

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

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

GADWALL FED 30-31-16HN

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 30-31-16HN
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #1

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	Vsect	Dep	Annotation
0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.0	SHL: 752ft FNL & 1967ft FEL of Sec 30
100.0	100.0	0.00	0.00	0.0	0.0	0.0	0.0	START NUDGE (2°/100ft BUR)
1011.0	1027.1	18.54	62.06	69.7	131.4	-52.5	148.7	EOB TO 18.54° INC
4759.1	4980.4	18.54	62.06	658.8	1241.9	-496.2	1405.9	END OF TANGENT
5670.1	5907.5	0.00	0.00	728.5	1373.3	-548.7	1554.6	EOD TO VERTICAL
5770.1	6007.5	0.00	0.00	728.5	1373.3	-548.7	1554.6	KOP (10°/100ft BUR)
6343.0	6907.5	90.00	180.84	155.6	1364.9	18.6	2127.5	HZ LP: 600ft FNL & 605ft FEL of Sec 30
6343.0	16284.6	90.00	181.45	-9219.6	1177.5	9294.5	11504.6	BHL: 600ft FSL & 605ft FEL of Sec 31

PROPOSED LOCAL COORDINATES:

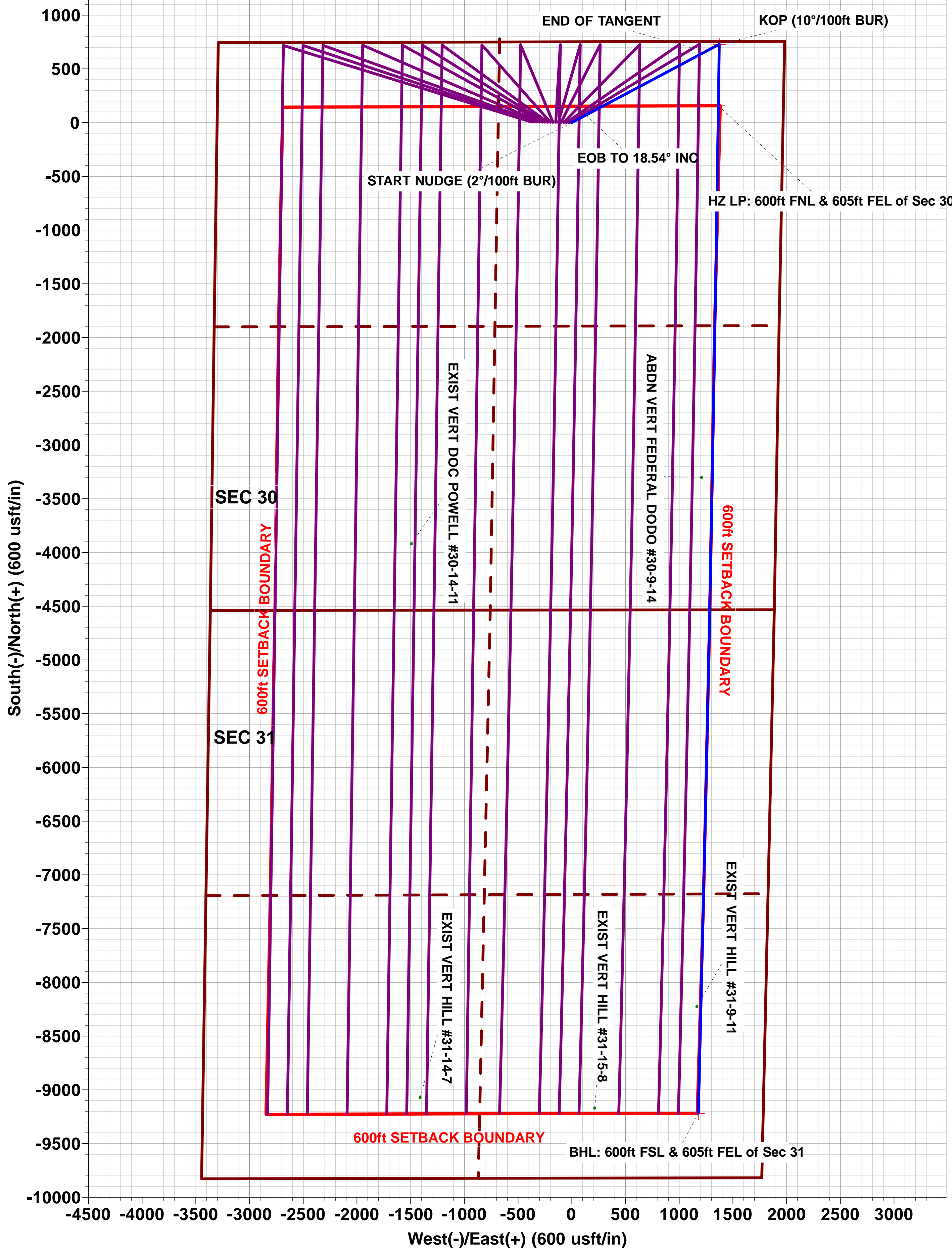
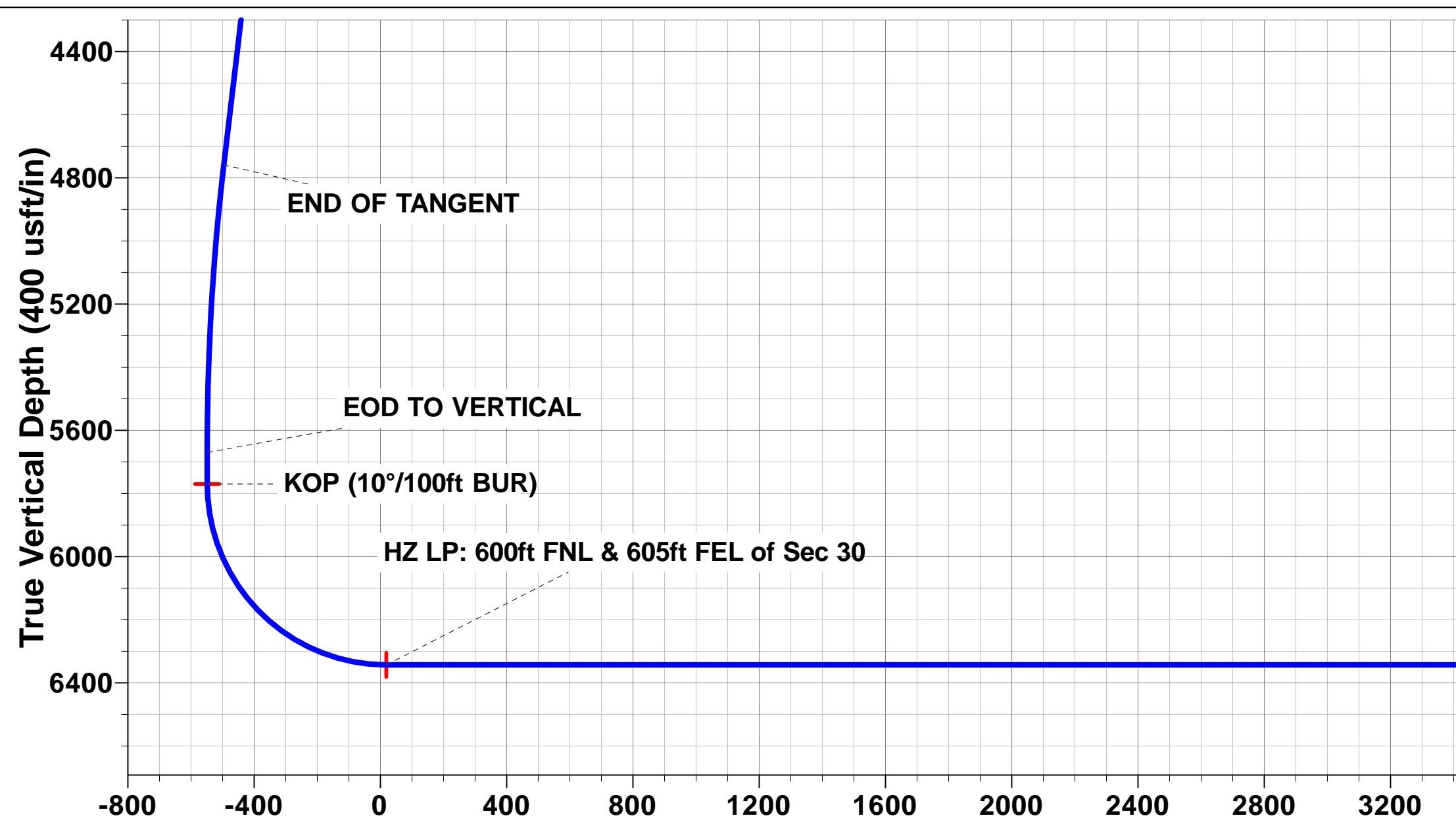
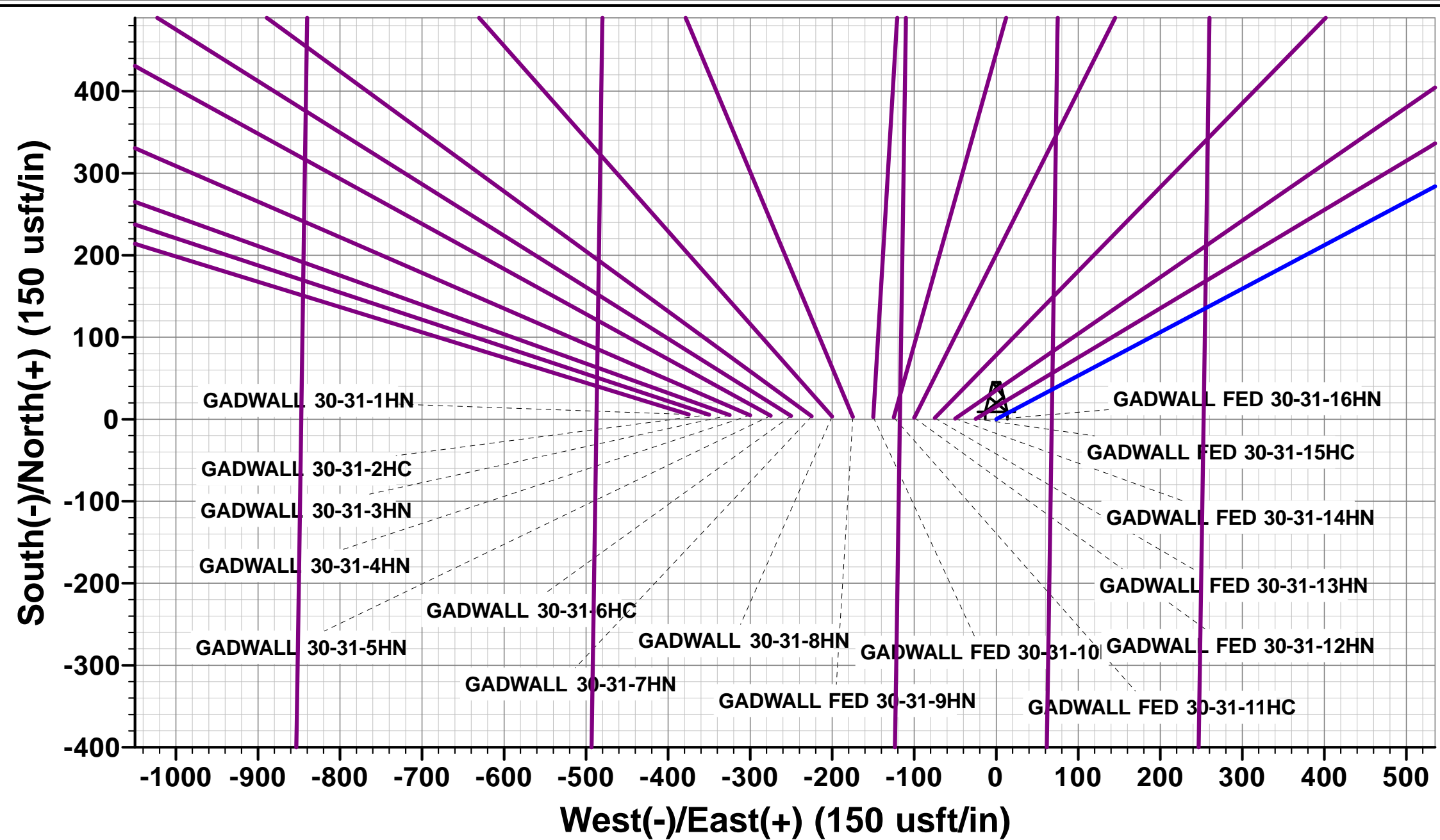
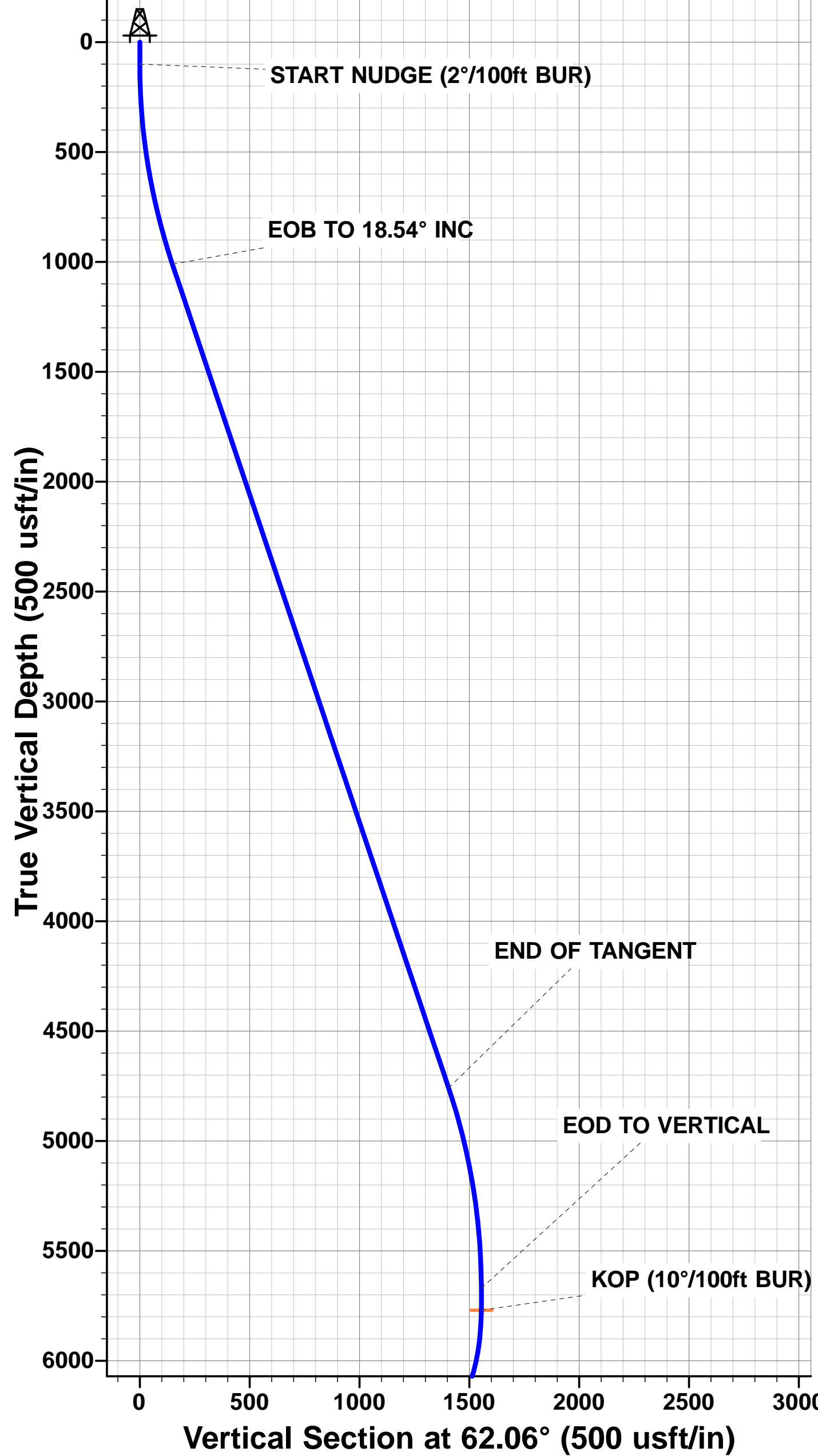
SHL: 752ft FNL & 1967ft FEL of Sec 30

HZ LP: 600ft FNL & 605ft FEL of Sec 30

BHL: 600ft FSL & 605ft FEL of Sec 31

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP: GADWALL FED 30-31-16HN	5770.1	728.5	1373.3	40.640423	-104.127517
HZ LP: GADWALL FED 30-31-16HN	6343.0	155.6	1364.9	40.638851	-104.127547
BHL: GADWALL FED 30-31-16HN	6343.0	-9219.6	1177.5	40.613118	-104.128224



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-16HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4961.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4961.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-16HN	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
From:	Lat/Long	Easting:	3,379,143.09 usft
Position Uncertainty:	0.0 usft	Slot Radius:	1.10000 ft
		Latitude:	40.638440
		Longitude:	-104.133816
		Grid Convergence:	0.88 °

Well	GADWALL FED 30-31-16HN		
Well Position	+N/-S	-5.8 usft	Northing: 1,478,346.53 usft
	+E/-W	375.0 usft	Easting: 3,379,518.07 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	40.638424
		Longitude:	-104.132465
		Ground Level:	4,945.0 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	172.72	

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	-4,961.0	0.0	0.0	0.00	0.00	0.00	0.00	
100.0	0.00	0.00	100.0	-4,861.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,027.1	18.54	62.06	1,011.0	-3,950.0	69.7	131.4	2.00	2.00	0.00	62.06	
4,980.4	18.54	62.06	4,759.1	-201.9	658.8	1,241.9	0.00	0.00	0.00	0.00	
5,907.5	0.00	0.00	5,670.1	709.1	728.5	1,373.3	2.00	-2.00	0.00	180.00	
6,007.5	0.00	0.00	5,770.1	809.1	728.5	1,373.3	0.00	0.00	0.00	0.00	KOP: GADWALL FED
6,907.5	90.00	180.84	6,343.0	1,382.0	155.6	1,364.9	10.00	10.00	-19.91	180.84	HZ LP: GADWALL FE
16,284.6	90.00	181.45	6,343.0	1,382.0	-9,219.6	1,177.5	0.01	0.00	0.01	90.90	BHL: GADWALL FED

Planning Report



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Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4961.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4961.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-16HN	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: 752ft FNL & 1967ft FEL of Sec 30										
0.0	0.00	0.00	0.0	4,961.00	0.0	0.0	0.0	0.00	0.00	0.00
START NUDGE (2°/100ft BUR)										
100.0	0.00	0.00	100.0	4,861.00	0.0	0.0	0.0	0.00	0.00	0.00
200.0	2.00	62.06	200.0	4,761.02	0.8	1.5	-0.6	2.00	2.00	0.00
300.0	4.00	62.06	299.8	4,661.16	3.3	6.2	-2.5	2.00	2.00	0.00
400.0	6.00	62.06	399.5	4,561.55	7.4	13.9	-5.5	2.00	2.00	0.00
500.0	8.00	62.06	498.7	4,462.30	13.1	24.6	-9.8	2.00	2.00	0.00
600.0	10.00	62.06	597.5	4,363.53	20.4	38.4	-15.4	2.00	2.00	0.00
700.0	12.00	62.06	695.6	4,265.38	29.3	55.3	-22.1	2.00	2.00	0.00
800.0	14.00	62.06	793.1	4,167.94	39.9	75.2	-30.0	2.00	2.00	0.00
900.0	16.00	62.06	889.6	4,071.36	52.0	98.0	-39.2	2.00	2.00	0.00
1,000.0	18.00	62.06	985.3	3,975.73	65.7	123.9	-49.5	2.00	2.00	0.00
EOB TO 18.54° INC										
1,027.1	18.54	62.06	1,011.0	3,950.00	69.7	131.4	-52.5	2.00	2.00	0.00
1,100.0	18.54	62.06	1,080.1	3,880.88	80.6	151.8	-60.7	0.00	0.00	0.00
1,200.0	18.54	62.06	1,174.9	3,786.07	95.5	179.9	-71.9	0.00	0.00	0.00
1,300.0	18.54	62.06	1,269.7	3,691.26	110.4	208.0	-83.1	0.00	0.00	0.00
1,400.0	18.54	62.06	1,364.5	3,596.45	125.3	236.1	-94.3	0.00	0.00	0.00
1,500.0	18.54	62.06	1,459.4	3,501.65	140.2	264.2	-105.6	0.00	0.00	0.00
FOX HILLS BASE										
1,584.0	18.54	62.06	1,539.0	3,422.00	152.7	287.8	-115.0	0.00	0.00	0.00
1,600.0	18.54	62.06	1,554.2	3,406.84	155.1	292.3	-116.8	0.00	0.00	0.00
1,700.0	18.54	62.06	1,649.0	3,312.03	170.0	320.4	-128.0	0.00	0.00	0.00
1,800.0	18.54	62.06	1,743.8	3,217.22	184.9	348.5	-139.2	0.00	0.00	0.00
1,900.0	18.54	62.06	1,838.6	3,122.41	199.8	376.6	-150.5	0.00	0.00	0.00
2,000.0	18.54	62.06	1,933.4	3,027.60	214.7	404.7	-161.7	0.00	0.00	0.00
2,100.0	18.54	62.06	2,028.2	2,932.79	229.6	432.8	-172.9	0.00	0.00	0.00
2,200.0	18.54	62.06	2,123.0	2,837.98	244.5	460.9	-184.1	0.00	0.00	0.00
2,300.0	18.54	62.06	2,217.8	2,743.17	259.4	489.0	-195.3	0.00	0.00	0.00
2,400.0	18.54	62.06	2,312.6	2,648.36	274.3	517.0	-206.6	0.00	0.00	0.00
2,500.0	18.54	62.06	2,407.4	2,553.55	289.2	545.1	-217.8	0.00	0.00	0.00
2,600.0	18.54	62.06	2,502.3	2,458.75	304.1	573.2	-229.0	0.00	0.00	0.00
2,700.0	18.54	62.06	2,597.1	2,363.94	319.0	601.3	-240.2	0.00	0.00	0.00
2,800.0	18.54	62.06	2,691.9	2,269.13	333.9	629.4	-251.5	0.00	0.00	0.00
2,900.0	18.54	62.06	2,786.7	2,174.32	348.8	657.5	-262.7	0.00	0.00	0.00
3,000.0	18.54	62.06	2,881.5	2,079.51	363.7	685.6	-273.9	0.00	0.00	0.00
3,100.0	18.54	62.06	2,976.3	1,984.70	378.6	713.7	-285.1	0.00	0.00	0.00
3,200.0	18.54	62.06	3,071.1	1,889.89	393.5	741.8	-296.4	0.00	0.00	0.00
3,300.0	18.54	62.06	3,165.9	1,795.08	408.4	769.9	-307.6	0.00	0.00	0.00
3,400.0	18.54	62.06	3,260.7	1,700.27	423.3	798.0	-318.8	0.00	0.00	0.00
3,500.0	18.54	62.06	3,355.5	1,605.46	438.2	826.1	-330.0	0.00	0.00	0.00
RICHARD SNADSTONE										
3,539.5	18.54	62.06	3,393.0	1,568.00	444.1	837.2	-334.5	0.00	0.00	0.00
3,600.0	18.54	62.06	3,450.3	1,510.65	453.1	854.1	-341.2	0.00	0.00	0.00
PARKMAN SANDSTONE										
3,659.8	18.54	62.06	3,507.0	1,454.00	462.0	870.9	-348.0	0.00	0.00	0.00
3,700.0	18.54	62.06	3,545.2	1,415.84	468.0	882.2	-352.5	0.00	0.00	0.00
3,800.0	18.54	62.06	3,640.0	1,321.04	482.9	910.3	-363.7	0.00	0.00	0.00
3,900.0	18.54	62.06	3,734.8	1,226.23	497.8	938.4	-374.9	0.00	0.00	0.00
4,000.0	18.54	62.06	3,829.6	1,131.42	512.7	966.5	-386.1	0.00	0.00	0.00
4,100.0	18.54	62.06	3,924.4	1,036.61	527.6	994.6	-397.4	0.00	0.00	0.00
4,200.0	18.54	62.06	4,019.2	941.80	542.5	1,022.7	-408.6	0.00	0.00	0.00

Planning Report



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Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4961.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-16HN	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)
4,300.0	18.54	62.06	4,114.0	846.99	557.4	1,050.8	-419.8	0.00	0.00	0.00
4,400.0	18.54	62.06	4,208.8	752.18	572.3	1,078.9	-431.0	0.00	0.00	0.00
SUSSEX SANDSTONE										
4,447.7	18.54	62.06	4,254.0	707.00	579.4	1,092.3	-436.4	0.00	0.00	0.00
4,500.0	18.54	62.06	4,303.6	657.37	587.2	1,107.0	-442.3	0.00	0.00	0.00
4,600.0	18.54	62.06	4,398.4	562.56	602.1	1,135.1	-453.5	0.00	0.00	0.00
4,700.0	18.54	62.06	4,493.2	467.75	617.0	1,163.2	-464.7	0.00	0.00	0.00
4,800.0	18.54	62.06	4,588.1	372.94	631.9	1,191.3	-475.9	0.00	0.00	0.00
4,900.0	18.54	62.06	4,682.9	278.14	646.8	1,219.3	-487.1	0.00	0.00	0.00
SHANNON SANDSTONE										
4,929.7	18.54	62.06	4,711.0	250.00	651.3	1,227.7	-490.5	0.00	0.00	0.00
END OF TANGENT										
4,980.4	18.54	62.06	4,759.1	201.90	658.8	1,241.9	-496.2	0.00	0.00	0.00
5,000.0	18.15	62.06	4,777.7	183.30	661.7	1,247.4	-498.3	2.00	-2.00	0.00
5,100.0	16.15	62.06	4,873.2	87.76	675.5	1,273.4	-508.8	2.00	-2.00	0.00
5,200.0	14.15	62.06	4,969.8	-8.76	687.8	1,296.5	-518.0	2.00	-2.00	0.00
5,300.0	12.15	62.06	5,067.1	-106.14	698.4	1,316.6	-526.0	2.00	-2.00	0.00
5,400.0	10.15	62.06	5,165.2	-204.24	707.5	1,333.7	-532.8	2.00	-2.00	0.00
5,500.0	8.15	62.06	5,264.0	-302.97	714.9	1,347.7	-538.4	2.00	-2.00	0.00
5,600.0	6.15	62.06	5,363.2	-402.18	720.8	1,358.7	-542.8	2.00	-2.00	0.00
5,700.0	4.15	62.06	5,462.8	-501.77	725.0	1,366.7	-546.0	2.00	-2.00	0.00
5,800.0	2.15	62.06	5,562.6	-601.62	727.6	1,371.5	-547.9	2.00	-2.00	0.00
5,900.0	0.15	62.06	5,662.6	-701.59	728.5	1,373.3	-548.6	2.00	-2.00	0.00
EOD TO VERTICAL										
5,907.5	0.00	0.00	5,670.1	-709.10	728.5	1,373.3	-548.7	2.00	-2.00	0.00
6,000.0	0.00	0.00	5,762.6	-801.59	728.5	1,373.3	-548.7	0.00	0.00	0.00
KOP (10°/100ft BUR)										
6,007.5	0.00	0.00	5,770.1	-809.10	728.5	1,373.3	-548.7	0.00	0.00	0.00
6,100.0	9.25	180.84	5,862.2	-901.19	721.1	1,373.2	-541.3	10.00	10.00	0.00
6,200.0	19.25	180.84	5,959.0	-997.99	696.5	1,372.8	-516.9	10.00	10.00	0.00
6,300.0	29.25	180.84	6,050.1	-1,089.05	655.4	1,372.2	-476.3	10.00	10.00	0.00
6,400.0	39.25	180.84	6,132.6	-1,171.60	599.2	1,371.4	-420.7	10.00	10.00	0.00
SHARON SPRINGS										
6,446.0	43.85	180.84	6,167.0	-1,206.00	568.8	1,371.0	-390.5	10.00	10.00	0.00
6,500.0	49.25	180.84	6,204.1	-1,243.14	529.6	1,370.4	-351.7	10.00	10.00	0.00
NIOBRARA A CHALK										
6,563.8	55.63	180.84	6,243.0	-1,282.00	479.0	1,369.6	-301.6	10.00	10.00	0.00
6,600.0	59.26	180.84	6,262.5	-1,301.48	448.5	1,369.2	-271.4	10.00	10.00	0.00
NIOBRARA A CHALK BASE										
6,617.1	60.97	180.84	6,271.0	-1,310.00	433.7	1,369.0	-256.8	10.00	10.00	0.00
NIOBRARA B1 CHALK TOP										
6,697.6	69.01	180.84	6,305.0	-1,344.00	360.8	1,367.9	-184.6	10.00	10.00	0.00
6,700.0	69.26	180.84	6,305.9	-1,344.86	358.6	1,367.9	-182.4	10.00	10.00	0.00
NIOBRARA B1 CHALK BASE										
6,748.1	74.07	180.84	6,321.0	-1,360.00	312.9	1,367.2	-137.2	10.00	10.00	0.00
6,800.0	79.26	180.84	6,333.0	-1,371.96	262.4	1,366.5	-87.2	10.00	10.00	0.00
6,900.0	89.26	180.84	6,343.0	-1,381.95	163.1	1,365.0	11.2	10.00	10.00	0.00
NIOBRARA B2 CHALK TOP										
6,903.7	89.26	180.84	6,343.0	-1,382.00	159.4	1,365.0	14.8	0.00	0.00	0.00
HZ LP: 600ft FNL & 605ft FEL of Sec 30										
6,907.5	90.00	180.84	6,343.0	-1,382.00	155.6	1,364.9	18.6	19.87	19.87	0.00
7,000.0	90.00	180.84	6,343.0	-1,381.99	63.1	1,363.6	110.2	0.01	0.00	0.01
7,100.0	90.00	180.85	6,343.0	-1,381.98	-36.9	1,362.1	209.2	0.01	0.00	0.01

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-16HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4961.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4961.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-16HN	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	180.86	6,343.0	-1,381.98	-136.9	1,360.6	308.2	0.01	0.00	0.01
7,300.0	90.00	180.86	6,343.0	-1,381.97	-236.9	1,359.1	407.1	0.01	0.00	0.01
7,400.0	90.00	180.87	6,343.0	-1,381.96	-336.9	1,357.6	506.1	0.01	0.00	0.01
7,500.0	90.00	180.88	6,343.0	-1,381.95	-436.9	1,356.0	605.1	0.01	0.00	0.01
7,600.0	90.00	180.88	6,342.9	-1,381.95	-536.8	1,354.5	704.1	0.01	0.00	0.01
7,700.0	90.00	180.89	6,342.9	-1,381.94	-636.8	1,353.0	803.1	0.01	0.00	0.01
7,800.0	90.00	180.90	6,342.9	-1,381.93	-736.8	1,351.4	902.1	0.01	0.00	0.01
7,900.0	90.00	180.90	6,342.9	-1,381.93	-836.8	1,349.8	1,001.1	0.01	0.00	0.01
8,000.0	90.00	180.91	6,342.9	-1,381.92	-936.8	1,348.2	1,100.1	0.01	0.00	0.01
8,100.0	90.00	180.92	6,342.9	-1,381.91	-1,036.8	1,346.7	1,199.0	0.01	0.00	0.01
8,200.0	90.00	180.92	6,342.9	-1,381.91	-1,136.8	1,345.0	1,298.0	0.01	0.00	0.01
8,300.0	90.00	180.93	6,342.9	-1,381.90	-1,236.8	1,343.4	1,397.0	0.01	0.00	0.01
8,400.0	90.00	180.94	6,342.9	-1,381.89	-1,336.7	1,341.8	1,496.0	0.01	0.00	0.01
8,500.0	90.00	180.94	6,342.9	-1,381.89	-1,436.7	1,340.2	1,594.9	0.01	0.00	0.01
8,600.0	90.00	180.95	6,342.9	-1,381.88	-1,536.7	1,338.5	1,693.9	0.01	0.00	0.01
8,700.0	90.00	180.96	6,342.9	-1,381.88	-1,636.7	1,336.8	1,792.9	0.01	0.00	0.01
8,800.0	90.00	180.96	6,342.9	-1,381.87	-1,736.7	1,335.2	1,891.8	0.01	0.00	0.01
8,900.0	90.00	180.97	6,342.9	-1,381.87	-1,836.7	1,333.5	1,990.8	0.01	0.00	0.01
9,000.0	90.00	180.98	6,342.9	-1,381.86	-1,936.7	1,331.8	2,089.8	0.01	0.00	0.01
9,100.0	90.00	180.98	6,342.9	-1,381.86	-2,036.6	1,330.1	2,188.7	0.01	0.00	0.01
9,200.0	90.00	180.99	6,342.9	-1,381.85	-2,136.6	1,328.4	2,287.7	0.01	0.00	0.01
9,300.0	90.00	181.00	6,342.9	-1,381.85	-2,236.6	1,326.6	2,386.7	0.01	0.00	0.01
9,400.0	90.00	181.00	6,342.8	-1,381.85	-2,336.6	1,324.9	2,485.6	0.01	0.00	0.01
9,500.0	90.00	181.01	6,342.8	-1,381.84	-2,436.6	1,323.1	2,584.6	0.01	0.00	0.01
9,600.0	90.00	181.01	6,342.8	-1,381.84	-2,536.6	1,321.4	2,683.5	0.01	0.00	0.01
9,700.0	90.00	181.02	6,342.8	-1,381.84	-2,636.6	1,319.6	2,782.5	0.01	0.00	0.01
9,800.0	90.00	181.03	6,342.8	-1,381.83	-2,736.5	1,317.8	2,881.4	0.01	0.00	0.01
9,900.0	90.00	181.03	6,342.8	-1,381.83	-2,836.5	1,316.0	2,980.4	0.01	0.00	0.01
10,000.0	90.00	181.04	6,342.8	-1,381.83	-2,936.5	1,314.2	3,079.3	0.01	0.00	0.01
10,100.0	90.00	181.05	6,342.8	-1,381.82	-3,036.5	1,312.4	3,178.3	0.01	0.00	0.01
10,200.0	90.00	181.05	6,342.8	-1,381.82	-3,136.5	1,310.5	3,277.2	0.01	0.00	0.01
10,300.0	90.00	181.06	6,342.8	-1,381.82	-3,236.5	1,308.7	3,376.2	0.01	0.00	0.01
10,400.0	90.00	181.07	6,342.8	-1,381.82	-3,336.4	1,306.8	3,475.1	0.01	0.00	0.01
10,500.0	90.00	181.07	6,342.8	-1,381.81	-3,436.4	1,305.0	3,574.1	0.01	0.00	0.01
10,600.0	90.00	181.08	6,342.8	-1,381.81	-3,536.4	1,303.1	3,673.0	0.01	0.00	0.01
10,700.0	90.00	181.09	6,342.8	-1,381.81	-3,636.4	1,301.2	3,771.9	0.01	0.00	0.01
10,800.0	90.00	181.09	6,342.8	-1,381.81	-3,736.4	1,299.3	3,870.9	0.01	0.00	0.01
10,900.0	90.00	181.10	6,342.8	-1,381.81	-3,836.3	1,297.4	3,969.8	0.01	0.00	0.01
11,000.0	90.00	181.11	6,342.8	-1,381.81	-3,936.3	1,295.5	4,068.7	0.01	0.00	0.01
11,100.0	90.00	181.11	6,342.8	-1,381.81	-4,036.3	1,293.5	4,167.7	0.01	0.00	0.01
11,200.0	90.00	181.12	6,342.8	-1,381.80	-4,136.3	1,291.6	4,266.6	0.01	0.00	0.01
11,300.0	90.00	181.13	6,342.8	-1,381.80	-4,236.3	1,289.6	4,365.5	0.01	0.00	0.01
11,400.0	90.00	181.13	6,342.8	-1,381.80	-4,336.3	1,287.6	4,464.4	0.01	0.00	0.01
11,500.0	90.00	181.14	6,342.8	-1,381.80	-4,436.2	1,285.7	4,563.4	0.01	0.00	0.01
11,600.0	90.00	181.15	6,342.8	-1,381.80	-4,536.2	1,283.7	4,662.3	0.01	0.00	0.01
11,700.0	90.00	181.15	6,342.8	-1,381.80	-4,636.2	1,281.7	4,761.2	0.01	0.00	0.01
11,800.0	90.00	181.16	6,342.8	-1,381.80	-4,736.2	1,279.6	4,860.1	0.01	0.00	0.01
11,900.0	90.00	181.17	6,342.8	-1,381.80	-4,836.2	1,277.6	4,959.0	0.01	0.00	0.01
12,000.0	90.00	181.17	6,342.8	-1,381.80	-4,936.1	1,275.6	5,058.0	0.01	0.00	0.01
12,100.0	90.00	181.18	6,342.8	-1,381.81	-5,036.1	1,273.5	5,156.9	0.01	0.00	0.01
12,200.0	90.00	181.18	6,342.8	-1,381.81	-5,136.1	1,271.5	5,255.8	0.01	0.00	0.01
12,300.0	90.00	181.19	6,342.8	-1,381.81	-5,236.1	1,269.4	5,354.7	0.01	0.00	0.01
12,400.0	90.00	181.20	6,342.8	-1,381.81	-5,336.0	1,267.3	5,453.6	0.01	0.00	0.01
12,500.0	90.00	181.20	6,342.8	-1,381.81	-5,436.0	1,265.2	5,552.5	0.01	0.00	0.01

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-16HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4961.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4961.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-16HN	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	181.21	6,342.8	-1,381.81	-5,536.0	1,263.1	5,651.4	0.01	0.00	0.01
12,700.0	90.00	181.22	6,342.8	-1,381.81	-5,636.0	1,261.0	5,750.3	0.01	0.00	0.01
12,800.0	90.00	181.22	6,342.8	-1,381.82	-5,736.0	1,258.9	5,849.2	0.01	0.00	0.01
12,900.0	90.00	181.23	6,342.8	-1,381.82	-5,835.9	1,256.7	5,948.1	0.01	0.00	0.01
13,000.0	90.00	181.24	6,342.8	-1,381.82	-5,935.9	1,254.6	6,047.0	0.01	0.00	0.01
13,100.0	90.00	181.24	6,342.8	-1,381.82	-6,035.9	1,252.4	6,145.9	0.01	0.00	0.01
13,200.0	90.00	181.25	6,342.8	-1,381.83	-6,135.9	1,250.2	6,244.8	0.01	0.00	0.01
13,300.0	90.00	181.26	6,342.8	-1,381.83	-6,235.8	1,248.0	6,343.7	0.01	0.00	0.01
13,400.0	90.00	181.26	6,342.8	-1,381.83	-6,335.8	1,245.8	6,442.6	0.01	0.00	0.01
13,500.0	90.00	181.27	6,342.8	-1,381.84	-6,435.8	1,243.6	6,541.5	0.01	0.00	0.01
13,600.0	90.00	181.28	6,342.8	-1,381.84	-6,535.8	1,241.4	6,640.4	0.01	0.00	0.01
13,700.0	90.00	181.28	6,342.8	-1,381.84	-6,635.7	1,239.2	6,739.3	0.01	0.00	0.01
13,800.0	90.00	181.29	6,342.8	-1,381.85	-6,735.7	1,236.9	6,838.1	0.01	0.00	0.01
13,900.0	90.00	181.30	6,342.9	-1,381.85	-6,835.7	1,234.7	6,937.0	0.01	0.00	0.01
14,000.0	90.00	181.30	6,342.9	-1,381.85	-6,935.7	1,232.4	7,035.9	0.01	0.00	0.01
14,100.0	90.00	181.31	6,342.9	-1,381.86	-7,035.6	1,230.1	7,134.8	0.01	0.00	0.01
14,200.0	90.00	181.32	6,342.9	-1,381.86	-7,135.6	1,227.8	7,233.7	0.01	0.00	0.01
14,300.0	90.00	181.32	6,342.9	-1,381.87	-7,235.6	1,225.5	7,332.5	0.01	0.00	0.01
14,400.0	90.00	181.33	6,342.9	-1,381.87	-7,335.6	1,223.2	7,431.4	0.01	0.00	0.01
14,500.0	90.00	181.34	6,342.9	-1,381.88	-7,435.5	1,220.9	7,530.3	0.01	0.00	0.01
14,600.0	90.00	181.34	6,342.9	-1,381.88	-7,535.5	1,218.5	7,629.2	0.01	0.00	0.01
14,700.0	90.00	181.35	6,342.9	-1,381.89	-7,635.5	1,216.2	7,728.0	0.01	0.00	0.01
14,800.0	90.00	181.36	6,342.9	-1,381.90	-7,735.4	1,213.8	7,826.9	0.01	0.00	0.01
14,900.0	90.00	181.36	6,342.9	-1,381.90	-7,835.4	1,211.5	7,925.8	0.01	0.00	0.01
15,000.0	90.00	181.37	6,342.9	-1,381.91	-7,935.4	1,209.1	8,024.6	0.01	0.00	0.01
15,100.0	90.00	181.37	6,342.9	-1,381.91	-8,035.4	1,206.7	8,123.5	0.01	0.00	0.01
15,200.0	90.00	181.38	6,342.9	-1,381.92	-8,135.3	1,204.3	8,222.4	0.01	0.00	0.01
15,300.0	90.00	181.39	6,342.9	-1,381.93	-8,235.3	1,201.9	8,321.2	0.01	0.00	0.01
15,400.0	90.00	181.39	6,342.9	-1,381.93	-8,335.3	1,199.4	8,420.1	0.01	0.00	0.01
15,500.0	90.00	181.40	6,342.9	-1,381.94	-8,435.2	1,197.0	8,518.9	0.01	0.00	0.01
15,600.0	90.00	181.41	6,342.9	-1,381.95	-8,535.2	1,194.6	8,617.8	0.01	0.00	0.01
15,700.0	90.00	181.41	6,343.0	-1,381.95	-8,635.2	1,192.1	8,716.6	0.01	0.00	0.01
15,800.0	90.00	181.42	6,343.0	-1,381.96	-8,735.2	1,189.6	8,815.5	0.01	0.00	0.01
15,900.0	90.00	181.43	6,343.0	-1,381.97	-8,835.1	1,187.1	8,914.3	0.01	0.00	0.01
16,000.0	90.00	181.43	6,343.0	-1,381.98	-8,935.1	1,184.6	9,013.2	0.01	0.00	0.01
16,100.0	90.00	181.44	6,343.0	-1,381.98	-9,035.1	1,182.1	9,112.0	0.01	0.00	0.01
16,200.0	90.00	181.45	6,343.0	-1,381.99	-9,135.0	1,179.6	9,210.9	0.01	0.00	0.01
BHL: 600ft FSL & 605ft FEL of Sec 31										
16,284.6	90.00	181.45	6,343.0	-1,382.00	-9,219.6	1,177.5	9,294.5	0.01	0.00	0.01

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-16HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4961.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4961.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-16HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,584.0	1,539.0	FOX HILLS BASE			
3,539.5	3,393.0	RICHARD SNADSTONE			
3,659.8	3,507.0	PARKMAN SANDSTONE			
4,447.7	4,254.0	SUSSEX SANDSTONE			
4,929.7	4,711.0	SHANNON SANDSTONE			
6,446.0	6,167.0	SHARON SPRINGS			
6,563.8	6,243.0	NIOBRARA A CHALK			
6,617.1	6,271.0	NIOBRARA A CHALK BASE			
6,697.6	6,305.0	NIOBRARA B1 CHALK TOP			
6,748.1	6,321.0	NIOBRARA B1 CHALK BASE			
6,903.7	6,343.0	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: 752ft FNL & 1967ft FEL of Sec 30
100.0	100.0	0.0	0.0	START NUDGE (2°/100ft BUR)
1,027.1	1,011.0	69.7	131.4	EOB TO 18.54° INC
4,980.4	4,759.1	658.8	1,241.9	END OF TANGENT
5,907.5	5,670.1	728.5	1,373.3	EOD TO VERTICAL
6,007.5	5,770.1	728.5	1,373.3	KOP (10°/100ft BUR)
6,907.5	6,343.0	155.6	1,364.9	HZ LP: 600ft FNL & 605ft FEL of Sec 30
16,284.6	6,343.0	-9,219.6	1,177.5	BHL: 600ft FSL & 605ft FEL of Sec 31