



## 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 441-26
County & State	Garfield County, CO
SDI Job No.	OP.006569
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 122 feet to a measured depth of 8,520 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

8-Jan-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 441-26 - Slot PA 441-26 (B7)
<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 441-26	<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 441-26 - Slot PA 441-26 (B7), B7				
Well Position	+N/-S	0.00 usft	Northing:	1,615,198.94 usft	Latitude:	39.4969113
	+E/-W	0.00 usft	Easting:	2,308,778.02 usft	Longitude:	-107.9497291
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	12/11/2017	9.40	65.78	51,677

<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	241.44	

<b>Survey Program</b>	<b>Date</b>	1/8/2018			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
122.00	672.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
746.00	1,088.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,197.00	8,520.00	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	
0.01	0.00	241.44	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
<b>SHL (PA 441-26)</b>										
122.00	0.26	241.44	122.00	-0.13	-0.24	0.28	0.21	0.21	0.00	
<b>First SDI Gyro MWD Survey</b>										
213.00	1.32	310.52	212.99	0.45	-1.22	0.86	1.37	1.16	75.91	
305.00	3.34	310.43	304.91	2.88	-4.07	2.20	2.20	2.20	-0.10	
398.00	5.98	314.82	397.59	8.05	-9.57	4.55	2.86	2.84	4.72	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well PA 441-26 - Slot PA 441-26 (B7)
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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 441-26	<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	9.77	311.13	487.72	16.47	-18.75	8.59	4.20	4.16	-4.05
580.00	13.37	310.08	576.86	28.33	-32.62	15.11	3.96	3.96	-1.15
672.00	15.40	312.10	665.97	43.37	-49.82	23.03	2.27	2.21	2.20
<b>Last SDI Gyro MWD Survey</b>									
746.00	16.26	311.97	737.16	56.88	-64.82	29.73	1.16	1.16	-0.18
<b>First SDI Surface MWD Survey</b>									
838.00	19.21	311.74	824.78	75.58	-85.69	39.13	3.21	3.21	-0.25
932.00	22.77	311.73	912.53	97.99	-110.81	50.48	3.79	3.79	-0.01
1,027.00	25.25	310.44	999.30	123.37	-139.96	63.95	2.67	2.61	-1.36
1,088.00	26.04	308.55	1,054.29	140.16	-160.33	73.82	1.86	1.30	-3.10
<b>Last SDI Surface MWD Survey</b>									
1,197.00	27.43	306.56	1,151.64	170.02	-199.21	93.69	1.52	1.28	-1.83
<b>First SDI Production MWD Survey</b>									
1,272.00	28.40	306.01	1,217.91	190.80	-227.52	108.61	1.34	1.29	-0.73
1,366.00	30.01	304.60	1,299.96	217.29	-264.95	128.83	1.86	1.71	-1.50
1,461.00	32.47	304.29	1,381.18	245.16	-305.58	151.19	2.59	2.59	-0.33
1,555.00	34.68	306.40	1,459.50	275.25	-347.96	174.03	2.66	2.35	2.24
1,649.00	35.70	307.38	1,536.32	307.77	-391.28	196.53	1.24	1.09	1.04
1,744.00	34.82	307.69	1,613.89	341.18	-434.77	218.76	0.95	-0.93	0.33
1,838.00	35.11	306.64	1,690.92	373.72	-477.70	240.90	0.71	0.31	-1.12
1,933.00	36.24	305.06	1,768.09	406.15	-522.61	264.84	1.53	1.19	-1.66
2,028.00	35.39	304.81	1,845.13	437.99	-568.18	289.65	0.91	-0.89	-0.26
2,122.00	35.36	304.03	1,921.78	468.75	-613.07	314.37	0.48	-0.03	-0.83
2,217.00	34.95	304.50	1,999.45	499.55	-658.28	339.35	0.52	-0.43	0.49
2,311.00	36.10	305.83	2,075.95	531.01	-702.92	363.52	1.47	1.22	1.41
2,406.00	35.39	305.03	2,153.05	563.18	-748.14	387.86	0.89	-0.75	-0.84
2,500.00	34.84	304.46	2,229.95	594.00	-792.57	412.15	0.68	-0.59	-0.61
2,594.00	36.18	306.40	2,306.46	625.66	-837.04	436.07	1.86	1.43	2.06
2,689.00	36.06	305.90	2,383.20	658.69	-882.26	460.00	0.33	-0.13	-0.53
2,782.00	34.93	306.07	2,458.92	690.42	-925.95	483.20	1.22	-1.22	0.18
2,876.00	34.07	306.16	2,536.39	721.80	-968.96	505.98	0.92	-0.91	0.10
2,971.00	34.83	307.93	2,614.73	754.18	-1,011.85	528.17	1.32	0.80	1.86
3,066.00	33.54	307.65	2,693.31	786.89	-1,054.03	549.58	1.37	-1.36	-0.29
3,161.00	34.83	308.71	2,771.90	819.89	-1,095.98	570.65	1.50	1.36	1.12
3,255.00	33.69	308.19	2,849.59	852.79	-1,137.42	591.31	1.25	-1.21	-0.55
3,350.00	34.81	307.32	2,928.11	885.53	-1,179.69	612.79	1.29	1.18	-0.92
3,445.00	34.07	306.60	3,006.46	917.83	-1,222.62	635.05	0.89	-0.78	-0.76
3,539.00	35.19	306.30	3,083.81	949.57	-1,265.59	657.62	1.21	1.19	-0.32
3,634.00	34.00	305.90	3,162.01	981.35	-1,309.17	680.70	1.28	-1.25	-0.42
3,728.00	32.96	306.15	3,240.41	1,011.84	-1,351.11	702.96	1.12	-1.11	0.27
3,822.00	31.79	305.98	3,319.80	1,041.48	-1,391.79	724.53	1.25	-1.24	-0.18
3,917.00	30.73	305.73	3,401.00	1,070.35	-1,431.74	745.81	1.12	-1.12	-0.26
4,011.00	29.72	305.40	3,482.22	1,097.87	-1,470.24	766.46	1.09	-1.07	-0.35
4,106.00	29.25	305.23	3,564.92	1,124.90	-1,508.39	787.05	0.50	-0.49	-0.18

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<b>Well:</b>	PA 441-26	<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)	
4,201.00	28.55	304.03	3,648.09	1,151.00	-1,546.16	807.75	0.96	-0.74	-1.26	
4,295.00	27.24	305.62	3,731.17	1,176.10	-1,582.27	827.46	1.60	-1.39	1.69	
4,389.00	26.26	310.14	3,815.12	1,202.04	-1,615.66	844.39	2.40	-1.04	4.81	
4,483.00	25.32	309.71	3,899.75	1,228.29	-1,647.02	859.39	1.02	-1.00	-0.46	
4,578.00	25.52	309.38	3,985.55	1,254.25	-1,678.46	874.59	0.26	0.21	-0.35	
4,688.00	23.36	309.02	4,085.69	1,283.02	-1,713.73	891.81	1.97	-1.96	-0.33	
4,768.00	22.95	308.74	4,159.25	1,302.76	-1,738.21	903.88	0.53	-0.51	-0.35	
4,863.00	20.87	308.91	4,247.38	1,324.98	-1,765.83	917.51	2.19	-2.19	0.18	
4,973.00	20.14	308.34	4,350.41	1,349.04	-1,795.93	932.45	0.69	-0.66	-0.52	
5,052.00	18.90	308.56	4,424.87	1,365.45	-1,816.60	942.76	1.57	-1.57	0.28	
5,088.93	18.06	308.81	4,459.89	1,372.77	-1,825.74	947.29	2.28	-2.27	0.67	
PA 441-26 MVRD										
5,147.00	16.74	309.25	4,515.31	1,383.70	-1,839.23	953.91	2.28	-2.27	0.76	
5,242.00	16.42	309.55	4,606.36	1,400.91	-1,860.18	964.09	0.35	-0.34	0.32	
5,337.00	14.61	307.79	4,697.89	1,416.80	-1,880.00	973.90	1.97	-1.91	-1.85	
5,432.00	13.40	309.45	4,790.07	1,431.14	-1,897.97	982.83	1.34	-1.27	1.75	
5,526.00	11.16	313.17	4,881.91	1,444.28	-1,913.02	989.76	2.53	-2.38	3.96	
5,621.00	10.52	314.23	4,975.21	1,456.62	-1,925.94	995.21	0.71	-0.67	1.12	
5,716.00	9.04	311.01	5,068.83	1,467.57	-1,937.79	1,000.38	1.66	-1.56	-3.39	
5,811.00	8.16	312.51	5,162.76	1,477.02	-1,948.39	1,005.17	0.96	-0.93	1.58	
5,905.00	8.37	306.41	5,255.79	1,485.59	-1,958.81	1,010.23	0.96	0.22	-6.49	
6,000.00	7.71	307.13	5,349.85	1,493.54	-1,969.46	1,015.78	0.70	-0.69	0.76	
6,095.00	6.59	301.45	5,444.11	1,500.23	-1,979.19	1,021.13	1.39	-1.18	-5.98	
6,190.00	5.72	297.66	5,538.57	1,505.28	-1,988.03	1,026.48	1.01	-0.92	-3.99	
6,285.00	4.12	300.05	5,633.21	1,509.18	-1,995.18	1,030.89	1.70	-1.68	2.52	
6,380.00	3.69	300.13	5,727.99	1,512.43	-2,000.78	1,034.26	0.45	-0.45	0.08	
6,474.00	2.20	304.17	5,821.87	1,514.96	-2,004.89	1,036.66	1.60	-1.59	4.30	
6,569.00	0.70	243.82	5,916.84	1,515.73	-2,006.92	1,038.07	2.05	-1.58	-63.53	
6,664.00	1.33	227.14	6,011.82	1,514.72	-2,008.25	1,039.72	0.73	0.66	-17.56	
6,759.00	1.32	224.63	6,106.80	1,513.19	-2,009.82	1,041.84	0.06	-0.01	-2.64	
6,853.00	1.14	204.42	6,200.78	1,511.57	-2,010.97	1,043.62	0.50	-0.19	-21.50	
6,948.00	1.18	199.27	6,295.76	1,509.79	-2,011.69	1,045.10	0.12	0.04	-5.42	
7,043.00	1.31	204.52	6,390.73	1,507.87	-2,012.46	1,046.69	0.18	0.14	5.53	
7,137.00	1.50	188.19	6,484.71	1,505.68	-2,013.08	1,048.29	0.47	0.20	-17.37	
7,232.00	1.63	182.84	6,579.67	1,503.10	-2,013.32	1,049.74	0.21	0.14	-5.63	
7,326.00	2.17	189.00	6,673.62	1,500.01	-2,013.67	1,051.52	0.61	0.57	6.55	
7,421.00	1.32	224.01	6,768.58	1,497.44	-2,014.71	1,053.66	1.40	-0.89	36.85	
7,515.00	1.65	221.47	6,862.54	1,495.65	-2,016.36	1,055.96	0.36	0.35	-2.70	
7,610.00	1.63	204.68	6,957.51	1,493.40	-2,017.83	1,058.33	0.50	-0.02	-17.67	
7,705.00	1.17	183.44	7,052.48	1,491.20	-2,018.45	1,059.93	0.72	-0.48	-22.36	
7,799.00	1.15	186.39	7,146.46	1,489.31	-2,018.61	1,060.98	0.07	-0.02	3.14	
7,894.00	1.56	199.28	7,241.43	1,487.14	-2,019.15	1,062.48	0.54	0.43	13.57	
7,988.00	1.26	235.07	7,335.40	1,485.34	-2,020.42	1,064.46	0.97	-0.32	38.07	
8,083.00	1.45	239.44	7,430.38	1,484.13	-2,022.31	1,066.70	0.23	0.20	4.60	

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<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)	
8,177.00	1.66	220.22	7,524.34	1,482.48	-2,024.21	1,069.15	0.59	0.22	-20.45	
8,272.00	1.85	224.88	7,619.30	1,480.35	-2,026.18	1,071.91	0.25	0.20	4.91	
8,366.00	2.12	226.94	7,713.24	1,478.09	-2,028.52	1,075.04	0.30	0.29	2.19	
8,460.00	2.10	233.70	7,807.18	1,475.88	-2,031.18	1,078.43	0.27	-0.02	7.19	
Last SDI Production MWD Survey										
8,520.00	2.10	233.70	7,867.14	1,474.58	-2,032.95	1,080.61	0.00	0.00	0.00	
Projection to TD - PBHL (PA 441-26) - PA 441-26 PBHL										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
122.00	122.00	-0.13	-0.24	First SDI Gyro MWD Survey	
672.00	665.97	43.37	-49.82	Last SDI Gyro MWD Survey	
746.00	737.16	56.88	-64.82	First SDI Surface MWD Survey	
1,088.00	1,054.29	140.16	-160.33	Last SDI Surface MWD Survey	
1,197.00	1,151.64	170.02	-199.21	First SDI Production MWD Survey	
8,460.00	7,807.18	1,475.88	-2,031.18	Last SDI Production MWD Survey	
8,520.00	7,867.14	1,474.58	-2,032.95	Projection to TD	

Checked By: _____	Approved By: _____	Date: _____
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