



#### Well Details: GM 313-8

TVD Reference: GL 6280' & RKB 24' @ 6304.00usft (H&P 318) Level: 6280.00  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.00 0.00 1599869.2200 2256695.9500 39.4508413 -108.1326371 GM 313-8 (B10)

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well GM 313-8 - Slot GM 313-8 (B10), True North  
 Vertical (TVD) Reference: GL 6280' & RKB 24' @ 6304.00usft (H&P 318)  
 Section (VS) Reference: Slot - GM 313-8 (B10)(0.00N, 0.00E)  
 Measured Depth Reference: GL 6280' & RKB 24' @ 6304.00usft (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

13:02, November 15 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>	GM 313-8
<b>County &amp; State</b>	Garfield County, CO
<b>SDI Job No.</b>	OP.022154
<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 120 feet to a measured depth of 6,735 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

15-Nov-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 GM 313-8 - Slot GM 313-8 (B10)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 6280' & RKB 24' @ 6304.00usft (H&P 318)
<b>Site:</b>	GV 1-8 Pad	<b>MD Reference:</b>	GL 6280' & RKB 24' @ 6304.00usft (H&P 318)
<b>Well:</b>	GM 313-8	<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		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 313-8 - Slot GM 313-8 (B10)					
Well Position	+N/-S	0.00 usft	Northing:	1,599,869.2200 usft	Latitude:	39.4508413
	+E/-W	0.00 usft	Easting:	2,256,695.9500 usft	Longitude:	-108.1326372
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,280.00 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	11/11/2019	9.38	65.62	51,533

<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	267.14	

<b>Survey Program</b>	<b>Date</b>	11/15/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
120.00	487.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
558.00	953.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,080.00	6,735.00	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	
120.00	0.35	238.45	120.00	-0.19	-0.31	0.32	0.29	0.29	0.00	
<b>First SDI Gyro MWD Survey</b>										
212.00	3.61	265.96	211.93	-0.54	-3.44	3.46	3.59	3.54	29.90	
304.00	6.33	273.34	303.58	-0.45	-11.40	11.40	3.03	2.96	8.02	
395.00	9.41	270.26	393.71	-0.13	-23.85	23.82	3.41	3.38	-3.38	
487.00	12.05	268.95	484.09	-0.27	-40.97	40.93	2.88	2.87	-1.42	
<b>Last SDI Gyro MWD Survey</b>										

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well GM 313-8 - Slot GM 313-8 (B10)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 6280' & RKB 24' @ 6304.00usft (H&P 318)
<b>Site:</b>	GV 1-8 Pad	<b>MD Reference:</b>	GL 6280' & RKB 24' @ 6304.00usft (H&P 318)
<b>Well:</b>	GM 313-8	<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)	
558.00	14.03	268.44	553.26	-0.64	-56.99	56.95	2.79	2.79	-0.72	
First SDI Surface MWD Survey										
650.00	16.00	268.95	642.12	-1.17	-80.81	80.77	2.15	2.14	0.55	
744.00	17.02	266.60	732.24	-2.23	-107.50	107.48	1.30	1.09	-2.50	
839.00	18.02	264.55	822.83	-4.45	-136.01	136.06	1.24	1.05	-2.16	
933.00	18.90	264.88	911.99	-7.19	-165.65	165.80	0.94	0.94	0.35	
953.00	19.26	264.44	930.90	-7.80	-172.15	172.33	1.94	1.80	-2.20	
Last SDI Surface MWD Survey										
1,080.00	20.14	264.35	1,050.46	-11.98	-214.76	215.09	0.69	0.69	-0.07	
First SDI Production MWD Survey										
1,174.00	18.44	263.64	1,139.18	-15.22	-245.64	246.10	1.83	-1.81	-0.76	
1,268.00	16.98	262.96	1,228.72	-18.55	-274.04	274.63	1.57	-1.55	-0.72	
1,363.00	16.21	270.43	1,319.78	-20.15	-301.07	301.70	2.39	-0.81	7.86	
1,457.00	14.59	268.89	1,410.40	-20.28	-326.03	326.64	1.78	-1.72	-1.64	
1,551.00	15.43	274.33	1,501.20	-19.56	-350.34	350.88	1.74	0.89	5.79	
1,646.00	13.81	270.50	1,593.12	-18.51	-374.28	374.74	1.98	-1.71	-4.03	
1,740.00	15.70	274.31	1,684.02	-17.46	-398.18	398.56	2.26	2.01	4.05	
1,835.00	14.16	272.26	1,775.81	-16.03	-422.61	422.89	1.71	-1.62	-2.16	
1,929.00	16.30	273.85	1,866.50	-14.69	-447.27	447.44	2.32	2.28	1.69	
2,023.00	14.68	268.92	1,957.09	-14.03	-472.34	472.45	2.22	-1.72	-5.24	
2,118.00	15.60	268.60	2,048.79	-14.57	-497.15	497.25	0.97	0.97	-0.34	
2,213.00	14.25	267.34	2,140.58	-15.43	-521.60	521.72	1.46	-1.42	-1.33	
2,307.00	16.00	269.85	2,231.32	-16.00	-546.11	546.23	1.99	1.86	2.67	
2,401.00	14.77	266.81	2,321.96	-16.70	-571.03	571.15	1.56	-1.31	-3.23	
2,495.00	16.27	267.69	2,412.53	-17.89	-596.15	596.30	1.62	1.60	0.94	
2,590.00	14.68	266.46	2,504.08	-19.17	-621.47	621.65	1.71	-1.67	-1.29	
2,684.00	15.04	266.37	2,594.93	-20.68	-645.53	645.75	0.38	0.38	-0.10	
2,779.00	16.53	267.16	2,686.35	-22.13	-671.33	671.59	1.58	1.57	0.83	
2,873.00	16.52	273.29	2,776.47	-22.03	-698.03	698.26	1.85	-0.01	6.52	
2,968.00	17.55	273.32	2,867.31	-20.42	-725.81	725.93	1.08	1.08	0.03	
3,062.00	16.35	272.48	2,957.22	-19.03	-753.18	753.19	1.30	-1.28	-0.89	
3,156.00	17.94	272.43	3,047.04	-17.84	-780.86	780.78	1.69	1.69	-0.05	
3,250.00	16.79	270.55	3,136.75	-17.10	-808.90	808.75	1.36	-1.22	-2.00	
3,345.00	16.16	270.06	3,227.85	-16.95	-835.84	835.65	0.68	-0.66	-0.52	
3,439.00	16.16	265.22	3,318.14	-18.03	-861.96	861.79	1.43	0.00	-5.15	
3,533.00	15.86	264.08	3,408.50	-20.44	-887.77	887.69	0.46	-0.32	-1.21	
3,627.00	14.59	265.82	3,499.20	-22.63	-912.36	912.35	1.44	-1.35	1.85	
3,721.00	13.36	263.57	3,590.41	-24.71	-934.96	935.03	1.43	-1.31	-2.39	
3,816.00	11.78	261.64	3,683.13	-27.35	-955.46	955.64	1.72	-1.66	-2.03	
3,910.00	11.77	266.89	3,775.16	-29.27	-974.53	974.78	1.14	-0.01	5.59	
4,004.00	10.87	265.87	3,867.33	-30.43	-992.94	993.22	0.98	-0.96	-1.09	
4,098.00	8.64	271.22	3,959.97	-30.91	-1,008.84	1,009.13	2.56	-2.37	5.69	
4,193.00	5.88	272.58	4,054.20	-30.54	-1,020.84	1,021.09	2.91	-2.91	1.43	
4,287.00	4.15	279.80	4,147.83	-29.75	-1,029.00	1,029.21	1.96	-1.84	7.68	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well GM 313-8 - Slot GM 313-8 (B10)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 6280' & RKB 24' @ 6304.00usft (H&P 318)
<b>Site:</b>	GV 1-8 Pad	<b>MD Reference:</b>	GL 6280' & RKB 24' @ 6304.00usft (H&P 318)
<b>Well:</b>	GM 313-8	<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)
4,382.00	4.03	277.43	4,242.59	-28.73	-1,035.70	1,035.85	0.22	-0.13	-2.49
4,476.00	2.35	314.55	4,336.45	-26.95	-1,040.35	1,040.40	2.74	-1.79	39.49
4,570.00	0.20	356.11	4,430.42	-25.43	-1,041.74	1,041.71	2.35	-2.29	44.21
4,664.00	0.66	225.81	4,524.42	-25.65	-1,042.14	1,042.12	0.86	0.49	-138.62
4,759.00	1.20	214.62	4,619.41	-26.85	-1,043.09	1,043.13	0.60	0.57	-11.78
4,853.00	1.44	201.89	4,713.38	-28.75	-1,044.09	1,044.23	0.40	0.26	-13.54
4,948.00	1.75	208.05	4,808.35	-31.14	-1,045.22	1,045.47	0.37	0.33	6.48
4,996.44	1.89	211.44	4,856.76	-32.47	-1,045.98	1,046.30	0.36	0.28	7.01
GM 313-8 BTV									
5,042.00	2.02	214.21	4,902.30	-33.78	-1,046.83	1,047.21	0.36	0.29	6.07
5,137.00	0.62	144.12	4,997.27	-35.58	-1,047.47	1,047.94	2.00	-1.47	-73.78
5,231.00	0.86	157.74	5,091.27	-36.64	-1,046.90	1,047.43	0.31	0.26	14.49
5,325.00	1.28	158.52	5,185.25	-38.27	-1,046.25	1,046.86	0.45	0.45	0.83
5,420.00	1.62	180.17	5,280.22	-40.60	-1,045.86	1,046.59	0.67	0.36	22.79
5,514.00	1.80	185.57	5,374.18	-43.40	-1,046.01	1,046.87	0.26	0.19	5.74
5,608.00	1.93	204.22	5,468.13	-46.32	-1,046.80	1,047.81	0.66	0.14	19.84
5,703.00	2.39	201.28	5,563.06	-49.62	-1,048.18	1,049.35	0.50	0.48	-3.09
5,797.00	2.34	208.53	5,656.98	-53.13	-1,049.81	1,051.15	0.32	-0.05	7.71
5,891.00	2.26	213.78	5,750.90	-56.36	-1,051.75	1,053.26	0.24	-0.09	5.59
5,985.00	3.06	223.65	5,844.80	-59.72	-1,054.52	1,056.18	0.98	0.85	10.50
6,080.00	3.38	231.71	5,939.65	-63.29	-1,058.47	1,060.30	0.58	0.34	8.48
6,174.00	3.71	223.06	6,033.47	-67.22	-1,062.72	1,064.75	0.67	0.35	-9.20
6,269.00	3.42	217.31	6,128.29	-71.72	-1,066.53	1,068.78	0.48	-0.31	-6.05
6,363.00	2.79	194.69	6,222.16	-76.17	-1,068.81	1,071.28	1.45	-0.67	-24.06
6,457.00	2.52	198.96	6,316.05	-80.33	-1,070.06	1,072.74	0.36	-0.29	4.54
6,552.00	2.71	195.37	6,410.96	-84.48	-1,071.34	1,074.22	0.26	0.20	-3.78
6,647.00	2.42	198.35	6,505.86	-88.54	-1,072.56	1,075.65	0.34	-0.31	3.14
6,677.00	2.55	206.61	6,535.83	-89.74	-1,073.06	1,076.20	1.27	0.43	27.53
Last SDI Production MWD Survey									
6,735.00	2.55	206.61	6,593.78	-92.05	-1,074.22	1,077.47	0.00	0.00	0.00
Proejction to TD - GM 313-8 PBHL									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
120.00	120.00	-0.19	-0.31	First SDI Gyro MWD Survey
487.00	484.09	-0.27	-40.97	Last SDI Gyro MWD Survey
558.00	553.26	-0.64	-56.99	First SDI Surface MWD Survey
953.00	930.90	-7.80	-172.15	Last SDI Surface MWD Survey
1,080.00	1,050.46	-11.98	-214.76	First SDI Production MWD Survey
6,677.00	6,535.83	-89.74	-1,073.06	Last SDI Production MWD Survey
6,735.00	6,593.78	-92.05	-1,074.22	Proejction to TD



Scientific Drilling, Intl  
Survey Report

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well GM 313-8 - Slot GM 313-8 (B10)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6280' & RKB 24' @ 6304.00usft (H&P 318)
Site:	GV 1-8 Pad	MD Reference:	GL 6280' & RKB 24' @ 6304.00usft (H&P 318)
Well:	GM 313-8	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Checked By:	_____	Approved By:	_____	Date:	_____
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