



## 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.	GM 432-12
County & State	Garfield County, CO
SDI Job No.	OP.004322
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 9,338 feet is true and correct as determined from all available records.

  
Signature

22-Sep-17  
Date

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

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well SR 432-12 - Slot A12
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 7254' & RKB 24' @ 7278.00usft (H&P 318)
<b>Site:</b>	RU 32-12 Pad	<b>MD Reference:</b>	GL 7254' & RKB 24' @ 7278.00usft (H&P 318)
<b>Well:</b>	SR 432-12	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Grand Junction District

<b>Project</b>	Garfield County, CO NAD83		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	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 432-12 - Slot A12					
Well Position	+N/-S	0.00 usft	Northing:	1,599,173.00 usft	Latitude:	39.4552617
	+E/-W	0.00 usft	Easting:	2,341,068.80 usft	Longitude:	-107.8338816
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	7,254.00 usft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	9/14/2017	9.25	65.67	51,669

<b>Design</b>	OH				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	178.19	

<b>Survey Program</b>	<b>Date</b>	9/22/2017		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
124.00	584.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4
656.00	1,064.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1
1,176.00	9,338.00	Survey #3 - Production MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1

<b>Survey</b>									
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
124.00	1.14	217.18	123.99	-0.98	-0.75	0.96	0.92	0.92	0.00
<b>First SDI Gyro MWD Survey</b>									
216.00	2.82	206.10	215.93	-3.74	-2.29	3.67	1.86	1.83	-12.04
308.00	4.13	201.88	307.76	-8.85	-4.52	8.70	1.45	1.42	-4.59
399.00	4.31	206.10	398.52	-14.96	-7.25	14.73	0.39	0.20	4.64
491.00	5.10	194.06	490.21	-22.03	-9.76	21.71	1.37	0.86	-13.09
584.00	6.33	167.26	582.76	-31.05	-9.64	30.73	3.12	1.32	-28.82

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well SR 432-12 - Slot A12
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 7254' & RKB 24' @ 7278.00usft (H&P 318)
<b>Site:</b>	RU 32-12 Pad	<b>MD Reference:</b>	GL 7254' & RKB 24' @ 7278.00usft (H&P 318)
<b>Well:</b>	SR 432-12	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)
<b>Last SDI Gyro MWD Survey</b>									
656.00	7.33	160.72	654.25	-39.25	-7.25	39.00	1.76	1.39	-9.08
<b>First SDI Surface MWD Survey</b>									
750.00	8.21	158.82	747.39	-51.17	-2.84	51.06	0.98	0.94	-2.02
844.00	8.71	159.89	840.36	-64.11	2.03	64.15	0.56	0.53	1.14
939.00	8.86	161.73	934.25	-77.82	6.80	77.99	0.34	0.16	1.94
1,033.00	9.60	164.19	1,027.03	-92.23	11.20	92.54	0.89	0.79	2.62
1,064.00	9.67	164.90	1,057.59	-97.23	12.58	97.58	0.44	0.23	2.29
<b>Last SDI Surface MWD Survey</b>									
1,176.00	10.27	166.70	1,167.90	-116.03	17.33	116.52	0.60	0.54	1.61
<b>First SDI Production MWD Survey</b>									
1,271.00	10.48	166.16	1,261.35	-132.66	21.35	133.27	0.24	0.22	-0.57
1,365.00	9.85	163.23	1,353.87	-148.66	25.71	149.40	0.87	-0.67	-3.12
1,460.00	9.85	158.93	1,447.47	-164.02	30.98	164.92	0.77	0.00	-4.53
1,554.00	9.94	157.52	1,540.08	-179.02	36.97	180.10	0.27	0.10	-1.50
1,648.00	9.58	155.68	1,632.72	-193.65	43.29	194.92	0.51	-0.38	-1.96
1,743.00	8.79	149.35	1,726.50	-207.10	50.25	208.58	1.35	-0.83	-6.66
1,837.00	8.25	150.49	1,819.46	-219.14	57.23	220.85	0.60	-0.57	1.21
1,932.00	7.91	148.47	1,913.52	-230.65	64.01	232.56	0.47	-0.36	-2.13
2,026.00	7.74	151.63	2,006.64	-241.73	70.40	243.84	0.49	-0.18	3.36
2,121.00	7.47	147.68	2,100.81	-252.58	76.74	254.88	0.62	-0.28	-4.16
2,215.00	7.26	144.76	2,194.03	-262.59	83.44	265.10	0.46	-0.22	-3.11
2,310.00	6.77	144.07	2,288.32	-272.03	90.18	274.75	0.52	-0.52	-0.73
2,404.00	6.42	147.15	2,381.70	-280.93	96.29	283.84	0.53	-0.37	3.28
2,498.00	6.10	146.29	2,475.14	-289.50	101.91	292.58	0.35	-0.34	-0.91
2,593.00	5.64	142.96	2,569.64	-297.43	107.52	300.68	0.60	-0.48	-3.51
2,688.00	6.06	155.41	2,664.15	-305.71	112.42	309.12	1.40	0.44	13.11
2,782.00	5.63	156.03	2,757.66	-314.44	116.36	317.96	0.46	-0.46	0.66
2,877.00	6.60	164.20	2,852.12	-323.95	119.74	327.58	1.37	1.02	8.60
2,971.00	6.33	164.90	2,945.52	-334.15	122.56	337.86	0.30	-0.29	0.74
3,066.00	6.21	164.66	3,039.96	-344.16	125.28	347.96	0.13	-0.13	-0.25
3,160.00	7.30	176.95	3,133.31	-355.03	126.95	358.87	1.92	1.16	13.07
3,255.00	7.39	176.33	3,227.53	-367.15	127.66	371.01	0.13	0.09	-0.65
3,349.00	7.17	178.33	3,320.77	-379.05	128.22	382.92	0.36	-0.23	2.13
3,444.00	6.91	174.81	3,415.05	-390.67	128.91	394.55	0.53	-0.27	-3.71
3,538.00	6.44	175.91	3,508.42	-401.56	129.79	405.47	0.52	-0.50	1.17
3,633.00	6.14	171.31	3,602.84	-411.89	130.94	415.83	0.62	-0.32	-4.84
3,727.00	6.77	171.50	3,696.25	-422.34	132.52	426.33	0.67	0.67	0.20
3,822.00	6.33	170.71	3,790.63	-433.05	134.19	437.08	0.47	-0.46	-0.83
3,916.00	8.06	168.32	3,883.88	-444.62	136.36	448.71	1.87	1.84	-2.54
4,011.00	7.76	166.35	3,977.98	-457.37	139.23	461.55	0.43	-0.32	-2.07
4,105.00	7.74	166.75	4,071.12	-469.70	142.17	473.97	0.06	-0.02	0.43
4,200.00	7.69	165.80	4,165.26	-482.09	145.20	486.44	0.14	-0.05	-1.00
4,294.00	7.68	162.96	4,258.42	-494.19	148.58	498.65	0.40	-0.01	-3.02

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<b>Site:</b>	RU 32-12 Pad	<b>MD Reference:</b>	GL 7254' & RKB 24' @ 7278.00usft (H&P 318)
<b>Well:</b>	SR 432-12	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Grand Junction District

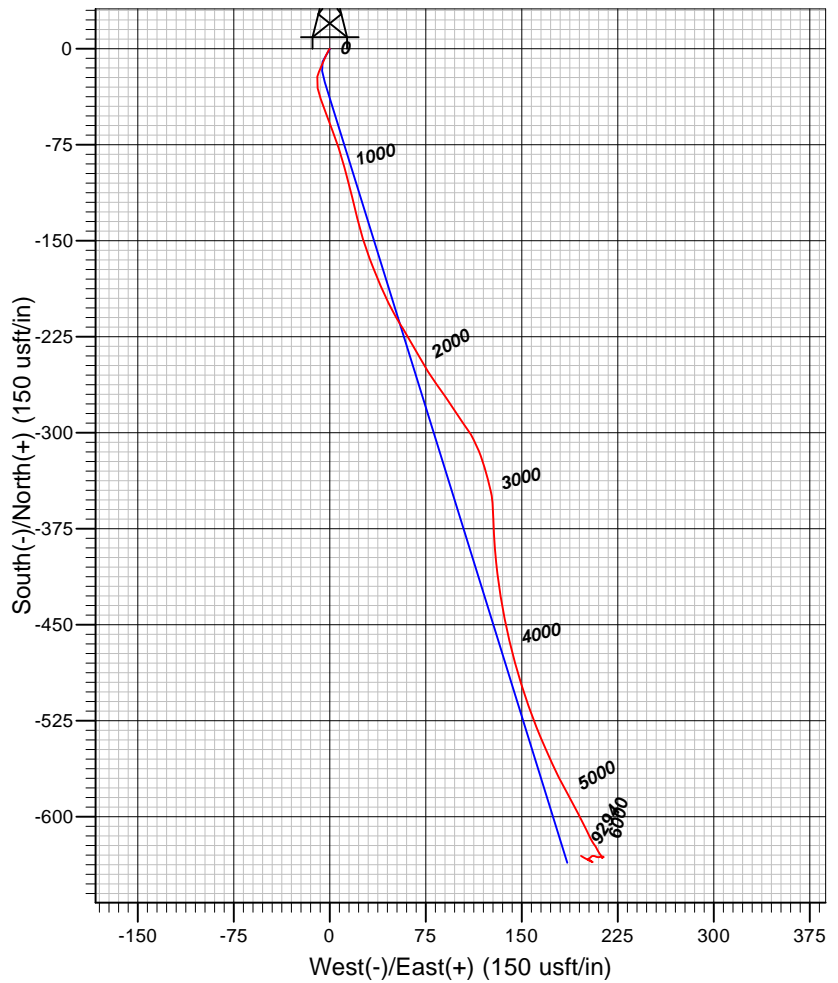
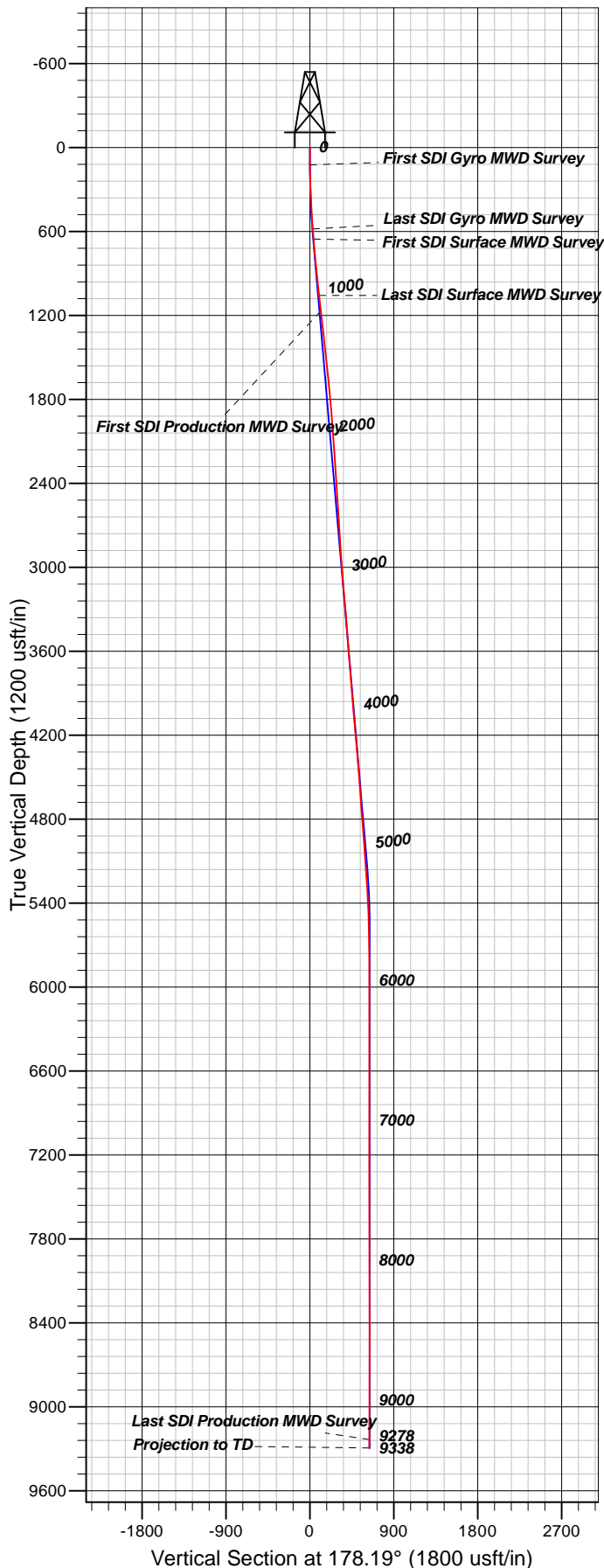
Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,389.00	7.21	159.28	4,352.62	-505.84	152.55	510.41	0.70	-0.49	-3.87
4,483.00	7.21	160.51	4,445.87	-516.92	156.61	521.61	0.16	0.00	1.31
4,578.00	6.83	160.40	4,540.16	-527.86	160.49	532.67	0.40	-0.40	-0.12
4,672.00	6.73	156.51	4,633.51	-538.17	164.56	543.11	0.50	-0.11	-4.14
4,767.00	6.51	156.41	4,727.87	-548.21	168.94	553.29	0.23	-0.23	-0.11
4,861.00	7.45	154.40	4,821.17	-558.59	173.70	563.81	1.03	1.00	-2.14
4,955.00	7.05	155.30	4,914.42	-569.33	178.75	574.70	0.44	-0.43	0.96
5,050.00	7.17	149.55	5,008.69	-579.74	184.19	585.28	0.76	0.13	-6.05
5,144.00	6.77	151.37	5,102.00	-589.66	189.81	595.37	0.49	-0.43	1.94
5,239.00	6.68	154.14	5,196.34	-599.55	194.91	605.42	0.35	-0.09	2.92
5,333.00	5.14	154.12	5,289.84	-608.25	199.13	614.25	1.64	-1.64	-0.02
5,427.00	5.45	152.78	5,383.44	-616.01	203.01	622.13	0.36	0.33	-1.43
5,522.00	3.25	144.14	5,478.16	-622.21	206.65	628.44	2.41	-2.32	-9.09
5,616.00	1.58	156.73	5,572.08	-625.56	208.72	631.85	1.85	-1.78	13.39
5,644.85	1.58	153.03	5,600.92	-626.28	209.06	632.58	0.35	-0.02	-12.84
SR 432-12 MVRD									
5,711.00	1.59	144.56	5,667.04	-627.83	210.01	634.17	0.35	0.02	-12.80
5,805.00	1.85	147.49	5,761.00	-630.18	211.58	636.56	0.29	0.28	3.12
5,900.00	0.18	199.36	5,855.98	-631.61	212.35	638.02	1.84	-1.76	54.60
5,994.00	0.09	113.49	5,949.98	-631.78	212.37	638.19	0.21	-0.10	-91.35
6,089.00	0.09	88.62	6,044.98	-631.81	212.51	638.22	0.04	0.00	-26.18
6,183.00	0.13	158.66	6,138.98	-631.90	212.63	638.32	0.14	0.04	74.51
6,277.00	0.09	289.97	6,232.98	-631.98	212.60	638.39	0.21	-0.04	139.69
6,372.00	0.24	39.95	6,327.98	-631.80	212.65	638.22	0.30	0.16	115.77
6,466.00	0.18	124.47	6,421.98	-631.73	212.90	638.16	0.30	-0.06	89.91
6,560.00	0.26	89.49	6,515.98	-631.82	213.24	638.25	0.16	0.09	-37.21
6,654.00	0.26	82.73	6,609.98	-631.79	213.66	638.23	0.03	0.00	-7.19
6,749.00	0.18	321.53	6,704.98	-631.64	213.78	638.09	0.41	-0.08	-127.58
6,844.00	0.26	333.83	6,799.98	-631.33	213.59	637.78	0.10	0.08	12.95
6,938.00	0.26	276.44	6,893.98	-631.12	213.29	637.55	0.27	0.00	-61.05
7,033.00	0.18	255.52	6,988.97	-631.13	212.93	637.55	0.12	-0.08	-22.02
7,127.00	0.44	279.16	7,082.97	-631.11	212.43	637.52	0.30	0.28	25.15
7,221.00	0.23	247.97	7,176.97	-631.12	211.90	637.51	0.29	-0.22	-33.18
7,316.00	0.35	255.26	7,271.97	-631.27	211.44	637.65	0.13	0.13	7.67
7,411.00	0.62	251.48	7,366.97	-631.51	210.67	637.86	0.29	0.28	-3.98
7,505.00	0.79	267.91	7,460.96	-631.69	209.54	638.01	0.28	0.18	17.48
7,599.00	0.91	293.55	7,554.95	-631.42	208.21	637.69	0.42	0.13	27.28
7,694.00	1.01	285.66	7,649.94	-630.89	206.71	637.12	0.17	0.11	-8.31
7,788.00	0.62	270.90	7,743.93	-630.66	205.41	636.84	0.47	-0.41	-15.70
7,883.00	0.57	228.16	7,838.92	-630.96	204.54	637.12	0.46	-0.05	-44.99
7,977.00	1.02	229.43	7,932.91	-631.82	203.56	637.95	0.48	0.48	1.35
8,072.00	1.31	237.87	8,027.89	-632.95	202.00	639.03	0.35	0.31	8.88
8,166.00	0.70	86.24	8,121.89	-633.48	201.66	639.55	2.08	-0.65	-161.31
8,261.00	0.97	123.68	8,216.88	-633.89	202.91	640.00	0.63	0.28	39.41

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<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)
8,355.00	0.64	130.51	8,310.87	-634.67	203.97	640.81	0.36	-0.35	7.27
8,449.00	0.47	126.27	8,404.86	-635.24	204.68	641.40	0.19	-0.18	-4.51
8,544.00	0.17	91.95	8,499.86	-635.48	205.13	641.65	0.36	-0.32	-36.13
8,638.00	0.09	323.55	8,593.86	-635.42	205.23	641.60	0.25	-0.09	-136.60
8,733.00	0.36	285.01	8,688.86	-635.28	204.90	641.45	0.31	0.28	-40.57
8,827.00	0.62	288.57	8,782.86	-635.05	204.13	641.19	0.28	0.28	3.79
8,921.00	0.88	301.08	8,876.85	-634.51	203.03	640.62	0.33	0.28	13.31
9,016.00	0.97	299.82	8,971.84	-633.73	201.71	639.80	0.10	0.09	-1.33
9,110.00	1.06	290.24	9,065.82	-633.04	200.20	639.06	0.20	0.10	-10.19
9,205.00	1.11	304.21	9,160.81	-632.22	198.62	638.19	0.28	0.05	14.71
9,278.00	1.32	300.52	9,233.79	-631.39	197.31	637.32	0.31	0.29	-5.05
<b>Last SDI Production MWD Survey</b>									
9,338.00	1.32	300.52	9,293.77	-630.69	196.12	636.58	0.00	0.00	0.00
<b>Projection to TD - SR 432-12 PBHL</b>									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
124.00	123.99	-0.98	-0.75	First SDI Gyro MWD Survey
584.00	582.76	-31.05	-9.64	Last SDI Gyro MWD Survey
656.00	654.25	-39.25	-7.25	First SDI Surface MWD Survey
1,064.00	1,057.59	-97.23	12.58	Last SDI Surface MWD Survey
1,176.00	1,167.90	-116.03	17.33	First SDI Production MWD Survey
9,278.00	9,233.79	-631.39	197.31	Last SDI Production MWD Survey
9,338.00	9,293.77	-630.69	196.12	Projection to TD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



#### Well Details: SR 432-12

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	1599173.00	2341068.80	39.4552617	-107.8338816	A12

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well SR 432-12 - Slot A12, True North  
 Vertical (TVD) Reference: GL 7254' & RKB 24' @ 7278.00usft (H&P 318)  
 Section (VS) Reference: Slot - A12(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

18:03, September 22 2017  
 Created By: Mel Mireles Jr.