



Laramie Energy, LLC

Mesa County, CO

Bruton 30-01 Pad

Bruton 19-17W

Wellbore #1

Design: Wellbore #1

QES Survey Report

17 July, 2017





Survey Report



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Bruton 19-17W
Project:	Mesa County, CO	TVD Reference:	well @ 7449.0usft (H&P #290)
Site:	Bruton 30-01 Pad	MD Reference:	well @ 7449.0usft (H&P #290)
Well:	Bruton 19-17W	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

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 19-17W					
Well Position	+N/-S	0.0 usft	Northing:	1,526,150.72 usft	Latitude:	39.255258
	+E/-W	0.0 usft	Easting:	2,347,023.25 usft	Longitude:	-107.806236
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	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	293.26	

Survey Program	Date	7/17/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
203.0	8,520.0	MWD Surveys (Wellbore #1)	MWD default	MWD - Standard	

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
First MWD Survey @ 203.0' MD / 202.6' TVD									
203.0	6.20	308.10	202.6	6.8	-8.6	10.6	3.05	3.05	0.00
294.0	9.20	306.60	292.8	14.1	-18.3	22.4	3.30	3.30	-1.65
386.0	11.30	300.90	383.3	23.2	-32.0	38.5	2.53	2.28	-6.20
476.0	12.80	288.00	471.3	30.8	-49.0	57.2	3.41	1.67	-14.33
566.0	15.70	285.60	558.6	37.1	-70.3	79.2	3.29	3.22	-2.67
657.0	17.10	290.20	645.9	45.1	-94.7	104.8	2.10	1.54	5.05
748.0	18.80	295.10	732.4	55.9	-120.5	132.8	2.50	1.87	5.38
839.0	19.70	293.90	818.3	68.3	-147.8	162.8	1.08	0.99	-1.32
929.0	21.90	296.70	902.5	82.0	-176.7	194.7	2.68	2.44	3.11



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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)
1,023.0	24.10	296.70	989.0	98.5	-209.5	231.4	2.34	2.34	0.00
1,118.0	26.80	296.60	1,074.8	116.8	-246.0	272.1	2.84	2.84	-0.11
1,212.0	29.60	296.90	1,157.6	136.8	-285.6	316.4	2.98	2.98	0.32
1,307.0	31.60	296.10	1,239.4	158.4	-328.9	364.7	2.15	2.11	-0.84
1,401.0	32.70	294.70	1,319.0	179.8	-374.1	414.7	1.41	1.17	-1.49
1,496.0	34.80	295.60	1,397.9	202.3	-421.9	467.5	2.27	2.21	0.95
1,624.0	35.20	296.90	1,502.8	234.8	-487.7	540.8	0.66	0.31	1.02
1,719.0	34.60	292.60	1,580.7	257.5	-537.0	595.1	2.67	-0.63	-4.53
1,813.0	34.10	292.50	1,658.3	277.8	-586.0	648.1	0.54	-0.53	-0.11
1,907.0	33.90	291.50	1,736.3	297.5	-634.7	700.7	0.63	-0.21	-1.06
2,002.0	34.00	290.90	1,815.1	316.7	-684.2	753.7	0.37	0.11	-0.63
2,096.0	33.90	292.10	1,893.0	336.0	-733.1	806.1	0.72	-0.11	1.28
2,191.0	34.50	293.00	1,971.6	356.4	-782.4	859.5	0.83	0.63	0.95
2,285.0	35.10	293.50	2,048.8	377.6	-831.7	913.2	0.71	0.64	0.53
2,380.0	34.10	291.80	2,127.0	398.4	-881.4	967.1	1.46	-1.05	-1.79
2,475.0	34.60	293.60	2,205.4	419.1	-930.9	1,020.7	1.19	0.53	1.89
2,570.0	35.00	294.40	2,283.4	441.1	-980.4	1,074.9	0.64	0.42	0.84
2,664.0	35.60	296.80	2,360.2	464.6	-1,029.4	1,129.2	1.61	0.64	2.55
2,759.0	34.30	295.40	2,438.0	488.6	-1,078.2	1,183.5	1.61	-1.37	-1.47
2,853.0	34.30	296.60	2,515.7	511.8	-1,125.9	1,236.5	0.72	0.00	1.28
2,948.0	34.00	297.40	2,594.3	536.0	-1,173.4	1,289.7	0.57	-0.32	0.84
3,042.0	36.40	297.10	2,671.1	560.8	-1,221.5	1,343.7	2.56	2.55	-0.32
3,137.0	37.40	298.60	2,747.1	587.5	-1,272.0	1,400.6	1.42	1.05	1.58
3,232.0	36.10	299.90	2,823.2	615.2	-1,321.6	1,457.1	1.59	-1.37	1.37
3,326.0	36.70	301.20	2,898.9	643.6	-1,369.6	1,512.4	1.04	0.64	1.38
3,421.0	36.80	301.40	2,975.0	673.1	-1,418.2	1,568.7	0.16	0.11	0.21
3,516.0	37.20	302.30	3,050.8	703.3	-1,466.7	1,625.2	0.71	0.42	0.95
3,610.0	36.10	300.90	3,126.3	732.7	-1,514.5	1,680.7	1.47	-1.17	-1.49
3,705.0	36.30	302.20	3,202.9	762.0	-1,562.3	1,736.3	0.84	0.21	1.37
3,799.0	35.30	300.80	3,279.2	790.8	-1,609.2	1,790.7	1.37	-1.06	-1.49
3,894.0	35.60	301.60	3,356.6	819.3	-1,656.3	1,845.2	0.58	0.32	0.84
3,988.0	34.90	300.90	3,433.3	847.5	-1,702.7	1,899.0	0.86	-0.74	-0.74
4,083.0	34.00	302.00	3,511.7	875.5	-1,748.5	1,952.2	1.15	-0.95	1.16
4,177.0	33.20	301.20	3,589.9	902.8	-1,792.8	2,003.6	0.97	-0.85	-0.85
4,272.0	32.30	301.40	3,669.8	929.5	-1,836.8	2,054.5	0.95	-0.95	0.21
4,366.0	32.20	298.70	3,749.4	954.6	-1,880.2	2,104.3	1.54	-0.11	-2.87
4,461.0	33.10	292.80	3,829.4	976.8	-1,926.3	2,155.5	3.48	0.95	-6.21
4,556.0	33.20	286.50	3,908.9	994.2	-1,975.2	2,207.2	3.63	0.11	-6.63
4,651.0	32.30	286.10	3,988.8	1,008.7	-2,024.5	2,258.3	0.97	-0.95	-0.42
4,745.0	31.80	285.70	4,068.5	1,022.3	-2,072.5	2,307.7	0.58	-0.53	-0.43
4,840.0	30.60	285.50	4,149.7	1,035.6	-2,119.9	2,356.5	1.27	-1.26	-0.21
4,935.0	31.20	288.30	4,231.3	1,049.7	-2,166.5	2,405.0	1.64	0.63	2.95
5,029.0	31.20	286.10	4,311.7	1,064.1	-2,213.0	2,453.4	1.21	0.00	-2.34



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Survey										
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5,123.0	31.10	284.40	4,392.1	1,076.9	-2,259.9	2,501.5	0.94	-0.11	-1.81	
5,218.0	29.60	285.20	4,474.1	1,089.2	-2,306.3	2,549.0	1.64	-1.58	0.84	
5,313.0	28.20	283.30	4,557.3	1,100.5	-2,350.8	2,594.4	1.76	-1.47	-2.00	
5,407.0	28.80	285.60	4,639.9	1,111.7	-2,394.3	2,638.7	1.33	0.64	2.45	
5,501.0	28.20	285.00	4,722.5	1,123.5	-2,437.5	2,683.1	0.71	-0.64	-0.64	
5,596.0	24.20	282.20	4,807.7	1,133.5	-2,478.3	2,724.4	4.41	-4.21	-2.95	
5,691.0	22.30	279.40	4,895.0	1,140.5	-2,515.1	2,761.0	2.31	-2.00	-2.95	
5,785.0	20.30	277.70	4,982.6	1,145.6	-2,548.8	2,794.1	2.23	-2.13	-1.81	
5,880.0	18.70	279.20	5,072.1	1,150.3	-2,580.2	2,824.7	1.76	-1.68	1.58	
5,975.0	19.00	284.40	5,162.0	1,156.5	-2,610.2	2,854.8	1.80	0.32	5.47	
6,069.0	15.90	282.80	5,251.7	1,163.2	-2,637.6	2,882.6	3.34	-3.30	-1.70	
6,164.0	13.80	286.60	5,343.5	1,169.3	-2,661.1	2,906.6	2.44	-2.21	4.00	
6,259.0	11.50	280.60	5,436.2	1,174.3	-2,681.3	2,927.1	2.79	-2.42	-6.32	
6,353.0	10.60	285.40	5,528.5	1,178.3	-2,698.9	2,944.8	1.37	-0.96	5.11	
6,448.0	10.30	289.70	5,621.9	1,183.5	-2,715.3	2,962.0	0.88	-0.32	4.53	
6,543.0	8.30	292.20	5,715.6	1,189.0	-2,729.6	2,977.3	2.15	-2.11	2.63	
6,637.0	5.60	299.50	5,808.9	1,193.8	-2,739.9	2,988.6	3.02	-2.87	7.77	
6,732.0	3.30	305.20	5,903.7	1,197.6	-2,746.2	2,995.9	2.46	-2.42	6.00	
6,827.0	3.10	304.60	5,998.5	1,200.7	-2,750.5	3,001.1	0.21	-0.21	-0.63	
6,922.0	1.60	313.20	6,093.4	1,203.0	-2,753.6	3,004.9	1.62	-1.58	9.05	
7,016.0	1.80	313.90	6,187.4	1,205.0	-2,755.6	3,007.5	0.21	0.21	0.74	
7,111.0	1.80	290.10	6,282.3	1,206.5	-2,758.1	3,010.4	0.78	0.00	-25.05	
7,206.0	0.30	244.30	6,377.3	1,206.9	-2,759.7	3,012.0	1.69	-1.58	-48.21	
7,300.0	1.00	251.40	6,471.3	1,206.6	-2,760.7	3,012.8	0.75	0.74	7.55	
7,395.0	0.83	248.70	6,566.3	1,206.0	-2,762.1	3,013.9	0.18	-0.18	-2.84	
7,490.0	0.97	222.60	6,661.3	1,205.2	-2,763.3	3,014.7	0.45	0.15	-27.47	
7,584.0	1.32	229.40	6,755.3	1,203.9	-2,764.7	3,015.4	0.40	0.37	7.23	
7,679.0	1.23	207.60	6,850.2	1,202.3	-2,766.0	3,016.0	0.52	-0.09	-22.95	
7,774.0	1.76	218.40	6,945.2	1,200.2	-2,767.4	3,016.4	0.63	0.56	11.37	
7,868.0	1.84	228.50	7,039.2	1,198.1	-2,769.4	3,017.5	0.35	0.09	10.74	
7,963.0	1.75	219.40	7,134.1	1,196.0	-2,771.5	3,018.5	0.31	-0.09	-9.58	
8,057.0	1.71	230.10	7,228.1	1,194.0	-2,773.5	3,019.5	0.35	-0.04	11.38	
8,152.0	1.84	230.80	7,323.0	1,192.1	-2,775.7	3,020.9	0.14	0.14	0.74	
8,246.0	2.28	225.00	7,417.0	1,189.8	-2,778.2	3,022.3	0.52	0.47	-6.17	
8,341.0	1.70	233.90	7,511.9	1,187.7	-2,780.7	3,023.7	0.69	-0.61	9.37	
8,435.0	2.10	222.40	7,605.9	1,185.6	-2,783.0	3,025.0	0.59	0.43	-12.23	
8,464.0	2.40	231.20	7,634.8	1,184.8	-2,783.8	3,025.4	1.57	1.03	30.34	
Projection to TD @ 8520.0' MD / 7690.8' TVD										
8,520.0	2.40	231.20	7,690.8	1,183.3	-2,785.6	3,026.5	0.00	0.00	0.00	



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Design Annotations

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		+N/-S (usft)	+E/-W (usft)	
203.0	202.6	6.8	-8.6	First MWD Survey @ 203.0' MD / 202.6' TVD
8,520.0	7,690.8	1,183.3	-2,785.6	Projection to TD @ 8520.0' MD / 7690.8' TVD