

# **MALLARD EXPLORATION**

**WELD COUNTY, COLORADO (NAD 83)**

**SW SW SEC. 35 T9N R60W 6TH P.M.**

**PINTAIL FED 2-4HN**

**ORIGINAL WELLBORE**

**12 October, 2017**

**Plan: PROPOSAL #2**



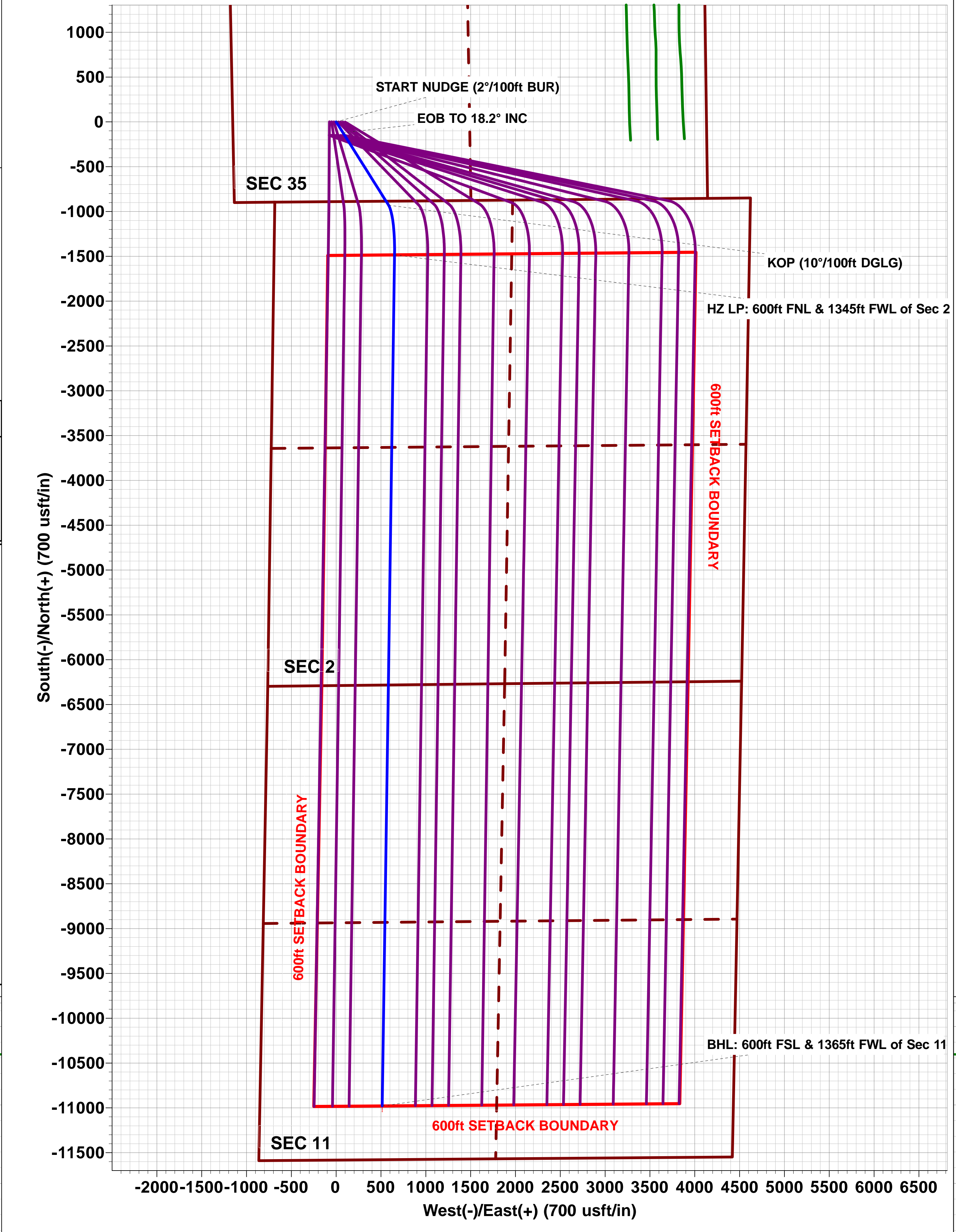
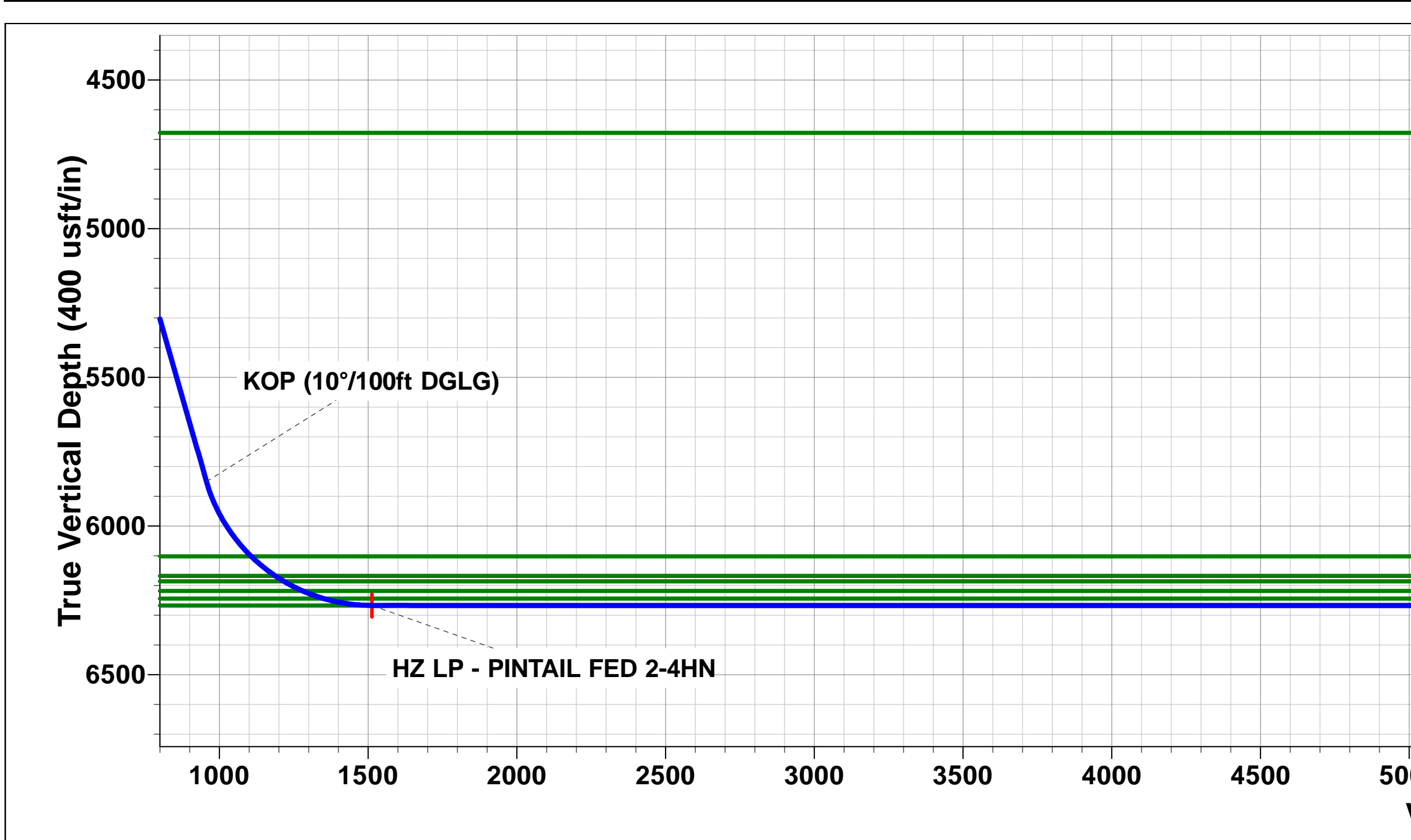
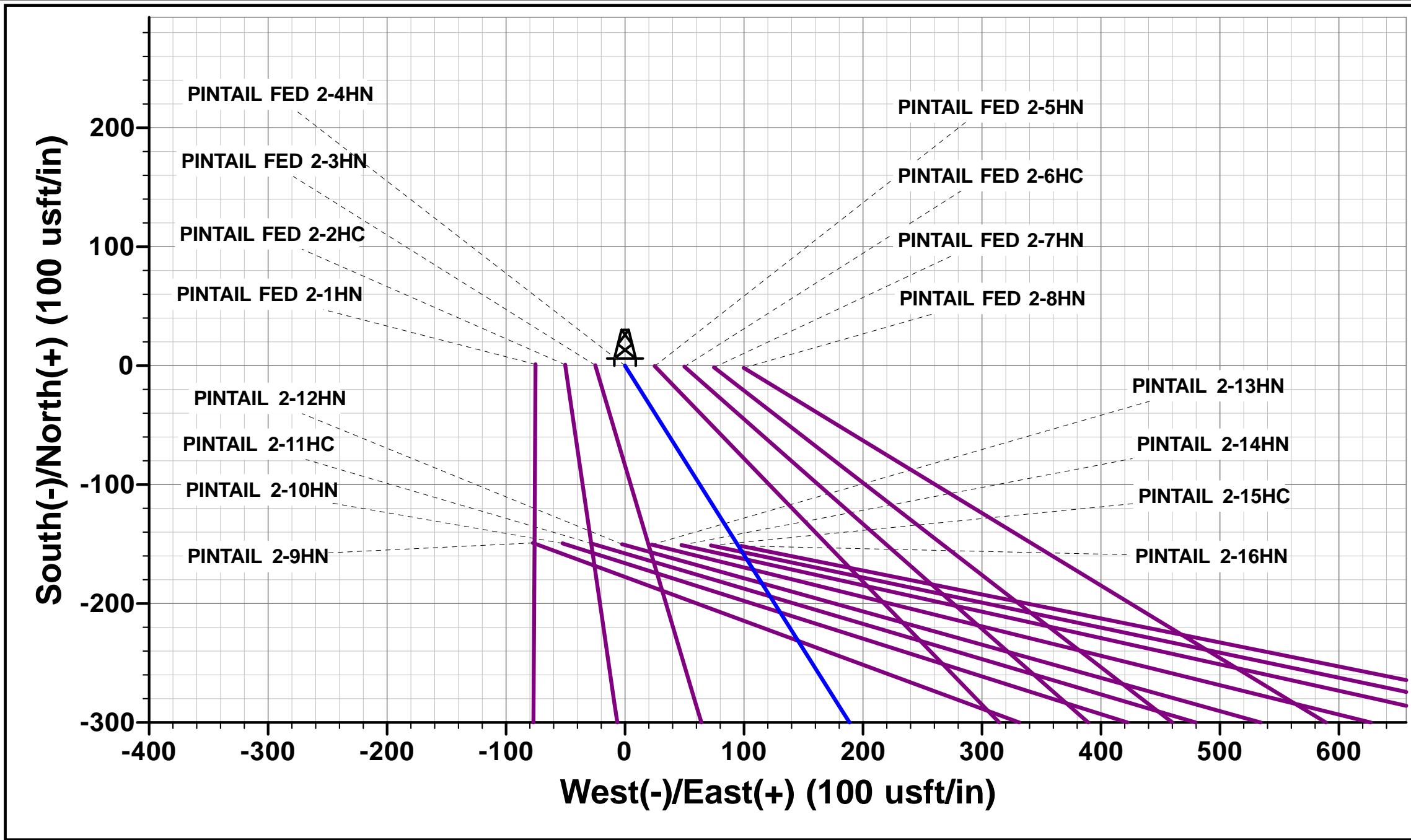
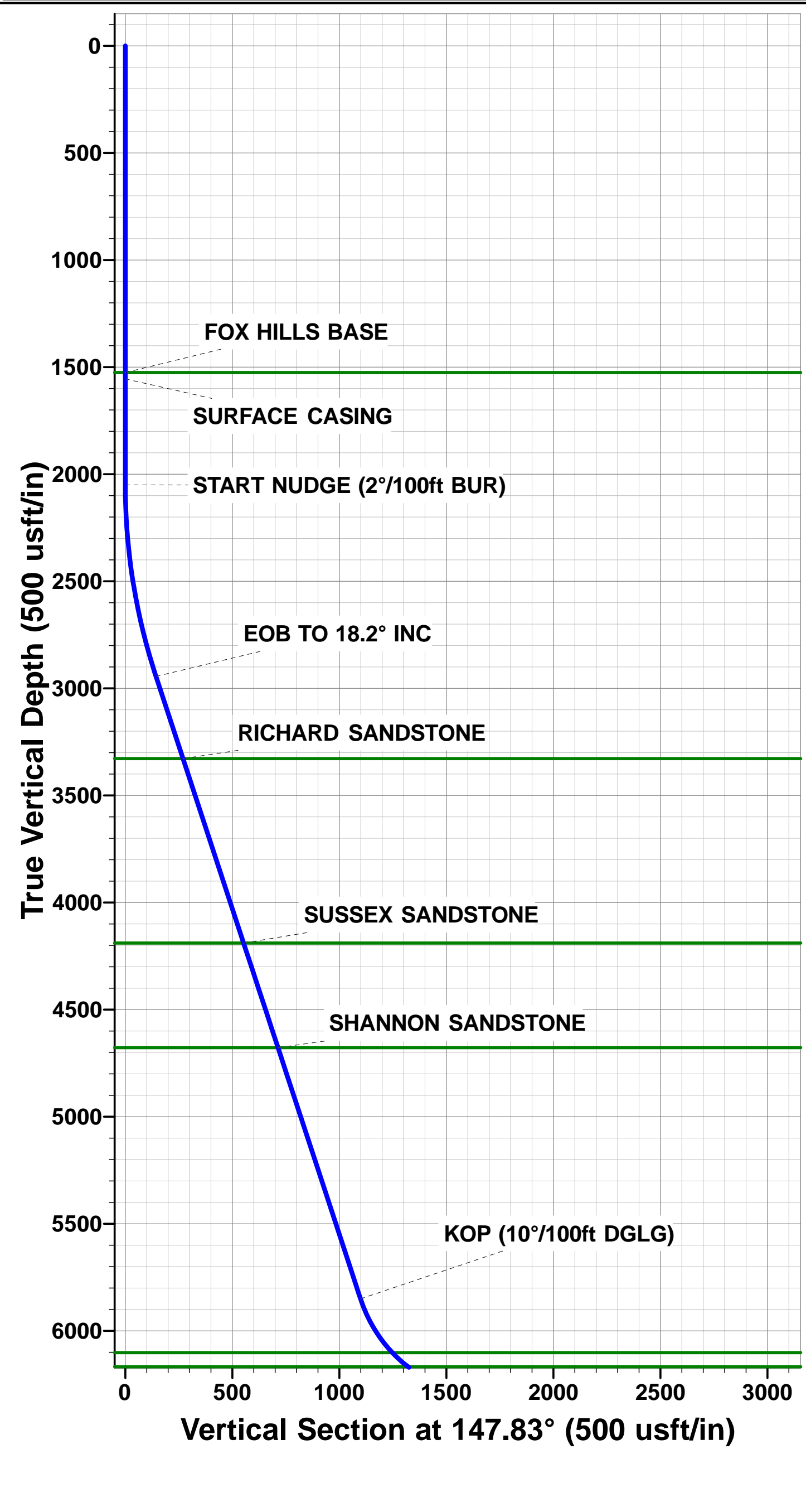


Project: WELD COUNTY, COLORADO (NAD 83)  
Site: SW SW SEC. 35 T9N R60W 6TH P.M.  
Well: PINTAIL FED 2-4HN  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL #2

ANNOTATIONS									
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Dep	Annotation	
0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.0	SHL: 890ft FSL & 1154ft FWL of Sec 35	
1555.0	1555.0	0.00	0.00	0.0	0.0	0.0	0.0	SURFACE CASING	
2050.0	2050.0	0.00	0.00	0.0	0.0	0.0	0.0	START NUDGE (2°/100ft BUR)	
2944.9	2960.1	18.20	147.83	-121.4	76.3	124.8	143.4	EOB TO 18.2° INC	
5851.0	6019.3	18.20	147.83	-930.3	585.1	956.6	1099.0	KOP (10°/100ft DGLG)	
6267.3	6767.5	90.00	180.83	-1484.3	651.6	1513.1	1661.0	HZ LP: 600ft FNL & 1345ft FWL of Sec 2	
6267.2	16262.9	90.00	180.83	-10978.7	513.7	10990.7	11156.4	BHL: 600ft FSL & 1365ft FWL of Sec 11	

PROPOSED LOCAL COORDINATES:  
  
SHL: 891ft FSL & 1154ft FWL Sec 35  
  
HZ LP: 600ft FNL & 1345ft FWL Sec 2  
  
BHL: 600ft FSL & 1365ft FWL of Sec 11

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
HZ LP - PINTAIL FED 2-4HN	6267.2	-1484.3	651.6	40.697469	-104.061882
BHL - PINTAIL FED 2-4HN (P2)	6267.2	-10978.7	513.7	40.671409	-104.062380



# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well PINTAIL FED 2-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4941.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4941.0usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

<b>Project</b>	WELD COUNTY, COLORADO (NAD 83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

<b>Site</b>	SW SW SEC. 35 T9N R60W 6TH P.M.		
<b>Site Position:</b>		<b>Northing:</b>	1,501,638.38 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,398,005.01 usft
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	1.10000ft
		<b>Latitude:</b>	40.701546
		<b>Longitude:</b>	-104.064503
		<b>Grid Convergence:</b>	0.93 °

<b>Well</b>	PINTAIL FED 2-4HN		
<b>Well Position</b>	<b>+N-S</b>	-1.1 usft	<b>Northing:</b>
	<b>+E-W</b>	75.1 usft	<b>Easting:</b>
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>
			<b>Latitude:</b>
			<b>Longitude:</b>
			<b>Ground Level:</b>

<b>Wellbore</b>	ORIGINAL WELLBORE				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	26/08/2017	7.83	67.20	52,597

<b>Design</b>	PROPOSAL #2			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N-S (usft)</b>	<b>+E-W (usft)</b>	<b>Direction (°)</b>
	6,267.2	0.0	0.0	177.32

<b>Plan Sections</b>											
MD (usft)	Inc (°)	Azi (°)	Vertical Depth	SS (usft)	+N-S (usft)	+E-W (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100usf)	Turn Rate (°/100usf)	TFO (°)	Target
0.0	0.00	0.00	0.0	-4,941.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,050.0	0.00	0.00	2,050.0	-2,891.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,960.1	18.20	147.83	2,944.9	-1,996.1	-121.4	76.3	2.00	2.00	0.00	147.83	
6,019.3	18.20	147.83	5,851.0	910.0	-930.3	585.1	0.00	0.00	0.00	0.00	
6,767.5	90.00	180.83	6,267.2	1,326.2	-1,484.3	651.6	10.00	9.60	4.41	34.36	HZ LP - PINTAIL FI
16,262.9	90.00	180.83	6,267.2	1,326.2	-10,978.7	513.7	0.00	0.00	0.00	0.00	BHL - PINTAIL FEC

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well PINTAIL FED 2-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4941.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4941.0usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
<b>SHL: 890ft FSL &amp; 1154ft FWL of Sec 35</b>										
0.0	0.00	0.00	0.0	4,941.00	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	4,841.00	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	4,741.00	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	4,641.00	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	4,541.00	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	4,441.00	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	4,341.00	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	4,241.00	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	4,141.00	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	4,041.00	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	3,941.00	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	3,841.00	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	3,741.00	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	3,641.00	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	3,541.00	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	3,441.00	0.0	0.0	0.0	0.00	0.00	0.00
<b>FOX HILLS BASE</b>										
1,525.7	0.00	0.00	1,525.7	3,415.25	0.0	0.0	0.0	0.00	0.00	0.00
<b>SURFACE CASING</b>										
1,555.0	0.00	0.00	1,555.0	3,386.00	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	3,341.00	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	3,241.00	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	3,141.00	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	3,041.00	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	2,941.00	0.0	0.0	0.0	0.00	0.00	0.00
<b>START NUDGE (2°/100ft BUR)</b>										
2,050.0	0.00	0.00	2,050.0	2,891.00	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	1.00	147.83	2,100.0	2,841.00	-0.4	0.2	0.4	2.00	2.00	0.00
2,200.0	3.00	147.83	2,199.9	2,741.07	-3.3	2.1	3.4	2.00	2.00	0.00
2,300.0	5.00	147.83	2,299.7	2,641.32	-9.2	5.8	9.5	2.00	2.00	0.00
2,400.0	7.00	147.83	2,399.1	2,541.87	-18.1	11.4	18.6	2.00	2.00	0.00
2,500.0	9.00	147.83	2,498.2	2,442.85	-29.9	18.8	30.7	2.00	2.00	0.00
2,600.0	11.00	147.83	2,596.6	2,344.37	-44.6	28.0	45.8	2.00	2.00	0.00
2,700.0	13.00	147.83	2,694.4	2,246.56	-62.2	39.1	63.9	2.00	2.00	0.00
2,800.0	15.00	147.83	2,791.5	2,149.54	-82.6	52.0	85.0	2.00	2.00	0.00
2,900.0	17.00	147.83	2,887.6	2,053.42	-106.0	66.6	109.0	2.00	2.00	0.00
<b>EOB TO 18.2° INC</b>										
2,960.1	18.20	147.83	2,944.9	1,996.09	-121.4	76.3	124.8	2.00	2.00	0.00
3,000.0	18.20	147.83	2,982.8	1,958.23	-131.9	83.0	135.6	0.00	0.00	0.00
3,100.0	18.20	147.83	3,077.8	1,863.23	-158.3	99.6	162.8	0.00	0.00	0.00
3,200.0	18.20	147.83	3,172.8	1,768.24	-184.8	116.2	190.0	0.00	0.00	0.00
3,300.0	18.20	147.83	3,267.8	1,673.24	-211.2	132.9	217.2	0.00	0.00	0.00
<b>RICHARD SANDSTONE</b>										
3,363.7	18.20	147.83	3,328.2	1,612.75	-228.1	143.4	234.5	0.00	0.00	0.00
3,400.0	18.20	147.83	3,362.8	1,578.25	-237.7	149.5	244.4	0.00	0.00	0.00
3,500.0	18.20	147.83	3,457.7	1,483.25	-264.1	166.1	271.6	0.00	0.00	0.00
3,600.0	18.20	147.83	3,552.7	1,388.25	-290.6	182.7	298.8	0.00	0.00	0.00
3,700.0	18.20	147.83	3,647.7	1,293.26	-317.0	199.4	326.0	0.00	0.00	0.00
3,800.0	18.20	147.83	3,742.7	1,198.26	-343.4	216.0	353.2	0.00	0.00	0.00
3,900.0	18.20	147.83	3,837.7	1,103.27	-369.9	232.6	380.4	0.00	0.00	0.00
4,000.0	18.20	147.83	3,932.7	1,008.27	-396.3	249.3	407.5	0.00	0.00	0.00
4,100.0	18.20	147.83	4,027.7	913.28	-422.8	265.9	434.7	0.00	0.00	0.00



# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well PINTAIL FED 2-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4941.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4941.0usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

## Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,200.0	18.20	147.83	4,122.7	818.28	-449.2	282.5	461.9	0.00	0.00	0.00
<b>SUSSEX SANDSTONE</b>										
<b>4,270.6</b>	<b>18.20</b>	<b>147.83</b>	<b>4,189.7</b>	<b>751.25</b>	<b>-467.9</b>	<b>294.3</b>	<b>481.1</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
4,300.0	18.20	147.83	4,217.7	723.29	-475.7	299.2	489.1	0.00	0.00	0.00
4,400.0	18.20	147.83	4,312.7	628.29	-502.1	315.8	516.3	0.00	0.00	0.00
4,500.0	18.20	147.83	4,407.7	533.29	-528.5	332.4	543.5	0.00	0.00	0.00
4,600.0	18.20	147.83	4,502.7	438.30	-555.0	349.1	570.7	0.00	0.00	0.00
4,700.0	18.20	147.83	4,597.7	343.30	-581.4	365.7	597.9	0.00	0.00	0.00
<b>SHANNON SANDSTONE</b>										
<b>4,784.3</b>	<b>18.20</b>	<b>147.83</b>	<b>4,677.7</b>	<b>263.25</b>	<b>-603.7</b>	<b>379.7</b>	<b>620.8</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
4,800.0	18.20	147.83	4,692.7	248.31	-607.9	382.3	625.1	0.00	0.00	0.00
4,900.0	18.20	147.83	4,787.7	153.31	-634.3	399.0	652.3	0.00	0.00	0.00
5,000.0	18.20	147.83	4,882.7	58.32	-660.8	415.6	679.5	0.00	0.00	0.00
5,100.0	18.20	147.83	4,977.7	-36.68	-687.2	432.2	706.6	0.00	0.00	0.00
5,200.0	18.20	147.83	5,072.7	-131.68	-713.6	448.9	733.8	0.00	0.00	0.00
5,300.0	18.20	147.83	5,167.7	-226.67	-740.1	465.5	761.0	0.00	0.00	0.00
5,400.0	18.20	147.83	5,262.7	-321.67	-766.5	482.1	788.2	0.00	0.00	0.00
5,500.0	18.20	147.83	5,357.7	-416.66	-793.0	498.7	815.4	0.00	0.00	0.00
5,600.0	18.20	147.83	5,452.7	-511.66	-819.4	515.4	842.6	0.00	0.00	0.00
5,700.0	18.20	147.83	5,547.7	-606.65	-845.9	532.0	869.8	0.00	0.00	0.00
5,800.0	18.20	147.83	5,642.6	-701.65	-872.3	548.6	897.0	0.00	0.00	0.00
5,900.0	18.20	147.83	5,737.6	-796.64	-898.7	565.3	924.2	0.00	0.00	0.00
6,000.0	18.20	147.83	5,832.6	-891.64	-925.2	581.9	951.4	0.00	0.00	0.00
<b>KOP (10°/100ft DGLG)</b>										
<b>6,019.3</b>	<b>18.20</b>	<b>147.83</b>	<b>5,851.0</b>	<b>-909.97</b>	<b>-930.3</b>	<b>585.1</b>	<b>956.6</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
6,100.0	25.26	158.52	5,925.9	-984.92	-957.0	598.2	983.9	9.99	8.74	13.25
6,200.0	34.60	165.78	6,012.5	-1,071.52	-1,004.5	613.0	1,032.1	10.00	9.34	7.26
6,300.0	44.20	170.22	6,089.7	-1,148.72	-1,066.5	625.9	1,094.6	10.00	9.60	4.44
<b>SHARON SPRINGS</b>										
<b>6,317.7</b>	<b>45.92</b>	<b>170.84</b>	<b>6,102.2</b>	<b>-1,161.25</b>	<b>-1,078.9</b>	<b>628.0</b>	<b>1,107.1</b>	<b>10.00</b>	<b>9.68</b>	<b>3.52</b>
6,400.0	53.92	173.33	6,155.2	-1,214.18	-1,141.2	636.5	1,169.7	10.00	9.73	3.03
<b>NIOBRARA A CHALK</b>										
<b>6,421.9</b>	<b>56.06</b>	<b>173.91</b>	<b>6,167.7</b>	<b>-1,226.75</b>	<b>-1,159.1</b>	<b>638.5</b>	<b>1,187.6</b>	<b>10.00</b>	<b>9.77</b>	<b>2.63</b>
<b>NIOBRARA A CHALK BASE</b>										
<b>6,456.6</b>	<b>59.45</b>	<b>174.76</b>	<b>6,186.2</b>	<b>-1,245.25</b>	<b>-1,188.2</b>	<b>641.4</b>	<b>1,216.9</b>	<b>10.00</b>	<b>9.78</b>	<b>2.47</b>
6,500.0	63.70	175.75	6,206.9	-1,265.90	-1,226.3	644.6	1,255.1	10.00	9.80	2.28
<b>NIOBRARA B1 CHALK TOP</b>										
<b>6,528.1</b>	<b>66.46</b>	<b>176.36</b>	<b>6,218.7</b>	<b>-1,277.75</b>	<b>-1,251.7</b>	<b>646.3</b>	<b>1,280.6</b>	<b>10.00</b>	<b>9.81</b>	<b>2.14</b>
6,600.0	73.52	177.80	6,243.3	-1,302.33	-1,319.1	649.7	1,348.1	10.00	9.82	2.00
<b>NIOBRARA B1 CHALK BASE</b>										
<b>6,603.3</b>	<b>73.84</b>	<b>177.86</b>	<b>6,244.2</b>	<b>-1,303.25</b>	<b>-1,322.3</b>	<b>649.9</b>	<b>1,351.2</b>	<b>10.00</b>	<b>9.83</b>	<b>1.91</b>
6,700.0	83.36	179.64	6,263.3	-1,322.34	-1,416.9	651.9	1,445.9	10.00	9.84	1.84
<b>HZ LP: 600ft FNL &amp; 1345ft FWL of Sec 2 - NIOBRARA B2 CHALK TOP</b>										
<b>6,767.5</b>	<b>90.00</b>	<b>180.83</b>	<b>6,267.2</b>	<b>-1,326.25</b>	<b>-1,484.3</b>	<b>651.6</b>	<b>1,513.1</b>	<b>10.00</b>	<b>9.84</b>	<b>1.77</b>
6,800.0	90.00	180.83	6,267.2	-1,326.25	-1,516.8	651.2	1,545.6	0.00	0.00	0.00
6,900.0	90.00	180.83	6,267.2	-1,326.25	-1,616.8	649.7	1,645.4	0.00	0.00	0.00
7,000.0	90.00	180.83	6,267.2	-1,326.25	-1,716.8	648.3	1,745.2	0.00	0.00	0.00
7,100.0	90.00	180.83	6,267.2	-1,326.25	-1,816.8	646.8	1,845.0	0.00	0.00	0.00
7,200.0	90.00	180.83	6,267.2	-1,326.25	-1,916.7	645.4	1,944.8	0.00	0.00	0.00
7,300.0	90.00	180.83	6,267.2	-1,326.25	-2,016.7	643.9	2,044.6	0.00	0.00	0.00
7,400.0	90.00	180.83	6,267.2	-1,326.25	-2,116.7	642.4	2,144.4	0.00	0.00	0.00
7,500.0	90.00	180.83	6,267.2	-1,326.25	-2,216.7	641.0	2,244.3	0.00	0.00	0.00
7,600.0	90.00	180.83	6,267.2	-1,326.25	-2,316.7	639.5	2,344.1	0.00	0.00	0.00

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well PINTAIL FED 2-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4941.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4941.0usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,700.0	90.00	180.83	6,267.2	-1,326.25	-2,416.7	638.1	2,443.9	0.00	0.00	0.00
7,800.0	90.00	180.83	6,267.2	-1,326.25	-2,516.7	636.6	2,543.7	0.00	0.00	0.00
7,900.0	90.00	180.83	6,267.2	-1,326.25	-2,616.7	635.2	2,643.5	0.00	0.00	0.00
8,000.0	90.00	180.83	6,267.2	-1,326.25	-2,716.7	633.7	2,743.3	0.00	0.00	0.00
8,100.0	90.00	180.83	6,267.2	-1,326.25	-2,816.7	632.3	2,843.1	0.00	0.00	0.00
8,200.0	90.00	180.83	6,267.2	-1,326.25	-2,916.6	630.8	2,942.9	0.00	0.00	0.00
8,300.0	90.00	180.83	6,267.2	-1,326.25	-3,016.6	629.4	3,042.8	0.00	0.00	0.00
8,400.0	90.00	180.83	6,267.2	-1,326.25	-3,116.6	627.9	3,142.6	0.00	0.00	0.00
8,500.0	90.00	180.83	6,267.2	-1,326.25	-3,216.6	626.5	3,242.4	0.00	0.00	0.00
8,600.0	90.00	180.83	6,267.2	-1,326.25	-3,316.6	625.0	3,342.2	0.00	0.00	0.00
8,700.0	90.00	180.83	6,267.2	-1,326.25	-3,416.6	623.6	3,442.0	0.00	0.00	0.00
8,800.0	90.00	180.83	6,267.2	-1,326.25	-3,516.6	622.1	3,541.8	0.00	0.00	0.00
8,900.0	90.00	180.83	6,267.2	-1,326.25	-3,616.6	620.7	3,641.6	0.00	0.00	0.00
9,000.0	90.00	180.83	6,267.2	-1,326.25	-3,716.6	619.2	3,741.4	0.00	0.00	0.00
9,100.0	90.00	180.83	6,267.2	-1,326.25	-3,816.5	617.8	3,841.3	0.00	0.00	0.00
9,200.0	90.00	180.83	6,267.2	-1,326.25	-3,916.5	616.3	3,941.1	0.00	0.00	0.00
9,300.0	90.00	180.83	6,267.2	-1,326.25	-4,016.5	614.9	4,040.9	0.00	0.00	0.00
9,400.0	90.00	180.83	6,267.2	-1,326.25	-4,116.5	613.4	4,140.7	0.00	0.00	0.00
9,500.0	90.00	180.83	6,267.2	-1,326.25	-4,216.5	612.0	4,240.5	0.00	0.00	0.00
9,600.0	90.00	180.83	6,267.2	-1,326.25	-4,316.5	610.5	4,340.3	0.00	0.00	0.00
9,700.0	90.00	180.83	6,267.2	-1,326.25	-4,416.5	609.0	4,440.1	0.00	0.00	0.00
9,800.0	90.00	180.83	6,267.2	-1,326.25	-4,516.5	607.6	4,539.9	0.00	0.00	0.00
9,900.0	90.00	180.83	6,267.2	-1,326.25	-4,616.5	606.1	4,639.8	0.00	0.00	0.00
10,000.0	90.00	180.83	6,267.2	-1,326.25	-4,716.5	604.7	4,739.6	0.00	0.00	0.00
10,100.0	90.00	180.83	6,267.2	-1,326.25	-4,816.4	603.2	4,839.4	0.00	0.00	0.00
10,200.0	90.00	180.83	6,267.2	-1,326.25	-4,916.4	601.8	4,939.2	0.00	0.00	0.00
10,300.0	90.00	180.83	6,267.2	-1,326.25	-5,016.4	600.3	5,039.0	0.00	0.00	0.00
10,400.0	90.00	180.83	6,267.2	-1,326.25	-5,116.4	598.9	5,138.8	0.00	0.00	0.00
10,500.0	90.00	180.83	6,267.2	-1,326.25	-5,216.4	597.4	5,238.6	0.00	0.00	0.00
10,600.0	90.00	180.83	6,267.2	-1,326.25	-5,316.4	596.0	5,338.4	0.00	0.00	0.00
10,700.0	90.00	180.83	6,267.2	-1,326.25	-5,416.4	594.5	5,438.2	0.00	0.00	0.00
10,800.0	90.00	180.83	6,267.2	-1,326.25	-5,516.4	593.1	5,538.1	0.00	0.00	0.00
10,900.0	90.00	180.83	6,267.2	-1,326.25	-5,616.4	591.6	5,637.9	0.00	0.00	0.00
11,000.0	90.00	180.83	6,267.2	-1,326.25	-5,716.3	590.2	5,737.7	0.00	0.00	0.00
11,100.0	90.00	180.83	6,267.2	-1,326.25	-5,816.3	588.7	5,837.5	0.00	0.00	0.00
11,200.0	90.00	180.83	6,267.2	-1,326.25	-5,916.3	587.3	5,937.3	0.00	0.00	0.00
11,300.0	90.00	180.83	6,267.2	-1,326.25	-6,016.3	585.8	6,037.1	0.00	0.00	0.00
11,400.0	90.00	180.83	6,267.2	-1,326.25	-6,116.3	584.4	6,136.9	0.00	0.00	0.00
11,500.0	90.00	180.83	6,267.2	-1,326.25	-6,216.3	582.9	6,236.7	0.00	0.00	0.00
11,600.0	90.00	180.83	6,267.2	-1,326.25	-6,316.3	581.5	6,336.6	0.00	0.00	0.00
11,700.0	90.00	180.83	6,267.2	-1,326.25	-6,416.3	580.0	6,436.4	0.00	0.00	0.00
11,800.0	90.00	180.83	6,267.2	-1,326.25	-6,516.3	578.6	6,536.2	0.00	0.00	0.00
11,900.0	90.00	180.83	6,267.2	-1,326.25	-6,616.3	577.1	6,636.0	0.00	0.00	0.00
12,000.0	90.00	180.83	6,267.2	-1,326.25	-6,716.2	575.6	6,735.8	0.00	0.00	0.00
12,100.0	90.00	180.83	6,267.2	-1,326.25	-6,816.2	574.2	6,835.6	0.00	0.00	0.00
12,200.0	90.00	180.83	6,267.2	-1,326.25	-6,916.2	572.7	6,935.4	0.00	0.00	0.00
12,300.0	90.00	180.83	6,267.2	-1,326.25	-7,016.2	571.3	7,035.2	0.00	0.00	0.00
12,400.0	90.00	180.83	6,267.2	-1,326.25	-7,116.2	569.8	7,135.1	0.00	0.00	0.00
12,500.0	90.00	180.83	6,267.2	-1,326.25	-7,216.2	568.4	7,234.9	0.00	0.00	0.00
12,600.0	90.00	180.83	6,267.2	-1,326.25	-7,316.2	566.9	7,334.7	0.00	0.00	0.00
12,700.0	90.00	180.83	6,267.2	-1,326.25	-7,416.2	565.5	7,434.5	0.00	0.00	0.00
12,800.0	90.00	180.83	6,267.2	-1,326.25	-7,516.2	564.0	7,534.3	0.00	0.00	0.00
12,900.0	90.00	180.83	6,267.2	-1,326.25	-7,616.1	562.6	7,634.1	0.00	0.00	0.00
13,000.0	90.00	180.83	6,267.2	-1,326.25	-7,716.1	561.1	7,733.9	0.00	0.00	0.00

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well PINTAIL FED 2-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4941.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4941.0usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,100.0	90.00	180.83	6,267.2	-1,326.25	-7,816.1	559.7	7,833.7	0.00	0.00	0.00
13,200.0	90.00	180.83	6,267.2	-1,326.25	-7,916.1	558.2	7,933.6	0.00	0.00	0.00
13,300.0	90.00	180.83	6,267.2	-1,326.25	-8,016.1	556.8	8,033.4	0.00	0.00	0.00
13,400.0	90.00	180.83	6,267.2	-1,326.25	-8,116.1	555.3	8,133.2	0.00	0.00	0.00
13,500.0	90.00	180.83	6,267.2	-1,326.25	-8,216.1	553.9	8,233.0	0.00	0.00	0.00
13,600.0	90.00	180.83	6,267.2	-1,326.25	-8,316.1	552.4	8,332.8	0.00	0.00	0.00
13,700.0	90.00	180.83	6,267.2	-1,326.25	-8,416.1	551.0	8,432.6	0.00	0.00	0.00
13,800.0	90.00	180.83	6,267.2	-1,326.25	-8,516.1	549.5	8,532.4	0.00	0.00	0.00
13,900.0	90.00	180.83	6,267.2	-1,326.25	-8,616.0	548.1	8,632.2	0.00	0.00	0.00
14,000.0	90.00	180.83	6,267.2	-1,326.25	-8,716.0	546.6	8,732.1	0.00	0.00	0.00
14,100.0	90.00	180.83	6,267.2	-1,326.25	-8,816.0	545.2	8,831.9	0.00	0.00	0.00
14,200.0	90.00	180.83	6,267.2	-1,326.25	-8,916.0	543.7	8,931.7	0.00	0.00	0.00
14,300.0	90.00	180.83	6,267.2	-1,326.25	-9,016.0	542.2	9,031.5	0.00	0.00	0.00
14,400.0	90.00	180.83	6,267.2	-1,326.25	-9,116.0	540.8	9,131.3	0.00	0.00	0.00
14,500.0	90.00	180.83	6,267.2	-1,326.25	-9,216.0	539.3	9,231.1	0.00	0.00	0.00
14,600.0	90.00	180.83	6,267.2	-1,326.25	-9,316.0	537.9	9,330.9	0.00	0.00	0.00
14,700.0	90.00	180.83	6,267.2	-1,326.25	-9,416.0	536.4	9,430.7	0.00	0.00	0.00
14,800.0	90.00	180.83	6,267.2	-1,326.25	-9,515.9	535.0	9,530.6	0.00	0.00	0.00
14,900.0	90.00	180.83	6,267.2	-1,326.25	-9,615.9	533.5	9,630.4	0.00	0.00	0.00
15,000.0	90.00	180.83	6,267.2	-1,326.25	-9,715.9	532.1	9,730.2	0.00	0.00	0.00
15,100.0	90.00	180.83	6,267.2	-1,326.25	-9,815.9	530.6	9,830.0	0.00	0.00	0.00
15,200.0	90.00	180.83	6,267.2	-1,326.25	-9,915.9	529.2	9,929.8	0.00	0.00	0.00
15,300.0	90.00	180.83	6,267.2	-1,326.25	-10,015.9	527.7	10,029.6	0.00	0.00	0.00
15,400.0	90.00	180.83	6,267.2	-1,326.25	-10,115.9	526.3	10,129.4	0.00	0.00	0.00
15,500.0	90.00	180.83	6,267.2	-1,326.25	-10,215.9	524.8	10,229.2	0.00	0.00	0.00
15,600.0	90.00	180.83	6,267.2	-1,326.25	-10,315.9	523.4	10,329.1	0.00	0.00	0.00
15,700.0	90.00	180.83	6,267.2	-1,326.25	-10,415.9	521.9	10,428.9	0.00	0.00	0.00
15,800.0	90.00	180.83	6,267.2	-1,326.25	-10,515.8	520.5	10,528.7	0.00	0.00	0.00
15,900.0	90.00	180.83	6,267.2	-1,326.25	-10,615.8	519.0	10,628.5	0.00	0.00	0.00
16,000.0	90.00	180.83	6,267.2	-1,326.25	-10,715.8	517.6	10,728.3	0.00	0.00	0.00
16,100.0	90.00	180.83	6,267.2	-1,326.25	-10,815.8	516.1	10,828.1	0.00	0.00	0.00
16,200.0	90.00	180.83	6,267.2	-1,326.25	-10,915.8	514.7	10,927.9	0.00	0.00	0.00
<b>BHL: 600ft FSL &amp; 1365ft FWL of Sec 11</b>										
<b>16,262.9</b>	<b>90.00</b>	<b>180.83</b>	<b>6,267.2</b>	<b>-1,326.25</b>	<b>-10,978.7</b>	<b>513.7</b>	<b>10,990.7</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

Formations						
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,525.7	1,525.7	FOX HILLS BASE				
3,363.7	3,328.2	RICHARD SANDSTONE				
4,270.6	4,189.7	SUSSEX SANDSTONE				
4,784.3	4,677.7	SHANNON SANDSTONE				
6,317.7	6,102.2	SHARON SPRINGS				
6,421.9	6,167.7	NIOBRARA A CHALK				
6,456.6	6,186.2	NIOBRARA A CHALK BASE				
6,528.1	6,218.7	NIOBRARA B1 CHALK TOP				
6,603.3	6,244.2	NIOBRARA B1 CHALK BASE				
6,767.5	6,267.2	NIOBRARA B2 CHALK TOP				

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well PINTAIL FED 2-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4941.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4941.0usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

Plan Annotations				
Local Coordinates				
MD (usft)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Comment
0.0	0.0	0.0	0.0	SHL: 890ft FSL & 1154ft FWL of Sec 35
1,555.0	1,555.0	0.0	0.0	SURFACE CASING
2,050.0	2,050.0	0.0	0.0	START NUDGE (2°/100ft BUR)
2,960.1	2,944.9	-121.4	76.3	EOB TO 18.2° INC
6,019.3	5,851.0	-930.3	585.1	KOP (10°/100ft DGLG)
6,767.5	6,267.3	-1,484.3	651.6	HZ LP: 600ft FNL & 1345ft FWL of Sec 2
16,262.9	6,267.2	-10,978.7	513.7	BHL: 600ft FSL & 1365ft FWL of Sec 11