



#### Well Details: PA 322-24

TVD Reference: GL 5371' & RKB 24' @ 5395.00usft (H&P 318) Level: 5371.00  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.00 0.00 1618402.7700 2310464.9400 39.5058287 -107.9440589PA 322-24 (A7)

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well PA 322-24 - Slot PA 322-24 (A7), True North  
 Vertical (TVD) Reference: GL 5371' & RKB 24' @ 5395.00usft (H&P 318)  
 Section (VS) Reference: Slot - PA 322-24 (A7)(0.00N, 0.00E)  
 Measured Depth Reference: GL 5371' & RKB 24' @ 5395.00usft (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

12:09, October 04 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>	PA 322-24
<b>County &amp; State</b>	Garfield County, CO
<b>SDI Job No.</b>	OP.021196
<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 122 feet to a measured depth of 9,200 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

04-Oct-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 PA 322-24 - Slot PA 322-24 (A7)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5371' & RKB 24' @ 5395.00usft (H&P 318)
<b>Site:</b>	PA 34-24 Pad	<b>MD Reference:</b>	GL 5371' & RKB 24' @ 5395.00usft (H&P 318)
<b>Well:</b>	PA 322-24	<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		PA 34-24 Pad			
Site Position:		Northing:	1,618,371.2000 usft	Latitude:	39.5057421
From:	Map	Easting:	2,310,465.7000 usft	Longitude:	-107.9440532
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.54 °

Well	PA 322-24 - Slot PA 322-24 (A7)					
Well Position	+N/-S	0.00 usft	Northing:	1,618,402.7700 usft	Latitude:	39.5058287
	+E/-W	0.00 usft	Easting:	2,310,464.9400 usft	Longitude:	-107.9440589
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,371.00 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	9/24/2019	9.25	65.72	51,474

<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	316.84	

<b>Survey Program</b>	<b>Date</b>	10/4/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
122.00	579.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
652.00	1,077.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,169.00	9,200.00	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	
122.00	0.35	31.20	122.00	0.32	0.19	0.10	0.29	0.29	0.00	
<b>First SDI Gyro MWD Survey</b>										
214.00	4.31	354.11	213.91	4.00	-0.02	2.93	4.39	4.30	-40.32	
306.00	7.74	348.57	305.39	13.51	-1.60	10.95	3.78	3.73	-6.02	
397.00	11.00	345.41	395.16	27.93	-5.00	23.79	3.63	3.58	-3.47	
488.00	13.64	336.62	484.06	46.18	-11.45	41.52	3.55	2.90	-9.66	
579.00	17.07	328.36	571.81	67.41	-22.72	64.71	4.46	3.77	-9.08	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well PA 322-24 - Slot PA 322-24 (A7)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5371' & RKB 24' @ 5395.00usft (H&P 318)
<b>Site:</b>	PA 34-24 Pad	<b>MD Reference:</b>	GL 5371' & RKB 24' @ 5395.00usft (H&P 318)
<b>Well:</b>	PA 322-24	<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)
<b>Last SDI Gyro MWD Survey</b>									
652.00	18.68	320.91	641.30	85.61	-35.71	86.87	3.83	2.21	-10.21
<b>First SDI Surface MWD Survey</b>									
743.00	21.54	319.63	726.74	109.65	-55.72	118.10	3.18	3.14	-1.41
837.00	25.22	318.72	813.01	137.86	-80.12	155.37	3.93	3.91	-0.97
932.00	28.73	319.66	897.66	170.48	-108.26	198.41	3.72	3.69	0.99
1,026.00	32.20	317.90	978.67	206.30	-139.69	246.04	3.81	3.69	-1.87
1,077.00	34.29	317.04	1,021.32	226.89	-158.59	273.99	4.20	4.10	-1.69
<b>Last SDI Surface MWD Survey</b>									
1,169.00	35.35	317.39	1,096.85	265.45	-194.27	326.52	1.17	1.15	0.38
<b>First SDI Production MWD Survey</b>									
1,263.00	35.21	316.55	1,173.58	305.14	-231.32	380.81	0.54	-0.15	-0.89
1,357.00	37.66	317.40	1,249.20	345.95	-269.40	436.63	2.66	2.61	0.90
1,451.00	40.01	318.10	1,322.42	389.59	-309.02	495.57	2.54	2.50	0.74
1,546.00	38.67	317.37	1,395.89	434.16	-349.52	555.78	1.49	-1.41	-0.77
1,640.00	39.95	315.72	1,468.62	477.37	-390.48	615.32	1.76	1.36	-1.76
1,734.00	39.04	314.93	1,541.16	519.89	-432.51	675.09	1.11	-0.97	-0.84
1,829.00	39.92	316.08	1,614.49	562.98	-474.84	735.47	1.20	0.93	1.21
1,923.00	38.95	315.64	1,687.09	605.83	-516.42	795.17	1.07	-1.03	-0.47
2,018.00	40.10	316.87	1,760.37	649.51	-558.21	855.62	1.46	1.21	1.29
2,112.00	38.25	314.32	1,833.24	691.94	-599.74	914.97	2.61	-1.97	-2.71
2,207.00	39.83	316.52	1,907.03	734.56	-641.71	974.78	2.21	1.66	2.32
2,301.00	38.95	315.90	1,979.67	777.63	-682.99	1,034.43	1.03	-0.94	-0.66
2,396.00	37.99	314.67	2,054.05	819.63	-724.57	1,093.50	1.29	-1.01	-1.29
2,490.00	40.36	316.69	2,126.92	862.12	-766.03	1,152.86	2.86	2.52	2.15
2,585.00	39.19	315.30	2,199.93	905.84	-808.24	1,213.63	1.55	-1.23	-1.46
2,679.00	37.90	314.23	2,273.45	947.09	-849.82	1,272.16	1.54	-1.37	-1.14
2,773.00	38.95	316.43	2,347.10	988.64	-890.87	1,330.55	1.83	1.12	2.34
2,867.00	37.57	315.53	2,420.90	1,030.50	-931.32	1,388.75	1.58	-1.47	-0.96
2,962.00	39.31	317.39	2,495.31	1,073.32	-971.98	1,447.80	2.20	1.83	1.96
3,056.00	38.16	316.34	2,568.64	1,116.24	-1,012.19	1,506.62	1.41	-1.22	-1.12
3,151.00	36.84	316.25	2,644.01	1,158.05	-1,052.15	1,564.45	1.39	-1.39	-0.09
3,245.00	38.78	319.15	2,718.27	1,200.68	-1,090.90	1,622.05	2.80	2.06	3.09
3,340.00	38.16	318.27	2,792.65	1,245.09	-1,129.89	1,681.12	0.87	-0.65	-0.93
3,434.00	38.87	318.80	2,866.20	1,288.95	-1,168.65	1,739.62	0.83	0.76	0.56
3,529.00	37.37	317.92	2,940.94	1,332.78	-1,207.61	1,798.24	1.68	-1.58	-0.93
3,623.00	39.39	319.06	3,014.62	1,376.49	-1,246.28	1,856.58	2.28	2.15	1.21
3,718.00	38.40	318.59	3,088.56	1,421.39	-1,285.54	1,916.19	1.09	-1.04	-0.49
3,812.00	37.20	318.71	3,162.83	1,464.64	-1,323.61	1,973.77	1.28	-1.28	0.13
3,907.00	39.22	319.59	3,237.48	1,509.09	-1,362.03	2,032.48	2.20	2.13	0.93
4,001.00	37.64	319.42	3,311.11	1,553.52	-1,399.97	2,090.84	1.68	-1.68	-0.18
4,096.00	38.69	317.92	3,385.80	1,597.60	-1,438.74	2,149.51	1.47	1.11	-1.58
4,190.00	37.46	317.31	3,459.80	1,640.42	-1,477.81	2,207.48	1.37	-1.31	-0.65
4,285.00	35.53	316.43	3,536.17	1,681.65	-1,516.43	2,263.97	2.10	-2.03	-0.93

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well PA 322-24 - Slot PA 322-24 (A7)
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<b>Site:</b>	PA 34-24 Pad	<b>MD Reference:</b>	GL 5371' & RKB 24' @ 5395.00usft (H&P 318)
<b>Well:</b>	PA 322-24	<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)	
4,380.00	38.34	316.08	3,612.09	1,722.89	-1,555.90	2,321.05	2.97	2.96	-0.37	
4,474.00	38.87	315.90	3,685.55	1,765.07	-1,596.65	2,379.69	0.58	0.56	-0.19	
4,568.00	37.72	315.29	3,759.33	1,806.69	-1,637.41	2,437.93	1.29	-1.22	-0.65	
4,663.00	39.22	315.72	3,833.70	1,848.84	-1,678.83	2,497.01	1.60	1.58	0.45	
4,757.00	38.69	315.72	3,906.80	1,891.16	-1,720.09	2,556.10	0.56	-0.56	0.00	
4,852.00	37.11	314.76	3,981.76	1,932.60	-1,761.17	2,614.43	1.78	-1.66	-1.01	
4,947.00	38.98	317.08	4,056.58	1,974.66	-1,801.87	2,672.96	2.48	1.97	2.44	
5,041.00	37.90	316.69	4,130.20	2,017.32	-1,841.81	2,731.40	1.18	-1.15	-0.41	
5,136.00	35.79	315.02	4,206.22	2,058.21	-1,881.47	2,788.35	2.46	-2.22	-1.76	
5,230.00	36.86	316.00	4,281.96	2,097.94	-1,920.48	2,844.01	1.30	1.14	1.04	
5,324.00	35.70	315.25	4,357.73	2,137.70	-1,959.38	2,899.62	1.32	-1.23	-0.80	
5,419.00	34.65	314.41	4,435.39	2,176.28	-1,998.19	2,954.32	1.22	-1.11	-0.88	
5,513.00	31.05	315.27	4,514.34	2,212.22	-2,034.35	3,005.26	3.86	-3.83	0.91	
5,608.00	29.19	314.23	4,596.51	2,245.78	-2,068.19	3,052.90	2.03	-1.96	-1.09	
5,702.00	28.29	313.59	4,678.93	2,277.13	-2,100.75	3,098.04	1.01	-0.96	-0.68	
5,797.00	24.36	315.81	4,764.06	2,306.71	-2,130.73	3,140.12	4.26	-4.14	2.34	
5,891.00	22.16	314.49	4,850.42	2,333.04	-2,156.89	3,177.22	2.41	-2.34	-1.40	
5,986.00	20.31	313.18	4,938.97	2,356.88	-2,181.70	3,211.58	2.01	-1.95	-1.38	
6,080.00	17.85	311.77	5,027.80	2,377.64	-2,204.34	3,242.22	2.66	-2.62	-1.50	
6,174.00	17.85	314.33	5,117.27	2,397.31	-2,225.39	3,270.96	0.83	0.00	2.72	
6,269.00	15.04	312.38	5,208.38	2,415.80	-2,244.91	3,297.80	3.01	-2.96	-2.05	
6,363.00	15.21	318.89	5,299.13	2,433.31	-2,262.03	3,322.28	1.82	0.18	6.93	
6,458.00	12.66	318.27	5,391.32	2,450.47	-2,277.16	3,345.15	2.69	-2.68	-0.65	
6,552.00	12.49	317.66	5,483.07	2,465.67	-2,290.86	3,365.61	0.23	-0.18	-0.65	
6,647.00	11.61	320.12	5,575.98	2,480.60	-2,303.91	3,385.43	1.07	-0.93	2.59	
6,741.00	13.28	317.75	5,667.76	2,495.85	-2,317.23	3,405.67	1.86	1.78	-2.52	
6,766.70	12.39	317.73	5,692.82	2,500.08	-2,321.07	3,411.37	3.47	-3.47	-0.08	
PA 322-24 BTV										
6,835.00	10.02	317.66	5,759.82	2,509.89	-2,330.01	3,424.64	3.47	-3.47	-0.10	
6,930.00	7.84	319.88	5,853.66	2,520.96	-2,339.75	3,439.38	2.32	-2.29	2.34	
7,025.00	5.28	317.04	5,948.03	2,529.11	-2,346.90	3,450.22	2.72	-2.69	-2.99	
7,119.00	3.25	310.89	6,041.76	2,534.02	-2,351.87	3,457.20	2.21	-2.16	-6.54	
7,213.00	2.79	311.25	6,135.63	2,537.27	-2,355.60	3,462.13	0.49	-0.49	0.38	
7,308.00	2.45	301.53	6,230.53	2,539.86	-2,359.07	3,466.38	0.59	-0.36	-10.23	
7,403.00	1.96	298.65	6,325.46	2,541.70	-2,362.23	3,469.89	0.53	-0.52	-3.03	
7,497.00	2.02	296.65	6,419.41	2,543.21	-2,365.12	3,472.97	0.10	0.06	-2.13	
7,592.00	2.24	298.94	6,514.34	2,544.86	-2,368.24	3,476.31	0.25	0.23	2.41	
7,686.00	1.87	299.71	6,608.28	2,546.51	-2,371.18	3,479.52	0.39	-0.39	0.82	
7,780.00	1.85	294.37	6,702.23	2,547.90	-2,373.89	3,482.39	0.19	-0.02	-5.68	
7,875.00	0.46	304.91	6,797.21	2,548.75	-2,375.60	3,484.18	1.47	-1.46	11.09	
7,969.00	0.70	268.62	6,891.21	2,548.95	-2,376.49	3,484.93	0.45	0.26	-38.61	
8,064.00	1.07	247.07	6,986.19	2,548.59	-2,377.88	3,485.62	0.52	0.39	-22.68	
8,158.00	0.97	242.51	7,080.18	2,547.88	-2,379.40	3,486.14	0.14	-0.11	-4.85	
8,253.00	1.29	238.06	7,175.16	2,546.95	-2,381.02	3,486.57	0.35	0.34	-4.68	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well PA 322-24 - Slot PA 322-24 (A7)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5371' & RKB 24' @ 5395.00usft (H&P 318)
<b>Site:</b>	PA 34-24 Pad	<b>MD Reference:</b>	GL 5371' & RKB 24' @ 5395.00usft (H&P 318)
<b>Well:</b>	PA 322-24	<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)
8,347.00	0.97	227.48	7,269.14	2,545.85	-2,382.50	3,486.78	0.41	-0.34	-11.26
8,441.00	0.47	204.08	7,363.13	2,544.96	-2,383.25	3,486.64	0.61	-0.53	-24.89
8,536.00	0.50	245.05	7,458.13	2,544.43	-2,383.78	3,486.62	0.36	0.03	43.13
8,631.00	0.69	215.79	7,553.13	2,543.79	-2,384.49	3,486.64	0.37	0.20	-30.80
8,725.00	1.56	185.60	7,647.11	2,542.06	-2,384.95	3,485.69	1.09	0.93	-32.12
8,820.00	1.67	227.31	7,742.07	2,539.83	-2,386.09	3,484.85	1.22	0.12	43.91
8,914.00	2.29	226.16	7,836.02	2,537.60	-2,388.45	3,484.84	0.66	0.66	-1.22
9,008.00	3.36	220.36	7,929.90	2,534.20	-2,391.59	3,484.50	1.18	1.14	-6.17
9,103.00	3.25	216.32	8,024.74	2,529.91	-2,394.99	3,483.70	0.27	-0.12	-4.25
9,141.00	2.81	214.39	8,062.69	2,528.28	-2,396.15	3,483.30	1.19	-1.16	-5.08
Last SDI Production MWD Survey									
9,200.00	2.81	214.39	8,121.62	2,525.89	-2,397.79	3,482.68	0.00	0.00	0.00
Projection to TD - PA 322-24 PBHL									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
122.00	122.00	0.32	0.19	First SDI Gyro MWD Survey
579.00	571.81	67.41	-22.72	Last SDI Gyro MWD Survey
652.00	641.30	85.61	-35.71	First SDI Surface MWD Survey
1,077.00	1,021.32	226.89	-158.59	Last SDI Surface MWD Survey
1,169.00	1,096.85	265.45	-194.27	First SDI Production MWD Survey
9,141.00	8,062.69	2,528.28	-2,396.15	Last SDI Production MWD Survey
9,200.00	8,121.62	2,525.89	-2,397.79	Projection to TD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_