

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

NE NE SEC. 30 T8N R60W 6th P.M.

GADWALL FED 30-31-10HN

ORIGINAL WELLBORE

31 August, 2017

Plan: PROPOSAL #1





Project: WELD COUNTY, COLORADO (NAD 83)
Site: NE NE SEC. 30 T8N R60W 6th P.M.
Well: GADWALL FED 30-31-10HN
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #1

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Dep	Annotation
0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.0	SHL: 749ft FNL & 2117ft FEL of Sec 30
700.0	700.0	0.00	0.00	0.0	0.0	0.0	0.0	START NUDGE (2°/100ft BUR)
1295.5	1299.9	12.00	3.42	62.5	3.7	-62.5	62.6	EOB TO 12° INC
4109.6	4176.8	12.00	3.42	659.4	39.4	-660.0	660.6	END OF TANGENT
4705.1	4776.7	0.00	0.00	721.9	43.1	-722.5	723.2	EOD TO VERTICAL
5775.1	5846.7	0.00	0.00	721.9	43.1	-722.5	723.2	KOP (10°/100ft BUR)
6348.0	6746.6	90.00	180.84	149.0	34.7	-149.6	1296.1	HZ LP: 600ft FNL & 2085ft FEL of Sec 30
6348.0	16122.6	90.00	181.45	-9225.1	-152.7	9226.3	10672.1	BHL: 600ft FSL & 2085ft FEL of Sec 31

PROPOSED LOCAL COORDINATES:

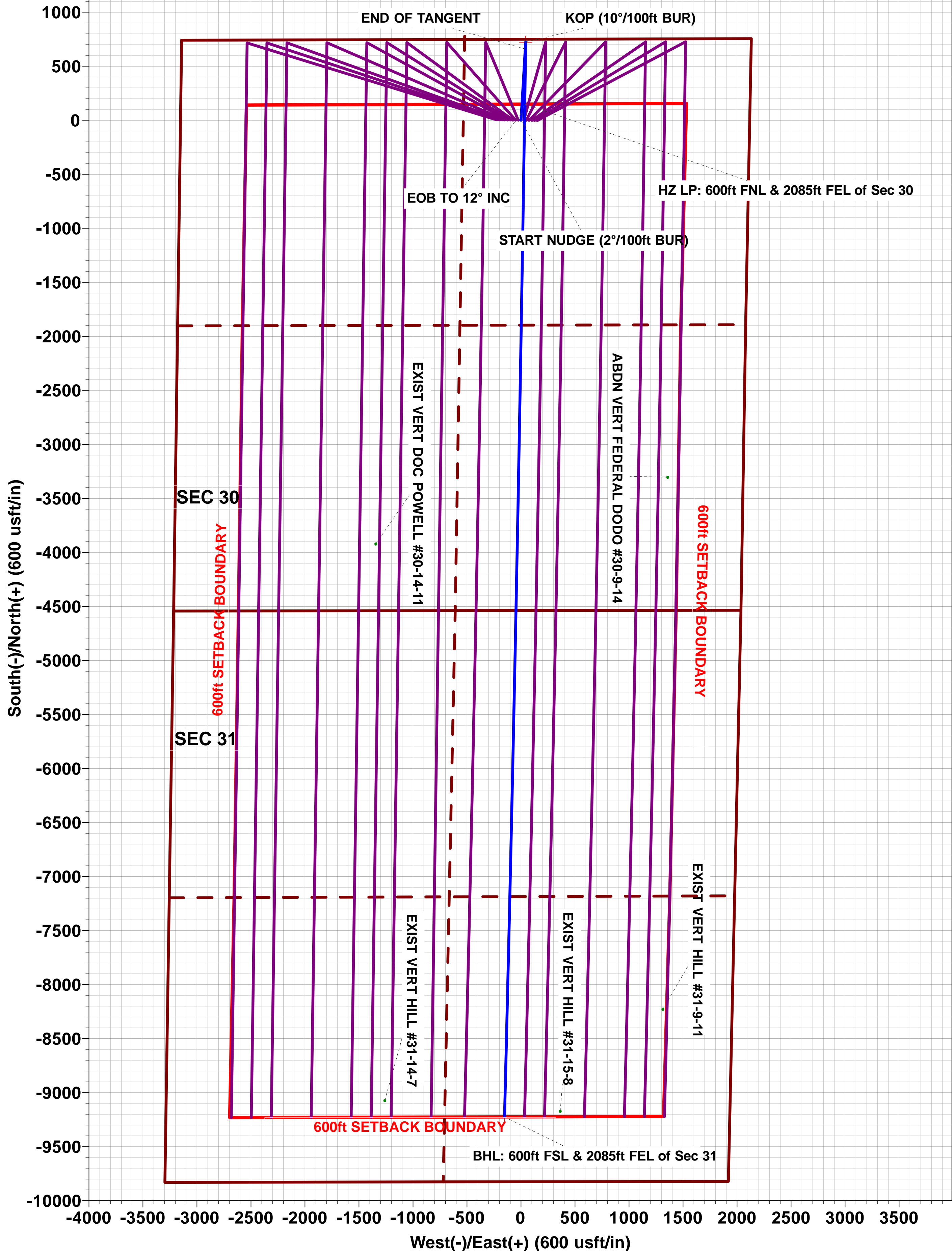
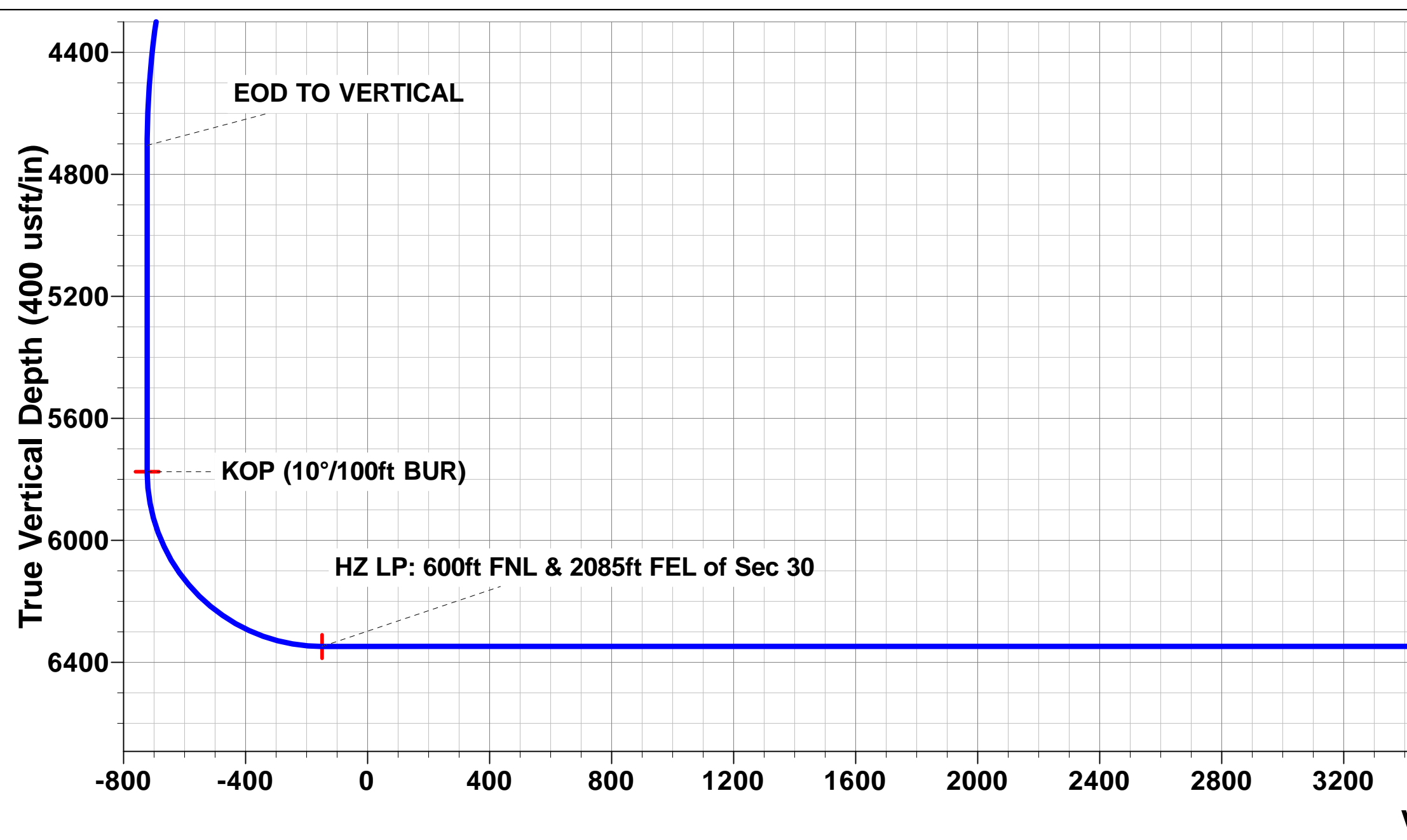
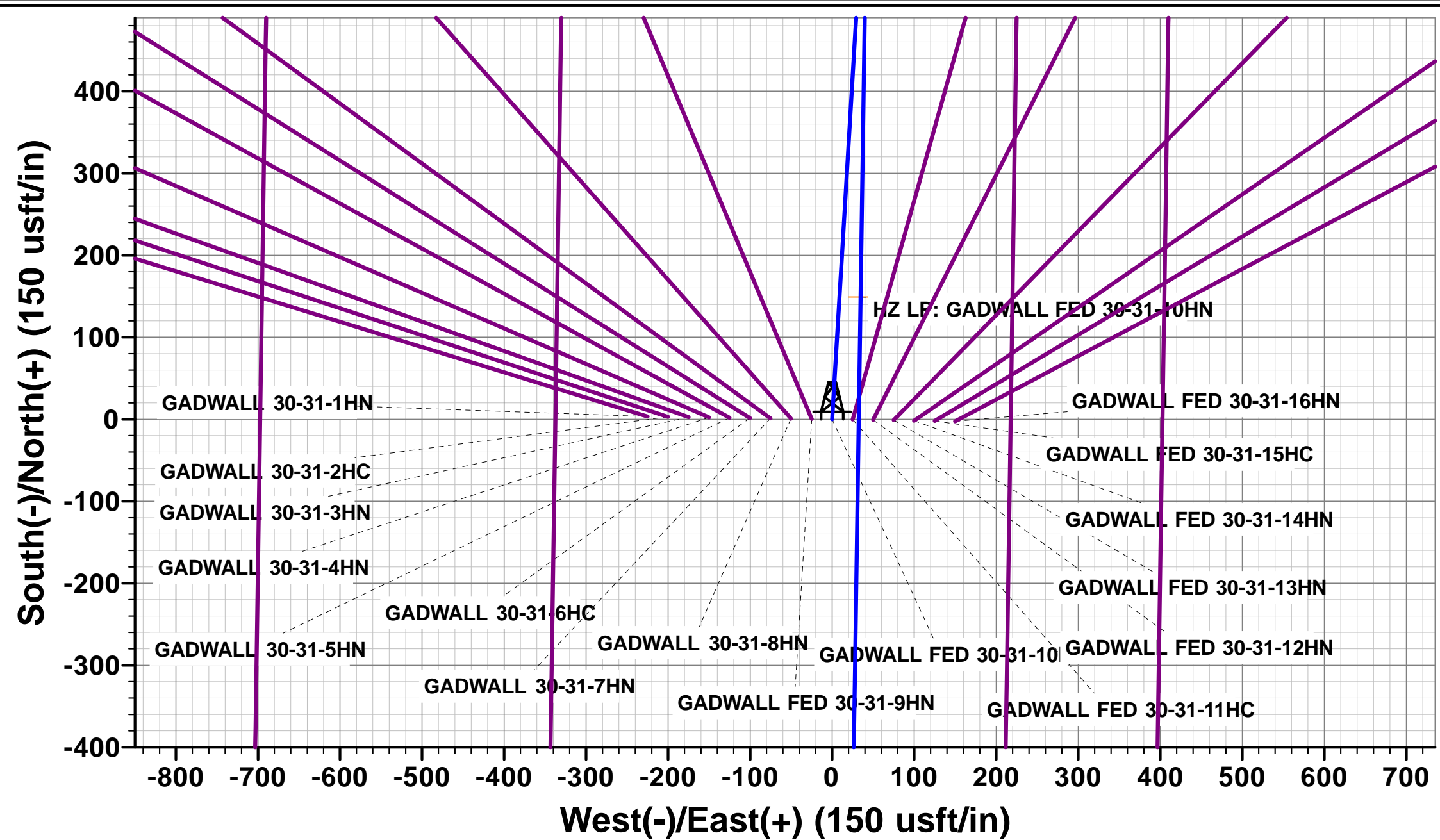
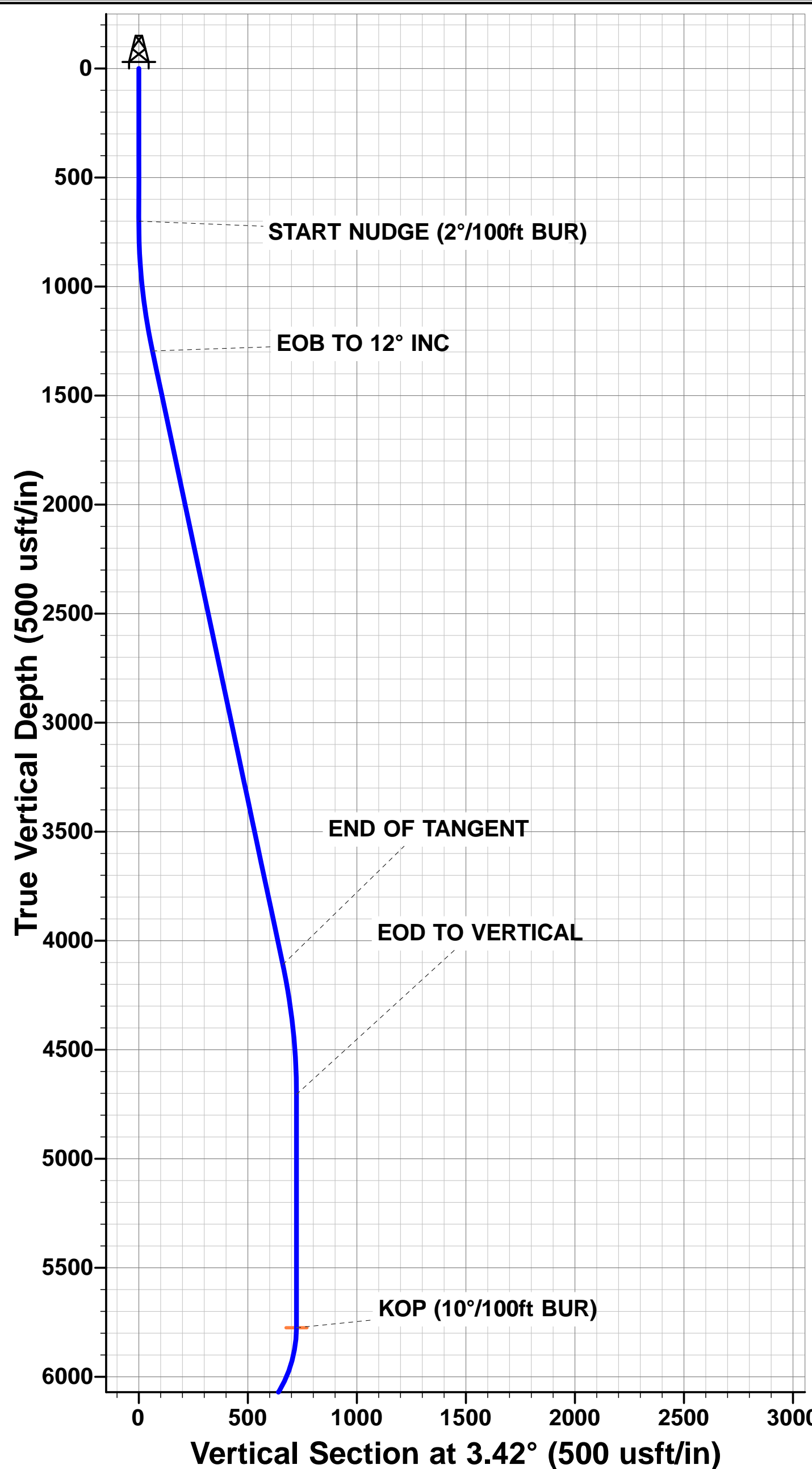
SHL: 749ft FNL & 2117ft FEL of Sec 30

HZ LP: 600ft FNL & 2085ft FEL of Sec 30

BHL: 600ft FSL & 2085ft FEL of Sec 31

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP: GADWALL FED 30-31-10HN	5775.1	721.9	43.1	40.640412	-104.132850
HZ LP: GADWALL FED 30-31-10HN	6348.0	149.0	34.7	40.638840	-104.132880
BHL: GADWALL FED 30-31-10HN	6348.0	-9225.1	-152.7	40.613110	-104.133555



BHL: 600ft FSL & 2085ft FEL of Sec 31

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-10HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4966.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4966.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-10HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

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		NE NE SEC. 30 T8N R60W 6th P.M.			
Site Position:		Northing:	1,478,346.58 usft	Latitude:	40.638440
From:	Lat/Long	Easting:	3,379,143.09 usft	Longitude:	-104.133816
Position Uncertainty:	0.0 usft	Slot Radius:	1.10000 ft	Grid Convergence:	0.88 °

Well	GADWALL FED 30-31-10HN					
Well Position	+N/-S	-3.3 usft	Northing:	1,478,346.76 usft	Latitude:	40.638431
	+E/-W	225.1 usft	Easting:	3,379,368.19 usft	Longitude:	-104.133005
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,950.0 usft

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	30/08/2017	7.87	67.14	52,556

Design	PROPOSAL #1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	180.95

Plan Sections											
MD (usft)	Inc (°)	Azi (°)	Vertical Depth	SS (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	-4,966.0	0.0	0.0	0.00	0.00	0.00	0.00	
700.0	0.00	0.00	700.0	-4,266.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,299.9	12.00	3.42	1,295.5	-3,670.5	62.5	3.7	2.00	2.00	0.00	3.42	
4,176.8	12.00	3.42	4,109.6	-856.4	659.4	39.4	0.00	0.00	0.00	0.00	
4,776.7	0.00	0.00	4,705.1	-260.9	721.9	43.1	2.00	-2.00	0.00	180.00	
5,846.7	0.00	0.00	5,775.1	809.1	721.9	43.1	0.00	0.00	0.00	0.00	KOP: GADWALL FED
6,746.6	90.00	180.84	6,348.0	1,382.0	149.0	34.7	10.00	10.00	-19.91	180.84	HZ LP: GADWALL FE
16,122.6	90.00	181.45	6,348.0	1,382.0	-9,225.1	-152.7	0.01	0.00	0.01	90.83	BHL: GADWALL FED

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-10HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4966.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4966.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-10HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

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: 749ft FNL & 2117ft FEL of Sec 30										
0.0	0.00	0.00	0.0	4,966.00	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	4,866.00	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	4,766.00	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	4,666.00	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	4,566.00	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	4,466.00	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	4,366.00	0.0	0.0	0.0	0.00	0.00	0.00
START NUDGE (2°/100ft BUR)										
700.0	0.00	0.00	700.0	4,266.00	0.0	0.0	0.0	0.00	0.00	0.00
800.0	2.00	3.42	800.0	4,166.02	1.7	0.1	-1.7	2.00	2.00	0.00
900.0	4.00	3.42	899.8	4,066.16	7.0	0.4	-7.0	2.00	2.00	0.00
1,000.0	6.00	3.42	999.5	3,966.55	15.7	0.9	-15.7	2.00	2.00	0.00
1,100.0	8.00	3.42	1,098.7	3,867.30	27.8	1.7	-27.9	2.00	2.00	0.00
1,200.0	10.00	3.42	1,197.5	3,768.53	43.4	2.6	-43.5	2.00	2.00	0.00
EOB TO 12° INC										
1,299.9	12.00	3.42	1,295.5	3,670.49	62.5	3.7	-62.5	2.00	2.00	0.00
1,300.0	12.00	3.42	1,295.6	3,670.38	62.5	3.7	-62.5	0.00	0.00	0.00
1,400.0	12.00	3.42	1,393.4	3,572.56	83.2	5.0	-83.3	0.00	0.00	0.00
1,500.0	12.00	3.42	1,491.3	3,474.75	104.0	6.2	-104.1	0.00	0.00	0.00
FOX HILLS BASE										
1,553.9	12.00	3.42	1,544.0	3,422.00	115.2	6.9	-115.3	0.00	0.00	0.00
1,600.0	12.00	3.42	1,589.1	3,376.93	124.7	7.4	-124.8	0.00	0.00	0.00
1,700.0	12.00	3.42	1,686.9	3,279.11	145.5	8.7	-145.6	0.00	0.00	0.00
1,800.0	12.00	3.42	1,784.7	3,181.30	166.2	9.9	-166.4	0.00	0.00	0.00
1,900.0	12.00	3.42	1,882.5	3,083.48	187.0	11.2	-187.2	0.00	0.00	0.00
2,000.0	12.00	3.42	1,980.3	2,985.67	207.7	12.4	-207.9	0.00	0.00	0.00
2,100.0	12.00	3.42	2,078.1	2,887.85	228.5	13.6	-228.7	0.00	0.00	0.00
2,200.0	12.00	3.42	2,176.0	2,790.04	249.2	14.9	-249.5	0.00	0.00	0.00
2,300.0	12.00	3.42	2,273.8	2,692.22	270.0	16.1	-270.2	0.00	0.00	0.00
2,400.0	12.00	3.42	2,371.6	2,594.40	290.7	17.4	-291.0	0.00	0.00	0.00
2,500.0	12.00	3.42	2,469.4	2,496.59	311.5	18.6	-311.8	0.00	0.00	0.00
2,600.0	12.00	3.42	2,567.2	2,398.77	332.2	19.8	-332.5	0.00	0.00	0.00
2,700.0	12.00	3.42	2,665.0	2,300.96	353.0	21.1	-353.3	0.00	0.00	0.00
2,800.0	12.00	3.42	2,762.9	2,203.14	373.7	22.3	-374.1	0.00	0.00	0.00
2,900.0	12.00	3.42	2,860.7	2,105.33	394.5	23.6	-394.8	0.00	0.00	0.00
3,000.0	12.00	3.42	2,958.5	2,007.51	415.2	24.8	-415.6	0.00	0.00	0.00
3,100.0	12.00	3.42	3,056.3	1,909.70	436.0	26.0	-436.4	0.00	0.00	0.00
3,200.0	12.00	3.42	3,154.1	1,811.88	456.7	27.3	-457.1	0.00	0.00	0.00
3,300.0	12.00	3.42	3,251.9	1,714.06	477.5	28.5	-477.9	0.00	0.00	0.00
3,400.0	12.00	3.42	3,349.8	1,616.25	498.2	29.7	-498.7	0.00	0.00	0.00
RICHARD SNADSTONE										
3,449.3	12.00	3.42	3,398.0	1,568.00	508.5	30.4	-508.9	0.00	0.00	0.00
3,500.0	12.00	3.42	3,447.6	1,518.43	519.0	31.0	-519.4	0.00	0.00	0.00
PARKMAN SANDSTONE										
3,565.9	12.00	3.42	3,512.0	1,454.00	532.7	31.8	-533.1	0.00	0.00	0.00
3,600.0	12.00	3.42	3,545.4	1,420.62	539.7	32.2	-540.2	0.00	0.00	0.00
3,700.0	12.00	3.42	3,643.2	1,322.80	560.5	33.5	-561.0	0.00	0.00	0.00
3,800.0	12.00	3.42	3,741.0	1,224.99	581.2	34.7	-581.7	0.00	0.00	0.00
3,900.0	12.00	3.42	3,838.8	1,127.17	602.0	35.9	-602.5	0.00	0.00	0.00
4,000.0	12.00	3.42	3,936.6	1,029.35	622.7	37.2	-623.3	0.00	0.00	0.00
4,100.0	12.00	3.42	4,034.5	931.54	643.5	38.4	-644.0	0.00	0.00	0.00
END OF TANGENT										

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-10HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4966.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4966.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-10HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

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)
4,176.8	12.00	3.42	4,109.6	856.41	659.4	39.4	-660.0	0.00	0.00	0.00
4,200.0	11.53	3.42	4,132.3	833.70	664.2	39.7	-664.7	2.00	-2.00	0.00
4,300.0	9.53	3.42	4,230.6	735.39	682.4	40.7	-683.0	2.00	-2.00	0.00
SUSSEX SANDSTONE										
4,328.8	8.96	3.42	4,259.0	707.00	687.0	41.0	-687.6	2.00	-2.00	0.00
4,400.0	7.53	3.42	4,329.5	636.51	697.2	41.6	-697.8	2.00	-2.00	0.00
4,500.0	5.53	3.42	4,428.8	537.16	708.6	42.3	-709.2	2.00	-2.00	0.00
4,600.0	3.53	3.42	4,528.5	437.48	716.5	42.8	-717.1	2.00	-2.00	0.00
4,700.0	1.53	3.42	4,628.4	337.58	720.9	43.0	-721.5	2.00	-2.00	0.00
EOD TO VERTICAL										
4,776.7	0.00	0.00	4,705.1	260.90	721.9	43.1	-722.5	2.00	-2.00	0.00
SHANNON SANDSTONE										
4,787.6	0.00	0.00	4,716.0	250.00	721.9	43.1	-722.5	0.00	0.00	0.00
4,800.0	0.00	0.00	4,728.4	237.59	721.9	43.1	-722.5	0.00	0.00	0.00
4,900.0	0.00	0.00	4,828.4	137.59	721.9	43.1	-722.5	0.00	0.00	0.00
5,000.0	0.00	0.00	4,928.4	37.59	721.9	43.1	-722.5	0.00	0.00	0.00
5,100.0	0.00	0.00	5,028.4	-62.41	721.9	43.1	-722.5	0.00	0.00	0.00
5,200.0	0.00	0.00	5,128.4	-162.41	721.9	43.1	-722.5	0.00	0.00	0.00
5,300.0	0.00	0.00	5,228.4	-262.41	721.9	43.1	-722.5	0.00	0.00	0.00
5,400.0	0.00	0.00	5,328.4	-362.41	721.9	43.1	-722.5	0.00	0.00	0.00
5,500.0	0.00	0.00	5,428.4	-462.41	721.9	43.1	-722.5	0.00	0.00	0.00
5,600.0	0.00	0.00	5,528.4	-562.41	721.9	43.1	-722.5	0.00	0.00	0.00
5,700.0	0.00	0.00	5,628.4	-662.41	721.9	43.1	-722.5	0.00	0.00	0.00
5,800.0	0.00	0.00	5,728.4	-762.41	721.9	43.1	-722.5	0.00	0.00	0.00
KOP (10°/100ft BUR)										
5,846.7	0.00	0.00	5,775.1	-809.10	721.9	43.1	-722.5	0.00	0.00	0.00
5,900.0	5.33	180.84	5,828.3	-862.33	719.4	43.1	-720.0	10.00	10.00	0.00
6,000.0	15.33	180.84	5,926.6	-960.59	701.5	42.8	-702.1	10.00	10.00	0.00
6,100.0	25.33	180.84	6,020.2	-1,054.24	666.8	42.3	-667.4	10.00	10.00	0.00
6,200.0	35.33	180.84	6,106.4	-1,140.44	616.4	41.6	-617.0	10.00	10.00	0.00
SHARON SPRINGS										
6,285.2	43.85	180.84	6,172.0	-1,206.00	562.2	40.8	-562.8	10.00	10.00	0.00
6,300.0	45.34	180.84	6,182.6	-1,216.57	551.7	40.6	-552.3	10.00	10.00	0.00
6,400.0	55.34	180.84	6,246.3	-1,280.31	474.9	39.5	-475.5	10.00	10.00	0.00
NIOBRARA A CHALK										
6,403.0	55.63	180.84	6,248.0	-1,282.00	472.4	39.4	-473.0	10.00	10.00	0.00
NIOBRARA A CHALK BASE										
6,456.3	60.97	180.84	6,276.0	-1,310.00	427.1	38.8	-427.7	10.00	10.00	0.00
6,500.0	65.34	180.84	6,295.7	-1,329.74	388.1	38.2	-388.7	10.00	10.00	0.00
NIOBRARA B1 CHALK TOP										
6,536.8	69.01	180.84	6,310.0	-1,344.00	354.2	37.7	-354.8	10.00	10.00	0.00
NIOBRARA B1 CHALK BASE										
6,587.3	74.07	180.84	6,326.0	-1,360.00	306.3	37.0	-306.9	10.00	10.00	0.00
6,600.0	75.34	180.84	6,329.3	-1,363.35	294.1	36.8	-294.6	10.00	10.00	0.00
6,700.0	85.34	180.84	6,346.1	-1,380.11	195.6	35.4	-196.2	10.00	10.00	0.00
NIOBRARA B2 CHALK TOP										
6,746.6	90.00	180.84	6,348.0	-1,382.00	149.1	34.7	-149.7	10.00	10.00	0.00
HZ LP: 600ft FNL & 2085ft FEL of Sec 30										
6,746.6	90.00	180.84	6,348.0	-1,382.00	149.0	34.7	-149.6	10.00	10.00	0.00
6,800.0	90.00	180.84	6,348.0	-1,382.00	95.7	33.9	-96.2	0.01	0.00	0.01
6,900.0	90.00	180.85	6,348.0	-1,381.99	-4.3	32.4	3.8	0.01	0.00	0.01
7,000.0	90.00	180.86	6,348.0	-1,381.98	-104.3	30.9	103.8	0.01	0.00	0.01
7,100.0	90.00	180.86	6,348.0	-1,381.97	-204.3	29.4	203.8	0.01	0.00	0.01

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-10HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4966.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4966.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-10HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

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)
7,200.0	90.00	180.87	6,348.0	-1,381.97	-304.3	27.9	303.8	0.01	0.00	0.01
7,300.0	90.00	180.88	6,348.0	-1,381.96	-404.3	26.4	403.8	0.01	0.00	0.01
7,400.0	90.00	180.88	6,348.0	-1,381.95	-504.3	24.9	503.8	0.01	0.00	0.01
7,500.0	90.00	180.89	6,347.9	-1,381.95	-604.3	23.3	603.8	0.01	0.00	0.01
7,600.0	90.00	180.90	6,347.9	-1,381.94	-704.2	21.8	703.8	0.01	0.00	0.01
7,700.0	90.00	180.90	6,347.9	-1,381.93	-804.2	20.2	803.8	0.01	0.00	0.01
7,800.0	90.00	180.91	6,347.9	-1,381.93	-904.2	18.6	903.8	0.01	0.00	0.01
7,900.0	90.00	180.92	6,347.9	-1,381.92	-1,004.2	17.0	1,003.8	0.01	0.00	0.01
8,000.0	90.00	180.92	6,347.9	-1,381.92	-1,104.2	15.4	1,103.8	0.01	0.00	0.01
8,100.0	90.00	180.93	6,347.9	-1,381.91	-1,204.2	13.8	1,203.8	0.01	0.00	0.01
8,200.0	90.00	180.94	6,347.9	-1,381.91	-1,304.2	12.2	1,303.8	0.01	0.00	0.01
8,300.0	90.00	180.94	6,347.9	-1,381.90	-1,404.1	10.5	1,403.8	0.01	0.00	0.01
8,400.0	90.00	180.95	6,347.9	-1,381.90	-1,504.1	8.9	1,503.8	0.01	0.00	0.01
8,500.0	90.00	180.95	6,347.9	-1,381.89	-1,604.1	7.2	1,603.8	0.01	0.00	0.01
8,600.0	90.00	180.96	6,347.9	-1,381.89	-1,704.1	5.5	1,703.8	0.01	0.00	0.01
8,700.0	90.00	180.97	6,347.9	-1,381.88	-1,804.1	3.9	1,803.8	0.01	0.00	0.01
8,800.0	90.00	180.97	6,347.9	-1,381.88	-1,904.1	2.2	1,903.8	0.01	0.00	0.01
8,900.0	90.00	180.98	6,347.9	-1,381.87	-2,004.1	0.5	2,003.8	0.01	0.00	0.01
9,000.0	90.00	180.99	6,347.9	-1,381.87	-2,104.1	-1.3	2,103.8	0.01	0.00	0.01
9,100.0	90.00	180.99	6,347.9	-1,381.86	-2,204.0	-3.0	2,203.8	0.01	0.00	0.01
9,200.0	90.00	181.00	6,347.9	-1,381.86	-2,304.0	-4.7	2,303.8	0.01	0.00	0.01
9,300.0	90.00	181.01	6,347.9	-1,381.86	-2,404.0	-6.5	2,403.8	0.01	0.00	0.01
9,400.0	90.00	181.01	6,347.9	-1,381.85	-2,504.0	-8.2	2,503.8	0.01	0.00	0.01
9,500.0	90.00	181.02	6,347.9	-1,381.85	-2,604.0	-10.0	2,603.8	0.01	0.00	0.01
9,600.0	90.00	181.03	6,347.8	-1,381.85	-2,704.0	-11.8	2,703.8	0.01	0.00	0.01
9,700.0	90.00	181.03	6,347.8	-1,381.84	-2,803.9	-13.6	2,803.8	0.01	0.00	0.01
9,800.0	90.00	181.04	6,347.8	-1,381.84	-2,903.9	-15.4	2,903.8	0.01	0.00	0.01
9,900.0	90.00	181.05	6,347.8	-1,381.84	-3,003.9	-17.2	3,003.8	0.01	0.00	0.01
10,000.0	90.00	181.05	6,347.8	-1,381.84	-3,103.9	-19.0	3,103.8	0.01	0.00	0.01
10,100.0	90.00	181.06	6,347.8	-1,381.83	-3,203.9	-20.9	3,203.8	0.01	0.00	0.01
10,200.0	90.00	181.07	6,347.8	-1,381.83	-3,303.9	-22.7	3,303.8	0.01	0.00	0.01
10,300.0	90.00	181.07	6,347.8	-1,381.83	-3,403.8	-24.6	3,403.8	0.01	0.00	0.01
10,400.0	90.00	181.08	6,347.8	-1,381.83	-3,503.8	-26.5	3,503.8	0.01	0.00	0.01
10,500.0	90.00	181.08	6,347.8	-1,381.83	-3,603.8	-28.4	3,603.8	0.01	0.00	0.01
10,600.0	90.00	181.09	6,347.8	-1,381.83	-3,703.8	-30.3	3,703.8	0.01	0.00	0.01
10,700.0	90.00	181.10	6,347.8	-1,381.82	-3,803.8	-32.2	3,803.8	0.01	0.00	0.01
10,800.0	90.00	181.10	6,347.8	-1,381.82	-3,903.8	-34.1	3,903.8	0.01	0.00	0.01
10,900.0	90.00	181.11	6,347.8	-1,381.82	-4,003.7	-36.0	4,003.8	0.01	0.00	0.01
11,000.0	90.00	181.12	6,347.8	-1,381.82	-4,103.7	-38.0	4,103.8	0.01	0.00	0.01
11,100.0	90.00	181.12	6,347.8	-1,381.82	-4,203.7	-39.9	4,203.8	0.01	0.00	0.01
11,200.0	90.00	181.13	6,347.8	-1,381.82	-4,303.7	-41.9	4,303.8	0.01	0.00	0.01
11,300.0	90.00	181.14	6,347.8	-1,381.82	-4,403.7	-43.9	4,403.8	0.01	0.00	0.01
11,400.0	90.00	181.14	6,347.8	-1,381.82	-4,503.6	-45.9	4,503.8	0.01	0.00	0.01
11,500.0	90.00	181.15	6,347.8	-1,381.82	-4,603.6	-47.9	4,603.8	0.01	0.00	0.01
11,600.0	90.00	181.16	6,347.8	-1,381.82	-4,703.6	-49.9	4,703.8	0.01	0.00	0.01
11,700.0	90.00	181.16	6,347.8	-1,381.82	-4,803.6	-51.9	4,803.8	0.01	0.00	0.01
11,800.0	90.00	181.17	6,347.8	-1,381.82	-4,903.6	-53.9	4,903.8	0.01	0.00	0.01
11,900.0	90.00	181.18	6,347.8	-1,381.82	-5,003.5	-56.0	5,003.8	0.01	0.00	0.01
12,000.0	90.00	181.18	6,347.8	-1,381.82	-5,103.5	-58.0	5,103.8	0.01	0.00	0.01
12,100.0	90.00	181.19	6,347.8	-1,381.82	-5,203.5	-60.1	5,203.8	0.01	0.00	0.01
12,200.0	90.00	181.19	6,347.8	-1,381.82	-5,303.5	-62.2	5,303.8	0.01	0.00	0.01
12,300.0	90.00	181.20	6,347.8	-1,381.83	-5,403.4	-64.3	5,403.8	0.01	0.00	0.01
12,400.0	90.00	181.21	6,347.8	-1,381.83	-5,503.4	-66.4	5,503.8	0.01	0.00	0.01
12,500.0	90.00	181.21	6,347.8	-1,381.83	-5,603.4	-68.5	5,603.8	0.01	0.00	0.01

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-10HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4966.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4966.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-10HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

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)
12,600.0	90.00	181.22	6,347.8	-1,381.83	-5,703.4	-70.6	5,703.8	0.01	0.00	0.01
12,700.0	90.00	181.23	6,347.8	-1,381.83	-5,803.4	-72.8	5,803.8	0.01	0.00	0.01
12,800.0	90.00	181.23	6,347.8	-1,381.83	-5,903.3	-74.9	5,903.8	0.01	0.00	0.01
12,900.0	90.00	181.24	6,347.8	-1,381.84	-6,003.3	-77.1	6,003.8	0.01	0.00	0.01
13,000.0	90.00	181.25	6,347.8	-1,381.84	-6,103.3	-79.2	6,103.8	0.01	0.00	0.01
13,100.0	90.00	181.25	6,347.8	-1,381.84	-6,203.3	-81.4	6,203.8	0.01	0.00	0.01
13,200.0	90.00	181.26	6,347.8	-1,381.85	-6,303.2	-83.6	6,303.8	0.01	0.00	0.01
13,300.0	90.00	181.27	6,347.8	-1,381.85	-6,403.2	-85.8	6,403.8	0.01	0.00	0.01
13,400.0	90.00	181.27	6,347.9	-1,381.85	-6,503.2	-88.0	6,503.8	0.01	0.00	0.01
13,500.0	90.00	181.28	6,347.9	-1,381.85	-6,603.2	-90.3	6,603.8	0.01	0.00	0.01
13,600.0	90.00	181.29	6,347.9	-1,381.86	-6,703.1	-92.5	6,703.8	0.01	0.00	0.01
13,700.0	90.00	181.29	6,347.9	-1,381.86	-6,803.1	-94.7	6,803.8	0.01	0.00	0.01
13,800.0	90.00	181.30	6,347.9	-1,381.87	-6,903.1	-97.0	6,903.7	0.01	0.00	0.01
13,900.0	90.00	181.31	6,347.9	-1,381.87	-7,003.1	-99.3	7,003.7	0.01	0.00	0.01
14,000.0	90.00	181.31	6,347.9	-1,381.87	-7,103.0	-101.6	7,103.7	0.01	0.00	0.01
14,100.0	90.00	181.32	6,347.9	-1,381.88	-7,203.0	-103.9	7,203.7	0.01	0.00	0.01
14,200.0	90.00	181.32	6,347.9	-1,381.88	-7,303.0	-106.2	7,303.7	0.01	0.00	0.01
14,300.0	90.00	181.33	6,347.9	-1,381.89	-7,403.0	-108.5	7,403.7	0.01	0.00	0.01
14,400.0	90.00	181.34	6,347.9	-1,381.89	-7,502.9	-110.8	7,503.7	0.01	0.00	0.01
14,500.0	90.00	181.34	6,347.9	-1,381.90	-7,602.9	-113.1	7,603.7	0.01	0.00	0.01
14,600.0	90.00	181.35	6,347.9	-1,381.90	-7,702.9	-115.5	7,703.7	0.01	0.00	0.01
14,700.0	90.00	181.36	6,347.9	-1,381.91	-7,802.8	-117.9	7,803.7	0.01	0.00	0.01
14,800.0	90.00	181.36	6,347.9	-1,381.91	-7,902.8	-120.2	7,903.7	0.01	0.00	0.01
14,900.0	90.00	181.37	6,347.9	-1,381.92	-8,002.8	-122.6	8,003.7	0.01	0.00	0.01
15,000.0	90.00	181.38	6,347.9	-1,381.92	-8,102.8	-125.0	8,103.7	0.01	0.00	0.01
15,100.0	90.00	181.38	6,347.9	-1,381.93	-8,202.7	-127.4	8,203.7	0.01	0.00	0.01
15,200.0	90.00	181.39	6,347.9	-1,381.94	-8,302.7	-129.8	8,303.7	0.01	0.00	0.01
15,300.0	90.00	181.40	6,347.9	-1,381.94	-8,402.7	-132.3	8,403.7	0.01	0.00	0.01
15,400.0	90.00	181.40	6,347.9	-1,381.95	-8,502.6	-134.7	8,503.7	0.01	0.00	0.01
15,500.0	90.00	181.41	6,348.0	-1,381.96	-8,602.6	-137.2	8,603.7	0.01	0.00	0.01
15,600.0	90.00	181.42	6,348.0	-1,381.96	-8,702.6	-139.6	8,703.7	0.01	0.00	0.01
15,700.0	90.00	181.42	6,348.0	-1,381.97	-8,802.6	-142.1	8,803.7	0.01	0.00	0.01
15,800.0	90.00	181.43	6,348.0	-1,381.98	-8,902.5	-144.6	8,903.7	0.01	0.00	0.01
15,900.0	90.00	181.44	6,348.0	-1,381.98	-9,002.5	-147.1	9,003.7	0.01	0.00	0.01
16,000.0	90.00	181.44	6,348.0	-1,381.99	-9,102.5	-149.6	9,103.7	0.01	0.00	0.01
16,100.0	90.00	181.45	6,348.0	-1,382.00	-9,202.4	-152.1	9,203.7	0.01	0.00	0.01
BHL: 600ft FSL & 2085ft FEL of Sec 31										
16,122.6	90.00	181.45	6,348.0	-1,382.00	-9,225.1	-152.7	9,226.3	0.01	0.00	0.01

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-10HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4966.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4966.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-10HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Formations						
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,553.9	1,544.0	FOX HILLS BASE				
3,449.3	3,398.0	RICHARD SNADSTONE				
3,565.9	3,512.0	PARKMAN SANDSTONE				
4,328.8	4,259.0	SUSSEX SANDSTONE				
4,787.6	4,716.0	SHANNON SANDSTONE				
6,285.2	6,172.0	SHARON SPRINGS				
6,403.0	6,248.0	NIOBRARA A CHALK				
6,456.3	6,276.0	NIOBRARA A CHALK BASE				
6,536.8	6,310.0	NIOBRARA B1 CHALK TOP				
6,587.3	6,326.0	NIOBRARA B1 CHALK BASE				
6,746.6	6,348.0	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: 749ft FNL & 2117ft FEL of Sec 30
700.0	700.0	0.0	0.0	START NUDGE (2°/100ft BUR)
1,299.9	1,295.5	62.5	3.7	EOB TO 12° INC
4,176.8	4,109.6	659.4	39.4	END OF TANGENT
4,776.7	4,705.1	721.9	43.1	EOD TO VERTICAL
5,846.7	5,775.1	721.9	43.1	KOP (10°/100ft BUR)
6,746.6	6,348.0	149.0	34.7	HZ LP: 600ft FNL & 2085ft FEL of Sec 30
16,122.6	6,348.0	-9,225.1	-152.7	BHL: 600ft FSL & 2085ft FEL of Sec 31