



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 522-26
County & State	Garfield County, CO
SDI Job No.	OP.012472
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 123 feet to a measured depth of 8,473 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

30-Aug-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 522-26 - Slot PA 522-26 (B11)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
Site:	PA 23-26 Pad	MD Reference:	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
Well:	PA 522-26	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		PA 23-26 Pad			
Site Position:		Northing:	1,614,399.90 usft	Latitude:	39.4943598
From:	Map	Easting:	2,303,951.10 usft	Longitude:	-107.9667508
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.56 °

Well	PA 522-26 - Slot PA 522-26 (B11), B11					
Well Position	+N/-S	0.00 usft	Northing:	1,614,389.40 usft	Latitude:	39.4943276
	+E/-W	0.00 usft	Easting:	2,303,906.20 usft	Longitude:	-107.9669088
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,637.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/20/2018	9.35	65.75	51,597

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	350.01	

Survey Program	Date	8/30/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
123.00	763.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
835.00	1,085.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,172.00	8,473.00	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	
123.00	0.44	139.48	123.00	-0.36	0.31	-0.41	0.36	0.36	0.00	
First SDI Gyro MWD Survey										
214.00	0.97	346.64	214.00	0.12	0.36	0.06	1.51	0.58	-167.96	
306.00	3.26	335.57	305.93	3.26	-0.91	3.37	2.52	2.49	-12.03	
398.00	5.10	334.16	397.68	9.33	-3.77	9.84	2.00	2.00	-1.53	
490.00	7.48	344.44	489.12	18.78	-7.16	19.74	2.85	2.59	11.17	
581.00	8.53	359.30	579.24	31.23	-8.83	32.29	2.54	1.15	16.33	
673.00	11.00	358.51	669.90	46.83	-9.14	47.71	2.69	2.68	-0.86	

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Site:	PA 23-26 Pad	MD Reference:	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
Well:	PA 522-26	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)
763.00	13.46	352.97	757.86	65.82	-10.65	66.67	3.03	2.73	-6.16
Last SDI Gyro MWD Survey									
835.00	14.58	346.43	827.71	82.94	-13.80	84.08	2.69	1.56	-9.08
First SDI Surface MWD Survey									
929.00	15.59	347.48	918.47	106.78	-19.32	108.51	1.11	1.07	1.12
1,023.00	15.12	352.30	1,009.12	131.26	-23.70	133.38	1.45	-0.50	5.13
1,085.00	15.04	351.77	1,068.99	147.23	-25.93	149.50	0.26	-0.13	-0.85
Last SDI Surface MWD Survey									
1,172.00	15.74	353.31	1,152.87	170.12	-28.92	172.56	0.93	0.80	1.77
First SDI Production MWD Survey									
1,266.00	15.90	352.83	1,243.31	195.56	-32.01	198.15	0.22	0.17	-0.51
1,361.00	15.70	351.54	1,334.72	221.19	-35.53	224.00	0.43	-0.21	-1.36
1,455.00	15.50	349.62	1,425.26	246.12	-39.66	249.27	0.59	-0.21	-2.04
1,549.00	15.34	352.13	1,515.87	270.79	-43.63	274.26	0.73	-0.17	2.67
1,644.00	15.79	354.88	1,607.39	296.12	-46.50	299.69	0.91	0.47	2.89
1,738.00	14.66	352.51	1,698.09	320.65	-49.20	324.32	1.37	-1.20	-2.52
1,832.00	15.60	357.59	1,788.84	345.07	-51.28	348.74	1.73	1.00	5.40
1,927.00	15.06	356.81	1,880.45	370.16	-52.50	373.65	0.61	-0.57	-0.82
2,021.00	16.07	357.09	1,971.01	395.34	-53.84	398.69	1.08	1.07	0.30
2,116.00	15.19	356.21	2,062.49	420.89	-55.33	424.11	0.96	-0.93	-0.93
2,210.00	14.06	355.20	2,153.45	444.56	-57.10	447.73	1.23	-1.20	-1.07
2,304.00	15.51	356.97	2,244.33	468.49	-58.72	471.58	1.62	1.54	1.88
2,398.00	16.45	358.89	2,334.70	494.35	-59.64	497.20	1.15	1.00	2.04
2,493.00	15.87	0.19	2,425.94	520.79	-59.86	523.28	0.72	-0.61	1.37
2,587.00	16.34	355.46	2,516.26	546.82	-60.86	549.09	1.48	0.50	-5.03
2,682.00	15.39	355.99	2,607.64	572.72	-62.80	574.93	1.01	-1.00	0.56
2,776.00	16.53	356.43	2,698.02	598.51	-64.51	600.63	1.22	1.21	0.47
2,871.00	16.99	354.89	2,788.98	625.82	-66.59	627.89	0.67	0.48	-1.62
2,965.00	16.36	354.21	2,879.03	652.67	-69.15	654.77	0.70	-0.67	-0.72
3,059.00	15.29	354.17	2,969.46	678.18	-71.74	680.34	1.14	-1.14	-0.04
3,154.00	15.71	353.12	3,061.01	703.41	-74.55	705.67	0.53	0.44	-1.11
3,248.00	16.20	352.78	3,151.39	729.05	-77.73	731.48	0.53	0.52	-0.36
3,343.00	15.40	352.34	3,242.80	754.70	-81.07	757.32	0.85	-0.84	-0.46
3,437.00	14.28	351.96	3,333.66	778.55	-84.36	781.38	1.20	-1.19	-0.40
3,532.00	16.31	351.38	3,425.29	803.34	-88.00	806.43	2.14	2.14	-0.61
3,626.00	17.14	352.13	3,515.31	830.11	-91.87	833.46	0.91	0.88	0.80
3,720.00	16.17	353.12	3,605.37	856.83	-95.34	860.38	1.08	-1.03	1.05
3,815.00	15.23	352.74	3,696.82	882.34	-98.50	886.05	1.00	-0.99	-0.40
3,909.00	14.65	352.71	3,787.64	906.38	-101.57	910.26	0.62	-0.62	-0.03
4,003.00	16.13	354.64	3,878.27	931.17	-104.29	935.15	1.67	1.57	2.05
4,098.00	15.51	353.61	3,969.67	956.93	-106.94	960.98	0.72	-0.65	-1.08
4,192.00	15.19	353.50	4,060.32	981.66	-109.73	985.81	0.34	-0.34	-0.12
4,286.00	14.09	352.00	4,151.27	1,005.23	-112.72	1,009.54	1.24	-1.17	-1.60
4,381.00	14.54	353.80	4,243.32	1,028.53	-115.62	1,033.00	0.67	0.47	1.89

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Well:	PA 522-26	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

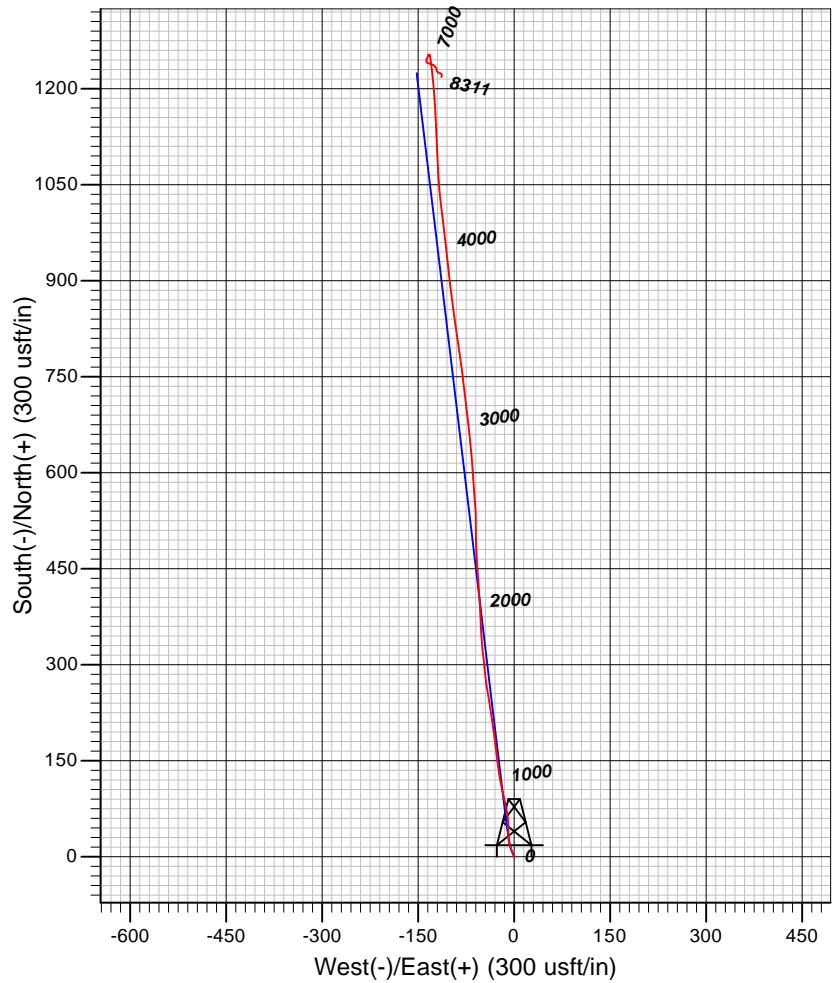
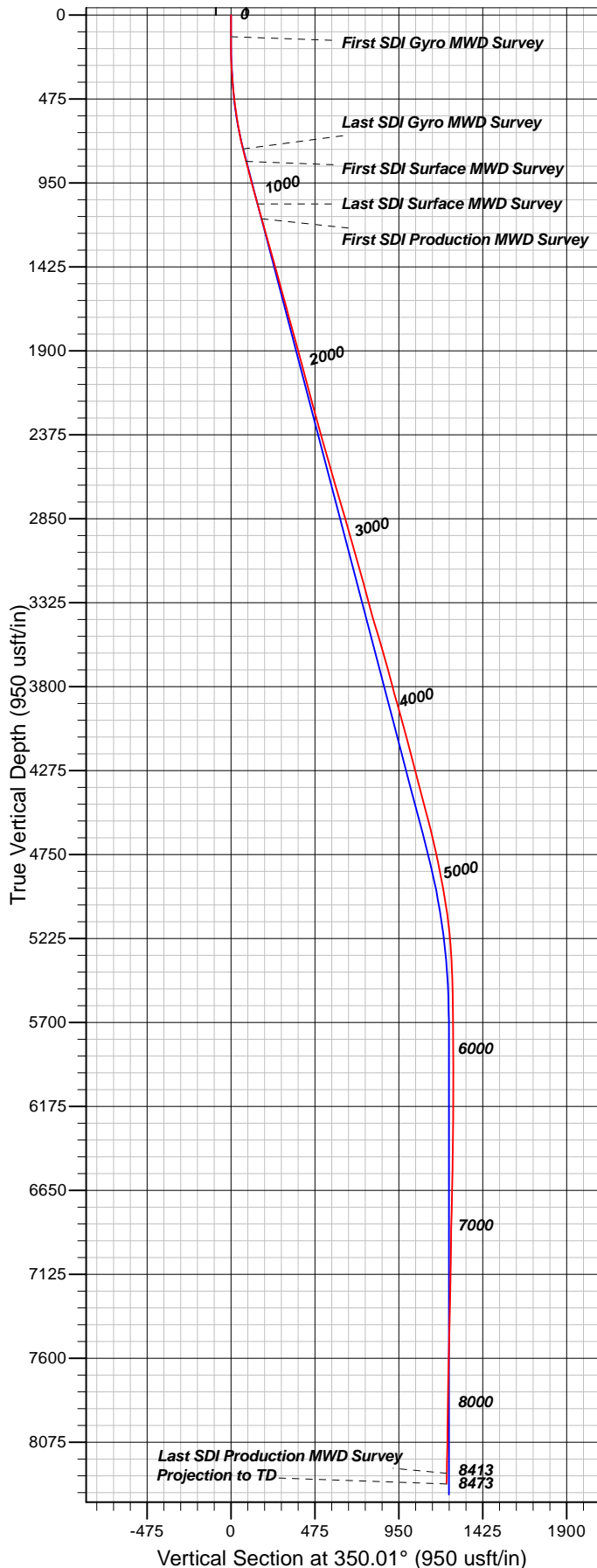
Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,475.00	15.52	356.20	4,334.10	1,052.81	-117.73	1,057.27	1.23	1.04	2.55
4,569.00	14.39	355.61	4,424.92	1,077.01	-119.45	1,081.40	1.21	-1.20	-0.63
4,664.00	14.82	357.64	4,516.85	1,100.92	-120.86	1,105.19	0.70	0.45	2.14
4,758.00	14.50	359.42	4,607.79	1,124.70	-121.47	1,128.72	0.59	-0.34	1.89
4,947.00	11.76	356.12	4,791.83	1,167.58	-123.01	1,171.22	1.50	-1.45	-1.75
5,042.00	10.46	354.13	4,885.05	1,185.82	-124.55	1,189.45	1.43	-1.37	-2.09
5,136.00	10.11	354.67	4,977.54	1,202.52	-126.19	1,206.18	0.39	-0.37	0.57
5,230.00	8.23	356.01	5,070.33	1,217.45	-127.43	1,221.10	2.01	-2.00	1.43
5,325.00	6.36	352.24	5,164.56	1,229.45	-128.61	1,233.12	2.03	-1.97	-3.97
5,419.00	4.05	352.33	5,258.17	1,237.90	-129.76	1,241.64	2.46	-2.46	0.10
5,513.00	3.02	353.65	5,351.99	1,243.65	-130.47	1,247.43	1.10	-1.10	1.40
5,607.00	1.95	352.03	5,445.90	1,247.69	-130.97	1,251.50	1.14	-1.14	-1.72
5,702.00	1.36	347.89	5,540.86	1,250.40	-131.43	1,254.24	0.63	-0.62	-4.36
5,796.00	0.77	355.71	5,634.84	1,252.12	-131.71	1,255.98	0.64	-0.63	8.32
5,849.94	0.58	341.53	5,688.78	1,252.74	-131.82	1,256.61	0.47	-0.36	-26.29
BTV (PA 522-26)									
5,891.00	0.47	323.74	5,729.84	1,253.07	-131.99	1,256.97	0.47	-0.26	-43.32
5,985.00	0.50	255.23	5,823.83	1,253.27	-132.61	1,257.28	0.58	0.03	-72.88
6,080.00	0.84	227.16	5,918.83	1,252.69	-133.52	1,256.87	0.49	0.36	-29.55
6,174.00	0.50	334.54	6,012.82	1,252.60	-134.21	1,256.89	1.17	-0.36	114.23
6,269.00	0.15	348.19	6,107.82	1,253.09	-134.41	1,257.41	0.37	-0.37	14.37
6,363.00	0.32	151.61	6,201.82	1,252.98	-134.31	1,257.29	0.50	0.18	173.85
6,458.00	0.47	152.33	6,296.82	1,252.40	-134.00	1,256.66	0.16	0.16	0.76
6,552.00	0.66	200.39	6,390.81	1,251.55	-134.01	1,255.83	0.52	0.20	51.13
6,646.00	1.11	212.11	6,484.80	1,250.28	-134.68	1,254.69	0.51	0.48	12.47
6,741.00	1.52	217.10	6,579.78	1,248.49	-135.93	1,253.14	0.45	0.43	5.25
6,835.00	1.51	193.63	6,673.75	1,246.29	-136.98	1,251.16	0.66	-0.01	-24.97
6,929.00	2.08	187.99	6,767.70	1,243.40	-137.51	1,248.40	0.63	0.61	-6.00
7,024.00	1.22	122.10	6,862.67	1,241.16	-136.89	1,246.09	2.04	-0.91	-69.36
7,118.00	1.95	111.26	6,956.63	1,240.04	-134.55	1,244.59	0.84	0.78	-11.53
7,212.00	1.77	107.87	7,050.58	1,239.02	-131.68	1,243.08	0.22	-0.19	-3.61
7,306.00	1.74	102.69	7,144.54	1,238.26	-128.91	1,241.85	0.17	-0.03	-5.51
7,401.00	1.43	121.51	7,239.50	1,237.32	-126.49	1,240.51	0.63	-0.33	19.81
7,496.00	1.81	134.46	7,334.46	1,235.65	-124.41	1,238.50	0.55	0.40	13.63
7,590.00	1.94	144.51	7,428.41	1,233.32	-122.42	1,235.86	0.38	0.14	10.69
7,684.00	1.33	171.62	7,522.37	1,230.94	-121.34	1,233.33	1.03	-0.65	28.84
7,778.00	1.16	174.66	7,616.35	1,228.92	-121.09	1,231.29	0.19	-0.18	3.23
7,873.00	1.06	147.07	7,711.34	1,227.22	-120.53	1,229.52	0.57	-0.11	-29.04
7,967.00	1.61	134.67	7,805.31	1,225.56	-119.11	1,227.65	0.66	0.59	-13.19
8,062.00	1.49	96.27	7,900.28	1,224.49	-116.94	1,226.21	1.08	-0.13	-40.42
8,156.00	1.14	109.63	7,994.25	1,224.04	-114.84	1,225.41	0.49	-0.37	14.21
8,251.00	0.88	150.88	8,089.24	1,223.09	-113.60	1,224.25	0.79	-0.27	43.42
8,345.00	1.21	176.16	8,183.22	1,221.47	-113.18	1,222.58	0.60	0.35	26.89

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Well:	PA 522-26	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)	
8,413.00	1.49	191.55	8,251.21	1,219.88	-113.31	1,221.05	0.67	0.41	22.63	
Last SDI Production MWD Survey										
8,473.00	1.49	191.55	8,311.18	1,218.35	-113.62	1,219.59	0.00	0.00	0.00	
Projection to TD - PBHL(PA 522-26)										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
123.00	123.00	-0.36	0.31	First SDI Gyro MWD Survey	
763.00	757.86	65.82	-10.65	Last SDI Gyro MWD Survey	
835.00	827.71	82.94	-13.80	First SDI Surface MWD Survey	
1,085.00	1,068.99	147.23	-25.93	Last SDI Surface MWD Survey	
1,172.00	1,152.87	170.12	-28.92	First SDI Production MWD Survey	
8,413.00	8,251.21	1,219.88	-113.31	Last SDI Production MWD Survey	
8,473.00	8,311.18	1,218.35	-113.62	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____



Well Details: PA 522-26

TVD Reference: GL 5637' & RKB 24' @ 5661.00usft (H&P 271) and Level: 5637.00
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.00 0.00 1614389.40 2303906.20 39.4943276 -107.9669088 PA 522-26 (B11)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well PA 522-26 - Slot PA 522-26 (B11), True North
 Vertical (TVD) Reference: GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
 Section (VS) Reference: Slot - PA 522-26 (B11)(0.00N, 0.00E)
 Measured Depth Reference: GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
 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

15:13, August 30 2018
 Created By: Mel Mireles Jr.