P.O. Box 10640 Bozeman, Montana 59719 (406) 460-0903

TO: Jim Griswold, NMOCD

FROM: Curtis Shuck, Chairman

DATE: July 23, 2023

RE: Artesia Metex #040 (30-015-00954) 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 Chaves County, NM.

The site conditions found at the Artesia Metex #040 by the WDF Measure 1 Field Team on June 27, 2023, revealed a cement filled casing to within 10'-2" of the surface. The WDF Measure 1Team took site photographs, performed field gas measurements and collected a gas sample for immediate laboratory analysis.

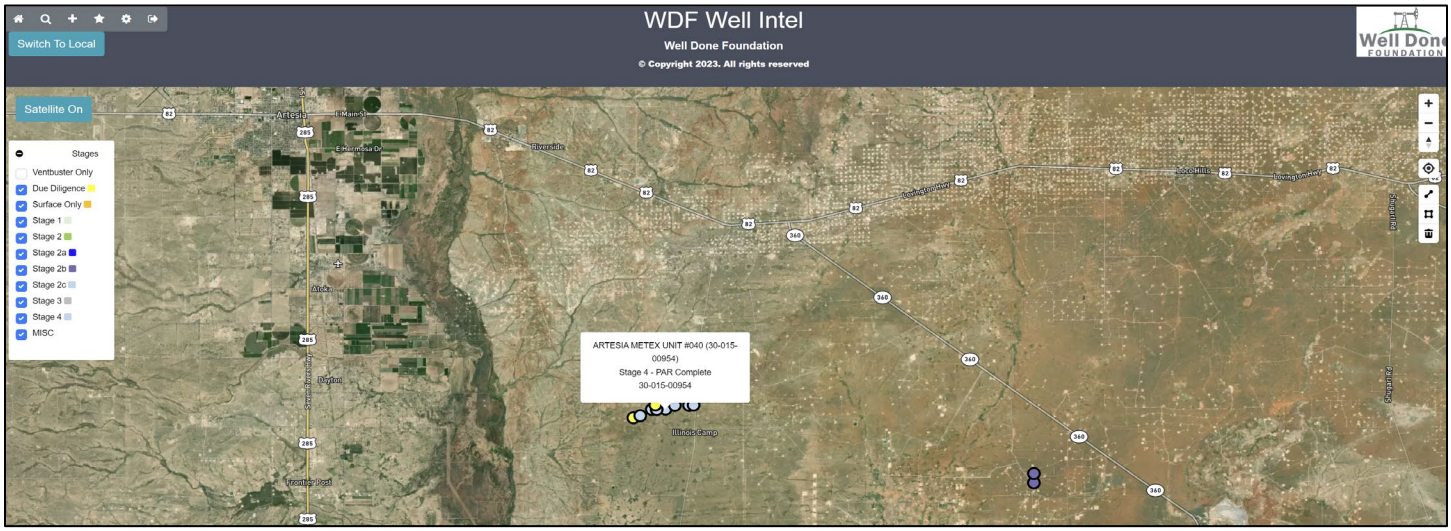


Image 1.1 – Artesia Metex #040 (30-015-00954) Orphan Well in Eddy County, NM

The Pre-Plugging Methane Flow Calculations were conducted by the Well Done Foundation and Well Done New Mexico LLC and monitored using Ventbuster™ Instruments VB100-44 Series Ultra-Low Flow Meter with GPS on February 26, 2023. The Methane Concentration was measured at 5,000 ppm and Methane Flow was measured at 2.86 cfd. Therefore, the adjusted average methane gas emission measured at this wellhead is calculated at **0.01 grams per hour (g/hour)**.[1]

The State of New Mexico used the methane flow data collected by WDF to prioritize the Artesia Metex #040 orphan well plugging under the IIJA Program and began mobilizing a contractor to location. A-Plus P&A Well Service, Inc. of Farmington, NM was awarded the plugging contract.

WDF arrived at the Artesia Metex #040 location on June 27, 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: 0.01 g/hour.**

[1] Methane Calculation: 717 grams CH4 per cubic meter (717 x 0.07 m3/day = 50.19 g/day total /24 = 2.09 g/hour x 0.005000 (methane concentration) = **0.01 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/m^3; 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/ft^3].

Test Report

Start Date: Sun Feb 26 2023 19:40:40 GMT+0000 (Coordinated Universal Time)
End Date: Tue Feb 28 2023 18:05:15 GMT+0000 (Coordinated Universal Time)
Device: VB100-0044
Well Licensee: 30-015-00954
Well Name: Artesia Metex 040
UWI: 30-015-00954
Well License Number: 30-015-00954
Surface Location: State of NM
Bottom Hole Location: Unknown

Test Operator: Sean O. Jacobson
Authorized By: State of NM
Test Reason: IIJA Pre Plugging
Scope Of Work: 12 Hour
AFE Number: 52100-0000072986
GPS: 32.71930,-104.22683
Notes: GTG
Prepared By: Curtis Shuck

Flow / Pressure Test

Flow Duration	Average Flowrate	Average Pressure	Average Flow Temperature	Average CH4 Mass
46 hrs 22 minutes Duration	2.8636 cfd	0.7118 psig	54.6386 °F	0.01 g/hr

Methane Calculation: 717 grams CH4 per cubic meter (717 g/m^3 x 0.0811 m^3/day = 58.15 g/day total /24 = 2.42 g/hour x 0.005 (methane concentration) = **0.01 g/hour CH4**). **Methane, gas** weighs 0.000717 *gram per cubic centimeter* or 0.717 *kilgram per cubic meter*, i.e. density of *methane, gas* is equal to 0.717 kg/m^3; at 0°C (32°F or 273.15K) at standard atmospheric pressure. In imperial or US customary measurement system, the density is equal to 0.0448 *pound per cubic foot* [lb/ft^3], or 0.0004144 *ounce per cubic inch* [oz/$inch^3$].

Flow / Pressure / Temperature Timeseries

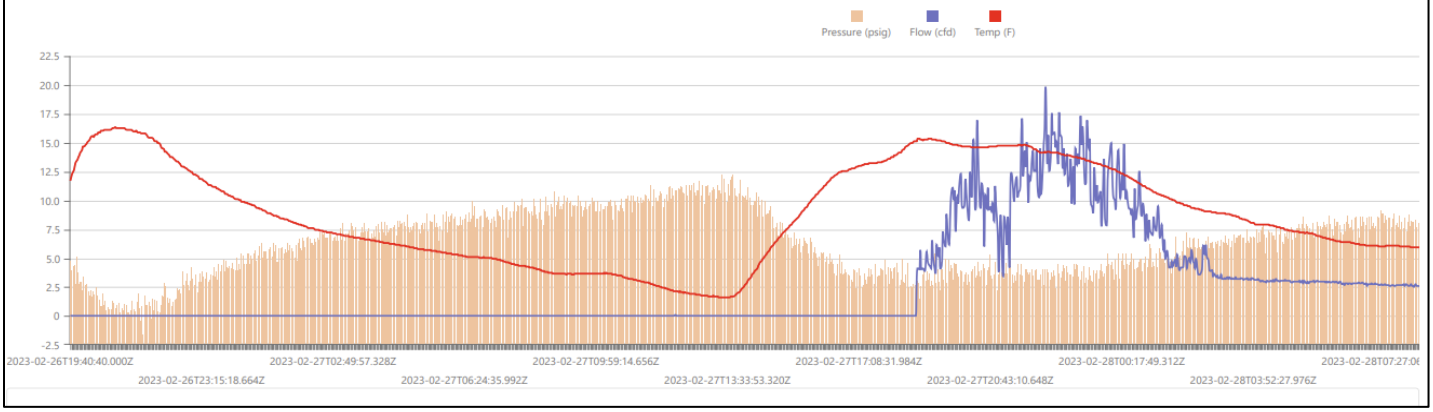


Image 2.1 – Artesia Metex #040 Pre Plugging Test Report

This orphan well did not 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].

[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).

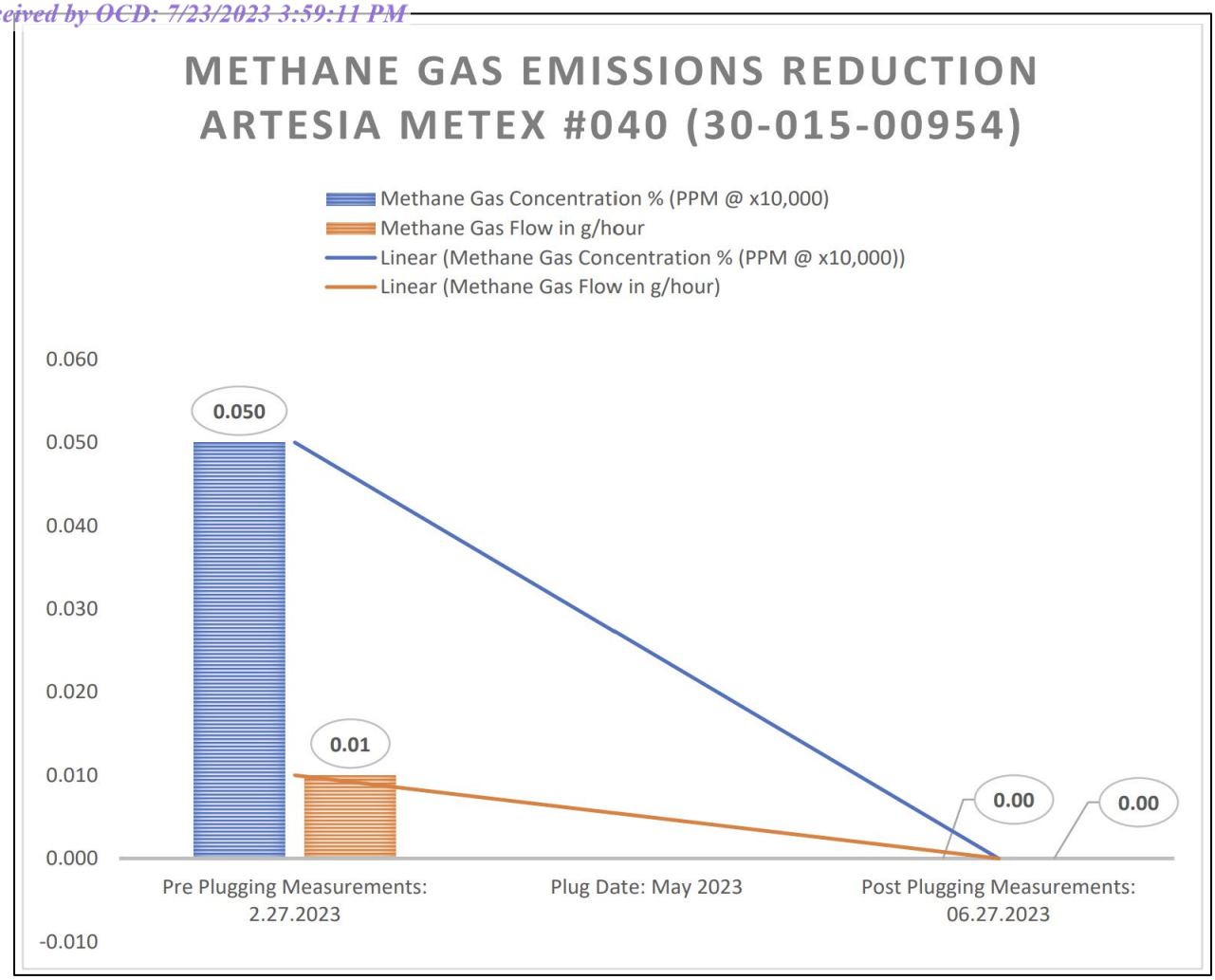


Image 3.1 – Artesia Metex #040 (30-015-00954) Methane Gas Emissions Reduction Pre Plugging to Post Plugging

TECHNICAL FINDINGS

Artesia Metex #040 (30-015-00954):

- **Total C1 through C6 Gas Concentration: 23,410 ppm**
- **Total Measured Wellhead Gas Emissions: 0.07 m3/day**
- **Methane Gas Concentration: 5,000 ppm**
- **Calculated Average Wellhead Methane Gas Emissions: 0.01 g/hour**
- **Post Plugging Methane Gas Concentration: 0.00 ppm**
- **Post Plugging Methane Flow: 0.00 g/hour**

CONCLUSIONS

- The Artesia Metex #040 (30-015-00954) was emitting Methane gas pre-plugging at the average rate of 0.01 g/hour, which was below 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 Artesia Metex #040 (30-015-00954) presented 0.00 ppm of Methane gas emissions from field gas tests and laboratory analysis of WDF collected gas samples.

FIELD NOTES

#	Date	Note
1	2023-06-27	ces: WDF Measure 1 on location to take site photos, perform Field Gas Analysis and collect gas sample for Laboratory analysis post plugging. Non-detect. All clear to cut and place monument prior to backfill. WILDCAT OUT!
2	2023-04-03	ces: On location to collect a gas Sample for Lab analysis.
3	2023-03-11	Arrived 11:35am 3/11/2023. Rigged down flow test. SP VB #16
4	2023-03-10	Arrived 12:31pm 3/10/2023. Rigged up flow test. SP VB #44
5	2023-02-28	Arrived 11:04am 2/28/2023. Rigged down flow test.
6	2023-02-26	Arrived 12:26pm 2/26/2023. Rigged up Ventbuster #44 for flow testing.

Image 4.1 – Artesia Metex #040 (30-015-00954) Field Notes from WDF Well Intel™ Orphan Well Project Management IoT

1) Artesia Metex #040 – Cement

2) Artesia Metex #040 – Gas Sample

3) Artesia Metex #040 – Ribbon

LABORATORY SERVICES Natural Gas Analysis
www.permianls.com
575.397.3713 2609 W Marland Hobbs NM 88240

C6+ Gas Analysis Report

Sample Point Code	Sample Point Name	Sample Point Location
17424G	Open Casing	Artesia Metex #040

Source Laboratory	Lab File No	Container Identity	Sampler
Laboratory Services	2023070988	Tedlar Bag	CES - Spot

District	Area Name	Field Name	Facility Name
USA	USA	USA	New Mexico

Date Sampled	Date Effective	Date Received	Date Reported
Jun 27, 2023 18:00	Jun 27, 2023 18:00	Jun 28, 2023 13:20	Jul 5, 2023

Ambient Temp (°F)	Flow Rate (Mcf)	Analyst	Press PSI @ Temp °F Source Conditions
		System Administrator	

Operator	Lab Source Description
Well Done Foundation	NG

Component	Normalized Mol %	Un-Normalized Mol %	GPM
H2S (H2S)	0.0000	0	
Nitrogen (N2)	99.9590	99.959	
CO2 (CO2)	0.0410	0.041	
Methane (C1)	0.0000	0	
Ethane (C2)	0.0000	0	0.0000
Propane (C3)	0.0000	0	0.0000
I-Butane (IC4)	0.0000	0	0.0000
N-Butane (NC4)	0.0000	0	0.0000
I-Pentane (IC5)	0.0000	0	0.0000
N-Pentane (NC5)	0.0000	0	0.0000
Hexanes Plus (C6+)	0.0000	0	0.0000
TOTAL	100.0000	100.0000	0.0000

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

Gross Heating Values (Real, BTU/ft³)

14.696 PSI @ 60.00 Â°F		14.73 PSI @ 60.00 Â°F	
Dry	Saturated	Dry	Saturated
0	0.9	0	0.9

Calculated Total Sample Properties

GPA2145-16 *Calculated at Contract Conditions

Relative Density Real	Relative Density Ideal
0.9673	0.9674

Molecular Weight: 28.0200

C6+ Group Properties

Assumed Composition

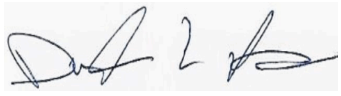
C6 - 60.000% C7 - 30.000% C8 - 10.000%

PROTREND STATUS:
Passed By Validator on Jul 7, 2023

DATA SOURCE:
Imported

PASSED BY VALIDATOR REASON:
First sample taken @ this point, composition looks reasonable

VALIDATOR:
. Rush

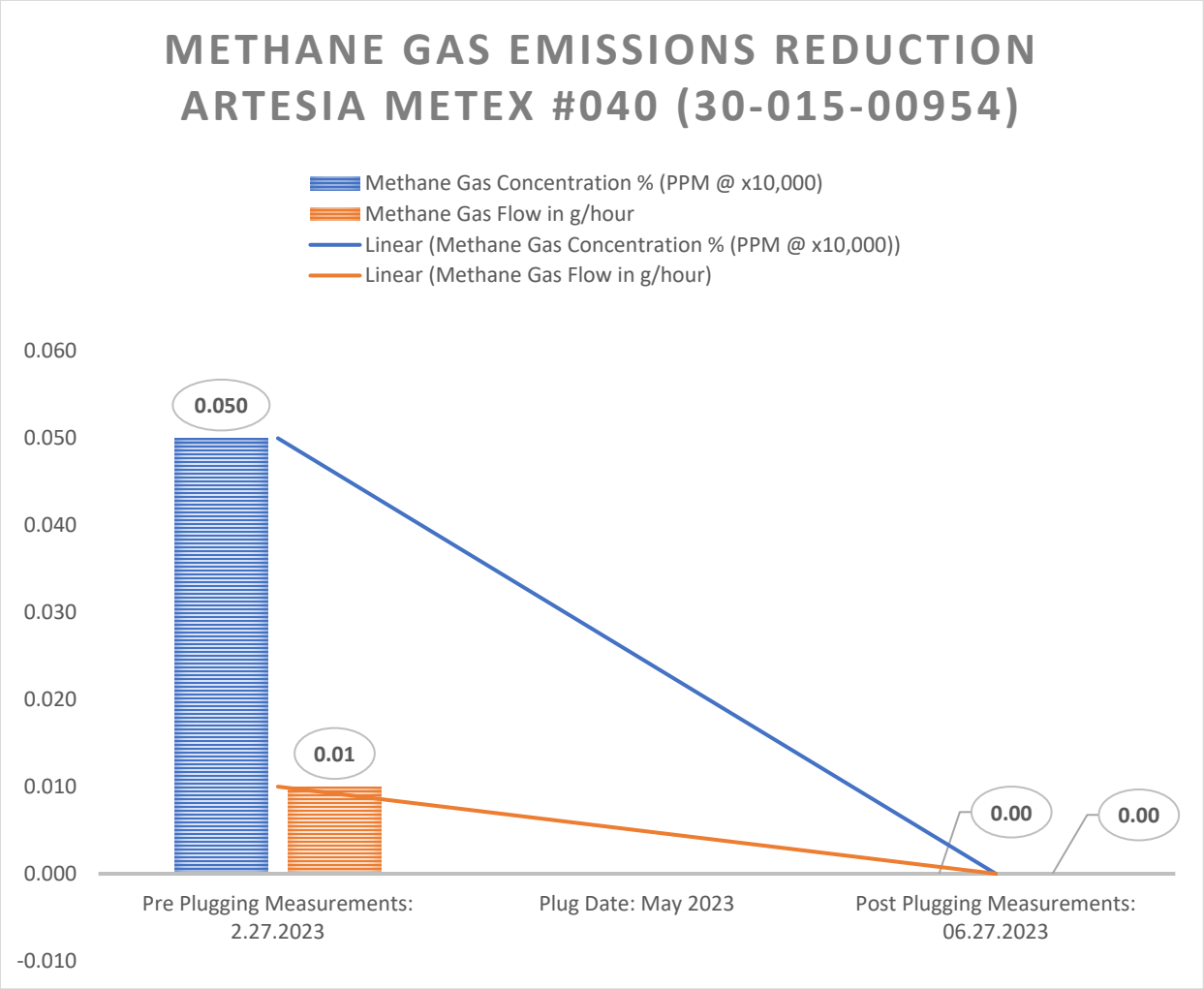


VALIDATOR COMMENTS:
OK

Analyzer Information

Device Type: Device Make:
Device Model: Last Cal Date:

Source	Date	Notes
. Rush	Jul 7, 2023 12:01 pm	Methane = 0 ppm


METHANE GAS EMISSIONS REDUCTION
ARTESIA METEX #040 (30-015-00954)
Methane Gas Concentration % (PPM @ x10,000)
Methane Gas Flow in g/hour
Linear (Methane Gas Concentration % (PPM @ x10,000))
Linear (Methane Gas Flow in g/hour)
0.060
0.050
0.040
0.030
0.020
0.010
0.000
-0.010
0.050
0.01
0.00
0.00
Pre Plugging Measurements: 2.27.2023
Plug Date: May 2023
Post Plugging Measurements: 06.27.2023

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

Operator: CANYON E & P COMPANY 251 O'Connor Ridge Blvd. Irving, TX 75038	OGRID: 269864
	Action Number: 243473
	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
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

QUESTIONS

Action 243473

QUESTIONS

Operator: CANYON E & P COMPANY 251 O'Connor Ridge Blvd. Irving, TX 75038	OGRID: 269864
	Action Number: 243473
	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	**[30-015-00954] ARTESIA METEX UNIT #040**
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	06/27/2023
Latitude	32.7191315
Longitude	-104.2266922

Monitoring Event Details *Please answer all the questions in this group.*	
Flow rate in cubic meters per day (m^3/day)	0.00
Test duration in hours (hr)	1.0
Average flow temperature in degrees Celsius (°C)	38.9
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	Other

Monitoring Contractor *Please answer all the questions in this group.*	
Name of monitoring contractor	Well Done New Mexico LLC