



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>GM 333-5</u>
County & State	<u>Garfield County, CO</u>
SDI Job No.	<u>OP.004411</u>
Rig	<u>H&P 271</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 7,163 feet is true and correct as determined from all available records.


Signature

25-Sep-17
Date

Mel Mireles Jr.
Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well GM 333-5 - Slot A6 (GM 333-5)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
Site:	MV 34-5 Pad	MD Reference:	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
Well:	GM 333-5	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	MV 34-5 Pad				
Site Position:		Northing:	1,603,476.79 usft	Latitude:	39.4609066
From:	Map	Easting:	2,258,772.10 usft	Longitude:	-108.1256571
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.66 °

Well	GM 333-5 - Slot A6 (GM 333-5)					
Well Position	+N/-S	0.00 usft	Northing:	1,603,514.13 usft	Latitude:	39.4610110
	+E/-W	0.00 usft	Easting:	2,258,796.44 usft	Longitude:	-108.1255748
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,977.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	9/17/2017	9.57	65.77	51,764

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	314.42	

Survey Program	Date	9/25/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
122.00	491.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
569.00	1,131.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,268.00	7,163.00	Survey #3 - Production MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

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	0.00
122.00	0.88	318.08	122.00	0.70	-0.63	0.93	0.72	0.72	0.00	
First SDI Gyro MWD Survey										
215.00	3.78	314.65	214.91	3.38	-3.28	4.71	3.12	3.12	-3.69	
307.00	7.57	313.77	306.44	9.71	-9.82	13.81	4.12	4.12	-0.96	
399.00	11.61	312.10	397.14	20.11	-21.07	29.13	4.40	4.39	-1.82	
491.00	14.78	313.15	486.70	34.35	-36.50	50.11	3.46	3.45	1.14	
Last SDI Gyro MWD Survey										

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well GM 333-5 - Slot A6 (GM 333-5)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
Site:	MV 34-5 Pad	MD Reference:	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
Well:	GM 333-5	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)	
569.00	17.84	310.21	561.55	48.87	-52.89	71.98	4.06	3.92	-3.77	
First SDI Surface MWD Survey										
662.00	19.59	310.65	649.63	68.22	-75.60	101.75	1.89	1.88	0.47	
754.00	22.80	315.12	735.40	90.91	-99.89	134.97	3.90	3.49	4.86	
847.00	25.45	315.45	820.27	117.92	-126.63	172.98	2.85	2.85	0.35	
941.00	28.35	315.52	904.09	148.25	-156.44	215.49	3.09	3.09	0.07	
1,036.00	31.70	317.04	986.33	182.62	-189.26	262.99	3.62	3.53	1.60	
1,131.00	35.11	316.29	1,065.63	220.64	-225.16	315.25	3.62	3.59	-0.79	
Last SDI Surface MWD Survey										
1,268.00	35.10	315.97	1,177.71	277.44	-279.76	394.00	0.13	-0.01	-0.23	
First SDI Production MWD Survey										
1,362.00	37.15	316.29	1,253.63	317.39	-318.16	449.39	2.19	2.18	0.34	
1,457.00	36.81	316.17	1,329.52	358.66	-357.69	506.50	0.37	-0.36	-0.13	
1,552.00	36.38	313.05	1,405.80	398.43	-398.00	563.12	2.01	-0.45	-3.28	
1,646.00	35.43	312.16	1,481.94	435.74	-438.57	618.22	1.15	-1.01	-0.95	
1,741.00	36.43	311.98	1,558.86	473.09	-479.95	673.92	1.06	1.05	-0.19	
1,836.00	35.88	311.19	1,635.57	510.30	-521.87	729.89	0.76	-0.58	-0.83	
1,930.00	35.41	312.92	1,711.96	546.98	-562.54	784.62	1.18	-0.50	1.84	
2,025.00	34.17	311.86	1,789.97	583.53	-602.57	838.79	1.45	-1.31	-1.12	
2,120.00	34.32	313.50	1,868.51	619.77	-641.86	892.22	0.98	0.16	1.73	
2,214.00	34.64	315.86	1,946.00	657.18	-679.69	945.43	1.46	0.34	2.51	
2,309.00	35.09	315.52	2,023.94	696.04	-717.63	999.72	0.52	0.47	-0.36	
2,403.00	35.75	317.32	2,100.55	735.51	-755.17	1,054.16	1.31	0.70	1.91	
2,497.00	35.73	318.26	2,176.85	776.18	-792.06	1,108.97	0.58	-0.02	1.00	
2,592.00	35.88	317.05	2,253.89	817.25	-829.50	1,164.46	0.76	0.16	-1.27	
2,686.00	34.17	316.74	2,330.87	856.64	-866.36	1,218.35	1.83	-1.82	-0.33	
2,781.00	30.87	314.37	2,410.96	893.12	-902.08	1,269.40	3.72	-3.47	-2.49	
2,875.00	28.89	315.95	2,492.47	926.31	-935.11	1,316.22	2.27	-2.11	1.68	
2,970.00	28.19	315.94	2,575.92	958.93	-966.67	1,361.59	0.74	-0.74	-0.01	
3,064.00	27.88	317.15	2,658.89	991.00	-997.05	1,405.74	0.69	-0.33	1.29	
3,159.00	30.62	319.03	2,741.77	1,025.56	-1,028.03	1,452.05	3.04	2.88	1.98	
3,253.00	29.24	318.46	2,823.23	1,060.82	-1,058.95	1,498.81	1.50	-1.47	-0.61	
3,348.00	28.36	318.21	2,906.48	1,095.01	-1,089.38	1,544.47	0.93	-0.93	-0.26	
3,442.00	27.71	317.92	2,989.45	1,127.88	-1,118.90	1,588.56	0.71	-0.69	-0.31	
3,536.00	25.30	315.88	3,073.57	1,158.52	-1,147.53	1,630.47	2.74	-2.56	-2.17	
3,631.00	24.84	315.47	3,159.62	1,187.32	-1,175.66	1,670.71	0.52	-0.48	-0.43	
3,725.00	22.35	314.58	3,245.75	1,213.94	-1,202.24	1,708.33	2.68	-2.65	-0.95	
3,820.00	20.32	314.36	3,334.24	1,238.16	-1,226.90	1,742.89	2.14	-2.14	-0.23	
3,914.00	19.14	313.51	3,422.72	1,260.18	-1,249.75	1,774.62	1.29	-1.26	-0.90	
4,007.20	17.77	313.10	3,511.12	1,280.41	-1,271.21	1,804.11	1.48	-1.47	-0.44	
GM 433-5 MVRD										
4,009.00	17.74	313.09	3,512.84	1,280.79	-1,271.61	1,804.66	1.48	-1.47	-0.48	
4,104.00	17.21	312.94	3,603.45	1,300.25	-1,292.47	1,833.18	0.56	-0.56	-0.16	
4,110.06	17.05	312.99	3,609.24	1,301.47	-1,293.78	1,834.97	2.64	-2.63	0.90	

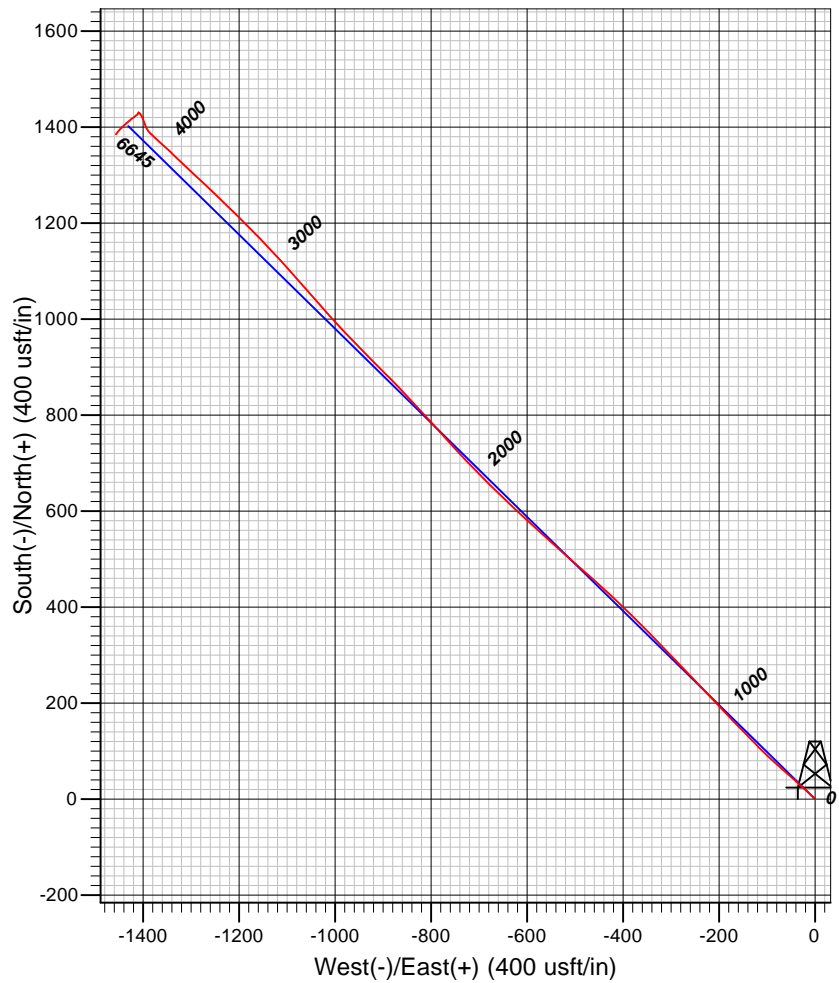
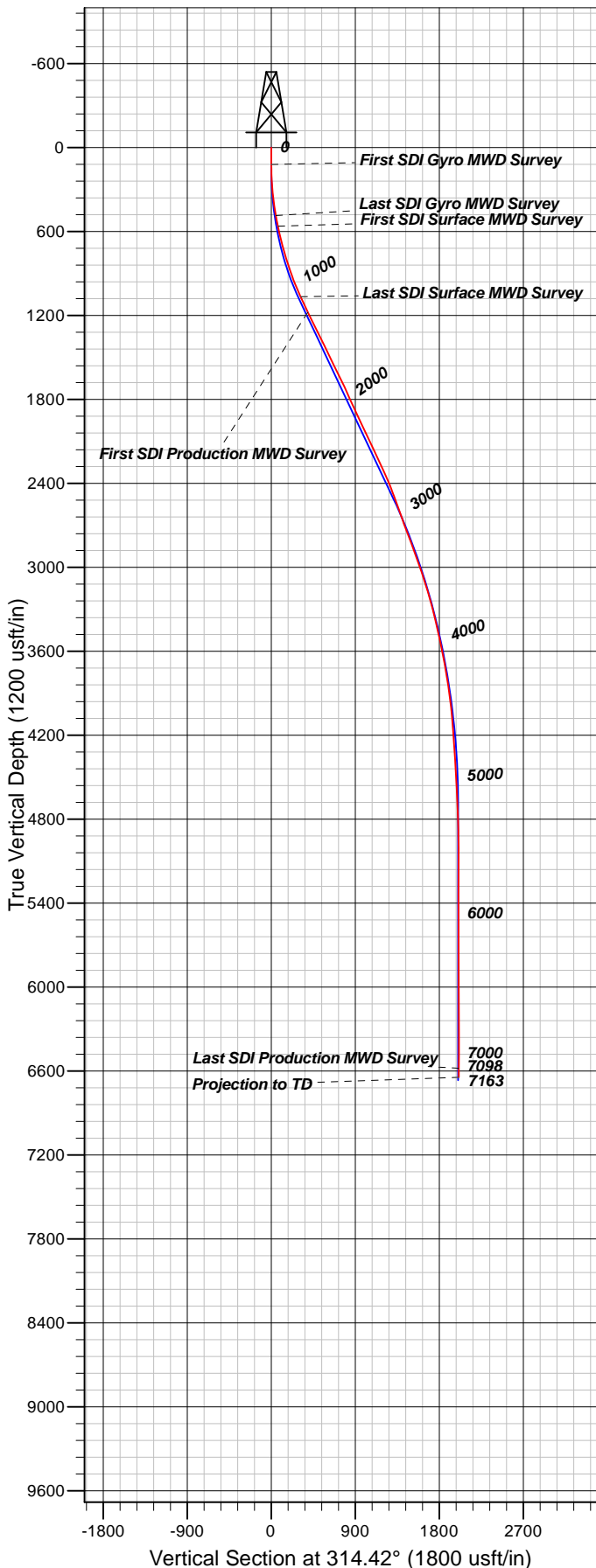
Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well GM 333-5 - Slot A6 (GM 333-5)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
Site:	MV 34-5 Pad	MD Reference:	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
Well:	GM 333-5	North Reference:	True
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)	
GM 333-5 MVRD										
4,198.00	14.74	313.91	3,693.82	1,318.02	-1,311.27	1,859.05	2.64	-2.63	1.04	
4,293.00	13.91	312.80	3,785.86	1,334.16	-1,328.36	1,882.55	0.92	-0.87	-1.17	
4,387.00	11.78	314.97	3,877.51	1,348.62	-1,343.44	1,903.44	2.32	-2.27	2.31	
4,482.00	10.38	311.21	3,970.73	1,361.11	-1,356.74	1,921.68	1.66	-1.47	-3.96	
4,576.00	7.67	309.23	4,063.56	1,370.66	-1,367.97	1,936.38	2.90	-2.88	-2.11	
4,671.00	6.97	317.70	4,157.79	1,378.94	-1,376.76	1,948.45	1.35	-0.74	8.92	
4,765.00	4.94	312.13	4,251.28	1,385.87	-1,383.60	1,958.19	2.24	-2.16	-5.93	
4,860.00	5.52	320.13	4,345.88	1,392.12	-1,389.56	1,966.83	0.98	0.61	8.42	
4,955.00	5.77	340.91	4,440.43	1,400.14	-1,394.05	1,975.65	2.16	0.26	21.87	
5,049.00	5.58	339.40	4,533.97	1,408.88	-1,397.21	1,984.02	0.26	-0.20	-1.61	
5,144.00	3.99	338.85	4,628.64	1,416.29	-1,400.02	1,991.22	1.67	-1.67	-0.58	
5,221.13	3.75	334.95	4,705.59	1,421.08	-1,402.06	1,996.02	0.46	-0.31	-5.06	
GM 333-5 KMV										
5,238.00	3.70	334.03	4,722.43	1,422.07	-1,402.53	1,997.05	0.46	-0.30	-5.45	
5,333.00	3.43	322.99	4,817.24	1,427.09	-1,405.58	2,002.75	0.77	-0.28	-11.62	
5,428.00	1.30	312.73	4,912.16	1,430.09	-1,408.09	2,006.64	2.28	-2.24	-10.80	
5,522.00	1.06	227.54	5,006.14	1,430.23	-1,409.51	2,007.75	1.71	-0.26	-90.63	
5,617.00	0.70	56.95	5,101.14	1,429.95	-1,409.67	2,007.67	1.85	-0.38	-179.57	
5,711.00	0.17	101.37	5,195.14	1,430.24	-1,409.06	2,007.43	0.63	-0.56	47.26	
5,806.00	0.39	164.66	5,290.14	1,429.90	-1,408.83	2,007.03	0.37	0.23	66.62	
5,900.00	0.58	210.33	5,384.13	1,429.18	-1,408.99	2,006.64	0.44	0.20	48.59	
5,995.00	0.86	221.54	5,479.12	1,428.23	-1,409.70	2,006.49	0.33	0.29	11.80	
6,089.00	1.47	229.21	5,573.10	1,426.92	-1,411.08	2,006.55	0.67	0.65	8.16	
6,184.00	1.76	231.67	5,668.07	1,425.21	-1,413.15	2,006.84	0.31	0.31	2.59	
6,278.00	2.27	231.14	5,762.01	1,423.15	-1,415.73	2,007.24	0.54	0.54	-0.56	
6,373.00	3.08	233.69	5,856.90	1,420.46	-1,419.26	2,007.87	0.86	0.85	2.68	
6,468.00	3.25	233.87	5,951.76	1,417.36	-1,423.49	2,008.72	0.18	0.18	0.19	
6,562.00	3.18	228.59	6,045.61	1,414.06	-1,427.59	2,009.35	0.32	-0.07	-5.62	
6,657.00	3.05	227.92	6,140.47	1,410.63	-1,431.45	2,009.70	0.14	-0.14	-0.71	
6,752.00	3.39	227.99	6,235.32	1,407.05	-1,435.41	2,010.03	0.36	0.36	0.07	
6,847.00	4.13	228.60	6,330.12	1,402.91	-1,440.06	2,010.45	0.78	0.78	0.64	
6,941.00	4.13	225.78	6,423.87	1,398.31	-1,445.03	2,010.78	0.22	0.00	-3.00	
7,005.00	4.66	221.12	6,487.68	1,394.75	-1,448.39	2,010.68	1.00	0.83	-7.28	
7,098.00	4.57	216.47	6,580.38	1,388.92	-1,453.08	2,009.95	0.41	-0.10	-5.00	
Last SDI Production MWD Survey										
7,163.00	4.57	216.47	6,645.18	1,384.76	-1,456.15	2,009.24	0.00	0.00	0.00	
Projection to TD - GM 333-5 PBHL - GM 433-5 PBHL										

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well GM 333-5 - Slot A6 (GM 333-5)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
Site:	MV 34-5 Pad	MD Reference:	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
Well:	GM 333-5	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	0.70	-0.63	First SDI Gyro MWD Survey
491.00	486.70	34.35	-36.50	Last SDI Gyro MWD Survey
569.00	561.55	48.87	-52.89	First SDI Surface MWD Survey
1,131.00	1,065.63	220.64	-225.16	Last SDI Surface MWD Survey
1,268.00	1,177.71	277.44	-279.76	First SDI Production MWD Survey
7,098.00	6,580.38	1,388.92	-1,453.08	Last SDI Production MWD Survey
7,163.00	6,645.18	1,384.76	-1,456.15	Projection to TD

Checked By: _____ Approved By: _____ Date: _____



Well Details: GM 333-5

TVD Reference: GL 5977' & RKB 24' @ 6001.00usft (H&P 271) & H&P 271 Level: 5977.00					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1603514.14	2258796.44	39.4610110	-108.1255747 A6 (GM 333-5)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well GM 333-5 - Slot A6 (GM 333-5), True North
 Vertical (TVD) Reference: GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
 Section (VS) Reference: Slot - A6 (GM 333-5)(0.00N, 0.00E)
 Measured Depth Reference: GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
 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

10:55, September 25 2017
 Created By: Mel Mireles Jr.