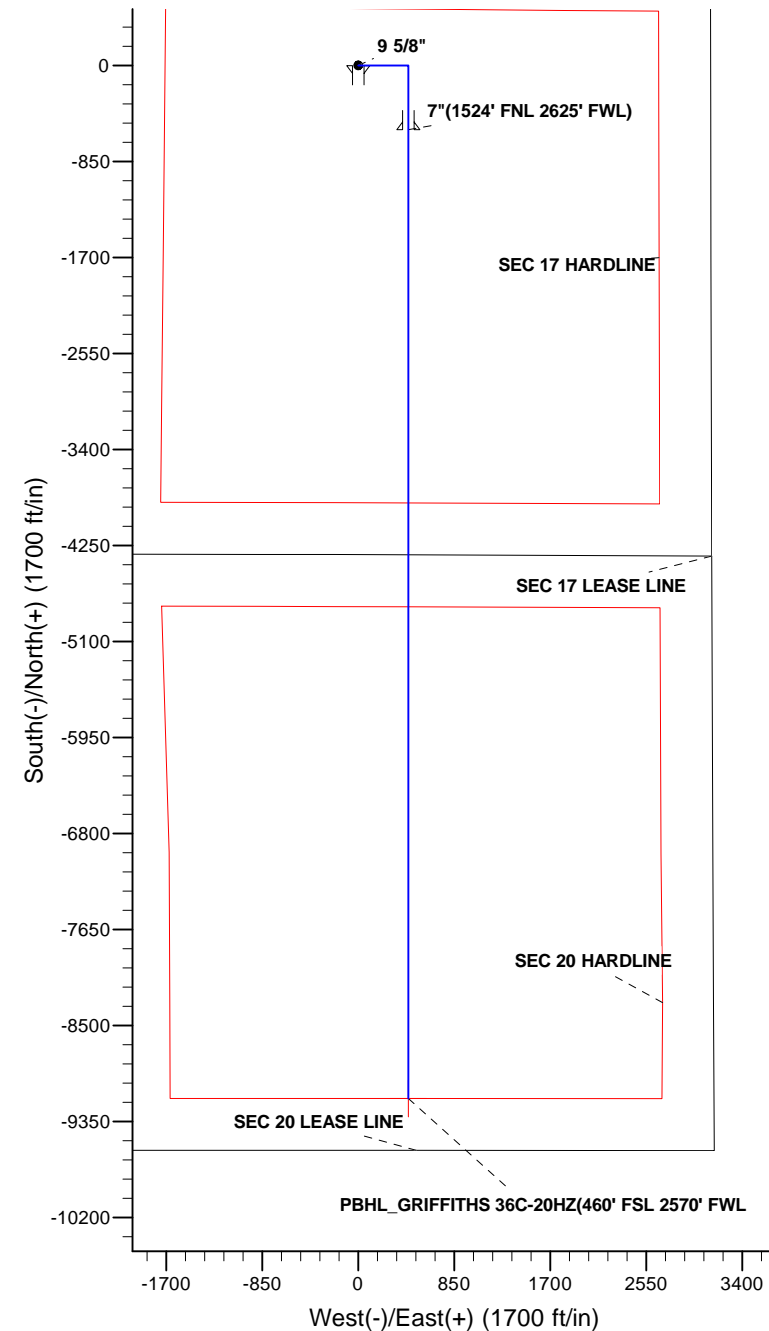
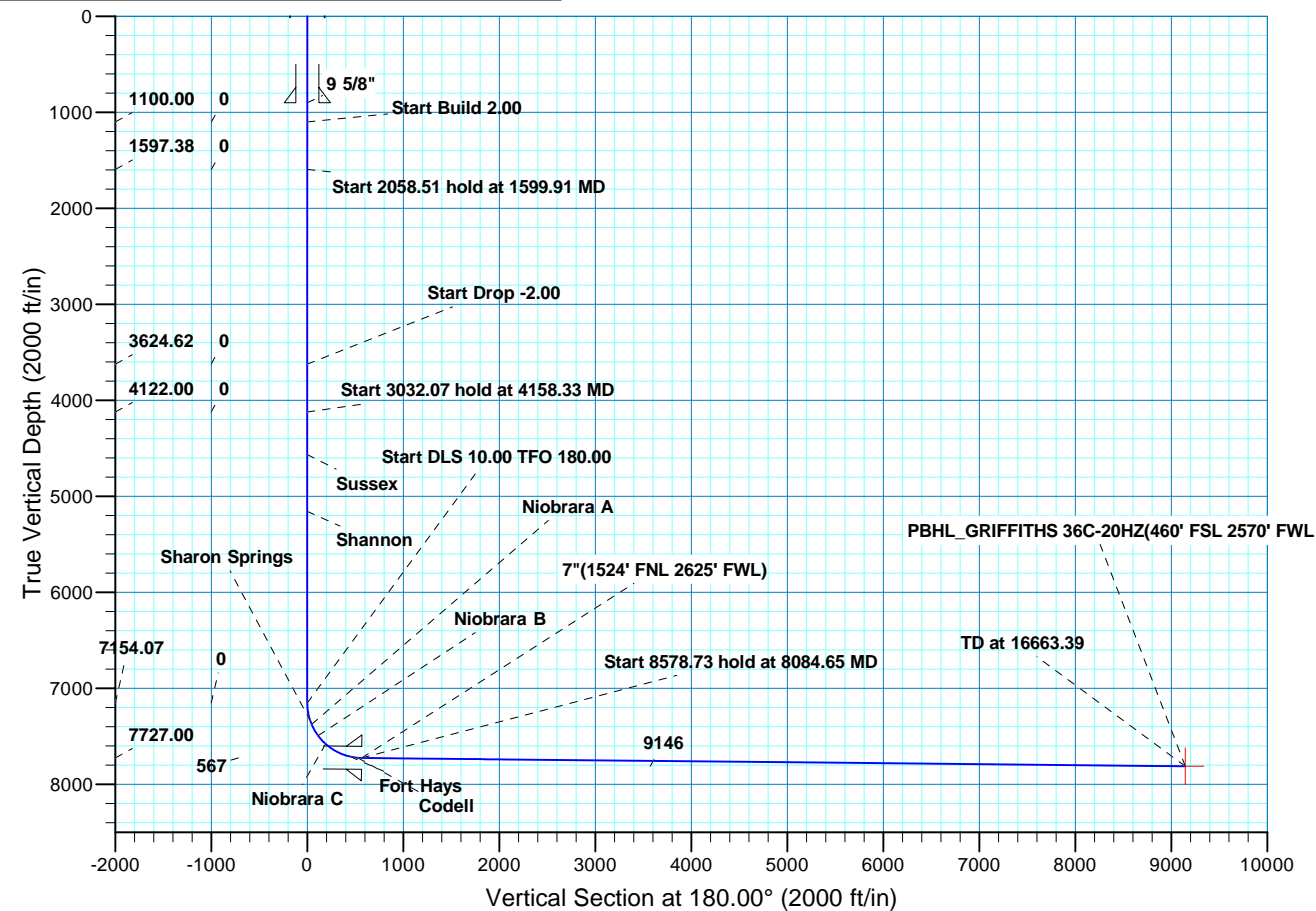


WELL DETAILS: GRIFFITHS 36C-20HZ											
GL 5060 & KB 25 @ 5085.00ft (ASSUMED)											
+N/-S		+E/-W		Northing		Easting		Latitude		Longitude	
0.00		0.00		1263673.38		3163410.52		40.0556960		-104.9162300	
SECTION DETAILS											
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	0.00			
1599.91	10.00	90.00	1597.38	0.00	43.51	2.00	90.00	0.00			
3658.42	10.00	90.00	3624.62	0.00	400.90	0.00	0.00	0.00			
4158.33	0.00	0.00	4122.00	0.00	444.41	2.00	180.00	0.00			
7190.40	0.00	0.00	7154.07	0.00	444.41	0.00	0.00	0.00			
8084.65	89.43	180.00	7727.00	-567.21	444.41	10.00	180.00	567.21			
16663.39	89.43	180.00	7813.00	-9145.52	444.41	0.00	0.00	9145.52	PBHL_GRIFFITHS 36C-20HZ(460' FSL 2570' FWL)		
FORMATION TOP DETAILS								CASING DETAILS			
TVDPath	MDPath	Formation				Inc		TVD	MD	Name	Size
4567.00	4603.33	Sussex				0.00		900.00	900.00	9 5/8"	9.625
5158.00	5194.33	Shannon				0.00		7727.00	8084.65	7"	7.000
7349.00	7389.30	Sharon Springs				19.89					
7377.00	7419.37	Niobrara A				22.90					
7495.00	7555.55	Niobrara B				36.52					
7581.00	7672.10	Niobrara C				48.17					
7713.00	7963.35	Fort Hays				77.30					
7725.00	8042.18	Codell				85.18					





# Scientific Drilling

## **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**GRIFFITHS 36C-20HZ**

**GRIFFITHS 36C-20HZ**

**OH**

**Plan: PLAN #1 PRELIMINARY**

## **Standard Planning Report**

**06 May, 2013**

<b>Database:</b>	EDM5000-RobertS-Local	<b>Local Co-ordinate Reference:</b>	Well GRIFFITHS 36C-20HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	GL 5060 & KB 25 @ 5085.00ft (ASSUMED)
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	GL 5060 & KB 25 @ 5085.00ft (ASSUMED)
<b>Site:</b>	GRIFFITHS 36C-20HZ	<b>North Reference:</b>	True
<b>Well:</b>	GRIFFITHS 36C-20HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1 PRELIMINARY		

<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>	GRIFFITHS 36C-20HZ, SECTION 17 T1N R67W			
<b>Site Position:</b>		<b>Northing:</b>	1,263,673.37 usft	<b>Latitude:</b> 40.0556960
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,163,410.52 usft	<b>Longitude:</b> -104.9162300
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b> 0.38 °

<b>Well</b>	GRIFFITHS 36C-20HZ, 965' FNL 2171' FWL			
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	1,263,673.37 usft
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	3,163,410.52 usft
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	<b>Ground Level:</b> 5,060.00 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>
	BGGM2012	2013/05/06	8.71	66.66	52,635

<b>Design</b>	PLAN #1 PRELIMINARY			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<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	180.00

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,599.91	10.00	90.00	1,597.38	0.00	43.51	2.00	2.00	0.00	90.00	
3,658.42	10.00	90.00	3,624.63	0.00	400.90	0.00	0.00	0.00	0.00	
4,158.33	0.00	0.00	4,122.00	0.00	444.41	2.00	-2.00	0.00	180.00	
7,190.40	0.00	0.00	7,154.07	0.00	444.41	0.00	0.00	0.00	0.00	
8,084.65	89.43	180.00	7,727.00	-567.21	444.41	10.00	10.00	20.13	180.00	
16,663.39	89.43	180.00	7,813.00	-9,145.52	444.41	0.00	0.00	0.00	0.00	PBHL_GRIFFITHS 36C

<b>Database:</b>	EDM5000-RobertS-Local	<b>Local Co-ordinate Reference:</b>	Well GRIFFITHS 36C-20HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	GL 5060 & KB 25 @ 5085.00ft (ASSUMED)
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	GL 5060 & KB 25 @ 5085.00ft (ASSUMED)
<b>Site:</b>	GRIFFITHS 36C-20HZ	<b>North Reference:</b>	True
<b>Well:</b>	GRIFFITHS 36C-20HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1 PRELIMINARY		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
1,200.00	2.00	90.00	1,199.98	0.00	1.75	0.00	2.00	2.00	0.00
1,300.00	4.00	90.00	1,299.84	0.00	6.98	0.00	2.00	2.00	0.00
1,400.00	6.00	90.00	1,399.45	0.00	15.69	0.00	2.00	2.00	0.00
1,500.00	8.00	90.00	1,498.70	0.00	27.88	0.00	2.00	2.00	0.00
1,599.91	10.00	90.00	1,597.38	0.00	43.51	0.00	2.00	2.00	0.00
Start 2058.51 hold at 1599.91 MD									
1,600.00	10.00	90.00	1,597.47	0.00	43.52	0.00	0.00	0.00	0.00
1,700.00	10.00	90.00	1,695.95	0.00	60.88	0.00	0.00	0.00	0.00
1,800.00	10.00	90.00	1,794.43	0.00	78.25	0.00	0.00	0.00	0.00
1,900.00	10.00	90.00	1,892.91	0.00	95.61	0.00	0.00	0.00	0.00
2,000.00	10.00	90.00	1,991.39	0.00	112.97	0.00	0.00	0.00	0.00
2,100.00	10.00	90.00	2,089.87	0.00	130.33	0.00	0.00	0.00	0.00
2,200.00	10.00	90.00	2,188.35	0.00	147.69	0.00	0.00	0.00	0.00
2,300.00	10.00	90.00	2,286.83	0.00	165.05	0.00	0.00	0.00	0.00
2,400.00	10.00	90.00	2,385.32	0.00	182.42	0.00	0.00	0.00	0.00
2,500.00	10.00	90.00	2,483.80	0.00	199.78	0.00	0.00	0.00	0.00
2,600.00	10.00	90.00	2,582.28	0.00	217.14	0.00	0.00	0.00	0.00
2,700.00	10.00	90.00	2,680.76	0.00	234.50	0.00	0.00	0.00	0.00
2,800.00	10.00	90.00	2,779.24	0.00	251.86	0.00	0.00	0.00	0.00
2,900.00	10.00	90.00	2,877.72	0.00	269.22	0.00	0.00	0.00	0.00
3,000.00	10.00	90.00	2,976.20	0.00	286.59	0.00	0.00	0.00	0.00
3,100.00	10.00	90.00	3,074.69	0.00	303.95	0.00	0.00	0.00	0.00
3,200.00	10.00	90.00	3,173.17	0.00	321.31	0.00	0.00	0.00	0.00
3,300.00	10.00	90.00	3,271.65	0.00	338.67	0.00	0.00	0.00	0.00
3,400.00	10.00	90.00	3,370.13	0.00	356.03	0.00	0.00	0.00	0.00
3,500.00	10.00	90.00	3,468.61	0.00	373.39	0.00	0.00	0.00	0.00
3,600.00	10.00	90.00	3,567.09	0.00	390.76	0.00	0.00	0.00	0.00
3,658.42	10.00	90.00	3,624.63	0.00	400.90	0.00	0.00	0.00	0.00
Start Drop -2.00									
3,700.00	9.17	90.00	3,665.62	0.00	407.82	0.00	2.00	-2.00	0.00
3,800.00	7.17	90.00	3,764.61	0.00	422.02	0.00	2.00	-2.00	0.00
3,900.00	5.17	90.00	3,864.02	0.00	432.77	0.00	2.00	-2.00	0.00
4,000.00	3.17	90.00	3,963.75	0.00	440.03	0.00	2.00	-2.00	0.00
4,100.00	1.17	90.00	4,063.68	0.00	443.81	0.00	2.00	-2.00	0.00
4,158.33	0.00	0.00	4,122.00	0.00	444.41	0.00	2.00	-2.00	0.00
Start 3032.07 hold at 4158.33 MD									
4,200.00	0.00	0.00	4,163.67	0.00	444.41	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,263.67	0.00	444.41	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,363.67	0.00	444.41	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,463.67	0.00	444.41	0.00	0.00	0.00	0.00

<b>Database:</b>	EDM5000-RobertS-Local	<b>Local Co-ordinate Reference:</b>	Well GRIFFITHS 36C-20HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	GL 5060 & KB 25 @ 5085.00ft (ASSUMED)
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	GL 5060 & KB 25 @ 5085.00ft (ASSUMED)
<b>Site:</b>	GRIFFITHS 36C-20HZ	<b>North Reference:</b>	True
<b>Well:</b>	GRIFFITHS 36C-20HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1 PRELIMINARY		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,600.00	0.00	0.00	4,563.67	0.00	444.41	0.00	0.00	0.00	0.00
4,603.33	0.00	0.00	4,567.00	0.00	444.41	0.00	0.00	0.00	0.00
<b>Sussex</b>									
4,700.00	0.00	0.00	4,663.67	0.00	444.41	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,763.67	0.00	444.41	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,863.67	0.00	444.41	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	4,963.67	0.00	444.41	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,063.67	0.00	444.41	0.00	0.00	0.00	0.00
5,194.33	0.00	0.00	5,158.00	0.00	444.41	0.00	0.00	0.00	0.00
<b>Shannon</b>									
5,200.00	0.00	0.00	5,163.67	0.00	444.41	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,263.67	0.00	444.41	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,363.67	0.00	444.41	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,463.67	0.00	444.41	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,563.67	0.00	444.41	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,663.67	0.00	444.41	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,763.67	0.00	444.41	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,863.67	0.00	444.41	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,963.67	0.00	444.41	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,063.67	0.00	444.41	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,163.67	0.00	444.41	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,263.67	0.00	444.41	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,363.67	0.00	444.41	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,463.67	0.00	444.41	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,563.67	0.00	444.41	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,663.67	0.00	444.41	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,763.67	0.00	444.41	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,863.67	0.00	444.41	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	6,963.67	0.00	444.41	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,063.67	0.00	444.41	0.00	0.00	0.00	0.00
7,190.40	0.00	0.00	7,154.07	0.00	444.41	0.00	0.00	0.00	0.00
<b>Start DLS 10.00 TFO 180.00</b>									
7,200.00	0.96	180.00	7,163.67	-0.08	444.41	0.08	10.00	10.00	0.00
7,300.00	10.96	180.00	7,263.00	-10.45	444.41	10.45	10.00	10.00	0.00
7,389.30	19.89	180.00	7,349.00	-34.18	444.41	34.18	10.00	10.00	0.00
<b>Sharon Springs</b>									
7,400.00	20.96	180.00	7,359.03	-37.91	444.41	37.91	10.00	10.00	0.00
7,419.38	22.90	180.00	7,377.00	-45.15	444.41	45.15	10.00	10.00	0.00
<b>Niobrara A</b>									
7,500.00	30.96	180.00	7,448.82	-81.63	444.41	81.63	10.00	10.00	0.00
7,555.55	36.52	180.00	7,495.00	-112.47	444.41	112.47	10.00	10.00	0.00
<b>Niobrara B</b>									
7,600.00	40.96	180.00	7,529.66	-140.28	444.41	140.28	10.00	10.00	0.00
7,672.10	48.17	180.00	7,581.00	-190.84	444.41	190.84	10.00	10.00	0.00
<b>Niobrara C</b>									
7,700.00	50.96	180.00	7,599.09	-212.07	444.41	212.07	10.00	10.00	0.00
7,800.00	60.96	180.00	7,655.00	-294.83	444.41	294.83	10.00	10.00	0.00
7,900.00	70.96	180.00	7,695.68	-386.04	444.41	386.04	10.00	10.00	0.00
7,963.35	77.30	180.00	7,713.00	-446.95	444.41	446.95	10.00	10.00	0.00
<b>Fort Hays</b>									
8,000.00	80.96	180.00	7,719.91	-482.93	444.41	482.93	10.00	10.00	0.00
8,042.18	85.18	180.00	7,725.00	-524.80	444.41	524.80	10.00	10.00	0.00
<b>Codell</b>									

<b>Database:</b>	EDM5000-RobertS-Local	<b>Local Co-ordinate Reference:</b>	Well GRIFFITHS 36C-20HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	GL 5060 & KB 25 @ 5085.00ft (ASSUMED)
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	GL 5060 & KB 25 @ 5085.00ft (ASSUMED)
<b>Site:</b>	GRIFFITHS 36C-20HZ	<b>North Reference:</b>	True
<b>Well:</b>	GRIFFITHS 36C-20HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1 PRELIMINARY		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,084.65	89.43	180.00	7,727.00	-567.21	444.41	567.21	10.00	10.00	0.00
<b>Start 8578.73 hold at 8084.65 MD - 7" (1524' FNL 2625' FWL)</b>									
8,100.00	89.43	180.00	7,727.15	-582.56	444.41	582.56	0.00	0.00	0.00
8,200.00	89.43	180.00	7,728.16	-682.55	444.41	682.55	0.00	0.00	0.00
8,300.00	89.43	180.00	7,729.16	-782.55	444.41	782.55	0.00	0.00	0.00
8,400.00	89.43	180.00	7,730.16	-882.54	444.41	882.54	0.00	0.00	0.00
8,500.00	89.43	180.00	7,731.16	-982.54	444.41	982.54	0.00	0.00	0.00
8,600.00	89.43	180.00	7,732.17	-1,082.53	444.41	1,082.53	0.00	0.00	0.00
8,700.00	89.43	180.00	7,733.17	-1,182.53	444.41	1,182.53	0.00	0.00	0.00
8,800.00	89.43	180.00	7,734.17	-1,282.52	444.41	1,282.52	0.00	0.00	0.00
8,900.00	89.43	180.00	7,735.17	-1,382.52	444.41	1,382.52	0.00	0.00	0.00
9,000.00	89.43	180.00	7,736.18	-1,482.51	444.41	1,482.51	0.00	0.00	0.00
9,100.00	89.43	180.00	7,737.18	-1,582.51	444.41	1,582.51	0.00	0.00	0.00
9,200.00	89.43	180.00	7,738.18	-1,682.50	444.41	1,682.50	0.00	0.00	0.00
9,300.00	89.43	180.00	7,739.18	-1,782.50	444.41	1,782.50	0.00	0.00	0.00
9,400.00	89.43	180.00	7,740.19	-1,882.49	444.41	1,882.49	0.00	0.00	0.00
9,500.00	89.43	180.00	7,741.19	-1,982.49	444.41	1,982.49	0.00	0.00	0.00
9,600.00	89.43	180.00	7,742.19	-2,082.48	444.41	2,082.48	0.00	0.00	0.00
9,700.00	89.43	180.00	7,743.19	-2,182.48	444.41	2,182.48	0.00	0.00	0.00
9,800.00	89.43	180.00	7,744.20	-2,282.47	444.41	2,282.47	0.00	0.00	0.00
9,900.00	89.43	180.00	7,745.20	-2,382.47	444.41	2,382.47	0.00	0.00	0.00
10,000.00	89.43	180.00	7,746.20	-2,482.46	444.41	2,482.46	0.00	0.00	0.00
10,100.00	89.43	180.00	7,747.20	-2,582.46	444.41	2,582.46	0.00	0.00	0.00
10,200.00	89.43	180.00	7,748.21	-2,682.45	444.41	2,682.45	0.00	0.00	0.00
10,300.00	89.43	180.00	7,749.21	-2,782.45	444.41	2,782.45	0.00	0.00	0.00
10,400.00	89.43	180.00	7,750.21	-2,882.44	444.41	2,882.44	0.00	0.00	0.00
10,500.00	89.43	180.00	7,751.21	-2,982.44	444.41	2,982.44	0.00	0.00	0.00
10,600.00	89.43	180.00	7,752.22	-3,082.43	444.41	3,082.43	0.00	0.00	0.00
10,700.00	89.43	180.00	7,753.22	-3,182.43	444.41	3,182.43	0.00	0.00	0.00
10,800.00	89.43	180.00	7,754.22	-3,282.42	444.41	3,282.42	0.00	0.00	0.00
10,900.00	89.43	180.00	7,755.22	-3,382.42	444.41	3,382.42	0.00	0.00	0.00
11,000.00	89.43	180.00	7,756.23	-3,482.41	444.41	3,482.41	0.00	0.00	0.00
11,100.00	89.43	180.00	7,757.23	-3,582.41	444.41	3,582.41	0.00	0.00	0.00
11,200.00	89.43	180.00	7,758.23	-3,682.40	444.41	3,682.40	0.00	0.00	0.00
11,300.00	89.43	180.00	7,759.23	-3,782.40	444.41	3,782.40	0.00	0.00	0.00
11,400.00	89.43	180.00	7,760.24	-3,882.39	444.41	3,882.39	0.00	0.00	0.00
11,500.00	89.43	180.00	7,761.24	-3,982.39	444.41	3,982.39	0.00	0.00	0.00
11,600.00	89.43	180.00	7,762.24	-4,082.38	444.41	4,082.38	0.00	0.00	0.00
11,700.00	89.43	180.00	7,763.24	-4,182.38	444.41	4,182.38	0.00	0.00	0.00
11,800.00	89.43	180.00	7,764.25	-4,282.37	444.41	4,282.37	0.00	0.00	0.00
11,900.00	89.43	180.00	7,765.25	-4,382.37	444.41	4,382.37	0.00	0.00	0.00
12,000.00	89.43	180.00	7,766.25	-4,482.36	444.41	4,482.36	0.00	0.00	0.00
12,100.00	89.43	180.00	7,767.25	-4,582.36	444.41	4,582.36	0.00	0.00	0.00
12,200.00	89.43	180.00	7,768.26	-4,682.35	444.41	4,682.35	0.00	0.00	0.00
12,300.00	89.43	180.00	7,769.26	-4,782.35	444.41	4,782.35	0.00	0.00	0.00
12,400.00	89.43	180.00	7,770.26	-4,882.34	444.41	4,882.34	0.00	0.00	0.00
12,500.00	89.43	180.00	7,771.26	-4,982.34	444.41	4,982.34	0.00	0.00	0.00
12,600.00	89.43	180.00	7,772.27	-5,082.33	444.41	5,082.33	0.00	0.00	0.00
12,700.00	89.43	180.00	7,773.27	-5,182.33	444.41	5,182.33	0.00	0.00	0.00
12,800.00	89.43	180.00	7,774.27	-5,282.32	444.41	5,282.32	0.00	0.00	0.00
12,900.00	89.43	180.00	7,775.27	-5,382.32	444.41	5,382.32	0.00	0.00	0.00
13,000.00	89.43	180.00	7,776.28	-5,482.31	444.41	5,482.31	0.00	0.00	0.00
13,100.00	89.43	180.00	7,777.28	-5,582.31	444.41	5,582.31	0.00	0.00	0.00

<b>Database:</b>	EDM5000-RobertS-Local	<b>Local Co-ordinate Reference:</b>	Well GRIFFITHS 36C-20HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	GL 5060 & KB 25 @ 5085.00ft (ASSUMED)
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	GL 5060 & KB 25 @ 5085.00ft (ASSUMED)
<b>Site:</b>	GRIFFITHS 36C-20HZ	<b>North Reference:</b>	True
<b>Well:</b>	GRIFFITHS 36C-20HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1 PRELIMINARY		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
13,200.00	89.43	180.00	7,778.28	-5,682.30	444.41	5,682.30	0.00	0.00	0.00
13,300.00	89.43	180.00	7,779.28	-5,782.30	444.41	5,782.30	0.00	0.00	0.00
13,400.00	89.43	180.00	7,780.29	-5,882.29	444.41	5,882.29	0.00	0.00	0.00
13,500.00	89.43	180.00	7,781.29	-5,982.29	444.41	5,982.29	0.00	0.00	0.00
13,600.00	89.43	180.00	7,782.29	-6,082.28	444.41	6,082.28	0.00	0.00	0.00
13,700.00	89.43	180.00	7,783.29	-6,182.28	444.41	6,182.28	0.00	0.00	0.00
13,800.00	89.43	180.00	7,784.29	-6,282.27	444.41	6,282.27	0.00	0.00	0.00
13,900.00	89.43	180.00	7,785.30	-6,382.27	444.41	6,382.27	0.00	0.00	0.00
14,000.00	89.43	180.00	7,786.30	-6,482.26	444.41	6,482.26	0.00	0.00	0.00
14,100.00	89.43	180.00	7,787.30	-6,582.26	444.41	6,582.26	0.00	0.00	0.00
14,200.00	89.43	180.00	7,788.30	-6,682.25	444.41	6,682.25	0.00	0.00	0.00
14,300.00	89.43	180.00	7,789.31	-6,782.25	444.41	6,782.25	0.00	0.00	0.00
14,400.00	89.43	180.00	7,790.31	-6,882.24	444.41	6,882.24	0.00	0.00	0.00
14,500.00	89.43	180.00	7,791.31	-6,982.24	444.41	6,982.24	0.00	0.00	0.00
14,600.00	89.43	180.00	7,792.31	-7,082.23	444.41	7,082.23	0.00	0.00	0.00
14,700.00	89.43	180.00	7,793.32	-7,182.23	444.41	7,182.23	0.00	0.00	0.00
14,800.00	89.43	180.00	7,794.32	-7,282.22	444.41	7,282.22	0.00	0.00	0.00
14,900.00	89.43	180.00	7,795.32	-7,382.22	444.41	7,382.22	0.00	0.00	0.00
15,000.00	89.43	180.00	7,796.32	-7,482.21	444.41	7,482.21	0.00	0.00	0.00
15,100.00	89.43	180.00	7,797.33	-7,582.21	444.41	7,582.21	0.00	0.00	0.00
15,200.00	89.43	180.00	7,798.33	-7,682.20	444.41	7,682.20	0.00	0.00	0.00
15,300.00	89.43	180.00	7,799.33	-7,782.20	444.41	7,782.20	0.00	0.00	0.00
15,400.00	89.43	180.00	7,800.33	-7,882.19	444.41	7,882.19	0.00	0.00	0.00
15,500.00	89.43	180.00	7,801.34	-7,982.19	444.41	7,982.19	0.00	0.00	0.00
15,600.00	89.43	180.00	7,802.34	-8,082.18	444.41	8,082.18	0.00	0.00	0.00
15,700.00	89.43	180.00	7,803.34	-8,182.18	444.41	8,182.18	0.00	0.00	0.00
15,800.00	89.43	180.00	7,804.34	-8,282.17	444.41	8,282.17	0.00	0.00	0.00
15,900.00	89.43	180.00	7,805.35	-8,382.17	444.41	8,382.17	0.00	0.00	0.00
16,000.00	89.43	180.00	7,806.35	-8,482.16	444.41	8,482.16	0.00	0.00	0.00
16,100.00	89.43	180.00	7,807.35	-8,582.16	444.41	8,582.16	0.00	0.00	0.00
16,200.00	89.43	180.00	7,808.35	-8,682.15	444.41	8,682.15	0.00	0.00	0.00
16,300.00	89.43	180.00	7,809.36	-8,782.15	444.41	8,782.15	0.00	0.00	0.00
16,400.00	89.43	180.00	7,810.36	-8,882.14	444.41	8,882.14	0.00	0.00	0.00
16,500.00	89.43	180.00	7,811.36	-8,982.14	444.41	8,982.14	0.00	0.00	0.00
16,600.00	89.43	180.00	7,812.36	-9,082.13	444.41	9,082.13	0.00	0.00	0.00
16,663.39	89.43	180.00	7,813.00	-9,145.52	444.41	9,145.52	0.00	0.00	0.00
TD at 16663.39 - PBHL_GRIFFITHS 36C-20HZ(460' FSL 2570' FWL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL_GRIFFITHS 36C-	0.00	0.00	7,813.00	-9,145.52	444.41	1,254,531.00	3,163,915.12	40.0305900	-104.9146430
- plan hits target center									
- Point									

<b>Database:</b>	EDM5000-RobertS-Local	<b>Local Co-ordinate Reference:</b>	Well GRIFFITHS 36C-20HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	GL 5060 & KB 25 @ 5085.00ft (ASSUMED)
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	GL 5060 & KB 25 @ 5085.00ft (ASSUMED)
<b>Site:</b>	GRIFFITHS 36C-20HZ	<b>North Reference:</b>	True
<b>Well:</b>	GRIFFITHS 36C-20HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1 PRELIMINARY		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
900.00	900.00	9 5/8"	9.625	12.250	
8,084.65	7,727.00	7"(1524' FNL 2625' FWL)	7.000	7.500	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,603.33	4,567.00	Sussex				
5,194.33	5,158.00	Shannon				
7,389.30	7,349.00	Sharon Springs				
7,419.38	7,377.00	Niobrara A				
7,555.55	7,495.00	Niobrara B				
7,672.10	7,581.00	Niobrara C				
7,963.35	7,713.00	Fort Hays				
8,042.18	7,725.00	Codell				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
1,100.00	1,100.00	0.00	0.00	Start Build 2.00	
1,599.91	1,597.38	0.00	43.51	Start 2058.51 hold at 1599.91 MD	
3,658.42	3,624.63	0.00	400.90	Start Drop -2.00	
4,158.33	4,122.00	0.00	444.41	Start 3032.07 hold at 4158.33 MD	
7,190.40	7,154.07	0.00	444.41	Start DLS 10.00 TFO 180.00	
8,084.65	7,727.00	-567.21	444.41	Start 8578.73 hold at 8084.65 MD	
16,663.39	7,813.00	-9,145.52	444.41	TD at 16663.39	