



Project: Mesa County, CO
 Site: Bruton 30-01 Pad
 Well: Bruton 19-17E
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.255244
 Longitude: -107.806189
 Ground Level: 7425.0
 well @ 7455.0usft (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 Bruton 19-17E, True North
 Vertical (TVD) Reference: well @ 7455.0usft (H&P #522)
 Section (V/S) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 7455.0usft (H&P #522)
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton 19-17E

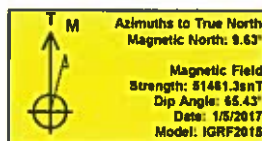
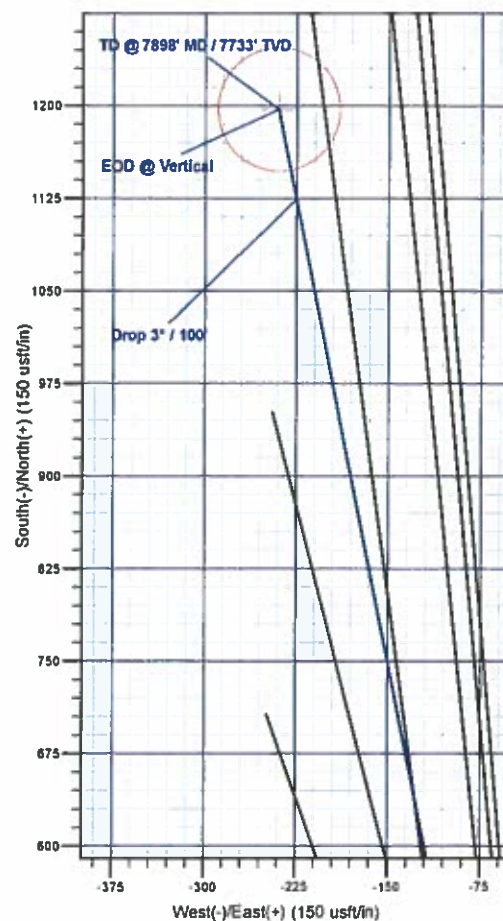
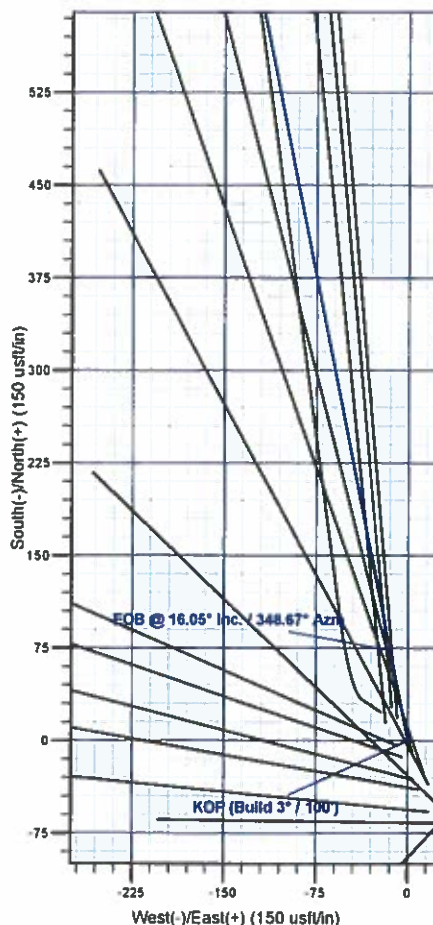
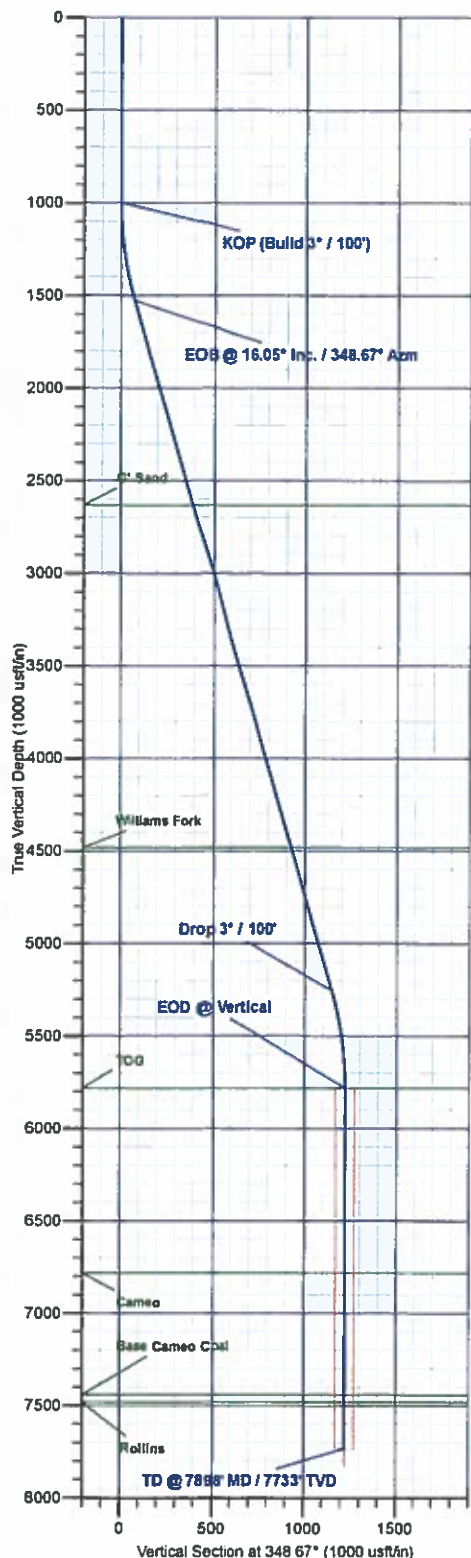
+N-S	+E-W	Northing	Ground Level: 7425.0	Latitude	Longitude
0.0	0.0	1526145.32	2347036.48	39.255244	-107.806189

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

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
BRUTON 19-17E	7733.0	1197.0	-239.9	1527348.05	2346827.08	39.258531	-107.807036

SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Diep	TFace	Vsect	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3° / 100')
1534.9	16.05	348.67	1527.9	73.0	-14.6	3.00	348.67	74.4	EOB @ 16.05° Inc. / 348.67° Azm
5413.2	16.05	348.67	5255.1	1124.1	-225.2	0.00	0.00	1146.4	Drop 3° / 100'
5948.0	0.00	0.00	5783.0	1197.0	-239.9	3.00	180.00	1220.8	EOD @ Vertical
7898.0	0.00	0.00	7733.0	1197.0	-239.9	0.00	0.00	1220.8	TD @ 7898' MD / 7733' TVD



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2633.0	2684.8	G' Sand
4483.0	4509.8	Williams Fork
5783.0	5948.0	TOG
6783.0	6948.0	Cameo
7443.0	7508.0	Base Cameo Coal
7483.0	7648.0	Hollins

Plan: Design #1 (Bruton 19-17E/Wellbore #1)

Created By: Will Jircik Date: 15:23, January 09 2017



Laramie Energy, LLC

**Mesa County, CO
Bruton 30-01 Pad
Bruton 19-17E**

Wellbore #1

Plan: Design #1

QES Well Planning Report

09 January, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-17E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7455.0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7455.0usft (H&P #522)
Site:	Bruton 30-01 Pad	North Reference:	True
Well:	Bruton 19-17E	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		Bruton 30-01 Pad			
Site Position:		Northing:	1,526,078.02 usft	Latitude:	39 255061
From:	Lat/Long	Easting:	2,347,056.81 usft	Longitude:	-107.806111
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.45 °

Well	Bruton 19-17E					
Well Position	+N/-S	66.8 usft	Northing:	1,526,145.32 usft	Latitude:	39.255245
	+E/-W	-22.0 usft	Easting:	2,347,036.49 usft	Longitude:	-107.806189
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,425.0 usft

Wellbore		Wellbore #1			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/5/2017	9.63	65.43	51,461

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	348.67

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	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,534.9	16.05	348.67	1,527.9	73.0	-14.6	3.00	3.00	0.00	348.67	
5,413.2	16.05	348.67	5,255.1	1,124.1	-225.2	0.00	0.00	0.00	0.00	
5,948.0	0.00	0.00	5,783.0	1,197.0	-239.9	3.00	-3.00	0.00	180.00	
7,898.0	0.00	0.00	7,733.0	1,197.0	-239.9	0.00	0.00	0.00	0.00	BRUTON 19-17E



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-17E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7455.0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7455.0usft (H&P #522)
Site:	Bruton 30-01 Pad	North Reference:	True
Well:	Bruton 19-17E	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
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
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP (Build 3° / 100')									
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	3.00	348.67	1,100.0	2.6	-0.5	2.6	3.00	3.00	0.00
1,200.0	6.00	348.67	1,199.6	10.3	-2.1	10.5	3.00	3.00	0.00
1,300.0	9.00	348.67	1,298.8	23.1	-4.6	23.5	3.00	3.00	0.00
1,400.0	12.00	348.67	1,397.1	40.9	-8.2	41.7	3.00	3.00	0.00
1,500.0	15.00	348.67	1,494.3	63.8	-12.8	65.1	3.00	3.00	0.00
8 5/8"									
1,530.0	15.90	348.67	1,523.2	71.6	-14.4	73.1	3.00	3.00	0.00
EOB @ 16.05° Inc. / 348.67° Azm									
1,534.9	16.05	348.67	1,527.9	73.0	-14.6	74.4	3.00	3.00	0.00
1,600.0	16.05	348.67	1,590.5	90.6	-18.2	92.4	0.00	0.00	0.00
1,700.0	16.05	348.67	1,686.6	117.7	-23.6	120.1	0.00	0.00	0.00
1,800.0	16.05	348.67	1,782.7	144.8	-29.0	147.7	0.00	0.00	0.00
1,900.0	16.05	348.67	1,878.8	171.9	-34.4	175.3	0.00	0.00	0.00
2,000.0	16.05	348.67	1,974.9	199.0	-39.9	203.0	0.00	0.00	0.00
2,100.0	16.05	348.67	2,071.0	226.1	-45.3	230.6	0.00	0.00	0.00
2,200.0	16.05	348.67	2,167.1	253.2	-50.7	258.3	0.00	0.00	0.00
2,300.0	16.05	348.67	2,263.2	280.3	-56.2	285.9	0.00	0.00	0.00
2,400.0	16.05	348.67	2,359.3	307.4	-61.6	313.5	0.00	0.00	0.00
2,500.0	16.05	348.67	2,455.4	334.5	-67.0	341.2	0.00	0.00	0.00
2,600.0	16.05	348.67	2,551.5	361.6	-72.5	368.8	0.00	0.00	0.00
G° Sand									
2,684.8	16.05	348.67	2,633.0	384.6	-77.1	392.3	0.00	0.00	0.00
2,700.0	16.05	348.67	2,647.6	388.7	-77.9	396.5	0.00	0.00	0.00
2,800.0	16.05	348.67	2,743.7	415.8	-83.3	424.1	0.00	0.00	0.00
2,900.0	16.05	348.67	2,839.8	442.9	-88.8	451.7	0.00	0.00	0.00
3,000.0	16.05	348.67	2,936.0	470.0	-94.2	479.4	0.00	0.00	0.00
3,100.0	16.05	348.67	3,032.1	497.1	-99.6	507.0	0.00	0.00	0.00
3,200.0	16.05	348.67	3,128.2	524.3	-105.0	534.7	0.00	0.00	0.00
3,300.0	16.05	348.67	3,224.3	551.4	-110.5	562.3	0.00	0.00	0.00
3,400.0	16.05	348.67	3,320.4	578.5	-115.9	590.0	0.00	0.00	0.00
3,500.0	16.05	348.67	3,416.5	605.6	-121.3	617.6	0.00	0.00	0.00
3,600.0	16.05	348.67	3,512.6	632.7	-126.8	645.2	0.00	0.00	0.00
3,700.0	16.05	348.67	3,608.7	659.8	-132.2	672.9	0.00	0.00	0.00
3,800.0	16.05	348.67	3,704.8	686.9	-137.6	700.5	0.00	0.00	0.00
3,900.0	16.05	348.67	3,800.9	714.0	-143.1	728.2	0.00	0.00	0.00
4,000.0	16.05	348.67	3,897.0	741.1	-148.5	755.8	0.00	0.00	0.00
4,100.0	16.05	348.67	3,993.1	768.2	-153.9	783.4	0.00	0.00	0.00
4,200.0	16.05	348.67	4,089.2	795.3	-159.4	811.1	0.00	0.00	0.00
4,300.0	16.05	348.67	4,185.3	822.4	-164.8	838.7	0.00	0.00	0.00
4,400.0	16.05	348.67	4,281.4	849.5	-170.2	866.4	0.00	0.00	0.00
4,500.0	16.05	348.67	4,377.5	876.6	-175.7	894.0	0.00	0.00	0.00
4,600.0	16.05	348.67	4,473.6	903.7	-181.1	921.6	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-17E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7455 0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7455 0usft (H&P #522)
Site:	Bruton 30-01 Pad	North Reference:	True
Well:	Bruton 19-17E	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)	Buird Rate ("/100usft)	Turn Rate ("/100usft)
Williams Fork									
4,609.8	16.05	348.67	4,483.0	906.3	-181.6	924.3	0.00	0.00	0.00
4,700.0	16.05	348.67	4,589.7	930.8	-186.5	949.3	0.00	0.00	0.00
4,800.0	16.05	348.67	4,685.8	957.9	-191.9	976.9	0.00	0.00	0.00
4,900.0	16.05	348.67	4,761.9	985.0	-197.4	1,004.6	0.00	0.00	0.00
5,000.0	16.05	348.67	4,858.0	1,012.1	-202.8	1,032.2	0.00	0.00	0.00
5,100.0	16.05	348.67	4,954.1	1,039.2	-208.2	1,059.9	0.00	0.00	0.00
5,200.0	16.05	348.67	5,050.2	1,066.3	-213.7	1,087.5	0.00	0.00	0.00
5,300.0	16.05	348.67	5,146.3	1,093.4	-219.1	1,115.1	0.00	0.00	0.00
5,400.0	16.05	348.67	5,242.4	1,120.5	-224.5	1,142.8	0.00	0.00	0.00
Drop 3" / 100'									
5,413.2	16.05	348.67	5,255.1	1,124.1	-225.2	1,146.4	0.00	0.00	0.00
5,500.0	13.44	348.67	5,339.1	1,145.7	-229.6	1,168.5	3.00	-3.00	0.00
5,600.0	10.44	348.67	5,436.9	1,166.0	-233.6	1,189.2	3.00	-3.00	0.00
5,700.0	7.44	348.67	5,535.7	1,181.3	-236.7	1,204.7	3.00	-3.00	0.00
5,800.0	4.44	348.67	5,635.1	1,191.4	-238.7	1,215.1	3.00	-3.00	0.00
5,900.0	1.44	348.67	5,735.0	1,196.4	-239.7	1,220.2	3.00	-3.00	0.00
EOD @ Vertical - TOG									
5,948.0	0.00	0.00	5,783.0	1,197.0	-239.9	1,220.8	3.00	-3.00	23.59
6,000.0	0.00	0.00	5,835.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
6,100.0	0.00	0.00	5,935.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
6,200.0	0.00	0.00	6,035.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
6,300.0	0.00	0.00	6,135.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
6,400.0	0.00	0.00	6,235.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
6,500.0	0.00	0.00	6,335.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
6,600.0	0.00	0.00	6,435.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
6,700.0	0.00	0.00	6,535.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
6,800.0	0.00	0.00	6,635.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
6,900.0	0.00	0.00	6,735.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
Cameo									
6,948.0	0.00	0.00	6,783.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
7,000.0	0.00	0.00	6,835.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
7,100.0	0.00	0.00	6,935.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
7,200.0	0.00	0.00	7,035.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
7,300.0	0.00	0.00	7,135.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
7,400.0	0.00	0.00	7,235.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
7,500.0	0.00	0.00	7,335.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
7,600.0	0.00	0.00	7,435.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
Base Cameo Coal									
7,608.0	0.00	0.00	7,443.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
Rollins									
7,648.0	0.00	0.00	7,483.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
7,700.0	0.00	0.00	7,535.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
7,800.0	0.00	0.00	7,635.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00
TD @ 7898' MD / 7733' TVD									
7,898.0	0.00	0.00	7,733.0	1,197.0	-239.9	1,220.8	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-17E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7455 0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7455 0usft (H&P #522)
Site:	Bruton 30-01 Pad	North Reference:	True
Well:	Bruton 19-17E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
BRUTON 19-17E - plan hits target center - Circle (radius 50.0)	0.00	0.00	7,733.0	1,197.0	-239.9	1,527,348.06	2,346,827.09	39.258531	-107.807036

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,530.0	1,523.2	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,684.8	2,633.0	G' Sand			
4,809.8	4,483.0	Williams Fork			
5,948.0	5,783.0	TOG			
6,948.0	6,783.0	Cameo			
7,608.0	7,443.0	Base Cameo Coal			
7,648.0	7,483.0	Rollins			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,000.0	1,000.0	0.0	0.0	KOP (Build 3" / 100')
1,534.9	1,527.9	73.0	-14.6	EOB @ 16.05° Inc. / 348.67° Azm
5,413.2	5,255.1	1,124.1	-225.2	Drop 3" / 100'
5,948.0	5,783.0	1,197.0	-239.9	EOD @ Vertical
7,898.0	7,733.0	1,197.0	-239.9	TD @ 7898' MD / 7733' TVD