



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.	TR 323-23-597
County & State	Garfield County, CO
SDI Job No.	OP.001805 & OP.001913
Rig	H&P 271

I, Mel Mireles Jr., having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 143 feet to a measured depth of 10,339 feet is true and correct as determined from all available records.


Signature

21-Jun-17
Date

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

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well TR 323-23-597 - Slot B4 (TR 323-23-597)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
Site:	TR 32-23-597 Pad	MD Reference:	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
Well:	TR 323-23-597	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		TR 32-23-597 Pad			
Site Position:		Northing:	1,654,899.00 usft	Latitude:	39.5994964
From:	Map	Easting:	2,227,644.00 usft	Longitude:	-108.2413519
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.73 °

Well	TR 323-23-597 - Slot B4 (TR 323-23-597)					
Well Position	+N/-S	0.00 usft	Northing:	1,654,857.90 usft	Latitude:	39.5993799
	+E/-W	0.00 usft	Easting:	2,227,598.80 usft	Longitude:	-108.2415079
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	8,545.20 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	6/13/2017	9.75	65.93	51,602

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	260.91	

Survey Program	Date	6/21/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
143.00	621.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
690.00	2,927.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
3,062.00	10,339.00	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	
143.00	0.79	252.16	143.00	-0.30	-0.94	0.97	0.55	0.55	0.00	
First SDI Gyro MWD Survey										
173.00	1.58	257.34	172.99	-0.46	-1.54	1.59	2.65	2.63	17.27	
263.00	3.34	251.54	262.90	-1.56	-5.24	5.42	1.97	1.96	-6.44	
352.00	5.37	255.67	351.64	-3.41	-11.73	12.12	2.31	2.28	4.64	
442.00	8.01	262.62	441.02	-5.26	-22.03	22.59	3.06	2.93	7.72	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well TR 323-23-597 - Slot B4 (TR 323-23-597)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
Site:	TR 32-23-597 Pad	MD Reference:	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
Well:	TR 323-23-597	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)
531.00	10.21	264.73	528.89	-6.78	-36.04	36.66	2.50	2.47	2.37
621.00	11.61	263.67	617.27	-8.51	-52.98	53.66	1.57	1.56	-1.18
Last SDI Gyro MWD Survey									
690.00	12.65	263.31	684.72	-10.16	-67.39	68.15	1.51	1.51	-0.52
First SDI Surface MWD Survey									
779.00	14.35	260.80	771.26	-13.06	-87.96	88.91	2.02	1.91	-2.82
868.00	15.01	262.42	857.36	-16.34	-110.27	111.46	0.87	0.74	1.82
958.00	15.34	260.68	944.22	-19.80	-133.57	135.02	0.62	0.37	-1.93
1,053.00	15.38	257.24	1,035.83	-24.62	-158.26	160.16	0.96	0.04	-3.62
1,148.00	15.03	257.22	1,127.50	-30.13	-182.55	185.02	0.37	-0.37	-0.02
1,242.00	15.92	259.38	1,218.09	-35.20	-207.11	210.07	1.13	0.95	2.30
1,337.00	16.00	257.35	1,309.43	-40.47	-232.69	236.17	0.59	0.08	-2.14
1,432.00	17.41	259.20	1,400.42	-46.00	-259.43	263.44	1.59	1.48	1.95
1,526.00	18.47	258.41	1,489.85	-51.63	-287.83	292.37	1.16	1.13	-0.84
1,621.00	18.29	253.84	1,580.01	-58.80	-316.89	322.20	1.53	-0.19	-4.81
1,716.00	17.50	252.96	1,670.41	-67.13	-344.87	351.14	0.88	-0.83	-0.93
1,811.00	16.66	258.64	1,761.23	-74.00	-371.88	378.90	1.97	-0.88	5.98
1,905.00	17.50	264.65	1,851.09	-77.98	-399.16	406.47	2.08	0.89	6.39
2,000.00	18.55	265.88	1,941.43	-80.39	-428.46	435.78	1.18	1.11	1.29
2,095.00	16.97	262.10	2,031.90	-83.38	-457.26	464.69	2.06	-1.66	-3.98
2,190.00	17.15	264.21	2,122.72	-86.70	-484.93	492.54	0.68	0.19	2.22
2,284.00	14.81	260.81	2,213.08	-90.02	-510.58	518.39	2.68	-2.49	-3.62
2,379.00	14.95	262.10	2,304.90	-93.64	-534.71	542.79	0.38	0.15	1.36
2,475.00	13.72	261.49	2,397.91	-97.03	-558.23	566.55	1.29	-1.28	-0.64
2,569.00	13.89	263.51	2,489.19	-99.96	-580.47	588.97	0.54	0.18	2.15
2,664.00	13.01	263.16	2,581.58	-102.52	-602.42	611.05	0.93	-0.93	-0.37
2,759.00	13.88	264.70	2,673.98	-104.84	-624.38	633.10	0.99	0.92	1.62
2,854.00	15.30	268.69	2,765.92	-106.18	-648.26	656.89	1.83	1.49	4.20
2,927.00	15.21	267.90	2,836.34	-106.75	-667.46	675.94	0.31	-0.12	-1.08
Last SDI Surface MWD Survey									
3,062.00	14.95	267.27	2,966.70	-108.23	-702.55	710.82	0.23	-0.19	-0.47
First SDI Production MWD Survey									
3,157.00	14.07	265.95	3,058.66	-109.63	-726.31	734.51	0.99	-0.93	-1.39
3,251.00	12.51	265.83	3,150.14	-111.18	-747.86	756.03	1.66	-1.66	-0.13
3,345.00	13.28	261.47	3,241.78	-113.52	-768.69	776.97	1.32	0.82	-4.64
3,439.00	11.52	260.33	3,333.58	-116.70	-788.62	797.16	1.89	-1.87	-1.21
3,534.00	12.84	261.91	3,426.44	-119.78	-808.43	817.20	1.43	1.39	1.66
3,629.00	15.65	262.88	3,518.51	-122.85	-831.60	840.56	2.97	2.96	1.02
3,722.00	15.92	261.47	3,608.00	-126.30	-856.66	865.85	0.50	0.29	-1.52
3,817.00	15.56	261.29	3,699.44	-130.16	-882.14	891.62	0.38	-0.38	-0.19
3,911.00	14.60	259.45	3,790.20	-134.24	-906.25	916.07	1.14	-1.02	-1.96
4,006.00	13.01	259.10	3,882.45	-138.45	-928.52	938.73	1.68	-1.67	-0.37
4,100.00	12.14	257.59	3,974.20	-142.58	-948.56	959.18	0.99	-0.93	-1.61

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Well:	TR 323-23-597	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)
4,195.00	13.90	256.16	4,066.75	-147.46	-969.40	980.52	1.88	1.85	-1.51
4,289.00	15.39	263.23	4,157.70	-151.63	-992.75	1,004.24	2.47	1.59	7.52
4,384.00	15.49	262.78	4,249.28	-154.71	-1,017.85	1,029.51	0.16	0.11	-0.47
4,478.00	14.42	263.14	4,340.09	-157.68	-1,041.93	1,053.76	1.14	-1.14	0.38
4,573.00	14.16	262.61	4,432.15	-160.59	-1,065.20	1,077.19	0.31	-0.27	-0.56
4,667.00	13.54	261.56	4,523.42	-163.69	-1,087.48	1,099.69	0.71	-0.66	-1.12
4,762.00	12.47	260.97	4,615.98	-166.93	-1,108.61	1,121.06	1.13	-1.13	-0.62
4,858.00	13.81	265.86	4,709.47	-169.38	-1,130.28	1,142.85	1.81	1.40	5.09
4,952.00	13.19	264.90	4,800.87	-171.15	-1,152.15	1,164.72	0.70	-0.66	-1.02
5,047.00	12.40	262.79	4,893.51	-173.39	-1,173.07	1,185.73	0.97	-0.83	-2.22
5,142.00	11.43	265.07	4,986.46	-175.48	-1,192.57	1,205.31	1.13	-1.02	2.40
5,237.00	10.90	266.65	5,079.66	-176.81	-1,210.91	1,223.64	0.64	-0.56	1.66
5,331.00	9.94	260.94	5,172.12	-178.61	-1,227.80	1,240.59	1.50	-1.02	-6.07
5,426.00	9.85	261.29	5,265.70	-181.13	-1,243.92	1,256.92	0.11	-0.09	0.37
5,520.00	8.35	260.15	5,358.52	-183.52	-1,258.60	1,271.79	1.61	-1.60	-1.21
5,615.00	7.30	255.32	5,452.63	-186.23	-1,271.23	1,284.69	1.30	-1.11	-5.08
5,709.00	6.16	246.53	5,545.99	-189.75	-1,281.64	1,295.52	1.63	-1.21	-9.35
5,804.00	5.19	247.58	5,640.52	-193.42	-1,290.28	1,304.64	1.03	-1.02	1.11
5,898.00	3.25	243.19	5,734.26	-196.24	-1,296.59	1,311.31	2.09	-2.06	-4.67
5,993.00	1.37	241.50	5,829.18	-198.00	-1,300.00	1,314.95	1.98	-1.98	-1.78
6,087.00	2.11	13.35	5,923.16	-196.85	-1,300.58	1,315.35	3.40	0.79	140.27
6,182.00	2.37	26.63	6,018.09	-193.39	-1,299.30	1,313.54	0.61	0.27	13.98
6,276.00	2.55	18.19	6,112.00	-189.67	-1,297.77	1,311.44	0.43	0.19	-8.98
6,371.00	1.06	52.20	6,206.95	-187.12	-1,296.42	1,309.70	1.87	-1.57	35.80
6,465.00	0.62	105.90	6,300.94	-186.73	-1,295.24	1,308.48	0.91	-0.47	57.13
6,560.00	0.28	128.63	6,395.94	-187.01	-1,294.57	1,307.86	0.40	-0.36	23.93
6,584.12	0.34	136.37	6,420.06	-187.10	-1,294.47	1,307.78	0.30	0.25	32.09
TR 323-23-597 MVRD									
6,654.00	0.53	148.27	6,489.94	-187.53	-1,294.16	1,307.54	0.30	0.27	17.03
6,748.00	0.88	176.65	6,583.93	-188.62	-1,293.89	1,307.44	0.52	0.37	30.19
6,843.00	1.19	187.82	6,678.91	-190.32	-1,293.98	1,307.80	0.39	0.33	11.76
6,938.00	1.41	213.39	6,773.89	-192.28	-1,294.76	1,308.88	0.65	0.23	26.92
7,032.00	1.76	213.13	6,867.85	-194.45	-1,296.18	1,310.63	0.37	0.37	-0.28
7,126.00	1.58	231.50	6,961.82	-196.47	-1,297.99	1,312.73	0.60	-0.19	19.54
7,221.00	2.29	228.51	7,056.76	-198.54	-1,300.43	1,315.47	0.75	0.75	-3.15
7,315.00	1.93	239.32	7,150.70	-200.59	-1,303.20	1,318.53	0.57	-0.38	11.50
7,410.00	1.58	216.73	7,245.65	-202.46	-1,305.36	1,320.95	0.81	-0.37	-23.78
7,504.00	0.44	235.28	7,339.64	-203.70	-1,306.43	1,322.21	1.25	-1.21	19.73
7,599.00	1.12	23.17	7,434.63	-203.05	-1,306.37	1,322.04	1.59	0.72	155.67
7,694.00	1.49	36.73	7,529.61	-201.21	-1,305.26	1,320.66	0.50	0.39	14.27
7,788.00	1.06	3.77	7,623.59	-199.36	-1,304.48	1,319.59	0.89	-0.46	-35.06
7,883.00	1.23	342.94	7,718.57	-197.51	-1,304.72	1,319.54	0.47	0.18	-21.93

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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)	
7,977.00	1.85	303.57	7,812.54	-195.71	-1,306.28	1,320.79	1.27	0.66	-41.88	
8,072.00	2.20	308.75	7,907.48	-193.72	-1,308.98	1,323.14	0.42	0.37	5.45	
8,166.00	1.58	295.31	8,001.42	-192.04	-1,311.56	1,325.42	0.81	-0.66	-14.30	
8,261.00	1.49	246.44	8,096.39	-191.97	-1,313.87	1,327.70	1.34	-0.09	-51.44	
8,355.00	1.32	230.62	8,190.37	-193.15	-1,315.83	1,329.82	0.45	-0.18	-16.83	
8,450.00	1.58	235.80	8,285.34	-194.58	-1,317.76	1,331.95	0.31	0.27	5.45	
8,545.00	1.58	221.83	8,380.30	-196.29	-1,319.71	1,334.15	0.40	0.00	-14.71	
8,639.00	1.23	182.89	8,474.27	-198.26	-1,320.63	1,335.37	1.06	-0.37	-41.43	
8,734.00	1.58	167.60	8,569.25	-200.56	-1,320.40	1,335.50	0.54	0.37	-16.09	
8,828.00	2.02	197.31	8,663.20	-203.41	-1,320.61	1,336.17	1.08	0.47	31.61	
8,923.00	2.61	215.98	8,758.12	-206.75	-1,322.38	1,338.44	1.00	0.62	19.65	
9,017.00	3.19	234.16	8,852.01	-210.02	-1,325.76	1,342.29	1.15	0.62	19.34	
9,112.00	4.04	240.90	8,946.82	-213.19	-1,330.83	1,347.80	1.00	0.89	7.09	
9,206.00	3.49	230.90	9,040.61	-216.61	-1,335.94	1,353.39	0.91	-0.59	-10.64	
9,301.00	1.09	190.59	9,135.54	-219.32	-1,338.35	1,356.19	2.90	-2.53	-42.43	
9,395.00	0.98	92.97	9,229.53	-220.24	-1,337.71	1,355.71	1.66	-0.12	-103.85	
9,490.00	1.65	66.01	9,324.50	-219.73	-1,335.65	1,353.59	0.94	0.71	-28.38	
9,585.00	1.86	54.69	9,419.46	-218.28	-1,333.15	1,350.89	0.43	0.22	-11.92	
9,679.00	1.85	54.31	9,513.41	-216.51	-1,330.67	1,348.16	0.02	-0.01	-0.40	
9,774.00	1.58	59.03	9,608.36	-214.94	-1,328.30	1,345.58	0.32	-0.28	4.97	
9,868.00	1.06	61.71	9,702.34	-213.87	-1,326.42	1,343.55	0.56	-0.55	2.85	
9,963.00	1.00	40.28	9,797.32	-212.82	-1,325.11	1,342.09	0.41	-0.06	-22.56	
10,058.00	1.03	344.58	9,892.31	-211.36	-1,324.80	1,341.56	1.00	0.03	-58.63	
10,152.00	1.58	326.93	9,986.29	-209.46	-1,325.74	1,342.18	0.72	0.59	-18.78	
10,247.00	2.11	337.41	10,081.24	-206.75	-1,327.12	1,343.12	0.66	0.56	11.03	
Last SDI Production MWD Survey										
10,339.00	2.11	337.41	10,173.18	-203.62	-1,328.42	1,343.91	0.00	0.00	0.00	
Projection to TD - TR 323-23-597 PBHL										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
143.00	143.00	-0.30	-0.94	First SDI Gyro MWD Survey	
621.00	617.27	-8.51	-52.98	Last SDI Gyro MWD Survey	
690.00	684.72	-10.16	-67.39	First SDI Surface MWD Survey	
2,927.00	2,836.34	-106.75	-667.46	Last SDI Surface MWD Survey	
3,062.00	2,966.70	-108.23	-702.55	First SDI Production MWD Survey	
10,247.00	10,081.24	-206.75	-1,327.12	Last SDI Production MWD Survey	
10,339.00	10,173.18	-203.62	-1,328.42	Projection to TD	

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Site:	TR 32-23-597 Pad	MD Reference:	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
Well:	TR 323-23-597	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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