

# GRMR Oil & Gas, LLC

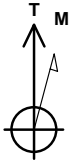
Project: Moffat County, CO

Site: Stover Federal

Well: #9-12 1D

Wellbore: OH

Design: Plan #3 Draft 3



Azimuths to True North  
Magnetic North: 9.62°

Magnetic Field  
Strength: 52146.1nT  
Dip Angle: 66.40°  
Date: 1/28/2016  
Model: BGGM2015

## PROJECT DETAILS: Moffat County, CO

Geodetic System: US State Plane 1983

Datum: North American Datum 1983

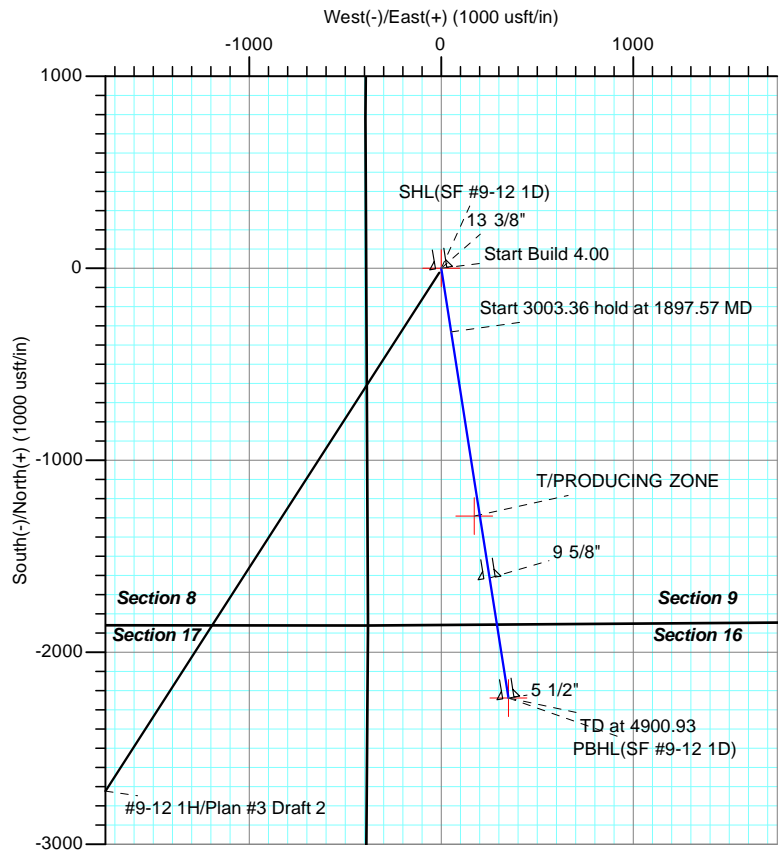
Ellipsoid: GRS 1980

Zone: Colorado Northern Zone

Datum: GE 6908.5' + KB 19' @ 6927.50usft (Prelim. Planning)

## CASING DETAILS

TVD	MD	Name
500.00	500.00	13 3/8"
3365.00	3916.65	9 5/8"
4119.00	4900.93	5 1/2"



## DESIGN TARGET DETAILS

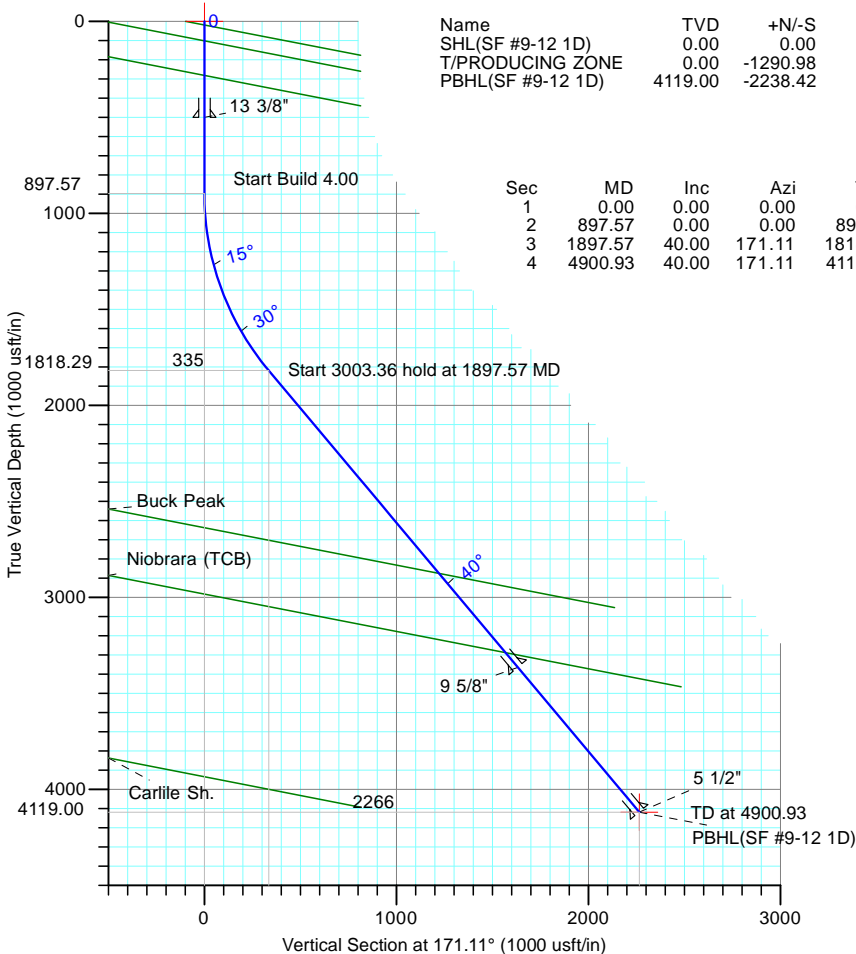
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHL(SF #9-12 1D)	0.00	0.00	0.00	1368514.78	2437431.38	40° 19' 38.648 N	107° 31' 4.560 W
T/PRODUCING ZONE	0.00	-1290.98	172.24	1367220.21	2437574.20	40° 19' 25.890 N	107° 31' 2.336 W
PBHL(SF #9-12 1D)	4119.00	-2238.42	350.15	1366268.97	2437730.50	40° 19' 16.527 N	107° 31' 0.039 W

## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	897.57	0.00	0.00	897.57	0.00	0.00	0.00	0.00	0.00	
3	1897.57	40.00	171.11	1818.29	-331.09	51.79	4.00	171.11	335.12	
4	4900.93	40.00	171.11	4119.00	-2238.42	350.15	0.00	0.00	2265.64	PBHL(SF #9-12 1D)

## FORMATION TOP DETAILS

TVDPath	MDPath	Formation
19.00	19.00	Mancos Sh.
102.00	102.00	Morapos Ss.
282.00	282.00	B/Morapos
2875.59	3277.77	Buck Peak
3289.02	3817.47	Niobrara (TCB)



LEAM DRILLING SYSTEMS LLC  
2010 East Davis, Conroe, Texas 77301  
Phone: 936/756-7577, Fax: 936/756-7595

Plan: Plan #3 Draft 3 (#9-12 1D/OH)  
Stover Federal

Created By: Nora Tucker Date: 16:15, February 01 2016  
Approved: \_\_\_\_\_ Date: \_\_\_\_\_

# LEAM Drilling Systems LLC

## Planning Report

<b>Database:</b>	EDM 5000.1 Multi_User Db	<b>Local Co-ordinate Reference:</b>	Well #9-12 1D
<b>Company:</b>	GRMR Oil & Gas, LLC	<b>TVD Reference:</b>	GE 6908.5' + KB 19' @ 6927.50usft (Prelim. Planning)
<b>Project:</b>	Moffat County, CO	<b>MD Reference:</b>	GE 6908.5' + KB 19' @ 6927.50usft (Prelim. Planning)
<b>Site:</b>	Stover Federal	<b>North Reference:</b>	True
<b>Well:</b>	#9-12 1D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #3 Draft 3		

Project	Moffat County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		Stover Federal			
Site Position:		Northing:	1,368,514.78 usft	Latitude:	40° 19' 38.648 N
From:	Lat/Long	Easting:	2,437,431.38 usft	Longitude:	107° 31' 4.560 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.30 °

Well	#9-12 1D					
Well Position	+N/-S	0.00 usft	Northing:	1,368,514.78 usft	Latitude:	40° 19' 38.648 N
	+E/-W	0.00 usft	Easting:	2,437,431.38 usft	Longitude:	107° 31' 4.560 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,908.50 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2015	1/28/2016	9.62	66.40	52,146

Design	Plan #3 Draft 3			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	171.11

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
897.57	0.00	0.00	897.57	0.00	0.00	0.00	0.00	0.00	0.00	
1,897.57	40.00	171.11	1,818.29	-331.09	51.79	4.00	4.00	0.00	171.11	
4,900.93	40.00	171.11	4,119.00	-2,238.42	350.15	0.00	0.00	0.00	0.00	PBHL(SF #9-12 1D)

# LEAM Drilling Systems LLC

## Planning Report

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<b>Company:</b>	GRMR Oil & Gas, LLC	<b>TVD Reference:</b>	GE 6908.5' + KB 19' @ 6927.50usft (Prelim. Planning)
<b>Project:</b>	Moffat County, CO	<b>MD Reference:</b>	GE 6908.5' + KB 19' @ 6927.50usft (Prelim. Planning)
<b>Site:</b>	Stover Federal	<b>North Reference:</b>	True
<b>Well:</b>	#9-12 1D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #3 Draft 3		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>T/PRODUCING ZONE (SF #9-12 1D) - SHL(SF #9-12 1D)</b>									
19.00	0.00	0.00	19.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Mancos Sh.</b>									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
102.00	0.00	0.00	102.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Morapos Ss.</b>									
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
282.00	0.00	0.00	282.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>B/Morapos</b>									
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
<b>13 3/8"</b>									
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
897.57	0.00	0.00	897.57	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.10	171.11	900.00	0.00	0.00	0.00	4.00	4.00	0.00
1,000.00	4.10	171.11	999.91	-3.62	0.57	3.66	4.00	4.00	0.00
1,100.00	8.10	171.11	1,099.33	-14.11	2.21	14.28	4.00	4.00	0.00
1,200.00	12.10	171.11	1,197.76	-31.43	4.92	31.81	4.00	4.00	0.00
1,300.00	16.10	171.11	1,294.73	-55.49	8.68	56.16	4.00	4.00	0.00
1,400.00	20.10	171.11	1,389.76	-86.17	13.48	87.22	4.00	4.00	0.00
1,500.00	24.10	171.11	1,482.40	-123.33	19.29	124.83	4.00	4.00	0.00
1,600.00	28.10	171.11	1,572.18	-166.78	26.09	168.81	4.00	4.00	0.00
1,700.00	32.10	171.11	1,658.68	-216.32	33.84	218.95	4.00	4.00	0.00
1,800.00	36.10	171.11	1,741.47	-271.69	42.50	274.99	4.00	4.00	0.00
1,897.57	40.00	171.11	1,818.29	-331.09	51.79	335.12	4.00	4.00	0.00
1,900.00	40.00	171.11	1,820.16	-332.64	52.03	336.68	0.00	0.00	0.00
2,000.00	40.00	171.11	1,896.76	-396.14	61.97	400.96	0.00	0.00	0.00
2,100.00	40.00	171.11	1,973.37	-459.65	71.90	465.24	0.00	0.00	0.00
2,200.00	40.00	171.11	2,049.97	-523.15	81.84	529.52	0.00	0.00	0.00
2,300.00	40.00	171.11	2,126.57	-586.66	91.77	593.80	0.00	0.00	0.00
2,400.00	40.00	171.11	2,203.18	-650.17	101.70	658.07	0.00	0.00	0.00
2,500.00	40.00	171.11	2,279.78	-713.67	111.64	722.35	0.00	0.00	0.00
2,600.00	40.00	171.11	2,356.39	-777.18	121.57	786.63	0.00	0.00	0.00
2,700.00	40.00	171.11	2,432.99	-840.69	131.51	850.91	0.00	0.00	0.00
2,800.00	40.00	171.11	2,509.60	-904.19	141.44	915.19	0.00	0.00	0.00
2,900.00	40.00	171.11	2,586.20	-967.70	151.37	979.47	0.00	0.00	0.00
3,000.00	40.00	171.11	2,662.81	-1,031.21	161.31	1,043.75	0.00	0.00	0.00
3,100.00	40.00	171.11	2,739.41	-1,094.71	171.24	1,108.03	0.00	0.00	0.00
3,200.00	40.00	171.11	2,816.01	-1,158.22	181.18	1,172.30	0.00	0.00	0.00
3,277.77	40.00	171.11	2,875.59	-1,207.61	188.90	1,222.29	0.00	0.00	0.00
<b>Buck Peak</b>									
3,300.00	40.00	171.11	2,892.62	-1,221.73	191.11	1,236.58	0.00	0.00	0.00
3,400.00	40.00	171.11	2,969.22	-1,285.23	201.04	1,300.86	0.00	0.00	0.00
3,500.00	40.00	171.11	3,045.83	-1,348.74	210.98	1,365.14	0.00	0.00	0.00
3,600.00	40.00	171.11	3,122.43	-1,412.25	220.91	1,429.42	0.00	0.00	0.00
3,700.00	40.00	171.11	3,199.04	-1,475.75	230.85	1,493.70	0.00	0.00	0.00
3,800.00	40.00	171.11	3,275.64	-1,539.26	240.78	1,557.98	0.00	0.00	0.00

# LEAM Drilling Systems LLC

## Planning Report

<b>Database:</b>	EDM 5000.1 Multi_User Db	<b>Local Co-ordinate Reference:</b>	Well #9-12 1D
<b>Company:</b>	GRMR Oil & Gas, LLC	<b>TVD Reference:</b>	GE 6908.5' + KB 19' @ 6927.50usft (Prelim. Planning)
<b>Project:</b>	Moffat County, CO	<b>MD Reference:</b>	GE 6908.5' + KB 19' @ 6927.50usft (Prelim. Planning)
<b>Site:</b>	Stover Federal	<b>North Reference:</b>	True
<b>Well:</b>	#9-12 1D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #3 Draft 3		

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,817.47	40.00	171.11	3,289.02	-1,550.35	242.52	1,569.21	0.00	0.00	0.00
<b>Niobrara (TCB)</b>									
3,900.00	40.00	171.11	3,352.25	-1,602.77	250.71	1,622.26	0.00	0.00	0.00
3,916.65	40.00	171.11	3,365.00	-1,613.34	252.37	1,632.96	0.00	0.00	0.00
<b>9 5/8"</b>									
4,000.00	40.00	171.11	3,428.85	-1,666.27	260.65	1,686.53	0.00	0.00	0.00
4,100.00	40.00	171.11	3,505.45	-1,729.78	270.58	1,750.81	0.00	0.00	0.00
4,200.00	40.00	171.11	3,582.06	-1,793.28	280.52	1,815.09	0.00	0.00	0.00
4,300.00	40.00	171.11	3,658.66	-1,856.79	290.45	1,879.37	0.00	0.00	0.00
4,400.00	40.00	171.11	3,735.27	-1,920.30	300.38	1,943.65	0.00	0.00	0.00
4,500.00	40.00	171.11	3,811.87	-1,983.80	310.32	2,007.93	0.00	0.00	0.00
4,600.00	40.00	171.11	3,888.48	-2,047.31	320.25	2,072.21	0.00	0.00	0.00
4,700.00	40.00	171.11	3,965.08	-2,110.82	330.19	2,136.49	0.00	0.00	0.00
4,800.00	40.00	171.11	4,041.69	-2,174.32	340.12	2,200.76	0.00	0.00	0.00
4,900.93	40.00	171.11	4,119.00	-2,238.42	350.15	2,265.64	0.00	0.00	0.00
<b>5 1/2" - PBHL(SF #9-12 1D)</b>									

### Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
T/PRODUCING ZONE ( : - plan misses target center by 1302.42usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.00	0.00	-1,290.98	172.24	1,367,220.21	2,437,574.20	40° 19' 25.890 N	107° 31' 2.336 W
SHL(SF #9-12 1D) - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	1,368,514.78	2,437,431.38	40° 19' 38.648 N	107° 31' 4.560 W
PBHL(SF #9-12 1D) - plan hits target center - Point	0.00	0.00	4,119.00	-2,238.42	350.15	1,366,268.97	2,437,730.51	40° 19' 16.527 N	107° 31' 0.039 W

### Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
500.00	500.00	13 3/8"	13-3/8	17-1/2
3,916.65	3,365.00	9 5/8"	9-5/8	12-1/4
4,900.93	4,119.00	5 1/2"	5-1/2	6

# LEAM Drilling Systems LLC

## Planning Report

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<b>Project:</b>	Moffat County, CO	<b>MD Reference:</b>	GE 6908.5' + KB 19' @ 6927.50usft (Prelim. Planning)
<b>Site:</b>	Stover Federal	<b>North Reference:</b>	True
<b>Well:</b>	#9-12 1D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #3 Draft 3		

Formations						
	Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
	19.00	19.00	Mancos Sh.		11.00	171.11
	102.00	102.00	Morapos Ss.		11.00	171.11
	282.00	282.00	B/Morapos		11.00	171.11
	3,277.77	2,875.59	Buck Peak		11.00	171.11
	3,817.47	3,289.02	Niobrara (TCB)		11.00	171.11

# **GRMR Oil & Gas, LLC**

**Moffat County, CO**

**Stover Federal**

**#9-12 1D**

**OH**

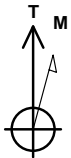
**Plan #3 Draft 3**

## **Anticollision Report**

**01 February, 2016**

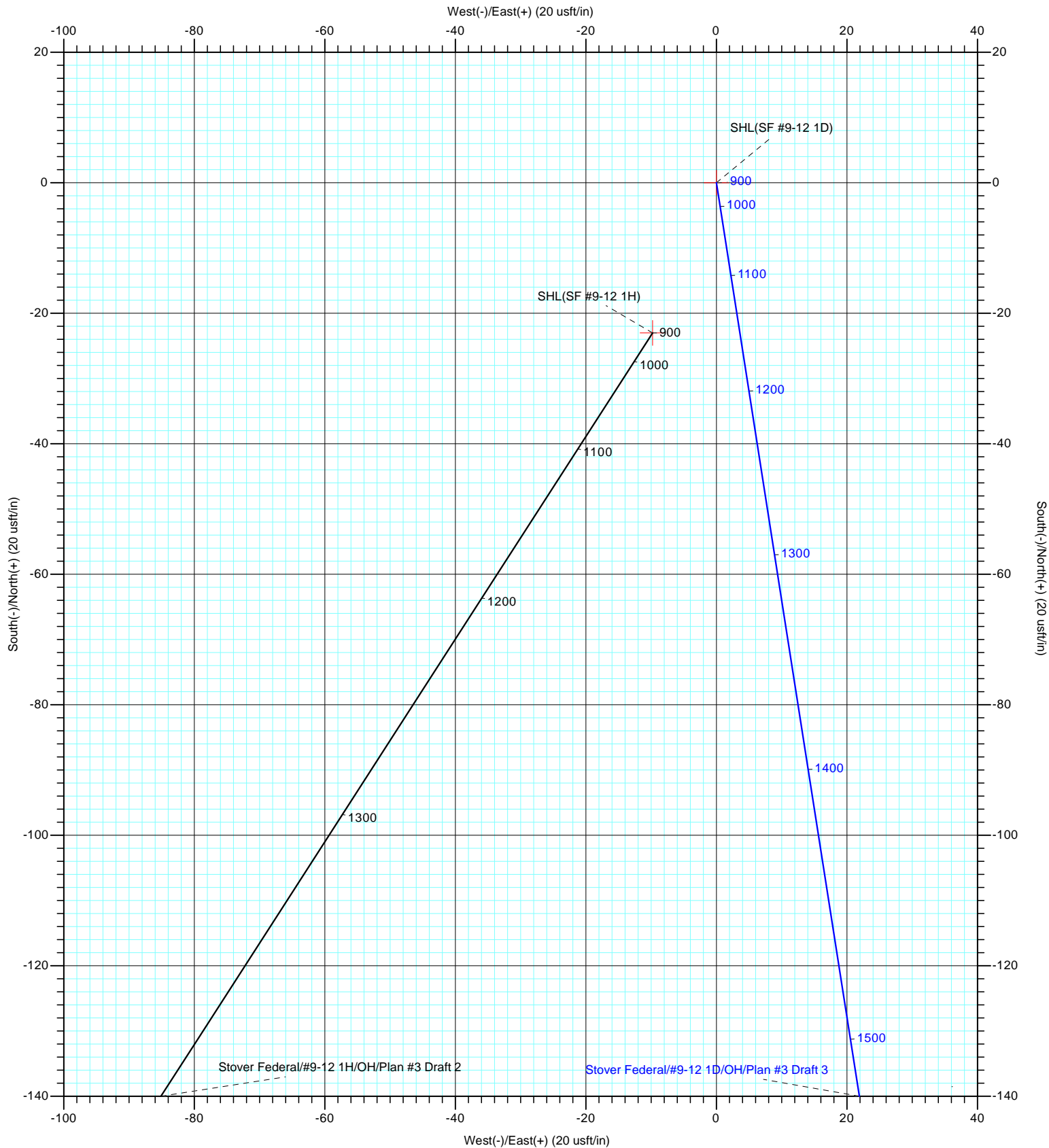
# GRMR Oil & Gas, LLC

Project: Moffat County, CO  
Site: Stover Federal  
Well: #9-12 1D  
Wellbore: OH  
Design: Plan #3 Draft 3



Azimuths to True North  
Magnetic North: 9.62°

Magnetic Field  
Strength: 52146.1snT  
Dip Angle: 66.40°  
Date: 1/28/2016  
Model: BGGM2015



LEAM DRILLING SYSTEMS LLC  
2010 East Davis, Conroe, Texas 77301  
Phone: 936/756-7577, Fax: 936/756-7595

Plan: Plan #3 Draft 3 (#9-12 1D/OH)  
Stover Federal  
Created By: Nora Tucker  
Date: 15:55, February 01 2016  
Approved: \_\_\_\_\_ Date: \_\_\_\_\_

# LEAM Drilling Systems LLC

## Anticollision Report

<b>Company:</b>	GRMR Oil & Gas, LLC	<b>Local Co-ordinate Reference:</b>	Well #9-12 1D
<b>Project:</b>	Moffat County, CO	<b>TVD Reference:</b>	GE 6908.5' + KB 19' @ 6927.50usft (Prelim. Planning)
<b>Reference Site:</b>	Stover Federal	<b>MD Reference:</b>	GE 6908.5' + KB 19' @ 6927.50usft (Prelim. Planning)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	#9-12 1D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	EDM 5000.1 Multi_User Db
<b>Reference Design:</b>	Plan #3 Draft 3	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #3 Draft 3		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD + Stations Interval 100.00usft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 9,999.98 usft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	Date 2/1/2016			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.00	4,900.00	Plan #3 Draft 3 (OH)	LEAM MWD	MWD - Standard

<b>Summary</b>						
<b>Site Name</b>	<b>Reference Measured Depth (usft)</b>	<b>Offset Measured Depth (usft)</b>	<b>Distance Between Centres (usft)</b>	<b>Distance Between Ellipses (usft)</b>	<b>Separation Factor</b>	<b>Warning</b>
<b>Offset Well - Wellbore - Design</b>						
Stover Federal						
#9-12 1H - OH - Plan #3 Draft 2	903.49	903.40	24.99	21.20	6.592	CC, ES
#9-12 1H - OH - Plan #3 Draft 2	1,000.00	997.33	27.05	22.88	6.492	SF

<b>Offset Design</b>	Stover Federal - #9-12 1H - OH - Plan #3 Draft 2											<b>Offset Site Error:</b>	0.00 usft
<b>Survey Program:</b>	0-LEAM MWD											<b>Offset Well Error:</b>	0.00 usft
<b>Reference</b>	<b>Offset</b>	<b>Semi Major Axis</b>		<b>Distance</b>									
<b>Measured Depth (usft)</b>	<b>Vertical Depth (usft)</b>	<b>Measured Depth (usft)</b>	<b>Vertical Depth (usft)</b>	<b>Reference (usft)</b>	<b>Offset (usft)</b>	<b>Highside Toolface (°)</b>	<b>Offset Wellbore Centre +N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Between Centres (usft)</b>	<b>Between Ellipses (usft)</b>	<b>Minimum Separation (usft)</b>	<b>Separation Factor</b>	<b>Warning</b>
0.00	0.00	0.00	0.00	0.00	0.00	-157.00	-23.00	-9.76	24.99				
100.00	100.00	100.00	100.00	0.09	0.09	-157.00	-23.00	-9.76	24.99	24.81	0.18	137.270	
200.00	200.00	200.00	200.00	0.32	0.32	-157.00	-23.00	-9.76	24.99	24.36	0.63	39.569	
300.00	300.00	300.00	300.00	0.54	0.54	-157.00	-23.00	-9.76	24.99	23.91	1.08	23.116	
400.00	400.00	400.00	400.00	0.77	0.77	-157.00	-23.00	-9.76	24.99	23.46	1.53	16.327	
500.00	500.00	500.00	500.00	0.99	0.99	-157.00	-23.00	-9.76	24.99	23.01	1.98	12.621	
600.00	600.00	600.00	600.00	1.21	1.21	-157.00	-23.00	-9.76	24.99	22.56	2.43	10.286	
700.00	700.00	700.00	700.00	1.44	1.44	-157.00	-23.00	-9.76	24.99	22.11	2.88	8.680	
800.00	800.00	800.00	800.00	1.66	1.66	-157.00	-23.00	-9.76	24.99	21.66	3.33	7.508	
897.57	897.57	897.57	897.57	1.88	1.88	-157.00	-23.00	-9.76	24.99	21.22	3.77	6.634	
900.00	900.00	900.00	900.00	1.89	1.89	31.89	-23.00	-9.76	24.99	21.21	3.78	6.615	
903.49	903.49	903.40	903.40	1.89	1.90	31.91	-23.01	-9.77	24.99	21.20	3.79	6.592	CC, ES
1,000.00	999.91	997.33	997.17	2.06	2.08	37.63	-27.17	-12.45	27.05	22.88	4.17	6.492	SF
1,100.00	1,099.33	1,093.75	1,092.42	2.26	2.29	49.59	-39.47	-20.37	34.65	30.05	4.60	7.532	
1,200.00	1,197.76	1,188.39	1,184.02	2.49	2.55	60.12	-59.34	-33.16	49.17	44.07	5.10	9.647	
1,300.00	1,294.73	1,280.51	1,270.52	2.81	2.95	66.91	-85.91	-50.27	70.61	64.91	5.71	12.373	
1,400.00	1,389.76	1,369.56	1,350.87	3.24	3.50	70.82	-118.13	-71.02	98.36	91.86	6.49	15.150	
1,500.00	1,482.40	1,455.15	1,424.40	3.81	4.18	72.93	-154.90	-94.70	131.73	124.25	7.48	17.615	
1,600.00	1,572.18	1,537.07	1,490.85	4.51	4.98	73.93	-195.14	-120.61	170.12	161.44	8.68	19.600	
1,700.00	1,658.68	1,615.25	1,550.23	5.36	5.86	74.19	-237.88	-148.13	212.93	202.88	10.06	21.175	
1,800.00	1,741.47	1,689.78	1,602.77	6.33	6.81	73.94	-282.29	-176.73	259.64	248.04	11.60	22.375	
1,897.57	1,818.29	1,759.11	1,647.82	7.41	7.78	73.35	-326.59	-205.25	308.47	295.22	13.25	23.280	
1,900.00	1,820.16	1,760.80	1,648.87	7.44	7.80	73.39	-327.70	-205.97	309.72	296.43	13.29	23.305	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



# LEAM Drilling Systems LLC

## Anticollision Report

<b>Company:</b>	GRMR Oil & Gas, LLC	<b>Local Co-ordinate Reference:</b>	Well #9-12 1D
<b>Project:</b>	Moffat County, CO	<b>TVD Reference:</b>	GE 6908.5' + KB 19' @ 6927.50usft (Prelim. Planning)
<b>Reference Site:</b>	Stover Federal	<b>MD Reference:</b>	GE 6908.5' + KB 19' @ 6927.50usft (Prelim. Planning)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	#9-12 1D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	EDM 5000.1 Multi_User Db
<b>Reference Design:</b>	Plan #3 Draft 3	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-LEAM MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
2,000.00	1,896.76	1,828.27	1,688.83	8.61	8.82	74.37	-373.39	-235.39	363.56	348.56	15.00	24.238		
2,100.00	1,973.37	1,897.59	1,726.06	9.81	9.92	74.58	-422.55	-267.05	421.21	404.46	16.75	25.148		
2,200.00	2,049.97	1,978.65	1,768.57	11.02	11.24	74.65	-480.58	-304.41	479.78	460.94	18.84	25.466		
2,300.00	2,126.57	2,059.71	1,811.08	12.24	12.57	74.71	-538.60	-341.78	538.34	517.38	20.96	25.689		
2,400.00	2,203.18	2,140.76	1,853.59	13.47	13.91	74.75	-596.63	-379.14	596.90	573.81	23.09	25.849		
2,500.00	2,279.78	2,221.82	1,896.09	14.71	15.26	74.78	-654.66	-416.51	655.47	630.23	25.24	25.967		
2,600.00	2,356.39	2,302.88	1,938.60	15.94	16.62	74.81	-712.68	-453.87	714.03	686.63	27.40	26.056		
2,700.00	2,432.99	2,383.93	1,981.11	17.19	17.97	74.84	-770.71	-491.24	772.60	743.02	29.57	26.124		
2,800.00	2,509.60	2,464.99	2,023.62	18.43	19.33	74.86	-828.74	-528.60	831.16	799.41	31.75	26.177		
2,900.00	2,586.20	2,546.05	2,066.12	19.68	20.69	74.88	-886.76	-565.97	889.73	855.79	33.93	26.221		
3,000.00	2,662.81	2,627.10	2,108.63	20.93	22.06	74.90	-944.79	-603.34	948.29	912.17	36.12	26.256		
3,100.00	2,739.41	2,708.16	2,151.14	22.17	23.43	74.91	-1,002.82	-640.70	1,006.86	968.55	38.31	26.285		
3,200.00	2,816.01	2,789.22	2,193.65	23.43	24.79	74.92	-1,060.84	-678.07	1,065.42	1,024.92	40.50	26.309		
3,300.00	2,892.62	2,870.27	2,236.15	24.68	26.16	74.94	-1,118.87	-715.43	1,123.98	1,081.30	42.69	26.330		
3,400.00	2,969.22	2,951.33	2,278.66	25.93	27.53	74.95	-1,176.90	-752.80	1,182.55	1,137.67	44.88	26.348		
3,500.00	3,045.83	3,032.38	2,321.17	27.18	28.90	74.96	-1,234.92	-790.16	1,241.11	1,194.04	47.08	26.363		
3,600.00	3,122.43	3,113.44	2,363.68	28.44	30.27	74.96	-1,292.95	-827.53	1,299.68	1,250.41	49.27	26.377		
3,700.00	3,199.04	3,194.50	2,406.19	29.69	31.65	74.97	-1,350.97	-864.89	1,358.24	1,306.78	51.47	26.390		
3,800.00	3,275.64	3,275.55	2,448.69	30.95	33.02	74.98	-1,409.00	-902.26	1,416.81	1,363.14	53.66	26.401		
3,900.00	3,352.25	3,356.61	2,491.20	32.20	34.39	74.99	-1,467.03	-939.62	1,475.37	1,419.51	55.86	26.412		
4,000.00	3,428.85	3,437.67	2,533.71	33.46	35.76	74.99	-1,525.05	-976.99	1,533.94	1,475.88	58.06	26.422		
4,100.00	3,505.45	3,518.72	2,576.22	34.72	37.14	75.00	-1,583.08	-1,014.35	1,592.50	1,532.25	60.25	26.431		
4,200.00	3,582.06	3,599.78	2,618.72	35.97	38.51	75.00	-1,641.11	-1,051.72	1,651.07	1,588.62	62.45	26.439		
4,300.00	3,658.66	3,680.84	2,661.23	37.23	39.89	75.01	-1,699.13	-1,089.08	1,709.63	1,644.99	64.64	26.447		
4,400.00	3,735.27	3,761.89	2,703.74	38.49	41.26	75.01	-1,757.16	-1,126.45	1,768.20	1,701.36	66.84	26.455		
4,500.00	3,811.87	3,842.95	2,746.25	39.74	42.64	75.02	-1,815.19	-1,163.82	1,826.76	1,757.73	69.03	26.463		
4,600.00	3,888.48	3,924.01	2,788.75	41.00	44.01	75.02	-1,873.21	-1,201.18	1,885.33	1,814.10	71.22	26.470		
4,700.00	3,965.08	4,005.06	2,831.26	42.26	45.39	75.02	-1,931.24	-1,238.55	1,943.89	1,870.47	73.42	26.477		
4,800.00	4,041.69	4,086.12	2,873.77	43.52	46.76	75.03	-1,989.27	-1,275.91	2,002.46	1,926.85	75.61	26.484		
4,900.00	4,118.29	4,167.17	2,916.28	44.52	48.14	75.03	-2,047.29	-1,313.28	2,061.02	1,983.42	77.60	26.560		
4,900.93	4,119.00	4,167.93	2,916.67	44.53	48.15	75.03	-2,047.83	-1,313.62	2,061.56	1,983.95	77.62	26.561		

# LEAM Drilling Systems LLC

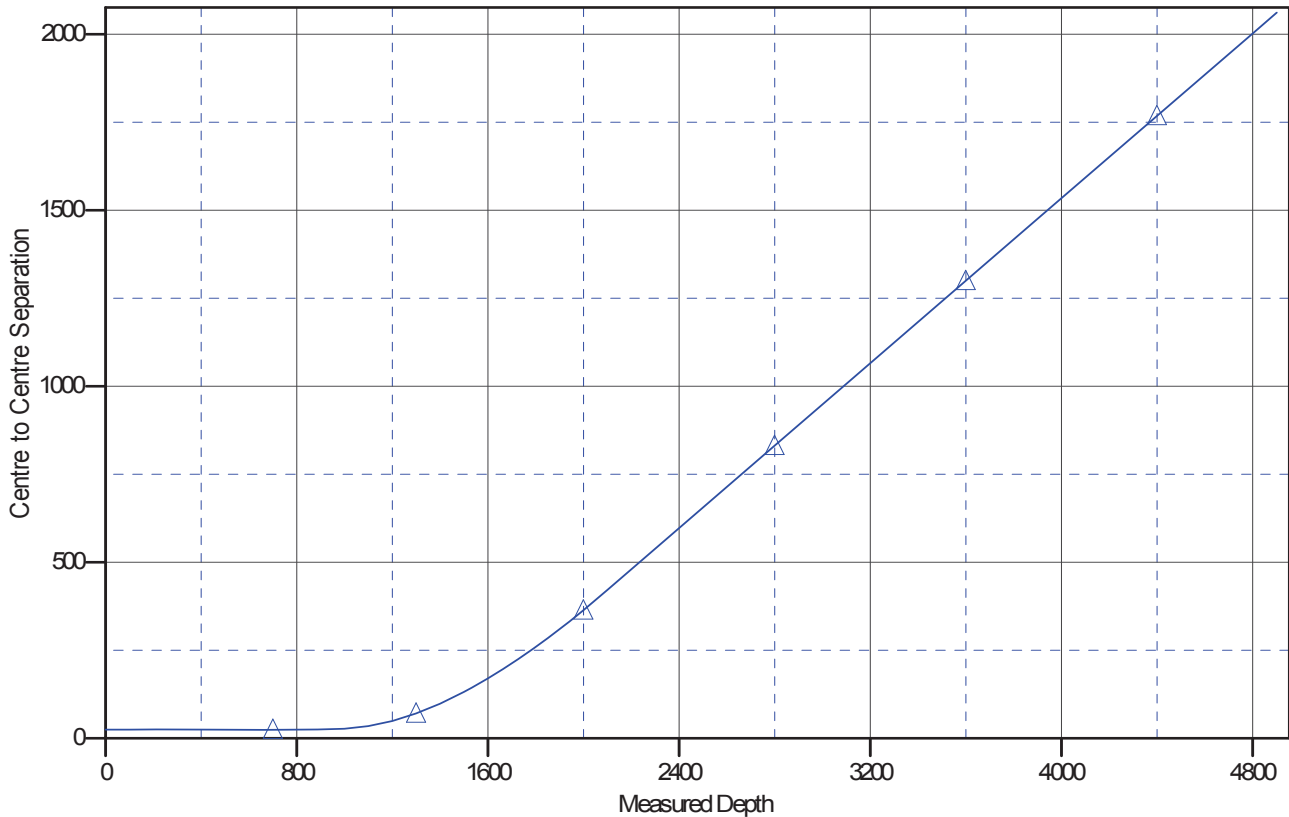
## Anticollision Report

<b>Company:</b>	GRMR Oil & Gas, LLC	<b>Local Co-ordinate Reference:</b>	Well #9-12 1D
<b>Project:</b>	Moffat County, CO	<b>TVD Reference:</b>	GE 6908.5' + KB 19' @ 6927.50usft (Prelim. Planning)
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<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	#9-12 1D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	EDM 5000.1 Multi_User Db
<b>Reference Design:</b>	Plan #3 Draft 3	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to GE 6908.5' + KB 19' @ 6927.50usft (P)  
Offset Depths are relative to Offset Datum  
Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: #9-12 1D  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: -1.30°

### Ladder Plot



### LEGEND

▲ #9-12 1H, OH, Plan #3 Draft2 V0

# LEAM Drilling Systems LLC

## Anticollision Report

<b>Company:</b>	GRMR Oil & Gas, LLC	<b>Local Co-ordinate Reference:</b>	Well #9-12 1D
<b>Project:</b>	Moffat County, CO	<b>TVD Reference:</b>	GE 6908.5' + KB 19' @ 6927.50usft (Prelim. Planning)
<b>Reference Site:</b>	Stover Federal	<b>MD Reference:</b>	GE 6908.5' + KB 19' @ 6927.50usft (Prelim. Planning)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	#9-12 1D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	EDM 5000.1 Multi_User Db
<b>Reference Design:</b>	Plan #3 Draft 3	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to GE 6908.5' + KB 19' @ 6927.50usft (P)  
Offset Depths are relative to Offset Datum  
Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: #9-12 1D  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: -1.30°

