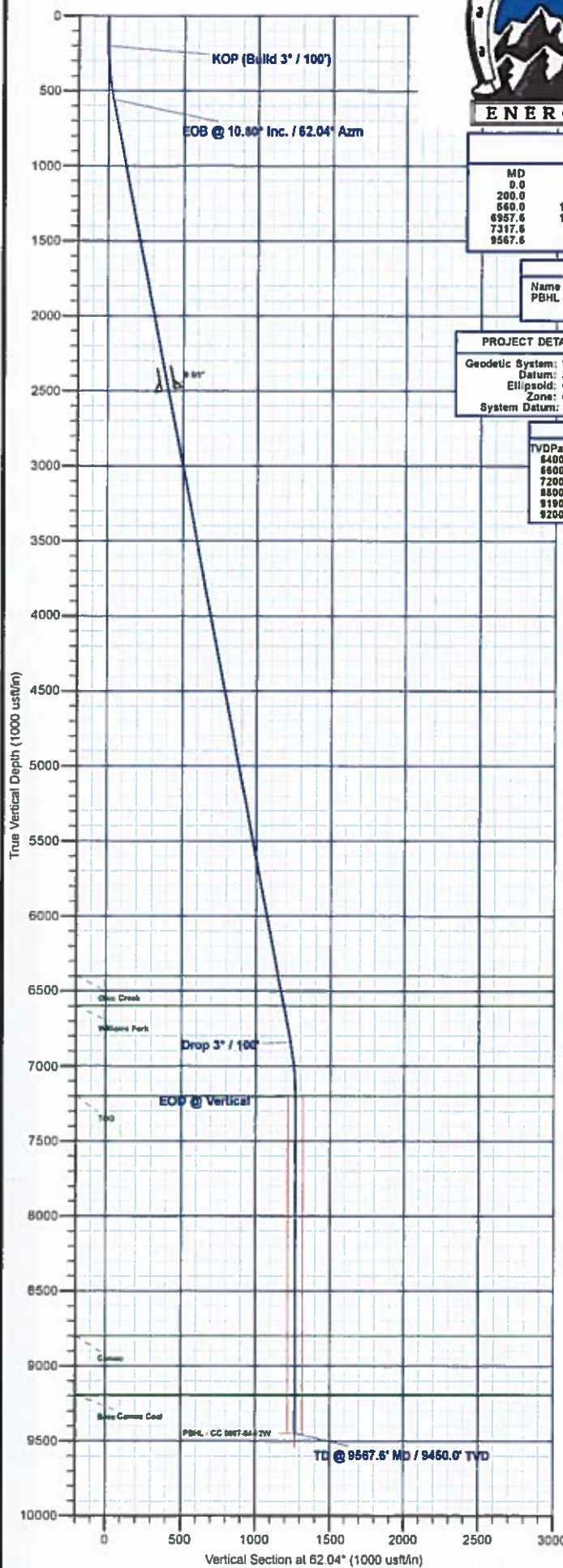




Project: Garfield County, CO
 Site: CC 604-12-13 Pad
 Well: CC 0697-04-12W
 Wellbore: B-2
 Design: Design #1
 Latitude: 39.553212
 Longitude: -108.233439
 Ground Level: 8529.0
 WELL @ 8559.0usft (H&P #522)



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	KOP (Build 3° / 100')
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	EOB @ 10.80° Inc. / 62.04° Azm
560.0	10.80	62.04	557.9	15.9	29.9	3.00	62.04	33.8	Drop 3° / 100'
6957.6	10.80	62.04	6942.1	577.9	1088.7	0.00	0.00	1232.6	EOB @ Vertical
7317.6	0.00	0.00	7206.0	593.8	1118.6	3.00	180.00	1266.4	TD @ 9567.6' MD / 9450.0' TVD
9567.6	0.00	0.00	9450.0	593.8	1118.6	0.00	0.00	1266.4	

DESIGN TARGET DETAILS							
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - CC 0697-04-12W	9450.0	593.8	1118.6	1637980.28	2230501.45	39.554842	-108.229472

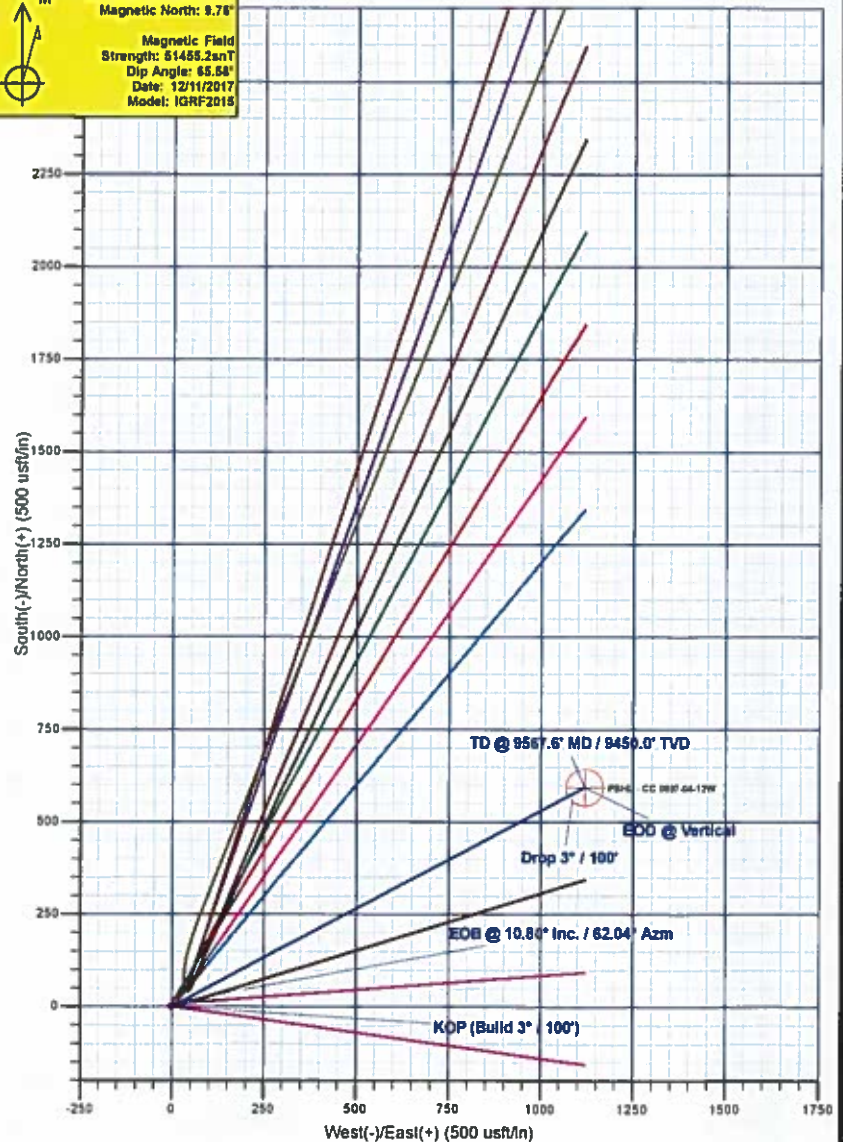
PROJECT DETAILS: Garfield County, CO
 Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Colorado Central Zone
 System Datum: Mean Sea Level

WELL DETAILS: CC 0697-04-12W					
+N-S	+E-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1637980.42	2229365.54	39.553212	-108.233439

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
6400.0	6307.6	Ohio Creek
6600.0	6711.1	Williams Park
7200.0	7317.6	TOG
8800.0	8917.6	Cameo
9190.0	9307.6	Base Cameo Coal
9200.0	9317.6	Rollins

REFERENCE INFORMATION
 Co-ordinate (N/E) Reference: Well CC 0697-04-12W, True North
 Vertical (TVD) Reference: WELL @ 8559.0usft (H&P #522)
 Section (VS) Reference: Shot - (0.0N, 0.0E)
 Measured Depth Reference: WELL @ 8559.0usft (H&P #522)
 Calculation Method: Minimum Curvature

Azimuths to True North
 Magnetic North: 9.78°
 Magnetic Field Strength: 51455.2nT
 Dip Angle: 65.58°
 Date: 12/11/2017
 Model: IGRF2015





Laramie Energy, LLC

Garfield County, CO

CC 604-12-13 Pad

CC 0697-04-12W

B-2

Plan: Design #1

QES Well Planning Report

14 December, 2017





Well Planning Report



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Well CC 0697-04-12W
Company:	Laramie Energy, LLC	TVD Reference:	WELL @ 8559.0usft (H&P #522)
Project:	Garfield County, CO	MD Reference:	WELL @ 8559.0usft (H&P #522)
Site:	CC 604-12-13 Pad	North Reference:	True
Well:	CC 0697-04-12W	Survey Calculation Method:	Minimum Curvature
Wellbore:	B-2		
Design:	Design #1		

Project	Garfield 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	CC 604-12-13 Pad			
Site Position:		Northing:	1 638,031.56 usft	Latitude: 39 553356
From:	Lat/Long	Easting:	2 229,410.52 usft	Longitude: -108.233285
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence: -1.72 "

Well	CC 0697-04-12W			
Well Position	+N/-S	-52.5 usft	Northing:	1 637,980.42 usft
	+E/-W	-43.4 usft	Easting:	2 229,365.54 usft
Position Uncertainty	0.0 usft		Wellhead Elevation:	
			Ground Level:	8,529.0 usft

Wellbore	B-2				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	12/11/2017	9.76	65.58	51,455.17005018

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	62.04

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	
560.0	10.80	62.04	557.9	15.9	29.9	3.00	3.00	0.00	62.04	
6,957.6	10.80	62.04	6,842.1	577.9	1,088.7	0.00	0.00	0.00	0.00	
7,317.6	0.00	0.00	7,200.0	593.8	1,118.6	3.00	-3.00	0.00	180.00	
9,567.6	0.00	0.00	9,450.0	593.8	1,118.6	0.00	0.00	0.00	0.00	PBHL - CC 0697-04-1



Well Planning Report



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Well CC 0697-04-12W
Company:	Laramie Energy, LLC	TVD Reference:	WELL @ 8559 0usft (H&P #522)
Project:	Garfield County, CO	MD Reference:	WELL @ 8559 0usft (H&P #522)
Site:	CC 604-12-13 Pad	North Reference:	True
Well:	CC 0697-04-12W	Survey Calculation Method:	Minimum Curvature
Wellbore:	B-2		
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
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	62.04	300.0	1.2	2.3	2.6	3.00	3.00	0.00
400.0	6.00	62.04	399.6	4.9	9.2	10.5	3.00	3.00	0.00
500.0	9.00	62.04	498.8	11.0	20.8	23.5	3.00	3.00	0.00
EOB @ 10.80° Inc. / 62.04° Azm									
560.0	10.80	62.04	557.9	15.9	29.9	33.8	3.00	3.00	0.00
600.0	10.80	62.04	597.2	19.4	36.5	41.3	0.00	0.00	0.00
700.0	10.80	62.04	695.4	28.2	53.0	60.1	0.00	0.00	0.00
800.0	10.80	62.04	793.6	36.9	69.6	78.8	0.00	0.00	0.00
900.0	10.80	62.04	891.9	45.7	86.1	97.5	0.00	0.00	0.00
1,000.0	10.80	62.04	990.1	54.5	102.7	116.3	0.00	0.00	0.00
1,100.0	10.80	62.04	1,088.3	63.3	119.2	135.0	0.00	0.00	0.00
1,200.0	10.80	62.04	1,186.5	72.1	135.8	153.7	0.00	0.00	0.00
1,300.0	10.80	62.04	1,284.8	80.9	152.3	172.5	0.00	0.00	0.00
1,400.0	10.80	62.04	1,383.0	89.7	168.9	191.2	0.00	0.00	0.00
1,500.0	10.80	62.04	1,481.2	98.4	185.4	210.0	0.00	0.00	0.00
1,600.0	10.80	62.04	1,579.5	107.2	202.0	228.7	0.00	0.00	0.00
1,700.0	10.80	62.04	1,677.7	116.0	218.5	247.4	0.00	0.00	0.00
1,800.0	10.80	62.04	1,775.9	124.8	235.1	266.2	0.00	0.00	0.00
1,900.0	10.80	62.04	1,874.1	133.6	251.6	284.9	0.00	0.00	0.00
2,000.0	10.80	62.04	1,972.4	142.4	268.2	303.6	0.00	0.00	0.00
2,100.0	10.80	62.04	2,070.6	151.2	284.7	322.4	0.00	0.00	0.00
2,200.0	10.80	62.04	2,168.8	159.9	301.3	341.1	0.00	0.00	0.00
2,300.0	10.80	62.04	2,267.1	168.7	317.8	359.9	0.00	0.00	0.00
2,400.0	10.80	62.04	2,365.3	177.5	334.4	378.6	0.00	0.00	0.00
2,500.0	10.80	62.04	2,463.5	186.3	350.9	397.3	0.00	0.00	0.00
9 5/8"									
2,530.0	10.80	62.04	2,493.0	188.9	355.9	403.0	0.00	0.00	0.00
2,600.0	10.80	62.04	2,561.7	195.1	367.5	416.1	0.00	0.00	0.00
2,700.0	10.80	62.04	2,660.0	203.9	384.0	434.8	0.00	0.00	0.00
2,800.0	10.80	62.04	2,758.2	212.7	400.6	453.5	0.00	0.00	0.00
2,900.0	10.80	62.04	2,856.4	221.4	417.1	472.3	0.00	0.00	0.00
3,000.0	10.80	62.04	2,954.7	230.2	433.7	491.0	0.00	0.00	0.00
3,100.0	10.80	62.04	3,052.9	239.0	450.2	509.8	0.00	0.00	0.00
3,200.0	10.80	62.04	3,151.1	247.8	466.8	528.5	0.00	0.00	0.00
3,300.0	10.80	62.04	3,249.3	256.6	483.3	547.2	0.00	0.00	0.00
3,400.0	10.80	62.04	3,347.6	265.4	499.9	566.0	0.00	0.00	0.00
3,500.0	10.80	62.04	3,445.8	274.1	516.4	584.7	0.00	0.00	0.00
3,600.0	10.80	62.04	3,544.0	282.9	533.0	603.4	0.00	0.00	0.00
3,700.0	10.80	62.04	3,642.3	291.7	549.5	622.2	0.00	0.00	0.00
3,800.0	10.80	62.04	3,740.5	300.5	566.1	640.9	0.00	0.00	0.00
3,900.0	10.80	62.04	3,838.7	309.3	582.6	659.6	0.00	0.00	0.00
4,000.0	10.80	62.04	3,936.9	318.1	599.2	678.4	0.00	0.00	0.00
4,100.0	10.80	62.04	4,035.2	326.9	615.7	697.1	0.00	0.00	0.00
4,200.0	10.80	62.04	4,133.4	335.6	632.3	715.9	0.00	0.00	0.00
4,300.0	10.80	62.04	4,231.6	344.4	648.8	734.6	0.00	0.00	0.00
4,400.0	10.80	62.04	4,329.9	353.2	665.4	753.3	0.00	0.00	0.00
4,500.0	10.80	62.04	4,428.1	362.0	681.9	772.1	0.00	0.00	0.00
4,600.0	10.80	62.04	4,526.3	370.8	698.5	790.8	0.00	0.00	0.00
4,700.0	10.80	62.04	4,624.5	379.6	715.0	809.5	0.00	0.00	0.00



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC 0697-04-12W
Company:	Laramie Energy, LLC	TVD Reference:	WELL @ 8559.0usft (H&P #522)
Project:	Garfield County, CO	MD Reference:	WELL @ 8559.0usft (H&P #522)
Site:	CC 604-12-13 Pad	North Reference:	True
Well:	CC 0697-04-12W	Survey Calculation Method:	Minimum Curvature
Wellbore:	B-2		
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)
4,800.0	10.80	62.04	4,722.8	388.4	731.6	828.3	0.00	0.00	0.00
4,900.0	10.80	62.04	4,821.0	397.1	748.1	847.0	0.00	0.00	0.00
5,000.0	10.80	62.04	4,919.2	405.9	764.7	865.8	0.00	0.00	0.00
5,100.0	10.80	62.04	5,017.5	414.7	781.2	884.5	0.00	0.00	0.00
5,200.0	10.80	62.04	5,115.7	423.5	797.8	903.2	0.00	0.00	0.00
5,300.0	10.80	62.04	5,213.9	432.3	814.3	922.0	0.00	0.00	0.00
5,400.0	10.80	62.04	5,312.2	441.1	830.9	940.7	0.00	0.00	0.00
5,500.0	10.80	62.04	5,410.4	449.9	847.4	959.4	0.00	0.00	0.00
5,600.0	10.80	62.04	5,508.6	458.6	864.0	978.2	0.00	0.00	0.00
5,700.0	10.80	62.04	5,606.8	467.4	880.5	996.9	0.00	0.00	0.00
5,800.0	10.80	62.04	5,705.1	476.2	897.1	1,015.7	0.00	0.00	0.00
5,900.0	10.80	62.04	5,803.3	485.0	913.6	1,034.4	0.00	0.00	0.00
6,000.0	10.80	62.04	5,901.5	493.8	930.2	1,053.1	0.00	0.00	0.00
6,100.0	10.80	62.04	5,999.8	502.6	946.7	1,071.9	0.00	0.00	0.00
6,200.0	10.80	62.04	6,098.0	511.3	963.3	1,090.6	0.00	0.00	0.00
6,300.0	10.80	62.04	6,196.2	520.1	979.8	1,109.3	0.00	0.00	0.00
6,400.0	10.80	62.04	6,294.4	528.9	996.4	1,128.1	0.00	0.00	0.00
6,500.0	10.80	62.04	6,392.7	537.7	1,012.9	1,146.8	0.00	0.00	0.00
Ohio Creek									
6,507.5	10.80	62.04	6,400.0	538.4	1,014.2	1,148.2	0.00	0.00	0.00
6,600.0	10.80	62.04	6,490.9	546.5	1,029.5	1,165.6	0.00	0.00	0.00
6,700.0	10.80	62.04	6,589.1	555.3	1,046.0	1,184.3	0.00	0.00	0.00
Williams Fork									
6,711.1	10.80	62.04	6,600.0	556.2	1,047.9	1,186.4	0.00	0.00	0.00
6,800.0	10.80	62.04	6,687.4	564.1	1,062.6	1,203.0	0.00	0.00	0.00
6,900.0	10.80	62.04	6,785.6	572.8	1,079.1	1,221.8	0.00	0.00	0.00
Drop 3° / 100'									
6,957.6	10.80	62.04	6,842.1	577.9	1,088.7	1,232.6	0.00	0.00	0.00
7,000.0	9.53	62.04	6,883.9	581.4	1,095.3	1,240.0	3.00	-3.00	0.00
7,100.0	6.53	62.04	6,982.9	588.0	1,107.6	1,254.0	3.00	-3.00	0.00
7,200.0	3.53	62.04	7,082.5	592.1	1,115.4	1,262.8	3.00	-3.00	0.00
7,300.0	0.53	62.04	7,182.4	593.7	1,118.5	1,266.3	3.00	-3.00	0.00
EOD @ Vertical - TOG									
7,317.6	0.00	0.00	7,200.0	593.8	1,118.6	1,266.4	3.00	-3.00	0.00
7,400.0	0.00	0.00	7,282.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
7,500.0	0.00	0.00	7,382.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
7,600.0	0.00	0.00	7,482.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
7,700.0	0.00	0.00	7,582.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
7,800.0	0.00	0.00	7,682.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
7,900.0	0.00	0.00	7,782.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
8,000.0	0.00	0.00	7,882.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
8,100.0	0.00	0.00	7,982.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
8,200.0	0.00	0.00	8,082.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
8,300.0	0.00	0.00	8,182.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
8,400.0	0.00	0.00	8,282.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
8,500.0	0.00	0.00	8,382.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
8,600.0	0.00	0.00	8,482.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
8,700.0	0.00	0.00	8,582.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
8,800.0	0.00	0.00	8,682.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
8,900.0	0.00	0.00	8,782.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
Cameo									
8,917.6	0.00	0.00	8,800.0	593.8	1,118.6	1,266.4	0.00	0.00	0.00
9,000.0	0.00	0.00	8,882.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
9,100.0	0.00	0.00	8,982.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC 0697-04-12W
Company:	Laramie Energy, LLC	TVD Reference:	WELL @ 8559 0usft (H&P #522)
Project:	Garfield County, CO	MD Reference:	WELL @ 8559 0usft (H&P #522)
Site:	CC 604-12-13 Pad	North Reference:	True
Well:	CC 0697-04-12W	Survey Calculation Method:	Minimum Curvature
Wellbore:	B-2		
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)
9,200.0	0.00	0.00	9,082.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
9,300.0	0.00	0.00	9,182.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
Base Cameo Coal									
9,307.6	0.00	0.00	9,190.0	593.8	1,118.6	1,266.4	0.00	0.00	0.00
Rollins									
9,317.6	0.00	0.00	9,200.0	593.8	1,118.6	1,266.4	0.00	0.00	0.00
9,400.0	0.00	0.00	9,282.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
9,500.0	0.00	0.00	9,382.4	593.8	1,118.6	1,266.4	0.00	0.00	0.00
TD @ 9567.6' MD / 9450.0' TVD									
9,567.6	0.00	0.00	9,450.0	593.8	1,118.6	1,266.4	0.00	0.00	0.00

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL - CC 0697-04-12V	0.00	0.00	9,450.0	593.8	1,118.6	1,638,540.26	2,230,501.45	39.554842	-108.229472
- plan hits target center									
- Circle (radius 50.0)									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,530.0	2,493.0	9 5/8"	9-5/8	14-3/4

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,507.5	6,400.0	Ohio Creek			
6,711.1	6,600.0	Williams Fork			
7,317.6	7,200.0	TOG			
8,917.6	8,800.0	Cameo			
9,307.6	9,190.0	Base Cameo Coal			
9,317.6	9,200.0	Rollins			

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
200.0	200.0	0.0	0.0	KOP (Build 3" / 100')
560.0	557.9	15.9	29.9	EOB @ 10.80" Inc. / 62.04" Azm
6,957.6	6,842.1	577.9	1,088.7	Drop 3" / 100'
7,317.6	7,200.0	593.8	1,118.6	EOD @ Vertical
9,567.6	9,450.0	593.8	1,118.6	TD @ 9567.6' MD / 9450.0' TVD