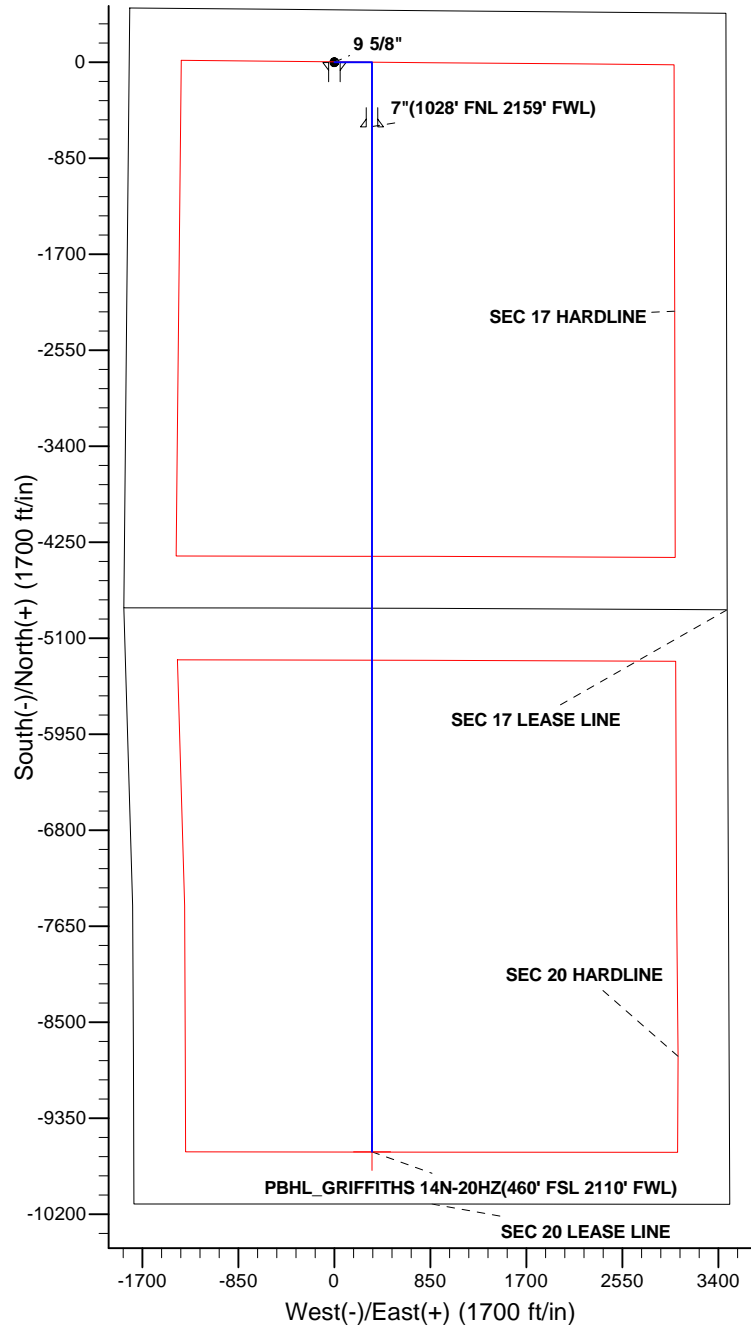
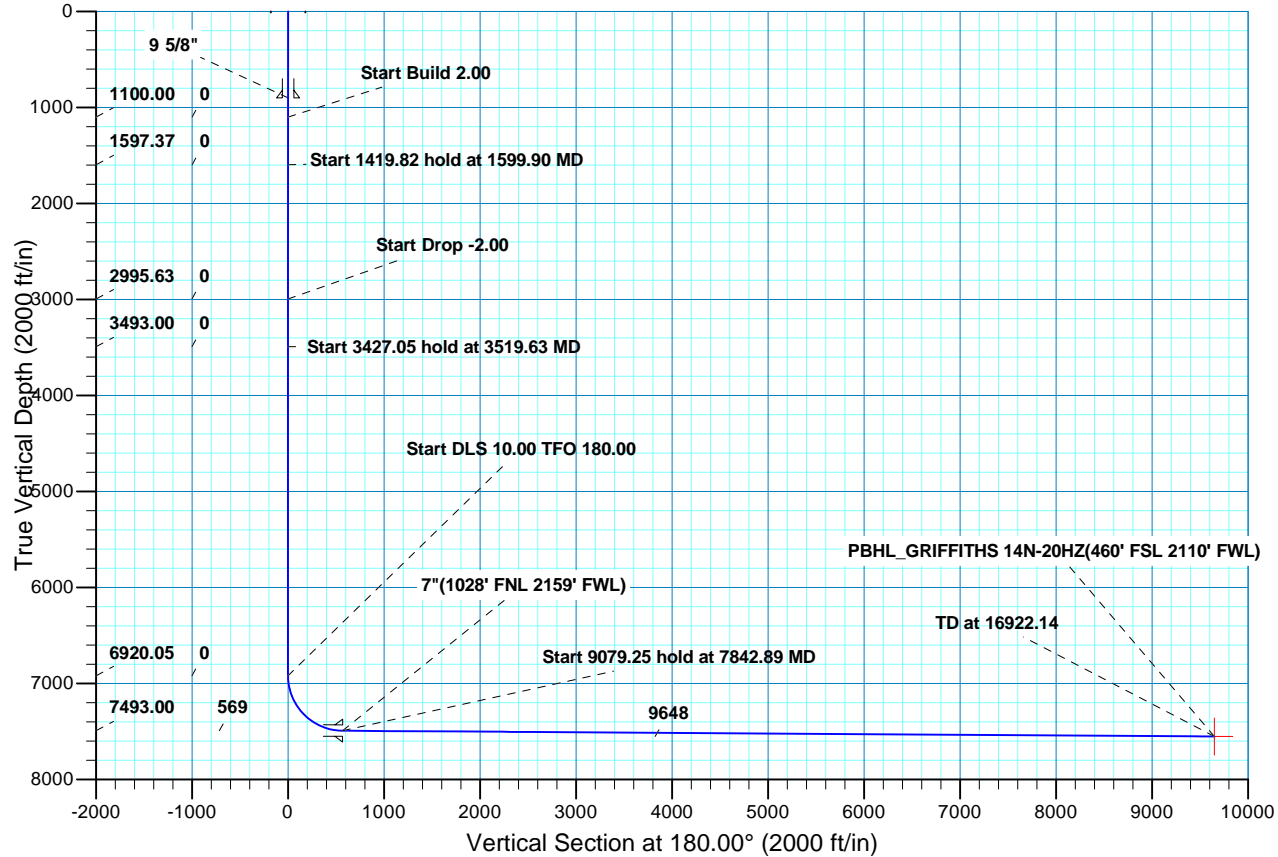




Project: COLORADO NORTHERN ZONE - 83
Site: GRIFFITHS 3W-17 HZ PAD
Well: GRIFFITHS 14N-20HZ
Wellbore: OH
Design: PLAN #1 PRELIMINARY



WELL DETAILS: GRIFFITHS 14N-20HZ											
GL 5061 & KB 17 @ 5078.00ft (ASSUMED)											
+N/-S 0.00		+E/-W 0.00		Northing 1264173.77		Easting 3163058.44		Latitude 40.0570760		Longitude -104.9174760	
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			
1599.90	10.00	90.00	1597.37	0.00	43.51	2.00	90.00	0.00			
3019.72	10.00	90.00	2995.63	0.00	290.01	0.00	0.00	0.00			
3519.63	0.00	0.00	3493.00	0.00	333.51	2.00	180.00	0.00			
6946.68	0.00	0.00	6920.05	0.00	333.51	0.00	0.00	0.00			
7842.89	89.62	180.00	7493.00	-569.17	333.51	10.00	180.00	569.17			
16922.14	89.62	180.00	7553.00	-9648.22	333.51	0.00	0.009648.22	PBHL_GRIFFITHS 14N-20HZ(460' FSL 2110' FWL)			
FORMATION TOP DETAILS								CASING DETAILS			
TVDPath	MDPath	Formation		Inc		TVD	MD	Name	Size		
4560.00	4586.63	Sussex		0.00		900.00	900.00	9 5/8"	9.625		
5151.00	5177.63	Shannon		0.00		7493.00	7842.89	7"	7.000		
7341.00	7419.49	Sharon Springs		47.28							
7375.00	7472.32	Niobrara A		52.56							
7476.00	7706.73	Niobrara B		76.00							





Scientific Drilling

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

GRIFFITHS 3W-17 HZ PAD

GRIFFITHS 14N-20HZ

OH

Plan: PLAN #1 PRELIMINARY

Standard Planning Report

06 May, 2013

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRIFFITHS 14N-20HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5061 & KB 17 @ 5078.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5061 & KB 17 @ 5078.00ft (ASSUMED)
Site:	GRIFFITHS 3W-17 HZ PAD	North Reference:	True
Well:	GRIFFITHS 14N-20HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1 PRELIMINARY		

Project	COLORADO NORTHERN ZONE - 83, KERR MCGEE OIL & GAS ONSHORE LP		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	GRIFFITHS 3W-17 HZ PAD, SECTION 17 T1N R67W			
Site Position:		Northing:	1,264,173.77 usft	Latitude: 40.0570760
From:	Lat/Long	Easting:	3,163,058.44 usft	Longitude: -104.9174760
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence: 0.38 °

Well	GRIFFITHS 14N-20HZ, 465' FNL 1817' FWL			
Well Position	+N/-S	0.00 ft	Northing:	1,264,173.77 usft
	+E/-W	0.00 ft	Easting:	3,163,058.44 usft
Position Uncertainty		0.00 ft	Wellhead Elevation:	Ground Level: 5,061.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2012	2013/05/06	8.71	66.66	52,635

Design	PLAN #1 PRELIMINARY			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	180.00

Plan Sections										
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	
1,599.90	10.00	90.00	1,597.37	0.00	43.51	2.00	2.00	0.00	90.00	
3,019.72	10.00	90.00	2,995.63	0.00	290.01	0.00	0.00	0.00	0.00	
3,519.63	0.00	0.00	3,493.00	0.00	333.51	2.00	-2.00	0.00	180.00	
6,946.68	0.00	0.00	6,920.05	0.00	333.51	0.00	0.00	0.00	0.00	
7,842.89	89.62	180.00	7,493.00	-569.17	333.51	10.00	10.00	20.08	180.00	
16,922.14	89.62	180.00	7,553.00	-9,648.22	333.51	0.00	0.00	0.00	0.00	PBHL_GRIFFITHS 14

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRIFFITHS 14N-20HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5061 & KB 17 @ 5078.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5061 & KB 17 @ 5078.00ft (ASSUMED)
Site:	GRIFFITHS 3W-17 HZ PAD	North Reference:	True
Well:	GRIFFITHS 14N-20HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	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
1,599.90	10.00	90.00	1,597.37	0.00	43.51	0.00	2.00	2.00	0.00
Start 1419.82 hold at 1599.90 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	182.41	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	286.58	0.00	0.00	0.00	0.00
3,019.72	10.00	90.00	2,995.63	0.00	290.01	0.00	0.00	0.00	0.00
Start Drop -2.00									
3,100.00	8.39	90.00	3,074.87	0.00	302.84	0.00	2.00	-2.00	0.00
3,200.00	6.39	90.00	3,174.03	0.00	315.70	0.00	2.00	-2.00	0.00
3,300.00	4.39	90.00	3,273.59	0.00	325.10	0.00	2.00	-2.00	0.00
3,400.00	2.39	90.00	3,373.41	0.00	331.02	0.00	2.00	-2.00	0.00
3,500.00	0.39	90.00	3,473.37	0.00	333.45	0.00	2.00	-2.00	0.00
3,519.63	0.00	0.00	3,493.00	0.00	333.51	0.00	2.00	-2.00	0.00
Start 3427.05 hold at 3519.63 MD									
3,600.00	0.00	0.00	3,573.37	0.00	333.51	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,673.37	0.00	333.51	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,773.37	0.00	333.51	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,873.37	0.00	333.51	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	3,973.37	0.00	333.51	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,073.37	0.00	333.51	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,173.37	0.00	333.51	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,273.37	0.00	333.51	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,373.37	0.00	333.51	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,473.37	0.00	333.51	0.00	0.00	0.00	0.00

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRIFFITHS 14N-20HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5061 & KB 17 @ 5078.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5061 & KB 17 @ 5078.00ft (ASSUMED)
Site:	GRIFFITHS 3W-17 HZ PAD	North Reference:	True
Well:	GRIFFITHS 14N-20HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	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)
4,586.63	0.00	0.00	4,560.00	0.00	333.51	0.00	0.00	0.00	0.00
Sussex									
4,600.00	0.00	0.00	4,573.37	0.00	333.51	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,673.37	0.00	333.51	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,773.37	0.00	333.51	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,873.37	0.00	333.51	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	4,973.37	0.00	333.51	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,073.37	0.00	333.51	0.00	0.00	0.00	0.00
5,177.63	0.00	0.00	5,151.00	0.00	333.51	0.00	0.00	0.00	0.00
Shannon									
5,200.00	0.00	0.00	5,173.37	0.00	333.51	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,273.37	0.00	333.51	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,373.37	0.00	333.51	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,473.37	0.00	333.51	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,573.37	0.00	333.51	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,673.37	0.00	333.51	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,773.37	0.00	333.51	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,873.37	0.00	333.51	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,973.37	0.00	333.51	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,073.37	0.00	333.51	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,173.37	0.00	333.51	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,273.37	0.00	333.51	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,373.37	0.00	333.51	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,473.37	0.00	333.51	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,573.37	0.00	333.51	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,673.37	0.00	333.51	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,773.37	0.00	333.51	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,873.37	0.00	333.51	0.00	0.00	0.00	0.00
6,946.68	0.00	0.00	6,920.05	0.00	333.51	0.00	0.00	0.00	0.00
Start DLS 10.00 TFO 180.00									
7,000.00	5.33	180.00	6,973.29	-2.48	333.51	2.48	10.00	10.00	0.00
7,100.00	15.33	180.00	7,071.55	-20.39	333.51	20.39	10.00	10.00	0.00
7,200.00	25.33	180.00	7,165.20	-55.09	333.51	55.09	10.00	10.00	0.00
7,300.00	35.33	180.00	7,251.40	-105.53	333.51	105.53	10.00	10.00	0.00
7,400.00	45.33	180.00	7,327.53	-170.17	333.51	170.17	10.00	10.00	0.00
7,419.49	47.28	180.00	7,341.00	-184.27	333.51	184.27	10.00	10.00	0.00
Sharon Springs									
7,472.32	52.56	180.00	7,375.00	-224.67	333.51	224.67	10.00	10.00	0.00
Niobrara A									
7,500.00	55.33	180.00	7,391.29	-247.05	333.51	247.05	10.00	10.00	0.00
7,600.00	65.33	180.00	7,440.72	-333.83	333.51	333.83	10.00	10.00	0.00
7,700.00	75.33	180.00	7,474.34	-427.88	333.51	427.88	10.00	10.00	0.00
7,706.73	76.00	180.00	7,476.00	-434.39	333.51	434.39	10.00	10.00	0.00
Niobrara B									
7,800.00	85.33	180.00	7,491.11	-526.33	333.51	526.33	10.00	10.00	0.00
7,842.89	89.62	180.00	7,493.00	-569.17	333.51	569.17	10.00	10.00	0.00
Start 9079.25 hold at 7842.89 MD - 7"(1028' FNL 2159' FWL)									
7,900.00	89.62	180.00	7,493.37	-626.28	333.51	626.28	0.00	0.00	0.00
8,000.00	89.62	180.00	7,494.03	-726.28	333.51	726.28	0.00	0.00	0.00
8,100.00	89.62	180.00	7,494.69	-826.27	333.51	826.27	0.00	0.00	0.00
8,200.00	89.62	180.00	7,495.36	-926.27	333.51	926.27	0.00	0.00	0.00
8,300.00	89.62	180.00	7,496.02	-1,026.27	333.51	1,026.27	0.00	0.00	0.00
8,400.00	89.62	180.00	7,496.68	-1,126.27	333.51	1,126.27	0.00	0.00	0.00

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRIFFITHS 14N-20HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5061 & KB 17 @ 5078.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5061 & KB 17 @ 5078.00ft (ASSUMED)
Site:	GRIFFITHS 3W-17 HZ PAD	North Reference:	True
Well:	GRIFFITHS 14N-20HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	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)
8,500.00	89.62	180.00	7,497.34	-1,226.27	333.51	1,226.27	0.00	0.00	0.00
8,600.00	89.62	180.00	7,498.00	-1,326.26	333.51	1,326.26	0.00	0.00	0.00
8,700.00	89.62	180.00	7,498.66	-1,426.26	333.51	1,426.26	0.00	0.00	0.00
8,800.00	89.62	180.00	7,499.32	-1,526.26	333.51	1,526.26	0.00	0.00	0.00
8,900.00	89.62	180.00	7,499.98	-1,626.26	333.51	1,626.26	0.00	0.00	0.00
9,000.00	89.62	180.00	7,500.64	-1,726.25	333.51	1,726.25	0.00	0.00	0.00
9,100.00	89.62	180.00	7,501.30	-1,826.25	333.51	1,826.25	0.00	0.00	0.00
9,200.00	89.62	180.00	7,501.96	-1,926.25	333.51	1,926.25	0.00	0.00	0.00
9,300.00	89.62	180.00	7,502.63	-2,026.25	333.51	2,026.25	0.00	0.00	0.00
9,400.00	89.62	180.00	7,503.29	-2,126.25	333.51	2,126.25	0.00	0.00	0.00
9,500.00	89.62	180.00	7,503.95	-2,226.24	333.51	2,226.24	0.00	0.00	0.00
9,600.00	89.62	180.00	7,504.61	-2,326.24	333.51	2,326.24	0.00	0.00	0.00
9,700.00	89.62	180.00	7,505.27	-2,426.24	333.51	2,426.24	0.00	0.00	0.00
9,800.00	89.62	180.00	7,505.93	-2,526.24	333.51	2,526.24	0.00	0.00	0.00
9,900.00	89.62	180.00	7,506.59	-2,626.23	333.51	2,626.23	0.00	0.00	0.00
10,000.00	89.62	180.00	7,507.25	-2,726.23	333.51	2,726.23	0.00	0.00	0.00
10,100.00	89.62	180.00	7,507.91	-2,826.23	333.51	2,826.23	0.00	0.00	0.00
10,200.00	89.62	180.00	7,508.57	-2,926.23	333.51	2,926.23	0.00	0.00	0.00
10,300.00	89.62	180.00	7,509.23	-3,026.23	333.51	3,026.23	0.00	0.00	0.00
10,400.00	89.62	180.00	7,509.90	-3,126.22	333.51	3,126.22	0.00	0.00	0.00
10,500.00	89.62	180.00	7,510.56	-3,226.22	333.51	3,226.22	0.00	0.00	0.00
10,600.00	89.62	180.00	7,511.22	-3,326.22	333.51	3,326.22	0.00	0.00	0.00
10,700.00	89.62	180.00	7,511.88	-3,426.22	333.51	3,426.22	0.00	0.00	0.00
10,800.00	89.62	180.00	7,512.54	-3,526.22	333.51	3,526.22	0.00	0.00	0.00
10,900.00	89.62	180.00	7,513.20	-3,626.21	333.51	3,626.21	0.00	0.00	0.00
11,000.00	89.62	180.00	7,513.86	-3,726.21	333.51	3,726.21	0.00	0.00	0.00
11,100.00	89.62	180.00	7,514.52	-3,826.21	333.51	3,826.21	0.00	0.00	0.00
11,200.00	89.62	180.00	7,515.18	-3,926.21	333.51	3,926.21	0.00	0.00	0.00
11,300.00	89.62	180.00	7,515.84	-4,026.20	333.51	4,026.20	0.00	0.00	0.00
11,400.00	89.62	180.00	7,516.50	-4,126.20	333.51	4,126.20	0.00	0.00	0.00
11,500.00	89.62	180.00	7,517.17	-4,226.20	333.51	4,226.20	0.00	0.00	0.00
11,600.00	89.62	180.00	7,517.83	-4,326.20	333.51	4,326.20	0.00	0.00	0.00
11,700.00	89.62	180.00	7,518.49	-4,426.20	333.51	4,426.20	0.00	0.00	0.00
11,800.00	89.62	180.00	7,519.15	-4,526.19	333.51	4,526.19	0.00	0.00	0.00
11,900.00	89.62	180.00	7,519.81	-4,626.19	333.51	4,626.19	0.00	0.00	0.00
12,000.00	89.62	180.00	7,520.47	-4,726.19	333.51	4,726.19	0.00	0.00	0.00
12,100.00	89.62	180.00	7,521.13	-4,826.19	333.51	4,826.19	0.00	0.00	0.00
12,200.00	89.62	180.00	7,521.79	-4,926.18	333.51	4,926.18	0.00	0.00	0.00
12,300.00	89.62	180.00	7,522.45	-5,026.18	333.51	5,026.18	0.00	0.00	0.00
12,400.00	89.62	180.00	7,523.11	-5,126.18	333.51	5,126.18	0.00	0.00	0.00
12,500.00	89.62	180.00	7,523.77	-5,226.18	333.51	5,226.18	0.00	0.00	0.00
12,600.00	89.62	180.00	7,524.44	-5,326.18	333.51	5,326.18	0.00	0.00	0.00
12,700.00	89.62	180.00	7,525.10	-5,426.17	333.51	5,426.17	0.00	0.00	0.00
12,800.00	89.62	180.00	7,525.76	-5,526.17	333.51	5,526.17	0.00	0.00	0.00
12,900.00	89.62	180.00	7,526.42	-5,626.17	333.51	5,626.17	0.00	0.00	0.00
13,000.00	89.62	180.00	7,527.08	-5,726.17	333.51	5,726.17	0.00	0.00	0.00
13,100.00	89.62	180.00	7,527.74	-5,826.16	333.51	5,826.16	0.00	0.00	0.00
13,200.00	89.62	180.00	7,528.40	-5,926.16	333.51	5,926.16	0.00	0.00	0.00
13,300.00	89.62	180.00	7,529.06	-6,026.16	333.51	6,026.16	0.00	0.00	0.00
13,400.00	89.62	180.00	7,529.72	-6,126.16	333.51	6,126.16	0.00	0.00	0.00
13,500.00	89.62	180.00	7,530.38	-6,226.16	333.51	6,226.16	0.00	0.00	0.00
13,600.00	89.62	180.00	7,531.04	-6,326.15	333.51	6,326.15	0.00	0.00	0.00
13,700.00	89.62	180.00	7,531.71	-6,426.15	333.51	6,426.15	0.00	0.00	0.00
13,800.00	89.62	180.00	7,532.37	-6,526.15	333.51	6,526.15	0.00	0.00	0.00

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRIFFITHS 14N-20HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5061 & KB 17 @ 5078.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5061 & KB 17 @ 5078.00ft (ASSUMED)
Site:	GRIFFITHS 3W-17 HZ PAD	North Reference:	True
Well:	GRIFFITHS 14N-20HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	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)
13,900.00	89.62	180.00	7,533.03	-6,626.15	333.51	6,626.15	0.00	0.00	0.00
14,000.00	89.62	180.00	7,533.69	-6,726.15	333.51	6,726.15	0.00	0.00	0.00
14,100.00	89.62	180.00	7,534.35	-6,826.14	333.51	6,826.14	0.00	0.00	0.00
14,200.00	89.62	180.00	7,535.01	-6,926.14	333.51	6,926.14	0.00	0.00	0.00
14,300.00	89.62	180.00	7,535.67	-7,026.14	333.51	7,026.14	0.00	0.00	0.00
14,400.00	89.62	180.00	7,536.33	-7,126.14	333.51	7,126.14	0.00	0.00	0.00
14,500.00	89.62	180.00	7,536.99	-7,226.13	333.51	7,226.13	0.00	0.00	0.00
14,600.00	89.62	180.00	7,537.65	-7,326.13	333.51	7,326.13	0.00	0.00	0.00
14,700.00	89.62	180.00	7,538.31	-7,426.13	333.51	7,426.13	0.00	0.00	0.00
14,800.00	89.62	180.00	7,538.97	-7,526.13	333.51	7,526.13	0.00	0.00	0.00
14,900.00	89.62	180.00	7,539.64	-7,626.13	333.51	7,626.13	0.00	0.00	0.00
15,000.00	89.62	180.00	7,540.30	-7,726.12	333.51	7,726.12	0.00	0.00	0.00
15,100.00	89.62	180.00	7,540.96	-7,826.12	333.51	7,826.12	0.00	0.00	0.00
15,200.00	89.62	180.00	7,541.62	-7,926.12	333.51	7,926.12	0.00	0.00	0.00
15,300.00	89.62	180.00	7,542.28	-8,026.12	333.51	8,026.12	0.00	0.00	0.00
15,400.00	89.62	180.00	7,542.94	-8,126.11	333.51	8,126.11	0.00	0.00	0.00
15,500.00	89.62	180.00	7,543.60	-8,226.11	333.51	8,226.11	0.00	0.00	0.00
15,600.00	89.62	180.00	7,544.26	-8,326.11	333.51	8,326.11	0.00	0.00	0.00
15,700.00	89.62	180.00	7,544.92	-8,426.11	333.51	8,426.11	0.00	0.00	0.00
15,800.00	89.62	180.00	7,545.58	-8,526.11	333.51	8,526.11	0.00	0.00	0.00
15,900.00	89.62	180.00	7,546.24	-8,626.10	333.51	8,626.10	0.00	0.00	0.00
16,000.00	89.62	180.00	7,546.91	-8,726.10	333.51	8,726.10	0.00	0.00	0.00
16,100.00	89.62	180.00	7,547.57	-8,826.10	333.51	8,826.10	0.00	0.00	0.00
16,200.00	89.62	180.00	7,548.23	-8,926.10	333.51	8,926.10	0.00	0.00	0.00
16,300.00	89.62	180.00	7,548.89	-9,026.10	333.51	9,026.10	0.00	0.00	0.00
16,400.00	89.62	180.00	7,549.55	-9,126.09	333.51	9,126.09	0.00	0.00	0.00
16,500.00	89.62	180.00	7,550.21	-9,226.09	333.51	9,226.09	0.00	0.00	0.00
16,600.00	89.62	180.00	7,550.87	-9,326.09	333.51	9,326.09	0.00	0.00	0.00
16,700.00	89.62	180.00	7,551.53	-9,426.09	333.51	9,426.09	0.00	0.00	0.00
16,800.00	89.62	180.00	7,552.19	-9,526.08	333.51	9,526.08	0.00	0.00	0.00
16,900.00	89.62	180.00	7,552.85	-9,626.08	333.51	9,626.08	0.00	0.00	0.00
16,922.14	89.62	180.00	7,553.00	-9,648.22	333.51	9,648.22	0.00	0.00	0.00
TD at 16922.14 - PBHL_GRIFFITHS 14N-20HZ(460' FSL 2110' 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 14N- - plan hits target center - Point	0.00	0.00	7,553.00	-9,648.22	333.51	1,254,527.97	3,163,455.32	40.0305900	-104.9162850

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	
7,842.89	7,493.00	7"(1028' FNL 2159' FWL)	7.000	7.500	

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRIFFITHS 14N-20HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5061 & KB 17 @ 5078.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5061 & KB 17 @ 5078.00ft (ASSUMED)
Site:	GRIFFITHS 3W-17 HZ PAD	North Reference:	True
Well:	GRIFFITHS 14N-20HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1 PRELIMINARY		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,586.63	4,578.00	Sussex				
5,177.63	5,169.00	Shannon				
7,419.49	7,359.00	Sharon Springs				
7,472.32	7,393.00	Niobrara A				
7,706.73	7,494.00	Niobrara B				

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
1,599.90	1,597.37	0.00	43.51	Start 1419.82 hold at 1599.90 MD
3,019.72	2,995.63	0.00	290.01	Start Drop -2.00
3,519.63	3,493.00	0.00	333.51	Start 3427.05 hold at 3519.63 MD
6,946.68	6,920.05	0.00	333.51	Start DLS 10.00 TFO 180.00
7,842.89	7,493.00	-569.17	333.51	Start 9079.25 hold at 7842.89 MD
16,922.14	7,553.00	-9,648.22	333.51	TD at 16922.14