



TEP Rocky Mountain LLC

Garfield County, CO NAD83

SG 11-22 Pad

SG 441-21 - Slot SG 441-21 (A10)

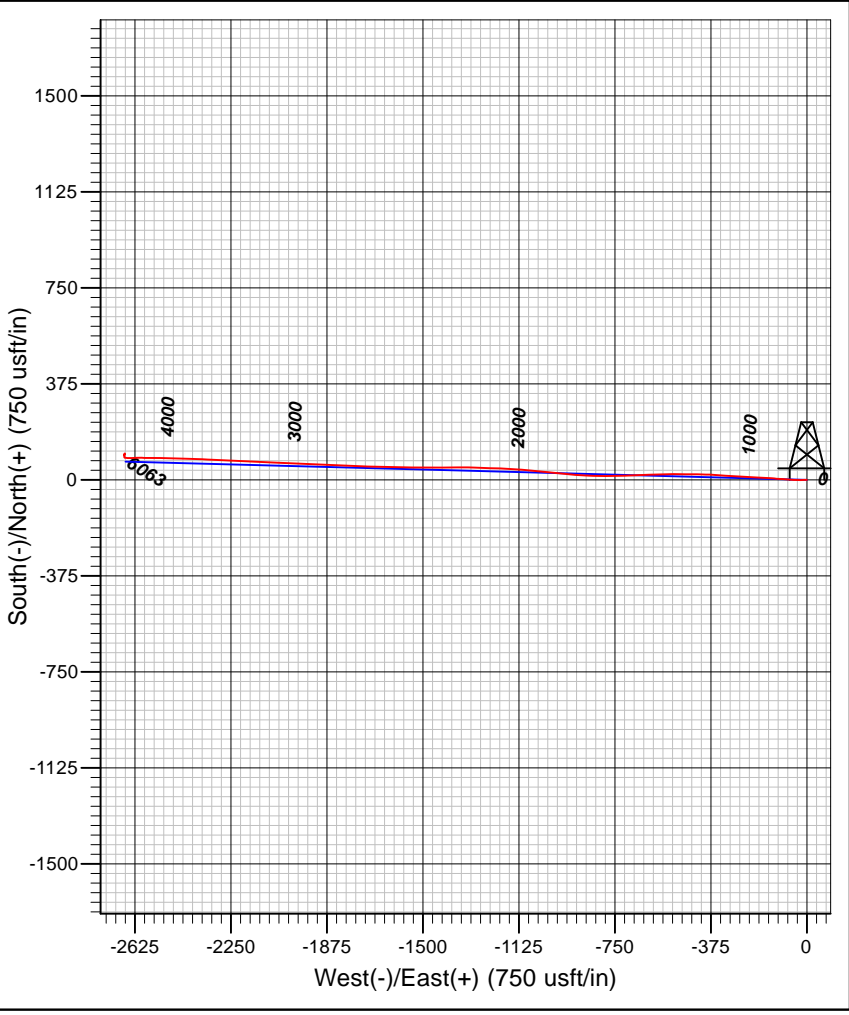
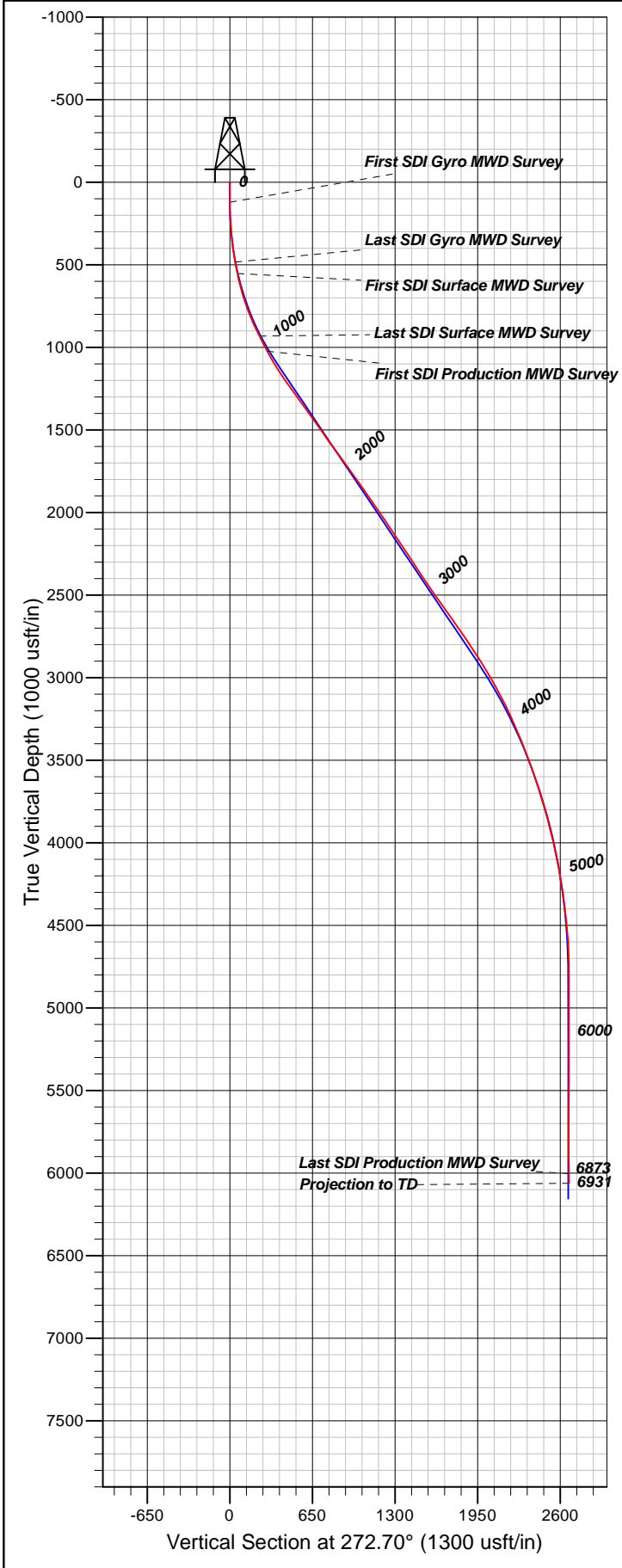
OH

Design: OH

Standard Survey Report

02 April, 2019





Well Details: SG 441-21					
TVD Reference: GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318) Level: 6092.40					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1591214.90	2264510.70	39.4277091	-108.1040953
Slot SG 441-21 (A10)					
REFERENCE INFORMATION					
Co-ordinate (N/E) Reference: Well SG 441-21 - Slot SG 441-21 (A10), True North					
Vertical (TVD) Reference: GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318)					
Section (VS) Reference: Slot - SG 441-21 (A10)(0.00N, 0.00E)					
Measured Depth Reference: GL 6092.4' & RKB 24' @ 6116.40usft (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					
10:38, 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	<u>TEP Rocky Mountain, LLC.</u>
Well Name & No.	<u>SG 441-21</u>
County & State	<u>Garfield County, CO</u>
SDI Job No.	<u>OP.017384</u>
Rig	<u>H&P 318</u>

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 6,931 feet is true and correct as determined from all available records.

Signature

02-Apr-19

Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District



Scientific Drilling, Intl Survey Report

Company: TEP Rocky Mountain LLC	Local Co-ordinate Reference: Well SG 441-21 - Slot SG 441-21 (A10)
Project: Garfield County, CO NAD83	TVD Reference: GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318)
Site: SG 11-22 Pad	MD Reference: GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318)
Well: SG 441-21	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 441-21 - Slot SG 441-21 (A10)					
Well Position	+N/-S 0.00 usft	Northing: 1,591,214.90 usft	Latitude: 39.4277091		
	+E/-W 0.00 usft	Easting: 2,264,510.70 usft	Longitude: -108.1040957		
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	3/20/2019	9.38	65.58	51,614

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	272.70	

Survey Program		Date 4/2/2019
From (usft)	To (usft)	Survey (Wellbore)
122.00	488.00	Survey #1 - Gyro MWD Survey (OH)
559.00	978.00	Survey #2 - Surface MWD Survey (OH)
1,088.00	6,931.00	Survey #3 - Production MWD Survey (OH)
		Tool Name
		Gyro MWD 105
		MWD+HDGM
		MWD+HDGM
		Description
		Gyro MWD Error Model Ver 1.0.5
		OWSG 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	0.09	14.50	122.00	0.09	0.02	-0.02	0.07	0.07	0.00	
First SDI Gyro MWD Survey										
213.00	3.08	270.53	212.96	0.18	-2.40	2.41	3.41	3.29	-114.25	
305.00	7.04	266.66	304.58	-0.12	-10.51	10.49	4.32	4.30	-4.21	
396.00	10.29	268.33	394.53	-0.68	-24.20	24.14	3.58	3.57	1.84	
488.00	12.84	271.14	484.65	-0.72	-42.64	42.56	2.84	2.77	3.05	
Last SDI Gyro MWD Survey										



Scientific Drilling, Intl Survey Report

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SG 441-21 - Slot SG 441-21 (A10)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318)
Site:	SG 11-22 Pad	MD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318)
Well:	SG 441-21	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)	
559.00	14.42	273.55	553.65	-0.01	-59.35	59.28	2.36	2.23	3.39	
First SDI Surface MWD Survey										
650.00	18.55	274.43	640.89	1.81	-85.10	85.09	4.55	4.54	0.97	
745.00	24.01	275.16	729.38	4.71	-119.44	119.53	5.75	5.75	0.77	
839.00	28.75	272.40	813.57	7.38	-161.10	161.27	5.21	5.04	-2.94	
934.00	31.92	272.96	895.56	9.64	-209.02	209.25	3.35	3.34	0.59	
978.00	32.54	273.49	932.78	10.96	-232.45	232.71	1.55	1.41	1.20	
Last SDI Surface MWD Survey										
1,088.00	35.26	273.40	1,024.07	14.64	-293.69	294.05	2.47	2.47	-0.08	
First SDI Production MWD Survey										
1,182.00	37.85	273.76	1,099.57	18.14	-349.56	350.03	2.76	2.76	0.38	
1,277.00	40.93	271.51	1,172.99	20.87	-409.77	410.30	3.57	3.24	-2.37	
1,371.00	42.91	269.64	1,242.93	21.49	-472.56	473.04	2.49	2.11	-1.99	
1,466.00	44.41	270.73	1,311.66	21.71	-538.14	538.56	1.77	1.58	1.15	
1,559.00	43.46	268.09	1,378.63	21.05	-602.65	602.97	2.22	-1.02	-2.84	
1,654.00	42.25	266.61	1,448.28	18.08	-667.19	667.30	1.66	-1.27	-1.56	
1,748.00	42.46	268.45	1,517.74	15.35	-730.46	730.37	1.34	0.22	1.96	
1,843.00	43.61	270.54	1,587.19	14.79	-795.28	795.09	1.93	1.21	2.20	
1,937.00	43.75	272.50	1,655.17	16.51	-860.17	859.99	1.45	0.15	2.09	
2,032.00	43.40	275.75	1,724.00	21.22	-925.46	925.44	2.39	-0.37	3.42	
2,126.00	43.28	275.88	1,792.37	27.75	-989.65	989.85	0.16	-0.13	0.14	
2,220.00	42.60	275.19	1,861.18	33.93	-1,053.38	1,053.81	0.88	-0.72	-0.73	
2,315.00	41.40	275.00	1,931.78	39.58	-1,116.70	1,117.32	1.27	-1.26	-0.20	
2,409.00	40.66	271.42	2,002.70	43.05	-1,178.28	1,179.00	2.62	-0.79	-3.81	
2,503.00	41.06	272.86	2,073.80	45.35	-1,239.73	1,240.49	1.09	0.43	1.53	
2,598.00	42.47	271.71	2,144.65	47.86	-1,302.96	1,303.76	1.69	1.48	-1.21	
2,692.00	40.90	269.66	2,214.86	48.62	-1,365.46	1,366.23	2.21	-1.67	-2.18	
2,787.00	40.10	270.42	2,287.09	48.66	-1,427.15	1,427.86	0.99	-0.84	0.80	
2,881.00	40.37	270.21	2,358.85	49.00	-1,487.87	1,488.52	0.32	0.29	-0.22	
2,975.00	41.65	270.03	2,429.78	49.13	-1,549.55	1,550.14	1.37	1.36	-0.19	
3,070.00	43.02	271.22	2,500.01	49.83	-1,613.52	1,614.08	1.67	1.44	1.25	
3,164.00	42.01	271.17	2,569.30	51.16	-1,677.03	1,677.58	1.08	-1.07	-0.05	
3,259.00	43.17	270.83	2,639.24	52.28	-1,741.31	1,741.84	1.24	1.22	-0.36	
3,353.00	42.43	272.30	2,708.21	54.02	-1,805.15	1,805.69	1.32	-0.79	1.56	
3,448.00	41.00	272.98	2,779.12	56.92	-1,868.29	1,868.90	1.58	-1.51	0.72	
3,542.00	39.96	272.58	2,850.62	59.88	-1,929.24	1,929.92	1.14	-1.11	-0.43	
3,637.00	39.36	274.07	2,923.75	63.40	-1,989.77	1,990.55	1.18	-0.63	1.57	
3,731.00	37.48	272.00	2,997.40	66.51	-2,048.09	2,048.95	2.42	-2.00	-2.20	
3,826.00	34.81	272.38	3,074.11	68.64	-2,104.08	2,104.98	2.82	-2.81	0.40	
3,920.00	33.59	272.72	3,151.85	70.99	-2,156.86	2,157.81	1.31	-1.30	0.36	
4,015.00	30.54	272.10	3,232.35	73.12	-2,207.24	2,208.24	3.23	-3.21	-0.65	
4,109.00	29.13	272.41	3,313.89	74.96	-2,253.97	2,255.00	1.51	-1.50	0.33	
4,204.00	27.64	272.61	3,397.47	76.94	-2,299.09	2,300.16	1.57	-1.57	0.21	
4,298.00	26.06	273.37	3,481.33	79.14	-2,341.49	2,342.62	1.72	-1.68	0.81	



Scientific Drilling, Intl
Survey Report

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SG 441-21 - Slot SG 441-21 (A10)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318)
Site:	SG 11-22 Pad	MD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318)
Well:	SG 441-21	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)	
4,392.00	24.56	271.64	3,566.31	80.92	-2,381.63	2,382.80	1.78	-1.60	-1.84	
4,487.00	23.19	272.10	3,653.18	82.17	-2,420.06	2,421.24	1.46	-1.44	0.48	
4,581.00	21.05	272.21	3,740.25	83.50	-2,455.43	2,456.63	2.28	-2.28	0.12	
4,675.00	19.57	271.65	3,828.41	84.60	-2,488.03	2,489.26	1.59	-1.57	-0.60	
4,770.00	17.87	269.60	3,918.38	84.96	-2,518.52	2,519.72	1.92	-1.79	-2.16	
4,864.00	16.44	270.85	4,008.19	85.06	-2,546.24	2,547.42	1.57	-1.52	1.33	
4,958.00	15.61	269.47	4,098.54	85.14	-2,572.19	2,573.34	0.97	-0.88	-1.47	
5,053.00	12.93	272.41	4,190.60	85.46	-2,595.59	2,596.74	2.92	-2.82	3.09	
5,148.00	10.70	273.16	4,283.58	86.40	-2,615.02	2,616.19	2.35	-2.35	0.79	
5,173.19	10.22	270.85	4,308.36	86.56	-2,619.59	2,620.76	2.52	-1.89	-9.19	
SG 441-21 BTV										
5,242.00	9.02	263.34	4,376.20	86.02	-2,631.05	2,632.18	2.52	-1.75	-10.91	
5,337.00	8.44	268.13	4,470.10	84.93	-2,645.42	2,646.48	0.98	-0.61	5.04	
5,431.00	5.63	276.66	4,563.38	85.24	-2,656.89	2,657.96	3.18	-2.99	9.07	
5,526.00	3.17	283.77	4,658.10	86.41	-2,664.08	2,665.19	2.65	-2.59	7.48	
5,620.00	1.93	357.69	4,752.02	88.61	-2,666.66	2,667.88	3.43	-1.32	78.64	
5,715.00	1.89	5.54	4,846.97	91.77	-2,666.58	2,667.94	0.28	-0.04	8.26	
5,809.00	1.49	356.46	4,940.93	94.53	-2,666.50	2,668.00	0.51	-0.43	-9.66	
5,904.00	1.24	9.31	5,035.90	96.78	-2,666.41	2,668.01	0.41	-0.26	13.53	
5,998.00	1.07	10.81	5,129.88	98.64	-2,666.08	2,667.77	0.18	-0.18	1.60	
6,093.00	0.67	14.52	5,224.87	100.05	-2,665.78	2,667.53	0.42	-0.42	3.91	
6,187.00	0.71	358.12	5,318.87	101.17	-2,665.66	2,667.47	0.21	0.04	-17.45	
6,282.00	0.35	23.26	5,413.86	102.02	-2,665.56	2,667.41	0.44	-0.38	26.46	
6,376.00	0.14	323.61	5,507.86	102.38	-2,665.52	2,667.38	0.32	-0.22	-63.46	
6,471.00	0.29	88.07	5,602.86	102.48	-2,665.35	2,667.22	0.41	0.16	131.01	
6,565.00	0.99	172.94	5,696.86	101.68	-2,665.01	2,666.84	1.07	0.74	90.29	
6,660.00	0.63	197.05	5,791.85	100.37	-2,665.06	2,666.83	0.51	-0.38	25.38	
6,754.00	0.76	211.86	5,885.84	99.34	-2,665.54	2,667.26	0.23	0.14	15.76	
6,849.00	1.67	210.65	5,980.82	97.62	-2,666.58	2,668.22	0.96	0.96	-1.27	
6,873.00	1.76	209.68	6,004.81	97.00	-2,666.94	2,668.55	0.39	0.38	-4.04	
Last SDI Production MWD Survey										
6,931.00	1.76	209.68	6,062.78	95.45	-2,667.82	2,669.36	0.00	0.00	0.00	
Projection to TD - SG 441-21 PBHL										



Scientific Drilling, Intl
Survey Report

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SG 441-21 - Slot SG 441-21 (A10)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318)
Site:	SG 11-22 Pad	MD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318)
Well:	SG 441-21	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	122.00	0.09	0.02	First SDI Gyro MWD Survey	
488.00	484.65	-0.72	-42.64	Last SDI Gyro MWD Survey	
559.00	553.65	-0.01	-59.35	First SDI Surface MWD Survey	
978.00	932.78	10.96	-232.45	Last SDI Surface MWD Survey	
1,088.00	1,024.07	14.64	-293.69	First SDI Production MWD Survey	
6,873.00	6,004.81	97.00	-2,666.94	Last SDI Production MWD Survey	
6,931.00	6,062.78	95.45	-2,667.82	Projection to TD	

Checked By: _____	Approved By: _____	Date: _____
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