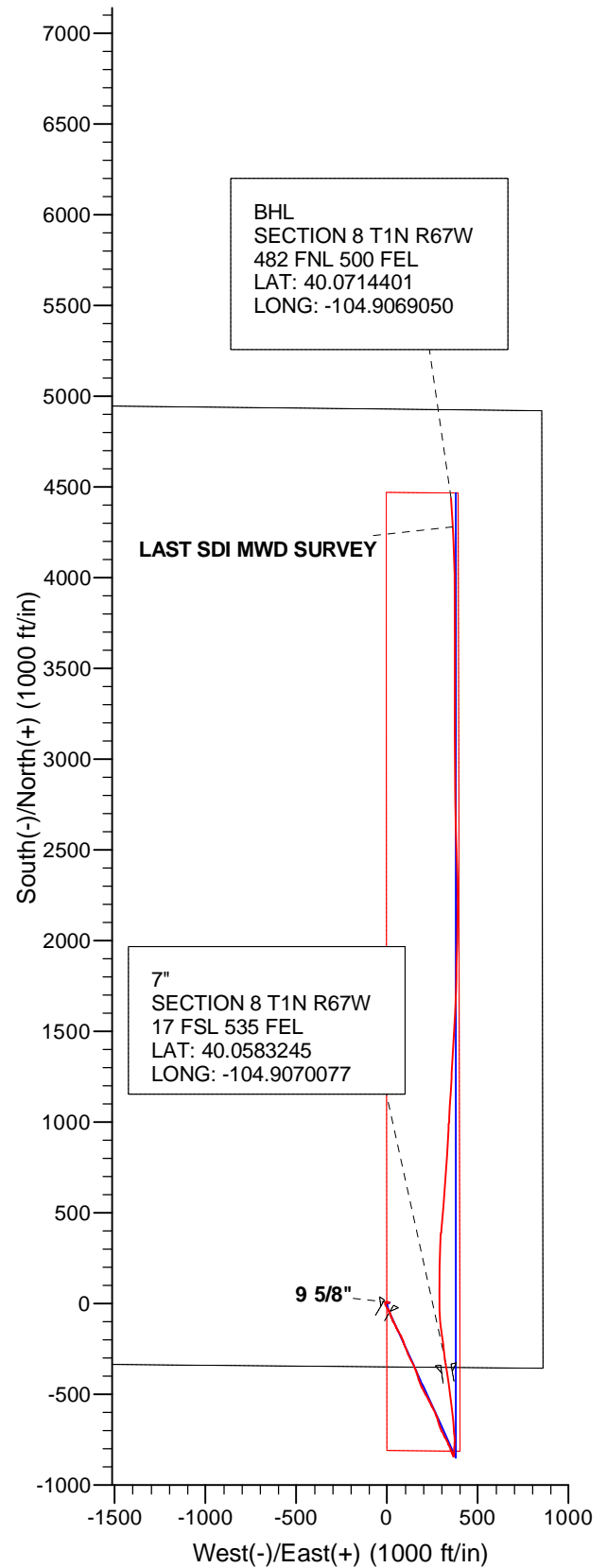
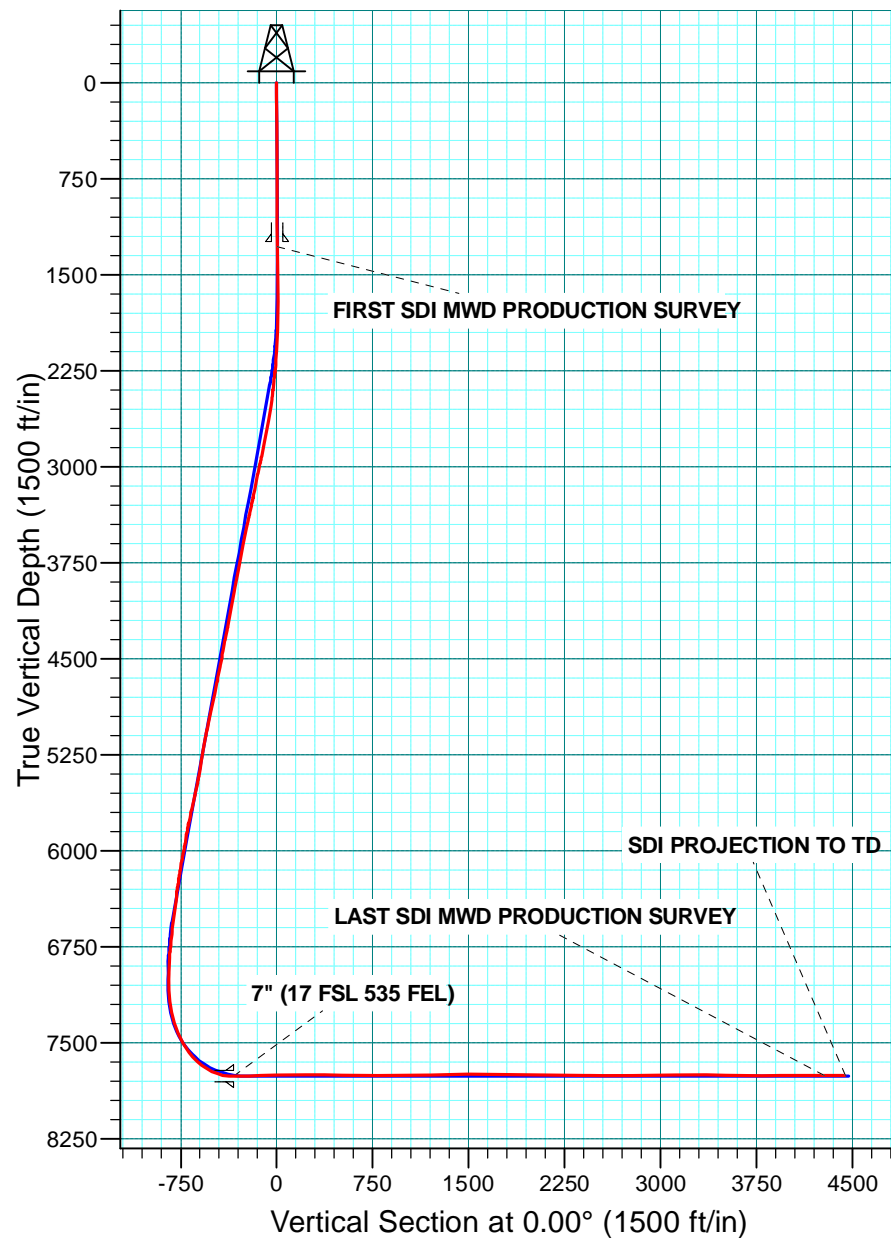


WELL DETAILS: NRC 1C-8HZ

GL 5074 & KB 25 @ 5099.00ft (H&P 311)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1264982.21	3165659.14	40.0592480	-104.9081660



# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**NRC 16-8HZ PAD**

**NRC 1C-8HZ**

**OH**

**Design: OH**

## **Standard Survey Report**

**30 April, 2014**

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well NRC 1C-8HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 5074 & KB 25 @ 5099.00ft (H&P 311)
<b>Site:</b>	NRC 16-8HZ PAD	<b>MD Reference:</b>	GL 5074 & KB 25 @ 5099.00ft (H&P 311)
<b>Well:</b>	NRC 1C-8HZ	<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 Office

<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>	NRC 16-8HZ PAD, SESE SECTION 8 T1N R67W		
<b>Site Position:</b>		<b>Northing:</b>	1,264,982.38 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,165,629.19 usft
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.200 in
		<b>Latitude:</b>	40.0592490
		<b>Longitude:</b>	-104.9082730
		<b>Grid Convergence:</b>	0.38 °

<b>Well</b>	NRC 1C-8HZ, 350 FSL 860 FEL		
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b> 1,264,982.21 usft
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b> 3,165,659.15 usft
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>	0.00 ft
		<b>Latitude:</b>	40.0592480
		<b>Longitude:</b>	-104.9081660
		<b>Ground Level:</b>	5,074.00 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	4/1/2014	8.58	66.64	52,558

<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>	4/30/2014			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
25.00	1,166.00	Survey #1 SURFACE GYRO (OH)	NS-GYRO-MS	North sensing gyrocompassing m/s	
1,281.00	12,897.00	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	0.39	319.27	125.00	0.26	-0.22	0.26	0.39	0.39	0.00	
<b>FIRST GYRO SURFACE SURVEY</b>										
225.00	0.83	52.19	225.00	0.96	0.13	0.96	0.93	0.44	92.92	
325.00	0.09	338.34	324.99	1.48	0.67	1.48	0.81	-0.74	-73.85	
425.00	1.05	36.01	424.99	2.29	1.18	2.29	1.00	0.96	57.67	
525.00	0.76	104.28	524.98	2.87	2.36	2.87	1.04	-0.29	68.27	
625.00	0.67	35.91	624.97	3.18	3.35	3.18	0.81	-0.09	-68.37	
725.00	1.03	109.11	724.96	3.36	4.54	3.36	1.05	0.36	73.20	

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well NRC 1C-8HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 5074 & KB 25 @ 5099.00ft (H&P 311)
<b>Site:</b>	NRC 16-8HZ PAD	<b>MD Reference:</b>	GL 5074 & KB 25 @ 5099.00ft (H&P 311)
<b>Well:</b>	NRC 1C-8HZ	<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 Office

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	1.43	61.71	824.94	3.66	6.49	3.66	1.05	0.40	-47.40
925.00	0.63	27.04	924.92	4.74	7.84	4.74	0.98	-0.80	-34.67
1,025.00	0.50	121.42	1,024.92	5.00	8.46	5.00	0.83	-0.13	94.38
1,125.00	1.15	93.06	1,124.91	4.72	9.83	4.72	0.75	0.65	-28.36
1,166.00	1.00	80.31	1,165.90	4.76	10.60	4.76	0.69	-0.37	-31.10
LAST GYRO SURFACE SURVEY									
1,242.00	0.59	30.21	1,241.90	5.21	11.45	5.21	1.01	-0.54	-65.92
9 5/8"									
1,281.00	0.69	355.42	1,280.89	5.61	11.53	5.61	1.01	0.25	-89.20
FIRST SDI MWD PRODUCTION SURVEY									
1,373.00	2.15	286.36	1,372.87	6.65	9.83	6.65	2.18	1.59	-75.07
1,573.00	2.37	291.20	1,572.71	9.21	2.38	9.21	0.15	0.11	2.42
1,664.00	1.78	282.21	1,663.65	10.18	-0.76	10.18	0.74	-0.65	-9.88
1,755.00	1.57	262.86	1,754.61	10.33	-3.38	10.33	0.66	-0.23	-21.26
1,846.00	1.93	248.70	1,845.57	9.62	-6.04	9.62	0.62	0.40	-15.56
1,937.00	2.12	209.93	1,936.52	7.60	-8.31	7.60	1.49	0.21	-42.60
2,029.00	2.70	182.70	2,028.44	3.96	-9.26	3.96	1.38	0.63	-29.60
2,120.00	4.07	180.36	2,119.28	-1.41	-9.38	-1.41	1.51	1.51	-2.57
2,211.00	5.36	165.15	2,209.97	-8.75	-8.31	-8.75	1.96	1.42	-16.71
2,303.00	7.51	147.33	2,301.40	-17.96	-3.97	-17.96	3.16	2.34	-19.37
2,394.00	7.28	143.38	2,391.64	-27.60	2.68	-27.60	0.61	-0.25	-4.34
2,485.00	9.32	154.16	2,481.69	-38.86	9.34	-38.86	2.81	2.24	11.85
2,577.00	10.15	158.86	2,572.36	-53.12	15.51	-53.12	1.25	0.90	5.11
2,669.00	11.41	160.49	2,662.74	-69.26	21.47	-69.26	1.41	1.37	1.77
2,760.00	11.18	156.96	2,751.98	-85.87	27.93	-85.87	0.80	-0.25	-3.88
2,852.00	12.04	150.66	2,842.10	-102.44	36.12	-102.44	1.66	0.93	-6.85
2,944.00	13.12	155.15	2,931.89	-120.28	45.21	-120.28	1.58	1.17	4.88
3,035.00	14.08	152.77	3,020.34	-139.49	54.62	-139.49	1.22	1.05	-2.62
3,127.00	12.76	150.71	3,109.82	-158.31	64.71	-158.31	1.53	-1.43	-2.24
3,218.00	12.72	150.80	3,198.58	-175.82	74.51	-175.82	0.05	-0.04	0.10
3,310.00	13.92	157.95	3,288.11	-194.92	83.61	-194.92	2.21	1.30	7.77
3,404.00	12.43	161.06	3,379.64	-214.97	91.14	-214.97	1.75	-1.59	3.31
3,499.00	13.30	158.59	3,472.25	-234.81	98.45	-234.81	1.08	0.92	-2.60
3,687.00	11.58	156.78	3,655.83	-272.29	113.78	-272.29	0.94	-0.91	-0.96
3,782.00	11.52	153.87	3,748.91	-289.57	121.72	-289.57	0.62	-0.06	-3.06
3,876.00	11.59	155.20	3,841.01	-306.57	129.81	-306.57	0.29	0.07	1.41
4,065.00	12.02	152.74	4,026.01	-341.30	146.79	-341.30	0.35	0.23	-1.30
4,254.00	10.63	160.49	4,211.34	-375.22	161.63	-375.22	1.09	-0.74	4.10
4,348.00	12.48	164.71	4,303.43	-393.20	167.20	-393.20	2.16	1.97	4.49
4,536.00	10.47	159.57	4,487.67	-428.80	178.52	-428.80	1.20	-1.07	-2.73
4,631.00	12.43	158.00	4,580.77	-446.37	185.37	-446.37	2.09	2.06	-1.65
4,725.00	12.20	152.76	4,672.61	-464.58	193.70	-464.58	1.21	-0.24	-5.57
4,914.00	15.08	151.51	4,856.26	-503.96	214.57	-503.96	1.53	1.52	-0.66
5,103.00	11.68	150.89	5,040.10	-542.29	235.62	-542.29	1.80	-1.80	-0.33

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well NRC 1C-8HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 5074 & KB 25 @ 5099.00ft (H&P 311)
<b>Site:</b>	NRC 16-8HZ PAD	<b>MD Reference:</b>	GL 5074 & KB 25 @ 5099.00ft (H&P 311)
<b>Well:</b>	NRC 1C-8HZ	<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 Office

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)
5,197.00	12.26	155.54	5,132.06	-559.69	244.38	-559.69	1.20	0.62	4.95
5,292.00	10.16	154.38	5,225.24	-576.43	252.18	-576.43	2.22	-2.21	-1.22
5,480.00	10.79	154.82	5,410.11	-607.30	266.83	-607.30	0.34	0.34	0.23
5,668.00	13.95	163.99	5,593.74	-645.02	280.58	-645.02	1.97	1.68	4.88
5,763.00	12.85	162.54	5,686.15	-666.11	286.90	-666.11	1.21	-1.16	-1.53
5,858.00	13.09	160.27	5,778.73	-686.31	293.71	-686.31	0.59	0.25	-2.39
5,952.00	10.56	150.72	5,870.74	-703.85	301.51	-703.85	3.39	-2.69	-10.16
6,141.00	12.49	151.91	6,055.92	-736.99	319.61	-736.99	1.03	1.02	0.63
6,235.00	10.30	152.30	6,148.06	-753.40	328.30	-753.40	2.33	-2.33	0.41
6,330.00	9.65	157.07	6,241.62	-768.25	335.35	-768.25	1.11	-0.68	5.02
6,424.00	7.28	154.57	6,334.59	-780.89	340.98	-780.89	2.55	-2.52	-2.66
6,518.00	7.70	157.28	6,427.79	-792.08	345.97	-792.08	0.58	0.45	2.88
6,613.00	8.32	162.47	6,521.86	-804.50	350.50	-804.50	1.00	0.65	5.46
6,707.00	7.40	152.24	6,614.99	-816.34	355.37	-816.34	1.78	-0.98	-10.88
6,802.00	6.43	158.02	6,709.29	-826.69	360.21	-826.69	1.26	-1.02	6.08
6,896.00	4.32	162.85	6,802.88	-834.96	363.22	-834.96	2.29	-2.24	5.14
6,991.00	2.98	158.55	6,897.68	-840.67	365.18	-840.67	1.44	-1.41	-4.53
7,085.00	0.62	341.00	6,991.65	-842.47	365.91	-842.47	3.83	-2.51	-188.88
7,179.00	0.64	329.09	7,085.64	-841.54	365.47	-841.54	0.14	0.02	-12.67
7,226.00	3.56	14.68	7,132.61	-839.90	365.71	-839.90	6.69	6.21	97.00
7,273.00	7.93	13.28	7,179.36	-835.33	366.82	-835.33	9.30	9.30	-2.98
7,320.00	10.05	2.68	7,225.78	-828.08	367.76	-828.08	5.71	4.51	-22.55
7,368.00	12.96	4.36	7,272.81	-818.52	368.37	-818.52	6.10	6.06	3.50
7,415.00	15.96	4.96	7,318.32	-806.83	369.33	-806.83	6.39	6.38	1.28
7,462.00	19.44	5.61	7,363.09	-792.60	370.65	-792.60	7.42	7.40	1.38
7,509.00	22.08	2.96	7,407.03	-775.99	371.87	-775.99	5.96	5.62	-5.64
7,556.00	25.71	359.31	7,450.00	-756.97	372.20	-756.97	8.34	7.72	-7.77
7,603.00	28.94	355.72	7,491.75	-735.43	371.23	-735.43	7.71	6.87	-7.64
7,651.00	31.53	355.92	7,533.22	-711.33	369.47	-711.33	5.40	5.40	0.42
7,745.00	40.33	356.07	7,609.26	-656.36	365.63	-656.36	9.36	9.36	0.16
7,792.00	46.44	354.17	7,643.40	-624.21	362.86	-624.21	13.29	13.00	-4.04
7,840.00	52.75	353.19	7,674.50	-587.90	358.82	-587.90	13.24	13.15	-2.04
7,935.00	65.37	352.83	7,723.24	-507.19	348.91	-507.19	13.29	13.28	-0.38
7,982.00	71.89	352.42	7,740.36	-463.81	343.29	-463.81	13.90	13.87	-0.87
8,029.00	78.21	351.37	7,752.48	-418.88	336.88	-418.88	13.62	13.45	-2.23
8,079.00	85.58	351.14	7,759.52	-369.98	329.36	-369.98	14.75	14.74	-0.46
8,113.00	89.08	351.41	7,761.11	-336.42	324.21	-336.42	10.32	10.29	0.78
7" (17 FSL 535 FEL)									
8,138.00	91.65	351.60	7,760.95	-311.70	320.52	-311.70	10.32	10.29	0.78
8,232.00	91.89	352.37	7,758.05	-218.66	307.42	-218.66	0.86	0.26	0.82
8,326.00	92.12	354.22	7,754.76	-125.36	296.45	-125.36	1.98	0.24	1.97
8,421.00	90.61	356.92	7,752.49	-30.69	289.11	-30.69	3.26	-1.59	2.84
8,515.00	91.24	0.50	7,750.98	63.26	287.00	63.26	3.87	0.67	3.81

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well NRC 1C-8HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 5074 & KB 25 @ 5099.00ft (H&P 311)
<b>Site:</b>	NRC 16-8HZ PAD	<b>MD Reference:</b>	GL 5074 & KB 25 @ 5099.00ft (H&P 311)
<b>Well:</b>	NRC 1C-8HZ	<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 Office

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)
8,609.00	89.63	1.44	7,750.26	157.24	288.59	157.24	1.98	-1.71	1.00
8,703.00	89.56	1.31	7,750.93	251.21	290.84	251.21	0.16	-0.07	-0.14
8,798.00	89.53	3.15	7,751.68	346.13	294.54	346.13	1.94	-0.03	1.94
8,892.00	89.33	4.94	7,752.62	439.89	301.17	439.89	1.92	-0.21	1.90
8,986.00	89.33	4.96	7,753.72	533.53	309.28	533.53	0.02	0.00	0.02
9,080.00	89.83	3.46	7,754.40	627.27	316.18	627.27	1.68	0.53	-1.60
9,175.00	90.64	3.77	7,754.02	722.08	322.17	722.08	0.91	0.85	0.33
9,269.00	90.20	5.00	7,753.33	815.80	329.36	815.80	1.39	-0.47	1.31
9,458.00	89.50	2.43	7,753.82	1,004.39	341.60	1,004.39	1.41	-0.37	-1.36
9,646.00	91.78	3.64	7,751.72	1,192.10	351.55	1,192.10	1.37	1.21	0.64
9,740.00	92.56	3.22	7,748.16	1,285.86	357.17	1,285.86	0.94	0.83	-0.45
9,929.00	90.07	3.23	7,743.82	1,474.50	367.80	1,474.50	1.32	-1.32	0.01
10,023.00	88.89	2.84	7,744.68	1,568.36	372.78	1,568.36	1.32	-1.26	-0.41
10,118.00	88.79	2.49	7,746.60	1,663.24	377.20	1,663.24	0.38	-0.11	-0.37
10,212.00	88.93	1.68	7,748.47	1,757.16	380.62	1,757.16	0.87	0.15	-0.86
10,306.00	89.56	1.27	7,749.71	1,851.12	383.03	1,851.12	0.80	0.67	-0.44
10,401.00	90.61	1.38	7,749.57	1,946.09	385.23	1,946.09	1.11	1.11	0.12
10,495.00	89.36	0.63	7,749.59	2,040.07	386.88	2,040.07	1.55	-1.33	-0.80
10,590.00	88.93	359.58	7,751.01	2,135.06	387.05	2,135.06	1.19	-0.45	-1.11
10,684.00	90.30	359.96	7,751.64	2,229.05	386.68	2,229.05	1.51	1.46	0.40
10,778.00	89.63	359.33	7,751.70	2,323.05	386.09	2,323.05	0.98	-0.71	-0.67
10,873.00	89.36	358.30	7,752.54	2,418.03	384.13	2,418.03	1.12	-0.28	-1.08
10,967.00	89.80	358.84	7,753.23	2,511.99	381.78	2,511.99	0.74	0.47	0.57
11,061.00	89.29	358.48	7,753.97	2,605.96	379.59	2,605.96	0.66	-0.54	-0.38
11,156.00	89.80	358.91	7,754.73	2,700.94	377.42	2,700.94	0.70	0.54	0.45
11,250.00	90.20	359.91	7,754.73	2,794.93	376.45	2,794.93	1.15	0.43	1.06
11,438.00	91.11	359.12	7,752.58	2,982.91	374.86	2,982.91	0.64	0.48	-0.42
11,627.00	90.98	359.92	7,749.13	3,171.87	373.28	3,171.87	0.43	-0.07	0.42
11,722.00	89.30	0.18	7,748.90	3,266.86	373.36	3,266.86	1.79	-1.77	0.27
11,816.00	88.49	0.25	7,750.71	3,360.84	373.72	3,360.84	0.86	-0.86	0.07
12,005.00	88.86	359.52	7,755.08	3,549.79	373.34	3,549.79	0.43	0.20	-0.39
12,099.00	89.43	359.31	7,756.49	3,643.78	372.38	3,643.78	0.65	0.61	-0.22
12,194.00	90.13	0.70	7,756.85	3,738.77	372.39	3,738.77	1.64	0.74	1.46
12,288.00	90.57	0.85	7,756.28	3,832.76	373.66	3,832.76	0.49	0.47	0.16
12,383.00	90.20	359.29	7,755.64	3,927.76	373.77	3,927.76	1.69	-0.39	-1.64
12,477.00	89.77	358.13	7,755.66	4,021.73	371.66	4,021.73	1.32	-0.46	-1.23
12,571.00	90.37	357.98	7,755.55	4,115.68	368.47	4,115.68	0.66	0.64	-0.16
12,665.00	90.37	357.22	7,754.94	4,209.59	364.53	4,209.59	0.81	0.00	-0.81
12,736.00	90.17	357.11	7,754.61	4,280.50	361.02	4,280.50	0.32	-0.28	-0.15
LAST SDI MWD PRODUCTION SURVEY									
12,897.00	90.17	357.11	7,754.13	4,441.30	352.90	4,441.30	0.00	0.00	0.00
SDI PROJECTION TO TD									

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well NRC 1C-8HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 5074 & KB 25 @ 5099.00ft (H&P 311)
<b>Site:</b>	NRC 16-8HZ PAD	<b>MD Reference:</b>	GL 5074 & KB 25 @ 5099.00ft (H&P 311)
<b>Well:</b>	NRC 1C-8HZ	<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 Office

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name		Casing Diameter (in)	Hole Diameter (in)
1,242.00	1,241.90	9 5/8"		9.625	12.250
8,113.00	7,761.11	7" (17 FSL 535 FEL)		7.000	7.500

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
125.00	125.00	0.26	-0.22	FIRST GYRO SURFACE SURVEY	
1,166.00	1,165.90	4.76	10.60	LAST GYRO SURFACE SURVEY	
1,281.00	1,280.89	5.61	11.53	FIRST SDI MWD PRODUCTION SURVEY	
12,736.00	7,754.61	4,280.50	361.02	LAST SDI MWD PRODUCTION SURVEY	
12,897.00	7,754.13	4,441.30	352.90	SDI PROJECTION TO TD	

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