





## Directional Survey Certification

Survey Company: Native Navigation Survey Company Job #: 23072797

Well Name: SR 421-24 A.P.I.# 05-045-24565 Operator Terra Energy Partners

Latitude: 40.217433 Longitude: -107.829197 County, State: Garfield County, CO

Legal Description (S,TS,R): Sec 13, T7S, R94W

Final Report 8/14/2023 Date of First Survey 7/31/2023 Date of Last Survey: 8/4/2023

Datum: NAD83 Survey MD From: 387.00 To: 10802 FT. Tool Type: MWD + HRGM

Bit to Sensor: 66 FT. Rig (Company & Number): HP 329 RKB Height: 30.00 FT.

Ground Elevation: 8007.00 Northings: 1591968.3 Eastings: 2342207.1

Surveyor Kyle Temple Depth of Final Projection: 10868 FT.

The data and calculations for this survey have been checked by me and conform to the calibration standards and operational procedures set forth by Native Navigation. I am authorized and qualified to review the data, calculations and this report, and that the report represents a true and correct Directional Survey of this well, based on the original data corrected to True North and obtained at the well site. Wellbore coordinates are calculated using the minimum curvature method.

  
Signature

Well Planner  
Title

Native Navigation  
Company

8/14/23  
Date



## **Terra Energy Partners, LLP**

**Garfield County, CO (Nad 83)**

**S. Leverich 13-09 Pad**

**SR 421-24 - Slot SR 421-24**

**OWB**

**Design: Surveys**

## **Survey Certification Report**

**14 August, 2023**



<b>Company:</b>	Terra Energy Partners, LLP	<b>Local Co-ordinate Reference:</b>	Well SR 421-24 - Slot SR 421-24
<b>Project:</b>	Garfield County, CO (Nad 83)	<b>TVD Reference:</b>	RKB @ 30' @ 8037.0ft
<b>Site:</b>	S. Leverich 13-09 Pad	<b>MD Reference:</b>	RKB @ 30' @ 8037.0ft
<b>Well:</b>	SR 421-24	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	NN

<b>Project</b>	Garfield County, CO (Nad 83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		

Site	S. Leverich 13-09 Pad				
Site Position:		Northing:	1,591,962.800 usft	Latitude:	39.435551
From:	Map	Easting:	2,342,185.300 usft	Longitude:	-107.829274
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16"	Grid Convergence:	-1.47 °

Well	SR 421-24 - Slot SR 421-24					
Well Position	+N/-S	0.0 ft	Northing:	1,591,968.300 usft	Latitude:	39.435568
	+E/-W	0.0 ft	Easting:	2,342,207.100 usft	Longitude:	-107.829197
Position Uncertainty		0.0 ft	Wellhead Elevation:	8,037.0 ft	Ground Level:	8,007.0 ft

<b>Wellbore</b>	OWB				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	4/5/2023	8.83	65.37	50,996

<b>Design</b>	Surveys				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	225.94	

<b>Survey Program</b>	<b>Date</b>	8/4/2023			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
387.0	10,868.0	Surveys (OWB)	OWSG (REV5) MWD HDGM	OWSG MWD - Standard	

<b>Survey</b>								
<b>MD (ft)</b>	<b>Inc (°)</b>	<b>Azi (azimuth) (°)</b>	<b>TVD (ft)</b>	<b>N/S (ft)</b>	<b>E/W (ft)</b>	<b>Closure Distance (ft)</b>	<b>Closure Azimuth (°)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00
387.0	8.79	199.90	385.5	-27.9	-10.1	29.6	199.90	
<b>First Survey @ 387 MD/ 385.5 TVD</b>								
478.0	11.54	209.84	475.1	-42.3	-17.0	45.6	201.88	
568.0	14.15	218.89	562.8	-58.7	-28.4	65.2	205.81	
659.0	16.00	208.43	650.7	-78.4	-41.3	88.6	207.81	
750.0	17.27	210.54	737.9	-101.0	-54.2	114.6	208.20	
841.0	19.12	215.11	824.3	-124.9	-69.6	142.9	209.14	
931.0	20.74	221.44	908.9	-148.9	-88.6	173.3	210.77	
1,021.0	23.03	227.41	992.5	-172.7	-112.1	205.9	212.99	
1,109.0	25.27	227.50	1,072.8	-197.1	-138.7	241.0	215.13	
1,269.0	27.20	226.62	1,216.3	-245.3	-190.4	310.5	217.83	

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<b>Site:</b>	S. Leverich 13-09 Pad	<b>MD Reference:</b>	RKB @ 30' @ 8037.0ft
<b>Well:</b>	SR 421-24	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	NN

Survey								
MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	N/S (ft)	E/W (ft)	Closure Distance (ft)	Closure Azimuth (°)	
1,360.0	28.08	226.62	1,296.9	-274.3	-221.1	352.3	218.88	
1,450.0	28.52	227.68	1,376.1	-303.3	-252.4	394.6	219.77	
1,541.0	30.06	228.64	1,455.5	-333.0	-285.6	438.6	220.62	
1,631.0	31.16	229.35	1,532.9	-363.0	-320.2	484.0	221.41	
1,720.0	32.96	228.73	1,608.4	-394.0	-355.8	530.9	222.09	
1,811.0	34.19	228.91	1,684.2	-427.1	-393.7	580.9	222.67	
1,901.0	34.76	227.77	1,758.4	-461.0	-431.8	631.6	223.12	
1,992.0	34.32	228.12	1,833.3	-495.6	-470.1	683.0	223.49	
2,082.0	33.66	227.68	1,908.0	-529.3	-507.4	733.2	223.79	
2,173.0	34.41	228.56	1,983.4	-563.3	-545.3	784.0	224.07	
2,263.0	33.84	228.64	2,057.9	-596.7	-583.2	834.3	224.35	
2,354.0	35.46	229.26	2,132.7	-630.6	-622.2	885.9	224.61	
2,444.0	34.85	229.00	2,206.3	-664.6	-661.4	937.6	224.86	
2,535.0	33.44	228.47	2,281.6	-698.2	-699.8	988.6	225.06	
2,626.0	35.11	228.56	2,356.8	-732.2	-738.2	1,039.7	225.23	
2,716.0	35.82	225.66	2,430.1	-767.7	-776.4	1,091.9	225.32	
2,807.0	35.02	226.01	2,504.3	-804.5	-814.3	1,144.6	225.35	
2,897.0	34.10	225.75	2,578.4	-840.0	-850.9	1,195.7	225.37	
2,988.0	33.93	226.27	2,653.8	-875.4	-887.5	1,246.6	225.40	
3,078.0	34.80	224.16	2,728.1	-911.2	-923.6	1,297.4	225.39	
3,169.0	34.72	224.07	2,802.9	-948.4	-959.7	1,349.3	225.34	
3,259.0	34.19	224.07	2,877.1	-985.0	-995.1	1,400.2	225.29	
3,350.0	33.35	224.16	2,952.7	-1,021.3	-1,030.3	1,450.7	225.25	
3,440.0	34.23	225.48	3,027.5	-1,056.8	-1,065.6	1,500.8	225.24	
3,531.0	33.66	225.39	3,103.0	-1,092.5	-1,101.8	1,551.6	225.24	
3,621.0	34.54	225.39	3,177.6	-1,127.9	-1,137.7	1,602.1	225.25	
3,712.0	35.55	226.80	3,252.1	-1,164.1	-1,175.4	1,654.3	225.28	
3,802.0	35.20	227.24	3,325.4	-1,199.6	-1,213.5	1,706.4	225.33	
3,893.0	34.80	227.24	3,400.0	-1,235.1	-1,251.8	1,758.5	225.39	
3,983.0	34.28	227.50	3,474.1	-1,269.6	-1,289.4	1,809.5	225.44	
4,074.0	33.44	227.68	3,549.7	-1,303.8	-1,326.8	1,860.2	225.50	
4,164.0	35.16	228.12	3,624.0	-1,337.8	-1,364.4	1,910.9	225.56	
4,255.0	35.68	227.41	3,698.2	-1,373.3	-1,403.5	1,963.6	225.62	
4,345.0	34.89	231.11	3,771.7	-1,407.2	-1,442.8	2,015.4	225.72	
4,436.0	35.16	228.56	3,846.2	-1,440.9	-1,482.7	2,067.5	225.82	
4,526.0	34.76	229.52	3,920.0	-1,474.7	-1,521.7	2,119.0	225.90	
4,617.0	33.79	228.64	3,995.1	-1,508.3	-1,560.4	2,170.2	225.97	
4,707.0	34.41	226.71	4,069.7	-1,542.2	-1,597.7	2,220.6	226.01	
4,798.0	33.66	226.10	4,145.1	-1,577.4	-1,634.6	2,271.6	226.02	
4,888.0	32.83	226.89	4,220.4	-1,611.3	-1,670.4	2,320.9	226.03	
4,978.0	31.68	226.45	4,296.5	-1,644.3	-1,705.3	2,368.9	226.04	
5,069.0	32.12	226.71	4,373.7	-1,677.3	-1,740.2	2,417.0	226.05	
5,159.0	31.16	227.24	4,450.3	-1,709.6	-1,774.8	2,464.2	226.07	
5,250.0	32.08	226.54	4,527.8	-1,742.2	-1,809.6	2,511.9	226.09	

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<b>Well:</b>	SR 421-24	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	NN

Survey								
MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	N/S (ft)	E/W (ft)	Closure Distance (ft)	Closure Azimuth (°)	
5,341.0	30.98	226.89	4,605.4	-1,774.8	-1,844.2	2,559.5	226.10	
5,431.0	30.41	226.71	4,682.8	-1,806.2	-1,877.7	2,605.4	226.11	
5,522.0	29.31	226.10	4,761.7	-1,837.5	-1,910.5	2,650.7	226.12	
5,617.0	28.87	226.54	4,844.7	-1,869.4	-1,943.9	2,696.9	226.12	
5,711.0	27.95	225.83	4,927.4	-1,900.3	-1,976.2	2,741.6	226.12	
5,806.0	26.94	225.92	5,011.7	-1,930.8	-2,007.6	2,785.4	226.12	
5,900.0	26.10	225.74	5,095.8	-1,960.1	-2,037.7	2,827.4	226.11	
5,995.0	25.44	226.18	5,181.4	-1,988.8	-2,067.4	2,868.7	226.11	
6,090.0	24.70	226.45	5,267.4	-2,016.6	-2,096.5	2,909.0	226.11	
6,184.0	24.30	226.36	5,353.0	-2,043.5	-2,124.8	2,947.9	226.12	
6,279.0	22.06	225.74	5,440.3	-2,069.4	-2,151.7	2,985.3	226.12	
6,373.0	21.58	224.43	5,527.5	-2,094.1	-2,176.4	3,020.3	226.10	
6,468.0	20.70	224.16	5,616.2	-2,118.6	-2,200.4	3,054.5	226.08	
6,563.0	20.21	223.02	5,705.2	-2,142.6	-2,223.3	3,087.7	226.06	
6,658.0	18.11	224.25	5,794.9	-2,165.2	-2,244.8	3,118.8	226.03	
6,753.0	16.00	225.39	5,885.7	-2,185.0	-2,264.4	3,146.7	226.02	
6,849.0	15.64	225.66	5,978.1	-2,203.3	-2,283.1	3,172.8	226.02	
6,944.0	15.16	226.54	6,069.7	-2,220.8	-2,301.2	3,198.1	226.02	
7,038.0	12.39	227.68	6,161.0	-2,236.1	-2,317.6	3,220.4	226.03	
7,133.0	12.79	227.24	6,253.7	-2,250.1	-2,332.9	3,241.1	226.04	
7,227.0	12.22	228.91	6,345.4	-2,263.7	-2,348.0	3,261.5	226.05	
7,321.0	11.95	227.06	6,437.4	-2,276.8	-2,362.6	3,281.2	226.06	
7,415.0	10.50	223.46	6,529.6	-2,289.7	-2,375.6	3,299.4	226.06	
7,509.0	8.70	220.73	6,622.2	-2,301.3	-2,386.2	3,315.1	226.04	
7,604.0	7.29	222.40	6,716.3	-2,311.2	-2,394.9	3,328.2	226.02	
7,698.0	6.99	225.30	6,809.6	-2,319.6	-2,403.0	3,339.9	226.01	
7,793.0	6.28	225.57	6,903.9	-2,327.3	-2,410.8	3,350.9	226.01	
7,887.0	5.01	228.56	6,997.5	-2,333.6	-2,417.6	3,360.1	226.01	
7,981.0	4.04	228.29	7,091.2	-2,338.5	-2,423.1	3,367.5	226.02	
8,075.0	3.16	218.89	7,185.0	-2,342.8	-2,427.2	3,373.4	226.01	
8,170.0	2.55	197.71	7,279.9	-2,346.8	-2,429.5	3,377.9	225.99	
8,264.0	0.62	141.46	7,373.9	-2,349.2	-2,429.8	3,379.8	225.97	
8,358.0	0.83	98.83	7,467.8	-2,349.7	-2,428.8	3,379.4	225.95	
8,452.0	0.62	108.06	7,561.8	-2,350.0	-2,427.7	3,378.8	225.93	
8,547.0	0.75	118.87	7,656.8	-2,350.4	-2,426.7	3,378.3	225.91	
8,641.0	0.70	142.86	7,750.8	-2,351.2	-2,425.8	3,378.2	225.89	
8,736.0	0.70	182.85	7,845.8	-2,352.2	-2,425.5	3,378.7	225.88	
8,830.0	0.66	180.22	7,939.8	-2,353.3	-2,425.5	3,379.5	225.86	
8,924.0	0.70	170.29	8,033.8	-2,354.4	-2,425.4	3,380.2	225.85	
9,018.0	0.70	179.78	8,127.8	-2,355.6	-2,425.3	3,381.0	225.84	
9,112.0	0.88	188.74	8,221.8	-2,356.9	-2,425.4	3,381.9	225.82	
9,207.0	0.97	201.57	8,316.8	-2,358.3	-2,425.8	3,383.2	225.81	
9,301.0	1.49	211.86	8,410.8	-2,360.1	-2,426.7	3,385.2	225.80	
9,396.0	1.63	209.13	8,505.7	-2,362.4	-2,428.1	3,387.6	225.79	
9,490.0	1.58	210.28	8,599.7	-2,364.6	-2,429.4	3,390.2	225.77	

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<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	NN

Survey								
MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	N/S (ft)	E/W (ft)	Closure Distance (ft)	Closure Azimuth (°)	
9,585.0	1.32	197.71	8,694.7	-2,366.8	-2,430.3	3,392.4	225.76	
9,679.0	1.80	192.35	8,788.6	-2,369.3	-2,431.0	3,394.6	225.74	
9,774.0	1.67	186.63	8,883.6	-2,372.1	-2,431.5	3,396.9	225.71	
9,868.0	1.76	195.42	8,977.5	-2,374.9	-2,432.0	3,399.2	225.68	
9,962.0	1.49	209.04	9,071.5	-2,377.3	-2,433.0	3,401.6	225.66	
10,056.0	1.45	217.92	9,165.5	-2,379.3	-2,434.3	3,404.0	225.65	
10,151.0	1.36	229.87	9,260.4	-2,381.0	-2,435.9	3,406.3	225.65	
10,244.0	1.19	229.00	9,353.4	-2,382.4	-2,437.5	3,408.4	225.66	
10,338.0	1.36	238.14	9,447.4	-2,383.6	-2,439.2	3,410.4	225.66	
10,433.0	1.19	266.35	9,542.4	-2,384.2	-2,441.1	3,412.3	225.68	
10,528.0	1.63	263.45	9,637.3	-2,384.5	-2,443.4	3,414.1	225.70	
10,622.0	1.71	267.93	9,731.3	-2,384.7	-2,446.2	3,416.2	225.73	
10,713.0	1.76	275.23	9,822.3	-2,384.6	-2,448.9	3,418.1	225.76	
10,802.0	1.80	278.83	9,911.2	-2,384.2	-2,451.7	3,419.8	225.80	
10,868.0	1.80	278.83	9,977.2	-2,383.9	-2,453.7	3,421.1	225.83	
PTB @ 10868 MD/ 9977.2 TVD								

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
10,868.0	9,977.2	-2,383.9	-2,453.7	PTB @ 10868 MD/ 9977.2 TVD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_