



Laramie Energy, LLC

Mesa County, CO

Nichols 24-07 Pad

Nichols Federal 0994-24-20E

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

21 May, 2018





Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols Federal 0994-24-20E
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 0994-24-20E	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 0994-24-20E				
Well Position	+N/-S	0.0 usft	Northing:	1,529,221.21 usft	Latitude:	39.263203
	+E/-W	0.0 usft	Easting:	2,340,129.94 usft	Longitude:	-107.830850
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	5/10/2018	9.43	65.40	51,296.50000000

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	151.24	

Survey Program	Date	5/21/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
232.0	8,128.0	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	1,529,221.21	2,340,129.94	39.263203	-107.830850
232.0	7.00	133.00	231.4	-9.7	10.4	1,529,211.29	2,340,140.04	39.263177	-107.830814
First MWD Survey @ 232.0' MD / 231.4' TVD									
293.0	9.60	138.70	291.8	-16.0	16.4	1,529,204.78	2,340,145.95	39.263159	-107.830792
383.0	12.10	149.90	380.2	-29.8	26.1	1,529,190.74	2,340,155.28	39.263121	-107.830758
473.0	14.60	154.00	467.7	-48.2	35.8	1,529,172.13	2,340,164.51	39.263071	-107.830724
563.0	17.40	154.40	554.2	-70.5	46.6	1,529,149.53	2,340,174.73	39.263009	-107.830686
658.0	19.30	154.70	644.4	-97.5	59.5	1,529,122.20	2,340,186.88	39.262935	-107.830640
753.0	21.70	152.20	733.4	-127.2	74.4	1,529,092.10	2,340,201.01	39.262854	-107.830588
847.0	22.50	151.50	820.5	-158.4	91.0	1,529,060.50	2,340,216.89	39.262768	-107.830529
942.0	22.20	151.40	908.3	-190.2	108.3	1,529,028.33	2,340,233.34	39.262681	-107.830468
1,037.0	22.10	150.90	996.3	-221.5	125.6	1,528,996.53	2,340,249.81	39.262595	-107.830407



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Site:	Nichols 24-07 Pad	MD Reference:	well @ 7236.0usft (H&P #290)
Well:	Nichols Federal 0994-24-20E	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
1,131.0	21.90	153.10	1,083.5	-252.6	142.1	1,528,965.03	2,340,265.54	39.262509	-107.830348
1,226.0	21.40	153.40	1,171.8	-283.9	157.9	1,528,933.34	2,340,280.51	39.262424	-107.830293
1,320.0	23.10	150.10	1,258.8	-315.2	174.8	1,528,901.59	2,340,296.57	39.262338	-107.830233
1,415.0	22.90	153.00	1,346.2	-347.9	192.5	1,528,868.52	2,340,313.41	39.262248	-107.830171
1,509.0	22.10	152.30	1,433.1	-379.8	209.0	1,528,836.16	2,340,329.11	39.262160	-107.830112
1,624.0	21.50	150.60	1,539.9	-417.3	229.4	1,528,798.13	2,340,348.54	39.262057	-107.830040
1,718.0	23.60	153.00	1,626.7	-449.1	246.4	1,528,765.93	2,340,364.72	39.261970	-107.829980
1,812.0	22.30	152.90	1,713.2	-481.7	263.0	1,528,732.87	2,340,380.54	39.261880	-107.829921
1,907.0	25.00	153.70	1,800.2	-515.8	280.2	1,528,698.40	2,340,396.77	39.261787	-107.829861
2,001.0	23.80	153.00	1,885.8	-550.5	297.6	1,528,663.25	2,340,413.29	39.261692	-107.829799
2,096.0	22.50	153.40	1,973.2	-583.8	314.4	1,528,629.50	2,340,429.27	39.261600	-107.829740
2,191.0	24.20	152.30	2,060.4	-617.3	331.6	1,528,595.57	2,340,445.60	39.261508	-107.829679
2,285.0	23.30	151.60	2,146.4	-650.7	349.4	1,528,561.71	2,340,462.53	39.261416	-107.829616
2,380.0	24.00	152.30	2,233.5	-684.4	367.3	1,528,527.63	2,340,479.58	39.261324	-107.829553
2,474.0	23.20	152.20	2,319.6	-717.7	384.8	1,528,493.89	2,340,496.24	39.261233	-107.829491
2,568.0	24.10	151.50	2,405.7	-750.9	402.6	1,528,460.20	2,340,513.18	39.261141	-107.829428
2,663.0	26.50	150.70	2,491.6	-786.5	422.3	1,528,424.17	2,340,531.89	39.261044	-107.829359
2,758.0	29.00	149.70	2,575.7	-824.8	444.3	1,528,385.25	2,340,552.89	39.260938	-107.829281
2,852.0	31.00	149.40	2,657.1	-865.3	468.1	1,528,344.14	2,340,575.67	39.260827	-107.829197
2,947.0	33.30	147.20	2,737.5	-908.3	494.7	1,528,300.48	2,340,601.14	39.260709	-107.829103
3,042.0	35.20	147.50	2,816.0	-953.4	523.5	1,528,254.74	2,340,628.82	39.260586	-107.829001
3,136.0	37.20	146.90	2,891.9	-1,000.0	553.6	1,528,207.33	2,340,657.69	39.260457	-107.828895
3,231.0	38.50	147.40	2,966.9	-1,049.0	585.2	1,528,157.56	2,340,688.04	39.260323	-107.828783
3,326.0	37.50	147.20	3,041.7	-1,098.2	616.8	1,528,107.55	2,340,718.36	39.260188	-107.828672
3,420.0	38.40	148.60	3,115.9	-1,147.2	647.5	1,528,057.81	2,340,747.80	39.260053	-107.828563
3,515.0	36.90	148.50	3,191.1	-1,196.7	677.8	1,528,007.54	2,340,776.80	39.259917	-107.828457
3,609.0	38.20	148.20	3,265.6	-1,245.4	707.8	1,527,958.02	2,340,805.60	39.259784	-107.828350
3,704.0	38.00	147.90	3,340.4	-1,295.2	738.9	1,527,907.50	2,340,835.33	39.259647	-107.828241
3,799.0	37.60	146.50	3,415.4	-1,344.1	770.4	1,527,857.77	2,340,865.60	39.259513	-107.828129
3,893.0	39.30	148.50	3,489.0	-1,393.4	801.8	1,527,807.68	2,340,895.71	39.259377	-107.828019
3,988.0	38.60	148.00	3,562.9	-1,444.2	833.2	1,527,756.10	2,340,925.83	39.259238	-107.827908
4,082.0	38.30	147.80	3,636.5	-1,493.7	864.3	1,527,705.81	2,340,955.61	39.259102	-107.827798
4,177.0	38.00	146.20	3,711.2	-1,542.9	896.2	1,527,655.79	2,340,986.29	39.258967	-107.827685
4,271.0	38.80	148.60	3,784.9	-1,592.1	927.7	1,527,605.81	2,341,016.46	39.258832	-107.827574
4,366.0	38.30	147.20	3,859.2	-1,642.3	959.1	1,527,554.87	2,341,046.62	39.258694	-107.827463
4,460.0	37.90	147.20	3,933.2	-1,691.0	990.5	1,527,505.33	2,341,076.78	39.258560	-107.827352
4,555.0	39.00	149.10	4,007.6	-1,741.2	1,021.7	1,527,454.36	2,341,106.64	39.258422	-107.827242
4,650.0	37.30	149.30	4,082.3	-1,791.6	1,051.8	1,527,403.21	2,341,135.39	39.258284	-107.827136
4,744.0	35.30	149.00	4,158.0	-1,839.4	1,080.3	1,527,354.71	2,341,162.68	39.258153	-107.827035
4,839.0	35.70	149.20	4,235.4	-1,886.7	1,108.6	1,527,306.67	2,341,189.79	39.258023	-107.826935
4,933.0	34.60	149.20	4,312.2	-1,933.2	1,136.3	1,527,259.49	2,341,216.30	39.257895	-107.826837
5,028.0	33.00	148.90	4,391.2	-1,978.5	1,163.5	1,527,213.48	2,341,242.30	39.257771	-107.826741
5,123.0	30.30	147.80	4,472.0	-2,021.0	1,189.6	1,527,170.39	2,341,267.34	39.257654	-107.826649
5,217.0	29.00	146.90	4,553.7	-2,060.1	1,214.7	1,527,130.60	2,341,291.41	39.257547	-107.826560
5,312.0	25.70	147.40	4,638.1	-2,096.8	1,238.4	1,527,093.35	2,341,314.14	39.257446	-107.826477
5,407.0	22.80	144.80	4,724.7	-2,129.2	1,260.1	1,527,060.40	2,341,335.02	39.257357	-107.826400
5,501.0	22.00	146.70	4,811.6	-2,158.8	1,280.3	1,527,030.29	2,341,354.42	39.257276	-107.826329
5,596.0	21.30	144.90	4,899.9	-2,187.8	1,300.0	1,527,000.81	2,341,373.36	39.257196	-107.826259
5,691.0	18.50	146.10	4,989.2	-2,214.4	1,318.3	1,526,973.71	2,341,391.00	39.257123	-107.826195
5,786.0	15.60	146.70	5,080.1	-2,237.6	1,333.7	1,526,950.14	2,341,405.82	39.257059	-107.826140
5,880.0	16.00	146.10	5,170.5	-2,258.9	1,347.9	1,526,928.46	2,341,419.44	39.257001	-107.826090
5,975.0	12.80	146.10	5,262.5	-2,278.5	1,361.1	1,526,908.52	2,341,432.10	39.256947	-107.826044
6,069.0	10.30	147.40	5,354.6	-2,294.2	1,371.4	1,526,892.54	2,341,442.04	39.256904	-107.826007
6,164.0	8.40	148.10	5,448.3	-2,307.3	1,379.6	1,526,879.28	2,341,449.94	39.256868	-107.825978
6,259.0	7.90	149.30	5,542.4	-2,318.8	1,386.6	1,526,867.60	2,341,456.64	39.256836	-107.825953



Survey Report - Geographic



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Site:	Nichols 24-07 Pad	MD Reference:	well @ 7236.0usft (H&P #290)
Well:	Nichols Federal 0994-24-20E	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
6,354.0	4.80	151.50	5,636.8	-2,327.9	1,391.9	1,526,858.36	2,341,461.64	39.256811	-107.825935
6,448.0	4.70	150.00	5,730.5	-2,334.7	1,395.7	1,526,851.48	2,341,465.27	39.256793	-107.825921
6,543.0	4.10	161.10	5,825.2	-2,341.3	1,398.7	1,526,844.82	2,341,468.14	39.256775	-107.825911
6,637.0	3.30	157.30	5,919.0	-2,347.0	1,400.9	1,526,839.09	2,341,470.13	39.256759	-107.825903
6,732.0	2.20	150.70	6,013.9	-2,351.1	1,402.8	1,526,834.93	2,341,471.97	39.256748	-107.825896
6,826.0	0.80	75.60	6,107.8	-2,352.5	1,404.3	1,526,833.48	2,341,473.45	39.256744	-107.825891
6,921.0	1.00	82.40	6,202.8	-2,352.2	1,405.8	1,526,833.72	2,341,474.92	39.256745	-107.825886
7,016.0	0.31	69.02	6,297.8	-2,352.0	1,406.9	1,526,833.89	2,341,475.99	39.256745	-107.825882
7,110.0	0.09	241.20	6,391.8	-2,351.9	1,407.0	1,526,833.94	2,341,476.16	39.256745	-107.825881
7,205.0	0.40	272.49	6,486.8	-2,352.0	1,406.6	1,526,833.93	2,341,475.77	39.256745	-107.825883
7,299.0	0.88	225.38	6,580.8	-2,352.5	1,405.8	1,526,833.46	2,341,474.91	39.256744	-107.825886
7,394.0	2.07	242.43	6,675.8	-2,353.8	1,403.7	1,526,832.20	2,341,472.84	39.256740	-107.825893
7,489.0	2.37	246.21	6,770.7	-2,355.4	1,400.4	1,526,830.70	2,341,469.48	39.256736	-107.825905
7,583.0	1.63	215.18	6,864.7	-2,357.2	1,397.9	1,526,828.89	2,341,466.89	39.256731	-107.825914
7,678.0	1.23	195.76	6,959.6	-2,359.3	1,396.8	1,526,826.84	2,341,465.78	39.256725	-107.825917
7,773.0	1.89	194.53	7,054.6	-2,361.8	1,396.2	1,526,824.36	2,341,465.04	39.256718	-107.825920
7,867.0	1.85	189.43	7,148.5	-2,364.8	1,395.5	1,526,821.38	2,341,464.33	39.256710	-107.825922
7,961.0	1.67	193.82	7,242.5	-2,367.6	1,394.9	1,526,818.56	2,341,463.68	39.256702	-107.825924
8,068.0	2.02	197.87	7,349.4	-2,370.9	1,394.0	1,526,815.28	2,341,462.64	39.256693	-107.825927
8,128.0	2.02	197.87	7,409.4	-2,373.0	1,393.3	1,526,813.29	2,341,461.94	39.256688	-107.825930
Projection to TD @ 8128.0' MD / 7409.4' TVD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
232.0	231.4	-9.7	10.4	First MWD Survey @ 232.0' MD / 231.4' TVD
8,128.0	7,409.4	-2,373.0	1,393.3	Projection to TD @ 8128.0' MD / 7409.4' TVD