AP - 9

STAGE 2 REPORT

Date

11-17-11

AP-9

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

AUSTIN
911 W. Anderson Lane
Suite 202
Austin, Texas 78757
Phone 512.989.3428
Fax 512.989.3487

MIDLAND
2901 State Highway 349
Midland, Texas 79706
Phone 432.522.2133
Fax 432.522.2180

SAN ANTONIO
11 Commercial Place
Schertz, Texas 78154
Phone 210.265.8025
Fax 210.568.2191

TULSA
525 South Main Street
Suite 535
Tulsa, Oklahoma 74103
Phone 918.742.0871
Fax 918.382.0232

HOBBS
318 East Taylor Street
Hobbs, New Mexico 88241
Phone 505.393.4261
Fax 505.393.4658

ARTESIA
408 W. Texas Ave.
Artesia, New Mexico 88210
Phone 575.746.8768
Fax 505.746.8905

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 # 700376.099.01

RECEIVED OCD
2011 DEC -6 A 10:42

PREPARED FOR:

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

PREPARED BY:

TALON/LPE
921 N. BIVINS
AMARILLO, TEXAS 79107

DISTRIBUTION:

COPY 1 - PLAINS MARKETING, L.P. - MIDLAND
COPY 2 - PLAINS MARKETING, L.P. - HOUSTON
COPY 3 – NMOCD – SANTA FE
COPY 4 - NOVA
COPY 5 - TALON/LPE

November 17, 2011

PLAINS
PIPELINE, L.P.

RECEIVED OCD
2011 DEC -6 A 10:43

December 2, 2011

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 Seven (7) 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 September 2011:

HDO 90-23	NMOCD Reference #AP-009
SPS-11	NMOCD Reference #GW-140
Livingston Ridge to Hugh P. Sims	NMOCD Reference #1R-0398
Monument 10	NMOCD Reference #1R-0119
Monument 18	NMOCD Reference #1R-0124
DCP Plant to Lea Station 6-inch #2	NMOCD Reference #1R-2136
DCP Plant to Lea Station 6-inch Sec. 31	NMOCD Reference #1R-2166

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

Sincerely,

Jason Henry
Remediation Coordinator
Plains Pipeline, L.P.

Enclosure

TABLE OF CONTENTS

Section Page

I. MDPE SUMMARY REPORT AND WASTE DISPOSITION i
A. MDPE Results 1
B. Air Quality 2
C. Waste Management and Disposition 2

II. SYSTEM OPERATION DATA AND MASS RECOVERY CALCULATIONS 2

Table 1 3

Attachments:

Attachment 1 - MDPE field logs
Attachment 2 - Laboratory Analytical Results
Attachment 3 – Oxidizer Charts
Attachment 4 – Waste Tickets

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 on September 15, 2011 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, MW-6, RW-1, & RW-2 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 **74.20 equivalent gallons of PSH (Total)** were removed during the event. The combined volume of PSH was comprised of approximately **12 gallons of PSH (liquid phase)** and approximately **62.20 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 207.24 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 49,327 ppmv for Hydrocarbon Composition. Laboratory analytical results can be found in Attachment 2.

C. Waste Management and Disposition

A cumulative total of 2,505 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:

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

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

Recovery (lbs) = (lbs/hr) x (hrs)

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

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

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)	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	59	15	204.14	81	224.64	50000	-	49327.00	1.00	49327	47.64	40.01	0.00	0.00
11:30	1	64	16	217.74	78	211.92	50000	49327.00	49327.00	1.00	49327	47.19	37.38	37.38	37.38
12:30	1	69	17	231.35	73	196.60	50000	-	49327.00	1.00	49327	46.74	34.35	34.35	71.74
13:30	1	69	17	231.35	73	196.60	50000	-	49327.00	1.00	49327	46.74	34.35	34.35	106.09
14:30	1	69	17	231.35	73	196.60	50000	-	44721.00	1.00	44721	40.54	29.80	29.80	135.89
15:30	1	69	17	231.35	73	196.60	50000	-	44721.00	1.00	44721	40.54	29.80	29.80	165.68
16:30	1	69	17	231.35	73	196.60	50000	44721.00	44721.00	1.00	44721	40.54	29.80	29.80	195.48
17:30	1	69	17	231.35	75	199.28	50000	-	44721.00	1.00	44721	40.54	30.20	30.20	225.69
18:30	1	69	16	217.74	80	213.61	50000	-	44721.00	1.00	44721	40.54	32.38	32.38	258.06
19:30	1	69	16	217.74	80	213.61	50000	-	23837.00	1.00	23837	26.05	20.80	20.80	278.86
20:30	1	68	16	217.74	81	215.14	50000	-	23837.00	1.00	23837	26.10	20.99	20.99	299.85
21:30	1	68	16	217.74	81	215.14	50000	23837.00	23837.00	1.00	23837	26.10	20.99	20.99	320.84
22:30	1	68	16	217.74	83	217.78	50000	-	23837.00	1.00	23837	26.10	21.25	21.25	342.08
Averages:		67.62	16.38	222.98	77.23	207.24	50000.00						Total	342.08	

PSH Mass Recovered in Vapor Phase = 62.20 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.
(C_ppmv)	(Grams)	(atm)	(atm.liter/K.mole)	(F)	(K)	(C_mg/l)
49327	22.83747522	1	0.0821	59	288	47.64278573

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

Liquid-phase Hydrocarbon Recovery

(assumes gasoline product)

$\prod * r^2 * h$ = volume

Total Hydrocarbon Recovery

PSH Mass Recovered in Vapor Phase =	342.08	lbs
	62.20	gallons
PSH Mass Recovered in Liquid Phase =	66.00	lbs
	12.00	gallons
TOTAL =	**408.08**	**lbs**
	74.20	**gallons**

Gallons removed determined at time of pick up

PSH Volume in Gallons=	12
PSH Mass in Pounds=	66

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

Compound	Molecular Weight (g/mol)	% total	=	ppmv
Methane (CH4)	16.04	4.3106		43106.00
Ethane (C2H6)	30.07	0.001		10.00
Propane (C3H8)	44.10	0.0208		208.00
Iso-Butane (C4H10)	58.12	0.1313		1313.00
N-Butane (C4H10)	58.12	0.0936		936.00
Iso-Pentane (C4H12)	72.15	0.14		1400.00
N-Pentane (C5H12)	72.15	0.064		640.00
Hexane+ (C6H14)	86.18	0.1714		1714.00
			Total	**49327.00**

Molecular Weight Calculations

Total Hydrocarbon %=	4.9327
g of Methane (CH4) =	14.01707462
g of Ethane (C2H6) =	0.006096053
g of Propane (C3H8) =	0.185959008
g of Iso-Butane (C4H10) =	1.547054554
g of N-Butane (C4H10) =	1.102850771
g of Iso-Pentane (C4H12) =	2.047762888
g of N-Pentane (C5H12) =	0.936120178
g of Hexane+ (C6H14) =	2.994557139
Calculated MW (Grams)	**22.83747522**

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

Compound	Molecular Weight (g/mol)	% total	=	ppmv
Methane (CH4)	16.04	3.9936		39936.00
Ethane (C2H6)	30.07	0.0002		2.00
Propane (C3H8)	44.10	0.0252		252.00
Iso-Butane (C4H10)	58.12	0.1553		1553.00
N-Butane (C4H10)	58.12	0.0342		342.00
Iso-Pentane (C4H12)	72.15	0.0441		441.00
N-Pentane (C5H12)	72.15	0.0407		407.00
Hexane+ (C6H14)	86.18	0.1788		1788.00
			Total	**44721.00**

Molecular Weight Calculations

Total Hydrocarbon %=	4.4721
g of Methane (CH4) =	14.32377272
g of Ethane (C2H6) =	0.001344782
g of Propane (C3H8) =	0.248500704
g of Iso-Butane (C4H10) =	2.018299233
g of N-Butane (C4H10) =	0.4444677
g of Iso-Pentane (C4H12) =	0.711481183
g of N-Pentane (C5H12) =	0.656627759
g of Hexane+ (C6H14) =	3.445581271
Calculated MW (Grams)	**21.85007536**

% Total Hydrocarbon to mg/m³ to ppmv - Influent 3

Compound	Molecular Weight (g/mol)	% total	=	ppmv
Methane (CH4)	16.04	1.9165		19165.00
Ethane (C2H6)	30.07	0		0.00
Propane (C3H8)	44.10	0.0465		465.00
Iso-Butane (C4H10)	58.12	0.1064		1064.00
N-Butane (C4H10)	58.12	0.074		740.00
Iso-Pentane (C4H12)	72.15	0.0456		456.00
N-Pentane (C5H12)	72.15	0.0404		404.00
Hexane+ (C6H14)	86.18	0.1543		1543.00
			Total	**23837.00**

Molecular Weight Calculations

Total Hydrocarbon %=	2.3837
g of Methane (CH4) =	12.89619499
g of Ethane (C2H6) =	0
g of Propane (C3H8) =	0.860280237
g of Iso-Butane (C4H10) =	2.594272769
g of N-Butane (C4H10) =	1.804287452
g of Iso-Pentane (C4H12) =	1.380224021
g of N-Pentane (C5H12) =	1.222830054
g of Hexane+ (C6H14) =	5.578543441
Calculated MW (Grams)	**26.33663297**

ATTACHMENT 1

MDPE Field Logs

MDPE FIELD NOTES					
Site Name:	HDO 90-23			Event #:	1
Location:	NW of Eunice, NM			Arrive at site:	9/15/2011 8:30
Date:	9/15/2011				
Job#:	700376.099.01	SRS:	HDO 90-23	Start Vac:	9/15/2011 10:30
Phase:	MDPE	Unit:	1107	Stop Vac:	9/15/2011 22:30
Onsite Personnel:	M.Coggins & L.Jaquez			Leave Site:	9/15/2011 23:00

GAUGING DATA

WELL#	BEFORE			AFTER			COMMENTS
	PSH	GW	PSH-T	PSH	GW	PSH-T	
RW2	-	46.02	-	-	47.56	-	
RW1	-	45.83	-	-	45.99	-	
MW6	45.74	47.68	1.94	-	46.14	-	
MW2	46.05	46.27	0.22	-	46.12	-	
MW12	-	47.48	-	NG			
MW8	-	48.34	-	NG			
MW13	-	48.00	-	NG			
MW5	-	48.36	-	NG			
MW14	-	47.66	-	NG			
MW17	-	49.96	-	NG			
MW16	-	47.05	-	NG			
MW4	-	46.62	-	NG			
MW15	-	46.98	-	NG			
MW3	-	45.93	-	NG			
MW9	-	46.32	-	NG			
WASTE:	H2O:	2493		PSH:	12		TOTAL (GAL): 2505

Sample Name	Analysis	Date:	Time:	Comments:
INFLUENT	ASTM D1945	15-Sep-11	11:30	FID = >50K
INFLUENT	ASTM D1945	15-Sep-11	16:30	FID = >50K
INFLUENT	ASTM D1945	15-Sep-11	21:30	FID = >50K

Notes:	

Start Date: 15-Sep-11

MDPE FIELD DATA

		Well Flow						Well Data									
TIME	SAMPLE TAKEN *	Inflent temp. (°f)	Diff. Pressure (INH20) 2" Preso	Vac (In.Hg)	FID Composite (PPM)	Propane Tank (%-size) 250 Gal.	EXHAUST TEMP F	COMMENTS:									
								MW6		MW2		RW1		RW2			
								VAC (INH2O)	PPM	VAC (INH2O)	PPM	VAC (INH2O)	PPM	VAC (INH2O)	PPM	VAC (INH2O)	PPM
10:30		59	81	15	>50K	60	1422	All Extraction from bottom of stinger. No data available from wellhead.									
11:30	*	64	78	16	>50K	58	1407										
12:30		69	73	17	>50K	56	1410										
13:30		69	73	17	>50K	54	1409										
14:30		69	73	17	>50K	50	1407										
15:30		69	73	17	>50K	48	1414										
16:30	*	69	73	17	>50K	90	1408										
17:30		69	75	17	>50K	88	1411										
18:30		69	80	16	>50K	87	1408										
19:30		69	80	16	>50K	85	1407										
20:30		68	81	16	>50K	84	1409										
21:30	*	68	81	16	>50K	82	1407										
22:30		68	83	16	>50K	79	1407										

Soil Vacuum Influence

Observation Well	MW3
Extraction Well (EW)	MW2
Distance (ft) to EW	93
Time:	In.H2O
11:30	-0.03
16:30	0
21:30	0.01

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 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: September 29, 2011

Work Order: 11091918

Project Location: NW of Eunice New Mexico
Project Name: HDO 90-23
Project Number: 700376.099.01
SRS #: HDO 90-523

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
277799	Influent Air #1	air	2011-09-15	11:30	2011-09-19

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 3

Analytical Report 4
Sample 277799 (Influent Air #1) 4

Appendix 5
Laboratory Certifications 5
Standard Flags 5
Attachments 5

Case Narrative

Samples for project HDO 90-23 were received by TraceAnalysis, Inc. on 2011-09-19 and assigned to work order 11091918. Samples for work order 11091918 were received intact at a temperature of 22.4 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 11091918 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

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 # 1109198

Page 1 of 1

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
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

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

Company Name: TALON LPE / PLAINS ALL AMERICAN
Phone #: 806-467-0607
Address: (Street, City, Zip) 921 N. BIVINS AMARILLO TX 79107
Fax #: 806-467-0622
Contact Person: SIMON NALSHE
E-mail: SNALSHE@TALONLPE
Invoice to: (If different from above) JASON HENRY PLAINS ALL AMERICAN
Project #: 700376.099.01
Project Name: HDO 90-23
Project Location (including state): NW OF EUNICE NEW MEXICO
Sampler Signature:

ANALYSIS REQUEST
(Circle or Specify Method No.)

SRS# HDO 90-23

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
277799	INF AIR # 1	1	1 LTR			X							X	9-15-11	11:30
800	INF AIR # 2	1	1 LTR			X							X	9-15-11	16:30
801	INF AIR # 3	1	1 LTR			X							X	9-15-11	21:30

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, Fl, S04, NO3, NO2, Alkalinity	Na, Ca, Mg, K, TDS, EC	ASTM D 1945			Turn Around Time if different from standard	Hold
																			X				
																			X				
																			X				

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	
	TALON LPE	9-16-11	20:00					INST ____ °C OBS ____ °C COR ____ °C
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	
								INST ____ °C OBS ____ °C COR ____ °C
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	
				Brandon Ward	Trac Lubbock	9/19/11	8:00	INST IR °C OBS 22.8 °C COR 22.4 °C

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

REMARKS:

- ☐ 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 #

ORIGINAL COPY

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

Midwest Precision Testing LLC
135 N Price Rd
Pampa, TX 79065

www.mwptlab.com

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

COC #: N/A

Lab #: 6963-6965

Quality Control #: 1672

Approved by:

Neil Ray

Neil Ray

Date: 9/26/11

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

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

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

Sample Id.: Influent #1
Trace: 277799-1
Sample Temp.: N/A
Atmospheric Temp.: N/A
Pressure: N/A
Field Data: N/A
Sample Date: 9/15/11 Time: 11:30 am
Sampled By: N/A
Analysis Date: 9/26/11
Analysis By: Neil Ray

Lab #: 6963
Quality Control Report: 1672

Analytical Results

Gas Composition				
	Mol %	GPM	Vol %	Wt. %
Nitrogen (N2):	85.9070	9.4032	79.4808	81.6829
Carbon Dioxide (CO2):	10.8609	1.8319	15.5866	16.1887
Hydrocarbon Composition	**Mol %**	**GPM**	**Vol. %**	**Wt. %**
Methane (CH4):	3.0225	0.5132	4.3106	1.6420
Ethane (C2H6):	0.0004	0.0001	0.0010	0.0004
Propane (C3H8):	0.0090	0.0025	0.0208	0.0134
Iso-Butane (C4H10):	0.0477	0.0155	0.1313	0.0939
N-Butane (C4H10):	0.0353	0.0111	0.0936	0.0694
Iso-Pentane (C5H12):	0.0455	0.0166	0.1400	0.1111
N-Pentane (C5H12):	0.0210	0.0076	0.0640	0.0513
Hexane+ (C6H14):	0.0506	0.0219	0.1714	0.1471
Totals	100.0000	11.8234	100.0000	100.0000

Comments - Additional Data

BTU -dry (BTU/ft^3):	38.6	Z-Comp. Factor-dry:	0.99940
BTU -water vapor sat.(BTU/ft^3):	39.1	Z-Comp. Factor-water vapor sat.:	0.99374
Specific Gravity -dry:	1.0180	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	1.0169		

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

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

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

Sample Id.: Influent #2
Trace: 277800-1
Sample Temp.: N/A
Atmospheric Temp.: N/A
Pressure: N/A
Field Data: N/A
Sample Date: 9/15/11 Time: 4:30 pm
Sampled By: N/A
Analysis Date: 9/26/11
Analysis By: Neil Ray

Lab #: 6964
Quality Control Report: 1672

Analytical Results

Gas Composition				
	Mol %	**GPM**	**Vol %**	**Wt. %**
Nitrogen (N2):	86.2241	9.4378	79.9611	81.9802
Carbon Dioxide (CO2):	10.8217	1.8253	15.5667	16.1294
Hydrocarbon Composition	**Mol %**	**GPM**	**Vol. %**	**Wt. %**
Methane (CH4):	2.7937	0.4744	3.9936	1.5176
Ethane (C2H6):	0.0001	0.0000	0.0002	0.0001
Propane (C3H8):	0.0109	0.0030	0.0252	0.0162
Iso-Butane (C4H10):	0.0563	0.0183	0.1553	0.1107
N-Butane (C4H10):	0.0129	0.0040	0.0342	0.0253
Iso-Pentane (C5H12):	0.0143	0.0052	0.0441	0.0349
N-Pentane (C5H12):	0.0133	0.0048	0.0407	0.0325
Hexane+ (C6H14):	0.0527	0.0228	0.1788	0.1531
Totals	100.0000	11.7955	100.0000	100.0000

Comments - Additional Data

BTU -dry (BTU/ft^3):	34.5	Z-Comp. Factor-dry:	0.99941
BTU -water vapor sat.(BTU/ft^3):	34.9	Z-Comp. Factor-water vapor sat.:	0.99379
Specific Gravity -dry:	1.0181	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	1.0169		

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

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

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

Sample Id.: Influent #3
Trace: 277801-1
Sample Temp.: N/A
Atmospheric Temp.: N/A
Pressure: N/A
Field Data: N/A
Sample Date: 9/15/11 Time: 9:30 pm
Sampled By: N/A
Analysis Date: 9/26/11
Analysis By: Neil Ray

Lab #: 6965
Quality Control Report: 1672

Analytical Results

Gas Composition				
	Mol %	**GPM**	**Vol %**	**Wt. %**
Nitrogen (N2):	89.7557	9.8236	84.7676	85.7839
Carbon Dioxide (CO2):	8.7708	1.4792	12.8487	13.1409
Hydrocarbon Composition	**Mol %**	**GPM**	**Vol. %**	**Wt. %**
Methane (CH4):	1.3164	0.2235	1.9165	0.7188
Ethane (C2H6):	0.0000	0.0000	0.0000	0.0000
Propane (C3H8):	0.0197	0.0054	0.0465	0.0295
Iso-Butane (C4H10):	0.0379	0.0123	0.1064	0.0749
N-Butane (C4H10):	0.0273	0.0086	0.0740	0.0541
Iso-Pentane (C5H12):	0.0145	0.0053	0.0456	0.0356
N-Pentane (C5H12):	0.0130	0.0047	0.0404	0.0318
Hexane+ (C6H14):	0.0447	0.0193	0.1543	0.1304
Totals	100.0000	11.5819	100.0000	100.0000

Comments - Additional Data

BTU -dry (BTU/ft^3):	19.3	Z-Comp. Factor-dry:	0.99949
BTU -water vapor sat.(BTU/ft^3):	19.9	Z-Comp. Factor-water vapor sat.:	0.99420
Specific Gravity -dry:	1.0126	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	1.0111		

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

Midwest Precision Testing LLC
135 N Price Rd
Pampa, TX 79065

www.mwptlab.com

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

Sample Id.: DCG
Reference Std. 47366AW
Sample Temp.: 120° F
Analysis Date: 9/26/11
Analysis By: Neil Ray

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

Quality Control Report#: 1672

Analytical Results

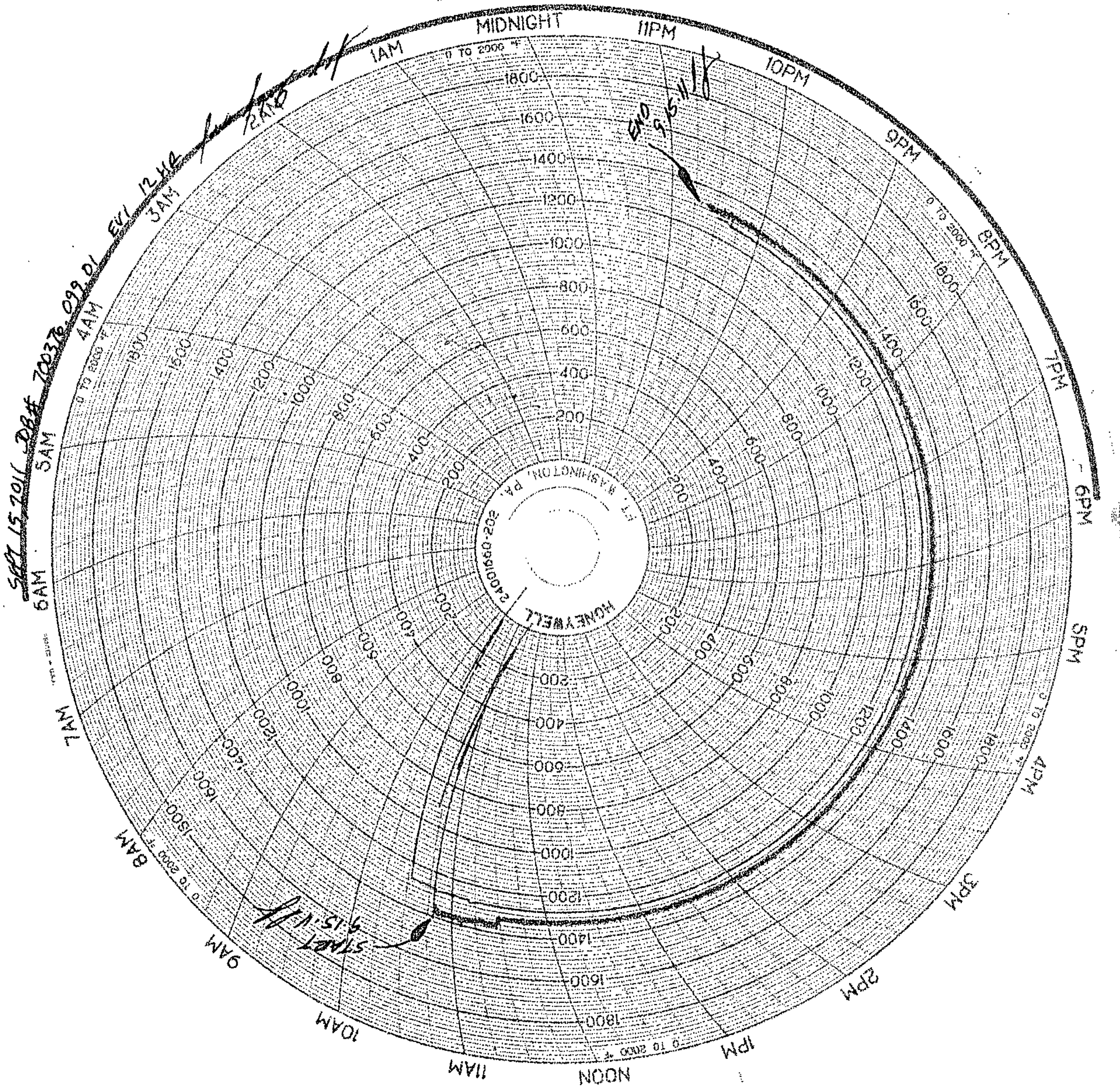
RESULTS	ACTUAL	ANALYSIS			
Gas Composition			MDL	RL	% Deviation
	Mol %	Mol %	Mol %	ppm mol	(90-100%)
Nitrogen (N2):	4.926	4.9098	0.0010	10	99.7
Carbon Dioxide (CO2):	1.489	1.4796	0.0010	10	99.4
			MDL	RL	% Deviation
Hydrocarbon Composition	Mol %	Mol %	Mol %	ppm mol	(90-100%)
Methane (CH4):	69.955	70.2404	0.0001	1	99.6
Ethane (C2H6):	9.138	9.0434	0.0001	1	99.0
Propane (C3H8):	5.947	5.8388	0.0001	1	98.2
Iso-Butane (C4H10):	3.018	2.9734	0.0001	1	98.5
N-Butane (C4H10):	3.021	2.9932	0.0001	1	99.1
Iso-Pentane (C5H12):	1.001	1.0165	0.0001	1	98.4
N-Pentane (C5H12):	1.007	0.9901	0.0001	1	98.3
Hexane+ (C6H14):	0.498	0.5148	0.0001	1	96.6
Totals	100.000	100.000			

Comments - Additional Data

ACTUAL		ANALYSIS	
BTU -dry (BTU/ft3):	1322.3	BTU -dry (BTU/ft^3):	1319.2
BTU -water vapor sat. (BTU/ft3):	1316.6	BTU -water vapor sat. (BTU/ft^3):	1313.5
Specific Gravity -dry:	0.8337	Specific Gravity -dry:	0.8314
Specific Gravity -water vapor sat.:	0.8406	Specific Gravity -water vapor sat.:	0.8383
Z-Comp. Factor -dry:	0.99565	Z-Comp. Factor -dry:	0.99568
Z-Comp. Factor -water vapor sat.:	0.98309	Z-Comp. Factor -water vapor sat.:	0.98314

ATTACHMENT 3

Oxidizer Charts


SEPT 15 2011 JOB# 70037?.099.01 EV1 12 HR
MIDNIGHT
1AM
2AM
3AM
4AM
5AM
6AM
7AM
8AM
9AM
10AM
11AM
NOON
1PM
2PM
3PM
4PM
5PM
6PM
7PM
8PM
9PM
10PM
11PM
0 TO 2000 °F
200
400
600
800
1000
1200
1400
1600
1800
HONEYWELL
FT. WASHINGTON, PA.
C4001660-202
START 9.15.11
END 9.15.11

ATTACHMENT 4

Waste Tickets

S. C. C. 35434
ICC MC #259649

TRANSPORTS
FRAC TANKS
VAC TRUCKS
WINCH TRUCKS

PATE TRUCKING CO.

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

BILL TO: Plains

CONTRACT NUMBER		FIELD ORDER NUMBER	166309
A. F. E. NUMBER		DATE	10-6-11
REQ. OR PURCHASE ORDER NUMBER		ORDERED BY	JASON HENRY

DELIVERED FROM: LOCATION
TO: SWD

LOCATION: HDO-90-23
WELL OR RIG NO.:

TRUCK OR UNIT NO.	CAPACITY	AMOUNT HAULED	START TIME AM/PM	END TIME AM/PM	HOURS CHGD.
110					4

DESCRIPTION	OHR. OBBL.		RATE	AMOUNT
Provide Vac Truck				
Haul 45 BBL PW TO SWD	4	Hrs.	82 00	328 00
		Bbls		
		Bbls		
		KCL		
	45	Disp	1 10	49 00
		Disp		
		Helper		
		Tank Min		
		Day Rental		
		Chart Recorder		
				377 00

TOP GAUGE BOTTOM GAUGE SET DATE RELEASE DATE

FOR OFFICE USE ONLY

TAX	25.00
NET TOTAL	402.00

Thank You

Joe Haas
OPERATOR OR DRIVER

SRS # TNM HDO 90-23

Jason Henry 11/10/2011
AUTHORIZED BY: