



Laramie Energy, LLC

Mesa County, CO

Nichols 24-06A

Nichols 0994-24-08E

A-11

Design: Wellbore #1

Survey Report - Geographic

29 November, 2017





Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols 0994-24-08E
Project:	Mesa County, CO	TVD Reference:	well @ 7161.0usft (H&P #290)
Site:	Nichols 24-06A	MD Reference:	well @ 7161.0usft (H&P #290)
Well:	Nichols 0994-24-08E	North Reference:	True
Wellbore:	A-11	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 24-06A				
Site Position:		Northing:	1,529,702.08 usft	Latitude:	39.264528
From:	Lat/Long	Easting:	2,340,203.74 usft	Longitude:	-107.830633
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.47 °

Well	Nichols 0994-24-08E					
Well Position	+N/-S	0.0 usft	Northing:	1,529,708.90 usft	Latitude:	39.264547
	+E/-W	0.0 usft	Easting:	2,340,207.03 usft	Longitude:	-107.830622
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,137.0 usft

Wellbore	A-11				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/14/2017	9.55	65.42	51,370.28249162

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	85.74	

Survey Program	Date	11/29/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
200.0	7,627.0	QES MWD Surveys (A-11)	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	1,529,708.90	2,340,207.03	39.264547	-107.830622
200.0	2.20	187.20	200.0	-3.8	-0.5	1,529,705.10	2,340,206.45	39.264537	-107.830624
First MWD Survey @ 200.0' MD / 200.0' TVD									
291.0	1.10	143.40	290.9	-6.2	-0.2	1,529,702.66	2,340,206.69	39.264530	-107.830623
381.0	1.30	98.20	380.9	-7.1	1.3	1,529,701.78	2,340,208.19	39.264528	-107.830618
472.0	2.10	67.70	471.9	-6.6	3.9	1,529,702.20	2,340,210.77	39.264529	-107.830608
563.0	1.90	70.60	562.8	-5.5	6.9	1,529,703.26	2,340,213.76	39.264532	-107.830598
653.0	3.10	75.00	652.7	-4.3	10.6	1,529,704.29	2,340,217.55	39.264535	-107.830585
743.0	3.80	81.90	742.6	-3.3	15.9	1,529,705.20	2,340,222.88	39.264538	-107.830566
834.0	5.20	90.00	833.3	-2.9	23.0	1,529,705.44	2,340,230.00	39.264539	-107.830541
926.0	7.20	82.90	924.7	-2.2	32.9	1,529,705.90	2,340,239.90	39.264541	-107.830506
1,020.0	9.90	81.40	1,017.7	-0.2	46.8	1,529,707.48	2,340,253.79	39.264546	-107.830457



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Site:	Nichols 24-06A	MD Reference:	well @ 7161.0usft (H&P #290)
Well:	Nichols 0994-24-08E	North Reference:	True
Wellbore:	A-11	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
1,115.0	12.10	84.70	1,110.9	1.9	64.8	1,529,709.16	2,340,271.83	39.264552	-107.830394
1,209.0	14.40	84.80	1,202.4	3.9	86.2	1,529,710.58	2,340,293.32	39.264558	-107.830318
1,304.0	17.10	85.20	1,293.8	6.1	111.9	1,529,712.16	2,340,319.06	39.264564	-107.830227
1,398.0	17.10	84.40	1,383.7	8.6	139.4	1,529,713.96	2,340,346.64	39.264571	-107.830130
1,492.0	18.00	84.70	1,473.3	11.3	167.6	1,529,715.93	2,340,374.92	39.264578	-107.830030
1,591.0	18.20	84.20	1,567.4	14.3	198.3	1,529,718.11	2,340,405.59	39.264586	-107.829922
1,686.0	17.70	84.00	1,657.8	17.3	227.4	1,529,720.38	2,340,434.78	39.264595	-107.829819
1,781.0	16.80	81.40	1,748.5	20.9	255.3	1,529,723.22	2,340,462.80	39.264604	-107.829720
1,875.0	18.60	84.50	1,838.1	24.3	283.7	1,529,725.96	2,340,491.24	39.264614	-107.829620
1,970.0	17.50	85.70	1,928.4	26.9	313.0	1,529,727.73	2,340,520.62	39.264621	-107.829517
2,064.0	17.10	84.00	2,018.1	29.4	340.8	1,529,729.52	2,340,548.51	39.264628	-107.829418
2,159.0	18.50	88.70	2,108.6	31.2	369.8	1,529,730.58	2,340,577.51	39.264633	-107.829316
2,253.0	19.20	91.70	2,197.5	31.1	400.2	1,529,729.68	2,340,607.86	39.264632	-107.829209
2,348.0	17.80	89.50	2,287.6	30.7	430.3	1,529,728.57	2,340,637.98	39.264631	-107.829102
2,442.0	17.10	88.90	2,377.3	31.1	458.5	1,529,728.24	2,340,666.16	39.264632	-107.829003
2,537.0	16.20	89.60	2,468.3	31.5	485.7	1,529,727.90	2,340,693.38	39.264633	-107.828907
2,631.0	18.70	86.70	2,558.0	32.4	513.9	1,529,728.14	2,340,721.56	39.264636	-107.828807
2,726.0	18.20	85.60	2,648.1	34.4	543.9	1,529,729.38	2,340,751.59	39.264642	-107.828701
2,821.0	17.20	86.40	2,738.6	36.5	572.7	1,529,730.66	2,340,780.45	39.264647	-107.828600
2,915.0	16.70	85.50	2,828.5	38.4	600.0	1,529,731.89	2,340,807.82	39.264652	-107.828503
3,010.0	18.10	88.80	2,919.2	39.8	628.4	1,529,732.54	2,340,836.21	39.264656	-107.828403
3,105.0	17.30	89.20	3,009.7	40.3	657.2	1,529,732.31	2,340,865.10	39.264658	-107.828301
3,199.0	18.30	83.60	3,099.2	42.1	685.9	1,529,733.41	2,340,893.78	39.264663	-107.828200
3,294.0	17.80	83.30	3,189.5	45.5	715.1	1,529,736.02	2,340,923.10	39.264672	-107.828096
3,389.0	17.40	82.60	3,280.1	49.0	743.6	1,529,738.81	2,340,951.69	39.264682	-107.827996
3,484.0	16.10	84.00	3,371.0	52.2	770.8	1,529,741.32	2,340,978.95	39.264690	-107.827900
3,578.0	18.10	87.70	3,460.9	54.2	798.4	1,529,742.56	2,341,006.54	39.264696	-107.827802
3,673.0	17.50	86.60	3,551.3	55.6	827.4	1,529,743.26	2,341,035.57	39.264700	-107.827700
3,767.0	16.90	88.40	3,641.1	56.8	855.2	1,529,743.76	2,341,063.36	39.264703	-107.827602
3,862.0	16.40	86.90	3,732.1	57.9	882.4	1,529,744.18	2,341,090.58	39.264706	-107.827506
3,957.0	18.30	88.10	3,822.8	59.2	910.7	1,529,744.67	2,341,118.90	39.264709	-107.827406
4,051.0	17.80	89.00	3,912.2	59.9	939.8	1,529,744.66	2,341,148.03	39.264711	-107.827303
4,145.0	17.70	83.50	4,001.7	61.8	968.3	1,529,745.80	2,341,176.63	39.264717	-107.827202
4,240.0	17.10	83.90	4,092.4	64.9	996.6	1,529,748.19	2,341,204.94	39.264725	-107.827102
4,335.0	16.00	85.00	4,183.4	67.5	1,023.5	1,529,750.12	2,341,231.93	39.264732	-107.827007
4,429.0	17.00	84.30	4,273.6	70.0	1,050.1	1,529,751.94	2,341,258.56	39.264739	-107.826913
4,524.0	17.80	79.70	4,364.2	74.0	1,078.2	1,529,755.19	2,341,286.76	39.264750	-107.826814
4,619.0	16.10	80.40	4,455.1	78.8	1,105.5	1,529,759.28	2,341,314.15	39.264763	-107.826718
4,713.0	16.00	83.30	4,545.4	82.5	1,131.2	1,529,762.31	2,341,339.96	39.264773	-107.826627
4,807.0	14.80	83.40	4,636.1	85.3	1,156.0	1,529,764.56	2,341,364.82	39.264781	-107.826539
4,902.0	13.40	83.60	4,728.2	88.0	1,179.0	1,529,766.59	2,341,387.87	39.264788	-107.826458
4,997.0	12.10	84.30	4,820.8	90.2	1,199.8	1,529,768.27	2,341,408.77	39.264795	-107.826385
5,091.0	10.70	84.30	4,913.0	92.0	1,218.3	1,529,769.64	2,341,427.30	39.264800	-107.826319
5,186.0	10.40	86.60	5,006.4	93.4	1,235.6	1,529,770.58	2,341,444.66	39.264803	-107.826258
5,280.0	9.70	85.80	5,098.9	94.5	1,252.0	1,529,771.24	2,341,461.05	39.264806	-107.826200
5,375.0	8.00	83.50	5,192.8	95.8	1,266.6	1,529,772.21	2,341,475.63	39.264810	-107.826149
5,469.0	6.60	84.50	5,286.0	97.1	1,278.4	1,529,773.16	2,341,487.54	39.264814	-107.826107
5,564.0	5.80	82.70	5,380.5	98.2	1,288.6	1,529,774.03	2,341,497.76	39.264817	-107.826071
5,658.0	5.20	84.80	5,474.1	99.2	1,297.6	1,529,774.79	2,341,506.73	39.264819	-107.826039
5,753.0	5.00	87.00	5,568.7	99.8	1,306.0	1,529,775.18	2,341,515.17	39.264821	-107.826009
5,847.0	4.60	85.10	5,662.3	100.4	1,313.9	1,529,775.51	2,341,523.03	39.264822	-107.825982
5,942.0	3.60	71.90	5,757.1	101.6	1,320.5	1,529,776.60	2,341,529.69	39.264826	-107.825958
6,036.0	3.20	57.60	5,850.9	103.9	1,325.5	1,529,778.79	2,341,534.77	39.264832	-107.825941
6,131.0	2.60	54.70	5,945.8	106.6	1,329.5	1,529,781.35	2,341,538.83	39.264840	-107.825926
6,225.0	1.90	60.20	6,039.7	108.6	1,332.6	1,529,783.28	2,341,541.97	39.264845	-107.825916



Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols 0994-24-08E
Project:	Mesa County, CO	TVD Reference:	well @ 7161.0usft (H&P #290)
Site:	Nichols 24-06A	MD Reference:	well @ 7161.0usft (H&P #290)
Well:	Nichols 0994-24-08E	North Reference:	True
Wellbore:	A-11	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
6,320.0	1.20	61.70	6,134.7	109.9	1,334.8	1,529,784.47	2,341,544.25	39.264849	-107.825908
6,415.0	0.80	68.30	6,229.7	110.6	1,336.3	1,529,785.15	2,341,545.76	39.264851	-107.825902
6,509.0	0.60	114.30	6,323.7	110.6	1,337.4	1,529,785.17	2,341,546.82	39.264851	-107.825899
6,604.0	0.20	88.60	6,418.7	110.4	1,338.0	1,529,784.95	2,341,547.43	39.264850	-107.825896
6,698.0	0.10	228.70	6,512.7	110.4	1,338.1	1,529,784.90	2,341,547.53	39.264850	-107.825896
6,792.0	0.30	202.70	6,606.7	110.1	1,338.0	1,529,784.62	2,341,547.37	39.264849	-107.825897
6,887.0	1.40	167.80	6,701.7	108.7	1,338.1	1,529,783.25	2,341,547.48	39.264845	-107.825896
6,982.0	2.40	180.50	6,796.6	105.6	1,338.3	1,529,780.12	2,341,547.63	39.264837	-107.825895
7,076.0	1.70	188.90	6,890.6	102.2	1,338.1	1,529,776.79	2,341,547.31	39.264828	-107.825896
7,171.0	1.90	206.20	6,985.5	99.4	1,337.2	1,529,774.00	2,341,546.33	39.264820	-107.825899
7,266.0	2.10	214.50	7,080.5	96.6	1,335.5	1,529,771.20	2,341,544.57	39.264812	-107.825905
7,360.0	1.90	212.20	7,174.4	93.9	1,333.7	1,529,768.51	2,341,542.70	39.264805	-107.825912
7,455.0	2.00	209.80	7,269.3	91.1	1,332.0	1,529,765.78	2,341,540.96	39.264797	-107.825918
7,550.0	1.60	211.50	7,364.3	88.5	1,330.5	1,529,763.25	2,341,539.38	39.264790	-107.825923
7,571.0	1.80	211.70	7,385.3	88.0	1,330.2	1,529,762.73	2,341,539.04	39.264789	-107.825924
7,627.0	1.80	211.70	7,441.3	86.5	1,329.3	1,529,761.26	2,341,538.08	39.264784	-107.825927
Projection to TD @ 7627.0' MD / 7441.3' TVD									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
200.0	200.0	-3.8	-0.5	First MWD Survey @ 200.0' MD / 200.0' TVD	
7,627.0	7,441.3	86.5	1,329.3	Projection to TD @ 7627.0' MD / 7441.3' TVD	