



Well Details: GM 543-8

TVD Reference: GL 6280'; & RKB 24' @ 6304.00usft
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.00 0.00 1599844.6900 2256693.8100 39.4507738 -108.1326422 GM 543-8 (A7)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well GM 543-8 - Slot GM 543-8 (A7), True North
 Vertical (TVD) Reference: GL 6280'; & RKB 24' @ 6304.00usft
 Section (VS) Reference: Slot - GM 543-8 (A7)(0.00N, 0.00E)
 Measured Depth Reference: GL 6280'; & RKB 24' @ 6304.00usft
 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

16:37, November 05 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.	GM 543-8
County & State	Garfield County, CO
SDI Job No.	OP.021966
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 120 feet to a measured depth of 7,360 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

05-Nov-19

Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well GM 543-8 - Slot GM 543-8 (A7)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6280'; & RKB 24' @ 6304.00usft
Site:	GV 1-8 Pad	MD Reference:	GL 6280'; & RKB 24' @ 6304.00usft
Well:	GM 543-8	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		GV 1-8 Pad			
Site Position:		Northing:	1,599,836.4100 usft	Latitude:	39.4507498
From:	Map	Easting:	2,256,677.8100 usft	Longitude:	-108.1326980
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.66 °

Well	GM 543-8 - Slot GM 543-8 (A7)					
Well Position	+N/-S	0.00 usft	Northing:	1,599,844.6900 usft	Latitude:	39.4507738
	+E/-W	0.00 usft	Easting:	2,256,693.8100 usft	Longitude:	-108.1326422
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,280.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	10/30/2019	9.38	65.62	51,537

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	113.51	

Survey Program	Date	11/5/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
120.00	764.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
839.00	963.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,080.00	7,360.00	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	
120.00	0.97	137.02	119.99	-0.74	0.69	0.93	0.81	0.81	0.00	
First SDI Gyro MWD Survey										
212.00	3.87	105.29	211.91	-2.13	4.22	4.72	3.36	3.15	-34.49	
304.00	6.95	117.07	303.49	-5.48	12.17	13.35	3.54	3.35	12.80	
395.00	11.17	118.65	393.33	-12.22	24.82	27.63	4.64	4.64	1.74	
487.00	14.69	112.24	482.99	-20.91	43.44	48.18	4.13	3.83	-6.97	
578.00	18.48	113.64	570.19	-31.06	67.34	74.14	4.19	4.16	1.54	
670.00	21.99	107.67	656.51	-42.14	97.12	105.87	4.42	3.82	-6.49	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well GM 543-8 - Slot GM 543-8 (A7)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6280'; & RKB 24' @ 6304.00usft
Site:	GV 1-8 Pad	MD Reference:	GL 6280'; & RKB 24' @ 6304.00usft
Well:	GM 543-8	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)
764.00	25.95	109.16	742.38	-54.24	133.33	143.90	4.26	4.21	1.59
Last SDI Gyro MWD Survey									
839.00	29.49	107.92	808.76	-65.31	166.41	178.65	4.78	4.72	-1.65
First SDI Surface MWD Survey									
933.00	31.97	109.63	889.56	-80.79	211.87	226.51	2.80	2.64	1.82
963.00	32.80	109.31	914.89	-86.15	227.02	242.54	2.83	2.77	-1.07
Last SDI Surface MWD Survey									
1,080.00	34.09	111.24	1,012.52	-108.51	287.49	306.91	1.43	1.10	1.65
First SDI Production MWD Survey									
1,174.00	33.33	110.67	1,090.72	-127.17	336.21	359.03	0.88	-0.81	-0.61
1,268.00	34.04	111.82	1,168.93	-146.06	384.80	411.12	1.02	0.76	1.22
1,363.00	35.01	113.88	1,247.20	-166.98	434.40	464.95	1.60	1.02	2.17
1,457.00	34.22	112.79	1,324.57	-188.13	483.43	518.35	1.07	-0.84	-1.16
1,552.00	35.84	115.35	1,402.36	-210.39	533.20	572.86	2.30	1.71	2.69
1,646.00	34.44	115.08	1,479.22	-233.44	582.14	626.94	1.50	-1.49	-0.29
1,740.00	36.56	118.70	1,555.76	-258.16	630.79	681.41	3.18	2.26	3.85
1,835.00	35.97	117.98	1,632.35	-284.83	680.24	737.40	0.77	-0.62	-0.76
1,929.00	35.35	117.43	1,708.73	-310.31	728.76	792.05	0.74	-0.66	-0.59
2,024.00	33.85	117.66	1,786.92	-335.26	776.59	845.86	1.58	-1.58	0.24
2,118.00	34.94	119.92	1,864.49	-360.84	823.11	898.73	1.79	1.16	2.40
2,213.00	35.24	117.56	1,942.23	-387.09	870.99	953.10	1.46	0.32	-2.48
2,307.00	35.61	115.20	2,018.83	-411.29	919.79	1,007.51	1.51	0.39	-2.51
2,401.00	34.41	115.12	2,095.82	-434.22	968.61	1,061.42	1.28	-1.28	-0.09
2,496.00	35.46	110.33	2,173.71	-455.19	1,018.76	1,115.77	3.09	1.11	-5.04
2,590.00	34.03	110.86	2,250.95	-474.03	1,068.91	1,169.28	1.55	-1.52	0.56
2,684.00	35.35	108.61	2,328.24	-492.08	1,119.26	1,222.65	1.96	1.40	-2.39
2,779.00	33.17	108.82	2,406.76	-509.23	1,169.91	1,275.94	2.30	-2.29	0.22
2,873.00	34.96	112.09	2,484.63	-527.66	1,219.22	1,328.50	2.72	1.90	3.48
2,968.00	34.38	111.73	2,562.76	-547.83	1,269.35	1,382.52	0.65	-0.61	-0.38
3,062.00	33.08	109.69	2,640.94	-566.30	1,318.16	1,434.64	1.83	-1.38	-2.17
3,156.00	33.60	109.32	2,719.47	-583.55	1,366.86	1,486.18	0.59	0.55	-0.39
3,250.00	36.39	110.93	2,796.47	-602.12	1,417.46	1,539.99	3.13	2.97	1.71
3,345.00	37.62	112.38	2,872.33	-623.22	1,470.60	1,597.13	1.59	1.29	1.53
3,439.00	37.12	113.20	2,947.04	-645.32	1,523.20	1,654.18	0.75	-0.53	0.87
3,533.00	36.24	113.30	3,022.42	-667.49	1,574.79	1,710.33	0.94	-0.94	0.11
3,627.00	37.71	114.10	3,097.52	-690.22	1,626.55	1,766.87	1.65	1.56	0.85
3,721.00	36.53	114.53	3,172.47	-713.57	1,678.25	1,823.59	1.29	-1.26	0.46
3,816.00	35.30	115.16	3,249.41	-736.98	1,728.82	1,879.30	1.35	-1.29	0.66
3,910.00	35.45	115.82	3,326.05	-760.40	1,777.94	1,933.68	0.44	0.16	0.70
4,004.00	34.04	113.09	3,403.30	-782.59	1,826.68	1,987.23	2.23	-1.50	-2.90
4,098.00	33.26	113.82	3,481.54	-803.32	1,874.47	2,039.32	0.93	-0.83	0.78
4,193.00	31.71	114.16	3,561.68	-824.06	1,921.08	2,090.34	1.64	-1.63	0.36
4,287.00	30.24	110.28	3,642.28	-842.38	1,965.83	2,138.68	2.64	-1.56	-4.13
4,382.00	28.55	110.55	3,725.05	-858.64	2,009.53	2,185.24	1.78	-1.78	0.28

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well GM 543-8 - Slot GM 543-8 (A7)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6280'; & RKB 24' @ 6304.00usft
Site:	GV 1-8 Pad	MD Reference:	GL 6280'; & RKB 24' @ 6304.00usft
Well:	GM 543-8	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)
4,476.00	27.47	111.43	3,808.03	-874.45	2,050.75	2,229.34	1.23	-1.15	0.94
4,570.00	26.82	112.05	3,891.68	-890.33	2,090.58	2,272.21	0.75	-0.69	0.66
4,665.00	26.12	112.72	3,976.72	-906.45	2,129.74	2,314.54	0.80	-0.74	0.71
4,759.00	23.23	114.41	4,062.13	-922.11	2,165.71	2,353.77	3.16	-3.07	1.80
4,853.00	20.64	116.05	4,149.32	-937.05	2,197.48	2,388.87	2.83	-2.76	1.74
4,948.00	18.07	117.90	4,238.94	-951.30	2,225.55	2,420.29	2.78	-2.71	1.95
5,042.00	17.69	117.06	4,328.40	-964.62	2,251.15	2,449.08	0.49	-0.40	-0.89
5,137.00	16.44	118.10	4,419.22	-977.52	2,275.87	2,476.89	1.35	-1.32	1.09
5,231.00	14.68	120.30	4,509.77	-989.79	2,297.89	2,501.98	1.97	-1.87	2.34
5,325.00	13.89	120.47	4,600.86	-1,001.52	2,317.89	2,525.00	0.84	-0.84	0.18
5,420.00	13.89	121.62	4,693.09	-1,013.28	2,337.43	2,547.61	0.29	0.00	1.21
5,514.00	12.22	116.87	4,784.66	-1,023.70	2,355.92	2,568.71	2.11	-1.78	-5.05
5,514.58	12.20	116.85	4,785.22	-1,023.75	2,356.02	2,568.84	2.92	-2.83	-3.31
GM 543-8 BTV									
5,608.00	9.58	112.92	4,876.95	-1,031.24	2,372.00	2,586.47	2.92	-2.81	-4.21
5,703.00	7.03	115.11	4,970.95	-1,036.79	2,384.54	2,600.19	2.70	-2.68	2.31
5,797.00	4.92	117.49	5,064.43	-1,041.09	2,393.33	2,609.96	2.26	-2.24	2.53
5,891.00	2.37	119.68	5,158.23	-1,043.91	2,398.60	2,615.92	2.72	-2.71	2.33
5,985.00	1.58	104.74	5,252.18	-1,045.20	2,401.54	2,619.13	1.00	-0.84	-15.89
6,080.00	0.84	101.04	5,347.16	-1,045.67	2,403.49	2,621.10	0.78	-0.78	-3.89
6,174.00	0.47	235.06	5,441.15	-1,046.02	2,403.85	2,621.57	1.29	-0.39	142.57
6,269.00	0.89	258.24	5,536.15	-1,046.40	2,402.81	2,620.77	0.52	0.44	24.40
6,363.00	1.72	227.46	5,630.12	-1,047.50	2,401.05	2,619.60	1.13	0.88	-32.74
6,457.00	0.44	240.38	5,724.10	-1,048.63	2,399.70	2,618.81	1.38	-1.36	13.74
6,552.00	1.36	218.17	5,819.09	-1,049.70	2,398.68	2,618.31	1.02	0.97	-23.38
6,647.00	1.42	224.40	5,914.06	-1,051.43	2,397.16	2,617.60	0.17	0.06	6.56
6,741.00	1.66	217.61	6,008.03	-1,053.34	2,395.52	2,616.85	0.32	0.26	-7.22
6,836.00	1.91	208.60	6,102.98	-1,055.82	2,393.92	2,616.38	0.39	0.26	-9.48
6,930.00	2.56	209.22	6,196.91	-1,059.02	2,392.15	2,616.03	0.69	0.69	0.66
7,025.00	2.41	213.28	6,291.82	-1,062.55	2,390.01	2,615.48	0.24	-0.16	4.27
7,120.00	3.01	222.58	6,386.72	-1,066.05	2,387.23	2,614.33	0.78	0.63	9.79
7,214.00	2.75	221.89	6,480.60	-1,069.55	2,384.06	2,612.81	0.28	-0.28	-0.73
7,307.00	2.81	218.56	6,573.49	-1,072.99	2,381.14	2,611.51	0.19	0.06	-3.58
Last SDI Production MWD Survey									
7,360.00	2.81	218.56	6,626.42	-1,075.02	2,379.52	2,610.84	0.00	0.00	0.00
Projection to TD - GM 543-8 PBHL									



Scientific Drilling, Intl
Survey Report

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well GM 543-8 - Slot GM 543-8 (A7)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6280'; & RKB 24' @ 6304.00usft
Site:	GV 1-8 Pad	MD Reference:	GL 6280'; & RKB 24' @ 6304.00usft
Well:	GM 543-8	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)	
120.00	119.99	-0.74	0.69	First SDI Gyro MWD Survey
764.00	742.38	-54.24	133.33	Last SDI Gyro MWD Survey
839.00	808.76	-65.31	166.41	First SDI Surface MWD Survey
963.00	914.89	-86.15	227.02	Last SDI Surface MWD Survey
1,080.00	1,012.52	-108.51	287.49	First SDI Production MWD Survey
7,307.00	6,573.49	-1,072.99	2,381.14	Last SDI Production MWD Survey
7,360.00	6,626.42	-1,075.02	2,379.52	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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