



Well Details: PA 333-24

TVD Reference: GL 5733' & RKB 24' @ 5757.00usft
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.00 0.00 1618793.40 2312496.80 39.5070506 -107.9368975PA 333-24 (A1)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well PA 333-24 - Slot PA 333-24 (A1), True North
 Vertical (TVD) Reference: GL 5733' & RKB 24' @ 5757.00usft
 Section (VS) Reference: Slot - PA 333-24 (A1)(0.00N, 0.00E)
 Measured Depth Reference: GL 5733' & RKB 24' @ 5757.00usft
 Calculation Method: Minimum Curvature

PROJECT DETAILS: Garfield County, CO NAD83

Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Colorado Central Zone

System Datum: Mean Sea Level

Plan: OH

11:39, October 29 2018
 Created By: Mel Mireles Jr.



Directional Survey Certification

2948 I-70 Business Loop
Grand Junction, CO 81504
(970)-245-9447 Fax (970)-245-9454

Operator	TEP Rocky Mountain, LLC.
Well Name & No.	PA 333-24
County & State	Garfield County, CO
SDI Job No.	OP.014018
Rig	H&P 271

I, Mel Mireles Jr., having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 124 feet to a measured depth of 9,061 feet is true and correct as determined from all available records.

A handwritten signature in black ink, appearing to read 'Mel Mireles Jr.', written over a horizontal line.

Signature

29-Oct-18

Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well PA 333-24 - Slot PA 333-24 (A1)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5733' & RKB 24' @ 5757.00usft
Site:	RWF 13-19 Pad	MD Reference:	GL 5733' & RKB 24' @ 5757.00usft
Well:	PA 333-24	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Project	Garfield County, CO NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		RWF 13-19 Pad			
Site Position:		Northing:	1,618,792.50 usft	Latitude:	39.5070510
From:	Map	Easting:	2,312,535.60 usft	Longitude:	-107.9367600
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.54 °

Well		PA 333-24 - Slot PA 333-24 (A1)				
Well Position	+N/-S	0.00 usft	Northing:	1,618,793.40 usft	Latitude:	39.5070506
	+E/-W	0.00 usft	Easting:	2,312,496.80 usft	Longitude:	-107.9368976
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,733.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	10/23/2018	9.35	65.75	51,561

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	285.57	

Survey Program	Date	10/29/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
124.00	678.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
749.00	1,069.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,176.00	9,061.00	Survey #3 - Production MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
124.00	0.26	219.90	124.00	-0.22	-0.18	0.12	0.21	0.21	0.00	
First SDI Gyro MWD Survey										
217.00	2.38	285.47	216.97	0.14	-2.18	2.13	2.46	2.28	70.51	
310.00	5.89	286.70	309.71	2.02	-8.61	8.84	3.78	3.77	1.32	
402.00	9.33	286.61	400.89	5.51	-20.28	21.02	3.74	3.74	-0.10	
494.00	12.67	286.17	491.19	10.46	-37.12	38.57	3.63	3.63	-0.48	
586.00	15.40	288.98	580.43	17.24	-58.37	60.85	3.06	2.97	3.05	
678.00	17.95	287.58	668.56	25.50	-83.44	87.22	2.81	2.77	-1.52	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well PA 333-24 - Slot PA 333-24 (A1)
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Site:	RWF 13-19 Pad	MD Reference:	GL 5733' & RKB 24' @ 5757.00usft
Well:	PA 333-24	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Last SDI Gyro MWD Survey									
749.00	20.16	285.33	735.66	32.04	-105.67	110.39	3.28	3.11	-3.17
First SDI Surface MWD Survey									
841.00	22.61	283.23	821.33	40.28	-138.18	143.92	2.79	2.66	-2.28
935.00	24.72	284.05	907.42	49.18	-174.84	181.63	2.27	2.24	0.87
1,030.00	26.56	285.76	993.06	59.78	-214.56	222.73	2.09	1.94	1.80
1,069.00	26.82	285.32	1,027.90	64.47	-231.43	240.25	0.84	0.67	-1.13
Last SDI Surface MWD Survey									
1,176.00	28.08	284.01	1,122.86	76.94	-279.15	289.56	1.31	1.18	-1.22
First SDI Production MWD Survey									
1,271.00	29.94	286.47	1,205.94	89.08	-323.58	335.62	2.33	1.96	2.59
1,365.00	32.56	288.42	1,286.29	103.73	-370.09	384.35	2.99	2.79	2.07
1,460.00	32.83	288.37	1,366.24	119.92	-418.78	435.60	0.29	0.28	-0.05
1,554.00	32.96	288.40	1,445.17	136.02	-467.23	486.59	0.14	0.14	0.03
1,649.00	31.71	286.44	1,525.44	151.25	-515.70	537.37	1.72	-1.32	-2.06
1,743.00	31.03	285.31	1,605.70	164.63	-562.76	586.30	0.96	-0.72	-1.20
1,837.00	32.72	287.51	1,685.52	178.68	-610.36	635.92	2.18	1.80	2.34
1,932.00	31.89	285.78	1,765.82	193.23	-659.00	686.68	1.31	-0.87	-1.82
2,026.00	32.36	284.62	1,845.43	206.33	-707.23	736.66	0.82	0.50	-1.23
2,121.00	32.35	284.73	1,925.68	219.21	-756.42	787.50	0.06	-0.01	0.12
2,215.00	31.78	283.09	2,005.34	231.21	-804.85	837.37	1.11	-0.61	-1.74
2,310.00	30.96	284.11	2,086.45	242.83	-852.92	886.80	1.03	-0.86	1.07
2,404.00	30.35	284.83	2,167.32	254.81	-899.32	934.71	0.76	-0.65	0.77
2,498.00	31.20	287.86	2,248.08	268.35	-945.46	982.79	1.88	0.90	3.22
2,592.00	30.15	287.20	2,328.93	282.80	-991.18	1,030.72	1.17	-1.12	-0.70
2,687.00	30.65	290.73	2,410.88	298.43	-1,036.62	1,078.69	1.95	0.53	3.72
2,781.00	29.42	291.42	2,492.25	315.34	-1,080.53	1,125.52	1.36	-1.31	0.73
2,876.00	29.99	292.53	2,574.77	332.96	-1,124.18	1,172.30	0.83	0.60	1.17
2,970.00	32.34	292.72	2,655.20	351.67	-1,169.08	1,220.57	2.50	2.50	0.20
3,065.00	31.39	292.43	2,735.88	370.93	-1,215.39	1,270.35	1.01	-1.00	-0.31
3,159.00	30.57	293.98	2,816.47	389.98	-1,259.86	1,318.30	1.22	-0.87	1.65
3,253.00	30.75	290.48	2,897.34	408.11	-1,304.21	1,365.89	1.91	0.19	-3.72
3,348.00	32.20	288.63	2,978.36	424.69	-1,350.95	1,415.37	1.83	1.53	-1.95
3,442.00	31.47	287.89	3,058.22	440.23	-1,398.04	1,464.89	0.88	-0.78	-0.79
3,536.00	30.49	287.48	3,138.81	454.93	-1,444.13	1,513.25	1.07	-1.04	-0.44
3,631.00	29.06	289.15	3,221.26	469.74	-1,488.92	1,560.36	1.74	-1.51	1.76
3,725.00	30.20	285.99	3,302.98	483.74	-1,533.22	1,606.79	2.06	1.21	-3.36
3,819.00	31.68	285.60	3,383.60	496.90	-1,579.72	1,655.12	1.59	1.57	-0.41
3,914.00	30.63	286.37	3,464.90	510.43	-1,626.97	1,704.27	1.18	-1.11	0.81
4,008.00	28.96	286.09	3,546.47	523.48	-1,671.81	1,750.97	1.78	-1.78	-0.30
4,102.00	27.84	287.35	3,629.15	536.34	-1,714.63	1,795.67	1.35	-1.19	1.34
4,197.00	26.38	289.43	3,713.72	549.97	-1,755.71	1,838.90	1.83	-1.54	2.19
4,291.00	27.19	285.42	3,797.64	562.63	-1,796.11	1,881.22	2.11	0.86	-4.27
4,385.00	24.97	281.61	3,882.07	572.34	-1,836.26	1,922.49	2.96	-2.36	-4.05

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well PA 333-24 - Slot PA 333-24 (A1)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5733' & RKB 24' @ 5757.00usft
Site:	RWF 13-19 Pad	MD Reference:	GL 5733' & RKB 24' @ 5757.00usft
Well:	PA 333-24	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,480.00	23.91	282.68	3,968.55	580.60	-1,874.68	1,961.73	1.21	-1.12	1.13	
4,574.00	22.78	283.02	4,054.86	588.88	-1,911.00	1,998.93	1.21	-1.20	0.36	
4,668.00	21.83	282.84	4,141.82	596.86	-1,945.77	2,034.57	1.01	-1.01	-0.19	
4,857.00	18.66	284.78	4,319.13	612.39	-2,009.28	2,099.92	1.71	-1.68	1.03	
4,951.00	16.92	283.40	4,408.63	619.40	-2,037.13	2,128.63	1.90	-1.85	-1.47	
5,045.00	17.03	287.40	4,498.54	626.68	-2,063.58	2,156.06	1.25	0.12	4.26	
5,140.00	15.98	288.58	4,589.62	635.01	-2,089.25	2,183.02	1.16	-1.11	1.24	
5,234.00	14.47	289.47	4,680.32	643.05	-2,112.59	2,207.66	1.63	-1.61	0.95	
5,328.00	13.16	290.45	4,771.60	650.70	-2,133.68	2,230.04	1.42	-1.39	1.04	
5,423.00	13.02	289.58	4,864.13	658.07	-2,153.90	2,251.49	0.25	-0.15	-0.92	
5,517.00	12.40	289.51	4,955.82	664.99	-2,173.39	2,272.12	0.66	-0.66	-0.07	
5,611.00	11.69	281.86	5,047.76	670.31	-2,192.22	2,291.70	1.86	-0.76	-8.14	
5,706.00	9.76	278.37	5,141.10	673.46	-2,209.61	2,309.29	2.14	-2.03	-3.67	
5,800.00	8.82	273.95	5,233.87	675.12	-2,224.68	2,324.25	1.25	-1.00	-4.70	
5,894.00	7.21	274.74	5,326.94	676.10	-2,237.75	2,337.11	1.72	-1.71	0.84	
5,988.00	5.65	291.32	5,420.36	678.27	-2,247.94	2,347.51	2.56	-1.66	17.64	
6,082.00	4.67	290.87	5,513.98	681.32	-2,255.83	2,355.92	1.04	-1.04	-0.48	
6,175.00	4.49	305.73	5,606.68	684.79	-2,262.32	2,363.11	1.29	-0.19	15.98	
6,269.00	3.76	304.63	5,700.44	688.69	-2,267.85	2,369.48	0.78	-0.78	-1.17	
6,284.00	3.62	304.47	5,715.41	689.24	-2,268.64	2,370.39	0.94	-0.94	-1.09	
PA 333-24 KMV										
6,364.00	2.87	303.32	5,795.28	691.77	-2,272.40	2,374.68	0.94	-0.94	-1.43	
6,459.00	2.22	306.34	5,890.18	694.17	-2,275.87	2,378.67	0.70	-0.68	3.18	
6,553.00	1.57	302.45	5,984.13	695.94	-2,278.42	2,381.60	0.70	-0.69	-4.14	
6,648.00	1.39	306.77	6,079.10	697.33	-2,280.44	2,383.92	0.22	-0.19	4.55	
6,742.00	0.57	300.17	6,173.09	698.24	-2,281.76	2,385.44	0.88	-0.87	-7.02	
6,836.00	0.21	178.52	6,267.08	698.31	-2,282.16	2,385.84	0.75	-0.38	-129.41	
6,931.00	0.29	129.04	6,362.08	697.98	-2,281.97	2,385.57	0.23	0.08	-52.08	
7,025.00	0.26	92.33	6,456.08	697.82	-2,281.57	2,385.14	0.19	-0.03	-39.05	
7,119.00	0.47	119.02	6,550.08	697.63	-2,281.02	2,384.56	0.28	0.22	28.39	
7,214.00	0.26	157.24	6,645.08	697.24	-2,280.59	2,384.05	0.33	-0.22	40.23	
7,308.00	0.41	131.20	6,739.08	696.82	-2,280.26	2,383.61	0.22	0.16	-27.70	
7,402.00	1.16	149.76	6,833.07	695.78	-2,279.53	2,382.63	0.83	0.80	19.74	
7,497.00	1.10	165.93	6,928.05	694.06	-2,278.82	2,381.49	0.34	-0.06	17.02	
7,591.00	1.09	147.28	7,022.03	692.43	-2,278.12	2,380.37	0.38	-0.01	-19.84	
7,686.00	1.18	158.50	7,117.01	690.76	-2,277.27	2,379.11	0.25	0.09	11.81	
7,780.00	1.06	155.19	7,211.00	689.07	-2,276.55	2,377.96	0.14	-0.13	-3.52	
7,874.00	0.77	134.86	7,304.98	687.84	-2,275.74	2,376.85	0.46	-0.31	-21.63	
7,969.00	0.98	150.52	7,399.97	686.68	-2,274.89	2,375.72	0.33	0.22	16.48	
8,063.00	1.02	147.61	7,493.96	685.28	-2,274.04	2,374.53	0.07	0.04	-3.10	
8,157.00	0.92	145.59	7,587.95	683.95	-2,273.17	2,373.33	0.11	-0.11	-2.15	
8,251.00	1.06	150.23	7,681.93	682.57	-2,272.31	2,372.13	0.17	0.15	4.94	
8,346.00	0.95	117.14	7,776.92	681.45	-2,271.17	2,370.74	0.61	-0.12	-34.83	

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Design:	OH	Database:	Grand Junction District

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8,440.00	0.88	135.75	7,870.91	680.57	-2,269.98	2,369.35	0.32	-0.07	19.80	
8,535.00	0.67	114.94	7,965.90	679.82	-2,268.96	2,368.17	0.37	-0.22	-21.91	
8,629.00	0.79	140.79	8,059.89	679.08	-2,268.05	2,367.10	0.37	0.13	27.50	
8,724.00	0.93	152.74	8,154.88	677.89	-2,267.29	2,366.04	0.24	0.15	12.58	
8,818.00	1.45	147.25	8,248.86	676.21	-2,266.29	2,364.63	0.57	0.55	-5.84	
8,913.00	1.48	118.59	8,343.83	674.62	-2,264.57	2,362.54	0.76	0.03	-30.17	
9,001.00	1.58	130.20	8,431.80	673.29	-2,262.64	2,360.33	0.37	0.11	13.19	
Last SDI Production MWD Survey										
9,061.00	1.58	130.20	8,491.77	672.22	-2,261.38	2,358.83	0.00	0.00	0.00	
Projection to TD - PA 333-24 PBHL										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
124.00	124.00	-0.22	-0.18	First SDI Gyro MWD Survey	
678.00	668.56	25.50	-83.44	Last SDI Gyro MWD Survey	
749.00	735.66	32.04	-105.67	First SDI Surface MWD Survey	
1,069.00	1,027.90	64.47	-231.43	Last SDI Surface MWD Survey	
1,176.00	1,122.86	76.94	-279.15	First SDI Production MWD Survey	
9,001.00	8,431.80	673.29	-2,262.64	Last SDI Production MWD Survey	
9,061.00	8,491.77	672.22	-2,261.38	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____