

Devon Energy

Project: Lea County, NM (NAD-83)
Site: Thistle Unit
Well: 138H
Wellbore: OH
Design: Plan #1

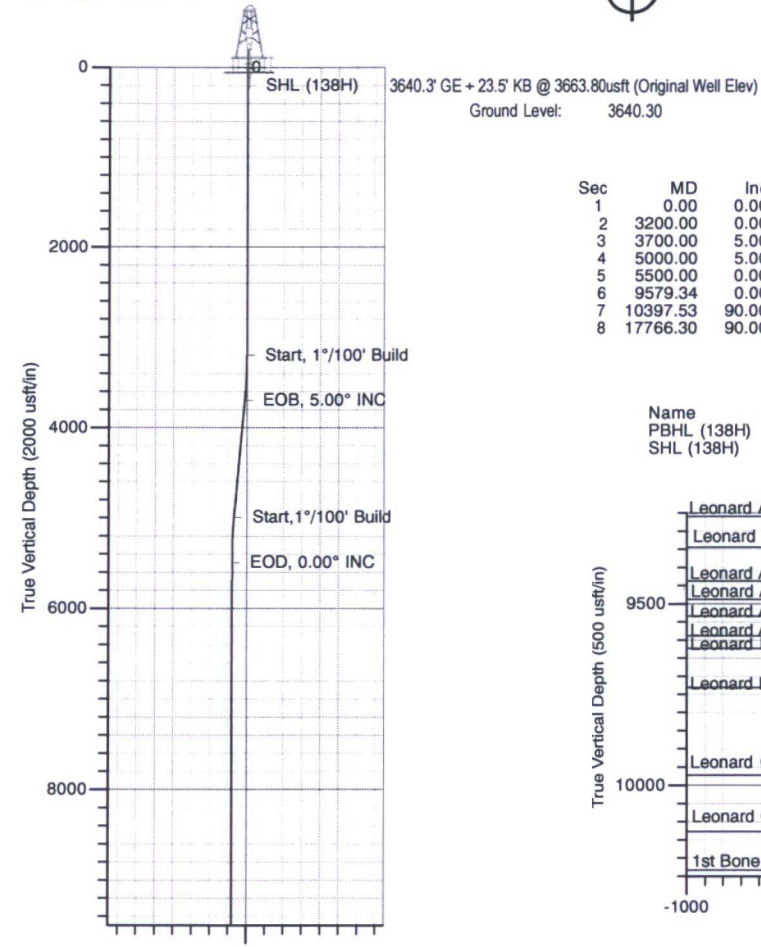


Azimuths to Grid North
True North: -0.42°
Magnetic North: 6.48°

Magnetic Field
Strength: 48205.2nT
Dip Angle: 60.05°
Date: 1/5/2017
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

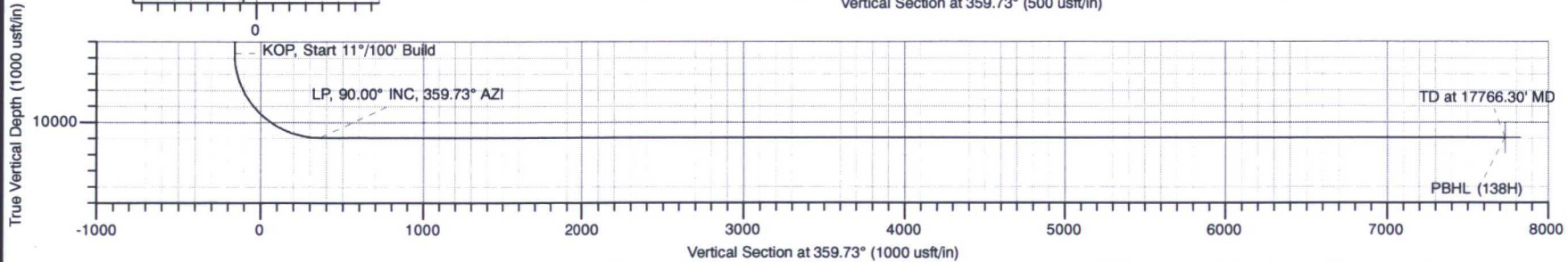
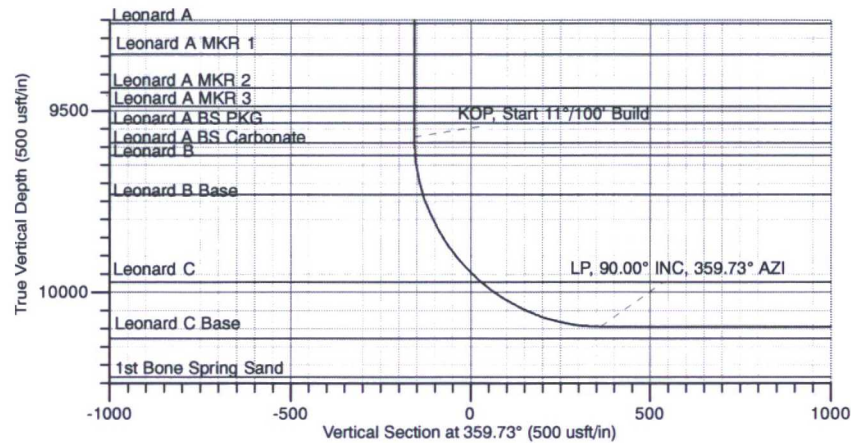


SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3200.00	0.00	0.00	3200.00	0.00	0.00	0.00	0.00	0.00	Start, 1°/100' Build
3	3700.00	5.00	180.00	3699.37	-21.80	0.00	1.00	180.00	-21.80	EOB, 5.00° INC
4	5000.00	5.00	180.00	4994.42	-135.11	0.00	0.00	0.00	-135.10	Start, 1°/100' Build
5	5500.00	0.00	0.00	5493.78	-156.91	0.00	1.00	180.00	-156.91	EOD, 0.00° INC
6	9579.34	0.00	0.00	9573.13	-156.91	0.00	0.00	0.00	-156.91	KOP, Start 11°/100' Build
7	10397.53	90.00	359.73	10094.00	363.96	-2.48	11.00	359.73	363.96	LP, 90.00° INC, 359.73° AZI
8	17766.30	90.00	359.73	10094.00	7732.65	-37.51	0.00	0.00	7732.74	TD at 17766.30' MD

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
PBHL (138H)	10094.00	7732.65	-37.51	32° 16' 32.321 N	103° 33' 10.435 W
SHL (138H)	0.00	0.00	0.00	32° 15' 15.804 N	103° 33' 10.653 W



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

Plan: Plan #1 (138H/OH)
Thistle Unit
Created By: Brady Deaver
Date: 14:00, January 12 2017
Approved: _____
Date: _____

Devon Energy

Project: Lea County, NM (NAD-83)
Site: Thistle Unit
Well: 138H
Wellbore: OH
Design: Plan #1



Azimuths to Grid North
True North: -0.42°
Magnetic North: 6.48°

Magnetic Field
Strength: 48205.2snT
Dip Angle: 60.05°
Date: 1/5/2017
Model: HDGM

devon

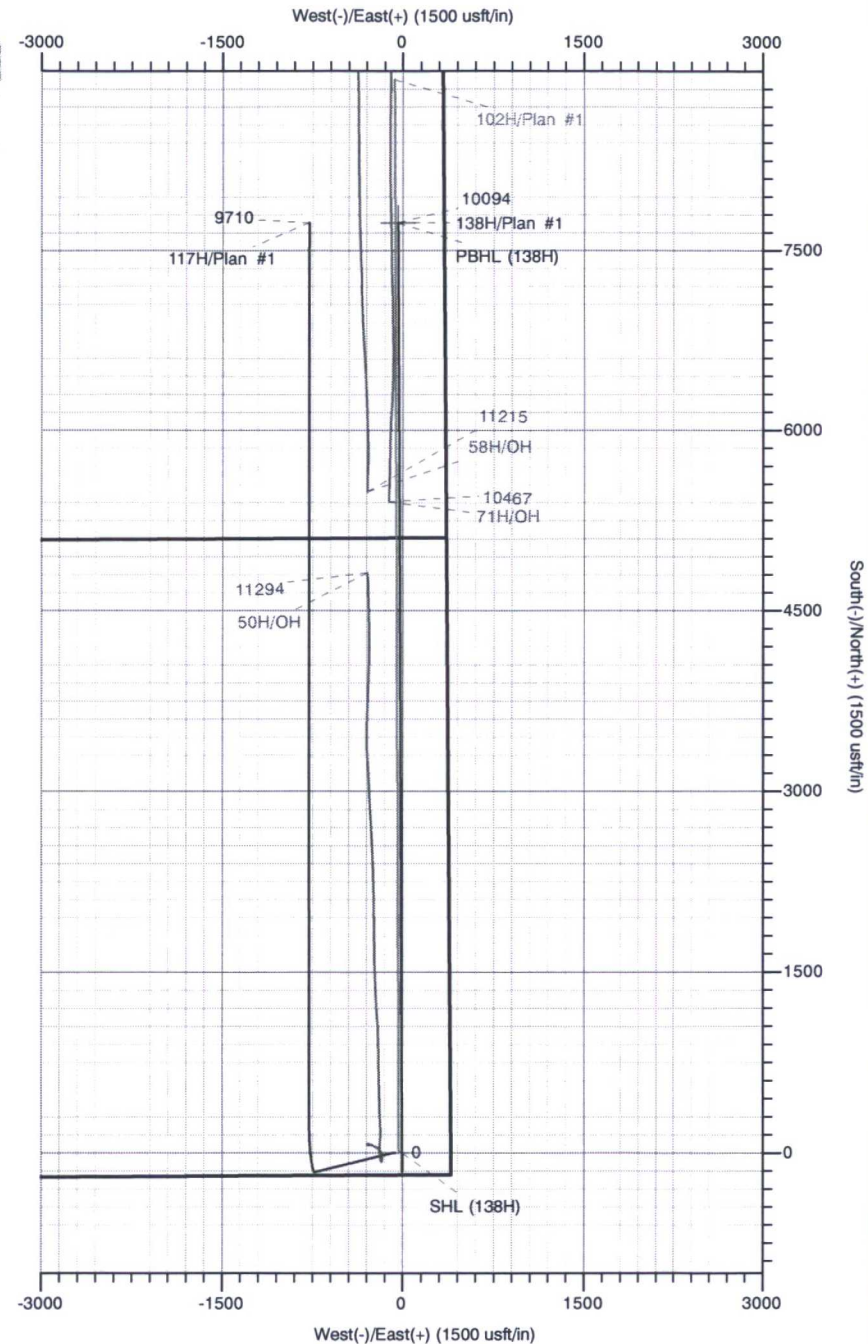
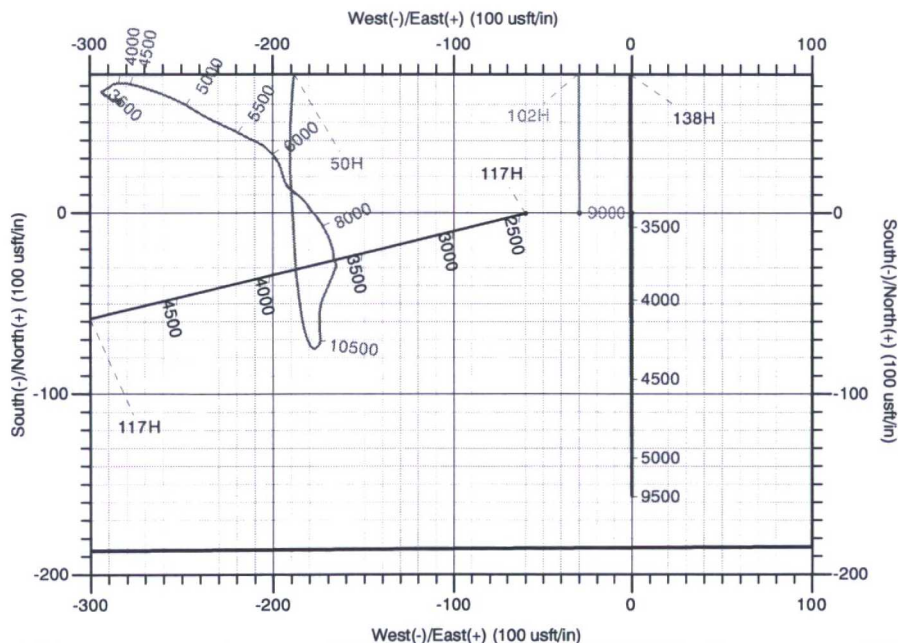
PROJECT DETAILS: Lea County, NM (NAD-83)
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3200.00	0.00	0.00	3200.00	0.00	0.00	0.00	0.00	0.00	
3700.00	5.00	180.00	3699.37	-21.80	0.00	1.00	180.00	-21.80	
5000.00	5.00	180.00	4994.42	-135.11	0.00	0.00	0.00	-135.10	
5500.00	0.00	0.00	5493.78	-156.91	0.00	1.00	180.00	-156.91	
9579.34	0.00	0.00	9573.13	-156.91	0.00	0.00	0.00	-156.91	
10397.53	90.00	359.73	10094.00	363.96	-2.48	11.00	359.73	363.96	
17766.30	90.00	359.73	10094.00	7732.65	-37.51	0.00	0.00	7732.74	PBHL (138H)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL (138H)	10094.00	7732.65	-37.51	464889.75	782539.61	32° 16' 32.321 N	103° 33' 10.435 W
SHL (138H)	0.00	0.00	0.00	457157.10	782577.12	32° 15' 15.804 N	103° 33' 10.653 W



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

Plan: Plan #1 (138H/OH)
Thistle Unit
Created By: Brady Deaver
Date: 14:05, January 12 2017
Approved: _____
Date: _____

Devon Energy

Lea County, NM (NAD-83)

Thistle Unit

138H

OH

Plan: Plan #1

Standard Planning Report

12 January, 2017

LEAM Drilling Systems LLC

Planning Report

Database:	EDM 5000.1 Multi User Db	Local Co-ordinate Reference:	Well 138H
Company:	Devon Energy	TVD Reference:	3640.3' GE + 23.5' KB @ 3663.80usft (Original Well Elev)
Project:	Lea County, NM (NAD-83)	MD Reference:	3640.3' GE + 23.5' KB @ 3663.80usft (Original Well Elev)
Site:	Thistle Unit	North Reference:	Grid
Well:	138H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

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
From:	Map	Easting:	780,722.56 usft	Longitude:	103° 33' 31.335
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.41

Well	138H					
Well Position	+N/-S	-10,869.80 usft	Northing:	457,157.10 usft	Latitude:	32° 15' 15.804
	+E/-W	1,854.56 usft	Easting:	782,577.12 usft	Longitude:	103° 33' 10.653
Position Uncertainty		0.00 usft	Wellhead Elevation:	3,663.80 usft	Ground Level:	3,640.30 us

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	1/5/2017	6.90	60.05	48,205

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	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

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,700.00	5.00	180.00	3,699.37	-21.80	0.00	1.00	1.00	0.00	180.00	
5,000.00	5.00	180.00	4,994.42	-135.11	0.00	0.00	0.00	0.00	0.00	
5,500.00	0.00	0.00	5,493.78	-156.91	0.00	1.00	-1.00	0.00	180.00	
9,579.35	0.00	0.00	9,573.13	-156.91	0.00	0.00	0.00	0.00	0.00	
10,397.53	90.00	359.73	10,094.00	363.96	-2.48	11.00	11.00	0.00	359.73	
17,766.30	90.00	359.73	10,094.00	7,732.65	-37.51	0.00	0.00	0.00	0.00	PBHL (138H)

LEAM Drilling Systems LLC

Planning Report

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Company:	Devon Energy	TVD Reference:	3640.3' GE + 23.5' KB @ 3663.80usft (Original Well Elev)
Project:	Lea County, NM (NAD-83)	MD Reference:	3640.3' GE + 23.5' KB @ 3663.80usft (Original Well Elev)
Site:	Thistle Unit	North Reference:	Grid
Well:	138H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned 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 (138H)									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,323.80	0.00	0.00	1,323.80	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,823.80	0.00	0.00	1,823.80	0.00	0.00	0.00	0.00	0.00	0.00
Top of Salt									
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
Start, 1°/100' Build									
3,300.00	1.00	180.00	3,299.99	-0.87	0.00	-0.87	1.00	1.00	0.00
3,400.00	2.00	180.00	3,399.96	-3.49	0.00	-3.49	1.00	1.00	0.00
3,500.00	3.00	180.00	3,499.86	-7.85	0.00	-7.85	1.00	1.00	0.00
3,600.00	4.00	180.00	3,599.68	-13.96	0.00	-13.96	1.00	1.00	0.00
3,700.00	5.00	180.00	3,699.37	-21.80	0.00	-21.80	1.00	1.00	0.00
EOB, 5.00° INC									
3,800.00	5.00	180.00	3,798.99	-30.52	0.00	-30.52	0.00	0.00	0.00
3,900.00	5.00	180.00	3,898.60	-39.23	0.00	-39.23	0.00	0.00	0.00
4,000.00	5.00	180.00	3,998.22	-47.95	0.00	-47.95	0.00	0.00	0.00
4,100.00	5.00	180.00	4,097.84	-56.67	0.00	-56.66	0.00	0.00	0.00
4,200.00	5.00	180.00	4,197.46	-65.38	0.00	-65.38	0.00	0.00	0.00
4,300.00	5.00	180.00	4,297.08	-74.10	0.00	-74.10	0.00	0.00	0.00

LEAM Drilling Systems LLC

Planning Report

Database:	EDM 5000.1 Multi User Db	Local Co-ordinate Reference:	Well 138H
Company:	Devon Energy	TVD Reference:	3640.3' GE + 23.5' KB @ 3663.80usft (Original Well Elev)
Project:	Lea County, NM (NAD-83)	MD Reference:	3640.3' GE + 23.5' KB @ 3663.80usft (Original Well Elev)
Site:	Thistle Unit	North Reference:	Grid
Well:	138H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned 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)
4,400.00	5.00	180.00	4,396.70	-82.81	0.00	-82.81	0.00	0.00	0.00
4,500.00	5.00	180.00	4,496.32	-91.53	0.00	-91.53	0.00	0.00	0.00
4,600.00	5.00	180.00	4,595.94	-100.24	0.00	-100.24	0.00	0.00	0.00
4,700.00	5.00	180.00	4,695.56	-108.96	0.00	-108.96	0.00	0.00	0.00
4,800.00	5.00	180.00	4,795.18	-117.67	0.00	-117.67	0.00	0.00	0.00
4,900.00	5.00	180.00	4,894.80	-126.39	0.00	-126.39	0.00	0.00	0.00
4,974.28	5.00	180.00	4,968.80	-132.86	0.00	-132.86	0.00	0.00	0.00
Base of Salt									
5,000.00	5.00	180.00	4,994.42	-135.11	0.00	-135.10	0.00	0.00	0.00
Start, 1' / 100' Build									
5,100.00	4.00	180.00	5,094.11	-142.95	0.00	-142.95	1.00	-1.00	0.00
5,200.00	3.00	180.00	5,193.92	-149.06	0.00	-149.05	1.00	-1.00	0.00
5,241.93	2.58	180.00	5,235.80	-151.10	0.00	-151.10	1.00	-1.00	0.00
Delaware									
5,300.00	2.00	180.00	5,293.83	-153.42	0.00	-153.42	1.00	-1.00	0.00
5,400.00	1.00	180.00	5,393.79	-156.04	0.00	-156.03	1.00	-1.00	0.00
5,500.00	0.00	0.00	5,493.78	-156.91	0.00	-156.91	1.00	-1.00	0.00
EOD, 0.00° INC									
5,600.00	0.00	0.00	5,593.78	-156.91	0.00	-156.91	0.00	0.00	0.00
5,700.00	0.00	0.00	5,693.78	-156.91	0.00	-156.91	0.00	0.00	0.00
5,800.00	0.00	0.00	5,793.78	-156.91	0.00	-156.91	0.00	0.00	0.00
5,900.00	0.00	0.00	5,893.78	-156.91	0.00	-156.91	0.00	0.00	0.00
6,000.00	0.00	0.00	5,993.78	-156.91	0.00	-156.91	0.00	0.00	0.00
6,100.00	0.00	0.00	6,093.78	-156.91	0.00	-156.91	0.00	0.00	0.00
6,200.00	0.00	0.00	6,193.78	-156.91	0.00	-156.91	0.00	0.00	0.00
6,300.00	0.00	0.00	6,293.78	-156.91	0.00	-156.91	0.00	0.00	0.00
6,400.00	0.00	0.00	6,393.78	-156.91	0.00	-156.91	0.00	0.00	0.00
6,500.00	0.00	0.00	6,493.78	-156.91	0.00	-156.91	0.00	0.00	0.00
6,600.00	0.00	0.00	6,593.78	-156.91	0.00	-156.91	0.00	0.00	0.00
6,700.00	0.00	0.00	6,693.78	-156.91	0.00	-156.91	0.00	0.00	0.00
6,800.00	0.00	0.00	6,793.78	-156.91	0.00	-156.91	0.00	0.00	0.00
6,900.00	0.00	0.00	6,893.78	-156.91	0.00	-156.91	0.00	0.00	0.00
7,000.00	0.00	0.00	6,993.78	-156.91	0.00	-156.91	0.00	0.00	0.00
7,100.00	0.00	0.00	7,093.78	-156.91	0.00	-156.91	0.00	0.00	0.00
7,200.00	0.00	0.00	7,193.78	-156.91	0.00	-156.91	0.00	0.00	0.00
7,300.00	0.00	0.00	7,293.78	-156.91	0.00	-156.91	0.00	0.00	0.00
7,400.00	0.00	0.00	7,393.78	-156.91	0.00	-156.91	0.00	0.00	0.00
7,500.00	0.00	0.00	7,493.78	-156.91	0.00	-156.91	0.00	0.00	0.00
7,600.00	0.00	0.00	7,593.78	-156.91	0.00	-156.91	0.00	0.00	0.00
7,700.00	0.00	0.00	7,693.78	-156.91	0.00	-156.91	0.00	0.00	0.00
7,800.00	0.00	0.00	7,793.78	-156.91	0.00	-156.91	0.00	0.00	0.00
7,900.00	0.00	0.00	7,893.78	-156.91	0.00	-156.91	0.00	0.00	0.00
8,000.00	0.00	0.00	7,993.78	-156.91	0.00	-156.91	0.00	0.00	0.00
8,100.00	0.00	0.00	8,093.78	-156.91	0.00	-156.91	0.00	0.00	0.00
8,200.00	0.00	0.00	8,193.78	-156.91	0.00	-156.91	0.00	0.00	0.00
8,300.00	0.00	0.00	8,293.78	-156.91	0.00	-156.91	0.00	0.00	0.00
8,400.00	0.00	0.00	8,393.78	-156.91	0.00	-156.91	0.00	0.00	0.00
8,500.00	0.00	0.00	8,493.78	-156.91	0.00	-156.91	0.00	0.00	0.00
8,600.00	0.00	0.00	8,593.78	-156.91	0.00	-156.91	0.00	0.00	0.00
8,700.00	0.00	0.00	8,693.78	-156.91	0.00	-156.91	0.00	0.00	0.00
8,800.00	0.00	0.00	8,793.78	-156.91	0.00	-156.91	0.00	0.00	0.00
8,900.00	0.00	0.00	8,893.78	-156.91	0.00	-156.91	0.00	0.00	0.00

LEAM Drilling Systems LLC

Planning Report

Database:	EDM 5000.1 Multi User Db	Local Co-ordinate Reference:	Well 138H
Company:	Devon Energy	TVD Reference:	3640.3' GE + 23.5' KB @ 3663.80usft (Original Well Elev)
Project:	Lea County, NM (NAD-83)	MD Reference:	3640.3' GE + 23.5' KB @ 3663.80usft (Original Well Elev)
Site:	Thistle Unit	North Reference:	Grid
Well:	138H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned 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)
8,942.02	0.00	0.00	8,935.80	-156.91	0.00	-156.91	0.00	0.00	0.00
Lower Brushy									
9,000.00	0.00	0.00	8,993.78	-156.91	0.00	-156.91	0.00	0.00	0.00
9,100.00	0.00	0.00	9,093.78	-156.91	0.00	-156.91	0.00	0.00	0.00
9,135.02	0.00	0.00	9,128.80	-156.91	0.00	-156.91	0.00	0.00	0.00
1st BSPG Lime									
9,200.00	0.00	0.00	9,193.78	-156.91	0.00	-156.91	0.00	0.00	0.00
9,266.02	0.00	0.00	9,259.80	-156.91	0.00	-156.91	0.00	0.00	0.00
Leonard A									
9,300.00	0.00	0.00	9,293.78	-156.91	0.00	-156.91	0.00	0.00	0.00
9,351.02	0.00	0.00	9,344.80	-156.91	0.00	-156.91	0.00	0.00	0.00
Leonard A MKR 1									
9,400.00	0.00	0.00	9,393.78	-156.91	0.00	-156.91	0.00	0.00	0.00
9,444.02	0.00	0.00	9,437.80	-156.91	0.00	-156.91	0.00	0.00	0.00
Leonard A MKR 2									
9,494.02	0.00	0.00	9,487.80	-156.91	0.00	-156.91	0.00	0.00	0.00
Leonard A MKR 3									
9,500.00	0.00	0.00	9,493.78	-156.91	0.00	-156.91	0.00	0.00	0.00
9,540.02	0.00	0.00	9,533.80	-156.91	0.00	-156.91	0.00	0.00	0.00
Leonard A BS PKG									
9,579.35	0.00	0.00	9,573.13	-156.91	0.00	-156.91	0.00	0.00	0.00
KOP, Start 11°/100' Build									
9,595.02	1.72	359.73	9,588.80	-156.67	0.00	-156.67	11.00	11.00	0.00
Leonard A BS Carbonate									
9,600.00	2.27	359.73	9,593.78	-156.50	0.00	-156.50	11.00	11.00	0.00
9,630.10	5.58	359.73	9,623.80	-154.44	-0.01	-154.44	11.00	11.00	0.00
Leonard B									
9,650.00	7.77	359.73	9,643.57	-152.12	-0.02	-152.12	11.00	11.00	0.00
9,700.00	13.27	359.73	9,692.71	-143.00	-0.07	-142.99	11.00	11.00	0.00
9,740.58	17.74	359.73	9,731.80	-132.15	-0.12	-132.15	11.00	11.00	0.00
Leonard B Base									
9,750.00	18.77	359.73	9,740.75	-129.20	-0.13	-129.20	11.00	11.00	0.00
9,800.00	24.27	359.73	9,787.24	-110.87	-0.22	-110.86	11.00	11.00	0.00
9,850.00	29.77	359.73	9,831.77	-88.16	-0.33	-88.16	11.00	11.00	0.00
9,900.00	35.27	359.73	9,873.91	-61.29	-0.45	-61.28	11.00	11.00	0.00
9,950.00	40.77	359.73	9,913.28	-30.50	-0.60	-30.50	11.00	11.00	0.00
10,000.00	46.27	359.73	9,949.53	3.92	-0.76	3.92	11.00	11.00	0.00
10,034.92	50.11	359.73	9,972.80	29.94	-0.89	29.94	11.00	11.00	0.00
Leonard C									
10,050.00	51.77	359.73	9,982.30	41.65	-0.94	41.65	11.00	11.00	0.00
10,100.00	57.27	359.73	10,011.31	82.35	-1.14	82.36	11.00	11.00	0.00
10,150.00	62.77	359.73	10,036.28	125.64	-1.34	125.65	11.00	11.00	0.00
10,200.00	68.27	359.73	10,056.99	171.13	-1.56	171.14	11.00	11.00	0.00
10,250.00	73.77	359.73	10,073.25	218.40	-1.78	218.40	11.00	11.00	0.00
10,300.00	79.27	359.73	10,084.90	267.00	-2.02	267.01	11.00	11.00	0.00
10,350.00	84.77	359.73	10,091.83	316.50	-2.25	316.50	11.00	11.00	0.00
10,397.53	90.00	359.73	10,094.00	363.96	-2.48	363.96	11.00	11.00	0.00
LP, 90.00° INC, 359.73° AZI									
10,400.00	90.00	359.73	10,094.00	366.43	-2.49	366.44	0.00	0.00	0.00
10,500.00	90.00	359.73	10,094.00	466.43	-2.96	466.44	0.00	0.00	0.00

LEAM Drilling Systems LLC

Planning Report

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Project:	Lea County, NM (NAD-83)	MD Reference:	3640.3' GE + 23.5' KB @ 3663.80usft (Original Well Elev)
Site:	Thistle Unit	North Reference:	Grid
Well:	138H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned 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)
10,600.00	90.00	359.73	10,094.00	566.43	-3.44	566.44	0.00	0.00	0.00
10,700.00	90.00	359.73	10,094.00	666.43	-3.91	666.44	0.00	0.00	0.00
10,800.00	90.00	359.73	10,094.00	766.43	-4.39	766.44	0.00	0.00	0.00
10,900.00	90.00	359.73	10,094.00	866.42	-4.87	866.44	0.00	0.00	0.00
11,000.00	90.00	359.73	10,094.00	966.42	-5.34	966.44	0.00	0.00	0.00
11,100.00	90.00	359.73	10,094.00	1,066.42	-5.82	1,066.44	0.00	0.00	0.00
11,200.00	90.00	359.73	10,094.00	1,166.42	-6.29	1,166.44	0.00	0.00	0.00
11,300.00	90.00	359.73	10,094.00	1,266.42	-6.77	1,266.44	0.00	0.00	0.00
11,400.00	90.00	359.73	10,094.00	1,366.42	-7.24	1,366.44	0.00	0.00	0.00
11,500.00	90.00	359.73	10,094.00	1,466.42	-7.72	1,466.44	0.00	0.00	0.00
11,600.00	90.00	359.73	10,094.00	1,566.42	-8.19	1,566.44	0.00	0.00	0.00
11,700.00	90.00	359.73	10,094.00	1,666.42	-8.67	1,666.44	0.00	0.00	0.00
11,800.00	90.00	359.73	10,094.00	1,766.41	-9.14	1,766.44	0.00	0.00	0.00
11,900.00	90.00	359.73	10,094.00	1,866.41	-9.62	1,866.44	0.00	0.00	0.00
12,000.00	90.00	359.73	10,094.00	1,966.41	-10.10	1,966.44	0.00	0.00	0.00
12,100.00	90.00	359.73	10,094.00	2,066.41	-10.57	2,066.44	0.00	0.00	0.00
12,200.00	90.00	359.73	10,094.00	2,166.41	-11.05	2,166.44	0.00	0.00	0.00
12,300.00	90.00	359.73	10,094.00	2,266.41	-11.52	2,266.44	0.00	0.00	0.00
12,400.00	90.00	359.73	10,094.00	2,366.41	-12.00	2,366.44	0.00	0.00	0.00
12,500.00	90.00	359.73	10,094.00	2,466.41	-12.47	2,466.44	0.00	0.00	0.00
12,600.00	90.00	359.73	10,094.00	2,566.41	-12.95	2,566.44	0.00	0.00	0.00
12,700.00	90.00	359.73	10,094.00	2,666.40	-13.42	2,666.44	0.00	0.00	0.00
12,800.00	90.00	359.73	10,094.00	2,766.40	-13.90	2,766.44	0.00	0.00	0.00
12,900.00	90.00	359.73	10,094.00	2,866.40	-14.37	2,866.44	0.00	0.00	0.00
13,000.00	90.00	359.73	10,094.00	2,966.40	-14.85	2,966.44	0.00	0.00	0.00
13,100.00	90.00	359.73	10,094.00	3,066.40	-15.32	3,066.44	0.00	0.00	0.00
13,200.00	90.00	359.73	10,094.00	3,166.40	-15.80	3,166.44	0.00	0.00	0.00
13,300.00	90.00	359.73	10,094.00	3,266.40	-16.28	3,266.44	0.00	0.00	0.00
13,400.00	90.00	359.73	10,094.00	3,366.40	-16.75	3,366.44	0.00	0.00	0.00
13,500.00	90.00	359.73	10,094.00	3,466.40	-17.23	3,466.44	0.00	0.00	0.00
13,600.00	90.00	359.73	10,094.00	3,566.39	-17.70	3,566.44	0.00	0.00	0.00
13,700.00	90.00	359.73	10,094.00	3,666.39	-18.18	3,666.44	0.00	0.00	0.00
13,800.00	90.00	359.73	10,094.00	3,766.39	-18.65	3,766.44	0.00	0.00	0.00
13,900.00	90.00	359.73	10,094.00	3,866.39	-19.13	3,866.44	0.00	0.00	0.00
14,000.00	90.00	359.73	10,094.00	3,966.39	-19.60	3,966.44	0.00	0.00	0.00
14,100.00	90.00	359.73	10,094.00	4,066.39	-20.08	4,066.44	0.00	0.00	0.00
14,200.00	90.00	359.73	10,094.00	4,166.39	-20.55	4,166.44	0.00	0.00	0.00
14,300.00	90.00	359.73	10,094.00	4,266.39	-21.03	4,266.44	0.00	0.00	0.00
14,400.00	90.00	359.73	10,094.00	4,366.38	-21.51	4,366.44	0.00	0.00	0.00
14,500.00	90.00	359.73	10,094.00	4,466.38	-21.98	4,466.44	0.00	0.00	0.00
14,600.00	90.00	359.73	10,094.00	4,566.38	-22.46	4,566.44	0.00	0.00	0.00
14,700.00	90.00	359.73	10,094.00	4,666.38	-22.93	4,666.44	0.00	0.00	0.00
14,800.00	90.00	359.73	10,094.00	4,766.38	-23.41	4,766.44	0.00	0.00	0.00
14,900.00	90.00	359.73	10,094.00	4,866.38	-23.88	4,866.44	0.00	0.00	0.00
15,000.00	90.00	359.73	10,094.00	4,966.38	-24.36	4,966.44	0.00	0.00	0.00
15,100.00	90.00	359.73	10,094.00	5,066.38	-24.83	5,066.44	0.00	0.00	0.00
15,200.00	90.00	359.73	10,094.00	5,166.38	-25.31	5,166.44	0.00	0.00	0.00
15,300.00	90.00	359.73	10,094.00	5,266.37	-25.78	5,266.44	0.00	0.00	0.00
15,400.00	90.00	359.73	10,094.00	5,366.37	-26.26	5,366.44	0.00	0.00	0.00
15,500.00	90.00	359.73	10,094.00	5,466.37	-26.74	5,466.44	0.00	0.00	0.00
15,600.00	90.00	359.73	10,094.00	5,566.37	-27.21	5,566.44	0.00	0.00	0.00
15,700.00	90.00	359.73	10,094.00	5,666.37	-27.69	5,666.44	0.00	0.00	0.00

LEAM Drilling Systems LLC

Planning Report

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Project:	Lea County, NM (NAD-83)	MD Reference:	3640.3' GE + 23.5' KB @ 3663.80usft (Original Well Elev)
Site:	Thistle Unit	North Reference:	Grid
Well:	138H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned 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)
15,800.00	90.00	359.73	10,094.00	5,766.37	-28.16	5,766.44	0.00	0.00	0.00
15,900.00	90.00	359.73	10,094.00	5,866.37	-28.64	5,866.44	0.00	0.00	0.00
16,000.00	90.00	359.73	10,094.00	5,966.37	-29.11	5,966.44	0.00	0.00	0.00
16,100.00	90.00	359.73	10,094.00	6,066.37	-29.59	6,066.44	0.00	0.00	0.00
16,200.00	90.00	359.73	10,094.00	6,166.36	-30.06	6,166.44	0.00	0.00	0.00
16,300.00	90.00	359.73	10,094.00	6,266.36	-30.54	6,266.44	0.00	0.00	0.00
16,400.00	90.00	359.73	10,094.00	6,366.36	-31.01	6,366.44	0.00	0.00	0.00
16,500.00	90.00	359.73	10,094.00	6,466.36	-31.49	6,466.44	0.00	0.00	0.00
16,600.00	90.00	359.73	10,094.00	6,566.36	-31.97	6,566.44	0.00	0.00	0.00
16,700.00	90.00	359.73	10,094.00	6,666.36	-32.44	6,666.44	0.00	0.00	0.00
16,800.00	90.00	359.73	10,094.00	6,766.36	-32.92	6,766.44	0.00	0.00	0.00
16,900.00	90.00	359.73	10,094.00	6,866.36	-33.39	6,866.44	0.00	0.00	0.00
17,000.00	90.00	359.73	10,094.00	6,966.36	-33.87	6,966.44	0.00	0.00	0.00
17,100.00	90.00	359.73	10,094.00	7,066.35	-34.34	7,066.44	0.00	0.00	0.00
17,200.00	90.00	359.73	10,094.00	7,166.35	-34.82	7,166.44	0.00	0.00	0.00
17,300.00	90.00	359.73	10,094.00	7,266.35	-35.29	7,266.44	0.00	0.00	0.00
17,400.00	90.00	359.73	10,094.00	7,366.35	-35.77	7,366.44	0.00	0.00	0.00
17,500.00	90.00	359.73	10,094.00	7,466.35	-36.24	7,466.44	0.00	0.00	0.00
17,600.00	90.00	359.73	10,094.00	7,566.35	-36.72	7,566.44	0.00	0.00	0.00
17,700.00	90.00	359.73	10,094.00	7,666.35	-37.19	7,666.44	0.00	0.00	0.00
17,766.30	90.00	359.73	10,094.00	7,732.65	-37.51	7,732.74	0.00	0.00	0.00
TD at 17766.30' MD - PBHL (138H)									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL (138H) - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	457,157.10	782,577.12	32° 15' 15.804 N	103° 33' 10.653 W
PBHL (138H) - plan hits target center - Point	0.00	0.00	10,094.00	7,732.65	-37.51	464,889.75	782,539.61	32° 16' 32.321 N	103° 33' 10.435 W

LEAM Drilling Systems LLC

Planning Report

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Project:	Lea County, NM (NAD-83)	MD Reference:	3640.3' GE + 23.5' KB @ 3663.80usft (Original Well Elev)
Site:	Thistle Unit	North Reference:	Grid
Well:	138H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,323.80	1,321.30	Rustler		0.00		
1,823.80	1,821.30	Top of Salt		0.00		
4,974.28	4,966.30	Base of Salt		0.00		
5,241.93	5,233.30	Delaware		0.00		
8,942.02	8,933.30	Lower Brushy		0.00		
9,135.02	9,126.30	1st BSPG Lime		0.00		
9,266.02	9,257.30	Leonard A		0.00		
9,351.02	9,342.30	Leonard A MKR 1		0.00		
9,444.02	9,435.30	Leonard A MKR 2		0.00		
9,494.02	9,485.30	Leonard A MKR 3		0.00		
9,540.02	9,531.30	Leonard A BS PKG		0.00		
9,595.02	9,586.30	Leonard A BS Carbonate		0.00		
9,630.10	9,621.30	Leonard B		0.00		
9,740.58	9,729.30	Leonard B Base		0.00		
10,034.92	9,970.30	Leonard C		0.00		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,200.00	3,200.00	0.00	0.00	Start, 1°/100' Build
3,700.00	3,699.37	-21.80	0.00	EOB, 5.00° INC
5,000.00	4,994.42	-135.11	0.00	Start, 1°/100' Build
5,500.00	5,493.78	-156.91	0.00	EOD, 0.00° INC
9,579.35	9,573.13	-156.91	0.00	KOP, Start 11°/100' Build
10,397.53	10,094.00	363.96	-2.48	LP, 90.00° INC, 359.73° AZI
17,766.30	10,094.00	7,732.65	-37.51	TD at 17766.30' MD