



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.	SR 411-12
County & State	Garfield County, CO
SDI Job No.	OP.002724 & OP.003209
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 122 feet to a measured depth of 10,177 feet is true and correct as determined from all available records.


Signature

14-Aug-17
Date

Mel Mireles Jr.
Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SR 411-12 - Slot A7
Project:	Garfield County, CO NAD83	TVD Reference:	GL 7254' & RKB 24' @ 7278.00usft (H&P 318)
Site:	RU 32-12 Pad	MD Reference:	GL 7254' & RKB 24' @ 7278.00usft (H&P 318)
Well:	SR 411-12	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 32-12 Pad			
Site Position:		Northing:	1,599,253.30 usft	Latitude:	39.4554808
From:	Map	Easting:	2,341,050.00 usft	Longitude:	-107.8339555
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.47 °

Well	SR 411-12 - Slot A7					
Well Position	+N/-S	0.00 usft	Northing:	1,599,209.50 usft	Latitude:	39.4553613
	+E/-W	0.00 usft	Easting:	2,341,060.20 usft	Longitude:	-107.8339154
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	7,254.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/2/2017	9.25	65.67	51,683

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	289.53	

Survey Program	Date	8/14/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
122.00	962.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
1,038.00	1,178.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,274.00	10,177.00	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	
122.00	0.62	263.58	122.00	-0.07	-0.66	0.59	0.51	0.51	0.00	
First SDI Gyro MWD Survey										
218.00	3.43	289.95	217.93	0.85	-3.87	3.93	3.01	2.93	27.47	
310.00	6.25	298.39	309.59	4.17	-10.87	11.63	3.15	3.07	9.17	
402.00	7.74	301.11	400.91	9.75	-20.58	22.65	1.66	1.62	2.96	
494.00	10.21	299.62	491.77	16.98	-32.97	36.75	2.70	2.68	-1.62	
586.00	13.20	290.13	581.86	24.63	-49.93	55.29	3.86	3.25	-10.32	
679.00	17.51	286.17	671.52	32.19	-73.35	79.89	4.77	4.63	-4.26	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SR 411-12 - Slot A7
Project:	Garfield County, CO NAD83	TVD Reference:	GL 7254' & RKB 24' @ 7278.00usft (H&P 318)
Site:	RU 32-12 Pad	MD Reference:	GL 7254' & RKB 24' @ 7278.00usft (H&P 318)
Well:	SR 411-12	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)
773.00	20.50	285.64	760.39	40.56	-102.78	110.43	3.19	3.18	-0.56
867.00	24.02	288.63	847.37	51.12	-136.78	145.99	3.93	3.74	3.18
962.00	28.24	287.67	932.64	64.12	-176.53	187.81	4.46	4.44	-1.01
Last SDI Gyro MWD Survey									
1,038.00	32.02	288.52	998.36	75.98	-212.78	225.94	5.01	4.97	1.12
First SDI Surface MWD Survey									
1,131.00	36.02	289.48	1,075.43	92.94	-261.96	277.96	4.34	4.30	1.03
1,178.00	36.40	288.06	1,113.35	101.87	-288.25	305.72	1.96	0.81	-3.02
Last SDI Surface MWD Survey									
1,274.00	36.97	288.52	1,190.34	119.87	-342.70	363.06	0.66	0.59	0.48
First SDI Production MWD Survey									
1,369.00	37.18	290.53	1,266.13	139.01	-396.67	420.32	1.29	0.22	2.12
1,463.00	36.18	289.33	1,341.52	158.16	-449.45	476.47	1.31	-1.06	-1.28
1,557.00	37.01	291.33	1,416.99	177.63	-501.99	532.49	1.55	0.88	2.13
1,652.00	37.89	290.46	1,492.41	198.23	-555.96	590.24	1.08	0.93	-0.92
1,746.00	37.20	292.87	1,566.95	219.37	-609.19	647.47	1.73	-0.73	2.56
1,841.00	36.96	290.00	1,642.74	240.30	-662.49	704.71	1.84	-0.25	-3.02
1,935.00	36.88	291.76	1,717.89	260.42	-715.24	761.15	1.13	-0.09	1.87
2,030.00	36.52	289.82	1,794.07	280.57	-768.31	817.91	1.28	-0.38	-2.04
2,125.00	37.45	293.81	1,869.96	301.82	-821.34	874.99	2.71	0.98	4.20
2,219.00	37.76	293.12	1,944.43	324.66	-873.96	932.21	0.56	0.33	-0.73
2,313.00	36.76	291.91	2,019.25	346.46	-926.53	989.04	1.32	-1.06	-1.29
2,408.00	36.57	291.00	2,095.45	367.21	-979.32	1,045.74	0.61	-0.20	-0.96
2,502.00	37.56	293.18	2,170.46	388.52	-1,031.80	1,102.33	1.75	1.05	2.32
2,597.00	36.85	292.65	2,246.12	410.89	-1,084.71	1,159.67	0.82	-0.75	-0.56
2,691.00	36.06	291.91	2,321.73	432.07	-1,136.39	1,215.46	0.96	-0.84	-0.79
2,786.00	36.80	293.56	2,398.17	453.88	-1,188.42	1,271.78	1.29	0.78	1.74
2,880.00	36.83	293.36	2,473.42	476.30	-1,240.09	1,327.97	0.13	0.03	-0.21
2,975.00	36.00	292.48	2,549.87	498.27	-1,292.03	1,384.27	1.03	-0.87	-0.93
3,069.00	37.66	293.63	2,625.11	520.34	-1,343.87	1,440.51	1.91	1.77	1.22
3,164.00	37.55	293.54	2,700.37	543.54	-1,397.00	1,498.33	0.13	-0.12	-0.09
3,258.00	36.82	292.82	2,775.26	565.90	-1,449.22	1,555.03	0.90	-0.78	-0.77
3,353.00	35.96	292.52	2,851.73	587.63	-1,501.23	1,611.30	0.92	-0.91	-0.32
3,447.00	37.03	293.00	2,927.30	609.26	-1,552.78	1,667.12	1.18	1.14	0.51
3,542.00	36.76	292.08	3,003.28	631.12	-1,605.45	1,724.07	0.65	-0.28	-0.97
3,636.00	35.96	291.73	3,078.97	651.91	-1,657.16	1,779.75	0.88	-0.85	-0.37
3,731.00	36.76	293.22	3,155.48	673.45	-1,709.19	1,836.00	1.25	0.84	1.57
3,825.00	34.85	293.27	3,231.71	695.15	-1,759.72	1,890.87	2.03	-2.03	0.05
3,920.00	33.90	292.98	3,310.12	716.22	-1,809.05	1,944.40	1.01	-1.00	-0.31
4,014.00	32.89	292.70	3,388.60	736.30	-1,856.73	1,996.05	1.09	-1.07	-0.30
4,109.00	32.62	292.52	3,468.49	756.06	-1,904.18	2,047.38	0.30	-0.28	-0.19
4,203.00	31.50	292.53	3,548.16	775.17	-1,950.26	2,097.21	1.19	-1.19	0.01
4,298.00	32.01	293.49	3,628.94	794.72	-1,996.28	2,147.11	0.76	0.54	1.01
4,392.00	31.48	293.49	3,708.87	814.43	-2,041.64	2,196.45	0.56	-0.56	0.00

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Site:	RU 32-12 Pad	MD Reference:	GL 7254' & RKB 24' @ 7278.00usft (H&P 318)
Well:	SR 411-12	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

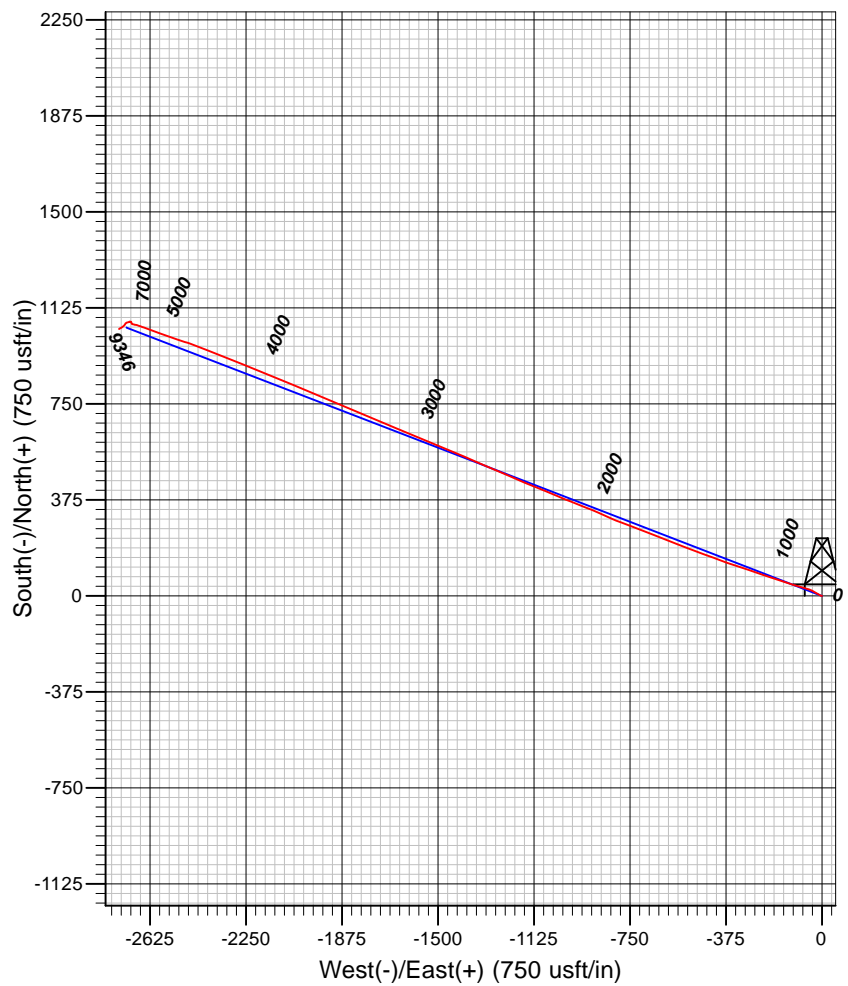
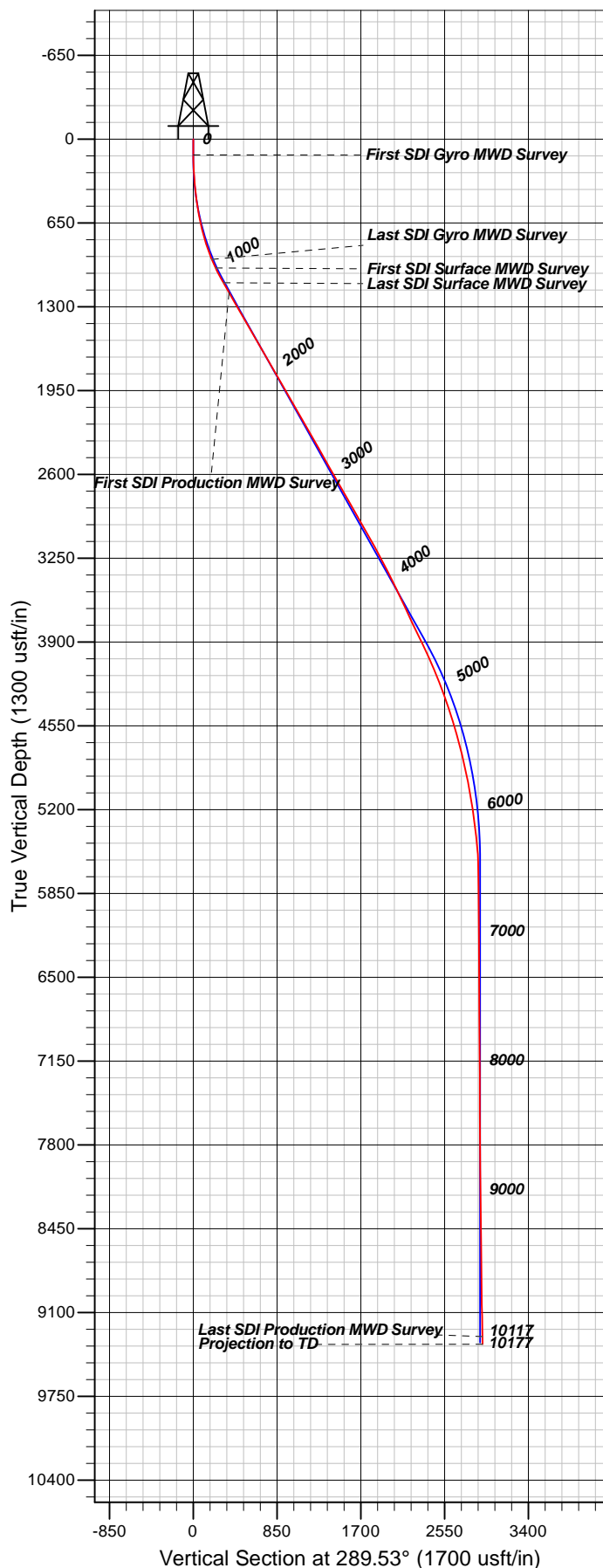
Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,487.00	32.80	292.17	3,789.31	834.03	-2,088.22	2,246.90	1.57	1.39	-1.39
4,581.00	32.08	291.67	3,868.64	852.86	-2,135.00	2,297.28	0.82	-0.77	-0.53
4,676.00	31.13	291.82	3,949.55	871.30	-2,181.24	2,347.03	1.00	-1.00	0.16
4,770.00	30.60	291.73	4,030.24	889.19	-2,226.02	2,395.21	0.57	-0.56	-0.10
4,864.00	29.19	292.52	4,111.73	906.83	-2,269.42	2,442.02	1.56	-1.50	0.84
4,959.00	26.82	291.55	4,195.60	923.57	-2,310.76	2,486.57	2.54	-2.49	-1.02
5,053.00	26.12	292.52	4,279.75	939.29	-2,349.60	2,528.43	0.88	-0.74	1.03
5,148.00	24.27	290.85	4,365.71	954.25	-2,387.17	2,568.84	2.09	-1.95	-1.76
5,242.00	23.83	290.76	4,451.55	967.86	-2,422.98	2,607.14	0.47	-0.47	-0.10
5,337.00	21.63	291.03	4,539.16	980.94	-2,457.27	2,643.83	2.32	-2.32	0.28
5,431.00	19.35	287.65	4,627.21	991.88	-2,488.29	2,676.72	2.73	-2.43	-3.60
5,525.00	19.30	288.59	4,715.92	1,001.56	-2,517.85	2,707.82	0.34	-0.05	1.00
5,620.00	17.18	288.56	4,806.14	1,011.03	-2,546.03	2,737.55	2.23	-2.23	-0.03
5,714.00	14.86	289.95	4,896.48	1,019.56	-2,570.53	2,763.48	2.50	-2.47	1.48
5,809.00	13.76	291.29	4,988.53	1,027.82	-2,592.51	2,786.96	1.21	-1.16	1.41
5,904.00	13.42	290.59	5,080.87	1,035.80	-2,613.35	2,809.27	0.40	-0.36	-0.74
5,998.00	11.34	289.09	5,172.68	1,042.66	-2,632.30	2,829.42	2.24	-2.21	-1.60
6,092.00	11.08	288.48	5,264.89	1,048.55	-2,649.60	2,847.70	0.30	-0.28	-0.65
6,186.00	8.97	291.03	5,357.45	1,054.04	-2,665.01	2,864.05	2.29	-2.24	2.71
6,281.00	7.04	282.70	5,451.52	1,057.98	-2,677.60	2,877.24	2.37	-2.03	-8.77
6,375.00	4.78	279.87	5,545.02	1,059.92	-2,687.08	2,886.82	2.42	-2.40	-3.01
6,421.48	3.40	281.55	5,591.38	1,060.52	-2,690.34	2,890.10	2.98	-2.97	3.61
SR 411-12 MVRD									
6,469.00	2.00	285.64	5,638.84	1,061.03	-2,692.52	2,892.32	2.98	-2.95	8.62
6,564.00	0.62	299.01	5,733.82	1,061.73	-2,694.57	2,894.48	1.48	-1.45	14.07
6,658.00	0.53	312.65	5,827.81	1,062.27	-2,695.33	2,895.38	0.17	-0.10	14.51
6,753.00	0.59	313.64	5,922.81	1,062.90	-2,696.01	2,896.23	0.06	0.06	1.04
6,847.00	0.62	309.31	6,016.80	1,063.56	-2,696.75	2,897.15	0.06	0.03	-4.61
6,942.00	0.44	336.20	6,111.80	1,064.22	-2,697.30	2,897.89	0.32	-0.19	28.31
7,036.00	0.74	350.24	6,205.79	1,065.15	-2,697.55	2,898.43	0.35	0.32	14.94
7,131.00	0.88	1.69	6,300.78	1,066.48	-2,697.63	2,898.96	0.22	0.15	12.05
7,225.00	0.85	344.51	6,394.77	1,067.87	-2,697.79	2,899.58	0.28	-0.03	-18.28
7,320.00	0.79	337.79	6,489.76	1,069.16	-2,698.23	2,900.42	0.12	-0.06	-7.07
7,414.00	0.53	307.38	6,583.76	1,070.02	-2,698.82	2,901.26	0.45	-0.28	-32.35
7,509.00	0.53	307.38	6,678.75	1,070.56	-2,699.52	2,902.10	0.00	0.00	0.00
7,603.00	0.44	259.65	6,772.75	1,070.75	-2,700.22	2,902.83	0.43	-0.10	-50.78
7,697.00	0.56	260.99	6,866.75	1,070.62	-2,701.03	2,903.54	0.13	0.13	1.43
7,792.00	0.59	259.70	6,961.74	1,070.46	-2,701.97	2,904.38	0.03	0.03	-1.36
7,886.00	0.53	296.56	7,055.74	1,070.57	-2,702.83	2,905.23	0.38	-0.06	39.21
7,981.00	0.43	297.23	7,150.73	1,070.93	-2,703.54	2,906.02	0.11	-0.11	0.71
8,075.00	0.38	276.99	7,244.73	1,071.12	-2,704.16	2,906.67	0.16	-0.05	-21.53
8,170.00	0.35	259.83	7,339.73	1,071.11	-2,704.76	2,907.23	0.12	-0.03	-18.06
8,264.00	0.14	315.24	7,433.73	1,071.14	-2,705.13	2,907.58	0.31	-0.22	58.95

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Site:	RU 32-12 Pad	MD Reference:	GL 7254' & RKB 24' @ 7278.00usft (H&P 318)
Well:	SR 411-12	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)
8,359.00	0.09	117.85	7,528.73	1,071.19	-2,705.14	2,907.61	0.24	-0.05	171.17
8,453.00	0.26	218.32	7,622.73	1,070.99	-2,705.21	2,907.61	0.31	0.18	106.88
8,547.00	0.55	276.34	7,716.73	1,070.87	-2,705.79	2,908.12	0.50	0.31	61.72
8,642.00	0.92	247.40	7,811.72	1,070.63	-2,706.95	2,909.13	0.54	0.39	-30.46
8,736.00	1.32	243.92	7,905.70	1,069.86	-2,708.62	2,910.44	0.43	0.43	-3.70
8,830.00	1.49	247.70	7,999.67	1,068.92	-2,710.72	2,912.11	0.21	0.18	4.02
8,925.00	1.67	254.90	8,094.64	1,068.09	-2,713.20	2,914.17	0.28	0.19	7.58
9,020.00	1.41	246.20	8,189.60	1,067.26	-2,715.60	2,916.16	0.37	-0.27	-9.16
9,114.00	1.85	246.03	8,283.56	1,066.18	-2,718.05	2,918.10	0.47	0.47	-0.18
9,208.00	1.14	220.63	8,377.53	1,064.85	-2,720.04	2,919.54	1.02	-0.76	-27.02
9,303.00	0.97	203.58	8,472.52	1,063.40	-2,720.98	2,919.93	0.37	-0.18	-17.95
9,397.00	1.41	204.72	8,566.50	1,061.62	-2,721.78	2,920.10	0.47	0.47	1.21
9,492.00	2.11	217.74	8,661.45	1,059.17	-2,723.34	2,920.75	0.84	0.74	13.71
9,586.00	2.19	222.49	8,755.39	1,056.48	-2,725.62	2,921.99	0.21	0.09	5.05
9,681.00	2.81	226.96	8,850.29	1,053.55	-2,728.54	2,923.77	0.68	0.65	4.71
9,775.00	2.66	232.47	8,944.19	1,050.65	-2,731.96	2,926.02	0.32	-0.16	5.86
9,869.00	2.41	235.58	9,038.10	1,048.20	-2,735.32	2,928.37	0.30	-0.27	3.31
9,964.00	2.29	243.79	9,133.02	1,046.24	-2,738.67	2,930.87	0.38	-0.13	8.64
10,059.00	2.33	245.45	9,227.94	1,044.60	-2,742.13	2,933.58	0.08	0.04	1.75
10,117.00	2.11	245.68	9,285.90	1,043.67	-2,744.17	2,935.19	0.38	-0.38	0.40
Last SDI Production MWD Survey									
10,163.08	2.11	245.68	9,331.94	1,042.97	-2,745.72	2,936.42	0.00	0.00	0.00
SR 411-12 PBHL									
10,177.00	2.11	245.68	9,345.85	1,042.76	-2,746.19	2,936.79	0.00	0.00	0.00
Projection to TD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
122.00	122.00	-0.07	-0.66	First SDI Gyro MWD Survey
962.00	932.64	64.12	-176.53	Last SDI Gyro MWD Survey
1,038.00	998.36	75.98	-212.78	First SDI Surface MWD Survey
1,178.00	1,113.35	101.87	-288.25	Last SDI Surface MWD Survey
1,274.00	1,190.34	119.87	-342.70	First SDI Production MWD Survey
10,117.00	9,285.90	1,043.67	-2,744.17	Last SDI Production MWD Survey
10,177.00	9,345.85	1,042.76	-2,746.19	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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Well Details: SR 411-12

TVD Reference: GL 7254' & RKB 24' @ 7278.00usft (H&P 318) Level: 7254.00
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.00 0.00 1599209.50 2341060.20 39.4553612 -107.8339154 A7

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well SR 411-12 - Slot A7, True North
Vertical (TVD) Reference: GL 7254' & RKB 24' @ 7278.00usft (H&P 318)
Section (VS) Reference: Slot - A7(0.00N, 0.00E)
Measured Depth Reference: GL 7254' & RKB 24' @ 7278.00usft (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

12:21, August 14 2017
Created By: Mel Mireles Jr.