

Devon Energy

Project: Lea County, NM (NAD-83)
Site: Thistle Unit
Well: 138Y
Wellbore: OH
Design: Plan #10



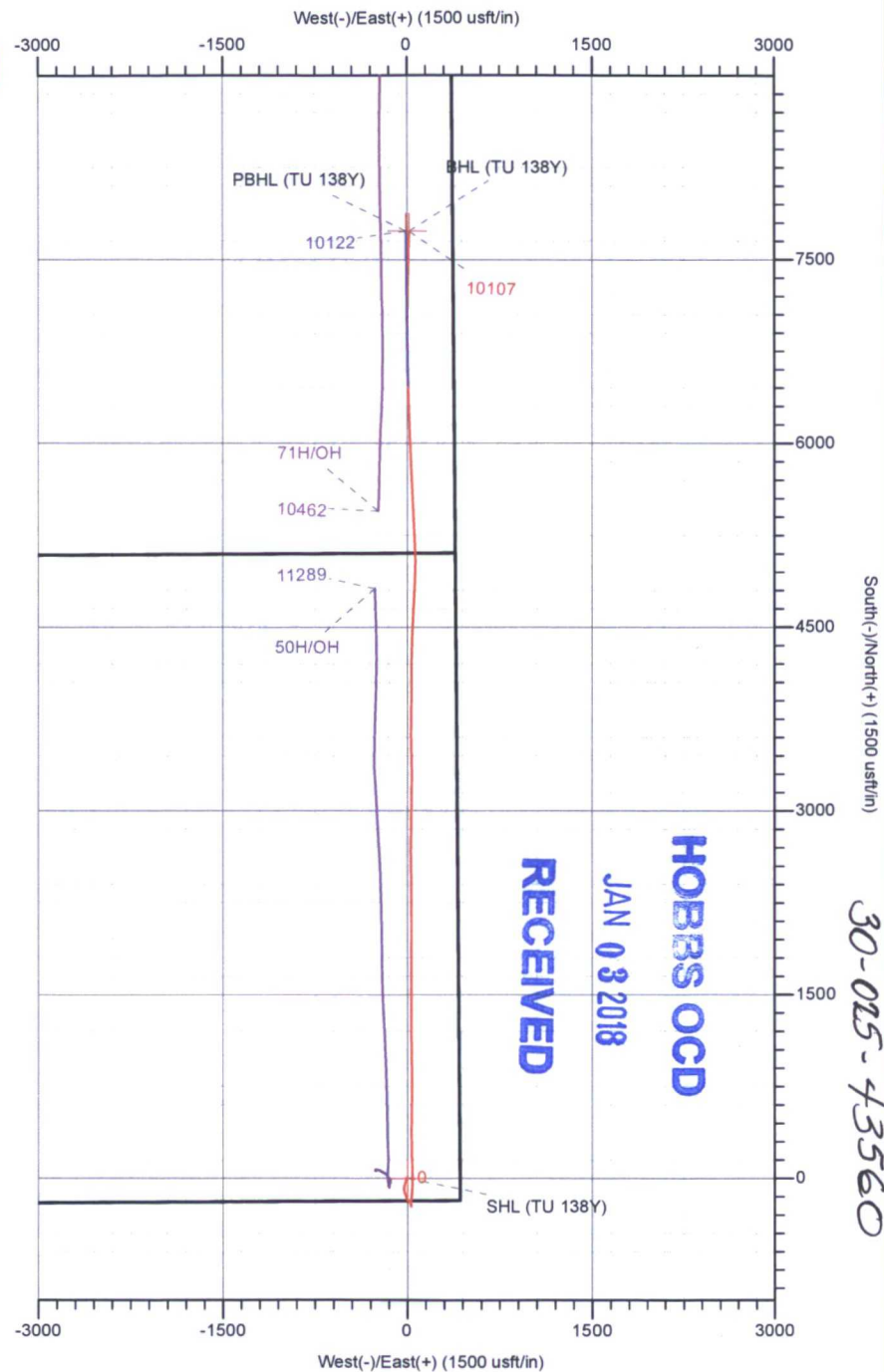
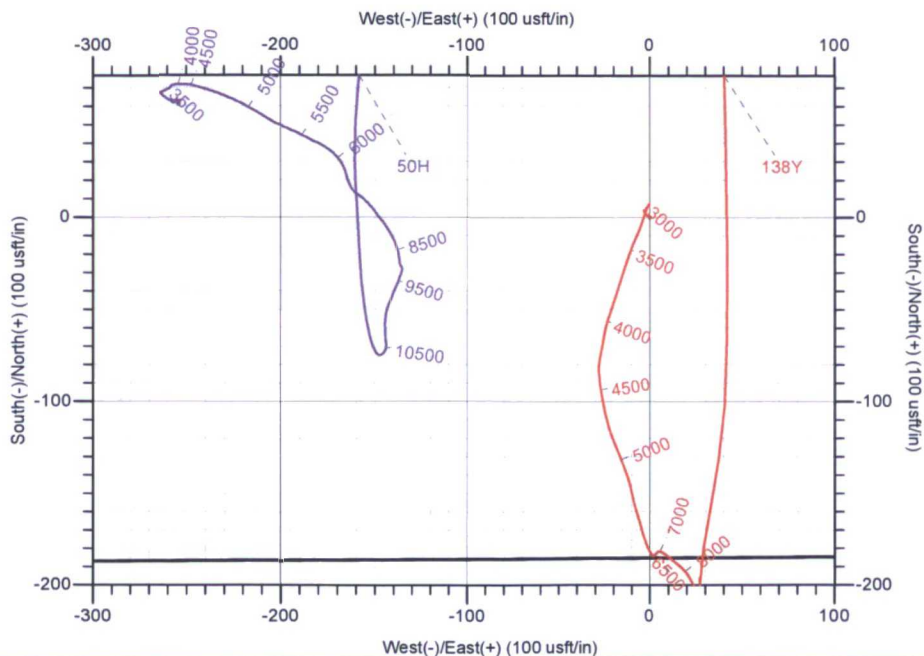
Azimuths to Grid North
True North: -0.42°
Magnetic North: 6.47°
Magnetic Field
Strength: 48197.7snT
Dip Angle: 60.05°
Date: 1/30/2017
Model: HDGM



PROJECT DETAILS: Lea County, NM (NAD-83)
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL (TU 138Y)	10107.23	7732.47	17.55	464889.39	782564.74	32° 16' 32.316 N	103° 33' 10.142 W
PBHL (TU 138Y)	10122.00	7732.83	-7.58	464889.75	782539.61	32° 16' 32.321 N	103° 33' 10.435 W
SHL (TU 138Y)	0.00	0.00	0.00	457156.92	782547.19	32° 15' 15.804 N	103° 33' 11.002 W



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

Plan: Plan #10 (138Y/OH)
Created By: Brady Deaver
Date: 15/27, March 06 2017
Approved: _____
Date: _____

30-025-43560

Devon Energy

Project: Lea County, NM (NAD-83)
Site: Thistle Unit
Well: 138Y
Wellbore: OH
Design: Plan #10

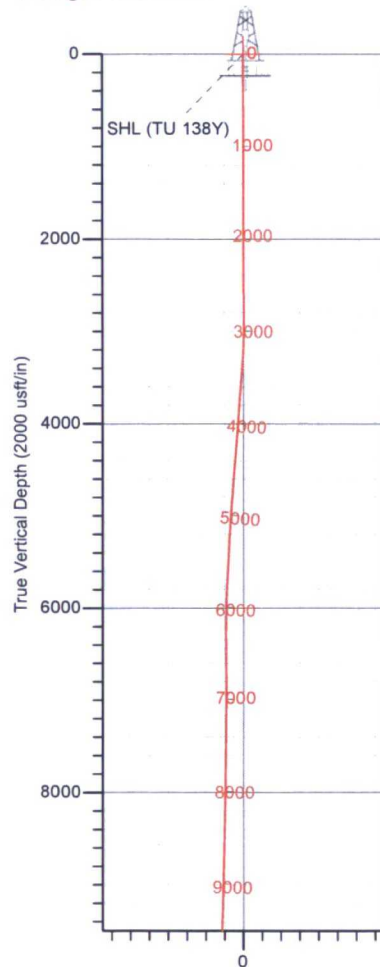


Azimuths to Grid North
True North: -0.42°
Magnetic North: 6.47°

Magnetic Field
Strength: 48197.7snT
Dip Angle: 60.05°
Date: 1/30/2017
Model: HDGM

PROJECT DETAILS: Lea County, NM (NAD-83)

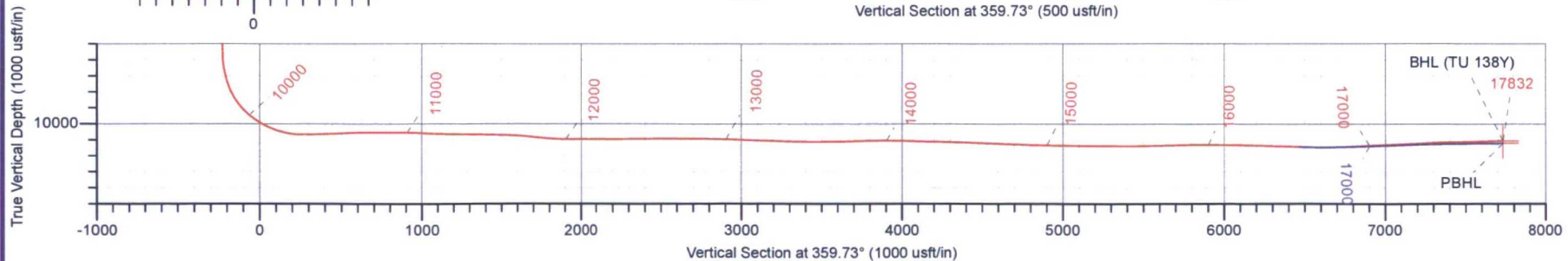
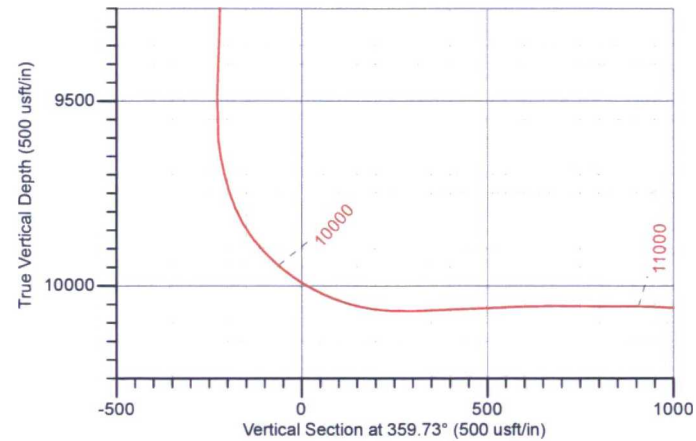
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone



3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Ground Level: 3637.80

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL (TU 138Y)	10107.23	7732.47	17.55	32° 16' 32.316 N	103° 33' 10.142 W
PBHL (TU 138Y)	10122.00	7732.83	-7.58	32° 16' 32.321 N	103° 33' 10.435 W
SHL (TU 138Y)	0.00	0.00	0.00	32° 15' 15.804 N	103° 33' 11.002 W



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

Plan: Plan #10 (138Y/OH)
Thistle Unit
Created By: Brady Deaver
Date: 15/23, March 06 2017
Approved: _____
Date: _____

Devon Energy

Lea County, NM (NAD-83)

Thistle Unit

138Y

OH

Design: OH

Standard Survey Report

06 March, 2017

LEAM Drilling Systems LLC

Survey Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 138Y
Project:	Lea County, NM (NAD-83)	TVD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Site:	Thistle Unit	MD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Well:	138Y	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Multi User Db

Project	Lea 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	Thistle Unit		
Site Position:		Northing:	468,026.90 usft
From:	Map	Easting:	780,722.56 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 17' 3.494 N
		Longitude:	103° 33' 31.335 W
		Grid Convergence:	0.41 °

Well	138Y		
Well Position	+N/-S	0.00 usft	Northing: 457,156.92 usft
	+E/-W	0.00 usft	Easting: 782,547.19 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	3,658.80 usft
		Latitude:	32° 15' 15.804 N
		Longitude:	103° 33' 11.002 W
		Ground Level:	3,637.80 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	1/30/2017	6.88
			Dip Angle (°)
			60.05
			Field Strength (nT)
			48,198

Design	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 (°)
			359.73

Survey Program	Date	3/6/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
176.00	17,776.00	Survey #1 (OH)	LEAM MWD+HDGM	MWD+HDGM
17,832.00	17,832.00	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
SHL (TU 138Y)									
176.00	0.50	298.50	176.00	0.37	-0.67	0.37	0.28	0.28	0.00
207.00	0.60	305.80	207.00	0.53	-0.93	0.53	0.39	0.32	23.55
330.00	0.60	318.70	329.99	1.39	-1.87	1.40	0.11	0.00	10.49
421.00	0.40	321.50	420.99	1.99	-2.38	2.00	0.22	-0.22	3.08
514.00	0.30	336.80	513.98	2.47	-2.68	2.48	0.15	-0.11	16.45
606.00	0.10	1.60	605.98	2.77	-2.78	2.79	0.23	-0.22	26.96

LEAM Drilling Systems LLC

Survey Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 138Y
Project:	Lea County, NM (NAD-83)	TVD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Site:	Thistle Unit	MD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Well:	138Y	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Multi 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)
698.00	0.10	164.90	697.98	2.78	-2.75	2.79	0.22	0.00	177.50
824.00	0.00	206.90	823.98	2.67	-2.72	2.68	0.08	-0.08	0.00
1,013.00	0.10	2.10	1,012.98	2.83	-2.72	2.85	0.05	0.05	0.00
1,108.00	0.20	355.10	1,107.98	3.08	-2.73	3.09	0.11	0.11	-7.37
1,203.00	0.20	1.20	1,202.98	3.41	-2.74	3.43	0.02	0.00	6.42
1,273.00	0.20	352.20	1,272.98	3.66	-2.75	3.67	0.04	0.00	-12.86
1,434.00	0.20	161.30	1,433.98	3.67	-2.70	3.68	0.25	0.00	105.03
1,530.00	0.20	286.30	1,529.98	3.56	-2.81	3.57	0.37	0.00	130.21
1,625.00	0.20	302.10	1,624.98	3.69	-3.11	3.71	0.06	0.00	16.63
1,719.00	0.20	63.40	1,718.98	3.85	-3.10	3.87	0.37	0.00	129.04
1,814.00	0.20	90.00	1,813.98	3.93	-2.79	3.94	0.10	0.00	28.00
1,910.00	0.10	143.90	1,909.98	3.86	-2.57	3.87	0.17	-0.10	56.15
2,004.00	0.20	355.80	2,003.98	3.96	-2.53	3.97	0.31	0.11	-157.55
2,099.00	0.10	45.20	2,098.98	4.18	-2.49	4.19	0.16	-0.11	52.00
2,194.00	0.20	74.70	2,193.98	4.28	-2.27	4.29	0.13	0.11	31.05
2,289.00	0.30	29.70	2,288.98	4.54	-1.98	4.55	0.22	0.11	-47.37
2,384.00	0.30	22.50	2,383.98	4.99	-1.77	5.00	0.04	0.00	-7.58
2,480.00	0.40	61.70	2,479.98	5.38	-1.38	5.38	0.26	0.10	40.83
2,575.00	0.40	34.10	2,574.97	5.81	-0.90	5.81	0.20	0.00	-29.05
2,670.00	0.20	42.20	2,669.97	6.21	-0.60	6.21	0.21	-0.21	8.53
2,765.00	0.40	28.50	2,764.97	6.62	-0.33	6.62	0.22	0.21	-14.42
2,860.00	0.30	41.10	2,859.97	7.10	-0.01	7.10	0.13	-0.11	13.26
2,956.00	0.30	254.50	2,955.97	7.22	-0.09	7.22	0.60	0.00	-152.71
3,051.00	1.30	213.00	3,050.96	6.25	-0.91	6.26	1.15	1.05	-43.68
3,146.00	2.50	198.40	3,145.90	3.38	-2.15	3.39	1.35	1.26	-15.37
3,241.00	3.30	198.60	3,240.78	-1.17	-3.68	-1.16	0.84	0.84	0.21
3,336.00	3.70	201.60	3,335.61	-6.62	-5.68	-6.59	0.46	0.42	3.16
3,431.00	4.10	205.60	3,430.39	-12.53	-8.28	-12.49	0.51	0.42	4.21
3,527.00	5.30	200.00	3,526.06	-19.79	-11.28	-19.74	1.34	1.25	-5.83
3,622.00	5.40	197.20	3,620.65	-28.18	-14.10	-28.12	0.29	0.11	-2.95
3,717.00	4.80	199.30	3,715.27	-36.21	-16.73	-36.13	0.66	-0.63	2.21
3,812.00	4.40	196.50	3,809.96	-43.45	-19.08	-43.36	0.48	-0.42	-2.95
3,907.00	4.00	198.40	3,904.71	-50.09	-21.16	-49.99	0.45	-0.42	2.00
4,002.00	3.90	199.00	3,999.48	-56.29	-23.26	-56.18	0.11	-0.11	0.63
4,097.00	4.30	188.90	4,094.24	-62.86	-24.86	-62.74	0.87	0.42	-10.63
4,193.00	4.30	190.20	4,189.97	-69.96	-26.06	-69.84	0.10	0.00	1.35
4,288.00	4.10	192.50	4,284.72	-76.78	-27.42	-76.65	0.28	-0.21	2.42
4,382.00	4.50	177.50	4,378.45	-83.75	-27.99	-83.61	1.27	0.43	-15.96
4,477.00	4.70	170.70	4,473.15	-91.31	-27.20	-91.18	0.61	0.21	-7.16
4,572.00	4.70	169.40	4,567.83	-98.98	-25.85	-98.85	0.11	0.00	-1.37
4,666.00	4.30	168.90	4,661.54	-106.22	-24.47	-106.10	0.43	-0.43	-0.53
4,761.00	4.60	163.50	4,756.25	-113.37	-22.70	-113.26	0.54	0.32	-5.68

LEAM Drilling Systems LLC

Survey Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 138Y
Project:	Lea County, NM (NAD-83)	TVD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Site:	Thistle Unit	MD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Well:	138Y	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Multi 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)
4,855.00	4.50	159.90	4,849.96	-120.44	-20.36	-120.35	0.32	-0.11	-3.83
4,950.00	4.70	155.50	4,944.65	-127.49	-17.47	-127.40	0.43	0.21	-4.63
5,015.00	4.40	157.70	5,009.45	-132.22	-15.42	-132.14	0.53	-0.46	3.38
5,136.00	3.50	161.90	5,130.16	-140.02	-12.51	-139.96	0.78	-0.74	3.47
5,230.00	2.90	167.00	5,224.01	-145.07	-11.08	-145.01	0.71	-0.64	5.43
5,325.00	2.90	165.20	5,318.89	-149.73	-9.93	-149.68	0.10	0.00	-1.89
5,421.00	3.00	166.30	5,414.76	-154.52	-8.71	-154.48	0.12	0.10	1.15
5,516.00	3.00	164.00	5,509.63	-159.32	-7.44	-159.29	0.13	0.00	-2.42
5,611.00	3.00	162.60	5,604.50	-164.09	-6.01	-164.06	0.08	0.00	-1.47
5,706.00	4.00	165.40	5,699.32	-169.66	-4.43	-169.64	1.07	1.05	2.95
5,801.00	3.20	161.00	5,794.14	-175.38	-2.73	-175.36	0.89	-0.84	-4.63
5,896.00	2.10	152.70	5,889.03	-179.43	-1.07	-179.42	1.22	-1.16	-8.74
5,991.00	1.20	151.50	5,983.99	-181.85	0.20	-181.85	0.95	-0.95	-1.26
6,086.00	1.20	145.00	6,078.97	-183.54	1.25	-183.55	0.14	0.00	-6.84
6,181.00	0.20	104.90	6,173.96	-184.40	1.98	-184.41	1.11	-1.05	-42.21
6,276.00	0.10	38.10	6,268.96	-184.38	2.19	-184.38	0.19	-0.11	-70.32
6,371.00	0.30	36.90	6,363.96	-184.11	2.39	-184.12	0.21	0.21	-1.26
6,467.00	0.40	44.30	6,459.96	-183.67	2.78	-183.68	0.11	0.10	7.71
6,562.00	0.40	50.40	6,554.96	-183.22	3.26	-183.24	0.04	0.00	6.42
6,657.00	0.40	54.30	6,649.96	-182.82	3.79	-182.83	0.03	0.00	4.11
6,752.00	0.40	39.90	6,744.95	-182.37	4.27	-182.39	0.11	0.00	-15.16
6,847.00	0.40	52.70	6,839.95	-181.91	4.75	-181.94	0.09	0.00	13.47
6,942.00	0.40	72.70	6,934.95	-181.62	5.33	-181.64	0.15	0.00	21.05
7,038.00	0.50	117.70	7,030.95	-181.71	6.02	-181.74	0.37	0.10	46.88
7,133.00	0.90	119.50	7,125.94	-182.27	7.03	-182.30	0.42	0.42	1.89
7,228.00	0.90	129.50	7,220.93	-183.11	8.26	-183.15	0.17	0.00	10.53
7,323.00	0.80	125.10	7,315.92	-183.97	9.38	-184.01	0.13	-0.11	-4.63
7,418.00	0.90	133.40	7,410.91	-184.86	10.46	-184.91	0.17	0.11	8.74
7,513.00	0.80	131.40	7,505.90	-185.81	11.50	-185.87	0.11	-0.11	-2.11
7,608.00	1.10	124.10	7,600.88	-186.76	12.75	-186.82	0.34	0.32	-7.68
7,703.00	1.30	128.50	7,695.86	-187.95	14.35	-188.01	0.23	0.21	4.63
7,798.00	1.30	131.80	7,790.84	-189.33	16.00	-189.41	0.08	0.00	3.47
7,893.00	1.30	134.40	7,885.81	-190.81	17.57	-190.89	0.06	0.00	2.74
7,988.00	1.10	136.90	7,980.79	-192.23	18.97	-192.31	0.22	-0.21	2.63
8,083.00	1.20	147.10	8,075.77	-193.73	20.13	-193.82	0.24	0.11	10.74
8,178.00	1.10	149.20	8,170.76	-195.35	21.14	-195.44	0.11	-0.11	2.21
8,273.00	1.20	151.80	8,265.74	-197.01	22.07	-197.11	0.12	0.11	2.74
8,369.00	1.30	152.50	8,361.71	-198.86	23.05	-198.96	0.11	0.10	0.73
8,464.00	1.30	152.50	8,456.69	-200.77	24.05	-200.88	0.00	0.00	0.00
8,559.00	1.60	154.10	8,551.66	-202.92	25.12	-203.03	0.32	0.32	1.68
8,654.00	1.70	148.50	8,646.62	-205.31	26.44	-205.44	0.20	0.11	-5.89
8,749.00	1.70	151.80	8,741.58	-207.76	27.84	-207.89	0.10	0.00	3.47

LEAM Drilling Systems LLC

Survey Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 138Y
Project:	Lea County, NM (NAD-83)	TVD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Site:	Thistle Unit	MD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Well:	138Y	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Multi 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)
8,844.00	1.70	154.00	8,836.54	-210.27	29.13	-210.40	0.07	0.00	2.32
8,939.00	1.70	156.20	8,931.49	-212.82	30.31	-212.96	0.07	0.00	2.32
9,034.00	1.40	160.10	9,026.46	-215.20	31.28	-215.35	0.33	-0.32	4.11
9,129.00	1.40	158.70	9,121.43	-217.37	32.09	-217.52	0.04	0.00	-1.47
9,224.00	1.20	169.10	9,216.41	-219.43	32.70	-219.58	0.32	-0.21	10.95
9,319.00	1.70	185.60	9,311.38	-221.81	32.75	-221.96	0.68	0.53	17.37
9,414.00	2.10	196.10	9,406.32	-224.89	32.13	-225.04	0.56	0.42	11.05
9,491.00	2.40	195.10	9,483.26	-227.80	31.32	-227.94	0.39	0.39	-1.30
9,615.00	5.40	348.40	9,607.12	-224.58	29.47	-224.72	6.15	2.42	123.63
9,662.00	10.60	351.40	9,653.64	-218.14	28.38	-218.27	11.10	11.06	6.38
9,709.00	14.20	354.30	9,699.54	-208.13	27.16	-208.25	7.77	7.66	6.17
9,754.00	17.00	4.50	9,742.89	-196.07	27.13	-196.20	8.69	6.22	22.67
9,804.00	22.80	9.50	9,789.88	-179.21	29.30	-179.35	12.08	11.60	10.00
9,851.00	30.20	9.80	9,831.92	-158.55	32.82	-158.71	15.75	15.74	0.64
9,900.00	37.80	9.30	9,872.51	-131.55	37.35	-131.73	15.52	15.51	-1.02
9,947.00	43.30	3.80	9,908.22	-101.22	40.75	-101.41	13.95	11.70	-11.70
9,995.00	47.80	0.00	9,941.83	-67.00	41.84	-67.19	10.94	9.38	-7.92
10,042.00	54.30	0.30	9,971.36	-30.46	41.94	-30.66	13.84	13.83	0.64
10,058.00	56.80	359.40	9,980.41	-17.27	41.91	-17.47	16.30	15.63	-5.63
10,092.00	59.50	359.30	9,998.35	11.60	41.58	11.41	7.95	7.94	-0.29
10,139.00	64.50	358.90	10,020.41	53.08	40.92	52.89	10.66	10.64	-0.85
10,187.00	70.20	358.40	10,038.89	97.35	39.88	97.16	11.91	11.88	-1.04
10,234.00	75.40	357.90	10,052.78	142.21	38.42	142.03	11.11	11.06	-1.06
10,272.00	80.00	358.20	10,060.88	179.31	37.16	179.13	12.13	12.11	0.79
10,304.00	84.00	357.50	10,065.33	210.97	35.97	210.79	12.69	12.50	-2.19
10,400.00	92.60	359.80	10,068.17	306.80	33.72	306.64	9.27	8.96	2.40
10,495.00	92.00	0.00	10,064.36	401.72	33.55	401.56	0.67	-0.63	0.21
10,588.00	93.10	1.50	10,060.22	494.62	34.77	494.45	2.00	1.18	1.61
10,683.00	91.70	1.20	10,056.25	589.51	37.00	589.33	1.51	-1.47	-0.32
10,777.00	90.00	0.70	10,054.85	683.48	38.56	683.29	1.89	-1.81	-0.53
10,872.00	89.30	359.40	10,055.43	778.48	38.64	778.29	1.55	-0.74	-1.37
10,966.00	90.30	359.80	10,055.76	872.47	37.99	872.28	1.15	1.06	0.43
11,062.00	87.30	359.30	10,057.77	968.44	37.24	968.25	3.17	-3.13	-0.52
11,157.00	87.40	358.60	10,062.16	1,063.32	35.50	1,063.14	0.74	0.11	-0.74
11,251.00	88.50	359.10	10,065.52	1,157.24	33.61	1,157.07	1.29	1.17	0.53
11,346.00	90.20	359.30	10,066.60	1,252.22	32.28	1,252.05	1.80	1.79	0.21
11,440.00	89.30	359.60	10,067.01	1,346.21	31.38	1,346.05	1.01	-0.96	0.32
11,535.00	89.30	1.20	10,068.17	1,441.20	32.05	1,441.03	1.68	0.00	1.68
11,631.00	86.10	0.10	10,072.02	1,537.10	33.13	1,536.93	3.52	-3.33	-1.15
11,726.00	86.80	0.10	10,077.91	1,631.92	33.30	1,631.74	0.74	0.74	0.00
11,821.00	84.10	0.00	10,085.44	1,726.61	33.38	1,726.43	2.84	-2.84	-0.11
11,916.00	86.40	359.80	10,093.31	1,821.28	33.22	1,821.10	2.43	2.42	-0.21

LEAM Drilling Systems LLC

Survey Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 138Y
Project:	Lea County, NM (NAD-83)	TVD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Site:	Thistle Unit	MD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Well:	138Y	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Multi 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)
12,011.00	89.30	0.50	10,096.87	1,916.20	33.47	1,916.02	3.14	3.05	0.74
12,106.00	90.90	0.80	10,096.71	2,011.19	34.54	2,011.01	1.71	1.68	0.32
12,201.00	89.50	359.80	10,096.38	2,106.19	35.04	2,106.00	1.81	-1.47	-1.05
12,296.00	90.20	359.30	10,096.62	2,201.18	34.30	2,201.00	0.91	0.74	-0.53
12,391.00	90.10	359.40	10,096.38	2,296.17	33.22	2,295.99	0.15	-0.11	0.11
12,486.00	90.60	359.30	10,095.80	2,391.17	32.14	2,390.99	0.54	0.53	-0.11
12,581.00	91.40	358.90	10,094.14	2,486.14	30.65	2,485.97	0.94	0.84	-0.42
12,676.00	91.10	359.80	10,092.06	2,581.11	29.57	2,580.94	1.00	-0.32	0.95
12,762.00	88.70	0.30	10,092.21	2,667.10	29.65	2,666.93	2.85	-2.79	0.58
12,865.00	89.80	0.70	10,093.56	2,770.09	30.54	2,769.91	1.14	1.07	0.39
12,960.00	87.80	0.80	10,095.55	2,865.05	31.79	2,864.87	2.11	-2.11	0.11
13,055.00	88.20	1.00	10,098.87	2,959.98	33.28	2,959.80	0.47	0.42	0.21
13,150.00	87.80	1.20	10,102.18	3,054.91	35.10	3,054.71	0.47	-0.42	0.21
13,245.00	87.80	1.40	10,105.83	3,149.81	37.26	3,149.60	0.21	0.00	0.21
13,340.00	88.00	0.10	10,109.31	3,244.74	38.50	3,244.52	1.38	0.21	-1.37
13,436.00	88.00	358.60	10,112.66	3,340.67	37.41	3,340.46	1.56	0.00	-1.56
13,531.00	90.60	358.40	10,113.82	3,435.63	34.92	3,435.42	2.74	2.74	-0.21
13,626.00	90.10	358.60	10,113.24	3,530.59	32.44	3,530.40	0.57	-0.53	0.21
13,721.00	90.70	359.80	10,112.58	3,625.58	31.11	3,625.39	1.41	0.63	1.26
13,816.00	92.60	1.00	10,109.84	3,720.53	31.77	3,720.34	2.37	2.00	1.26
13,857.00	92.30	1.00	10,108.09	3,761.49	32.49	3,761.29	0.73	-0.73	0.00
14,007.00	89.50	0.80	10,105.73	3,911.43	34.84	3,911.23	1.87	-1.87	-0.13
14,102.00	88.20	359.60	10,107.64	4,006.41	35.17	4,006.20	1.86	-1.37	-1.26
14,195.00	88.50	0.30	10,110.32	4,099.37	35.09	4,099.16	0.82	0.32	0.75
14,290.00	88.60	0.70	10,112.72	4,194.34	35.92	4,194.12	0.43	0.11	0.42
14,385.00	89.40	1.40	10,114.38	4,289.30	37.66	4,289.08	1.12	0.84	0.74
14,480.00	88.11	1.72	10,116.45	4,384.25	40.25	4,384.01	1.40	-1.36	0.34
14,575.00	87.40	2.60	10,120.17	4,479.10	43.83	4,478.85	1.19	-0.75	0.93
14,670.00	87.50	2.80	10,124.39	4,573.90	48.30	4,573.63	0.24	0.11	0.21
14,765.00	87.80	3.30	10,128.29	4,668.69	53.35	4,668.39	0.61	0.32	0.53
14,860.00	88.20	3.70	10,131.60	4,763.45	59.14	4,763.12	0.60	0.42	0.42
14,955.00	88.20	2.30	10,134.59	4,858.27	64.11	4,857.92	1.47	0.00	-1.47
15,050.00	89.20	1.40	10,136.74	4,953.20	67.18	4,952.83	1.42	1.05	-0.95
15,145.00	89.60	359.30	10,137.74	5,048.19	67.76	5,047.81	2.25	0.42	-2.21
15,240.00	89.70	357.30	10,138.32	5,143.14	64.94	5,142.77	2.11	0.11	-2.11
15,335.00	89.70	356.80	10,138.82	5,238.01	60.05	5,237.67	0.53	0.00	-0.53
15,430.00	89.90	357.70	10,139.15	5,332.90	55.49	5,332.58	0.97	0.21	0.95
15,525.00	90.00	357.30	10,139.23	5,427.81	51.35	5,427.51	0.43	0.11	-0.42
15,620.00	90.80	357.70	10,138.57	5,522.71	47.21	5,522.43	0.94	0.84	0.42
15,715.00	92.20	357.50	10,136.08	5,617.60	43.23	5,617.33	1.49	1.47	-0.21
15,810.00	91.50	357.70	10,133.01	5,712.46	39.25	5,712.21	0.77	-0.74	0.21
15,905.00	90.50	357.20	10,131.36	5,807.35	35.03	5,807.12	1.18	-1.05	-0.53

LEAM Drilling Systems LLC

Survey Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 138Y
Project:	Lea County, NM (NAD-83)	TVD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Site:	Thistle Unit	MD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Well:	138Y	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Multi 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)
16,000.00	89.70	357.50	10,131.19	5,902.25	30.63	5,902.04	0.90	-0.84	0.32
16,095.00	89.30	357.20	10,132.02	5,997.14	26.24	5,996.95	0.53	-0.42	-0.32
16,191.00	89.00	357.20	10,133.44	6,093.02	21.55	6,092.85	0.31	-0.31	0.00
16,286.00	88.50	357.50	10,135.52	6,187.89	17.16	6,187.74	0.61	-0.53	0.32
16,381.00	88.10	358.00	10,138.33	6,282.78	13.43	6,282.65	0.67	-0.42	0.53
16,476.00	88.10	358.20	10,141.48	6,377.67	10.29	6,377.56	0.21	0.00	0.21
16,571.00	88.50	358.70	10,144.30	6,472.60	7.72	6,472.49	0.67	0.42	0.53
16,666.00	88.50	359.10	10,146.79	6,567.55	5.89	6,567.45	0.42	0.00	0.42
16,761.00	90.50	359.80	10,147.62	6,662.53	4.98	6,662.44	2.23	2.11	0.74
16,856.00	92.80	359.40	10,144.88	6,757.49	4.32	6,757.39	2.46	2.42	-0.42
16,951.00	94.00	359.40	10,139.25	6,852.31	3.33	6,852.22	1.26	1.26	0.00
17,046.00	92.20	0.00	10,134.11	6,947.17	2.83	6,947.08	2.00	-1.89	0.63
17,141.00	92.40	0.10	10,130.30	7,042.09	2.91	7,042.00	0.24	0.21	0.11
17,207.00	92.70	0.30	10,127.36	7,108.02	3.14	7,107.93	0.55	0.45	0.30
17,331.00	92.90	1.20	10,121.31	7,231.86	4.77	7,231.76	0.74	0.16	0.73
17,426.00	92.40	1.40	10,116.91	7,326.74	6.92	7,326.62	0.57	-0.53	0.21
17,521.00	90.80	1.50	10,114.26	7,421.67	9.32	7,421.54	1.69	-1.68	0.11
17,617.00	91.00	1.90	10,112.75	7,517.61	12.17	7,517.47	0.47	0.21	0.42
17,711.00	91.50	1.20	10,110.70	7,611.56	14.71	7,611.40	0.91	0.53	-0.74
17,776.00	91.70	1.40	10,108.89	7,676.51	16.18	7,676.35	0.44	0.31	0.31
17,831.31	91.70	1.40	10,107.25	7,731.78	17.54	7,731.61	0.00	0.00	0.00
PBHL (TU 138Y)									
17,832.00	91.70	1.40	10,107.23	7,732.47	17.55	7,732.30	0.00	0.00	0.00
BHL (TU 138Y)									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
BHL (TU 138Y)	0.00	0.00	10,107.23	7,732.47	17.55	464,889.39	782,564.74	32° 16' 32.316 N	103° 33' 10.142 W
- actual wellpath hits target center									
- Point									

Checked By: _____ Approved By: _____ Date: _____

Devon Energy

Lea County, NM (NAD-83)

Thistle Unit

138Y

OH

Design: OH

Survey Report - Geographic

06 March, 2017

LEAM Drilling Systems LLC

Survey Report - Geographic

Company:	Devon Energy	Local Co-ordinate Reference:	Well 138Y
Project:	Lea County, NM (NAD-83)	TVD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Site:	Thistle Unit	MD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Well:	138Y	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Multi User Db

Project	Lea 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		Thistle Unit			
Site Position:		Northing:	468,026.90 usft	Latitude:	32° 17' 3.494 N
From:	Map	Easting:	780,722.56 usft	Longitude:	103° 33' 31.335 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.41 °

Well	138Y					
Well Position	+N/-S	0.00 usft	Northing:	457,156.92 usft	Latitude:	32° 15' 15.804 N
	+E/-W	0.00 usft	Easting:	782,547.19 usft	Longitude:	103° 33' 11.002 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	3,658.80 usft	Ground Level:	3,637.80 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	1/30/2017	6.88	60.05	48,198

Design	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)	Direction (°)	
	0.00	0.00	0.00	359.73	

Survey Program	Date	3/6/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
176.00	17,776.00	Survey #1 (OH)	LEAM MWD+HDGM	MWD+HDGM	
17,832.00	17,832.00	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	457,156.92	782,547.19	32° 15' 15.804 N	103° 33' 11.002 W
SHL (TU 138Y)									
176.00	0.50	298.50	176.00	0.37	-0.67	457,157.29	782,546.51	32° 15' 15.808 N	103° 33' 11.009 W
207.00	0.60	305.80	207.00	0.53	-0.93	457,157.45	782,546.26	32° 15' 15.809 N	103° 33' 11.012 W
330.00	0.60	318.70	329.99	1.39	-1.87	457,158.31	782,545.31	32° 15' 15.818 N	103° 33' 11.023 W
421.00	0.40	321.50	420.99	1.99	-2.38	457,158.91	782,544.80	32° 15' 15.824 N	103° 33' 11.029 W
514.00	0.30	336.80	513.98	2.47	-2.68	457,159.39	782,544.50	32° 15' 15.829 N	103° 33' 11.033 W
606.00	0.10	1.60	605.98	2.77	-2.78	457,159.69	782,544.41	32° 15' 15.832 N	103° 33' 11.034 W
698.00	0.10	164.90	697.98	2.78	-2.75	457,159.70	782,544.44	32° 15' 15.832 N	103° 33' 11.033 W

LEAM Drilling Systems LLC

Survey Report - Geographic

Company:	Devon Energy	Local Co-ordinate Reference:	Well 138Y
Project:	Lea County, NM (NAD-83)	TVD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Site:	Thistle Unit	MD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Well:	138Y	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 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
824.00	0.00	206.90	823.98	2.67	-2.72	457,159.59	782,544.46	32° 15' 15.831 N	103° 33' 11.033 W
1,013.00	0.10	2.10	1,012.98	2.83	-2.72	457,159.75	782,544.47	32° 15' 15.832 N	103° 33' 11.033 W
1,108.00	0.20	355.10	1,107.98	3.08	-2.73	457,160.00	782,544.46	32° 15' 15.835 N	103° 33' 11.033 W
1,203.00	0.20	1.20	1,202.98	3.41	-2.74	457,160.33	782,544.45	32° 15' 15.838 N	103° 33' 11.033 W
1,273.00	0.20	352.20	1,272.98	3.66	-2.75	457,160.58	782,544.43	32° 15' 15.840 N	103° 33' 11.033 W
1,434.00	0.20	161.30	1,433.98	3.67	-2.70	457,160.59	782,544.49	32° 15' 15.840 N	103° 33' 11.033 W
1,530.00	0.20	286.30	1,529.98	3.56	-2.81	457,160.48	782,544.38	32° 15' 15.839 N	103° 33' 11.034 W
1,625.00	0.20	302.10	1,624.98	3.69	-3.11	457,160.61	782,544.08	32° 15' 15.841 N	103° 33' 11.037 W
1,719.00	0.20	63.40	1,718.98	3.85	-3.10	457,160.77	782,544.09	32° 15' 15.842 N	103° 33' 11.037 W
1,814.00	0.20	90.00	1,813.98	3.93	-2.79	457,160.85	782,544.40	32° 15' 15.843 N	103° 33' 11.034 W
1,910.00	0.10	143.90	1,909.98	3.86	-2.57	457,160.78	782,544.62	32° 15' 15.842 N	103° 33' 11.031 W
2,004.00	0.20	355.80	2,003.98	3.96	-2.53	457,160.88	782,544.65	32° 15' 15.843 N	103° 33' 11.031 W
2,099.00	0.10	45.20	2,098.98	4.18	-2.49	457,161.10	782,544.70	32° 15' 15.846 N	103° 33' 11.030 W
2,194.00	0.20	74.70	2,193.98	4.28	-2.27	457,161.20	782,544.92	32° 15' 15.846 N	103° 33' 11.028 W
2,289.00	0.30	29.70	2,288.98	4.54	-1.98	457,161.46	782,545.20	32° 15' 15.849 N	103° 33' 11.024 W
2,384.00	0.30	22.50	2,383.98	4.99	-1.77	457,161.91	782,545.42	32° 15' 15.853 N	103° 33' 11.022 W
2,480.00	0.40	61.70	2,479.98	5.38	-1.38	457,162.30	782,545.81	32° 15' 15.857 N	103° 33' 11.017 W
2,575.00	0.40	34.10	2,574.97	5.81	-0.90	457,162.73	782,546.29	32° 15' 15.862 N	103° 33' 11.012 W
2,670.00	0.20	42.20	2,669.97	6.21	-0.60	457,163.13	782,546.59	32° 15' 15.865 N	103° 33' 11.008 W
2,765.00	0.40	28.50	2,764.97	6.62	-0.33	457,163.54	782,546.86	32° 15' 15.870 N	103° 33' 11.005 W
2,860.00	0.30	41.10	2,859.97	7.10	-0.01	457,164.02	782,547.18	32° 15' 15.874 N	103° 33' 11.001 W
2,956.00	0.30	254.50	2,955.97	7.22	-0.09	457,164.14	782,547.10	32° 15' 15.875 N	103° 33' 11.002 W
3,051.00	1.30	213.00	3,050.96	6.25	-0.91	457,163.17	782,546.28	32° 15' 15.866 N	103° 33' 11.012 W
3,146.00	2.50	198.40	3,145.90	3.38	-2.15	457,160.30	782,545.03	32° 15' 15.838 N	103° 33' 11.026 W
3,241.00	3.30	198.60	3,240.78	-1.17	-3.68	457,155.75	782,543.51	32° 15' 15.793 N	103° 33' 11.045 W
3,336.00	3.70	201.60	3,335.61	-6.62	-5.68	457,150.30	782,541.51	32° 15' 15.739 N	103° 33' 11.068 W
3,431.00	4.10	205.60	3,430.39	-12.53	-8.28	457,144.39	782,538.91	32° 15' 15.681 N	103° 33' 11.099 W
3,527.00	5.30	200.00	3,526.06	-19.79	-11.28	457,137.13	782,535.91	32° 15' 15.609 N	103° 33' 11.135 W
3,622.00	5.40	197.20	3,620.65	-28.18	-14.10	457,128.74	782,533.09	32° 15' 15.526 N	103° 33' 11.168 W
3,717.00	4.80	199.30	3,715.27	-36.21	-16.73	457,120.71	782,530.45	32° 15' 15.447 N	103° 33' 11.200 W
3,812.00	4.40	196.50	3,809.96	-43.45	-19.08	457,113.47	782,528.11	32° 15' 15.375 N	103° 33' 11.227 W
3,907.00	4.00	198.40	3,904.71	-50.09	-21.16	457,106.83	782,526.02	32° 15' 15.310 N	103° 33' 11.252 W
4,002.00	3.90	199.00	3,999.48	-56.29	-23.26	457,100.63	782,523.93	32° 15' 15.249 N	103° 33' 11.277 W
4,097.00	4.30	188.90	4,094.24	-62.86	-24.86	457,094.06	782,522.32	32° 15' 15.184 N	103° 33' 11.296 W
4,193.00	4.30	190.20	4,189.97	-69.96	-26.06	457,086.96	782,521.13	32° 15' 15.114 N	103° 33' 11.311 W
4,288.00	4.10	192.50	4,284.72	-76.78	-27.42	457,080.14	782,519.76	32° 15' 15.046 N	103° 33' 11.327 W
4,382.00	4.50	177.50	4,378.45	-83.75	-27.99	457,073.18	782,519.20	32° 15' 14.977 N	103° 33' 11.335 W
4,477.00	4.70	170.70	4,473.15	-91.31	-27.20	457,065.61	782,519.99	32° 15' 14.902 N	103° 33' 11.326 W
4,572.00	4.70	169.40	4,567.83	-98.98	-25.85	457,057.94	782,521.33	32° 15' 14.826 N	103° 33' 11.311 W
4,666.00	4.30	168.90	4,661.54	-106.22	-24.47	457,050.70	782,522.72	32° 15' 14.755 N	103° 33' 11.295 W
4,761.00	4.60	163.50	4,756.25	-113.37	-22.70	457,043.55	782,524.49	32° 15' 14.684 N	103° 33' 11.276 W
4,855.00	4.50	159.90	4,849.96	-120.44	-20.36	457,036.48	782,526.83	32° 15' 14.614 N	103° 33' 11.249 W
4,950.00	4.70	155.50	4,944.65	-127.49	-17.47	457,029.43	782,529.72	32° 15' 14.544 N	103° 33' 11.216 W
5,015.00	4.40	157.70	5,009.45	-132.22	-15.42	457,024.70	782,531.77	32° 15' 14.497 N	103° 33' 11.192 W
5,136.00	3.50	161.90	5,130.16	-140.02	-12.51	457,016.90	782,534.68	32° 15' 14.419 N	103° 33' 11.159 W
5,230.00	2.90	167.00	5,224.01	-145.07	-11.08	457,011.86	782,536.11	32° 15' 14.369 N	103° 33' 11.143 W
5,325.00	2.90	165.20	5,318.89	-149.73	-9.93	457,007.19	782,537.26	32° 15' 14.323 N	103° 33' 11.130 W
5,421.00	3.00	166.30	5,414.76	-154.52	-8.71	457,002.40	782,538.48	32° 15' 14.276 N	103° 33' 11.116 W
5,516.00	3.00	164.00	5,509.63	-159.32	-7.44	456,997.60	782,539.75	32° 15' 14.228 N	103° 33' 11.102 W
5,611.00	3.00	162.60	5,604.50	-164.09	-6.01	456,992.83	782,541.18	32° 15' 14.181 N	103° 33' 11.085 W
5,706.00	4.00	165.40	5,699.32	-169.66	-4.43	456,987.26	782,542.76	32° 15' 14.125 N	103° 33' 11.068 W
5,801.00	3.20	161.00	5,794.14	-175.38	-2.73	456,981.54	782,544.46	32° 15' 14.069 N	103° 33' 11.048 W
5,896.00	2.10	152.70	5,889.03	-179.43	-1.07	456,977.49	782,546.12	32° 15' 14.029 N	103° 33' 11.029 W

LEAM Drilling Systems LLC

Survey Report - Geographic

Company:	Devon Energy	Local Co-ordinate Reference:	Well 138Y
Project:	Lea County, NM (NAD-83)	TVD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Site:	Thistle Unit	MD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Well:	138Y	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 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
5,991.00	1.20	151.50	5,983.99	-181.85	0.20	456,975.07	782,547.39	32° 15' 14.005 N	103° 33' 11.015 W
6,086.00	1.20	145.00	6,078.97	-183.54	1.25	456,973.38	782,548.44	32° 15' 13.988 N	103° 33' 11.003 W
6,181.00	0.20	104.90	6,173.96	-184.40	1.98	456,972.52	782,549.17	32° 15' 13.979 N	103° 33' 10.994 W
6,276.00	0.10	38.10	6,268.96	-184.38	2.19	456,972.54	782,549.38	32° 15' 13.979 N	103° 33' 10.992 W
6,371.00	0.30	36.90	6,363.96	-184.11	2.39	456,972.81	782,549.58	32° 15' 13.982 N	103° 33' 10.989 W
6,467.00	0.40	44.30	6,459.96	-183.67	2.78	456,973.25	782,549.96	32° 15' 13.986 N	103° 33' 10.985 W
6,562.00	0.40	50.40	6,554.96	-183.22	3.26	456,973.70	782,550.45	32° 15' 13.991 N	103° 33' 10.979 W
6,657.00	0.40	54.30	6,649.96	-182.82	3.79	456,974.10	782,550.98	32° 15' 13.995 N	103° 33' 10.973 W
6,752.00	0.40	39.90	6,744.95	-182.37	4.27	456,974.55	782,551.46	32° 15' 13.999 N	103° 33' 10.967 W
6,847.00	0.40	52.70	6,839.95	-181.91	4.75	456,975.01	782,551.93	32° 15' 14.004 N	103° 33' 10.962 W
6,942.00	0.40	72.70	6,934.95	-181.62	5.33	456,975.30	782,552.51	32° 15' 14.006 N	103° 33' 10.955 W
7,038.00	0.50	117.70	7,030.95	-181.71	6.02	456,975.21	782,553.21	32° 15' 14.005 N	103° 33' 10.947 W
7,133.00	0.90	119.50	7,125.94	-182.27	7.03	456,974.65	782,554.22	32° 15' 14.000 N	103° 33' 10.935 W
7,228.00	0.90	129.50	7,220.93	-183.11	8.26	456,973.81	782,555.45	32° 15' 13.991 N	103° 33' 10.921 W
7,323.00	0.80	125.10	7,315.92	-183.97	9.38	456,972.95	782,556.57	32° 15' 13.983 N	103° 33' 10.908 W
7,418.00	0.90	133.40	7,410.91	-184.86	10.46	456,972.06	782,557.65	32° 15' 13.974 N	103° 33' 10.895 W
7,513.00	0.80	131.40	7,505.90	-185.81	11.50	456,971.11	782,558.69	32° 15' 13.964 N	103° 33' 10.883 W
7,608.00	1.10	124.10	7,600.88	-186.76	12.75	456,970.16	782,559.94	32° 15' 13.955 N	103° 33' 10.869 W
7,703.00	1.30	128.50	7,695.86	-187.95	14.35	456,968.97	782,561.54	32° 15' 13.943 N	103° 33' 10.850 W
7,798.00	1.30	131.80	7,790.84	-189.33	16.00	456,967.59	782,563.19	32° 15' 13.929 N	103° 33' 10.831 W
7,893.00	1.30	134.40	7,885.81	-190.81	17.57	456,966.11	782,564.76	32° 15' 13.915 N	103° 33' 10.813 W
7,988.00	1.10	136.90	7,980.79	-192.23	18.97	456,964.69	782,566.15	32° 15' 13.901 N	103° 33' 10.797 W
8,083.00	1.20	147.10	8,075.77	-193.73	20.13	456,963.19	782,567.32	32° 15' 13.886 N	103° 33' 10.784 W
8,178.00	1.10	149.20	8,170.76	-195.35	21.14	456,961.57	782,568.32	32° 15' 13.869 N	103° 33' 10.772 W
8,273.00	1.20	151.80	8,265.74	-197.01	22.07	456,959.91	782,569.26	32° 15' 13.853 N	103° 33' 10.761 W
8,369.00	1.30	152.50	8,361.71	-198.86	23.05	456,958.06	782,570.24	32° 15' 13.835 N	103° 33' 10.750 W
8,464.00	1.30	152.50	8,456.69	-200.77	24.05	456,956.15	782,571.23	32° 15' 13.816 N	103° 33' 10.739 W
8,559.00	1.60	154.10	8,551.66	-202.92	25.12	456,954.00	782,572.31	32° 15' 13.794 N	103° 33' 10.726 W
8,654.00	1.70	148.50	8,646.62	-205.31	26.44	456,951.61	782,573.63	32° 15' 13.770 N	103° 33' 10.711 W
8,749.00	1.70	151.80	8,741.58	-207.76	27.84	456,949.16	782,575.03	32° 15' 13.746 N	103° 33' 10.695 W
8,844.00	1.70	154.00	8,836.54	-210.27	29.13	456,946.66	782,576.31	32° 15' 13.721 N	103° 33' 10.680 W
8,939.00	1.70	156.20	8,931.49	-212.82	30.31	456,944.10	782,577.50	32° 15' 13.696 N	103° 33' 10.667 W
9,034.00	1.40	160.10	9,026.46	-215.20	31.28	456,941.72	782,578.46	32° 15' 13.672 N	103° 33' 10.656 W
9,129.00	1.40	158.70	9,121.43	-217.37	32.09	456,939.55	782,579.28	32° 15' 13.651 N	103° 33' 10.646 W
9,224.00	1.20	169.10	9,216.41	-219.43	32.70	456,937.49	782,579.89	32° 15' 13.630 N	103° 33' 10.639 W
9,319.00	1.70	185.60	9,311.38	-221.81	32.75	456,935.11	782,579.94	32° 15' 13.607 N	103° 33' 10.639 W
9,414.00	2.10	196.10	9,406.32	-224.89	32.13	456,932.03	782,579.32	32° 15' 13.576 N	103° 33' 10.646 W
9,491.00	2.40	195.10	9,483.26	-227.80	31.32	456,929.12	782,578.51	32° 15' 13.548 N	103° 33' 10.656 W
9,615.00	5.40	348.40	9,607.12	-224.58	29.47	456,932.34	782,576.66	32° 15' 13.580 N	103° 33' 10.677 W
9,662.00	10.60	351.40	9,653.64	-218.14	28.38	456,938.78	782,575.56	32° 15' 13.643 N	103° 33' 10.690 W
9,709.00	14.20	354.30	9,699.54	-208.13	27.16	456,948.79	782,574.34	32° 15' 13.743 N	103° 33' 10.703 W
9,754.00	17.00	4.50	9,742.89	-196.07	27.13	456,960.85	782,574.31	32° 15' 13.862 N	103° 33' 10.702 W
9,804.00	22.80	9.50	9,789.88	-179.21	29.30	456,977.71	782,576.49	32° 15' 14.029 N	103° 33' 10.676 W
9,851.00	30.20	9.80	9,831.92	-158.55	32.82	456,998.37	782,580.01	32° 15' 14.233 N	103° 33' 10.633 W
9,900.00	37.80	9.30	9,872.51	-131.55	37.35	457,025.37	782,584.54	32° 15' 14.500 N	103° 33' 10.578 W
9,947.00	43.30	3.80	9,908.22	-101.22	40.75	457,055.70	782,587.94	32° 15' 14.799 N	103° 33' 10.536 W
9,995.00	47.80	0.00	9,941.83	-67.00	41.84	457,089.92	782,589.03	32° 15' 15.138 N	103° 33' 10.520 W
10,042.00	54.30	0.30	9,971.36	-30.46	41.94	457,126.46	782,589.13	32° 15' 15.499 N	103° 33' 10.516 W
10,058.00	56.80	359.40	9,980.41	-17.27	41.91	457,139.65	782,589.09	32° 15' 15.630 N	103° 33' 10.515 W
10,092.00	59.50	359.30	9,998.35	11.60	41.58	457,168.52	782,588.77	32° 15' 15.916 N	103° 33' 10.516 W
10,139.00	64.50	358.90	10,020.41	53.08	40.92	457,210.00	782,588.11	32° 15' 16.326 N	103° 33' 10.521 W
10,187.00	70.20	358.40	10,038.89	97.35	39.88	457,254.27	782,587.06	32° 15' 16.764 N	103° 33' 10.529 W
10,234.00	75.40	357.90	10,052.78	142.21	38.42	457,299.13	782,585.61	32° 15' 17.208 N	103° 33' 10.542 W

LEAM Drilling Systems LLC

Survey Report - Geographic

Company:	Devon Energy	Local Co-ordinate Reference:	Well 138Y
Project:	Lea County, NM (NAD-83)	TVD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Site:	Thistle Unit	MD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Well:	138Y	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 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
10,272.00	80.00	358.20	10,060.88	179.31	37.16	457,336.23	782,584.35	32° 15' 17.576 N	103° 33' 10.554 W
10,304.00	84.00	357.50	10,065.33	210.97	35.97	457,367.89	782,583.16	32° 15' 17.889 N	103° 33' 10.565 W
10,400.00	92.60	359.80	10,068.17	306.80	33.72	457,463.72	782,580.91	32° 15' 18.837 N	103° 33' 10.583 W
10,495.00	92.00	0.00	10,064.36	401.72	33.55	457,558.64	782,580.74	32° 15' 19.777 N	103° 33' 10.577 W
10,588.00	93.10	1.50	10,060.22	494.62	34.77	457,651.54	782,581.96	32° 15' 20.696 N	103° 33' 10.555 W
10,683.00	91.70	1.20	10,056.25	589.51	37.00	457,746.43	782,584.19	32° 15' 21.635 N	103° 33' 10.521 W
10,777.00	90.00	0.70	10,054.85	683.48	38.56	457,840.40	782,585.75	32° 15' 22.564 N	103° 33' 10.495 W
10,872.00	89.30	359.40	10,055.43	778.48	38.64	457,935.40	782,585.83	32° 15' 23.504 N	103° 33' 10.486 W
10,966.00	90.30	359.80	10,055.76	872.47	37.99	458,029.39	782,585.18	32° 15' 24.434 N	103° 33' 10.485 W
11,062.00	87.30	359.30	10,057.77	968.44	37.24	458,125.36	782,584.42	32° 15' 25.384 N	103° 33' 10.486 W
11,157.00	87.40	358.60	10,062.16	1,063.32	35.50	458,220.24	782,582.68	32° 15' 26.323 N	103° 33' 10.498 W
11,251.00	88.50	359.10	10,065.52	1,157.24	33.61	458,314.16	782,580.80	32° 15' 27.253 N	103° 33' 10.512 W
11,346.00	90.20	359.30	10,066.60	1,252.22	32.28	458,409.14	782,579.47	32° 15' 28.192 N	103° 33' 10.520 W
11,440.00	89.30	359.60	10,067.01	1,346.21	31.38	458,503.13	782,578.57	32° 15' 29.123 N	103° 33' 10.522 W
11,535.00	89.30	1.20	10,068.17	1,441.20	32.05	458,598.12	782,579.23	32° 15' 30.062 N	103° 33' 10.506 W
11,631.00	86.10	0.10	10,072.02	1,537.10	33.13	458,694.02	782,580.32	32° 15' 31.011 N	103° 33' 10.486 W
11,726.00	86.80	0.10	10,077.91	1,631.92	33.30	458,788.84	782,580.49	32° 15' 31.950 N	103° 33' 10.476 W
11,821.00	84.10	0.00	10,085.44	1,726.61	33.38	458,883.53	782,580.57	32° 15' 32.887 N	103° 33' 10.467 W
11,916.00	86.40	359.80	10,093.31	1,821.28	33.22	458,978.20	782,580.40	32° 15' 33.823 N	103° 33' 10.461 W
12,011.00	89.30	0.50	10,096.87	1,916.20	33.47	459,073.12	782,580.65	32° 15' 34.763 N	103° 33' 10.450 W
12,106.00	90.90	0.80	10,096.71	2,011.19	34.54	459,168.11	782,581.73	32° 15' 35.702 N	103° 33' 10.429 W
12,201.00	89.50	359.80	10,096.38	2,106.19	35.04	459,263.11	782,582.23	32° 15' 36.642 N	103° 33' 10.415 W
12,296.00	90.20	359.30	10,096.62	2,201.18	34.30	459,358.10	782,581.48	32° 15' 37.582 N	103° 33' 10.416 W
12,391.00	90.10	359.40	10,096.38	2,296.17	33.22	459,453.10	782,580.41	32° 15' 38.522 N	103° 33' 10.420 W
12,486.00	90.60	359.30	10,095.80	2,391.17	32.14	459,548.09	782,579.33	32° 15' 39.462 N	103° 33' 10.425 W
12,581.00	91.40	358.90	10,094.14	2,486.14	30.65	459,643.06	782,577.84	32° 15' 40.402 N	103° 33' 10.434 W
12,676.00	91.10	359.80	10,092.06	2,581.11	29.57	459,738.03	782,576.76	32° 15' 41.342 N	103° 33' 10.439 W
12,762.00	88.70	0.30	10,092.21	2,667.10	29.65	459,824.02	782,576.83	32° 15' 42.193 N	103° 33' 10.431 W
12,865.00	89.80	0.70	10,093.56	2,770.09	30.54	459,927.01	782,577.73	32° 15' 43.212 N	103° 33' 10.411 W
12,960.00	87.80	0.80	10,095.55	2,865.05	31.79	460,021.97	782,578.98	32° 15' 44.152 N	103° 33' 10.389 W
13,055.00	88.20	1.00	10,098.87	2,959.98	33.28	460,116.91	782,580.47	32° 15' 45.091 N	103° 33' 10.363 W
13,150.00	87.80	1.20	10,102.18	3,054.91	35.10	460,211.83	782,582.29	32° 15' 46.030 N	103° 33' 10.334 W
13,245.00	87.80	1.40	10,105.83	3,149.81	37.26	460,306.74	782,584.44	32° 15' 46.969 N	103° 33' 10.301 W
13,340.00	88.00	0.10	10,109.31	3,244.74	38.50	460,401.66	782,585.69	32° 15' 47.908 N	103° 33' 10.279 W
13,436.00	88.00	358.60	10,112.66	3,340.67	37.41	460,497.59	782,584.60	32° 15' 48.858 N	103° 33' 10.283 W
13,531.00	90.60	358.40	10,113.82	3,435.63	34.92	460,592.55	782,582.11	32° 15' 49.797 N	103° 33' 10.304 W
13,626.00	90.10	358.60	10,113.24	3,530.59	32.44	460,687.51	782,579.62	32° 15' 50.737 N	103° 33' 10.325 W
13,721.00	90.70	359.80	10,112.58	3,625.58	31.11	460,782.50	782,578.30	32° 15' 51.677 N	103° 33' 10.332 W
13,816.00	92.60	1.00	10,109.84	3,720.53	31.77	460,877.45	782,578.96	32° 15' 52.617 N	103° 33' 10.317 W
13,857.00	92.30	1.00	10,108.09	3,761.49	32.49	460,918.41	782,579.67	32° 15' 53.022 N	103° 33' 10.305 W
14,007.00	89.50	0.80	10,105.73	3,911.43	34.84	461,068.35	782,582.03	32° 15' 54.505 N	103° 33' 10.265 W
14,102.00	88.20	359.60	10,107.64	4,006.41	35.17	461,163.33	782,582.36	32° 15' 55.445 N	103° 33' 10.253 W
14,195.00	88.50	0.30	10,110.32	4,099.37	35.09	461,256.29	782,582.28	32° 15' 56.365 N	103° 33' 10.246 W
14,290.00	88.60	0.70	10,112.72	4,194.34	35.92	461,351.26	782,583.11	32° 15' 57.305 N	103° 33' 10.228 W
14,385.00	89.40	1.40	10,114.38	4,289.30	37.66	461,446.22	782,584.85	32° 15' 58.244 N	103° 33' 10.200 W
14,480.00	88.11	1.72	10,116.45	4,384.25	40.25	461,541.17	782,587.44	32° 15' 59.184 N	103° 33' 10.162 W
14,575.00	87.40	2.60	10,120.17	4,479.10	43.83	461,636.02	782,591.01	32° 16' 0.122 N	103° 33' 10.112 W
14,670.00	87.50	2.80	10,124.39	4,573.90	48.30	461,730.82	782,595.48	32° 16' 1.060 N	103° 33' 10.052 W
14,765.00	87.80	3.30	10,128.29	4,668.69	53.35	461,825.61	782,600.53	32° 16' 1.997 N	103° 33' 9.985 W
14,860.00	88.20	3.70	10,131.60	4,763.45	59.14	461,920.37	782,606.33	32° 16' 2.934 N	103° 33' 9.910 W
14,955.00	88.20	2.30	10,134.59	4,858.27	64.11	462,015.19	782,611.30	32° 16' 3.872 N	103° 33' 9.844 W
15,050.00	89.20	1.40	10,136.74	4,953.20	67.18	462,110.12	782,614.37	32° 16' 4.811 N	103° 33' 9.800 W
15,145.00	89.60	359.30	10,137.74	5,048.19	67.76	462,205.11	782,614.95	32° 16' 5.751 N	103° 33' 9.785 W

LEAM Drilling Systems LLC

Survey Report - Geographic

Company:	Devon Energy	Local Co-ordinate Reference:	Well 138Y
Project:	Lea County, NM (NAD-83)	TVD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Site:	Thistle Unit	MD Reference:	3637.8' GE + 21' KB @ 3658.80usft (Original Well Elev)
Well:	138Y	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 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
15,240.00	89.70	357.30	10,138.32	5,143.14	64.94	462,300.06	782,612.13	32° 16' 6.691 N	103° 33' 9.810 W
15,335.00	89.70	356.80	10,138.82	5,238.01	60.05	462,394.93	782,607.24	32° 16' 7.630 N	103° 33' 9.859 W
15,430.00	89.90	357.70	10,139.15	5,332.90	55.49	462,489.82	782,602.68	32° 16' 8.569 N	103° 33' 9.904 W
15,525.00	90.00	357.30	10,139.23	5,427.81	51.35	462,584.73	782,598.54	32° 16' 9.509 N	103° 33' 9.944 W
15,620.00	90.80	357.70	10,138.57	5,522.71	47.21	462,679.63	782,594.39	32° 16' 10.448 N	103° 33' 9.984 W
15,715.00	92.20	357.50	10,136.08	5,617.60	43.23	462,774.52	782,590.42	32° 16' 11.387 N	103° 33' 10.022 W
15,810.00	91.50	357.70	10,133.01	5,712.46	39.25	462,869.38	782,586.44	32° 16' 12.326 N	103° 33' 10.061 W
15,905.00	90.50	357.20	10,131.36	5,807.35	35.03	462,964.27	782,582.21	32° 16' 13.266 N	103° 33' 10.102 W
16,000.00	89.70	357.50	10,131.19	5,902.25	30.63	463,059.17	782,577.82	32° 16' 14.205 N	103° 33' 10.145 W
16,095.00	89.30	357.20	10,132.02	5,997.14	26.24	463,154.06	782,573.43	32° 16' 15.144 N	103° 33' 10.188 W
16,191.00	89.00	357.20	10,133.44	6,093.02	21.55	463,249.94	782,568.74	32° 16' 16.093 N	103° 33' 10.235 W
16,286.00	88.50	357.50	10,135.52	6,187.89	17.16	463,344.81	782,564.35	32° 16' 17.032 N	103° 33' 10.278 W
16,381.00	88.10	358.00	10,138.33	6,282.78	13.43	463,439.70	782,560.62	32° 16' 17.972 N	103° 33' 10.313 W
16,476.00	88.10	358.20	10,141.48	6,377.67	10.29	463,534.59	782,557.47	32° 16' 18.911 N	103° 33' 10.342 W
16,571.00	88.50	358.70	10,144.30	6,472.60	7.72	463,629.52	782,554.91	32° 16' 19.850 N	103° 33' 10.364 W
16,666.00	88.50	359.10	10,146.79	6,567.55	5.89	463,724.47	782,553.08	32° 16' 20.790 N	103° 33' 10.377 W
16,761.00	90.50	359.80	10,147.62	6,662.53	4.98	463,819.45	782,552.17	32° 16' 21.730 N	103° 33' 10.379 W
16,856.00	92.80	359.40	10,144.88	6,757.49	4.32	463,914.41	782,551.51	32° 16' 22.670 N	103° 33' 10.379 W
16,951.00	94.00	359.40	10,139.25	6,852.31	3.33	464,009.23	782,550.51	32° 16' 23.608 N	103° 33' 10.383 W
17,046.00	92.20	0.00	10,134.11	6,947.17	2.83	464,104.09	782,550.02	32° 16' 24.547 N	103° 33' 10.380 W
17,141.00	92.40	0.10	10,130.30	7,042.09	2.91	464,199.01	782,550.10	32° 16' 25.486 N	103° 33' 10.371 W
17,207.00	92.70	0.30	10,127.36	7,108.02	3.14	464,264.94	782,550.33	32° 16' 26.138 N	103° 33' 10.363 W
17,331.00	92.90	1.20	10,121.31	7,231.86	4.77	464,388.78	782,551.95	32° 16' 27.364 N	103° 33' 10.334 W
17,426.00	92.40	1.40	10,116.91	7,326.74	6.92	464,483.66	782,554.11	32° 16' 28.302 N	103° 33' 10.301 W
17,521.00	90.80	1.50	10,114.26	7,421.67	9.32	464,578.59	782,556.51	32° 16' 29.241 N	103° 33' 10.265 W
17,617.00	91.00	1.90	10,112.75	7,517.61	12.17	464,674.53	782,559.36	32° 16' 30.190 N	103° 33' 10.223 W
17,711.00	91.50	1.20	10,110.70	7,611.56	14.71	464,768.48	782,561.90	32° 16' 31.120 N	103° 33' 10.186 W
17,776.00	91.70	1.40	10,108.89	7,676.51	16.18	464,833.43	782,563.37	32° 16' 31.763 N	103° 33' 10.163 W
17,831.31	91.70	1.40	10,107.25	7,731.78	17.54	464,888.70	782,564.72	32° 16' 32.309 N	103° 33' 10.143 W
PBHL (TU 138Y)									
17,832.00	91.70	1.40	10,107.23	7,732.47	17.55	464,889.39	782,564.74	32° 16' 32.316 N	103° 33' 10.142 W
BHL (TU 138Y)									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
BHL (TU 138Y)	0.00	0.00	10,107.23	7,732.47	17.55	464,889.39	782,564.74	32° 16' 32.316 N	103° 33' 10.142 W
- actual wellpath hits target center									
- Point									

Checked By: _____ Approved By: _____ Date: _____