

Leam Drilling Systems LLC

Survey Report

15 40748

Company:	DEVON ENERGY	Local Co-ordinate Reference:	Well 15 Fed Com 2H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	GE 3384 + KB 25' @ 3409.00usft (Permitting)
Site:	Cotton Draw	MD Reference:	GE 3384 + KB 25' @ 3409.00usft (Permitting)
Well:	15 Fed Com 2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single 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				
Site Position:		Northing:	413,963.10 usft	Latitude:	32° 8' 12.412 N	
From:	Map	Easting:	717,683.70 usft	Longitude:	103° 45' 48.994 W	
Position Uncertainty:		0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.30 °

Well	15 Fed Com 2H				
Well Position	+N/-S	0.00 usft	Northing:	413,962.60 usft	Latitude: 32° 8' 12.410 N
	+E/-W	0.00 usft	Easting:	717,633.60 usft	Longitude: 103° 45' 49.577 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level: 3,409.00 usft

Wellbore		OH			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	03/21/13	7.45	60.03	48,366

Design		OH		
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 9,080.30
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	180.00

Survey Program		Date	08/27/13		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	9,080.30	Survey #1 (Pilot)	NS-GYRO-MS	North sensing gyrocompassing m/s	
9,189.00	15,413.00	Survey #1 (OH)	LEAM MWD	MWD - Standard	
15,475.00	15,475.00	Survey #2 (OH)	Project	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
100.00	0.22	348.22	100.00	0.19	-0.04	-0.19	0.22	0.22	0.00
200.00	0.43	317.10	200.00	0.65	-0.33	-0.65	0.27	0.21	-31.12
300.00	0.45	309.55	300.00	1.18	-0.89	-1.18	0.06	0.02	-7.55
400.00	0.83	304.70	399.99	1.84	-1.79	-1.84	0.38	0.38	-4.85
500.00	1.14	314.64	499.97	2.95	-3.09	-2.95	0.35	0.31	9.94
600.00	1.45	334.43	599.95	4.79	-4.35	-4.79	0.54	0.31	19.79
700.00	1.63	333.43	699.91	7.20	-5.53	-7.20	0.18	0.18	-1.00
800.00	1.91	334.99	799.86	9.99	-6.87	-9.99	0.28	0.28	1.56

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

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)
900.00	2.18	338.18	899.80	13.26	-8.28	-13.26	0.29	0.27	3.19
1,000.00	2.11	339.32	999.73	16.75	-9.64	-16.75	0.08	-0.07	1.14
1,100.00	2.02	341.26	1,099.67	20.14	-10.86	-20.14	0.11	-0.09	1.94
1,202.70	1.84	344.50	1,202.31	23.44	-11.88	-23.44	0.20	-0.18	3.15
1,297.60	1.50	352.74	1,297.17	26.14	-12.44	-26.14	0.44	-0.36	8.68
1,392.60	1.39	352.22	1,392.14	28.52	-12.75	-28.52	0.12	-0.12	-0.55
1,487.50	1.22	355.25	1,487.01	30.67	-12.99	-30.67	0.19	-0.18	3.19
1,582.40	1.27	2.31	1,581.89	32.72	-13.04	-32.72	0.17	0.05	7.44
1,677.30	1.28	3.41	1,676.77	34.83	-12.93	-34.83	0.03	0.01	1.16
1,772.20	1.19	11.01	1,771.64	36.86	-12.68	-36.86	0.20	-0.09	8.01
1,867.00	1.08	10.61	1,866.43	38.70	-12.33	-38.70	0.12	-0.12	-0.42
1,962.90	0.96	21.11	1,962.31	40.34	-11.87	-40.34	0.23	-0.13	10.95
2,056.90	1.19	30.79	2,056.29	41.91	-11.09	-41.91	0.31	0.24	10.30
2,246.70	1.59	58.82	2,246.04	44.97	-7.83	-44.97	0.41	0.21	14.77
2,341.70	1.66	75.98	2,341.00	45.99	-5.36	-45.99	0.52	0.07	18.06
2,436.60	1.77	98.79	2,435.86	46.09	-2.58	-46.09	0.72	0.12	24.04
2,531.50	1.97	109.06	2,530.71	45.34	0.41	-45.34	0.41	0.21	10.82
2,626.40	2.33	117.46	2,625.54	43.92	3.66	-43.92	0.50	0.38	8.85
2,721.30	2.56	112.95	2,720.36	42.20	7.33	-42.20	0.32	0.24	-4.75
2,816.20	2.30	119.70	2,815.17	40.43	10.93	-40.43	0.41	-0.27	7.11
2,911.10	2.15	111.98	2,910.00	38.82	14.24	-38.82	0.35	-0.16	-8.13
3,006.00	2.76	90.97	3,004.82	38.11	18.17	-38.11	1.14	0.64	-22.14
3,100.90	2.72	90.22	3,099.61	38.07	22.71	-38.07	0.06	-0.04	-0.79
3,195.80	3.10	85.76	3,194.38	38.25	27.52	-38.25	0.47	0.40	-4.70
3,290.80	3.34	82.62	3,289.23	38.79	32.83	-38.79	0.31	0.25	-3.31
3,385.70	2.65	80.11	3,384.00	39.53	37.73	-39.53	0.74	-0.73	-2.64
3,480.60	2.18	81.74	3,478.82	40.16	41.68	-40.16	0.50	-0.50	1.72
3,575.50	1.84	84.26	3,573.66	40.57	44.98	-40.57	0.37	-0.36	2.66
3,670.40	2.59	91.29	3,668.49	40.68	48.64	-40.68	0.84	0.79	7.41
3,765.30	3.55	101.55	3,763.25	40.04	53.66	-40.04	1.16	1.01	10.81
3,860.20	3.45	105.46	3,857.98	38.69	59.29	-38.69	0.27	-0.11	4.12
3,955.10	4.28	117.37	3,952.66	36.30	65.19	-36.30	1.21	0.87	12.55
4,050.00	5.24	127.72	4,047.24	32.02	71.76	-32.02	1.35	1.01	10.91
4,144.90	5.43	130.63	4,141.72	26.45	78.60	-26.45	0.35	0.20	3.07
4,239.90	4.61	132.88	4,236.36	20.92	84.81	-20.92	0.89	-0.86	2.37
4,334.80	3.43	133.00	4,331.02	16.39	89.68	-16.39	1.24	-1.24	0.13
4,429.70	3.21	131.44	4,425.76	12.70	93.74	-12.70	0.25	-0.23	-1.64
4,524.60	2.99	128.37	4,520.53	9.40	97.68	-9.40	0.29	-0.23	-3.23
4,619.50	2.54	126.29	4,615.31	6.62	101.31	-6.62	0.49	-0.47	-2.19
4,714.40	1.86	123.13	4,710.14	4.53	104.30	-4.53	0.73	-0.72	-3.33
4,809.30	1.69	112.81	4,805.00	3.15	106.88	-3.15	0.38	-0.18	-10.87
4,904.20	1.32	115.42	4,899.87	2.14	109.15	-2.14	0.40	-0.39	2.75
4,999.10	1.31	115.01	4,994.74	1.21	111.12	-1.21	0.01	-0.01	-0.43

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

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)	
5,094.00	1.06	114.34	5,089.62	0.39	112.91	-0.39	0.26	-0.26	-0.71	
5,189.00	0.73	122.47	5,184.61	-0.30	114.22	0.30	0.37	-0.35	8.56	
5,283.90	0.60	115.86	5,279.50	-0.84	115.18	0.84	0.16	-0.14	-6.97	
5,378.80	0.54	98.28	5,374.40	-1.12	116.06	1.12	0.19	-0.06	-18.52	
5,473.70	0.47	84.46	5,469.29	-1.15	116.89	1.15	0.15	-0.07	-14.56	
5,568.60	0.37	76.87	5,564.19	-1.04	117.58	1.04	0.12	-0.11	-8.00	
5,663.50	0.34	72.71	5,659.09	-0.89	118.15	0.89	0.04	-0.03	-4.38	
5,758.40	0.36	39.99	5,753.99	-0.57	118.61	0.57	0.21	0.02	-34.48	
5,853.30	0.58	24.69	5,848.89	0.09	119.00	-0.09	0.26	0.23	-16.12	
5,948.20	0.42	7.40	5,943.78	0.87	119.25	-0.87	0.23	-0.17	-18.22	
6,043.10	0.10	88.80	6,038.68	1.22	119.37	-1.22	0.44	-0.34	85.77	
6,138.10	0.18	129.38	6,133.68	1.13	119.57	-1.13	0.13	0.08	42.72	
6,233.00	0.19	193.24	6,228.58	0.88	119.65	-0.88	0.21	0.01	67.29	
6,327.90	0.45	171.56	6,323.48	0.36	119.67	-0.36	0.30	0.27	-22.85	
6,422.80	0.37	208.24	6,418.38	-0.28	119.58	0.28	0.28	-0.08	38.65	
6,517.70	0.52	215.77	6,513.27	-0.90	119.18	0.90	0.17	0.16	7.93	
6,612.60	0.54	215.72	6,608.17	-1.61	118.67	1.61	0.02	0.02	-0.05	
6,707.50	0.94	192.62	6,703.06	-2.74	118.24	2.74	0.52	0.42	-24.34	
6,802.40	0.78	181.66	6,797.95	-4.14	118.05	4.14	0.24	-0.17	-11.55	
6,897.30	0.86	153.39	6,892.84	-5.42	118.35	5.42	0.43	0.08	-29.79	
6,992.20	0.96	152.37	6,987.73	-6.76	119.04	6.76	0.11	0.11	-1.07	
7,087.20	0.75	149.82	7,082.72	-8.01	119.72	8.01	0.22	-0.22	-2.68	
7,182.10	0.62	158.59	7,177.61	-9.02	120.22	9.02	0.18	-0.14	9.24	
7,277.00	0.66	164.87	7,272.51	-10.03	120.55	10.03	0.09	0.04	6.62	
7,371.90	0.74	169.07	7,367.40	-11.16	120.81	11.16	0.10	0.08	4.43	
7,466.80	0.81	162.22	7,462.29	-12.40	121.13	12.40	0.12	0.07	-7.22	
7,561.70	0.92	158.62	7,557.18	-13.75	121.61	13.75	0.13	0.12	-3.79	
7,656.60	1.15	162.95	7,652.06	-15.37	122.17	15.37	0.26	0.24	4.56	
7,751.50	1.56	165.31	7,746.94	-17.53	122.78	17.53	0.44	0.43	2.49	
7,846.40	1.42	163.30	7,841.81	-19.90	123.44	19.90	0.16	-0.15	-2.12	
7,941.30	1.40	159.38	7,936.68	-22.11	124.19	22.11	0.10	-0.02	-4.13	
8,036.30	1.34	165.01	8,031.65	-24.27	124.88	24.27	0.16	-0.06	5.93	
8,131.20	1.48	167.64	8,126.52	-26.54	125.43	26.54	0.16	0.15	2.77	
8,226.10	1.38	173.53	8,221.39	-28.87	125.82	28.87	0.19	-0.11	6.21	
8,321.00	1.20	153.24	8,316.27	-30.90	126.40	30.90	0.51	-0.19	-21.38	
8,415.90	0.97	143.65	8,411.15	-32.43	127.32	32.43	0.31	-0.24	-10.11	
8,510.80	0.26	74.48	8,506.05	-33.02	128.01	33.02	0.96	-0.75	-72.89	
8,605.70	0.44	40.99	8,600.94	-32.69	128.45	32.69	0.28	0.19	-35.29	
8,700.60	0.24	353.88	8,695.84	-32.21	128.67	32.21	0.35	-0.21	-49.64	
8,795.50	0.95	296.19	8,790.74	-31.67	127.94	31.67	0.89	0.75	-60.79	
8,890.40	1.11	284.06	8,885.62	-31.10	126.35	31.10	0.28	0.17	-12.78	
8,985.40	2.52	296.20	8,980.57	-29.95	123.58	29.95	1.53	1.48	12.78	
9,080.30	3.09	292.97	9,075.36	-28.03	119.35	28.03	0.62	0.60	-3.40	

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9,189.00	12.70	292.10	9,182.90	-22.38	105.55	22.38	8.84	8.84	-0.80
9,221.00	12.30	281.50	9,214.15	-20.38	98.95	20.38	7.27	-1.25	-33.13
9,316.00	10.90	269.40	9,307.22	-18.46	80.05	18.46	2.95	-1.47	-12.74
9,411.00	10.40	270.30	9,400.58	-18.50	62.49	18.50	0.55	-0.53	0.95
9,506.00	9.80	271.90	9,494.11	-18.19	45.84	18.19	0.70	-0.63	1.68
9,601.00	10.30	259.20	9,587.66	-19.52	29.41	19.52	2.39	0.53	-13.37
9,702.00	9.80	260.80	9,687.11	-22.58	12.06	22.58	0.57	-0.50	1.58
9,792.00	9.20	259.00	9,775.88	-25.18	-2.56	25.18	0.74	-0.67	-2.00
9,887.00	10.80	255.90	9,869.43	-28.80	-18.65	28.80	1.78	1.68	-3.26
9,919.00	14.00	252.70	9,900.68	-30.68	-25.26	30.68	10.22	10.00	-10.00
9,950.00	16.80	250.40	9,930.57	-33.30	-33.06	33.30	9.24	9.03	-7.42
9,982.00	18.80	248.30	9,961.03	-36.76	-42.21	36.76	6.56	6.25	-6.56
10,014.00	21.60	247.40	9,991.06	-40.93	-52.44	40.93	8.80	8.75	-2.81
10,046.00	24.10	247.60	10,020.55	-45.68	-63.92	45.68	7.82	7.81	0.63
10,078.00	27.10	247.30	10,049.40	-50.98	-76.69	50.98	9.38	9.38	-0.94
10,110.00	29.50	247.10	10,077.58	-56.86	-90.67	56.86	7.51	7.50	-0.63
10,142.00	30.60	245.50	10,105.28	-63.31	-105.34	63.31	4.25	3.44	-5.00
10,173.00	32.90	244.50	10,131.64	-70.20	-120.12	70.20	7.61	7.42	-3.23
10,205.00	36.80	244.10	10,157.89	-78.14	-136.59	78.14	12.21	12.19	-1.25
10,237.00	40.80	243.40	10,182.83	-87.01	-154.57	87.01	12.57	12.50	-2.19
10,269.00	44.50	243.40	10,206.36	-96.71	-173.95	96.71	11.56	11.56	0.00
10,300.00	48.20	244.10	10,227.75	-106.63	-194.07	106.63	12.05	11.94	2.26
10,332.00	51.30	245.00	10,248.43	-117.12	-216.12	117.12	9.92	9.69	2.81
10,364.00	54.50	245.30	10,267.73	-127.84	-239.28	127.84	10.03	10.00	0.94
10,395.00	58.70	245.30	10,284.79	-138.65	-262.78	138.65	13.55	13.55	0.00
10,427.00	62.60	244.80	10,300.47	-150.42	-288.07	150.42	12.26	12.19	-1.56
10,459.00	66.60	244.80	10,314.19	-162.72	-314.22	162.72	12.50	12.50	0.00
10,491.00	69.80	245.30	10,326.07	-175.25	-341.15	175.25	10.10	10.00	1.56
10,522.00	72.00	246.20	10,336.22	-187.28	-367.86	187.28	7.61	7.10	2.90
10,554.00	74.60	245.50	10,345.41	-199.82	-395.83	199.82	8.39	8.13	-2.19
10,586.00	77.60	244.50	10,353.10	-212.95	-423.97	212.95	9.85	9.38	-3.13
10,616.00	80.70	244.10	10,358.74	-225.73	-450.52	225.73	10.42	10.33	-1.33
10,648.00	83.40	243.60	10,363.17	-239.69	-478.97	239.69	8.58	8.44	-1.56
10,680.00	86.00	243.40	10,366.13	-253.91	-507.48	253.91	8.15	8.13	-0.63
10,712.00	89.00	243.20	10,367.52	-268.27	-536.04	268.27	9.40	9.38	-0.63
10,744.00	90.20	242.00	10,367.75	-283.00	-564.44	283.00	5.30	3.75	-3.75
10,839.00	89.80	238.70	10,367.75	-329.99	-646.99	329.99	3.50	-0.42	-3.47
10,933.00	90.00	234.40	10,367.91	-381.79	-725.41	381.79	4.58	0.21	-4.57
11,028.00	89.50	230.20	10,368.32	-439.87	-800.55	439.87	4.45	-0.53	-4.42
11,124.00	88.80	224.90	10,369.75	-504.63	-871.36	504.63	5.57	-0.73	-5.52
11,219.00	89.70	222.00	10,370.99	-573.59	-936.68	573.59	3.20	0.95	-3.05
11,314.00	91.80	220.20	10,369.75	-645.16	-999.12	645.16	2.91	2.21	-1.89
11,409.00	90.80	220.00	10,367.59	-717.81	-1,060.29	717.81	1.07	-1.05	-0.21
11,504.00	89.80	220.20	10,367.10	-790.48	-1,121.48	790.48	1.07	-1.05	0.21

Leam Drilling Systems LLC

Survey Report

Company:	DEVON ENERGY	Local Co-ordinate Reference:	Well: 15 Fed Com 2H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	GE 3384 + KB 25 @ 3409.00usft (Permitting)
Site:	Cotton Draw	MD Reference:	GE 3384 + KB 25 @ 3409.00usft (Permitting)
Well:	15 Fed Com 2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

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)
11,599.00	90.20	217.70	10,367.10	-864.35	-1,181.20	864.35	2.67	0.42	-2.63
11,693.00	88.80	215.50	10,367.92	-939.81	-1,237.24	939.81	2.77	-1.49	-2.34
11,788.00	88.50	212.30	10,370.16	-1,018.63	-1,290.20	1,018.63	3.38	-0.32	-3.37
11,884.00	88.00	209.80	10,373.09	-1,100.83	-1,339.69	1,100.83	2.65	-0.52	-2.60
11,978.00	88.40	206.70	10,376.04	-1,183.58	-1,384.15	1,183.58	3.32	0.43	-3.30
12,073.00	89.20	204.20	10,378.03	-1,269.33	-1,424.96	1,269.33	2.76	0.84	-2.63
12,168.00	89.60	201.20	10,379.03	-1,356.96	-1,461.62	1,356.96	3.19	0.42	-3.16
12,263.00	89.00	198.60	10,380.19	-1,446.27	-1,493.95	1,446.27	2.81	-0.63	-2.74
12,358.00	88.80	194.70	10,382.01	-1,537.25	-1,521.16	1,537.25	4.11	-0.21	-4.11
12,453.00	89.60	191.20	10,383.34	-1,629.81	-1,542.44	1,629.81	3.78	0.84	-3.68
12,548.00	89.50	188.40	10,384.08	-1,723.42	-1,558.61	1,723.42	2.95	-0.11	-2.95
12,643.00	89.30	186.10	10,385.08	-1,817.64	-1,570.60	1,817.64	2.43	-0.21	-2.42
12,739.00	89.60	184.00	10,386.00	-1,913.26	-1,579.05	1,913.26	2.21	0.31	-2.19
12,834.00	89.00	179.80	10,387.16	-2,008.18	-1,582.20	2,008.18	4.47	-0.63	-4.42
12,959.00	90.00	178.50	10,388.25	-2,133.16	-1,580.34	2,133.16	1.31	0.80	-1.04
13,054.00	91.10	179.10	10,387.34	-2,228.13	-1,578.35	2,228.13	1.32	1.16	0.63
13,149.00	92.20	178.70	10,384.61	-2,323.07	-1,576.53	2,323.07	1.23	1.16	-0.42
13,244.00	91.00	179.90	10,381.95	-2,418.03	-1,575.37	2,418.03	1.79	-1.26	1.26
13,340.00	90.00	180.10	10,381.12	-2,514.02	-1,575.37	2,514.02	1.06	-1.04	0.21
13,434.00	89.70	180.10	10,381.36	-2,608.02	-1,575.53	2,608.02	0.32	-0.32	0.00
13,529.00	89.30	180.10	10,382.19	-2,703.02	-1,575.70	2,703.02	0.42	-0.42	0.00
13,624.00	90.10	180.10	10,382.69	-2,798.01	-1,575.87	2,798.01	0.84	0.84	0.00
13,719.00	89.10	180.80	10,383.35	-2,893.01	-1,576.61	2,893.01	1.28	-1.05	0.74
13,813.00	89.70	180.60	10,384.34	-2,986.99	-1,577.76	2,986.99	0.67	0.64	-0.21
13,908.00	90.70	180.60	10,384.00	-3,081.99	-1,578.75	3,081.99	1.05	1.05	0.00
14,004.00	89.60	181.00	10,383.75	-3,177.98	-1,580.09	3,177.98	1.22	-1.15	0.42
14,098.00	88.60	181.30	10,385.23	-3,271.94	-1,581.98	3,271.94	1.11	-1.06	0.32
14,193.00	88.50	180.30	10,387.63	-3,366.90	-1,583.31	3,366.90	1.06	-0.11	-1.05
14,287.00	89.30	180.50	10,389.44	-3,460.88	-1,583.96	3,460.88	0.88	0.85	0.21
14,382.00	90.00	180.10	10,390.02	-3,555.88	-1,584.46	3,555.88	0.85	0.74	-0.42
14,476.00	89.60	179.60	10,390.35	-3,649.88	-1,584.21	3,649.88	0.68	-0.43	-0.53
14,570.00	90.40	179.20	10,390.35	-3,743.87	-1,583.23	3,743.87	0.95	0.85	-0.43
14,662.00	89.40	179.40	10,390.51	-3,835.86	-1,582.11	3,835.86	1.11	-1.09	0.22
14,757.00	88.20	179.80	10,392.50	-3,930.84	-1,581.44	3,930.84	1.33	-1.26	0.42
14,851.00	88.90	179.90	10,394.87	-4,024.81	-1,581.20	4,024.81	0.75	0.74	0.11
14,946.00	89.90	179.90	10,395.87	-4,119.80	-1,581.03	4,119.80	1.05	1.05	0.00
15,041.00	88.60	178.20	10,397.11	-4,214.77	-1,579.46	4,214.77	2.25	-1.37	-1.79
15,135.00	89.50	178.00	10,398.67	-4,308.71	-1,576.34	4,308.71	0.98	0.96	-0.21
15,230.00	89.20	178.40	10,399.75	-4,403.65	-1,573.36	4,403.65	0.53	-0.32	0.42
15,325.00	90.30	178.90	10,400.16	-4,498.63	-1,571.12	4,498.63	1.27	1.16	0.53
15,413.00	91.50	179.40	10,398.78	-4,586.60	-1,569.81	4,586.60	1.48	1.36	0.57
15,475.00	91.50	179.40	10,397.16	-4,648.58	-1,569.16	4,648.58	0.00	0.00	0.00

Leam Drilling Systems LLC

Survey Report

Company:	DEVON ENERGY	Local Co-ordinate Reference:	Well: 15 Fed. Com 2H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	GE 3384 + KB 25' @ 3409.00usft (Permitting)
Site:	Cotton Draw	MD Reference:	GE 3384 + KB 25' @ 3409.00usft (Permitting)
Well:	15 Fed. Com 2H	North Reference:	Grid:
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Design Targets									
Target Name	hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	
Shape		(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)	
SHL(CD-15-F 2H)		0.00	0.00	0.00	0.00	0.00	413,962.60	717,633.60	32° 8' 12.410 N 103° 45' 49.577 W
- actual wellpath hits target center									
- Point									
BHL(CD-15-F 2H)		0.00	0.00	10,397.16	-4,648.58	-1,569.16	409,314.02	716,064.44	32° 7' 26.491 N 103° 46' 8.109 W
- actual wellpath hits target center									
- Point									
PBHL-W(CD-15-F 2H)		0.00	0.00	10,398.00	-4,648.62	-1,584.79	409,313.98	716,048.80	32° 7' 26.491 N 103° 46' 8.291 W
- actual wellpath misses target center by 15.65usft at 15474.86usft MD (10397.16 TVD, -4648.43 N, -1569.17 E)									
- Point									

Checked By: _____	Approved By: _____	Date: _____
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Leam Drilling Systems LLC

Survey Report - Geographic

Company:	DEVON ENERGY	Local Co-ordinate Reference:	Well-15 Fed Com-2H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	GE 3384 + KB 25' @ 3409.00usft (Permitting)
Site:	Cotton Draw	MD Reference:	GE 3384 + KB 25' @ 3409.00usft (Permitting)
Well:	15 Fed Com 2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single 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			
Site Position:		Northing:	413,963.10 usft	Latitude:	32° 8' 12.412 N
From:	Map	Easting:	717,683.70 usft	Longitude:	103° 45' 48.994 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.30 °

Well:	-15 Fed Com 2H				
Well Position	+N/-S	0.00 usft	Northing:	413,962.60 usft	Latitude: 32° 8' 12.410 N
	+E/-W	0.00 usft	Easting:	717,633.60 usft	Longitude: 103° 45' 49.577 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level: 3,409.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	03/21/13	7.45	60.03	48,366

Design:	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	9,080.30
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	180.00	

Survey Program		Date	08/27/13		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	9,080.30	Survey #1 (Pilot)	NS-GYRO-MS	North sensing gyrocompassing m/s	
9,189.00	15,413.00	Survey #1 (OH)	LEAM MWD	MWD - Standard	
15,475.00	15,475.00	Survey #2 (OH)	Project	Projection	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E/W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	413,962.60	717,633.60	32° 8' 12.410 N	103° 45' 49.577 W
100.00	0.22	348.22	100.00	0.19	-0.04	413,962.79	717,633.56	32° 8' 12.412 N	103° 45' 49.577 W
200.00	0.43	317.10	200.00	0.65	-0.33	413,963.25	717,633.26	32° 8' 12.417 N	103° 45' 49.580 W
300.00	0.45	309.55	300.00	1.18	-0.89	413,963.77	717,632.70	32° 8' 12.422 N	103° 45' 49.587 W
400.00	0.83	304.70	399.99	1.84	-1.79	413,964.44	717,631.81	32° 8' 12.428 N	103° 45' 49.597 W
500.00	1.14	314.64	499.97	2.95	-3.09	413,965.55	717,630.50	32° 8' 12.439 N	103° 45' 49.612 W
600.00	1.45	334.43	599.95	4.79	-4.35	413,967.39	717,629.25	32° 8' 12.458 N	103° 45' 49.627 W
700.00	1.63	333.43	699.91	7.20	-5.53	413,969.80	717,628.07	32° 8' 12.482 N	103° 45' 49.640 W
800.00	1.91	334.99	799.86	9.99	-6.87	413,972.58	717,626.73	32° 8' 12.509 N	103° 45' 49.656 W
900.00	2.18	338.18	899.80	13.26	-8.28	413,975.86	717,625.31	32° 8' 12.542 N	103° 45' 49.672 W

DEVON ENERGY

Project: Eddy County, NM (NAD-83)
 Site: Cotton Draw
 Well: 15 Fed Com 2H
 Wellbore: OH
 Design: OH



Azimuths to Grid North
 True North: -0.30°
 Magnetic North: 7.15°

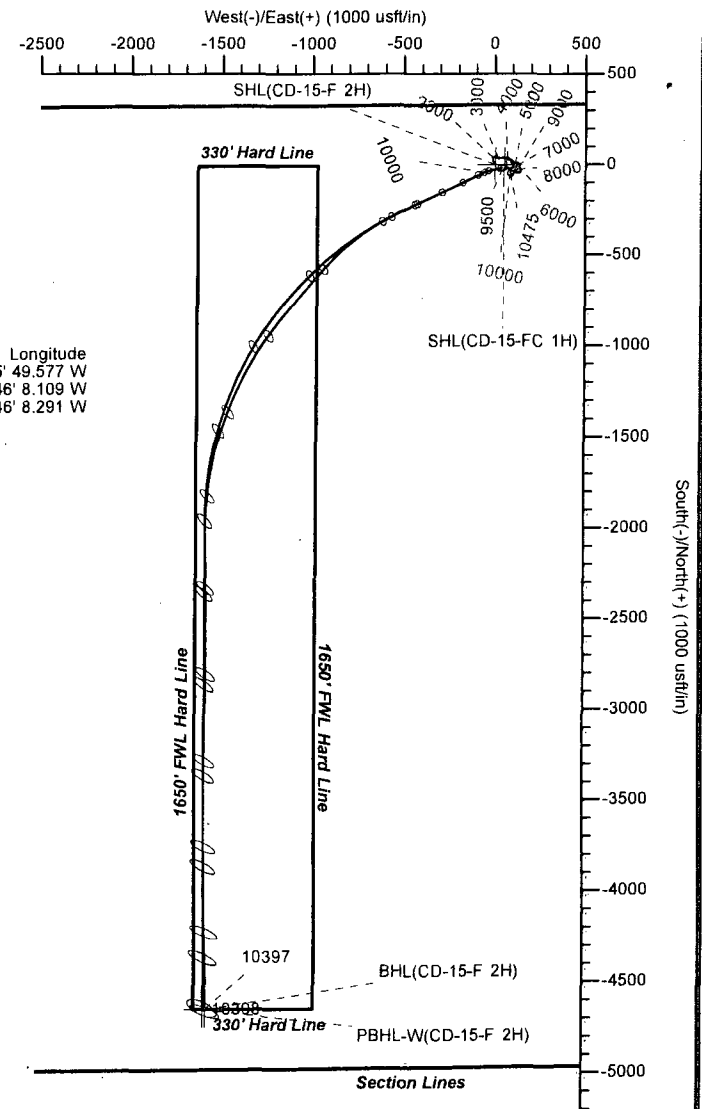
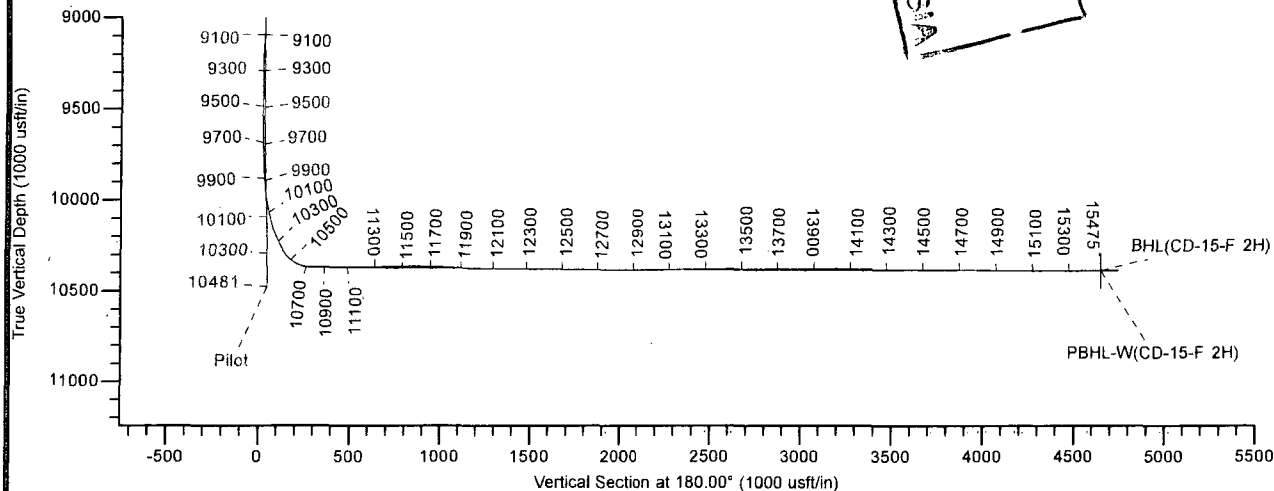
Magnetic Field
 Strength: 48366.5nT
 Dip Angle: 60.03°
 Date: 03/21/2013
 Model: IGRF2010

devon

DESIGN TARGET DETAILS

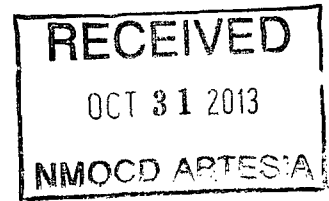
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHL(CD-15-F 2H)	0.00	0.00	0.00	413962.60	717633.60	32° 8' 12.410 N	103° 45' 49.577 W
BHL(CD-15-F 2H)	10397.16	-4648.58	-1569.16	409314.02	716064.44	32° 7' 26.491 N	103° 46' 8.109 W
PBHL-W(CD-15-F 2H)	10398.00	-4648.62	-1584.79	409313.98	716048.81	32° 7' 26.491 N	103° 46' 8.291 W

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 NMOC ARTESIA



LEAM DRILLING SYSTEMS LLC
 2010 East Davis, Conroe, Texas 77301
 Phone: 936/756-7577, Fax 936/756-7595

Design: OH (15 Fed Com 2H/OH)
 Cotton Draw
 Created By: Tyler Carlson
 Date: 13/01, August 27 2013
 Approved: _____
 Date: _____



Survey Certification Form

State of NM
Eddy County

I, Randy W. Rakowitz, certify that; I am employed by LEAM Drilling Systems LLC, that I did on the day(s) of June 28, 2013 through July 7, 2013, conduct or supervise the taking of MWD Survey from a depth of 9,189' to 15,475' MD; that the data is true, correct, complete and within the limitations of the tools as set forth by LEAM Drilling Systems LLC, that I am authorized and qualified to make this report; that this survey was conducted at the request of Devon Energy for the Cotton Draw 15 Fed Com 2H in Eddy County, NM; and that I reviewed this report and find that it conforms to the principals and procedures as set forth by LEAM Drilling Systems LLC.

A handwritten signature in black ink, appearing to read 'Randy W. Rakowitz', written over a horizontal line.

Randy W. Rakowitz
MWD Operations Coordinator