



P.O. Box 10640 Bozeman, Montana 59719

(406) 460-0903

TO: Jim Griswold, NMOCD

FROM: Curtis Shuck, Chairman

DATE: April 15, 2023

RE: O'Brien Fee 18 #002 (30-005-60640) 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 O'Brien Fee 18 #002 by the WDF Measure 1 Field Team on March 31, 2023, revealed a cement plugged orphan well with the cement to within -30'-7" 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 – O'Brien Fee 18 #002 (30-005-60640) Orphan Well in Chaves County, NM

The Pre-Plugging Methane Flow Monitoring Test on February 20, 2023, using Ventbuster™ Instruments VB100-054 Ultra-Low Flow Meter with GPS, resulted in 2.40 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 493,430 ppm, pursuant to Test ID 2023064651 performed by Laboratory Services of Hobbs, NM. Therefore, the adjusted average methane gas emission measured at this wellhead is calculated at **35.38 grams per hour (g/hour)**.¹

The State of New Mexico used the methane flow data collected by WDF to prioritize the O'Brien Fee 18 #002 orphan well plugging under the IJIA Program and began mobilizing a contractor to location. J A Drake Well Service, Inc. of Farmington, NM was awarded the plugging contract.

WDF arrived at the O'Brien Fee 18 #002 location on March 31, 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: 35.38 g/hour.**

¹ Methane Calculation: 717 grams CH₄ per cubic meter (717 x 2.40 m³/day = 1,720.80 g/day total /24 = 71.70 g/hour x 0.493430 (methane concentration) = **35.38 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.

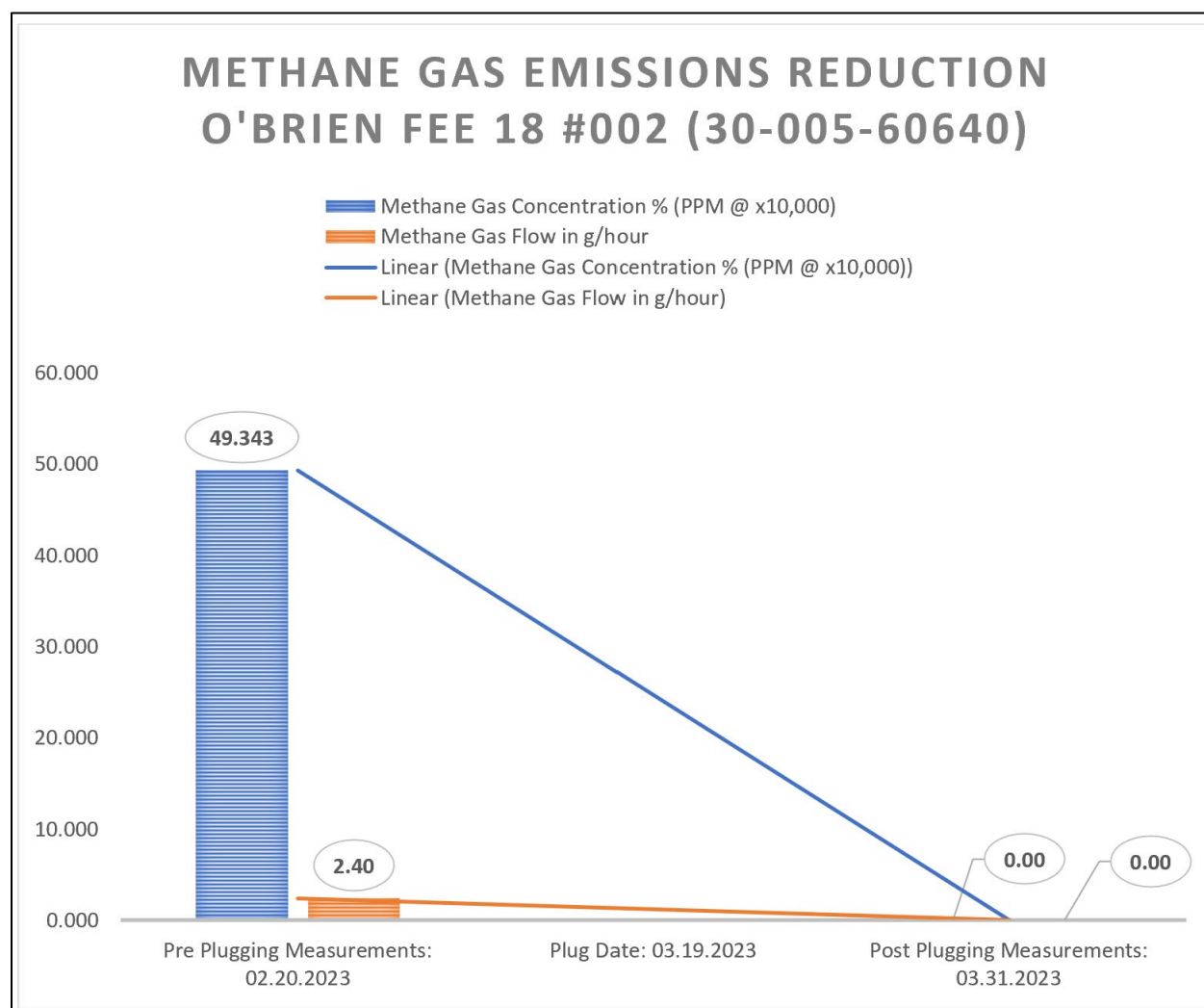


Image 2.1 – O'Brien Fee 18 #002 (30-005-60640) Methane Gas Emissions Reduction Pre Plugging to Post Plugging

TECHNICAL FINDINGS

O'Brien Fee 18 #002 (30-005-60640):

- **Total C1 through C6 Gas Concentration: 764,050 ppm**
- **Total Measured Wellhead Gas Emissions: 2.40 m3/day**
- **Methane Gas Concentration: 493,430 ppm**
- **Calculated Average Wellhead Methane Gas Emissions: 35.38 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 O'Brien Fee 18 #002 (30-005-60640) was emitting Methane gas pre-plugging at the average rate of 35.38 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 O'Brien Fee 18 #002 (30-005-60640) 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

04/23/2023

New Note

Required

Add

#	Date	Note
1	2023-04-15	ces: Prepare Post Plugging Report
2	2023-03-31	ces: On location to collect Post Plug Gas Sample and photo document condition. Cement was down 30'-7" from the top of casing. ND for CH4 using Field Gas Detection.
3	2023-03-28	ces: Review File. Review Data. Prepare Pre Plugging Report.
4	2023-02-21	Return to location to complete orphan well methane flow test and rig down VB100-054. Good Test Stop as confirmed by WDF JWOC. Secure Location.
5	2023-02-19	Arrive at location. Photo document site. Conduct Field Gas Analysis for H2S and CH4. Collect Gas Sample from casing vent for Laboratory Analysis. Rig up VB100-054 and begin Methane Flow Test. WDF JWOC confirmed good test start.

Image 4.2 – O'Brien Fee 18 #002 (30-005-60640) Field Notes from WDF Well Intel™ Orphan Well Project Management IoT



1) O'Brien Fee 18 #002 – Methane Measurement



2) O'Brien Fee 18 #002 – Orphan Well Plugging



3) O'Brien Fee 18 #002 – Cement Depth from Surface



4) O'Brien Fee 18 #002 – Post Plug Gas Sample



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

C6+ Gas Analysis Report

16510G	OBrien Fee 18 #002	OBrien Fee 18 #002	
Sample Point Code	Sample Point Name	Sample Point Location	
Laboratory Services	2023066467	Tedlar Bag	CES - Spot
Source Laboratory	Lab File No	Container Identity	Sampler
USA	USA	USA	New Mexico
District	Area Name	Field Name	Facility Name
Mar 31, 2023 19:40	Mar 31, 2023 19:40	Apr 3, 2023 13:27	Apr 3, 2023
Date Sampled	Date Effective	Date Received	Date Reported
System Administrator			
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)	99.6100	99.609	
CO2 (CO2)	0.0460	0.046	
Methane (C1)	0.0000	0	
Ethane (C2)	0.0000	0	0.0000
Propane (C3)	0.0140	0.014	0.0040
I-Butane (IC4)	0.0000	0	0.0000
N-Butane (NC4)	0.0380	0.038	0.0120
I-Pentane (IC5)	0.0650	0.065	0.0240
N-Pentane (NC5)	0.1480	0.148	0.0540
Hexanes Plus (C6+)	0.0790	0.079	0.0340
TOTAL	100.0000	99.9990	0.1280

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
14.2	14.9	14.2	14.9

Calculated Total Sample Properties	
GPA2145-16 *Calculated at Contract Conditions	
Relative Density Real	Relative Density Ideal
0.9728	0.9729
Molecular Weight	
28.1800	

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

Field H2S
0 PPM

PROTREND STATUS:

Passed By Validator on Apr 5, 2023

DATA SOURCE:

Imported

PASSED BY VALIDATOR REASON:

First sample taken @ this point, composition looks reasonable

VALIDATOR:

Brooke Rush

VALIDATOR COMMENTS:

OK

Source	Date	Notes
Brooke Rush	Apr 5, 2023 8:49 am	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 209898

DEFINITIONS

Operator: CANYON E & P COMPANY 251 O'Connor Ridge Blvd. Irving, TX 75038	OGRID: 269864
	Action Number: 209898
	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.

District I

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

QUESTIONS

Action 209898

QUESTIONS

Operator: CANYON E & P COMPANY 251 O'Connor Ridge Blvd. Irving, TX 75038	OGRID: 269864
	Action Number: 209898
	Action Type: [UF-OMA] Post-Plug Methane Monitoring (UF-OMA-MMB)

QUESTIONS

Prerequisites	
[OGRID] Well Operator	[269864] CANYON E & P COMPANY
[API] Well Name and Number	[30-005-60640] O'BRIEN FEE 18 #002
Well Status	Active

Monitoring Event Information*Please answer all the questions in this group.*

Reason For Filing	Post-Plug Methane Monitoring
Date of monitoring	03/31/2023
Latitude	33.613728
Longitude	-104.0231552

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)	17.2
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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