

AP - 9

# STAGE 2 REPORT

Date

1-15-13



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ENVIRONMENTAL CONSULTING  
ENGINEERING  
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CONSTRUCTION  
SPILL MANAGEMENT  
GENERAL CONTRACTING

**MOBILE DUAL PHASE EXTRACTION REPORT**  
**HDO 90-23 PIPELINE RELEASE**  
**LEA COUNTY, NEW MEXICO**  
**SRS # HDO 90-23**  
**NMOCD ID# AP-009**  
**TALON/LPE PROJECT # 700376.099.03**

**PREPARED FOR:**

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

**PREPARED BY:**

**TALON/LPE**  
**921 N. BIVINS**  
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**JANUARY 15, 2013**

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*Paul Santor*  
2/7/13  
TALON/LPE (F-6302)

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## 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 November 8th, 2012, at the HDO 90-23 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. (MW-2 and MW-6 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 **43.87 equivalent gallons of hydrocarbons (Total)** were removed during the event. The combined volume of hydrocarbons were comprised of approximately **13 gallons of PSH (liquid phase)** and approximately **30.87 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 specific gravity of hydrocarbon 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 170.64 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 influent concentration was recorded as 26,920 ppmv for Hydrocarbon Composition. Laboratory analytical results can be found in Attachment 2.

## C. Waste Management and Disposition

A cumulative total of 1,372 gallons of fluid were generated during this event. The fluids were transferred to an on-site storage tank prior to being hauled to an authorized disposal facility. A copy of the disposal ticket can be found in Attachment 4.

# II. SYSTEM OPERATION DATA AND MASS RECOVERY CALCULATIONS

## Formulae:

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

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

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

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

$$\frac{8.34 \text{ lbs}}{\text{gallon water}} \times 0.82 \text{ average specific gravity of light crude (estimated)} = \frac{6.84 \text{ lbs light crude}}{\text{gallon}}$$

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

Time	Period (hours)	Influent Temp. (°f)	Vacuum (hg) (In.)	Vacuum (In. h20)	Differential pressure (In. h20)	Flow (SCFM)	FID 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)
8:00	0.5	64	12.5	170.11	39.7	169.08	50000	-	26920.00	1.00	26920	32.14	20.31	10.16	10.16
8:30	0.5	67	13	176.92	46.8	180.42	50000	26920.00	26920.00	1.00	26920	31.95	21.55	10.78	20.93
9:30	1	78	16.5	224.55	54.3	171.35	50000	-	26920.00	1.00	26920	31.30	20.05	20.05	40.98
10:30	1	80	16.5	224.55	52.1	167.53	50000	-	26920.00	1.00	26920	31.18	19.53	19.53	60.51
11:30	1	84	16.5	224.55	53.7	169.46	50000	-	26920.00	1.00	26920	30.96	19.61	19.61	80.12
12:30	1	88	16.5	224.55	54.6	170.25	50000	-	26920.00	1.00	26920	30.73	19.56	19.56	99.68
13:30	1	88	16.5	224.55	53.4	168.37	50000	-	26920.00	1.00	26920	30.73	19.34	19.34	119.02
14:30	1	94	17	231.35	52.7	163.23	50000	-	20723.00	1.00	20723	23.49	14.33	14.33	133.35
15:30	1	82	16.5	224.55	54	170.24	50000	-	20723.00	1.00	20723	24.01	15.28	15.28	148.63
16:30	1	78	16.5	224.55	56.2	174.32	50000	-	20723.00	1.00	20723	24.19	15.76	15.76	164.39
17:30	1	76	16.5	224.55	55.2	173.09	50000	-	20723.00	1.00	20723	24.28	15.71	15.71	180.10
18:30	1	76	16.5	224.55	54.1	171.35	50000	20723.00	20723.00	1.00	20723	24.28	15.55	15.55	195.65
19:30	1	72	16.5	224.55	52.6	169.60	50000	-	20723.00	1.00	20723	24.46	15.51	15.51	211.16
Averages:		79.00	15.96	217.22	52.26	170.64	50000.00						Total	211.16	

PSH Mass Recovered in Vapor Phase =

30.87 gallons

FID maximum Concentration = 50,000 PPM

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

Measured Conc.	Molecular Wt.	Pressure	Gas Constant	Temp.	Temp.	Conc.
(ppmv)	(Grams)	(atm)	(atm.liter/K.mole)	(F)	(K)	(C_mg/l)
26920	28.5003	1	0.0821	64	290.777778	32.13807211

Inputs are the green values.

Calculated values are yellow.

Constants are purple values.

Output are the blue values.

Liquid-phase Hydrocarbon Recovery

[ ] \* r2 \* h = volume

### Total Hydrocarbon Recovery

PSH Mass Recovered in Vapor Phase =

211.16 lbs  
30.87 gallons

PSH Mass Recovered in Liquid Phase =

88.92 lbs  
13.00 gallons

**TOTAL = 300.08 lbs  
43.87 gallons**

Gallons removed determined at time of pick up

PSH Volume in Gallons=

13

PSH Mass in Pounds=

88.92

#### % Vol. Hydrocarbon to ppmv - Influent 1

Compound	Molecular Weight (g/mol)	% Vol	=	ppmv
Methane (CH4)	16.04	2.3829		23829.00
Ethane (C2H6)	30.07	0.0043		43.00
Propane (C3H8)	44.10	0.0053		53.00
Iso-Butane (C4H10)	58.12	0.0076		76.00
N-Butane (C4H10)	58.12	0.0099		99.00
Iso-Pentane (C5H12)	72.15	0.0129		129.00
N-Pentane (C5H12)	72.15	0.0125		125.00
Hexane+ (C6H14)	97.40	0.2566		2566.00
Total				26920.00
*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its (0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966				

#### Molecular Weight Calculations

component	Molecular Weight (g/mol)	mol%
Nitrogen (N2)	28.016	94.4411
Methane (CH4)	16.0425	1.5958
Carbon Dioxide (CO2)	44.011	3.8725
Ethane (C2H6)	30.069	0.0018
Propane (C3H8)	44.0956	0.0022
Iso-Butane (C4H10)	58.1222	0.0026
N-Butane (C4H10)	58.1222	0.0036
Iso-Pentane (C4H12)	72.1488	0.004
N-Pentane (C5H12)	72.1488	0.00
Hexane+	97.3966	0.07
Total		99.9999
Calculated MW		28.5003

#### % Vol. Hydrocarbon to ppmv - Influent 2

Compound	Molecular Weight (g/mol)	% Vol	=	ppmv
Methane (CH4)	16.04	1.8288		18288.00
Ethane (C2H6)	30.07	0.0011		11.00
Propane (C3H8)	44.10	0.0014		14.00
Iso-Butane (C4H10)	58.12	0.0033		33.00
N-Butane (C4H10)	58.12	0.0041		41.00
Iso-Pentane (C4H12)	72.15	0.0159		159.00
N-Pentane (C5H12)	72.15	0.0099		99.00
Hexane+ (C6H14)	97.40	0.2078		2078.00
Total				20723.00
*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its (0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966				

#### Molecular Weight Calculations

component	Molecular Weight (g/mol)	mol%
Nitrogen (N2)	28.016	94.3711
Methane (CH4)	16.0425	1.2248
Carbon Dioxide (CO2)	44.011	4.3338
Ethane (C2H6)	30.069	0.0005
Propane (C3H8)	44.0956	0.0006
Iso-Butane (C4H10)	58.1222	0.0011
N-Butane (C4H10)	58.1222	0.0015
Iso-Pentane (C4H12)	72.1488	0.0049
N-Pentane (C5H12)	72.1488	0.00
Hexane+	97.3966	0.06
Total		100
Calculated MW		28.6076

Calculated MW=  $\frac{\text{sum (individual component MW x their reported mol\%)}}{100}$

ppmv= % Vol x 10,000

**ATTACHMENT 1**  
MDPE Field Logs





Start Date: 8-Nov-12

## MDPE FIELD DATA

		Well Flow						Well Data				
TIME	SAMPLE TAKEN	Influent temp. (°f)	Diff. Pressure (INH2O) 2" Preso	Vac (In.Hg)	FID Composite (PPM)	Propane Tank (%-size) 500 Gal.	EXHAUST TEMP F	COMMENTS:				
								MW-6	MW-2			
								VAC (INH2O)	VAC (INH2O)	VAC (INH2O)	VAC (INH2O)	VAC (INH2O)
8:00		64	39.7	12.5	>50000	78	1403	8.3	27.5			
8:30	*	67	46.8	13	>50000	76	1406	11.4	36.9			
9:30		78	54.3	16.5	>50000	75	1424	11.8	35.7			
10:30		80	52.1	16.5	>50000	74	1419	11.5	35.1			
11:30		84	53.7	16.5	>50000	73	1407	11.9	36.3			
12:30		88	54.6	16.5	>50000	71	1408	10.9	36.7			
13:30		88	53.4	16.5	>50000	69	1404	11	35.6			
14:30		94	52.7	17	>50000	68	1407	11.3	36.1			
15:30		82	54	16.5	>50000	66	1408	7	36.2			
16:30		78	56.2	16.5	>50000	65	1409	7.2	34.7			
17:30		76	55.2	16.5	>50000	64	1406	7	35.6			
18:30	*	76	54.1	16.5	>50000	63	1408	7.4	34.3			
19:30		72	52.6	16.5	>50000	62	1409	7.1	36.1			

## Soil Vacuum Influence

Observation Well	RW-2
Extraction Well (EW)	MW-6
Time:	In.H2O
8:30	0.23
13:30	1.85
18:30	2.01

**ATTACHMENT 2**  
Laboratory Analytical Results



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  
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(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: November 26, 2012

Work Order: 12111202



Project Location: NW of Eunice, NM  
Project Name: HDO 90-23  
Project Number: 700376.099.03 MPDE Event #1  
SRS #: HDO-90-23

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
313942	Influent #1	air	2012-11-08	08:30	2012-11-09

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.

This report consists of a total of 5 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

---

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

# Report Contents

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## Case Narrative

Samples for project HDO 90-23 were received by TraceAnalysis, Inc. on 2012-11-09 and assigned to work order 12111202. Samples for work order 12111202 were received intact at a temperature of 23.3 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 12111202 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.

Report Date: November 26, 2012  
700376.099.03 MPDE Event #1

Work Order: 12111202  
HDO 90-23

Page Number: 4 of 5  
NW of Eunice, NM

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# 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
1	NELAP	T104704219-12-8	Lubbock

### 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 than 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.

## TraceAnalysis, Inc.

email: lab@traceanalysis.com

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

5002 Basin Street, Suite A1  
Midland, Texas 79703  
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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 #: 806 467-0607  
Address: (Street, City, Zip) 921 N TR. V.I.V.S Fax #:  
Contact Person: Simon Walker E-mail:  
Invoice to: Plain (Jose Henry)  
(If different from above) SRS# HDO 90-23  
Project #: 700376.099.03 Project Name: HDO 90-23  
Project Location (including state): NW of Eunice, NM Sampler Signature: [Signature]

ANALYSIS REQUEST  
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE EVENT#1	# CONTAINERS	Volume / Amount	MATRIX				PRESERVATIVE METHOD				SAMPLING		DATE	TIME	MTBE 8021 / 602 / 8260 / 624	BTX 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 <sub>4</sub> , NO <sub>3</sub> -N, NO <sub>2</sub> -N, PO <sub>4</sub> -P, Alkalinity	Na, Ca, Mg, K, TDS, EC	Turn Around Time if different from standard	Hold
				WATER	SOIL	AIR	SLUDGE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	ICE	NONE																							
313942	Influent #1	1	1			✓							✓	11-8	0830																					
943	Influent #2	1	1			✓							✓	11-8	1830																					

Relinquished by: <u>[Signature]</u>	Company: <u>Talon</u>	Date: <u>11-9-12</u>	Time: <u>---</u>	Received by: <u>[Signature]</u>	Company: <u>Trace</u>	Date: <u>11/9/12</u>	Time: <u>4:35</u>	INST <u>JK-3</u>	OBS <u>23.7</u>	COR <u>23.3</u>	<b>LAB USE ONLY</b> Intact <u>Y/N</u> Headspace <u>Y/N/NA</u> <input type="checkbox"/> Dry Weight Basis Required <input type="checkbox"/> TRRP Report Required <input type="checkbox"/> Check If Special Reporting Limits Are Needed Log-in-Review <u>[Signature]</u>	REMARKS:
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	INST	OBS	COR		
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	INST	OBS	COR		

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

Carrier #

Campbell

ORIGINAL COPY



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

**MIDWEST  
PRECISION  
TESTING, L.L.C.**

615 N. Price Rd.  
Pampa, TX 79065

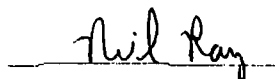
The following analytical results were produced using the strictest quality control and most current methods:

COC #: N/A

Lab #: 16378-16379

Quality Control #: 2310

Approved by:

A handwritten signature in cursive script, appearing to read "Neil Ray", is written over a horizontal line.

Neil Ray

Date: 11/19/12

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

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

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

Sample Id.: Influent Air #1  
Trace: 313942-1  
Sample Temp.: N/A  
Atmospheric Temp.: N/A  
Pressure: N/A  
Field Data: N/A  
Sample Date: 11/08/12 Time: N/A  
Sampled By: N/A  
Analysis Date: 11/16/12  
Analysis By: Jessica Cabezudo

Lab #: 16378  
Quality Control Report: 2310

**Analytical Results**

<b><u>Gas Composition</u></b>					
	<b><u>Mol %</u></b>	<b><u>GPM</u></b>	<b><u>Vol %</u></b>	<b><u>ppm vol.</u></b>	<b><u>Wt. %</u></b>
Nitrogen (N2):	94.4411	10.3352	91.4889	914889	92.8777
Carbon Dioxide (CO2):	3.8725	0.6530	5.8191	58191	5.9702
<b><u>Hydrocarbon Composition</u></b>					
	<b><u>Mol %</u></b>	<b><u>GPM</u></b>	<b><u>Vol. %</u></b>		<b><u>Wt. %</u></b>
Methane (CH4):	1.5958	0.2709	2.3829	23829	0.8966
Ethane (C2H6):	0.0018	0.0005	0.0043	43	0.0019
Propane (C3H8):	0.0022	0.0006	0.0053	53	0.0034
Iso-Butane (C4H10):	0.0026	0.0009	0.0076	76	0.0054
N-Butane (C4H10):	0.0036	0.0011	0.0099	99	0.0072
Iso-Pentane (C5H12):	0.0040	0.0015	0.0129	129	0.0101
N-Pentane (C5H12):	0.0039	0.0014	0.0125	125	0.0099
Hexanes+ (C6H14):	0.0724	0.0313	0.2566	2566	0.2176
<b>Totals</b>	100.000	11.2963	100.000		100.000

**Comments - Additional Data**

BTU -dry ( BTU/ft <sup>3</sup> ):	20.4	Z-Comp. Factor-dry:	0.99961
BTU -water vapor sat.( BTU/ft <sup>3</sup> ):	21.0	Z-Comp. Factor-water vapor sat.:	0.99492
Specific Gravity -dry:	0.9839	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	0.9822	Molecular Weight	28.5003

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



615 N. Price Rd.  
Pampa, TX 79065

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

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

Sample Id.: Influent Air #2  
Trace: 313943-1

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

Sample Temp.: N/A  
Atmospheric Temp.: N/A  
Pressure: N/A  
Field Data: N/A  
Sample Date: 11/08/12 Time: N/A  
Sampled By: N/A  
Analysis Date: 11/16/12  
Analysis By: Jessica Cabezudo

Lab #: 16379  
Quality Control Report: 2310

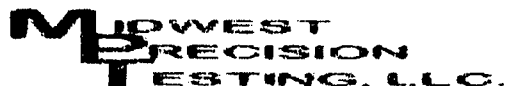
### Analytical Results

<b>Gas Composition</b>					
	<b>Mol %</b>	<b>GPM</b>	<b>Vol %</b>	<b>ppm vol.</b>	<b>Wt. %</b>
Nitrogen (N2):	94.3711	10.3276	91.4158	914158	92.4561
Carbon Dioxide (CO2):	4.3338	0.7308	6.5118	65118	6.6559
<b>Hydrocarbon Composition</b>					
	<b>Mol %</b>	<b>GPM</b>	<b>Vol. %</b>		<b>Wt. %</b>
Methane (CH4):	1.2248	0.2079	1.8288	18288	0.6856
Ethane (C2H6):	0.0005	0.0001	0.0011	11	0.0005
Propane (C3H8):	0.0006	0.0002	0.0014	14	0.0009
Iso-Butane (C4H10):	0.0011	0.0004	0.0033	33	0.0023
N-Butane (C4H10):	0.0015	0.0005	0.0041	41	0.0030
Iso-Pentane (C5H12):	0.0049	0.0018	0.0159	159	0.0124
N-Pentane (C5H12):	0.0031	0.0011	0.0099	99	0.0078
Hexanes+ (C6H14):	0.0586	0.0253	0.2078	2078	0.1755
<b>Totals</b>	<b>100.000</b>	<b>11.2957</b>	<b>100.000</b>		<b>100.000</b>

### Comments - Additional Data

BTU -dry ( BTU/ft <sup>3</sup> ):	15.8	Z-Comp. Factor-dry:	0.99960
BTU -water vapor sat.( BTU/ft <sup>3</sup> ):	16.4	Z-Comp. Factor-water vapor sat.:	0.99489
Specific Gravity -dry:	0.9876	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	0.9859	Molecular Weight	28.6077

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



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: 11/16/12  
Analysis By: Jessica Cabezudo

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

Quality Control Report#: 2310

### Analytical Results

RESULTS	ACTUAL	ANALYSIS			
<u>Gas Composition</u>			MDL	RL	% Deviation
	Mol %	Mol %	Mol %	ppm mol	(90-100%)
Nitrogen (N2):	4.918	4.9258	0.0010	10	99.8
Carbon Dioxide (CO2):	1.499	1.4967	0.0010	10	99.8
			MDL	RL	% Deviation
<u>Hydrocarbon Composition</u>	Mol %	Mol %	Mol %	ppm mol	(90-100%)
Methane (CH4):	69.891	69.8151	0.0001	1	99.9
Ethane (C2H6):	9.111	9.1503	0.0001	1	99.6
Propane (C3H8):	5.984	6.0173	0.0001	1	99.4
Iso-Butane (C4H10):	3.024	3.0340	0.0001	1	99.7
N-Butane (C4H10):	3.040	2.9660	0.0001	1	97.6
Iso-Pentane (C5H12):	1.012	1.0599	0.0001	1	95.3
N-Pentane (C5H12):	1.018	1.0337	0.0001	1	98.5
Hexane+ (C6H14):	0.503	0.5011	0.0001	1	99.6
<b>Totals</b>	100.000	100.000			

### Comments - Additional Data

ACTUAL		ANALYSIS	
BTU -dry (BTU/ft <sup>3</sup> ):	1324.0	BTU -dry (BTU/ft <sup>3</sup> ):	1325.2
BTU -water vapor sat. (BTU/ft <sup>3</sup> ):	1318.4	BTU -water vapor sat. (BTU/ft <sup>3</sup> ):	1319.6
Specific Gravity -dry:	0.8349	Specific Gravity -dry:	0.8357
Specific Gravity -water vapor sat.:	0.8419	Specific Gravity -water vapor sat.:	0.8426
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.:	0.98305

**TraceAnalysis, Inc.**

email: lab@traceanalysis.com

6701 Aberdeen Avenue, Suite 9  
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Fax (806) 794-1298  
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5002 Basin Street, Suite A1  
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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: \_\_\_\_\_ Phone #: \_\_\_\_\_  
Address: (Street, City, Zip) \_\_\_\_\_ Fax #: \_\_\_\_\_  
Contact Person: *Liz Givens* E-mail: \_\_\_\_\_  
Invoice to: \_\_\_\_\_  
(If different from above)  
Project #: \_\_\_\_\_ Project Name: \_\_\_\_\_  
Project Location (including state): \_\_\_\_\_ Sampler Signature: \_\_\_\_\_

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

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume / Amount	MATRIX				PRESERVATIVE METHOD						SAMPLING		DATE	TIME	MTBE 8021 / 602 / 8260 / 624	BTX 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 <sub>4</sub> , NO <sub>3</sub> -N, NO <sub>2</sub> -N, PO <sub>4</sub> -P, Alkalinity	Na, Ca, Mg, K, TDS, EC	Turn Around Time if different from standard	Hold
				WATER	SOIL	AIR	SLUDGE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	ICE	NONE																									
16378	313 942	1	1L			X							X			11-8-12																						
16379	943	1	1L			X							X																									

Relinquished by: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
Received by: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
INST \_\_\_\_\_ OBS \_\_\_\_\_ COR \_\_\_\_\_  
Intact Y / N \_\_\_\_\_  
Headspace Y / N / NA \_\_\_\_\_  
Log-in-Review \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
Received by: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
INST \_\_\_\_\_ OBS \_\_\_\_\_ COR \_\_\_\_\_  
Intact Y / N \_\_\_\_\_  
Headspace Y / N / NA \_\_\_\_\_  
Log-in-Review \_\_\_\_\_

Relinquished by: *AS* *SA* *11/12/12* *4:30*  
Received by: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
INST \_\_\_\_\_ OBS \_\_\_\_\_ COR \_\_\_\_\_  
Intact Y / N \_\_\_\_\_  
Headspace Y / N / NA \_\_\_\_\_  
Log-in-Review \_\_\_\_\_

**LAB USE ONLY**

REMARKS:

*12/12/02**Midwest*

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

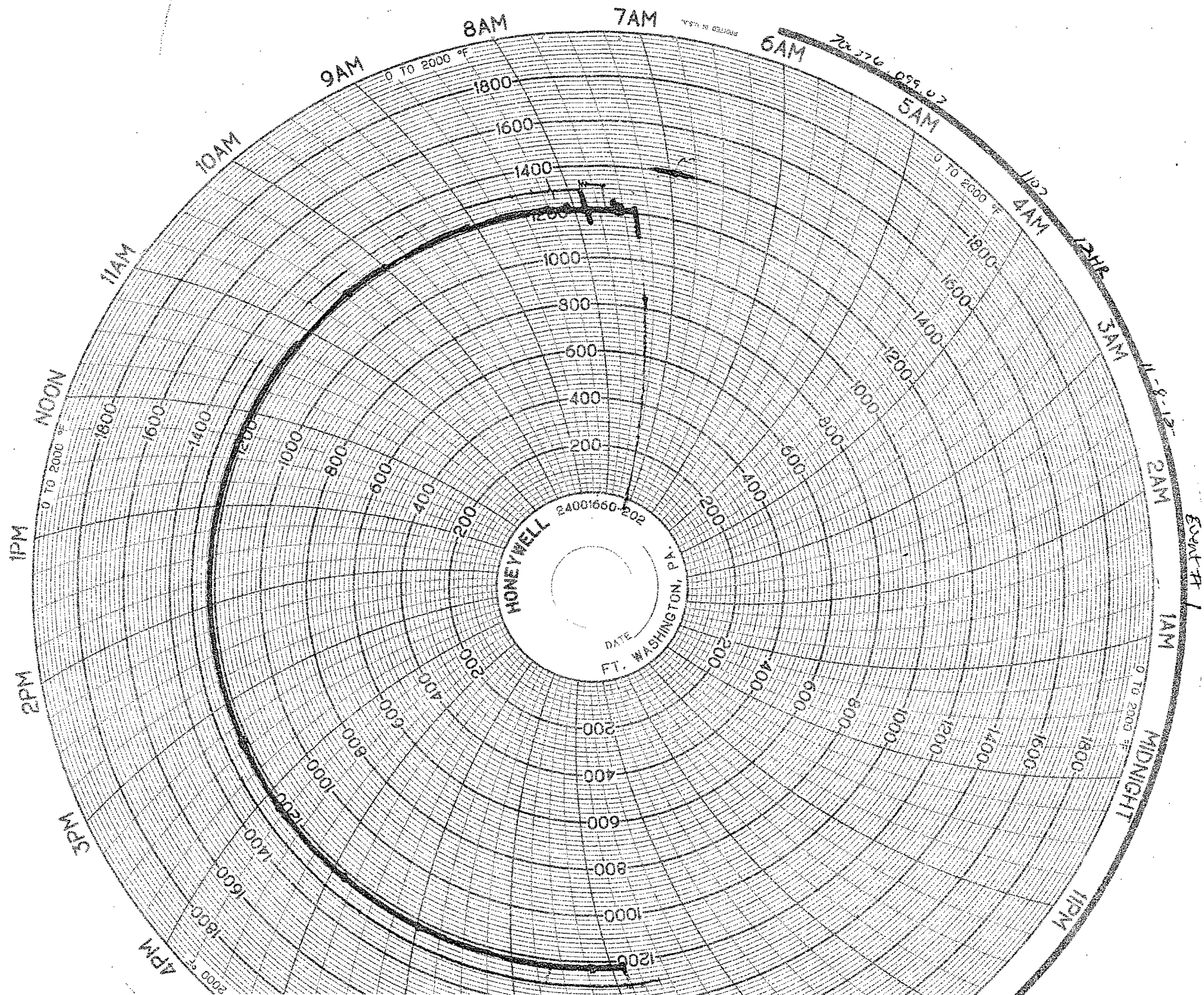
Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C.

Carrier # \_\_\_\_\_

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## **ATTACHMENT 3**

Oxidizer Charts



**ATTACHMENT 4**  
Waste Tickets



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