



# **TEP Rocky Mountain LLC**

**Garfield County, CO NAD83**

**SG 11-22 Pad**

**SG 311-22 - Slot SG 311-22 (A6)**

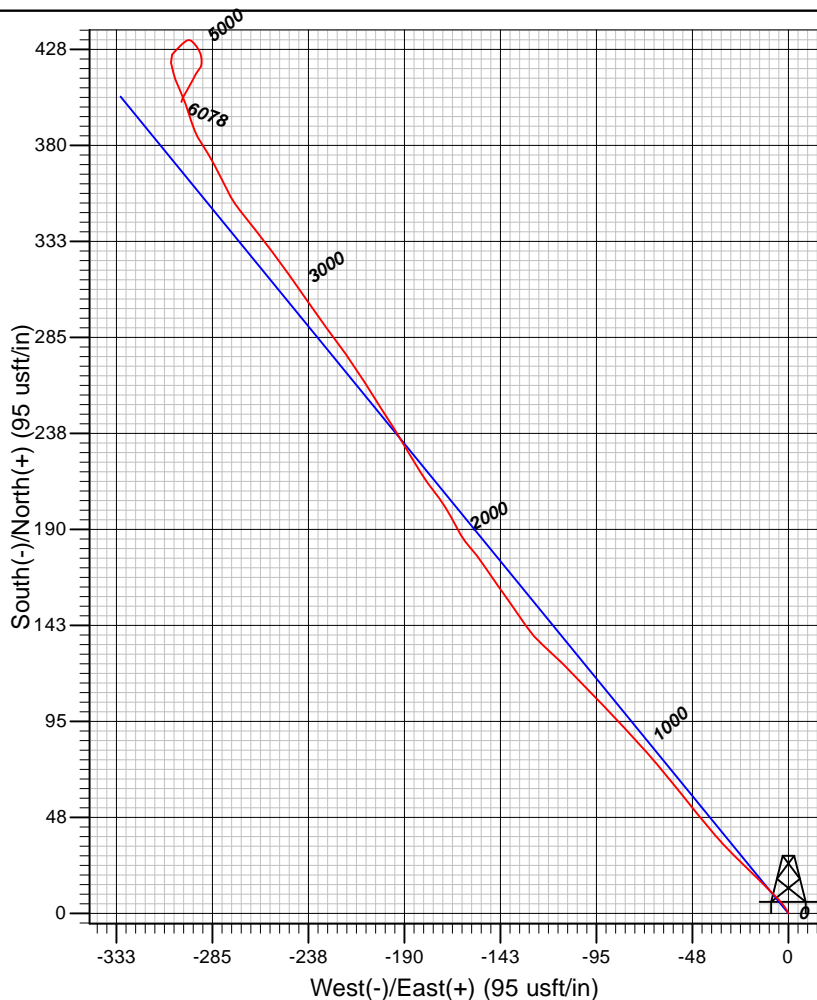
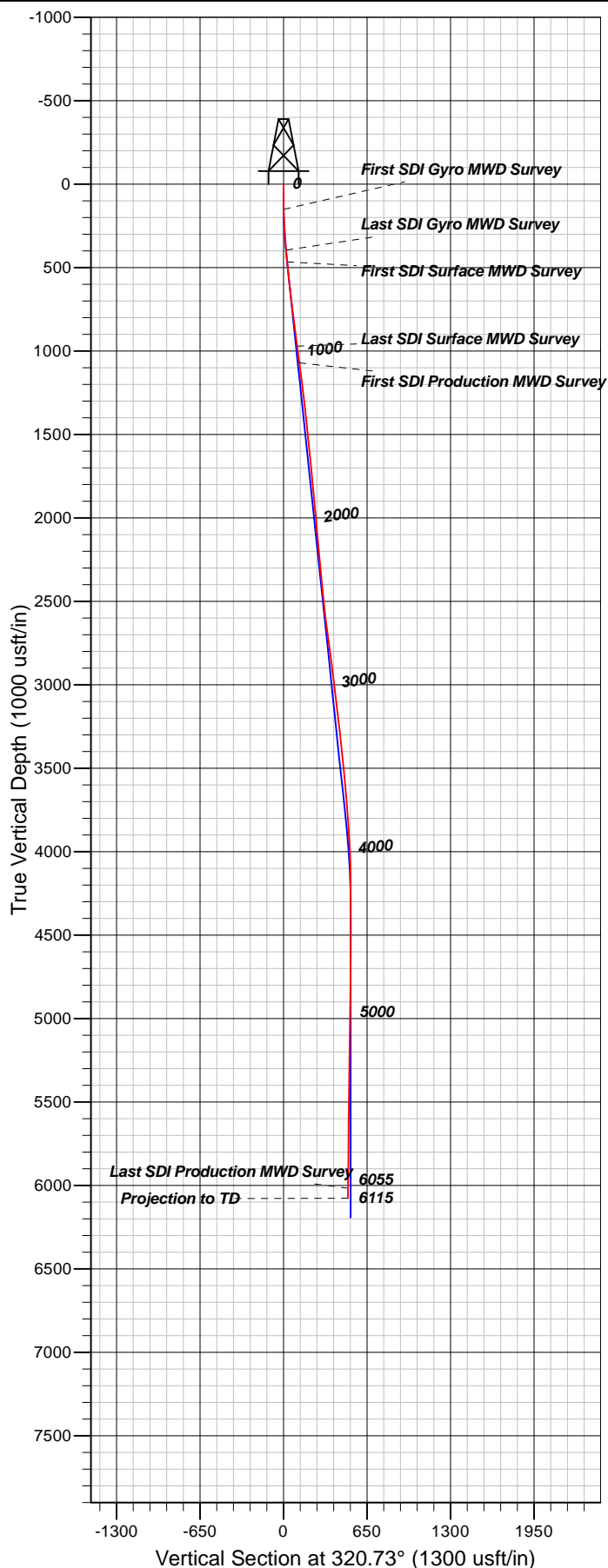
**OH**

**Design: OH**

## **Standard Survey Report**

**28 February, 2019**





#### Well Details: SG 311-22

+N/-S	+E/-W	North	East	Latitude	Longitude	Slot
0.00	0.00	1591231.00	2264536.00	39.4277553	-108.1040078	SG 311-22 (A6)

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well SG 311-22 - Slot SG 311-22 (A6), True North  
 Vertical (TVD) Reference: GL 6092.4' & RKB 24' @ 6116.40usft  
 Section (VS) Reference: Slot - SG 311-22 (A6)(0.00N, 0.00E)  
 Measured Depth Reference: GL 6092.4' & RKB 24' @ 6116.40usft  
 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

15:55, February 28 2019  
 Created By: Mel Mireles Jr.



## Directional Survey Certification

2948 I-70 Business Loop  
Grand Junction, CO 81504  
(970)-245-9447 Fax (970)-245-9454

<b>Operator</b>	TEP Rocky Mountain, LLC.
<b>Well Name &amp; No.</b>	SG 311-22
<b>County &amp; State</b>	Garfield County, CO
<b>SDI Job No.</b>	OP.016766
<b>Rig</b>	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 152 feet to a measured depth of 6,115 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

28-Feb-19

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 SG 311-22 - Slot SG 311-22 (A6)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 6092.4' & RKB 24' @ 6116.40usft
<b>Site:</b>	SG 11-22 Pad	<b>MD Reference:</b>	GL 6092.4' & RKB 24' @ 6116.40usft
<b>Well:</b>	SG 311-22	<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		SG 11-22 Pad			
Site Position:		Northing:	1,591,239.00 usft	Latitude:	39.4277783
From:	Map	Easting:	2,264,548.70 usft	Longitude:	-108.1039637
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.64 °

Well	SG 311-22 - Slot SG 311-22 (A6)					
Well Position	+N/-S	0.00 usft	Northing:	1,591,231.00 usft	Latitude:	39.4277553
	+E/-W	0.00 usft	Easting:	2,264,536.00 usft	Longitude:	-108.1040078
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,092.40 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	2/21/2019	9.38	65.58	51,622

<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	320.73	

<b>Survey Program</b>	<b>Date</b>	2/28/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
152.00	396.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
468.00	979.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,080.00	6,115.00	Survey #3 - Production MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	

<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	
152.00	1.14	330.73	151.99	1.32	-0.74	1.49	0.75	0.75	0.00	
<b>First SDI Gyro MWD Survey</b>										
213.00	2.55	328.27	212.96	3.00	-1.75	3.43	2.31	2.31	-4.03	
305.00	5.72	315.35	304.71	8.01	-6.05	10.03	3.57	3.45	-14.04	
396.00	6.69	315.35	395.17	15.00	-12.96	19.82	1.07	1.07	0.00	
<b>Last SDI Gyro MWD Survey</b>										
468.00	7.23	313.99	466.64	21.13	-19.17	28.49	0.78	0.75	-1.89	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well SG 311-22 - Slot SG 311-22 (A6)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 6092.4' & RKB 24' @ 6116.40usft
<b>Site:</b>	SG 11-22 Pad	<b>MD Reference:</b>	GL 6092.4' & RKB 24' @ 6116.40usft
<b>Well:</b>	SG 311-22	<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>First SDI Surface MWD Survey</b>									
559.00	7.54	314.62	556.89	29.30	-27.54	40.12	0.35	0.34	0.69
651.00	8.33	319.25	648.01	38.59	-36.18	52.78	1.10	0.86	5.03
745.00	9.11	321.15	740.92	49.55	-45.30	67.03	0.88	0.83	2.02
839.00	9.48	321.07	833.69	61.36	-54.83	82.21	0.39	0.39	-0.09
934.00	9.49	319.91	927.39	73.44	-64.79	97.87	0.20	0.01	-1.22
979.00	9.67	318.76	971.76	79.12	-69.67	105.35	0.58	0.40	-2.56
<b>Last SDI Surface MWD Survey</b>									
1,080.00	9.91	317.08	1,071.29	91.86	-81.18	122.50	0.37	0.24	-1.66
<b>First SDI Production MWD Survey</b>									
1,175.00	9.04	315.86	1,164.99	103.21	-91.94	138.10	0.94	-0.92	-1.28
1,269.00	8.89	316.11	1,257.84	113.74	-102.12	152.70	0.16	-0.16	0.27
1,363.00	8.33	315.00	1,350.78	123.79	-111.97	166.71	0.62	-0.60	-1.18
1,458.00	7.52	311.44	1,444.88	132.77	-121.50	179.69	1.00	-0.85	-3.75
1,552.00	8.23	324.94	1,538.00	142.35	-129.98	192.48	2.10	0.76	14.36
1,646.00	7.31	325.93	1,631.13	152.81	-137.19	205.14	0.99	-0.98	1.05
1,741.00	7.23	323.93	1,725.37	162.65	-144.10	217.13	0.28	-0.08	-2.11
1,835.00	7.25	326.14	1,818.62	172.36	-150.88	228.94	0.30	0.02	2.35
1,930.00	6.32	318.17	1,912.96	181.23	-157.71	240.13	1.39	-0.98	-8.39
2,024.00	7.81	332.93	2,006.25	190.77	-164.07	251.54	2.49	1.59	15.70
2,118.00	6.61	327.47	2,099.50	201.02	-169.89	263.16	1.47	-1.28	-5.81
2,213.00	5.69	321.26	2,193.96	209.31	-175.77	273.30	1.19	-0.97	-6.54
2,307.00	6.92	328.02	2,287.39	217.75	-181.69	283.58	1.53	1.31	7.19
2,401.00	8.20	328.91	2,380.57	228.29	-188.15	295.83	1.37	1.36	0.95
2,496.00	8.08	328.51	2,474.61	239.78	-195.14	309.15	0.14	-0.13	-0.42
2,590.00	7.51	326.97	2,567.74	250.57	-201.93	321.80	0.65	-0.61	-1.64
2,684.00	10.30	327.95	2,660.60	262.84	-209.74	336.25	2.97	2.97	1.04
2,779.00	10.01	324.08	2,754.11	276.73	-219.09	352.92	0.78	-0.31	-4.07
2,873.00	9.65	323.87	2,846.73	289.71	-228.53	368.94	0.38	-0.38	-0.22
2,968.00	9.77	325.11	2,940.37	302.75	-237.84	384.93	0.25	0.13	1.31
3,062.00	9.18	324.77	3,033.09	315.42	-246.73	400.36	0.63	-0.63	-0.36
3,157.00	8.54	322.64	3,126.96	327.21	-255.38	414.97	0.76	-0.67	-2.24
3,251.00	7.79	322.67	3,220.00	337.83	-263.48	428.31	0.80	-0.80	0.03
3,346.00	7.42	320.68	3,314.17	347.69	-271.27	440.88	0.48	-0.39	-2.09
3,440.00	8.51	334.64	3,407.27	358.67	-278.09	453.70	2.35	1.16	14.85
3,534.00	7.99	331.48	3,500.29	370.70	-284.19	466.87	0.73	-0.55	-3.36
3,629.00	6.75	325.80	3,594.51	381.12	-290.48	478.92	1.51	-1.31	-5.98
3,723.00	6.68	343.25	3,687.87	390.92	-295.16	489.47	2.16	-0.07	18.56
3,818.00	5.77	340.27	3,782.31	400.71	-298.37	499.08	1.02	-0.96	-3.14
3,912.00	4.94	334.56	3,875.90	408.81	-301.70	507.46	1.05	-0.88	-6.07
4,007.00	3.79	345.09	3,970.63	415.54	-304.27	514.29	1.47	-1.21	11.08
4,101.00	2.99	349.74	4,064.46	420.96	-305.50	519.27	0.90	-0.85	4.95
4,196.00	2.23	34.28	4,159.37	424.92	-304.90	521.96	2.21	-0.80	46.88
4,290.00	1.55	49.24	4,253.32	427.26	-302.91	522.51	0.89	-0.72	15.91

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<b>Well:</b>	SG 311-22	<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)	
4,383.71	1.47	39.38	4,347.00	429.02	-301.19	522.78	0.29	-0.08	-10.52	
SG 311-22 BTV										
4,385.00	1.47	39.24	4,348.29	429.05	-301.17	522.79	0.29	-0.06	-11.04	
4,479.00	1.32	54.26	4,442.26	430.61	-299.52	522.96	0.42	-0.16	15.98	
4,573.00	0.98	63.35	4,536.24	431.61	-297.93	522.72	0.41	-0.36	9.67	
4,667.00	0.38	69.74	4,630.23	432.07	-296.92	522.44	0.64	-0.64	6.80	
4,762.00	0.39	105.98	4,725.23	432.09	-296.31	522.07	0.25	0.01	38.15	
4,856.00	0.96	122.27	4,819.23	431.59	-295.34	521.06	0.63	0.61	17.33	
4,951.00	0.97	143.66	4,914.21	430.51	-294.19	519.50	0.38	0.01	22.52	
5,046.00	1.36	140.42	5,009.19	429.00	-292.99	517.57	0.42	0.41	-3.41	
5,140.00	1.29	150.07	5,103.17	427.22	-291.75	515.41	0.25	-0.07	10.27	
5,234.00	1.40	160.62	5,197.14	425.22	-290.85	513.29	0.29	0.12	11.22	
5,329.00	1.51	179.03	5,292.11	422.87	-290.44	511.22	0.50	0.12	19.38	
5,423.00	1.23	180.08	5,386.08	420.63	-290.42	509.46	0.30	-0.30	1.12	
5,518.00	0.81	201.17	5,481.07	418.98	-290.66	508.35	0.59	-0.44	22.20	
5,613.00	1.26	223.03	5,576.05	417.59	-291.62	507.87	0.62	0.47	23.01	
5,707.00	1.80	207.89	5,670.02	415.53	-293.01	507.16	0.71	0.57	-16.11	
5,802.00	2.56	210.83	5,764.95	412.39	-294.80	505.86	0.81	0.80	3.09	
5,896.00	3.18	207.39	5,858.83	408.27	-297.07	504.11	0.68	0.66	-3.66	
5,990.00	1.80	210.68	5,952.74	404.69	-299.03	502.57	1.48	-1.47	3.50	
6,055.00	1.51	200.61	6,017.72	403.01	-299.85	501.79	0.63	-0.45	-15.49	
Last SDI Production MWD Survey										
6,115.00	1.51	200.61	6,077.69	401.53	-300.41	501.00	0.00	0.00	0.00	
Projection to TD - SG 311-22 PBHL										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
152.00	151.99	1.32	-0.74	First SDI Gyro MWD Survey	
396.00	395.17	15.00	-12.96	Last SDI Gyro MWD Survey	
468.00	466.64	21.13	-19.17	First SDI Surface MWD Survey	
979.00	971.76	79.12	-69.67	Last SDI Surface MWD Survey	
1,080.00	1,071.29	91.86	-81.18	First SDI Production MWD Survey	
6,055.00	6,017.72	403.01	-299.85	Last SDI Production MWD Survey	
6,115.00	6,077.69	401.53	-300.41	Projection to TD	

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