



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 14-17
County & State	Garfield County, CO
SDI Job No.	OP.009785
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 124 feet to a measured depth of 10,736 feet is true and correct as determined from all available records.

Signature

 04-May-18

Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District



Scientific Drilling, Intl Survey Report

Company: TEP Rocky Mountain LLC	Local Co-ordinate Reference: Well RU 14-17 - Slot RU 14-17 (A10)
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 14-17	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 14-17 - Slot RU 14-17 (A10)				
Well Position	+N/-S	0.00 usft	Northing:	1,594,599.10 usft
	+E/-W	0.00 usft	Easting:	2,351,260.60 usft
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	4/26/2018	9.18	65.57	51,568

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	252.25

Survey Program		Date 5/4/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
124.00	676.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4
752.00	1,048.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1
1,180.00	10,736.00	Survey #3 - Production MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1

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	0.70	225.44	124.00	-0.53	-0.54	0.68	0.56	0.56	0.00	
First SDI Gyro MWD Survey										
217.00	2.64	265.08	216.95	-1.11	-3.08	3.27	2.31	2.09	42.62	
309.00	4.93	256.99	308.75	-2.19	-9.04	9.28	2.55	2.49	-8.79	
400.00	7.92	255.94	399.17	-4.59	-18.94	19.43	3.29	3.29	-1.15	
492.00	9.94	252.07	490.05	-8.57	-32.64	33.70	2.29	2.20	-4.21	
585.00	12.67	251.54	581.23	-14.28	-49.96	51.93	2.94	2.94	-0.57	
676.00	16.54	251.72	669.28	-21.50	-71.73	74.87	4.25	4.25	0.20	



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Site:	RU 23-17 Pad	MD Reference:	GL 8368.6' RKB 24' @ 8392.60usft (H&P 318)
Well:	RU 14-17	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)
Last SDI Gyro MWD Survey									
752.00	20.05	252.72	741.43	-28.77	-94.45	98.72	4.64	4.62	1.32
First SDI Surface MWD Survey									
867.00	20.85	251.89	849.18	-40.98	-132.72	138.90	0.74	0.70	-0.72
940.00	21.28	251.14	917.30	-49.30	-157.61	165.14	0.70	0.59	-1.03
1,035.00	23.21	250.44	1,005.22	-61.15	-191.56	201.09	2.05	2.03	-0.74
1,048.00	23.48	250.00	1,017.16	-62.89	-196.41	206.23	2.47	2.08	-3.38
Last SDI Surface MWD Survey									
1,180.00	23.99	248.50	1,138.00	-81.72	-246.09	259.29	0.60	0.39	-1.14
First SDI Production MWD Survey									
1,275.00	21.60	248.84	1,225.57	-95.11	-280.37	296.02	2.52	-2.52	0.36
1,369.00	20.81	246.73	1,313.21	-107.95	-311.85	329.91	1.17	-0.84	-2.24
1,463.00	19.67	250.97	1,401.40	-119.71	-342.14	362.35	1.98	-1.21	4.51
1,558.00	18.79	252.63	1,491.10	-129.49	-371.86	393.64	1.09	-0.93	1.75
1,652.00	18.91	256.94	1,580.07	-137.45	-401.15	423.96	1.49	0.13	4.59
1,747.00	18.47	255.45	1,670.06	-144.71	-430.71	454.32	0.68	-0.46	-1.57
1,842.00	18.38	261.34	1,760.20	-150.75	-460.09	484.14	1.96	-0.09	6.20
1,936.00	18.35	260.22	1,849.41	-155.49	-489.32	513.43	0.38	-0.03	-1.19
2,030.00	18.53	261.32	1,938.58	-160.26	-518.67	542.83	0.42	0.19	1.17
2,125.00	18.16	261.19	2,028.75	-164.81	-548.22	572.36	0.39	-0.39	-0.14
2,219.00	17.64	262.71	2,118.20	-168.86	-576.82	600.84	0.74	-0.55	1.62
2,313.00	17.43	260.77	2,207.84	-172.92	-604.85	628.77	0.66	-0.22	-2.06
2,408.00	16.53	261.96	2,298.69	-177.09	-632.27	656.16	1.02	-0.95	1.25
2,502.00	17.32	259.67	2,388.62	-181.47	-659.28	683.22	1.10	0.84	-2.44
2,597.00	17.91	256.74	2,479.17	-187.36	-687.41	711.80	1.12	0.62	-3.08
2,691.00	18.03	257.56	2,568.58	-193.81	-715.68	740.70	0.30	0.13	0.87
2,786.00	17.59	257.03	2,659.03	-200.20	-744.03	769.64	0.49	-0.46	-0.56
2,880.00	16.49	256.88	2,748.90	-206.41	-770.86	797.09	1.17	-1.17	-0.16
2,975.00	17.50	255.27	2,839.75	-213.11	-797.81	824.80	1.17	1.06	-1.69
3,070.00	16.71	253.69	2,930.55	-220.57	-824.73	852.71	0.96	-0.83	-1.66
3,164.00	17.59	254.83	3,020.37	-228.09	-851.41	880.41	1.00	0.94	1.21
3,258.00	17.11	254.88	3,110.10	-235.41	-878.47	908.41	0.51	-0.51	0.05
3,353.00	17.05	255.50	3,200.91	-242.54	-905.44	936.28	0.20	-0.06	0.65
3,447.00	16.18	253.34	3,290.98	-249.75	-931.33	963.13	1.13	-0.93	-2.30
3,542.00	17.41	255.27	3,381.93	-257.16	-957.76	990.56	1.42	1.29	2.03
3,636.00	16.53	255.80	3,471.83	-264.01	-984.33	1,017.95	0.95	-0.94	0.56
3,731.00	17.32	254.57	3,562.72	-271.09	-1,011.06	1,045.57	0.91	0.83	-1.29
3,825.00	18.64	255.27	3,652.13	-278.63	-1,039.08	1,074.55	1.42	1.40	0.74
3,920.00	18.03	256.33	3,742.30	-285.97	-1,068.05	1,104.38	0.73	-0.64	1.12
4,014.00	17.58	256.85	3,831.80	-292.64	-1,096.00	1,133.04	0.51	-0.48	0.55
4,109.00	17.32	256.24	3,922.43	-299.26	-1,123.71	1,161.45	0.33	-0.27	-0.64
4,204.00	18.11	257.47	4,012.92	-305.83	-1,151.86	1,190.26	0.92	0.83	1.29
4,298.00	18.55	254.04	4,102.16	-313.11	-1,180.50	1,219.75	1.24	0.47	-3.65
4,392.00	18.55	253.87	4,191.27	-321.38	-1,209.24	1,249.64	0.06	0.00	-0.18



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Well:	RU 14-17	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	18.21	254.71	4,281.43	-329.49	-1,238.07	1,279.58	0.45	-0.36	0.88	
4,582.00	16.07	254.93	4,372.20	-336.82	-1,265.09	1,307.55	2.25	-2.25	0.23	
4,676.00	16.88	252.02	4,462.34	-344.42	-1,290.63	1,334.19	1.23	0.86	-3.10	
4,771.00	15.92	252.81	4,553.48	-352.53	-1,316.20	1,361.01	1.04	-1.01	0.83	
4,865.00	17.23	251.23	4,643.57	-360.82	-1,341.70	1,387.82	1.47	1.39	-1.68	
4,960.00	18.03	249.21	4,734.11	-370.56	-1,368.77	1,416.57	1.06	0.84	-2.13	
5,054.00	17.23	249.21	4,823.69	-380.67	-1,395.38	1,445.00	0.85	-0.85	0.00	
5,149.00	18.41	251.21	4,914.13	-390.49	-1,422.74	1,474.05	1.40	1.24	2.11	
5,243.00	17.86	252.51	5,003.46	-399.61	-1,450.54	1,503.31	0.73	-0.59	1.38	
5,338.00	19.35	254.31	5,093.50	-408.24	-1,479.59	1,533.61	1.68	1.57	1.89	
5,432.00	18.93	255.50	5,182.30	-416.27	-1,509.34	1,564.39	0.61	-0.45	1.27	
5,526.00	18.51	256.04	5,271.33	-423.69	-1,538.58	1,594.50	0.48	-0.45	0.57	
5,621.00	19.83	254.36	5,361.06	-431.67	-1,568.74	1,625.66	1.51	1.39	-1.77	
5,715.00	18.82	253.51	5,449.76	-440.27	-1,598.63	1,656.75	1.12	-1.07	-0.90	
5,810.00	18.21	255.08	5,539.85	-448.44	-1,627.67	1,686.89	0.83	-0.64	1.65	
5,904.00	17.32	256.33	5,629.36	-455.53	-1,655.46	1,715.52	1.03	-0.95	1.33	
5,998.00	18.82	254.79	5,718.72	-462.82	-1,683.68	1,744.63	1.67	1.60	-1.64	
6,092.00	18.47	256.68	5,807.79	-470.23	-1,712.81	1,774.62	0.74	-0.37	2.01	
6,187.00	18.11	256.06	5,897.99	-477.25	-1,741.78	1,804.35	0.43	-0.38	-0.65	
6,282.00	17.04	256.73	5,988.56	-484.00	-1,769.66	1,832.96	1.15	-1.13	0.71	
6,376.00	16.09	257.29	6,078.65	-490.03	-1,795.77	1,859.67	1.02	-1.01	0.60	
6,471.00	17.67	250.83	6,169.57	-497.66	-1,822.23	1,887.20	2.58	1.66	-6.80	
6,565.00	17.46	252.65	6,259.18	-506.55	-1,849.17	1,915.57	0.63	-0.22	1.94	
6,660.00	17.59	253.16	6,349.78	-514.96	-1,876.51	1,944.17	0.21	0.14	0.54	
6,755.00	17.76	252.55	6,440.29	-523.46	-1,904.07	1,973.01	0.26	0.18	-0.64	
6,849.00	17.46	252.67	6,529.89	-531.96	-1,931.21	2,001.45	0.32	-0.32	0.13	
6,944.00	16.44	251.93	6,620.76	-540.38	-1,957.60	2,029.14	1.10	-1.07	-0.78	
7,039.00	16.53	253.51	6,711.85	-548.39	-1,983.34	2,056.10	0.48	0.09	1.66	
7,134.00	14.42	253.25	6,803.40	-555.63	-2,007.63	2,081.44	2.22	-2.22	-0.27	
7,228.00	14.25	253.34	6,894.48	-562.32	-2,029.92	2,104.71	0.18	-0.18	0.10	
7,323.00	13.89	253.25	6,986.63	-568.96	-2,052.04	2,127.80	0.38	-0.38	-0.09	
7,418.00	13.63	252.72	7,078.90	-575.57	-2,073.64	2,150.39	0.30	-0.27	-0.56	
7,512.00	12.31	251.49	7,170.50	-582.04	-2,093.72	2,171.49	1.43	-1.40	-1.31	
7,607.00	10.64	253.87	7,263.60	-587.69	-2,111.75	2,190.38	1.83	-1.76	2.51	
7,702.00	8.62	249.38	7,357.26	-592.64	-2,126.84	2,206.26	2.27	-2.13	-4.73	
7,796.00	6.77	247.45	7,450.41	-597.24	-2,138.55	2,218.82	1.99	-1.97	-2.05	
7,891.00	5.28	253.43	7,544.88	-600.64	-2,147.92	2,228.77	1.70	-1.57	6.29	
7,986.00	4.04	265.91	7,639.57	-602.12	-2,155.44	2,236.39	1.68	-1.31	13.14	
8,080.00	2.51	263.03	7,733.41	-602.61	-2,160.79	2,241.63	1.64	-1.63	-3.06	
8,175.00	2.11	259.23	7,828.33	-603.19	-2,164.57	2,245.41	0.45	-0.42	-4.00	
8,270.00	1.09	235.55	7,923.30	-604.03	-2,167.04	2,248.02	1.26	-1.07	-24.93	
8,364.00	0.88	221.00	8,017.28	-605.08	-2,168.25	2,249.49	0.35	-0.22	-15.48	
8,459.00	0.59	248.00	8,112.27	-605.81	-2,169.18	2,250.60	0.47	-0.31	28.42	



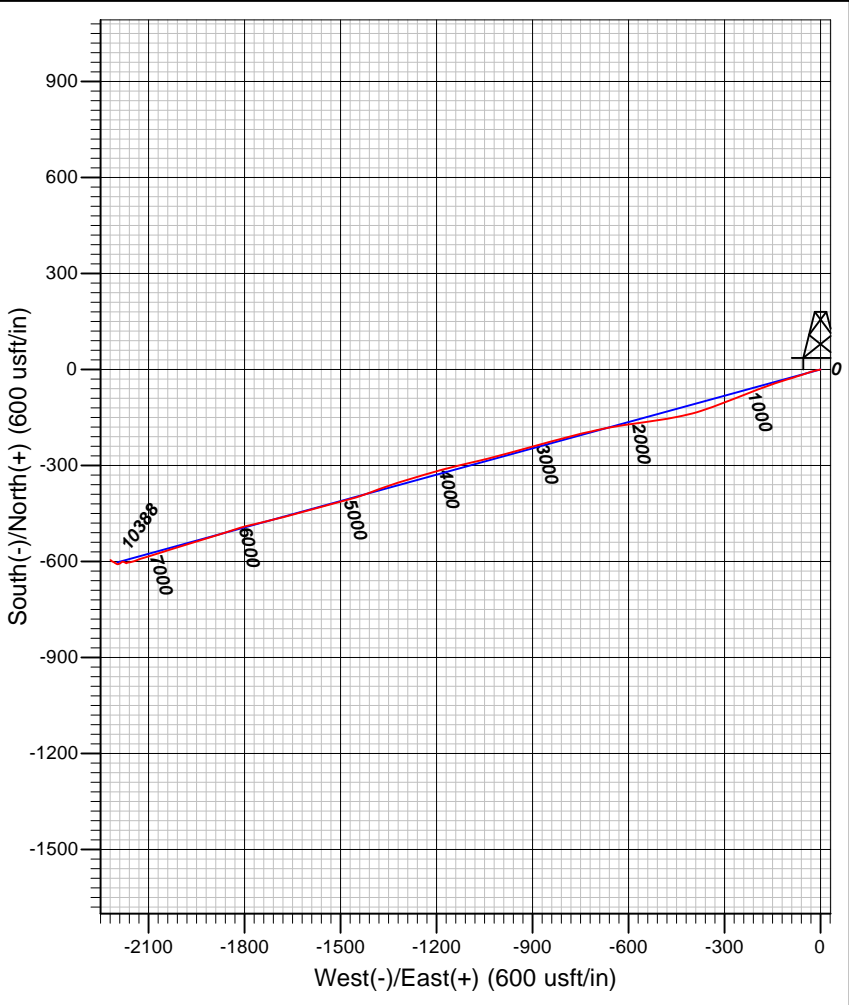
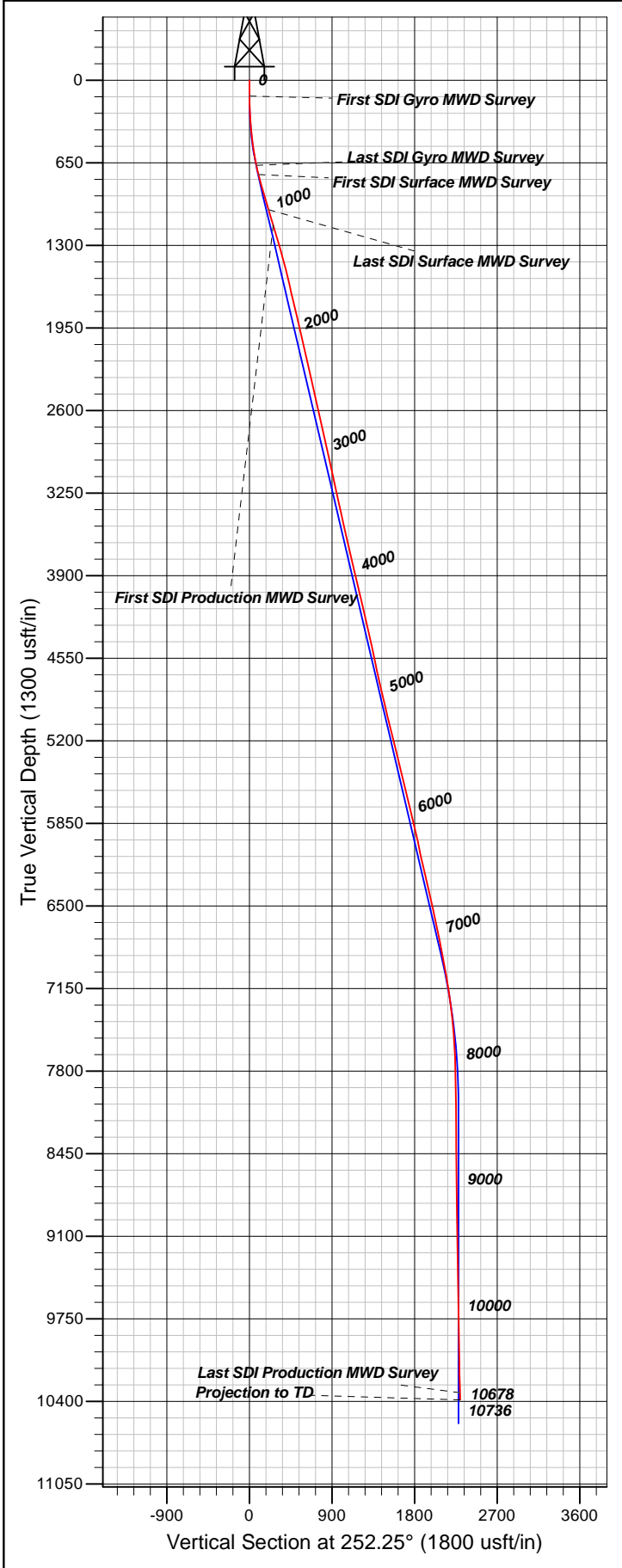
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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
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8,554.00	0.53	287.44	8,207.27	-605.86	-2,170.05	2,251.45	0.40	-0.06	41.52	
8,648.00	0.79	311.35	8,301.26	-605.30	-2,170.95	2,252.14	0.40	0.28	25.44	
8,743.00	1.14	313.90	8,396.25	-604.22	-2,172.13	2,252.92	0.37	0.37	2.68	
8,838.00	1.14	288.93	8,491.23	-603.25	-2,173.70	2,254.13	0.52	0.00	-26.28	
8,932.00	1.14	294.30	8,585.21	-602.57	-2,175.44	2,255.57	0.11	0.00	5.71	
9,027.00	1.41	278.12	8,680.19	-602.01	-2,177.46	2,257.32	0.47	0.28	-17.03	
9,122.00	1.61	295.10	8,775.16	-601.28	-2,179.82	2,259.35	0.51	0.21	17.87	
9,216.00	0.88	256.15	8,869.14	-600.89	-2,181.72	2,261.04	1.15	-0.78	-41.44	
9,311.00	0.79	249.82	8,964.13	-601.29	-2,183.04	2,262.43	0.14	-0.09	-6.66	
9,406.00	0.88	226.09	9,059.12	-602.03	-2,184.18	2,263.73	0.37	0.09	-24.98	
9,502.00	1.32	224.86	9,155.10	-603.32	-2,185.49	2,265.38	0.46	0.46	-1.28	
9,595.00	1.65	228.77	9,248.07	-604.96	-2,187.26	2,267.56	0.37	0.35	4.20	
9,690.00	1.49	238.57	9,343.03	-606.51	-2,189.34	2,270.01	0.33	-0.17	10.32	
9,784.00	1.14	249.13	9,437.01	-607.48	-2,191.25	2,272.13	0.45	-0.37	11.23	
9,879.00	1.57	253.07	9,531.98	-608.20	-2,193.38	2,274.38	0.46	0.45	4.15	
9,974.00	1.32	260.59	9,626.95	-608.75	-2,195.71	2,276.76	0.33	-0.26	7.92	
10,069.00	1.32	275.75	9,721.92	-608.82	-2,197.87	2,278.85	0.37	0.00	15.96	
10,163.00	1.67	297.90	9,815.89	-608.07	-2,200.16	2,280.80	0.71	0.37	23.56	
10,258.00	2.02	305.46	9,910.84	-606.45	-2,202.75	2,282.77	0.45	0.37	7.96	
10,352.00	1.72	302.17	10,004.79	-604.74	-2,205.29	2,284.67	0.34	-0.32	-3.50	
10,447.00	1.58	292.36	10,099.75	-603.48	-2,207.71	2,286.59	0.33	-0.15	-10.33	
10,541.00	2.46	300.01	10,193.70	-601.98	-2,210.66	2,288.94	0.98	0.94	8.14	
10,635.00	3.20	301.53	10,287.58	-599.60	-2,214.64	2,292.00	0.79	0.79	1.62	
10,678.00	3.43	305.11	10,330.51	-598.23	-2,216.72	2,293.56	0.72	0.53	8.33	
Last SDI Production MWD Survey										
10,736.00	3.43	305.11	10,388.40	-596.24	-2,219.55	2,295.66	0.00	0.00	0.00	
Projection to TD - PBHL(RU_14-17)										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
124.00	124.00	-0.53	-0.54	First SDI Gyro MWD Survey	
676.00	669.28	-21.50	-71.73	Last SDI Gyro MWD Survey	
752.00	741.43	-28.77	-94.45	First SDI Surface MWD Survey	
1,048.00	1,017.16	-62.89	-196.41	Last SDI Surface MWD Survey	
1,180.00	1,138.00	-81.72	-246.09	First SDI Production MWD Survey	
10,678.00	10,330.51	-598.23	-2,216.72	Last SDI Production MWD Survey	
10,736.00	10,388.40	-596.24	-2,219.55	Projection to TD	

Checked By: _____	Approved By: _____	Date: _____
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Well Details: RU 14-17					
TVD Reference: GL 8368.6' RKB 24' @ 8392.60usft (H&P 318) Grid Level: 8368.60					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1594599.10	2351260.60	39.4434214	-107.7973890RU 14-17 (A10)
REFERENCE INFORMATION					
Co-ordinate (N/E) Reference: Well RU 14-17 - Slot RU 14-17 (A10), True North					
Vertical (TVD) Reference: GL 8368.6' RKB 24' @ 8392.60usft (H&P 318)					
Section (VS) Reference: Slot - RU 14-17 (A10)(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					
13:50, May 04 2018					
Created By: Mel Mireles Jr.					