



P.O. Box 10640 Bozeman, Montana 59719

(406) 460-0903

TO: Randy Pancheco, APWS; Jim Griswold, NMOCD

FROM: Curtis Shuck, Chairman

DATE: September 27, 2022

RE: Twin Lakes SA #057 (30-005-61135) Orphan Well Pre-Plugging Methane Monitoring

## TECHNICAL MEMORANDUM

### EXECUTIVE SUMMARY

The Well Done Foundation, Inc. (WDF) performing contract professional services methane monitoring for A-Plus Well Services, Inc. (APWS) for the State of New Mexico Energy, Minerals and Natural Resources Department – Oil Conservation Division (OCD) under Purchase Order #10000002000038AA for Orphan Oil & Gas Wells at the Twin Lakes Field in Chavez County, NM.

The site conditions found at Twin Lakes SAU #057 by the WDF Measure 1 Team on August 24, 2022 at 3:30 revealed a leaking wellhead with high concentrations of methane gas present and leaking by the production valve at the 2-3/8" tubing. The WDF Team performed field gas measurements, collected gas samples and performed a 20.0-hour Methane Emissions Flow Monitoring Test using Ventbuster™ Instruments VB100-044 Ultra-Low Flow Meter with GPS for testing site verification.

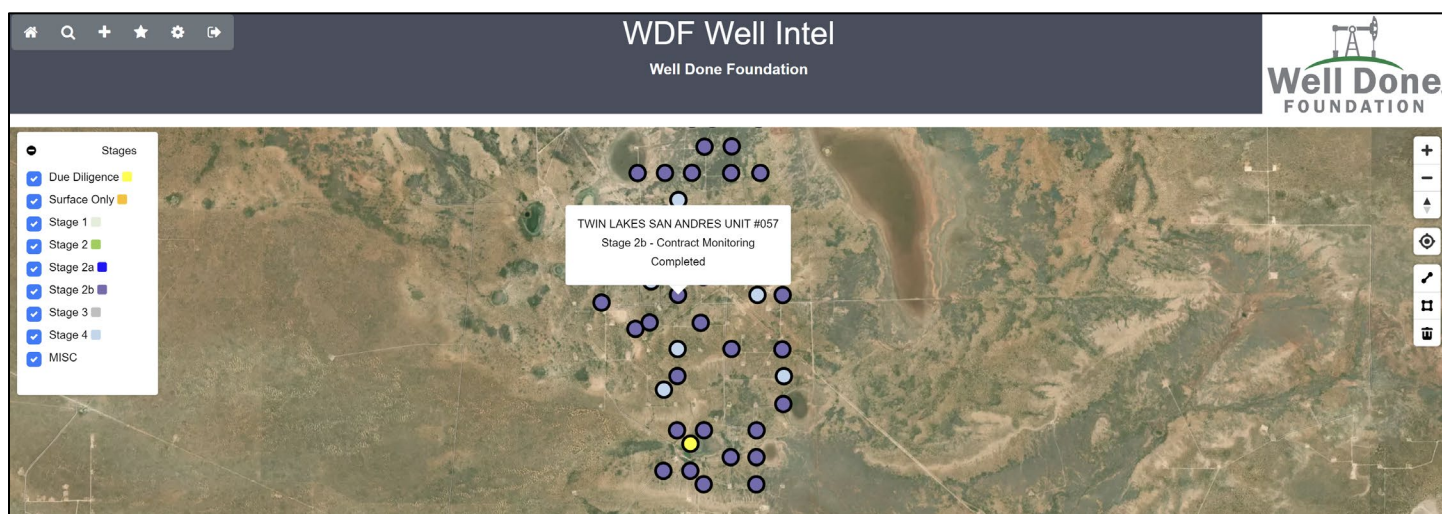


Image 1.1 – Twin Lakes SAU Field

The findings from the Methane Flow Monitoring Test, using Ventbuster™ Instruments VB100-0044 Ultra-Low Flow Meter with GPS, resulted in 0.72 cubic meters per day of total measured wellhead emissions. A composite gas sample was collected at the wellhead by WDF during the flow test beginning on August 24, 2022 and at the end of the flow test on August 25, 2022, approximately 20.0-hours later. Methane gas concentration levels were measured at 558,960 ppm, pursuant to Test ID 2022057513 performed by Laboratory Services of Hobbs, NM on August 31, 2022. Therefore, the adjusted methane gas emission measured at this wellhead is calculated at **9.29 grams per hour (g/hour)**.<sup>1</sup>

<sup>1</sup> Methane Calculation: 554 grams CH<sub>4</sub> per cubic meter (554 x 0.72 = 398.88 g/day total / 24 = 16.62 g/hour x 0.558.960 (methane concentration) = 9.29 g/hour CH<sub>4</sub>). **Methane, gas** weighs 0.000554 gram per cubic centimeter or 0.554 kilogram per cubic meter, i.e. density of methane, gas is equal to 0.554 kg/m<sup>3</sup>; at 0°C (32°F or 273.15K) at standard atmospheric pressure. In Imperial or US customary measurement system, the density is equal to 0.0346 pound per cubic foot [lb/ft<sup>3</sup>], or 0.0003202 ounce per cubic inch [oz/inch<sup>3</sup>].

This orphan well clearly exceeds 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)<sup>2</sup>.



## Test Report

**Start Date:** Wednesday, August 24th, 2022, 4:04 PM MDT

**End Date:** Thursday, August 25th, 2022, 12:03 PM MDT

**Device:** VB100-0044

**Well Licensee:** NMOCD

**Well Name:** Twin Lakes SA 57

**UWI:** 30-005-61135

**Well License Number:** 30-005-61135

**Surface Location:** private

**Bottom Hole Location:** unknown

**Test Operator:** ces

**Authorized By:** NMOCD

**Test Reason:** IJA PRE PLUG

**Scope Of Work:** 12-Hour

**AFE Number:** NMOCD038AA / APWS22.001

**GPS:** 33.56832,-104.03653

**Notes:** GTG

## Flow Test

Average Flowrate

**0.72**

m3/d

**9.29**

g/hour

Average Flow  
Temperature

**23.3**

°C

Average Flow  
Pressure

**3.8**

kPag

Flow Duration

**20.0**

hours

Image 2.1 – Twin Lakes SAU #057 (30-005-61335) Methane Monitoring Dashboard

## BACKGROUND

The Twin Lakes SAU #057 (30-005-61135) Orphan Well is located in Chavez County, NM at Latitude 33.56893 Longitude -104.0362396 was measured and monitored by the WDF Field Team on 8/24-25/2022 following a Safety Briefing. Per the WDF protocol, the well was photographed from four (4) compass point aspects and closeups capturing the wellhead, field gas analysis results and gas sampling and uploaded to the WDF Well Intel™ IoT site. A Field Gas Analysis was conducted to detect Methane and H<sub>2</sub>s gas presence and concentration levels using a Honeywell BW Quattro Multi Gas Meter, serial number: QA121-012211.

The WDF Field Team collected Gas Sample #1 using a 1 Liter Tedlar/TO-Plus Gas Sampling Bag from the 2-3/8" production tubing which was flowing gas past the valve at the beginning of the Flow Test at approximately 15:47 MDT on 8.24.2022 as the well was being prepared for the Flow Measurement and Gas Sample #2 in the same 1 Liter Tedlar Bag the following day 8.25.2022 before the Flow Test was concluded 12:03 MDT.

<sup>2</sup> 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).

Info	Well File	Images	Well Data	Regulatory	Field Notes	Access	Remove Well
Name	TWIN LAKES SAN ANDRES UNIT #057						
Stage	Stage 2b - Contract Monitoring Completed						⌵
GPS	33.568394		✓	-104.0362396		✓	
API#	30-005-61135						
Contract ID:	1000002000038AA						

Image 3.1 – WDF Well Intel™ Orphan Well Project Management IoT

WDF rigged up the Ventbuster™ VB100-044 Continuous Ultra-Low Flow Meter with GPS for testing site verification for a minimum 12-Hour Methane Emission Test and began Test ID: f21258, verifying a cellular signal, cloud link and GPS coordinates. WDF collected Gas Sample #2 in the same Tedlar/TO Plus Gas Sample Bag prior to the VB Test being concluded on 8.25.2022 to ensure the Methane Emission Flow was normalized. The collected Gas Sample was secured and placed in a storage cooler for transport to Laboratory Services, Inc. in Hobbs, NM.

WDF returned the following day (approximately 20.0 hours) to conclude the Methane Emission Flow Test and rig the Ventbuster™ Instruments VB100-044 down and secure the wellhead. A “Green Ribbon” was placed at the Wellhead indicating that WDF had concluded Pre-Plugging Methane Flow testing.

## TECHNICAL FINDINGS

Twin Lakes SAU #057 (30-005-61335):

- **Total C1 through C6 Gas Concentration: 673,300 ppm**
- **Total Measured Wellhead Gas Emissions: 0.72 m3/day**
- **Methane Gas Concentration: 558,960 ppm**
- **Calculated Wellhead Methane Gas Emissions: 9.29 g/hour**

## Flow/Pressure/Temperature Timeseries

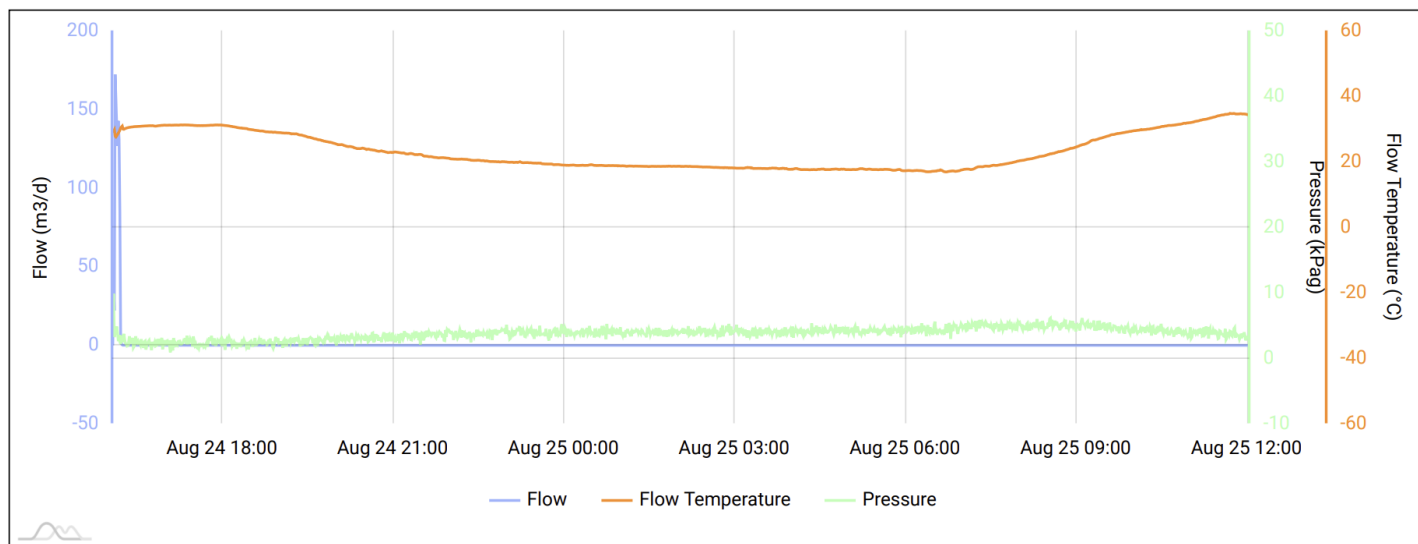


Image 3.2 – Twin Lakes SAU #057 (30-005-61335) Methane Flow/Pressure/Temperature Timeseries

## CONCLUSIONS

- The Twin Lakes SA #057 (30-005-61335) is currently emitting Methane at the rate of 9.29 g/hour, which is well beyond 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.
- Plugging of this well should be a priority in the NMOCD schedule.





1) Twin Lakes SA #057 (30-005-61335) – North Facing



2) Twin Lakes SA #057 (30-005-61335) – Monitoring



3) Twin Lakes SA #057 (30-005-61335) – Monitoring Complete



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

## C6+ Gas Analysis Report

<b>14818G</b>	<b>Twin Lakes #57</b>	<b>Twin Lakes #57</b>	
Sample Point Code	Sample Point Name	Sample Point Location	
<b>Laboratory Services</b>	<b>2022057513</b>	<b>Tedlar Bag</b>	<b>Stacy - Spot</b>
Source Laboratory	Lab File No	Container Identity	Sampler
<b>USA</b>	<b>USA</b>	<b>USA</b>	<b>New Mexico</b>
District	Area Name	Field Name	Facility Name
<b>Aug 24, 2022 15:30</b>	<b>Aug 24, 2022 15:30</b>	<b>Aug 30, 2022 14:07</b>	<b>Aug 30, 2022</b>
Date Sampled	Date Effective	Date Received	Date Reported
<b>Torrance</b>			
<b>Ambient Temp (°F)</b>	<b>Flow Rate (Mcf)</b>	<b>Analyst</b>	<b>Press PSI @ Temp °F</b> Source Conditions
<b>Well Done Foundation</b>		<b>NG</b>	
Operator		Lab Source Description	

Component	Mol %	GPM
H2S (H2S)	0.9400	
Nitrogen (N2)	32.0630	
CO2 (CO2)	0.6070	
Methane (C1)	55.8960	
Ethane (C2)	5.3830	1.4390
Propane (C3)	3.0230	0.8330
I-Butane (IC4)	0.3800	0.1240
N-Butane (NC4)	0.7950	0.2510
I-Pentane (IC5)	0.2830	0.1030
N-Pentane (NC5)	0.2130	0.0770
Hexanes Plus (C6+)	0.4170	0.1810
TOTAL	100.0000	3.0080

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

Gross Heating Values (Real, BTU/ft³)			
14.696 PSI @ 60.00 Å°F		14.73 PSI @ 60.00 Å°F	
Dry	Saturated	Dry	Saturated
824.3	811.2	826.2	813.1

Calculated Total Sample Properties	
GPA2145-16 *Calculated at Contract Conditions	
Relative Density Real	Relative Density Ideal
0.7925	0.7912
Molecular Weight	
22.9176	

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

Field H2S
9400 PPM

**PROTREND STATUS:**

Passed By Validator on Aug 31, 2022

**DATA SOURCE:**

Imported

**PASSED BY VALIDATOR REASON:**

First sample taken @ this point, composition looks reasonable

**VALIDATOR:**

Luis Cano

**VALIDATOR COMMENTS:**

ok

Source	Date	Notes
Brooke Rush	Aug 31, 2022 12:55 pm	Methane= 558,960 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 295409

DEFINITIONS

Operator:  BLUE SKY NM, INC. 7941 Katy Freeway Houston, TX 77024	OGRID:  300825
	Action Number:  295409
	Action Type:  [UF-OMA] Pre-Plug Methane Monitoring (UF-OMA-MMA)

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 295409

**QUESTIONS**

Operator: BLUE SKY NM, INC. 7941 Katy Freeway Houston, TX 77024	OGRID: 300825
	Action Number: 295409
	Action Type: [UF-OMA] Pre-Plug Methane Monitoring (UF-OMA-MMA)

**QUESTIONS**

<b>Prerequisites</b>	
[OGRID] Well Operator	[300825] BLUE SKY NM, INC.
[API] Well Name and Number	[30-005-61135] TWIN LAKES SAN ANDRES UNIT #057
Well Status	Plugged (not released)

**Monitoring Event Information**

Please answer all the questions in this group.

Reason For Filing	Pre-Plug Methane Monitoring
Date of monitoring	08/24/2023
Latitude	33.56832
Longitude	-104.03653

**Monitoring Event Details**

Please answer all the questions in this group.

Flow rate in cubic meters per day (m³/day)	0.72
Test duration in hours (hr)	20.0
Average flow temperature in degrees Celsius (°C)	23.3
Average gauge flow pressure in kilopascals (kPag)	3.8
Methane concentration in part per million (ppm)	558,960
Methane emission rate in grams per hour (g/hr)	12.02
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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