1R - 398

REPORTS

DATE:

10-2-12

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MOBILE DUAL PHASE EXTRACTION REPORT
LIVINGSTON RIDGE TO HUGH-P.SIMS PIPELINE RELEASE
LEA COUNTY, NEW MEXICO
SRS # 2001-1005
NMOCD# 1R-0398

PREPARED FOR:

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

PREPARED BY:

TALON/LPE
921 N. BIVINS
AMARILLO, TEXAS 79107

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COPY 5 - TALON/LPE

October 2, 2012

10/24/12
TALON/LPE, P-6802

TABLE OF CONTENTS

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 July 31, 2012 to August 1, 2012 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. MW4 & 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. 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 **28.46 equivalent gallons of hydrocarbons (Total)** were removed during the event. The combined volume of hydrocarbons were comprised of approximately **4 gallons of PSH (liquid phase)** and approximately **24.46 gallons as off-gas vapor**. The calculations used to estimate the off-gas vapor mass recovered reflect the mass of total hydrocarbons recovered and does not necessarily equate to an equal mass of the product released. The mass recovery calculations may be affected by variations in the type of product released, age of release, activity of aerobic and/or anaerobic processes, and site specific geochemical factors.

The cumulative air flow measurements for the MDPE event were calculated using a combination of field data measurements and Preso® B+ manufacturer provided formulas. **Air flow rates extracted from the recovery wells averaged 122.13 SCFM** during the event.

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

B. Air Quality

Two influent air samples were collected during the event. These samples were submitted for laboratory testing in order to compare the predicted vapor concentrations (based on field-screening or calculated based on fuel consumption) to the actual vapor concentrations. The maximum concentration in air influent was recorded as 15,783 ppmv for Hydrocarbon Composition. Laboratory analytical results can be found in Attachment 2.

C. Waste Management and Disposition

A cumulative total of 2,369 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)

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

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

Table 1

System Operation Data and Mass Recovery Calculations

Time	Period (hours)	Influent Temp. (°f)	Vacuum (In. hg)	Vacuum (In. h20)	Differential pressure (In. h20)	Flow (SCFM)	PID Readings (ppm)	Lab Result (ppmv)	Assigned Lab Result (ppmv)	Correction Factor (CF)	Adjusted Lab Result (ppmv)	Adjusted Lab Result (mg/L)	Recovery (lbs/hr)	Recovery in Period (lbs)	Total Recovery (lbs)
15:30	0.5	100	18	244.96	31.4	120.39	143.4	-	15783.00	1.63	25748	38.02	17.11	8.56	8.56
16:00	0.5	100	18	244.96	34.6	126.38	87.9	15783.00	15783.00	1.00	15783	23.31	11.01	5.50	14.06
17:00	1	98	18	244.96	33.5	124.57	195.5	-	15783.00	2.22	35103	52.02	24.22	24.22	38.28
18:00	1	94	18	244.96	38	133.15	133	-	15783.00	1.51	23881	35.64	17.74	17.74	56.03
19:00	1	91	18	244.96	33.2	124.80	106.7	-	15783.00	1.21	19159	28.75	13.41	13.41	69.44
20:00	1	90	18	244.96	32.9	124.35	112.4	-	15783.00	1.28	20182	30.34	14.10	14.10	83.55
21:00	1	88	18	244.96	34	126.64	145	-	15783.00	1.65	26036	39.29	18.60	18.60	102.14
22:00	1	86	18	244.96	32	123.08	625.4	-	4013.00	3.49	14005	22.75	10.47	10.47	112.61
23:00	1	82	18	244.96	29.6	118.81	819	-	4013.00	4.57	18341	30.01	13.33	13.33	125.94
0:00	1	78	18	244.96	28.9	117.84	265	-	4013.00	1.48	5934	9.78	4.31	4.31	130.25
1:00	1	76	18	244.96	27	114.11	135.4	-	4013.00	0.76	3032	5.02	2.14	2.14	132.39
2:00	0	76	18	244.96	26.9	113.90	179.2	4013.00	4013.00	1.00	4013	6.64	2.83	0.00	132.39
3:00	1	76	18	244.96	29.7	119.68	128.9	-	4013.00	0.72	2887	4.78	2.14	2.14	134.53
Averages:		87.31	18.00	244.96	31.67	122.13	236.68						Total	134.53	

PSH Mass Recovered in Vapor Phase = 24.46 gallons

PID maximum Concentration = 15,000 PPM

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

Measured Conc.	Molecular Wt.	Pressure	Gas Constant	Temp.	Temp.	Conc.
(C_ppmv)	(Grams)	(atm)	(atm.liter/K.mole)	(F)	(K)	(C_mg/l)
25748	37.6749623	1	0.0821	100	310.7777778	38.01977524

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

Total Hydrocarbon Recovery

PSH Mass Recovered in Vapor Phase =	134.53	lbs
	24.46	gallons
PSH Mass Recovered in Liquid Phase =	22.00	lbs
	4.00	gallons
TOTAL =	**156.53**	**lbs**
	28.46	**gallons**

Gallons removed determined at time of pick up

PSH Volume in Gallons=	4
PSH Mass in Pounds=	22

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

Compound	Molecular Weight (g/mol)	% total	=	ppmv
Methane (CH4)	16.04	1.0395		10395.00
Ethane (C2H6)	30.07	0.0002		2.00
Propane (C3H8)	44.10	0.0021		21.00
Iso-Butane (C4H10)	58.12	0.0244		244.00
N-Butane (C4H10)	58.12	0.0397		397.00
Iso-Pentane (C4H12)	72.15	0.0636		636.00
N-Pentane (C5H12)	72.15	0.0609		609.00
Hexane+ (C6H14)	86.18	0.3479		3479.00
			Total	**15783.00**

Molecular Weight Calculations

Total Hydrocarbon %=	1.5783
g of Methane (CH4) =	10.56426535
g of Ethane (C2H6) =	0.003810429
g of Propane (C3H8) =	0.058677058
g of Iso-Butane (C4H10) =	0.898516125
g of N-Butane (C4H10) =	1.461929925
g of Iso-Pentane (C4H12) =	2.907394032
g of N-Pentane (C5H12) =	2.783966926
g of Hexane+ (C6H14) =	18.99640246
Calculated MW (Grams)	**37.6749623**

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

Compound	Molecular Weight (g/mol)	% total	=	ppmv
Methane (CH4)	16.04	0.2443		2443.00
Ethane (C2H6)	30.07	0		0.00
Propane (C3H8)	44.10	0.0053		53.00
Iso-Butane (C4H10)	58.12	0.0025		25.00
N-Butane (C4H10)	58.12	0.0129		129.00
Iso-Pentane (C4H12)	72.15	0.0187		187.00
N-Pentane (C5H12)	72.15	0.0226		226.00
Hexane+ (C6H14)	86.18	0.095		950.00
			Total	**4013.00**

Molecular Weight Calculations

Total Hydrocarbon %=	0.4013
g of Methane (CH4) =	9.764694742
g of Ethane (C2H6) =	0
g of Propane (C3H8) =	0.582432096
g of Iso-Butane (C4H10) =	0.362073262
g of N-Butane (C4H10) =	1.868298031
g of Iso-Pentane (C4H12) =	3.362085721
g of N-Pentane (C5H12) =	4.063269375
g of Hexane+ (C6H14) =	20.4014453
Calculated MW (Grams)	**40.40429853**

ATTACHMENT 1

MDPE Field Logs

MDPE FIELD NOTES					
Site Name:	Livingston Ride to Hugh P-Sims			Event #:	3
Location:	NE of Eunice, NM			Arrive at site:	7/31/2012 14:30
Date:	7/31-8/1/12				
Job#:	700376.100.03	SRS#:	2001-1005	Start Vac:	7/31/2012 15:00
Phase:	MDPE3	Unit:	1107	Stop Vac:	8/1/2012 3:00
Onsite Personnel:	L. Bridges & B. Huntington			Leave Site:	8/1/2012 4:15

GAUGING DATA

WELL#	BEFORE			AFTER			COMMENTS
	PSH	GW	PSH-T	PSH	GW	PSH-T	
TMW1	33.88	39.38	5.50	-	35.84	-	Stinger @ 39'
MW4	34.85	35.19	0.34	-	35.23	-	Stinger @ 35'
MW1	-	37.66	-	Not Gauged			
MW5	32.20	32.21	0.01	Not Gauged			
MW6	-	39.35	-	Not Gauged			
MW9	-	38.14	-	Not Gauged			
MW8	-	35.78	-	Not Gauged			
WASTE:	H2O:	2365		PSH:	4		TOTAL (GAL): 2369

Sample Name	Analysis	Date:	Time:	Comments:
INFLUENT	ASTM D 1945	7/31/2012	16:00	PID = 87.9
INFLUENT	ASTM D 1945	8/1/2012	2:00	PID = 199.2
INFLUENT	-	-	-	-
EFFLUENT	-	-	-	-

Notes:
Tank #1 - Total = 75 3/4 Inches with PSH = 75 1/2 Inches = Total 2369 gallons with PSH = 4 Gallons

Start Date: 7/31/2012

MDPE FIELD DATA

		Well Flow						Well Data				
TIME	SAMPLE TAKEN *	Inflent temp. (°f)	Diff. Pressure (INH20) 2" Preso	Vac (In.Hg)	PID Composite (PPM)	Propane Tank (%-size) 500 Gal.	EXHAUST TEMP F	COMMENTS: TMW1 VAC (INH2O)	MW4 VAC (INH2O)	VAC (INH2O)	VAC (INH2O)	VAC (INH2O)
15:30		100	31.4	18	143.4	78	1410	20.3	3.6			
16:00	*	100	34.6	18	87.9	78	1413	19.9	2.9			
17:00		98	33.5	18	195.5	76	1407	20.9	10.5			
18:00		94	38	18	133	74	1409	21.3	10.7			
19:00		91	33.2	18	106.7	73	1407	21.5	12.5			
20:00		90	32.9	18	112.4	72	1414	21.2	11.9			
21:00		88	34	18	145	70	1407	19.7	14.2			
22:00		86	32	18	625.4	68	1410	20.1	13.2			
23:00		82	29.6	18	819	66	1411	21.9	13.8			
0:00		78	28.9	18	265	66	1412	20.7	12.9			
1:00		76	27	18	135.4	64	1413	21.6	12.7			
2:00	*	76	26.9	18	179.2	62	1412	21.8	13.3			
3:00		76	29.7	18	128.9	60	1413	22.6	12.5			

Soil Vacuum Influence

Observation Well	MW1
Extraction Well (EW)	TMW1
Time:	In. H2O
16:00	0
21:00	0
2:00	0

ATTACHMENT 2

Laboratory Analytical Results

TRACEANALYSIS, INC.
6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-794-1296 FAX 806-794-1298
200 East Sunset Road, Suite E El Paso, Texas 79922 915-585-3443 FAX 915-585-4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
(BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

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

Report Date: August 17, 2012

Work Order: 12080619

Project Location: Eunice, NM
Project Name: Livingston Ridge to Hughs P. Sims
Project Number: 700376.100.03
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
305986	Influent #1	air	2012-07-31	16:00	2012-08-04

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 Hughs P. Sims were received by TraceAnalysis, Inc. on 2012-08-04 and assigned to work order 12080619. Samples for work order 12080619 were received intact at a temperature of 22.8 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 12080619 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
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 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 # 1208 0619

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
Phone #: 8064670607
Address: (Street, City, Zip) 921 N. Bivins Amarillo Tx 79107
Fax #:
Contact Person: Simon Walshe
E-mail:
Invoice to: (If different from above) Plains (Jason Henry) SRS # 2001-1005
Project #: 700376.10003
Project Name: Livingston Ridge to Hugh P Sims
Project Location (including state): Eunice, NM
Sampler Signature: [signature]

ANALYSIS REQUEST
(Circle or Specify Method No.)

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

LAB # (LAB USE ONLY)	FIELD CODE MDPE EVENT#3	# CONTAINERS	Volume / Amount	WATER	SOIL	AIR	SLUDGE	HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	DATE	TIME	ASTM D-1945
305986	Influent #1	1	1			✓							✓	7-31-12	1600	✓
987	" " #2	1	1			✓							✓	8-1-12	0200	✓

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp
[signature]	Talon	8-2-12		[signature]	TA	8/4/12	10:15	INST ___ OBS 22.8 °C COR ___ °C
								INST ___ OBS ___ °C COR ___ °C
								INST ___ OBS ___ °C COR ___ °C

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

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 # UPS J204 412 5793

ORIGINAL COPY

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

MIDWEST PRECISION TESTING, LLC.

615 N. Price Rd.
Pampa, TX 79065

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

COC #: N/A

Lab #: 13085-13086

Quality Control #: 2138

Approved by:

Neil Ray

Neil Ray

Date: 8/14/12

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

MIDWEST PRECISION TESTING, LLC.

615 N. Price Rd.
Pampa, TX 79065

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

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

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

Sample Id.: Influent Air #1
Trace: 305986-1
Sample Temp.: N/A
Atmospheric Temp.: N/A
Pressure: N/A
Field Data: N/A
Sample Date: 7/31/12 Time: N/A
Sampled By: N/A
Analysis Date: 8/10/12
Analysis By: Jessica Cabezudo

Lab #: 13085
Quality Control Report: 2138

Analytical Results

Gas Composition					
	Mol %	GPM	Vol %	ppm vol.	Wt. %
Nitrogen (N2):	98.4290	10.7708	97.3002	973002	98.0325
Carbon Dioxide (CO2):	0.7313	0.1233	1.1214	11214	1.1418
Hydrocarbon Composition	**Mol %**	**GPM**	**Vol. %**		**Wt. %**
Methane (CH4):	0.6822	0.1158	1.0395	10395	0.3882
Ethane (C2H6):	0.0001	0.0000	0.0002	2	0.0001
Propane (C3H8):	0.0009	0.0002	0.0021	21	0.0013
Iso-Butane (C4H10):	0.0083	0.0027	0.0244	244	0.0171
N-Butane (C4H10):	0.0140	0.0044	0.0397	397	0.0289
Iso-Pentane (C5H12):	0.0194	0.0070	0.0636	636	0.0495
N-Pentane (C5H12):	0.0187	0.0067	0.0609	609	0.0479
Hexanes+ (C6H14):	0.0962	0.0415	0.3479	3479	0.2928
Totals	100.000	11.0726	100.000		100.000

Comments - Additional Data

BTU -dry (BTU/ft^3):	14.1	Z-Comp. Factor-dry:	0.99968
BTU -water vapor sat.(BTU/ft^3):	14.8	Z-Comp. Factor-water vapor sat.:	0.99541
Specific Gravity -dry:	0.9714	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	0.9694		

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

MIDWEST PRECISION TESTING, LLC.

615 N. Price Rd.
Pampa, TX 79065

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

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

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

Sample Id.: Influent Air #2
Trace: 305987-1
Sample Temp.: N/A
Atmospheric Temp.: N/A
Pressure: N/A
Field Data: N/A
Sample Date: 8/01/12 Time: N/A
Sampled By: N/A
Analysis Date: 8/10/12
Analysis By: Jessica Cabezudo

Lab #: 13086
Quality Control Report: 2138

Analytical Results

Gas Composition					
	Mol %	**GPM**	**Vol %**	**ppm vol.**	**Wt. %**
Nitrogen (N2):	99.5976	10.8984	99.2937	992937	99.4744
Carbon Dioxide (CO2):	0.1975	0.0333	0.3053	3053	0.3091
Hydrocarbon Composition	**Mol %**	**GPM**	**Vol. %**		**Wt. %**
Methane (CH4):	0.1590	0.0270	0.2443	2443	0.0907
Ethane (C2H6):	0.0000	0.0000	0.0000	0	0.0000
Propane (C3H8):	0.0021	0.0006	0.0053	53	0.0033
Iso-Butane (C4H10):	0.0008	0.0003	0.0025	25	0.0017
N-Butane (C4H10):	0.0045	0.0014	0.0129	129	0.0093
Iso-Pentane (C5H12):	0.0056	0.0020	0.0184	184	0.0143
N-Pentane (C5H12):	0.0069	0.0025	0.0226	226	0.0176
Hexanes+ (C6H14):	0.0260	0.0112	0.0950	950	0.0795
Totals	100.000	10.9767	100.000		100.000

Comments - Additional Data

BTU -dry (BTU/ft^3):	3.7	Z-Comp. Factor-dry:	0.99970
BTU -water vapor sat.(BTU/ft^3):	4.5	Z-Comp. Factor-water vapor sat.:	0.99561
Specific Gravity -dry:	0.9685	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	0.9664		

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

MIDWEST PRECISION TESTING, LLC.

615 N. Price Rd.
Pampa, TX 79065

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

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

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

Quality Control Report#: 2138

Analytical Results

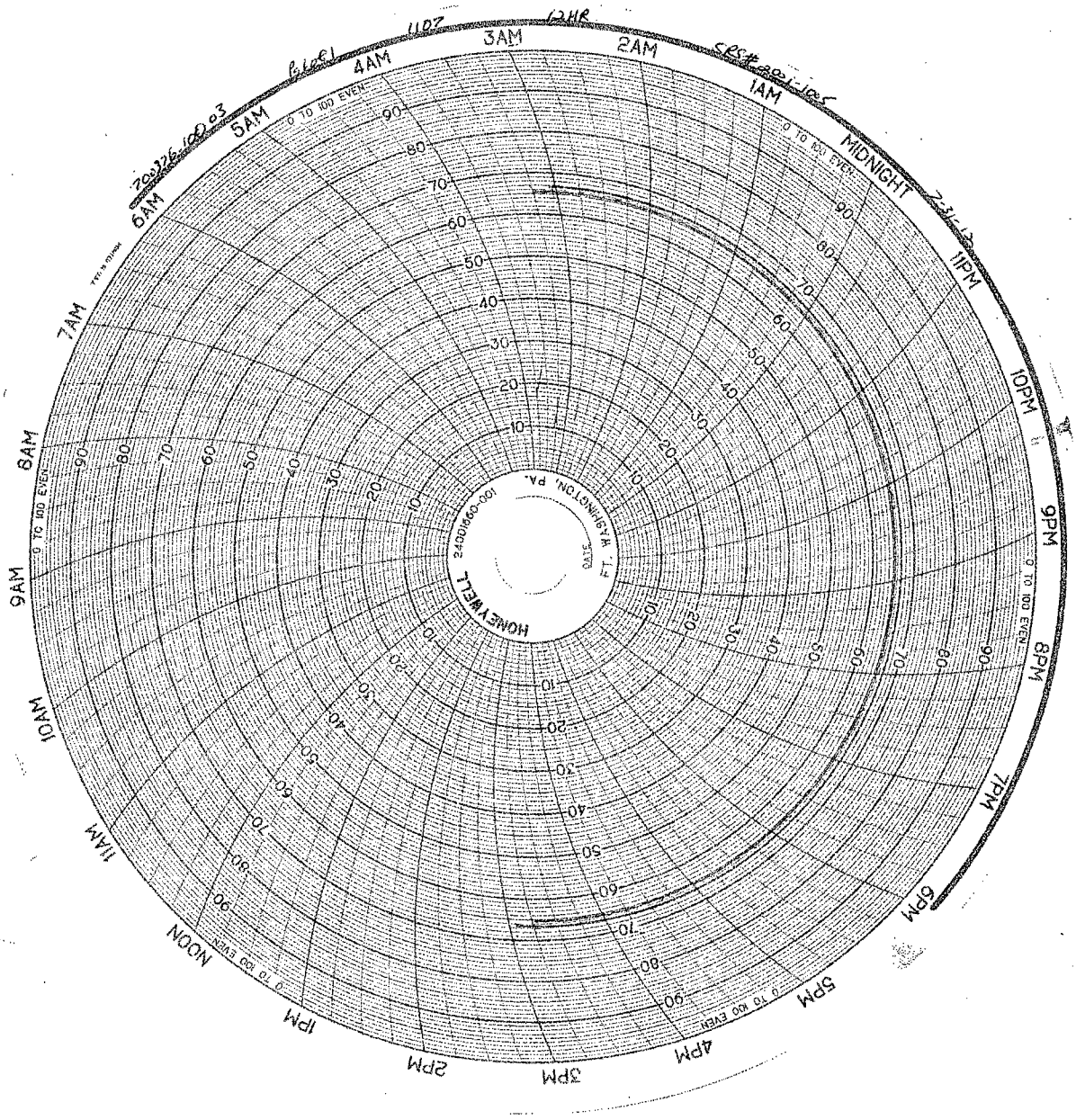
RESULTS	ACTUAL	ANALYSIS			
Gas Composition			**MDL**	**RL**	**% Deviation**
	Mol %	**Mol %**	**Mol %**	**ppm mol**	**(90-100%)**
Nitrogen (N2):	4.918	4.8674	0.0010	10	99.0
Carbon Dioxide (CO2):	1.499	1.5017	0.0010	10	99.8
			MDL	**RL**	**% Deviation**
Hydrocarbon Composition	**Mol %**	**Mol %**	**Mol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

Comments - Additional Data

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

ATTACHMENT 3

Oxidizer Charts


12HR
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 100 EVEN
HONEYWELL
WASHINGTON, PA.
DATE
FT.

ATTACHMENT 4

Waste Ticket

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

GANDY CORPORATION

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

P.O. BOX 2140
LOVINGTON, NEW MEXICO 88260

471155

Date 8/2/16 Truck No. 386/345T

Company [illegible] Plains Purchase Order No. ____ Invoice Number ____

From Livingston Ridge to [illegible] P Sims Rig No. ____ Location ____

To Lease Sprinkle Well No. ____ Location ____

Time Out ____ A.M. P.M. Time In ____ A.M. P.M.

Diesel Brine Water Fresh Water
Crude Oil Salt Water Acid Bbls. Hauled 60

Driver, Operator or Pusher [illegible]

Helper

Helper Sec 2001-1005

Helper

Other Charges

TIME	RATE	AMOUNT
4		

Description of Work: Emptied out 60 barrels from poly tank.

Sub Total
Sales Tax
TOTAL

Authorized by: [illegible]

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