATTACHMENT 1

MDPE Field Logs

| MDPE FIELD NOTES | | | | | | |
|---|---|---|---|---|---|---|
| Site Name: | Lovington Deep 6 | | | | Event #: | 2 |
| Location: | Lea County, NM | | | | Arrive at site: | 8/2/2012 8:30 |
| Date: | 8/2-3/2012 | | | | | |
| Job#: | 700376.051.03 | SRS#: | 2002-10312 | | Start Vac: | 8/2/2012 11:15 |
| Phase: | MDPE2 | Unit: | 1107 | | Stop Vac: | 8/2/2012 23:15 |
| Onsite Personnel: | L. Bridges & B. Huntington | | | | Leave Site: | 8/3/2012 1:00 |

| GAUGING DATA | | | | | | | |
|---|---|---|---|---|---|---|---|
| WELL# | BEFORE | | | AFTER | | | COMMENTS |
| | PSH | GW | PSH-T | PSH | GW | PSH-T | |
| MW2 | 64.28 | 64.50 | 0.22 | - | 65.23 | - | Stinger @ 65' |
| MW13 | 64.29 | 69.90 | 5.61 | Not Gauged | | | Unable to extract - well blocked by pipe |
| MW17 | 64.45 | 65.18 | 0.73 | - | 65.97 | - | Stinger @ 65' |
| MW15 | 64.83 | 64.90 | 0.07 | Not Gauged | | | |
| MW14 | 64.63 | 67.04 | 2.41 | Not Gauged | | | |
| MW1 | - | 64.53 | - | Not Gauged | | | |
| MW16 | 65.13 | 65.52 | 0.39 | Not Gauged | | | |
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| | | | | | | | |
| WASTE: | H2O: | 997 | | PSH: | 137 | | TOTAL (GAL): 1134 |

| Sample Name | Analysis | Date: | Time: | Comments: |
|---|---|---|---|---|
| INFLUENT | ASTM D 1945 | 8/2/2012 | 12:15 | PID = 721.4 ppm |
| INFLUENT | ASTM D 1945 | 8/2/2012 | 22:15 | PID = 612.7 ppm |
| INFLUENT | - | - | - | - |
| EFFLUENT | - | - | - | - |

| Notes: |
|---|
| Hand bailed all wells with PSH. |
| Tank #1 = Total 36 1/4 inches with PSH at 31 7/8 inches = Total 1134 gallons with 137 gallons of PSH |
| |
| |
| |
| |
| |

Start Date: 8/2/2012

MDPE FIELD DATA

| | | Well Flow | | | | | | Well Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | SAMPLE TAKEN * | Inflent temp. (°f) | Diff. Pressure (INH20) 2" Preso | Vac (In.Hg) | PID Composite (PPM) | Propane Tank (%-size) 500 Gal. | EXHAUST TEMP F | COMMENTS: MW17 VAC (INH2O) | MW2 VAC (INH2O) | VAC (INH2O) | VAC (INH2O) | VAC (INH2O) |
| 11:45 | | 100 | 74.3 | 16 | 700.3 | 41 | 1409 | 28.3 | 19.5 | | | |
| 12:15 | * | 102 | 75.2 | 16 | 721.4 | 40 | 1412 | 28.8 | 19.8 | | | |
| 13:15 | | 102 | 69.3 | 16 | 580.4 | 39 | 1410 | 32.7 | 19.2 | | | |
| 14:15 | | 103 | 70.2 | 16 | 300.2 | 38 | 1409 | 33.6 | 19.9 | | | |
| 15:15 | | 103 | 70.1 | 16 | 304.6 | 37 | 1411 | 33.2 | 19.7 | | | |
| 16:15 | | 104 | 50.3 | 16 | 283.5 | 35 | 1407 | 33.5 | 19.8 | | | |
| 17:15 | | 102 | 69.4 | 16.5 | 300 | 34 | 1414 | 33.1 | 20.1 | | | |
| 18:15 | | 96 | 64.1 | 16.5 | 356.7 | 33 | 1409 | 33 | 21.1 | | | |
| 19:15 | | 93 | 64.6 | 16 | 381.1 | 32 | 1408 | 33.2 | 20.5 | | | |
| 20:15 | | 85 | 65.9 | 16 | 400.1 | 31 | 1413 | 35.1 | 20.6 | | | |
| 21:15 | | 84 | 67.9 | 16 | 366.9 | 29 | 1405 | 34.7 | 20.5 | | | |
| 22:15 | * | 82 | 65.1 | 16.5 | 612.7 | 27 | 1406 | 34 | 21.4 | | | |
| 23:15 | | 82 | 65.7 | 16.5 | 585.2 | 26 | 1407 | 34.7 | 21.5 | | | |

Soil Vacuum Influence

| Observation Well | MW14 |
|---|---|
| Extraction Well (EW) | MW2 |
| Time: | In.H2O |
| 12:15 | 1 |
| 22:15 | 0.6 |

# ATTACHMENT 2

Laboratory Analytical Results

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

Simon Walshe
Talon LPE-Amarillo
921 North Bivins
Amarillo, TX, 79107

Report Date: August 17, 2012

Work Order: 12080622

Project Location: Hobbs, NM
Project Name: Lovington Deep 6
Project Number: 700376.051.03
SRS#: 2002-10312

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 |
|---|---|---|---|---|---|
| 305989 | Influent #1 | air | 2012-08-02 | 12:15 | 2012-08-06 |

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

# Case Narrative

Samples for project Lovington Deep 6 were received by TraceAnalysis, Inc. on 2012-08-06 and assigned to work order 12080622. Samples for work order 12080622 were received intact at a temperature of 22.2 C.

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

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 12080622 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

# 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 |

## 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. |
| 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 |

-

## Attachments

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

LAB Order ID # 120877022

Page 1 of 1

# TraceAnalysis, Inc.

email: lab@traceanalysis.com


6701 Aberdeen Avenue, Suite 9
**Lubbock, Texas 79424**
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Fax (806) 794-1298
1 (800) 378-1296

5002 Basin Street, Suite A1
**Midland, Texas 79703**
Tel (432) 689-6301
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200 East Sunset Rd., Suite E
**El Paso, Texas 79922**
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

BioAquatic Testing
2501 Mayes Rd., Ste 100
**Carrollton, Texas 75006**
Tel (972) 242-7750


**Company Name:** Talon LPE
**Phone #:** 8069620607
**Address:** (Street, City, Zip) 921 N Bivins Amarillo Tx 79107
**Fax #:**
**Contact Person:** Sinan Walshe
**E-mail:**
**Invoice to:** (If different from above) Plains (Jason Henry) SRS# 2052-10312
**Project #:** 200376.051.03
**Project Name:** Lovington Deep 6
**Project Location (including state):** Hobbs, NM
**Sampler Signature:**

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

| LAB # (LAB USE ONLY) | FIELD CODE | # CONTAINERS | Volume / Amount | MATRIX: WATER | SOIL | AIR | SLUDGE | PRESERVATIVE METHOD: HCl | $HNO_3$ | $H_2SO_4$ | NaOH | ICE | NONE | SAMPLING: DATE | TIME |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 205989 | mPE EVENT #1 (205989) | 1 | 1 | | | ✓ | | | | | | | ✓ | 8-2-12 | 1215 |
| 205990 | " #2 (205990) | 1 | 1 | | | ✓ | | | | | | | ✓ | 8-2-12 | 2215 |

| LAB # | MTBE 8021 / 602 / 8260 / 624 | BTEX 8021 / 602 / 8260 / 624 | TPH 418.1 / TX1005 / TX1005 Ext(C35) | TPH 8015 GRO / DRO / TVHC | PAH 8270 / 625 | Total Metals Ag As Ba Cd Cr Pb Se Hg 6010/200.7 | TCLP Metals Ag As Ba Cd Cr Pb Se Hg | TCLP Volatiles | TCLP Semi Volatiles | TCLP Pesticides | RCI | GC/MS Vol. 8260 / 624 | GC/MS Semi. Vol. 8270 / 625 | PCB's 8082 / 608 | Pesticides 8081 / 608 | BOD, TSS, pH | Moisture Content | Cl, F, $SO_4$, $NO_3$-N, $NO_2$-N, $PO_4$-P, Alkalinity | Na, Ca, Mg, K, TDS, EC | ASTM D 1945 | | | | Turn Around Time if different from standard | Hold |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 205989 | | | | | | | | | | | | | | | | | | | | L | | | | | |
| 205990 | | | | | | | | | | | | | | | | | | | | | | | | | |

| Relinquished by: | Company: | Date: | Time: | Received by: | Company: | Date: | Time: | |
|---|---|---|---|---|---|---|---|---|
| | Talon | 8-3-12 | | | | | | INST ____ °C<br>OBS ____ °C<br>COR ____ °C |
| Relinquished by: | Company: | Date: | Time: | Received by: | Company: | Date: | Time: | |
| | | | | | | | | INST ____ °C<br>OBS ____ °C<br>COR ____ °C |
| Relinquished by: | Company: | Date: | Time: | Received by: | Company: | Date: | Time: | |
| | | | | | | 8-6-12 | 8:30 | INST 1.7 °C<br>OBS 22.3 °C<br>COR 22.8 °C |

**LAB USE ONLY**
Intact Y / N
Headspace Y / N / NA
Log-in-Review

**REMARKS:**
UPS: J2041257577

- Dry Weight Basis Required
- TRRP Report Required
- Check If Special Reporting Limits Are Needed

Carrier # Fed Ex 7911 2990 7078

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C.

ORIGINAL COPY

Office: 806-665-0750
Fax: 806-665-0745

MIDWEST PRECISION TESTING, LLC.

615 N. Price Rd.
Pampa, TX 79065

The following analytical results were produced using the strictest quality control and most current methods:

COC #: N/A

Lab #: 13087-13088

Quality Control #: 2138

Approved by:

Neil Ray

Neil Ray

Date: 8/14/12

Office: 806-665-0750
Fax: 806-665-0745

MIDWEST PRECISION TESTING, LLC.

615 N. Price Rd.
Pampa, TX 79065

Sample Matrix: Gas
Sample Type: Spot
Preservative: N/A
Sample Container: Tedlar Bag

Method(s): ASTM D 1945
Gas Analysis by Gas Chromatography

Client: Trace Analysis, Inc.
Project Location: N/A

Sample Id.: Influent Air #1
Trace: 305989-1
Sample Temp.: N/A
Atmospheric Temp.: N/A
Pressure: N/A
Field Data: N/A
Sample Date: N/A Time: N/A
Sampled By: N/A
Analysis Date: 8/10/12
Analysis By: Neil Ray

Lab #: 13087
Quality Control Report: 2138

## Analytical Results

| **Gas Composition** | | | | | |
|---|---|---|---|---|---|
| | **Mol %** | **GPM** | **Vol %** | **ppm vol.** | **Wt. %** |
| Nitrogen (N2): | 97.5743 | 10.6776 | 95.8551 | 958551 | 96.2048 |
| Carbon Dioxide (CO2): | 1.9397 | 0.3271 | 2.9557 | 29557 | 2.9980 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **Hydrocarbon Composition** | **Mol %** | **GPM** | **Vol. %** | | **Wt. %** |
| Methane (CH4): | 0.2442 | 0.0415 | 0.3698 | 3698 | 0.1376 |
| Ethane (C2H6): | 0.0081 | 0.0021 | 0.0192 | 192 | 0.0085 |
| Propane (C3H8): | 0.0084 | 0.0023 | 0.0207 | 207 | 0.0130 |
| Iso-Butane (C4H10): | 0.0024 | 0.0008 | 0.0070 | 70 | 0.0049 |
| N-Butane (C4H10): | 0.0123 | 0.0038 | 0.0346 | 346 | 0.0250 |
| Iso-Pentane (C5H12): | 0.0180 | 0.0066 | 0.0589 | 589 | 0.0456 |
| N-Pentane (C5H12): | 0.0368 | 0.0133 | 0.1193 | 1193 | 0.0933 |
| Hexanes+ (C6H14): | 0.1558 | 0.0672 | 0.5597 | 5597 | 0.4692 |
| **Totals** | 100.000 | 11.1423 | 100.000 | | 100.000 |

## Comments - Additional Data

| | | | |
|---|---|---|---|
| BTU -dry ( BTU/ft$^3$): | 13.4 | Z-Comp. Factor-dry: | 0.99965 |
| BTU -water vapor sat.( BTU/ft$^3$): | 14.2 | Z-Comp. Factor-water vapor sat.: | 0.99521 |
| | | | |
| Specific Gravity -dry: | 0.9815 | 14.65 psi Pressure Base | |
| Specific Gravity-water vapor sat.: | 0.9795 | | |

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Sample Matrix: Gas
Sample Type: Spot
Preservative: N/A
Sample Container: Tedlar Bag

Method(s): ASTM D 1945
Gas Analysis by Gas Chromatography

Client: Trace Analysis, Inc.
Project Location: N/A

Sample Id.: Influent Air #2
Trace: 305990-1
Sample Temp.: N/A
Atmospheric Temp.: N/A
Pressure: N/A
Field Data: N/A
Sample Date: N/A Time: N/A
Sampled By: N/A
Analysis Date: 8/10/12
Analysis By: Neil Ray

Lab #: 13088
Quality Control Report: 2138

## Analytical Results

| Gas Composition | | | | | |
|---|---|---|---|---|---|
| | Mol % | GPM | Vol % | ppm vol. | Wt. % |
| Nitrogen (N2): | 96.4390 | 10.5539 | 93.6541 | 936541 | 94.0445 |
| Carbon Dioxide (CO2): | 2.8998 | 0.4890 | 4.3681 | 43681 | 4.4329 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **Hydrocarbon Composition** | **Mol %** | **GPM** | **Vol. %** | | **Wt. %** |
| Methane (CH4): | 0.1556 | 0.0264 | 0.2329 | 2329 | 0.0867 |
| Ethane (C2H6): | 0.0006 | 0.0002 | 0.0013 | 13 | 0.0006 |
| Propane (C3H8): | 0.0008 | 0.0002 | 0.0018 | 18 | 0.0012 |
| Iso-Butane (C4H10): | 0.0069 | 0.0022 | 0.0199 | 199 | 0.0139 |
| N-Butane (C4H10): | 0.0128 | 0.0040 | 0.0355 | 355 | 0.0257 |
| Iso-Pentane (C5H12): | 0.0422 | 0.0153 | 0.1360 | 1360 | 0.1054 |
| N-Pentane (C5H12): | 0.0621 | 0.0224 | 0.1989 | 1989 | 0.1557 |
| Hexanes+ (C6H14): | 0.3805 | 0.1642 | 1.3514 | 13514 | 1.1333 |
| **Totals** | 100.000 | 11.2779 | 100.000 | | 100.000 |

## Comments - Additional Data

| | | | |
|---|---|---|---|
| BTU -dry ( BTU/ft$^3$): | 25.9 | Z-Comp. Factor-dry: | 0.99960 |
| BTU -water vapor sat.( BTU/ft$^3$): | 26.4 | Z-Comp. Factor-water vapor sat.: | 0.99486 |
| | | | |
| Specific Gravity -dry: | 0.9930 | 14.65 psi Pressure Base | |
| Specific Gravity-water vapor sat.: | 0.9912 | | |

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MIDWEST PRECISION TESTING, LLC.

615 N. Price Rd.
Pampa, TX 79065

Sample Type: Standard
Preservative: N/A
Sample Container: Industrial Cylinder

Sample Id.: DCG
Reference Std. 53619AW
Sample Temp.: 120° F
Analysis Date: 8/10/12
Analysis By: Jessica Cabezudo

Method(s): ASTM D 1945
Gas Analysis by Gas Chromatography

Quality Control Report#: 2138

## Analytical Results

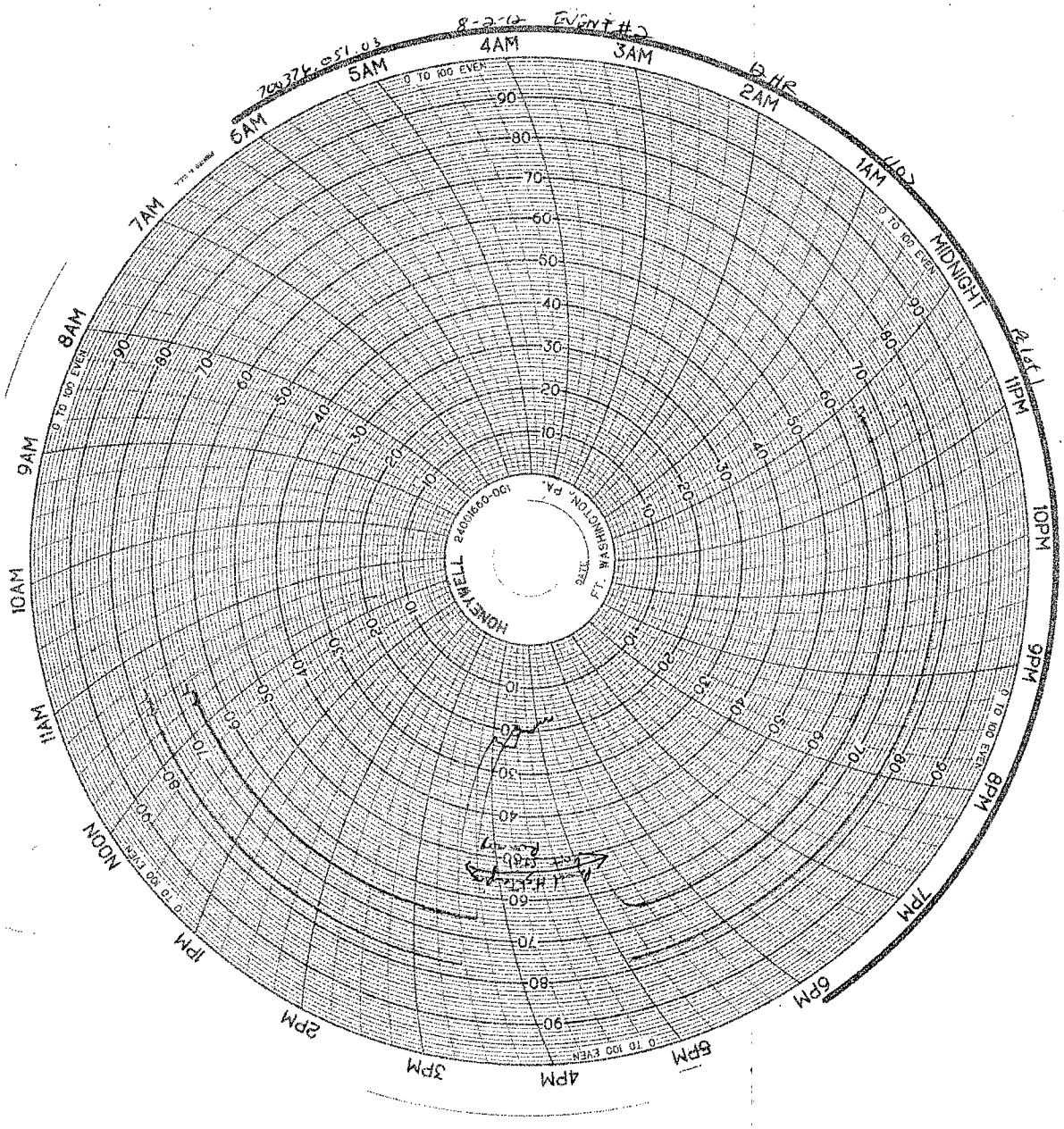
| RESULTS | ACTUAL | ANALYSIS | | | |
|---|---|---|---|---|---|
| **Gas Composition** | | | **MDL** | **RL** | **% Deviation** |
| | **Mol %** | **Mol %** | **Mol %** | **ppm mol** | **(90-100%)** |
| Nitrogen (N2): | 4.918 | 4.8674 | 0.0010 | 10 | 99.0 |
| Carbon Dioxide (CO2): | 1.499 | 1.5017 | 0.0010 | 10 | 99.8 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | **MDL** | **RL** | **% Deviation** |
| **Hydrocarbon Composition** | **Mol %** | **Mol %** | **Mol %** | **ppm mol** | **(90-100%)** |
| Methane (CH4): | 69.891 | 69.9739 | 0.0001 | 1 | 99.9 |
| Ethane (C2H6): | 9.111 | 9.1220 | 0.0001 | 1 | 99.9 |
| Propane (C3H8): | 5.984 | 5.8655 | 0.0001 | 1 | 98.0 |
| Iso-Butane (C4H10): | 3.024 | 3.0069 | 0.0001 | 1 | 99.4 |
| N-Butane (C4H10): | 3.040 | 3.0223 | 0.0001 | 1 | 99.4 |
| Iso-Pentane (C5H12): | 1.012 | 1.0630 | 0.0001 | 1 | 95.0 |
| N-Pentane (C5H12): | 1.018 | 1.0616 | 0.0001 | 1 | 95.7 |
| Hexane+ (C6H14): | 0.503 | 0.5157 | 0.0001 | 1 | 97.5 |
| **Totals** | 100.000 | 100.000 | | | |

## Comments - Additional Data

| ACTUAL | | ANALYSIS | |
|---|---|---|---|
| BTU -dry (BTU/ft3): | 1324.0 | BTU -dry (BTU/ft$^3$): | 1325.4 |
| BTU -water vapor sat. (BTU/ft3): | 1318.4 | BTU -water vapor sat. (BTU/ft$^3$): | 1319.8 |
| | | | |
| Specific Gravity -dry: | 0.8349 | Specific Gravity -dry: | 0.8353 |
| Specific Gravity -water vapor sat.: | 0.8419 | Specific Gravity -water vapor sat.: | 0.8423 |
| | | | |
| Z-Comp. Factor -dry: | 0.99564 | Z-Comp. Factor -dry: | 0.99563 |
| Z-Comp. Factor -water vapor sat.: | 0.98306 | Z-Comp. Factor -water vapor sat.: | 0.98304 |

# ATTACHMENT 3

Oxidizer Charts


8-3-0 EVENT #2
700374 051.03
5AM
4AM
3AM
2AM
1AM
MIDNIGHT
11PM
10PM
9PM
8PM
7PM
6PM
5PM
4PM
3PM
2PM
1PM
NOON
11AM
10AM
9AM
8AM
7AM
6AM
0 TO 100 EVEN
HONEYWELL
WASHINGTON, PA.
TYPE
FT

# ATTACHMENT 4

Waste Ticket

24-HOUR SERVICE, CALL
LOVINGTON 396-4948
TATUM 398-4960

# GANDY CORPORATION

KILL TRUCKS - VACUUM TRUCKS - WINCH TRUCKS
TANK CLEANING - ROUSTABOUTING
PRC #14225

P.O. BOX 2140
LOVINGTON, NEW MEXICO 88260

473101

Date _____ Truck No. 37

Company _____ Purchase Order No. _____ Invoice Number _____

From _____ Rig No. _____ Location _____

To Lease _____ Well No. _____ Location _____

| | | | | | | TIME | RATE | AMOUNT |
|---|---|---|---|---|---|---|---|---|
| Time Out _____ | | A.M. P.M. | Time In _____ | | A.M. P.M. | | | |
| Diesel | Brine Water | Fresh Water | | | | | | |
| Crude Oil | Salt Water | Acid | Bbls. Hauled _____ | | | | | |
| Driver, Operator or Pusher | | | | | | | | |
| Helper | | | | | | | | |
| Helper | | | | | | | | |
| Helper | | | | | | | | |
| Other Charges | | | | | | | | |
| Description of Work: | | | | | | | | |
| | | | | | | | Sub Total | |
| | | | | | | | Sales Tax | |
| Authorized by: | | | | | | | TOTAL | |

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