

Devon Energy

Eddy County, NM (NAD-83)

Spud Muffin 31-30 Com

Spud Muffin 31-30 332H

OH

Design: OH

Survey Report - Geographic

12 March, 2019

LEAM Drilling Services

Survey Report - Geographic

Company:	Devon Energy	Local Co-ordinate Reference:	Well Spud Muffin 31-30 332H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Site:	Spud Muffin 31-30 Com	MD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Well:	Spud Muffin 31-30 332H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	LEAM Multi_User Db

Project	Eddy County, NM (NAD-83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Spud Muffin 31-30 Com		
Site Position:	Northing:	456,837.82 usft	Latitude: 32° 15' 19.9378 N
From: Map	Easting:	637,646.02 usft	Longitude: 104° 1' 18.4160 W
Position Uncertainty:	0.00 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0.17 °

Well	Spud Muffin 31-30 332H		
Well Position	+N/-S	0.00 usft	Northing: 456,993.86 usft
	+E/-W	0.00 usft	Easting: 636,785.66 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Ground Level:	2,959.40 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
	HDGM	12/3/2018	7.12
			60.03
			47,955.00000000

Design	OH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			0.00

Survey Program	Date	3/12/2019		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
172.00	19,890.00	Survey #1 - MWD (OH)	LEAM MWD+HDGM	MWD+HDGM
19,942.00	19,942.00	Projection (OH)	Project	Projection

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Map	Map	Latitude	Longitude
Depth	(°)	(°)	Depth	(usft)	(usft)	Northing	Easting		
(usft)			(usft)			(usft)	(usft)		
0.00	0.00	0.00	0.00	0.00	0.00	456,993.86	636,785.66	32° 15' 21.5066 N	104° 1' 28.4302 W
172.00	0.20	77.80	172.00	0.06	0.29	456,993.92	636,785.96	32° 15' 21.5072 N	104° 1' 28.4267 W
263.00	0.00	248.30	263.00	0.10	0.45	456,993.96	636,786.11	32° 15' 21.5075 N	104° 1' 28.4249 W
427.00	0.30	353.60	427.00	0.52	0.40	456,994.38	636,786.07	32° 15' 21.5117 N	104° 1' 28.4255 W
514.00	0.80	337.10	513.99	1.31	0.14	456,995.17	636,785.80	32° 15' 21.5195 N	104° 1' 28.4285 W
606.00	1.00	336.50	605.98	2.64	-0.43	456,996.50	636,785.23	32° 15' 21.5327 N	104° 1' 28.4351 W
699.00	1.60	336.50	698.96	4.57	-1.27	456,998.43	636,784.39	32° 15' 21.5518 N	104° 1' 28.4448 W
781.00	1.40	323.00	780.93	6.42	-2.33	457,000.28	636,783.33	32° 15' 21.5702 N	104° 1' 28.4571 W
873.00	0.70	301.20	872.92	7.61	-3.49	457,001.47	636,782.18	32° 15' 21.5820 N	104° 1' 28.4705 W
965.00	1.10	331.10	964.90	8.68	-4.40	457,002.54	636,781.27	32° 15' 21.5925 N	104° 1' 28.4811 W
1,057.00	1.10	328.50	1,056.89	10.20	-5.28	457,004.06	636,780.38	32° 15' 21.6077 N	104° 1' 28.4914 W

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Site:	Spud Muffin 31-30 Com	MD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Well:	Spud Muffin 31-30 332H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	LEAM Multi_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	
1,149.00	0.20	318.60	1,148.88	11.07	-5.85	457,004.93	636,779.81	32° 15' 21.6163 N	104° 1' 28.4979 W	
1,240.00	0.50	321.40	1,239.88	11.50	-6.20	457,005.36	636,779.46	32° 15' 21.6206 N	104° 1' 28.5020 W	
1,331.00	0.60	2.60	1,330.87	12.29	-6.43	457,006.15	636,779.23	32° 15' 21.6284 N	104° 1' 28.5046 W	
1,423.00	0.40	113.60	1,422.87	12.64	-6.11	457,006.50	636,779.55	32° 15' 21.6318 N	104° 1' 28.5009 W	
1,514.00	0.40	93.60	1,513.87	12.50	-5.51	457,006.36	636,780.16	32° 15' 21.6304 N	104° 1' 28.4939 W	
1,610.00	0.40	29.10	1,609.87	12.77	-5.01	457,006.63	636,780.66	32° 15' 21.6330 N	104° 1' 28.4881 W	
1,703.00	1.00	359.00	1,702.86	13.86	-4.87	457,007.72	636,780.80	32° 15' 21.6439 N	104° 1' 28.4864 W	
1,794.00	1.20	342.50	1,793.84	15.57	-5.17	457,009.43	636,780.50	32° 15' 21.6607 N	104° 1' 28.4898 W	
1,888.00	0.40	10.50	1,887.84	16.83	-5.40	457,010.69	636,780.26	32° 15' 21.6732 N	104° 1' 28.4925 W	
1,982.00	0.50	142.10	1,981.83	16.83	-5.09	457,010.69	636,780.57	32° 15' 21.6732 N	104° 1' 28.4889 W	
2,076.00	0.00	170.30	2,075.83	16.50	-4.84	457,010.36	636,780.83	32° 15' 21.6700 N	104° 1' 28.4860 W	
2,171.00	0.60	177.60	2,170.83	16.01	-4.82	457,009.87	636,780.85	32° 15' 21.6651 N	104° 1' 28.4857 W	
2,266.00	2.00	181.00	2,265.80	13.85	-4.83	457,007.71	636,780.84	32° 15' 21.6438 N	104° 1' 28.4859 W	
2,361.00	3.60	178.20	2,360.69	9.21	-4.76	457,003.07	636,780.90	32° 15' 21.5978 N	104° 1' 28.4853 W	
2,455.00	3.40	153.90	2,454.52	3.76	-3.44	456,997.62	636,782.22	32° 15' 21.5438 N	104° 1' 28.4701 W	
2,550.00	4.30	157.80	2,549.30	-2.07	-0.86	456,991.79	636,784.81	32° 15' 21.4861 N	104° 1' 28.4402 W	
2,644.00	4.30	157.90	2,643.04	-8.60	1.80	456,985.26	636,787.46	32° 15' 21.4214 N	104° 1' 28.4095 W	
2,739.00	3.80	152.80	2,737.80	-14.70	4.58	456,979.16	636,790.24	32° 15' 21.3610 N	104° 1' 28.3773 W	
2,833.00	3.50	149.90	2,831.61	-19.95	7.44	456,973.91	636,793.11	32° 15' 21.3089 N	104° 1' 28.3442 W	
2,928.00	3.40	150.70	2,926.44	-24.91	10.28	456,968.95	636,795.94	32° 15' 21.2597 N	104° 1' 28.3113 W	
3,023.00	3.30	151.30	3,021.28	-29.77	12.97	456,964.09	636,798.63	32° 15' 21.2116 N	104° 1' 28.2802 W	
3,117.00	3.10	148.30	3,115.13	-34.31	15.60	456,959.55	636,801.27	32° 15' 21.1666 N	104° 1' 28.2496 W	
3,212.00	3.90	157.80	3,209.95	-39.48	18.17	456,954.38	636,803.84	32° 15' 21.1153 N	104° 1' 28.2199 W	
3,307.00	4.90	162.00	3,304.67	-46.33	20.65	456,947.53	636,806.31	32° 15' 21.0475 N	104° 1' 28.1913 W	
3,401.00	4.30	162.20	3,398.37	-53.51	22.96	456,940.35	636,808.63	32° 15' 20.9764 N	104° 1' 28.1645 W	
3,495.00	5.40	166.40	3,492.03	-61.16	25.08	456,932.70	636,810.75	32° 15' 20.9006 N	104° 1' 28.1401 W	
3,589.00	6.80	171.50	3,585.50	-70.96	26.94	456,922.90	636,812.61	32° 15' 20.8035 N	104° 1' 28.1188 W	
3,684.00	7.70	170.80	3,679.74	-82.81	28.79	456,911.05	636,814.46	32° 15' 20.6863 N	104° 1' 28.0976 W	
3,779.00	7.60	170.30	3,773.89	-95.28	30.87	456,898.58	636,816.53	32° 15' 20.5628 N	104° 1' 28.0739 W	
3,874.00	7.20	169.70	3,868.10	-107.33	32.99	456,886.53	636,818.66	32° 15' 20.4435 N	104° 1' 28.0495 W	
3,969.00	6.90	169.70	3,962.38	-118.81	35.08	456,875.05	636,820.74	32° 15' 20.3299 N	104° 1' 28.0256 W	
4,062.00	7.60	169.00	4,054.64	-130.34	37.25	456,863.52	636,822.91	32° 15' 20.2157 N	104° 1' 28.0007 W	
4,157.00	7.30	169.50	4,148.83	-142.44	39.55	456,851.42	636,825.21	32° 15' 20.0959 N	104° 1' 27.9744 W	
4,251.00	6.80	170.60	4,242.12	-153.80	41.55	456,840.06	636,827.21	32° 15' 19.9834 N	104° 1' 27.9515 W	
4,346.00	7.10	169.40	4,336.42	-165.12	43.54	456,828.74	636,829.21	32° 15' 19.8713 N	104° 1' 27.9286 W	
4,441.00	7.40	170.40	4,430.67	-176.93	45.64	456,816.93	636,831.31	32° 15' 19.7544 N	104° 1' 27.9045 W	
4,534.00	7.10	171.30	4,522.92	-188.51	47.51	456,805.35	636,833.18	32° 15' 19.6397 N	104° 1' 27.8832 W	
4,629.00	6.90	171.30	4,617.21	-199.96	49.26	456,793.90	636,834.93	32° 15' 19.5264 N	104° 1' 27.8632 W	
4,723.00	6.60	172.50	4,710.56	-210.89	50.82	456,782.97	636,836.49	32° 15' 19.4181 N	104° 1' 27.8454 W	
4,817.00	7.00	172.20	4,803.90	-221.92	52.31	456,771.94	636,837.97	32° 15' 19.3089 N	104° 1' 27.8285 W	
4,912.00	6.60	174.10	4,898.23	-233.09	53.65	456,760.77	636,839.32	32° 15' 19.1984 N	104° 1' 27.8132 W	
5,007.00	6.90	171.30	4,992.57	-244.16	55.08	456,749.70	636,840.74	32° 15' 19.0888 N	104° 1' 27.7969 W	
5,102.00	6.90	170.30	5,086.89	-255.43	56.90	456,738.43	636,842.57	32° 15' 18.9773 N	104° 1' 27.7761 W	
5,197.00	7.00	167.10	5,181.19	-266.70	59.16	456,727.17	636,844.82	32° 15' 18.8657 N	104° 1' 27.7502 W	
5,291.00	6.10	166.20	5,274.57	-277.13	61.63	456,716.73	636,847.29	32° 15' 18.7624 N	104° 1' 27.7218 W	
5,386.00	5.90	168.10	5,369.05	-286.81	63.84	456,707.05	636,849.50	32° 15' 18.6665 N	104° 1' 27.6964 W	
5,480.00	7.20	166.00	5,462.44	-297.25	66.26	456,696.61	636,851.92	32° 15' 18.5631 N	104° 1' 27.6685 W	
5,574.00	7.40	167.10	5,555.68	-308.87	69.03	456,684.99	636,854.70	32° 15' 18.4481 N	104° 1' 27.6366 W	
5,668.00	6.80	168.00	5,648.95	-320.21	71.54	456,673.65	636,857.21	32° 15' 18.3357 N	104° 1' 27.6077 W	
5,763.00	7.50	163.40	5,743.22	-331.66	74.48	456,662.20	636,860.15	32° 15' 18.2224 N	104° 1' 27.5739 W	
5,858.00	8.20	158.60	5,837.33	-343.91	78.73	456,649.95	636,864.39	32° 15' 18.1011 N	104° 1' 27.5249 W	
5,953.00	7.80	158.80	5,931.40	-356.22	83.53	456,637.64	636,869.19	32° 15' 17.9790 N	104° 1' 27.4693 W	
6,047.00	6.90	158.60	6,024.63	-367.43	87.90	456,626.43	636,873.56	32° 15' 17.8680 N	104° 1' 27.4189 W	
6,142.00	6.40	158.80	6,118.99	-377.68	91.89	456,616.18	636,877.56	32° 15' 17.7665 N	104° 1' 27.3727 W	
6,235.00	6.50	158.30	6,211.40	-387.40	95.71	456,606.46	636,881.38	32° 15' 17.6702 N	104° 1' 27.3285 W	

LEAM Drilling Services

Survey Report - Geographic

Company:	Devon Energy	Local Co-ordinate Reference:	Well Spud Muffin 31-30 332H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Site:	Spud Muffin 31-30 Com	MD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Well:	Spud Muffin 31-30 332H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	LEAM Multi_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
6,329.00	8.40	161.60	6,304.60	-398.86	99.85	456,595.00	636,885.51	32° 15' 17.5566 N	104° 1' 27.2807 W
6,424.00	8.30	163.70	6,398.60	-412.03	103.96	456,581.83	636,889.63	32° 15' 17.4262 N	104° 1' 27.2332 W
6,519.00	7.20	163.20	6,492.73	-424.31	107.61	456,569.55	636,893.27	32° 15' 17.3046 N	104° 1' 27.1912 W
6,614.00	5.70	161.80	6,587.12	-434.49	110.80	456,559.37	636,896.47	32° 15' 17.2038 N	104° 1' 27.1543 W
6,709.00	5.90	160.80	6,681.64	-443.58	113.88	456,550.28	636,899.55	32° 15' 17.1137 N	104° 1' 27.1188 W
6,804.00	6.00	161.80	6,776.12	-452.91	117.04	456,540.95	636,902.70	32° 15' 17.0213 N	104° 1' 27.0823 W
6,899.00	4.70	158.80	6,870.71	-461.25	120.00	456,532.61	636,905.66	32° 15' 16.9386 N	104° 1' 27.0482 W
6,993.00	3.20	147.20	6,964.48	-467.05	122.81	456,526.81	636,908.48	32° 15' 16.8812 N	104° 1' 27.0156 W
7,088.00	3.10	153.20	7,059.34	-471.57	125.41	456,522.29	636,911.07	32° 15' 16.8364 N	104° 1' 26.9855 W
7,182.00	4.80	172.70	7,153.12	-477.74	127.05	456,516.12	636,912.72	32° 15' 16.7753 N	104° 1' 26.9666 W
7,277.00	5.20	176.90	7,247.76	-485.98	127.79	456,507.88	636,913.45	32° 15' 16.6937 N	104° 1' 26.9583 W
7,371.00	4.80	176.60	7,341.40	-494.16	128.25	456,499.70	636,913.92	32° 15' 16.6127 N	104° 1' 26.9531 W
7,467.00	5.20	177.80	7,437.03	-502.52	128.66	456,491.34	636,914.32	32° 15' 16.5300 N	104° 1' 26.9487 W
7,561.00	4.90	175.70	7,530.67	-510.78	129.12	456,483.08	636,914.79	32° 15' 16.4483 N	104° 1' 26.9436 W
7,655.00	3.80	174.50	7,624.40	-517.88	129.72	456,475.98	636,915.39	32° 15' 16.3779 N	104° 1' 26.9368 W
7,750.00	2.60	172.20	7,719.25	-523.15	130.32	456,470.71	636,915.98	32° 15' 16.3258 N	104° 1' 26.9301 W
7,845.00	2.80	158.30	7,814.14	-527.44	131.47	456,466.42	636,917.13	32° 15' 16.2833 N	104° 1' 26.9168 W
7,939.00	2.10	144.10	7,908.06	-530.97	133.33	456,462.89	636,918.99	32° 15' 16.2483 N	104° 1' 26.8953 W
8,033.00	1.80	79.70	8,002.01	-532.10	135.79	456,461.76	636,921.45	32° 15' 16.2371 N	104° 1' 26.8667 W
8,128.00	2.60	59.00	8,096.94	-530.73	139.10	456,463.13	636,924.77	32° 15' 16.2506 N	104° 1' 26.8280 W
8,223.00	1.80	41.20	8,191.87	-528.49	141.93	456,465.37	636,927.60	32° 15' 16.2726 N	104° 1' 26.7950 W
8,312.00	1.30	39.40	8,280.84	-526.66	143.50	456,467.20	636,929.16	32° 15' 16.2907 N	104° 1' 26.7767 W
8,406.00	0.60	89.90	8,374.83	-525.84	144.66	456,468.02	636,930.33	32° 15' 16.2988 N	104° 1' 26.7631 W
8,501.00	1.00	175.30	8,469.82	-526.66	145.23	456,467.20	636,930.89	32° 15' 16.2906 N	104° 1' 26.7565 W
8,596.00	0.80	205.80	8,564.81	-528.09	145.01	456,465.77	636,930.67	32° 15' 16.2766 N	104° 1' 26.7591 W
8,690.00	1.30	277.10	8,658.80	-528.54	143.67	456,465.32	636,929.33	32° 15' 16.2720 N	104° 1' 26.7748 W
8,784.00	0.60	211.60	8,752.79	-528.83	142.35	456,465.03	636,928.01	32° 15' 16.2692 N	104° 1' 26.7901 W
8,879.00	1.60	131.20	8,847.77	-530.13	143.09	456,463.73	636,928.75	32° 15' 16.2564 N	104° 1' 26.7816 W
8,966.00	1.10	152.40	8,934.75	-531.67	144.39	456,462.19	636,930.05	32° 15' 16.2411 N	104° 1' 26.7665 W
9,078.00	1.70	160.20	9,046.71	-534.19	145.45	456,459.67	636,931.11	32° 15' 16.2162 N	104° 1' 26.7542 W
9,173.00	2.90	17.70	9,141.68	-533.22	146.66	456,460.64	636,932.32	32° 15' 16.2257 N	104° 1' 26.7401 W
9,268.00	12.90	2.70	9,235.66	-520.31	147.89	456,473.55	636,933.55	32° 15' 16.3535 N	104° 1' 26.7253 W
9,316.00	18.50	4.00	9,281.85	-507.35	148.67	456,486.51	636,934.34	32° 15' 16.4817 N	104° 1' 26.7158 W
9,362.00	24.10	3.90	9,324.69	-490.68	149.82	456,503.18	636,935.49	32° 15' 16.6465 N	104° 1' 26.7018 W
9,409.00	29.60	3.20	9,366.61	-469.50	151.13	456,524.36	636,936.79	32° 15' 16.8561 N	104° 1' 26.6860 W
9,456.00	35.30	1.10	9,406.26	-444.32	152.03	456,549.54	636,937.70	32° 15' 17.1053 N	104° 1' 26.6745 W
9,503.00	40.20	359.40	9,443.41	-415.55	152.14	456,578.31	636,937.80	32° 15' 17.3900 N	104° 1' 26.6724 W
9,550.00	44.20	359.70	9,478.22	-383.99	151.89	456,609.87	636,937.56	32° 15' 17.7023 N	104° 1' 26.6742 W
9,597.00	49.20	359.10	9,510.44	-349.80	151.53	456,644.06	636,937.19	32° 15' 18.0407 N	104° 1' 26.6773 W
9,645.00	53.90	358.30	9,540.28	-312.23	150.67	456,681.63	636,936.33	32° 15' 18.4125 N	104° 1' 26.6860 W
9,692.00	57.00	359.30	9,566.94	-273.53	149.86	456,720.33	636,935.53	32° 15' 18.7955 N	104° 1' 26.6941 W
9,740.00	60.20	0.20	9,591.94	-232.57	149.69	456,761.29	636,935.35	32° 15' 19.2008 N	104° 1' 26.6948 W
9,787.00	64.50	0.30	9,613.75	-190.94	149.87	456,802.92	636,935.53	32° 15' 19.6127 N	104° 1' 26.6912 W
9,834.00	70.10	0.00	9,631.88	-147.60	149.98	456,846.26	636,935.65	32° 15' 20.0416 N	104° 1' 26.6885 W
9,881.00	73.30	359.90	9,646.63	-102.98	149.94	456,890.88	636,935.61	32° 15' 20.4832 N	104° 1' 26.6874 W
9,929.00	76.30	0.40	9,659.22	-56.67	150.06	456,937.19	636,935.73	32° 15' 20.9415 N	104° 1' 26.6845 W
9,976.00	79.40	359.40	9,669.11	-10.73	149.98	456,983.13	636,935.65	32° 15' 21.3961 N	104° 1' 26.6839 W
10,024.00	81.90	358.70	9,676.91	36.62	149.20	457,030.48	636,934.86	32° 15' 21.8647 N	104° 1' 26.6915 W
10,071.00	88.40	359.30	9,680.88	83.42	148.38	457,077.28	636,934.04	32° 15' 22.3279 N	104° 1' 26.6994 W
10,119.00	89.30	359.00	9,681.84	131.41	147.67	457,125.27	636,933.33	32° 15' 22.8027 N	104° 1' 26.7061 W
10,213.00	89.30	359.20	9,682.99	225.39	146.19	457,219.25	636,931.86	32° 15' 23.7328 N	104° 1' 26.7201 W
10,308.00	90.00	358.10	9,683.57	320.36	143.95	457,314.22	636,929.62	32° 15' 24.6272 N	104° 1' 26.7430 W
10,402.00	91.30	357.30	9,682.50	414.27	140.18	457,408.13	636,925.85	32° 15' 25.6022 N	104° 1' 26.7838 W
10,496.00	88.60	358.50	9,682.59	508.20	136.74	457,502.06	636,922.40	32° 15' 26.5317 N	104° 1' 26.8207 W
10,591.00	88.80	0.10	9,684.74	603.17	135.58	457,597.03	636,921.24	32° 15' 27.4715 N	104° 1' 26.8310 W

LEAM Drilling Services

Survey Report - Geographic

Company:	Devon Energy	Local Co-ordinate Reference:	Well Spud Muffin 31-30 332H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Site:	Spud Muffin 31-30 Com	MD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Well:	Spud Muffin 31-30 332H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	LEAM Multi_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
10,686.00	88.90	359.80	9,686.65	698.15	135.49	457,692.01	636,921.16	32° 15' 28.4115 N	104° 1' 26.8288 W
10,780.00	89.10	359.50	9,688.29	792.13	134.92	457,785.99	636,920.58	32° 15' 29.3415 N	104° 1' 26.8324 W
10,874.00	90.10	359.60	9,688.95	886.12	134.18	457,879.98	636,919.85	32° 15' 30.2717 N	104° 1' 26.8378 W
10,969.00	90.50	359.20	9,688.45	981.12	133.19	457,974.98	636,918.85	32° 15' 31.2118 N	104° 1' 26.8462 W
11,064.00	90.50	0.20	9,687.62	1,076.11	132.69	458,069.97	636,918.35	32° 15' 32.1518 N	104° 1' 26.8488 W
11,159.00	87.40	1.10	9,689.36	1,171.08	133.77	458,164.94	636,919.43	32° 15' 33.0916 N	104° 1' 26.8331 W
11,253.00	87.20	0.60	9,693.79	1,264.96	135.16	458,258.82	636,920.82	32° 15' 34.0206 N	104° 1' 26.8137 W
11,348.00	87.10	0.50	9,698.51	1,359.84	136.07	458,353.70	636,921.73	32° 15' 34.9595 N	104° 1' 26.7999 W
11,443.00	89.60	1.20	9,701.25	1,454.78	137.48	458,448.64	636,923.14	32° 15' 35.8990 N	104° 1' 26.7803 W
11,537.00	89.30	1.20	9,702.15	1,548.76	139.45	458,542.62	636,925.11	32° 15' 36.8289 N	104° 1' 26.7542 W
11,632.00	89.30	0.30	9,703.31	1,643.74	140.69	458,637.60	636,926.36	32° 15' 37.7688 N	104° 1' 26.7366 W
11,727.00	90.20	1.10	9,703.72	1,738.73	141.85	458,732.59	636,927.52	32° 15' 38.7088 N	104° 1' 26.7199 W
11,822.00	90.60	359.50	9,703.06	1,833.72	142.35	458,827.58	636,928.01	32° 15' 39.6488 N	104° 1' 26.7109 W
11,916.00	91.20	359.10	9,701.58	1,927.70	141.20	458,921.56	636,926.87	32° 15' 40.5788 N	104° 1' 26.7211 W
12,010.00	91.20	359.20	9,699.62	2,021.67	139.81	459,015.53	636,925.47	32° 15' 41.5088 N	104° 1' 26.7342 W
12,105.00	91.20	359.70	9,697.63	2,116.65	138.90	459,110.51	636,924.56	32° 15' 42.4487 N	104° 1' 26.7416 W
12,199.00	90.20	358.90	9,696.48	2,210.63	137.75	459,204.49	636,923.41	32° 15' 43.3787 N	104° 1' 26.7518 W
12,294.00	91.30	359.70	9,695.23	2,305.61	136.59	459,299.47	636,922.25	32° 15' 44.3187 N	104° 1' 26.7622 W
12,388.00	91.50	1.00	9,692.94	2,399.58	137.16	459,393.44	636,922.82	32° 15' 45.2486 N	104° 1' 26.7523 W
12,483.00	90.70	1.10	9,691.11	2,494.55	138.90	459,488.41	636,924.57	32° 15' 46.1883 N	104° 1' 26.7289 W
12,577.00	90.90	1.50	9,689.80	2,588.51	141.03	459,582.37	636,926.70	32° 15' 47.1181 N	104° 1' 26.7009 W
12,672.00	86.10	359.20	9,692.29	2,683.45	141.62	459,677.31	636,927.28	32° 15' 48.0575 N	104° 1' 26.6909 W
12,767.00	85.80	358.80	9,699.00	2,778.19	139.96	459,772.05	636,925.63	32° 15' 48.9952 N	104° 1' 26.7070 W
12,861.00	87.00	359.30	9,704.90	2,871.99	138.41	459,865.85	636,924.07	32° 15' 49.9235 N	104° 1' 26.7220 W
12,956.00	88.90	359.30	9,708.30	2,966.92	137.25	459,960.78	636,922.91	32° 15' 50.8629 N	104° 1' 26.7323 W
13,051.00	90.80	0.90	9,708.55	3,061.91	137.41	460,055.77	636,923.08	32° 15' 51.8029 N	104° 1' 26.7272 W
13,145.00	90.60	1.60	9,707.40	3,155.88	139.46	460,149.74	636,925.13	32° 15' 52.7328 N	104° 1' 26.7001 W
13,239.00	91.20	1.10	9,705.92	3,249.84	141.68	460,243.70	636,927.34	32° 15' 53.6625 N	104° 1' 26.6712 W
13,334.00	91.20	2.40	9,703.93	3,344.78	144.58	460,338.64	636,930.24	32° 15' 54.6019 N	104° 1' 26.6342 W
13,429.00	89.10	0.80	9,703.68	3,439.73	147.23	460,433.59	636,932.89	32° 15' 55.5415 N	104° 1' 26.6002 W
13,522.00	87.80	0.00	9,706.20	3,532.69	147.88	460,526.55	636,933.54	32° 15' 56.4614 N	104° 1' 26.5895 W
13,617.00	87.90	0.00	9,709.76	3,627.63	147.88	460,621.49	636,933.54	32° 15' 57.4008 N	104° 1' 26.5863 W
13,712.00	88.30	359.50	9,712.91	3,722.57	147.46	460,716.43	636,933.13	32° 15' 58.3404 N	104° 1' 26.5879 W
13,806.00	88.00	359.20	9,715.95	3,816.52	146.40	460,810.38	636,932.06	32° 15' 59.2701 N	104° 1' 26.5972 W
13,901.00	88.80	0.10	9,718.60	3,911.48	145.82	460,905.34	636,931.48	32° 16' 0.2098 N	104° 1' 26.6008 W
13,996.00	88.20	359.80	9,721.09	4,006.44	145.74	461,000.30	636,931.40	32° 16' 1.1496 N	104° 1' 26.5985 W
14,091.00	92.00	1.40	9,720.92	4,101.42	146.73	461,095.28	636,932.40	32° 16' 2.0894 N	104° 1' 26.5838 W
14,185.00	91.90	0.60	9,717.72	4,195.35	148.37	461,189.21	636,934.03	32° 16' 3.0189 N	104° 1' 26.5615 W
14,279.00	92.20	1.40	9,714.36	4,289.27	150.01	461,283.13	636,935.67	32° 16' 3.9483 N	104° 1' 26.5393 W
14,374.00	92.30	1.30	9,710.63	4,384.17	152.25	461,378.03	636,937.91	32° 16' 4.8874 N	104° 1' 26.5100 W
14,468.00	91.50	0.20	9,707.51	4,478.11	153.48	461,471.97	636,939.14	32° 16' 5.8169 N	104° 1' 26.4926 W
14,563.00	90.80	0.30	9,705.61	4,573.09	153.89	461,566.95	636,939.55	32° 16' 6.7568 N	104° 1' 26.4845 W
14,658.00	88.80	359.30	9,705.94	4,668.08	153.56	461,661.94	636,939.22	32° 16' 7.6969 N	104° 1' 26.4852 W
14,753.00	88.40	359.00	9,708.26	4,763.04	152.15	461,756.90	636,937.81	32° 16' 8.6366 N	104° 1' 26.4984 W
14,848.00	88.30	359.00	9,710.99	4,857.99	150.49	461,851.85	636,936.16	32° 16' 9.5763 N	104° 1' 26.5146 W
14,942.00	89.70	359.60	9,712.63	4,951.97	149.34	461,945.83	636,935.01	32° 16' 10.5063 N	104° 1' 26.5248 W
15,036.00	90.20	0.00	9,712.72	5,045.97	149.02	462,039.83	636,934.68	32° 16' 11.4365 N	104° 1' 26.5254 W
15,131.00	93.20	2.50	9,709.90	5,140.88	151.09	462,134.74	636,936.75	32° 16' 12.3757 N	104° 1' 26.4981 W
15,224.00	94.10	2.80	9,703.98	5,233.59	155.38	462,227.45	636,941.04	32° 16' 13.2930 N	104° 1' 26.4451 W
15,318.00	92.00	1.00	9,698.98	5,327.40	158.49	462,321.26	636,944.15	32° 16' 14.2212 N	104° 1' 26.4057 W
15,413.00	90.30	1.90	9,697.07	5,422.35	160.89	462,416.21	636,946.55	32° 16' 15.1607 N	104° 1' 26.3745 W
15,507.00	90.30	1.00	9,696.58	5,516.31	163.27	462,510.17	636,948.93	32° 16' 16.0906 N	104° 1' 26.3436 W
15,602.00	88.80	0.80	9,697.32	5,611.30	164.76	462,605.16	636,950.43	32° 16' 17.0304 N	104° 1' 26.3231 W
15,696.00	91.70	2.30	9,696.91	5,705.25	167.30	462,699.11	636,952.97	32° 16' 17.9601 N	104° 1' 26.2903 W
15,766.00	89.00	1.10	9,696.49	5,775.21	169.38	462,765.07	636,955.04	32° 16' 18.6524 N	104° 1' 26.2638 W

LEAM Drilling Services

Survey Report - Geographic

Company:	Devon Energy	Local Co-ordinate Reference:	Well Spud Muffin 31-30 332H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Site:	Spud Muffin 31-30 Com	MD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Well:	Spud Muffin 31-30 332H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	LEAM Multi_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
15,860.00	88.10	0.90	9,698.86	5,869.16	171.02	462,863.02	636,956.68	32° 16' 19.5821 N	104° 1' 26.2415 W
15,956.00	87.30	358.40	9,702.72	5,965.07	170.43	462,958.94	636,956.10	32° 16' 20.5312 N	104° 1' 26.2451 W
16,051.00	87.00	358.60	9,707.44	6,059.92	167.95	463,053.78	636,953.61	32° 16' 21.4699 N	104° 1' 26.2708 W
16,145.00	87.60	358.70	9,711.87	6,153.79	165.74	463,147.65	636,951.40	32° 16' 22.3989 N	104° 1' 26.2935 W
16,240.00	88.40	358.20	9,715.18	6,248.70	163.17	463,242.56	636,948.83	32° 16' 23.3381 N	104° 1' 26.3202 W
16,334.00	89.40	359.00	9,716.99	6,342.65	160.87	463,336.51	636,946.54	32° 16' 24.2680 N	104° 1' 26.3438 W
16,428.00	89.10	359.00	9,718.22	6,436.63	159.23	463,430.49	636,944.90	32° 16' 25.1980 N	104° 1' 26.3597 W
16,522.00	89.10	357.50	9,719.70	6,530.57	156.36	463,524.43	636,942.03	32° 16' 26.1277 N	104° 1' 26.3900 W
16,617.00	89.70	356.40	9,720.69	6,625.43	151.31	463,619.29	636,936.97	32° 16' 27.0665 N	104° 1' 26.4457 W
16,711.00	91.20	356.50	9,719.95	6,719.24	145.49	463,713.10	636,931.15	32° 16' 27.9951 N	104° 1' 26.5103 W
16,806.00	90.30	356.50	9,718.71	6,814.06	139.69	463,807.92	636,925.35	32° 16' 28.9335 N	104° 1' 26.5747 W
16,900.00	90.70	357.00	9,717.89	6,907.90	134.36	463,901.76	636,920.03	32° 16' 29.8623 N	104° 1' 26.6336 W
16,995.00	91.10	359.30	9,716.40	7,002.84	131.29	463,996.70	636,916.96	32° 16' 30.8019 N	104° 1' 26.6662 W
17,090.00	91.30	358.80	9,714.41	7,097.80	129.72	464,091.66	636,915.38	32° 16' 31.7417 N	104° 1' 26.6813 W
17,184.00	90.60	1.10	9,712.85	7,191.78	129.64	464,185.64	636,915.30	32° 16' 32.6717 N	104° 1' 26.6791 W
17,279.00	89.80	0.70	9,712.52	7,286.77	131.13	464,280.63	636,916.79	32° 16' 33.6116 N	104° 1' 26.6585 W
17,374.00	89.20	0.40	9,713.35	7,381.76	132.04	464,375.62	636,917.71	32° 16' 34.5516 N	104° 1' 26.6447 W
17,468.00	89.40	1.00	9,714.49	7,475.74	133.19	464,469.61	636,918.86	32° 16' 35.4816 N	104° 1' 26.6282 W
17,561.00	89.70	1.20	9,715.22	7,568.72	134.98	464,562.59	636,920.64	32° 16' 36.4017 N	104° 1' 26.6043 W
17,656.00	89.40	1.50	9,715.97	7,663.70	137.21	464,657.56	636,922.88	32° 16' 37.3415 N	104° 1' 26.5750 W
17,751.00	89.10	1.20	9,717.21	7,758.66	139.45	464,752.52	636,925.12	32° 16' 38.2811 N	104° 1' 26.5458 W
17,846.00	90.20	1.10	9,717.79	7,853.64	141.36	464,847.50	636,927.02	32° 16' 39.2210 N	104° 1' 26.5204 W
17,941.00	90.50	0.50	9,717.21	7,948.63	142.69	464,942.49	636,928.35	32° 16' 40.1609 N	104° 1' 26.5017 W
18,035.00	90.10	359.70	9,716.72	8,042.62	142.85	465,036.48	636,928.51	32° 16' 41.0911 N	104° 1' 26.4967 W
18,129.00	91.10	0.70	9,715.74	8,136.62	143.18	465,130.48	636,928.84	32° 16' 42.0212 N	104° 1' 26.4897 W
18,224.00	90.60	0.40	9,714.33	8,231.60	144.09	465,225.46	636,929.75	32° 16' 42.9612 N	104° 1' 26.4759 W
18,318.00	90.30	0.10	9,713.59	8,325.60	144.50	465,319.46	636,930.16	32° 16' 43.8913 N	104° 1' 26.4679 W
18,412.00	89.80	0.40	9,713.51	8,419.60	144.91	465,413.46	636,930.57	32° 16' 44.8215 N	104° 1' 26.4600 W
18,506.00	91.20	1.40	9,712.69	8,513.58	146.39	465,507.44	636,932.05	32° 16' 45.7515 N	104° 1' 26.4396 W
18,601.00	91.00	1.30	9,710.86	8,608.53	148.62	465,602.39	636,934.29	32° 16' 46.6911 N	104° 1' 26.4104 W
18,695.00	92.00	1.10	9,708.40	8,702.48	150.59	465,696.34	636,936.26	32° 16' 47.6207 N	104° 1' 26.3843 W
18,790.00	91.70	0.80	9,705.34	8,797.42	152.17	465,791.28	636,937.83	32° 16' 48.5601 N	104° 1' 26.3628 W
18,884.00	91.50	0.90	9,702.71	8,891.37	153.56	465,885.23	636,939.22	32° 16' 49.4898 N	104° 1' 26.3434 W
18,978.00	90.60	0.70	9,700.99	8,985.34	154.87	465,979.20	636,940.54	32° 16' 50.4198 N	104° 1' 26.3249 W
19,073.00	89.60	0.40	9,700.82	9,080.34	155.78	466,074.20	636,941.45	32° 16' 51.3598 N	104° 1' 26.3111 W
19,168.00	89.20	0.20	9,701.82	9,175.33	156.28	466,169.19	636,941.95	32° 16' 52.2998 N	104° 1' 26.3021 W
19,262.00	88.70	359.70	9,703.54	9,269.31	156.20	466,263.17	636,941.86	32° 16' 53.2298 N	104° 1' 26.2999 W
19,357.00	89.40	0.00	9,705.12	9,364.30	155.95	466,358.16	636,941.61	32° 16' 54.1698 N	104° 1' 26.2996 W
19,452.00	91.50	0.70	9,704.37	9,459.29	156.53	466,453.15	636,942.19	32° 16' 55.1098 N	104° 1' 26.2897 W
19,546.00	91.50	0.50	9,701.91	9,553.25	157.51	466,547.11	636,943.18	32° 16' 56.0396 N	104° 1' 26.2751 W
19,640.00	91.30	0.20	9,699.61	9,647.22	158.09	466,641.08	636,943.75	32° 16' 56.9695 N	104° 1' 26.2652 W
19,734.00	91.00	359.70	9,697.73	9,741.20	158.01	466,735.06	636,943.67	32° 16' 57.8995 N	104° 1' 26.2630 W
19,829.00	90.80	359.30	9,696.23	9,836.19	157.18	466,830.05	636,942.84	32° 16' 58.8395 N	104° 1' 26.2695 W
19,890.00	90.50	358.90	9,695.54	9,897.18	156.22	466,891.04	636,941.88	32° 16' 59.4431 N	104° 1' 26.2786 W
19,942.00	90.50	358.90	9,695.09	9,949.16	155.22	466,943.02	636,940.89	32° 16' 59.9576 N	104° 1' 26.2885 W

LEAM Drilling Services

Survey Report - Geographic

Company:	Devon Energy	Local Co-ordinate Reference:	Well Spud Muffin 31-30 332H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Site:	Spud Muffin 31-30 Com	MD Reference:	2959.4' GE + 23.5' KB @ 2982.90usft
Well:	Spud Muffin 31-30 332H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	LEAM Multi_User Db

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
SHL (SM 332H) - 625' F:	0.00	0.00	0.00	0.00	0.00	456,993.86	636,785.66	32° 15' 21.5066 N	104° 1' 28.4302 W
- actual wellpath hits target center									
- Point									
BHL (SM 332H) - 19.95'	0.00	0.00	9,695.09	9,949.16	155.22	466,943.02	636,940.89	32° 16' 59.9576 N	104° 1' 26.2885 W
- actual wellpath hits target center									
- Point									

Casing Points				
Measured Depth	Vertical Depth	Name	Casing Diameter	Hole Diameter
(usft)	(usft)		(")	(")
9,018.00	8,986.74	7 5/8"	7-5/8	9-7/8

Design Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	
9,239.22	9,207.45	-525.97	147.57	100' FSL HL Crossing @ 9239.22' MD
14,650.01	9,705.78	4,660.10	153.65	SL Crossing @ 14650.01' MD
19,861.91	9,695.82	9,869.09	156.71	100' FNL HL Crossing @ 19861.91' MD
19,942.00	9,695.09	9,949.16	155.22	TD Projection

Checked By: _____	Approved By: _____	Date: _____
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