



P.O. Box 10640 Bozeman, Montana 59719

(406) 460-0903

TO: Jim Griswold, NMOCD

FROM: Curtis Shuck, Chairman

DATE: July 24, 2023

RE: Twin Lakes San Andres (TLSA) #057 (30-005-61135) 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 Twin Lakes San Andres (TLSA) #057 by the WDF Measure 1 Field Team on May 27, 2023, revealed a cement filled casing, cut off 3' below the surface with a welded monument cap. The WDF Measure 1 Team took site photographs, performed field gas measurements and collected a gas sample for immediate laboratory analysis.

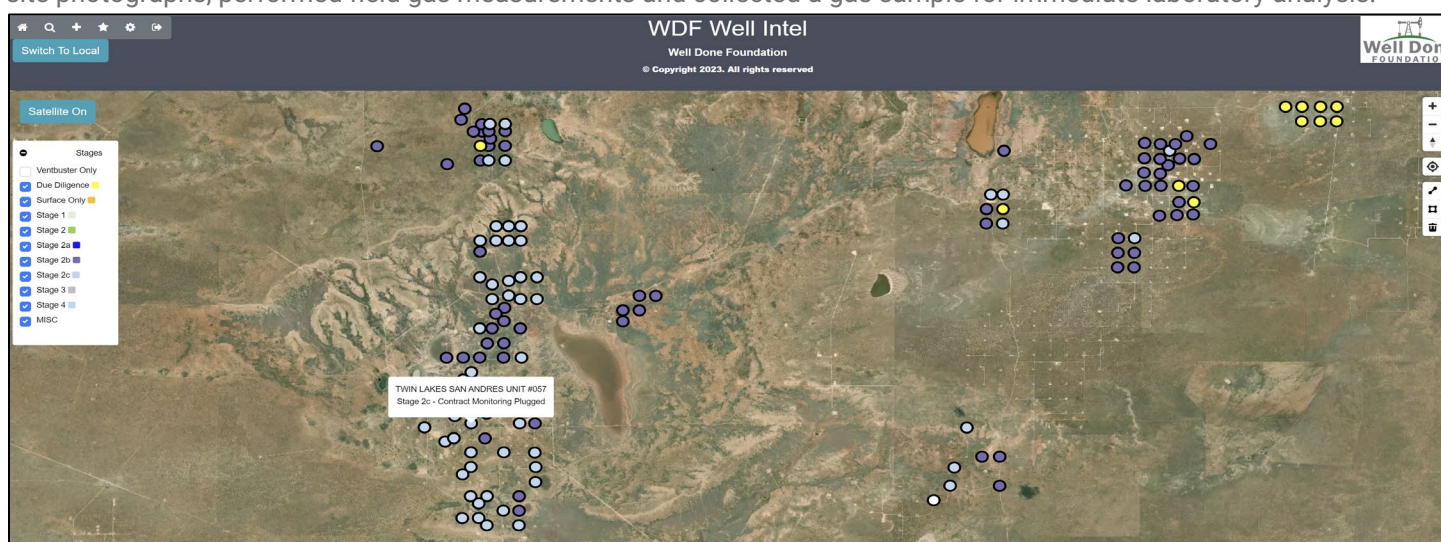


Image 1.1 – TLSA #057 (30-005-61135) Orphan Well in Chaves County, NM

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 August 24, 2022. The Methane Concentration was measured at 558,960 ppm and Methane Flow was measured at 0.72 m<sup>3</sup>/d. Therefore, the adjusted average methane gas emission measured at this wellhead is calculated at **12.02 grams per hour (g/hour)**.<sup>1</sup>

The State of New Mexico used the methane flow data collected by WDF to prioritize the TLSA #057 orphan well plugging under the IIJA Program and began mobilizing a contractor to location. Drake Well Service, Inc. of Farmington, NM was awarded the plugging contract.

WDF arrived at the TLSA #057 location on May 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 H<sub>2</sub>s gasses. The post plugging collected gas samples, analyzed by Laboratory Services, Inc. confirmed 0.00 ppm or methane gas and 0.00 ppm of H<sub>2</sub>s gas. THEREFORE, the total Methane Gas Emissions Reduction is: 12.02 g/hour.**

<sup>1</sup> Methane Calculation: 717 grams CH<sub>4</sub> per cubic meter (717 x 0.72 m<sup>3</sup>/day = 516.24 g/day total /24 = 21.51 g/hour x 0.558960 (methane concentration) = **12.02 g/hour CH<sub>4</sub>**). **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<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 0.044 pound per cubic foot [lb/ft<sup>3</sup>].



## Test Report

<b>Start Date:</b> Wednesday, August 24th, 2022, 4:04 PM MDT	<b>Test Operator:</b> ces
<b>End Date:</b> Thursday, August 25th, 2022, 12:03 PM MDT	<b>Authorized By:</b> NMOCD
<b>Device:</b> VB100-0044	<b>Test Reason:</b> I/IJA PRE PLUG
<b>Well Licensee:</b> NMOCD	<b>Scope Of Work:</b> 12-Hour
<b>Well Name:</b> Twin Lakes SA 57	<b>AFE Number:</b> NMOCD038AA / APWS22.001
<b>UWI:</b> 30-005-61135	<b>GPS:</b> 33.56832,-104.03653
<b>Well License Number:</b> 30-005-61135	<b>Notes:</b> GTG
<b>Surface Location:</b> private	
<b>Bottom Hole Location:</b> unknown	

## Flow Test

Average Flowrate <b>0.72</b> m <sup>3</sup> /d <b>12.02</b> g/hour	Average Flow Temperature <b>23.3</b> °C	Average Flow Pressure <b>3.8</b> kPag	Flow Duration <b>20.0</b> hours	Methane Concentration <b>558,960</b> ppm
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## Methane Calculation

- <sup>1</sup> Methane Calculation: 717 grams CH<sub>4</sub> per cubic meter (717 x 0.72 m<sup>3</sup>/day = 516.24 g/day total /24 = 21.51 g/hour x 0.558960 (methane concentration) = **12.02 g/hour CH<sub>4</sub>**). 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<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 0.044 pound per cubic foot [lb/ft<sup>3</sup>].

## Flow/Pressure/Temperature Timeseries

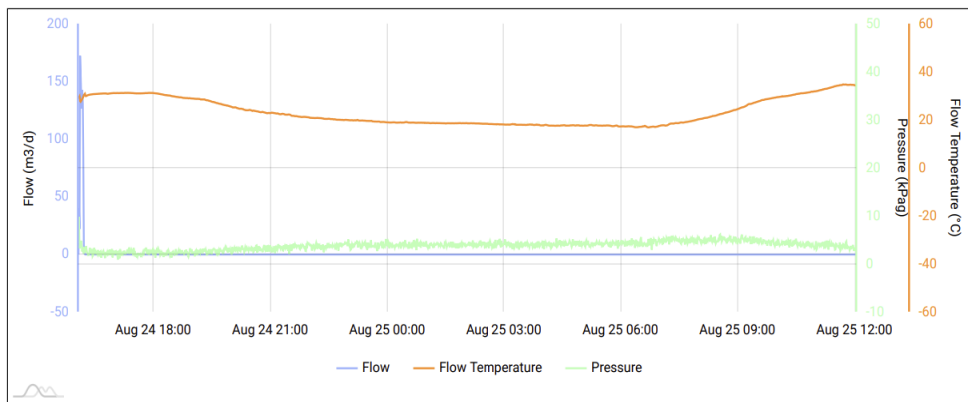


Image 2.1 – TLISA #057 Pre Plugging Test Report

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)<sup>2</sup>.

<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).

## METHANE GAS EMISSIONS REDUCTION TLSA #057 (30-005-61135)

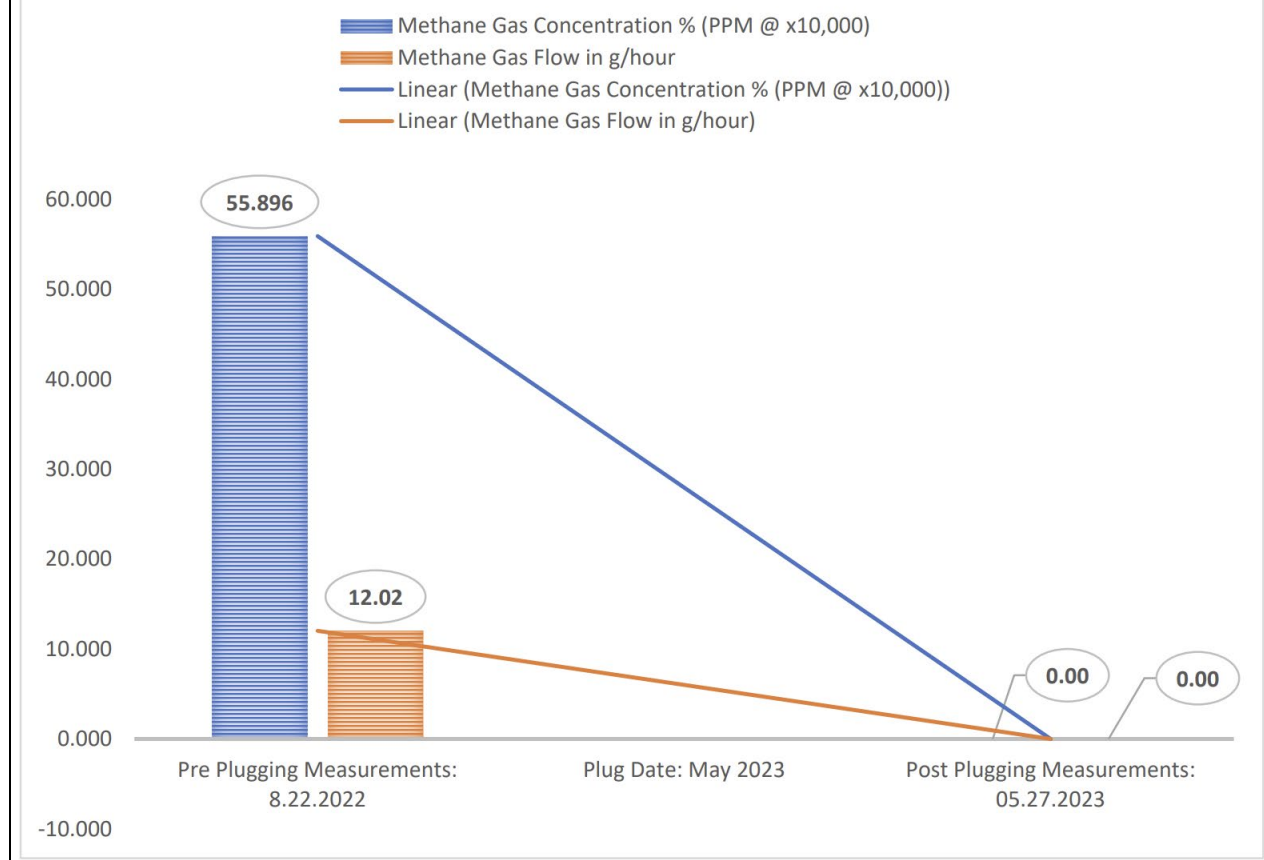


Image 3.1 – TLSA #057 (30-005-61135) Methane Gas Emissions Reduction Pre Plugging to Post Plugging

### TECHNICAL FINDINGS

TLSA #057 (30-005-61135):

- Total C1 through C6 Gas Concentration: 673,300 ppm
- Total Measured Wellhead Gas Emissions: 0.72 m<sup>3</sup>/day
- Methane Gas Concentration: 558,960 ppm
- Calculated Average Wellhead Methane Gas Emissions: 12.02 g/hour
- Post Plugging Methane Gas Concentration: 0.00 ppm
- Post Plugging Methane Flow: 0.00 g/hour

### CONCLUSIONS

- The TLSA #057 (30-005-61135) was emitting Methane gas pre-plugging at the average rate of 12.02 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 TLSA #057 (30-005-61135) 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	2023-05-27	ces: On location with WDF Measure 1 to perform post plugging methane measurement. Field gas analysis yielded a non detect for methane. Collect gas sample for Laboratory analysis. Place ribbon at monument. photo document. WILDCAT OUT!
2	2022-08-25	ces: Rug down VB100-046 and complete test. Secure well. Green Flag. Wildcat out!
3	2022-08-24	ces: Rig up VB100-046. Collect Gas Sample. Update GPS.

Image 4.1 – TLSA #057 (30-005-61135) Field Notes from WDF Well Intel™ Orphan Well Project Management IoT



Appendix A – Site Photos for TLSA #057 (30-005-61135)



1) TLSA #057 – Gas Sample



2) TLSA #057 – Ribbon



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## C6+ Gas Analysis Report

17155G	TLSA # 057 POST PLUG	TLSA # 057 POST PLUG	
Sample Point Code	Sample Point Name	Sample Point Location	
Laboratory Services	2023069832	bag	ces - Spot
Source Laboratory	Lab File No	Container Identity	Sampler
USA	USA	USA	New Mexico
District	Area Name	Field Name	Facility Name
May 27, 2023 19:05	May 27, 2023 19:05	Jun 6, 2023 09:04	Jun 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)	98.8280	98.82846	
CO2 (CO2)	0.0410	0.0411	
Methane (C1)	0.0000	0	
Ethane (C2)	0.0190	0.01914	0.0050
Propane (C3)	0.0280	0.02809	0.0080
I-Butane (IC4)	0.0080	0.00844	0.0030
N-Butane (NC4)	0.0380	0.03766	0.0120
I-Pentane (IC5)	0.0250	0.02461	0.0090
N-Pentane (NC5)	0.0510	0.05067	0.0180
Hexanes Plus (C6+)	0.9620	0.96183	0.4170
TOTAL	100.0000	100.0000	0.4720

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: Jun 5, 2023

Gross Heating Values (Real, BTU/ft<sup>3</sup>)

14.696 PSI @ 60.00 Å°F		14.73 PSI @ 60.00 Å°F	
Dry	Saturated	Dry	Saturated
55.1	55.1	55.2	55.2

## Calculated Total Sample Properties

GPA2145-16 \*Calculated at Contract Conditions

Relative Density Real	Relative Density Ideal
0.9910	0.9910
Molecular Weight	
28.6992	

## C6+ Group Properties

Assumed Composition

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

Field H2S  
0 PPM

## PROTREND STATUS:

Passed By Validator on Jun 9, 2023

## DATA SOURCE:

Imported

## PASSED BY VALIDATOR REASON:

First sample taken @ this point, composition looks reasonable

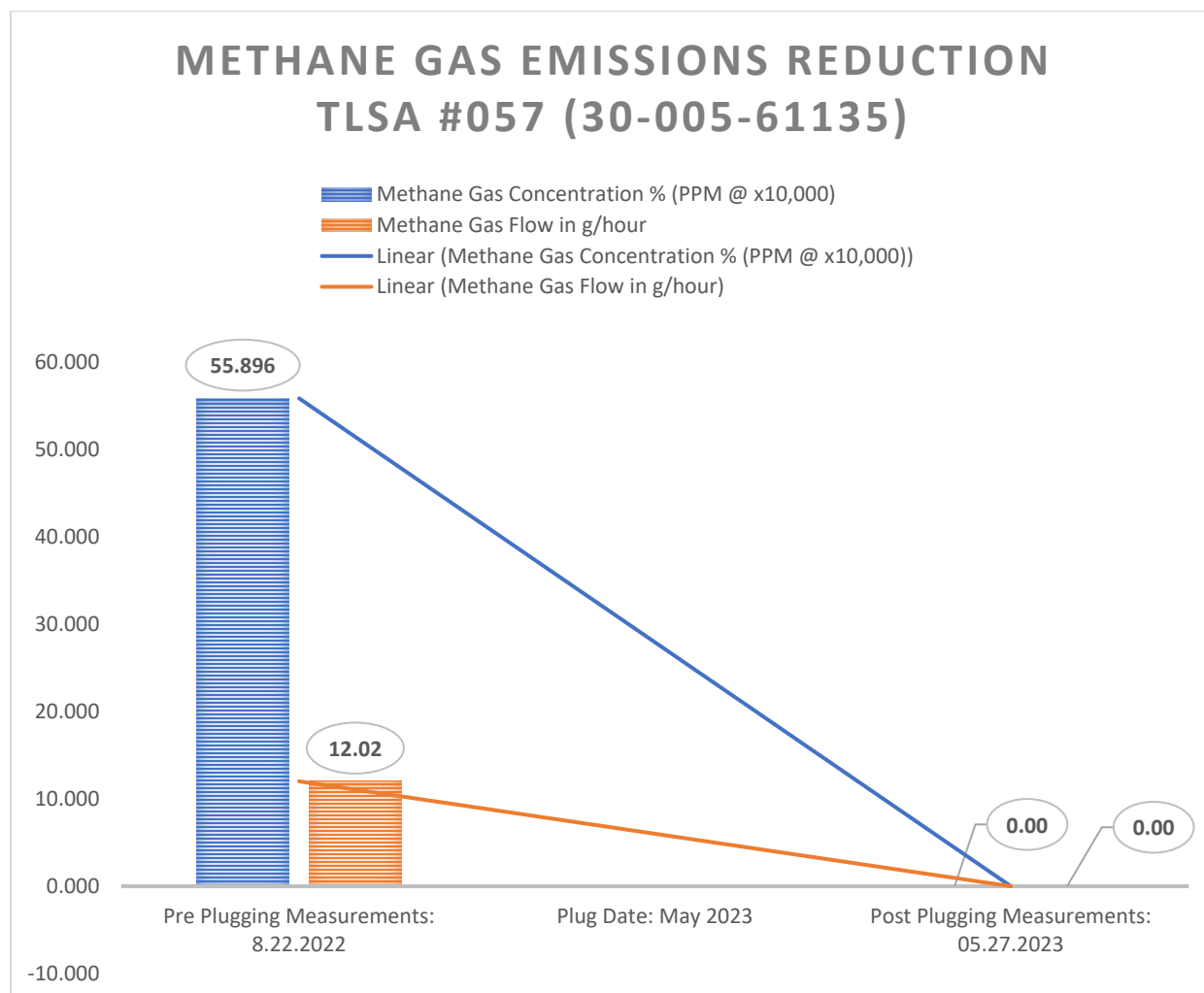
## VALIDATOR:

. Rush

## VALIDATOR COMMENTS:

OK

Source	Date	Notes
Luis Cano	Jun 7, 2023 3:06 pm	Methane: 0 PPM
. Rush	Jun 9, 2023 2:44 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 243536

DEFINITIONS

Operator:  BLUE SKY NM, INC. 7941 Katy Freeway Houston, TX 77024	OGRID:  300825
	Action Number:  243536
	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 243536

**QUESTIONS**

Operator: BLUE SKY NM, INC. 7941 Katy Freeway Houston, TX 77024	OGRID: 300825
	Action Number: 243536
	Action Type: [UF-OMA] Post-Plug Methane Monitoring (UF-OMA-MMB)

**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	Post-Plug Methane Monitoring
Date of monitoring	05/27/2023
Latitude	33.5683937
Longitude	-104.0362396

**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)	28.8
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
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