

# **MALLARD EXPLORATION**

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

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

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

**ORIGINAL WELLBORE**

**04 December, 2018**

**Plan: PROPOSAL #4**



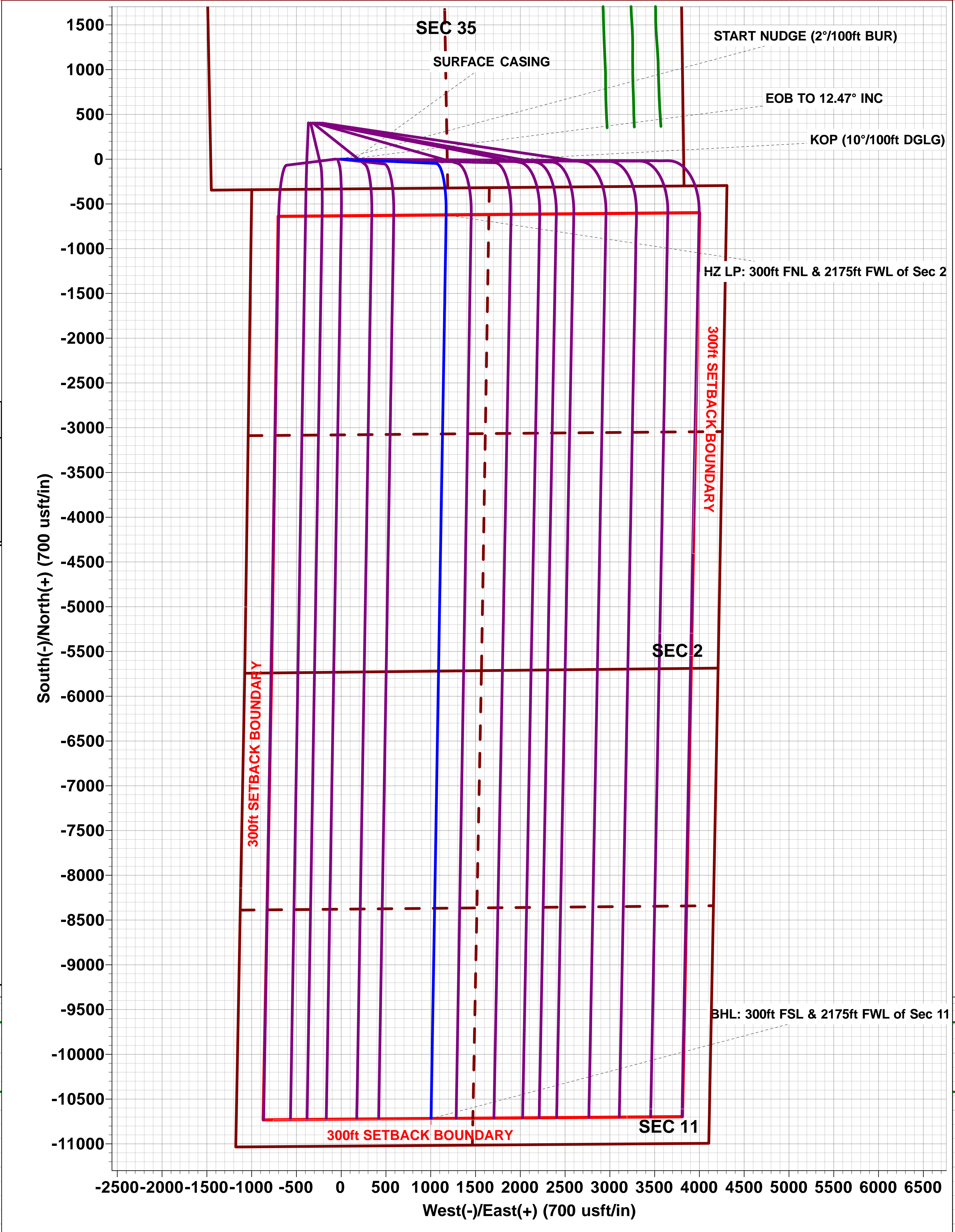
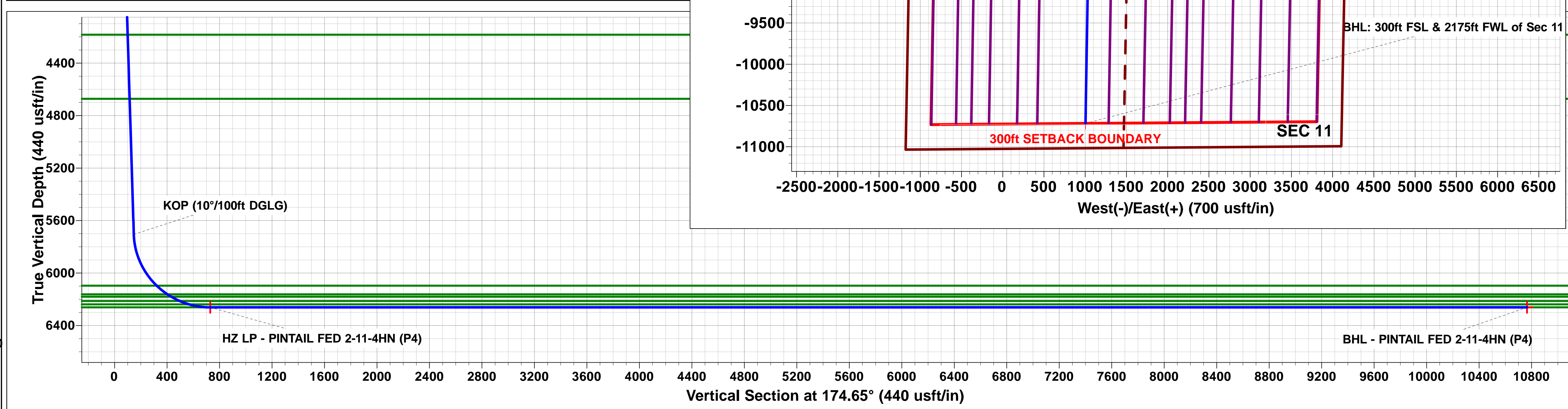
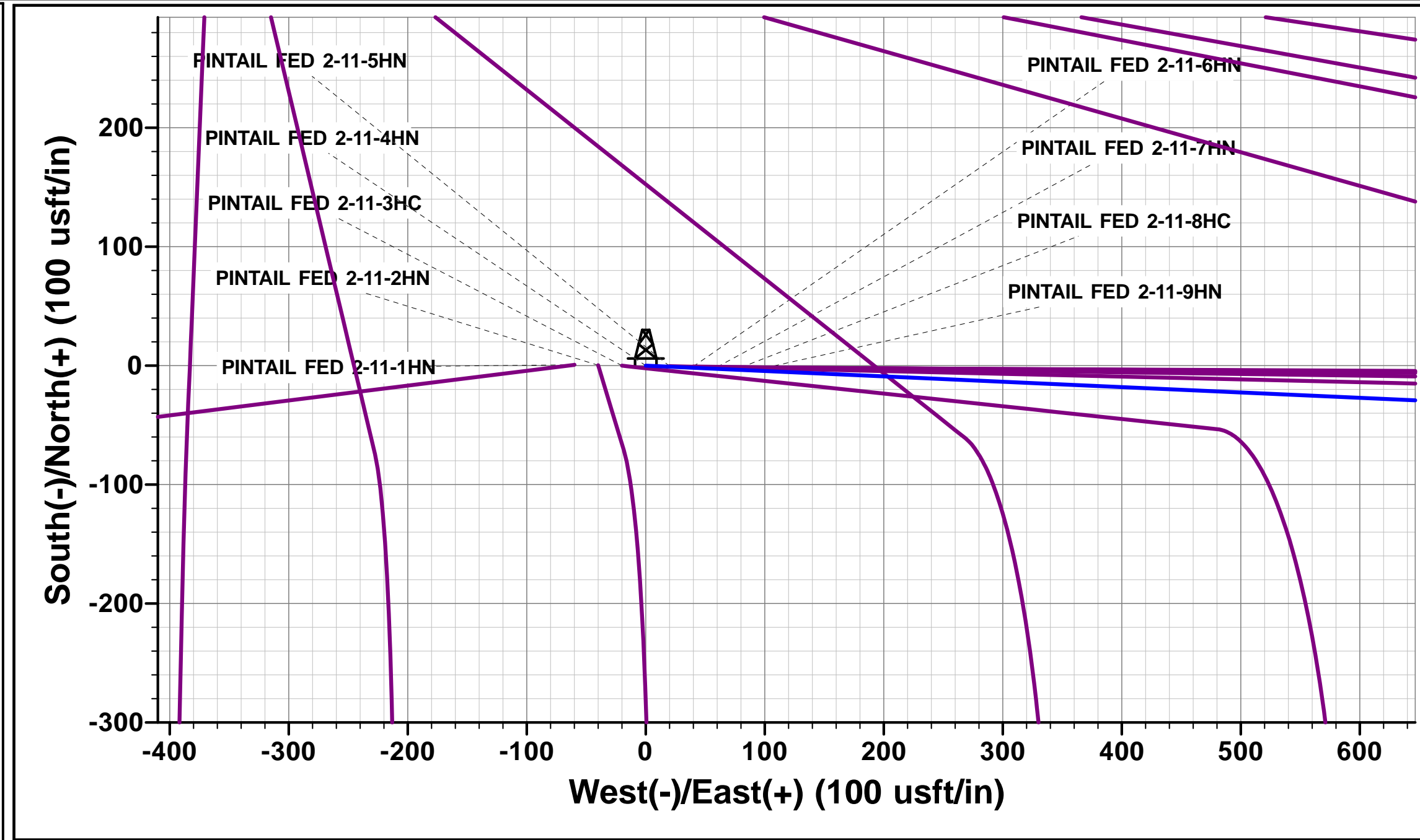
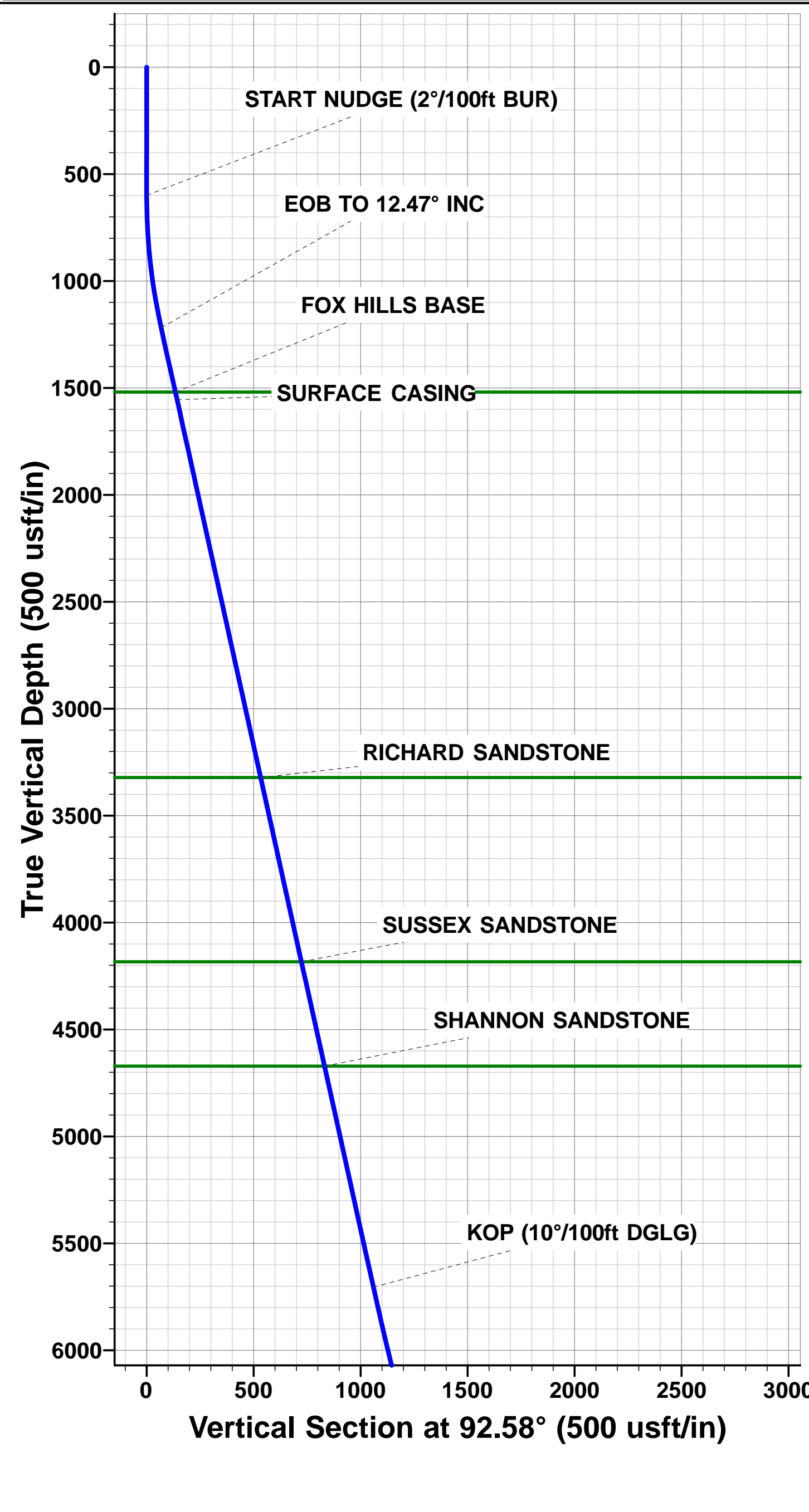


Project: WELD COUNTY, COLORADO (NAD 83)  
Site: SE SW SEC. 35 T9N R60W 6TH P.M.  
Well: PINTAIL FED 2-11-4HN  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL #4

ANNOTATIONS									
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	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	
600.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2"/100ft BUR)	
1218.62	1223.53	12.47	92.58	-3.04	67.52	9.32	67.59	EOB TO 12.47° INC	
1555.00	1568.04	12.47	92.58	-6.39	141.84	19.58	141.98	SURFACE CASING	
5705.22	5818.54	12.47	92.58	-47.69	1058.75	146.19	1059.83	KOP (10"/100ft DGLG)	
6261.25	6715.04	90.00	180.96	-622.61	1172.10	729.17	1665.04	HZ LP: 300ft FNL & 2175ft FWL of Sec 2	
6261.25	16812.00	90.00	180.96	-10718.16	1003.64	10765.05	11762.00	BHL: 300ft FSL & 2175ft FWL of Sec 11	

PROPOSED LOCAL COORDINATES:  
  
SHL: 333ft FSL & 1457ft FWL Sec 35  
  
HZ LP: 300ft FNL & 2175ft FWL Sec 2  
  
BHL: 300ft FSL & 2175ft FWL of Sec 11

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
HZ LP - PINTAIL FED 2-11-4HN (P4)	6261.25	-622.60	1172.10	40.698313	-104.058873
BHL - PINTAIL FED 2-11-4HN (P4)	6261.25	-10718.16	1003.64	40.670603	-104.059482



# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well PINTAIL FED 2-11-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4935.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4935.00usft
<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 #4		

<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>	SE 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>	0.00 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 2-11-4HN		
<b>Well Position</b>	<b>+N/-S</b>	-555.24 usft	<b>Northing:</b>
	<b>+E/-W</b>	389.03 usft	<b>Easting:</b>
<b>Position Uncertainty</b>		0.00 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	04/12/2018	7.70	67.16	52,450

<b>Design</b>	PROPOSAL #4			
<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>
	6,261.25	0.00	0.00	174.65

<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	-4,935.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	-4,335.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,223.53	12.47	92.58	1,218.62	-3,716.38	-3.04	67.52	2.00	2.00	0.00	92.58	
5,818.54	12.47	92.58	5,705.22	770.22	-47.69	1,058.75	0.00	0.00	0.00	0.00	
6,715.04	90.00	180.96	6,261.25	1,326.25	-622.60	1,172.10	10.00	8.65	9.86	88.42	HZ LP - PINTAIL FI
16,812.00	90.00	180.96	6,261.25	1,326.25	-10,718.16	1,003.64	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 2-11-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4935.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4935.00usft
<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 #4		

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	4,935.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,835.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4,735.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	4,635.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	4,535.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	4,435.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>START NUDGE (2°/100ft BUR)</b>										
600.00	0.00	0.00	600.00	4,335.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	2.00	92.58	699.98	4,235.02	-0.08	1.74	0.24	2.00	2.00	0.00
800.00	4.00	92.58	799.84	4,135.16	-0.31	6.97	0.96	2.00	2.00	0.00
900.00	6.00	92.58	899.45	4,035.55	-0.71	15.68	2.16	2.00	2.00	0.00
1,000.00	8.00	92.58	998.70	3,936.30	-1.25	27.85	3.85	2.00	2.00	0.00
1,100.00	10.00	92.58	1,097.47	3,837.53	-1.96	43.48	6.00	2.00	2.00	0.00
1,200.00	12.00	92.58	1,195.62	3,739.38	-2.82	62.54	8.64	2.00	2.00	0.00
<b>EOB TO 12.47° INC</b>										
1,223.53	12.47	92.58	1,218.62	3,716.38	-3.04	67.52	9.32	2.00	2.00	0.00
1,300.00	12.47	92.58	1,293.28	3,641.72	-3.78	84.02	11.60	0.00	0.00	0.00
1,400.00	12.47	92.58	1,390.93	3,544.07	-4.76	105.59	14.58	0.00	0.00	0.00
1,500.00	12.47	92.58	1,488.57	3,446.43	-5.73	127.16	17.56	0.00	0.00	0.00
<b>FOX HILLS BASE</b>										
1,531.94	12.47	92.58	1,519.75	3,415.25	-6.04	134.05	18.51	0.00	0.00	0.00
<b>SURFACE CASING</b>										
1,568.04	12.47	92.58	1,555.00	3,380.00	-6.39	141.84	19.58	0.00	0.00	0.00
1,600.00	12.47	92.58	1,586.21	3,348.79	-6.70	148.73	20.54	0.00	0.00	0.00
1,700.00	12.47	92.58	1,683.85	3,251.15	-7.67	170.30	23.51	0.00	0.00	0.00
1,800.00	12.47	92.58	1,781.49	3,153.51	-8.64	191.88	26.49	0.00	0.00	0.00
1,900.00	12.47	92.58	1,879.13	3,055.87	-9.61	213.45	29.47	0.00	0.00	0.00
2,000.00	12.47	92.58	1,976.77	2,958.23	-10.59	235.02	32.45	0.00	0.00	0.00
2,100.00	12.47	92.58	2,074.41	2,860.59	-11.56	256.59	35.43	0.00	0.00	0.00
2,200.00	12.47	92.58	2,172.05	2,762.95	-12.53	278.16	38.41	0.00	0.00	0.00
2,300.00	12.47	92.58	2,269.69	2,665.31	-13.50	299.74	41.39	0.00	0.00	0.00
2,400.00	12.47	92.58	2,367.33	2,567.67	-14.47	321.31	44.36	0.00	0.00	0.00
2,500.00	12.47	92.58	2,464.97	2,470.03	-15.44	342.88	47.34	0.00	0.00	0.00
2,600.00	12.47	92.58	2,562.61	2,372.39	-16.41	364.45	50.32	0.00	0.00	0.00
2,700.00	12.47	92.58	2,660.25	2,274.75	-17.39	386.02	53.30	0.00	0.00	0.00
2,800.00	12.47	92.58	2,757.90	2,177.10	-18.36	407.60	56.28	0.00	0.00	0.00
2,900.00	12.47	92.58	2,855.54	2,079.46	-19.33	429.17	59.26	0.00	0.00	0.00
3,000.00	12.47	92.58	2,953.18	1,981.82	-20.30	450.74	62.24	0.00	0.00	0.00
3,100.00	12.47	92.58	3,050.82	1,884.18	-21.27	472.31	65.21	0.00	0.00	0.00
3,200.00	12.47	92.58	3,148.46	1,786.54	-22.24	493.88	68.19	0.00	0.00	0.00
3,300.00	12.47	92.58	3,246.10	1,688.90	-23.22	515.46	71.17	0.00	0.00	0.00
<b>RICHARD SANDSTONE</b>										
3,377.99	12.47	92.58	3,322.25	1,612.75	-23.97	532.28	73.49	0.00	0.00	0.00
3,400.00	12.47	92.58	3,343.74	1,591.26	-24.19	537.03	74.15	0.00	0.00	0.00
3,500.00	12.47	92.58	3,441.38	1,493.62	-25.16	558.60	77.13	0.00	0.00	0.00
3,600.00	12.47	92.58	3,539.02	1,395.98	-26.13	580.17	80.11	0.00	0.00	0.00
3,700.00	12.47	92.58	3,636.66	1,298.34	-27.10	601.74	83.09	0.00	0.00	0.00
3,800.00	12.47	92.58	3,734.30	1,200.70	-28.07	623.32	86.06	0.00	0.00	0.00
3,900.00	12.47	92.58	3,831.94	1,103.06	-29.05	644.89	89.04	0.00	0.00	0.00
4,000.00	12.47	92.58	3,929.58	1,005.42	-30.02	666.46	92.02	0.00	0.00	0.00
4,100.00	12.47	92.58	4,027.22	907.78	-30.99	688.03	95.00	0.00	0.00	0.00
4,200.00	12.47	92.58	4,124.86	810.14	-31.96	709.60	97.98	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 2-11-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4935.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4935.00usft
<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 #4		

## 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>SUSSEX SANDSTONE</b>										
4,260.31	12.47	92.58	4,183.75	751.25	-32.55	722.61	99.78	0.00	0.00	0.00
4,300.00	12.47	92.58	4,222.51	712.49	-32.93	731.17	100.96	0.00	0.00	0.00
4,400.00	12.47	92.58	4,320.15	614.85	-33.90	752.75	103.94	0.00	0.00	0.00
4,500.00	12.47	92.58	4,417.79	517.21	-34.88	774.32	106.91	0.00	0.00	0.00
4,600.00	12.47	92.58	4,515.43	419.57	-35.85	795.89	109.89	0.00	0.00	0.00
4,700.00	12.47	92.58	4,613.07	321.93	-36.82	817.46	112.87	0.00	0.00	0.00
<b>SHANNON SANDSTONE</b>										
4,760.10	12.47	92.58	4,671.75	263.25	-37.40	830.43	114.66	0.00	0.00	0.00
4,800.00	12.47	92.58	4,710.71	224.29	-37.79	839.03	115.85	0.00	0.00	0.00
4,900.00	12.47	92.58	4,808.35	126.65	-38.76	860.61	118.83	0.00	0.00	0.00
5,000.00	12.47	92.58	4,905.99	29.01	-39.73	882.18	121.81	0.00	0.00	0.00
5,100.00	12.47	92.58	5,003.63	-68.63	-40.71	903.75	124.79	0.00	0.00	0.00
5,200.00	12.47	92.58	5,101.27	-166.27	-41.68	925.32	127.76	0.00	0.00	0.00
5,300.00	12.47	92.58	5,198.91	-263.91	-42.65	946.89	130.74	0.00	0.00	0.00
5,400.00	12.47	92.58	5,296.55	-361.55	-43.62	968.47	133.72	0.00	0.00	0.00
5,500.00	12.47	92.58	5,394.19	-459.19	-44.59	990.04	136.70	0.00	0.00	0.00
5,600.00	12.47	92.58	5,491.83	-556.83	-45.56	1,011.61	139.68	0.00	0.00	0.00
5,700.00	12.47	92.58	5,589.48	-654.48	-46.53	1,033.18	142.66	0.00	0.00	0.00
5,800.00	12.47	92.58	5,687.12	-752.12	-47.51	1,054.75	145.64	0.00	0.00	0.00
<b>KOP (10°/100ft DGLG)</b>										
5,818.54	12.47	92.58	5,705.22	-770.22	-47.69	1,058.75	146.19	0.00	0.00	0.00
5,900.00	15.05	125.64	5,784.45	-849.45	-54.25	1,076.16	154.35	10.00	3.16	40.59
6,000.00	22.18	148.12	5,879.28	-944.28	-77.91	1,096.73	179.82	10.00	7.13	22.48
6,100.00	30.89	159.27	5,968.71	-1,033.71	-118.05	1,115.84	221.57	10.00	8.71	11.15
6,200.00	40.16	165.77	6,050.04	-1,115.04	-173.46	1,132.89	278.33	10.00	9.27	6.50
<b>SHARON SPRINGS</b>										
6,263.39	46.18	168.71	6,096.25	-1,161.25	-215.75	1,142.41	321.31	10.00	9.49	4.63
6,300.00	49.68	170.14	6,120.78	-1,185.78	-242.46	1,147.38	348.37	10.00	9.57	3.92
<b>NIOBRARA A CHALK</b>										
6,368.04	56.23	172.46	6,161.75	-1,226.75	-296.11	1,155.55	402.56	10.00	9.63	3.40
6,400.00	59.32	173.42	6,178.79	-1,243.79	-322.94	1,158.87	429.58	10.00	9.67	3.02
<b>NIOBRARA A CHALK BASE</b>										
6,402.87	59.60	173.50	6,180.25	-1,245.25	-325.40	1,159.15	432.05	10.00	9.68	2.91
<b>NIOBRARA B1 CHALK TOP</b>										
6,474.70	66.57	175.46	6,212.75	-1,277.75	-389.11	1,165.27	496.05	10.00	9.70	2.72
6,500.00	69.03	176.09	6,222.31	-1,287.31	-412.47	1,166.99	519.47	10.00	9.72	2.52
<b>NIOBRARA B1 CHALK BASE</b>										
6,550.18	73.90	177.30	6,238.25	-1,303.25	-459.95	1,169.73	567.00	9.96	9.70	2.39
6,600.00	78.77	178.44	6,250.01	-1,315.01	-508.31	1,171.52	615.32	10.04	9.78	2.30
6,700.00	88.53	180.63	6,261.06	-1,326.06	-607.57	1,172.31	714.22	10.00	9.76	2.19
<b>HZ LP: 300ft FNL &amp; 2175ft FWL of Sec 2 - NIOBRARA B2 CHALK TOP</b>										
6,715.04	90.00	180.96	6,261.25	-1,326.25	-622.60	1,172.10	729.17	10.00	9.76	2.16
6,800.00	90.00	180.96	6,261.25	-1,326.25	-707.55	1,170.68	813.62	0.00	0.00	0.00
6,900.00	90.00	180.96	6,261.25	-1,326.25	-807.54	1,169.01	913.01	0.00	0.00	0.00
7,000.00	90.00	180.96	6,261.25	-1,326.25	-907.53	1,167.34	1,012.41	0.00	0.00	0.00
7,100.00	90.00	180.96	6,261.25	-1,326.25	-1,007.51	1,165.67	1,111.80	0.00	0.00	0.00
7,200.00	90.00	180.96	6,261.25	-1,326.25	-1,107.50	1,164.01	1,211.20	0.00	0.00	0.00
7,300.00	90.00	180.96	6,261.25	-1,326.25	-1,207.49	1,162.34	1,310.59	0.00	0.00	0.00
7,400.00	90.00	180.96	6,261.25	-1,326.25	-1,307.47	1,160.67	1,409.99	0.00	0.00	0.00
7,500.00	90.00	180.96	6,261.25	-1,326.25	-1,407.46	1,159.00	1,509.38	0.00	0.00	0.00
7,600.00	90.00	180.96	6,261.25	-1,326.25	-1,507.44	1,157.33	1,608.78	0.00	0.00	0.00
7,700.00	90.00	180.96	6,261.25	-1,326.25	-1,607.43	1,155.66	1,708.17	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 2-11-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4935.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4935.00usft
<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 #4		

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)
7,800.00	90.00	180.96	6,261.25	-1,326.25	-1,707.42	1,154.00	1,807.57	0.00	0.00	0.00
7,900.00	90.00	180.96	6,261.25	-1,326.25	-1,807.40	1,152.33	1,906.96	0.00	0.00	0.00
8,000.00	90.00	180.96	6,261.25	-1,326.25	-1,907.39	1,150.66	2,006.36	0.00	0.00	0.00
8,100.00	90.00	180.96	6,261.25	-1,326.25	-2,007.37	1,148.99	2,105.75	0.00	0.00	0.00
8,200.00	90.00	180.96	6,261.25	-1,326.25	-2,107.36	1,147.32	2,205.15	0.00	0.00	0.00
8,300.00	90.00	180.96	6,261.25	-1,326.25	-2,207.35	1,145.65	2,304.54	0.00	0.00	0.00
8,400.00	90.00	180.96	6,261.25	-1,326.25	-2,307.33	1,143.99	2,403.94	0.00	0.00	0.00
8,500.00	90.00	180.96	6,261.25	-1,326.25	-2,407.32	1,142.32	2,503.33	0.00	0.00	0.00
8,600.00	90.00	180.96	6,261.25	-1,326.25	-2,507.30	1,140.65	2,602.73	0.00	0.00	0.00
8,700.00	90.00	180.96	6,261.25	-1,326.25	-2,607.29	1,138.98	2,702.12	0.00	0.00	0.00
8,800.00	90.00	180.96	6,261.25	-1,326.25	-2,707.28	1,137.31	2,801.52	0.00	0.00	0.00
8,900.00	90.00	180.96	6,261.25	-1,326.25	-2,807.26	1,135.64	2,900.91	0.00	0.00	0.00
9,000.00	90.00	180.96	6,261.25	-1,326.25	-2,907.25	1,133.98	3,000.31	0.00	0.00	0.00
9,100.00	90.00	180.96	6,261.25	-1,326.25	-3,007.23	1,132.31	3,099.70	0.00	0.00	0.00
9,200.00	90.00	180.96	6,261.25	-1,326.25	-3,107.22	1,130.64	3,199.10	0.00	0.00	0.00
9,300.00	90.00	180.96	6,261.25	-1,326.25	-3,207.21	1,128.97	3,298.49	0.00	0.00	0.00
9,400.00	90.00	180.96	6,261.25	-1,326.25	-3,307.19	1,127.30	3,397.89	0.00	0.00	0.00
9,500.00	90.00	180.96	6,261.25	-1,326.25	-3,407.18	1,125.63	3,497.28	0.00	0.00	0.00
9,600.00	90.00	180.96	6,261.25	-1,326.25	-3,507.16	1,123.96	3,596.68	0.00	0.00	0.00
9,700.00	90.00	180.96	6,261.25	-1,326.25	-3,607.15	1,122.30	3,696.07	0.00	0.00	0.00
9,800.00	90.00	180.96	6,261.25	-1,326.25	-3,707.14	1,120.63	3,795.47	0.00	0.00	0.00
9,900.00	90.00	180.96	6,261.25	-1,326.25	-3,807.12	1,118.96	3,894.86	0.00	0.00	0.00
10,000.00	90.00	180.96	6,261.25	-1,326.25	-3,907.11	1,117.29	3,994.26	0.00	0.00	0.00
10,100.00	90.00	180.96	6,261.25	-1,326.25	-4,007.10	1,115.62	4,093.65	0.00	0.00	0.00
10,200.00	90.00	180.96	6,261.25	-1,326.25	-4,107.08	1,113.95	4,193.05	0.00	0.00	0.00
10,300.00	90.00	180.96	6,261.25	-1,326.25	-4,207.07	1,112.29	4,292.44	0.00	0.00	0.00
10,400.00	90.00	180.96	6,261.25	-1,326.25	-4,307.05	1,110.62	4,391.84	0.00	0.00	0.00
10,500.00	90.00	180.96	6,261.25	-1,326.25	-4,407.04	1,108.95	4,491.23	0.00	0.00	0.00
10,600.00	90.00	180.96	6,261.25	-1,326.25	-4,507.03	1,107.28	4,590.63	0.00	0.00	0.00
10,700.00	90.00	180.96	6,261.25	-1,326.25	-4,607.01	1,105.61	4,690.02	0.00	0.00	0.00
10,800.00	90.00	180.96	6,261.25	-1,326.25	-4,707.00	1,103.94	4,789.42	0.00	0.00	0.00
10,900.00	90.00	180.96	6,261.25	-1,326.25	-4,806.98	1,102.28	4,888.81	0.00	0.00	0.00
11,000.00	90.00	180.96	6,261.25	-1,326.25	-4,906.97	1,100.61	4,988.21	0.00	0.00	0.00
11,100.00	90.00	180.96	6,261.25	-1,326.25	-5,006.96	1,098.94	5,087.60	0.00	0.00	0.00
11,200.00	90.00	180.96	6,261.25	-1,326.25	-5,106.94	1,097.27	5,187.00	0.00	0.00	0.00
11,300.00	90.00	180.96	6,261.25	-1,326.25	-5,206.93	1,095.60	5,286.39	0.00	0.00	0.00
11,400.00	90.00	180.96	6,261.25	-1,326.25	-5,306.91	1,093.93	5,385.79	0.00	0.00	0.00
11,500.00	90.00	180.96	6,261.25	-1,326.25	-5,406.90	1,092.27	5,485.18	0.00	0.00	0.00
11,600.00	90.00	180.96	6,261.25	-1,326.25	-5,506.89	1,090.60	5,584.58	0.00	0.00	0.00
11,700.00	90.00	180.96	6,261.25	-1,326.25	-5,606.87	1,088.93	5,683.97	0.00	0.00	0.00
11,800.00	90.00	180.96	6,261.25	-1,326.25	-5,706.86	1,087.26	5,783.37	0.00	0.00	0.00
11,900.00	90.00	180.96	6,261.25	-1,326.25	-5,806.84	1,085.59	5,882.76	0.00	0.00	0.00
12,000.00	90.00	180.96	6,261.25	-1,326.25	-5,906.83	1,083.92	5,982.16	0.00	0.00	0.00
12,100.00	90.00	180.96	6,261.25	-1,326.25	-6,006.82	1,082.26	6,081.55	0.00	0.00	0.00
12,200.00	90.00	180.96	6,261.25	-1,326.25	-6,106.80	1,080.59	6,180.95	0.00	0.00	0.00
12,300.00	90.00	180.96	6,261.25	-1,326.25	-6,206.79	1,078.92	6,280.34	0.00	0.00	0.00
12,400.00	90.00	180.96	6,261.25	-1,326.25	-6,306.78	1,077.25	6,379.74	0.00	0.00	0.00
12,500.00	90.00	180.96	6,261.25	-1,326.25	-6,406.76	1,075.58	6,479.13	0.00	0.00	0.00
12,600.00	90.00	180.96	6,261.25	-1,326.25	-6,506.75	1,073.91	6,578.53	0.00	0.00	0.00
12,700.00	90.00	180.96	6,261.25	-1,326.25	-6,606.73	1,072.24	6,677.92	0.00	0.00	0.00
12,800.00	90.00	180.96	6,261.25	-1,326.25	-6,706.72	1,070.58	6,777.32	0.00	0.00	0.00
12,900.00	90.00	180.96	6,261.25	-1,326.25	-6,806.71	1,068.91	6,876.71	0.00	0.00	0.00
13,000.00	90.00	180.96	6,261.25	-1,326.25	-6,906.69	1,067.24	6,976.11	0.00	0.00	0.00
13,100.00	90.00	180.96	6,261.25	-1,326.25	-7,006.68	1,065.57	7,075.50	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 2-11-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4935.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4935.00usft
<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 #4		

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)
13,200.00	90.00	180.96	6,261.25	-1,326.25	-7,106.66	1,063.90	7,174.90	0.00	0.00	0.00
13,300.00	90.00	180.96	6,261.25	-1,326.25	-7,206.65	1,062.23	7,274.29	0.00	0.00	0.00
13,400.00	90.00	180.96	6,261.25	-1,326.25	-7,306.64	1,060.57	7,373.69	0.00	0.00	0.00
13,500.00	90.00	180.96	6,261.25	-1,326.25	-7,406.62	1,058.90	7,473.08	0.00	0.00	0.00
13,600.00	90.00	180.96	6,261.25	-1,326.25	-7,506.61	1,057.23	7,572.48	0.00	0.00	0.00
13,700.00	90.00	180.96	6,261.25	-1,326.25	-7,606.59	1,055.56	7,671.87	0.00	0.00	0.00
13,800.00	90.00	180.96	6,261.25	-1,326.25	-7,706.58	1,053.89	7,771.27	0.00	0.00	0.00
13,900.00	90.00	180.96	6,261.25	-1,326.25	-7,806.57	1,052.22	7,870.67	0.00	0.00	0.00
14,000.00	90.00	180.96	6,261.25	-1,326.25	-7,906.55	1,050.56	7,970.06	0.00	0.00	0.00
14,100.00	90.00	180.96	6,261.25	-1,326.25	-8,006.54	1,048.89	8,069.46	0.00	0.00	0.00
14,200.00	90.00	180.96	6,261.25	-1,326.25	-8,106.52	1,047.22	8,168.85	0.00	0.00	0.00
14,300.00	90.00	180.96	6,261.25	-1,326.25	-8,206.51	1,045.55	8,268.25	0.00	0.00	0.00
14,400.00	90.00	180.96	6,261.25	-1,326.25	-8,306.50	1,043.88	8,367.64	0.00	0.00	0.00
14,500.00	90.00	180.96	6,261.25	-1,326.25	-8,406.48	1,042.21	8,467.04	0.00	0.00	0.00
14,600.00	90.00	180.96	6,261.25	-1,326.25	-8,506.47	1,040.55	8,566.43	0.00	0.00	0.00
14,700.00	90.00	180.96	6,261.25	-1,326.25	-8,606.46	1,038.88	8,665.83	0.00	0.00	0.00
14,800.00	90.00	180.96	6,261.25	-1,326.25	-8,706.44	1,037.21	8,765.22	0.00	0.00	0.00
14,900.00	90.00	180.96	6,261.25	-1,326.25	-8,806.43	1,035.54	8,864.62	0.00	0.00	0.00
15,000.00	90.00	180.96	6,261.25	-1,326.25	-8,906.41	1,033.87	8,964.01	0.00	0.00	0.00
15,100.00	90.00	180.96	6,261.25	-1,326.25	-9,006.40	1,032.20	9,063.41	0.00	0.00	0.00
15,200.00	90.00	180.96	6,261.25	-1,326.25	-9,106.39	1,030.54	9,162.80	0.00	0.00	0.00
15,300.00	90.00	180.96	6,261.25	-1,326.25	-9,206.37	1,028.87	9,262.20	0.00	0.00	0.00
15,400.00	90.00	180.96	6,261.25	-1,326.25	-9,306.36	1,027.20	9,361.59	0.00	0.00	0.00
15,500.00	90.00	180.96	6,261.25	-1,326.25	-9,406.34	1,025.53	9,460.99	0.00	0.00	0.00
15,600.00	90.00	180.96	6,261.25	-1,326.25	-9,506.33	1,023.86	9,560.38	0.00	0.00	0.00
15,700.00	90.00	180.96	6,261.25	-1,326.25	-9,606.32	1,022.19	9,659.78	0.00	0.00	0.00
15,800.00	90.00	180.96	6,261.25	-1,326.25	-9,706.30	1,020.52	9,759.17	0.00	0.00	0.00
15,900.00	90.00	180.96	6,261.25	-1,326.25	-9,806.29	1,018.86	9,858.57	0.00	0.00	0.00
16,000.00	90.00	180.96	6,261.25	-1,326.25	-9,906.27	1,017.19	9,957.96	0.00	0.00	0.00
16,100.00	90.00	180.96	6,261.25	-1,326.25	-10,006.26	1,015.52	10,057.36	0.00	0.00	0.00
16,200.00	90.00	180.96	6,261.25	-1,326.25	-10,106.25	1,013.85	10,156.75	0.00	0.00	0.00
16,300.00	90.00	180.96	6,261.25	-1,326.25	-10,206.23	1,012.18	10,256.15	0.00	0.00	0.00
16,400.00	90.00	180.96	6,261.25	-1,326.25	-10,306.22	1,010.51	10,355.54	0.00	0.00	0.00
16,500.00	90.00	180.96	6,261.25	-1,326.25	-10,406.20	1,008.85	10,454.94	0.00	0.00	0.00
16,600.00	90.00	180.96	6,261.25	-1,326.25	-10,506.19	1,007.18	10,554.33	0.00	0.00	0.00
16,700.00	90.00	180.96	6,261.25	-1,326.25	-10,606.18	1,005.51	10,653.73	0.00	0.00	0.00
16,800.00	90.00	180.96	6,261.25	-1,326.25	-10,706.16	1,003.84	10,753.12	0.00	0.00	0.00
<b>BHL: 300ft FSL &amp; 2175ft FWL of Sec 11</b>										
<b>16,812.00</b>	<b>90.00</b>	<b>180.96</b>	<b>6,261.25</b>	<b>-1,326.25</b>	<b>-10,718.16</b>	<b>1,003.64</b>	<b>10,765.05</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 FED 2-11-4HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4935.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4935.00usft
<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 #4		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,531.94	1,519.75	FOX HILLS BASE			
3,377.99	3,322.25	RICHARD SANDSTONE			
4,260.31	4,183.75	SUSSEX SANDSTONE			
4,760.10	4,671.75	SHANNON SANDSTONE			
6,263.39	6,096.25	SHARON SPRINGS			
6,368.04	6,161.75	NIOBRARA A CHALK			
6,402.87	6,180.25	NIOBRARA A CHALK BASE			
6,474.70	6,212.75	NIOBRARA B1 CHALK TOP			
6,550.18	6,238.25	NIOBRARA B1 CHALK BASE			
6,715.04	6,261.25	NIOBRARA B2 CHALK TOP			

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
600.00	600.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1,223.53	1,218.62	-3.04	67.52	EOB TO 12.47° INC
1,568.04	1,555.00	-6.39	141.84	SURFACE CASING
5,818.54	5,705.22	-47.69	1,058.75	KOP (10°/100ft DGLG)
6,715.04	6,261.25	-622.61	1,172.10	HZ LP: 300ft FNL & 2175ft FWL of Sec 2
16,812.00	6,261.25	-10,718.16	1,003.64	BHL: 300ft FSL & 2175ft FWL of Sec 11