

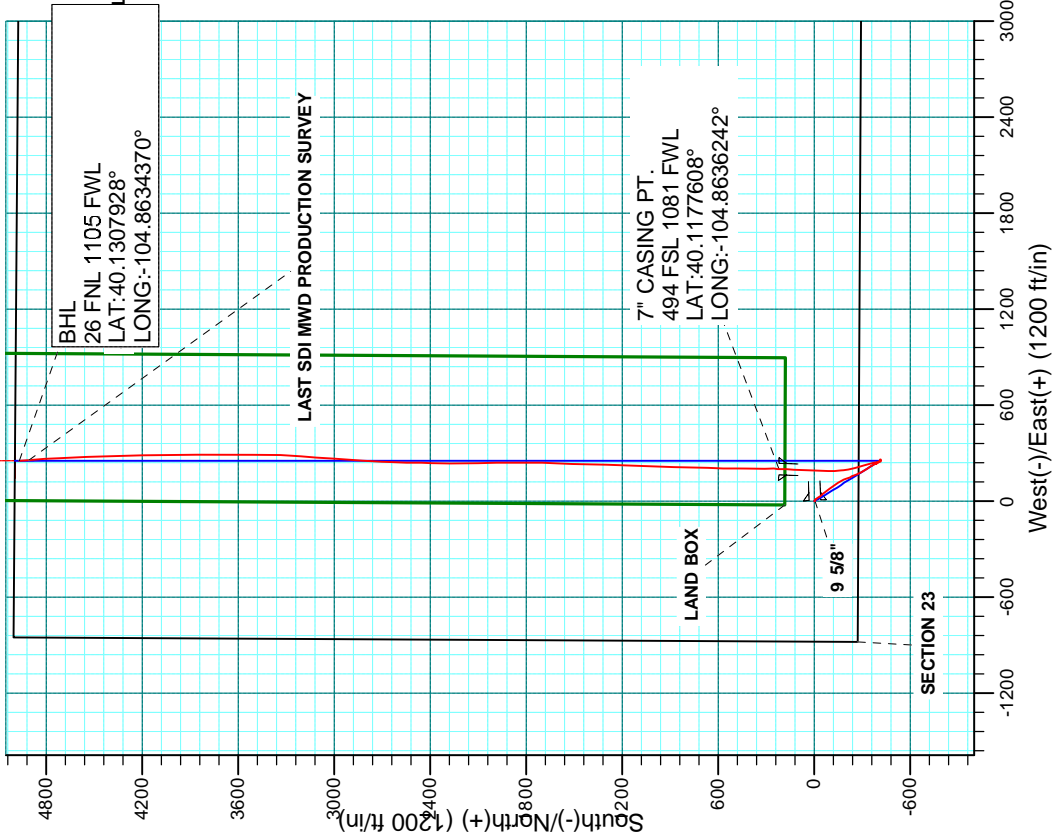
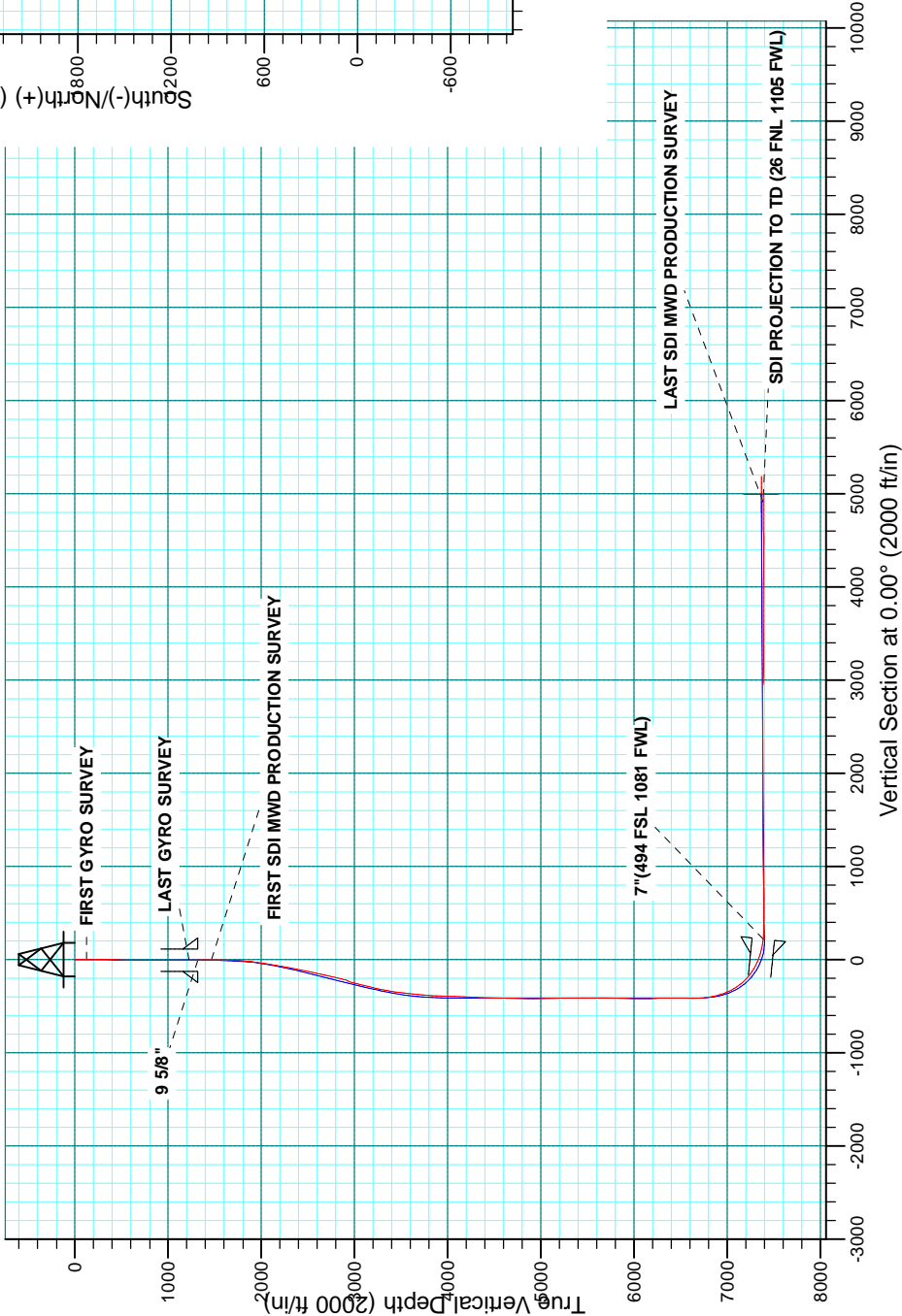


Project: COLORADO NORTHERN ZONE - 83  
Site: SPOTTED 35-23HZ PAD  
Well: SPOTTED 29N-23HZ  
Wellbore: OH  
Design: OH



WELL DETAILS: SPOTTED 29N-23HZ				
GL 4966 & KB 25 @ 4991.00ft (H&P 311)				
+N/-S 0.00	+E/-W 0.00	Northing 1286160.42	Easting 3177774.99	Latitude 40.1171540 Longitude -104.8643400

PROJECT DETAILS: COLORADO NORTHERN ZONE - 83	
Geodetic System: US State Plane 1983	
Datum: North American Datum 1983	
Ellipsoid: GRS 1980	
Zone: Colorado Northern Zone	
Location: SMSW SECTION 23 T2N R67W	
System Datum: Mean Sea Level	



# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**SPOTTED 35-23HZ PAD**

**SPOTTED 29N-23HZ**

**OH**

**Design: OH**

## **Standard Survey Report**

**01 July, 2014**

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPOTTED 29N-23HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
<b>Site:</b>	SPOTTED 35-23HZ PAD	<b>MD Reference:</b>	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
<b>Well:</b>	SPOTTED 29N-23HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Denver Sales

<b>Project</b>	COLORADO NORTHERN ZONE - 83, KERR MCGEE OIL & GAS ONSHORE LP		
<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 Northern Zone		

<b>Site</b>	SPOTTED 35-23HZ PAD, SWSW SECTION 23 T2N R67W			
<b>Site Position:</b>		<b>Northing:</b>	1,286,160.43 usft	<b>Latitude:</b> 40.1171540
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,177,774.99 usft	<b>Longitude:</b> -104.8643400
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b> 0.41 °

<b>Well</b>	SPOTTED 29N-23HZ, 275' FSL 880' FWL			
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	1,286,160.42 usft
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	3,177,774.99 usft
<b>Position Uncertainty</b>	0.00 ft		<b>Wellhead Elevation:</b>	0.00 ft
			<b>Ground Level:</b>	4,966.00 ft

<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>
	BGGM2013	5/22/2014	8.55	66.69	52,577

<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) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00		0.00

<b>Survey Program</b>	<b>Date</b>	7/1/2014			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
25.00	1,225.00	Survey #1 SURFACE GYRO (OH)	NS-GYRO-MS	North sensing gyrocompassing m/s	
1,465.00	12,536.00	Survey #2 SDI MWD PRODUCTION (OH)	SDI_MWD+CRUST_1.0	SDI MWD + Crustal anomaly, Version 1.0	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</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	
25.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	
125.00	0.77	148.76	125.00	-0.57	0.35	-0.57	0.77	0.77	0.00	
<b>FIRST GYRO SURVEY</b>										
225.00	0.87	141.53	224.99	-1.74	1.17	-1.74	0.14	0.10	-7.23	
325.00	0.80	145.29	324.98	-2.91	2.04	-2.91	0.09	-0.07	3.76	
425.00	0.88	131.11	424.97	-3.99	3.02	-3.99	0.22	0.08	-14.18	
525.00	0.49	125.44	524.96	-4.74	3.94	-4.74	0.40	-0.39	-5.67	
625.00	0.43	116.76	624.95	-5.16	4.63	-5.16	0.09	-0.06	-8.68	
725.00	0.35	112.21	724.95	-5.44	5.24	-5.44	0.09	-0.08	-4.55	

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPOTTED 29N-23HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
<b>Site:</b>	SPOTTED 35-23HZ PAD	<b>MD Reference:</b>	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
<b>Well:</b>	SPOTTED 29N-23HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Denver Sales

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
825.00	0.29	78.37	824.95	-5.51	5.77	-5.51	0.19	-0.06	-33.84
925.00	0.18	27.05	924.95	-5.32	6.09	-5.32	0.23	-0.11	-51.32
1,025.00	0.29	305.25	1,024.95	-5.03	5.96	-5.03	0.32	0.11	-81.80
1,125.00	0.36	341.40	1,124.95	-4.59	5.65	-4.59	0.21	0.07	36.15
1,225.00	0.60	267.56	1,224.95	-4.31	5.03	-4.31	0.61	0.24	-73.84
LAST GYRO SURVEY									
1,465.00	0.95	324.81	1,464.93	-2.74	2.63	-2.74	0.33	0.15	23.85
FIRST SDI MWD PRODUCTION SURVEY									
1,573.00	1.69	126.44	1,572.91	-2.95	3.39	-2.95	2.42	0.69	149.66
1,753.00	4.44	137.37	1,752.64	-9.66	10.25	-9.66	1.56	1.53	6.07
1,844.00	6.30	147.20	1,843.24	-16.45	15.34	-16.45	2.27	2.04	10.80
1,936.00	8.16	143.50	1,934.50	-25.94	21.96	-25.94	2.08	2.02	-4.02
2,027.00	11.09	147.70	2,024.21	-38.53	30.48	-38.53	3.31	3.22	4.62
2,119.00	11.64	139.63	2,114.42	-53.08	41.22	-53.08	1.83	0.60	-8.77
2,210.00	12.78	138.20	2,203.36	-67.58	53.87	-67.58	1.30	1.25	-1.57
2,302.00	12.32	142.05	2,293.16	-82.91	66.69	-82.91	1.04	-0.50	4.18
2,484.00	14.50	144.10	2,470.19	-116.68	91.99	-116.68	1.23	1.20	1.13
2,576.00	15.47	148.53	2,559.06	-136.47	105.15	-136.47	1.63	1.05	4.82
2,667.00	15.01	147.69	2,646.86	-156.79	117.79	-156.79	0.56	-0.51	-0.92
2,759.00	15.57	151.43	2,735.61	-177.70	130.06	-177.70	1.23	0.61	4.07
2,850.00	15.58	159.11	2,823.27	-199.84	140.26	-199.84	2.26	0.01	8.44
2,941.00	17.39	157.83	2,910.53	-223.86	149.75	-223.86	2.03	1.99	-1.41
3,033.00	16.35	155.65	2,998.57	-248.39	160.28	-248.39	1.32	-1.13	-2.37
3,124.00	16.77	157.29	3,085.80	-272.17	170.63	-272.17	0.69	0.46	1.80
3,216.00	16.69	151.27	3,173.91	-296.00	182.10	-296.00	1.88	-0.09	-6.54
3,307.00	14.09	150.86	3,261.64	-317.13	193.78	-317.13	2.86	-2.86	-0.45
3,496.00	9.10	143.49	3,446.73	-349.26	213.89	-349.26	2.75	-2.64	-3.90
3,590.00	7.02	151.94	3,539.80	-360.31	221.01	-360.31	2.54	-2.21	8.99
3,779.00	5.73	157.69	3,727.63	-379.23	230.03	-379.23	0.76	-0.68	3.04
3,873.00	3.46	167.07	3,821.32	-386.34	232.45	-386.34	2.54	-2.41	9.98
3,967.00	2.15	136.50	3,915.21	-390.38	234.29	-390.38	2.07	-1.39	-32.52
4,250.00	2.59	156.40	4,197.98	-400.09	240.51	-400.09	0.33	0.16	7.03
4,344.00	3.22	149.89	4,291.86	-404.32	242.68	-404.32	0.76	0.67	-6.93
4,439.00	2.42	139.01	4,386.74	-408.14	245.34	-408.14	1.01	-0.84	-11.45
4,627.00	2.28	108.65	4,574.59	-412.33	251.48	-412.33	0.66	-0.07	-16.15
4,721.00	2.21	130.03	4,668.52	-414.10	254.64	-414.10	0.89	-0.07	22.74
4,816.00	1.26	156.36	4,763.48	-416.23	256.47	-416.23	1.28	-1.00	27.72
4,910.00	0.68	131.69	4,857.46	-417.55	257.30	-417.55	0.75	-0.62	-26.24
5,004.00	0.46	59.24	4,951.46	-417.73	258.04	-417.73	0.74	-0.23	-77.07
5,288.00	0.88	354.34	5,235.44	-414.98	258.80	-414.98	0.28	0.15	-22.85
5,382.00	0.69	293.80	5,329.43	-414.03	258.21	-414.03	0.86	-0.20	-64.40
5,476.00	0.27	21.28	5,423.43	-413.59	257.77	-413.59	0.78	-0.45	93.06
5,571.00	1.18	313.78	5,518.42	-412.71	257.15	-412.71	1.16	0.96	-71.05

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPOTTED 29N-23HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
<b>Site:</b>	SPOTTED 35-23HZ PAD	<b>MD Reference:</b>	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
<b>Well:</b>	SPOTTED 29N-23HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Denver Sales

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,665.00	1.20	311.34	5,612.40	-411.39	255.71	-411.39	0.06	0.02	-2.60	
5,853.00	1.12	196.65	5,800.38	-411.85	253.71	-411.85	1.04	-0.04	-61.01	
5,948.00	1.92	196.47	5,895.35	-414.26	252.99	-414.26	0.84	0.84	-0.19	
6,042.00	1.02	252.09	5,989.32	-416.03	251.75	-416.03	1.69	-0.96	59.17	
6,136.00	0.78	262.02	6,083.31	-416.38	250.32	-416.38	0.30	-0.26	10.56	
6,231.00	0.59	37.30	6,178.31	-416.08	249.97	-416.08	1.34	-0.20	142.40	
6,325.00	0.80	319.60	6,272.30	-415.19	249.84	-415.19	0.94	0.22	-82.66	
6,419.00	0.44	56.06	6,366.30	-414.49	249.72	-414.49	1.02	-0.38	102.62	
6,514.00	0.30	284.66	6,461.30	-414.23	249.78	-414.23	0.71	-0.15	-138.32	
6,608.00	0.70	310.25	6,555.29	-413.79	249.10	-413.79	0.48	0.43	27.22	
6,702.00	0.94	0.87	6,649.28	-412.65	248.67	-412.65	0.78	0.26	53.85	
6,796.00	4.86	341.87	6,743.15	-408.09	247.45	-408.09	4.24	4.17	-20.21	
6,843.00	7.60	338.57	6,789.87	-403.31	245.69	-403.31	5.88	5.83	-7.02	
6,891.00	10.27	348.54	6,837.28	-396.16	243.68	-396.16	6.41	5.56	20.77	
6,985.00	18.73	348.33	6,928.20	-373.12	238.96	-373.12	9.00	9.00	-0.22	
7,079.00	25.19	345.41	7,015.34	-338.95	230.85	-338.95	6.97	6.87	-3.11	
7,173.00	34.26	341.88	7,096.89	-294.34	217.56	-294.34	9.82	9.65	-3.76	
7,268.00	44.17	345.15	7,170.41	-236.79	200.71	-236.79	10.65	10.43	3.44	
7,362.00	52.46	355.04	7,232.96	-167.79	189.06	-167.79	11.79	8.82	10.52	
7,409.00	55.39	0.16	7,260.64	-129.86	187.51	-129.86	10.79	6.23	10.89	
7,457.00	61.53	1.86	7,285.74	-88.98	188.25	-88.98	13.14	12.79	3.54	
7,504.00	64.31	2.57	7,307.13	-47.17	189.87	-47.17	6.07	5.91	1.51	
7,551.00	66.30	2.25	7,326.77	-4.51	191.66	-4.51	4.28	4.23	-0.68	
7,598.00	69.74	2.23	7,344.36	39.04	193.36	39.04	7.32	7.32	-0.04	
7,645.00	74.29	2.49	7,358.87	83.69	195.21	83.69	9.70	9.68	0.55	
7,692.00	76.92	2.53	7,370.55	129.17	197.20	129.17	5.60	5.60	0.09	
7,739.00	82.54	1.81	7,378.93	175.36	198.95	175.36	12.05	11.96	-1.53	
7,785.00	84.12	1.30	7,384.27	221.03	200.19	221.03	3.61	3.44	-1.11	
7"(494 FSL 1081 FWL)										
7,920.00	88.76	359.82	7,392.65	355.73	201.50	355.73	3.61	3.44	-1.10	
8,041.00	89.43	1.01	7,394.56	476.71	202.38	476.71	1.13	0.55	0.98	
8,135.00	90.17	0.97	7,394.89	570.69	204.00	570.69	0.79	0.79	-0.04	
8,230.00	91.74	0.62	7,393.31	665.66	205.32	665.66	1.69	1.65	-0.37	
8,513.00	91.65	2.55	7,384.93	948.42	213.14	948.42	0.68	-0.03	0.68	
8,702.00	90.98	2.38	7,380.60	1,137.19	221.27	1,137.19	0.37	-0.35	-0.09	
8,796.00	89.60	1.54	7,380.12	1,231.13	224.48	1,231.13	1.72	-1.47	-0.89	
8,984.00	89.06	1.88	7,382.32	1,419.04	230.09	1,419.04	0.34	-0.29	0.18	
9,078.00	89.49	1.17	7,383.51	1,512.99	232.59	1,512.99	0.88	0.46	-0.76	
9,173.00	90.61	1.08	7,383.43	1,607.98	234.46	1,607.98	1.18	1.18	-0.09	
9,267.00	90.10	1.48	7,382.84	1,701.95	236.56	1,701.95	0.69	-0.54	0.43	
9,361.00	89.70	359.88	7,383.01	1,795.94	237.67	1,795.94	1.75	-0.43	-1.70	
9,456.00	89.97	359.84	7,383.28	1,890.94	237.44	1,890.94	0.29	0.28	-0.04	
9,550.00	90.50	359.55	7,382.90	1,984.94	236.94	1,984.94	0.64	0.56	-0.31	
9,738.00	90.20	359.74	7,381.75	2,172.93	235.78	2,172.93	0.19	-0.16	0.10	

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPOTTED 29N-23HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
<b>Site:</b>	SPOTTED 35-23HZ PAD	<b>MD Reference:</b>	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
<b>Well:</b>	SPOTTED 29N-23HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Denver Sales

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,833.00	89.83	359.70	7,381.72	2,267.93	235.31	2,267.93	0.39	-0.39	-0.04
9,927.00	89.97	0.82	7,381.89	2,361.92	235.74	2,361.92	1.20	0.15	1.19
10,021.00	89.73	0.80	7,382.13	2,455.91	237.07	2,455.91	0.26	-0.26	-0.02
10,305.00	90.50	3.64	7,381.56	2,739.67	248.07	2,739.67	1.04	0.27	1.00
10,399.00	90.37	3.60	7,380.85	2,833.48	254.00	2,833.48	0.14	-0.14	-0.04
10,493.00	89.02	4.18	7,381.35	2,927.26	260.38	2,927.26	1.56	-1.44	0.62
10,587.00	88.01	3.94	7,383.79	3,020.99	267.03	3,020.99	1.10	-1.07	-0.26
10,682.00	89.06	3.87	7,386.21	3,115.74	273.50	3,115.74	1.11	1.11	-0.07
10,776.00	89.46	3.56	7,387.43	3,209.53	279.59	3,209.53	0.54	0.43	-0.33
10,965.00	90.20	1.35	7,387.99	3,398.34	287.69	3,398.34	1.23	0.39	-1.17
11,059.00	90.20	0.07	7,387.66	3,492.33	288.85	3,492.33	1.36	0.00	-1.36
11,154.00	89.97	0.13	7,387.52	3,587.33	289.02	3,587.33	0.25	-0.24	0.06
11,248.00	91.04	359.82	7,386.69	3,681.33	288.98	3,681.33	1.19	1.14	-0.33
11,436.00	90.97	359.50	7,383.39	3,869.30	287.86	3,869.30	0.17	-0.04	-0.17
11,531.00	90.27	0.09	7,382.37	3,964.29	287.52	3,964.29	0.96	-0.74	0.62
11,625.00	88.96	359.36	7,383.00	4,058.28	287.07	4,058.28	1.60	-1.39	-0.78
11,720.00	88.56	358.50	7,385.05	4,153.24	285.30	4,153.24	1.00	-0.42	-0.91
11,814.00	88.86	358.96	7,387.17	4,247.20	283.21	4,247.20	0.58	0.32	0.49
11,908.00	88.93	358.31	7,388.98	4,341.15	280.97	4,341.15	0.70	0.07	-0.69
12,003.00	89.60	358.59	7,390.20	4,436.11	278.40	4,436.11	0.76	0.71	0.29
12,097.00	90.34	358.20	7,390.25	4,530.07	275.77	4,530.07	0.89	0.79	-0.41
12,191.00	91.11	357.19	7,389.06	4,623.99	271.99	4,623.99	1.35	0.82	-1.07
12,286.00	91.92	356.48	7,386.55	4,718.81	266.75	4,718.81	1.13	0.85	-0.75
12,380.00	90.34	356.98	7,384.70	4,812.63	261.39	4,812.63	1.76	-1.68	0.53
12,475.00	90.94	356.62	7,383.63	4,907.48	256.09	4,907.48	0.74	0.63	-0.38
LAST SDI MWD PRODUCTION SURVEY									
12,536.00	90.94	356.62	7,382.63	4,968.36	252.49	4,968.36	0.00	0.00	0.00
SDI PROJECTION TO TD (26 FNL 1105 FWL)									

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
7,785.00	7,384.27	7"(494 FSL 1081 FWL)	7.000	8.750

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPOTTED 29N-23HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
<b>Site:</b>	SPOTTED 35-23HZ PAD	<b>MD Reference:</b>	GL 4966 & KB 25 @ 4991.00ft (H&P 311)
<b>Well:</b>	SPOTTED 29N-23HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Denver Sales

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
125.00	125.00	-0.57	0.35	FIRST GYRO SURVEY
1,225.00	1,224.95	-4.31	5.03	LAST GYRO SURVEY
1,465.00	1,464.93	-2.74	2.63	FIRST SDI MWD PRODUCTION SURVEY
12,475.00	7,383.63	4,907.48	256.09	LAST SDI MWD PRODUCTION SURVEY
12,536.00	7,382.63	4,968.36	252.49	SDI PROJECTION TO TD (26 FNL 1105 FWL)

Checked By: _____	Approved By: _____	Date: _____
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