



Project: Mesa County, CO
 Site: Nichols 24-07 Pad
 Well: Nichols 0994-24-19W
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.263225
 Longitude: -107.830883
 Ground Level: 7212.0
 well @ 7242.0usft (H&P #522)

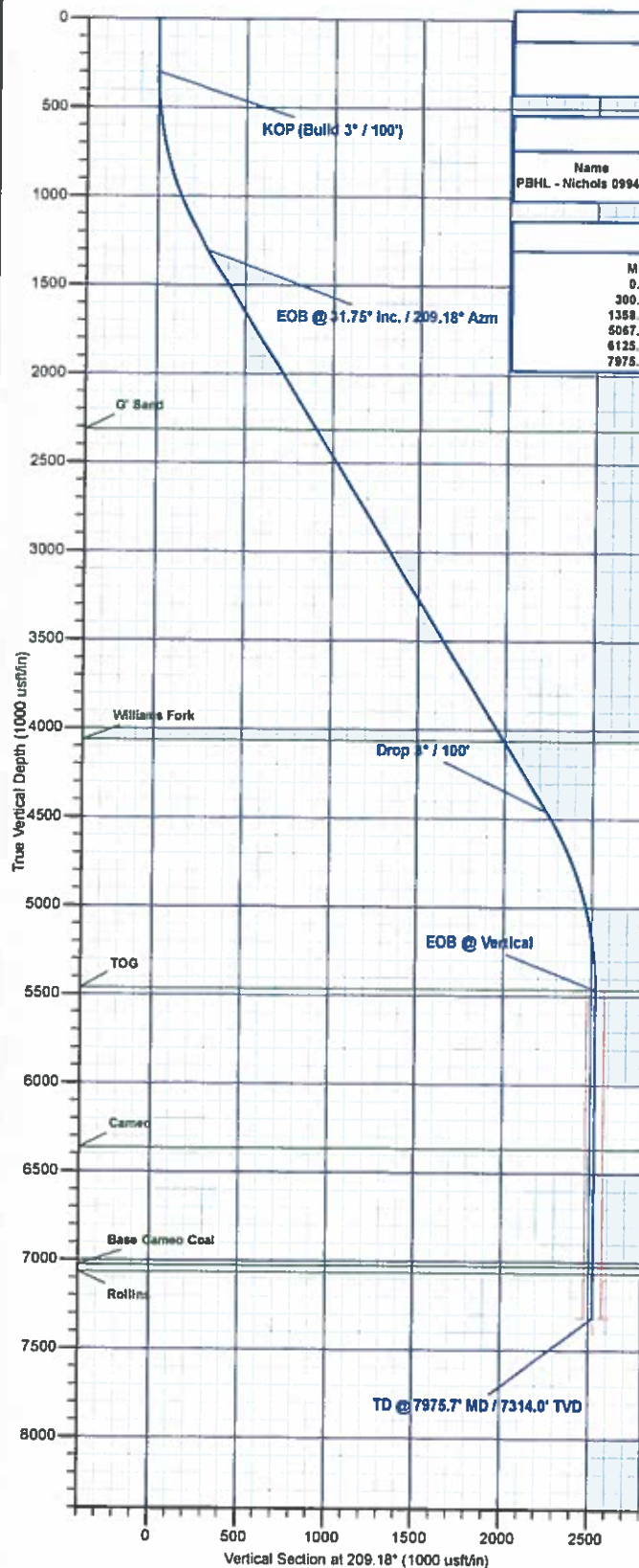


PROJECT DETAILS: Mesa County, CO

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 Nichols 0994-24-19W, True North
 Vertical (TVD) Reference: well @ 7242.0usft (H&P #522)
 Section (VS) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 7242.0usft (H&P #522)
 Calculation Method: Minimum Curvature



WELL DETAILS: Nichols 0994-24-19W

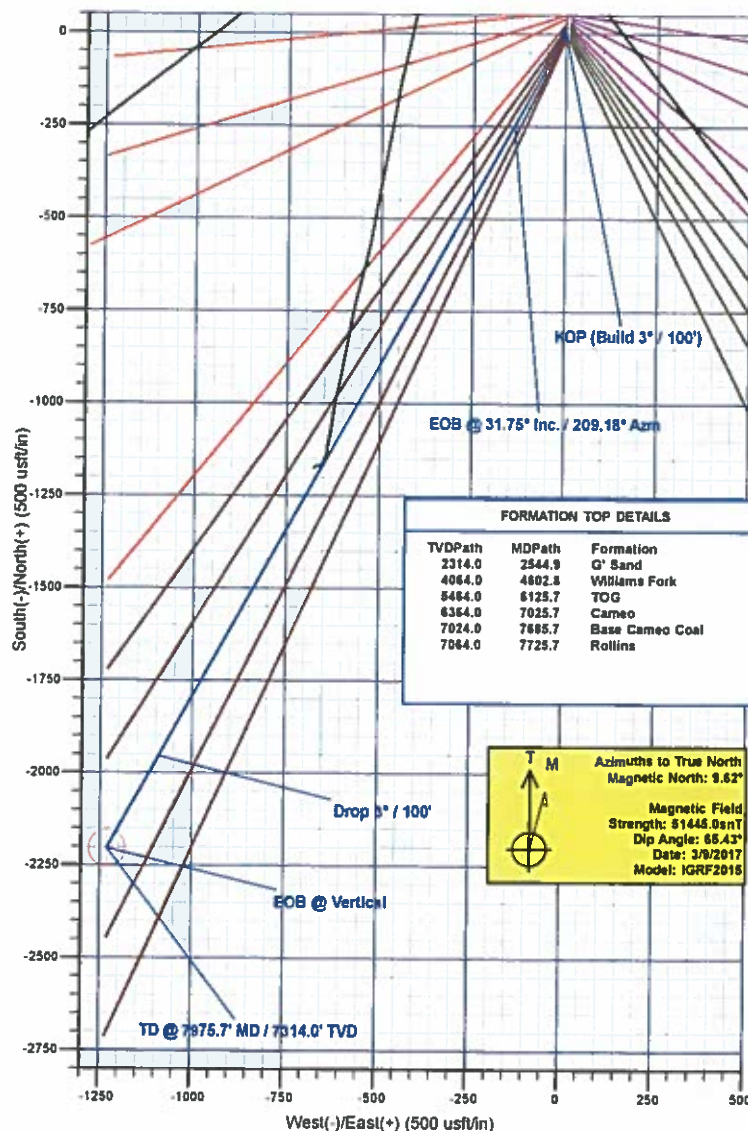
+N-S	+E-W	Northing	Ground Level: Easting	7212.0 Latitude	Longitude
0.0	0.0	1529229.46	2348126.80	39.263225	-107.830883

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

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Nichols 0994-24-19W	7314.0	-2203.1	-1230.0	1527059.63	2338834.65	39.257176	-107.835227

SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Diag	TFace	VSect	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3° / 100')
1358.3	31.75	209.18	1304.9	-248.5	-138.3	3.00	209.18	285.8	EOB @ 31.75° Inc. / 209.18° Azm
5067.4	31.75	209.18	4459.1	-1953.6	-1090.7	0.00	0.00	2237.5	Drop 3° / 100'
6125.7	0.00	0.00	5444.0	-2203.1	-1230.0	3.00	180.00	2523.2	EOB @ Vertical
7975.7	0.00	0.00	7314.0	-2203.1	-1230.0	0.00	0.00	2523.2	TD @ 7975.7' MD / 7314.0' TVD



Plan: Design #1 (Nichols 0994-24-19W/Wellbore #1)

Created By: Will Jircik Date: 17:29, March 10 2017



Laramie Energy, LLC

Mesa County, CO

Nichols 24-07 Pad

Nichols 0994-24-19W

Wellbore #1

Plan: Design #1

QES Well Planning Report

10 March, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Nichols 0994-24-19W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7242.0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7242.0usft (H&P #522)
Site:	Nichols 24-07 Pad	North Reference:	True
Well:	Nichols 0994-24-19W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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	Nichols 24-07 Pad			
Site Position:		Northing:	1,529,213.07 usft	Latitude: 39.263181
From:	Lat/Long	Easting:	2,340,128.94 usft	Longitude: -107.830853
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence: -1.47 "

Well	Nichols 0994-24-19W			
Well Position	+N/-S	16.2 usft	Northing:	1,529,229.46 usft
	+E/-W	-8.6 usft	Easting:	2,340,120.81 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level: 7,212.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/9/2017	9.63	65.43	51,445

Design	Design #1			
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	209.18

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	
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,358.3	31.75	209.18	1,304.9	-249.5	-139.3	3.00	3.00	0.00	209.18	
5,067.4	31.75	209.18	4,459.1	-1,953.6	-1,090.7	0.00	0.00	0.00	0.00	
6,125.7	0.00	0.00	5,464.0	-2,203.1	-1,230.0	3.00	-3.00	0.00	180.00	
7,975.7	0.00	0.00	7,314.0	-2,203.1	-1,230.0	0.00	0.00	0.00	0.00	PBHL - Nichols 0994-



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Nichols 0994-24-19W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7242 Ousft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7242 Ousft (H&P #522)
Site:	Nichols 24-07 Pad	North Reference:	True
Well:	Nichols 0994-24-19W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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)
0.0	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
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP (Build 3° / 100')									
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	3.00	209.18	400.0	-2.3	-1.3	2.6	3.00	3.00	0.00
500.0	6.00	209.18	499.6	-9.1	-5.1	10.5	3.00	3.00	0.00
600.0	9.00	209.18	598.8	-20.5	-11.5	23.5	3.00	3.00	0.00
700.0	12.00	209.18	697.1	-36.4	-20.3	41.7	3.00	3.00	0.00
800.0	15.00	209.18	794.3	-56.8	-31.7	65.1	3.00	3.00	0.00
900.0	18.00	209.18	890.2	-81.6	-45.6	93.5	3.00	3.00	0.00
1,000.0	21.00	209.18	984.4	-110.8	-61.8	126.9	3.00	3.00	0.00
1,100.0	24.00	209.18	1,076.8	-144.2	-80.5	165.1	3.00	3.00	0.00
1,200.0	27.00	209.18	1,167.1	-181.8	-101.5	208.2	3.00	3.00	0.00
1,300.0	30.00	209.18	1,254.9	-223.4	-124.7	255.9	3.00	3.00	0.00
EOB @ 31.75° Inc. / 209.18° Azm									
1,358.3	31.75	209.18	1,304.9	-249.5	-139.3	285.8	3.00	3.00	0.00
1,400.0	31.75	209.18	1,340.4	-268.7	-150.0	307.7	0.00	0.00	0.00
1,500.0	31.75	209.18	1,425.5	-314.6	-175.7	360.3	0.00	0.00	0.00
8 5/8"									
1,530.0	31.75	209.18	1,451.0	-328.4	-183.4	376.1	0.00	0.00	0.00
1,600.0	31.75	209.18	1,510.5	-360.6	-201.3	413.0	0.00	0.00	0.00
1,700.0	31.75	209.18	1,595.5	-406.5	-227.0	465.6	0.00	0.00	0.00
1,800.0	31.75	209.18	1,680.6	-452.5	-252.6	518.2	0.00	0.00	0.00
1,900.0	31.75	209.18	1,765.6	-498.4	-278.3	570.8	0.00	0.00	0.00
2,000.0	31.75	209.18	1,850.6	-544.3	-303.9	623.4	0.00	0.00	0.00
2,100.0	31.75	209.18	1,935.7	-590.3	-329.6	676.1	0.00	0.00	0.00
2,200.0	31.75	209.18	2,020.7	-636.2	-355.2	728.7	0.00	0.00	0.00
2,300.0	31.75	209.18	2,105.8	-682.2	-380.9	781.3	0.00	0.00	0.00
2,400.0	31.75	209.18	2,190.8	-728.1	-406.5	833.9	0.00	0.00	0.00
2,500.0	31.75	209.18	2,275.8	-774.1	-432.2	886.5	0.00	0.00	0.00
G' Sand									
2,544.9	31.75	209.18	2,314.0	-794.7	-443.7	910.2	0.00	0.00	0.00
2,600.0	31.75	209.18	2,360.9	-820.0	-457.8	939.2	0.00	0.00	0.00
2,700.0	31.75	209.18	2,445.9	-865.9	-483.5	991.8	0.00	0.00	0.00
2,800.0	31.75	209.18	2,530.9	-911.9	-509.1	1,044.4	0.00	0.00	0.00
2,900.0	31.75	209.18	2,616.0	-957.8	-534.8	1,097.0	0.00	0.00	0.00
3,000.0	31.75	209.18	2,701.0	-1,003.8	-560.4	1,149.6	0.00	0.00	0.00
3,100.0	31.75	209.18	2,786.1	-1,049.7	-586.1	1,202.2	0.00	0.00	0.00
3,200.0	31.75	209.18	2,871.1	-1,095.7	-611.7	1,254.9	0.00	0.00	0.00
3,300.0	31.75	209.18	2,956.1	-1,141.6	-637.4	1,307.5	0.00	0.00	0.00
3,400.0	31.75	209.18	3,041.2	-1,187.5	-663.0	1,360.1	0.00	0.00	0.00
3,500.0	31.75	209.18	3,126.2	-1,233.5	-688.7	1,412.7	0.00	0.00	0.00
3,600.0	31.75	209.18	3,211.2	-1,279.4	-714.3	1,465.3	0.00	0.00	0.00
3,700.0	31.75	209.18	3,296.3	-1,325.4	-740.0	1,518.0	0.00	0.00	0.00
3,800.0	31.75	209.18	3,381.3	-1,371.3	-765.6	1,570.6	0.00	0.00	0.00
3,900.0	31.75	209.18	3,466.3	-1,417.3	-791.3	1,623.2	0.00	0.00	0.00
4,000.0	31.75	209.18	3,551.4	-1,463.2	-816.9	1,675.8	0.00	0.00	0.00
4,100.0	31.75	209.18	3,636.4	-1,509.2	-842.6	1,728.4	0.00	0.00	0.00
4,200.0	31.75	209.18	3,721.5	-1,555.1	-868.2	1,781.1	0.00	0.00	0.00
4,300.0	31.75	209.18	3,806.5	-1,601.0	-893.9	1,833.7	0.00	0.00	0.00
4,400.0	31.75	209.18	3,891.5	-1,647.0	-919.5	1,886.3	0.00	0.00	0.00
4,500.0	31.75	209.18	3,976.6	-1,692.9	-945.2	1,938.9	0.00	0.00	0.00
4,600.0	31.75	209.18	4,061.6	-1,738.9	-970.8	1,991.5	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Nichols 0994-24-19W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7242.0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7242.0usft (H&P #522)
Site:	Nichols 24-07 Pad	North Reference:	True
Well:	Nichols 0994-24-19W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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)
Williams Fork									
4,602.8	31.75	209.18	4,064.0	-1,740.2	-971.6	1,993.0	0.00	0.00	0.00
4,700.0	31.75	209.18	4,146.6	-1,784.8	-996.5	2,044.1	0.00	0.00	0.00
4,800.0	31.75	209.18	4,231.7	-1,830.8	-1,022.1	2,096.8	0.00	0.00	0.00
4,900.0	31.75	209.18	4,316.7	-1,876.7	-1,047.8	2,149.4	0.00	0.00	0.00
5,000.0	31.75	209.18	4,401.8	-1,922.6	-1,073.4	2,202.0	0.00	0.00	0.00
Drop 3° / 100'									
5,067.4	31.75	209.18	4,459.1	-1,953.6	-1,090.7	2,237.5	0.00	0.00	0.00
5,100.0	30.77	209.18	4,486.9	-1,968.4	-1,099.0	2,254.4	3.00	-3.00	0.00
5,200.0	27.77	209.18	4,574.2	-2,011.1	-1,122.8	2,303.3	3.00	-3.00	0.00
5,300.0	24.77	209.18	4,663.8	-2,049.7	-1,144.4	2,347.5	3.00	-3.00	0.00
5,400.0	21.77	209.18	4,755.7	-2,084.2	-1,163.6	2,387.0	3.00	-3.00	0.00
5,500.0	18.77	209.18	4,849.5	-2,114.4	-1,180.5	2,421.7	3.00	-3.00	0.00
5,600.0	15.77	209.18	4,945.0	-2,140.4	-1,195.0	2,451.3	3.00	-3.00	0.00
5,700.0	12.77	209.18	5,041.9	-2,161.9	-1,207.0	2,476.0	3.00	-3.00	0.00
5,800.0	9.77	209.18	5,139.9	-2,178.9	-1,216.5	2,495.5	3.00	-3.00	0.00
5,900.0	6.77	209.18	5,238.9	-2,191.5	-1,223.5	2,509.9	3.00	-3.00	0.00
6,000.0	3.77	209.18	5,338.4	-2,199.5	-1,228.0	2,519.1	3.00	-3.00	0.00
6,100.0	0.77	209.18	5,438.3	-2,203.0	-1,230.0	2,523.1	3.00	-3.00	0.00
EOB @ Vertical - TOG									
6,125.7	0.00	0.00	5,464.0	-2,203.1	-1,230.0	2,523.2	3.00	-3.00	587.85
6,200.0	0.00	0.00	5,538.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
6,300.0	0.00	0.00	5,638.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
6,400.0	0.00	0.00	5,738.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
6,500.0	0.00	0.00	5,838.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
6,600.0	0.00	0.00	5,938.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
6,700.0	0.00	0.00	6,038.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
6,800.0	0.00	0.00	6,138.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
6,900.0	0.00	0.00	6,238.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
7,000.0	0.00	0.00	6,338.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
Cameo									
7,025.7	0.00	0.00	6,364.0	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
7,100.0	0.00	0.00	6,438.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
7,200.0	0.00	0.00	6,538.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
7,300.0	0.00	0.00	6,638.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
7,400.0	0.00	0.00	6,738.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
7,500.0	0.00	0.00	6,838.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
7,600.0	0.00	0.00	6,938.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
Base Cameo Coal									
7,685.7	0.00	0.00	7,024.0	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
7,700.0	0.00	0.00	7,038.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
Rollins									
7,725.7	0.00	0.00	7,064.0	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
7,800.0	0.00	0.00	7,138.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
7,900.0	0.00	0.00	7,238.3	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00
TD @ 7975.7' MD / 7314.0' TVD									
7,975.7	0.00	0.00	7,314.0	-2,203.1	-1,230.0	2,523.2	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Nichols 0994-24-19W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7242.0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7242.0usft (H&P #522)
Site:	Nichols 24-07 Pad	North Reference:	True
Well:	Nichols 0994-24-19W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Design Targets

Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape									
PBHL - Nichols 0994-24	0.00	0.00	7,314.0	-2,203.1	-1,230.0	1,527,058.63	2,338,834.65	39.257176	-107.835227
- plan hits target center									
- Point									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,530.0	1,451.0	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,544.9	2,314.0	G' Sand			
4,602.8	4,064.0	Williams Fork			
6,125.7	5,464.0	TOG			
7,025.7	6,364.0	Cameo			
7,685.7	7,024.0	Base Cameo Coal			
7,725.7	7,064.0	Rollins			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
300.0	300.0	0.0	0.0	KOP (Build 3° / 100')
1,358.3	1,304.9	-249.5	-139.3	EOB @ 31.75° Inc. / 209.18° Azm
5,067.4	4,459.1	-1,953.6	-1,090.7	Drop 3° / 100'
6,125.7	5,464.0	-2,203.1	-1,230.0	EOB @ Vertical
7,975.7	7,314.0	-2,203.1	-1,230.0	TD @ 7975.7' MD / 7314.0' TVD