



## 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 422-23-597
County & State	Garfield County, CO
SDI Job No.	OP.001675 & OP.002128
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 10,362 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

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well TR 422-23-597 - Slot B6 (TR 422-23-597)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
<b>Site:</b>	TR 32-23-597 Pad	<b>MD Reference:</b>	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
<b>Well:</b>	TR 422-23-597	<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		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 422-23-597 - Slot B6 (TR 422-23-597)					
Well Position	+N/-S	0.00 usft	Northing:	1,654,869.60 usft	Latitude:	39.5994127
	+E/-W	0.00 usft	Easting:	2,227,608.10 usft	Longitude:	-108.2414761
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	8,545.20 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	6/10/2017	9.75	65.93	51,602

<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	284.73	

<b>Survey Program</b>	<b>Date</b>	6/21/2017			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
143.00	531.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
601.00	2,934.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
3,062.00	10,362.00	Survey #3 - Production MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

<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	
143.00	0.79	259.72	143.00	-0.18	-0.97	0.89	0.55	0.55	0.00	
<b>First SDI Gyro MWD Survey</b>										
173.00	1.50	279.76	172.99	-0.15	-1.56	1.47	2.68	2.37	66.80	
263.00	3.96	289.07	262.88	1.07	-5.66	5.75	2.77	2.73	10.34	
352.00	6.25	289.69	351.52	3.71	-13.13	13.64	2.57	2.57	0.70	
442.00	9.24	284.59	440.69	7.18	-24.73	25.75	3.41	3.32	-5.67	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well TR 422-23-597 - Slot B6 (TR 422-23-597)
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<b>Site:</b>	TR 32-23-597 Pad	<b>MD Reference:</b>	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
<b>Well:</b>	TR 422-23-597	<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)	
531.00	11.35	285.64	528.25	11.34	-40.08	41.65	2.38	2.37	1.18	
<b>Last SDI Gyro MWD Survey</b>										
601.00	12.10	285.00	596.79	15.09	-53.80	55.87	1.09	1.07	-0.91	
<b>First SDI Surface MWD Survey</b>										
690.00	13.78	285.03	683.53	20.26	-73.05	75.80	1.89	1.89	0.03	
779.00	15.54	281.72	769.63	25.43	-94.97	98.31	2.19	1.98	-3.72	
868.00	16.27	282.92	855.22	30.64	-118.79	122.68	0.90	0.82	1.35	
958.00	16.86	282.73	941.49	36.33	-143.81	148.32	0.66	0.66	-0.21	
1,053.00	17.97	283.77	1,032.13	42.86	-171.48	176.74	1.21	1.17	1.09	
1,148.00	17.68	288.71	1,122.58	50.97	-199.38	205.79	1.62	-0.31	5.20	
1,242.00	18.52	286.24	1,211.93	59.73	-227.23	234.95	1.21	0.89	-2.63	
1,337.00	16.45	286.43	1,302.53	67.75	-254.63	263.48	2.18	-2.18	0.20	
1,432.00	14.98	292.09	1,393.98	76.18	-278.91	289.11	2.23	-1.55	5.96	
1,526.00	15.47	291.87	1,484.68	85.41	-301.80	313.60	0.52	0.52	-0.23	
1,621.00	15.21	285.73	1,576.30	93.51	-325.55	338.63	1.73	-0.27	-6.46	
1,716.00	14.68	285.46	1,668.09	100.10	-349.15	363.13	0.56	-0.56	-0.28	
1,811.00	15.04	292.15	1,759.92	107.96	-372.17	387.39	1.84	0.38	7.04	
1,905.00	15.21	292.11	1,850.66	117.20	-394.89	411.71	0.18	0.18	-0.04	
2,000.00	15.30	291.00	1,942.32	126.38	-418.14	436.53	0.32	0.09	-1.17	
2,095.00	14.51	291.09	2,034.12	135.15	-440.94	460.81	0.83	-0.83	0.09	
2,190.00	13.89	292.41	2,126.22	143.78	-462.59	483.94	0.74	-0.65	1.39	
2,284.00	12.50	295.51	2,217.73	152.47	-482.20	505.12	1.66	-1.48	3.30	
2,379.00	14.86	299.15	2,310.03	162.83	-502.12	527.02	2.64	2.48	3.83	
2,475.00	18.17	297.33	2,402.06	175.70	-526.18	553.56	3.49	3.45	-1.90	
2,569.00	16.01	293.30	2,491.91	187.56	-551.11	580.68	2.62	-2.30	-4.29	
2,664.00	15.48	292.23	2,583.34	197.54	-574.88	606.21	0.64	-0.56	-1.13	
2,759.00	17.25	290.33	2,674.49	207.23	-599.82	632.80	1.95	1.86	-2.00	
2,854.00	17.89	285.64	2,765.06	216.06	-627.08	661.41	1.63	0.67	-4.94	
2,934.00	18.11	282.91	2,841.15	222.15	-651.03	686.12	1.09	0.28	-3.41	
<b>Last SDI Surface MWD Survey</b>										
3,062.00	18.32	281.18	2,962.74	230.49	-690.16	726.08	0.45	0.16	-1.35	
<b>First SDI Production MWD Survey</b>										
3,156.00	17.42	280.87	3,052.20	236.01	-718.47	754.87	0.96	-0.96	-0.33	
3,251.00	17.26	282.48	3,142.88	241.74	-746.20	783.14	0.53	-0.17	1.69	
3,345.00	17.15	284.41	3,232.68	248.20	-773.24	810.93	0.62	-0.12	2.05	
3,439.00	17.85	289.07	3,322.33	256.36	-800.28	839.16	1.67	0.74	4.96	
3,534.00	16.36	287.93	3,413.13	265.23	-826.77	867.04	1.61	-1.57	-1.20	
3,628.00	15.65	286.52	3,503.48	272.91	-851.52	892.93	0.86	-0.76	-1.50	
3,722.00	14.45	285.49	3,594.26	279.65	-874.98	917.33	1.31	-1.28	-1.10	
3,817.00	13.72	284.68	3,686.40	285.67	-897.30	940.44	0.80	-0.77	-0.85	
3,911.00	13.10	284.76	3,777.84	291.21	-918.39	962.25	0.66	-0.66	0.09	
4,006.00	11.85	283.52	3,870.59	296.23	-938.28	982.76	1.35	-1.32	-1.31	
4,100.00	10.64	284.32	3,962.79	300.64	-956.07	1,001.09	1.30	-1.29	0.85	

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<b>Well:</b>	TR 422-23-597	<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)
4,195.00	11.87	287.14	4,055.96	305.69	-973.91	1,019.62	1.42	1.29	2.97
4,289.00	12.84	289.86	4,147.78	312.08	-992.97	1,039.69	1.20	1.03	2.89
4,384.00	14.68	287.22	4,240.05	319.23	-1,014.40	1,062.23	2.05	1.94	-2.78
4,478.00	13.63	286.17	4,331.20	325.84	-1,036.41	1,085.20	1.15	-1.12	-1.12
4,573.00	16.18	286.79	4,422.99	332.79	-1,059.84	1,109.62	2.69	2.68	0.65
4,667.00	16.09	286.70	4,513.29	340.31	-1,084.86	1,135.73	0.10	-0.10	-0.10
4,763.00	15.30	287.49	4,605.71	347.94	-1,109.68	1,161.68	0.85	-0.82	0.82
4,858.00	14.42	289.33	4,697.53	355.62	-1,132.80	1,185.99	1.05	-0.93	1.94
4,952.00	12.66	287.75	4,788.92	362.64	-1,153.65	1,207.94	1.91	-1.87	-1.68
5,047.00	12.22	286.96	4,881.69	368.75	-1,173.18	1,228.38	0.50	-0.46	-0.83
5,142.00	11.34	285.99	4,974.69	374.25	-1,191.78	1,247.77	0.95	-0.93	-1.02
5,237.00	10.11	284.94	5,068.02	378.98	-1,208.82	1,265.44	1.31	-1.29	-1.11
5,331.00	9.94	292.76	5,160.59	384.24	-1,224.27	1,281.73	1.46	-0.18	8.32
5,426.00	8.09	305.24	5,254.42	391.27	-1,237.29	1,296.11	2.82	-1.95	13.14
5,520.00	7.39	305.07	5,347.57	398.56	-1,247.64	1,307.97	0.75	-0.74	-0.18
5,615.00	6.60	299.00	5,441.86	404.72	-1,257.42	1,318.99	1.14	-0.83	-6.39
5,709.00	5.98	297.07	5,535.29	409.57	-1,266.50	1,329.01	0.70	-0.66	-2.05
5,804.00	5.39	295.66	5,629.83	413.75	-1,274.93	1,338.23	0.64	-0.62	-1.48
5,898.00	5.19	301.11	5,723.43	417.86	-1,282.55	1,346.64	0.58	-0.21	5.80
5,993.00	2.81	320.89	5,818.19	421.89	-1,287.70	1,352.65	2.86	-2.51	20.82
6,087.00	1.49	287.22	5,912.13	424.04	-1,290.32	1,355.73	1.89	-1.40	-35.82
6,182.00	1.32	275.89	6,007.10	424.51	-1,292.59	1,358.04	0.34	-0.18	-11.93
6,276.00	1.49	280.11	6,101.07	424.84	-1,294.87	1,360.33	0.21	0.18	4.49
6,371.00	1.49	285.64	6,196.04	425.39	-1,297.27	1,362.80	0.15	0.00	5.82
6,465.00	1.65	281.97	6,290.00	426.00	-1,299.77	1,365.37	0.20	0.17	-3.90
6,560.00	0.88	0.88	6,384.99	427.01	-1,301.10	1,366.91	1.80	-0.81	83.06
6,572.73	0.85	358.44	6,397.71	427.21	-1,301.10	1,366.96	0.38	-0.24	-19.16
TR 422-23-597 MVRD									
6,654.00	0.70	338.47	6,478.98	428.27	-1,301.30	1,367.42	0.38	-0.18	-24.57
6,748.00	0.79	318.34	6,572.97	429.29	-1,301.94	1,368.30	0.29	0.10	-21.41
6,843.00	1.14	317.64	6,667.96	430.47	-1,303.02	1,369.64	0.37	0.37	-0.74
6,937.00	0.44	76.64	6,761.95	431.25	-1,303.29	1,370.11	1.50	-0.74	126.60
7,032.00	0.70	162.07	6,856.95	430.78	-1,302.76	1,369.47	0.84	0.27	89.93
7,126.00	1.06	196.35	6,950.94	429.40	-1,302.83	1,369.19	0.66	0.38	36.47
7,221.00	0.79	207.77	7,045.92	427.98	-1,303.38	1,369.36	0.34	-0.28	12.02
7,315.00	1.05	229.68	7,139.91	426.85	-1,304.34	1,370.00	0.46	0.28	23.31
7,410.00	0.44	289.33	7,234.90	426.40	-1,305.35	1,370.86	0.96	-0.64	62.79
7,504.00	0.18	294.78	7,328.90	426.59	-1,305.82	1,371.37	0.28	-0.28	5.80
7,599.00	0.53	245.65	7,423.90	426.47	-1,306.36	1,371.86	0.46	0.37	-51.72
7,694.00	0.62	354.94	7,518.90	426.80	-1,306.80	1,372.37	0.99	0.09	115.04
7,788.00	0.70	330.82	7,612.89	427.81	-1,307.13	1,372.94	0.30	0.09	-25.66
7,883.00	1.41	284.06	7,707.88	428.60	-1,308.55	1,374.51	1.12	0.75	-49.22

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<b>Well:</b>	TR 422-23-597	<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)	
7,977.00	0.74	11.52	7,801.86	429.47	-1,309.55	1,375.70	1.66	-0.71	93.04	
8,072.00	0.52	59.68	7,896.86	430.29	-1,309.05	1,375.43	0.58	-0.23	50.69	
8,166.00	0.79	275.71	7,990.86	430.57	-1,309.33	1,375.77	1.33	0.29	-153.16	
8,261.00	1.17	108.87	8,085.85	430.32	-1,309.06	1,375.45	2.05	0.40	-175.62	
8,355.00	1.02	133.54	8,179.84	429.44	-1,307.55	1,373.76	0.52	-0.16	26.24	
8,450.00	0.77	186.26	8,274.82	428.22	-1,307.00	1,372.92	0.87	-0.26	55.49	
8,544.00	1.58	213.66	8,368.81	426.51	-1,307.79	1,373.25	1.03	0.86	29.15	
8,639.00	0.53	32.87	8,463.80	425.79	-1,308.28	1,373.54	2.22	-1.11	188.64	
8,734.00	0.80	81.10	8,558.79	426.26	-1,307.38	1,372.80	0.63	0.28	50.77	
8,828.00	0.62	203.76	8,652.79	425.90	-1,306.94	1,372.27	1.33	-0.19	130.49	
8,923.00	1.32	214.98	8,747.77	424.53	-1,307.78	1,372.73	0.76	0.74	11.81	
9,017.00	1.17	229.97	8,841.75	423.03	-1,309.13	1,373.66	0.38	-0.16	15.95	
9,112.00	1.60	256.70	8,936.72	422.10	-1,311.16	1,375.39	0.81	0.45	28.14	
9,206.00	1.23	175.16	9,030.70	420.79	-1,312.36	1,376.21	1.99	-0.39	-86.74	
9,301.00	1.72	177.29	9,125.67	418.35	-1,312.20	1,375.45	0.52	0.52	2.24	
9,395.00	1.71	174.51	9,219.63	415.55	-1,312.00	1,374.54	0.09	-0.01	-2.96	
9,490.00	1.76	180.79	9,314.59	412.68	-1,311.89	1,373.70	0.21	0.05	6.61	
9,585.00	1.58	191.95	9,409.54	409.94	-1,312.18	1,373.28	0.39	-0.19	11.75	
9,679.00	1.58	194.32	9,503.51	407.41	-1,312.77	1,373.21	0.07	0.00	2.52	
9,774.00	1.14	214.63	9,598.48	405.37	-1,313.63	1,373.52	0.68	-0.46	21.38	
9,868.00	0.70	261.21	9,692.47	404.51	-1,314.73	1,374.37	0.89	-0.47	49.55	
9,963.00	0.79	316.40	9,787.46	404.89	-1,315.75	1,375.46	0.73	0.09	58.09	
10,057.00	0.70	343.12	9,881.46	405.91	-1,316.37	1,376.31	0.38	-0.10	28.43	
10,152.00	1.06	13.97	9,976.45	407.32	-1,316.32	1,376.62	0.61	0.38	32.47	
10,247.00	1.24	353.09	10,071.43	409.19	-1,316.23	1,377.02	0.48	0.19	-21.98	
Last SDI Production MWD Survey										
10,362.00	1.24	353.09	10,186.40	411.67	-1,316.53	1,377.93	0.00	0.00	0.00	
Projection to TD - TR 422-23-597 PBHL										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
143.00	143.00	-0.18	-0.97	First SDI Gyro MWD Survey	
531.00	528.25	11.34	-40.08	Last SDI Gyro MWD Survey	
601.00	596.79	15.09	-53.80	First SDI Surface MWD Survey	
2,934.00	2,841.15	222.15	-651.03	Last SDI Surface MWD Survey	
3,062.00	2,962.74	230.49	-690.16	First SDI Production MWD Survey	
10,247.00	10,071.43	409.19	-1,316.23	Last SDI Production MWD Survey	
10,362.00	10,186.40	411.67	-1,316.53	Projection to TD	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well TR 422-23-597 - Slot B6 (TR 422-23-597)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
<b>Site:</b>	TR 32-23-597 Pad	<b>MD Reference:</b>	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
<b>Well:</b>	TR 422-23-597	<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

Checked By: _____	Approved By: _____	Date: _____
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