1R- 398

REPORTS

DATE:

10-5-11

IR-398

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921 North Bivins
Amarillo, Texas 79107
Phone 806.467.0607
Fax 806.467.0622

AUSTIN
3003 Tom Gary Cove
Building C-100
Round Rock, Texas 78664
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MIDLAND
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Midland, Texas 79706
Phone 432.522.2133
Fax 432.522.2180

SAN ANTONIO
17170 Jordan Road
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Selma, Texas 78154
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Tyler, Texas 75702
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3233 West 11th Street
Suite 400
Houston, Texas 77008
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ENVIRONMENTAL CONSULTING
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MOBILE DUAL PHASE EXTRACTION REPORT
LIVINGSTON RIDGE TO HUGH-P.SIMS PIPELINE RELEASE
LEA COUNTY, NEW MEXICO
SRS # 2001-1005
TALON/LPE PROJECT # 700376.100.01

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:

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October 5, 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

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 September 15, 2011 to September 16, 2011 at the Livingston Ridge to Hugh-P.Sims 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. MW1, 4, 5, & TMW1 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 **89 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 **77 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 213.30 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 39,149 ppmv for Hydrocarbon Composition. Laboratory analytical results can be found in Attachment 2.

C. Waste Management and Disposition

A cumulative total of 3,291 gallons of fluid were generated during this event. The fluids were temporarily transferred to an on-site storage tank prior to being transported 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:

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

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

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)
0:00	0.5	68	16	217.74	80	213.81	50000	-	31377.00	1.00	31377	42.51	33.98	16.99	16.99
0:30	0.5	68	16	217.74	79	212.47	50000	31377.00	31377.00	1.00	31377	42.51	33.76	16.88	33.87
1:30	1	67	16	217.74	80	214.01	50000	-	31377.00	1.00	31377	42.59	34.07	34.07	67.94
2:30	1	66	16	217.74	79	212.87	50000	-	31377.00	1.00	31377	42.67	33.96	33.96	101.90
3:30	1	66	16	217.74	79	212.87	50000	-	39149.00	1.00	39149	54.17	43.11	43.11	145.00
4:30	1	66	16	217.74	80	214.21	50000	-	39149.00	1.00	39149	54.17	43.38	43.38	188.38
5:30	1	66	16	217.74	80	214.21	50000	39149.00	39149.00	1.00	39149	54.17	43.38	43.38	231.76
6:30	1	66	16	217.74	80	214.21	50000	-	39149.00	1.00	39149	54.17	43.38	43.38	275.14
7:30	1	66	16	217.74	80	214.21	50000	-	39149.00	1.00	39149	54.17	43.38	43.38	318.52
8:30	1	68	16	217.74	80	213.81	50000	-	18962.00	1.00	18962	33.14	26.49	26.49	345.00
9:30	1	68	16	217.74	79	212.47	50000	-	18962.00	1.00	18962	33.14	26.32	26.32	371.32
10:30	1	70	16	217.74	79	212.07	50000	18962.00	18962.00	1.00	18962	33.01	26.17	26.17	397.50
11:30	1	72	16	217.74	79	211.67	50000	-	18962.00	1.00	18962	32.89	26.02	26.02	423.52
Averages:		67.46	16.00	217.74	79.54	213.30	50000.00						Total	423.52	

PSH Mass Recovered in Vapor Phase = 77.00 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)
31377	32.58982407	1	0.0821	68	293	42.50917303

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

Gallons removed determined at time of pick up

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

Total Hydrocarbon Recovery

PSH Mass Recovered in Vapor Phase =	423.52	lbs
	77.00	gallons
PSH Mass Recovered in Liquid Phase =	66.00	lbs
	12.00	gallons
TOTAL =	**489.52**	**lbs**
	89.00	**gallons**

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

Compound	Molecular Weight (g/mol)	% total	=	ppmv
Methane (CH4)	16.04	2.1809		21809.00
Ethane (C2H6)	30.07	0.0002		2.00
Propane (C3H8)	44.10	0.0292		292.00
Iso-Butane (C4H10)	58.12	0.2358		2358.00
N-Butane (C4H10)	58.12	0.0877		877.00
Iso-Pentane (C4H12)	72.15	0.1803		1803.00
N-Pentane (C5H12)	72.15	0.1664		1664.00
Hexane+ (C6H14)	86.18	0.2572		2572.00
			Total	**31377.00**

Molecular Weight Calculations

Total Hydrocarbon %=	3.1377
g of Methane (CH4) =	11.14881474
g of Ethane (C2H6) =	0.001916691
g of Propane (C3H8) =	0.410402524
g of Iso-Butane (C4H10) =	4.367752175
g of N-Butane (C4H10) =	1.624477802
g of Iso-Pentane (C4H12) =	4.145917392
g of N-Pentane (C5H12) =	3.826293145
g of Hexane+ (C6H14) =	7.06424961
Calculated MW (Grams)	**32.58982407**

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

Compound	Molecular Weight (g/mol)	% total	=	ppmv
Methane (CH4)	16.04	2.244		22440.00
Ethane (C2H6)	30.07	0.3264		3264.00
Propane (C3H8)	44.10	0.2634		2634.00
Iso-Butane (C4H10)	58.12	0.2817		2817.00
N-Butane (C4H10)	58.12	0.2535		2535.00
Iso-Pentane (C4H12)	72.15	0.2049		2049.00
N-Pentane (C5H12)	72.15	0.206		2060.00
Hexane+ (C6H14)	86.18	0.135		1350.00
			Total	**39149.00**

Molecular Weight Calculations

Total Hydrocarbon %=	3.9149
g of Methane (CH4) =	9.194043271
g of Ethane (C2H6) =	2.507049478
g of Propane (C3H8) =	2.967110271
g of Iso-Butane (C4H10) =	4.182074638
g of N-Butane (C4H10) =	3.763421799
g of Iso-Pentane (C4H12) =	3.776222892
g of N-Pentane (C5H12) =	3.79649544
g of Hexane+ (C6H14) =	2.971800046
Calculated MW (Grams)	**33.15821783**

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

Compound	Molecular Weight (g/mol)	% total	=	ppmv
Methane (CH4)	16.04	0.9477		9477.00
Ethane (C2H6)	30.07	0.0222		222.00
Propane (C3H8)	44.10	0.0409		409.00
Iso-Butane (C4H10)	58.12	0.0985		985.00
N-Butane (C4H10)	58.12	0.1875		1875.00
Iso-Pentane (C4H12)	72.15	0.2191		2191.00
N-Pentane (C5H12)	72.15	0.2252		2252.00
Hexane+ (C6H14)	86.18	0.1551		1551.00
			Total	**18962.00**

Molecular Weight Calculations

Total Hydrocarbon %=	1.8962
g of Methane (CH4) =	8.016616391
g of Ethane (C2H6) =	0.352048307
g of Propane (C3H8) =	0.951212952
g of Iso-Butane (C4H10) =	3.019101361
g of N-Butane (C4H10) =	5.747020357
g of Iso-Pentane (C4H12) =	8.336707626
g of N-Pentane (C5H12) =	8.568811307
g of Hexane+ (C6H14) =	7.049107689
Calculated MW (Grams)	**42.04062599**

ATTACHMENT 1

MDPE Field Logs

MDPE FIELD NOTES					
Site Name:	Livingston Ride to Hugh P-Sims			Event #:	1
Location:	NE of Eunice, NM			Arrive at site:	9/15/2011 23:15
Date:	9/15-16/2011				
Job#:	700376.100.01	SRS#:	2001-1005	Start Vac:	9/15/2011 23:30
Phase:	MDPE	Unit:	1107	Stop Vac:	9/16/2011 11:30
Onsite Personnel:	L. Jaquez & M. Coggins			Leave Site:	9/16/2011 12:30

GAUGING DATA							
WELL#	BEFORE			AFTER			COMMENTS
	PSH	GW	PSH-T	PSH	GW	PSH-T	
MW1	35.60	35.66	0.06	-	34.47	-	
TMW1	33.00	37.16	4.16	-	34.55	-	
MW5	-	32.23	-	-	32.85	-	
MW4	33.93	33.96	0.03	-	34.18	-	
MW8	-	34.80	-	NG			
MW10	-	31.50	-	NG			
MW7	-	30.53	-	NG			
MW3	Dry			NG			
MW2	-	39.00	-	NG			
MW9	-	37.19	-	NG			
MW6	-	38.41	-	NG			
MW12	-	30.36	-	NG			
MW13	-	33.85	-	NG			
MW11	-	35.41	-	NG			
MW15	-	39.25	-	NG			
MW14	-	33.15	-	NG			
WASTE:	H2O:	3279		PSH:	12		TOTAL (GAL): 3291

Sample Name	Analysis	Date:	Time:	Comments:
INFLUENT	ASTM D 1945	9/16/2011	0:30	FID = >50K
INFLUENT	ASTM D 1945	9/16/2011	5:30	FID = >50K
INFLUENT	ASTM D 1945	9/16/2011	10:30	FID = >50K
EFFLUENT				

Notes:	

Start Date: 9/15/2011

MDPE FIELD DATA

		Total Flow			Well Flow						Well Data									
TIME	SAMPLE TAKEN *	Inflent temp. (°f)	Diff. Pressure (INH20) 6" Pitot	Pressure (In. h2O)	Inflent temp. (°f)	Diff. Pressure (INH20) 2" Preso	Vac (In.Hg)	FID Composite (PPM)	Propane Tank (%-size) 250 Gal.	EXHAUST TEMP F	COMMENTS:									
											MW4		MW1		MW5		TMW1			
											VAC (INH2O)	PPM	VAC (INH2O)	PPM	VAC (INH2O)	PPM	VAC (INH2O)	PPM	VAC (INH2O)	PPM
0:00		88	0.3	0.25	68	80	16	>50K	61	1414										
0:30	*	90	0.3	0.25	68	79	16	>50K	60	1414										
1:30		88	0.3	0.25	67	80	16	>50K	58	1411										
2:30		86	0.4	0.25	66	79	16	>50K	56	1413										
3:30		86	0.4	0.25	66	79	16	>50K	52	1415										
4:30		86	0.3	0.25	66	80	16	>50K	48	1411										
5:30	*	86	0.4	0.25	66	80	16	>50K	45	1408	All recovery through stinger. No data collected.									
6:30		86	0.3	0.25	66	80	16	>50K	42	1410										
7:30		86	0.3	0.25	66	80	16	>50K	40	1413										
8:30		88	0.3	0.25	68	80	16	>50K	38	1409										
9:30		90	0.4	0.25	68	79	16	>50K	36	1411										
10:30	*	93	0.4	0.25	70	79	16	>50K	30	1414										
11:30		96	0.3	0.25	72	79	16	>50K	28	1412										

Soil Vacuum Influence

Observation Well	MW6
Extraction Well (EW)	MW4
Distance (ft) to EW	44
Time:	In. H2O
1:30	0.05
6:30	0.12
11:30	0.19

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: 11091919

Project Location: Eunice New Mexico
Project Name: Livingston Ridge to Hugh P. Sims
Project Number: 700376.100.01
SRS #: 2001-1005

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
277802	Influent Air #1	air	2011-09-16	00:30	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

Samples for project Livingston Ridge to Hugh P. Sims were received by TraceAnalysis, Inc. on 2011-09-19 and assigned to work order 11091919. Samples for work order 11091919 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 11091919 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 # 1109191 9

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 / CO PLAINS ALL AMERICAN
Phone #: 806-467-0607
Address: (Street, City, Zip) 821 N. BIVINS AMARILLO TX 79107
Fax #: 806-467-0622
Contact Person: SIMON WALSHE
E-mail: SWALSHE@TALONLPE
Invoice to: (If different from above) JASON HENRY PLAINS ALL AMERICAN
Project #: 700376.100.01 SRS# 2001-1005
Project Name: LIVINGSTON RIDGE TO HUGH P.SYMS
Project Location (including state): EUNICE NEW MEXICO
Sampler Signature:

ANALYSIS REQUEST

(Circle or Specify Method No.)

SRS# 2001-1005

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
27802	INFL AIR # 1	1	1 LTR			X							X	9-16-11	00:30
803	INFL AIR # 2	1	1 LTR			X							X	9-16-11	05:30
804	INFL AIR # 3	1	1 LTR			X							X	9-16-11	10:30

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
								INST ___ °C
								OBS ___ °C
								COR ___ °C
				Brenda Ward	Trace Lubbock	9/19/11	8:00	INST IR
								OBS 22.7 °C
								COR 22.6 °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 # Courier

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 #: 6966-6968

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: 277802-1
Sample Temp.: N/A
Atmospheric Temp.: N/A
Pressure: N/A
Field Data: N/A
Sample Date: 9/16/11 Time: 12:30 am
Sampled By: N/A
Analysis Date: 9/26/11
Analysis By: Neil Ray

Lab #: 6966
Quality Control Report: 1672

Analytical Results

Gas Composition				
	Mol %	GPM	Vol %	Wt. %
Nitrogen (N2):	94.9430	10.3901	91.9225	93.3673
Carbon Dioxide (CO2):	3.2893	0.5547	4.9399	5.0708
Hydrocarbon Composition	**Mol %**	**GPM**	**Vol. %**	**Wt. %**
Methane (CH4):	1.4613	0.2481	2.1809	0.8211
Ethane (C2H6):	0.0001	0.0000	0.0002	0.0001
Propane (C3H8):	0.0120	0.0033	0.0292	0.0186
Iso-Butane (C4H10):	0.0818	0.0266	0.2358	0.1665
N-Butane (C4H10):	0.0316	0.0099	0.0877	0.0643
Iso-Pentane (C5H12):	0.0560	0.0204	0.1803	0.1413
N-Pentane (C5H12):	0.0521	0.0188	0.1664	0.1318
Hexane+ (C6H14):	0.0726	0.0314	0.2572	0.2182
Totals	100.0000	11.3033	100.0000	100.0000

Comments - Additional Data

BTU -dry (BTU/ft^3):	26.7	Z-Comp. Factor-dry:	0.99961
BTU -water vapor sat.(BTU/ft^3):	27.3	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		

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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 #2
Trace: 277803-1
Sample Temp.: N/A
Atmospheric Temp.: N/A
Pressure: N/A
Field Data: N/A
Sample Date: 9/16/11 Time: 6:30 am
Sampled By: N/A
Analysis Date: 9/26/11
Analysis By: Neil Ray

Lab #: 6967
Quality Control Report: 1672

Analytical Results

Gas Composition				
	Mol %	**GPM**	**Vol %**	**Wt. %**
Nitrogen (N2):	94.9881	10.3951	91.7400	93.5340
Carbon Dioxide (CO2):	2.9004	0.4891	4.3451	4.4772
Hydrocarbon Composition	**Mol %**	**GPM**	**Vol. %**	**Wt. %**
Methane (CH4):	1.5073	0.2559	2.2440	0.8480
Ethane (C2H6):	0.1390	0.0370	0.3264	0.1464
Propane (C3H8):	0.1088	0.0298	0.2634	0.1682
Iso-Butane (C4H10):	0.0980	0.0319	0.2817	0.1998
N-Butane (C4H10):	0.0915	0.0287	0.2535	0.1865
Iso-Pentane (C5H12):	0.0638	0.0232	0.2049	0.1612
N-Pentane (C5H12):	0.0647	0.0233	0.2060	0.1637
Hexane+ (C6H14):	0.0382	0.0165	0.1350	0.1150
Totals	100.0000	11.3305	100.0000	100.0000

Comments - Additional Data

BTU -dry (BTU/ft^3):	33.6	Z-Comp. Factor-dry:	0.99960
BTU -water vapor sat.(BTU/ft^3):	34.1	Z-Comp. Factor-water vapor sat.:	0.99491
Specific Gravity -dry:	0.9826	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	0.9809		

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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 #3
Trace: 277804-1
Sample Temp.: N/A
Atmospheric Temp.: N/A
Pressure: N/A
Field Data: N/A
Sample Date: 9/16/11 Time: 10:30 am
Sampled By: N/A
Analysis Date: 9/26/11
Analysis By: Neil Ray

Lab #: 6968
Quality Control Report: 1672

Analytical Results

Gas Composition				
	Mol %	**GPM**	**Vol %**	**Wt. %**
Nitrogen (N2):	95.8275	10.4868	93.2271	93.9598
Carbon Dioxide (CO2):	3.2316	0.5449	4.8766	4.9671
Hydrocarbon Composition	**Mol %**	**GPM**	**Vol. %**	**Wt. %**
Methane (CH4):	0.6320	0.1073	0.9477	0.3540
Ethane (C2H6):	0.0094	0.0025	0.0222	0.0099
Propane (C3H8):	0.0168	0.0046	0.0409	0.0259
Iso-Butane (C4H10):	0.0340	0.0111	0.0985	0.0690
N-Butane (C4H10):	0.0672	0.0211	0.1875	0.1363
Iso-Pentane (C5H12):	0.0678	0.0247	0.2191	0.1704
N-Pentane (C5H12):	0.0702	0.0253	0.2252	0.1770
Hexane+ (C6H14):	0.0436	0.0188	0.1551	0.1306
Totals	100.0000	11.2471	100.0000	100.0000

Comments - Additional Data

BTU -dry (BTU/ft^3):	18.0	Z-Comp. Factor-dry:	0.99962
BTU -water vapor sat.(BTU/ft^3):	18.6	Z-Comp. Factor-water vapor sat.:	0.99500
Specific Gravity -dry:	0.9867	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	0.9849		

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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: 9/26/11
Analysis By: Neil Ray

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

Quality Control Report#: 1672

Analytical Results

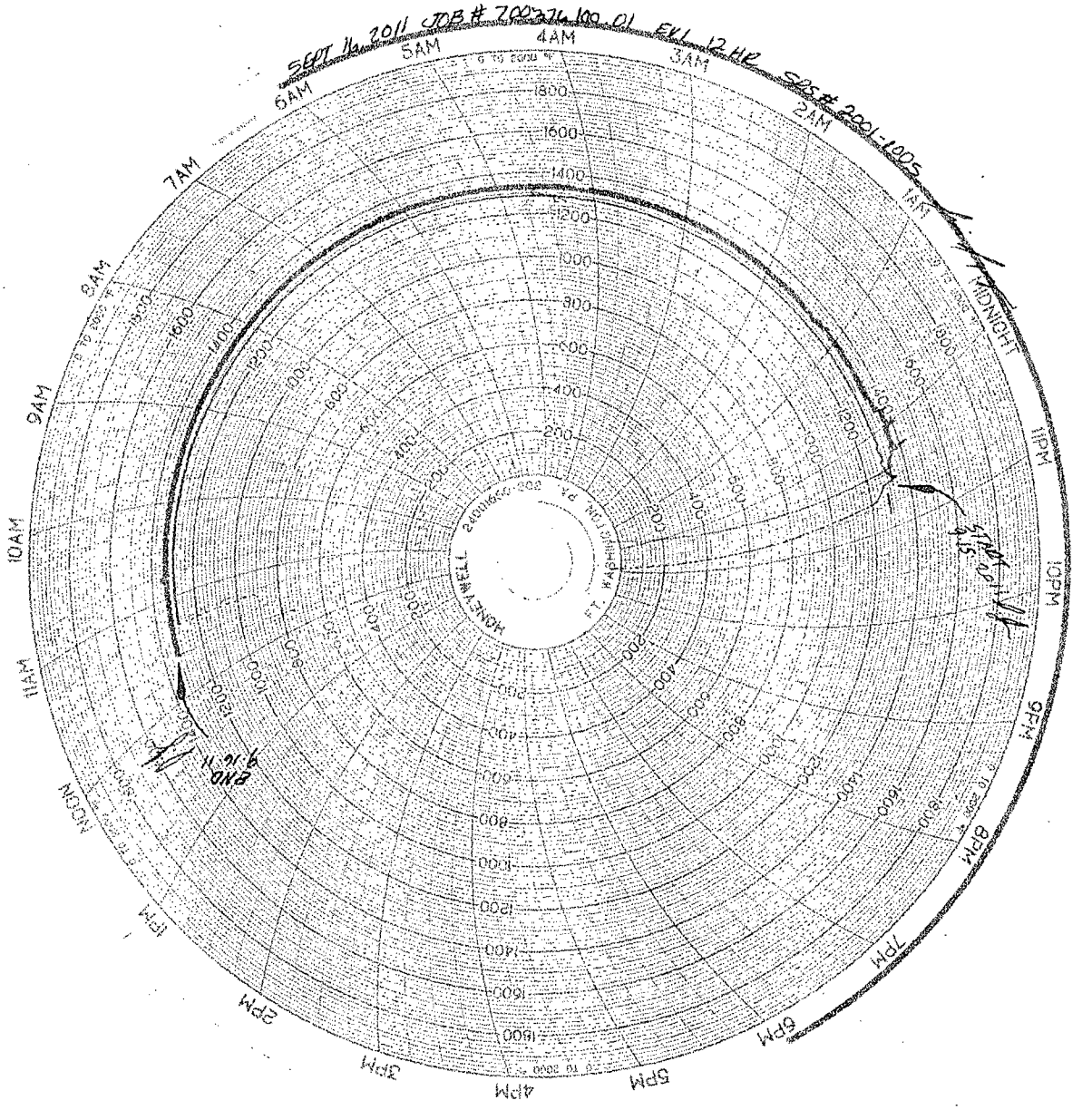
RESULTS	ACTUAL	ANALYSIS			
Gas Composition			MDL	RL	% Deviation
	Mol %	Mol %	Mol %	ppm mol	(90-100%)
Nitrogen (N2):	4.926	4.9098	0.0010	10	99.7
Carbon Dioxide (CO2):	1.489	1.4796	0.0010	10	99.4
			MDL	RL	% Deviation
Hydrocarbon Composition	Mol %	Mol %	Mol %	ppm mol	(90-100%)
Methane (CH4):	69.955	70.2404	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 11 2011 JOB # 700274.100.01 FULL 12 HR SDS # 2001-1005
MIDNIGHT
1AM
2AM
3AM
4AM
5AM
6AM
7AM
8AM
9AM
10AM
11AM
NOON
1PM
2PM
3PM
4PM
5PM
6PM
7PM
8PM
9PM
10PM
11PM
START 9:15
END 9:11
HONEYWELL

ATTACHMENT 4

Waste Ticket

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:
A. F. E. NUMBER:
REQ. OR PURCHASE ORDER NUMBER:

FIELD ORDER NUMBER: 164318
DATE: 9-16-11
ORDERED BY: JASON H

DELIVERED FROM: location
TO: Disposal

LOCATION: Livingston Ridge
WELL OR RIG NO.:

TRUCK OR UNIT NO.	CAPACITY	AMOUNT HAULED	START TIME AM/PM	END TIME AM/PM	HOURS CHGD.
62	130	80			4

DESCRIPTION	○HR. ○BBL.		RATE		AMOUNT	
Provide TV to Empty Poly Tanks to Disposal	4	Hrs.	82	00	328	00
		Bbls				
		Bbls				
		KCL				
	80	Disp	1	10	88	00
		Disp				
		Helper				
		Tank Min				
		Day Rental				
		Chart Recorder				
					416	00

TOP GAUGE BOTTOM GAUGE SET DATE RELEASE DATE

FOR OFFICE USE ONLY

TAX: 28.00

NET TOTAL: 444 00

Thank You

OPERATOR OR DRIVER

SRS # 2001-11005

Jason Henry 09/22/2011
AUTHORIZED BY: