

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 Federal 0697-03-08E

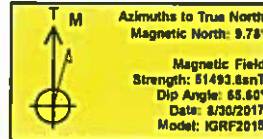
+N/-S 0.0 +E/-W 0.0 Northing 1629624.21 Easting 2237400.64
Latitude 39.558383 Longitude -108.205129

Project: Garfield County, CO
Site: CC 0697-03-07 Pad
Well: CC Federal 0697-03-08E
Wellbore: Wellbore #1
Design: Design #2
Latitude: 39.558383
Ground Level: 8428.0
WELL @ 8458.0usft (30' RKB)



REFERENCE INFORMATION

Co-ordinate (NE) Reference: Well CC Federal 0697-03-08E, True North
Vertical (TV) Reference: WELL @ 8458.0usft (30' RKB)
Section (VS) Reference: Slat - (0.0N, 0.0E)
Measured Depth Reference: WELL @ 8458.0usft (30' RKB)
Calculation Method: Minimum Curvature



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
4663.0	4725.4	G' Band
6763.0	6869.8	Williams Fork
7863.0	7869.2	TOG
8863.0	8869.2	Cameo
9423.0	9529.2	Base Cameo Coal
9463.0	9569.2	Rollins

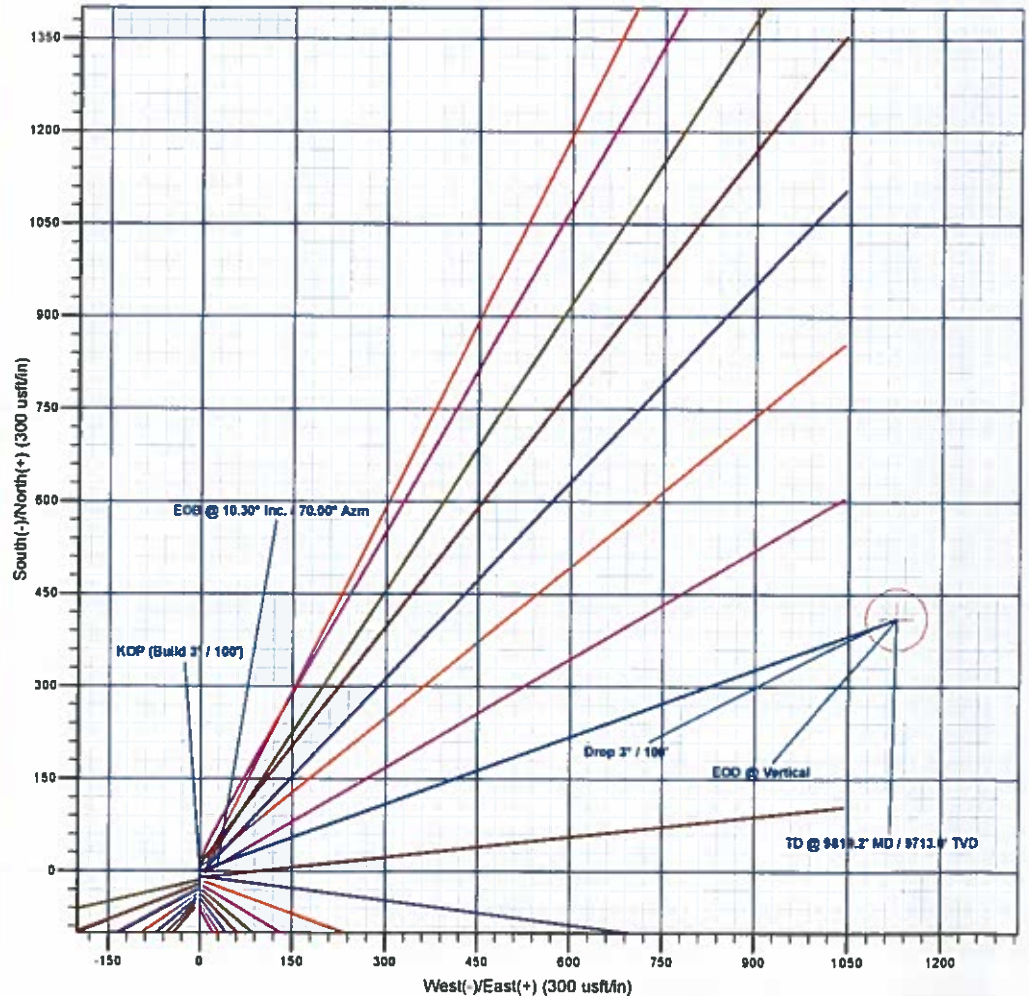
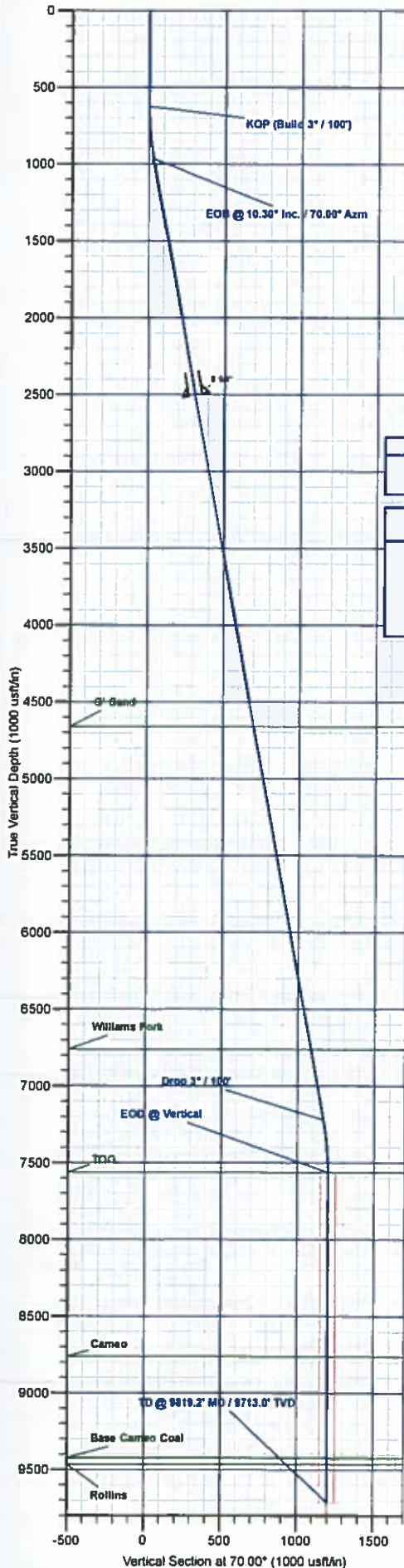


DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL - CC Federal 0697-03-08E	9713.0	409.8	1126.1	1640000.31	2238538.43	39.559508	-108.201135

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	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')
825.0	0.00	0.00	825.0	0.0	0.0	0.00	0.00	0.0	EOB @ 10.30" Inc. / 70.00° Azm
969.4	10.30	70.00	966.6	10.6	28.8	3.00	78.00	39.8	Drop 3' / 100'
7325.8	10.30	70.00	7221.5	399.3	1097.2	0.00	0.00	1167.6	EOB @ Vertical
7869.2	0.00	0.00	7863.0	409.8	1126.1	3.00	180.00	1199.3	TD @ 9819.2' MD / 9713.0' TVD
9819.2	0.00	0.00	9713.0	409.8	1126.1	0.00	0.00	1199.3	



Plan: Design #2 (CC Federal 0697-03-08E/Wellbore #1)

Created By: Will Jircik

Date: 14:16, October 24 2017



Laramie Energy, LLC

Garfield County, CO

CC 0697-03-07 Pad

CC Federal 0697-03-08E

Wellbore #1

Plan: Design #2

QES Well Planning Report

24 October, 2017





Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-03-08E
Company:	Laramie Energy, LLC	TVD Reference:	WELL @ 8458 0usft (30' RKB)
Project:	Garfield County, CO	MD Reference:	WELL @ 8458 0usft (30' RKB)
Site:	CC 0697-03-07 Pad	North Reference:	True
Well:	CC Federal 0697-03-08E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

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 0697-03-07 Pad			
Site Position:		Northing:	1,638,132.66 usft	Latitude: 39.554247
From:	Lat/Long	Easting:	2,236,874.96 usft	Longitude: -108.206835
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence: -1.71°

Well	CC Federal 0697-03-08E			
Well Position	+N/-S	1,506.5 usft	Northing:	1,639,624.20 usft
	+E/-W	481.0 usft	Easting:	2,237,400.64 usft
Position Uncertainty		0.0 usft	Wellhead Elevation:	Ground Level: 8,428.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	8/30/2017	9.78	65.60	51,493.75892449

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	70.00

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	
625.0	0.00	0.00	625.0	0.0	0.0	0.00	0.00	0.00	0.00	
968.4	10.30	70.00	968.5	10.5	28.9	3.00	3.00	0.00	70.00	
7,325.8	10.30	70.00	7,221.5	399.3	1,097.2	0.00	0.00	0.00	0.00	
7,669.2	0.00	0.00	7,563.0	409.8	1,126.1	3.00	-3.00	0.00	180.00	
9,819.2	0.00	0.00	9,713.0	409.8	1,126.1	0.00	0.00	0.00	0.00	PBHL - CC Federal 01



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-03-08E
Company:	Laramie Energy, LLC	TVD Reference:	WELL @ 8458.0usft (30' RKB)
Project:	Garfield County, CO	MD Reference:	WELL @ 8458.0usft (30' RKB)
Site:	CC 0697-03-07 Pad	North Reference:	True
Well:	CC Federal 0697-03-08E	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)
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
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP (Build 3° / 100')									
625.0	0.00	0.00	625.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	2.25	70.00	700.0	0.5	1.4	1.5	3.00	3.00	0.00
800.0	5.25	70.00	799.8	2.7	7.5	8.0	3.00	3.00	0.00
900.0	8.25	70.00	899.1	6.8	18.6	19.8	3.00	3.00	0.00
EOB @ 10.30° Inc. / 70.00° Azm									
968.4	10.30	70.00	966.5	10.5	28.9	30.8	3.00	3.00	0.00
1,000.0	10.30	70.00	997.6	12.5	34.2	36.4	0.00	0.00	0.00
1,100.0	10.30	70.00	1,096.0	18.6	51.0	54.3	0.00	0.00	0.00
1,200.0	10.30	70.00	1,194.4	24.7	67.8	72.2	0.00	0.00	0.00
1,300.0	10.30	70.00	1,292.8	30.8	84.7	90.1	0.00	0.00	0.00
1,400.0	10.30	70.00	1,391.2	36.9	101.5	108.0	0.00	0.00	0.00
1,500.0	10.30	70.00	1,489.6	43.0	118.3	125.8	0.00	0.00	0.00
1,600.0	10.30	70.00	1,588.0	49.2	135.1	143.7	0.00	0.00	0.00
1,700.0	10.30	70.00	1,686.4	55.3	151.9	161.6	0.00	0.00	0.00
1,800.0	10.30	70.00	1,784.8	61.4	168.7	179.5	0.00	0.00	0.00
1,900.0	10.30	70.00	1,883.1	67.5	185.5	197.4	0.00	0.00	0.00
2,000.0	10.30	70.00	1,981.5	73.6	202.3	215.3	0.00	0.00	0.00
2,100.0	10.30	70.00	2,079.9	79.7	219.1	233.1	0.00	0.00	0.00
2,200.0	10.30	70.00	2,178.3	85.8	235.9	251.0	0.00	0.00	0.00
2,300.0	10.30	70.00	2,276.7	92.0	252.7	268.9	0.00	0.00	0.00
2,400.0	10.30	70.00	2,375.1	98.1	269.5	286.8	0.00	0.00	0.00
2,500.0	10.30	70.00	2,473.5	104.2	286.3	304.7	0.00	0.00	0.00
9 5/8"									
2,530.0	10.30	70.00	2,503.0	106.0	291.3	310.0	0.00	0.00	0.00
2,600.0	10.30	70.00	2,571.9	110.3	303.1	322.5	0.00	0.00	0.00
2,700.0	10.30	70.00	2,670.2	116.4	319.9	340.4	0.00	0.00	0.00
2,800.0	10.30	70.00	2,768.6	122.5	336.7	358.3	0.00	0.00	0.00
2,900.0	10.30	70.00	2,867.0	128.6	353.5	376.2	0.00	0.00	0.00
3,000.0	10.30	70.00	2,965.4	134.8	370.3	394.1	0.00	0.00	0.00
3,100.0	10.30	70.00	3,063.8	140.9	387.1	411.9	0.00	0.00	0.00
3,200.0	10.30	70.00	3,162.2	147.0	403.9	429.8	0.00	0.00	0.00
3,300.0	10.30	70.00	3,260.6	153.1	420.7	447.7	0.00	0.00	0.00
3,400.0	10.30	70.00	3,359.0	159.2	437.5	465.6	0.00	0.00	0.00
3,500.0	10.30	70.00	3,457.4	165.3	454.3	483.5	0.00	0.00	0.00
3,600.0	10.30	70.00	3,555.7	171.5	471.1	501.3	0.00	0.00	0.00
3,700.0	10.30	70.00	3,654.1	177.6	487.9	519.2	0.00	0.00	0.00
3,800.0	10.30	70.00	3,752.5	183.7	504.7	537.1	0.00	0.00	0.00
3,900.0	10.30	70.00	3,850.9	189.8	521.5	555.0	0.00	0.00	0.00
4,000.0	10.30	70.00	3,949.3	195.9	538.3	572.9	0.00	0.00	0.00
4,100.0	10.30	70.00	4,047.7	202.0	555.1	590.8	0.00	0.00	0.00
4,200.0	10.30	70.00	4,146.1	208.1	571.9	608.6	0.00	0.00	0.00
4,300.0	10.30	70.00	4,244.5	214.3	588.7	626.5	0.00	0.00	0.00
4,400.0	10.30	70.00	4,342.8	220.4	605.5	644.4	0.00	0.00	0.00
4,500.0	10.30	70.00	4,441.2	226.5	622.3	662.3	0.00	0.00	0.00
4,600.0	10.30	70.00	4,539.6	232.6	639.2	680.2	0.00	0.00	0.00



Well Planning Report



Database: EDM 5000.1 Single User Db
 Company: Laramie Energy, LLC
 Project: Garfield County, CO
 Site: CC 0697-03-07 Pad
 Well: CC Federal 0697-03-08E
 Wellbore: Wellbore #1
 Design: Design #2

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:

Well CC Federal 0697-03-08E
 WELL @ 8458.0usft (30' RKB)
 WELL @ 8458.0usft (30' RKB)
 True
 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)
4,700.0	10.30	70.00	4,638.0	238.7	656.0	698.0	0.00	0.00	0.00
G' Sand									
4,725.4	10.30	70.00	4,663.0	240.3	660.2	702.6	0.00	0.00	0.00
4,800.0	10.30	70.00	4,736.4	244.8	672.8	715.9	0.00	0.00	0.00
4,900.0	10.30	70.00	4,834.8	250.9	689.6	733.8	0.00	0.00	0.00
5,000.0	10.30	70.00	4,933.2	257.1	706.4	751.7	0.00	0.00	0.00
5,100.0	10.30	70.00	5,031.6	263.2	723.2	769.6	0.00	0.00	0.00
5,200.0	10.30	70.00	5,130.0	269.3	740.0	787.4	0.00	0.00	0.00
5,300.0	10.30	70.00	5,228.3	275.4	756.8	805.3	0.00	0.00	0.00
5,400.0	10.30	70.00	5,326.7	281.5	773.6	823.2	0.00	0.00	0.00
5,500.0	10.30	70.00	5,425.1	287.6	790.4	841.1	0.00	0.00	0.00
5,600.0	10.30	70.00	5,523.5	293.8	807.2	859.0	0.00	0.00	0.00
5,700.0	10.30	70.00	5,621.9	299.9	824.0	876.9	0.00	0.00	0.00
5,800.0	10.30	70.00	5,720.3	306.0	840.8	894.7	0.00	0.00	0.00
5,900.0	10.30	70.00	5,818.7	312.1	857.6	912.6	0.00	0.00	0.00
6,000.0	10.30	70.00	5,917.1	318.2	874.4	930.5	0.00	0.00	0.00
6,100.0	10.30	70.00	6,015.4	324.3	891.2	948.4	0.00	0.00	0.00
6,200.0	10.30	70.00	6,113.8	330.4	908.0	966.3	0.00	0.00	0.00
6,300.0	10.30	70.00	6,212.2	336.6	924.8	984.1	0.00	0.00	0.00
6,400.0	10.30	70.00	6,310.6	342.7	941.6	1,002.0	0.00	0.00	0.00
6,500.0	10.30	70.00	6,409.0	348.8	958.4	1,019.9	0.00	0.00	0.00
6,600.0	10.30	70.00	6,507.4	354.9	975.2	1,037.8	0.00	0.00	0.00
6,700.0	10.30	70.00	6,605.8	361.0	992.0	1,055.7	0.00	0.00	0.00
6,800.0	10.30	70.00	6,704.2	367.1	1,008.8	1,073.5	0.00	0.00	0.00
Williams Fork									
6,859.8	10.30	70.00	6,763.0	370.8	1,018.9	1,084.2	0.00	0.00	0.00
6,900.0	10.30	70.00	6,802.6	373.2	1,025.6	1,091.4	0.00	0.00	0.00
7,000.0	10.30	70.00	6,900.9	379.4	1,042.4	1,109.3	0.00	0.00	0.00
7,100.0	10.30	70.00	6,999.3	385.5	1,059.2	1,127.2	0.00	0.00	0.00
7,200.0	10.30	70.00	7,097.7	391.6	1,076.0	1,145.1	0.00	0.00	0.00
7,300.0	10.30	70.00	7,196.1	397.7	1,092.8	1,162.9	0.00	0.00	0.00
Drop 3° / 100'									
7,325.8	10.30	70.00	7,221.5	399.3	1,097.2	1,167.6	0.00	0.00	0.00
7,400.0	8.07	70.00	7,294.7	403.3	1,108.3	1,179.4	3.00	-3.00	0.00
7,500.0	5.07	70.00	7,394.1	407.3	1,119.1	1,190.9	3.00	-3.00	0.00
7,600.0	2.07	70.00	7,493.9	409.4	1,124.9	1,197.1	3.00	-3.00	0.00
EOD @ Vertical - TOG									
7,669.2	0.00	0.00	7,583.0	409.8	1,126.1	1,198.3	3.00	-3.00	0.00
7,700.0	0.00	0.00	7,593.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
7,800.0	0.00	0.00	7,693.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
7,900.0	0.00	0.00	7,793.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
8,000.0	0.00	0.00	7,893.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
8,100.0	0.00	0.00	7,993.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
8,200.0	0.00	0.00	8,093.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
8,300.0	0.00	0.00	8,193.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
8,400.0	0.00	0.00	8,293.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
8,500.0	0.00	0.00	8,393.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
8,600.0	0.00	0.00	8,493.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
8,700.0	0.00	0.00	8,593.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
8,800.0	0.00	0.00	8,693.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
Cameo									
8,869.2	0.00	0.00	8,763.0	409.8	1,126.1	1,198.3	0.00	0.00	0.00
8,900.0	0.00	0.00	8,793.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
9,000.0	0.00	0.00	8,893.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00



Well Planning Report



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-03-08E
Company:	Laramie Energy, LLC	TVD Reference:	WELL @ 8458.0usft (30' RKB)
Project:	Garfield County, CO	MD Reference:	WELL @ 8458.0usft (30' RKB)
Site:	CC 0697-03-07 Pad	North Reference:	True
Well:	CC Federal 0697-03-08E	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)
9,100.0	0.00	0.00	8,993.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
9,200.0	0.00	0.00	9,093.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
9,300.0	0.00	0.00	9,193.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
9,400.0	0.00	0.00	9,293.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
9,500.0	0.00	0.00	9,393.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
Base Cameo Coal									
9,529.2	0.00	0.00	9,423.0	409.8	1,126.1	1,198.3	0.00	0.00	0.00
Rollins									
9,569.2	0.00	0.00	9,463.0	409.8	1,126.1	1,198.3	0.00	0.00	0.00
9,600.0	0.00	0.00	9,493.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
9,700.0	0.00	0.00	9,593.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
9,800.0	0.00	0.00	9,693.8	409.8	1,126.1	1,198.3	0.00	0.00	0.00
TD @ 9819.2' MD / 9713.0' TVD									
9,819.2	0.00	0.00	9,713.0	409.8	1,126.1	1,198.3	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 Federal 0697; - plan hits target center - Circle (radius 50.0)	0.00	0.00	9,713.0	409.8	1,126.1	1,640,000.30	2,238,538.43	39.559508	-108.201135

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,530.0	2,503.0	9 5/8"	9-5/8	12-1/4

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,725.4	4,663.0	G' Sand			
6,859.8	6,763.0	Williams Fork			
7,669.2	7,563.0	TOG			
8,869.2	8,763.0	Cameo			
9,529.2	9,423.0	Base Cameo Coal			
9,569.2	9,463.0	Rollins			



Well Planning Report



Database: EDM 5000.1 Single User Db
Company: Laramie Energy, LLC
Project: Garfield County, CO
Site: CC 0697-03-07 Pad
Well: CC Federal 0697-03-08E
Wellbore: Wellbore #1
Design: Design #2

Local Co-ordinate Reference: Well CC Federal 0697-03-08E
TVD Reference: WELL @ 8458 0usft (30' RKB)
MD Reference: WELL @ 8458 0usft (30' RKB)
North Reference: True
Survey Calculation Method: Minimum Curvature

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
625.0	625.0	0.0	0.0	KOP (Build 3" / 100')
968.4	966.5	10.5	28.9	EOB @ 10.30° Inc. / 70.00° Azm
7,325.8	7,221.5	399.3	1,097.2	Drop 3" / 100'
7,669.2	7,563.0	409.8	1,126.1	EOD @ Vertical
9,819.2	9,713.0	409.8	1,126.1	TD @ 9819.2' MD / 8713.0' TVD