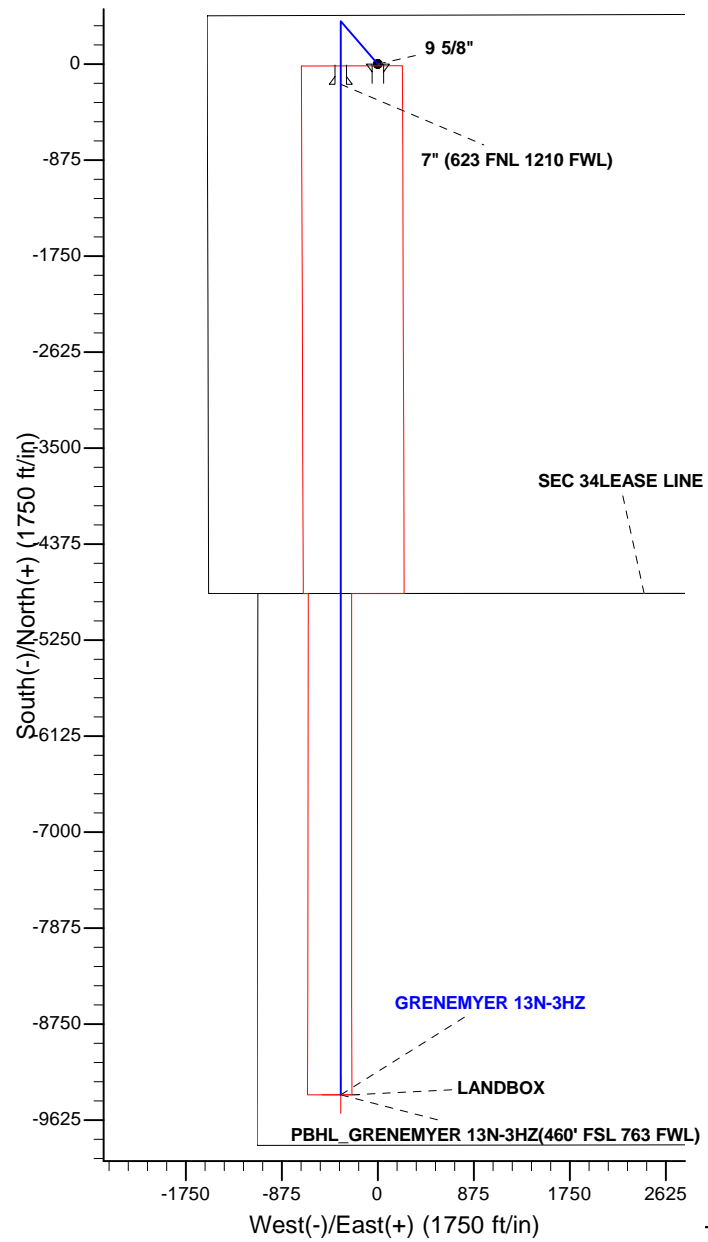
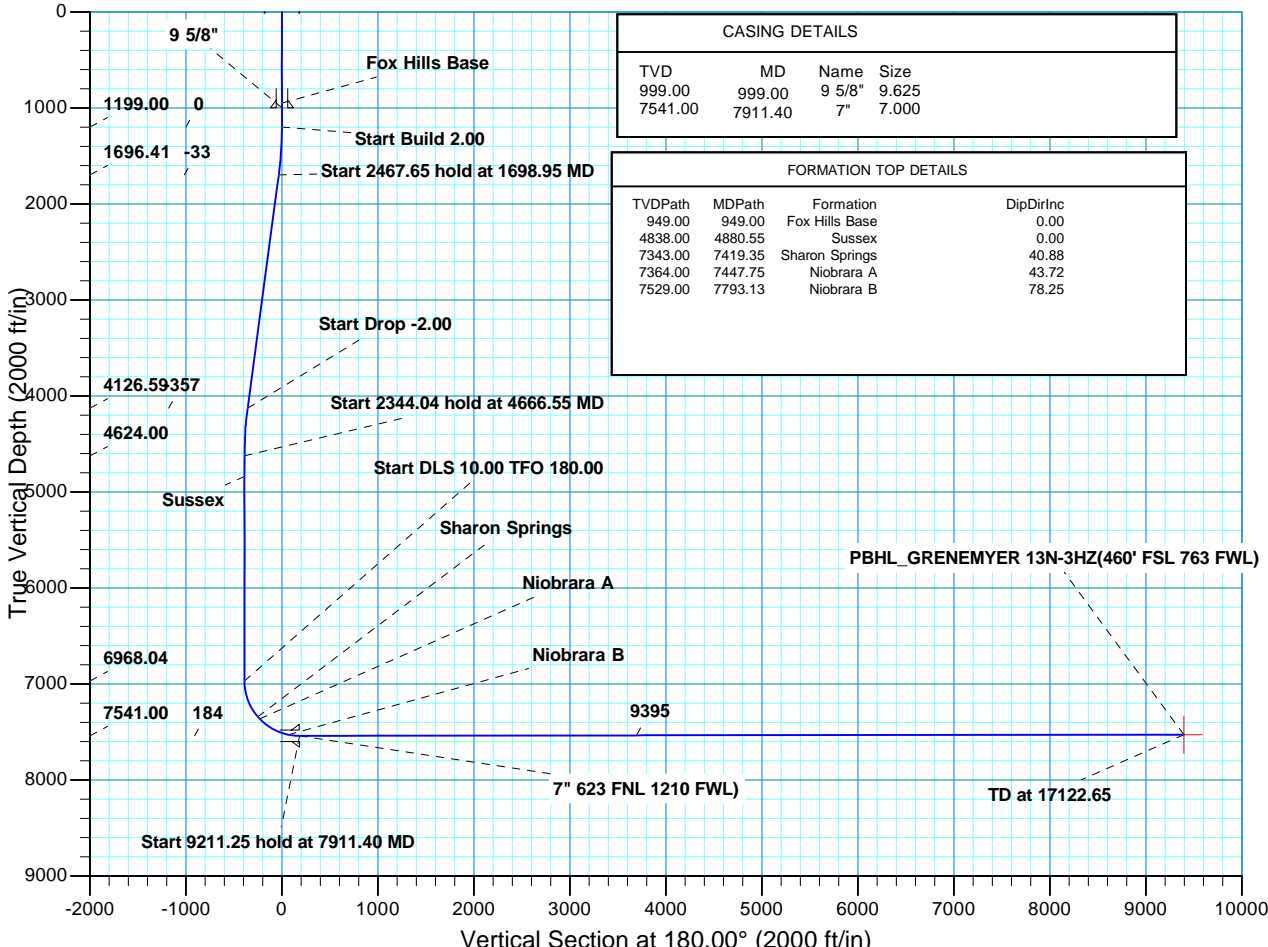


WELL DETAILS: GRENEMYER 13N-3HZ														
GL 5047 & KB 17 @ 5064.00ft (ASSUMED)														
+N/-S		+E/-W		Northing		Easting		Latitude		Longitude				
0.00		0.00		1248412.58		3173523.57		40.0136150		-104.8804840				
SECTION DETAILS														
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target					
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
1199.00	0.00	0.00	1199.00	0.00	0.00	0.00	0.00	0.00	0.00					
1698.95	10.00	319.16	1696.41	32.92	-28.45	2.00	319.16	-32.92						
4166.60	10.00	319.16	4126.59	357.08	-308.63	0.00	0.00	-357.08						
4666.55	0.00	0.00	4624.00	390.00	-337.09	2.00	180.00	-390.00						
7010.59	0.00	0.00	6968.04	390.00	-337.09	0.00	0.00	-390.00						
7911.40	90.08	180.00	7541.00	-183.77	-337.09	10.00	180.00	183.77						
17122.65	90.08	180.00	7528.00	-9395.00	-337.09	0.00	0.009395.00		PBHL_GRENEMYER 13N-3HZ(460' FSL 763 FWL)					
DESIGN TARGET DETAILS														
Name	TVD	+N/-S		+E/-W		Northing		Easting		Latitude		Longitude		Shape
PBH	7528.00	-9395.00		-337.09		1239015.46		3173252.13		39.9878240		-104.8816870		Point
- plan hits target center														





Scientific Drilling

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

GRENNEMYER 35C-3HZ PAD

GRENNEMYER 13N-3HZ

OH

Plan: PLAN #1 PRELIMINARY

Standard Planning Report

26 August, 2013

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENEMYER 13N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Site:	GRENEMYER 35C-3HZ PAD	North Reference:	True
Well:	GRENEMYER 13N-3HZ	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	GRENEMYER 35C-3HZ PAD, NENW SEC 34 T1N R67W			
Site Position:		Northing:	1,248,412.57 usft	Latitude: 40.0136150
From:	Lat/Long	Easting:	3,173,523.57 usft	Longitude: -104.8804840
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence: 0.40 °

Well	GRENEMYER 13N-3HZ, 445 FNL 1555 FWL			
Well Position	+N/-S	0.00 ft	Northing:	1,248,412.57 usft
	+E/-W	0.00 ft	Easting:	3,173,523.57 usft
Position Uncertainty		0.00 ft	Wellhead Elevation:	Ground Level: 5,047.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	2013/08/26	8.63	66.63	52,611

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	
1,199.00	0.00	0.00	1,199.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,698.95	10.00	319.16	1,696.41	32.92	-28.45	2.00	2.00	0.00	319.16	
4,166.60	10.00	319.16	4,126.59	357.08	-308.63	0.00	0.00	0.00	0.00	
4,666.55	0.00	0.00	4,624.00	390.00	-337.09	2.00	-2.00	0.00	180.00	
7,010.59	0.00	0.00	6,968.04	390.00	-337.09	0.00	0.00	0.00	0.00	
7,911.40	90.08	180.00	7,541.00	-183.77	-337.09	10.00	10.00	19.98	180.00	
17,122.65	90.08	180.00	7,528.00	-9,395.00	-337.09	0.00	0.00	0.00	0.00	PBHL_GRENEMYER

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENNEMYER 13N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Site:	GRENNEMYER 35C-3HZ PAD	North Reference:	True
Well:	GRENNEMYER 13N-3HZ	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
949.00	0.00	0.00	949.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Base									
999.00	0.00	0.00	999.00	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
1,199.00	0.00	0.00	1,199.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
1,200.00	0.02	319.16	1,200.00	0.00	0.00	0.00	2.00	2.00	0.00
1,300.00	2.02	319.16	1,299.98	1.35	-1.16	-1.35	2.00	2.00	0.00
1,400.00	4.02	319.16	1,399.84	5.33	-4.61	-5.33	2.00	2.00	0.00
1,500.00	6.02	319.16	1,499.45	11.95	-10.33	-11.95	2.00	2.00	0.00
1,600.00	8.02	319.16	1,598.69	21.20	-18.32	-21.20	2.00	2.00	0.00
1,698.95	10.00	319.16	1,696.41	32.92	-28.45	-32.92	2.00	2.00	0.00
Start 2467.65 hold at 1698.95 MD									
1,700.00	10.00	319.16	1,697.45	33.06	-28.57	-33.06	0.00	0.00	0.00
1,800.00	10.00	319.16	1,795.93	46.20	-39.93	-46.20	0.00	0.00	0.00
1,900.00	10.00	319.16	1,894.41	59.33	-51.28	-59.33	0.00	0.00	0.00
2,000.00	10.00	319.16	1,992.89	72.47	-62.64	-72.47	0.00	0.00	0.00
2,100.00	10.00	319.16	2,091.37	85.60	-73.99	-85.60	0.00	0.00	0.00
2,200.00	10.00	319.16	2,189.86	98.74	-85.34	-98.74	0.00	0.00	0.00
2,300.00	10.00	319.16	2,288.34	111.88	-96.70	-111.88	0.00	0.00	0.00
2,400.00	10.00	319.16	2,386.82	125.01	-108.05	-125.01	0.00	0.00	0.00
2,500.00	10.00	319.16	2,485.30	138.15	-119.41	-138.15	0.00	0.00	0.00
2,600.00	10.00	319.16	2,583.78	151.29	-130.76	-151.29	0.00	0.00	0.00
2,700.00	10.00	319.16	2,682.26	164.42	-142.11	-164.42	0.00	0.00	0.00
2,800.00	10.00	319.16	2,780.74	177.56	-153.47	-177.56	0.00	0.00	0.00
2,900.00	10.00	319.16	2,879.22	190.69	-164.82	-190.69	0.00	0.00	0.00
3,000.00	10.00	319.16	2,977.70	203.83	-176.18	-203.83	0.00	0.00	0.00
3,100.00	10.00	319.16	3,076.19	216.97	-187.53	-216.97	0.00	0.00	0.00
3,200.00	10.00	319.16	3,174.67	230.10	-198.88	-230.10	0.00	0.00	0.00
3,300.00	10.00	319.16	3,273.15	243.24	-210.24	-243.24	0.00	0.00	0.00
3,400.00	10.00	319.16	3,371.63	256.38	-221.59	-256.38	0.00	0.00	0.00
3,500.00	10.00	319.16	3,470.11	269.51	-232.95	-269.51	0.00	0.00	0.00
3,600.00	10.00	319.16	3,568.59	282.65	-244.30	-282.65	0.00	0.00	0.00
3,700.00	10.00	319.16	3,667.07	295.79	-255.65	-295.79	0.00	0.00	0.00
3,800.00	10.00	319.16	3,765.55	308.92	-267.01	-308.92	0.00	0.00	0.00
3,900.00	10.00	319.16	3,864.03	322.06	-278.36	-322.06	0.00	0.00	0.00
4,000.00	10.00	319.16	3,962.52	335.19	-289.72	-335.19	0.00	0.00	0.00
4,100.00	10.00	319.16	4,061.00	348.33	-301.07	-348.33	0.00	0.00	0.00
4,166.60	10.00	319.16	4,126.59	357.08	-308.63	-357.08	0.00	0.00	0.00
Start Drop -2.00									
4,200.00	9.33	319.16	4,159.51	361.32	-312.30	-361.32	2.00	-2.00	0.00
4,300.00	7.33	319.16	4,258.45	372.28	-321.77	-372.28	2.00	-2.00	0.00

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENNEMYER 13N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Site:	GRENNEMYER 35C-3HZ PAD	North Reference:	True
Well:	GRENNEMYER 13N-3HZ	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)
4,400.00	5.33	319.16	4,357.84	380.63	-328.98	-380.63	2.00	-2.00	0.00
4,500.00	3.33	319.16	4,457.54	386.34	-333.92	-386.34	2.00	-2.00	0.00
4,600.00	1.33	319.16	4,557.46	389.42	-336.58	-389.42	2.00	-2.00	0.00
4,666.55	0.00	0.00	4,624.00	390.00	-337.09	-390.00	2.00	-2.00	0.00
Start 2344.04 hold at 4666.55 MD									
4,700.00	0.00	0.00	4,657.45	390.00	-337.09	-390.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,757.45	390.00	-337.09	-390.00	0.00	0.00	0.00
4,880.55	0.00	0.00	4,838.00	390.00	-337.09	-390.00	0.00	0.00	0.00
Sussex									
4,900.00	0.00	0.00	4,857.45	390.00	-337.09	-390.00	0.00	0.00	0.00
5,000.00	0.00	0.00	4,957.45	390.00	-337.09	-390.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,057.45	390.00	-337.09	-390.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,157.45	390.00	-337.09	-390.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,257.45	390.00	-337.09	-390.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,357.45	390.00	-337.09	-390.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,457.45	390.00	-337.09	-390.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,557.45	390.00	-337.09	-390.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,657.45	390.00	-337.09	-390.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,757.45	390.00	-337.09	-390.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,857.45	390.00	-337.09	-390.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,957.45	390.00	-337.09	-390.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,057.45	390.00	-337.09	-390.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,157.45	390.00	-337.09	-390.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,257.45	390.00	-337.09	-390.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,357.45	390.00	-337.09	-390.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,457.45	390.00	-337.09	-390.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,557.45	390.00	-337.09	-390.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,657.45	390.00	-337.09	-390.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,757.45	390.00	-337.09	-390.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,857.45	390.00	-337.09	-390.00	0.00	0.00	0.00
7,000.00	0.00	0.00	6,957.45	390.00	-337.09	-390.00	0.00	0.00	0.00
7,010.59	0.00	0.00	6,968.04	390.00	-337.09	-390.00	0.00	0.00	0.00
Start DLS 10.00 TFO 180.00									
7,100.00	8.94	180.00	7,057.09	383.04	-337.09	-383.04	10.00	10.00	0.00
7,200.00	18.94	180.00	7,154.02	358.98	-337.09	-358.98	10.00	10.00	0.00
7,300.00	28.94	180.00	7,245.30	318.45	-337.09	-318.45	10.00	10.00	0.00
7,400.00	38.94	180.00	7,328.16	262.68	-337.09	-262.68	10.00	10.00	0.00
7,419.35	40.88	180.00	7,343.00	250.27	-337.09	-250.27	10.00	10.00	0.00
Sharon Springs									
7,447.75	43.72	180.00	7,364.00	231.16	-337.09	-231.16	10.00	10.00	0.00
Niobrara A									
7,500.00	48.94	180.00	7,400.07	193.38	-337.09	-193.38	10.00	10.00	0.00
7,600.00	58.94	180.00	7,458.86	112.64	-337.09	-112.64	10.00	10.00	0.00
7,700.00	68.94	180.00	7,502.73	22.92	-337.09	-22.92	10.00	10.00	0.00
7,793.13	78.25	180.00	7,529.00	-66.32	-337.09	66.32	10.00	10.00	0.00
Niobrara B									
7,800.00	78.94	180.00	7,530.36	-73.05	-337.09	73.05	10.00	10.00	0.00
7,900.00	88.94	180.00	7,540.90	-172.37	-337.09	172.37	10.00	10.00	0.00
7,911.40	90.08	180.00	7,541.00	-183.77	-337.09	183.77	10.00	10.00	0.00
Start 9211.25 hold at 7911.40 MD - 7" 623 FNL 1210 FWL)									
8,000.00	90.08	180.00	7,540.87	-272.37	-337.09	272.37	0.00	0.00	0.00
8,100.00	90.08	180.00	7,540.73	-372.37	-337.09	372.37	0.00	0.00	0.00
8,200.00	90.08	180.00	7,540.59	-472.37	-337.09	472.37	0.00	0.00	0.00

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENNEMYER 13N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Site:	GRENNEMYER 35C-3HZ PAD	North Reference:	True
Well:	GRENNEMYER 13N-3HZ	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)
8,300.00	90.08	180.00	7,540.45	-572.37	-337.09	572.37	0.00	0.00	0.00
8,400.00	90.08	180.00	7,540.31	-672.37	-337.09	672.37	0.00	0.00	0.00
8,500.00	90.08	180.00	7,540.17	-772.37	-337.09	772.37	0.00	0.00	0.00
8,600.00	90.08	180.00	7,540.03	-872.37	-337.09	872.37	0.00	0.00	0.00
8,700.00	90.08	180.00	7,539.88	-972.37	-337.09	972.37	0.00	0.00	0.00
8,800.00	90.08	180.00	7,539.74	-1,072.37	-337.09	1,072.37	0.00	0.00	0.00
8,900.00	90.08	180.00	7,539.60	-1,172.37	-337.09	1,172.37	0.00	0.00	0.00
9,000.00	90.08	180.00	7,539.46	-1,272.37	-337.09	1,272.37	0.00	0.00	0.00
9,100.00	90.08	180.00	7,539.32	-1,372.37	-337.09	1,372.37	0.00	0.00	0.00
9,200.00	90.08	180.00	7,539.18	-1,472.37	-337.09	1,472.37	0.00	0.00	0.00
9,300.00	90.08	180.00	7,539.04	-1,572.37	-337.09	1,572.37	0.00	0.00	0.00
9,400.00	90.08	180.00	7,538.90	-1,672.37	-337.09	1,672.37	0.00	0.00	0.00
9,500.00	90.08	180.00	7,538.76	-1,772.37	-337.09	1,772.37	0.00	0.00	0.00
9,600.00	90.08	180.00	7,538.61	-1,872.37	-337.09	1,872.37	0.00	0.00	0.00
9,700.00	90.08	180.00	7,538.47	-1,972.37	-337.09	1,972.37	0.00	0.00	0.00
9,800.00	90.08	180.00	7,538.33	-2,072.37	-337.09	2,072.37	0.00	0.00	0.00
9,900.00	90.08	180.00	7,538.19	-2,172.37	-337.09	2,172.37	0.00	0.00	0.00
10,000.00	90.08	180.00	7,538.05	-2,272.37	-337.09	2,272.37	0.00	0.00	0.00
10,100.00	90.08	180.00	7,537.91	-2,372.37	-337.09	2,372.37	0.00	0.00	0.00
10,200.00	90.08	180.00	7,537.77	-2,472.37	-337.09	2,472.37	0.00	0.00	0.00
10,300.00	90.08	180.00	7,537.63	-2,572.37	-337.09	2,572.37	0.00	0.00	0.00
10,400.00	90.08	180.00	7,537.49	-2,672.37	-337.09	2,672.37	0.00	0.00	0.00
10,500.00	90.08	180.00	7,537.34	-2,772.37	-337.09	2,772.37	0.00	0.00	0.00
10,600.00	90.08	180.00	7,537.20	-2,872.37	-337.09	2,872.37	0.00	0.00	0.00
10,700.00	90.08	180.00	7,537.06	-2,972.37	-337.09	2,972.37	0.00	0.00	0.00
10,800.00	90.08	180.00	7,536.92	-3,072.37	-337.09	3,072.37	0.00	0.00	0.00
10,900.00	90.08	180.00	7,536.78	-3,172.37	-337.09	3,172.37	0.00	0.00	0.00
11,000.00	90.08	180.00	7,536.64	-3,272.37	-337.09	3,272.37	0.00	0.00	0.00
11,100.00	90.08	180.00	7,536.50	-3,372.37	-337.09	3,372.37	0.00	0.00	0.00
11,200.00	90.08	180.00	7,536.36	-3,472.37	-337.09	3,472.37	0.00	0.00	0.00
11,300.00	90.08	180.00	7,536.22	-3,572.37	-337.09	3,572.37	0.00	0.00	0.00
11,400.00	90.08	180.00	7,536.07	-3,672.37	-337.09	3,672.37	0.00	0.00	0.00
11,500.00	90.08	180.00	7,535.93	-3,772.37	-337.09	3,772.37	0.00	0.00	0.00
11,600.00	90.08	180.00	7,535.79	-3,872.37	-337.09	3,872.37	0.00	0.00	0.00
11,700.00	90.08	180.00	7,535.65	-3,972.36	-337.09	3,972.36	0.00	0.00	0.00
11,800.00	90.08	180.00	7,535.51	-4,072.36	-337.09	4,072.36	0.00	0.00	0.00
11,900.00	90.08	180.00	7,535.37	-4,172.36	-337.09	4,172.36	0.00	0.00	0.00
12,000.00	90.08	180.00	7,535.23	-4,272.36	-337.09	4,272.36	0.00	0.00	0.00
12,100.00	90.08	180.00	7,535.09	-4,372.36	-337.09	4,372.36	0.00	0.00	0.00
12,200.00	90.08	180.00	7,534.95	-4,472.36	-337.09	4,472.36	0.00	0.00	0.00
12,300.00	90.08	180.00	7,534.81	-4,572.36	-337.09	4,572.36	0.00	0.00	0.00
12,400.00	90.08	180.00	7,534.66	-4,672.36	-337.09	4,672.36	0.00	0.00	0.00
12,500.00	90.08	180.00	7,534.52	-4,772.36	-337.09	4,772.36	0.00	0.00	0.00
12,600.00	90.08	180.00	7,534.38	-4,872.36	-337.09	4,872.36	0.00	0.00	0.00
12,700.00	90.08	180.00	7,534.24	-4,972.36	-337.09	4,972.36	0.00	0.00	0.00
12,800.00	90.08	180.00	7,534.10	-5,072.36	-337.09	5,072.36	0.00	0.00	0.00
12,900.00	90.08	180.00	7,533.96	-5,172.36	-337.09	5,172.36	0.00	0.00	0.00
13,000.00	90.08	180.00	7,533.82	-5,272.36	-337.09	5,272.36	0.00	0.00	0.00
13,100.00	90.08	180.00	7,533.68	-5,372.36	-337.09	5,372.36	0.00	0.00	0.00
13,200.00	90.08	180.00	7,533.54	-5,472.36	-337.09	5,472.36	0.00	0.00	0.00
13,300.00	90.08	180.00	7,533.39	-5,572.36	-337.09	5,572.36	0.00	0.00	0.00
13,400.00	90.08	180.00	7,533.25	-5,672.36	-337.09	5,672.36	0.00	0.00	0.00
13,500.00	90.08	180.00	7,533.11	-5,772.36	-337.09	5,772.36	0.00	0.00	0.00
13,600.00	90.08	180.00	7,532.97	-5,872.36	-337.09	5,872.36	0.00	0.00	0.00

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENNEMYER 13N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Site:	GRENNEMYER 35C-3HZ PAD	North Reference:	True
Well:	GRENNEMYER 13N-3HZ	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)
13,700.00	90.08	180.00	7,532.83	-5,972.36	-337.09	5,972.36	0.00	0.00	0.00
13,800.00	90.08	180.00	7,532.69	-6,072.36	-337.09	6,072.36	0.00	0.00	0.00
13,900.00	90.08	180.00	7,532.55	-6,172.36	-337.09	6,172.36	0.00	0.00	0.00
14,000.00	90.08	180.00	7,532.41	-6,272.36	-337.09	6,272.36	0.00	0.00	0.00
14,100.00	90.08	180.00	7,532.27	-6,372.36	-337.09	6,372.36	0.00	0.00	0.00
14,200.00	90.08	180.00	7,532.12	-6,472.36	-337.09	6,472.36	0.00	0.00	0.00
14,300.00	90.08	180.00	7,531.98	-6,572.36	-337.09	6,572.36	0.00	0.00	0.00
14,400.00	90.08	180.00	7,531.84	-6,672.36	-337.09	6,672.36	0.00	0.00	0.00
14,500.00	90.08	180.00	7,531.70	-6,772.36	-337.09	6,772.36	0.00	0.00	0.00
14,600.00	90.08	180.00	7,531.56	-6,872.36	-337.09	6,872.36	0.00	0.00	0.00
14,700.00	90.08	180.00	7,531.42	-6,972.36	-337.09	6,972.36	0.00	0.00	0.00
14,800.00	90.08	180.00	7,531.28	-7,072.36	-337.09	7,072.36	0.00	0.00	0.00
14,900.00	90.08	180.00	7,531.14	-7,172.36	-337.09	7,172.36	0.00	0.00	0.00
15,000.00	90.08	180.00	7,531.00	-7,272.36	-337.09	7,272.36	0.00	0.00	0.00
15,100.00	90.08	180.00	7,530.85	-7,372.36	-337.09	7,372.36	0.00	0.00	0.00
15,200.00	90.08	180.00	7,530.71	-7,472.36	-337.09	7,472.36	0.00	0.00	0.00
15,300.00	90.08	180.00	7,530.57	-7,572.36	-337.09	7,572.36	0.00	0.00	0.00
15,400.00	90.08	180.00	7,530.43	-7,672.36	-337.09	7,672.36	0.00	0.00	0.00
15,500.00	90.08	180.00	7,530.29	-7,772.36	-337.09	7,772.36	0.00	0.00	0.00
15,600.00	90.08	180.00	7,530.15	-7,872.36	-337.09	7,872.36	0.00	0.00	0.00
15,700.00	90.08	180.00	7,530.01	-7,972.36	-337.09	7,972.36	0.00	0.00	0.00
15,800.00	90.08	180.00	7,529.87	-8,072.36	-337.09	8,072.36	0.00	0.00	0.00
15,900.00	90.08	180.00	7,529.73	-8,172.36	-337.09	8,172.36	0.00	0.00	0.00
16,000.00	90.08	180.00	7,529.58	-8,272.36	-337.09	8,272.36	0.00	0.00	0.00
16,100.00	90.08	180.00	7,529.44	-8,372.36	-337.09	8,372.36	0.00	0.00	0.00
16,200.00	90.08	180.00	7,529.30	-8,472.36	-337.09	8,472.36	0.00	0.00	0.00
16,300.00	90.08	180.00	7,529.16	-8,572.36	-337.09	8,572.36	0.00	0.00	0.00
16,400.00	90.08	180.00	7,529.02	-8,672.36	-337.09	8,672.36	0.00	0.00	0.00
16,500.00	90.08	180.00	7,528.88	-8,772.36	-337.09	8,772.36	0.00	0.00	0.00
16,600.00	90.08	180.00	7,528.74	-8,872.36	-337.09	8,872.36	0.00	0.00	0.00
16,700.00	90.08	180.00	7,528.60	-8,972.36	-337.09	8,972.36	0.00	0.00	0.00
16,800.00	90.08	180.00	7,528.46	-9,072.36	-337.09	9,072.36	0.00	0.00	0.00
16,900.00	90.08	180.00	7,528.31	-9,172.36	-337.09	9,172.36	0.00	0.00	0.00
17,000.00	90.08	180.00	7,528.17	-9,272.36	-337.09	9,272.36	0.00	0.00	0.00
17,100.00	90.08	180.00	7,528.03	-9,372.36	-337.09	9,372.36	0.00	0.00	0.00
17,122.65	90.08	180.00	7,528.00	-9,395.00	-337.09	9,395.00	0.00	0.00	0.00
PBHL_GRENNEMYER 13N-3HZ(460' FSL 763 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_GRENNEMYER 13N-3HZ	0.00	0.00	7,528.00	-9,395.00	-337.09	1,239,015.46	3,173,252.13	39.9878240	-104.8816870
- plan hits target center									
- Point									

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENEMYER 13N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Site:	GRENEMYER 35C-3HZ PAD	North Reference:	True
Well:	GRENEMYER 13N-3HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1 PRELIMINARY		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
999.00	999.00	9 5/8"	9.625	12.250	
7,911.40	7,541.00	7" 623 FNL 1210 FWL)	7.000	7.500	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
949.00	949.00	Fox Hills Base		0.00	
4,880.55	4,838.00	Sussex			
7,419.35	7,343.00	Sharon Springs			
7,447.75	7,364.00	Niobrara A			
7,793.13	7,529.00	Niobrara B			

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,199.00	1,199.00	0.00	0.00	Start Build 2.00	
1,698.95	1,696.41	32.92	-28.45	Start 2467.65 hold at 1698.95 MD	
4,166.60	4,126.59	357.08	-308.63	Start Drop -2.00	
4,666.55	4,624.00	390.00	-337.09	Start 2344.04 hold at 4666.55 MD	
7,010.59	6,968.04	390.00	-337.09	Start DLS 10.00 TFO 180.00	
7,911.40	7,541.00	-183.77	-337.09	Start 9211.25 hold at 7911.40 MD	
17,122.65	7,528.00	-9,395.00	-337.09	TD at 17122.65	