



Laramie Energy, LLC

Mesa County, CO

Nichols 24-07 Pad

Nichols Federal 0994-24-18E

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

02 May, 2018





Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols Federal 0994-24-18E
Project:	Mesa County, CO	TVD Reference:	well @ 7236.0usft (H&P #290)
Site:	Nichols 24-07 Pad	MD Reference:	well @ 7236.0usft (H&P #290)
Well:	Nichols Federal 0994-24-18E	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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		Nichols 24-07 Pad						
Site Position:		Northing:	1,529,213.07	usft	Latitude:	39.263181		
From:	Lat/Long	Easting:	2,340,128.94	usft	Longitude:	-107.830853		
Position Uncertainty:	0.0	usft	Slot Radius:	13-3/16	"	Grid Convergence:	-1.47	°

Well	Nichols Federal 0994-24-18E					
Well Position	+N/-S	0.0 usft	Northing:	1,529,235.36 usft	Latitude:	39.263242
	+E/-W	0.0 usft	Easting:	2,340,132.00 usft	Longitude:	-107.830844
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,212.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	User Defined	4/17/2018	9.44	65.40	51,303.80000000

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	143.83	

Survey Program	Date	5/2/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
383.0	7,979.0	QES MWD Surveys (Wellbore #1)	MWD default	MWD - Standard	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	1,529,235.36	2,340,132.00	39.263242	-107.830844
383.0	8.20	121.10	381.7	-14.1	23.4	1,529,220.63	2,340,155.06	39.263203	-107.830762
First MWD Survey @ 383.0' MD / 381.7' TVD									
473.0	9.70	126.60	470.6	-22.0	35.0	1,529,212.50	2,340,166.44	39.263182	-107.830721
563.0	10.50	138.80	559.2	-32.7	46.5	1,529,201.52	2,340,177.65	39.263152	-107.830680
658.0	10.60	142.00	652.6	-46.1	57.6	1,529,187.84	2,340,188.39	39.263116	-107.830641
752.0	12.30	145.90	744.7	-61.2	68.5	1,529,172.46	2,340,198.93	39.263074	-107.830602
847.0	14.90	146.50	837.1	-79.7	80.9	1,529,153.58	2,340,210.87	39.263023	-107.830558
942.0	16.90	148.90	928.4	-101.7	94.8	1,529,131.22	2,340,224.17	39.262963	-107.830509
1,036.0	18.70	149.80	1,017.9	-126.5	109.5	1,529,106.13	2,340,238.17	39.262895	-107.830458
1,131.0	20.00	151.40	1,107.6	-153.9	124.9	1,529,078.31	2,340,252.90	39.262820	-107.830403
1,225.0	20.40	146.10	1,195.8	-181.6	141.7	1,529,050.18	2,340,269.02	39.262743	-107.830344



Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols Federal 0994-24-18E
Project:	Mesa County, CO	TVD Reference:	well @ 7236.0usft (H&P #290)
Site:	Nichols 24-07 Pad	MD Reference:	well @ 7236.0usft (H&P #290)
Well:	Nichols Federal 0994-24-18E	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,320.0	20.10	145.20	1,284.9	-208.8	160.3	1,529,022.56	2,340,286.87	39.262669	-107.830278
1,414.0	19.50	144.80	1,373.3	-234.8	178.5	1,528,996.02	2,340,304.45	39.262597	-107.830214
1,515.0	18.59	145.32	1,468.8	-261.9	197.4	1,528,968.53	2,340,322.63	39.262523	-107.830147
1,618.0	17.30	143.60	1,566.8	-287.7	215.8	1,528,942.24	2,340,340.40	39.262452	-107.830082
1,717.0	19.20	142.90	1,660.8	-312.5	234.4	1,528,916.93	2,340,358.31	39.262384	-107.830016
1,811.0	19.10	141.50	1,749.6	-336.9	253.3	1,528,892.09	2,340,376.57	39.262317	-107.829950
1,906.0	19.90	145.40	1,839.2	-362.4	272.2	1,528,866.14	2,340,394.77	39.262247	-107.829883
2,000.0	19.50	144.80	1,927.7	-388.3	290.3	1,528,839.70	2,340,412.23	39.262176	-107.829819
2,095.0	19.00	142.80	2,017.4	-413.6	308.8	1,528,813.96	2,340,430.06	39.262106	-107.829754
2,189.0	20.60	148.20	2,105.8	-439.9	326.7	1,528,787.26	2,340,447.35	39.262034	-107.829690
2,284.0	19.80	148.00	2,195.0	-467.7	344.1	1,528,758.97	2,340,463.97	39.261958	-107.829629
2,378.0	21.10	146.00	2,283.0	-495.2	362.0	1,528,730.99	2,340,481.15	39.261882	-107.829566
2,473.0	20.50	145.80	2,371.9	-523.2	380.9	1,528,702.58	2,340,499.34	39.261806	-107.829499
2,567.0	21.90	144.90	2,459.5	-551.1	400.2	1,528,674.14	2,340,517.95	39.261729	-107.829431
2,662.0	23.80	143.30	2,547.0	-581.0	421.9	1,528,643.73	2,340,538.82	39.261647	-107.829354
2,756.0	25.50	142.20	2,632.5	-612.2	445.6	1,528,611.93	2,340,561.75	39.261561	-107.829270
2,851.0	26.90	140.90	2,717.7	-645.0	471.7	1,528,578.43	2,340,586.99	39.261471	-107.829178
2,946.0	26.60	140.60	2,802.5	-678.2	498.7	1,528,544.64	2,340,613.19	39.261380	-107.829083
3,041.0	27.30	140.80	2,887.2	-711.5	526.0	1,528,510.63	2,340,639.59	39.261289	-107.828986
3,135.0	28.30	141.90	2,970.4	-745.7	553.4	1,528,475.70	2,340,666.08	39.261195	-107.828890
3,230.0	30.10	142.00	3,053.3	-782.2	582.0	1,528,438.48	2,340,693.70	39.261094	-107.828789
3,324.0	31.20	143.40	3,134.2	-820.3	611.0	1,528,399.63	2,340,721.74	39.260990	-107.828686
3,419.0	32.30	143.60	3,214.9	-860.5	640.7	1,528,358.69	2,340,750.43	39.260879	-107.828581
3,514.0	33.80	144.30	3,294.6	-902.4	671.2	1,528,316.03	2,340,779.83	39.260764	-107.828474
3,608.0	33.90	144.40	3,372.6	-945.0	701.7	1,528,272.72	2,340,809.25	39.260648	-107.828366
3,703.0	33.80	144.10	3,451.5	-987.9	732.6	1,528,228.99	2,340,839.05	39.260530	-107.828257
3,798.0	33.90	144.20	3,530.4	-1,030.8	763.6	1,528,185.32	2,340,868.93	39.260412	-107.828147
3,892.0	33.80	143.50	3,608.5	-1,073.1	794.5	1,528,142.26	2,340,898.72	39.260296	-107.828038
3,986.0	33.50	143.50	3,686.7	-1,114.9	825.5	1,528,099.61	2,340,928.62	39.260181	-107.827929
4,081.0	32.50	142.60	3,766.4	-1,156.3	856.6	1,528,057.48	2,340,958.65	39.260067	-107.827819
4,176.0	34.30	144.70	3,845.7	-1,198.4	887.6	1,528,014.57	2,340,988.53	39.259952	-107.827710
4,270.0	34.00	143.90	3,923.5	-1,241.3	918.4	1,527,970.94	2,341,018.21	39.259834	-107.827601
4,364.0	33.80	143.50	4,001.5	-1,283.5	949.4	1,527,927.91	2,341,048.15	39.259718	-107.827491
4,459.0	33.40	142.00	4,080.7	-1,325.4	981.2	1,527,885.26	2,341,078.89	39.259603	-107.827379
4,554.0	34.10	143.40	4,159.7	-1,367.4	1,013.2	1,527,842.47	2,341,109.77	39.259488	-107.827266
4,648.0	34.20	143.10	4,237.5	-1,409.6	1,044.8	1,527,799.39	2,341,140.25	39.259372	-107.827155
4,743.0	33.90	142.90	4,316.2	-1,452.1	1,076.8	1,527,756.10	2,341,171.16	39.259255	-107.827041
4,838.0	34.10	143.20	4,394.9	-1,494.6	1,108.7	1,527,712.84	2,341,202.00	39.259138	-107.826929
4,932.0	33.40	143.20	4,473.1	-1,536.4	1,140.0	1,527,670.24	2,341,232.20	39.259024	-107.826818
5,027.0	32.60	142.90	4,552.8	-1,577.7	1,171.1	1,527,628.10	2,341,262.23	39.258910	-107.826708
5,121.0	31.00	142.40	4,632.6	-1,617.1	1,201.1	1,527,587.97	2,341,291.25	39.258802	-107.826602
5,216.0	30.10	141.80	4,714.5	-1,655.2	1,230.8	1,527,549.11	2,341,319.92	39.258697	-107.826498
5,311.0	26.90	142.00	4,797.9	-1,690.9	1,258.8	1,527,512.74	2,341,346.97	39.258599	-107.826399
5,406.0	25.60	141.90	4,883.1	-1,724.0	1,284.7	1,527,479.00	2,341,372.01	39.258509	-107.826307
5,500.0	24.10	142.40	4,968.4	-1,755.2	1,308.9	1,527,447.20	2,341,395.44	39.258423	-107.826222
5,595.0	20.10	144.60	5,056.4	-1,783.8	1,330.2	1,527,417.98	2,341,416.00	39.258344	-107.826146
5,690.0	17.20	144.90	5,146.4	-1,808.6	1,347.7	1,527,392.74	2,341,432.89	39.258276	-107.826085
5,784.0	15.00	144.00	5,236.7	-1,829.9	1,362.9	1,527,371.14	2,341,447.49	39.258218	-107.826031
5,879.0	11.60	142.90	5,329.2	-1,847.4	1,375.9	1,527,353.24	2,341,460.02	39.258170	-107.825985
5,974.0	7.80	140.90	5,422.8	-1,860.1	1,385.7	1,527,340.37	2,341,469.53	39.258135	-107.825950
6,068.0	4.20	136.30	5,516.3	-1,867.5	1,392.1	1,527,332.77	2,341,475.74	39.258115	-107.825928
6,163.0	3.80	139.30	5,611.0	-1,872.4	1,396.6	1,527,327.75	2,341,480.07	39.258101	-107.825912
6,258.0	2.90	129.30	5,705.9	-1,876.3	1,400.5	1,527,323.74	2,341,483.88	39.258090	-107.825898
6,352.0	2.60	139.40	5,799.8	-1,879.4	1,403.7	1,527,320.54	2,341,487.02	39.258082	-107.825887
6,447.0	2.50	141.90	5,894.7	-1,882.7	1,406.4	1,527,317.20	2,341,489.62	39.258073	-107.825877



Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols Federal 0994-24-18E
Project:	Mesa County, CO	TVD Reference:	well @ 7236.0usft (H&P #290)
Site:	Nichols 24-07 Pad	MD Reference:	well @ 7236.0usft (H&P #290)
Well:	Nichols Federal 0994-24-18E	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
6,541.0	2.50	148.00	5,988.6	-1,886.1	1,408.7	1,527,313.79	2,341,491.88	39.258064	-107.825869	
6,636.0	1.40	166.30	6,083.5	-1,888.9	1,410.1	1,527,310.87	2,341,493.18	39.258056	-107.825864	
6,731.0	1.30	162.50	6,178.5	-1,891.1	1,410.7	1,527,308.70	2,341,493.73	39.258050	-107.825862	
6,825.0	0.75	136.00	6,272.5	-1,892.6	1,411.4	1,527,307.22	2,341,494.44	39.258046	-107.825860	
6,920.0	0.66	128.97	6,367.5	-1,893.3	1,412.3	1,527,306.41	2,341,495.27	39.258044	-107.825857	
7,014.0	0.62	132.22	6,461.5	-1,894.0	1,413.1	1,527,305.71	2,341,496.05	39.258042	-107.825854	
7,109.0	0.48	151.91	6,556.5	-1,894.7	1,413.7	1,527,305.00	2,341,496.60	39.258040	-107.825852	
7,203.0	0.97	196.12	6,650.5	-1,895.8	1,413.6	1,527,303.89	2,341,496.54	39.258037	-107.825852	
7,298.0	1.36	205.08	6,745.4	-1,897.6	1,412.9	1,527,302.11	2,341,495.79	39.258032	-107.825854	
7,393.0	1.58	200.51	6,840.4	-1,899.9	1,412.0	1,527,299.89	2,341,494.80	39.258026	-107.825858	
7,487.0	1.80	186.80	6,934.4	-1,902.6	1,411.4	1,527,297.23	2,341,494.10	39.258018	-107.825860	
7,582.0	1.98	192.60	7,029.3	-1,905.6	1,410.8	1,527,294.16	2,341,493.49	39.258010	-107.825862	
7,677.0	1.98	197.30	7,124.3	-1,908.8	1,410.0	1,527,291.01	2,341,492.56	39.258001	-107.825865	
7,771.0	1.98	200.07	7,218.2	-1,911.9	1,408.9	1,527,287.96	2,341,491.44	39.257993	-107.825868	
7,866.0	2.02	201.04	7,313.2	-1,915.0	1,407.8	1,527,284.89	2,341,490.20	39.257984	-107.825872	
7,920.0	2.02	205.52	7,367.1	-1,916.7	1,407.0	1,527,283.16	2,341,489.40	39.257979	-107.825875	
7,979.0	2.02	205.52	7,426.1	-1,918.6	1,406.1	1,527,281.31	2,341,488.46	39.257974	-107.825878	
Projection to TD @ 7979.0' MD / 7426.1' TVD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
383.0	381.7	-14.1	23.4	First MWD Survey @ 383.0' MD / 381.7' TVD	
7,979.0	7,426.1	-1,918.6	1,406.1	Projection to TD @ 7979.0' MD / 7426.1' TVD	

Checked By: _____	Approved By: _____	Date: _____
-------------------	--------------------	-------------