



## 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 423-23-597
County & State	Garfield County, CO
SDI Job No.	OP.001163 & OP.003306
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 123 feet to a measured depth of 10,380 feet is true and correct as determined from all available records.

  
Signature

17-Aug-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 423-23-597 - Slot A5 (TR 423-23-597)
<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 423-23-597	<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 423-23-597 - Slot A5 (TR 423-23-597)					
Well Position	+N/-S	0.00 usft	Northing:	1,654,857.70 usft	Latitude:	39.5993804
	+E/-W	0.00 usft	Easting:	2,227,611.70 usft	Longitude:	-108.2414621
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	5/5/2017	9.77	65.93	51,614

<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	238.14	

<b>Survey Program</b>	<b>Date</b>	8/17/2017			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
123.00	678.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
750.00	2,905.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
3,067.00	10,380.00	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	
123.00	0.53	271.67	123.00	0.02	-0.57	0.47	0.43	0.43	0.00	
<b>First SDI Gyro MWD Survey</b>										
216.00	2.38	246.62	215.96	-0.74	-2.77	2.74	2.06	1.99	-26.94	
308.00	4.84	237.66	307.78	-3.57	-7.80	8.51	2.74	2.67	-9.74	
401.00	7.65	241.61	400.22	-8.61	-16.57	18.62	3.05	3.02	4.25	
493.00	10.82	236.69	491.01	-16.27	-29.17	33.37	3.55	3.45	-5.35	

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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 423-23-597	<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)
587.00	13.46	235.20	582.90	-27.36	-45.53	53.12	2.83	2.81	-1.59
678.00	16.80	233.79	670.74	-41.18	-64.85	76.81	3.69	3.67	-1.55
<b>Last SDI Gyro MWD Survey</b>									
750.00	18.01	232.39	739.44	-54.12	-82.06	98.26	1.78	1.68	-1.94
<b>First Surface MWD Survey</b>									
842.00	17.59	237.13	827.04	-70.34	-105.00	126.32	1.64	-0.46	5.15
935.00	17.67	239.40	915.67	-85.16	-128.96	154.48	0.74	0.09	2.44
1,027.00	19.00	236.81	1,003.00	-100.46	-153.51	183.41	1.70	1.45	-2.82
1,126.00	18.70	235.30	1,096.69	-118.32	-180.04	215.37	0.58	-0.30	-1.53
1,220.00	19.17	230.46	1,185.61	-136.72	-204.34	245.72	1.74	0.50	-5.15
1,315.00	19.90	236.68	1,275.15	-155.54	-229.88	277.34	2.32	0.77	6.55
1,410.00	19.40	240.00	1,364.62	-172.31	-257.05	309.28	1.29	-0.53	3.49
1,505.00	20.48	239.67	1,453.92	-188.59	-285.06	341.66	1.14	1.14	-0.35
1,599.00	19.70	238.72	1,542.20	-205.12	-312.80	373.94	0.90	-0.83	-1.01
1,694.00	18.20	239.78	1,632.05	-220.90	-339.30	404.79	1.62	-1.58	1.12
1,789.00	18.44	235.53	1,722.24	-236.87	-364.51	434.63	1.43	0.25	-4.47
1,884.00	18.73	238.28	1,812.29	-253.40	-389.87	464.89	0.97	0.31	2.89
1,978.00	18.38	241.71	1,901.41	-268.36	-415.76	494.77	1.22	-0.37	3.65
2,073.00	18.40	239.56	1,991.56	-283.05	-441.88	524.71	0.71	0.02	-2.26
2,168.00	17.76	236.88	2,081.87	-298.57	-466.94	554.19	1.10	-0.67	-2.82
2,262.00	17.36	238.76	2,171.49	-313.67	-490.94	582.54	0.74	-0.43	2.00
2,357.00	16.36	239.60	2,262.40	-327.79	-514.59	610.09	1.08	-1.05	0.88
2,452.00	16.53	242.50	2,353.52	-340.80	-538.12	636.94	0.88	0.18	3.05
2,547.00	17.21	243.07	2,444.43	-353.41	-562.64	664.42	0.74	0.72	0.60
2,642.00	17.77	241.83	2,535.04	-366.62	-587.95	692.89	0.71	0.59	-1.31
2,737.00	17.59	238.81	2,625.55	-380.90	-613.01	721.71	0.98	-0.19	-3.18
2,832.00	17.85	237.98	2,716.04	-396.05	-637.64	750.62	0.38	0.27	-0.87
2,905.00	17.41	237.58	2,785.62	-407.84	-656.34	772.73	0.63	-0.60	-0.55
<b>Last Surface MWD Survey</b>									
3,067.00	17.59	237.45	2,940.12	-434.00	-697.43	821.44	0.11	0.11	-0.08
<b>First SDI Production MWD Survey</b>									
3,162.00	18.73	237.98	3,030.38	-449.81	-722.47	851.05	1.21	1.20	0.56
3,256.00	17.86	238.06	3,119.63	-465.44	-747.49	880.56	0.93	-0.93	0.09
3,351.00	18.37	238.45	3,209.92	-480.98	-772.61	910.09	0.55	0.54	0.41
3,445.00	16.62	237.02	3,299.57	-496.05	-796.51	938.35	1.92	-1.86	-1.52
3,540.00	18.54	239.13	3,390.13	-511.20	-820.88	967.04	2.13	2.02	2.22
3,634.00	20.14	242.67	3,478.83	-526.30	-848.08	998.11	2.11	1.70	3.77
3,729.00	18.99	240.53	3,568.34	-541.41	-876.07	1,029.86	1.43	-1.21	-2.25
3,823.00	18.35	240.84	3,657.40	-556.14	-902.31	1,059.92	0.69	-0.68	0.33
3,918.00	17.71	241.54	3,747.73	-570.32	-928.07	1,089.29	0.71	-0.67	0.74
4,012.00	16.66	241.68	3,837.53	-583.52	-952.50	1,117.01	1.12	-1.12	0.15
4,107.00	16.27	239.04	3,928.64	-596.83	-975.90	1,143.91	0.89	-0.41	-2.78
4,201.00	16.48	240.66	4,018.83	-610.13	-998.82	1,170.39	0.53	0.22	1.72

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<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)
4,296.00	17.06	238.95	4,109.79	-623.93	-1,022.50	1,197.79	0.80	0.61	-1.80
4,390.00	16.19	237.49	4,199.86	-638.08	-1,045.37	1,224.68	1.03	-0.93	-1.55
4,485.00	17.39	236.87	4,290.80	-652.96	-1,068.43	1,252.12	1.28	1.26	-0.65
4,579.00	16.59	239.02	4,380.70	-667.54	-1,091.69	1,279.58	1.08	-0.85	2.29
4,674.00	17.26	238.11	4,471.59	-681.97	-1,115.29	1,307.24	0.76	0.71	-0.96
4,768.00	16.70	236.35	4,561.49	-696.82	-1,138.37	1,334.68	0.81	-0.60	-1.87
4,863.00	16.03	236.94	4,652.64	-711.54	-1,160.73	1,361.44	0.73	-0.71	0.62
4,958.00	15.74	234.47	4,744.01	-726.18	-1,182.21	1,387.41	0.77	-0.31	-2.60
5,052.00	13.63	237.37	4,834.94	-739.57	-1,201.91	1,411.21	2.38	-2.24	3.09
5,147.00	12.13	234.20	4,927.55	-751.44	-1,219.44	1,432.36	1.74	-1.58	-3.34
5,241.00	10.54	234.16	5,019.71	-762.25	-1,234.42	1,450.79	1.69	-1.69	-0.04
5,335.00	8.44	231.48	5,112.42	-771.59	-1,246.79	1,466.22	2.28	-2.23	-2.85
5,430.00	7.23	227.60	5,206.53	-779.96	-1,256.66	1,479.03	1.39	-1.27	-4.08
5,525.00	7.21	227.95	5,300.78	-787.98	-1,265.50	1,490.77	0.05	-0.02	0.37
5,619.00	5.80	222.16	5,394.17	-795.45	-1,273.07	1,501.14	1.65	-1.50	-6.16
5,714.00	5.28	220.67	5,488.73	-802.33	-1,279.14	1,509.93	0.57	-0.55	-1.57
5,808.00	4.57	234.20	5,582.38	-807.80	-1,284.99	1,517.79	1.44	-0.76	14.39
5,903.00	2.11	243.87	5,677.21	-810.78	-1,289.63	1,523.31	2.65	-2.59	10.18
5,997.00	2.20	243.78	5,771.15	-812.34	-1,292.81	1,526.82	0.10	0.10	-0.10
6,092.00	2.19	245.54	5,866.08	-813.90	-1,296.09	1,530.44	0.07	-0.01	1.85
6,186.00	2.37	239.30	5,960.00	-815.64	-1,299.40	1,534.16	0.33	0.19	-6.64
6,281.00	0.09	307.06	6,054.98	-816.59	-1,301.15	1,536.15	2.46	-2.40	71.33
6,375.00	0.44	204.32	6,148.98	-816.88	-1,301.36	1,536.48	0.50	0.37	-109.30
6,470.00	0.70	238.33	6,243.97	-817.52	-1,302.00	1,537.36	0.44	0.27	35.80
6,564.00	0.88	225.85	6,337.96	-818.32	-1,303.01	1,538.64	0.26	0.19	-13.28
6,634.49	0.73	219.55	6,408.45	-819.04	-1,303.68	1,539.60	0.25	-0.21	-8.94
TR 423-23-597 MVRD									
6,659.00	0.68	216.72	6,432.95	-819.28	-1,303.87	1,539.88	0.25	-0.20	-11.55
6,753.00	0.79	225.85	6,526.95	-820.18	-1,304.67	1,541.03	0.17	0.12	9.71
6,847.00	0.95	73.90	6,620.94	-820.41	-1,304.38	1,540.92	1.80	0.17	-161.65
6,942.00	0.62	73.37	6,715.93	-820.05	-1,303.13	1,539.66	0.35	-0.35	-0.56
7,036.00	0.44	69.32	6,809.93	-819.78	-1,302.31	1,538.82	0.20	-0.19	-4.31
7,130.00	0.26	113.44	6,903.93	-819.73	-1,301.77	1,538.34	0.33	-0.19	46.94
7,225.00	0.47	201.50	6,998.93	-820.18	-1,301.72	1,538.53	0.56	0.22	92.69
7,319.00	0.44	348.20	7,092.92	-820.19	-1,301.93	1,538.72	0.93	-0.03	156.06
7,413.00	0.66	313.85	7,186.92	-819.46	-1,302.40	1,538.73	0.41	0.23	-36.54
7,507.00	0.77	270.34	7,280.91	-819.08	-1,303.42	1,539.39	0.57	0.12	-46.29
7,602.00	0.70	271.56	7,375.91	-819.06	-1,304.64	1,540.42	0.08	-0.07	1.28
7,696.00	0.47	259.12	7,469.90	-819.12	-1,305.59	1,541.26	0.28	-0.24	-13.23
7,791.00	0.95	115.54	7,564.90	-819.53	-1,305.26	1,541.20	1.43	0.51	-151.14
7,885.00	0.93	150.70	7,658.89	-820.53	-1,304.19	1,540.81	0.60	-0.02	37.40
7,980.00	1.06	161.87	7,753.87	-822.04	-1,303.54	1,541.05	0.25	0.14	11.76

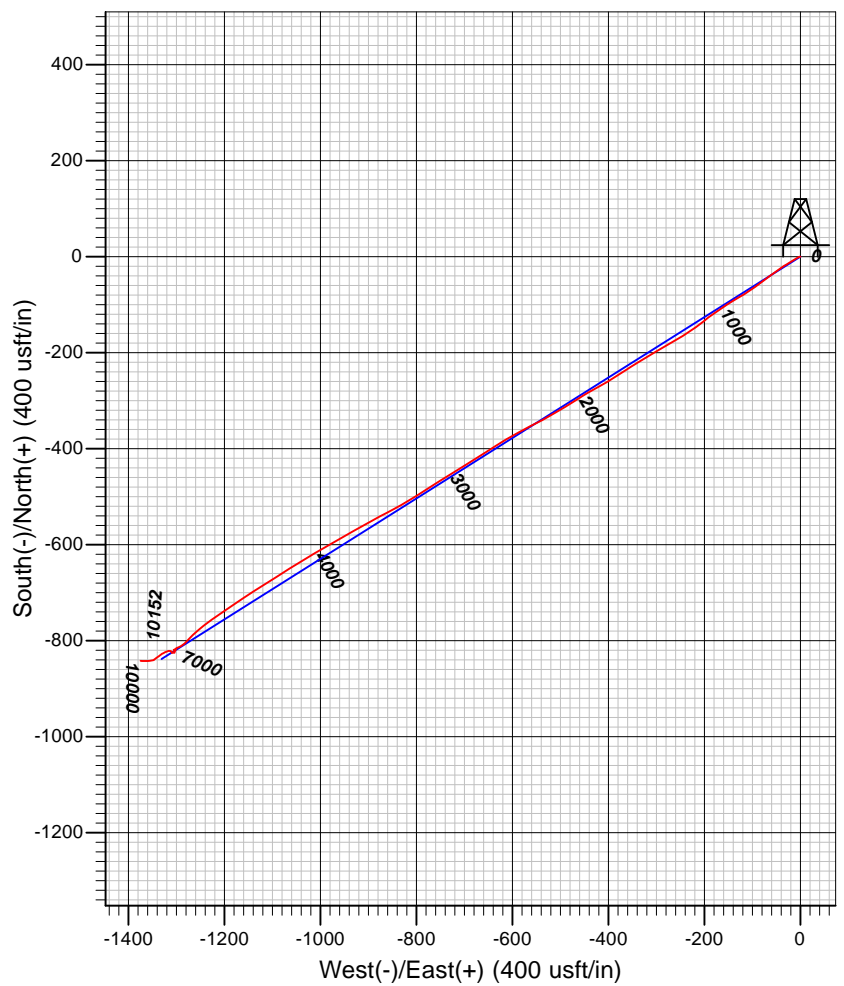
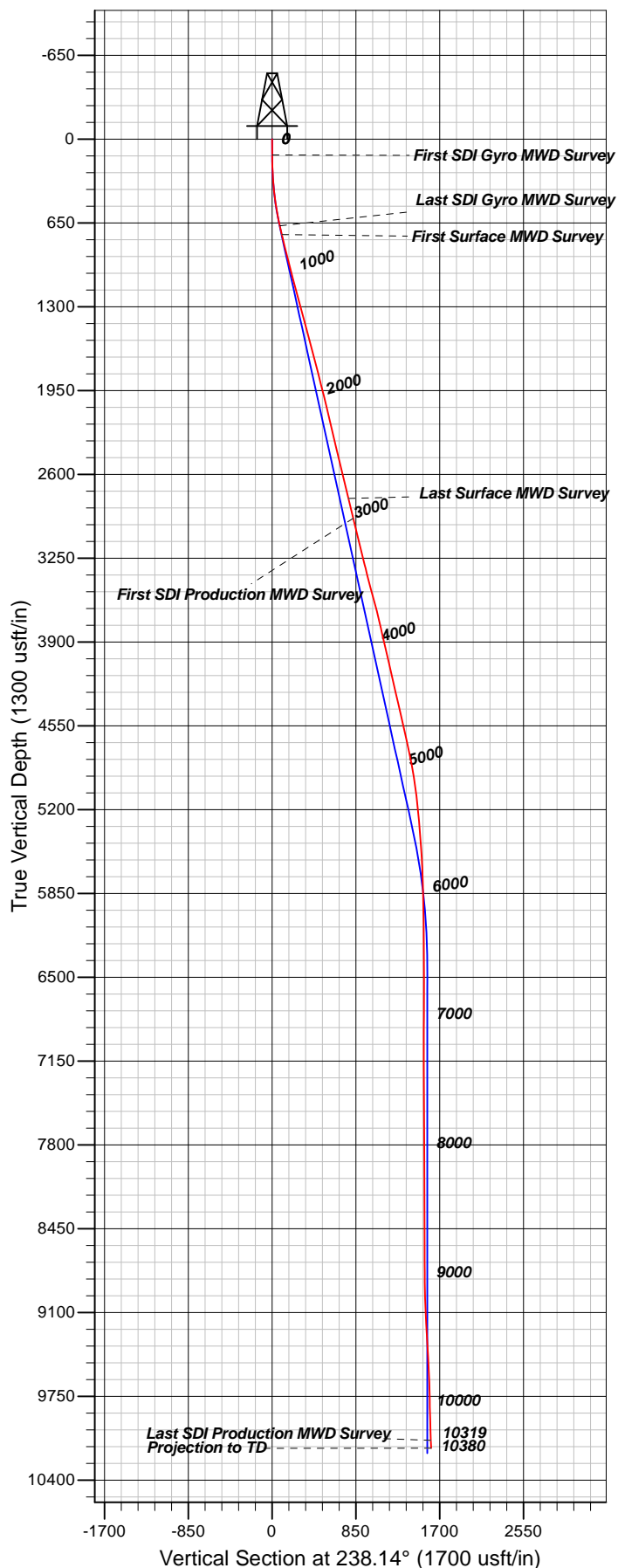
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Survey										
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8,074.00	0.95	195.69	7,847.86	-823.62	-1,303.48	1,541.84	0.63	-0.12	35.98	
8,169.00	1.05	189.61	7,942.84	-825.23	-1,303.83	1,542.99	0.15	0.11	-6.40	
8,263.00	0.70	322.88	8,036.84	-825.62	-1,304.33	1,543.62	1.72	-0.37	141.78	
8,358.00	0.70	301.97	8,131.83	-824.85	-1,305.17	1,543.93	0.27	0.00	-22.01	
8,452.00	0.42	257.08	8,225.83	-824.63	-1,305.99	1,544.51	0.53	-0.30	-47.76	
8,547.00	0.88	242.82	8,320.82	-825.04	-1,306.98	1,545.56	0.51	0.48	-15.01	
8,643.00	1.32	249.50	8,416.80	-825.76	-1,308.67	1,547.38	0.48	0.46	6.96	
8,738.00	0.79	16.67	8,511.79	-825.52	-1,309.51	1,547.96	2.00	-0.56	133.86	
8,832.00	0.98	343.54	8,605.78	-824.13	-1,309.55	1,547.26	0.57	0.20	-35.24	
8,927.00	0.92	314.93	8,700.77	-822.81	-1,310.32	1,547.22	0.50	-0.06	-30.12	
9,022.00	1.07	295.95	8,795.76	-821.88	-1,311.66	1,547.87	0.38	0.16	-19.98	
9,116.00	1.41	269.62	8,889.74	-821.50	-1,313.60	1,549.32	0.70	0.36	-28.01	
9,211.00	1.85	261.54	8,984.70	-821.74	-1,316.29	1,551.73	0.52	0.46	-8.51	
9,305.00	2.64	250.64	9,078.62	-822.68	-1,319.83	1,555.23	0.95	0.84	-11.60	
9,400.00	3.42	245.90	9,173.49	-824.56	-1,324.48	1,560.18	0.86	0.82	-4.99	
9,494.00	4.40	235.52	9,267.27	-827.75	-1,330.01	1,566.56	1.28	1.04	-11.04	
9,589.00	6.33	235.17	9,361.85	-832.80	-1,337.32	1,575.43	2.03	2.03	-0.37	
9,683.00	4.22	230.07	9,455.45	-837.98	-1,344.22	1,584.03	2.30	-2.24	-5.43	
9,778.00	1.97	245.96	9,550.31	-840.89	-1,348.40	1,589.11	2.51	-2.37	16.73	
9,873.00	2.32	264.97	9,645.24	-841.72	-1,351.80	1,592.44	0.83	0.37	20.01	
9,967.00	2.29	265.40	9,739.16	-842.04	-1,355.57	1,595.81	0.04	-0.03	0.46	
10,062.00	2.43	266.76	9,834.08	-842.31	-1,359.47	1,599.26	0.16	0.15	1.43	
10,156.00	2.61	270.05	9,927.99	-842.42	-1,363.60	1,602.83	0.25	0.19	3.50	
10,250.00	2.95	269.19	10,021.88	-842.45	-1,368.16	1,606.72	0.36	0.36	-0.91	
10,319.00	2.90	273.67	10,090.79	-842.36	-1,371.68	1,609.66	0.34	-0.07	6.49	
Last SDI Production MWD Survey										
10,380.00	2.90	273.67	10,151.71	-842.17	-1,374.76	1,612.17	0.00	0.00	0.00	
Projection to TD - TR 423-23-597 PBHL										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
123.00	123.00	0.02	-0.57	First SDI Gyro MWD Survey	
678.00	670.74	-41.18	-64.85	Last SDI Gyro MWD Survey	
750.00	739.44	-54.12	-82.06	First Surface MWD Survey	
2,905.00	2,785.62	-407.84	-656.34	Last Surface MWD Survey	
3,067.00	2,940.12	-434.00	-697.43	First SDI Production MWD Survey	
10,319.00	10,090.79	-842.36	-1,371.68	Last SDI Production MWD Survey	
10,380.00	10,151.71	-842.17	-1,374.76	Projection to TD	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well TR 423-23-597 - Slot A5 (TR 423-23-597)
<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 423-23-597	<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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#### Well Details: TR 423-23-597

TVD Reference: GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318) Level: 8545.20  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.00 0.00 1654857.70 2227611.70 39.5993803 -108.2414620 (TR 423-23-597)

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well TR 423-23-597 - Slot A5 (TR 423-23-597), True North  
 Vertical (TVD) Reference: GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)  
 Section (VS) Reference: Slot - A5 (TR 423-23-597)(0.00N, 0.00E)  
 Measured Depth Reference: GL 8545.20' & RKB 24' @ 8569.20usft (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

17:39, August 17 2017  
 Created By: Mel Mireles Jr.