



Laramie Energy, LLC

Mesa County, CO

Nichols 24-06A

Nichols 0994-24-04E

A-7

Design: A-7

Survey Report - Geographic

28 December, 2017





Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols 0994-24-04E
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 0994-24-04E	North Reference:	True
Wellbore:	A-7	Survey Calculation Method:	Minimum Curvature
Design:	A-7	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 0994-24-04E					
Well Position	+N/-S	0.0 usft	Northing:	1,529,735.89 usft	Latitude:	39.264622
	+E/-W	0.0 usft	Easting:	2,340,219.34 usft	Longitude:	-107.830581
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,137.0 usft

Wellbore	A-7				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	12/24/2017	9.54	65.42	51,358.16022901

Design	A-7				
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	51.73	

Survey Program	Date	12/28/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
111.0	7,721.0	QES MWD Surveys (A-7)	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	1,529,735.89	2,340,219.34	39.264622	-107.830581
111.0	1.40	90.10	111.0	0.0	1.4	1,529,735.86	2,340,220.69	39.264622	-107.830576
First MWD Survey @ 111.0' MD / 111.0' TVD									
293.0	4.40	119.00	292.7	-3.4	9.7	1,529,732.25	2,340,228.93	39.264613	-107.830547
383.0	5.90	82.90	382.4	-4.5	17.3	1,529,730.96	2,340,236.51	39.264610	-107.830520
473.0	8.00	72.00	471.7	-2.0	27.8	1,529,733.19	2,340,247.12	39.264617	-107.830483
565.0	9.90	59.40	562.6	4.0	40.7	1,529,738.87	2,340,260.17	39.264633	-107.830437
655.0	10.60	46.80	651.2	13.6	53.4	1,529,748.14	2,340,273.11	39.264659	-107.830393
745.0	11.20	41.60	739.6	25.8	65.3	1,529,760.04	2,340,285.26	39.264693	-107.830351
836.0	11.50	40.10	828.8	39.4	77.0	1,529,773.28	2,340,297.31	39.264730	-107.830309
927.0	11.50	47.50	918.0	52.4	89.5	1,529,786.02	2,340,310.17	39.264766	-107.830265
1,022.0	13.40	53.30	1,010.7	65.4	105.3	1,529,798.59	2,340,326.31	39.264802	-107.830209



Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols 0994-24-04E
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 0994-24-04E	North Reference:	True
Wellbore:	A-7	Survey Calculation Method:	Minimum Curvature
Design:	A-7	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
1,116.0	15.30	53.20	1,101.8	79.4	124.0	1,529,812.05	2,340,345.33	39.264840	-107.830143
1,211.0	17.20	52.40	1,193.0	95.4	145.2	1,529,827.58	2,340,366.90	39.264884	-107.830069
1,305.0	20.10	49.30	1,282.1	114.5	168.4	1,529,845.99	2,340,390.64	39.264936	-107.829986
1,400.0	20.20	49.70	1,371.2	135.7	193.3	1,529,866.60	2,340,416.06	39.264995	-107.829898
1,494.0	20.90	46.60	1,459.3	157.7	217.9	1,529,887.98	2,340,441.18	39.265055	-107.829812
1,587.0	21.10	46.50	1,546.1	180.7	242.1	1,529,910.28	2,340,465.96	39.265118	-107.829726
1,681.0	20.60	45.70	1,633.9	203.8	266.2	1,529,932.85	2,340,490.65	39.265182	-107.829641
1,776.0	20.70	50.20	1,722.8	226.3	291.0	1,529,954.62	2,340,516.08	39.265243	-107.829553
1,870.0	19.60	49.00	1,811.1	247.2	315.7	1,529,974.96	2,340,541.27	39.265301	-107.829466
1,965.0	21.00	52.10	1,900.2	268.2	341.2	1,529,995.21	2,340,567.26	39.265358	-107.829376
2,059.0	20.50	51.00	1,988.1	288.9	367.2	1,530,015.24	2,340,593.87	39.265415	-107.829284
2,154.0	20.00	51.30	2,077.2	309.5	392.9	1,530,035.20	2,340,620.00	39.265472	-107.829194
2,248.0	19.60	51.10	2,165.7	329.4	417.7	1,530,054.51	2,340,645.31	39.265527	-107.829106
2,342.0	18.90	49.80	2,254.4	349.2	441.6	1,530,073.62	2,340,669.71	39.265581	-107.829022
2,437.0	21.90	53.10	2,343.4	369.7	467.5	1,530,093.52	2,340,696.16	39.265637	-107.828930
2,532.0	20.80	53.10	2,431.9	390.5	495.1	1,530,113.57	2,340,724.34	39.265694	-107.828832
2,626.0	20.40	53.50	2,519.9	410.3	521.7	1,530,132.65	2,340,751.35	39.265748	-107.828739
2,721.0	20.30	52.40	2,609.0	430.2	548.0	1,530,151.87	2,340,778.22	39.265803	-107.828646
2,815.0	19.90	52.40	2,697.2	449.9	573.6	1,530,170.92	2,340,804.31	39.265857	-107.828555
2,910.0	19.60	53.10	2,786.7	469.3	599.2	1,530,189.69	2,340,830.35	39.265911	-107.828465
3,005.0	19.40	53.30	2,876.2	488.3	624.6	1,530,208.03	2,340,856.23	39.265963	-107.828375
3,100.0	21.60	49.10	2,965.2	509.2	650.4	1,530,228.24	2,340,882.62	39.266020	-107.828284
3,194.0	21.60	49.10	3,052.6	531.9	676.6	1,530,250.22	2,340,909.35	39.266082	-107.828192
3,289.0	21.40	49.20	3,141.0	554.6	702.9	1,530,272.31	2,340,936.26	39.266145	-107.828098
3,384.0	20.70	49.30	3,229.6	576.9	728.8	1,530,293.91	2,340,962.68	39.266206	-107.828007
3,478.0	20.60	50.00	3,317.6	598.4	754.0	1,530,314.72	2,340,988.48	39.266265	-107.827918
3,573.0	20.30	49.30	3,406.6	619.9	779.3	1,530,335.55	2,341,014.32	39.266324	-107.827829
3,667.0	19.70	48.50	3,494.9	641.0	803.6	1,530,356.06	2,341,039.08	39.266382	-107.827743
3,762.0	21.30	51.80	3,583.9	662.3	829.1	1,530,376.68	2,341,065.17	39.266440	-107.827653
3,857.0	20.90	52.10	3,672.6	683.3	856.1	1,530,397.06	2,341,092.64	39.266498	-107.827558
3,951.0	20.40	51.70	3,760.5	703.8	882.1	1,530,416.84	2,341,119.24	39.266554	-107.827465
4,046.0	20.20	51.60	3,849.6	724.3	908.0	1,530,436.61	2,341,145.60	39.266610	-107.827374
4,140.0	19.80	51.40	3,937.9	744.3	933.2	1,530,455.98	2,341,171.27	39.266665	-107.827285
4,235.0	19.60	51.20	4,027.4	764.3	958.1	1,530,475.35	2,341,196.77	39.266720	-107.827197
4,329.0	19.20	49.70	4,116.1	784.2	982.2	1,530,494.60	2,341,221.35	39.266775	-107.827112
4,424.0	19.10	51.40	4,205.8	804.0	1,006.3	1,530,513.78	2,341,245.91	39.266829	-107.827027
4,519.0	19.80	52.30	4,295.4	823.5	1,031.2	1,530,532.67	2,341,271.28	39.266883	-107.826939
4,614.0	19.10	51.60	4,385.0	843.0	1,056.1	1,530,551.52	2,341,296.68	39.266936	-107.826851
4,708.0	18.20	50.90	4,474.0	861.8	1,079.5	1,530,569.73	2,341,320.60	39.266988	-107.826768
4,802.0	18.10	51.60	4,563.3	880.1	1,102.4	1,530,587.46	2,341,343.90	39.267038	-107.826688
4,897.0	17.50	51.70	4,653.8	898.2	1,125.1	1,530,604.89	2,341,367.13	39.267088	-107.826607
4,991.0	16.70	51.20	4,743.6	915.4	1,146.7	1,530,621.55	2,341,389.18	39.267135	-107.826531
5,086.0	16.20	50.40	4,834.7	932.4	1,167.6	1,530,638.01	2,341,410.46	39.267182	-107.826457
5,180.0	15.50	49.50	4,925.2	948.9	1,187.2	1,530,654.02	2,341,430.53	39.267227	-107.826388
5,275.0	15.00	48.90	5,016.8	965.2	1,206.2	1,530,669.85	2,341,449.86	39.267272	-107.826321
5,370.0	14.30	50.20	5,108.7	980.8	1,224.4	1,530,684.97	2,341,468.53	39.267315	-107.826256
5,464.0	13.20	50.00	5,200.0	995.1	1,241.6	1,530,698.86	2,341,486.04	39.267354	-107.826196
5,558.0	12.20	49.60	5,291.7	1,008.5	1,257.4	1,530,711.78	2,341,502.16	39.267391	-107.826140
5,653.0	11.10	51.50	5,384.8	1,020.7	1,272.2	1,530,723.60	2,341,517.27	39.267424	-107.826088
5,747.0	9.60	54.30	5,477.3	1,030.9	1,285.6	1,530,733.46	2,341,530.97	39.267452	-107.826040
5,842.0	7.70	52.60	5,571.2	1,039.4	1,297.1	1,530,741.65	2,341,542.68	39.267476	-107.826000
5,936.0	6.70	49.30	5,664.4	1,046.8	1,306.3	1,530,748.81	2,341,552.02	39.267496	-107.825967
6,031.0	4.60	46.40	5,759.0	1,053.0	1,313.2	1,530,754.87	2,341,559.14	39.267513	-107.825943
6,125.0	2.80	46.90	5,852.8	1,057.2	1,317.6	1,530,758.93	2,341,563.66	39.267525	-107.825927
6,220.0	1.10	42.20	5,947.7	1,059.4	1,319.9	1,530,761.13	2,341,566.02	39.267531	-107.825919



Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols 0994-24-04E
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 0994-24-04E	North Reference:	True
Wellbore:	A-7	Survey Calculation Method:	Minimum Curvature
Design:	A-7	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
6,315.0	0.83	46.99	6,042.7	1,060.6	1,321.1	1,530,762.25	2,341,567.16	39.267534	-107.825915
6,409.0	0.48	5.86	6,136.7	1,061.4	1,321.6	1,530,763.09	2,341,567.72	39.267536	-107.825913
6,504.0	0.31	11.04	6,231.7	1,062.1	1,321.7	1,530,763.73	2,341,567.83	39.267538	-107.825913
6,599.0	0.22	336.15	6,326.7	1,062.5	1,321.7	1,530,764.15	2,341,567.82	39.267539	-107.825913
6,693.0	0.31	359.44	6,420.7	1,062.9	1,321.6	1,530,764.57	2,341,567.75	39.267540	-107.825913
6,787.0	0.22	292.12	6,514.7	1,063.3	1,321.4	1,530,764.90	2,341,567.59	39.267541	-107.825914
6,882.0	0.53	286.41	6,609.7	1,063.4	1,320.8	1,530,765.11	2,341,567.01	39.267542	-107.825916
6,977.0	0.75	237.74	6,704.7	1,063.2	1,319.9	1,530,764.93	2,341,566.05	39.267541	-107.825919
7,071.0	0.70	251.07	6,798.7	1,062.7	1,318.8	1,530,764.44	2,341,564.98	39.267540	-107.825923
7,166.0	0.62	225.15	6,893.7	1,062.2	1,317.9	1,530,763.91	2,341,564.05	39.267538	-107.825926
7,260.0	0.40	160.90	6,987.7	1,061.5	1,317.6	1,530,763.25	2,341,563.78	39.267536	-107.825927
7,355.0	0.70	181.70	7,082.6	1,060.6	1,317.7	1,530,762.35	2,341,563.85	39.267534	-107.825927
7,450.0	0.90	218.60	7,177.6	1,059.4	1,317.3	1,530,761.20	2,341,563.34	39.267531	-107.825929
7,545.0	1.00	227.90	7,272.6	1,058.3	1,316.2	1,530,760.09	2,341,562.23	39.267528	-107.825932
7,639.0	1.30	230.20	7,366.6	1,057.1	1,314.7	1,530,758.90	2,341,560.77	39.267524	-107.825937
7,667.0	1.30	232.60	7,394.6	1,056.7	1,314.3	1,530,758.51	2,341,560.26	39.267523	-107.825939
7,721.0	1.30	232.60	7,448.6	1,055.9	1,313.3	1,530,757.79	2,341,559.27	39.267521	-107.825943

Projection to TD @ 7721.0' MD / 7448.6' TVD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
111.0	111.0	0.0	1.4	First MWD Survey @ 111.0' MD / 111.0' TVD
7,721.0	7,448.6	1,055.9	1,313.3	Projection to TD @ 7721.0' MD / 7448.6' TVD

Checked By: _____ Approved By: _____ Date: _____