

LEAM Drilling Systems LLC

Survey Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 251H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3440.4' GE + 27' KB @ 3467.40usft
Site:	Cotton Draw Unit	MD Reference:	3440.4' GE + 27' KB @ 3467.40usft
Well:	251H	North Reference:	Grid
Wellbore:	251H OH	Survey Calculation Method:	Minimum Curvature
Design:	251H OH	Database:	EDM 5000.1 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	Cotton Draw Unit		
Site Position:		Northing:	419,194.51 usft
From:	Map	Easting:	722,955.98 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 9' 3.901 N
		Longitude:	103° 44' 47.345 W
		Grid Convergence:	0.31 °

Well	251H, Brushy Canyon		
Well Position	+N/-S	0.00 usft	Northing: 419,356.41 usft
	+E/-W	0.00 usft	Easting: 731,829.88 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	3,467.40 usft
		Latitude:	32° 9' 5.012 N
		Longitude:	103° 43' 4.115 W
		Ground Level:	3,440.40 usft

Wellbore	251H OH		
Magnetics	Model Name	Sample Date	Declination (°)
	BGGM2015	12/07/15	7.29
			Dip Angle (°) 60.04
			Field Strength (nT) 48,110

Design	251H OH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°) 175.71

Survey Program	Date 12/23/15		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
99.00	4,338.00	Survey #1 (251H OH)	MWD-ISCWSA
4,583.00	12,911.00	Survey #2 (251H OH)	LEAM MWD+HDGM
12,969.00	12,969.00	Survey #3 (251H OH)	Project
			Description
			MWD - Standard
			MWD+HDGM
			Projection

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
99.00	0.31	245.11	99.00	-0.11	-0.24	0.09	0.31	0.31	0.00	
275.00	0.22	51.00	275.00	-0.10	-0.41	0.07	0.30	-0.05	94.26	
338.00	0.40	93.58	338.00	-0.04	-0.10	0.03	0.45	0.29	67.59	
462.00	0.48	56.58	461.99	0.22	0.77	-0.16	0.23	0.06	-29.84	
521.00	0.31	90.29	520.99	0.36	1.13	-0.27	0.48	-0.29	57.14	
582.00	0.31	42.21	581.99	0.48	1.41	-0.37	0.41	0.00	-78.82	
643.00	0.31	44.45	642.99	0.72	1.63	-0.59	0.02	0.00	3.67	
706.00	0.31	35.49	705.99	0.98	1.85	-0.84	0.08	0.00	-14.22	

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Survey									
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830.00	0.31	35.20	829.99	1.53	2.24	-1.35	0.00	0.00	-0.23
954.00	0.31	52.98	953.99	2.00	2.70	-1.79	0.08	0.00	14.34
1,077.00	0.09	105.60	1,076.99	2.18	3.06	-1.94	0.22	-0.18	42.78
1,200.00	0.09	28.59	1,199.99	2.23	3.20	-1.99	0.09	0.00	-62.61
1,341.00	0.09	115.40	1,340.99	2.28	3.35	-2.03	0.09	0.00	61.57
1,483.00	0.09	343.15	1,482.99	2.34	3.42	-2.08	0.12	0.00	-93.13
1,673.00	0.09	110.20	1,672.99	2.43	3.52	-2.16	0.08	0.00	66.87
1,865.00	0.09	115.38	1,864.99	2.32	3.80	-2.03	0.00	0.00	2.70
2,053.00	0.31	104.18	2,052.98	2.13	4.42	-1.79	0.12	0.12	-5.96
2,242.00	0.40	140.78	2,241.98	1.49	5.34	-1.09	0.13	0.05	19.37
2,431.00	0.40	108.79	2,430.98	0.77	6.38	-0.29	0.12	0.00	-16.93
2,527.00	0.22	110.81	2,526.98	0.60	6.87	-0.08	0.19	-0.19	2.10
2,717.00	0.31	84.00	2,716.97	0.52	7.72	0.06	0.08	0.05	-14.11
2,907.00	0.31	64.58	2,906.97	0.80	8.69	-0.14	0.06	0.00	-10.22
3,097.00	0.40	34.74	3,096.97	1.56	9.54	-0.84	0.11	0.05	-15.71
3,287.00	0.62	49.68	3,286.96	2.77	10.70	-1.96	0.13	0.12	7.86
3,477.00	0.79	25.91	3,476.95	4.61	12.05	-3.70	0.18	0.09	-12.51
3,668.00	0.88	26.39	3,667.93	7.11	13.28	-6.10	0.05	0.05	0.25
3,858.00	0.79	67.92	3,857.91	8.91	15.14	-7.75	0.31	-0.05	21.86
4,053.00	0.62	110.20	4,052.89	9.05	17.38	-7.73	0.27	-0.09	21.68
4,239.00	1.19	140.39	4,238.87	7.22	19.56	-5.73	0.39	0.31	16.23
4,338.00	1.01	140.38	4,337.85	5.75	20.77	-4.18	0.18	-0.18	-0.01
4,583.00	0.90	41.70	4,582.83	5.53	23.42	-3.76	0.59	-0.04	-40.28
4,773.00	2.90	1.10	4,772.72	11.45	24.51	-9.58	1.21	1.05	-21.37
4,963.00	4.70	356.70	4,962.30	24.02	24.15	-22.15	0.96	0.95	-2.32
5,153.00	5.10	355.70	5,151.60	40.22	23.07	-38.38	0.22	0.21	-0.53
5,343.00	5.20	351.30	5,340.84	57.15	21.14	-55.41	0.21	0.05	-2.32
5,533.00	5.30	346.70	5,530.04	74.20	17.82	-72.66	0.23	0.05	-2.42
5,723.00	5.50	343.50	5,719.20	91.47	13.21	-90.23	0.19	0.11	-1.68
5,913.00	5.40	356.20	5,908.35	109.12	10.03	-108.07	0.64	-0.05	6.68
6,104.00	5.20	353.50	6,098.53	126.69	8.46	-125.70	0.17	-0.10	-1.41
6,294.00	4.30	9.20	6,287.88	142.28	8.62	-141.23	0.83	-0.47	8.26
6,484.00	4.40	4.40	6,477.34	156.58	10.32	-155.36	0.20	0.05	-2.53
6,673.00	3.70	21.80	6,665.87	169.47	13.14	-168.01	0.74	-0.37	9.21
6,862.00	2.10	10.40	6,854.62	178.54	16.03	-176.84	0.90	-0.85	-6.03
7,052.00	1.80	9.20	7,044.51	184.91	17.14	-183.11	0.16	-0.16	-0.63
7,242.00	1.70	5.00	7,234.42	190.66	17.86	-188.79	0.09	-0.05	-2.21
7,433.00	1.80	359.70	7,425.34	196.48	18.09	-194.58	0.10	0.05	-2.77
7,623.00	1.50	342.50	7,615.26	201.84	17.33	-199.97	0.30	-0.16	-9.05
7,718.00	1.90	187.10	7,710.24	201.46	16.76	-199.64	3.50	0.42	-163.58
7,765.00	7.60	179.00	7,757.06	197.58	16.72	-195.77	12.18	12.13	-17.23
7,813.00	13.50	177.60	7,804.23	188.80	17.01	-186.99	12.30	12.29	-2.92
7,860.00	20.00	178.10	7,849.21	175.27	17.50	-173.47	13.83	13.83	1.06

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7,908.00	26.60	179.30	7,893.27	156.30	17.91	-154.52	13.78	13.75	2.50	
7,955.00	32.40	179.30	7,934.16	133.16	18.19	-131.43	12.34	12.34	0.00	
8,003.00	36.30	179.00	7,973.78	106.09	18.59	-104.40	8.13	8.13	-0.63	
8,050.00	42.20	179.30	8,010.16	76.37	19.03	-74.73	12.56	12.55	0.64	
8,098.00	47.30	178.10	8,044.24	42.60	19.81	-41.00	10.77	10.63	-2.50	
8,145.00	52.30	175.80	8,074.57	6.77	21.75	-5.12	11.27	10.64	-4.89	
8,193.00	57.30	174.20	8,102.23	-32.29	25.18	34.08	10.77	10.42	-3.33	
8,240.00	63.00	174.20	8,125.62	-72.83	29.30	74.82	12.13	12.13	0.00	
8,288.00	69.30	174.10	8,145.01	-116.48	33.77	118.68	13.13	13.13	-0.21	
8,335.00	73.00	173.70	8,160.20	-160.70	38.50	163.13	7.91	7.87	-0.85	
8,383.00	76.80	172.80	8,172.70	-206.71	43.95	209.42	8.12	7.92	-1.88	
8,430.00	80.70	172.70	8,181.87	-252.43	49.77	255.45	8.30	8.30	-0.21	
8,489.00	83.80	170.60	8,189.82	-310.26	58.26	313.75	6.33	5.25	-3.56	
8,584.00	87.40	175.50	8,197.11	-404.24	69.71	408.32	6.39	3.79	5.16	
8,679.00	89.30	175.50	8,199.85	-498.91	77.16	503.28	2.00	2.00	0.00	
8,774.00	90.40	176.00	8,200.10	-593.64	84.20	598.28	1.27	1.16	0.53	
8,869.00	90.30	175.70	8,199.52	-688.39	91.07	693.28	0.33	-0.11	-0.32	
8,964.00	91.00	176.00	8,198.44	-783.14	97.94	788.27	0.80	0.74	0.32	
9,060.00	90.40	176.70	8,197.27	-878.93	104.06	884.25	0.96	-0.63	0.73	
9,155.00	89.60	176.40	8,197.27	-973.76	109.77	979.24	0.90	-0.84	-0.32	
9,250.00	89.60	176.70	8,197.93	-1,068.59	115.49	1,074.23	0.32	0.00	0.32	
9,345.00	90.50	177.20	8,197.85	-1,163.45	120.54	1,169.21	1.08	0.95	0.53	
9,440.00	90.20	178.30	8,197.27	-1,258.37	124.27	1,264.14	1.20	-0.32	1.16	
9,535.00	90.80	177.60	8,196.44	-1,353.31	127.67	1,359.07	0.97	0.63	-0.74	
9,630.00	90.70	177.90	8,195.19	-1,448.23	131.40	1,454.00	0.33	-0.11	0.32	
9,725.00	90.90	177.60	8,193.87	-1,543.14	135.13	1,548.93	0.38	0.21	-0.32	
9,820.00	91.10	176.40	8,192.21	-1,638.00	140.10	1,643.89	1.28	0.21	-1.26	
9,915.00	87.60	170.70	8,193.29	-1,732.34	150.76	1,738.76	7.04	-3.68	-6.00	
10,010.00	87.80	172.10	8,197.10	-1,826.19	164.96	1,833.41	1.49	0.21	1.47	
10,105.00	89.30	172.10	8,199.51	-1,920.26	178.01	1,928.19	1.58	1.58	0.00	
10,200.00	91.30	173.90	8,199.01	-2,014.54	189.59	2,023.08	2.83	2.11	1.89	
10,296.00	90.40	174.20	8,197.58	-2,110.01	199.54	2,119.02	0.99	-0.94	0.31	
10,391.00	88.70	175.70	8,198.33	-2,204.63	207.90	2,214.01	2.39	-1.79	1.58	
10,485.00	88.90	174.80	8,200.30	-2,298.29	215.68	2,307.98	0.98	0.21	-0.96	
10,580.00	90.90	175.10	8,200.46	-2,392.91	224.04	2,402.97	2.13	2.11	0.32	
10,675.00	91.00	174.80	8,198.89	-2,487.53	232.41	2,497.95	0.33	0.11	-0.32	
10,770.00	90.10	175.80	8,197.98	-2,582.21	240.19	2,592.94	1.42	-0.95	1.05	
10,865.00	90.00	175.80	8,197.89	-2,676.95	247.15	2,687.94	0.11	-0.11	0.00	
10,961.00	90.00	175.70	8,197.89	-2,772.69	254.26	2,783.94	0.10	0.00	-0.10	
11,056.00	90.00	176.50	8,197.89	-2,867.47	260.72	2,878.93	0.84	0.00	0.84	
11,151.00	90.20	176.20	8,197.73	-2,962.27	266.77	2,973.93	0.38	0.21	-0.32	
11,246.00	90.80	174.20	8,196.90	-3,056.93	274.72	3,068.92	2.20	0.63	-2.11	
11,341.00	90.00	173.40	8,196.24	-3,151.37	284.98	3,163.86	1.19	-0.84	-0.84	

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11,436.00	90.30	174.10	8,195.99	-3,245.81	295.32	3,258.80	0.80	0.32	0.74
11,531.00	90.00	175.00	8,195.74	-3,340.37	304.34	3,353.78	1.00	-0.32	0.95
11,626.00	89.30	175.50	8,196.32	-3,435.05	312.21	3,448.78	0.91	-0.74	0.53
11,721.00	88.20	176.50	8,198.39	-3,529.79	318.83	3,543.75	1.56	-1.16	1.05
11,816.00	90.50	177.60	8,199.47	-3,624.65	323.72	3,638.71	2.68	2.42	1.16
11,911.00	90.20	176.00	8,198.89	-3,719.50	329.03	3,733.69	1.71	-0.32	-1.68
12,006.00	89.10	174.60	8,199.47	-3,814.17	336.81	3,828.68	1.87	-1.16	-1.47
12,101.00	89.30	174.40	8,200.80	-3,908.72	345.91	3,923.65	0.30	0.21	-0.21
12,196.00	89.70	175.10	8,201.62	-4,003.32	354.61	4,018.63	0.85	0.42	0.74
12,291.00	88.80	175.50	8,202.87	-4,097.99	362.39	4,113.62	1.04	-0.95	0.42
12,386.00	89.00	176.70	8,204.69	-4,192.75	368.85	4,208.60	1.28	0.21	1.26
12,481.00	88.90	179.00	8,206.43	-4,287.66	372.41	4,303.51	2.42	-0.11	2.42
12,576.00	88.60	178.60	8,208.51	-4,382.62	374.40	4,398.35	0.53	-0.32	-0.42
12,671.00	89.50	179.30	8,210.08	-4,477.59	376.14	4,493.18	1.20	0.95	0.74
12,766.00	89.30	180.60	8,211.08	-4,572.58	376.23	4,587.91	1.38	-0.21	1.37
12,861.00	89.90	182.90	8,211.74	-4,667.53	373.32	4,682.38	2.50	0.63	2.42
12,911.00	90.20	184.60	8,211.70	-4,717.42	370.05	4,731.88	3.45	0.60	3.40
12,969.00	90.20	184.60	8,211.49	-4,775.23	365.40	4,789.19	0.00	0.00	0.00
Projection									