



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 411-26
County & State	Garfield County, CO
SDI Job No.	OP.011018
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 154 feet to a measured depth of 9,195 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

05-Jul-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 411-26 - Slot PA 411-26 (A7)
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 411-26	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 411-26 - Slot PA 411-26 (A7), A7					
Well Position	+N/-S	0.00 usft	Northing:	1,614,399.70 usft	Latitude:	39.4943581
	+E/-W	0.00 usft	Easting:	2,303,936.10 usft	Longitude:	-107.9668039
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	6/17/2018	9.37	65.75	51,617

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	283.33	

Survey Program	Date	7/5/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
154.00	581.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
653.00	1,045.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,172.00	9,195.00	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	
154.00	0.70	298.21	154.00	0.44	-0.83	0.91	0.45	0.45	0.00	
First SDI Gyro MWD Survey										
215.00	1.67	275.45	214.98	0.71	-2.04	2.15	1.74	1.59	-37.31	
306.00	3.52	269.12	305.89	0.79	-6.16	6.17	2.05	2.03	-6.96	
398.00	5.19	284.41	397.62	1.78	-13.01	13.07	2.20	1.82	16.62	
490.00	7.30	295.05	489.07	5.29	-22.34	22.96	2.61	2.29	11.57	
581.00	9.68	297.69	579.07	11.30	-34.35	36.03	2.65	2.62	2.90	

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Site:	PA 23-26 Pad	MD Reference:	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
Well:	PA 411-26	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)
Last SDI Gyro MWD Survey									
653.00	11.22	306.73	649.88	18.30	-45.33	48.32	3.12	2.14	12.56
First SDI Surface MWD Survey									
745.00	13.54	312.07	739.73	30.87	-60.50	65.98	2.81	2.52	5.80
836.00	16.80	316.14	827.55	47.49	-77.52	86.38	3.77	3.58	4.47
931.00	18.65	320.82	918.04	69.17	-96.63	109.98	2.46	1.95	4.93
1,025.00	20.94	324.42	1,006.49	94.49	-115.91	134.56	2.76	2.44	3.83
1,045.00	21.46	323.93	1,025.13	100.35	-120.14	140.04	2.75	2.60	-2.45
Last SDI Surface MWD Survey									
1,172.00	23.04	324.28	1,142.67	139.31	-148.33	176.45	1.25	1.24	0.28
First SDI Production MWD Survey									
1,266.00	24.38	325.75	1,228.74	170.28	-169.99	204.66	1.56	1.43	1.56
1,361.00	25.91	326.66	1,314.73	203.83	-192.43	234.23	1.66	1.61	0.96
1,455.00	28.67	329.47	1,398.27	240.42	-215.18	264.80	3.24	2.94	2.99
1,549.00	31.76	330.92	1,479.49	281.47	-238.66	297.12	3.38	3.29	1.54
1,644.00	33.38	329.19	1,559.55	325.77	-264.20	332.18	1.97	1.71	-1.82
1,738.00	33.93	326.32	1,637.80	369.82	-292.00	369.38	1.79	0.59	-3.05
1,833.00	34.50	324.94	1,716.36	413.90	-322.16	408.89	1.01	0.60	-1.45
1,927.00	32.84	322.89	1,794.59	456.02	-352.83	448.45	2.14	-1.77	-2.18
2,021.00	33.70	324.63	1,873.18	497.62	-383.31	487.69	1.37	0.91	1.85
2,116.00	33.90	324.95	1,952.12	540.80	-413.78	527.29	0.28	0.21	0.34
2,210.00	32.63	327.06	2,030.72	583.53	-442.61	565.20	1.83	-1.35	2.24
2,304.00	33.37	328.72	2,109.56	626.89	-469.82	601.67	1.24	0.79	1.77
2,399.00	34.19	328.29	2,188.52	671.93	-497.41	638.90	0.90	0.86	-0.45
2,493.00	33.64	328.59	2,266.53	716.62	-524.87	675.92	0.61	-0.59	0.32
2,588.00	34.21	327.33	2,345.36	761.56	-553.00	713.65	0.95	0.60	-1.33
2,681.00	34.43	324.40	2,422.17	804.95	-582.41	752.28	1.79	0.24	-3.15
2,776.00	34.13	323.99	2,500.67	848.34	-613.72	792.74	0.40	-0.32	-0.43
2,870.00	33.48	323.31	2,578.78	890.47	-644.71	832.61	0.80	-0.69	-0.72
2,965.00	33.94	323.55	2,657.80	932.81	-676.12	872.94	0.50	0.48	0.25
3,059.00	32.83	323.40	2,736.29	974.38	-706.91	912.47	1.18	-1.18	-0.16
3,153.00	33.45	323.60	2,815.00	1,015.68	-737.47	951.74	0.67	0.66	0.21
3,248.00	33.46	324.23	2,894.26	1,058.01	-768.32	991.51	0.37	0.01	0.66
3,342.00	33.74	325.06	2,972.55	1,100.43	-798.42	1,030.58	0.57	0.30	0.88
3,436.00	31.93	324.08	3,051.53	1,141.97	-827.96	1,068.89	2.01	-1.93	-1.04
3,531.00	32.80	323.52	3,131.78	1,183.00	-857.99	1,107.58	0.97	0.92	-0.59
3,625.00	31.11	323.18	3,211.53	1,222.92	-887.69	1,145.67	1.81	-1.80	-0.36
3,720.00	31.18	324.30	3,292.84	1,262.54	-916.74	1,183.08	0.61	0.07	1.18
3,814.00	31.90	326.80	3,372.95	1,303.08	-944.54	1,219.48	1.59	0.77	2.66
3,909.00	32.68	325.70	3,453.26	1,345.27	-972.74	1,256.64	1.03	0.82	-1.16
4,003.00	32.89	325.92	3,532.29	1,387.38	-1,001.35	1,294.18	0.26	0.22	0.23
4,097.00	33.67	328.43	3,610.88	1,430.72	-1,029.29	1,331.36	1.68	0.83	2.67
4,192.00	34.80	327.82	3,689.41	1,476.10	-1,057.52	1,369.29	1.24	1.19	-0.64
4,286.00	34.84	327.98	3,766.58	1,521.57	-1,086.04	1,407.52	0.11	0.04	0.17

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Well:	PA 411-26	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

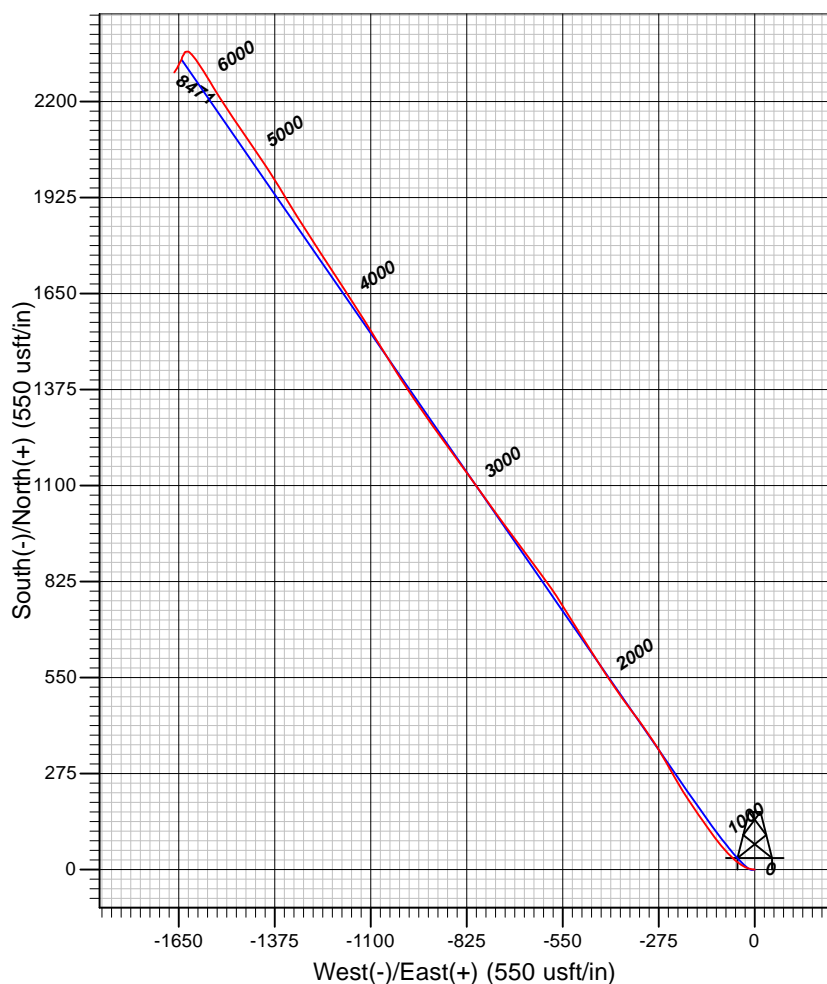
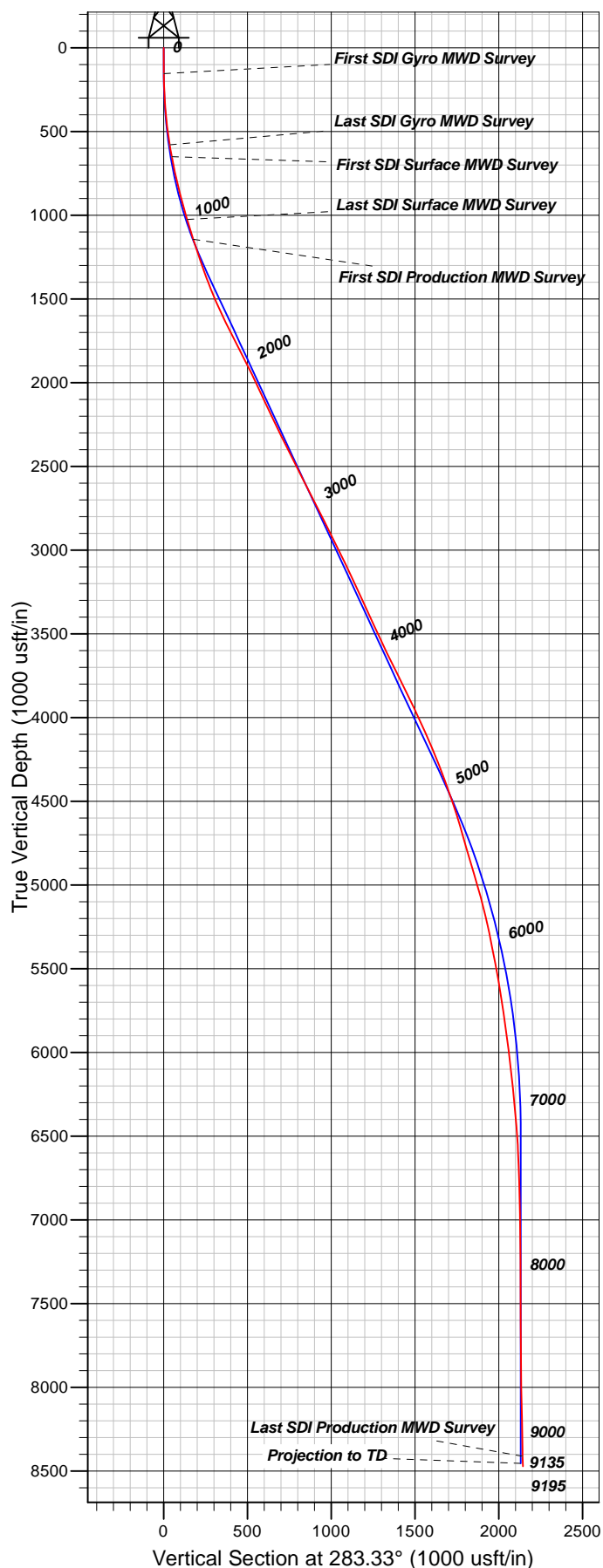
Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,380.00	34.66	327.90	3,843.82	1,566.98	-1,114.48	1,445.67	0.20	-0.19	-0.09
4,474.00	33.86	327.20	3,921.51	1,611.63	-1,142.87	1,483.58	0.95	-0.85	-0.74
4,569.00	32.71	327.43	4,000.92	1,655.51	-1,171.02	1,521.10	1.22	-1.21	0.24
4,663.00	31.93	326.15	4,080.36	1,697.56	-1,198.54	1,557.57	1.10	-0.83	-1.36
4,757.00	30.63	327.35	4,160.70	1,738.37	-1,225.31	1,593.02	1.53	-1.38	1.28
4,852.00	28.93	327.00	4,243.15	1,778.02	-1,250.88	1,627.04	1.80	-1.79	-0.37
4,946.00	27.26	327.01	4,326.07	1,815.15	-1,274.99	1,659.06	1.78	-1.78	0.01
5,040.00	27.19	327.65	4,409.65	1,851.35	-1,298.20	1,689.99	0.32	-0.07	0.68
5,134.00	25.15	327.89	4,494.01	1,886.41	-1,320.31	1,719.59	2.17	-2.17	0.26
5,229.00	24.94	328.87	4,580.08	1,920.66	-1,341.40	1,748.00	0.49	-0.22	1.03
5,323.00	21.81	328.59	4,666.36	1,952.53	-1,360.75	1,774.18	3.33	-3.33	-0.30
5,417.00	21.87	328.35	4,753.61	1,982.34	-1,379.04	1,798.84	0.11	0.06	-0.26
5,512.00	22.57	326.34	4,841.56	2,012.58	-1,398.43	1,824.68	1.09	0.74	-2.12
5,606.00	21.65	325.40	4,928.64	2,041.87	-1,418.27	1,850.74	1.05	-0.98	-1.00
5,700.00	21.37	326.10	5,016.10	2,070.35	-1,437.67	1,876.19	0.40	-0.30	0.74
5,795.00	18.98	325.67	5,105.26	2,097.48	-1,456.04	1,900.31	2.52	-2.52	-0.45
5,890.00	17.67	325.01	5,195.44	2,122.05	-1,473.02	1,922.50	1.40	-1.38	-0.69
5,984.00	15.83	326.76	5,285.45	2,144.47	-1,488.23	1,942.47	2.03	-1.96	1.86
6,079.00	15.39	326.54	5,376.94	2,165.82	-1,502.28	1,961.06	0.47	-0.46	-0.23
6,173.00	14.41	325.47	5,467.78	2,185.86	-1,515.79	1,978.83	1.08	-1.04	-1.14
6,267.00	13.78	326.79	5,558.95	2,204.86	-1,528.55	1,995.63	0.75	-0.67	1.40
6,361.00	13.12	328.96	5,650.37	2,223.37	-1,540.19	2,011.21	0.88	-0.70	2.31
6,455.00	11.94	329.65	5,742.13	2,240.90	-1,550.60	2,025.39	1.27	-1.26	0.73
6,550.00	11.32	329.08	5,835.18	2,257.38	-1,560.36	2,038.68	0.66	-0.65	-0.60
6,645.00	9.92	329.43	5,928.55	2,272.43	-1,569.31	2,050.86	1.48	-1.47	0.37
6,739.00	9.29	326.87	6,021.24	2,285.75	-1,577.58	2,061.97	0.81	-0.67	-2.72
6,833.00	8.76	325.98	6,114.07	2,298.04	-1,585.73	2,072.74	0.58	-0.56	-0.95
6,928.00	8.11	324.86	6,208.04	2,309.52	-1,593.63	2,083.07	0.71	-0.68	-1.18
7,022.00	7.77	326.13	6,301.14	2,320.21	-1,600.99	2,092.70	0.41	-0.36	1.35
7,116.00	6.69	319.85	6,394.40	2,329.68	-1,608.06	2,101.76	1.42	-1.15	-6.68
7,210.00	4.73	316.64	6,487.92	2,336.68	-1,614.25	2,109.40	2.11	-2.09	-3.41
7,304.00	2.54	314.46	6,581.73	2,340.96	-1,618.40	2,114.42	2.33	-2.33	-2.32
7,399.00	2.20	290.45	6,676.65	2,343.07	-1,621.61	2,118.04	1.09	-0.36	-25.27
7,493.00	2.55	262.41	6,770.57	2,343.42	-1,625.38	2,121.78	1.28	0.37	-29.83
7,587.00	1.85	257.22	6,864.50	2,342.81	-1,628.93	2,125.09	0.77	-0.74	-5.52
7,682.00	0.97	242.28	6,959.47	2,342.10	-1,631.14	2,127.08	1.00	-0.93	-15.73
7,776.00	0.28	225.80	7,053.47	2,341.57	-1,632.00	2,127.80	0.75	-0.73	-17.53
7,870.00	0.53	211.66	7,147.47	2,341.04	-1,632.40	2,128.06	0.28	0.27	-15.04
7,965.00	0.93	219.68	7,242.46	2,340.07	-1,633.12	2,128.54	0.43	0.42	8.44
8,059.00	1.29	187.07	7,336.44	2,338.43	-1,633.74	2,128.77	0.76	0.38	-34.69
8,154.00	1.49	213.21	7,431.41	2,336.34	-1,634.55	2,129.07	0.69	0.21	27.52
8,248.00	2.22	217.21	7,525.36	2,333.87	-1,636.32	2,130.22	0.79	0.78	4.26
8,342.00	2.54	206.07	7,619.28	2,330.54	-1,638.33	2,131.42	0.60	0.34	-11.85

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey										
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8,437.00	2.59	194.90	7,714.19	2,326.58	-1,639.81	2,131.94	0.53	0.05	-11.76	
8,531.00	3.22	200.65	7,808.07	2,322.06	-1,641.29	2,132.34	0.74	0.67	6.12	
8,626.00	3.47	206.80	7,902.91	2,316.99	-1,643.52	2,133.35	0.46	0.26	6.47	
8,720.00	3.70	209.62	7,996.72	2,311.82	-1,646.31	2,134.86	0.31	0.24	3.00	
8,814.00	3.62	206.27	8,090.53	2,306.52	-1,649.12	2,136.38	0.24	-0.09	-3.56	
8,909.00	3.96	207.55	8,185.32	2,300.92	-1,651.96	2,137.85	0.37	0.36	1.35	
9,003.00	3.97	208.45	8,279.10	2,295.18	-1,655.01	2,139.50	0.07	0.01	0.96	
9,098.00	3.87	214.16	8,373.88	2,289.64	-1,658.38	2,141.50	0.42	-0.11	6.01	
9,135.00	4.31	212.93	8,410.78	2,287.44	-1,659.84	2,142.41	1.21	1.19	-3.32	
Last SDI Production MWD Survey										
9,175.34	4.31	212.93	8,451.00	2,284.90	-1,661.49	2,143.43	0.00	0.00	0.00	
PBHL(PA 411-26)										
9,195.00	4.31	212.93	8,470.61	2,283.65	-1,662.29	2,143.92	0.00	0.00	0.00	
Projection to TD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
154.00	154.00	0.44	-0.83	First SDI Gyro MWD Survey	
581.00	579.07	11.30	-34.35	Last SDI Gyro MWD Survey	
653.00	649.88	18.30	-45.33	First SDI Surface MWD Survey	
1,045.00	1,025.13	100.35	-120.14	Last SDI Surface MWD Survey	
1,172.00	1,142.67	139.31	-148.33	First SDI Production MWD Survey	
9,135.00	8,410.78	2,287.44	-1,659.84	Last SDI Production MWD Survey	
9,195.00	8,470.61	2,283.65	-1,662.29	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____



Well Details: PA 411-26

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 1614399.70 2303936.10 39.4943581 -107.9668038 PA 411-26 (A7)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well PA 411-26 - Slot PA 411-26 (A7), True North
 Vertical (TVD) Reference: GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
 Section (VS) Reference: Slot - PA 411-26 (A7)(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

10:52, July 05 2018
 Created By: Mel Mireles Jr.