



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.	RU 312-17
County & State	Garfield County, CO
SDI Job No.	OP.008417
Rig	H&P 318

I, Mel Mireles Jr., having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 120 feet to a measured depth of 10,872 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

14-Mar-18

Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well RU 312-17 - Slot RU 312-17 (A1)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318)
Site:	RU 23-17 Pad	MD Reference:	GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318)
Well:	RU 312-17	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		RU 23-17 Pad			
Site Position:		Northing:	1,594,634.40 usft	Latitude:	39.4435163
From:	Map	Easting:	2,351,232.80 usft	Longitude:	-107.7974906
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.45 °

Well	RU 312-17 - Slot RU 312-17 (A1)					
Well Position	+N/-S	0.00 usft	Northing:	1,594,652.10 usft	Latitude:	39.4435640
	+E/-W	0.00 usft	Easting:	2,351,218.90 usft	Longitude:	-107.7975414
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	8,368.60 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	2/25/2018	9.20	65.58	51,588

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	305.27	

Survey Program	Date	3/14/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
120.00	211.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4
291.00	1,088.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1
1,247.00	10,872.00	Survey #3 - 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
120.00	0.26	31.46	120.00	0.23	0.14	0.02	0.22	0.22	0.00
First SDI Gyro MWD Survey									
211.00	2.99	306.74	210.96	1.83	-1.65	2.40	3.27	3.00	-93.10
Last SDI Gyro MWD Survey									
291.00	5.29	309.53	290.74	5.42	-6.17	8.17	2.89	2.88	3.49
First SDI Surface MWD Survey									
383.00	7.56	302.71	382.16	11.39	-14.53	18.45	2.60	2.47	-7.41

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Site:	RU 23-17 Pad	MD Reference:	GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318)
Well:	RU 312-17	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)
476.00	10.64	300.29	473.98	19.03	-27.10	33.11	3.34	3.31	-2.60
568.00	12.86	303.47	564.05	28.96	-42.97	51.81	2.51	2.41	3.46
660.00	16.42	305.22	653.05	42.11	-62.14	75.06	3.90	3.87	1.90
755.00	20.35	305.64	743.18	59.49	-86.55	105.01	4.14	4.14	0.44
849.00	22.57	306.31	830.66	79.70	-114.37	139.40	2.38	2.36	0.71
943.00	24.16	304.14	916.95	101.18	-144.83	176.67	1.92	1.69	-2.31
1,038.00	26.23	303.98	1,002.91	123.82	-178.33	217.10	2.18	2.18	-0.17
1,088.00	27.35	303.63	1,047.54	136.36	-197.06	239.63	2.26	2.24	-0.70
Last SDI Surface MWD Survey									
1,247.00	28.00	301.97	1,188.35	176.35	-259.14	313.40	0.63	0.41	-1.04
First SDI Production MWD Survey									
1,342.00	26.47	300.91	1,272.82	199.04	-296.22	356.78	1.69	-1.61	-1.12
1,436.00	25.59	299.79	1,357.28	219.88	-331.81	397.87	1.07	-0.94	-1.19
1,531.00	25.15	298.36	1,443.12	239.67	-367.38	438.34	0.79	-0.46	-1.51
1,625.00	25.06	299.50	1,528.24	258.96	-402.29	477.97	0.52	-0.10	1.21
1,719.00	24.34	303.24	1,613.64	279.38	-435.82	517.14	1.83	-0.77	3.98
1,814.00	24.39	302.16	1,700.18	300.55	-468.80	556.29	0.47	0.05	-1.14
1,908.00	22.93	306.52	1,786.29	321.78	-499.95	593.99	2.42	-1.55	4.64
2,003.00	21.16	310.07	1,874.34	343.84	-527.95	629.58	2.33	-1.86	3.74
2,097.00	21.46	309.98	1,961.91	365.81	-554.10	663.62	0.32	0.32	-0.10
2,192.00	19.56	309.66	2,050.89	387.12	-579.67	696.80	2.00	-2.00	-0.34
2,286.00	19.49	309.28	2,139.48	407.09	-603.92	728.13	0.15	-0.07	-0.40
2,381.00	19.89	310.08	2,228.93	427.53	-628.55	760.05	0.51	0.42	0.84
2,475.00	19.33	309.33	2,317.48	447.69	-652.82	791.50	0.65	-0.60	-0.80
2,569.00	18.99	308.33	2,406.27	467.03	-676.85	822.29	0.50	-0.36	-1.06
2,663.00	18.75	307.81	2,495.22	485.78	-700.78	852.65	0.31	-0.26	-0.55
2,757.00	18.79	308.21	2,584.22	504.41	-724.61	882.86	0.14	0.04	0.43
2,852.00	18.74	307.24	2,674.17	523.11	-748.79	913.40	0.33	-0.05	-1.02
2,946.00	17.74	308.19	2,763.44	541.10	-772.06	942.79	1.11	-1.06	1.01
3,040.00	20.03	309.34	2,852.38	560.16	-795.77	973.15	2.47	2.44	1.22
3,134.00	19.52	308.81	2,940.84	580.21	-820.46	1,004.89	0.58	-0.54	-0.56
3,229.00	21.73	308.07	3,029.74	601.00	-846.68	1,038.30	2.34	2.33	-0.78
3,324.00	21.91	308.03	3,117.93	622.76	-874.48	1,073.56	0.19	0.19	-0.04
3,418.00	21.63	306.87	3,205.23	643.96	-902.16	1,108.40	0.55	-0.30	-1.23
3,513.00	20.87	306.20	3,293.77	664.46	-929.82	1,142.82	0.84	-0.80	-0.71
3,607.00	20.13	306.48	3,381.82	683.97	-956.34	1,175.74	0.79	-0.79	0.30
3,702.00	21.39	305.18	3,470.65	703.67	-983.64	1,209.41	1.41	1.33	-1.37
3,796.00	20.92	305.41	3,558.31	723.27	-1,011.33	1,243.33	0.51	-0.50	0.24
3,890.00	23.13	304.95	3,645.45	743.57	-1,040.14	1,278.58	2.36	2.35	-0.49
3,985.00	22.74	305.01	3,732.94	764.80	-1,070.48	1,315.60	0.41	-0.41	0.06
4,080.00	22.54	304.43	3,820.62	785.63	-1,100.53	1,352.16	0.32	-0.21	-0.61
4,174.00	22.58	303.93	3,907.42	805.89	-1,130.37	1,388.22	0.21	0.04	-0.53
4,268.00	21.77	304.81	3,994.47	825.91	-1,159.65	1,423.69	0.93	-0.86	0.94
4,363.00	21.40	304.83	4,082.81	845.87	-1,188.35	1,458.64	0.39	-0.39	0.02

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Well:	RU 312-17	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

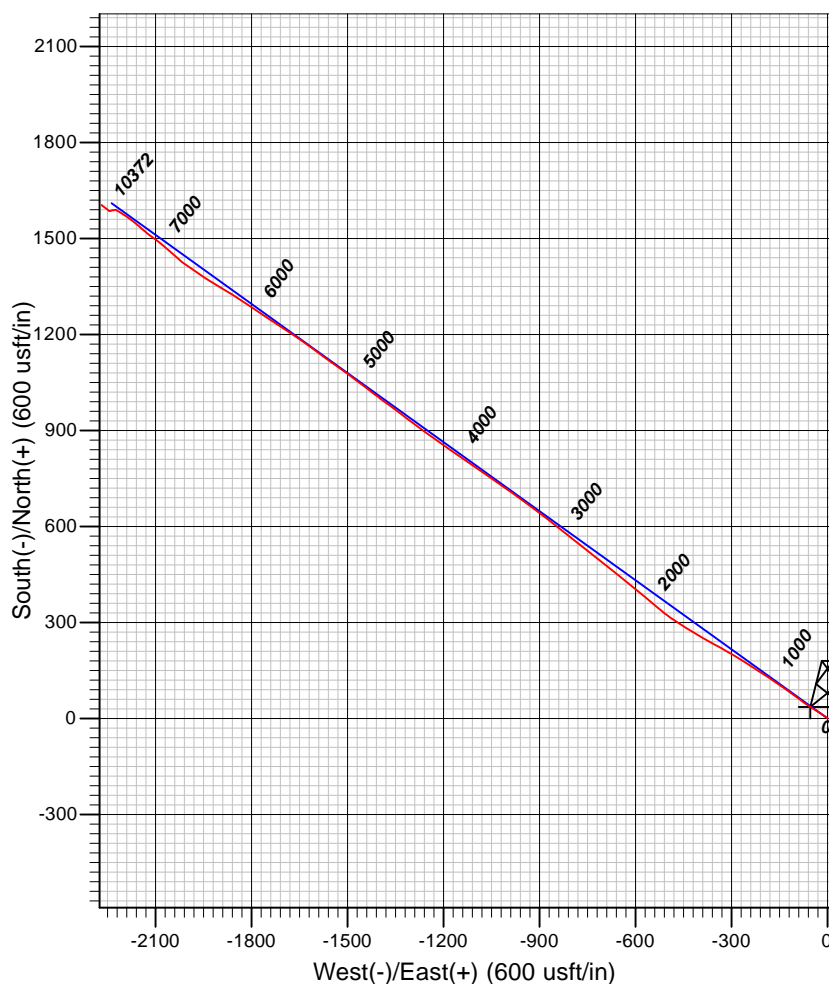
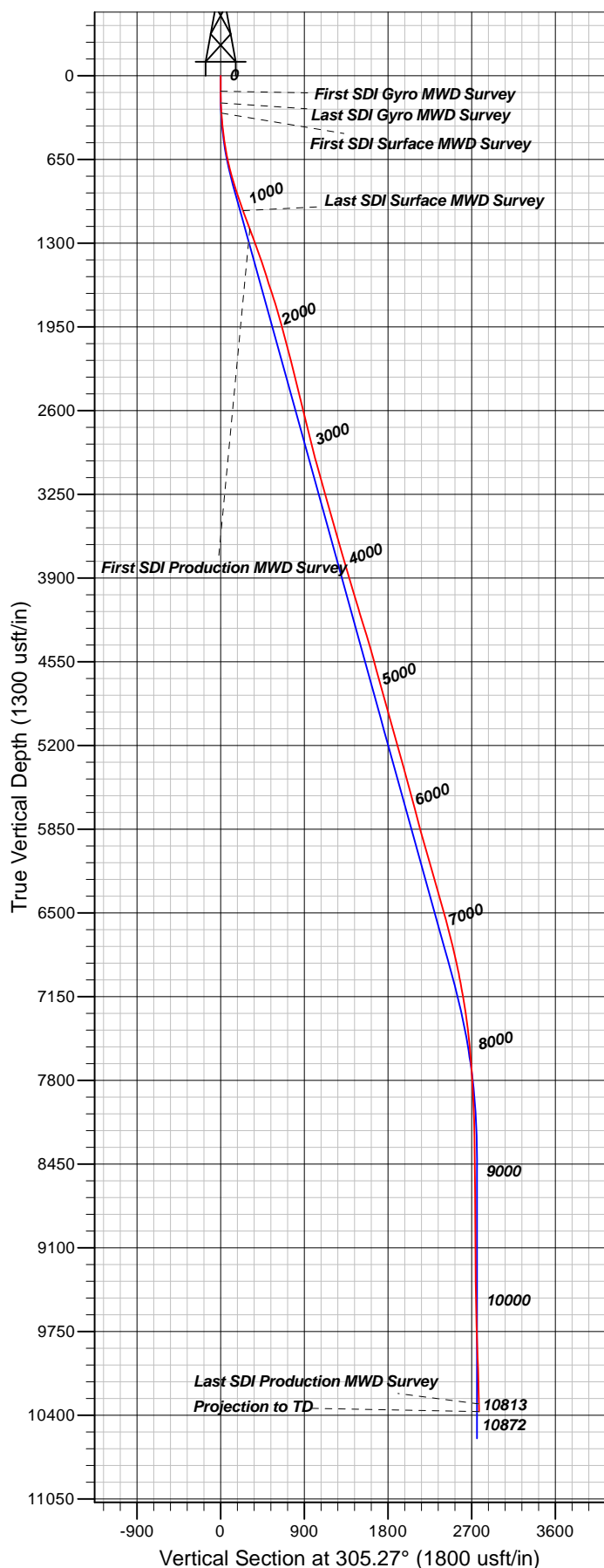
Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,457.00	23.63	305.86	4,169.64	866.70	-1,217.69	1,494.63	2.41	2.37	1.10	
4,552.00	23.31	306.01	4,256.78	888.90	-1,248.33	1,532.47	0.34	-0.34	0.16	
4,646.00	22.44	307.07	4,343.39	910.65	-1,277.69	1,569.00	1.02	-0.93	1.13	
4,741.00	21.58	306.71	4,431.46	932.03	-1,306.16	1,604.58	0.92	-0.91	-0.38	
4,835.00	21.22	306.51	4,518.98	952.48	-1,333.69	1,638.87	0.39	-0.38	-0.21	
4,930.00	20.65	306.91	4,607.71	972.77	-1,360.91	1,672.81	0.62	-0.60	0.42	
5,024.00	19.93	305.89	4,695.88	992.12	-1,387.14	1,705.39	0.85	-0.77	-1.09	
5,119.00	22.14	307.55	4,784.54	1,012.52	-1,414.45	1,739.48	2.41	2.33	1.75	
5,213.00	22.14	307.48	4,871.61	1,034.09	-1,442.55	1,774.87	0.03	0.00	-0.07	
5,308.00	21.80	306.56	4,959.71	1,055.50	-1,470.93	1,810.40	0.51	-0.36	-0.97	
5,402.00	20.98	306.36	5,047.24	1,075.87	-1,498.50	1,844.67	0.88	-0.87	-0.21	
5,496.00	20.37	305.63	5,135.18	1,095.38	-1,525.35	1,877.86	0.70	-0.65	-0.78	
5,591.00	19.70	304.86	5,224.43	1,114.16	-1,551.93	1,910.40	0.76	-0.71	-0.81	
5,686.00	22.00	307.18	5,313.21	1,134.07	-1,579.25	1,944.20	2.57	2.42	2.44	
5,780.00	21.37	306.18	5,400.55	1,154.82	-1,607.10	1,978.93	0.78	-0.67	-1.06	
5,875.00	20.81	305.32	5,489.19	1,174.79	-1,634.84	2,013.11	0.67	-0.59	-0.91	
5,969.00	20.08	304.01	5,577.27	1,193.47	-1,661.84	2,045.94	0.92	-0.78	-1.39	
6,064.00	20.21	303.33	5,666.46	1,211.61	-1,689.07	2,078.64	0.28	0.14	-0.72	
6,158.00	19.69	302.93	5,754.82	1,229.14	-1,715.93	2,110.69	0.57	-0.55	-0.43	
6,253.00	20.05	303.81	5,844.16	1,246.90	-1,742.89	2,142.96	0.49	0.38	0.93	
6,347.00	22.26	304.03	5,931.82	1,265.84	-1,771.04	2,176.88	2.35	2.35	0.23	
6,442.00	21.68	303.78	6,019.92	1,285.66	-1,800.54	2,212.41	0.62	-0.61	-0.26	
6,537.00	21.55	302.93	6,108.24	1,304.90	-1,829.76	2,247.38	0.36	-0.14	-0.89	
6,631.00	21.46	301.91	6,195.70	1,323.38	-1,858.85	2,281.80	0.41	-0.10	-1.09	
6,726.00	21.68	301.49	6,284.04	1,341.73	-1,888.57	2,316.66	0.28	0.23	-0.44	
6,820.00	21.47	300.64	6,371.46	1,359.57	-1,918.17	2,351.13	0.40	-0.22	-0.90	
6,915.00	21.39	305.29	6,459.90	1,378.44	-1,947.27	2,385.78	1.79	-0.08	4.89	
7,009.00	21.46	303.99	6,547.40	1,397.95	-1,975.52	2,420.12	0.51	0.07	-1.38	
7,103.00	19.67	303.60	6,635.41	1,416.32	-2,002.96	2,453.12	1.91	-1.90	-0.41	
7,198.00	17.23	311.81	6,725.53	1,434.55	-2,026.77	2,483.09	3.75	-2.57	8.64	
7,292.00	17.33	311.75	6,815.29	1,453.16	-2,047.59	2,510.83	0.11	0.11	-0.06	
7,387.00	18.24	310.59	6,905.75	1,472.25	-2,069.44	2,539.70	1.03	0.96	-1.22	
7,481.00	15.21	308.03	6,995.76	1,489.43	-2,090.33	2,566.67	3.32	-3.22	-2.72	
7,576.00	13.98	306.45	7,087.70	1,503.92	-2,109.38	2,590.59	1.36	-1.29	-1.66	
7,670.00	13.81	307.77	7,178.95	1,517.54	-2,127.38	2,613.15	0.38	-0.18	1.40	
7,764.00	11.52	312.33	7,270.66	1,530.73	-2,143.19	2,633.68	2.66	-2.44	4.85	
7,858.00	10.46	310.84	7,362.93	1,542.63	-2,156.58	2,651.48	1.17	-1.13	-1.59	
7,953.00	8.09	307.50	7,456.68	1,552.34	-2,168.41	2,666.75	2.56	-2.49	-3.52	
8,047.00	7.12	305.57	7,549.86	1,559.76	-2,178.40	2,679.18	1.07	-1.03	-2.05	
8,141.00	6.28	306.44	7,643.21	1,566.20	-2,187.27	2,690.15	0.90	-0.89	0.93	
8,236.00	5.68	304.40	7,737.70	1,571.94	-2,195.33	2,700.04	0.67	-0.63	-2.15	
8,331.00	4.22	304.69	7,832.34	1,576.59	-2,202.09	2,708.24	1.54	-1.54	0.31	
8,362.00	4.04	302.14	7,863.26	1,577.82	-2,203.95	2,710.47	0.83	-0.58	-8.23	

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8,457.00	3.87	302.32	7,958.03	1,581.31	-2,209.49	2,717.02	0.18	-0.18	0.19
8,552.00	3.52	293.01	8,052.84	1,584.17	-2,214.88	2,723.07	0.73	-0.37	-9.80
8,646.00	2.02	305.04	8,146.72	1,586.25	-2,218.90	2,727.54	1.70	-1.60	12.80
8,741.00	1.14	312.69	8,241.69	1,587.85	-2,220.96	2,730.16	0.95	-0.93	8.05
8,836.00	0.88	296.43	8,336.67	1,588.82	-2,222.31	2,731.81	0.40	-0.27	-17.12
8,931.00	0.62	290.01	8,431.66	1,589.32	-2,223.45	2,733.03	0.29	-0.27	-6.76
9,025.00	0.79	275.60	8,525.66	1,589.55	-2,224.57	2,734.08	0.26	0.18	-15.33
9,120.00	1.32	256.17	8,620.64	1,589.36	-2,226.28	2,735.37	0.67	0.56	-20.45
9,215.00	1.58	247.82	8,715.61	1,588.60	-2,228.56	2,736.79	0.35	0.27	-8.79
9,309.00	0.70	215.30	8,809.59	1,587.64	-2,230.09	2,737.49	1.13	-0.94	-34.60
9,404.00	0.44	322.62	8,904.59	1,587.46	-2,230.65	2,737.84	0.98	-0.27	112.97
9,499.00	0.53	303.11	8,999.59	1,587.99	-2,231.24	2,738.62	0.20	0.09	-20.54
9,593.00	0.88	270.67	9,093.58	1,588.23	-2,232.32	2,739.65	0.55	0.37	-34.51
9,688.00	0.88	259.60	9,188.57	1,588.11	-2,233.77	2,740.76	0.18	0.00	-11.65
9,783.00	1.43	258.02	9,283.55	1,587.73	-2,235.65	2,742.08	0.58	0.58	-1.66
9,877.00	1.76	249.76	9,377.51	1,586.99	-2,238.15	2,743.69	0.43	0.35	-8.79
9,972.00	2.46	248.79	9,472.45	1,585.75	-2,241.42	2,745.64	0.74	0.74	-1.02
10,067.00	1.67	296.87	9,567.39	1,585.64	-2,244.55	2,748.14	1.93	-0.83	50.61
10,161.00	1.93	313.48	9,661.34	1,587.34	-2,246.93	2,751.06	0.62	0.28	17.67
10,256.00	2.25	312.97	9,756.28	1,589.72	-2,249.45	2,754.49	0.34	0.34	-0.54
10,351.00	2.55	305.66	9,851.20	1,592.22	-2,252.53	2,758.45	0.45	0.32	-7.69
10,445.00	2.81	303.55	9,945.10	1,594.71	-2,256.15	2,762.85	0.30	0.28	-2.24
10,540.00	2.58	310.54	10,039.99	1,597.39	-2,259.72	2,767.30	0.42	-0.24	7.36
10,635.00	2.25	311.42	10,134.91	1,600.01	-2,262.74	2,771.29	0.35	-0.35	0.93
10,729.00	1.85	304.95	10,228.85	1,602.10	-2,265.37	2,774.64	0.49	-0.43	-6.88
10,813.00	1.58	311.10	10,312.81	1,603.64	-2,267.35	2,777.15	0.39	-0.32	7.32
Last SDI Production MWD Survey									
10,872.00	1.58	311.10	10,371.79	1,604.71	-2,268.58	2,778.77	0.00	0.00	0.00
Projection to TD - PBHL(RU_312-17)									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
120.00	120.00	0.23	0.14	First SDI Gyro MWD Survey
211.00	210.96	1.83	-1.65	Last SDI Gyro MWD Survey
291.00	290.74	5.42	-6.17	First SDI Surface MWD Survey
1,088.00	1,047.54	136.36	-197.06	Last SDI Surface MWD Survey
1,247.00	1,188.35	176.35	-259.14	First SDI Production MWD Survey
10,813.00	10,312.81	1,603.64	-2,267.35	Last SDI Production MWD Survey
10,872.00	10,371.79	1,604.71	-2,268.58	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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Well Details: RU 312-17

TVD Reference: GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318) Level: 8368.60
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.00 0.00 1594652.10 2351218.90 39.4435639 -107.7975413 RU 312-17 (A1)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well RU 312-17 - Slot RU 312-17 (A1), True North
 Vertical (TVD) Reference: GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318)
 Section (VS) Reference: Slot - RU 312-17 (A1)(0.00N, 0.00E)
 Measured Depth Reference: GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318)
 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

13:53, March 14 2018
 Created By: Mel Mireles Jr.