

AP - 29

# STAGE 2 REPORT

Date  
8-25-11



AP-29

**MOBILE DUAL PHASE EXTRACTION REPORT  
KIMBROUGH SWEET 8 INCH PIPELINE RELEASE  
LEA COUNTY, NEW MEXICO**

AMARILLO  
921 North Bivins  
Amarillo, Texas 79107  
Phone 806.467.0607  
Fax 806.467.0622

**SRS # 2000-10757**

**TALON/LPE PROJECT # 700376.050.02**

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**PREPARED FOR:**

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ENVIRONMENTAL CONSULTING  
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August 25, 2011

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**PLAINS**  
PIPELINE, L.P.

September 8, 2011

RECEIVED OCD

2011 SEP 12 P 11:48

Mr. Edward Hansen  
New Mexico Oil Conservation Division  
Environmental Bureau  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

RE: Plains Pipeline, L.P.  
Reports for MDPE Events at Two (2) Remediation Sites in Lea County, NM

Dear Mr. Hansen:

Plains Pipeline, L.P. is pleased to submit the attached reports which provide details regarding the Mobile Dual Phase Extraction (MDPE) events that were conducted at the following sites during July 2011:

Red Byrd #1  
Kimbrough Sweet 8-inch Sweet

NMOCD Reference #1R-0085  
NMOCD Reference #AP-0029

Should you have any questions or comments, please contact me at (575) 441-1099.

Sincerely,

Jason Henry  
Remediation Coordinator  
Plains Pipeline, L.P.

Enclosure

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- Attachment 1 - MDPE field logs
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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 from July 20, 2011 to July 21, 2011 at the Kimrough Sweet 8" 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, 5, 6, & 7 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. Three 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. All three 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 **42.56 equivalent gallons of PSH (Total)** were removed during the event. The combined volume of PSH was comprised of approximately **23 gallons of PSH (liquid phase)** and approximately **19.56 gallons as off-gas vapor**.

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 227.67 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**

Three 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 4,249.14 ppmv for Hydrocarbon Composition. Laboratory analytical results can be found in Attachment 2.

**C. Waste Management and Disposition**

A cumulative total of 362 gallons of fluid were generated during this event. The fluids were temporarily transferred to an on-site storage tank prior to being transferred to a frac tank located at the Plains 8-Inch Moore to Jal #1 remediation site (NMOCD Reference #AP-91) for disposal at a later date. A copy of the waste ticket can be found in Attachment 4.

**II. SYSTEM OPERATION DATA AND MASS RECOVERY CALCULATIONS**

**Formulae:**

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

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

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

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

$$\frac{8.34 \text{ lbs}}{\text{gallon water}} \times 0.835 \text{ average specific gravity of light crude (estimated)} = \frac{6.96 \text{ lbs light crude}}{\text{gallon}}$$

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

Time	Period (hours)	Influent Temp. (°f)	Vacuum (In. hg)	Vacuum (In. h2O)	Differential pressure (In. h2O)	Flow (SCFM)	FID Readings (ppmv)	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)
10:30	0	96	14	190.53	83.4	227.47	28347	-	4249.14	1.09	4638	16.48	14.01	0.00	0.00
11:00	0.5	100	14	190.53	90.2	235.71	25972	4249.14	4249.14	1.00	4249	14.99	13.21	6.60	6.60
12:00	1	100	14	190.53	93.1	239.47	20830	-	4249.14	0.80	3408	12.02	10.76	10.76	17.36
13:00	1	102	16	217.74	91.8	222.00	18748	-	4249.14	0.72	3067	10.78	8.95	8.95	26.31
14:00	1	102	16	217.74	95.3	226.19	21325	-	4249.14	0.82	3489	12.26	10.37	10.37	36.68
15:00	1	102	14	190.53	91.5	236.98	18748	-	3778.84	0.95	3587	12.61	11.17	11.17	47.85
16:00	1	102	14	190.53	82.3	224.75	15831	-	3778.84	0.80	3029	10.65	8.95	8.95	56.79
17:00	1	98	14	190.53	74.5	214.60	19748	3778.84	3778.84	1.00	3779	13.38	10.73	10.73	67.53
18:00	1	96	14	190.53	79.3	221.80	17322	-	3778.84	0.88	3315	11.78	9.76	9.76	77.29
19:00	1	92	14	190.53	83.4	228.29	14173	-	3778.84	0.72	2712	9.71	8.28	8.28	85.57
20:00	1	90	14	190.53	86.5	232.91	11396	-	3861.15	1.17	4513	16.21	14.11	14.11	99.69
21:00	1	90	14	190.53	80.4	224.55	10143	-	3861.15	1.04	4017	14.43	12.11	12.11	111.80
22:00	1	86	14	190.53	79.7	224.39	9749	3861.15	3861.15	1.00	3861	13.97	11.72	11.72	123.52
23:00	1	86	14	190.53	82.5	228.30	10315	-	3861.15	1.06	4085	14.78	12.61	12.61	136.13
Averages:		95.86	14.29	194.41	85.28	227.67	17331.71						Total	136.13	

PSH Mass Recovered in Vapor Phase = 19.56 gallons

FID maximum Concentration = 50,000 PPM

Ex: Conversion from ppmv to mg/L (light crude)

Measured Conc.	Molecular Wt.	Pressure	Gas Constant	Temp.	Temp.	Conc.
(C_ppmv)	(Grams)	(atm)	(atm.liter/K.mole)	(F)	(K)	(C_mg/l)
4638	90	1	0.0821	96	308.5555556	16.47663287

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

**Total Hydrocarbon Recovery**

PSH Mass Recovered in Vapor Phase =

136.13 lbs

PSH Mass Recovered in Liquid Phase =

19.56 gallons

160.08 lbs

23.00 gallons

TOTAL =

296.21 lbs

42.56 gallons

**Liquid-phase Hydrocarbon Recovery**

(assumes gasoline product)

[ ] \* r<sup>2</sup> \* h = volume

Gallons removed determined at time of pick up	
PSH Volume in Gallons =	23
PSH Mass in Pounds =	160.08

% Total Hydrocarbon to mg/m <sup>3</sup> to ppmv - Influent 1							
Compound	Molecular Weight (g/mol)	% total	% total (Decimal)	=	Mg/M <sup>3</sup>	=	ppmv
Methane (CH4)	16.04	0.1856	0.001856	=	1856	=	526.78
Ethane (C2H6)	30.07	0	0	=	0	=	0.00
Propane (C3H8)	44.10	0.0163	0.000163	=	163	=	46.26
Iso-Butane (C4H10)	58.12	0.0289	0.000289	=	289	=	82.03
N-Butane (C4H10)	58.12	0.15	0.0015	=	1500	=	425.74
Iso-Pentane (C4H12)	72.15	0.1401	0.001401	=	1401	=	397.64
N-Pentane (C5H12)	72.15	0.2078	0.002078	=	2078	=	589.79
Hexane+ (C6H14)	86.18	0.7684	0.007684	=	7684	=	2180.91
<b>Total</b>							<b>4249.14</b>

% Total Hydrocarbon to mg/m <sup>3</sup> to ppmv - Influent 2							
Compound	Molecular Weight (g/mol)	% total	% total (Decimal)	=	Mg/M <sup>3</sup>	=	ppmv
Methane (CH4)	16.04	0.131	0.00131	=	1310	=	371.81
Ethane (C2H6)	30.07	0	0	=	0	=	0.00
Propane (C3H8)	44.10	0.112	0.00112	=	1120	=	317.88
Iso-Butane (C4H10)	58.12	0.0242	0.000242	=	242	=	68.69
N-Butane (C4H10)	58.12	0.1194	0.001194	=	1194	=	338.89
Iso-Pentane (C4H12)	72.15	0.1224	0.001224	=	1224	=	347.40
N-Pentane (C5H12)	72.15	0.1657	0.001657	=	1657	=	470.30
Hexane+ (C6H14)	86.18	0.6567	0.006567	=	6567	=	1863.88
<b>Total</b>							<b>3778.84</b>

% Total Hydrocarbon to mg/m <sup>3</sup> to ppmv - Influent 3							
Compound	Molecular Weight (g/mol)	% total	% total (Decimal)	=	Mg/M <sup>3</sup>	=	ppmv
Methane (CH4)	16.04	0.151	0.00151	=	1510	=	428.58
Ethane (C2H6)	30.07	0	0	=	0	=	0.00
Propane (C3H8)	44.10	0.0184	0.000184	=	184	=	52.22
Iso-Butane (C4H10)	58.12	0.0218	0.000218	=	218	=	61.87
N-Butane (C4H10)	58.12	0.1315	0.001315	=	1315	=	373.23
Iso-Pentane (C4H12)	72.15	0.1305	0.001305	=	1305	=	370.39
N-Pentane (C5H12)	72.15	0.1736	0.001736	=	1736	=	492.72
Hexane+ (C6H14)	86.18	0.7336	0.007336	=	7336	=	2082.14
<b>Total</b>							<b>3861.15</b>

**ATTACHMENT 1**  
MDPE Field Logs



Start Date: 7/20/2011

MDPE FIELD DATA

TIME	SAMPLE TAKEN	Total Flow			Well Flow			EXHAUST TEMP F	Well Data											
		Influent temp. (°F)	Diff. Pressure (In. H2O) 6" Pitot	Pressure (In. H2O)	Influent temp. (°F)	Diff. Pressure (INH2O) 2" Preso	Vac (In.Hg)		FID Composite (PPM)	Propane Tank (%-size) 250 Gal.	PPM	In. HG								
10:30	*	118	16	0.24	96	83.4	14	28347	75	1419										
11:00	*	120	18	0.24	100	90.2	14	25972	74	1415										
12:00		122	18	0.25	100	93.1	14	20830	74	1417										
13:00		126	18	0.26	102	91.8	16	18748	73	1409										
14:00		128	18	0.26	102	95.3	16	21325	72	1411										
15:00		130	18	0.26	102	91.5	14	18745	70	1414										
16:00		130	18	0.26	102	82.3	14	15831	68	1415										
17:00	*	124	18	0.26	98	74.5	14	19748	67	1412										
18:00		122	18	0.26	96	79.3	14	17322	65	1416										
19:00		120	18	0.26	92	83.4	14	14173	63	1414										
20:00		116	18	0.26	90	86.5	14	11396	62	1418										
21:00		114	18	0.26	90	80.4	14	10143	60	1413										
22:00	*	108	18	0.24	86	79.7	14	9749	58	1414										
23:00		102	18	0.24	86	82.5	14	10315	56	1412										

Soil Vacuum Influence

Observation Well	MW9
Extraction Well (EW)	MW5
Distance (ft) to EW	78
Time:	In.H2O
12:00	0.01
18:00	0.03
23:00	0.02

**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 888•588•3443 915•585•3443 FAX 915•585•4944  
 5002 Basin Street, Suite A1 Midland, Texas 79703 432•689•6301 FAX 432•689•6313  
 6015 Harris Parkway, Suite 110 Ft. Worth, Texas 76132 817•201•5260  
 E-Mail: lab@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 24, 2011

Work Order: 11072217



Project Location: Monument, New Mexico  
 Project Name: Kimbrough Sweet 8"  
 Project Number: 700376.050.02  
 SRS #: 2000-10757

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
272533	Influent #1	air	2011-07-20	11:00	2011-07-22

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

<b>Case Narrative</b>	<b>3</b>
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## Case Narrative

Samples for project Kimbrough Sweet 8" were received by TraceAnalysis, Inc. on 2011-07-22 and assigned to work order 11072217. Samples for work order 11072217 were received intact at a temperature of 22.3 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 11072217 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: August 24, 2011  
700376.050.02

Work Order: 11072217  
Kimbrough Sweet 8"

Page Number: 4 of 5  
Monument, New Mexico

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## Analytical Report

## Appendix

### 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 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.

# 11072217 TraceAnalysis, Inc.

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  
Tel (432) 689-6301  
Fax (432) 689-6313

200 East Sunset Rd., Suite E  
El Paso, Texas 79922  
Tel (915) 585-3443  
Fax (915) 585-4944  
1 (888) 588-3443

email: lab@traceanalysis.com

Company Name: **JALONPE** Phone #: **806-467-0607**  
 Address: (Street, City, Zip) **921 N. BIVINS AMARILLO TEXAS 79107** Fax #: **806-467-0622**  
 Contact Person: **S. SIMON WALSH** E-mail: **S.WALSH@JALONPE.COM**  
 Invoice to: **JASON HENRY PLAINS**  
 (If different from above)  
 Project #: **700376.050.02** Project Name: **KIMBROUGH SWEET 8"**  
 Project Location (including state): **MONUMENT, NEW MEXICO** Sampler Signature: **LUIS JAEQUEZ**

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume / Amount	MATRIX			PRESERVATIVE METHOD					SAMPLING		TIME	Temp °C
				WATER	AIR	SLUDGE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	ICE	NONE	DATE		
533	INFLUENT #1	1	1.1L	X	X						X			7/20/11	11:00
534	INFLUENT #2	1	1.1L	X	X						X			7/20/11	17:00
535	INFLUENT #3	1	1.1L	X	X						X			7/20/11	22:00

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

*SPS # 7000-10757*

MTBE 8021B / 602 / 8260B / 624	
BTEX 8021B / 602 / 8260B / 624	
TPH 418.1 / TX1005 / TX1005 Ext(C35)	
TPH 8015 GRO / DRO / TVHC	
PAH 8270C / 625	
Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	
TCP Metals Ag As Ba Cd Cr Pb Se Hg	
TCP Volatiles	
TCP Semi Volatiles	
TCP Pesticides	
RCI	
GC/MS Vol. 8260B / 624	
GC/MS Semi. Vol. 8270C / 625	
PCB's 8082 / 608	
BOD, TSS, pH	
Moisture Content	
Turn Around Time if different from standard	

**LAB USE ONLY**

Infect: Y / N  
 Headspace: Y / N / NA  
 Log-in-Review:

REMARKS:

Relinquished by: **JALONPE** Company: **JALONPE** Date: **7-20-11** Time: **13:40** Temp °C:  
 Relinquished by: **Brendalyn Trace** Company: **Trace** Date: **8/15** Time: **7/22/11** Temp °C:  
 Relinquished by: **Brendalyn Trace** Company: **Trace** Date: **8/15** Time: **7/22/11** Temp °C:

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

Carrier # **Campbell**

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

806-665-0750  
806-665-0753  
877-788-0750

**Midwest Precision Testing LLC**

135 N Price Rd  
Pampa, TX 79065

[www.mwptlab.com](http://www.mwptlab.com)

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

COC #: N/A

Lab #: 6009-6011

Quality Control #: 1580

Approved by:

Neil Ray

Neil Ray

Date: 8/01/11

806-665-0750  
806-665-0753  
877-788-0750

**Midwest Precision Testing LLC**

135 N Price Rd  
Pampa, TX 79065

www.mwptlab.com

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

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

Sample Id.: Influent #1  
Trace: 272533

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: 7/20/11 Time: 11:00 am  
Sampled By: N/A  
Analysis Date: 7/29/11  
Analysis By: Neil Ray

Lab #: 6009  
Quality Control Report: 1580

**Analytical Results**

<u>Gas Composition</u>	<u>Mol %</u>	<u>GPM</u>	<u>Vol %</u>	<u>Wt. %</u>
Nitrogen (N2):	98.4730	10.7759	96.9529	97.3045
Carbon Dioxide (CO2):	1.0150	0.1712	1.5501	1.5723
<u>Hydrocarbon Composition</u>	<u>Mol %</u>	<u>GPM</u>	<u>Vol. %</u>	<u>Wt. %</u>
Methane (CH4):	0.1223	0.0208	0.1856	0.0690
Ethane (C2H6):	0.0000	0.0000	0.0000	0.0000
Propane (C3H8):	0.0066	0.0018	0.0163	0.0103
Iso-Butane (C4H10):	0.0099	0.0032	0.0289	0.0202
N-Butane (C4H10):	0.0531	0.0167	0.1500	0.1086
Iso-Pentane (C5H12):	0.0428	0.0156	0.1401	0.1085
N-Pentane (C5H12):	0.0640	0.0231	0.2078	0.1626
Hexane+ (C6H14):	0.2134	0.0921	0.7684	0.6441
<b>Totals</b>	100.0000	11.1202	100.0000	100.0000

**Comments - Additional Data**

BTU -dry ( BTU/ft <sup>3</sup> ):	18.6	Z-Comp. Factor-dry:	0.99966
BTU -water vapor sat. ( BTU/ft <sup>3</sup> ):	19.3	Z-Comp. Factor-water vapor sat.:	0.99526
Specific Gravity -dry:	0.9794	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	0.9775		

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 806-665-0753  
 877-788-0750

**Midwest Precision Testing LLC**

135 N Price Rd  
 Pampa, TX 79065

www.mwptlab.com

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 #2  
 Trace: 272534  
 Sample Temp.: N/A  
 Atmospheric Temp.: N/A  
 Pressure: N/A  
 Field Data: N/A  
 Sample Date: 7/20/11 Time: 5:00 pm  
 Sampled By: N/A  
 Analysis Date: 7/29/11  
 Analysis By: Neil Ray

Lab #: 6010  
 Quality Control Report: 1580

**Analytical Results**

<b>Gas Composition</b>	<b>Mol %</b>	<b>GPM</b>	<b>Vol %</b>	<b>Wt. %</b>
Nitrogen (N2):	98.6812	10.7986	97.3802	97.6587
Carbon Dioxide (CO2):	0.9075	0.1530	1.3890	1.4078
<b>Hydrocarbon Composition</b>	<b>Mol %</b>	<b>GPM</b>	<b>Vol %</b>	<b>Wt. %</b>
Methane (CH4):	0.0862	0.0146	0.1310	0.0487
Ethane (C2H6):	0.0000	0.0000	0.0000	0.0000
Propane (C3H8):	0.0045	0.0012	0.0112	0.0070
Iso-Butane (C4H10):	0.0083	0.0027	0.0242	0.0169
N-Butane (C4H10):	0.0422	0.0132	0.1194	0.0864
Iso-Pentane (C5H12):	0.0373	0.0136	0.1224	0.0947
N-Pentane (C5H12):	0.0509	0.0184	0.1657	0.1296
Hexane+ (C6H14):	0.1820	0.0785	0.6567	0.5501
<b>Totals</b>	<b>100.0000</b>	<b>11.0939</b>	<b>100.0000</b>	<b>100.0000</b>

**Comments - Additional Data**

BTU -dry ( BTU/ft <sup>3</sup> ):	15.5	Z-Comp. Factor-dry:	0.99966
BTU -water vapor sat.( BTU/ft <sup>3</sup> ):	16.1	Z-Comp. Factor-water vapor sat.:	0.99532
Specific Gravity -dry:	0.9779	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	0.9759		

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 806-665-0753  
 877-788-0750

**Midwest Precision Testing LLC**

135 N Price Rd  
 Pampa, TX 79065

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

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

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

Sample Id.: Influent #3  
 Trace: 272535  
 Sample Temp.: N/A  
 Atmospheric Temp.: N/A  
 Pressure: N/A  
 Field Data: N/A  
 Sample Date: 7/20/11 Time: 10:00 pm  
 Sampled By: N/A  
 Analysis Date: 7/29/11  
 Analysis By: Neil Ray

Lab #: 6011  
 Quality Control Report: 1580

**Analytical Results**

<b>Gas Composition</b>	<b>Mol %</b>	<b>GPM</b>	<b>Vol %</b>	<b>Wt. %</b>
Nitrogen (N2):	98.4486	10.7732	96.9688	97.2766
Carbon Dioxide (CO2):	1.0935	0.1844	1.6706	1.6937
<b>Hydrocarbon Composition</b>	<b>Mol %</b>	<b>GPM</b>	<b>Vol %</b>	<b>Wt. %</b>
Methane (CH4):	0.0995	0.0169	0.1510	0.0562
Ethane (C2H6):	0.0000	0.0000	0.0000	0.0000
Propane (C3H8):	0.0074	0.0020	0.0184	0.0116
Iso-Butane (C4H10):	0.0074	0.0024	0.0218	0.0152
N-Butane (C4H10):	0.0466	0.0146	0.1315	0.0952
Iso-Pentane (C5H12):	0.0399	0.0145	0.1305	0.1010
N-Pentane (C5H12):	0.0535	0.0193	0.1736	0.1358
Hexane+ (C6H14):	0.2036	0.0879	0.7336	0.6147
<b>Totals</b>	<b>100.0000</b>	<b>11.1152</b>	<b>100.0000</b>	<b>100.0000</b>

**Comments - Additional Data**

BTU -dry ( BTU/ft <sup>3</sup> ):	17.1	Z-Comp. Factor-dry:	0.99966
BTU -water vapor sat.( BTU/ft <sup>3</sup> ):	17.7	Z-Comp. Factor-water vapor sat.:	0.99527
Specific Gravity -dry:	0.9795	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	0.9775		

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**Midwest Precision Testing LLC**

135 N Price Rd  
 Pampa, TX 79065

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

Sample Id.: DCG  
 Reference Std. 47366AW  
 Sample Temp.: 120° F  
 Analysis Date: 7/29/11  
 Analysis By: Neil Ray

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

Quality Control Report#: 1580

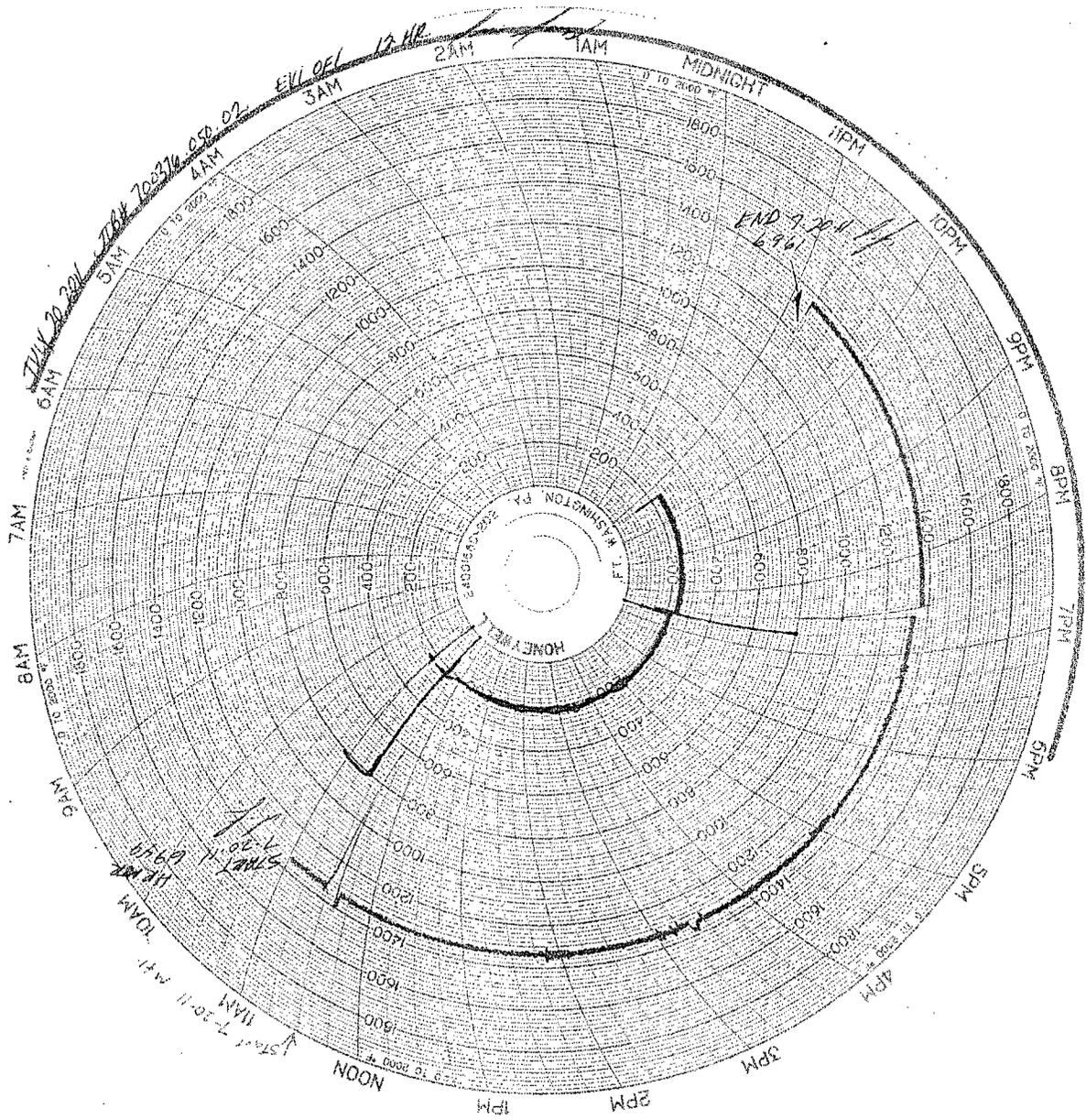
**Analytical Results**

<b>RESULTS</b>	<b>ACTUAL</b>	<b>ANALYSIS</b>			
<b><u>Gas Composition</u></b>			<b>MDL</b>	<b>RL</b>	<b>% Deviation</b>
	<b>Mol %</b>	<b>Mol %</b>	<b>Mol %</b>	<b>ppm mol</b>	<b>(90-100%)</b>
Nitrogen (N2):	4.926	4.7451	0.0010	10	96.3
Carbon Dioxide (CO2):	1.489	1.4885	0.0010	10	100.0
			<b>MDL</b>	<b>RL</b>	<b>% Deviation</b>
<b><u>Hydrocarbon Composition</u></b>	<b>Mol %</b>	<b>Mol %</b>	<b>Mol %</b>	<b>ppm mol</b>	<b>(90-100%)</b>
Methane (CH4):	69.955	70.5102	0.0001	1	99.2
Ethane (C2H6):	9.138	9.0967	0.0001	1	99.5
Propane (C3H8):	5.947	5.8182	0.0001	1	97.8
Iso-Butane (C4H10):	3.018	2.9541	0.0001	1	97.9
N-Butane (C4H10):	3.021	2.9588	0.0001	1	97.9
Iso-Pentane (C5H12):	1.001	0.9971	0.0001	1	99.6
N-Pentane (C5H12):	1.007	0.9773	0.0001	1	97.0
Hexane+ (C6H14):	0.498	0.4541	0.0001	1	91.2
<b>Totals</b>	<b>100.000</b>	<b>100.000</b>			

**Comments - Additional Data**

<b>ACTUAL</b>		<b>ANALYSIS</b>	
BTU -dry (BTU/ft3):	1322.3	BTU -dry (BTU/ft <sup>3</sup> ):	1316.1
BTU -water vapor sat. (BTU/ft3):	1316.6	BTU -water vapor sat. (BTU/ft <sup>3</sup> ):	1310.4
Specific Gravity -dry:	0.8337	Specific Gravity -dry:	0.8278
Specific Gravity -water vapor sat.:	0.8406	Specific Gravity -water vapor sat.:	0.8347
Z-Comp. Factor -dry:	0.99565	Z-Comp. Factor -dry:	0.99571
Z-Comp. Factor -water vapor sat.:	0.98309	Z-Comp. Factor -water vapor sat.:	0.98320

**ATTACHMENT 3**  
Oxidizer Charts



**ATTACHMENT 4**  
Waste Ticket

S. C. C 35434  
ICC MC #259649

TRANSPORTS  
FRAC TANKS  
VAC TRUCKS  
WINCH TRUCKS

# PATE TRUCKING CO. *JP*

Denver City(806) 592-2772  
Hobbs (575) 397-6264  
Levelland(806) 897-1705  
Seminole(432) 758-2166

*Plans*

B  
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O

CONTRACT NUMBER		FIELD ORDER NUMBER	167069
A. F. E. NUMBER		DATE	8-3-11
REQ. OR PURCHASE ORDER NUMBER		ORDERED BY	BRAD IVY

DELIVERED FROM	Location	TO	Moore Jal #1
LOCATION	Kimbrough Sweet 8"	WELL OR RIG NO.	
TRUCK OR UNIT NO.	73	CAPACITY	130
		AMOUNT HAULED	40
		START TIME	
		AMEND TIME	
		AM/PM	PM
		AM/PM	PM
		AM/PM	PM

DESCRIPTION	OHR.	OBL.	RATE	AMOUNT
Drive to location	4	Hrs.	82 00	328 00
mt containers on location		Bbls		
took 40 BBLs Fluids and oil		Bbls		
to moore Jal #1		KCL		
		Disp		
		Disp		
		Helper		
		Tank Min		
		Day Rental		
SRS 2000-10757		Chart Recorder		
				328 00

TOP GAUGE    BOTTOM GAUGE    SET DATE    RELEASE DATE

FOR OFFICE USE ONLY

TAX	22.00
NET TOTAL	350.00

Thank You

*Alfredo Saldaña*  
OPERATOR OR DRIVER

*Jason Henry* 08/15/2011  
AUTHORIZED BY:  
SRS # 2000-10757