



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 341-26
County & State	Garfield County, CO
SDI Job No.	OP.007067
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 116 feet to a measured depth of 8,722 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

18-Jan-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 341-26 - Slot PA 341-26 (A8)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5224' & RKB 24' @ 5248.00usft
Site:	PA 22-25 Pad	MD Reference:	GL 5224' & RKB 24' @ 5248.00usft
Well:	PA 341-26	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 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 341-26 - Slot PA 341-26 (A8), A8					
Well Position	+N/-S	0.00 usft	Northing:	1,615,188.76 usft	Latitude:	39.4968839
	+E/-W	0.00 usft	Easting:	2,308,785.27 usft	Longitude:	-107.9497025
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,224.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	1/1/2018	9.40	65.78	51,670

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	307.37	

Survey Program	Date	1/18/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
116.00	1,048.00	Survey #1 - Gyro Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
1,175.00	8,722.00	Survey #2 - Production MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

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	
0.04	0.00	175.17	0.04	0.00	0.00	0.00	0.00	0.00	0.00	
SHL (PA 341-26)										
116.00	1.58	175.17	115.99	-1.59	0.13	-1.07	1.36	1.36	0.00	
First SDI Gyro MWD Survey										
200.00	3.34	177.36	199.90	-5.19	0.34	-3.43	2.10	2.10	2.61	
300.00	2.11	171.56	299.79	-9.92	0.75	-6.62	1.26	-1.23	-5.80	
392.00	0.70	118.65	391.76	-11.87	1.49	-8.39	1.93	-1.53	-57.51	
483.00	1.85	343.04	482.75	-10.73	1.55	-7.74	2.64	1.26	-149.02	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well PA 341-26 - Slot PA 341-26 (A8)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5224' & RKB 24' @ 5248.00usft
Site:	PA 22-25 Pad	MD Reference:	GL 5224' & RKB 24' @ 5248.00usft
Well:	PA 341-26	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)
575.00	4.66	328.36	574.59	-6.13	-0.84	-3.05	3.16	3.05	-15.96
667.00	8.27	322.21	665.99	2.29	-6.86	6.84	3.99	3.92	-6.68
759.00	11.79	311.48	756.58	13.75	-17.96	22.62	4.32	3.83	-11.66
859.00	12.32	298.74	854.39	25.64	-34.97	43.36	2.71	0.53	-12.74
953.00	14.43	294.79	945.84	35.38	-54.40	64.71	2.44	2.24	-4.20
1,048.00	16.45	304.45	1,037.42	47.95	-76.25	89.70	3.44	2.13	10.17
Last SDI Gyro MWD Survey									
1,175.00	19.12	310.35	1,158.35	71.60	-106.93	128.44	2.53	2.10	4.65
First SDI Production MWD Survey									
1,269.00	22.80	315.24	1,246.12	94.51	-131.50	161.87	4.33	3.91	5.20
1,364.00	26.34	314.05	1,332.51	122.24	-159.62	201.05	3.76	3.73	-1.25
1,459.00	29.55	311.66	1,416.42	152.48	-192.28	245.36	3.58	3.38	-2.52
1,553.00	32.82	311.68	1,496.83	184.83	-228.63	293.89	3.48	3.48	0.02
1,648.00	35.45	312.56	1,575.46	220.59	-268.16	347.00	2.82	2.77	0.93
1,742.00	35.25	314.34	1,652.13	257.99	-307.64	401.08	1.12	-0.21	1.89
1,837.00	36.17	313.20	1,729.27	296.34	-347.68	456.18	1.20	0.97	-1.20
1,931.00	37.86	311.58	1,804.32	334.48	-389.48	512.55	2.08	1.80	-1.72
2,026.00	36.49	309.99	1,880.02	371.98	-432.94	569.85	1.76	-1.44	-1.67
2,120.00	36.95	311.08	1,955.36	408.51	-475.65	625.96	0.85	0.49	1.16
2,215.00	36.54	310.08	2,031.49	445.48	-518.81	682.70	0.76	-0.43	-1.05
2,310.00	35.61	308.92	2,108.27	481.06	-561.97	738.60	1.21	-0.98	-1.22
2,404.00	36.24	312.26	2,184.40	516.95	-603.83	793.65	2.19	0.67	3.55
2,499.00	35.86	311.92	2,261.21	554.42	-645.32	849.36	0.45	-0.40	-0.36
2,593.00	35.85	313.70	2,337.40	591.83	-685.70	904.17	1.11	-0.01	1.89
2,687.00	34.54	313.60	2,414.21	629.23	-724.90	958.02	1.39	-1.39	-0.11
2,782.00	35.53	316.12	2,492.00	667.70	-763.54	1,012.08	1.85	1.04	2.65
2,877.00	36.07	316.47	2,569.05	707.88	-801.94	1,066.98	0.61	0.57	0.37
2,971.00	34.70	316.67	2,645.69	747.40	-839.36	1,120.71	1.46	-1.46	0.21
3,066.00	36.12	316.13	2,723.11	787.26	-877.32	1,175.07	1.53	1.49	-0.57
3,160.00	35.92	314.95	2,799.14	826.71	-916.04	1,229.79	0.77	-0.21	-1.26
3,255.00	35.86	313.67	2,876.11	865.62	-955.89	1,285.07	0.79	-0.06	-1.35
3,348.00	36.62	311.54	2,951.12	902.82	-996.35	1,339.81	1.58	0.82	-2.29
3,443.00	35.44	311.22	3,027.94	939.76	-1,038.28	1,395.55	1.26	-1.24	-0.34
3,537.00	35.80	310.19	3,104.36	975.46	-1,079.78	1,450.21	0.74	0.38	-1.10
3,632.00	34.16	309.70	3,182.19	1,010.43	-1,121.53	1,504.61	1.75	-1.73	-0.52
3,727.00	35.70	309.82	3,260.08	1,045.22	-1,163.34	1,558.96	1.62	1.62	0.13
3,821.00	34.84	309.68	3,336.82	1,079.93	-1,205.07	1,613.19	0.92	-0.91	-0.15
3,916.00	35.49	310.27	3,414.48	1,115.08	-1,247.00	1,667.84	0.77	0.68	0.62
4,010.00	34.58	310.79	3,491.45	1,150.15	-1,288.02	1,721.72	1.02	-0.97	0.55
4,105.00	35.39	311.08	3,569.28	1,185.84	-1,329.17	1,776.09	0.87	0.85	0.31
4,199.00	34.51	310.51	3,646.33	1,221.02	-1,369.93	1,829.84	1.00	-0.94	-0.61
4,294.00	36.15	312.05	3,723.83	1,257.27	-1,411.20	1,884.64	1.96	1.73	1.62
4,387.00	36.07	313.01	3,798.97	1,294.32	-1,451.59	1,939.23	0.61	-0.09	1.03
4,481.00	35.35	313.21	3,875.29	1,331.81	-1,491.64	1,993.82	0.78	-0.77	0.21

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well PA 341-26 - Slot PA 341-26 (A8)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5224' & RKB 24' @ 5248.00usft
Site:	PA 22-25 Pad	MD Reference:	GL 5224' & RKB 24' @ 5248.00usft
Well:	PA 341-26	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

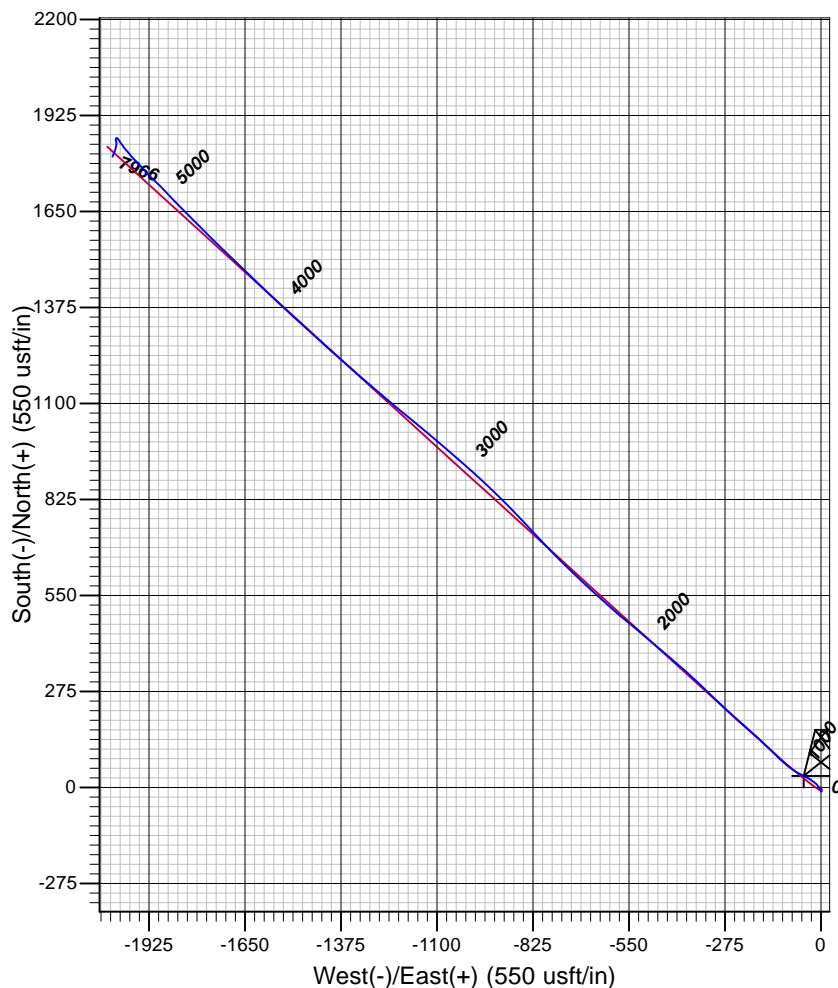
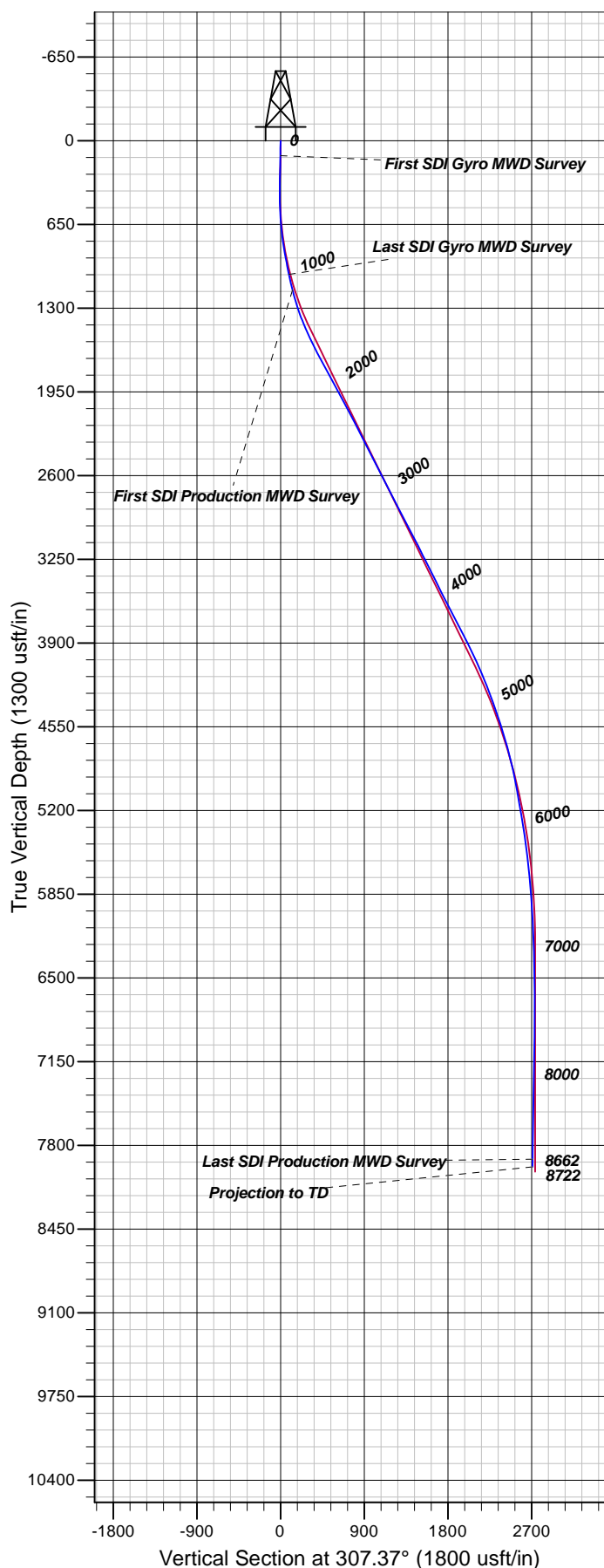
Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,575.00	34.90	311.85	3,952.18	1,368.37	-1,531.49	2,047.68	0.96	-0.48	-1.45
4,668.00	32.55	313.45	4,029.52	1,403.34	-1,569.48	2,099.09	2.70	-2.53	1.72
4,762.00	31.16	313.88	4,109.36	1,437.58	-1,605.37	2,148.40	1.50	-1.48	0.46
4,856.00	29.78	314.11	4,190.38	1,470.69	-1,639.66	2,195.75	1.47	-1.47	0.24
4,950.00	27.89	313.53	4,272.72	1,502.08	-1,672.37	2,240.79	2.03	-2.01	-0.62
5,044.00	26.84	314.20	4,356.20	1,532.02	-1,703.52	2,283.72	1.16	-1.12	0.71
5,139.00	25.42	314.49	4,441.49	1,561.26	-1,733.44	2,325.25	1.50	-1.49	0.31
5,171.09	24.80	314.67	4,470.55	1,570.82	-1,743.14	2,338.76	1.94	-1.93	0.57
PA 341-26 MVRD									
5,233.00	23.61	315.05	4,527.01	1,588.73	-1,761.13	2,363.93	1.94	-1.93	0.61
5,327.00	22.64	314.78	4,613.46	1,614.79	-1,787.28	2,400.52	1.04	-1.03	-0.29
5,420.00	21.69	315.17	4,699.58	1,639.59	-1,812.10	2,435.30	1.03	-1.02	0.42
5,515.00	19.84	315.81	4,788.41	1,663.60	-1,835.71	2,468.64	1.96	-1.95	0.67
5,609.00	17.41	315.70	4,877.48	1,685.11	-1,856.66	2,498.34	2.59	-2.59	-0.12
5,704.00	15.08	316.45	4,968.68	1,704.24	-1,875.10	2,524.61	2.46	-2.45	0.79
5,799.00	13.57	314.93	5,060.72	1,721.07	-1,891.51	2,547.86	1.64	-1.59	-1.60
5,893.00	13.48	313.79	5,152.12	1,736.44	-1,907.22	2,569.68	0.30	-0.10	-1.21
5,987.00	13.98	315.52	5,243.43	1,752.12	-1,923.09	2,591.81	0.69	0.53	1.84
6,082.00	12.62	317.12	5,335.88	1,767.91	-1,938.19	2,613.40	1.48	-1.43	1.68
6,176.00	11.17	317.54	5,427.86	1,782.16	-1,951.33	2,632.48	1.55	-1.54	0.45
6,271.00	9.77	317.13	5,521.28	1,794.85	-1,963.02	2,649.48	1.48	-1.47	-0.43
6,366.00	8.37	319.36	5,615.09	1,806.01	-1,973.01	2,664.19	1.52	-1.47	2.35
6,461.00	7.26	318.89	5,709.20	1,815.78	-1,981.46	2,676.84	1.17	-1.17	-0.49
6,556.00	7.20	319.14	5,803.45	1,824.80	-1,989.30	2,688.55	0.07	-0.06	0.26
6,650.00	6.03	321.11	5,896.82	1,833.10	-1,996.26	2,699.11	1.27	-1.24	2.10
6,745.00	4.70	326.33	5,991.40	1,840.22	-2,001.55	2,707.64	1.49	-1.40	5.49
6,840.00	4.07	325.15	6,086.12	1,846.23	-2,005.63	2,714.53	0.67	-0.66	-1.24
6,935.00	3.19	326.32	6,180.93	1,851.20	-2,009.02	2,720.24	0.93	-0.93	1.23
6,962.37	2.89	325.58	6,208.26	1,852.40	-2,009.84	2,721.62	1.10	-1.09	-2.69
PA 341-26 BTV									
7,029.00	2.17	322.95	6,274.83	1,854.79	-2,011.55	2,724.43	1.10	-1.08	-3.95
7,124.00	1.35	328.09	6,369.78	1,857.18	-2,013.22	2,727.21	0.88	-0.86	5.41
7,219.00	0.97	314.91	6,464.76	1,858.70	-2,014.38	2,729.05	0.49	-0.40	-13.87
7,313.00	1.06	301.90	6,558.75	1,859.72	-2,015.68	2,730.71	0.26	0.10	-13.84
7,408.00	0.71	295.62	6,653.74	1,860.44	-2,016.96	2,732.16	0.38	-0.37	-6.61
7,502.00	0.68	252.91	6,747.73	1,860.52	-2,018.02	2,733.05	0.54	-0.03	-45.44
7,597.00	1.11	210.41	6,842.72	1,859.56	-2,019.02	2,733.27	0.80	0.45	-44.74
7,691.00	1.14	197.05	6,936.70	1,857.89	-2,019.76	2,732.83	0.28	0.03	-14.21
7,785.00	1.39	177.94	7,030.68	1,855.85	-2,019.99	2,731.78	0.52	0.27	-20.33
7,880.00	1.64	171.19	7,125.65	1,853.36	-2,019.74	2,730.07	0.32	0.26	-7.11
7,974.00	1.76	159.25	7,219.61	1,850.68	-2,019.02	2,727.88	0.40	0.13	-12.70
8,067.00	2.34	175.50	7,312.55	1,847.45	-2,018.37	2,725.40	0.88	0.62	17.47
8,161.00	2.97	181.60	7,406.44	1,843.10	-2,018.29	2,722.69	0.73	0.67	6.49

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well PA 341-26 - Slot PA 341-26 (A8)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5224' & RKB 24' @ 5248.00usft
Site:	PA 22-25 Pad	MD Reference:	GL 5224' & RKB 24' @ 5248.00usft
Well:	PA 341-26	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)	
8,254.00	3.34	188.87	7,499.30	1,838.02	-2,018.77	2,719.99	0.59	0.40	7.82	
8,348.00	3.78	194.76	7,593.12	1,832.32	-2,019.98	2,717.49	0.61	0.47	6.27	
8,442.00	3.96	198.01	7,686.91	1,826.23	-2,021.78	2,715.22	0.30	0.19	3.46	
8,536.00	4.22	201.27	7,780.67	1,819.92	-2,024.03	2,713.19	0.37	0.28	3.47	
8,631.00	4.25	202.16	7,875.41	1,813.41	-2,026.63	2,711.30	0.08	0.03	0.94	
8,662.00	4.57	199.95	7,906.32	1,811.18	-2,027.49	2,710.63	1.17	1.03	-7.13	
Last SDI Production MWD Survey										
8,722.00	4.57	199.95	7,966.13	1,806.69	-2,029.12	2,709.19	0.00	0.00	0.00	
Projection to TD - PA 341-26 PBHL - PBHL (PA 341-26)										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
116.00	115.99	-1.59	0.13	First SDI Gyro MWD Survey	
1,048.00	1,037.42	47.95	-76.25	Last SDI Gyro MWD Survey	
1,175.00	1,158.35	71.60	-106.93	First SDI Production MWD Survey	
8,662.00	7,906.32	1,811.18	-2,027.49	Last SDI Production MWD Survey	
8,722.00	7,966.13	1,806.69	-2,029.12	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____



Well Details: PA 341-26

TVD Reference: GL 5224' & RKB 24' @ 5248.00usft		Ground Level: 5224.00		Slot	
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1615188.76	2308785.27	39.4968838	-107.9497024

PA 341-26 (A8)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well PA 341-26 - Slot PA 341-26 (A8), True North
 Vertical (TVD) Reference: GL 5224' & RKB 24' @ 5248.00usft
 Section (VS) Reference: Slot - PA 341-26 (A8) (0.00N, 0.00E)
 Measured Depth Reference: GL 5224' & RKB 24' @ 5248.00usft
 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

18:35, January 18 2018
 Created By: Mel Mireles Jr.