



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 413-12
County & State	Garfield County, CO
SDI Job No.	OP.006450
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 93 feet to a measured depth of 9,844 feet is true and correct as determined from all available records.

Signature

 27-Dec-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 413-12 - Slot SR 413-12 (A6)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 7478' & RKB 24' @ 7502.00usft (H&P 318)
Site:	SR 23-12 Pad	MD Reference:	GL 7478' & RKB 24' @ 7502.00usft (H&P 318)
Well:	SR 413-12	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	SR 23-12 Pad				
Site Position:		Northing:	1,597,713.40 usft	Latitude:	39.4511965
From:	Map	Easting:	2,340,229.70 usft	Longitude:	-107.8367194
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.47 °

Well	SR 413-12 - Slot SR 413-12 (A6)					
Well Position	+N/-S	0.00 usft	Northing:	1,597,678.40 usft	Latitude:	39.4511014
	+E/-W	0.00 usft	Easting:	2,340,243.30 usft	Longitude:	-107.8366681
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	7,478.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/5/2017	9.23	65.62	51,639

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	131.31	

Survey Program	Date	12/27/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
93.00	582.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
661.00	1,074.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,182.00	9,844.00	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	0.00
93.00	0.44	131.31	93.00	-0.24	0.27	0.36	0.47	0.47	0.00	0.00
First SDI Gyro MWD Survey										
163.00	0.79	270.35	163.00	-0.41	-0.01	0.26	1.66	0.50	198.63	
210.00	2.11	279.23	209.98	-0.27	-1.19	-0.72	2.84	2.81	18.89	
303.00	4.66	280.37	302.81	0.69	-6.60	-5.41	2.74	2.74	1.23	
395.00	7.74	276.86	394.26	2.10	-16.43	-13.72	3.37	3.35	-3.82	
488.00	11.17	275.36	485.99	3.69	-31.62	-26.18	3.70	3.69	-1.61	
582.00	13.55	268.51	577.81	4.25	-51.69	-41.64	2.97	2.53	-7.29	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SR 413-12 - Slot SR 413-12 (A6)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 7478' & RKB 24' @ 7502.00usft (H&P 318)
Site:	SR 23-12 Pad	MD Reference:	GL 7478' & RKB 24' @ 7502.00usft (H&P 318)
Well:	SR 413-12	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)	
Last SDI Gyro MWD Survey										
661.00	16.37	269.42	654.12	3.90	-72.08	-56.72	3.58	3.57	1.15	
First SDI Surface MWD Survey										
756.00	18.75	267.50	744.69	3.10	-100.73	-77.71	2.58	2.51	-2.02	
850.00	22.16	266.30	832.75	1.29	-133.52	-101.15	3.65	3.63	-1.28	
945.00	22.29	267.25	920.69	-0.73	-169.40	-126.76	0.40	0.14	1.00	
1,039.00	23.52	267.68	1,007.28	-2.34	-205.95	-153.15	1.32	1.31	0.46	
1,074.00	23.39	266.83	1,039.38	-3.01	-219.86	-163.16	1.04	-0.37	-2.43	
Last SDI Surface MWD Survey										
1,182.00	24.09	267.27	1,138.25	-5.24	-263.28	-194.30	0.67	0.65	0.41	
First SDI Production MWD Survey										
1,276.00	23.60	267.63	1,224.22	-6.94	-301.24	-221.70	0.54	-0.52	0.38	
1,371.00	23.99	266.69	1,311.15	-8.84	-339.53	-249.20	0.57	0.41	-0.99	
1,465.00	24.15	267.76	1,396.97	-10.69	-377.82	-276.74	0.49	0.17	1.14	
1,560.00	24.54	267.38	1,483.53	-12.35	-416.94	-305.03	0.44	0.41	-0.40	
1,654.00	24.33	266.28	1,569.11	-14.50	-455.77	-332.78	0.53	-0.22	-1.17	
1,749.00	24.31	266.11	1,655.68	-17.10	-494.80	-360.38	0.08	-0.02	-0.18	
1,843.00	24.30	266.51	1,741.34	-19.59	-533.41	-387.74	0.18	-0.01	0.43	
1,938.00	24.41	265.01	1,827.89	-22.49	-572.48	-415.17	0.66	0.12	-1.58	
2,032.00	24.22	269.00	1,913.56	-24.51	-611.11	-442.85	1.76	-0.20	4.24	
2,126.00	24.09	269.73	1,999.33	-24.94	-649.57	-471.46	0.35	-0.14	0.78	
2,221.00	24.30	269.75	2,085.98	-25.12	-688.51	-500.59	0.22	0.22	0.02	
2,315.00	24.00	270.62	2,171.76	-24.99	-726.96	-529.56	0.50	-0.32	0.93	
2,409.00	23.92	269.29	2,257.66	-25.02	-765.14	-558.21	0.58	-0.09	-1.41	
2,504.00	23.70	269.57	2,344.57	-25.40	-803.49	-586.77	0.26	-0.23	0.29	
2,598.00	23.47	271.08	2,430.72	-25.19	-841.09	-615.16	0.69	-0.24	1.61	
2,693.00	23.23	270.45	2,517.94	-24.69	-878.74	-643.77	0.36	-0.25	-0.66	
2,787.00	22.67	270.80	2,604.50	-24.29	-915.39	-671.56	0.61	-0.60	0.37	
2,882.00	22.54	272.32	2,692.20	-23.30	-951.89	-699.63	0.63	-0.14	1.60	
2,977.00	23.79	269.64	2,779.54	-22.68	-989.25	-728.10	1.72	1.32	-2.82	
3,071.00	23.83	270.83	2,865.54	-22.53	-1,027.19	-756.71	0.51	0.04	1.27	
3,165.00	23.72	270.60	2,951.57	-22.05	-1,065.09	-785.48	0.15	-0.12	-0.24	
3,260.00	23.12	270.95	3,038.74	-21.54	-1,102.84	-814.18	0.65	-0.63	0.37	
3,354.00	22.56	271.24	3,125.37	-20.85	-1,139.32	-842.04	0.61	-0.60	0.31	
3,448.00	22.10	270.95	3,212.32	-20.16	-1,175.03	-869.31	0.50	-0.49	-0.31	
3,543.00	24.12	269.34	3,299.69	-20.09	-1,212.31	-897.36	2.23	2.13	-1.69	
3,637.00	23.58	268.93	3,385.66	-20.66	-1,250.32	-925.53	0.60	-0.57	-0.44	
3,732.00	22.77	269.73	3,473.00	-21.10	-1,287.70	-953.32	0.91	-0.85	0.84	
3,826.00	21.97	270.59	3,559.92	-21.01	-1,323.47	-980.26	0.92	-0.85	0.91	
3,921.00	21.72	271.22	3,648.10	-20.45	-1,358.82	-1,007.17	0.36	-0.26	0.66	
4,015.00	21.10	269.99	3,735.62	-20.08	-1,393.13	-1,033.19	0.81	-0.66	-1.31	
4,110.00	20.54	271.39	3,824.41	-19.68	-1,426.89	-1,058.81	0.79	-0.59	1.47	
4,204.00	20.20	271.03	3,912.53	-18.99	-1,459.60	-1,083.84	0.39	-0.36	-0.38	
4,298.00	19.90	271.19	4,000.84	-18.37	-1,491.82	-1,108.45	0.32	-0.32	0.17	

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Site:	SR 23-12 Pad	MD Reference:	GL 7478' & RKB 24' @ 7502.00usft (H&P 318)
Well:	SR 413-12	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

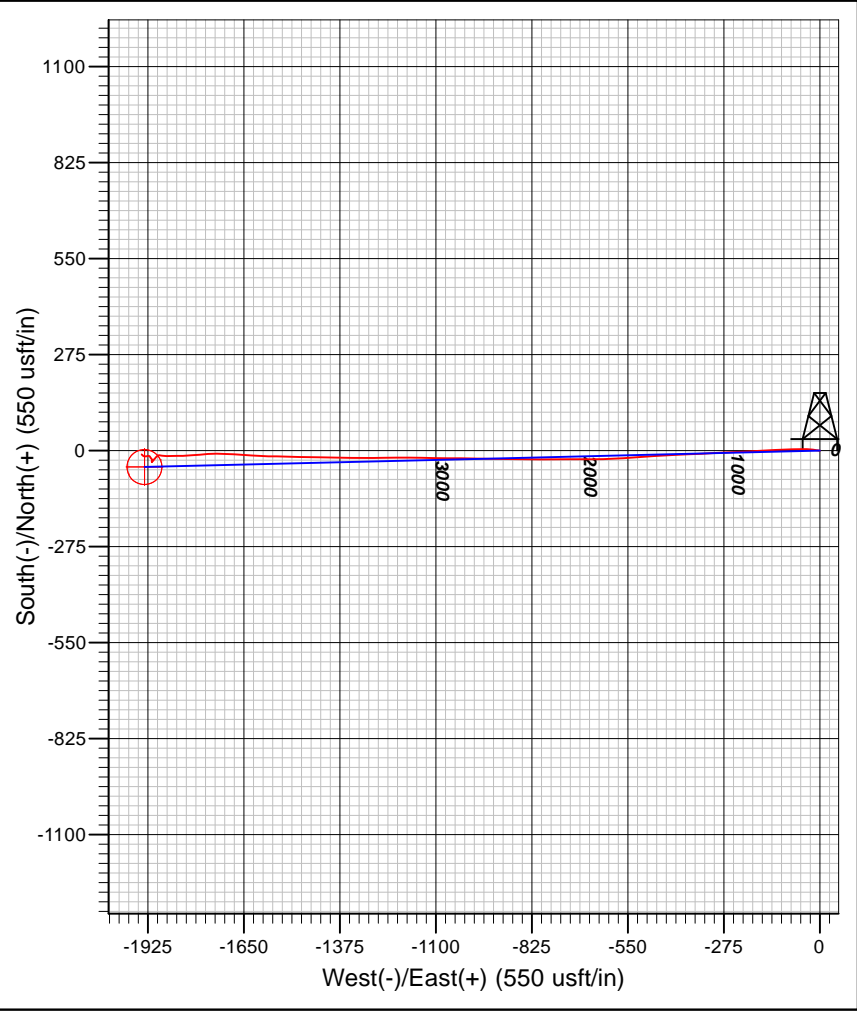
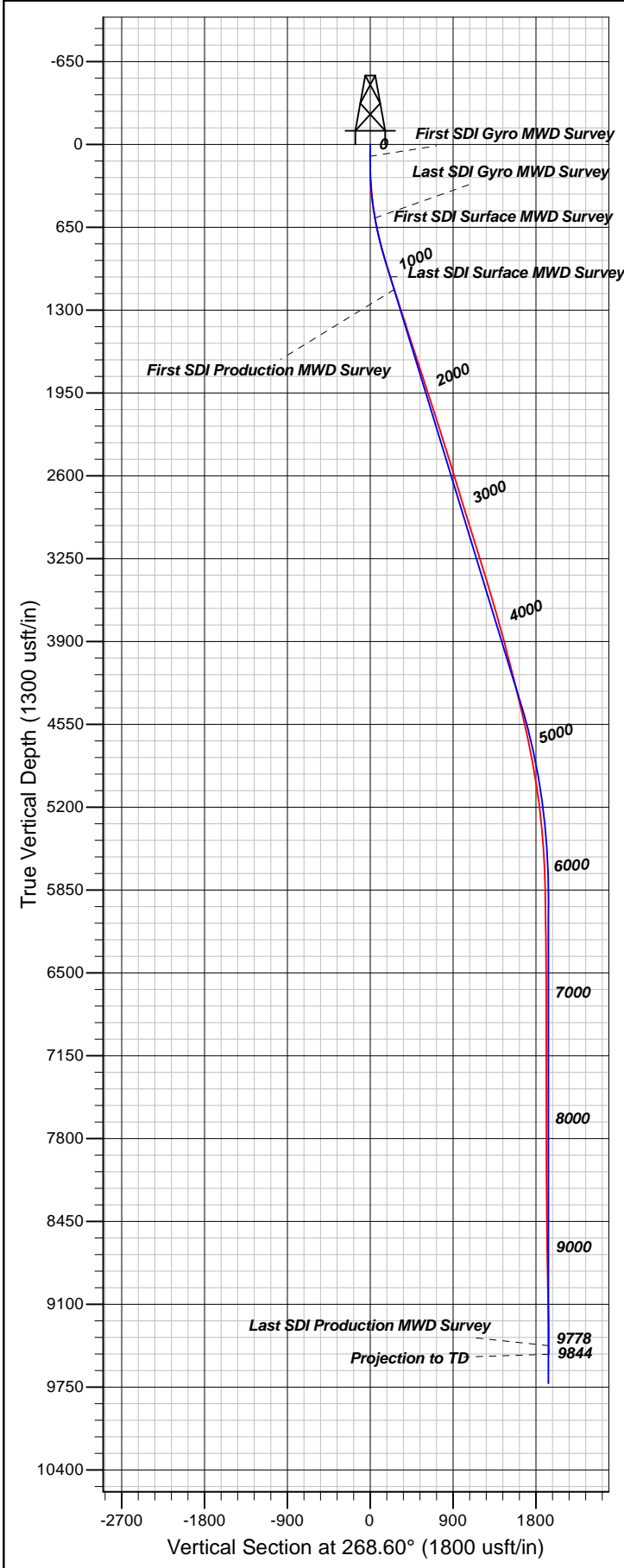
Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,393.00	19.64	271.61	4,090.24	-17.58	-1,523.94	-1,133.10	0.31	-0.27	0.44	
4,487.00	19.17	272.00	4,178.90	-16.60	-1,555.16	-1,157.20	0.52	-0.50	0.41	
4,582.00	18.78	271.75	4,268.74	-15.59	-1,586.03	-1,181.06	0.42	-0.41	-0.26	
4,676.00	18.40	272.24	4,357.83	-14.55	-1,615.98	-1,204.24	0.44	-0.40	0.52	
4,771.00	18.09	272.99	4,448.05	-13.19	-1,645.69	-1,227.45	0.41	-0.33	0.79	
4,865.00	17.45	273.66	4,537.57	-11.53	-1,674.33	-1,250.06	0.71	-0.68	0.71	
4,959.00	17.16	273.85	4,627.31	-9.70	-1,702.23	-1,272.23	0.31	-0.31	0.20	
5,054.00	15.51	270.48	4,718.48	-8.65	-1,728.92	-1,292.96	2.00	-1.74	-3.55	
5,149.00	14.60	264.98	4,810.22	-9.59	-1,753.55	-1,310.84	1.78	-0.96	-5.79	
5,244.00	14.26	264.83	4,902.22	-11.70	-1,777.13	-1,327.17	0.36	-0.36	-0.16	
5,339.00	12.13	265.77	4,994.71	-13.49	-1,798.74	-1,342.22	2.25	-2.24	0.99	
5,434.00	12.05	267.00	5,087.60	-14.74	-1,818.60	-1,356.30	0.28	-0.08	1.29	
5,529.00	9.50	268.94	5,180.92	-15.41	-1,836.34	-1,369.19	2.71	-2.68	2.04	
5,624.00	8.73	271.73	5,274.72	-15.33	-1,851.38	-1,380.54	0.93	-0.81	2.94	
5,719.00	7.41	263.27	5,368.78	-15.83	-1,864.68	-1,390.20	1.87	-1.39	-8.91	
5,813.00	5.80	275.79	5,462.16	-16.06	-1,875.42	-1,398.12	2.29	-1.71	13.32	
5,907.00	5.82	282.07	5,555.68	-14.59	-1,884.81	-1,406.14	0.68	0.02	6.68	
6,002.00	4.40	267.71	5,650.30	-13.73	-1,893.16	-1,412.98	2.00	-1.49	-15.12	
6,096.00	2.32	226.88	5,744.15	-15.17	-1,898.15	-1,415.78	3.24	-2.21	-43.44	
6,191.00	2.02	223.67	5,839.08	-17.70	-1,900.71	-1,416.04	0.34	-0.32	-3.38	
6,222.51	2.04	223.37	5,870.57	-18.51	-1,901.48	-1,416.08	0.06	0.05	-0.95	
SR 413-12 BTV										
6,285.00	2.07	222.79	5,933.02	-20.14	-1,903.01	-1,416.15	0.06	0.05	-0.93	
6,379.00	2.02	218.49	6,026.96	-22.68	-1,905.19	-1,416.11	0.17	-0.05	-4.57	
6,473.00	1.67	218.14	6,120.91	-25.06	-1,907.07	-1,415.95	0.37	-0.37	-0.37	
6,568.00	1.29	220.89	6,215.88	-26.96	-1,908.63	-1,415.87	0.41	-0.40	2.89	
6,662.00	0.88	219.54	6,309.86	-28.31	-1,909.78	-1,415.84	0.44	-0.44	-1.44	
6,757.00	0.70	222.79	6,404.85	-29.30	-1,910.64	-1,415.83	0.20	-0.19	3.42	
6,851.00	0.79	243.71	6,498.85	-30.01	-1,911.61	-1,416.09	0.30	0.10	22.26	
6,946.00	0.53	232.11	6,593.84	-30.57	-1,912.54	-1,416.42	0.31	-0.27	-12.21	
7,040.00	0.50	201.46	6,687.84	-31.22	-1,913.04	-1,416.37	0.29	-0.03	-32.61	
7,135.00	0.26	164.08	6,782.83	-31.81	-1,913.13	-1,416.04	0.35	-0.25	-39.35	
7,229.00	0.11	336.75	6,876.83	-31.93	-1,913.10	-1,415.95	0.39	-0.16	183.69	
7,323.00	0.17	353.28	6,970.83	-31.71	-1,913.16	-1,416.13	0.08	0.06	17.59	
7,418.00	0.24	262.33	7,065.83	-31.60	-1,913.37	-1,416.37	0.31	0.07	-95.74	
7,512.00	0.18	248.11	7,159.83	-31.68	-1,913.70	-1,416.56	0.08	-0.06	-15.13	
7,606.00	0.18	24.60	7,253.83	-31.60	-1,913.78	-1,416.67	0.36	0.00	145.20	
7,701.00	0.17	261.29	7,348.83	-31.49	-1,913.86	-1,416.81	0.32	-0.01	-129.80	
7,795.00	0.44	12.65	7,442.83	-31.15	-1,913.91	-1,417.07	0.56	0.29	118.47	
7,889.00	0.53	24.78	7,536.83	-30.41	-1,913.65	-1,417.37	0.14	0.10	12.90	
7,984.00	0.70	356.04	7,631.82	-29.43	-1,913.51	-1,417.90	0.37	0.18	-30.25	
8,078.00	0.97	0.52	7,725.81	-28.06	-1,913.54	-1,418.83	0.30	0.29	4.77	
8,172.00	0.95	1.09	7,819.80	-26.49	-1,913.52	-1,419.85	0.02	-0.02	0.61	

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Well:	SR 413-12	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

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)
8,267.00	0.88	335.03	7,914.79	-25.04	-1,913.81	-1,421.03	0.44	-0.07	-27.43
8,361.00	1.13	320.65	8,008.77	-23.67	-1,914.70	-1,422.61	0.38	0.27	-15.30
8,456.00	1.15	318.94	8,103.75	-22.22	-1,915.92	-1,424.47	0.04	0.02	-1.80
8,550.00	0.96	320.19	8,197.74	-20.91	-1,917.05	-1,426.19	0.20	-0.20	1.33
8,645.00	0.95	319.57	8,292.72	-19.70	-1,918.07	-1,427.75	0.02	-0.01	-0.65
8,739.00	1.32	329.51	8,386.71	-18.17	-1,919.12	-1,429.55	0.44	0.39	10.57
8,833.00	1.04	323.78	8,480.69	-16.55	-1,920.18	-1,431.41	0.32	-0.30	-6.10
8,928.00	1.04	292.92	8,575.67	-15.52	-1,921.48	-1,433.07	0.58	0.00	-32.48
9,022.00	0.97	282.38	8,669.66	-15.02	-1,923.04	-1,434.58	0.21	-0.07	-11.21
9,117.00	1.64	249.00	8,764.63	-15.33	-1,925.10	-1,435.92	1.04	0.71	-35.14
9,211.00	1.88	258.52	8,858.59	-16.12	-1,927.86	-1,437.47	0.40	0.26	10.13
9,306.00	1.93	263.93	8,953.54	-16.60	-1,930.98	-1,439.50	0.20	0.05	5.69
9,400.00	1.49	273.51	9,047.49	-16.69	-1,933.78	-1,441.54	0.56	-0.47	10.19
9,495.00	2.29	290.09	9,142.44	-15.96	-1,936.79	-1,444.28	1.01	0.84	17.45
9,589.00	1.61	315.91	9,236.39	-14.37	-1,939.47	-1,447.35	1.16	-0.72	27.47
9,683.00	1.09	307.31	9,330.36	-12.88	-1,941.10	-1,449.56	0.59	-0.55	-9.15
9,778.00	0.72	313.53	9,425.35	-11.92	-1,942.26	-1,451.05	0.40	-0.39	6.55
Last SDI Production MWD Survey									
9,844.00	0.72	313.53	9,491.35	-11.35	-1,942.86	-1,451.88	0.00	0.00	0.00
Projection to TD - SR 413-12 PBHL									

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
93.00	93.00	-0.24	0.27	First SDI Gyro MWD Survey
582.00	577.81	4.25	-51.69	Last SDI Gyro MWD Survey
661.00	654.12	3.90	-72.08	First SDI Surface MWD Survey
1,074.00	1,039.38	-3.01	-219.86	Last SDI Surface MWD Survey
1,182.00	1,138.25	-5.24	-263.28	First SDI Production MWD Survey
9,778.00	9,425.35	-11.92	-1,942.26	Last SDI Production MWD Survey
9,844.00	9,491.35	-11.35	-1,942.86	Projection to TD

Checked By: _____ Approved By: _____ Date: _____



Well Details: SR 413-12					
TVD Reference: GL 7478' & RKB 24' @ 7502.00usft (H&P 318) @ 7478.00					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1597678.40	2340243.30	39.4511014	-107.8366680
SR 413-12 (A6)					
REFERENCE INFORMATION					
Co-ordinate (N/E) Reference: Well SR 413-12 - Slot SR 413-12 (A6), True North					
Vertical (TVD) Reference: GL 7478' & RKB 24' @ 7502.00usft (H&P 318)					
Section (VS) Reference: Slot - SR 413-12 (A6)(0.00N, 0.00E)					
Measured Depth Reference: GL 7478' & RKB 24' @ 7502.00usft (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: Plan #1 28Oct2016 jcsdi					
15:31, December 27 2017 Created By: Mel Mireles Jr.					