



## 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 41-26
County & State	Garfield County, CO
SDI Job No.	OP.007496
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 110 feet to a measured depth of 8,840 feet is true and correct as determined from all available records.

  
Signature

1-Mar-18  
Date

**Mel Mireles Jr.**  
Grand Junction Assistant Well Planner  
Scientific Drilling - Colorado District

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well PA 41-26 - Slot PA 41-26 (B12)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5224' & RKB 24' @ 5248.00usft
<b>Site:</b>	PA 22-25 Pad	<b>MD Reference:</b>	GL 5224' & RKB 24' @ 5248.00usft
<b>Well:</b>	PA 41-26	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Grand Junction District

<b>Project</b>	Garfield County, CO NAD83		
<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		PA 22-25 Pad			
Site Position:		Northing:	1,615,186.77 usft	Latitude:	39.4968742
From:	Map	Easting:	2,308,728.18 usft	Longitude:	-107.9499045
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.55 °

Well		PA 41-26 - Slot PA 41-26 (B12), B12				
Well Position	+N/-S	0.00 usft	Northing:	1,615,198.02 usft	Latitude:	39.4969115
	+E/-W	0.00 usft	Easting:	2,308,815.51 usft	Longitude:	-107.9495963
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,224.00 usft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	1/22/2018	9.40	65.77	51,664

<b>Design</b>	OH				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	337.96	

<b>Survey Program</b>	<b>Date</b>	3/1/2018			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
110.00	857.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
933.00	1,083.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,174.00	8,840.00	Survey #3 - Production MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
<b>SHL (PA 41-26)</b>										
110.00	0.18	315.79	110.00	0.12	-0.12	0.16	0.16	0.16	0.00	
<b>First SDI Gyro MWD Survey</b>										
151.00	0.18	312.89	151.00	0.21	-0.21	0.28	0.02	0.00	-7.07	
213.00	0.88	332.93	213.00	0.70	-0.50	0.84	1.15	1.13	32.32	
305.00	2.29	357.45	304.96	3.17	-0.90	3.28	1.67	1.53	26.65	
398.00	3.78	343.83	397.83	7.97	-1.84	8.08	1.77	1.60	-14.65	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well PA 41-26 - Slot PA 41-26 (B12)
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<b>Site:</b>	PA 22-25 Pad	<b>MD Reference:</b>	GL 5224' & RKB 24' @ 5248.00usft
<b>Well:</b>	PA 41-26	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)
489.00	7.04	348.57	488.41	16.32	-3.78	16.55	3.61	3.58	5.21
580.00	9.59	341.37	578.45	28.97	-7.31	29.60	3.02	2.80	-7.91
672.00	12.32	338.29	668.76	45.35	-13.39	47.06	3.03	2.97	-3.35
765.00	16.50	336.88	758.82	66.73	-22.25	70.20	4.51	4.49	-1.52
857.00	19.44	337.94	846.32	92.94	-33.13	98.58	3.22	3.20	1.15
<b>Last SDI Gyro MWD Survey</b>									
933.00	22.00	337.60	917.40	117.82	-43.31	125.47	3.37	3.37	-0.45
<b>First SDI Surface MWD Survey</b>									
1,027.00	24.45	335.59	1,003.78	151.82	-58.06	162.51	2.74	2.61	-2.14
1,083.00	25.41	334.18	1,054.56	173.19	-68.08	186.08	2.02	1.71	-2.52
<b>Last SDI Surface MWD Survey</b>									
1,174.00	26.69	333.02	1,136.31	208.98	-85.86	225.93	1.51	1.41	-1.27
<b>First SDI Production MWD Survey</b>									
1,269.00	28.96	329.53	1,220.33	247.83	-107.20	269.94	2.94	2.39	-3.67
1,363.00	30.64	324.38	1,301.91	286.92	-132.70	315.75	3.26	1.79	-5.48
1,457.00	32.20	320.24	1,382.13	325.65	-162.67	362.90	2.83	1.66	-4.40
1,552.00	34.76	321.14	1,461.37	366.20	-195.86	412.94	2.74	2.69	0.95
1,647.00	37.22	318.16	1,538.23	408.71	-232.03	465.91	3.18	2.59	-3.14
1,741.00	38.76	314.35	1,612.32	450.47	-272.04	519.63	2.98	1.64	-4.05
1,836.00	39.34	310.87	1,686.11	490.96	-316.08	573.70	2.39	0.61	-3.66
1,931.00	39.13	308.80	1,759.70	529.45	-362.21	626.69	1.40	-0.22	-2.18
2,025.00	39.04	310.36	1,832.66	567.21	-407.89	678.83	1.05	-0.10	1.66
2,120.00	38.31	310.00	1,906.83	605.51	-453.24	731.35	0.80	-0.77	-0.38
2,214.00	37.95	309.06	1,980.77	642.45	-498.01	782.39	0.73	-0.38	-1.00
2,309.00	37.10	311.88	2,056.12	679.99	-542.03	833.71	2.02	-0.89	2.97
2,403.00	37.65	313.92	2,130.82	718.83	-583.82	885.39	1.44	0.59	2.17
2,498.00	37.48	313.03	2,206.12	758.68	-625.84	938.10	0.60	-0.18	-0.94
2,592.00	37.92	316.01	2,280.50	798.98	-666.81	990.83	1.99	0.47	3.17
2,687.00	37.14	316.00	2,355.84	840.61	-707.01	1,044.51	0.82	-0.82	-0.01
2,781.00	36.48	316.60	2,431.10	881.33	-745.92	1,096.85	0.80	-0.70	0.64
2,876.00	37.77	314.63	2,506.85	922.29	-786.03	1,149.87	1.85	1.36	-2.07
2,970.00	36.53	315.00	2,581.77	962.30	-826.31	1,202.07	1.34	-1.32	0.39
3,065.00	37.49	313.02	2,657.63	1,002.02	-867.44	1,254.32	1.61	1.01	-2.08
3,159.00	36.14	311.52	2,732.89	1,039.91	-909.11	1,305.08	1.73	-1.44	-1.60
3,254.00	37.71	315.36	2,808.84	1,079.16	-950.50	1,357.00	2.94	1.65	4.04
3,348.00	36.16	314.92	2,883.97	1,119.20	-990.34	1,409.07	1.67	-1.65	-0.47
3,443.00	38.92	316.34	2,959.29	1,160.59	-1,030.80	1,462.61	3.04	2.91	1.49
3,537.00	38.12	315.84	3,032.84	1,202.77	-1,071.40	1,516.94	0.91	-0.85	-0.53
3,631.00	37.63	316.25	3,107.04	1,244.31	-1,111.46	1,570.48	0.59	-0.52	0.44
3,725.00	36.68	314.67	3,181.96	1,284.78	-1,151.27	1,622.93	1.43	-1.01	-1.68
3,820.00	38.42	316.35	3,257.27	1,326.09	-1,191.82	1,676.44	2.13	1.83	1.77
3,915.00	37.64	316.58	3,332.10	1,368.52	-1,232.14	1,730.90	0.83	-0.82	0.24
4,010.00	37.11	315.95	3,407.60	1,410.18	-1,272.00	1,784.49	0.69	-0.56	-0.66
4,104.00	36.57	315.88	3,482.83	1,450.67	-1,311.21	1,836.73	0.58	-0.57	-0.07

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<b>Well:</b>	PA 41-26	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)	
4,199.00	35.19	315.42	3,559.80	1,490.49	-1,350.13	1,888.24	1.48	-1.45	-0.48	
4,293.00	33.49	314.67	3,637.41	1,528.01	-1,387.59	1,937.08	1.86	-1.81	-0.80	
4,388.00	34.28	315.43	3,716.28	1,565.50	-1,425.01	1,985.87	0.94	0.83	0.80	
4,482.00	33.86	315.78	3,794.14	1,603.13	-1,461.85	2,034.57	0.49	-0.45	0.37	
4,576.00	33.27	314.71	3,872.47	1,640.03	-1,498.43	2,082.51	0.89	-0.63	-1.14	
4,670.00	31.82	314.52	3,951.71	1,675.55	-1,534.43	2,128.94	1.55	-1.54	-0.20	
4,779.00	30.70	315.30	4,044.88	1,715.48	-1,574.49	2,180.98	1.09	-1.03	0.72	
4,857.00	29.57	314.99	4,112.34	1,743.24	-1,602.11	2,217.08	1.46	-1.45	-0.40	
4,967.00	28.52	314.89	4,208.50	1,780.96	-1,639.91	2,266.23	0.96	-0.95	-0.09	
5,046.00	27.37	314.36	4,278.29	1,806.97	-1,666.25	2,300.23	1.49	-1.46	-0.67	
5,140.00	25.64	314.23	4,362.41	1,836.26	-1,696.28	2,338.65	1.84	-1.84	-0.14	
5,235.00	26.28	311.83	4,447.82	1,864.63	-1,726.68	2,376.35	1.29	0.67	-2.53	
5,329.00	24.91	311.40	4,532.60	1,891.60	-1,757.03	2,412.74	1.47	-1.46	-0.46	
5,387.86	24.20	310.76	4,586.13	1,907.67	-1,775.47	2,434.56	1.29	-1.20	-1.09	
PA 41-26 MVRD										
5,423.00	23.78	310.36	4,618.24	1,916.96	-1,786.33	2,447.24	1.29	-1.20	-1.14	
5,517.00	23.34	310.43	4,704.40	1,941.31	-1,814.94	2,480.55	0.47	-0.47	0.07	
5,611.00	21.28	307.88	4,791.36	1,963.86	-1,842.58	2,511.83	2.42	-2.19	-2.71	
5,705.00	19.02	310.60	4,879.61	1,984.31	-1,867.68	2,540.20	2.60	-2.40	2.89	
5,799.00	17.50	310.16	4,968.87	2,003.39	-1,890.11	2,566.31	1.62	-1.62	-0.47	
5,893.00	16.23	317.04	5,058.83	2,022.12	-1,909.87	2,591.08	2.51	-1.35	7.32	
5,986.00	14.66	315.16	5,148.47	2,039.98	-1,927.02	2,614.07	1.77	-1.69	-2.02	
6,080.00	14.01	316.10	5,239.55	2,056.61	-1,943.30	2,635.60	0.73	-0.69	1.00	
6,175.00	12.72	316.04	5,331.97	2,072.43	-1,958.54	2,655.98	1.36	-1.36	-0.06	
6,269.00	11.87	314.03	5,423.82	2,086.60	-1,972.67	2,674.41	1.01	-0.90	-2.14	
6,363.00	10.54	313.03	5,516.02	2,099.18	-1,985.91	2,691.05	1.43	-1.41	-1.06	
6,457.00	9.13	323.56	5,608.65	2,111.05	-1,996.62	2,706.07	2.43	-1.50	11.20	
6,551.00	8.08	322.38	5,701.59	2,122.29	-2,005.09	2,719.66	1.13	-1.12	-1.26	
6,645.00	7.71	322.65	5,794.70	2,132.53	-2,012.94	2,732.10	0.40	-0.39	0.29	
6,740.00	6.93	322.69	5,888.92	2,142.15	-2,020.28	2,743.78	0.82	-0.82	0.04	
6,835.00	5.66	322.14	5,983.35	2,150.41	-2,026.63	2,753.82	1.34	-1.34	-0.58	
6,929.00	5.23	318.85	6,076.92	2,157.30	-2,032.30	2,762.32	0.57	-0.46	-3.50	
7,023.00	5.01	316.16	6,170.55	2,163.48	-2,037.96	2,770.18	0.35	-0.23	-2.86	
7,117.00	4.47	315.03	6,264.22	2,169.04	-2,043.39	2,777.37	0.58	-0.57	-1.20	
7,211.00	3.99	313.16	6,357.97	2,173.86	-2,048.37	2,783.71	0.53	-0.51	-1.99	
7,305.00	3.18	308.53	6,451.78	2,177.73	-2,052.79	2,788.95	0.91	-0.86	-4.93	
7,400.00	2.82	307.16	6,546.65	2,180.78	-2,056.71	2,793.25	0.39	-0.38	-1.44	
7,495.00	2.84	302.48	6,641.54	2,183.45	-2,060.56	2,797.18	0.24	0.02	-4.93	
7,590.00	2.46	295.66	6,736.44	2,185.60	-2,064.39	2,800.60	0.52	-0.40	-7.18	
7,685.00	2.29	283.35	6,831.36	2,186.92	-2,068.07	2,803.21	0.56	-0.18	-12.96	
7,780.00	1.89	255.03	6,926.29	2,186.96	-2,071.43	2,804.50	1.15	-0.42	-29.81	
7,875.00	1.86	236.43	7,021.24	2,185.70	-2,074.23	2,804.39	0.64	-0.03	-19.58	
7,969.00	1.89	220.84	7,115.19	2,183.68	-2,076.51	2,803.37	0.54	0.03	-16.59	
8,064.00	2.15	221.01	7,210.14	2,181.15	-2,078.71	2,801.85	0.27	0.27	0.18	

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<b>Design:</b>	OH	<b>Database:</b>	Grand Junction District

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8,158.00	2.10	235.44	7,304.07	2,178.85	-2,081.28	2,800.68	0.57	-0.05	15.35	
8,252.00	1.05	224.03	7,398.03	2,177.25	-2,083.30	2,799.96	1.16	-1.12	-12.14	
8,347.00	1.07	213.09	7,493.02	2,175.88	-2,084.39	2,799.10	0.21	0.02	-11.52	
8,441.00	0.53	212.78	7,587.01	2,174.78	-2,085.10	2,798.35	0.57	-0.57	-0.33	
8,536.00	0.13	116.62	7,682.01	2,174.36	-2,085.24	2,798.01	0.59	-0.42	-101.22	
8,630.00	0.07	93.36	7,776.01	2,174.31	-2,085.09	2,797.91	0.08	-0.06	-24.74	
8,725.00	0.21	227.55	7,871.01	2,174.19	-2,085.16	2,797.82	0.28	0.15	141.25	
8,780.00	0.35	298.12	7,926.01	2,174.20	-2,085.38	2,797.91	0.62	0.25	128.31	
<b>Last SDI Production MWD Survey</b>										
8,840.00	0.35	298.12	7,986.01	2,174.37	-2,085.71	2,798.20	0.00	0.00	0.00	
<b>Projection to TD - PA 41-26 PBHL</b>										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
110.00	110.00	0.12	-0.12	First SDI Gyro MWD Survey	
857.00	846.32	92.94	-33.13	Last SDI Gyro MWD Survey	
933.00	917.40	117.82	-43.31	First SDI Surface MWD Survey	
1,083.00	1,054.56	173.19	-68.08	Last SDI Surface MWD Survey	
1,174.00	1,136.31	208.98	-85.86	First SDI Production MWD Survey	
8,780.00	7,926.01	2,174.20	-2,085.38	Last SDI Production MWD Survey	
8,840.00	7,986.01	2,174.37	-2,085.71	Projection to TD	

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

