



Project: Mesa County, CO
 Site: Sup & Shep 25-11 Pad
 Well: Sup & Shep 0993-25-07W
 Wellbore: B-7
 Design: Design #1
 Latitude: 39.244836
 Longitude: -107.723396
 Ground Level: 8077.0
 well @ 8107.0usft (30' RKB)



SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSecl	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	Build 3.00"/100'
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0	EOB @ 11.63° Inc / 347.23° Azm
887.7	11.63	347.23	885.0	38.2	-8.7	3.00	347.23	39.2	Drop @ 3.00"/100'
8630.8	11.63	347.23	6510.0	1167.3	-264.6	0.00	0.00	1196.8	EOB @ Vertical
7018.2	0.00	0.00	6895.0	1205.6	-273.3	3.00	180.00	1238.2	TD @ 8768.2 MD / 8645.0' TVD
8768.2	0.00	0.00	8645.0	1205.6	-273.3	0.00	0.00	1238.2	

DESIGN TARGET DETAILS

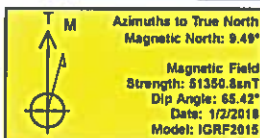
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - SUP & SHEP 0993-25-07W	8645.0	1205.6	-273.3	1522983.02	2370136.84	39.244836	-107.724381

WELL DETAILS: Sup & Shep 0993-25-07W

+N-S	+E-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1521771.12	2370360.53	39.244836	-107.723396

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

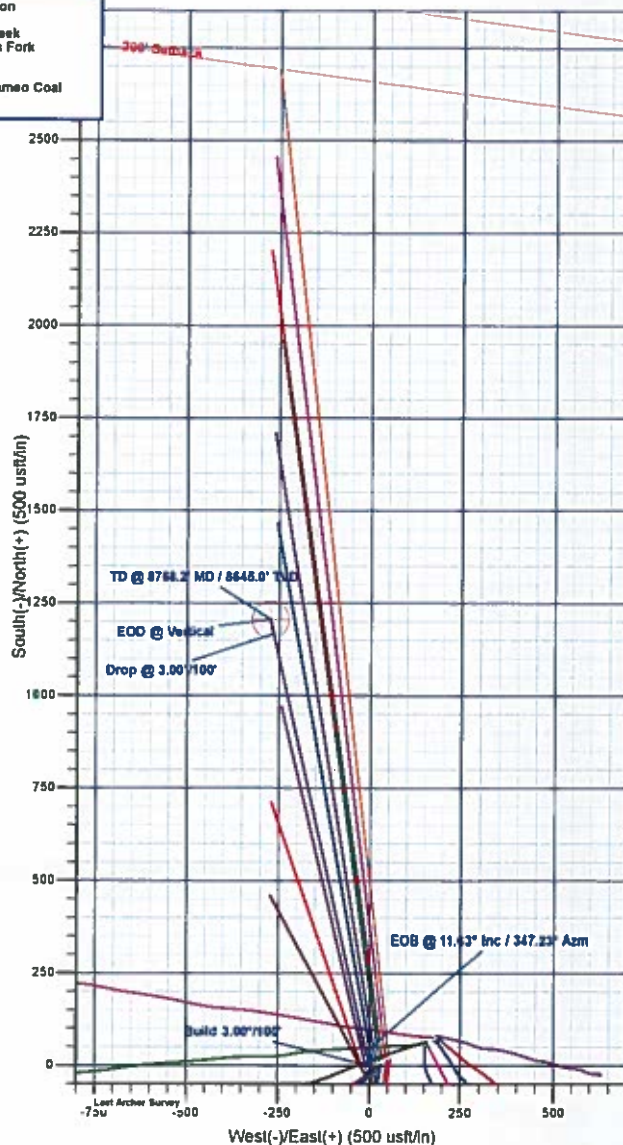
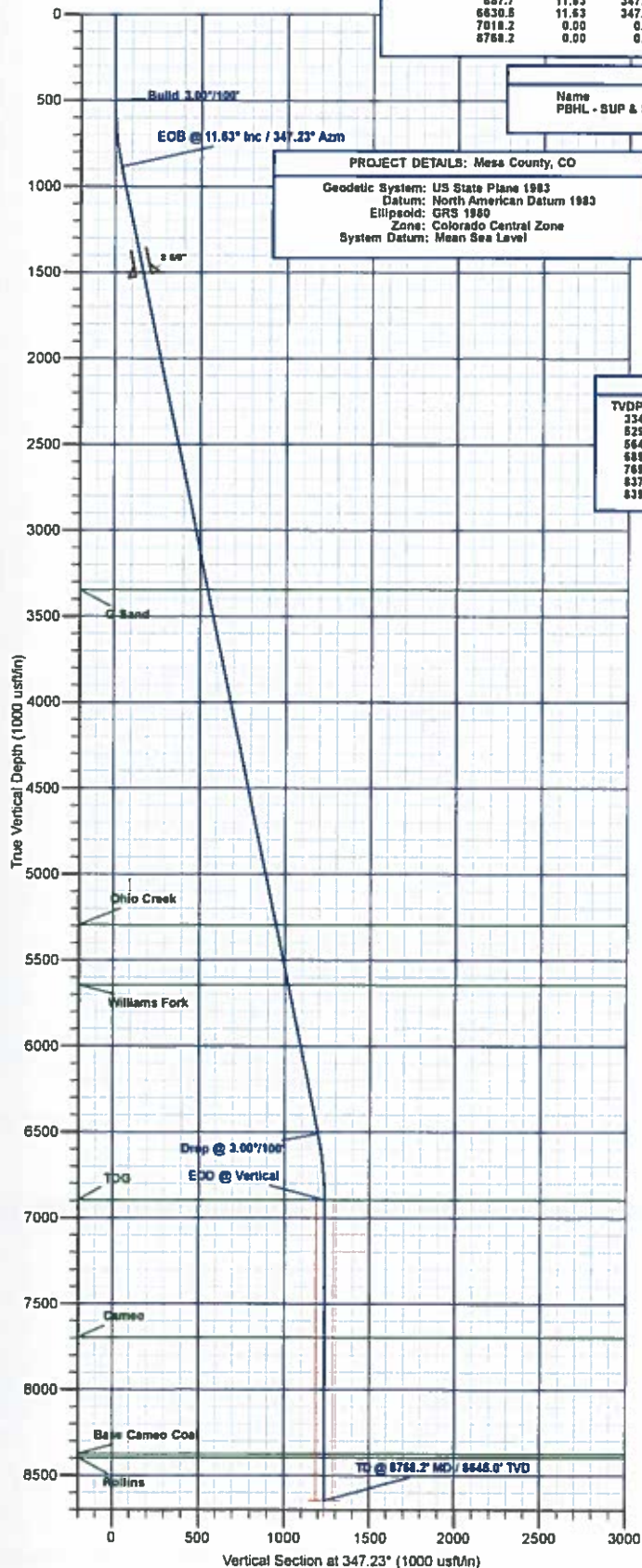


REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Sup & Shep 0993-25-07W, True North
 Vertical (TVD) Reference: well @ 8107.0usft (30' RKB)
 Section (VS) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 8107.0usft (30' RKB)
 Calculation Method: Minimum Curvature

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
3346.0	3399.2	G Sand
5295.0	5390.1	Ohio Creek
5645.0	5747.4	Williams Fork
5895.0	7018.2	TOG
7695.0	7818.2	Cameo
8375.0	8498.2	Base Cameo Coal
8395.0	8518.2	Rollins



Plan: Design #1 (Sup & Shep 0993-25-07W/B-7)

Created By: Will Jircik Date: 16:05, March 03 2018



Laramie Energy, LLC

Mesa County, CO

Sup & Shep 25-11 Pad

Sup & Shep 0993-25-07W

B-7

Plan: Design #1

QES Well Planning Report

03 March, 2018





Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Sup & Shep 0993-25-07W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 8107.0usft (30' RKB)
Project:	Mesa County, CO	MD Reference:	well @ 8107.0usft (30' RKB)
Site:	Sup & Shep 25-11 Pad	North Reference:	True
Well:	Sup & Shep 0993-25-07W	Survey Calculation Method:	Minimum Curvature
Wellbore:	B-7		
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	Sup & Shep 25-11 Pad			
Site Position:		Northing:	1,521,749.72 usft	Latitude: 39.244779
From:	Lat/Long	Easting:	2,370,406.93 usft	Longitude: -107.723301
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence: -1.40 "

Well	Sup & Shep 0993-25-07W			
Well Position	+N/-S	20.8 usft	Northing:	1,521,771.13 usft
	+E/-W	-26.9 usft	Easting:	2,370,380.54 usft
Position Uncertainty	0.0 usft		Wellhead Elevation:	
			Ground Level:	8,077.0 usft

Wellbore	B-7				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/2/2018	9.49	65.42	51,350.84809547

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	347.23

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	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.00	0.00	
887.7	11.63	347.23	885.0	38.2	-8.7	3.00	3.00	0.00	347.23	
6,630.5	11.63	347.23	6,510.0	1,167.3	-264.6	0.00	0.00	0.00	0.00	
7,018.2	0.00	0.00	6,895.0	1,205.6	-273.3	3.00	-3.00	0.00	180.00	
8,768.2	0.00	0.00	8,645.0	1,205.6	-273.3	0.00	0.00	0.00	0.00	PBHL - SUP & SHE



Well Planning Report



Database: EDM 5000.1 Single User Db
Company: Laramie Energy, LLC
Project: Mesa County, CO
Site: Sup & Shep 25-11 Pad
Well: Sup & Shep 0993-25-07W
Wellbore: B-7
Design: Design #1

Local Co-ordinate Reference: Well Sup & Shep 0993-25-07W
TVD Reference: well @ 8107.0usft (30' RKB)
MD Reference: well @ 8107.0usft (30' RKB)
North Reference: True
Survey Calculation Method: Minimum Curvature

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
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
Build 3.00°/100'									
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	3.00	347.23	600.0	2.6	-0.6	2.6	3.00	3.00	0.00
700.0	6.00	347.23	699.6	10.2	-2.3	10.5	3.00	3.00	0.00
800.0	9.00	347.23	798.8	22.9	-5.2	23.5	3.00	3.00	0.00
EOB @ 11.63° Inc / 347.23° Azm									
887.7	11.63	347.23	885.0	38.2	-8.7	39.2	3.00	3.00	0.00
900.0	11.63	347.23	897.1	40.7	-9.2	41.7	0.00	0.00	0.00
1,000.0	11.63	347.23	995.0	60.3	-13.7	61.9	0.00	0.00	0.00
1,100.0	11.63	347.23	1,093.0	80.0	-18.1	82.0	0.00	0.00	0.00
1,200.0	11.63	347.23	1,190.9	99.6	-22.6	102.2	0.00	0.00	0.00
1,300.0	11.63	347.23	1,288.9	119.3	-27.0	122.3	0.00	0.00	0.00
1,400.0	11.63	347.23	1,386.8	139.0	-31.5	142.5	0.00	0.00	0.00
1,500.0	11.63	347.23	1,484.8	158.6	-36.0	162.7	0.00	0.00	0.00
8 5/8"									
1,530.0	11.63	347.23	1,514.2	164.5	-37.3	168.7	0.00	0.00	0.00
1,600.0	11.63	347.23	1,582.7	178.3	-40.4	182.8	0.00	0.00	0.00
1,700.0	11.63	347.23	1,680.7	197.9	-44.9	203.0	0.00	0.00	0.00
1,800.0	11.63	347.23	1,778.6	217.6	-49.3	223.1	0.00	0.00	0.00
1,900.0	11.63	347.23	1,876.6	237.3	-53.8	243.3	0.00	0.00	0.00
2,000.0	11.63	347.23	1,974.5	256.9	-58.2	263.4	0.00	0.00	0.00
2,100.0	11.63	347.23	2,072.5	276.6	-62.7	283.6	0.00	0.00	0.00
2,200.0	11.63	347.23	2,170.4	296.3	-67.2	303.8	0.00	0.00	0.00
2,300.0	11.63	347.23	2,268.3	315.9	-71.6	323.9	0.00	0.00	0.00
2,400.0	11.63	347.23	2,366.3	335.6	-76.1	344.1	0.00	0.00	0.00
2,500.0	11.63	347.23	2,464.2	355.2	-80.5	364.2	0.00	0.00	0.00
2,600.0	11.63	347.23	2,562.2	374.9	-85.0	384.4	0.00	0.00	0.00
2,700.0	11.63	347.23	2,660.1	394.6	-89.4	404.6	0.00	0.00	0.00
2,800.0	11.63	347.23	2,758.1	414.2	-93.9	424.7	0.00	0.00	0.00
2,900.0	11.63	347.23	2,856.0	433.9	-98.4	444.9	0.00	0.00	0.00
3,000.0	11.63	347.23	2,954.0	453.5	-102.8	465.0	0.00	0.00	0.00
3,100.0	11.63	347.23	3,051.9	473.2	-107.3	485.2	0.00	0.00	0.00
3,200.0	11.63	347.23	3,149.9	492.9	-111.7	505.4	0.00	0.00	0.00
3,300.0	11.63	347.23	3,247.8	512.5	-116.2	525.5	0.00	0.00	0.00
G Sand									
3,399.2	11.63	347.23	3,345.0	532.0	-120.6	545.5	0.00	0.00	0.00
3,400.0	11.63	347.23	3,345.8	532.2	-120.6	545.7	0.00	0.00	0.00
3,500.0	11.63	347.23	3,443.7	551.8	-125.1	565.8	0.00	0.00	0.00
3,600.0	11.63	347.23	3,541.7	571.5	-129.6	586.0	0.00	0.00	0.00
3,700.0	11.63	347.23	3,639.6	591.2	-134.0	606.2	0.00	0.00	0.00
3,800.0	11.63	347.23	3,737.6	610.8	-138.5	626.3	0.00	0.00	0.00
3,900.0	11.63	347.23	3,835.5	630.5	-142.9	646.5	0.00	0.00	0.00
4,000.0	11.63	347.23	3,933.4	650.1	-147.4	666.6	0.00	0.00	0.00
4,100.0	11.63	347.23	4,031.4	669.8	-151.8	686.8	0.00	0.00	0.00
4,200.0	11.63	347.23	4,129.3	689.5	-156.3	707.0	0.00	0.00	0.00
4,300.0	11.63	347.23	4,227.3	709.1	-160.7	727.1	0.00	0.00	0.00
4,400.0	11.63	347.23	4,325.2	728.8	-165.2	747.3	0.00	0.00	0.00
4,500.0	11.63	347.23	4,423.2	748.4	-169.7	767.4	0.00	0.00	0.00
4,600.0	11.63	347.23	4,521.1	768.1	-174.1	787.6	0.00	0.00	0.00



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Sup & Shep 0993-25-07W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 8107.0usft (30' RKB)
Project:	Mesa County, CO	MD Reference:	well @ 8107.0usft (30' RKB)
Site:	Sup & Shep 25-11 Pad	North Reference:	True
Well:	Sup & Shep 0993-25-07W	Survey Calculation Method:	Minimum Curvature
Wellbore:	B-7		
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)
4,700.0	11.63	347.23	4,619.1	787.8	-178.6	807.8	0.00	0.00	0.00
4,800.0	11.63	347.23	4,717.0	807.4	-183.0	827.9	0.00	0.00	0.00
4,900.0	11.63	347.23	4,815.0	827.1	-187.5	848.1	0.00	0.00	0.00
5,000.0	11.63	347.23	4,912.9	846.8	-191.9	868.2	0.00	0.00	0.00
5,100.0	11.63	347.23	5,010.9	866.4	-196.4	888.4	0.00	0.00	0.00
5,200.0	11.63	347.23	5,108.8	886.1	-200.9	908.6	0.00	0.00	0.00
5,300.0	11.63	347.23	5,206.8	905.7	-205.3	928.7	0.00	0.00	0.00
Ohio Creek									
5,390.1	11.63	347.23	5,295.0	923.4	-209.3	946.9	0.00	0.00	0.00
5,400.0	11.63	347.23	5,304.7	925.4	-209.8	948.9	0.00	0.00	0.00
5,500.0	11.63	347.23	5,402.6	945.1	-214.2	969.0	0.00	0.00	0.00
5,600.0	11.63	347.23	5,500.6	964.7	-218.7	989.2	0.00	0.00	0.00
5,700.0	11.63	347.23	5,598.5	984.4	-223.1	1,009.3	0.00	0.00	0.00
Williams Fork									
5,747.4	11.63	347.23	5,645.0	993.7	-225.3	1,018.9	0.00	0.00	0.00
5,800.0	11.63	347.23	5,696.5	1,004.0	-227.6	1,029.5	0.00	0.00	0.00
5,900.0	11.63	347.23	5,794.4	1,023.7	-232.1	1,049.7	0.00	0.00	0.00
6,000.0	11.63	347.23	5,892.4	1,043.4	-236.5	1,069.8	0.00	0.00	0.00
6,100.0	11.63	347.23	5,990.3	1,063.0	-241.0	1,090.0	0.00	0.00	0.00
6,200.0	11.63	347.23	6,088.3	1,082.7	-245.4	1,110.1	0.00	0.00	0.00
6,300.0	11.63	347.23	6,186.2	1,102.3	-249.9	1,130.3	0.00	0.00	0.00
6,400.0	11.63	347.23	6,284.2	1,122.0	-254.3	1,150.5	0.00	0.00	0.00
6,500.0	11.63	347.23	6,382.1	1,141.7	-258.8	1,170.6	0.00	0.00	0.00
6,600.0	11.63	347.23	6,480.1	1,161.3	-263.3	1,190.8	0.00	0.00	0.00
Drop @ 3.00°/100'									
6,630.5	11.63	347.23	6,510.0	1,167.3	-264.6	1,196.9	0.00	0.00	0.00
6,700.0	9.55	347.23	6,578.3	1,179.8	-267.4	1,209.7	3.00	-3.00	0.00
6,800.0	6.55	347.23	6,677.3	1,193.4	-270.5	1,223.7	3.00	-3.00	0.00
6,900.0	3.55	347.23	6,776.9	1,202.0	-272.5	1,232.5	3.00	-3.00	0.00
7,000.0	0.55	347.23	6,876.8	1,205.5	-273.3	1,236.1	3.00	-3.00	0.00
EOD @ Vertical - TOG									
7,018.2	0.00	0.00	6,895.0	1,205.6	-273.3	1,236.2	3.00	-3.00	0.00
7,100.0	0.00	0.00	6,976.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
7,200.0	0.00	0.00	7,076.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
7,300.0	0.00	0.00	7,176.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
7,400.0	0.00	0.00	7,276.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
7,500.0	0.00	0.00	7,376.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
7,600.0	0.00	0.00	7,476.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
7,700.0	0.00	0.00	7,576.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
7,800.0	0.00	0.00	7,676.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
Cameo									
7,818.2	0.00	0.00	7,695.0	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
7,900.0	0.00	0.00	7,776.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
8,000.0	0.00	0.00	7,876.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
8,100.0	0.00	0.00	7,976.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
8,200.0	0.00	0.00	8,076.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
8,300.0	0.00	0.00	8,176.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
8,400.0	0.00	0.00	8,276.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
Base Cameo Coal									
8,498.2	0.00	0.00	8,375.0	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
8,500.0	0.00	0.00	8,376.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
Rollins									
8,518.2	0.00	0.00	8,395.0	1,205.6	-273.3	1,236.2	0.00	0.00	0.00



Well Planning Report



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Site:	Sup & Shep 25-11 Pad	North Reference:	True
Well:	Sup & Shep 0993-25-07W	Survey Calculation Method:	Minimum Curvature
Wellbore:	B-7		
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)
8,600.0	0.00	0.00	8,476.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
8,700.0	0.00	0.00	8,576.8	1,205.6	-273.3	1,236.2	0.00	0.00	0.00
TD @ 8768.2' MD / 8645.0' TVD									
8,768.2	0.00	0.00	8,645.0	1,205.6	-273.3	1,236.2	0.00	0.00	0.00

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 - SUP & SHEP	0.00	0.00	8,645.0	1,205.6	-273.3	1,522,983.02	2,370,136.84	39.248146	-107.724361
- plan hits target center									
- Circle (radius 50.0)									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,530.0	1,514.2	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,399.2	3,345.0	G Sand			
5,390.1	5,295.0	Ohio Creek			
5,747.4	5,645.0	Williams Fork			
7,018.2	6,895.0	TOG			
7,818.2	7,695.0	Cameo			
8,498.2	8,375.0	Base Cameo Coal			
8,518.2	8,395.0	Rollins			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
500.0	500.0	0.0	0.0	Build 3.00°/100'
887.7	885.0	38.2	-8.7	EOB @ 11.63° Inc / 347.23° Azm
6,630.5	6,510.0	1,167.3	-264.6	Drop @ 3.00°/100'
7,018.2	6,895.0	1,205.6	-273.3	EOD @ Vertical
8,768.2	8,645.0	1,205.6	-273.3	TD @ 8768.2' MD / 8645.0' TVD