



TEP Rocky Mountain LLC

Garfield County, CO NAD83

SG 11-22 Pad

SG 541-21 - Slot SG 541-21 (A11)

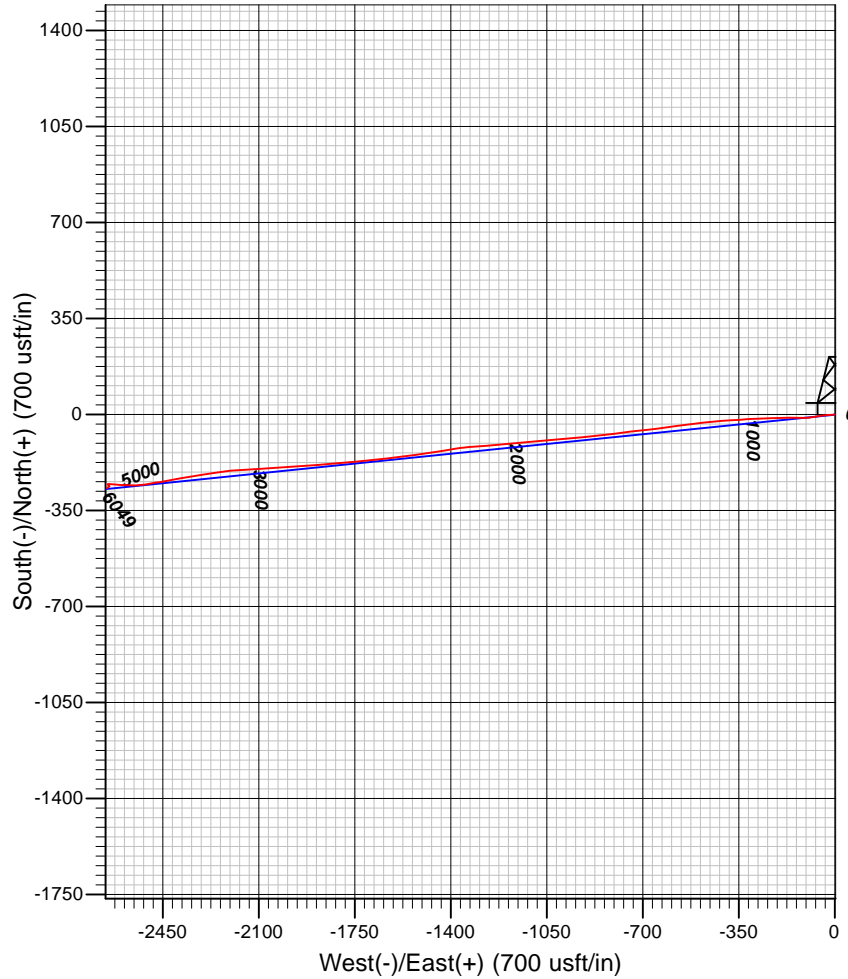
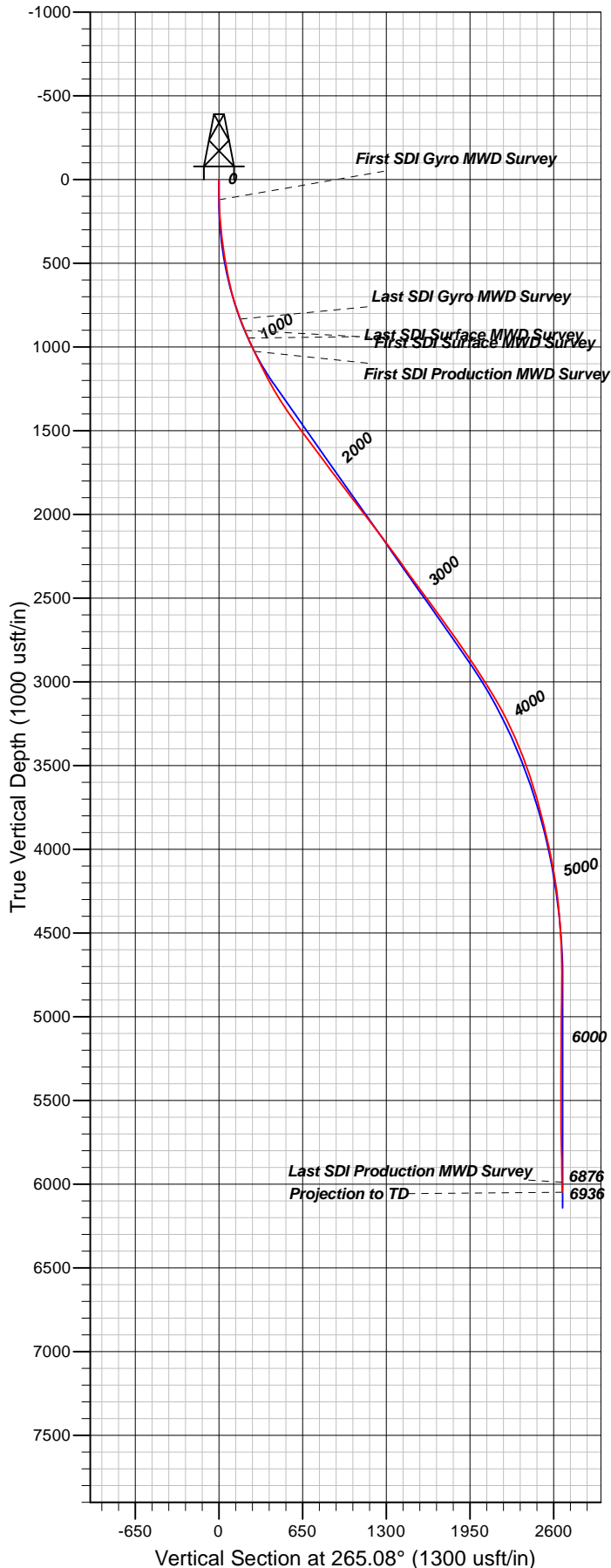
OH

Design: OH

Standard Survey Report

02 April, 2019





Well Details: SG 541-21

+N/-S	+E/-W	North	East	Latitude	Longitude	Slot
0.00	0.00	1591210.90	2264504.40	39.4276976	-108.1041175	SG 541-21 (A11)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well SG 541-21 - Slot SG 541-21 (A11), True North
 Vertical (TVD) Reference: GL 6092.4' & RKB 24' @ 6116.40usft
 Section (VS) Reference: Slot - SG 541-21 (A11)(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

16:57, April 02 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

Operator	TEP Rocky Mountain, LLC.
Well Name & No.	SG 541-21
County & State	Garfield County, CO
SDI Job No.	OP.017512
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 6,936 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

02-Apr-19

Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SG 541-21 - Slot SG 541-21 (A11)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft
Site:	SG 11-22 Pad	MD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft
Well:	SG 541-21	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		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 541-21 - Slot SG 541-21 (A11)					
Well Position	+N/-S	0.00 usft	Northing:	1,591,210.90 usft	Latitude:	39.4276977
	+E/-W	0.00 usft	Easting:	2,264,504.40 usft	Longitude:	-108.1041176
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,092.40 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	3/25/2019	9.38	65.58	51,613

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	265.08	

Survey Program	Date	4/2/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
122.00	859.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
934.00	987.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,079.00	6,936.00	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	
122.00	1.50	272.90	121.99	0.08	-1.59	1.58	1.23	1.23	0.00	
First SDI Gyro MWD Survey										
213.00	4.84	263.67	212.83	-0.28	-6.60	6.60	3.70	3.67	-10.14	
305.00	7.48	267.54	304.30	-0.97	-16.44	16.47	2.90	2.87	4.21	
396.00	10.29	264.02	394.20	-2.07	-30.45	30.51	3.14	3.09	-3.87	
488.00	11.96	262.71	484.46	-4.13	-48.08	48.25	1.84	1.82	-1.42	
579.00	14.43	259.37	573.06	-7.42	-68.58	68.96	2.84	2.71	-3.67	
670.00	18.21	262.97	660.38	-11.26	-93.84	94.46	4.30	4.15	3.96	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SG 541-21 - Slot SG 541-21 (A11)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft
Site:	SG 11-22 Pad	MD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft
Well:	SG 541-21	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)
765.00	22.70	273.16	749.39	-12.06	-126.90	127.47	6.02	4.73	10.73
859.00	26.39	269.21	834.89	-11.35	-165.92	166.28	4.29	3.93	-4.20
Last SDI Gyro MWD Survey									
934.00	28.93	268.04	901.31	-12.20	-200.72	201.03	3.46	3.39	-1.56
First SDI Surface MWD Survey									
987.00	30.25	267.95	947.40	-13.12	-226.88	227.17	2.49	2.49	-0.17
Last SDI Surface MWD Survey									
1,079.00	31.07	268.21	1,026.54	-14.69	-273.76	274.02	0.90	0.89	0.28
First SDI Production MWD Survey									
1,173.00	32.98	265.64	1,106.23	-17.39	-323.52	323.83	2.50	2.03	-2.73
1,268.00	34.72	266.99	1,185.13	-20.78	-376.33	376.72	2.00	1.83	1.42
1,361.00	36.87	265.25	1,260.56	-24.48	-430.59	431.10	2.56	2.31	-1.87
1,456.00	39.35	263.00	1,335.30	-30.51	-488.90	489.71	2.99	2.61	-2.37
1,550.00	42.32	262.99	1,406.42	-38.01	-549.90	551.13	3.16	3.16	-0.01
1,645.00	44.27	261.45	1,475.56	-46.84	-614.43	616.19	2.33	2.05	-1.62
1,730.00	44.17	263.76	1,536.48	-54.47	-673.21	675.40	1.90	-0.12	2.72
1,834.00	44.17	263.54	1,611.08	-62.48	-745.23	747.85	0.15	0.00	-0.21
1,928.00	44.05	262.69	1,678.57	-70.33	-810.19	813.23	0.64	-0.13	-0.90
2,022.00	43.74	262.98	1,746.31	-78.46	-874.85	878.36	0.39	-0.33	0.31
2,117.00	45.92	266.25	1,813.69	-84.70	-941.51	945.31	3.34	2.29	3.44
2,211.00	43.92	264.63	1,880.25	-89.96	-1,007.67	1,011.68	2.45	-2.13	-1.72
2,305.00	44.52	264.61	1,947.61	-96.11	-1,072.94	1,077.23	0.64	0.64	-0.02
2,400.00	45.21	264.48	2,014.95	-102.48	-1,139.65	1,144.24	0.73	0.73	-0.14
2,494.00	44.57	265.44	2,081.54	-108.31	-1,205.73	1,210.58	0.99	-0.68	1.02
2,588.00	44.35	265.22	2,148.63	-113.67	-1,271.35	1,276.42	0.29	-0.23	-0.23
2,683.00	44.98	265.43	2,216.20	-119.12	-1,337.91	1,343.20	0.68	0.66	0.22
2,777.00	42.27	261.09	2,284.25	-126.66	-1,402.29	1,407.98	4.30	-2.88	-4.62
2,872.00	42.69	259.54	2,354.32	-137.46	-1,465.53	1,471.91	1.19	0.44	-1.63
2,966.00	44.03	263.49	2,422.67	-146.95	-1,529.33	1,536.30	3.22	1.43	4.20
3,061.00	44.09	263.36	2,490.94	-154.51	-1,594.96	1,602.34	0.11	0.06	-0.14
3,155.00	42.71	262.50	2,559.24	-162.46	-1,659.06	1,666.88	1.60	-1.47	-0.91
3,250.00	44.09	263.84	2,628.26	-170.21	-1,723.86	1,732.11	1.75	1.45	1.41
3,344.00	43.51	265.23	2,696.11	-176.41	-1,788.63	1,797.16	1.20	-0.62	1.48
3,439.00	41.98	265.71	2,765.87	-181.51	-1,852.90	1,861.64	1.65	-1.61	0.51
3,533.00	41.37	266.72	2,836.08	-185.63	-1,915.26	1,924.13	0.97	-0.65	1.07
3,627.00	41.13	264.85	2,906.76	-190.19	-1,977.07	1,986.09	1.34	-0.26	-1.99
3,722.00	39.27	267.43	2,979.32	-194.34	-2,038.23	2,047.39	2.63	-1.96	2.72
3,816.00	39.10	266.41	3,052.18	-197.53	-2,097.54	2,106.75	0.71	-0.18	-1.09
3,911.00	36.98	267.19	3,127.00	-200.81	-2,155.98	2,165.26	2.29	-2.23	0.82
4,005.00	33.60	262.56	3,203.73	-205.56	-2,210.04	2,219.52	4.58	-3.60	-4.93
4,100.00	31.37	261.64	3,283.86	-212.56	-2,260.57	2,270.47	2.40	-2.35	-0.97
4,194.00	28.84	260.67	3,365.17	-219.80	-2,307.16	2,317.50	2.74	-2.69	-1.03
4,289.00	26.85	261.89	3,449.17	-226.54	-2,351.01	2,361.77	2.18	-2.09	1.28
4,383.00	24.18	258.59	3,534.00	-233.34	-2,390.91	2,402.11	3.22	-2.84	-3.51

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SG 541-21 - Slot SG 541-21 (A11)
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Site:	SG 11-22 Pad	MD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft
Well:	SG 541-21	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)	
4,478.00	22.27	259.80	3,621.30	-240.38	-2,427.70	2,439.37	2.07	-2.01	1.27	
4,572.00	19.96	261.47	3,708.98	-245.92	-2,461.10	2,473.12	2.54	-2.46	1.78	
4,666.00	18.98	259.99	3,797.61	-250.95	-2,492.02	2,504.36	1.17	-1.04	-1.57	
4,760.00	17.11	261.71	3,886.98	-255.60	-2,520.76	2,533.39	2.07	-1.99	1.83	
4,855.00	15.28	266.77	3,978.21	-258.32	-2,547.09	2,559.86	2.43	-1.93	5.33	
4,949.00	14.58	269.57	4,069.04	-259.11	-2,571.29	2,584.03	1.07	-0.74	2.98	
5,044.00	12.84	277.48	4,161.34	-257.83	-2,593.72	2,606.27	2.69	-1.83	8.33	
5,138.00	10.02	276.13	4,253.46	-255.59	-2,612.21	2,624.50	3.01	-3.00	-1.44	
5,180.31	8.66	276.53	4,295.21	-254.84	-2,619.03	2,631.23	3.23	-3.22	0.95	
SG 541-21 BTV										
5,233.00	6.96	277.25	4,347.41	-253.98	-2,626.14	2,638.24	3.23	-3.22	1.36	
5,327.00	5.36	270.40	4,440.87	-253.23	-2,636.18	2,648.18	1.87	-1.70	-7.29	
5,422.00	3.72	270.44	4,535.56	-253.18	-2,643.70	2,655.67	1.73	-1.73	0.04	
5,517.00	2.85	257.95	4,630.41	-253.65	-2,649.09	2,661.08	1.18	-0.92	-13.15	
5,611.00	0.68	176.40	4,724.37	-254.69	-2,651.34	2,663.41	3.01	-2.31	-86.76	
5,706.00	1.06	118.19	4,819.36	-255.67	-2,650.53	2,662.69	0.96	0.40	-61.27	
5,800.00	0.88	109.05	4,913.34	-256.32	-2,649.08	2,661.30	0.25	-0.19	-9.72	
5,894.00	0.85	160.76	5,007.33	-257.21	-2,648.17	2,660.47	0.80	-0.03	55.01	
5,989.00	1.24	141.05	5,102.32	-258.68	-2,647.29	2,659.72	0.55	0.41	-20.75	
6,083.00	1.17	145.48	5,196.30	-260.26	-2,646.11	2,658.67	0.12	-0.07	4.71	
6,178.00	0.59	129.35	5,291.29	-261.37	-2,645.18	2,657.85	0.66	-0.61	-16.98	
6,272.00	0.45	68.20	5,385.28	-261.54	-2,644.46	2,657.15	0.58	-0.15	-65.05	
6,367.00	0.18	181.91	5,480.28	-261.55	-2,644.12	2,656.81	0.58	-0.28	119.69	
6,462.00	0.20	269.43	5,575.28	-261.70	-2,644.29	2,656.99	0.28	0.02	92.13	
6,556.00	1.14	259.50	5,669.27	-261.87	-2,645.37	2,658.08	1.00	1.00	-10.56	
6,650.00	1.60	230.04	5,763.25	-262.88	-2,647.30	2,660.09	0.88	0.49	-31.34	
6,745.00	1.54	225.98	5,858.21	-264.62	-2,649.23	2,662.17	0.13	-0.06	-4.27	
6,839.00	1.93	228.32	5,952.17	-266.55	-2,651.32	2,664.41	0.42	0.41	2.49	
6,876.00	1.85	229.99	5,989.15	-267.35	-2,652.25	2,665.40	0.26	-0.22	4.51	
Last SDI Production MWD Survey										
6,936.00	1.85	229.99	6,049.12	-268.60	-2,653.73	2,666.99	0.00	0.00	0.00	
Projection to TD - SG 541-21 PBHL										



Scientific Drilling, Intl
Survey Report

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SG 541-21 - Slot SG 541-21 (A11)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft
Site:	SG 11-22 Pad	MD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft
Well:	SG 541-21	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
122.00	121.99	0.08	-1.59	First SDI Gyro MWD Survey
859.00	834.89	-11.35	-165.92	Last SDI Gyro MWD Survey
934.00	901.31	-12.20	-200.72	First SDI Surface MWD Survey
987.00	947.40	-13.12	-226.88	Last SDI Surface MWD Survey
1,079.00	1,026.54	-14.69	-273.76	First SDI Production MWD Survey
6,876.00	5,989.15	-267.35	-2,652.25	Last SDI Production MWD Survey
6,936.00	6,049.12	-268.60	-2,653.73	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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