

# **MALLARD EXPLORATION**

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

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

**PINTAIL 2-13HN**

**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 2-13HN  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL #2

ANNOTATIONS										
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Dep	Annotation		
0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.0	SHL: 740ft FSL & 1173ft FWL of Sec 35		
400.0	400.0	0.00	0.00	0.0	0.0	0.0	0.0	START NUDGE #1 (2°/100ft BUR)		
1555.0	1588.8	23.78	103.90	-58.4	236.0	120.6	243.2	SURFACE CASING		
1646.5	1688.8	23.78	103.90	-68.1	275.2	140.6	283.5	START NUDGE #2 (2°/100ft BUR)		
2096.1	2203.2	34.06	103.91	-127.8	516.3	263.9	531.9	EOB TO 34.06° INC		
5846.5	6730.3	34.06	103.91	-737.2	2977.7	1522.3	3067.5	KOP (10°/100ft DGLG)		
6265.3	7558.7	90.00	181.05	-1310.6	3243.2	2146.5	3740.5	HZ LP: 600ft FNL & 1345ft FEL of Sec 2		
6265.2	17058.1	90.00	181.05	-10808.3	3068.3	11235.4	13239.8	BHL: 600ft FSL & 1340ft FEL of Sec 11		

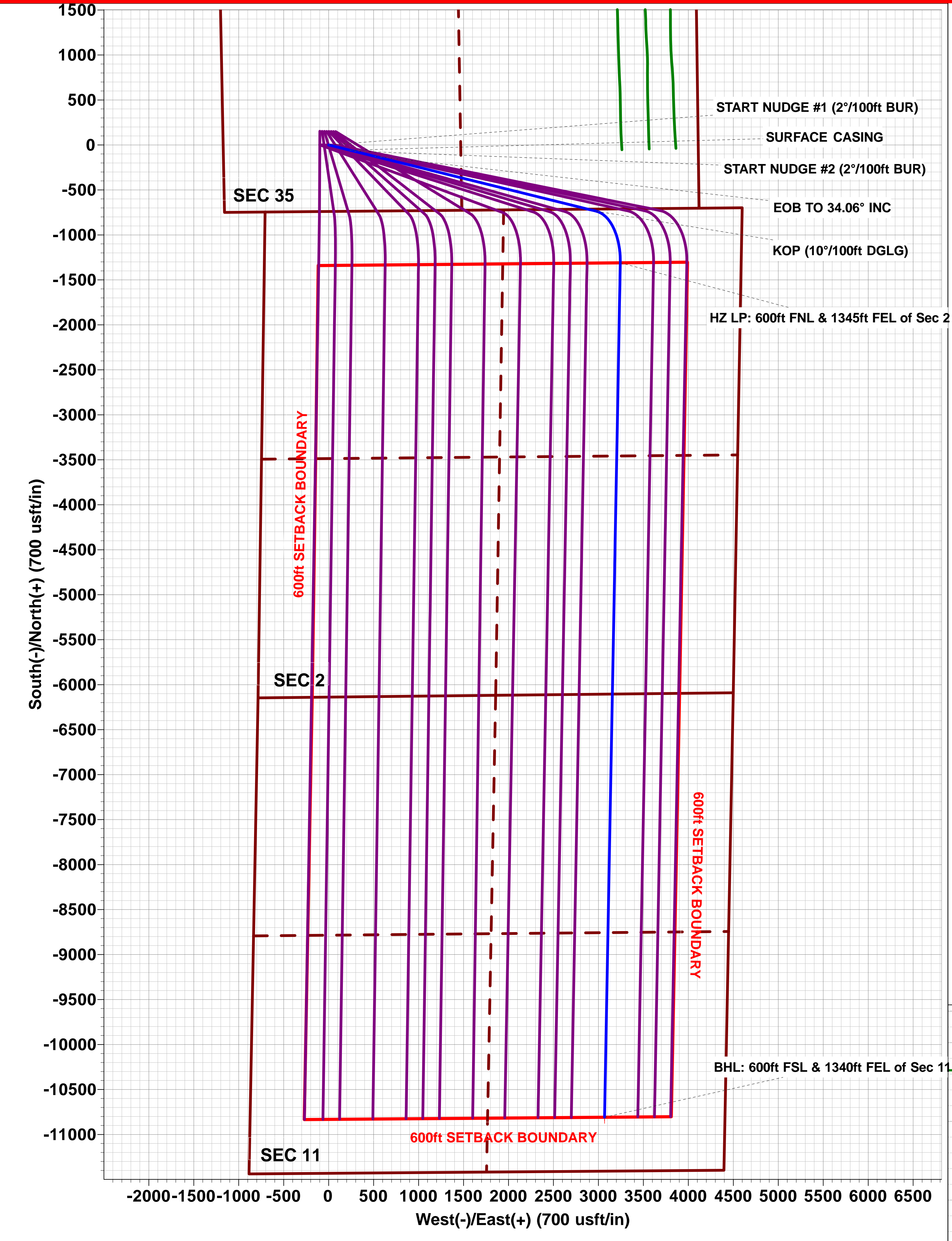
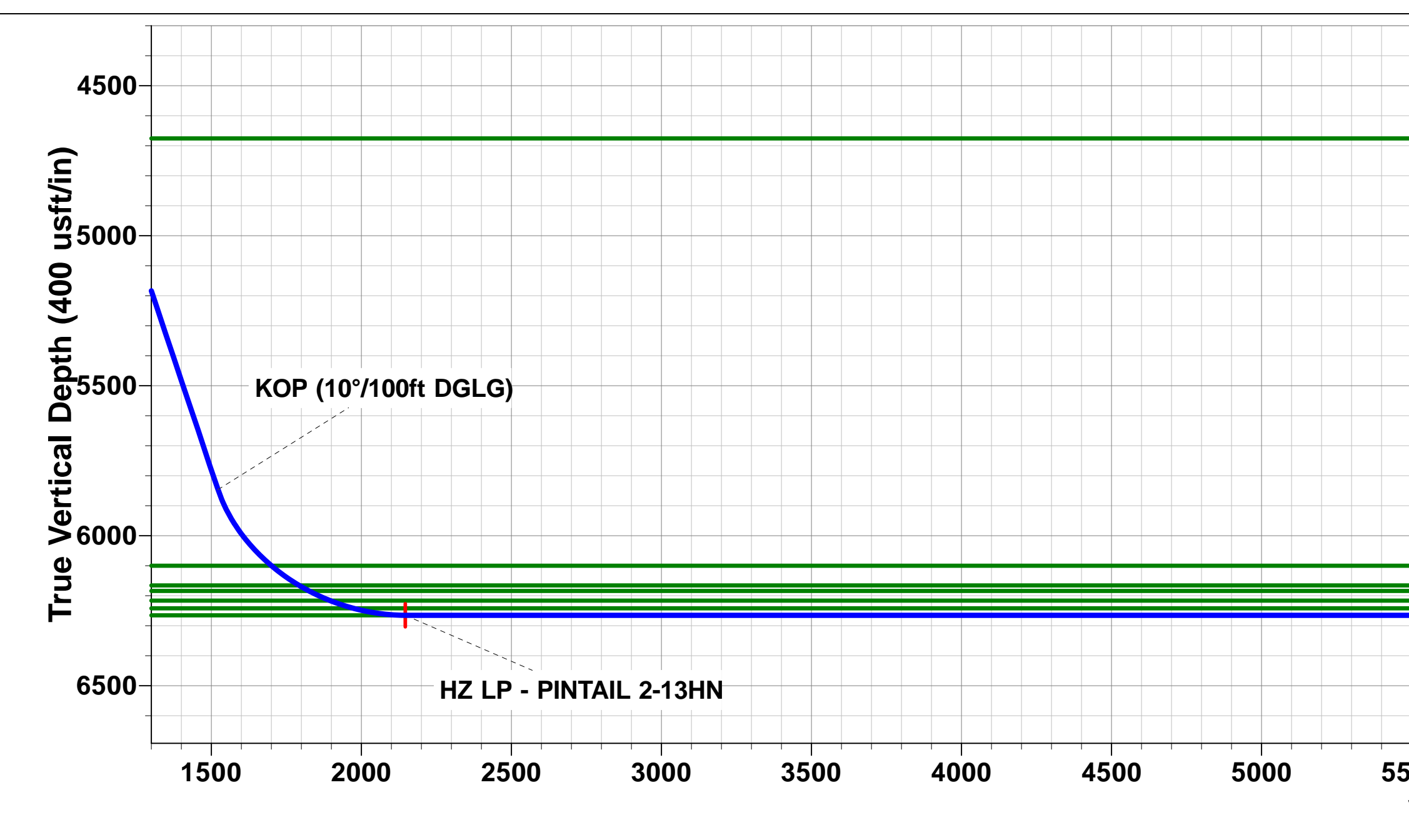
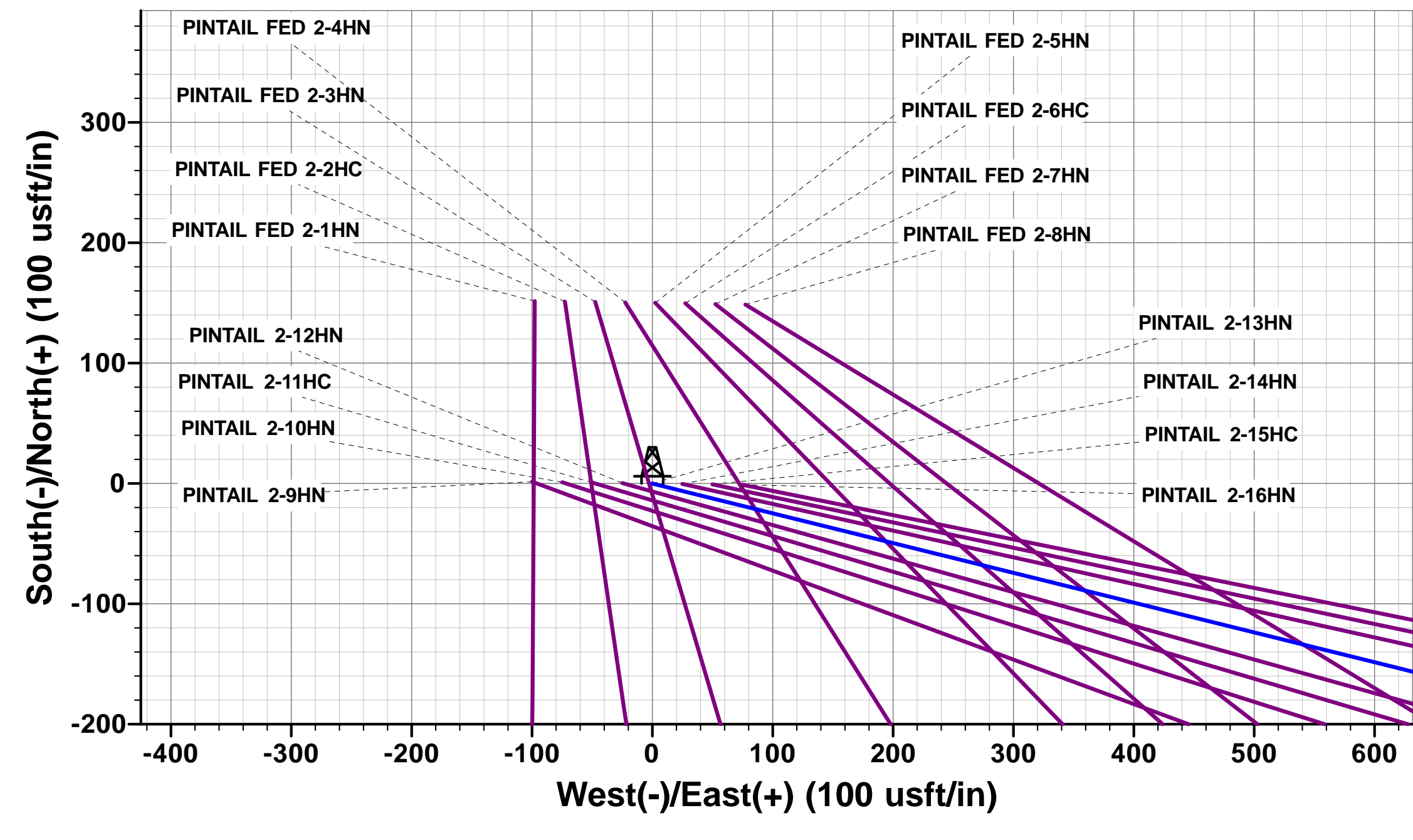
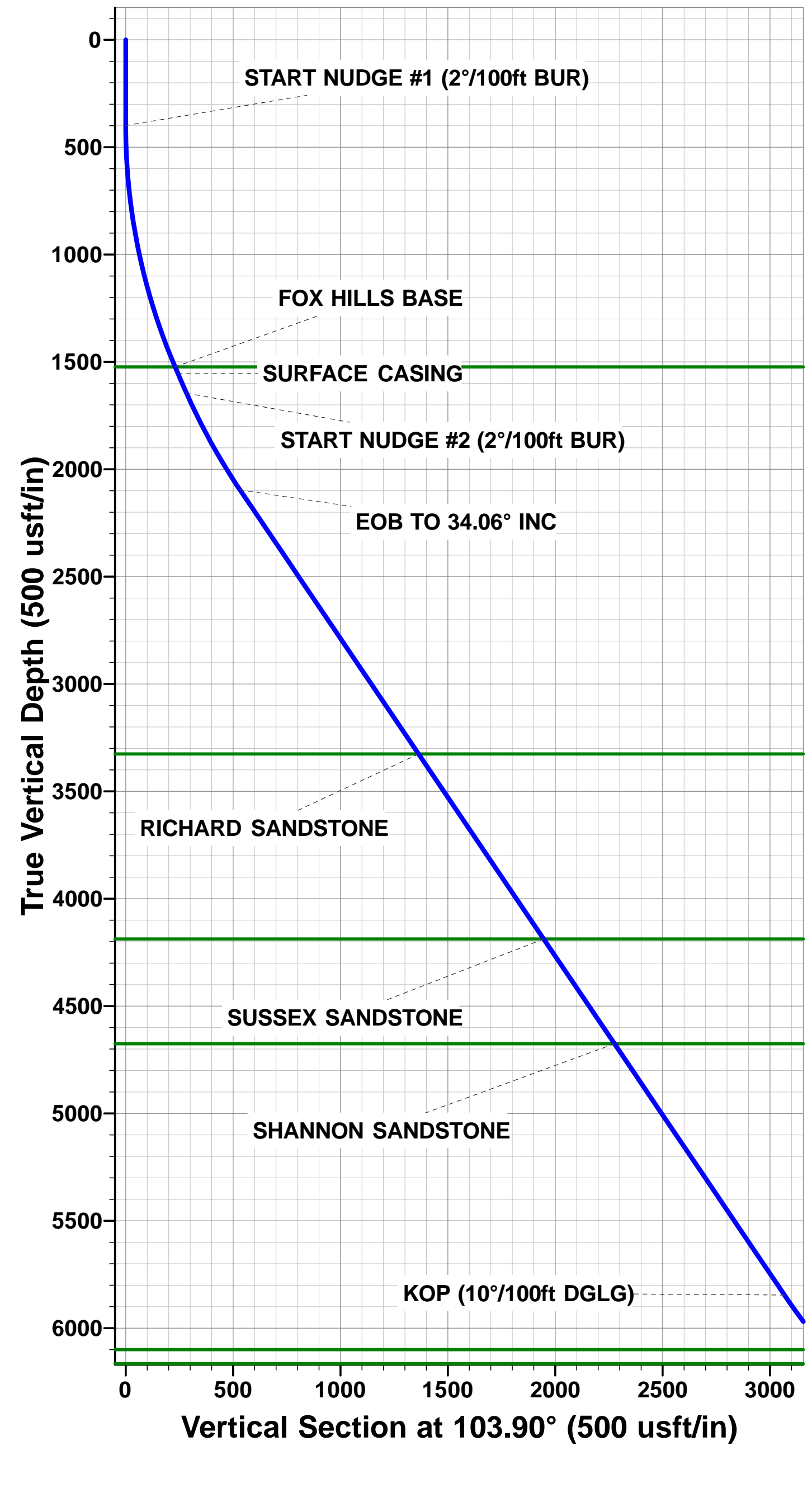
PROPOSED LOCAL COORDINATES:

SHL: 740ft FSL & 1173ft FWL Sec 35

HZ LP: 600ft FNL & 1345ft FEL Sec 2

BHL: 600ft FSL & 1340ft FEL of Sec 11

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
HZ LP - PINTAIL 2-13HN	6265.2	-1310.6	3243.2	40.697532	-104.052455
BHL - PINTAIL 2-13HN (P2)	6265.2	-10808.3	3068.3	40.671463	-104.053090



# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well PINTAIL 2-13HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4939.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4939.0usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL 2-13HN	<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 2-13HN		
<b>Well Position</b>	<b>+N/-S</b>	-151.6 usft	<b>Northing:</b> 1,501,488.41 usft
	<b>+E/-W</b>	97.6 usft	<b>Easting:</b> 3,398,105.05 usft
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b> usft
			<b>Latitude:</b> 40.701130
			<b>Longitude:</b> -104.064151
			<b>Ground Level:</b> 4,923.0 usft

<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>
	6,265.2	0.0	0.0	164.15

<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	-4,939.0	0.0	0.0	0.00	0.00	0.00	0.00	
400.0	0.00	0.00	400.0	-4,539.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,588.8	23.78	103.90	1,555.0	-3,384.0	-58.4	236.0	2.00	2.00	0.00	103.90	
1,688.8	23.78	103.90	1,646.5	-3,292.5	-68.1	275.2	0.00	0.00	0.00	0.00	
2,203.2	34.06	103.91	2,096.1	-2,842.9	-127.8	516.3	2.00	2.00	0.00	0.02	
6,730.3	34.06	103.91	5,846.5	907.5	-737.2	2,977.7	0.00	0.00	0.00	0.00	
7,558.7	90.00	181.05	6,265.2	1,326.2	-1,310.6	3,243.2	10.00	6.75	9.31	79.30	HZ LP - PINTAIL 2-
17,058.1	90.00	181.05	6,265.2	1,326.2	-10,808.3	3,068.3	0.00	0.00	0.00	0.00	BHL - PINTAIL 2-13

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well PINTAIL 2-13HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4939.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4939.0usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL 2-13HN	<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: 740ft FSL &amp; 1173ft FWL of Sec 35</b>										
0.0	0.00	0.00	0.0	4,939.00	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	4,839.00	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	4,739.00	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	4,639.00	0.0	0.0	0.0	0.00	0.00	0.00
<b>START NUDGE #1 (2°/100ft BUR)</b>										
400.0	0.00	0.00	400.0	4,539.00	0.0	0.0	0.0	0.00	0.00	0.00
500.0	2.00	103.90	500.0	4,439.02	-0.4	1.7	0.9	2.00	2.00	0.00
600.0	4.00	103.90	599.8	4,339.16	-1.7	6.8	3.5	2.00	2.00	0.00
700.0	6.00	103.90	699.5	4,239.55	-3.8	15.2	7.8	2.00	2.00	0.00
800.0	8.00	103.90	798.7	4,140.30	-6.7	27.1	13.8	2.00	2.00	0.00
900.0	10.00	103.90	897.5	4,041.53	-10.5	42.2	21.6	2.00	2.00	0.00
1,000.0	12.00	103.90	995.6	3,943.38	-15.0	60.8	31.1	2.00	2.00	0.00
1,100.0	14.00	103.90	1,093.1	3,845.94	-20.4	82.6	42.2	2.00	2.00	0.00
1,200.0	16.00	103.90	1,189.6	3,749.36	-26.7	107.7	55.1	2.00	2.00	0.00
1,300.0	18.00	103.90	1,285.3	3,653.73	-33.7	136.1	69.6	2.00	2.00	0.00
1,400.0	20.00	103.90	1,379.8	3,559.18	-41.5	167.7	85.7	2.00	2.00	0.00
1,500.0	22.00	103.90	1,473.2	3,465.83	-50.1	202.5	103.5	2.00	2.00	0.00
<b>FOX HILLS BASE</b>										
1,554.8	23.10	103.90	1,523.7	3,415.25	-55.2	222.9	113.9	2.00	2.00	0.00
<b>SURFACE CASING</b>										
1,588.8	23.78	103.90	1,555.0	3,384.00	-58.4	236.0	120.6	2.00	2.00	0.00
1,600.0	23.78	103.90	1,565.2	3,373.78	-59.5	240.4	122.9	0.00	0.00	0.00
<b>START NUDGE #2 (2°/100ft BUR)</b>										
1,688.8	23.78	103.90	1,646.5	3,292.51	-68.1	275.2	140.6	0.00	0.00	0.00
1,700.0	24.00	103.90	1,656.7	3,282.27	-69.2	279.6	142.9	1.99	1.99	0.00
1,800.0	26.00	103.90	1,747.4	3,191.65	-79.3	320.6	163.9	2.00	2.00	0.00
1,900.0	28.00	103.90	1,836.4	3,102.55	-90.2	364.6	186.4	2.00	2.00	0.00
2,000.0	30.00	103.90	1,923.9	3,015.09	-101.9	411.7	210.5	2.00	2.00	0.00
2,100.0	32.00	103.90	2,009.6	2,929.38	-114.3	461.7	236.0	2.00	2.00	0.00
2,200.0	34.00	103.91	2,093.5	2,845.52	-127.4	514.6	263.0	2.00	2.00	0.00
<b>EOB TO 34.06° INC</b>										
2,203.2	34.06	103.91	2,096.1	2,842.87	-127.8	516.3	263.9	1.98	1.98	0.00
2,300.0	34.06	103.91	2,176.3	2,762.68	-140.8	568.9	290.8	0.00	0.00	0.00
2,400.0	34.06	103.91	2,259.2	2,679.83	-154.3	623.3	318.6	0.00	0.00	0.00
2,500.0	34.06	103.91	2,342.0	2,596.99	-167.7	677.7	346.4	0.00	0.00	0.00
2,600.0	34.06	103.91	2,424.9	2,514.15	-181.2	732.0	374.2	0.00	0.00	0.00
2,700.0	34.06	103.91	2,507.7	2,431.31	-194.7	786.4	402.0	0.00	0.00	0.00
2,800.0	34.06	103.91	2,590.5	2,348.47	-208.1	840.8	429.8	0.00	0.00	0.00
2,900.0	34.06	103.91	2,673.4	2,265.62	-221.6	895.1	457.6	0.00	0.00	0.00
3,000.0	34.06	103.91	2,756.2	2,182.78	-235.0	949.5	485.4	0.00	0.00	0.00
3,100.0	34.06	103.91	2,839.1	2,099.94	-248.5	1,003.9	513.2	0.00	0.00	0.00
3,200.0	34.06	103.91	2,921.9	2,017.10	-262.0	1,058.3	541.0	0.00	0.00	0.00
3,300.0	34.06	103.91	3,004.7	1,934.26	-275.4	1,112.6	568.8	0.00	0.00	0.00
3,400.0	34.06	103.91	3,087.6	1,851.41	-288.9	1,167.0	596.6	0.00	0.00	0.00
3,500.0	34.06	103.91	3,170.4	1,768.57	-302.3	1,221.4	624.4	0.00	0.00	0.00
3,600.0	34.06	103.91	3,253.3	1,685.73	-315.8	1,275.7	652.2	0.00	0.00	0.00
<b>RICHARD SANDSTONE</b>										
3,688.1	34.06	103.91	3,326.2	1,612.75	-327.7	1,323.6	676.7	0.00	0.00	0.00
3,700.0	34.06	103.91	3,336.1	1,602.89	-329.3	1,330.1	680.0	0.00	0.00	0.00
3,800.0	34.06	103.91	3,419.0	1,520.05	-342.7	1,384.5	707.8	0.00	0.00	0.00
3,900.0	34.06	103.91	3,501.8	1,437.20	-356.2	1,438.8	735.6	0.00	0.00	0.00
4,000.0	34.06	103.91	3,584.6	1,354.36	-369.6	1,493.2	763.4	0.00	0.00	0.00



# Planning Report



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<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4939.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4939.0usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL 2-13HN	<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)
4,100.0	34.06	103.91	3,667.5	1,271.52	-383.1	1,547.6	791.2	0.00	0.00	0.00
4,200.0	34.06	103.91	3,750.3	1,188.68	-396.6	1,601.9	819.0	0.00	0.00	0.00
4,300.0	34.06	103.91	3,833.2	1,105.84	-410.0	1,656.3	846.8	0.00	0.00	0.00
4,400.0	34.06	103.91	3,916.0	1,023.00	-423.5	1,710.7	874.6	0.00	0.00	0.00
4,500.0	34.06	103.91	3,998.8	940.15	-436.9	1,765.1	902.4	0.00	0.00	0.00
4,600.0	34.06	103.91	4,081.7	857.31	-450.4	1,819.4	930.2	0.00	0.00	0.00
4,700.0	34.06	103.91	4,164.5	774.47	-463.9	1,873.8	958.0	0.00	0.00	0.00
<b>SUSSEX SANDSTONE</b>										
<b>4,728.0</b>	<b>34.06</b>	<b>103.91</b>	<b>4,187.7</b>	<b>751.25</b>	<b>-467.6</b>	<b>1,889.0</b>	<b>965.7</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
4,800.0	34.06	103.91	4,247.4	691.63	-477.3	1,928.2	985.8	0.00	0.00	0.00
4,900.0	34.06	103.91	4,330.2	608.79	-490.8	1,982.5	1,013.5	0.00	0.00	0.00
5,000.0	34.06	103.91	4,413.1	525.94	-504.2	2,036.9	1,041.3	0.00	0.00	0.00
5,100.0	34.06	103.91	4,495.9	443.10	-517.7	2,091.3	1,069.1	0.00	0.00	0.00
5,200.0	34.06	103.91	4,578.7	360.26	-531.2	2,145.6	1,096.9	0.00	0.00	0.00
5,300.0	34.06	103.91	4,661.6	277.42	-544.6	2,200.0	1,124.7	0.00	0.00	0.00
<b>SHANNON SANDSTONE</b>										
<b>5,317.1</b>	<b>34.06</b>	<b>103.91</b>	<b>4,675.7</b>	<b>263.25</b>	<b>-546.9</b>	<b>2,209.3</b>	<b>1,129.5</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
5,400.0	34.06	103.91	4,744.4	194.58	-558.1	2,254.4	1,152.5	0.00	0.00	0.00
5,500.0	34.06	103.91	4,827.3	111.73	-571.6	2,308.8	1,180.3	0.00	0.00	0.00
5,600.0	34.06	103.91	4,910.1	28.89	-585.0	2,363.1	1,208.1	0.00	0.00	0.00
5,700.0	34.06	103.91	4,992.9	-53.95	-598.5	2,417.5	1,235.9	0.00	0.00	0.00
5,800.0	34.06	103.91	5,075.8	-136.79	-611.9	2,471.9	1,263.7	0.00	0.00	0.00
5,900.0	34.06	103.91	5,158.6	-219.63	-625.4	2,526.2	1,291.5	0.00	0.00	0.00
6,000.0	34.06	103.91	5,241.5	-302.47	-638.9	2,580.6	1,319.3	0.00	0.00	0.00
6,100.0	34.06	103.91	5,324.3	-385.32	-652.3	2,635.0	1,347.1	0.00	0.00	0.00
6,200.0	34.06	103.91	5,407.2	-468.16	-665.8	2,689.3	1,374.9	0.00	0.00	0.00
6,300.0	34.06	103.91	5,490.0	-551.00	-679.2	2,743.7	1,402.7	0.00	0.00	0.00
6,400.0	34.06	103.91	5,572.8	-633.84	-692.7	2,798.1	1,430.5	0.00	0.00	0.00
6,500.0	34.06	103.91	5,655.7	-716.68	-706.2	2,852.4	1,458.3	0.00	0.00	0.00
6,600.0	34.06	103.91	5,738.5	-799.53	-719.6	2,906.8	1,486.1	0.00	0.00	0.00
6,700.0	34.06	103.91	5,821.4	-882.37	-733.1	2,961.2	1,513.9	0.00	0.00	0.00
<b>KOP (10°/100ft DGLG)</b>										
<b>6,730.3</b>	<b>34.06</b>	<b>103.91</b>	<b>5,846.5</b>	<b>-907.47</b>	<b>-737.2</b>	<b>2,977.7</b>	<b>1,522.3</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
6,800.0	35.94	115.63	5,903.6	-964.63	-750.7	3,015.1	1,545.6	10.00	2.69	16.82
6,900.0	40.36	130.19	5,982.4	-1,043.41	-784.4	3,066.4	1,592.0	10.00	4.42	14.56
7,000.0	46.28	141.98	6,055.3	-1,116.25	-833.9	3,113.5	1,652.5	10.00	5.92	11.78
<b>SHARON SPRINGS</b>										
<b>7,068.0</b>	<b>50.89</b>	<b>148.65</b>	<b>6,100.2</b>	<b>-1,161.25</b>	<b>-875.8</b>	<b>3,142.4</b>	<b>1,700.7</b>	<b>10.00</b>	<b>6.78</b>	<b>9.81</b>
7,100.0	53.18	151.48	6,119.9	-1,180.94	-897.7	3,155.0	1,725.2	10.00	7.16	8.86
<b>NIORARA A CHALK</b>										
<b>7,182.5</b>	<b>59.35</b>	<b>158.07</b>	<b>6,165.7</b>	<b>-1,226.75</b>	<b>-959.7</b>	<b>3,184.1</b>	<b>1,792.8</b>	<b>10.00</b>	<b>7.49</b>	<b>7.98</b>
7,200.0	60.71	159.35	6,174.5	-1,235.51	-973.8	3,189.6	1,807.9	10.00	7.72	7.33
<b>NIORARA A CHALK BASE</b>										
<b>7,220.4</b>	<b>62.30</b>	<b>160.81</b>	<b>6,184.2</b>	<b>-1,245.25</b>	<b>-990.7</b>	<b>3,195.7</b>	<b>1,825.8</b>	<b>10.00</b>	<b>7.80</b>	<b>7.13</b>
<b>NIORARA B1 CHALK TOP</b>										
<b>7,298.5</b>	<b>68.51</b>	<b>166.01</b>	<b>6,216.7</b>	<b>-1,277.75</b>	<b>-1,058.7</b>	<b>3,215.9</b>	<b>1,896.7</b>	<b>10.00</b>	<b>7.96</b>	<b>6.67</b>
7,300.0	68.63	166.11	6,217.3	-1,278.30	-1,060.1	3,216.2	1,898.1	10.00	8.06	6.35
<b>NIORARA B1 CHALK BASE</b>										
<b>7,380.3</b>	<b>75.18</b>	<b>171.01</b>	<b>6,242.2</b>	<b>-1,303.25</b>	<b>-1,134.9</b>	<b>3,231.3</b>	<b>1,974.2</b>	<b>10.00</b>	<b>8.15</b>	<b>6.10</b>
7,400.0	76.80	172.16	6,247.0	-1,308.01	-1,153.7	3,234.1	1,993.1	10.00	8.24	5.85
7,500.0	85.10	177.81	6,262.7	-1,323.74	-1,252.0	3,242.6	2,089.9	10.00	8.30	5.65
<b>HZ LP: 600ft FNL &amp; 1345ft FEL of Sec 2 - NIOBRARA B2 CHALK TOP</b>										
<b>7,558.7</b>	<b>90.00</b>	<b>181.05</b>	<b>6,265.2</b>	<b>-1,326.25</b>	<b>-1,310.6</b>	<b>3,243.2</b>	<b>2,146.5</b>	<b>10.00</b>	<b>8.34</b>	<b>5.52</b>

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well PINTAIL 2-13HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4939.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4939.0usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL 2-13HN	<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)
7,600.0	90.00	181.05	6,265.2	-1,326.25	-1,351.9	3,242.4	2,186.0	0.00	0.00	0.00
7,700.0	90.00	181.05	6,265.2	-1,326.25	-1,451.9	3,240.6	2,281.7	0.00	0.00	0.00
7,800.0	90.00	181.05	6,265.2	-1,326.25	-1,551.9	3,238.8	2,377.3	0.00	0.00	0.00
7,900.0	90.00	181.05	6,265.2	-1,326.25	-1,651.8	3,236.9	2,473.0	0.00	0.00	0.00
8,000.0	90.00	181.05	6,265.2	-1,326.25	-1,751.8	3,235.1	2,568.7	0.00	0.00	0.00
8,100.0	90.00	181.05	6,265.2	-1,326.25	-1,851.8	3,233.2	2,664.4	0.00	0.00	0.00
8,200.0	90.00	181.05	6,265.2	-1,326.25	-1,951.8	3,231.4	2,760.1	0.00	0.00	0.00
8,300.0	90.00	181.05	6,265.2	-1,326.25	-2,051.8	3,229.6	2,855.7	0.00	0.00	0.00
8,400.0	90.00	181.05	6,265.2	-1,326.25	-2,151.8	3,227.7	2,951.4	0.00	0.00	0.00
8,500.0	90.00	181.05	6,265.2	-1,326.25	-2,251.7	3,225.9	3,047.1	0.00	0.00	0.00
8,600.0	90.00	181.05	6,265.2	-1,326.25	-2,351.7	3,224.0	3,142.8	0.00	0.00	0.00
8,700.0	90.00	181.05	6,265.2	-1,326.25	-2,451.7	3,222.2	3,238.5	0.00	0.00	0.00
8,800.0	90.00	181.05	6,265.2	-1,326.25	-2,551.7	3,220.3	3,334.1	0.00	0.00	0.00
8,900.0	90.00	181.05	6,265.2	-1,326.25	-2,651.7	3,218.5	3,429.8	0.00	0.00	0.00
9,000.0	90.00	181.05	6,265.2	-1,326.25	-2,751.7	3,216.7	3,525.5	0.00	0.00	0.00
9,100.0	90.00	181.05	6,265.2	-1,326.25	-2,851.6	3,214.8	3,621.2	0.00	0.00	0.00
9,200.0	90.00	181.05	6,265.2	-1,326.25	-2,951.6	3,213.0	3,716.9	0.00	0.00	0.00
9,300.0	90.00	181.05	6,265.2	-1,326.25	-3,051.6	3,211.1	3,812.5	0.00	0.00	0.00
9,400.0	90.00	181.05	6,265.2	-1,326.25	-3,151.6	3,209.3	3,908.2	0.00	0.00	0.00
9,500.0	90.00	181.05	6,265.2	-1,326.25	-3,251.6	3,207.5	4,003.9	0.00	0.00	0.00
9,600.0	90.00	181.05	6,265.2	-1,326.25	-3,351.6	3,205.6	4,099.6	0.00	0.00	0.00
9,700.0	90.00	181.05	6,265.2	-1,326.25	-3,451.5	3,203.8	4,195.3	0.00	0.00	0.00
9,800.0	90.00	181.05	6,265.2	-1,326.25	-3,551.5	3,201.9	4,290.9	0.00	0.00	0.00
9,900.0	90.00	181.05	6,265.2	-1,326.25	-3,651.5	3,200.1	4,386.6	0.00	0.00	0.00
10,000.0	90.00	181.05	6,265.2	-1,326.25	-3,751.5	3,198.3	4,482.3	0.00	0.00	0.00
10,100.0	90.00	181.05	6,265.2	-1,326.25	-3,851.5	3,196.4	4,578.0	0.00	0.00	0.00
10,200.0	90.00	181.05	6,265.2	-1,326.25	-3,951.5	3,194.6	4,673.7	0.00	0.00	0.00
10,300.0	90.00	181.05	6,265.2	-1,326.25	-4,051.4	3,192.7	4,769.3	0.00	0.00	0.00
10,400.0	90.00	181.05	6,265.2	-1,326.25	-4,151.4	3,190.9	4,865.0	0.00	0.00	0.00
10,500.0	90.00	181.05	6,265.2	-1,326.25	-4,251.4	3,189.0	4,960.7	0.00	0.00	0.00
10,600.0	90.00	181.05	6,265.2	-1,326.25	-4,351.4	3,187.2	5,056.4	0.00	0.00	0.00
10,700.0	90.00	181.05	6,265.2	-1,326.25	-4,451.4	3,185.4	5,152.1	0.00	0.00	0.00
10,800.0	90.00	181.05	6,265.2	-1,326.25	-4,551.4	3,183.5	5,247.7	0.00	0.00	0.00
10,900.0	90.00	181.05	6,265.2	-1,326.25	-4,651.3	3,181.7	5,343.4	0.00	0.00	0.00
11,000.0	90.00	181.05	6,265.2	-1,326.25	-4,751.3	3,179.8	5,439.1	0.00	0.00	0.00
11,100.0	90.00	181.05	6,265.2	-1,326.25	-4,851.3	3,178.0	5,534.8	0.00	0.00	0.00
11,200.0	90.00	181.05	6,265.2	-1,326.25	-4,951.3	3,176.2	5,630.5	0.00	0.00	0.00
11,300.0	90.00	181.05	6,265.2	-1,326.25	-5,051.3	3,174.3	5,726.1	0.00	0.00	0.00
11,400.0	90.00	181.05	6,265.2	-1,326.25	-5,151.3	3,172.5	5,821.8	0.00	0.00	0.00
11,500.0	90.00	181.05	6,265.2	-1,326.25	-5,251.2	3,170.6	5,917.5	0.00	0.00	0.00
11,600.0	90.00	181.05	6,265.2	-1,326.25	-5,351.2	3,168.8	6,013.2	0.00	0.00	0.00
11,700.0	90.00	181.05	6,265.2	-1,326.25	-5,451.2	3,167.0	6,108.9	0.00	0.00	0.00
11,800.0	90.00	181.05	6,265.2	-1,326.25	-5,551.2	3,165.1	6,204.5	0.00	0.00	0.00
11,900.0	90.00	181.05	6,265.2	-1,326.25	-5,651.2	3,163.3	6,300.2	0.00	0.00	0.00
12,000.0	90.00	181.05	6,265.2	-1,326.25	-5,751.1	3,161.4	6,395.9	0.00	0.00	0.00
12,100.0	90.00	181.05	6,265.2	-1,326.25	-5,851.1	3,159.6	6,491.6	0.00	0.00	0.00
12,200.0	90.00	181.05	6,265.2	-1,326.25	-5,951.1	3,157.7	6,587.3	0.00	0.00	0.00
12,300.0	90.00	181.05	6,265.2	-1,326.25	-6,051.1	3,155.9	6,682.9	0.00	0.00	0.00
12,400.0	90.00	181.05	6,265.2	-1,326.25	-6,151.1	3,154.1	6,778.6	0.00	0.00	0.00
12,500.0	90.00	181.05	6,265.2	-1,326.25	-6,251.1	3,152.2	6,874.3	0.00	0.00	0.00
12,600.0	90.00	181.05	6,265.2	-1,326.25	-6,351.0	3,150.4	6,970.0	0.00	0.00	0.00
12,700.0	90.00	181.05	6,265.2	-1,326.25	-6,451.0	3,148.5	7,065.7	0.00	0.00	0.00
12,800.0	90.00	181.05	6,265.2	-1,326.25	-6,551.0	3,146.7	7,161.3	0.00	0.00	0.00
12,900.0	90.00	181.05	6,265.2	-1,326.25	-6,651.0	3,144.9	7,257.0	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 2-13HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4939.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4939.0usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL 2-13HN	<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)
13,000.0	90.00	181.05	6,265.2	-1,326.25	-6,751.0	3,143.0	7,352.7	0.00	0.00	0.00
13,100.0	90.00	181.05	6,265.2	-1,326.25	-6,851.0	3,141.2	7,448.4	0.00	0.00	0.00
13,200.0	90.00	181.05	6,265.2	-1,326.25	-6,950.9	3,139.3	7,544.1	0.00	0.00	0.00
13,300.0	90.00	181.05	6,265.2	-1,326.25	-7,050.9	3,137.5	7,639.7	0.00	0.00	0.00
13,400.0	90.00	181.05	6,265.2	-1,326.25	-7,150.9	3,135.7	7,735.4	0.00	0.00	0.00
13,500.0	90.00	181.05	6,265.2	-1,326.25	-7,250.9	3,133.8	7,831.1	0.00	0.00	0.00
13,600.0	90.00	181.05	6,265.2	-1,326.25	-7,350.9	3,132.0	7,926.8	0.00	0.00	0.00
13,700.0	90.00	181.05	6,265.2	-1,326.25	-7,450.9	3,130.1	8,022.5	0.00	0.00	0.00
13,800.0	90.00	181.05	6,265.2	-1,326.25	-7,550.8	3,128.3	8,118.1	0.00	0.00	0.00
13,900.0	90.00	181.05	6,265.2	-1,326.25	-7,650.8	3,126.4	8,213.8	0.00	0.00	0.00
14,000.0	90.00	181.05	6,265.2	-1,326.25	-7,750.8	3,124.6	8,309.5	0.00	0.00	0.00
14,100.0	90.00	181.05	6,265.2	-1,326.25	-7,850.8	3,122.8	8,405.2	0.00	0.00	0.00
14,200.0	90.00	181.05	6,265.2	-1,326.25	-7,950.8	3,120.9	8,500.8	0.00	0.00	0.00
14,300.0	90.00	181.05	6,265.2	-1,326.25	-8,050.8	3,119.1	8,596.5	0.00	0.00	0.00
14,400.0	90.00	181.05	6,265.2	-1,326.25	-8,150.7	3,117.2	8,692.2	0.00	0.00	0.00
14,500.0	90.00	181.05	6,265.2	-1,326.25	-8,250.7	3,115.4	8,787.9	0.00	0.00	0.00
14,600.0	90.00	181.05	6,265.2	-1,326.25	-8,350.7	3,113.6	8,883.6	0.00	0.00	0.00
14,700.0	90.00	181.05	6,265.2	-1,326.25	-8,450.7	3,111.7	8,979.2	0.00	0.00	0.00
14,800.0	90.00	181.05	6,265.2	-1,326.25	-8,550.7	3,109.9	9,074.9	0.00	0.00	0.00
14,900.0	90.00	181.05	6,265.2	-1,326.25	-8,650.7	3,108.0	9,170.6	0.00	0.00	0.00
15,000.0	90.00	181.05	6,265.2	-1,326.25	-8,750.6	3,106.2	9,266.3	0.00	0.00	0.00
15,100.0	90.00	181.05	6,265.2	-1,326.25	-8,850.6	3,104.4	9,362.0	0.00	0.00	0.00
15,200.0	90.00	181.05	6,265.2	-1,326.25	-8,950.6	3,102.5	9,457.6	0.00	0.00	0.00
15,300.0	90.00	181.05	6,265.2	-1,326.25	-9,050.6	3,100.7	9,553.3	0.00	0.00	0.00
15,400.0	90.00	181.05	6,265.2	-1,326.25	-9,150.6	3,098.8	9,649.0	0.00	0.00	0.00
15,500.0	90.00	181.05	6,265.2	-1,326.25	-9,250.6	3,097.0	9,744.7	0.00	0.00	0.00
15,600.0	90.00	181.05	6,265.2	-1,326.25	-9,350.5	3,095.1	9,840.4	0.00	0.00	0.00
15,700.0	90.00	181.05	6,265.2	-1,326.25	-9,450.5	3,093.3	9,936.0	0.00	0.00	0.00
15,800.0	90.00	181.05	6,265.2	-1,326.25	-9,550.5	3,091.5	10,031.7	0.00	0.00	0.00
15,900.0	90.00	181.05	6,265.2	-1,326.25	-9,650.5	3,089.6	10,127.4	0.00	0.00	0.00
16,000.0	90.00	181.05	6,265.2	-1,326.25	-9,750.5	3,087.8	10,223.1	0.00	0.00	0.00
16,100.0	90.00	181.05	6,265.2	-1,326.25	-9,850.5	3,085.9	10,318.8	0.00	0.00	0.00
16,200.0	90.00	181.05	6,265.2	-1,326.25	-9,950.4	3,084.1	10,414.4	0.00	0.00	0.00
16,300.0	90.00	181.05	6,265.2	-1,326.25	-10,050.4	3,082.3	10,510.1	0.00	0.00	0.00
16,400.0	90.00	181.05	6,265.2	-1,326.25	-10,150.4	3,080.4	10,605.8	0.00	0.00	0.00
16,500.0	90.00	181.05	6,265.2	-1,326.25	-10,250.4	3,078.6	10,701.5	0.00	0.00	0.00
16,600.0	90.00	181.05	6,265.2	-1,326.25	-10,350.4	3,076.7	10,797.2	0.00	0.00	0.00
16,700.0	90.00	181.05	6,265.2	-1,326.25	-10,450.4	3,074.9	10,892.8	0.00	0.00	0.00
16,800.0	90.00	181.05	6,265.2	-1,326.25	-10,550.3	3,073.1	10,988.5	0.00	0.00	0.00
16,900.0	90.00	181.05	6,265.2	-1,326.25	-10,650.3	3,071.2	11,084.2	0.00	0.00	0.00
17,000.0	90.00	181.05	6,265.2	-1,326.25	-10,750.3	3,069.4	11,179.9	0.00	0.00	0.00
<b>BHL: 600ft FSL &amp; 1340ft FEL of Sec 11</b>										
<b>17,058.1</b>	<b>90.00</b>	<b>181.05</b>	<b>6,265.2</b>	<b>-1,326.25</b>	<b>-10,808.3</b>	<b>3,068.3</b>	<b>11,235.4</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well PINTAIL 2-13HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4939.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4939.0usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL 2-13HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,554.8	1,523.7	FOX HILLS BASE			
3,688.1	3,326.2	RICHARD SANDSTONE			
4,728.0	4,187.7	SUSSEX SANDSTONE			
5,317.1	4,675.7	SHANNON SANDSTONE			
7,068.0	6,100.2	SHARON SPRINGS			
7,182.5	6,165.7	NIOBRARA A CHALK			
7,220.4	6,184.2	NIOBRARA A CHALK BASE			
7,298.5	6,216.7	NIOBRARA B1 CHALK TOP			
7,380.3	6,242.2	NIOBRARA B1 CHALK BASE			
7,558.7	6,265.2	NIOBRARA B2 CHALK TOP			

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.0	0.0	0.0	0.0	SHL: 740ft FSL & 1173ft FWL of Sec 35
400.0	400.0	0.0	0.0	START NUDGE #1 (2°/100ft BUR)
1,588.8	1,555.0	-58.4	236.0	SURFACE CASING
1,688.8	1,646.5	-68.1	275.2	START NUDGE #2 (2°/100ft BUR)
2,203.2	2,096.1	-127.8	516.3	EOB TO 34.06° INC
6,730.3	5,846.5	-737.2	2,977.7	KOP (10°/100ft DGLG)
7,558.7	6,265.3	-1,310.6	3,243.2	HZ LP: 600ft FNL & 1345ft FEL of Sec 2
17,058.1	6,265.2	-10,808.3	3,068.3	BHL: 600ft FSL & 1340ft FEL of Sec 11