GW - 140

REPORTS

YEAR(S):

1-15-13

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MOBILE DUAL PHASE EXTRACTION REPORT
TNM SPS-11 PIPELINE RELEASE
LEA COUNTY, NEW MEXICO
SRS # TNM SPS-11
TALON/LPE PROJECT # 700376.101.02

GW-140

PREPARED FOR:

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

RECEIVED OCD
2013 FEB 26 A 10:01

PREPARED BY:

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STATE OF TEXAS
PAUL A. SANTOS
95526
LICENSED
PROFESSIONAL ENGINEER

TALON/LPE
2/7/13

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JANUARY 15, 2013

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

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 November 8th, 2012, to November 9th, 2012, at the TNM SPS-11 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-1, 4, & 11 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 **45.91 equivalent gallons of hydrocarbons (Total)** were removed during the event. The combined volume of hydrocarbons were comprised of approximately **7 gallons of PSH (liquid phase)** and approximately **38.91 gallons as off-gas vapor**. The calculations used to estimate the off-gas vapor mass recovered reflect the mass of total hydrocarbons recovered and does not necessarily equate to an equal mass of the product released. The mass recovery calculations may be affected by variations in the specific gravity of hydrocarbon released, age of release, activity of aerobic and/or anaerobic processes, and site specific geochemical factors.

The cumulative air flow measurements for the MDPE event were calculated using a combination of field data measurements and Preso® B+ manufacturer provided formulas. **Air flow rates extracted from the recovery wells averaged 144.91 SCFM** during the event.

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

extraction wells for the purpose of enhancing liquid recovery rates.

B. Air Quality

Two influent air samples were collected during the event. These samples were submitted for laboratory testing in order to compare the predicted vapor concentrations (based on field-screening or calculated based on fuel consumption) to the actual vapor concentrations. The maximum influent concentration was recorded as 29,810 ppmv for Hydrocarbon Composition. Laboratory analytical results can be found in Attachment 2.

C. Waste Management and Disposition

A cumulative total of 2,009 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)

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

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

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 (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)
22:15	0.5	64	16.5	224.55	29.6	128.19	50000	-	29810.00	1.02	30358	36.21	17.35	8.68	8.68
22:45	0.5	64	16.5	224.55	31	131.19	49098	29810.00	29810.00	1.00	29810	35.56	17.44	8.72	17.40
23:45	1	62	17	231.35	33.6	134.27	50000	-	29810.00	1.02	30358	36.35	18.25	18.25	35.64
0:45	1	62	17.5	238.16	32.9	130.28	48761	-	29810.00	0.99	29605	35.45	17.27	17.27	52.91
1:45	1	60	17.5	238.16	40.3	144.47	39637	-	29810.00	0.81	24066	28.93	15.62	15.62	68.53
2:45	1	60	17.5	238.16	45.6	153.67	41573	-	29810.00	0.85	25241	30.34	17.43	17.43	85.96
3:45	1	60	17.5	238.16	45.3	153.17	28121	-	29810.00	0.57	17074	20.52	11.75	11.75	97.72
4:45	1	58	17.5	238.16	44.9	152.78	23775	-	7883.00	11.05	87090	103.59	59.16	59.16	156.88
5:45	1	58	17.5	238.16	44.4	151.93	12558	-	7883.00	5.84	46001	54.71	31.07	31.07	187.95
6:45	1	62	17	231.35	41.5	149.23	16751	-	7883.00	7.78	61361	72.42	40.40	40.40	228.35
7:45	1	67	17.5	238.16	45.3	152.14	8735	-	7883.00	4.06	31997	37.41	21.28	21.28	249.63
8:45	1	68	17.5	238.16	44.6	150.82	2152	7883.00	7883.00	1.00	7883	9.20	5.19	5.19	254.82
9:45	1	68	17.5	238.16	45.1	151.66	4675	-	7883.00	2.17	17125	19.98	11.33	11.33	266.15
Averages:		62.54	17.27	235.02	40.32	144.91	28910.46						Total	266.15	

PSH Mass Recovered in Vapor Phase = 38.91 gallons

FID maximum Concentration = 50,000 PPM

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

Measured Conc.	Molecular Wt.	Pressure	Gas Constant	Temp.	Temp.	Conc.
(ppmv)	(Grams)	(atm)	(atm.liter/K.mole)	(F)	(K)	(C_mg/l)
30358	28.4786	1	0.0821	64	290.7777778	36.21452067

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

Liquid-phase Hydrocarbon Recovery

∏ * r2 * h = volume

Total Hydrocarbon Recovery

PSH Mass Recovered in Vapor Phase =	266.15	lbs
	38.91	gallons
PSH Mass Recovered in Liquid Phase =	47.88	lbs
	7.00	gallons
TOTAL =	**314.03**	**lbs**
	45.91	**gallons**

Gallons removed determined at time of pick up

PSH Volume in Gallons=	7
PSH Mass in Pounds=	47.88

% Vol. Hydrocarbon to ppmv - Influent 1

Compound	Molecular Weight (g/mol)	% Vol	=	ppmv
Methane (CH4)	16.04	2.1386		21386.00
Ethane (C2H6)	30.07	0.0101		101.00
Propane (C3H8)	44.10	0.0143		143.00
Iso-Butane (C4H10)	58.12	0.0165		165.00
N-Butane (C4H10)	58.12	0.0225		225.00
Iso-Pentane (C4H12)	72.15	0.043		430.00
N-Pentane (C5H12)	72.15	0.0969		969.00
Hexane+ (C6H14)	97.40	0.6391		6391.00
			Total	29810.00

*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its (0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966

Molecular Weight Calculations

component	Molecular Weight (g/mol)	mol%
Nitrogen (N2)	28.016	95.2937
Methane (CH4)	16.0425	1.4299
Carbon Dioxide (CO2)	44.011	3.0287
Ethane (C2H6)	30.069	0.0043
Propane (C3H8)	44.0956	0.0059
Iso-Butane (C4H10)	58.1222	0.0057
N-Butane (C4H10)	58.1222	0.0081
Iso-Pentane (C4H12)	72.1488	0.0133
N-Pentane (C5H12)	72.1488	0.03
Hexane+	97.3966	0.18
	Total	100
	Calculated MW	**28.4786**

% Vol. Hydrocarbon to ppmv - Influent 2

Compound	Molecular Weight (g/mol)	% Vol	=	ppmv
Methane (CH4)	16.04	0.4701		4701.00
Ethane (C2H6)	30.07	0.0011		11.00
Propane (C3H8)	44.10	0.002		20.00
Iso-Butane (C4H10)	58.12	0.0143		143.00
N-Butane (C4H10)	58.12	0.0189		189.00
Iso-Pentane (C4H12)	72.15	0.0276		276.00
N-Pentane (C5H12)	72.15	0.0325		325.00
Hexane+ (C6H14)	97.40	0.2218		2218.00
			Total	7883.00

*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its (0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966

Molecular Weight Calculations

component	Molecular Weight (g/mol)	mol%
Nitrogen (N2)	28.016	99.377
Methane (CH4)	16.0425	0.3065
Carbon Dioxide (CO2)	44.011	0.2246
Ethane (C2H6)	30.069	0.0005
Propane (C3H8)	44.0956	0.0008
Iso-Butane (C4H10)	58.1222	0.0048
N-Butane (C4H10)	58.1222	0.0066
Iso-Pentane (C4H12)	72.1488	0.0084
N-Pentane (C5H12)	72.1488	0.01
Hexane+	97.3966	0.06
	Total	100.0001
	Calculated MW	**28.0692**

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

ppmv= % Vol x 10,000

ATTACHMENT 1

MDPE Field Logs

MDPE FIELD NOTES					
Site Name:	TNM SPS-11			Event #:	2
Location:	15 Miles W. of Hobbs, NM			Arrive at site:	11/8/2012 20:45
Date:	11/8-9/12				
Job#:	700376.101.02	SRS#:	TNM SPS-11	Start Vac:	11/8/2012 21:45
Phase:	MDPE2	Unit:	1107	Stop Vac:	11/9/2012 9:45
Onsite Personnel:	L. Bridges & B. Huntington			Leave Site:	11/9/2012 11:00

GAUGING DATA

WELL#	BEFORE			AFTER			COMMENTS
	PSH	GW	PSH-T	PSH	GW	PSH-T	
MW-1	60.04	60.62	0.58	-	61.29	-	Stinger set @ 61'
MW-11	60.97	63.64	2.67	-	61.48	-	Stinger set @ 64'
MW-4	60.28	60.91	0.63	-	60.71	-	Stinger set @ 61'
MW-7	60.38	60.60	0.22	Not Gauged			Unable to extract from due to distance - handbailed
MW-10	-	62.92	-	Not Gauged			
WASTE:	H2O:	2002		PSH:	7		TOTAL (GAL): 2009

Sample Name	Analysis	Date:	Time:	Comments:
INFLUENT 1	ASTM D 1945	11/8/2012	22:45	FID = 49098
INFLUENT 2	ASTM D 1945	11/9/2012	8:45	FID = 2152

Notes:
Tank #1 = Total fluids @ 19.75" with PSH @ 19.5" = 509 Total gallons with 4 gallons of PSH
Tank #2= Total fluids @ 58.5" with PSH @ 58.25" = 1500 Total gallons with 3 gallons of PSH

Start Date: 11/8-9/2012

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) 500 Gal.	EXHAUST TEMP F	COMMENTS: MW-1 VAC (INH2O)	MW-11 VAC (INH2O)	MW-4 VAC (INH2O)		
22:15		64	29.6	16.5	>50000	58	1433	28.6	14.4	1.8		
22:45	*	64	31	16.5	49098	56	1416	36.5	15.9	2.3		
23:45		62	33.6	17	>50000	54	1414	41.8	16.8	3.1		
0:45		62	32.9	17.5	48761	52	1412	42.2	17.3	3.4		
1:45		60	40.3	17.5	39637	50	1413	45.4	16.8	2.5		
2:45		60	45.6	17.5	41573	48	1411	47.3	16.4	1.9		
3:45		60	45.3	17.5	28121	46	1414	48	16.7	1.6		
4:45		58	44.9	17.5	23775	44	1410	48.6	16.5	1.8		
5:45		58	44.4	17.5	12558	42	1412	49.8	16.9	2		
6:45		62	41.5	17	16751	39	1409	48.9	17.2	2.8		
7:45		67	45.3	17.5	8735	38	1408	48.3	17.5	3.1		
8:45	*	68	44.6	17.5	2152	37	1411	48.5	17.1	3.4		
9:45		68	45.1	17.5	4675	35	1410	48.6	17.3	3.3		

Soil Vacuum Influence

Observation Well	MW-7
Extraction Well (EW)	MW-4
Time:	In. H2O
22:45	0
3:45	0
8:45	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: November 26, 2012

Work Order: 12111203

Project Location: West of Hobbs NM TMN SPS-11
Project Name: TNM SPS-11
Project Number: 700376.101.02
SRS #: TNM SPS-11

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
313944	Influent #1	air	2012-11-09	07:45	2012-11-09

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

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

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

Report Contents

Case Narrative

Samples for project TNM SPS-11 were received by TraceAnalysis, Inc. on 2012-11-09 and assigned to work order 12111203. Samples for work order 12111203 were received intact at a temperature of 23.3 C.

Samples were analyzed for the following tests using their respective methods.

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 12111203 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

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 # 12111203

Page 1 of 1

TraceAnalysis, Inc.

email: lab@traceanalysis.com

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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 #: 806 467-0607

Address: (Street, City, Zip) 921 N Bivins

Fax #:

Contact Person: Simon Walsh

E-mail:

Invoice to: (If different from above) Plains (Jason Henry)

Project #: 700376.101.02

Project Name: TNMSPS-11

Project Location (including state): West of Hobbs NM - TNMSPS-11

Sampler Signature:

ANALYSIS REQUEST (Circle or Specify Method No.)

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
31944	MDPE Event #1	1	1			✓								11/9	0745
945	Influent #2	1	1			✓								11/8	2244

LAB # (LAB USE ONLY)	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 D1945				Turn Around Time if different from standard	Hold
31944																				✓					
945																				✓					

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:
[illegible]	TALON LPE						
				Brenda Ward	Trace Lubbock	11/9/12	4:35 pm

INST ____ OBS ____ °C COR ____ °C

INST ____ OBS ____ °C COR ____ °C

INST 1.3 OBS 23.7 °C COR 23.3 °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

Carrier # Carrier

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

ORIGINAL COPY

Office: 806-665-0790
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 #: 16380-16381

Quality Control #: 2310

Approved by:

Neil Ray

Neil Ray

Date: 11/19/12

Office: 806-665-0730
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: 313944-1
Sample Temp.: N/A
Atmospheric Temp.: N/A
Pressure: N/A
Field Data: N/A
Sample Date: 11/09/12 Time: N/A
Sampled By: N/A
Analysis Date: 11/16/12
Analysis By: Jessica Cabezudo

Lab #: 16380
Quality Control Report: 2310

Analytical Results

Gas Composition					
	Mol %	GPM	Vol %	ppm vol.	Wt. %
Nitrogen (N2):	95.2937	10.4285	92.4607	924607	93.8270
Carbon Dioxide (CO2):	3.0287	0.5107	4.5583	45583	4.6749
Hydrocarbon Composition	**Mol %**	**GPM**	**Vol. %**		**Wt. %**
Methane (CH4):	1.4299	0.2427	2.1386	21386	0.8044
Ethane (C2H6):	0.0043	0.0011	0.0101	101	0.0045
Propane (C3H8):	0.0059	0.0016	0.0143	143	0.0091
Iso-Butane (C4H10):	0.0057	0.0019	0.0165	165	0.0116
N-Butane (C4H10):	0.0081	0.0025	0.0225	225	0.0164
Iso-Pentane (C5H12):	0.0133	0.0048	0.0430	430	0.0337
N-Pentane (C5H12):	0.0303	0.0109	0.0969	969	0.0767
Hexanes+ (C6H14):	0.1801	0.0777	0.6391	6391	0.5417
Totals	100.000	11.2826	100.000		100.000

Comments - Additional Data

BTU -dry (BTU/ft^3):	26.0	Z-Comp. Factor-dry:	0.99961
BTU -water vapor sat.(BTU/ft^3):	26.6	Z-Comp. Factor-water vapor sat.:	0.99495
Specific Gravity -dry:	0.9830	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	0.9812	Molecular Weight	28.4786

Office: 806-665-0790
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: 313945-1
Sample Temp.: N/A
Atmospheric Temp.: N/A
Pressure: N/A
Field Data: N/A
Sample Date: 11/09/12 Time: N/A
Sampled By: N/A
Analysis Date: 11/16/12
Analysis By: Jessica Cabezudo

Lab #: 16381
Quality Control Report: 2310

Analytical Results

Gas Composition					
	Mol %	GPM	Vol %	ppm vol.	Wt. %
Nitrogen (N2):	99.3770	10.8744	98.8651	988651	99.2155
Carbon Dioxide (CO2):	0.2246	0.0379	0.3466	3466	0.3515
Hydrocarbon Composition	**Mol %**	**GPM**	**Vol. %**		**Wt. %**
Methane (CH4):	0.3065	0.0520	0.4701	4701	0.1748
Ethane (C2H6):	0.0005	0.0001	0.0011	11	0.0005
Propane (C3H8):	0.0008	0.0002	0.0020	20	0.0013
Iso-Butane (C4H10):	0.0048	0.0016	0.0143	143	0.0099
N-Butane (C4H10):	0.0066	0.0021	0.0189	189	0.0137
Iso-Pentane (C5H12):	0.0084	0.0030	0.0276	276	0.0214
N-Pentane (C5H12):	0.0099	0.0036	0.0325	325	0.0254
Hexanes+ (C6H14):	0.0610	0.0263	0.2218	2218	0.1859
Totals	100.000	11.0012	100.000		100.000

Comments - Additional Data

BTU -dry (BTU/ft^3):	7.3	Z-Comp. Factor-dry:	0.99970
BTU -water vapor sat.(BTU/ft^3):	8.1	Z-Comp. Factor-water vapor sat.:	0.99556
Specific Gravity -dry:	0.9689	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	0.9669	Molecular Weight	28.0692

Office: 806-665-0790
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: 11/16/12
Analysis By: Jessica Cabezudo

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

Quality Control Report#: 2310

Analytical Results

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

Comments - Additional Data

ACTUAL		ANALYSIS	
BTU -dry (BTU/ft3):	1324.0	BTU -dry (BTU/ft^3):	1325.2
BTU -water vapor sat. (BTU/ft3):	1318.4	BTU -water vapor sat. (BTU/ft^3):	1319.6
Specific Gravity -dry:	0.8349	Specific Gravity -dry:	0.8357
Specific Gravity -water vapor sat.:	0.8419	Specific Gravity -water vapor sat.:	0.8426
Z-Comp. Factor -dry:	0.99564	Z-Comp. Factor -dry:	0.99563
Z-Comp. Factor -water vapor sat.:	0.98306	Z-Comp. Factor -water vapor sat.:	0.98305

LAB Order ID #_____ Page_____ of _____

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: _____ **Phone #:** _____

Address: (Street, City, Zip) _____ **Fax #:** _____

Contact Person: _____ **E-mail:** _____

Invoice to: (If different from above) _____

Project #: _____ **Project Name:** _____

Project Location (including state): _____ **Sampler Signature:** _____

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume / Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME
16350	313 944	1	1L			X							X	11/9/12	
16351	945	1	1L			X							X	11/9/12	

	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	TRRP 13						Turn Around Time if different from standard	Hold
16350																				X						
16351																				X						

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	
								INST_____ OBS_____ °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

REMARKS:
12111203
Midwest

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

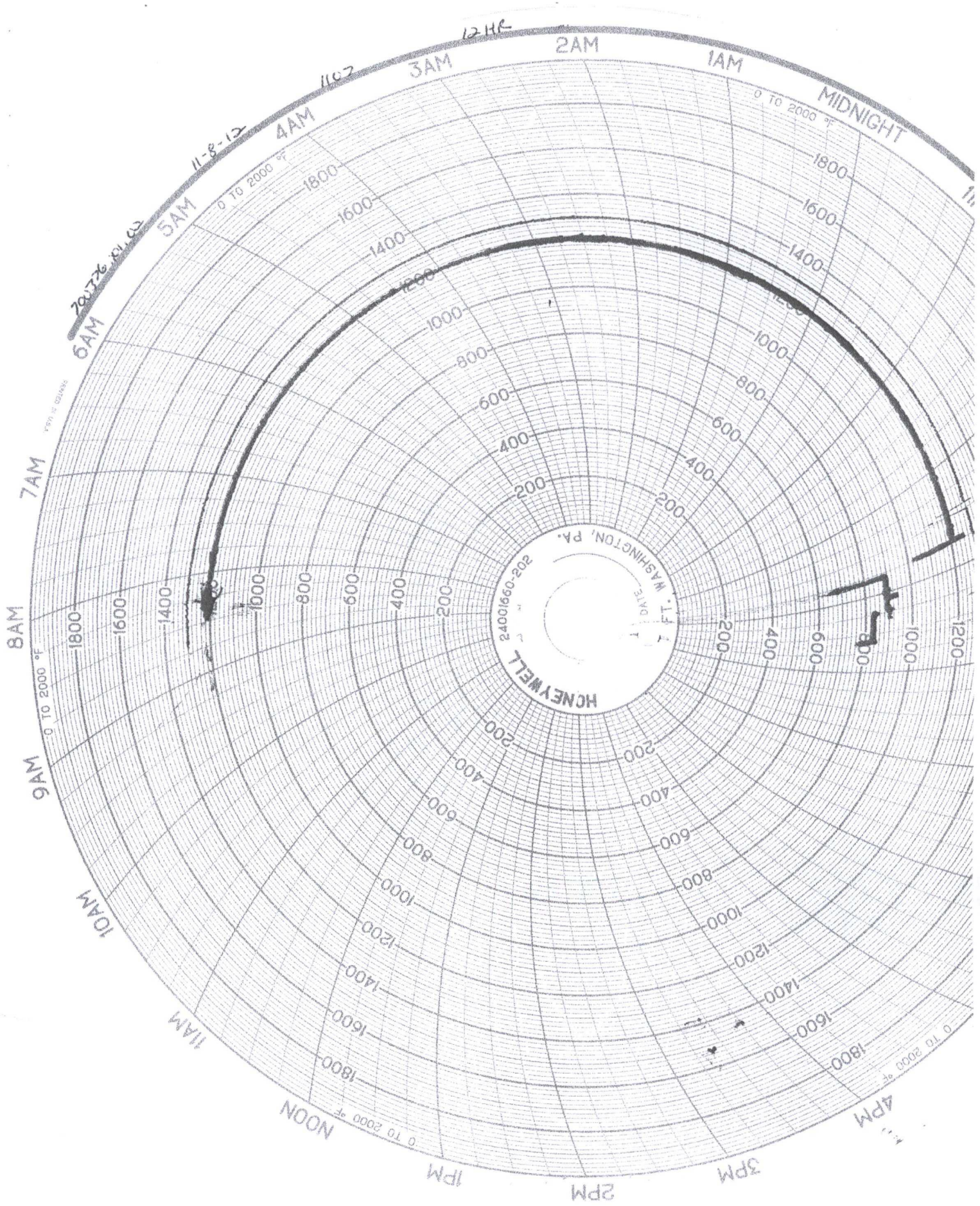
Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C.

Carrier # _____

ORIGINAL COPY

ATTACHMENT 3

Oxidizer Charts


12 HR
11-8-12
MIDNIGHT
1AM
2AM
3AM
4AM
5AM
6AM
7AM
8AM
9AM
10AM
11AM
NOON
1PM
2PM
3PM
4PM
0 TO 2000 °F
200 400 600 800 1000 1200 1400 1600 1800
HONEYWELL
24001660-202
WASHINGTON, PA.
DATE
7 DAY
FT.

ATTACHMENT 4

Waste Ticket

207804

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

476275

Date 11-9-12 Truck No. 369

Company Plains Pipe line Purchase Order No. Invoice Number

From SKS # Transps-11 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 52

	TIME	RATE	AMOUNT
	4	1.10	57.20
Driver, Operator or Pusher BRAD HARDCASTLE		102.00	408.00
Helper			
Helper			
Helper			
Other Charges			
Description of Work: empty out tanks Haul to Disposal			
		Sub Total	465.20
Sprinkle SWD ticket # CC317		Sales Tax	25.59
Authorized by:		TOTAL	490.79

Superior Printing Service, Inc. - 101