



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 524-17
County & State	Garfield County, CO
SDI Job No.	OP.010195
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 10,558 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

01-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 524-17 - Slot RU 524-17 (B14)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 8368.6' RKB 24' @ 8392.60usft
Site:	RU 23-17 Pad	MD Reference:	GL 8368.6' RKB 24' @ 8392.60usft
Well:	RU 524-17	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 524-17 - Slot RU 524-17 (B14)					
Well Position	+N/-S	0.00 usft	Northing:	1,594,581.70 usft	Latitude:	39.4433755
	+E/-W	0.00 usft	Easting:	2,351,287.00 usft	Longitude:	-107.7972940
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	5/17/2018	9.17	65.57	51,561

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	187.83	

Survey Program	Date	6/1/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
124.00	471.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
564.00	1,938.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,182.00	10,558.00	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	0.26	334.16	124.00	0.25	-0.12	-0.23	0.21	0.21	0.00	
First SDI Gyro MWD Survey										
216.00	0.62	61.00	216.00	0.68	0.22	-0.71	0.72	0.39	94.39	
308.00	1.85	177.28	307.98	-0.56	0.73	0.46	2.39	1.34	126.39	
400.00	3.70	175.17	399.87	-5.00	1.05	4.81	2.01	2.01	-2.29	
471.00	5.48	188.66	470.64	-10.64	0.73	10.44	2.92	2.51	19.00	
Last SDI Gyro MWD Survey										

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Site:	RU 23-17 Pad	MD Reference:	GL 8368.6' RKB 24' @ 8392.60usft
Well:	RU 524-17	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)	
564.00	7.73	196.43	563.02	-21.03	-1.71	21.06	2.60	2.42	8.35	
First SDI Surface MWD Survey										
655.00	10.65	194.60	652.84	-35.04	-5.56	35.47	3.22	3.21	-2.01	
750.00	13.48	187.92	745.74	-54.50	-9.30	55.26	3.32	2.98	-7.03	
844.00	14.61	184.91	836.93	-77.17	-11.82	78.06	1.43	1.20	-3.20	
938.00	15.69	181.51	927.66	-101.69	-13.17	102.53	1.49	1.15	-3.62	
1,032.00	16.71	177.74	1,017.93	-127.90	-12.97	128.47	1.56	1.09	-4.01	
1,038.00	16.79	177.71	1,023.68	-129.63	-12.91	130.18	1.38	1.37	-0.53	
Last SDI Surface MWD Survey										
1,083.00	17.41	177.48	1,066.69	-142.85	-12.35	143.20	1.38	1.37	-0.51	
1,182.00	16.24	182.06	1,161.45	-171.48	-12.20	171.54	1.79	-1.18	4.63	
First SDI Production MWD Survey										
1,277.00	15.74	179.94	1,252.78	-197.64	-12.66	197.52	0.81	-0.53	-2.23	
1,371.00	15.23	187.42	1,343.37	-222.64	-14.24	222.50	2.19	-0.54	7.96	
1,465.00	14.82	190.29	1,434.16	-246.71	-17.98	246.86	0.90	-0.44	3.05	
1,560.00	15.75	194.30	1,525.80	-271.16	-23.34	271.81	1.48	0.98	4.22	
1,654.00	15.74	191.98	1,616.28	-295.99	-29.14	297.20	0.67	-0.01	-2.47	
1,749.00	15.12	195.41	1,707.85	-320.54	-35.10	322.34	1.16	-0.65	3.61	
1,843.00	15.56	199.28	1,798.51	-344.26	-42.52	346.85	1.19	0.47	4.12	
1,938.00	14.73	198.69	1,890.21	-367.73	-50.60	371.20	0.89	-0.87	-0.62	
2,032.00	14.06	197.66	1,981.25	-389.93	-57.90	394.18	0.76	-0.71	-1.10	
2,127.00	13.33	198.09	2,073.55	-411.34	-64.80	416.33	0.78	-0.77	0.45	
2,221.00	14.42	197.70	2,164.81	-432.79	-71.72	438.53	1.16	1.16	-0.41	
2,316.00	13.27	195.29	2,257.05	-454.58	-78.19	460.99	1.35	-1.21	-2.54	
2,410.00	13.60	197.59	2,348.48	-475.52	-84.38	482.58	0.67	0.35	2.45	
2,505.00	12.89	196.34	2,440.95	-496.33	-90.73	504.07	0.81	-0.75	-1.32	
2,599.00	14.47	196.92	2,532.28	-517.63	-97.10	526.04	1.69	1.68	0.62	
2,694.00	14.09	196.41	2,624.34	-540.08	-103.82	549.19	0.42	-0.40	-0.54	
2,788.00	13.10	195.76	2,715.71	-561.31	-109.95	571.06	1.07	-1.05	-0.69	
2,883.00	13.89	198.66	2,808.09	-582.47	-116.52	592.92	1.09	0.83	3.05	
2,977.00	15.04	198.75	2,899.11	-604.71	-124.05	615.98	1.22	1.22	0.10	
3,072.00	14.48	196.74	2,990.97	-627.76	-131.44	639.81	0.80	-0.59	-2.12	
3,167.00	13.89	196.64	3,083.07	-650.06	-138.12	662.82	0.62	-0.62	-0.11	
3,260.00	15.12	195.94	3,173.11	-672.42	-144.65	685.86	1.34	1.32	-0.75	
3,354.00	14.89	194.60	3,263.90	-695.89	-151.06	709.99	0.44	-0.24	-1.43	
3,448.00	14.67	194.09	3,354.79	-719.12	-157.00	733.81	0.27	-0.23	-0.54	
3,543.00	13.80	193.88	3,446.87	-741.79	-162.65	757.04	0.92	-0.92	-0.22	
3,638.00	14.33	197.87	3,539.03	-763.98	-168.97	779.88	1.16	0.56	4.20	
3,732.00	15.39	197.43	3,629.88	-786.95	-176.28	803.64	1.13	1.13	-0.47	
3,827.00	14.77	197.78	3,721.61	-810.51	-183.75	827.99	0.66	-0.65	0.37	
3,921.00	14.60	198.13	3,812.54	-833.18	-191.10	851.45	0.20	-0.18	0.37	
4,016.00	13.85	198.21	3,904.63	-855.36	-198.38	874.42	0.79	-0.79	0.08	
4,110.00	14.62	192.88	3,995.74	-877.62	-204.54	897.30	1.62	0.82	-5.67	
4,205.00	13.80	193.06	4,087.84	-900.34	-209.77	920.53	0.86	-0.86	0.19	

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

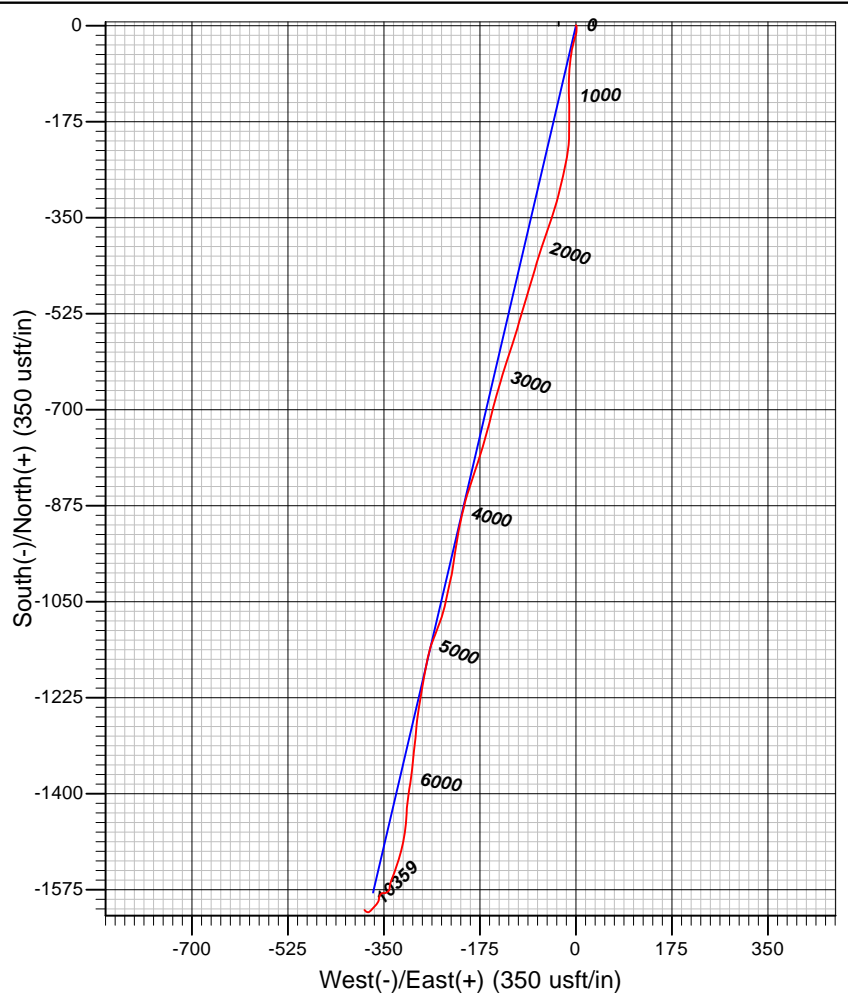
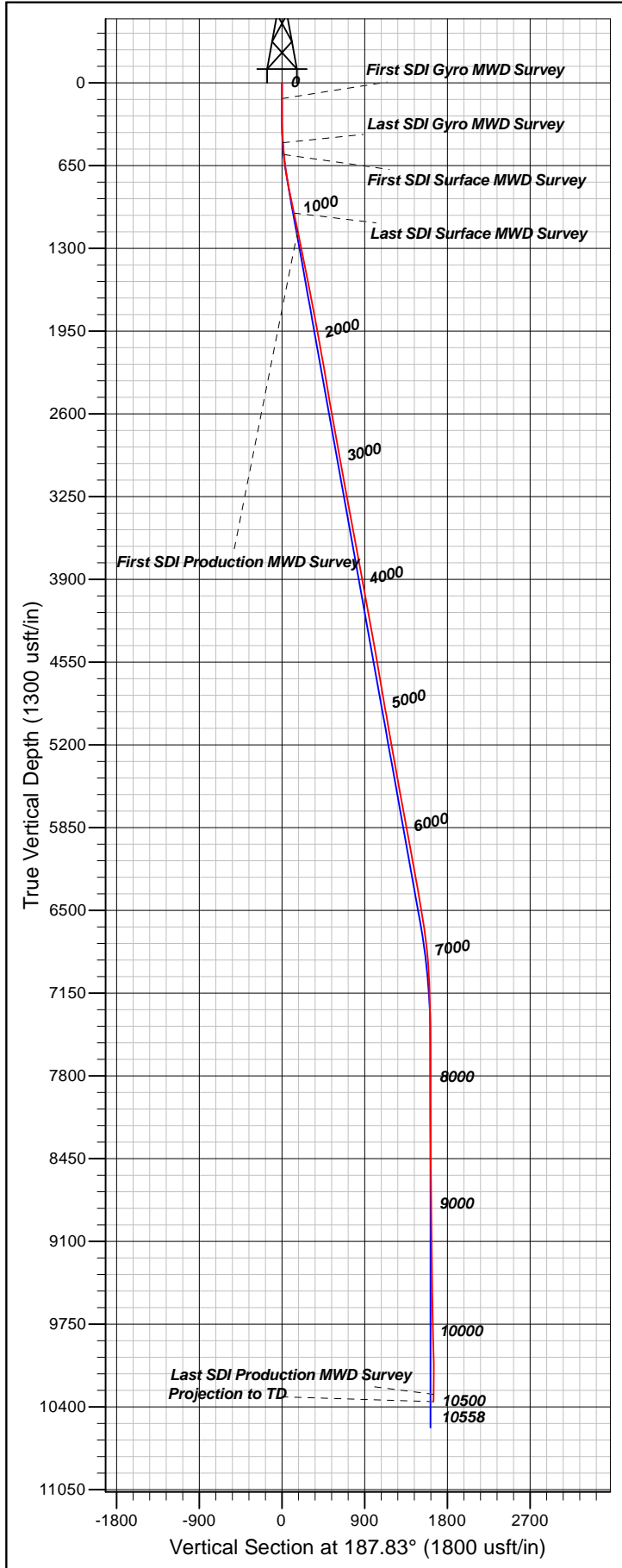
Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,299.00	14.60	190.49	4,178.97	-922.91	-214.46	943.53	1.08	0.85	-2.73	
4,393.00	14.60	188.99	4,269.93	-946.26	-218.47	967.21	0.40	0.00	-1.60	
4,488.00	13.81	188.91	4,362.02	-969.29	-222.10	990.52	0.83	-0.83	-0.08	
4,582.00	12.89	187.70	4,453.48	-990.77	-225.24	1,012.22	1.02	-0.98	-1.29	
4,677.00	13.45	194.18	4,545.99	-1,011.98	-229.37	1,033.80	1.66	0.59	6.82	
4,771.00	14.08	191.82	4,637.29	-1,033.77	-234.39	1,056.07	0.90	0.67	-2.51	
4,866.00	12.68	191.17	4,729.71	-1,055.31	-238.78	1,078.01	1.48	-1.47	-0.68	
4,960.00	13.72	198.93	4,821.23	-1,075.98	-244.39	1,099.25	2.18	1.11	8.26	
5,054.00	14.70	200.38	4,912.35	-1,097.70	-252.16	1,121.83	1.11	1.04	1.54	
5,148.00	13.63	201.74	5,003.50	-1,119.17	-260.42	1,144.22	1.19	-1.14	1.45	
5,243.00	14.06	195.03	5,095.74	-1,140.72	-267.56	1,166.54	1.75	0.45	-7.06	
5,337.00	13.34	190.12	5,187.07	-1,162.42	-272.42	1,188.70	1.45	-0.77	-5.22	
5,432.00	14.68	190.49	5,279.24	-1,185.05	-276.54	1,211.68	1.41	1.41	0.39	
5,527.00	13.98	189.43	5,371.29	-1,208.20	-280.61	1,235.17	0.79	-0.74	-1.12	
5,621.00	13.60	190.10	5,462.58	-1,230.29	-284.41	1,257.57	0.44	-0.40	0.71	
5,716.00	12.93	188.03	5,555.04	-1,251.81	-287.85	1,279.36	0.86	-0.71	-2.18	
5,811.00	15.21	185.83	5,647.19	-1,274.73	-290.60	1,302.44	2.46	2.40	-2.32	
5,905.00	14.51	184.42	5,738.04	-1,298.74	-292.76	1,326.52	0.84	-0.74	-1.50	
6,000.00	14.89	187.95	5,829.93	-1,322.69	-295.37	1,350.61	1.02	0.40	3.72	
6,095.00	13.85	184.27	5,921.96	-1,346.12	-297.91	1,374.16	1.46	-1.09	-3.87	
6,190.00	14.60	189.08	6,014.05	-1,369.29	-300.64	1,397.48	1.47	0.79	5.06	
6,284.00	13.37	188.20	6,105.26	-1,391.74	-304.06	1,420.20	1.33	-1.31	-0.94	
6,379.00	14.77	186.97	6,197.41	-1,414.64	-307.10	1,443.29	1.51	1.47	-1.29	
6,474.00	13.25	182.85	6,289.59	-1,437.53	-309.11	1,466.25	1.91	-1.60	-4.34	
6,568.00	13.81	186.53	6,380.98	-1,459.44	-310.92	1,488.19	1.09	0.60	3.91	
6,663.00	13.45	188.38	6,473.30	-1,481.63	-313.82	1,510.58	0.60	-0.38	1.95	
6,758.00	13.01	195.50	6,565.79	-1,502.87	-318.29	1,532.22	1.78	-0.46	7.49	
6,852.00	10.73	197.08	6,657.77	-1,521.43	-323.69	1,551.35	2.45	-2.43	1.68	
6,947.00	9.67	199.89	6,751.27	-1,537.39	-329.00	1,567.88	1.23	-1.12	2.96	
7,042.00	7.74	201.65	6,845.17	-1,550.84	-334.07	1,581.90	2.05	-2.03	1.85	
7,136.00	5.63	197.17	6,938.53	-1,561.13	-337.77	1,592.60	2.31	-2.24	-4.77	
7,231.00	4.13	184.78	7,033.18	-1,568.99	-339.43	1,600.61	1.92	-1.58	-13.04	
7,326.00	1.76	194.97	7,128.05	-1,573.81	-340.09	1,605.48	2.55	-2.49	10.73	
7,418.00	1.41	205.78	7,220.02	-1,576.19	-340.95	1,607.95	0.50	-0.38	11.75	
7,515.00	1.34	227.48	7,316.99	-1,578.04	-342.31	1,609.96	0.54	-0.07	22.37	
7,610.00	1.32	243.49	7,411.96	-1,579.27	-344.10	1,611.44	0.39	-0.02	16.85	
7,704.00	1.23	248.85	7,505.94	-1,580.12	-346.01	1,612.54	0.16	-0.10	5.70	
7,799.00	1.58	239.27	7,600.91	-1,581.16	-348.09	1,613.85	0.44	0.37	-10.08	
7,894.00	0.53	286.73	7,695.90	-1,581.70	-349.64	1,614.59	1.35	-1.11	49.96	
7,988.00	0.62	300.44	7,789.89	-1,581.32	-350.49	1,614.33	0.17	0.10	14.59	
8,083.00	0.62	264.40	7,884.89	-1,581.11	-351.45	1,614.25	0.40	0.00	-37.94	
8,178.00	0.62	250.43	7,979.88	-1,581.33	-352.44	1,614.61	0.16	0.00	-14.71	
8,272.00	0.88	256.58	8,073.87	-1,581.67	-353.62	1,615.10	0.29	0.28	6.54	

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
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Survey									
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8,367.00	0.53	251.92	8,168.86	-1,581.97	-354.75	1,615.56	0.37	-0.37	-4.91
8,462.00	0.88	218.96	8,263.86	-1,582.68	-355.63	1,616.38	0.55	0.37	-34.69
8,556.00	0.62	210.70	8,357.85	-1,583.68	-356.34	1,617.46	0.30	-0.28	-8.79
8,651.00	0.97	208.24	8,452.84	-1,584.83	-356.98	1,618.69	0.37	0.37	-2.59
8,746.00	1.06	214.83	8,547.83	-1,586.26	-357.87	1,620.23	0.16	0.09	6.94
8,840.00	0.97	197.70	8,641.81	-1,587.73	-358.60	1,621.79	0.34	-0.10	-18.22
8,935.00	0.88	194.00	8,736.80	-1,589.20	-359.03	1,623.30	0.11	-0.09	-3.89
9,030.00	1.14	184.51	8,831.78	-1,590.85	-359.28	1,624.97	0.32	0.27	-9.99
9,124.00	0.79	176.95	8,925.77	-1,592.43	-359.31	1,626.54	0.40	-0.37	-8.04
9,219.00	0.70	198.49	9,020.76	-1,593.64	-359.46	1,627.76	0.31	-0.09	22.67
9,314.00	0.35	205.34	9,115.76	-1,594.45	-359.77	1,628.60	0.37	-0.37	7.21
9,408.00	0.31	199.66	9,209.76	-1,594.95	-359.98	1,629.13	0.05	-0.04	-6.04
9,502.00	0.70	196.99	9,303.75	-1,595.74	-360.23	1,629.94	0.42	0.41	-2.84
9,597.00	0.79	199.01	9,398.75	-1,596.91	-360.62	1,631.16	0.10	0.09	2.13
9,691.00	1.51	216.13	9,492.73	-1,598.52	-361.56	1,632.88	0.84	0.77	18.21
9,785.00	2.46	215.63	9,586.67	-1,601.16	-363.46	1,635.76	1.01	1.01	-0.53
9,880.00	2.29	223.80	9,681.59	-1,604.19	-365.97	1,639.10	0.40	-0.18	8.60
9,974.00	2.90	224.06	9,775.49	-1,607.25	-368.92	1,642.54	0.65	0.65	0.28
10,069.00	3.52	219.76	9,870.34	-1,611.22	-372.46	1,646.95	0.70	0.65	-4.53
10,163.00	2.73	230.30	9,964.20	-1,614.87	-376.02	1,651.05	1.04	-0.84	11.21
10,257.00	2.02	273.98	10,058.13	-1,616.19	-379.40	1,652.81	2.01	-0.76	46.47
10,352.00	1.58	306.24	10,153.08	-1,615.30	-382.13	1,652.30	1.14	-0.46	33.96
10,446.00	1.23	311.34	10,247.05	-1,613.86	-383.93	1,651.13	0.40	-0.37	5.43
10,500.00	1.41	315.21	10,301.04	-1,613.01	-384.83	1,650.41	0.37	0.33	7.17
Last SDI Production MWD Survey									
10,558.00	1.41	315.21	10,359.02	-1,612.00	-385.84	1,649.54	0.00	0.00	0.00
Projection to TD - PBHL(RU_524-17)									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
124.00	124.00	0.25	-0.12	First SDI Gyro MWD Survey
471.00	470.64	-10.64	0.73	Last SDI Gyro MWD Survey
564.00	563.02	-21.03	-1.71	First SDI Surface MWD Survey
1,038.00	1,023.68	-129.63	-12.91	Last SDI Surface MWD Survey
1,182.00	1,161.45	-171.48	-12.20	First SDI Production MWD Survey
10,500.00	10,301.04	-1,613.01	-384.83	Last SDI Production MWD Survey
10,558.00	10,359.02	-1,612.00	-385.84	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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Well Details: RU 524-17

+N/-S	+E/-W	North	East	Latitude	Longitude	Slot
0.00	0.00	1594581.70	2351287.00	39.4433754	-107.7972938	RU 524-17 (B14)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well RU 524-17 - Slot RU 524-17 (B14), True North
 Vertical (TVD) Reference: GL 8368.6' RKB 24' @ 8392.60usft
 Section (VS) Reference: Slot - RU 524-17 (B14)(0.00N, 0.00E)
 Measured Depth Reference: GL 8368.6' RKB 24' @ 8392.60usft
 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

17:55, June 01 2018
 Created By: Mel Mireles Jr.