

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

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

PINTAIL FED 2-11-6HN

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 2-11-6HN
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #4

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: 332ft FSL & 1497ft FWL of Sec 35		
400.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE #1 (2°/100ft BUR)		
1555.00	1588.83	23.78	90.78	-3.31	243.13	55.69	243.15	SURFACE CASING		
1646.51	1688.83	23.78	90.78	-3.86	283.44	64.92	283.47	START NUDGE #2 (2°/100ft BUR)		
1764.24	1818.82	26.38	90.79	-4.61	338.53	77.54	338.56	EOB TO 26.38° INC		
5746.74	6264.09	26.38	90.79	-31.69	2313.22	530.01	2313.43	KOP (10°/100ft DGLG)		
6261.25	7165.43	90.00	181.09	-609.39	2557.43	1146.79	2988.48	HZ LP: 300ft FNL & 1705ft FEL of Sec 2		
6261.25	17264.64	90.00	181.09	-10706.77	2365.68	10965.01	13087.69	BHL: 300ft FSL & 1705ft FEL of Sec 11		

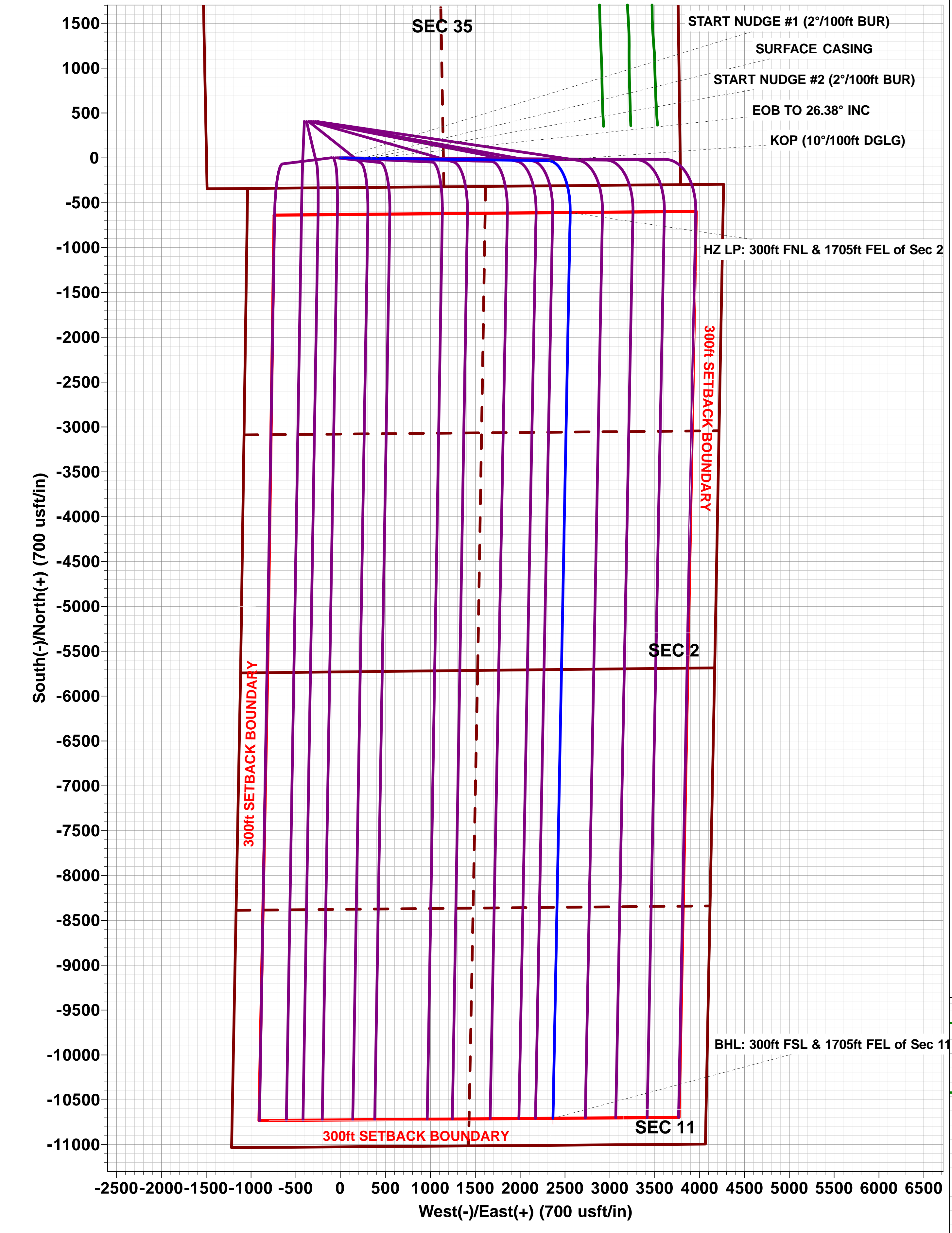
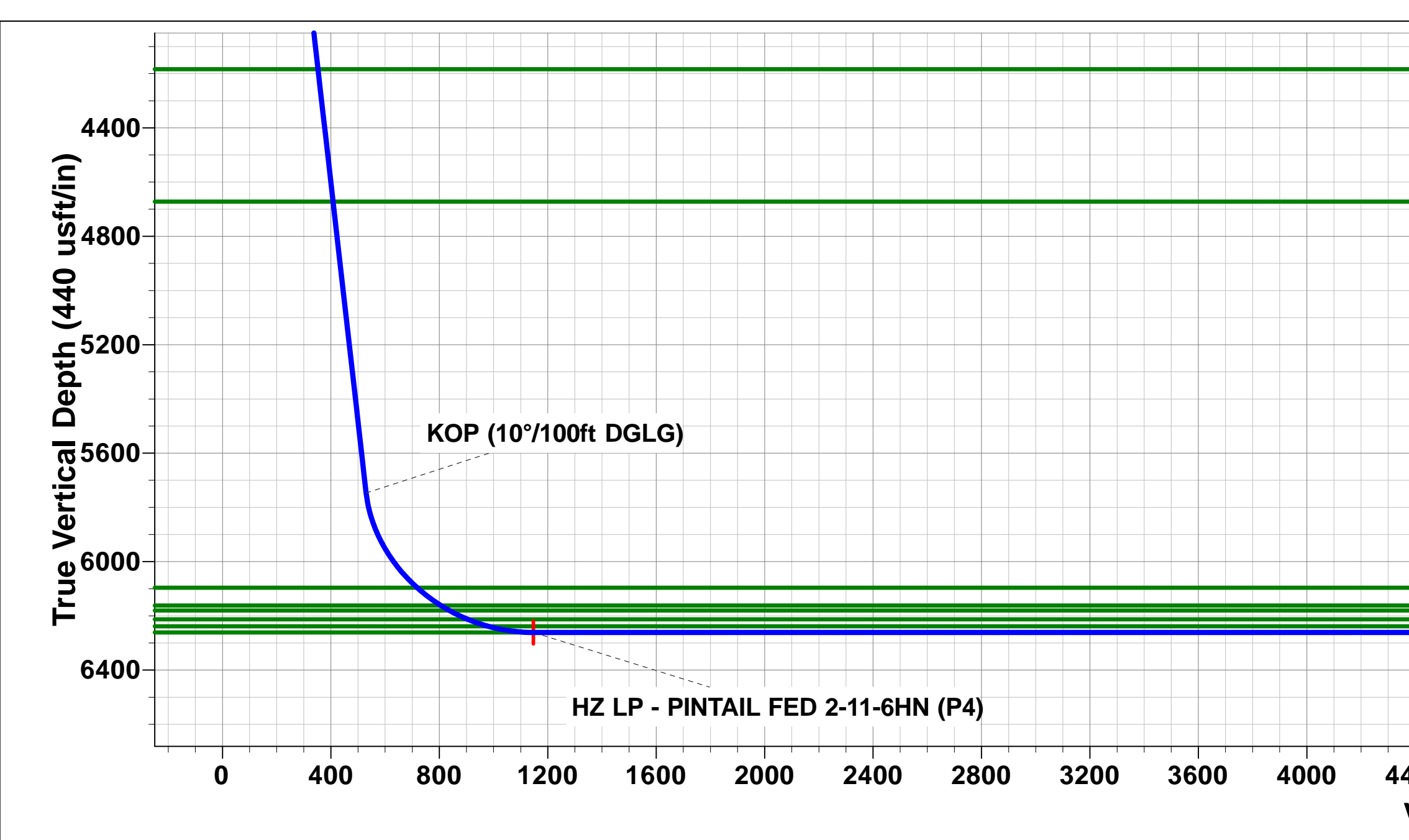
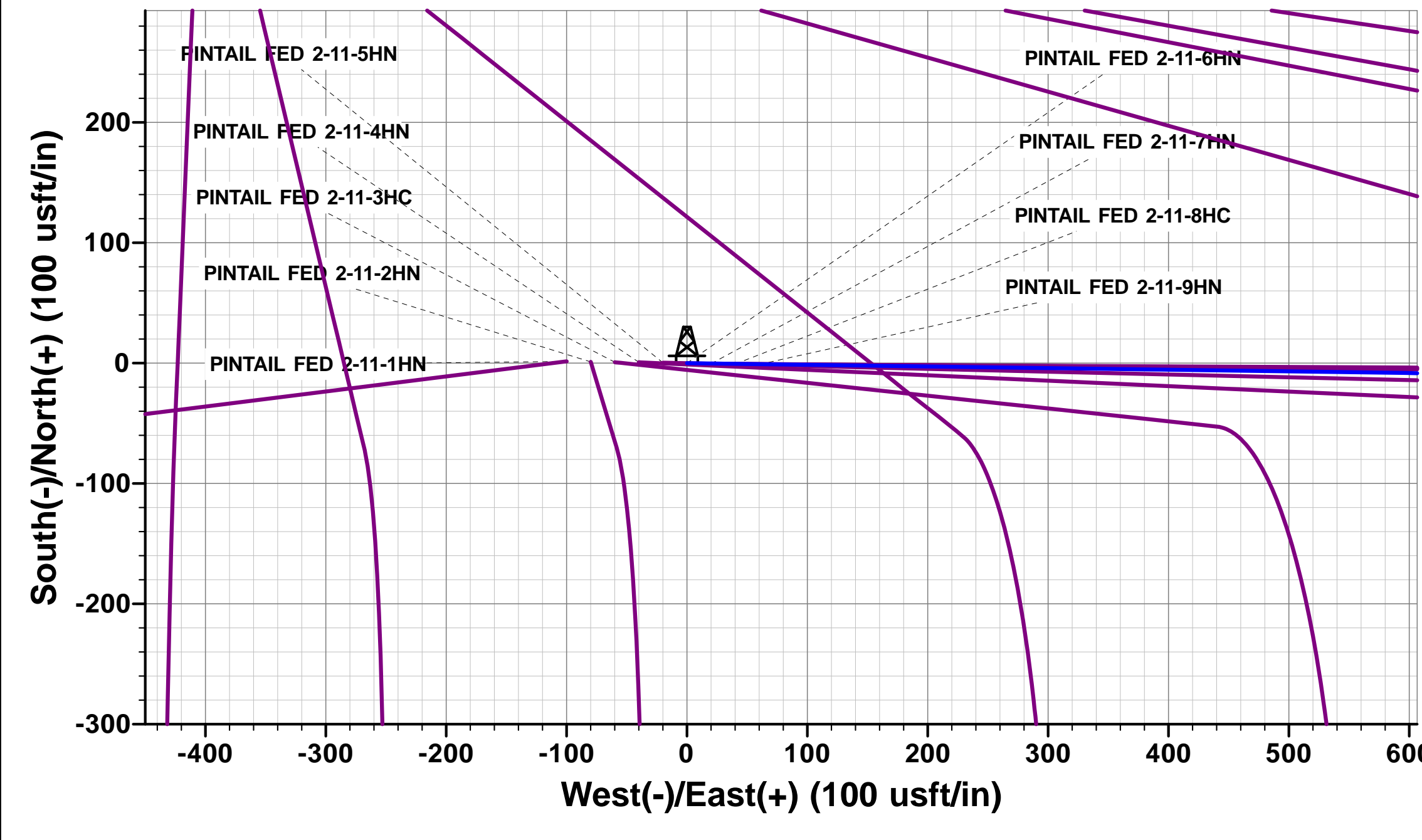
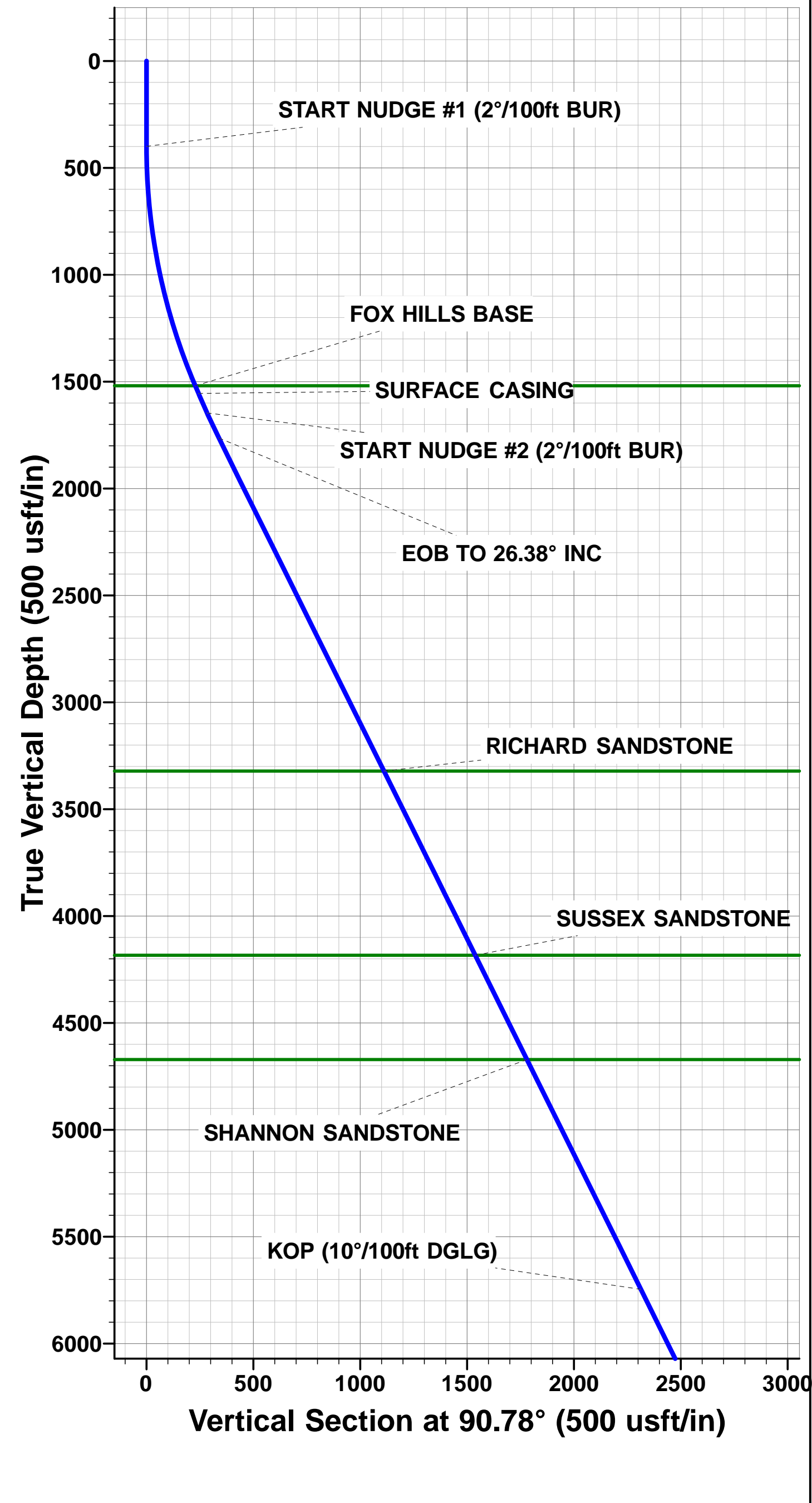
PROPOSED LOCAL COORDINATES:

SHL: 332ft FSL & 1497ft FWL Sec 35

HZ LP: 300ft FNL & 1705ft FEL Sec 2

BHL: 300ft FSL & 1705ft FEL of Sec 11

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
HZ LP - PINTAIL FED 2-11-6HN (P4)	6261.25	-609.38	2557.43	40.698347	-104.053733
BHL - PINTAIL FED 2-11-6HN (P4)	6261.25	-10706.77	2365.68	40.670632	-104.054428



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well PINTAIL FED 2-11-6HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4935.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4935.00usft
Site:	SE SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-11-6HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #4		

Project	WELD COUNTY, COLORADO (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	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
From:	Lat/Long	Easting:	3,398,005.01 usft
Position Uncertainty:	0.00 usft	Slot Radius:	1.10000ft
		Latitude:	40.701546
		Longitude:	-104.064503
		Grid Convergence:	0.93 °

Well	PINTAIL FED 2-11-6HN		
Well Position	+N/-S	-555.97 usft	Northing:
	+E/-W	428.95 usft	Easting:
Position Uncertainty	0.00 usft		Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	04/12/2018	7.70	67.16	52,450

Design	PROPOSAL #4			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	6,261.25	0.00	0.00	167.54

Plan Sections											
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	
400.00	0.00	0.00	400.00	-4,535.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,588.83	23.78	90.78	1,555.00	-3,380.00	-3.31	243.13	2.00	2.00	0.00	90.78	
1,688.83	23.78	90.78	1,646.51	-3,288.49	-3.86	283.44	0.00	0.00	0.00	0.00	
1,818.82	26.38	90.79	1,764.24	-3,170.76	-4.61	338.52	2.00	2.00	0.00	0.05	
6,264.09	26.38	90.79	5,746.74	811.74	-31.69	2,313.21	0.00	0.00	0.00	0.00	
7,165.43	90.00	181.09	6,261.25	1,326.25	-609.38	2,557.43	10.00	7.06	10.02	90.27	HZ LP - PINTAIL FE
17,264.64	90.00	181.09	6,261.25	1,326.25	-10,706.77	2,365.68	0.00	0.00	0.00	0.00	BHL - PINTAIL FEC

Planning Report



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Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4935.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4935.00usft
Site:	SE SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-11-6HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)
SHL: 332ft FSL & 1497ft FWL of Sec 35										
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
START NUDGE #1 (2°/100ft BUR)										
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	2.00	90.78	499.98	4,435.02	-0.02	1.74	0.40	2.00	2.00	0.00
600.00	4.00	90.78	599.84	4,335.16	-0.09	6.98	1.60	2.00	2.00	0.00
700.00	6.00	90.78	699.45	4,235.55	-0.21	15.69	3.59	2.00	2.00	0.00
800.00	8.00	90.78	798.70	4,136.30	-0.38	27.88	6.39	2.00	2.00	0.00
900.00	10.00	90.78	897.47	4,037.53	-0.59	43.52	9.97	2.00	2.00	0.00
1,000.00	12.00	90.78	995.62	3,939.38	-0.85	62.60	14.34	2.00	2.00	0.00
1,100.00	14.00	90.78	1,093.06	3,841.94	-1.16	85.09	19.49	2.00	2.00	0.00
1,200.00	16.00	90.78	1,189.64	3,745.36	-1.51	110.97	25.42	2.00	2.00	0.00
1,300.00	18.00	90.78	1,285.27	3,649.73	-1.91	140.20	32.11	2.00	2.00	0.00
1,400.00	20.00	90.78	1,379.82	3,555.18	-2.35	172.75	39.57	2.00	2.00	0.00
1,500.00	22.00	90.78	1,473.17	3,461.83	-2.84	208.58	47.77	2.00	2.00	0.00
FOX HILLS BASE										
1,550.42	23.01	90.78	1,519.75	3,415.25	-3.10	227.88	52.19	2.00	2.00	0.00
SURFACE CASING										
1,588.83	23.78	90.78	1,555.00	3,380.00	-3.31	243.13	55.69	2.00	2.00	0.00
1,600.00	23.78	90.78	1,565.22	3,369.78	-3.37	247.63	56.72	0.00	0.00	0.00
START NUDGE #2 (2°/100ft BUR)										
1,688.83	23.78	90.78	1,646.51	3,288.49	-3.86	283.44	64.92	0.00	0.00	0.00
1,700.00	24.00	90.78	1,656.73	3,278.27	-3.92	287.96	65.96	2.00	2.00	0.00
1,800.00	26.00	90.78	1,747.35	3,187.65	-4.50	330.22	75.64	2.00	2.00	0.00
EOB TO 26.38° INC										
1,818.82	26.38	90.79	1,764.24	3,170.76	-4.61	338.53	77.54	2.00	2.00	0.00
1,900.00	26.38	90.79	1,836.97	3,098.03	-5.11	374.59	85.80	0.00	0.00	0.00
2,000.00	26.38	90.79	1,926.56	3,008.44	-5.72	419.01	95.98	0.00	0.00	0.00
2,100.00	26.38	90.79	2,016.15	2,918.85	-6.32	463.43	106.16	0.00	0.00	0.00
2,200.00	26.38	90.79	2,105.74	2,829.26	-6.93	507.85	116.34	0.00	0.00	0.00
2,300.00	26.38	90.79	2,195.33	2,739.67	-7.54	552.28	126.52	0.00	0.00	0.00
2,400.00	26.38	90.79	2,284.92	2,650.08	-8.15	596.70	136.70	0.00	0.00	0.00
2,500.00	26.38	90.79	2,374.51	2,560.49	-8.76	641.12	146.88	0.00	0.00	0.00
2,600.00	26.38	90.79	2,464.10	2,470.90	-9.37	685.54	157.05	0.00	0.00	0.00
2,700.00	26.38	90.79	2,553.69	2,381.31	-9.98	729.97	167.23	0.00	0.00	0.00
2,800.00	26.38	90.79	2,643.28	2,291.72	-10.59	774.39	177.41	0.00	0.00	0.00
2,900.00	26.38	90.79	2,732.87	2,202.13	-11.20	818.81	187.59	0.00	0.00	0.00
3,000.00	26.38	90.79	2,822.46	2,112.54	-11.81	863.23	197.77	0.00	0.00	0.00
3,100.00	26.38	90.79	2,912.04	2,022.96	-12.42	907.65	207.95	0.00	0.00	0.00
3,200.00	26.38	90.79	3,001.63	1,933.37	-13.02	952.08	218.13	0.00	0.00	0.00
3,300.00	26.38	90.79	3,091.22	1,843.78	-13.63	996.50	228.31	0.00	0.00	0.00
3,400.00	26.38	90.79	3,180.81	1,754.19	-14.24	1,040.92	238.48	0.00	0.00	0.00
3,500.00	26.38	90.79	3,270.40	1,664.60	-14.85	1,085.34	248.66	0.00	0.00	0.00
RICHARD SANDSTONE										
3,557.87	26.38	90.79	3,322.25	1,612.75	-15.20	1,111.05	254.55	0.00	0.00	0.00
3,600.00	26.38	90.79	3,359.99	1,575.01	-15.46	1,129.77	258.84	0.00	0.00	0.00
3,700.00	26.38	90.79	3,449.58	1,485.42	-16.07	1,174.19	269.02	0.00	0.00	0.00
3,800.00	26.38	90.79	3,539.17	1,395.83	-16.68	1,218.61	279.20	0.00	0.00	0.00
3,900.00	26.38	90.79	3,628.76	1,306.24	-17.29	1,263.03	289.38	0.00	0.00	0.00
4,000.00	26.38	90.79	3,718.35	1,216.65	-17.90	1,307.46	299.56	0.00	0.00	0.00

Planning Report



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Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4935.00usft
Site:	SE SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-11-6HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)
4,100.00	26.38	90.79	3,807.94	1,127.06	-18.51	1,351.88	309.74	0.00	0.00	0.00
4,200.00	26.38	90.79	3,897.53	1,037.47	-19.12	1,396.30	319.91	0.00	0.00	0.00
4,300.00	26.38	90.79	3,987.12	947.88	-19.72	1,440.72	330.09	0.00	0.00	0.00
4,400.00	26.38	90.79	4,076.71	858.29	-20.33	1,485.14	340.27	0.00	0.00	0.00
4,500.00	26.38	90.79	4,166.30	768.70	-20.94	1,529.57	350.45	0.00	0.00	0.00
SUSSEX SANDSTONE										
4,519.48	26.38	90.79	4,183.75	751.25	-21.06	1,538.22	352.43	0.00	0.00	0.00
4,600.00	26.38	90.79	4,255.89	679.11	-21.55	1,573.99	360.63	0.00	0.00	0.00
4,700.00	26.38	90.79	4,345.48	589.52	-22.16	1,618.41	370.81	0.00	0.00	0.00
4,800.00	26.38	90.79	4,435.07	499.93	-22.77	1,662.83	380.99	0.00	0.00	0.00
4,900.00	26.38	90.79	4,524.66	410.34	-23.38	1,707.26	391.17	0.00	0.00	0.00
5,000.00	26.38	90.79	4,614.25	320.75	-23.99	1,751.68	401.34	0.00	0.00	0.00
SHANNON SANDSTONE										
5,064.19	26.38	90.79	4,671.75	263.25	-24.38	1,780.19	407.88	0.00	0.00	0.00
5,100.00	26.38	90.79	4,703.84	231.16	-24.60	1,796.10	411.52	0.00	0.00	0.00
5,200.00	26.38	90.79	4,793.43	141.57	-25.21	1,840.52	421.70	0.00	0.00	0.00
5,300.00	26.38	90.79	4,883.02	51.98	-25.82	1,884.94	431.88	0.00	0.00	0.00
5,400.00	26.38	90.79	4,972.60	-37.60	-26.42	1,929.37	442.06	0.00	0.00	0.00
5,500.00	26.38	90.79	5,062.19	-127.19	-27.03	1,973.79	452.24	0.00	0.00	0.00
5,600.00	26.38	90.79	5,151.78	-216.78	-27.64	2,018.21	462.42	0.00	0.00	0.00
5,700.00	26.38	90.79	5,241.37	-306.37	-28.25	2,062.63	472.60	0.00	0.00	0.00
5,800.00	26.38	90.79	5,330.96	-395.96	-28.86	2,107.06	482.78	0.00	0.00	0.00
5,900.00	26.38	90.79	5,420.55	-485.55	-29.47	2,151.48	492.95	0.00	0.00	0.00
6,000.00	26.38	90.79	5,510.14	-575.14	-30.08	2,195.90	503.13	0.00	0.00	0.00
6,100.00	26.38	90.79	5,599.73	-664.73	-30.69	2,240.32	513.31	0.00	0.00	0.00
6,200.00	26.38	90.79	5,689.32	-754.32	-31.30	2,284.75	523.49	0.00	0.00	0.00
KOP (10°/100ft DGLG)										
6,264.09	26.38	90.79	5,746.74	-811.74	-31.69	2,313.22	530.01	0.00	0.00	0.00
6,300.00	26.59	98.83	5,778.89	-843.89	-33.03	2,329.14	534.76	10.00	0.58	22.41
6,400.00	29.39	119.40	5,867.40	-932.40	-48.55	2,372.74	559.32	10.00	2.80	20.56
6,500.00	34.73	135.41	5,952.27	-1,017.27	-80.96	2,414.22	599.92	10.00	5.34	16.02
6,600.00	41.63	147.18	6,030.93	-1,095.93	-129.28	2,452.31	655.32	10.00	6.90	11.76
SHARON SPRINGS										
6,692.74	48.85	155.40	6,096.25	-1,161.25	-187.04	2,483.61	718.47	10.00	7.78	8.87
6,700.00	49.43	155.97	6,101.00	-1,166.00	-192.05	2,485.87	723.85	10.00	8.09	7.77
6,800.00	57.76	162.86	6,160.34	-1,225.34	-267.34	2,513.87	803.41	10.00	8.33	6.90
NIOBRARA A CHALK										
6,802.65	57.99	163.03	6,161.75	-1,226.75	-269.49	2,514.53	805.65	10.00	8.51	6.19
NIOBRARA A CHALK BASE										
6,839.16	61.12	165.21	6,180.25	-1,245.25	-299.76	2,523.13	837.06	10.00	8.57	5.98
6,900.00	66.40	168.58	6,207.15	-1,272.15	-352.88	2,535.47	891.60	10.00	8.69	5.53
NIOBRARA B1 CHALK TOP										
6,914.35	67.66	169.33	6,212.75	-1,277.75	-365.86	2,538.00	904.81	10.00	8.76	5.24
NIOBRARA B1 CHALK BASE										
6,993.26	74.62	173.25	6,238.25	-1,303.25	-439.61	2,549.24	979.25	10.00	8.83	4.97
7,000.00	75.22	173.57	6,240.00	-1,305.00	-446.07	2,549.99	985.72	10.00	8.88	4.77
7,100.00	84.14	178.17	6,257.91	-1,322.91	-544.08	2,557.01	1,082.94	10.00	8.92	4.60
HZ LP: 300ft FNL & 1705ft FEL of Sec 2 - NIOBRARA B2 CHALK TOP										
7,165.43	90.00	181.09	6,261.25	-1,326.25	-609.38	2,557.43	1,146.79	10.00	8.96	4.46
7,200.00	90.00	181.09	6,261.25	-1,326.25	-643.95	2,556.77	1,180.40	0.00	0.00	0.00
7,300.00	90.00	181.09	6,261.25	-1,326.25	-743.93	2,554.87	1,277.62	0.00	0.00	0.00
7,400.00	90.00	181.09	6,261.25	-1,326.25	-843.91	2,552.97	1,374.84	0.00	0.00	0.00
7,500.00	90.00	181.09	6,261.25	-1,326.25	-943.89	2,551.08	1,472.06	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well PINTAIL FED 2-11-6HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4935.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4935.00usft
Site:	SE SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-11-6HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)
7,600.00	90.00	181.09	6,261.25	-1,326.25	-1,043.88	2,549.18	1,569.27	0.00	0.00	0.00
7,700.00	90.00	181.09	6,261.25	-1,326.25	-1,143.86	2,547.28	1,666.49	0.00	0.00	0.00
7,800.00	90.00	181.09	6,261.25	-1,326.25	-1,243.84	2,545.38	1,763.71	0.00	0.00	0.00
7,900.00	90.00	181.09	6,261.25	-1,326.25	-1,343.82	2,543.48	1,860.93	0.00	0.00	0.00
8,000.00	90.00	181.09	6,261.25	-1,326.25	-1,443.80	2,541.58	1,958.14	0.00	0.00	0.00
8,100.00	90.00	181.09	6,261.25	-1,326.25	-1,543.79	2,539.68	2,055.36	0.00	0.00	0.00
8,200.00	90.00	181.09	6,261.25	-1,326.25	-1,643.77	2,537.79	2,152.58	0.00	0.00	0.00
8,300.00	90.00	181.09	6,261.25	-1,326.25	-1,743.75	2,535.89	2,249.80	0.00	0.00	0.00
8,400.00	90.00	181.09	6,261.25	-1,326.25	-1,843.73	2,533.99	2,347.02	0.00	0.00	0.00
8,500.00	90.00	181.09	6,261.25	-1,326.25	-1,943.71	2,532.09	2,444.23	0.00	0.00	0.00
8,600.00	90.00	181.09	6,261.25	-1,326.25	-2,043.70	2,530.19	2,541.45	0.00	0.00	0.00
8,700.00	90.00	181.09	6,261.25	-1,326.25	-2,143.68	2,528.29	2,638.67	0.00	0.00	0.00
8,800.00	90.00	181.09	6,261.25	-1,326.25	-2,243.66	2,526.39	2,735.89	0.00	0.00	0.00
8,900.00	90.00	181.09	6,261.25	-1,326.25	-2,343.64	2,524.50	2,833.10	0.00	0.00	0.00
9,000.00	90.00	181.09	6,261.25	-1,326.25	-2,443.62	2,522.60	2,930.32	0.00	0.00	0.00
9,100.00	90.00	181.09	6,261.25	-1,326.25	-2,543.61	2,520.70	3,027.54	0.00	0.00	0.00
9,200.00	90.00	181.09	6,261.25	-1,326.25	-2,643.59	2,518.80	3,124.76	0.00	0.00	0.00
9,300.00	90.00	181.09	6,261.25	-1,326.25	-2,743.57	2,516.90	3,221.97	0.00	0.00	0.00
9,400.00	90.00	181.09	6,261.25	-1,326.25	-2,843.55	2,515.00	3,319.19	0.00	0.00	0.00
9,500.00	90.00	181.09	6,261.25	-1,326.25	-2,943.53	2,513.10	3,416.41	0.00	0.00	0.00
9,600.00	90.00	181.09	6,261.25	-1,326.25	-3,043.52	2,511.21	3,513.63	0.00	0.00	0.00
9,700.00	90.00	181.09	6,261.25	-1,326.25	-3,143.50	2,509.31	3,610.84	0.00	0.00	0.00
9,800.00	90.00	181.09	6,261.25	-1,326.25	-3,243.48	2,507.41	3,708.06	0.00	0.00	0.00
9,900.00	90.00	181.09	6,261.25	-1,326.25	-3,343.46	2,505.51	3,805.28	0.00	0.00	0.00
10,000.00	90.00	181.09	6,261.25	-1,326.25	-3,443.44	2,503.61	3,902.50	0.00	0.00	0.00
10,100.00	90.00	181.09	6,261.25	-1,326.25	-3,543.43	2,501.71	3,999.72	0.00	0.00	0.00
10,200.00	90.00	181.09	6,261.25	-1,326.25	-3,643.41	2,499.81	4,096.93	0.00	0.00	0.00
10,300.00	90.00	181.09	6,261.25	-1,326.25	-3,743.39	2,497.91	4,194.15	0.00	0.00	0.00
10,400.00	90.00	181.09	6,261.25	-1,326.25	-3,843.37	2,496.02	4,291.37	0.00	0.00	0.00
10,500.00	90.00	181.09	6,261.25	-1,326.25	-3,943.35	2,494.12	4,388.59	0.00	0.00	0.00
10,600.00	90.00	181.09	6,261.25	-1,326.25	-4,043.34	2,492.22	4,485.80	0.00	0.00	0.00
10,700.00	90.00	181.09	6,261.25	-1,326.25	-4,143.32	2,490.32	4,583.02	0.00	0.00	0.00
10,800.00	90.00	181.09	6,261.25	-1,326.25	-4,243.30	2,488.42	4,680.24	0.00	0.00	0.00
10,900.00	90.00	181.09	6,261.25	-1,326.25	-4,343.28	2,486.52	4,777.46	0.00	0.00	0.00
11,000.00	90.00	181.09	6,261.25	-1,326.25	-4,443.26	2,484.62	4,874.67	0.00	0.00	0.00
11,100.00	90.00	181.09	6,261.25	-1,326.25	-4,543.25	2,482.73	4,971.89	0.00	0.00	0.00
11,200.00	90.00	181.09	6,261.25	-1,326.25	-4,643.23	2,480.83	5,069.11	0.00	0.00	0.00
11,300.00	90.00	181.09	6,261.25	-1,326.25	-4,743.21	2,478.93	5,166.33	0.00	0.00	0.00
11,400.00	90.00	181.09	6,261.25	-1,326.25	-4,843.19	2,477.03	5,263.55	0.00	0.00	0.00
11,500.00	90.00	181.09	6,261.25	-1,326.25	-4,943.17	2,475.13	5,360.76	0.00	0.00	0.00
11,600.00	90.00	181.09	6,261.25	-1,326.25	-5,043.16	2,473.23	5,457.98	0.00	0.00	0.00
11,700.00	90.00	181.09	6,261.25	-1,326.25	-5,143.14	2,471.33	5,555.20	0.00	0.00	0.00
11,800.00	90.00	181.09	6,261.25	-1,326.25	-5,243.12	2,469.44	5,652.42	0.00	0.00	0.00
11,900.00	90.00	181.09	6,261.25	-1,326.25	-5,343.10	2,467.54	5,749.63	0.00	0.00	0.00
12,000.00	90.00	181.09	6,261.25	-1,326.25	-5,443.08	2,465.64	5,846.85	0.00	0.00	0.00
12,100.00	90.00	181.09	6,261.25	-1,326.25	-5,543.07	2,463.74	5,944.07	0.00	0.00	0.00
12,200.00	90.00	181.09	6,261.25	-1,326.25	-5,643.05	2,461.84	6,041.29	0.00	0.00	0.00
12,300.00	90.00	181.09	6,261.25	-1,326.25	-5,743.03	2,459.94	6,138.50	0.00	0.00	0.00
12,400.00	90.00	181.09	6,261.25	-1,326.25	-5,843.01	2,458.04	6,235.72	0.00	0.00	0.00
12,500.00	90.00	181.09	6,261.25	-1,326.25	-5,942.99	2,456.15	6,332.94	0.00	0.00	0.00
12,600.00	90.00	181.09	6,261.25	-1,326.25	-6,042.98	2,454.25	6,430.16	0.00	0.00	0.00
12,700.00	90.00	181.09	6,261.25	-1,326.25	-6,142.96	2,452.35	6,527.38	0.00	0.00	0.00
12,800.00	90.00	181.09	6,261.25	-1,326.25	-6,242.94	2,450.45	6,624.59	0.00	0.00	0.00
12,900.00	90.00	181.09	6,261.25	-1,326.25	-6,342.92	2,448.55	6,721.81	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well PINTAIL FED 2-11-6HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4935.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4935.00usft
Site:	SE SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-11-6HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)
13,000.00	90.00	181.09	6,261.25	-1,326.25	-6,442.90	2,446.65	6,819.03	0.00	0.00	0.00
13,100.00	90.00	181.09	6,261.25	-1,326.25	-6,542.89	2,444.75	6,916.25	0.00	0.00	0.00
13,200.00	90.00	181.09	6,261.25	-1,326.25	-6,642.87	2,442.86	7,013.46	0.00	0.00	0.00
13,300.00	90.00	181.09	6,261.25	-1,326.25	-6,742.85	2,440.96	7,110.68	0.00	0.00	0.00
13,400.00	90.00	181.09	6,261.25	-1,326.25	-6,842.83	2,439.06	7,207.90	0.00	0.00	0.00
13,500.00	90.00	181.09	6,261.25	-1,326.25	-6,942.81	2,437.16	7,305.12	0.00	0.00	0.00
13,600.00	90.00	181.09	6,261.25	-1,326.25	-7,042.80	2,435.26	7,402.33	0.00	0.00	0.00
13,700.00	90.00	181.09	6,261.25	-1,326.25	-7,142.78	2,433.36	7,499.55	0.00	0.00	0.00
13,800.00	90.00	181.09	6,261.25	-1,326.25	-7,242.76	2,431.46	7,596.77	0.00	0.00	0.00
13,900.00	90.00	181.09	6,261.25	-1,326.25	-7,342.74	2,429.57	7,693.99	0.00	0.00	0.00
14,000.00	90.00	181.09	6,261.25	-1,326.25	-7,442.72	2,427.67	7,791.20	0.00	0.00	0.00
14,100.00	90.00	181.09	6,261.25	-1,326.25	-7,542.71	2,425.77	7,888.42	0.00	0.00	0.00
14,200.00	90.00	181.09	6,261.25	-1,326.25	-7,642.69	2,423.87	7,985.64	0.00	0.00	0.00
14,300.00	90.00	181.09	6,261.25	-1,326.25	-7,742.67	2,421.97	8,082.86	0.00	0.00	0.00
14,400.00	90.00	181.09	6,261.25	-1,326.25	-7,842.65	2,420.07	8,180.08	0.00	0.00	0.00
14,500.00	90.00	181.09	6,261.25	-1,326.25	-7,942.63	2,418.17	8,277.29	0.00	0.00	0.00
14,600.00	90.00	181.09	6,261.25	-1,326.25	-8,042.62	2,416.27	8,374.51	0.00	0.00	0.00
14,700.00	90.00	181.09	6,261.25	-1,326.25	-8,142.60	2,414.38	8,471.73	0.00	0.00	0.00
14,800.00	90.00	181.09	6,261.25	-1,326.25	-8,242.58	2,412.48	8,568.95	0.00	0.00	0.00
14,900.00	90.00	181.09	6,261.25	-1,326.25	-8,342.56	2,410.58	8,666.16	0.00	0.00	0.00
15,000.00	90.00	181.09	6,261.25	-1,326.25	-8,442.54	2,408.68	8,763.38	0.00	0.00	0.00
15,100.00	90.00	181.09	6,261.25	-1,326.25	-8,542.53	2,406.78	8,860.60	0.00	0.00	0.00
15,200.00	90.00	181.09	6,261.25	-1,326.25	-8,642.51	2,404.88	8,957.82	0.00	0.00	0.00
15,300.00	90.00	181.09	6,261.25	-1,326.25	-8,742.49	2,402.98	9,055.03	0.00	0.00	0.00
15,400.00	90.00	181.09	6,261.25	-1,326.25	-8,842.47	2,401.09	9,152.25	0.00	0.00	0.00
15,500.00	90.00	181.09	6,261.25	-1,326.25	-8,942.45	2,399.19	9,249.47	0.00	0.00	0.00
15,600.00	90.00	181.09	6,261.25	-1,326.25	-9,042.43	2,397.29	9,346.69	0.00	0.00	0.00
15,700.00	90.00	181.09	6,261.25	-1,326.25	-9,142.42	2,395.39	9,443.91	0.00	0.00	0.00
15,800.00	90.00	181.09	6,261.25	-1,326.25	-9,242.40	2,393.49	9,541.12	0.00	0.00	0.00
15,900.00	90.00	181.09	6,261.25	-1,326.25	-9,342.38	2,391.59	9,638.34	0.00	0.00	0.00
16,000.00	90.00	181.09	6,261.25	-1,326.25	-9,442.36	2,389.69	9,735.56	0.00	0.00	0.00
16,100.00	90.00	181.09	6,261.25	-1,326.25	-9,542.34	2,387.80	9,832.78	0.00	0.00	0.00
16,200.00	90.00	181.09	6,261.25	-1,326.25	-9,642.33	2,385.90	9,929.99	0.00	0.00	0.00
16,300.00	90.00	181.09	6,261.25	-1,326.25	-9,742.31	2,384.00	10,027.21	0.00	0.00	0.00
16,400.00	90.00	181.09	6,261.25	-1,326.25	-9,842.29	2,382.10	10,124.43	0.00	0.00	0.00
16,500.00	90.00	181.09	6,261.25	-1,326.25	-9,942.27	2,380.20	10,221.65	0.00	0.00	0.00
16,600.00	90.00	181.09	6,261.25	-1,326.25	-10,042.25	2,378.30	10,318.86	0.00	0.00	0.00
16,700.00	90.00	181.09	6,261.25	-1,326.25	-10,142.24	2,376.40	10,416.08	0.00	0.00	0.00
16,800.00	90.00	181.09	6,261.25	-1,326.25	-10,242.22	2,374.51	10,513.30	0.00	0.00	0.00
16,900.00	90.00	181.09	6,261.25	-1,326.25	-10,342.20	2,372.61	10,610.52	0.00	0.00	0.00
17,000.00	90.00	181.09	6,261.25	-1,326.25	-10,442.18	2,370.71	10,707.74	0.00	0.00	0.00
17,100.00	90.00	181.09	6,261.25	-1,326.25	-10,542.16	2,368.81	10,804.95	0.00	0.00	0.00
17,200.00	90.00	181.09	6,261.25	-1,326.25	-10,642.15	2,366.91	10,902.17	0.00	0.00	0.00
BHL: 300ft FSL & 1705ft FEL of Sec 11										
17,264.64	90.00	181.09	6,261.25	-1,326.25	-10,706.77	2,365.68	10,965.01	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well PINTAIL FED 2-11-6HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4935.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4935.00usft
Site:	SE SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-11-6HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #4		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,550.42	1,519.75	FOX HILLS BASE			
3,557.87	3,322.25	RICHARD SANDSTONE			
4,519.48	4,183.75	SUSSEX SANDSTONE			
5,064.19	4,671.75	SHANNON SANDSTONE			
6,692.74	6,096.25	SHARON SPRINGS			
6,802.65	6,161.75	NIOBRARA A CHALK			
6,839.16	6,180.25	NIOBRARA A CHALK BASE			
6,914.35	6,212.75	NIOBRARA B1 CHALK TOP			
6,993.26	6,238.25	NIOBRARA B1 CHALK BASE			
7,165.43	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: 332ft FSL & 1497ft FWL of Sec 35
400.00	400.00	0.00	0.00	START NUDGE #1 (2°/100ft BUR)
1,588.83	1,555.00	-3.31	243.13	SURFACE CASING
1,688.83	1,646.51	-3.86	283.44	START NUDGE #2 (2°/100ft BUR)
1,818.82	1,764.24	-4.61	338.53	EOB TO 26.38° INC
6,264.09	5,746.74	-31.69	2,313.22	KOP (10°/100ft DGLG)
7,165.43	6,261.25	-609.39	2,557.43	HZ LP: 300ft FNL & 1705ft FEL of Sec 2
17,264.64	6,261.25	-10,706.77	2,365.68	BHL: 300ft FSL & 1705ft FEL of Sec 11