

30-025-41579

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ELEVATION
RESOURCES

Elevation Resources

Sec. 19, T-21S, R-34E

Lea County

Birddog 19 State 1H

HZ Bone Spring

Plan: Preliminary Plan #1

Directional Plan

18 November, 2013

APR 14 2014



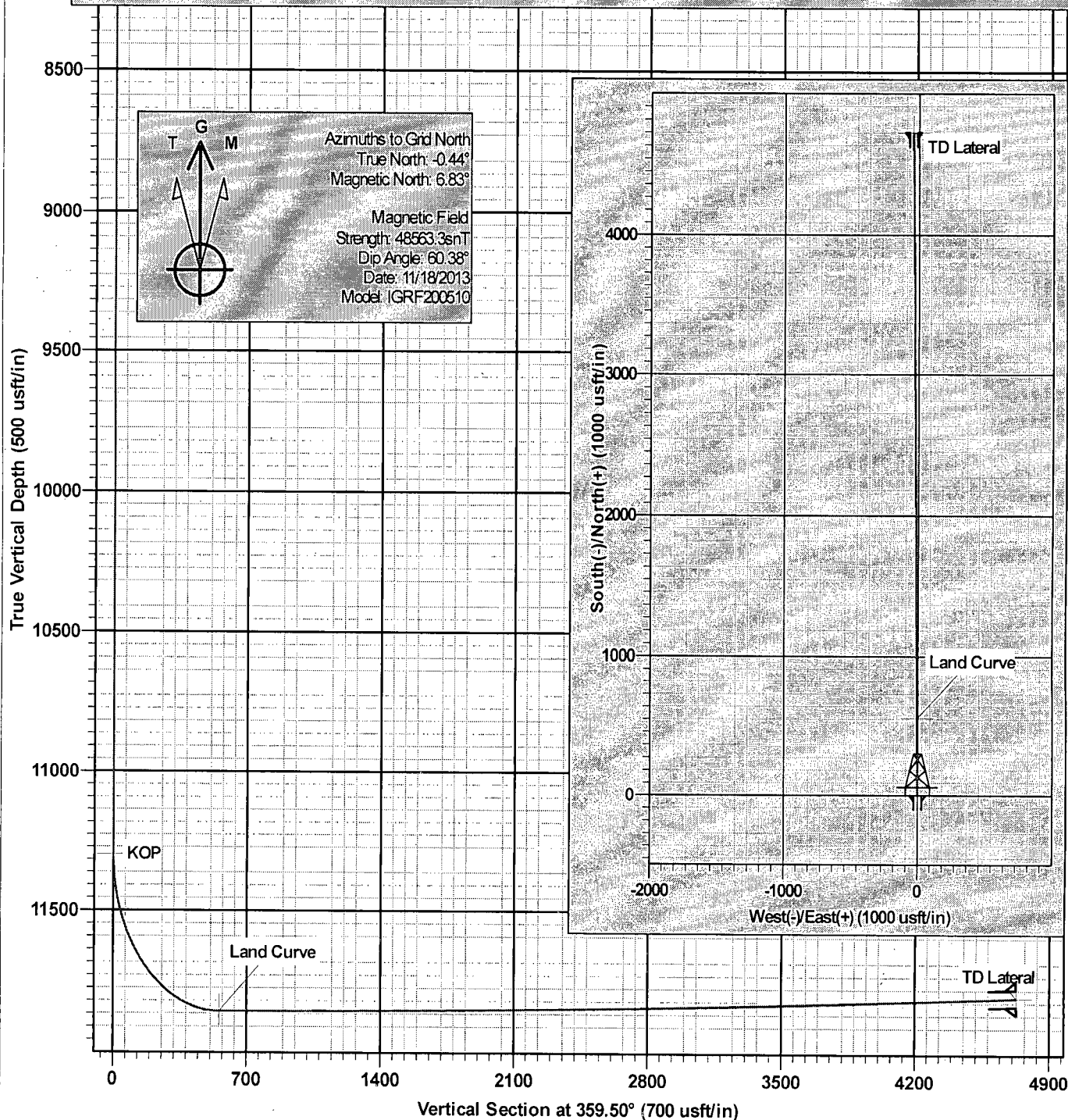
Project: Sec. 19, T-21S, R-34E
 Site: Lea County
 Well: Birddog 19 State 1H
 Wellbore: HZ Bone Spring
 Design: Preliminary Plan #1

PROJECT DETAILS: Sec. 19, T-21S, R-34E

Geodetic System: US State Plane 1927 (Exact solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: New Mexico East 3001

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	11300.0	0.00	0.00	11300.0	0.0	0.0	0.00	0.00	0.0	KOP
3	12171.8	90.00	359.50	11855.0	555.0	-4.8	10.32	359.50	555.0	Land Curve
4	16345.3	91.51	359.49	11800.0	4727.8	-41.3	0.04	-0.43	4728.0	TD Lateral



Directional Plan

Company:	Elevation Resources	Local Co-ordinate Reference:	Site Lea County
Project:	Sec. 19, T-21S, R-34E	TVD Reference:	KB @ 3769.0usft (Drilling Rig)
Site:	Lea County	MD Reference:	KB @ 3769.0usft (Drilling Rig)
Well:	Birdog 19 State 1H	North Reference:	Grid
Wellbore:	HZ Bone Spring	Survey Calculation Method:	Minimum Curvature
Design:	Preliminary Plan #1	Database:	EDM 5000.1 Single User Db

Project	Sec. 19, T-21S, R-34E		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Lea County				
Site Position:		Northing:	531,151.70 usft	Latitude:	32° 27' 27.120 N
From:	Lat/Long	Easting:	755,036.81 usft	Longitude:	103° 30' 23.400 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.44 °

Well	Birdog 19 State 1H					
Well Position	+N/-S	0.0 usft	Northing:	531,151.70 usf	Latitude:	32° 27' 27.120 N
	+E/-W	0.0 usft	Easting:	755,036.81 usf	Longitude:	103° 30' 23.400 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	3,747.0 usf	Ground Level:	3,747.0 usft

Wellbore	HZ Bone Spring				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF200510	11/18/2013	7.27	60.38	48,563

Design	Preliminary Plan #1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.0	0.0	0.0	359.50

Survey Tool Program	Date 11/18/2013			
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
0.0	16,345.3	Preliminary Plan #1 (HZ Bone Spring)		

Planned Survey								
MD	TVD	Inc	Azi (azimuth)	Buidd	N/S	E/W	V. Sec	
(usft)	(usft)	(°)	(°)	(°/100usft)	(usft)	(usft)	(usft)	
0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.0	
100.0	100.0	0.00	0.00	0.00	0.0	0.0	0.0	
200.0	200.0	0.00	0.00	0.00	0.0	0.0	0.0	
300.0	300.0	0.00	0.00	0.00	0.0	0.0	0.0	
400.0	400.0	0.00	0.00	0.00	0.0	0.0	0.0	
500.0	500.0	0.00	0.00	0.00	0.0	0.0	0.0	
600.0	600.0	0.00	0.00	0.00	0.0	0.0	0.0	
700.0	700.0	0.00	0.00	0.00	0.0	0.0	0.0	
800.0	800.0	0.00	0.00	0.00	0.0	0.0	0.0	
900.0	900.0	0.00	0.00	0.00	0.0	0.0	0.0	
1,000.0	1,000.0	0.00	0.00	0.00	0.0	0.0	0.0	
1,100.0	1,100.0	0.00	0.00	0.00	0.0	0.0	0.0	

Company: Elevation Resources
Project: Sec. 19, T-21S, R-34E
Site: Lea County
Well: Birdog 19 State 1H
Wellbore: HZ Bone Spring
Design: Preliminary Plan #1

Local Co-ordinate Reference: Site Lea County
TVD Reference: KB @ 3769.0usft (Drilling Rig)
MD Reference: KB @ 3769.0usft (Drilling Rig)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	TVD (usft)	Inc (°)	Azi (azimuth) (°)	Build (°/100usft)	N/S (usft)	E/W (usft)	V. Sec (usft)
1,200.0	1,200.0	0.00	0.00	0.00	0.0	0.0	0.0
1,300.0	1,300.0	0.00	0.00	0.00	0.0	0.0	0.0
1,400.0	1,400.0	0.00	0.00	0.00	0.0	0.0	0.0
1,500.0	1,500.0	0.00	0.00	0.00	0.0	0.0	0.0
1,600.0	1,600.0	0.00	0.00	0.00	0.0	0.0	0.0
1,700.0	1,700.0	0.00	0.00	0.00	0.0	0.0	0.0
1,800.0	1,800.0	0.00	0.00	0.00	0.0	0.0	0.0
1,900.0	1,900.0	0.00	0.00	0.00	0.0	0.0	0.0
2,000.0	2,000.0	0.00	0.00	0.00	0.0	0.0	0.0
2,100.0	2,100.0	0.00	0.00	0.00	0.0	0.0	0.0
2,200.0	2,200.0	0.00	0.00	0.00	0.0	0.0	0.0
2,300.0	2,300.0	0.00	0.00	0.00	0.0	0.0	0.0
2,400.0	2,400.0	0.00	0.00	0.00	0.0	0.0	0.0
2,500.0	2,500.0	0.00	0.00	0.00	0.0	0.0	0.0
2,600.0	2,600.0	0.00	0.00	0.00	0.0	0.0	0.0
2,700.0	2,700.0	0.00	0.00	0.00	0.0	0.0	0.0
2,800.0	2,800.0	0.00	0.00	0.00	0.0	0.0	0.0
2,900.0	2,900.0	0.00	0.00	0.00	0.0	0.0	0.0
3,000.0	3,000.0	0.00	0.00	0.00	0.0	0.0	0.0
3,100.0	3,100.0	0.00	0.00	0.00	0.0	0.0	0.0
3,200.0	3,200.0	0.00	0.00	0.00	0.0	0.0	0.0
3,300.0	3,300.0	0.00	0.00	0.00	0.0	0.0	0.0
3,400.0	3,400.0	0.00	0.00	0.00	0.0	0.0	0.0
3,500.0	3,500.0	0.00	0.00	0.00	0.0	0.0	0.0
3,600.0	3,600.0	0.00	0.00	0.00	0.0	0.0	0.0
3,700.0	3,700.0	0.00	0.00	0.00	0.0	0.0	0.0
3,800.0	3,800.0	0.00	0.00	0.00	0.0	0.0	0.0
3,900.0	3,900.0	0.00	0.00	0.00	0.0	0.0	0.0
4,000.0	4,000.0	0.00	0.00	0.00	0.0	0.0	0.0
4,100.0	4,100.0	0.00	0.00	0.00	0.0	0.0	0.0
4,200.0	4,200.0	0.00	0.00	0.00	0.0	0.0	0.0
4,300.0	4,300.0	0.00	0.00	0.00	0.0	0.0	0.0
4,400.0	4,400.0	0.00	0.00	0.00	0.0	0.0	0.0
4,500.0	4,500.0	0.00	0.00	0.00	0.0	0.0	0.0
4,600.0	4,600.0	0.00	0.00	0.00	0.0	0.0	0.0
4,700.0	4,700.0	0.00	0.00	0.00	0.0	0.0	0.0
4,800.0	4,800.0	0.00	0.00	0.00	0.0	0.0	0.0
4,900.0	4,900.0	0.00	0.00	0.00	0.0	0.0	0.0
5,000.0	5,000.0	0.00	0.00	0.00	0.0	0.0	0.0
5,100.0	5,100.0	0.00	0.00	0.00	0.0	0.0	0.0
5,200.0	5,200.0	0.00	0.00	0.00	0.0	0.0	0.0
5,300.0	5,300.0	0.00	0.00	0.00	0.0	0.0	0.0
5,400.0	5,400.0	0.00	0.00	0.00	0.0	0.0	0.0
5,500.0	5,500.0	0.00	0.00	0.00	0.0	0.0	0.0

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Site:	Lea County	MD Reference:	KB @ 3769.0usft (Drilling Rig)
Well:	Birddog 19 State 1H	North Reference:	Grid
Wellbore:	HZ Bone Spring	Survey Calculation Method:	Minimum Curvature
Design:	Preliminary Plan #1	Database:	EDM 5000.1 Single User Db

Planned Survey

MD (usft)	TVD (usft)	Inc (°)	Azi (azimuth) (°)	Build (°/100usft)	N/S (usft)	E/W (usft)	V. Sec (usft)
5,600.0	5,600.0	0.00	0.00	0.00	0.0	0.0	0.0
5,700.0	5,700.0	0.00	0.00	0.00	0.0	0.0	0.0
5,800.0	5,800.0	0.00	0.00	0.00	0.0	0.0	0.0
5,900.0	5,900.0	0.00	0.00	0.00	0.0	0.0	0.0
6,000.0	6,000.0	0.00	0.00	0.00	0.0	0.0	0.0
6,100.0	6,100.0	0.00	0.00	0.00	0.0	0.0	0.0
6,200.0	6,200.0	0.00	0.00	0.00	0.0	0.0	0.0
6,300.0	6,300.0	0.00	0.00	0.00	0.0	0.0	0.0
6,400.0	6,400.0	0.00	0.00	0.00	0.0	0.0	0.0
6,500.0	6,500.0	0.00	0.00	0.00	0.0	0.0	0.0
6,600.0	6,600.0	0.00	0.00	0.00	0.0	0.0	0.0
6,700.0	6,700.0	0.00	0.00	0.00	0.0	0.0	0.0
6,800.0	6,800.0	0.00	0.00	0.00	0.0	0.0	0.0
6,900.0	6,900.0	0.00	0.00	0.00	0.0	0.0	0.0
7,000.0	7,000.0	0.00	0.00	0.00	0.0	0.0	0.0
7,100.0	7,100.0	0.00	0.00	0.00	0.0	0.0	0.0
7,200.0	7,200.0	0.00	0.00	0.00	0.0	0.0	0.0
7,300.0	7,300.0	0.00	0.00	0.00	0.0	0.0	0.0
7,400.0	7,400.0	0.00	0.00	0.00	0.0	0.0	0.0
7,500.0	7,500.0	0.00	0.00	0.00	0.0	0.0	0.0
7,600.0	7,600.0	0.00	0.00	0.00	0.0	0.0	0.0
7,700.0	7,700.0	0.00	0.00	0.00	0.0	0.0	0.0
7,800.0	7,800.0	0.00	0.00	0.00	0.0	0.0	0.0
7,900.0	7,900.0	0.00	0.00	0.00	0.0	0.0	0.0
8,000.0	8,000.0	0.00	0.00	0.00	0.0	0.0	0.0
8,100.0	8,100.0	0.00	0.00	0.00	0.0	0.0	0.0
8,200.0	8,200.0	0.00	0.00	0.00	0.0	0.0	0.0
8,300.0	8,300.0	0.00	0.00	0.00	0.0	0.0	0.0
8,400.0	8,400.0	0.00	0.00	0.00	0.0	0.0	0.0
8,500.0	8,500.0	0.00	0.00	0.00	0.0	0.0	0.0
8,600.0	8,600.0	0.00	0.00	0.00	0.0	0.0	0.0
8,700.0	8,700.0	0.00	0.00	0.00	0.0	0.0	0.0
8,800.0	8,800.0	0.00	0.00	0.00	0.0	0.0	0.0
8,900.0	8,900.0	0.00	0.00	0.00	0.0	0.0	0.0
9,000.0	9,000.0	0.00	0.00	0.00	0.0	0.0	0.0
9,100.0	9,100.0	0.00	0.00	0.00	0.0	0.0	0.0
9,200.0	9,200.0	0.00	0.00	0.00	0.0	0.0	0.0
9,300.0	9,300.0	0.00	0.00	0.00	0.0	0.0	0.0
9,400.0	9,400.0	0.00	0.00	0.00	0.0	0.0	0.0
9,500.0	9,500.0	0.00	0.00	0.00	0.0	0.0	0.0
9,600.0	9,600.0	0.00	0.00	0.00	0.0	0.0	0.0
9,700.0	9,700.0	0.00	0.00	0.00	0.0	0.0	0.0
9,800.0	9,800.0	0.00	0.00	0.00	0.0	0.0	0.0
9,900.0	9,900.0	0.00	0.00	0.00	0.0	0.0	0.0

Directional Plan

Company:	Elevation Resources	Local Co-ordinate Reference:	Site Lea County
Project:	Sec. 19, T-21S, R-34E	TVD Reference:	KB @ 3769.0usft (Drilling Rig)
Site:	Lea County	MD Reference:	KB @ 3769.0usft (Drilling Rig)
Well:	Birddog 19 State 1H	North Reference:	Grid
Wellbore:	HZ Bone Spring	Survey Calculation Method:	Minimum Curvature
Design:	Preliminary Plan #1	Database:	EDM 5000.1 Single User Db

Planned Survey							
MD (usft)	TVD (usft)	Inc (°)	Azi (azimuth) (°)	Build (°/100usft)	N/S (usft)	E/W (usft)	V. Sec (usft)
10,000.0	10,000.0	0.00	0.00	0.00	0.0	0.0	0.0
10,100.0	10,100.0	0.00	0.00	0.00	0.0	0.0	0.0
10,200.0	10,200.0	0.00	0.00	0.00	0.0	0.0	0.0
10,300.0	10,300.0	0.00	0.00	0.00	0.0	0.0	0.0
10,400.0	10,400.0	0.00	0.00	0.00	0.0	0.0	0.0
10,500.0	10,500.0	0.00	0.00	0.00	0.0	0.0	0.0
10,600.0	10,600.0	0.00	0.00	0.00	0.0	0.0	0.0
10,700.0	10,700.0	0.00	0.00	0.00	0.0	0.0	0.0
10,800.0	10,800.0	0.00	0.00	0.00	0.0	0.0	0.0
10,900.0	10,900.0	0.00	0.00	0.00	0.0	0.0	0.0
11,000.0	11,000.0	0.00	0.00	0.00	0.0	0.0	0.0
11,100.0	11,100.0	0.00	0.00	0.00	0.0	0.0	0.0
11,200.0	11,200.0	0.00	0.00	0.00	0.0	0.0	0.0
11,300.0	11,300.0	0.00	0.00	0.00	0.0	0.0	0.0
KOP							
11,400.0	11,399.5	10.32	359.50	10.32	9.0	-0.1	9.0
11,500.0	11,495.7	20.65	359.50	10.32	35.6	-0.3	35.6
11,600.0	11,585.6	30.97	359.50	10.32	79.1	-0.7	79.1
11,700.0	11,666.3	41.29	359.50	10.32	138.0	-1.2	138.0
11,800.0	11,735.1	51.62	359.50	10.32	210.4	-1.8	210.4
11,900.0	11,789.8	61.94	359.50	10.32	293.9	-2.5	293.9
12,000.0	11,828.6	72.26	359.50	10.32	385.9	-3.3	385.9
12,100.0	11,850.4	82.59	359.50	10.32	483.4	-4.2	483.4
12,171.8	11,855.0	90.00	359.50	10.32	555.0	-4.8	555.0
Land Curve							
12,200.0	11,855.0	90.01	359.50	0.04	583.2	-5.0	583.2
12,300.0	11,854.9	90.05	359.50	0.04	683.2	-5.9	683.2
12,400.0	11,854.8	90.08	359.50	0.04	783.2	-6.8	783.2
12,500.0	11,854.6	90.12	359.50	0.04	883.2	-7.6	883.2
12,600.0	11,854.4	90.16	359.50	0.04	983.2	-8.5	983.2
12,700.0	11,854.1	90.19	359.50	0.04	1,083.2	-9.4	1,083.2
12,800.0	11,853.7	90.23	359.50	0.04	1,183.2	-10.2	1,183.2
12,900.0	11,853.3	90.26	359.50	0.04	1,283.2	-11.1	1,283.2
13,000.0	11,852.8	90.30	359.50	0.04	1,383.2	-12.0	1,383.2
13,100.0	11,852.3	90.34	359.50	0.04	1,483.1	-12.8	1,483.2
13,200.0	11,851.6	90.37	359.50	0.04	1,583.1	-13.7	1,583.2
13,300.0	11,850.9	90.41	359.50	0.04	1,683.1	-14.6	1,683.2
13,400.0	11,850.2	90.45	359.50	0.04	1,783.1	-15.5	1,783.2
13,500.0	11,849.4	90.48	359.50	0.04	1,883.1	-16.3	1,883.2
13,600.0	11,848.5	90.52	359.50	0.04	1,983.1	-17.2	1,983.2
13,700.0	11,847.6	90.55	359.50	0.04	2,083.1	-18.1	2,083.2
13,800.0	11,846.6	90.59	359.50	0.04	2,183.1	-18.9	2,183.2
13,900.0	11,845.5	90.63	359.50	0.04	2,283.1	-19.8	2,283.2
14,000.0	11,844.4	90.66	359.50	0.04	2,383.1	-20.7	2,383.2
14,100.0	11,843.2	90.70	359.50	0.04	2,483.1	-21.6	2,483.2

Directional Plan

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Site:	Lea County	MD Reference:	KB @ 3769.0usft (Drilling Rig)
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Planned Survey

MD (usft)	TVD (usft)	Inc (°)	Azi (azimuth) (°)	Build (°/100usft)	N/S (usft)	E/W (usft)	V. Sec (usft)
14,200.0	11,842.0	90.73	359.50	0.04	2,583.1	-22.4	2,583.2
14,300.0	11,840.7	90.77	359.50	0.04	2,683.0	-23.3	2,683.1
14,400.0	11,839.3	90.81	359.50	0.04	2,783.0	-24.2	2,783.1
14,500.0	11,837.8	90.84	359.50	0.04	2,883.0	-25.1	2,883.1
14,600.0	11,836.3	90.88	359.50	0.04	2,983.0	-25.9	2,983.1
14,700.0	11,834.8	90.91	359.50	0.04	3,083.0	-26.8	3,083.1
14,800.0	11,833.2	90.95	359.50	0.04	3,183.0	-27.7	3,183.1
14,900.0	11,831.5	90.99	359.50	0.04	3,282.9	-28.6	3,283.1
15,000.0	11,829.7	91.02	359.50	0.04	3,382.9	-29.4	3,383.1
15,100.0	11,827.9	91.06	359.50	0.04	3,482.9	-30.3	3,483.0
15,200.0	11,826.0	91.09	359.50	0.04	3,582.9	-31.2	3,583.0
15,300.0	11,824.1	91.13	359.50	0.04	3,682.9	-32.1	3,683.0
15,400.0	11,822.1	91.17	359.50	0.04	3,782.8	-33.0	3,783.0
15,500.0	11,820.0	91.20	359.50	0.04	3,882.8	-33.8	3,883.0
15,600.0	11,817.9	91.24	359.50	0.04	3,982.8	-34.7	3,982.9
15,700.0	11,815.7	91.28	359.49	0.04	4,082.8	-35.6	4,082.9
15,800.0	11,813.4	91.31	359.49	0.04	4,182.7	-36.5	4,182.9
15,900.0	11,811.1	91.35	359.49	0.04	4,282.7	-37.4	4,282.9
16,000.0	11,808.7	91.38	359.49	0.04	4,382.7	-38.2	4,382.8
16,100.0	11,806.3	91.42	359.49	0.04	4,482.6	-39.1	4,482.8
16,200.0	11,803.8	91.46	359.49	0.04	4,582.6	-40.0	4,582.8
16,300.0	11,801.2	91.49	359.49	0.04	4,682.6	-40.9	4,682.7
16,345.3	11,800.0	91.51	359.49	0.04	4,727.8	-41.3	4,728.0
TD Lateral							

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,850.0	1,850.0	13 3/8"	13-3/8	17-1/2
5,800.0	5,800.0	9 5/8"	9-5/8	12-1/4
16,345.0	11,800.0	5 1/2"	5-1/2	7-7/8

Checked By: _____ Approved By: _____ Date: _____

