



7327 West Barton Road
Casper, WY 82604
(307)-472-6621 Fax (307) 472-5439

Survey Certification

Operator	TEP Rocky Mountain LLC
Well Name & No.	PA 324-13
API #	05-045-24200
County & State	Garfield County, CO
SDI Job #	OP.025413
Rig	H&P 318
Survey Date	16-Jun-2020

I, Seth M. Burstad, having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 0 feet to a measured depth of 9828 feet is true and correct as determined from all available records.

Seth M. Burstad

Signature

16-Jun-2020

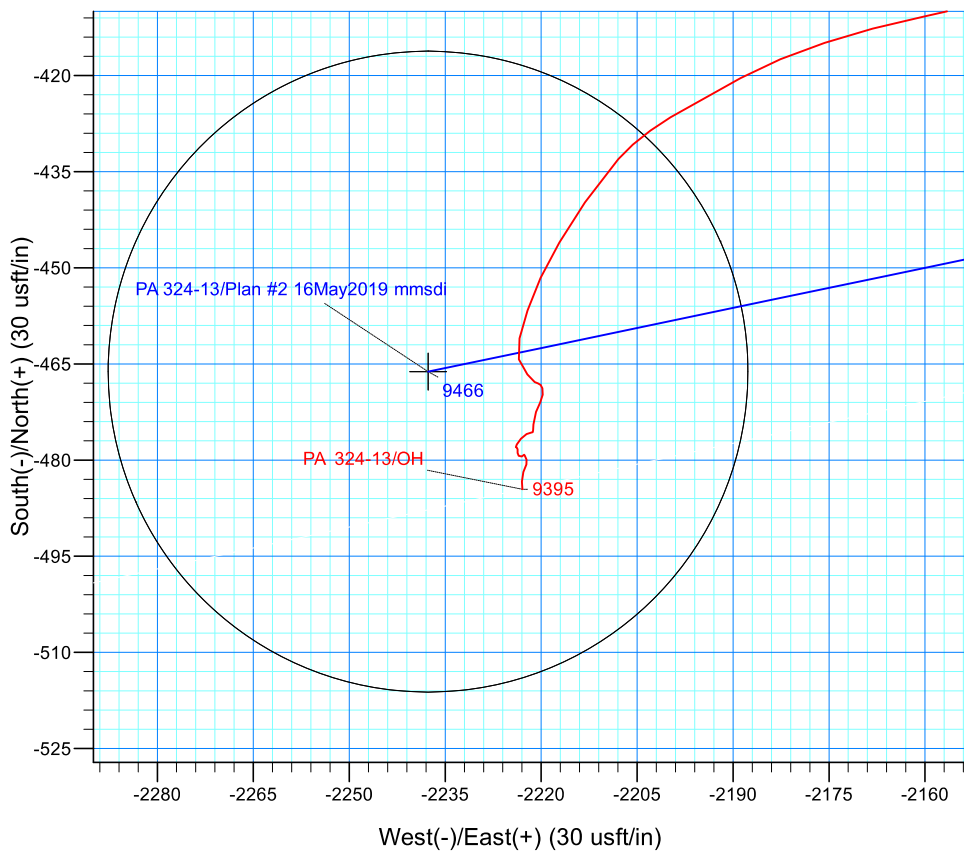
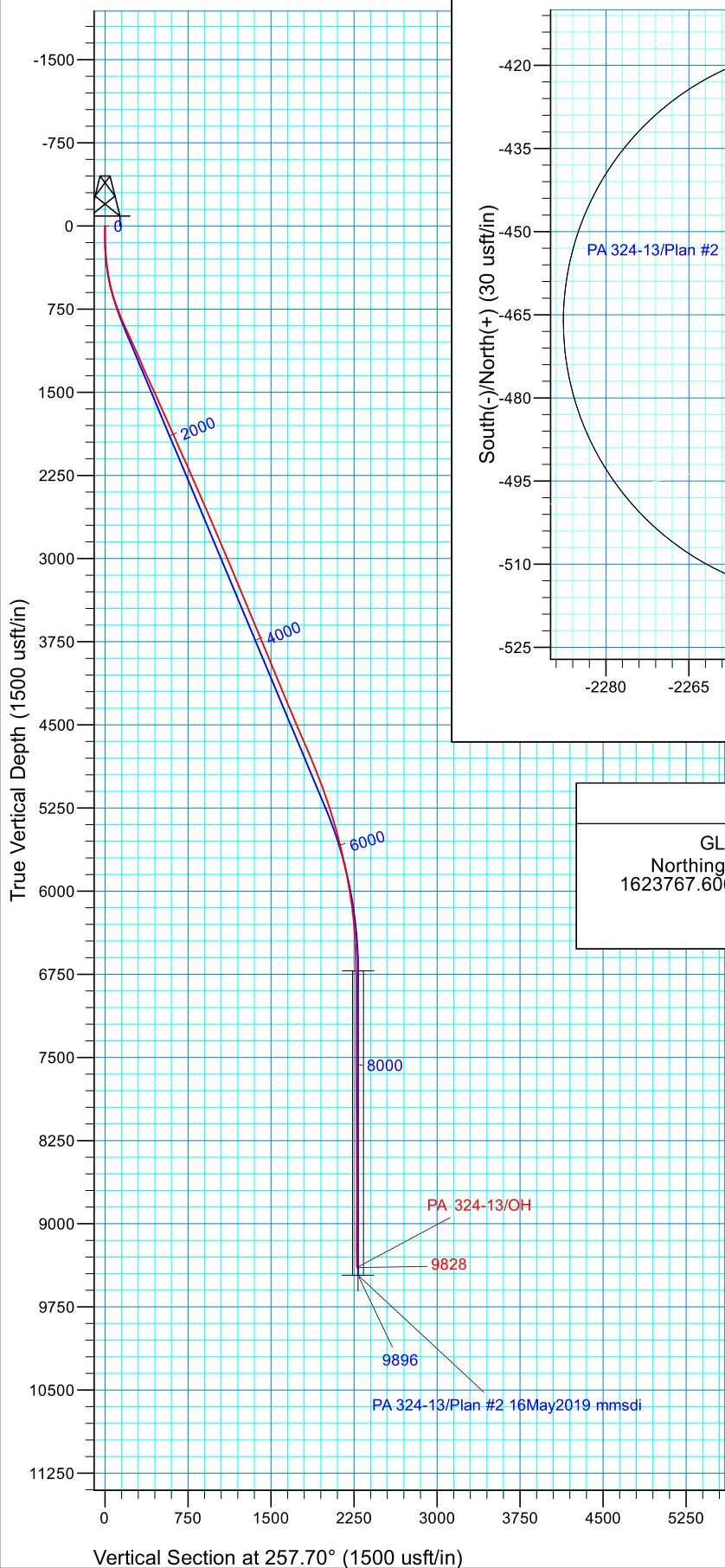
Date

Seth M. Burstad

Rockies Region Well Planner
Scientific Drilling - Rocky Mountain District



Project: Garfield County, CO NAD83
Site: PA 44-13 Pad
Well: PA 324-13
Wellbore: OH
Design: OH



WELL DETAILS: PA 324-13

GL 6571.1 & RKB 24' @ 6595.10usft (H&P 318)
Northing Easting Latitude Longitude
1623767.6000 2311235.5000 39.5206090 -107.9418399

PROJECT DETAILS: Garfield County, CO NAD83

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Central Zone

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well PA 324-13 - Slot PA 324-13 (B5), True North
Vertical (TVD) Reference: GL 6571.1 & RKB 24' @ 6595.10usft (H&P 318)
Section (VS) Reference: Slot - PA 324-13 (B5)(0.00N, 0.00E)
Measured Depth Reference: GL 6571.1 & RKB 24' @ 6595.10usft (H&P 318)
Calculation Method: Minimum Curvature
Local North: True
Location:



TEP Rocky Mountain LLC

Garfield County, CO NAD83

PA 44-13 Pad

PA 324-13 - Slot PA 324-13 (B5)

OH

Design: OH

Standard Survey Report

16 June, 2020



Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well PA 324-13 - Slot PA 324-13 (B5)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6571.1 & RKB 24' @ 6595.10usft (H&P 318)
Site:	PA 44-13 Pad	MD Reference:	GL 6571.1 & RKB 24' @ 6595.10usft (H&P 318)
Well:	PA 324-13	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction

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		PA 44-13 Pad			
Site Position:		Northing:	1,623,813.7000 usft	Latitude:	39.5207354
From:	Map	Easting:	2,311,233.5000 usft	Longitude:	-107.9418514
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.54 °

Well	PA 324-13 - Slot PA 324-13 (B5)					
Well Position	+N/-S	0.00 usft	Northing:	1,623,767.6000 usft	Latitude:	39.5206091
	+E/-W	0.00 usft	Easting:	2,311,235.5000 usft	Longitude:	-107.9418400
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,571.10 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM_FILE	6/10/2020	9.22	65.72	51,376.50000000

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	257.70	

Survey Program	Date	6/16/2020			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
122.00	855.00	Survey #1 - Surface Gyro (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
933.00	1,076.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,167.00	9,828.00	Survey #3 - Production (OH)	MWD+HDGM	OWSG MWD + HDGM	

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	
122.00	0.44	273.96	122.00	0.03	-0.47	0.45	0.36	0.36	0.00	
First SDI Gyro Survey										
213.00	2.82	262.18	212.96	-0.25	-3.03	3.02	2.63	2.62	-12.95	
304.00	6.16	261.12	303.66	-1.31	-10.08	10.12	3.67	3.67	-1.16	
395.00	8.27	256.20	393.94	-3.62	-21.26	21.54	2.41	2.32	-5.41	
486.00	11.09	256.55	483.63	-7.22	-36.13	36.84	3.10	3.10	0.38	
576.00	14.08	254.97	571.46	-12.07	-55.12	56.43	3.34	3.32	-1.76	
666.00	17.24	257.87	658.11	-17.72	-78.74	80.71	3.62	3.51	3.22	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well PA 324-13 - Slot PA 324-13 (B5)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6571.1 & RKB 24' @ 6595.10usft (H&P 318)
Site:	PA 44-13 Pad	MD Reference:	GL 6571.1 & RKB 24' @ 6595.10usft (H&P 318)
Well:	PA 324-13	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction

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)
761.00	20.94	257.08	747.87	-24.47	-109.06	111.77	3.90	3.89	-0.83
855.00	23.67	259.10	834.83	-31.80	-143.97	147.44	3.02	2.90	2.15
Last SDI Gyro Survey									
933.00	23.95	259.94	906.19	-37.52	-174.93	178.91	0.56	0.36	1.08
First SDI MWD Surface Survey									
1,027.00	24.93	256.38	991.77	-45.52	-212.98	217.79	1.88	1.04	-3.79
1,076.00	24.89	255.67	1,036.22	-50.51	-233.00	238.42	0.62	-0.08	-1.45
Last SDI MWD Surface Survey									
1,167.00	24.02	254.56	1,119.05	-60.18	-269.41	276.05	1.08	-0.96	-1.22
First SDI MWD Production Survey									
1,261.00	23.32	252.83	1,205.14	-70.76	-305.63	313.69	1.05	-0.74	-1.84
1,356.00	23.39	258.04	1,292.37	-80.22	-342.05	351.29	2.17	0.07	5.48
1,450.00	24.97	260.89	1,378.12	-87.23	-379.90	389.76	2.09	1.68	3.03
1,544.00	25.00	261.52	1,463.33	-93.30	-419.13	429.39	0.28	0.03	0.67
1,638.00	24.05	261.65	1,548.84	-99.01	-457.73	468.32	1.01	-1.01	0.14
1,733.00	24.95	263.03	1,635.29	-104.26	-496.77	507.58	1.12	0.95	1.45
1,827.00	22.84	261.18	1,721.23	-109.46	-534.48	545.53	2.38	-2.24	-1.97
1,921.00	24.72	262.78	1,807.25	-114.73	-572.01	583.32	2.11	2.00	1.70
2,016.00	24.23	263.03	1,893.71	-119.59	-611.07	622.52	0.53	-0.52	0.26
2,110.00	22.88	261.60	1,979.88	-124.60	-648.30	659.96	1.56	-1.44	-1.52
2,204.00	25.02	262.73	2,065.78	-129.79	-686.10	698.00	2.33	2.28	1.20
2,299.00	24.43	261.80	2,152.07	-135.13	-725.47	737.60	0.74	-0.62	-0.98
2,393.00	22.82	260.15	2,238.19	-141.02	-762.67	775.21	1.85	-1.71	-1.76
2,487.00	23.93	261.21	2,324.47	-147.05	-799.47	812.45	1.26	1.18	1.13
2,581.00	23.19	260.05	2,410.64	-153.16	-836.54	849.97	0.93	-0.79	-1.23
2,676.00	24.53	261.20	2,497.52	-159.41	-874.46	888.35	1.49	1.41	1.21
2,770.00	23.57	259.80	2,583.36	-165.73	-912.24	926.60	1.19	-1.02	-1.49
2,865.00	22.55	258.28	2,670.76	-172.79	-948.77	963.80	1.24	-1.07	-1.60
2,959.00	24.21	258.65	2,757.04	-180.25	-985.32	1,001.10	1.77	1.77	0.39
3,053.00	23.30	258.21	2,843.08	-187.84	-1,022.41	1,038.96	0.99	-0.97	-0.47
3,147.00	21.98	257.34	2,929.83	-195.49	-1,057.78	1,075.14	1.45	-1.40	-0.93
3,242.00	23.13	257.34	3,017.57	-203.48	-1,093.33	1,111.58	1.21	1.21	0.00
3,336.00	22.27	256.27	3,104.28	-211.75	-1,128.65	1,147.85	1.01	-0.91	-1.14
3,430.00	23.72	257.95	3,190.81	-219.93	-1,164.44	1,184.57	1.69	1.54	1.79
3,525.00	23.13	257.77	3,277.98	-227.87	-1,201.36	1,222.33	0.63	-0.62	-0.19
3,619.00	21.92	257.00	3,364.81	-235.73	-1,236.51	1,258.34	1.32	-1.29	-0.82
3,713.00	22.95	258.32	3,451.70	-243.38	-1,271.55	1,294.21	1.22	1.10	1.40
3,808.00	21.74	257.86	3,539.56	-250.83	-1,306.89	1,330.33	1.29	-1.27	-0.48
3,902.00	22.95	259.44	3,626.50	-257.85	-1,341.93	1,366.06	1.44	1.29	1.68
3,996.00	22.05	259.78	3,713.35	-264.34	-1,377.31	1,402.01	0.97	-0.96	0.36
4,091.00	23.39	260.24	3,800.97	-270.70	-1,413.44	1,438.67	1.42	1.41	0.48
4,185.00	22.86	260.76	3,887.42	-276.80	-1,449.85	1,475.54	0.60	-0.56	0.55
4,279.00	21.81	260.94	3,974.37	-282.48	-1,485.12	1,511.21	1.12	-1.12	0.19
4,374.00	22.87	259.60	4,062.23	-288.59	-1,520.71	1,547.28	1.24	1.12	-1.41

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well PA 324-13 - Slot PA 324-13 (B5)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6571.1 & RKB 24' @ 6595.10usft (H&P 318)
Site:	PA 44-13 Pad	MD Reference:	GL 6571.1 & RKB 24' @ 6595.10usft (H&P 318)
Well:	PA 324-13	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction

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)
4,468.00	21.90	259.01	4,149.15	-295.23	-1,555.88	1,583.06	1.06	-1.03	-0.63
4,562.00	23.30	260.50	4,235.93	-301.64	-1,591.43	1,619.16	1.61	1.49	1.59
4,657.00	22.51	260.76	4,323.44	-307.66	-1,627.91	1,656.08	0.84	-0.83	0.27
4,751.00	23.46	260.58	4,409.98	-313.62	-1,664.13	1,692.74	1.01	1.01	-0.19
4,846.00	22.45	260.87	4,497.45	-319.59	-1,700.69	1,729.74	1.07	-1.06	0.31
4,940.00	23.53	258.72	4,583.99	-326.11	-1,736.82	1,766.42	1.46	1.15	-2.29
5,034.00	22.95	258.57	4,670.36	-333.41	-1,773.18	1,803.51	0.62	-0.62	-0.16
5,129.00	23.92	258.48	4,757.52	-340.93	-1,810.21	1,841.29	1.02	1.02	-0.09
5,223.00	22.69	258.65	4,843.85	-348.30	-1,846.66	1,878.47	1.31	-1.31	0.18
5,318.00	21.54	258.73	4,931.86	-355.31	-1,881.73	1,914.23	1.21	-1.21	0.08
5,412.00	20.61	258.66	5,019.57	-361.94	-1,914.87	1,948.03	0.99	-0.99	-0.07
5,507.00	19.63	258.49	5,108.77	-368.41	-1,946.90	1,980.70	1.03	-1.03	-0.18
5,601.00	19.17	257.51	5,197.43	-374.90	-1,977.44	2,011.92	0.60	-0.49	-1.04
5,695.00	17.27	260.36	5,286.72	-380.58	-2,006.27	2,041.30	2.23	-2.02	3.03
5,790.00	16.16	260.05	5,377.70	-385.22	-2,033.20	2,068.59	1.17	-1.17	-0.33
5,884.00	15.30	259.88	5,468.18	-389.66	-2,058.29	2,094.06	0.92	-0.91	-0.18
5,979.00	14.41	259.35	5,560.01	-394.05	-2,082.25	2,118.40	0.95	-0.94	-0.56
6,074.00	12.95	258.08	5,652.31	-398.43	-2,104.28	2,140.86	1.57	-1.54	-1.34
6,168.00	11.82	257.96	5,744.12	-402.62	-2,124.00	2,161.02	1.20	-1.20	-0.13
6,263.00	11.23	256.46	5,837.21	-406.81	-2,142.51	2,180.00	0.70	-0.62	-1.58
6,357.00	10.74	258.15	5,929.48	-410.75	-2,159.98	2,197.91	0.62	-0.52	1.80
6,451.00	9.19	251.80	6,022.06	-414.90	-2,175.69	2,214.13	2.02	-1.65	-6.76
6,546.00	8.11	242.29	6,115.99	-420.38	-2,188.83	2,228.14	1.88	-1.14	-10.01
6,640.00	7.23	238.94	6,209.15	-426.52	-2,199.76	2,240.13	1.05	-0.94	-3.56
6,735.00	5.53	221.68	6,303.56	-433.02	-2,207.93	2,249.50	2.68	-1.79	-18.17
6,829.00	4.94	213.18	6,397.17	-439.79	-2,213.16	2,256.05	1.04	-0.63	-9.04
6,924.00	4.05	211.60	6,491.88	-446.07	-2,217.15	2,261.29	0.95	-0.94	-1.66
7,018.00	3.61	204.64	6,585.67	-451.59	-2,220.13	2,265.37	0.68	-0.47	-7.40
7,113.00	2.97	197.83	6,680.51	-456.65	-2,222.13	2,268.40	0.79	-0.67	-7.17
7,207.00	2.56	194.22	6,774.40	-461.00	-2,223.39	2,270.56	0.47	-0.44	-3.84
7,301.00	1.62	160.63	6,868.34	-464.29	-2,223.46	2,271.34	1.60	-1.00	-35.73
7,396.00	1.65	140.66	6,963.30	-466.62	-2,222.15	2,270.55	0.60	0.03	-21.02
7,490.00	0.38	118.82	7,057.29	-467.81	-2,221.02	2,269.70	1.39	-1.35	-23.23
7,584.00	0.30	109.78	7,151.29	-468.05	-2,220.52	2,269.25	0.10	-0.09	-9.62
7,679.00	0.29	129.66	7,246.29	-468.29	-2,220.10	2,268.90	0.11	-0.01	20.93
7,772.00	0.50	164.55	7,339.28	-468.83	-2,219.81	2,268.73	0.33	0.23	37.52
7,867.00	0.71	184.58	7,434.28	-469.81	-2,219.74	2,268.88	0.31	0.22	21.08
7,961.00	0.91	208.93	7,528.27	-471.05	-2,220.15	2,269.54	0.42	0.21	25.90
8,055.00	1.03	200.37	7,622.26	-472.49	-2,220.81	2,270.49	0.20	0.13	-9.11
8,150.00	1.41	184.41	7,717.23	-474.46	-2,221.19	2,271.28	0.53	0.40	-16.80
8,244.00	0.05	213.95	7,811.22	-475.65	-2,221.31	2,271.64	1.45	-1.45	31.43
8,339.00	0.32	263.62	7,906.22	-475.71	-2,221.59	2,271.94	0.31	0.28	52.28
8,433.00	0.57	241.73	8,000.22	-475.96	-2,222.27	2,272.65	0.32	0.27	-23.29

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Site:	PA 44-13 Pad	MD Reference:	GL 6571.1 & RKB 24' @ 6595.10usft (H&P 318)
Well:	PA 324-13	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction

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)	
8,527.00	0.83	224.43	8,094.21	-476.67	-2,223.15	2,273.67	0.35	0.28	-18.40	
8,622.00	0.54	202.97	8,189.21	-477.57	-2,223.81	2,274.50	0.40	-0.31	-22.59	
8,716.00	0.03	134.64	8,283.21	-478.00	-2,223.97	2,274.74	0.56	-0.54	-72.69	
8,811.00	0.14	92.99	8,378.21	-478.02	-2,223.83	2,274.62	0.13	0.12	-43.84	
8,905.00	0.38	175.55	8,472.20	-478.34	-2,223.69	2,274.55	0.41	0.26	87.83	
8,999.00	0.31	180.96	8,566.20	-478.90	-2,223.67	2,274.65	0.08	-0.07	5.76	
9,094.00	0.32	138.40	8,661.20	-479.36	-2,223.50	2,274.58	0.24	0.01	-44.80	
9,188.00	0.41	69.22	8,755.20	-479.43	-2,223.01	2,274.12	0.45	0.10	-73.60	
9,283.00	0.20	12.14	8,850.20	-479.15	-2,222.66	2,273.71	0.36	-0.22	-60.08	
9,378.00	0.40	165.89	8,945.20	-479.31	-2,222.54	2,273.63	0.62	0.21	161.84	
9,472.00	0.44	146.89	9,039.20	-479.93	-2,222.27	2,273.50	0.15	0.04	-20.21	
9,567.00	0.63	205.28	9,134.19	-480.71	-2,222.29	2,273.69	0.58	0.20	61.46	
9,661.00	0.89	201.28	9,228.18	-481.86	-2,222.78	2,274.40	0.28	0.28	-4.26	
9,758.00	0.97	176.56	9,325.17	-483.38	-2,223.00	2,274.95	0.42	0.08	-25.48	
Last SDI MWD Production Survey										
9,828.00	0.97	176.56	9,395.16	-484.56	-2,222.93	2,275.13	0.00	0.00	0.00	
Prodection to TD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
122.00	122.00	0.03	-0.47	First SDI Gyro Survey	
855.00	834.83	-31.80	-143.97	Last SDI Gyro Survey	
933.00	906.19	-37.52	-174.93	First SDI MWD Surface Survey	
1,076.00	1,036.22	-50.51	-233.00	Last SDI MWD Surface Survey	
1,167.00	1,119.05	-60.18	-269.41	First SDI MWD Production Survey	
9,758.00	9,325.17	-483.38	-2,223.00	Last SDI MWD Production Survey	
9,828.00	9,395.16	-484.56	-2,222.93	Prodection to TD	

Checked By: _____ Approved By: _____ Date: _____