



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 311-26
County & State	Garfield County, CO
SDI Job No.	OP.012567
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 9,396 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

04-Sep-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 311-26 - Slot PA 311-26 (B13)
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 311-26	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 311-26 - Slot PA 311-26 (B13), B13					
Well Position	+N/-S	0.00 usft	Northing:	1,614,389.10 usft	Latitude:	39.4943257
	+E/-W	0.00 usft	Easting:	2,303,890.60 usft	Longitude:	-107.9669640
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	8/24/2018	9.35	65.75	51,595

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	327.46	

Survey Program	Date	9/4/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
123.00	855.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
929.00	1,077.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,172.00	9,396.00	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	0.97	9.23	122.99	1.03	0.17	0.78	0.79	0.79	0.00	
First SDI Gyro MWD Survey										
214.00	2.64	1.58	213.95	3.88	0.35	3.09	1.85	1.84	-8.41	
306.00	4.75	336.88	305.75	9.51	-1.09	8.60	2.82	2.29	-26.85	
398.00	7.30	327.74	397.24	17.95	-5.71	18.20	2.95	2.77	-9.93	
490.00	10.47	322.12	488.13	29.50	-13.96	32.37	3.57	3.45	-6.11	
581.00	13.28	329.24	577.18	45.01	-24.39	51.06	3.48	3.09	7.82	
673.00	16.72	329.59	666.03	65.51	-36.49	74.85	3.74	3.74	0.38	

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Site:	PA 23-26 Pad	MD Reference:	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
Well:	PA 311-26	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	20.23	333.54	751.38	90.61	-49.98	103.27	4.14	3.90	4.39
855.00	23.58	334.60	836.73	121.48	-64.97	137.36	3.67	3.64	1.15
Last SDI Gyro MWD Survey									
929.00	26.76	332.08	903.69	149.58	-79.12	168.66	4.53	4.30	-3.41
First SDI Surface MWD Survey									
1,024.00	29.55	326.37	987.46	188.00	-102.12	213.41	4.08	2.94	-6.01
1,077.00	30.25	323.91	1,033.41	209.67	-117.22	239.81	2.66	1.32	-4.64
Last SDI Surface MWD Survey									
1,172.00	32.35	321.43	1,114.58	248.89	-147.17	288.97	2.59	2.21	-2.61
First SDI Production MWD Survey									
1,267.00	33.60	323.89	1,194.28	290.00	-178.51	340.49	1.93	1.32	2.59
1,361.00	34.57	327.97	1,272.14	333.63	-207.99	393.12	2.64	1.03	4.34
1,456.00	35.77	328.79	1,349.79	380.22	-236.67	447.84	1.36	1.26	0.86
1,549.00	34.80	327.68	1,425.71	425.90	-264.94	501.55	1.25	-1.04	-1.19
1,644.00	35.18	330.12	1,503.54	472.54	-293.07	556.00	1.53	0.40	2.57
1,738.00	35.01	329.52	1,580.45	519.26	-320.24	610.00	0.41	-0.18	-0.64
1,832.00	34.65	329.28	1,657.61	565.47	-347.57	663.65	0.41	-0.38	-0.26
1,926.00	33.58	328.48	1,735.43	610.60	-374.81	716.35	1.23	-1.14	-0.85
2,021.00	34.37	330.24	1,814.22	656.28	-401.86	769.41	1.33	0.83	1.85
2,115.00	33.21	329.74	1,892.34	701.55	-428.00	821.63	1.27	-1.23	-0.53
2,210.00	34.86	328.81	1,971.06	747.25	-455.17	874.78	1.82	1.74	-0.98
2,304.00	33.32	327.90	2,048.91	792.11	-482.81	927.45	1.73	-1.64	-0.97
2,399.00	31.71	326.96	2,129.01	835.14	-510.29	978.51	1.78	-1.69	-0.99
2,493.00	32.43	327.70	2,208.67	877.16	-537.22	1,028.42	0.87	0.77	0.79
2,587.00	33.82	328.21	2,287.39	920.70	-564.47	1,079.79	1.51	1.48	0.54
2,682.00	31.96	328.02	2,367.16	964.50	-591.72	1,131.37	1.96	-1.96	-0.20
2,776.00	32.71	325.67	2,446.59	1,006.58	-619.22	1,181.63	1.56	0.80	-2.50
2,870.00	34.45	325.59	2,524.90	1,049.49	-648.57	1,233.60	1.85	1.85	-0.09
2,965.00	33.66	325.47	2,603.60	1,093.35	-678.68	1,286.77	0.83	-0.83	-0.13
3,059.00	35.26	325.67	2,681.11	1,137.22	-708.75	1,339.92	1.71	1.70	0.21
3,154.00	33.53	324.73	2,759.49	1,181.29	-739.37	1,393.54	1.90	-1.82	-0.99
3,248.00	34.67	326.00	2,837.33	1,224.65	-769.31	1,446.21	1.43	1.21	1.35
3,342.00	33.24	325.87	2,915.30	1,268.15	-798.72	1,498.69	1.52	-1.52	-0.14
3,436.00	35.13	326.86	2,993.06	1,312.12	-827.96	1,551.49	2.10	2.01	1.05
3,531.00	33.05	325.90	3,071.73	1,356.47	-857.43	1,604.72	2.26	-2.19	-1.01
3,625.00	33.57	326.87	3,150.29	1,399.46	-886.01	1,656.34	0.79	0.55	1.03
3,720.00	34.32	327.00	3,229.09	1,443.91	-914.95	1,709.38	0.79	0.79	0.14
3,814.00	33.20	326.21	3,307.24	1,487.53	-943.69	1,761.61	1.28	-1.19	-0.84
3,909.00	35.12	327.94	3,385.85	1,532.31	-972.67	1,814.94	2.26	2.02	1.82
4,003.00	33.84	326.45	3,463.34	1,577.04	-1,001.49	1,868.15	1.63	-1.36	-1.59
4,098.00	34.06	328.22	3,542.14	1,621.70	-1,030.12	1,921.20	1.07	0.23	1.86
4,192.00	34.43	328.33	3,619.85	1,666.69	-1,057.93	1,974.10	0.40	0.39	0.12
4,286.00	35.16	327.55	3,697.04	1,712.15	-1,086.41	2,027.73	0.91	0.78	-0.83
4,381.00	33.82	327.55	3,775.34	1,757.54	-1,115.27	2,081.53	1.41	-1.41	0.00

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Site:	PA 23-26 Pad	MD Reference:	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
Well:	PA 311-26	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

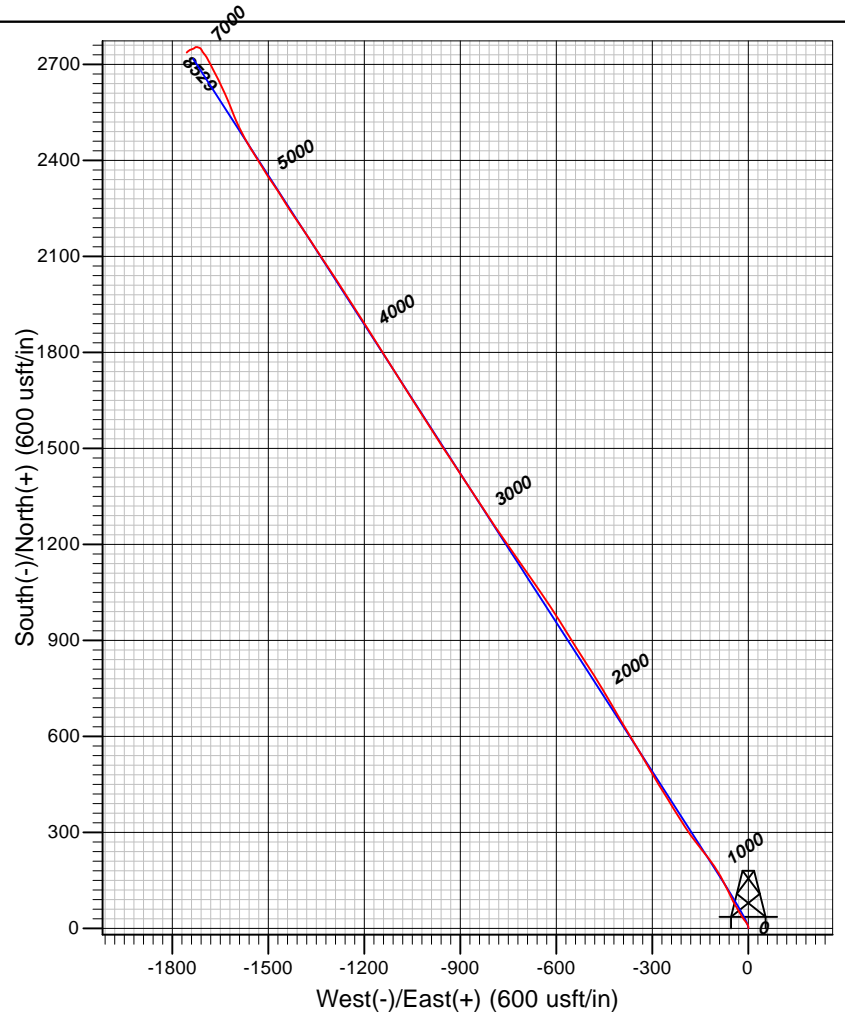
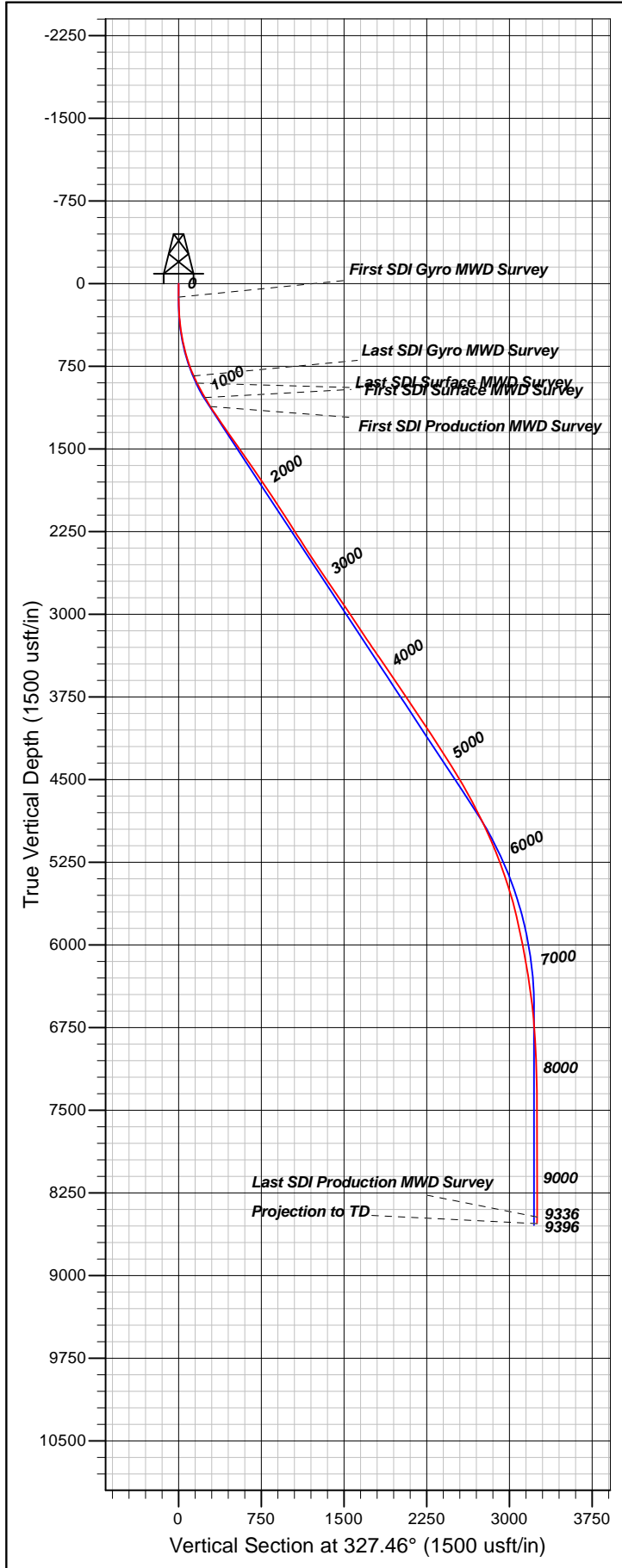
Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,475.00	34.22	327.83	3,853.25	1,801.99	-1,143.38	2,134.12	0.46	0.43	0.30
4,570.00	33.17	327.63	3,932.29	1,846.55	-1,171.52	2,186.82	1.11	-1.11	-0.21
4,664.00	33.62	327.62	4,010.77	1,890.25	-1,199.22	2,238.56	0.48	0.48	-0.01
4,759.00	33.41	327.16	4,089.98	1,934.43	-1,227.49	2,291.01	0.35	-0.22	-0.48
4,853.00	32.42	326.94	4,168.89	1,977.30	-1,255.27	2,342.09	1.06	-1.05	-0.23
4,947.00	32.56	326.53	4,248.17	2,019.52	-1,282.97	2,392.58	0.28	0.15	-0.44
5,041.00	31.93	327.30	4,327.68	2,061.53	-1,310.35	2,442.73	0.80	-0.67	0.82
5,136.00	31.48	326.61	4,408.50	2,103.39	-1,337.57	2,492.65	0.61	-0.47	-0.73
5,230.00	31.82	326.38	4,488.52	2,144.51	-1,364.80	2,541.97	0.38	0.36	-0.24
5,325.00	30.13	326.29	4,569.97	2,185.21	-1,391.90	2,590.85	1.78	-1.78	-0.09
5,419.00	27.89	325.83	4,652.17	2,223.03	-1,417.34	2,636.42	2.39	-2.38	-0.49
5,513.00	27.88	327.41	4,735.25	2,259.74	-1,441.53	2,680.37	0.79	-0.01	1.68
5,607.00	26.99	327.80	4,818.68	2,296.30	-1,464.73	2,723.68	0.97	-0.95	0.41
5,702.00	25.18	325.42	4,904.00	2,331.19	-1,487.69	2,765.44	2.20	-1.91	-2.51
5,796.00	25.55	327.87	4,988.94	2,364.82	-1,509.82	2,805.70	1.18	0.39	2.61
5,891.00	22.86	327.84	5,075.59	2,397.80	-1,530.55	2,844.64	2.83	-2.83	-0.03
5,985.00	21.29	329.40	5,162.69	2,427.94	-1,548.95	2,879.96	1.78	-1.67	1.66
6,080.00	20.14	328.91	5,251.55	2,456.80	-1,566.18	2,913.55	1.22	-1.21	-0.52
6,174.00	19.95	333.67	5,339.86	2,485.03	-1,581.65	2,945.67	1.75	-0.20	5.06
6,268.00	18.37	335.34	5,428.65	2,512.86	-1,594.94	2,976.29	1.78	-1.68	1.78
6,363.00	17.33	338.38	5,519.08	2,539.62	-1,606.40	3,005.01	1.47	-1.09	3.20
6,457.00	15.86	337.42	5,609.16	2,564.50	-1,616.49	3,031.41	1.59	-1.56	-1.02
6,551.00	14.01	336.91	5,699.98	2,586.83	-1,625.89	3,055.28	1.97	-1.97	-0.54
6,645.00	12.36	336.36	5,791.50	2,606.51	-1,634.39	3,076.45	1.76	-1.76	-0.59
6,740.00	12.44	334.06	5,884.29	2,625.03	-1,642.94	3,096.66	0.53	0.08	-2.42
6,834.00	11.02	334.95	5,976.32	2,642.27	-1,651.17	3,115.62	1.52	-1.51	0.95
6,929.00	10.82	333.07	6,069.60	2,658.45	-1,659.05	3,133.50	0.43	-0.21	-1.98
7,023.00	9.63	332.60	6,162.11	2,673.30	-1,666.67	3,150.11	1.27	-1.27	-0.50
7,118.00	9.45	333.63	6,255.79	2,687.34	-1,673.79	3,165.78	0.26	-0.19	1.08
7,212.00	8.93	330.93	6,348.59	2,700.63	-1,680.76	3,180.73	0.72	-0.55	-2.87
7,307.00	7.81	332.39	6,442.57	2,712.79	-1,687.34	3,194.52	1.20	-1.18	1.54
7,401.00	6.49	327.40	6,535.84	2,722.93	-1,693.16	3,206.20	1.55	-1.40	-5.31
7,437.29	6.17	325.91	6,571.90	2,726.27	-1,695.36	3,210.20	0.99	-0.88	-4.09
BTV (PA 311-26)									
7,496.00	5.66	323.16	6,630.31	2,731.20	-1,698.86	3,216.24	0.99	-0.87	-4.69
7,590.00	4.36	325.76	6,723.95	2,737.87	-1,703.65	3,224.44	1.40	-1.38	2.77
7,684.00	3.34	328.83	6,817.73	2,743.16	-1,707.08	3,230.74	1.11	-1.09	3.27
7,779.00	2.87	322.43	6,912.59	2,747.42	-1,709.96	3,235.88	0.61	-0.49	-6.74
7,873.00	3.19	312.77	7,006.46	2,751.06	-1,713.32	3,240.75	0.64	0.34	-10.28
7,967.00	2.59	284.23	7,100.35	2,753.35	-1,717.29	3,244.83	1.64	-0.64	-30.36
8,062.00	2.57	283.97	7,195.25	2,754.40	-1,721.44	3,247.94	0.02	-0.02	-0.27
8,156.00	1.64	254.57	7,289.19	2,754.55	-1,724.78	3,249.87	1.49	-0.99	-31.28
8,250.00	0.57	265.53	7,383.17	2,754.15	-1,726.55	3,250.48	1.16	-1.14	11.66

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Well:	PA 311-26	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)
8,344.00	0.86	242.86	7,477.16	2,753.79	-1,727.64	3,250.77	0.43	0.31	-24.12
8,439.00	1.15	224.41	7,572.15	2,752.79	-1,728.94	3,250.62	0.45	0.31	-19.42
8,534.00	1.58	237.14	7,667.12	2,751.40	-1,730.71	3,250.40	0.55	0.45	13.40
8,628.00	1.85	238.57	7,761.08	2,749.90	-1,733.09	3,250.42	0.29	0.29	1.52
8,722.00	2.37	251.84	7,855.02	2,748.51	-1,736.23	3,250.93	0.76	0.55	14.12
8,816.00	2.69	252.78	7,948.92	2,747.25	-1,740.19	3,252.00	0.34	0.34	1.00
8,911.00	1.52	251.72	8,043.86	2,746.19	-1,743.51	3,252.90	1.23	-1.23	-1.12
9,005.00	0.91	236.59	8,137.84	2,745.39	-1,745.32	3,253.19	0.73	-0.65	-16.10
9,100.00	1.45	236.62	8,232.82	2,744.31	-1,746.95	3,253.17	0.57	0.57	0.03
9,194.00	1.75	231.03	8,326.78	2,742.76	-1,749.06	3,252.99	0.36	0.32	-5.95
9,288.00	2.20	229.34	8,420.72	2,740.68	-1,751.55	3,252.57	0.48	0.48	-1.80
9,336.00	2.46	227.85	8,468.68	2,739.39	-1,753.01	3,252.27	0.56	0.54	-3.10
Last SDI Production MWD Survey									
9,396.00	2.46	227.85	8,528.63	2,737.66	-1,754.92	3,251.84	0.00	0.00	0.00
Projection to TD - PBHL (PA 311-26)									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
123.00	122.99	1.03	0.17	First SDI Gyro MWD Survey
855.00	836.73	121.48	-64.97	Last SDI Gyro MWD Survey
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9,336.00	8,468.68	2,739.39	-1,753.01	Last SDI Production MWD Survey
9,396.00	8,528.63	2,737.66	-1,754.92	Projection to TD

Checked By: _____ Approved By: _____ Date: _____



Well Details: PA 311-26

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 1614389.10 2303890.60 39.4943256 -107.9669640 PA 311-26 (B13)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well PA 311-26 - Slot PA 311-26 (B13), True North
 Vertical (TVD) Reference: GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
 Section (VS) Reference: Slot - PA 311-26 (B13) (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

14:02, September 04 2018
 Created By: Mel Mireles Jr.