



Project: Mesa County, CO
 Site: Bruton 19-06 Pad
 Well: Bruton Federal 19-07E
 Wellbore: Wellbore #1
 Design: Design #2
 Latitude: 39.262897
 Longitude: -107.815031
 Ground Level: 7262.0
 well @ 7286.0usft (H&P #290)



PROJECT DETAILS: Mesa County, CO

Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Colorado Central Zone
 System Datum: Mean Sea Level

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Bruton Federal 19-07E, True North
 Vertical (TVD) Reference: well @ 7286.0usft (H&P #290)
 Section (VS) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 7286.0usft (H&P #290)
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton Federal 19-07E

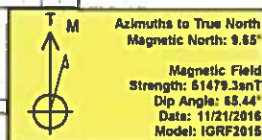
+N/-S	+E/-W	Northing	Ground Level: Easting	7262.0 Latitude	Longitude
0.0	0.0	1528995.36	2344604.66	39.262897	-107.815031

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton Federal 19-07E	7621.0	859.6	2307.3	1529795.88	2346933.16	39.265257	-107.806681

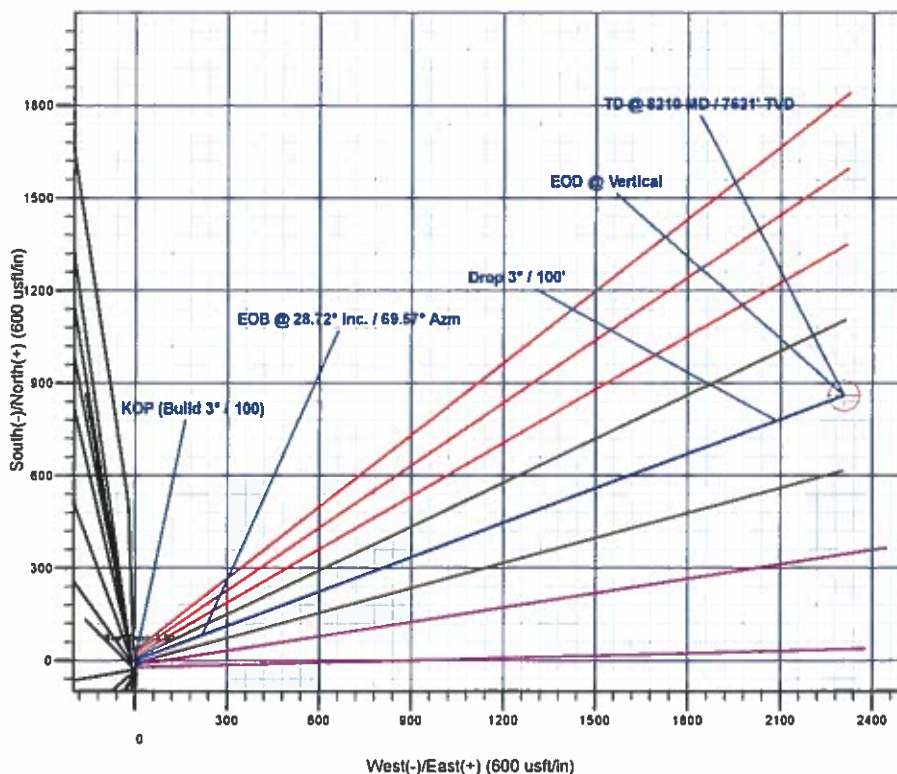
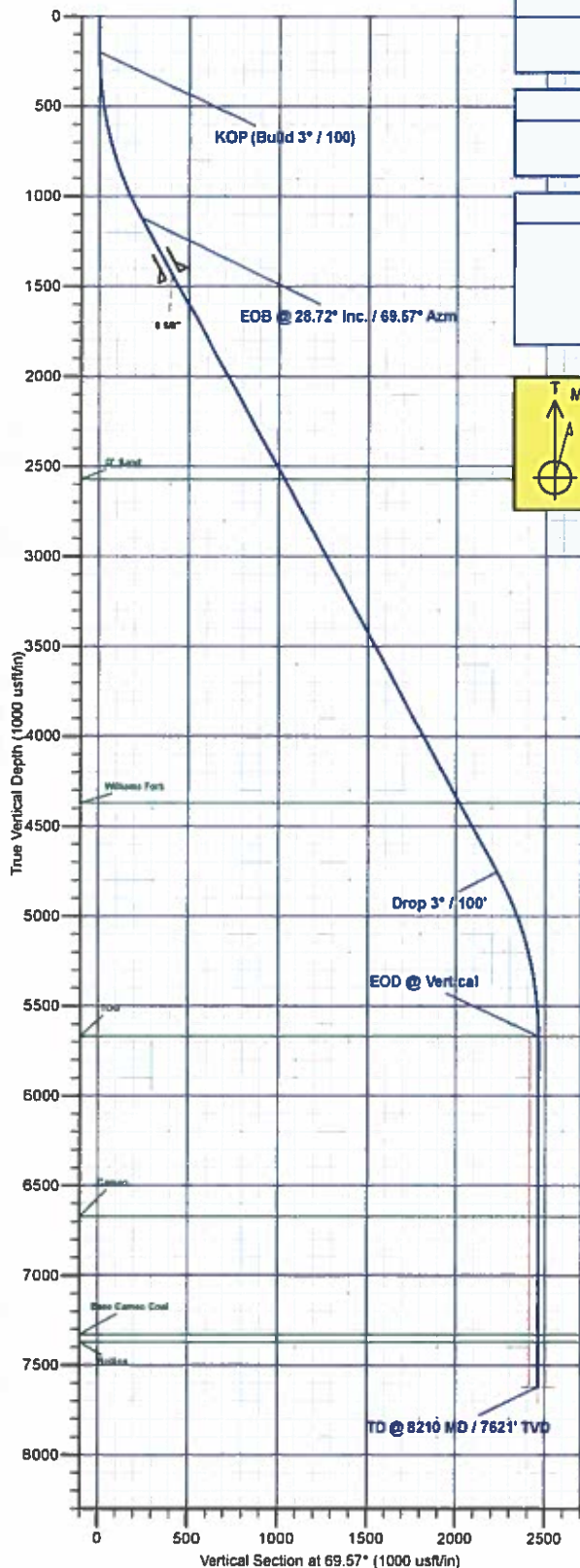
SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSeet	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3" / 100)
1157.6	28.72	69.57	1117.9	82.0	220.2	3.00	69.57	235.0	EOB @ 28.72" Inc. / 69.57" Azm
5302.9	28.72	69.57	4753.1	777.8	2087.1	0.00	0.00	2227.2	Drop 3" / 100'
6260.3	0.00	0.00	6671.0	859.6	2307.3	3.00	180.00	2462.3	EOD @ Vertical
8210.3	0.00	0.00	7621.0	859.6	2307.3	0.00	0.00	2462.3	TD @ 8210 MD / 7621' TVD



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2571.0	2814.8	G' Sand
4371.0	4867.1	Williams Fork
5671.0	6260.3	TOG
6671.0	7286.3	Cameo
7331.0	7920.3	Base Cameo Coal
7371.0	7960.3	Rollins



Plan: Design #2 (Bruton Federal 19-07E/Wellbore #1)

Created By: Will Jircik Date: 14:16, March 01 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 19-06 Pad

Bruton Federal 19-07E

Wellbore #1

Plan: Design #2

QES Well Planning Report

01 March, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 19-07E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7286 0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7286 0usft (H&P #290)
Site:	Bruton 19-06 Pad	North Reference:	True
Well:	Bruton Federal 19-07E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

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

Site	Bruton 19-06 Pad				
Site Position:		Northing:	1,528,940.55 usft	Latitude:	39.262756
From:	Lat/Long	Easting:	2,344,737.10 usft	Longitude:	-107.814558
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.46 *

Well	Bruton Federal 19-07E				
Well Position	+N/-S	51.4 usft	Northing:	1,528,995.36 usft	Latitude: 39.262897
	+E/-W	-133.8 usft	Easting:	2,344,604.66 usft	Longitude: -107.815031
Position Uncertainty	0.0 usft		Wellhead Elevation:	0.0 usft	Ground Level: 7,262.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/21/2016	9.65	65.44	51,479

Design	Design #2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	69.57

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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,157.5	28.72	69.57	1,117.9	82.0	220.2	3.00	3.00	0.00	69.57	
5,302.9	28.72	69.57	4,753.1	777.5	2,087.1	0.00	0.00	0.00	0.00	
6,260.3	0.00	0.00	5,671.0	859.6	2,307.3	3.00	-3.00	0.00	180.00	
8,210.3	0.00	0.00	7,621.0	859.6	2,307.3	0.00	0.00	0.00	0.00	PBHL - Bruton Federal



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 19-07E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7286.0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7286.0usft (H&P #290)
Site:	Bruton 19-06 Pad	North Reference:	True
Well:	Bruton Federal 19-07E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Buidl Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP (Build 3° / 100)									
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	3.00	69.57	300.0	0.9	2.5	2.6	3.00	3.00	0.00
400.0	6.00	69.57	399.6	3.7	9.8	10.5	3.00	3.00	0.00
500.0	9.00	69.57	498.8	8.2	22.0	23.5	3.00	3.00	0.00
600.0	12.00	69.57	597.1	14.6	39.1	41.7	3.00	3.00	0.00
700.0	15.00	69.57	694.3	22.7	61.0	65.1	3.00	3.00	0.00
800.0	18.00	69.57	790.2	32.6	87.6	93.5	3.00	3.00	0.00
900.0	21.00	69.57	884.4	44.3	118.9	126.9	3.00	3.00	0.00
1,000.0	24.00	69.57	976.8	57.6	154.7	165.1	3.00	3.00	0.00
1,100.0	27.00	69.57	1,067.1	72.7	195.1	208.2	3.00	3.00	0.00
EOB @ 28.72° Inc. / 69.57° Azm									
1,157.5	28.72	69.57	1,117.9	82.1	220.2	235.0	3.00	3.00	0.00
1,200.0	28.72	69.57	1,155.2	89.2	239.4	255.5	0.00	0.00	0.00
1,300.0	28.72	69.57	1,242.9	106.0	284.4	303.5	0.00	0.00	0.00
1,400.0	28.72	69.57	1,330.5	122.7	329.5	351.6	0.00	0.00	0.00
1,500.0	28.72	69.57	1,418.2	139.5	374.5	399.6	0.00	0.00	0.00
8 5/8"									
1,524.0	28.72	69.57	1,439.3	143.5	385.3	411.2	0.00	0.00	0.00
1,600.0	28.72	69.57	1,505.9	156.3	419.5	447.7	0.00	0.00	0.00
1,700.0	28.72	69.57	1,593.6	173.1	464.6	495.8	0.00	0.00	0.00
1,800.0	28.72	69.57	1,681.3	189.8	509.6	543.8	0.00	0.00	0.00
1,900.0	28.72	69.57	1,769.0	206.6	554.6	591.9	0.00	0.00	0.00
2,000.0	28.72	69.57	1,856.7	223.4	599.7	639.9	0.00	0.00	0.00
2,100.0	28.72	69.57	1,944.4	240.2	644.7	688.0	0.00	0.00	0.00
2,200.0	28.72	69.57	2,032.1	257.0	689.7	736.0	0.00	0.00	0.00
2,300.0	28.72	69.57	2,119.8	273.7	734.8	784.1	0.00	0.00	0.00
2,400.0	28.72	69.57	2,207.5	290.5	779.8	832.2	0.00	0.00	0.00
2,500.0	28.72	69.57	2,295.2	307.3	824.8	880.2	0.00	0.00	0.00
2,600.0	28.72	69.57	2,382.9	324.1	869.9	928.3	0.00	0.00	0.00
2,700.0	28.72	69.57	2,470.6	340.8	914.9	976.3	0.00	0.00	0.00
2,800.0	28.72	69.57	2,558.3	357.6	960.0	1,024.4	0.00	0.00	0.00
G' Sand									
2,814.5	28.72	69.57	2,571.0	360.1	966.5	1,031.4	0.00	0.00	0.00
2,900.0	28.72	69.57	2,646.0	374.4	1,005.0	1,072.5	0.00	0.00	0.00
3,000.0	28.72	69.57	2,733.7	391.2	1,050.0	1,120.5	0.00	0.00	0.00
3,100.0	28.72	69.57	2,821.4	408.0	1,095.1	1,168.6	0.00	0.00	0.00
3,200.0	28.72	69.57	2,909.1	424.7	1,140.1	1,216.8	0.00	0.00	0.00
3,300.0	28.72	69.57	2,996.7	441.5	1,185.1	1,264.7	0.00	0.00	0.00
3,400.0	28.72	69.57	3,084.4	458.3	1,230.2	1,312.8	0.00	0.00	0.00
3,500.0	28.72	69.57	3,172.1	475.1	1,275.2	1,360.8	0.00	0.00	0.00
3,600.0	28.72	69.57	3,259.8	491.8	1,320.2	1,408.9	0.00	0.00	0.00
3,700.0	28.72	69.57	3,347.5	508.6	1,365.3	1,456.9	0.00	0.00	0.00
3,800.0	28.72	69.57	3,435.2	525.4	1,410.3	1,505.0	0.00	0.00	0.00
3,900.0	28.72	69.57	3,522.9	542.2	1,455.3	1,553.1	0.00	0.00	0.00
4,000.0	28.72	69.57	3,610.6	559.0	1,500.4	1,601.1	0.00	0.00	0.00
4,100.0	28.72	69.57	3,698.3	575.7	1,545.4	1,649.2	0.00	0.00	0.00
4,200.0	28.72	69.57	3,786.0	592.5	1,590.4	1,697.2	0.00	0.00	0.00
4,300.0	28.72	69.57	3,873.7	609.3	1,635.5	1,745.3	0.00	0.00	0.00
4,400.0	28.72	69.57	3,961.4	626.1	1,680.5	1,793.3	0.00	0.00	0.00
4,500.0	28.72	69.57	4,049.1	642.8	1,725.5	1,841.4	0.00	0.00	0.00
4,600.0	28.72	69.57	4,136.8	659.6	1,770.6	1,889.5	0.00	0.00	0.00



Well Planning Report



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Company:	Laramie Energy, LLC	TVD Reference:	well @ 7286 0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7286 0usft (H&P #290)
Site:	Bruton 19-06 Pad	North Reference:	True
Well:	Bruton Federal 19-07E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

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)	
4,700.0	28.72	69.57	4,224.5	676.4	1,815.6	1,937.5	0.00	0.00	0.00	
4,800.0	28.72	69.57	4,312.2	693.2	1,860.7	1,985.6	0.00	0.00	0.00	
Williams Fork										
4,867.1	28.72	69.57	4,371.0	704.4	1,890.9	2,017.8	0.00	0.00	0.00	
4,900.0	28.72	69.57	4,399.9	710.0	1,905.7	2,033.6	0.00	0.00	0.00	
5,000.0	28.72	69.57	4,487.6	726.7	1,950.7	2,081.7	0.00	0.00	0.00	
5,100.0	28.72	69.57	4,575.2	743.5	1,995.8	2,129.8	0.00	0.00	0.00	
5,200.0	28.72	69.57	4,662.9	760.3	2,040.8	2,177.8	0.00	0.00	0.00	
5,300.0	28.72	69.57	4,750.6	777.1	2,085.8	2,225.9	0.00	0.00	0.00	
Drop 3° / 100'										
5,302.9	28.72	69.57	4,753.2	777.5	2,087.1	2,227.3	0.00	0.00	0.00	
5,400.0	25.81	69.57	4,839.5	793.1	2,128.8	2,271.7	3.00	-3.00	0.00	
5,500.0	22.81	69.57	4,930.6	807.4	2,167.4	2,312.9	3.00	-3.00	0.00	
5,600.0	19.81	69.57	5,023.8	820.1	2,201.4	2,349.2	3.00	-3.00	0.00	
5,700.0	16.81	69.57	5,118.7	831.1	2,230.9	2,380.7	3.00	-3.00	0.00	
5,800.0	13.81	69.57	5,215.1	840.3	2,255.6	2,407.1	3.00	-3.00	0.00	
5,900.0	10.81	69.57	5,312.8	847.8	2,275.6	2,428.4	3.00	-3.00	0.00	
6,000.0	7.81	69.57	5,411.5	853.4	2,290.7	2,444.5	3.00	-3.00	0.00	
6,100.0	4.81	69.57	5,510.9	857.2	2,301.0	2,455.5	3.00	-3.00	0.00	
6,200.0	1.81	69.57	5,610.7	859.3	2,306.5	2,461.3	3.00	-3.00	0.00	
EOD @ Vertical - TOG										
6,260.3	0.00	0.00	5,671.0	859.6	2,307.3	2,462.3	3.00	-3.00	0.00	
6,300.0	0.00	0.00	5,710.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
6,400.0	0.00	0.00	5,810.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
6,500.0	0.00	0.00	5,910.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
6,600.0	0.00	0.00	6,010.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
6,700.0	0.00	0.00	6,110.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
6,800.0	0.00	0.00	6,210.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
6,900.0	0.00	0.00	6,310.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
7,000.0	0.00	0.00	6,410.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
7,100.0	0.00	0.00	6,510.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
7,200.0	0.00	0.00	6,610.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
Cameo										
7,260.3	0.00	0.00	6,671.0	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
7,300.0	0.00	0.00	6,710.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
7,400.0	0.00	0.00	6,810.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
7,500.0	0.00	0.00	6,910.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
7,600.0	0.00	0.00	7,010.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
7,700.0	0.00	0.00	7,110.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
7,800.0	0.00	0.00	7,210.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
7,900.0	0.00	0.00	7,310.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
Base Cameo Coal										
7,920.3	0.00	0.00	7,331.0	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
Rollins										
7,960.3	0.00	0.00	7,371.0	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
8,000.0	0.00	0.00	7,410.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
8,100.0	0.00	0.00	7,510.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
8,200.0	0.00	0.00	7,610.7	859.6	2,307.3	2,462.3	0.00	0.00	0.00	
TD @ 8210 MD / 7621' TVD										
8,210.3	0.00	0.00	7,621.0	859.6	2,307.3	2,462.3	0.00	0.00	0.00	



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 19-07E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7286.0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7286.0usft (H&P #290)
Site:	Bruton 19-06 Pad	North Reference:	True
Well:	Bruton Federal 19-07E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
PBHL - Bruton Federal 1	0.00	0.00	7,621.0	859.6	2,307.3	1,529,795.88	2,346,933.16	39.265257	-107.806881
- plan hits target center									
- Circle (radius 50.0)									

Casing Points					
Measured Depth	Vertical Depth	Name		Casing Diameter	Hole Diameter
(usft)	(usft)			(")	(")
1,524.0	1,439.3	8 5/8"		8-5/8	11

Formations						
Measured Depth	Vertical Depth	Name		Lithology	Dip	Dip Direction
(usft)	(usft)				(°)	(°)
2,814.5	2,571.0	G' Sand				
4,867.1	4,371.0	Williams Fork				
6,260.3	5,671.0	TOG				
7,260.3	6,671.0	Cameo				
7,920.3	7,331.0	Base Cameo Coal				
7,960.3	7,371.0	Rollins				

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(usft)	(usft)	+N/-S	+E/-W		
(usft)	(usft)	(usft)	(usft)		
200.0	200.0	0.0	0.0	KOP (Build 3" / 100)	
1,157.5	1,117.9	82.1	220.2	EOB @ 28.72° Inc. / 69.57° Azm	
5,302.9	4,753.2	777.5	2,087.1	Drop 3" / 100'	
6,260.3	5,671.0	859.6	2,307.3	EOD @ Vertical	
8,210.3	7,621.0	859.6	2,307.3	TD @ 8210 MD / 7621' TVD	