



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 24-17
County & State	Garfield County, CO
SDI Job No.	OP.010504
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 124 feet to a measured depth of 10,357 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

06-Jun-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 24-17 - Slot RU 24-17 (B9)
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 24-17	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 24-17 - Slot RU 24-17 (B9)					
Well Position	+N/-S	0.00 usft	Northing:	1,594,611.10 usft	Latitude:	39.4434545
	+E/-W	0.00 usft	Easting:	2,351,263.80 usft	Longitude:	-107.7973787
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	5/30/2018	9.17	65.57	51,557

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	213.61	

Survey Program	Date	6/6/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
124.00	771.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
771.00	1,077.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,181.00	10,357.00	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	
124.00	0.44	0.09	124.00	0.48	0.00	-0.40	0.35	0.35	0.00	
First SDI Gyro MWD Survey										
216.00	0.26	102.57	216.00	0.78	0.21	-0.77	0.61	-0.20	111.39	
308.00	0.26	156.09	308.00	0.55	0.49	-0.73	0.25	0.00	58.17	
400.00	0.97	178.33	399.99	-0.42	0.60	0.02	0.80	0.77	24.17	
492.00	2.46	197.75	491.95	-3.08	0.02	2.55	1.72	1.62	21.11	
585.00	4.13	203.64	584.79	-8.05	-1.93	7.77	1.83	1.80	6.33	
676.00	5.81	214.19	675.45	-14.86	-5.83	15.61	2.09	1.85	11.59	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well RU 24-17 - Slot RU 24-17 (B9)
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 24-17	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)
771.00	6.69	215.24	769.88	-23.36	-11.73	25.95	0.93	0.93	1.11
Last SDI Gyro MWD Survey									
844.00	7.41	209.39	842.33	-30.93	-16.49	34.89	1.39	0.99	-8.01
First SDI Surface MWD Survey									
938.00	6.80	221.74	935.61	-40.37	-23.17	46.45	1.75	-0.65	13.14
1,032.00	7.39	223.80	1,028.89	-48.88	-31.06	57.91	0.68	0.63	2.19
1,077.00	8.09	226.09	1,073.48	-53.17	-35.35	63.85	1.70	1.56	5.09
Last SDI Surface MWD Survey									
1,181.00	7.83	220.88	1,176.48	-63.60	-45.25	78.02	0.74	-0.25	-5.01
First SDI Production MWD Survey									
1,275.00	7.38	219.43	1,269.66	-73.10	-53.28	90.38	0.52	-0.48	-1.54
1,369.00	6.56	218.65	1,362.96	-81.96	-60.47	101.73	0.88	-0.87	-0.83
1,464.00	5.80	216.86	1,457.41	-90.04	-66.74	111.93	0.83	-0.80	-1.88
1,558.00	5.53	213.07	1,550.95	-97.64	-72.06	121.20	0.49	-0.29	-4.03
1,653.00	7.21	215.01	1,645.36	-106.36	-77.97	131.74	1.78	1.77	2.04
1,747.00	6.86	210.96	1,738.65	-116.00	-84.25	143.24	0.65	-0.37	-4.31
1,842.00	6.57	208.57	1,833.00	-125.64	-89.76	154.32	0.42	-0.31	-2.52
1,936.00	7.83	219.76	1,926.26	-135.29	-96.43	166.05	2.00	1.34	11.90
2,031.00	7.56	218.61	2,020.41	-145.14	-104.47	178.71	0.33	-0.28	-1.21
2,125.00	7.12	217.03	2,113.64	-154.63	-111.84	190.68	0.51	-0.47	-1.68
2,220.00	7.01	216.81	2,207.91	-163.97	-118.86	202.35	0.12	-0.12	-0.23
2,314.00	6.38	214.94	2,301.27	-172.84	-125.28	213.30	0.71	-0.67	-1.99
2,409.00	6.07	212.90	2,395.71	-181.38	-131.04	223.60	0.40	-0.33	-2.15
2,503.00	6.07	210.91	2,489.19	-189.82	-136.29	233.53	0.22	0.00	-2.12
2,597.00	5.91	208.59	2,582.67	-198.34	-141.16	243.32	0.31	-0.17	-2.47
2,692.00	5.45	204.02	2,677.21	-206.75	-145.33	252.64	0.68	-0.48	-4.81
2,787.00	4.84	204.82	2,771.82	-214.51	-148.85	261.04	0.65	-0.64	0.84
2,881.00	6.78	200.43	2,865.34	-223.31	-152.45	270.37	2.12	2.06	-4.67
2,976.00	6.60	195.85	2,959.69	-233.82	-155.90	281.03	0.59	-0.19	-4.82
3,070.00	6.28	197.00	3,053.10	-243.93	-158.88	291.10	0.37	-0.34	1.22
3,163.00	6.20	195.34	3,145.55	-253.64	-161.70	300.74	0.21	-0.09	-1.78
3,258.00	6.42	184.95	3,239.97	-263.88	-163.51	310.27	1.22	0.23	-10.94
3,352.00	7.85	197.19	3,333.25	-275.25	-165.86	321.04	2.21	1.52	13.02
3,447.00	7.56	197.94	3,427.39	-287.39	-169.71	333.28	0.32	-0.31	0.79
3,541.00	6.98	197.93	3,520.64	-298.71	-173.37	344.73	0.62	-0.62	-0.01
3,636.00	6.73	197.16	3,614.96	-309.52	-176.79	355.63	0.28	-0.26	-0.81
3,731.00	6.18	197.43	3,709.35	-319.71	-179.96	365.88	0.58	-0.58	0.28
3,825.00	5.98	196.55	3,802.82	-329.23	-182.87	375.42	0.23	-0.21	-0.94
3,920.00	5.80	196.73	3,897.32	-338.58	-185.66	384.74	0.19	-0.19	0.19
4,014.00	5.63	198.14	3,990.86	-347.51	-188.47	393.73	0.23	-0.18	1.50
4,109.00	5.10	198.49	4,085.44	-355.94	-191.26	402.30	0.56	-0.56	0.37
4,203.00	5.63	212.29	4,179.03	-363.80	-195.05	410.94	1.48	0.56	14.68
4,298.00	5.28	212.55	4,273.60	-371.42	-199.89	419.97	0.37	-0.37	0.27
4,392.00	4.40	207.72	4,367.27	-378.26	-203.89	427.88	1.03	-0.94	-5.14

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Well:	RU 24-17	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

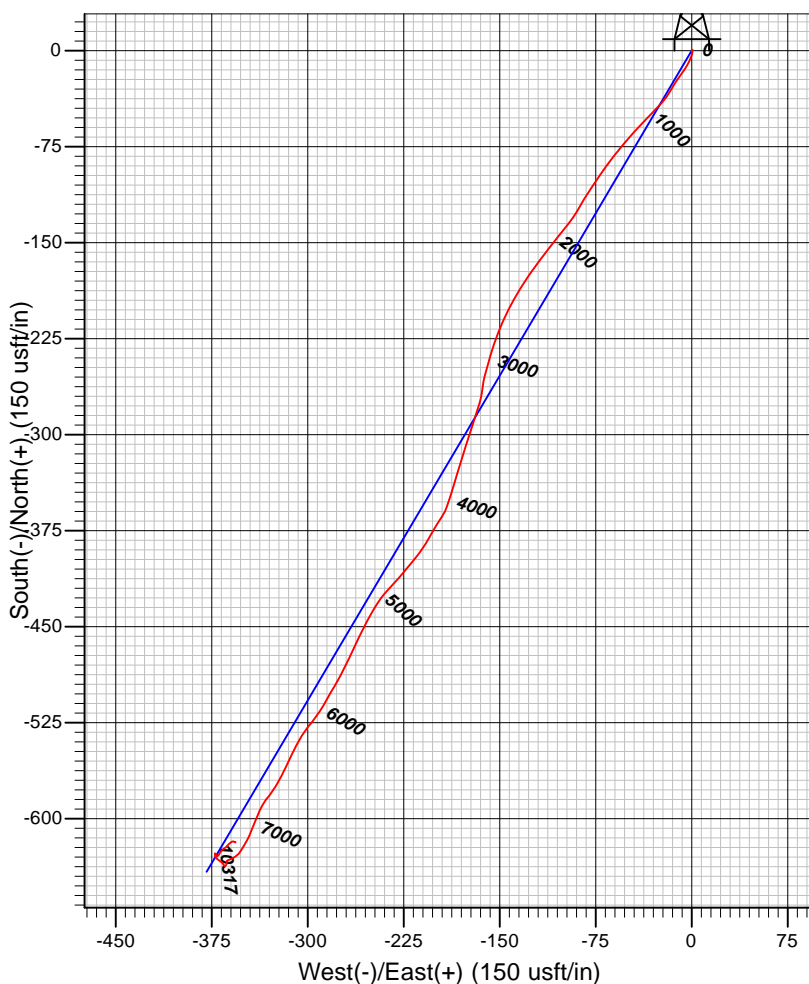
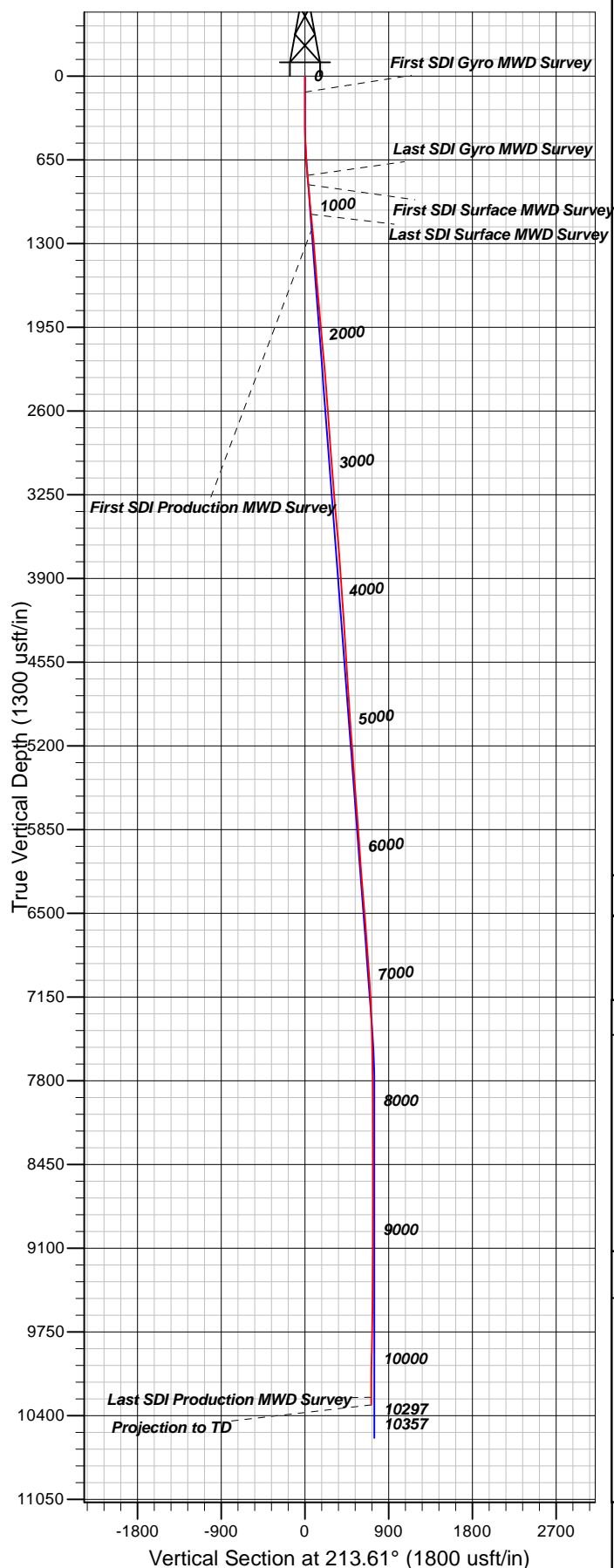
Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,487.00	5.00	212.36	4,461.95	-384.98	-207.80	435.65	0.75	0.63	4.88	
4,581.00	4.64	215.52	4,555.61	-391.54	-212.20	443.54	0.48	-0.38	3.36	
4,678.00	5.70	220.43	4,652.22	-398.40	-217.61	452.25	1.18	1.09	5.06	
4,770.00	5.48	219.04	4,743.78	-405.29	-223.34	461.16	0.28	-0.24	-1.51	
4,864.00	5.29	221.10	4,837.37	-412.04	-229.01	469.92	0.29	-0.20	2.19	
4,958.00	4.92	224.85	4,930.99	-418.16	-234.70	478.17	0.53	-0.39	3.99	
5,052.00	5.19	219.67	5,024.63	-424.29	-240.26	486.35	0.56	0.29	-5.51	
5,147.00	6.42	211.41	5,119.14	-432.13	-245.77	495.93	1.56	1.29	-8.69	
5,241.00	5.80	209.47	5,212.61	-440.75	-250.85	505.92	0.70	-0.66	-2.06	
5,336.00	5.63	206.88	5,307.13	-449.09	-255.32	515.34	0.33	-0.18	-2.73	
5,431.00	5.28	207.64	5,401.70	-457.12	-259.45	524.31	0.38	-0.37	0.80	
5,526.00	6.60	203.85	5,496.19	-465.99	-263.69	534.04	1.45	1.39	-3.99	
5,620.00	6.51	205.52	5,589.58	-475.73	-268.17	544.64	0.22	-0.10	1.78	
5,714.00	5.80	206.31	5,683.03	-484.80	-272.57	554.63	0.76	-0.76	0.84	
5,809.00	5.63	210.88	5,777.56	-493.10	-277.09	564.04	0.51	-0.18	4.81	
5,904.00	5.28	211.23	5,872.13	-500.84	-281.74	573.07	0.37	-0.37	0.37	
5,998.00	5.01	208.68	5,965.75	-508.14	-285.96	581.48	0.38	-0.29	-2.71	
6,093.00	6.16	212.29	6,060.30	-516.09	-290.67	590.70	1.27	1.21	3.80	
6,188.00	6.46	217.81	6,154.73	-524.62	-296.67	601.13	0.71	0.32	5.81	
6,283.00	5.89	217.47	6,249.18	-532.71	-302.91	611.32	0.60	-0.60	-0.36	
6,377.00	6.60	205.96	6,342.62	-541.40	-308.21	621.49	1.53	0.76	-12.24	
6,472.00	7.03	206.49	6,436.95	-551.51	-313.19	632.67	0.46	0.45	0.56	
6,567.00	5.85	205.97	6,531.35	-561.06	-317.91	643.24	1.24	-1.24	-0.55	
6,661.00	5.36	206.31	6,624.90	-569.31	-321.95	652.34	0.52	-0.52	0.36	
6,756.00	6.33	217.03	6,719.41	-577.46	-327.07	661.97	1.53	1.02	11.28	
6,851.00	5.45	214.92	6,813.90	-585.34	-332.81	671.71	0.95	-0.93	-2.22	
6,946.00	6.07	204.82	6,908.43	-593.60	-337.50	681.18	1.25	0.65	-10.63	
7,040.00	5.71	200.99	7,001.93	-602.48	-341.26	690.66	0.57	-0.38	-4.07	
7,135.00	5.10	203.41	7,096.51	-610.77	-344.63	699.42	0.69	-0.64	2.55	
7,229.00	2.99	207.89	7,190.27	-616.77	-347.44	705.98	2.27	-2.24	4.77	
7,324.00	2.58	211.99	7,285.16	-620.77	-349.73	710.58	0.48	-0.43	4.32	
7,419.00	2.37	210.70	7,380.07	-624.27	-351.87	714.68	0.23	-0.22	-1.36	
7,514.00	2.29	218.97	7,474.99	-627.44	-354.06	718.53	0.36	-0.08	8.71	
7,608.00	2.29	241.20	7,568.92	-629.80	-356.89	722.06	0.94	0.00	23.65	
7,703.00	1.49	245.60	7,663.86	-631.23	-359.68	724.79	0.86	-0.84	4.63	
7,798.00	1.76	245.51	7,758.82	-632.34	-362.13	727.08	0.28	0.28	-0.09	
7,892.00	0.35	179.94	7,852.81	-633.23	-363.44	728.54	1.75	-1.50	-69.76	
7,987.00	0.79	172.12	7,947.80	-634.17	-363.35	729.28	0.47	0.46	-8.23	
8,081.00	0.87	191.00	8,041.79	-635.51	-363.40	730.42	0.30	0.09	20.09	
8,176.00	0.97	227.49	8,136.78	-636.76	-364.13	731.87	0.61	0.11	38.41	
8,271.00	0.62	309.05	8,231.78	-636.98	-365.12	732.60	1.13	-0.37	85.85	
8,366.00	0.44	336.48	8,326.77	-636.32	-365.67	732.35	0.32	-0.19	28.87	
8,460.00	0.88	326.63	8,420.76	-635.39	-366.21	731.87	0.48	0.47	-10.48	

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Site:	RU 23-17 Pad	MD Reference:	GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318)
Well:	RU 24-17	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)
8,555.00	0.70	311.78	8,515.76	-634.39	-367.04	731.51	0.29	-0.19	-15.63
8,649.00	0.88	310.20	8,609.75	-633.55	-368.02	731.34	0.19	0.19	-1.68
8,744.00	1.23	302.37	8,704.73	-632.53	-369.44	731.28	0.40	0.37	-8.24
8,839.00	1.41	312.39	8,799.71	-631.19	-371.16	731.12	0.31	0.19	10.55
8,933.00	0.79	344.30	8,893.69	-629.79	-372.19	730.53	0.90	-0.66	33.95
9,028.00	1.26	352.60	8,988.67	-628.12	-372.51	729.31	0.52	0.49	8.74
9,123.00	0.18	140.30	9,083.67	-627.20	-372.55	728.57	1.49	-1.14	155.47
9,218.00	0.79	133.45	9,178.66	-627.77	-371.97	728.72	0.64	0.64	-7.21
9,312.00	0.79	162.36	9,272.65	-628.83	-371.31	729.24	0.42	0.00	30.76
9,407.00	0.35	98.20	9,367.65	-629.50	-370.82	729.52	0.75	-0.46	-67.54
9,500.00	1.49	38.17	9,460.64	-628.59	-369.79	728.19	1.45	1.23	-64.55
9,596.00	1.93	25.08	9,556.59	-626.14	-368.34	725.35	0.61	0.46	-13.64
9,690.00	1.76	61.99	9,650.55	-624.03	-366.39	722.52	1.25	-0.18	39.27
9,784.00	1.49	49.60	9,744.51	-622.56	-364.19	720.07	0.47	-0.29	-13.18
9,878.00	1.29	35.98	9,838.48	-620.91	-362.63	717.84	0.41	-0.21	-14.49
9,973.00	1.41	50.83	9,933.46	-619.31	-361.10	715.65	0.39	0.13	15.63
10,067.00	1.20	56.22	10,027.43	-618.03	-359.38	713.64	0.26	-0.22	5.73
10,161.00	0.62	125.63	10,121.42	-617.78	-358.15	712.75	1.21	-0.62	73.84
10,256.00	0.62	117.28	10,216.42	-618.31	-357.28	712.71	0.10	0.00	-8.79
10,297.00	0.44	82.91	10,257.42	-618.40	-356.93	712.58	0.87	-0.44	-83.83
Last SDI Production MWD Survey									
10,357.00	0.44	82.91	10,317.41	-618.34	-356.47	712.28	0.00	0.00	0.00
Projection to TD - PBHL(RU_24-17)									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
124.00	124.00	0.48	0.00	First SDI Gyro MWD Survey
771.00	769.88	-23.36	-11.73	Last SDI Gyro MWD Survey
844.00	842.33	-30.93	-16.49	First SDI Surface MWD Survey
1,077.00	1,073.48	-53.17	-35.35	Last SDI Surface MWD Survey
1,181.00	1,176.48	-63.60	-45.25	First SDI Production MWD Survey
10,297.00	10,257.42	-618.40	-356.93	Last SDI Production MWD Survey
10,357.00	10,317.41	-618.34	-356.47	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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Well Details: RU 24-17

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 1594611.10 2351263.80 39.4434545 -107.7973787 RU 24-17 (B9)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well RU 24-17 - Slot RU 24-17 (B9), True North
Vertical (TVD) Reference: GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318)
Section (VS) Reference: Slot - RU 24-17 (B9)(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

18:00, June 06 2018
Created By: Mel Mireles Jr.