

# **MALLARD EXPLORATION**

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

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

**PINTAIL FED 2-11-4HN**

**ORIGINAL WELLBORE**

**12 September, 2019**

**Plan: PROPOSAL #5**



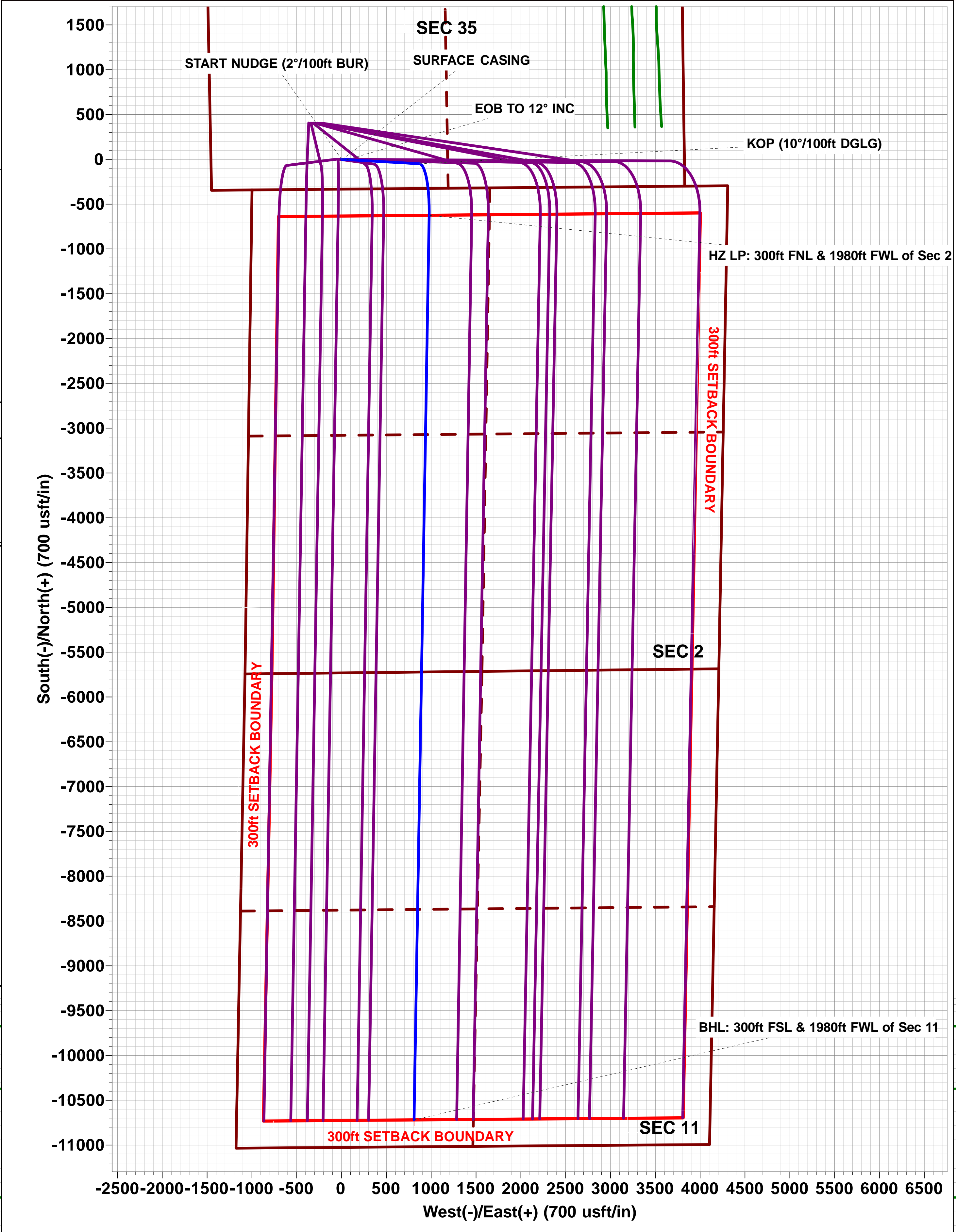
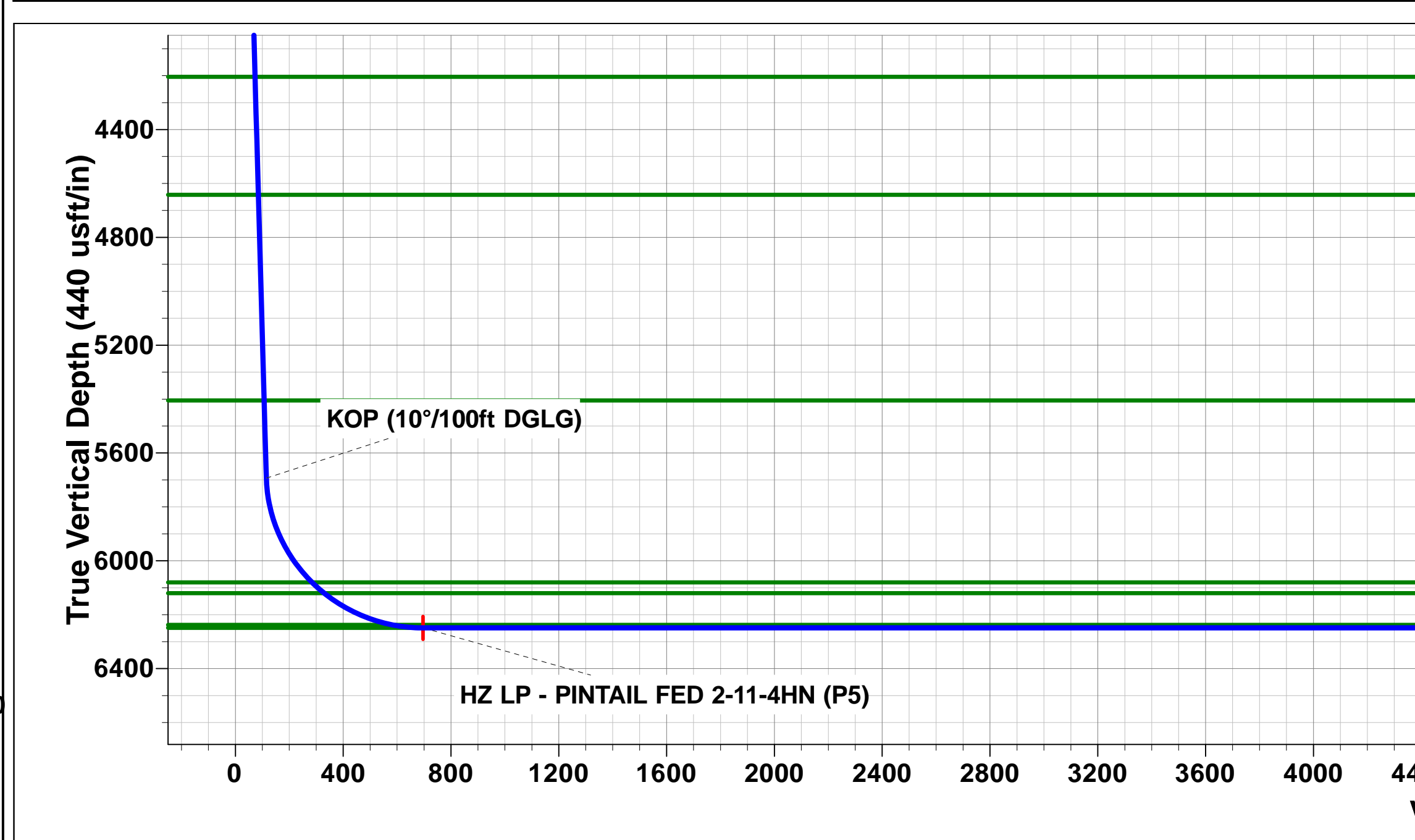
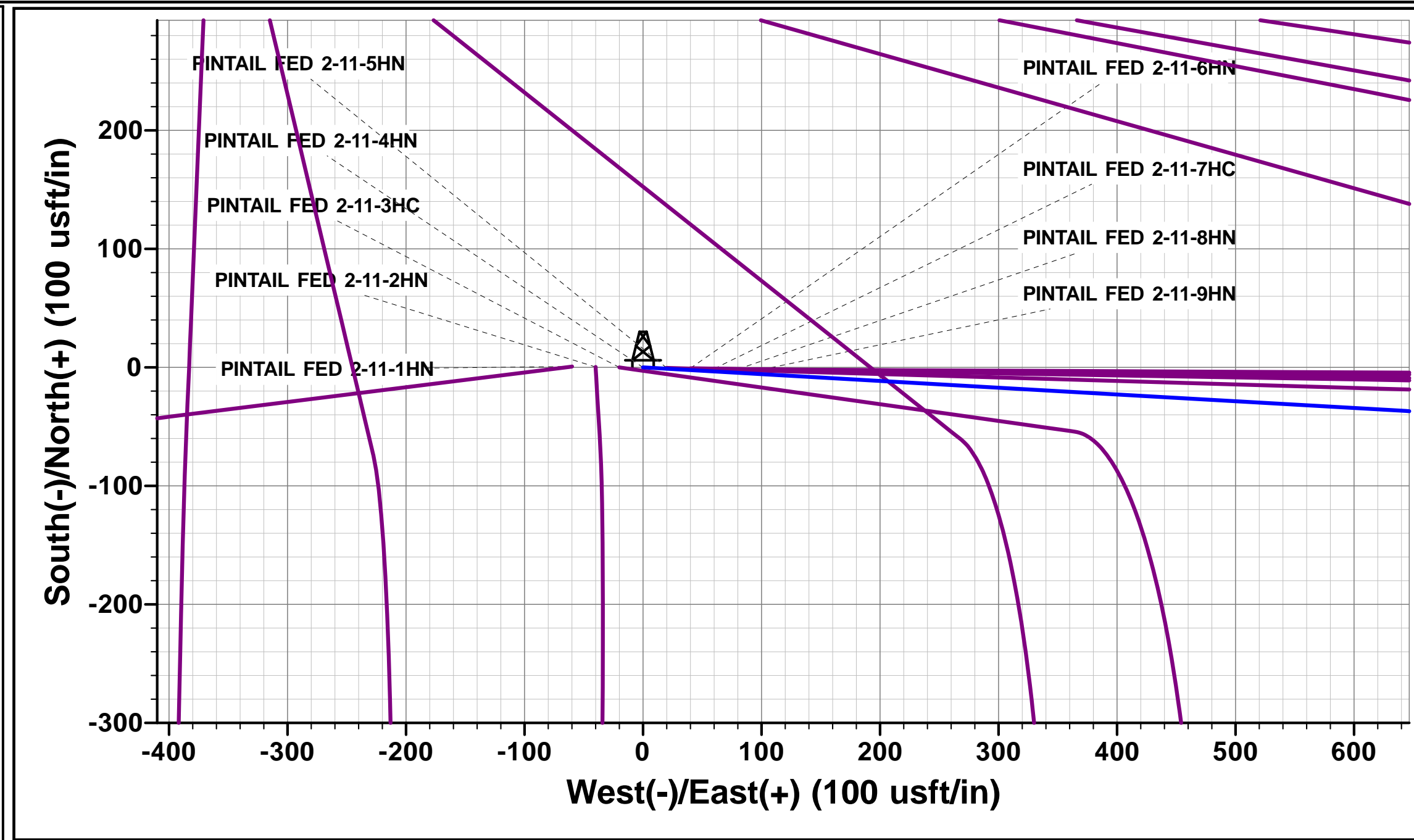
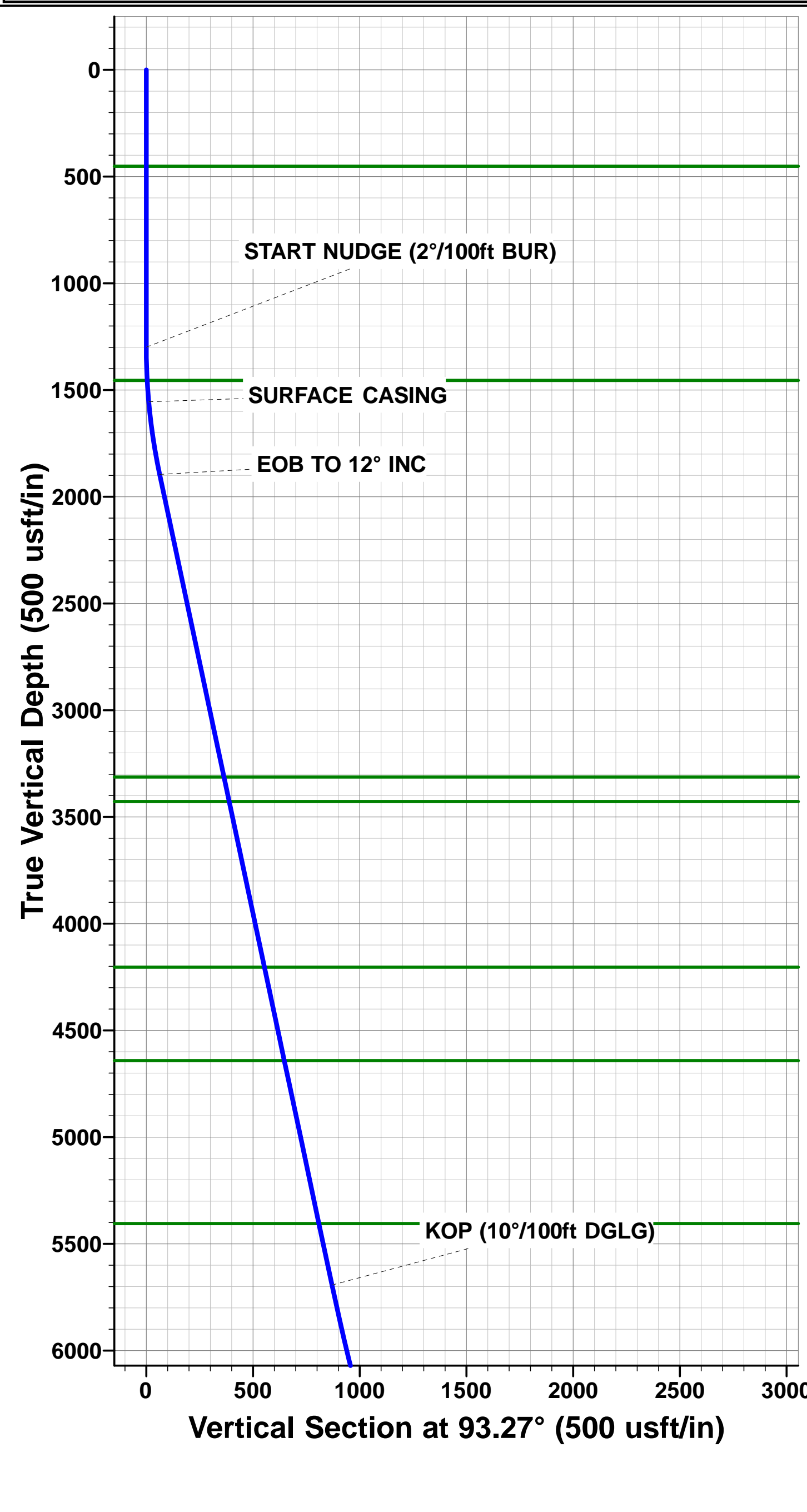


Project: WELD COUNTY, COLORADO (NAD 83)  
Site: SE SW SEC. 35 T9N R60W 6TH P.M.  
Well: PINTAIL FED 2-11-4HN  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL #5

ANNOTATIONS										
TVD	MD	Inc	Azi	+N/-S	+E/-W	Vsect	Dep	Annotation		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 333ft FSL & 1457ft FWL of Sec 35		
1300.00	1300.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)		
1555.00	1555.34	5.11	93.27	-0.65	11.35	1.50	11.80	SURFACE CASING		
1895.82	1900.20	12.00	93.27	-3.57	62.54	8.27	62.64	EOB TO 12° INC		
5693.25	5782.53	12.00	93.27	-49.60	868.67	114.80	870.09	KOP (10°/100ft DGLG)		
6249.00	6677.72	90.00	180.96	-624.43	977.16	696.16	1473.11	HZ LP: 300ft FNL & 1980ft FWL of Sec 2		
6249.00	16774.32	90.00	180.96	-10719.62	808.63	10750.07	11569.71	BHL: 300ft FSL & 1980ft FWL of Sec 11		

PROPOSED LOCAL COORDINATES:  
SHL: 333ft FSL & 1457ft FWL Sec 35  
HZ LP: 300ft FNL & 1980ft FWL Sec 2  
BHL: 300ft FSL & 1980ft FWL of Sec 11

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
HZ LP - PINTAIL FED 2-11-4HN (P5)	6249.00	-624.43	977.16	40.698308	-104.059576
BHL - PINTAIL FED 2-11-4HN (P5)	6249.00	-10719.62	808.63	40.670599	-104.060185



# Planning Report



<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well PINTAIL FED 2-11-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4944.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4944.00usft
<b>Site:</b>	SE SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-11-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #5		

<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

Site		SE SW SEC. 35 T9N R60W 6TH P.M.			
Site Position:		Northing:	1,501,638.38 usft	Latitude:	40.701546
From:	Lat/Long	Easting:	3,398,005.01 usft	Longitude:	-104.064503
Position Uncertainty:	0.00 usft	Slot Radius:	1.10 ft	Grid Convergence:	0.93 °

Well	PINTAIL FED 2-11-4HN					
Well Position	+N-S	-555.24 usft	Northing:	1,501,089.51 usft	Latitude:	40.700022
	+E-W	389.03 usft	Easting:	3,398,402.96 usft	Longitude:	-104.063100
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,919.00 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	12/09/2019	7.62	67.14	52,361

<b>Design</b>	PROPOSAL #5			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N-S (usft)</b>	<b>+E-W (usft)</b>	<b>Direction (°)</b>
	6,249.00	0.00	0.00	175.69

<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
0.00	0.00	0.00	0.00	-4,944.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,300.00	0.00	0.00	1,300.00	-3,644.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,900.20	12.00	93.27	1,895.82	-3,048.18	-3.57	62.54	2.00	2.00	0.00	93.27	
5,782.53	12.00	93.27	5,693.25	749.25	-49.61	868.67	0.00	0.00	0.00	0.00	
6,677.72	90.00	180.96	6,249.00	1,305.00	-624.43	977.16	10.00	8.71	9.80	87.74	HZ LP - PINTAIL FI
16,774.32	90.00	180.96	6,249.00	1,305.00	-10,719.62	808.63	0.00	0.00	0.00	0.00	BHL - PINTAIL FEC

# Planning Report



<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well PINTAIL FED 2-11-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4944.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4944.00usft
<b>Site:</b>	SE SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-11-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #5		

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: 333ft FSL &amp; 1457ft FWL of Sec 35</b>										
0.00	0.00	0.00	0.00	4,944.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,844.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4,744.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	4,644.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	4,544.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fox Hills Base</b>										
452.00	0.00	0.00	452.00	4,492.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	4,444.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	4,344.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	4,244.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	4,144.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	4,044.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	3,944.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	3,844.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	3,744.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>START NUDGE (2°/100ft BUR)</b>										
1,300.00	0.00	0.00	1,300.00	3,644.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	2.00	93.27	1,399.98	3,544.02	-0.10	1.74	0.23	2.00	2.00	0.00
<b>Pierre Shale Top</b>										
1,455.08	3.10	93.27	1,455.00	3,489.00	-0.24	4.19	0.55	2.00	2.00	0.00
1,500.00	4.00	93.27	1,499.84	3,444.16	-0.40	6.97	0.92	2.00	2.00	0.00
<b>SURFACE CASING</b>										
1,555.34	5.11	93.27	1,555.00	3,389.00	-0.65	11.35	1.50	2.00	2.00	0.00
1,600.00	6.00	93.27	1,599.45	3,344.55	-0.89	15.67	2.07	2.00	2.00	0.00
1,700.00	8.00	93.27	1,698.70	3,245.30	-1.59	27.83	3.68	2.00	2.00	0.00
1,800.00	10.00	93.27	1,797.47	3,146.53	-2.48	43.45	5.74	2.00	2.00	0.00
1,900.00	12.00	93.27	1,895.62	3,048.38	-3.57	62.50	8.26	2.00	2.00	0.00
<b>EOB TO 12" INC</b>										
1,900.20	12.00	93.27	1,895.82	3,048.18	-3.57	62.54	8.27	1.98	1.98	0.00
2,000.00	12.00	93.27	1,993.44	2,950.56	-4.75	83.26	11.00	0.00	0.00	0.00
2,100.00	12.00	93.27	2,091.25	2,852.75	-5.94	104.03	13.75	0.00	0.00	0.00
2,200.00	12.00	93.27	2,189.06	2,754.94	-7.13	124.79	16.49	0.00	0.00	0.00
2,300.00	12.00	93.27	2,286.88	2,657.12	-8.31	145.56	19.24	0.00	0.00	0.00
2,400.00	12.00	93.27	2,384.69	2,559.31	-9.50	166.32	21.98	0.00	0.00	0.00
2,500.00	12.00	93.27	2,482.50	2,461.50	-10.68	187.09	24.73	0.00	0.00	0.00
2,600.00	12.00	93.27	2,580.32	2,363.68	-11.87	207.85	27.47	0.00	0.00	0.00
2,700.00	12.00	93.27	2,678.13	2,265.87	-13.06	228.61	30.21	0.00	0.00	0.00
2,800.00	12.00	93.27	2,775.94	2,168.06	-14.24	249.38	32.96	0.00	0.00	0.00
2,900.00	12.00	93.27	2,873.76	2,070.24	-15.43	270.14	35.70	0.00	0.00	0.00
3,000.00	12.00	93.27	2,971.57	1,972.43	-16.61	290.91	38.45	0.00	0.00	0.00
3,100.00	12.00	93.27	3,069.38	1,874.62	-17.80	311.67	41.19	0.00	0.00	0.00
3,200.00	12.00	93.27	3,167.20	1,776.80	-18.98	332.43	43.94	0.00	0.00	0.00
3,300.00	12.00	93.27	3,265.01	1,678.99	-20.17	353.20	46.68	0.00	0.00	0.00
<b>Richard Sandstone</b>										
3,349.06	12.00	93.27	3,313.00	1,631.00	-20.75	363.39	48.03	0.00	0.00	0.00
3,400.00	12.00	93.27	3,362.82	1,581.18	-21.36	373.96	49.42	0.00	0.00	0.00
<b>Parkman Sandstone</b>										
3,466.63	12.00	93.27	3,428.00	1,516.00	-22.15	387.80	51.25	0.00	0.00	0.00
3,500.00	12.00	93.27	3,460.64	1,483.36	-22.54	394.73	52.17	0.00	0.00	0.00
3,600.00	12.00	93.27	3,558.45	1,385.55	-23.73	415.49	54.91	0.00	0.00	0.00
3,700.00	12.00	93.27	3,656.26	1,287.74	-24.91	436.25	57.66	0.00	0.00	0.00
3,800.00	12.00	93.27	3,754.08	1,189.92	-26.10	457.02	60.40	0.00	0.00	0.00

# Planning Report



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<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4944.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4944.00usft
<b>Site:</b>	SE SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-11-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #5		

## 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)
3,900.00	12.00	93.27	3,851.89	1,092.11	-27.28	477.78	63.15	0.00	0.00	0.00
4,000.00	12.00	93.27	3,949.70	994.30	-28.47	498.55	65.89	0.00	0.00	0.00
4,100.00	12.00	93.27	4,047.52	896.48	-29.66	519.31	68.63	0.00	0.00	0.00
4,200.00	12.00	93.27	4,145.33	798.67	-30.84	540.07	71.38	0.00	0.00	0.00
<b>Sussex Sandstone</b>										
<b>4,259.98</b>	<b>12.00</b>	<b>93.27</b>	<b>4,204.00</b>	<b>740.00</b>	<b>-31.55</b>	<b>552.53</b>	<b>73.02</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
4,300.00	12.00	93.27	4,243.14	700.86	-32.03	560.84	74.12	0.00	0.00	0.00
4,400.00	12.00	93.27	4,340.96	603.04	-33.21	581.60	76.87	0.00	0.00	0.00
4,500.00	12.00	93.27	4,438.77	505.23	-34.40	602.37	79.61	0.00	0.00	0.00
4,600.00	12.00	93.27	4,536.58	407.42	-35.58	623.13	82.36	0.00	0.00	0.00
4,700.00	12.00	93.27	4,634.40	309.60	-36.77	643.90	85.10	0.00	0.00	0.00
<b>Shannon Sandstone</b>										
<b>4,707.77</b>	<b>12.00</b>	<b>93.27</b>	<b>4,642.00</b>	<b>302.00</b>	<b>-36.86</b>	<b>645.51</b>	<b>85.31</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
4,800.00	12.00	93.27	4,732.21	211.79	-37.96	664.66	87.84	0.00	0.00	0.00
4,900.00	12.00	93.27	4,830.02	113.98	-39.14	685.42	90.59	0.00	0.00	0.00
5,000.00	12.00	93.27	4,927.84	16.16	-40.33	706.19	93.33	0.00	0.00	0.00
5,100.00	12.00	93.27	5,025.65	-81.65	-41.51	726.95	96.08	0.00	0.00	0.00
5,200.00	12.00	93.27	5,123.46	-179.46	-42.70	747.72	98.82	0.00	0.00	0.00
5,300.00	12.00	93.27	5,221.28	-277.28	-43.88	768.48	101.57	0.00	0.00	0.00
5,400.00	12.00	93.27	5,319.09	-375.09	-45.07	789.24	104.31	0.00	0.00	0.00
<b>TeePee Buttes</b>										
<b>5,487.83</b>	<b>12.00</b>	<b>93.27</b>	<b>5,405.00</b>	<b>-461.00</b>	<b>-46.11</b>	<b>807.48</b>	<b>106.72</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
5,500.00	12.00	93.27	5,416.90	-472.90	-46.26	810.01	107.05	0.00	0.00	0.00
5,600.00	12.00	93.27	5,514.72	-570.72	-47.44	830.77	109.80	0.00	0.00	0.00
5,700.00	12.00	93.27	5,612.53	-668.53	-48.63	851.54	112.54	0.00	0.00	0.00
<b>KOP (10°/100ft DGLG)</b>										
<b>5,782.53</b>	<b>12.00</b>	<b>93.27</b>	<b>5,693.25</b>	<b>-749.25</b>	<b>-49.61</b>	<b>868.67</b>	<b>114.81</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
5,800.00	12.20	101.56	5,710.34	-766.34	-50.08	872.29	115.55	10.00	1.10	47.46
5,900.00	17.06	137.16	5,807.25	-863.25	-62.99	892.67	129.96	10.00	4.87	35.60
6,000.00	25.11	154.00	5,900.56	-956.56	-92.89	912.00	161.23	10.00	8.05	16.84
6,100.00	34.16	162.71	5,987.43	-1,043.43	-138.89	929.69	208.43	10.00	9.05	8.71
6,200.00	43.59	168.06	6,065.22	-1,121.22	-199.58	945.21	270.11	10.00	9.43	5.35
<b>Sharon Springs</b>										
<b>6,220.75</b>	<b>45.57</b>	<b>168.94</b>	<b>6,080.00</b>	<b>-1,136.00</b>	<b>-213.85</b>	<b>948.11</b>	<b>284.56</b>	<b>10.00</b>	<b>9.55</b>	<b>4.22</b>
<b>Niobrara Top</b>										
<b>6,281.11</b>	<b>51.37</b>	<b>171.18</b>	<b>6,120.00</b>	<b>-1,176.00</b>	<b>-258.34</b>	<b>955.87</b>	<b>329.51</b>	<b>10.00</b>	<b>9.61</b>	<b>3.72</b>
6,300.00	53.19	171.81	6,131.56	-1,187.56	-273.12	958.07	344.41	10.00	9.65	3.32
6,400.00	62.88	174.71	6,184.44	-1,240.44	-357.27	967.91	429.06	10.00	9.69	2.90
6,500.00	72.63	177.15	6,222.25	-1,278.25	-449.48	974.40	521.50	10.00	9.74	2.43
<b>Niobrara B2 Chalk Target Top</b>										
<b>6,564.02</b>	<b>78.88</b>	<b>178.56</b>	<b>6,238.00</b>	<b>-1,294.00</b>	<b>-511.45</b>	<b>976.71</b>	<b>583.47</b>	<b>10.00</b>	<b>9.77</b>	<b>2.21</b>
6,600.00	82.40	179.33	6,243.85	-1,299.85	-546.94	977.36	618.91	10.00	9.78	2.14
<b>HZ LP: 300ft FNL &amp; 1980ft FWL of Sec 2 - Niobrara B2 Chalk Target Center</b>										
<b>6,677.72</b>	<b>90.00</b>	<b>180.96</b>	<b>6,249.00</b>	<b>-1,305.00</b>	<b>-624.43</b>	<b>977.16</b>	<b>696.17</b>	<b>10.00</b>	<b>9.78</b>	<b>2.09</b>
6,700.00	90.00	180.96	6,249.00	-1,305.00	-646.71	976.79	718.35	0.00	0.00	0.00
6,800.00	90.00	180.96	6,249.00	-1,305.00	-746.70	975.12	817.93	0.00	0.00	0.00
6,900.00	90.00	180.96	6,249.00	-1,305.00	-846.68	973.45	917.51	0.00	0.00	0.00
7,000.00	90.00	180.96	6,249.00	-1,305.00	-946.67	971.78	1,017.08	0.00	0.00	0.00
7,100.00	90.00	180.96	6,249.00	-1,305.00	-1,046.65	970.11	1,116.66	0.00	0.00	0.00
7,200.00	90.00	180.96	6,249.00	-1,305.00	-1,146.64	968.45	1,216.24	0.00	0.00	0.00
7,300.00	90.00	180.96	6,249.00	-1,305.00	-1,246.63	966.78	1,315.82	0.00	0.00	0.00
7,400.00	90.00	180.96	6,249.00	-1,305.00	-1,346.61	965.11	1,415.39	0.00	0.00	0.00
7,500.00	90.00	180.96	6,249.00	-1,305.00	-1,446.60	963.44	1,514.97	0.00	0.00	0.00



# Planning Report



<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well PINTAIL FED 2-11-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4944.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4944.00usft
<b>Site:</b>	SE SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-11-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #5		

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)
7,600.00	90.00	180.96	6,249.00	-1,305.00	-1,546.58	961.77	1,614.55	0.00	0.00	0.00
7,700.00	90.00	180.96	6,249.00	-1,305.00	-1,646.57	960.10	1,714.13	0.00	0.00	0.00
7,800.00	90.00	180.96	6,249.00	-1,305.00	-1,746.56	958.43	1,813.70	0.00	0.00	0.00
7,900.00	90.00	180.96	6,249.00	-1,305.00	-1,846.54	956.76	1,913.28	0.00	0.00	0.00
8,000.00	90.00	180.96	6,249.00	-1,305.00	-1,946.53	955.09	2,012.86	0.00	0.00	0.00
8,100.00	90.00	180.96	6,249.00	-1,305.00	-2,046.52	953.42	2,112.43	0.00	0.00	0.00
8,200.00	90.00	180.96	6,249.00	-1,305.00	-2,146.50	951.75	2,212.01	0.00	0.00	0.00
8,300.00	90.00	180.96	6,249.00	-1,305.00	-2,246.49	950.08	2,311.59	0.00	0.00	0.00
8,400.00	90.00	180.96	6,249.00	-1,305.00	-2,346.47	948.41	2,411.17	0.00	0.00	0.00
8,500.00	90.00	180.96	6,249.00	-1,305.00	-2,446.46	946.75	2,510.74	0.00	0.00	0.00
8,600.00	90.00	180.96	6,249.00	-1,305.00	-2,546.45	945.08	2,610.32	0.00	0.00	0.00
8,700.00	90.00	180.96	6,249.00	-1,305.00	-2,646.43	943.41	2,709.90	0.00	0.00	0.00
8,800.00	90.00	180.96	6,249.00	-1,305.00	-2,746.42	941.74	2,809.47	0.00	0.00	0.00
8,900.00	90.00	180.96	6,249.00	-1,305.00	-2,846.40	940.07	2,909.05	0.00	0.00	0.00
9,000.00	90.00	180.96	6,249.00	-1,305.00	-2,946.39	938.40	3,008.63	0.00	0.00	0.00
9,100.00	90.00	180.96	6,249.00	-1,305.00	-3,046.38	936.73	3,108.21	0.00	0.00	0.00
9,200.00	90.00	180.96	6,249.00	-1,305.00	-3,146.36	935.06	3,207.78	0.00	0.00	0.00
9,300.00	90.00	180.96	6,249.00	-1,305.00	-3,246.35	933.39	3,307.36	0.00	0.00	0.00
9,400.00	90.00	180.96	6,249.00	-1,305.00	-3,346.33	931.72	3,406.94	0.00	0.00	0.00
9,500.00	90.00	180.96	6,249.00	-1,305.00	-3,446.32	930.05	3,506.52	0.00	0.00	0.00
9,600.00	90.00	180.96	6,249.00	-1,305.00	-3,546.31	928.38	3,606.09	0.00	0.00	0.00
9,700.00	90.00	180.96	6,249.00	-1,305.00	-3,646.29	926.71	3,705.67	0.00	0.00	0.00
9,800.00	90.00	180.96	6,249.00	-1,305.00	-3,746.28	925.05	3,805.25	0.00	0.00	0.00
9,900.00	90.00	180.96	6,249.00	-1,305.00	-3,846.26	923.38	3,904.82	0.00	0.00	0.00
10,000.00	90.00	180.96	6,249.00	-1,305.00	-3,946.25	921.71	4,004.40	0.00	0.00	0.00
10,100.00	90.00	180.96	6,249.00	-1,305.00	-4,046.24	920.04	4,103.98	0.00	0.00	0.00
10,200.00	90.00	180.96	6,249.00	-1,305.00	-4,146.22	918.37	4,203.56	0.00	0.00	0.00
10,300.00	90.00	180.96	6,249.00	-1,305.00	-4,246.21	916.70	4,303.13	0.00	0.00	0.00
10,400.00	90.00	180.96	6,249.00	-1,305.00	-4,346.19	915.03	4,402.71	0.00	0.00	0.00
10,500.00	90.00	180.96	6,249.00	-1,305.00	-4,446.18	913.36	4,502.29	0.00	0.00	0.00
10,600.00	90.00	180.96	6,249.00	-1,305.00	-4,546.17	911.69	4,601.87	0.00	0.00	0.00
10,700.00	90.00	180.96	6,249.00	-1,305.00	-4,646.15	910.02	4,701.44	0.00	0.00	0.00
10,800.00	90.00	180.96	6,249.00	-1,305.00	-4,746.14	908.35	4,801.02	0.00	0.00	0.00
10,900.00	90.00	180.96	6,249.00	-1,305.00	-4,846.13	906.68	4,900.60	0.00	0.00	0.00
11,000.00	90.00	180.96	6,249.00	-1,305.00	-4,946.11	905.01	5,000.17	0.00	0.00	0.00
11,100.00	90.00	180.96	6,249.00	-1,305.00	-5,046.10	903.35	5,099.75	0.00	0.00	0.00
11,200.00	90.00	180.96	6,249.00	-1,305.00	-5,146.08	901.68	5,199.33	0.00	0.00	0.00
11,300.00	90.00	180.96	6,249.00	-1,305.00	-5,246.07	900.01	5,298.91	0.00	0.00	0.00
11,400.00	90.00	180.96	6,249.00	-1,305.00	-5,346.06	898.34	5,398.48	0.00	0.00	0.00
11,500.00	90.00	180.96	6,249.00	-1,305.00	-5,446.04	896.67	5,498.06	0.00	0.00	0.00
11,600.00	90.00	180.96	6,249.00	-1,305.00	-5,546.03	895.00	5,597.64	0.00	0.00	0.00
11,700.00	90.00	180.96	6,249.00	-1,305.00	-5,646.01	893.33	5,697.21	0.00	0.00	0.00
11,800.00	90.00	180.96	6,249.00	-1,305.00	-5,746.00	891.66	5,796.79	0.00	0.00	0.00
11,900.00	90.00	180.96	6,249.00	-1,305.00	-5,845.99	889.99	5,896.37	0.00	0.00	0.00
12,000.00	90.00	180.96	6,249.00	-1,305.00	-5,945.97	888.32	5,995.95	0.00	0.00	0.00
12,100.00	90.00	180.96	6,249.00	-1,305.00	-6,045.96	886.65	6,095.52	0.00	0.00	0.00
12,200.00	90.00	180.96	6,249.00	-1,305.00	-6,145.94	884.98	6,195.10	0.00	0.00	0.00
12,300.00	90.00	180.96	6,249.00	-1,305.00	-6,245.93	883.31	6,294.68	0.00	0.00	0.00
12,400.00	90.00	180.96	6,249.00	-1,305.00	-6,345.92	881.65	6,394.26	0.00	0.00	0.00
12,500.00	90.00	180.96	6,249.00	-1,305.00	-6,445.90	879.98	6,493.83	0.00	0.00	0.00
12,600.00	90.00	180.96	6,249.00	-1,305.00	-6,545.89	878.31	6,593.41	0.00	0.00	0.00
12,700.00	90.00	180.96	6,249.00	-1,305.00	-6,645.87	876.64	6,692.99	0.00	0.00	0.00
12,800.00	90.00	180.96	6,249.00	-1,305.00	-6,745.86	874.97	6,792.56	0.00	0.00	0.00
12,900.00	90.00	180.96	6,249.00	-1,305.00	-6,845.85	873.30	6,892.14	0.00	0.00	0.00

# Planning Report



<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well PINTAIL FED 2-11-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4944.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4944.00usft
<b>Site:</b>	SE SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-11-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #5		

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)
13,000.00	90.00	180.96	6,249.00	-1,305.00	-6,945.83	871.63	6,991.72	0.00	0.00	0.00
13,100.00	90.00	180.96	6,249.00	-1,305.00	-7,045.82	869.96	7,091.30	0.00	0.00	0.00
13,200.00	90.00	180.96	6,249.00	-1,305.00	-7,145.80	868.29	7,190.87	0.00	0.00	0.00
13,300.00	90.00	180.96	6,249.00	-1,305.00	-7,245.79	866.62	7,290.45	0.00	0.00	0.00
13,400.00	90.00	180.96	6,249.00	-1,305.00	-7,345.78	864.95	7,390.03	0.00	0.00	0.00
13,500.00	90.00	180.96	6,249.00	-1,305.00	-7,445.76	863.28	7,489.61	0.00	0.00	0.00
13,600.00	90.00	180.96	6,249.00	-1,305.00	-7,545.75	861.61	7,589.18	0.00	0.00	0.00
13,700.00	90.00	180.96	6,249.00	-1,305.00	-7,645.73	859.94	7,688.76	0.00	0.00	0.00
13,800.00	90.00	180.96	6,249.00	-1,305.00	-7,745.72	858.28	7,788.34	0.00	0.00	0.00
13,900.00	90.00	180.96	6,249.00	-1,305.00	-7,845.71	856.61	7,887.91	0.00	0.00	0.00
14,000.00	90.00	180.96	6,249.00	-1,305.00	-7,945.69	854.94	7,987.49	0.00	0.00	0.00
14,100.00	90.00	180.96	6,249.00	-1,305.00	-8,045.68	853.27	8,087.07	0.00	0.00	0.00
14,200.00	90.00	180.96	6,249.00	-1,305.00	-8,145.67	851.60	8,186.65	0.00	0.00	0.00
14,300.00	90.00	180.96	6,249.00	-1,305.00	-8,245.65	849.93	8,286.22	0.00	0.00	0.00
14,400.00	90.00	180.96	6,249.00	-1,305.00	-8,345.64	848.26	8,385.80	0.00	0.00	0.00
14,500.00	90.00	180.96	6,249.00	-1,305.00	-8,445.62	846.59	8,485.38	0.00	0.00	0.00
14,600.00	90.00	180.96	6,249.00	-1,305.00	-8,545.61	844.92	8,584.95	0.00	0.00	0.00
14,700.00	90.00	180.96	6,249.00	-1,305.00	-8,645.60	843.25	8,684.53	0.00	0.00	0.00
14,800.00	90.00	180.96	6,249.00	-1,305.00	-8,745.58	841.58	8,784.11	0.00	0.00	0.00
14,900.00	90.00	180.96	6,249.00	-1,305.00	-8,845.57	839.91	8,883.69	0.00	0.00	0.00
15,000.00	90.00	180.96	6,249.00	-1,305.00	-8,945.55	838.24	8,983.26	0.00	0.00	0.00
15,100.00	90.00	180.96	6,249.00	-1,305.00	-9,045.54	836.58	9,082.84	0.00	0.00	0.00
15,200.00	90.00	180.96	6,249.00	-1,305.00	-9,145.53	834.91	9,182.42	0.00	0.00	0.00
15,300.00	90.00	180.96	6,249.00	-1,305.00	-9,245.51	833.24	9,282.00	0.00	0.00	0.00
15,400.00	90.00	180.96	6,249.00	-1,305.00	-9,345.50	831.57	9,381.57	0.00	0.00	0.00
15,500.00	90.00	180.96	6,249.00	-1,305.00	-9,445.48	829.90	9,481.15	0.00	0.00	0.00
15,600.00	90.00	180.96	6,249.00	-1,305.00	-9,545.47	828.23	9,580.73	0.00	0.00	0.00
15,700.00	90.00	180.96	6,249.00	-1,305.00	-9,645.46	826.56	9,680.30	0.00	0.00	0.00
15,800.00	90.00	180.96	6,249.00	-1,305.00	-9,745.44	824.89	9,779.88	0.00	0.00	0.00
15,900.00	90.00	180.96	6,249.00	-1,305.00	-9,845.43	823.22	9,879.46	0.00	0.00	0.00
16,000.00	90.00	180.96	6,249.00	-1,305.00	-9,945.41	821.55	9,979.04	0.00	0.00	0.00
16,100.00	90.00	180.96	6,249.00	-1,305.00	-10,045.40	819.88	10,078.61	0.00	0.00	0.00
16,200.00	90.00	180.96	6,249.00	-1,305.00	-10,145.39	818.21	10,178.19	0.00	0.00	0.00
16,300.00	90.00	180.96	6,249.00	-1,305.00	-10,245.37	816.54	10,277.77	0.00	0.00	0.00
16,400.00	90.00	180.96	6,249.00	-1,305.00	-10,345.36	814.88	10,377.34	0.00	0.00	0.00
16,500.00	90.00	180.96	6,249.00	-1,305.00	-10,445.34	813.21	10,476.92	0.00	0.00	0.00
16,600.00	90.00	180.96	6,249.00	-1,305.00	-10,545.33	811.54	10,576.50	0.00	0.00	0.00
16,700.00	90.00	180.96	6,249.00	-1,305.00	-10,645.32	809.87	10,676.08	0.00	0.00	0.00
<b>BHL: 300ft FSL &amp; 1980ft FWL of Sec 11</b>										
<b>16,774.32</b>	<b>90.00</b>	<b>180.96</b>	<b>6,249.00</b>	<b>-1,305.00</b>	<b>-10,719.62</b>	<b>808.63</b>	<b>10,750.08</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

# Planning Report



<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well PINTAIL FED 2-11-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4944.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4944.00usft
<b>Site:</b>	SE SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-11-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #5		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
452.00	452.00	Fox Hills Base			
1,455.08	1,455.00	Pierre Shale Top			
3,349.06	3,313.00	Richard Sandstone			
3,466.63	3,428.00	Parkman Sandstone			
4,259.98	4,204.00	Sussex Sandstone			
4,707.77	4,642.00	Shannon Sandstone			
5,487.83	5,405.00	TeePee Buttes			
6,220.75	6,080.00	Sharon Springs			
6,281.11	6,120.00	Niobrara Top			
6,564.02	6,238.00	Niobrara B2 Chalk Target Top			
6,677.72	6,249.00	Niobrara B2 Chalk Target Center			

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.00	0.00	0.00	0.00	SHL: 333ft FSL & 1457ft FWL of Sec 35
1,300.00	1,300.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1,555.34	1,555.00	-0.65	11.35	SURFACE CASING
1,900.20	1,895.82	-3.57	62.54	EOB TO 12° INC
5,782.53	5,693.25	-49.61	868.67	KOP (10°/100ft DGLG)
6,677.72	6,249.00	-624.43	977.16	HZ LP: 300ft FNL & 1980ft FWL of Sec 2
16,774.32	6,249.00	-10,719.62	808.63	BHL: 300ft FSL & 1980ft FWL of Sec 11