



P.O. Box 10640 Bozeman, Montana 59719

(406) 460-0903

TO: Jim Griswold, NMOCD

FROM: Curtis Shuck, Chairman

DATE: April 29, 2023

RE: Harrison #001 (30-025-24609) Orphan Well Post-Plugging Methane Monitoring

TECHNICAL MEMORANDUM

Well Done New Mexico LLC and the Well Done Foundation, Inc. (WDF) performing contract professional services methane monitoring for the State of New Mexico Energy, Minerals and Natural Resources Department – Oil Conservation Division (OCD) under Purchase Order #52100-00000073985 for Orphan Oil & Gas Wells in Lea County, NM.

The site conditions found at the Harrison #001 by the WDF Measure 1 Field Team on March 1, 2023, revealed a cement plugged orphan well with the cement to within -1'-2" of the top of casing. The WDF Measure 1 Team took site photographs, performed field gas measurements and collected a gas sample for immediate laboratory analysis.

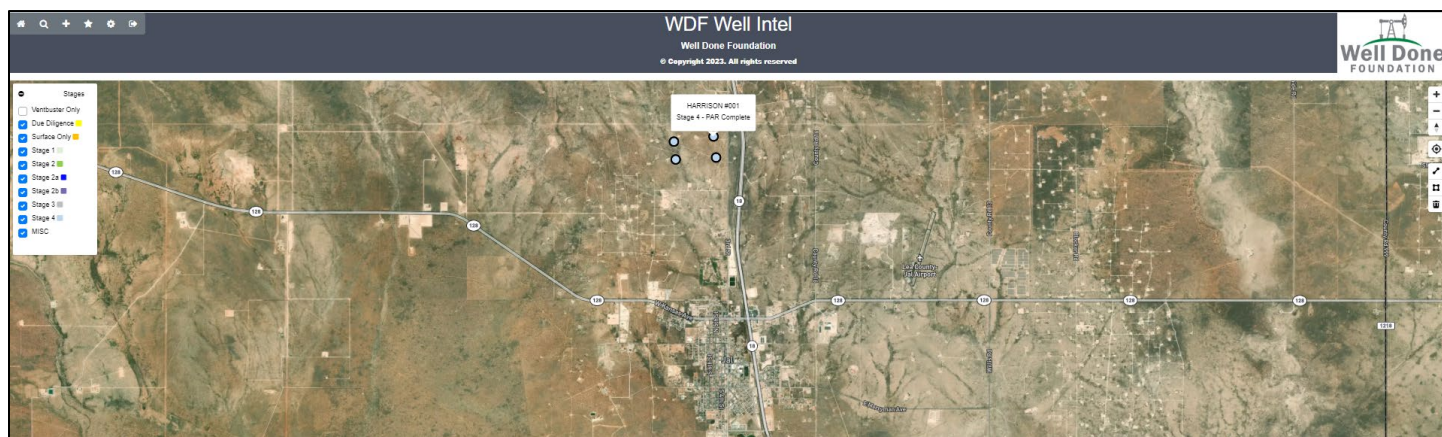


Image 1.1 – Harrison #001 (30-025-24609) Orphan Well in Lea County, NM

The Pre-Plugging Methane Flow Monitoring Test on September 17, 2022, using Ventbuster™ Instruments VB100-049 Ultra-Low Flow Meter with GPS, resulted in 6.25 cubic meters per day of total measured wellhead emissions. A composite gas sample collected at the wellhead by WDF during the flow test established a methane gas concentration level measured at 841,690 ppm, pursuant to Test ID 2022058130 performed by Laboratory Services of Hobbs, NM. Therefore, the adjusted average methane gas emission measured at this wellhead is calculated at **157.16 grams per hour (g/hour)**.¹

The State of New Mexico used the methane flow data collected by WDF to prioritize the Harrison #001 orphan well plugging under the IJA Program and began mobilizing a contractor to location. A-Plus Well Service, Inc. of Farmington, NM was awarded the plugging contract.

WDF arrived at the Harrison #001 location on March 1, 2023, to perform post-plugging orphan well methane testing and sampling on behalf of the State of New Mexico. **WDF post plugging field gas tests revealed 0.00% of methane or H₂s gasses. The post plugging collected gas samples, analyzed by Laboratory Services, Inc. confirmed 0.00 ppm or methane gas and 0.00 ppm of H₂s gas. THEREFORE, the total Methane Gas Emissions Reduction is: 157.16 g/hour.**

¹ Methane Calculation: 717 grams CH₄ per cubic meter (717 x 6.25 m³/day = 4,481.25 g/day total /24 = 186.72 g/hour x 0.841690 (methane concentration) = **157.16 g/hour CH₄**). **Methane, gas** weighs 0.000717 gram per cubic centimeter or 0.717 kilogram per cubic meter, i.e. density of methane, gas is equal to 0.717 kg/m³; at 0°C (32°F or 273.15K) at standard atmospheric pressure. In Imperial or US customary measurement system, the density is equal to 0.044 pound per cubic foot [lb/ft³].

This orphan well did exceed the >1 g/hour federal program reporting requirements for methane emissions reductions as described in Section 40601 (Orphaned well site plugging, remediation, and restoration) of Title V (Methane Reduction Infrastructure) of the 2021 Bipartisan Infrastructure Law (BIL; Public Law 117-58)².

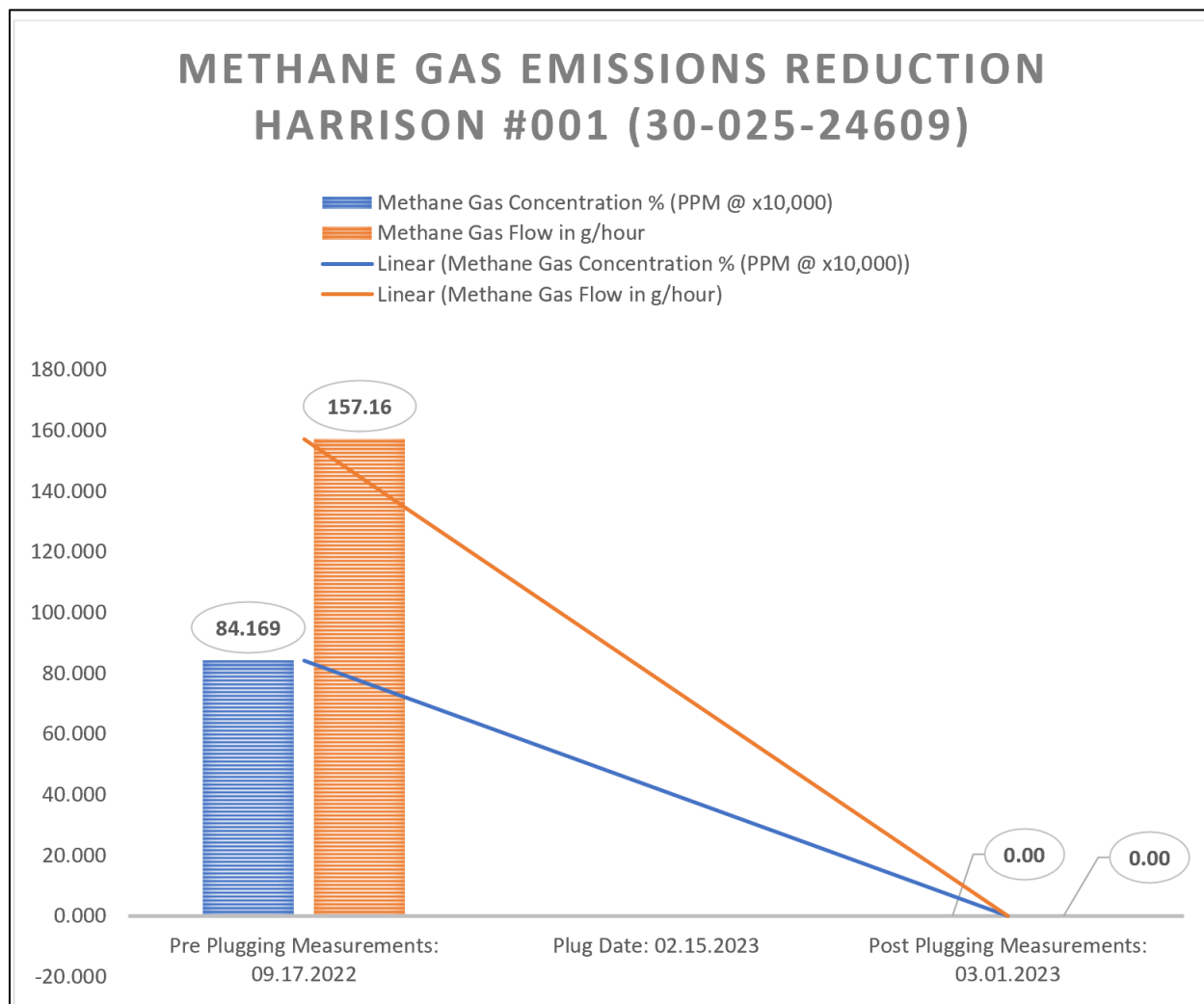


Image 2.1 – Harrison #001 (30-025-24609) Methane Gas Emissions Reduction Pre Plugging to Post Plugging

TECHNICAL FINDINGS

Harrison #001 (30-025-24609):

- **Total C1 through C6 Gas Concentration: 937,470 ppm**
- **Total Measured Wellhead Gas Emissions: 6.25 m³/day**
- **Methane Gas Concentration: 841,690 ppm**
- **Calculated Average Wellhead Methane Gas Emissions: 157.16 g/hour**
- **Post Plugging Methane Gas Concentration: 0.00 ppm**
- **Post Plugging Methane Flow: 0.00 g/hour**

² These April 11, 2022 Guidelines were developed to meet the federal program reporting requirements for methane emissions reductions as described in Section 40601 (Orphaned well site plugging, remediation, and restoration) of Title V (Methane Reduction Infrastructure) of the 2021 Bipartisan Infrastructure Law (BIL; Public Law 117-58).

CONCLUSIONS

- The Harrison #001 (30-025-24609) was emitting Methane gas pre-plugging at the average rate of 157.16 g/hour, which was above the Federal minimum threshold for reporting described in Section 40601 (Orphaned well site plugging, remediation, and restoration) of Title V (Methane Reduction Infrastructure) of the 2021 Bipartisan Infrastructure Law (BIL; Public Law 117-58) which is >1g/hour.
- Post Plugging, the Harrison #001 (30-025-24609) presented 0.00 ppm of Methane gas emissions from field gas tests and laboratory analysis of WDF collected gas samples.

FIELD NOTES

Well Done

FOUNDATION

Well Site

Info

Well File

Images

Well Data

Regulatory

Field Notes

Live Data View

Access

Remove Well

Date

04/29/2023

New Note

ces: Prepare Post Plugging Tech Memo - WILDCAT OUT

Add

#	Date	Note
1	2023-03-01	Arrived 11:45am 3/1/2023. Collected post plug gas samples and took cement depth photo.
2	2022-09-19	ces: WDF Measure 1 Team back on location of the Judy #001 Orphan Well. VB100-034 has been running for more than 40 hours. Collect Gas Sample #2. Rig down VB100-034. Secure Wellhead. Place green ribbon at the well to indicate to the pluggers that this well id "good to go" for plugging. WILDCAT OUT!
3	2022-09-17	CES: Well is leaking at tubing packing at wellhead. Collect gas sample. Rig up VB100-034 for 12-Hour Methane Flow Test. Update GPS Coordinates.

Image 3.1 – Judy #001 (30-025-24609) Field Notes from WDF Well Intel™ Orphan Well Project Management IoT

Appendix A – Site Photos for Harrison #001 (30-025-24609)



1) Harrison #001 – Pre Plugging Methane Measurement



2) Harrison #001 – Cement Elevation



3) Harrison #001 – Post Plug Gas Sample



www.permianls.com
575.397.3713 2609 W Marland Hobbs NM 88240

C6+ Gas Analysis Report

16151G	Harrison #001 Post Plug Sample B	Harrison #001 Post Plug Sample B	
Sample Point Code	Sample Point Name	Sample Point Location	
Laboratory Services	2023064930	Tedlar Bag	SOJ - Spot
Source Laboratory	Lab File No	Container Identity	Sampler
USA	USA	USA	New Mexico
District	Area Name	Field Name	Facility Name
Mar 1, 2023 11:25	Mar 1, 2023 11:25	Mar 2, 2023 07:35	Mar 6, 2023
Date Sampled	Date Effective	Date Received	Date Reported
Torrance			
Ambient Temp (°F)	Flow Rate (Mcf)	Analyst	Press PSI @ Temp °F
			Source Conditions
Well Done Foundation		NG	
Operator		Lab Source Description	

Component	Normalized Mol %	Un-Normalized Mol %	GPM
H2S (H2S)	0.0000	0	
Nitrogen (N2)	99.5610	99.56173	
CO2 (CO2)	0.0590	0.05901	
Methane (C1)	0.0000	0	
Ethane (C2)	0.0180	0.01827	0.0050
Propane (C3)	0.0220	0.02185	0.0060
I-Butane (IC4)	0.0000	0	0.0000
N-Butane (NC4)	0.0150	0.01469	0.0050
I-Pentane (IC5)	0.0000	0	0.0000
N-Pentane (NC5)	0.0070	0.0069	0.0030
Hexanes Plus (C6+)	0.3180	0.31755	0.1380
TOTAL	100.0000	100.0000	0.1570

Method(s): Gas C6+ - GPA 2261, Extended Gas - GPA 2286, Calculations - GPA 2172

Analyzer Information			
Device Type:	Gas Chromatograph	Device Make:	Shimadzu
Device Model:	GC-2014	Last Cal Date:	Feb 13, 2023

Gross Heating Values (Real, BTU/ft³)			
14.696 PSI @ 60.00 Å°F		14.73 PSI @ 60.00 Å°F	
Dry	Saturated	Dry	Saturated
18.1	18.6	18.1	18.6

Calculated Total Sample Properties	
GPA2145-16 *Calculated at Contract Conditions	
Relative Density Real	Relative Density Ideal
0.9750	0.9751
Molecular Weight	
28.2416	

C6+ Group Properties		
Assumed Composition		
C6 - 60.000%	C7 - 30.000%	C8 - 10.000%

Field H2S
0 PPM

PROTREND STATUS:

Passed By Validator on Mar 7, 2023

DATA SOURCE:

Imported

PASSED BY VALIDATOR REASON:

Close enough to be considered reasonable.

VALIDATOR:

Brooke Rush

VALIDATOR COMMENTS:

OK

Source	Date	Notes
Brooke Rush	Mar 7, 2023 2:08 pm	Methane = 0 PPM

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

DEFINITIONS

Action 211936

DEFINITIONS

Operator: PRIMAL ENERGY CORPORATION 211 Highland Cross Houston, TX 77073	OGRID: 154303
	Action Number: 211936
	Action Type: [UF-OMA] Post-Plug Methane Monitoring (UF-OMA-MMB)

DEFINITIONS

The Orphan Well Mitigation Activity (OMA) forms are a subset of the OCD's forms exclusively designed for activities related to State of New Mexico's contracted plugging and reclamation activities. Specifically, these forms are used for orphan wells or associated facilities which are in a "Reclamation Fund Approved" status. This status represents wells or facilities where the OCD has acquired a hearing order allowing the OCD to perform plugging or reclamation on wells and associated facilities that no longer have a viable operator to perform the necessary work. These forms are not to be utilized for any other purpose.

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QUESTIONS

Action 211936

QUESTIONS

Operator: PRIMAL ENERGY CORPORATION 211 Highland Cross Houston, TX 77073	OGRID: 154303
	Action Number: 211936
	Action Type: [UF-OMA] Post-Plug Methane Monitoring (UF-OMA-MMB)

QUESTIONS

Prerequisites	
[OGRID] Well Operator	[154303] PRIMAL ENERGY CORPORATION
[API] Well Name and Number	[30-025-24609] HARRISON #001
Well Status	Plugged (not released)

Monitoring Event Information

Please answer all the questions in this group.

Reason For Filing	Post-Plug Methane Monitoring
Date of monitoring	03/01/2023
Latitude	32.15027
Longitude	-103.19626

Monitoring Event Details

Please answer all the questions in this group.

Flow rate in cubic meters per day (m³/day)	0.00
Test duration in hours (hr)	1.0
Average flow temperature in degrees Celsius (°C)	8.2
Average gauge flow pressure in kilopascals (kPag)	0.0
Methane concentration in part per million (ppm)	0
Methane emission rate in grams per hour (g/hr)	0.00
Testing Method	Steady State

Monitoring Contractor

Please answer all the questions in this group.

Name of monitoring contractor	Well Done New Mexico LLC
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