

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

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

GADWALL 30-31-1HN

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 30-31-1HN
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: 745ft FNL & 2342ft FEL of Sec 30			
100.0	100.0	0.00	0.00	0.0	0.0	0.0	0.0	START NUDGE (2.5°/100ft BUR)			
1204.8	1252.8	28.82	287.12	83.6	-271.3	-11.0	283.9	EOB TO 28.82° INC			
4567.2	5090.6	28.82	287.12	628.2	-2039.3	-82.7	2133.9	END OF TANGENT			
5672.0	6243.3	0.00	0.00	711.8	-2310.6	-93.7	2417.8	EOD TO VERTICAL			
5772.0	6343.3	0.00	0.00	711.8	-2310.6	-93.7	2417.8	KOP (10°/100ft BUR)			
6345.0	7243.3	90.00	180.84	138.9	-2319.0	462.1	2990.7	HZ LP: 600ft FNL & 605ft FWL of Sec 30			
6345.0	16616.2	90.00	180.85	-9233.0	-2456.8	9554.3	12363.6	BHL: 600ft FSL & 605ft FWL of Sec 31			

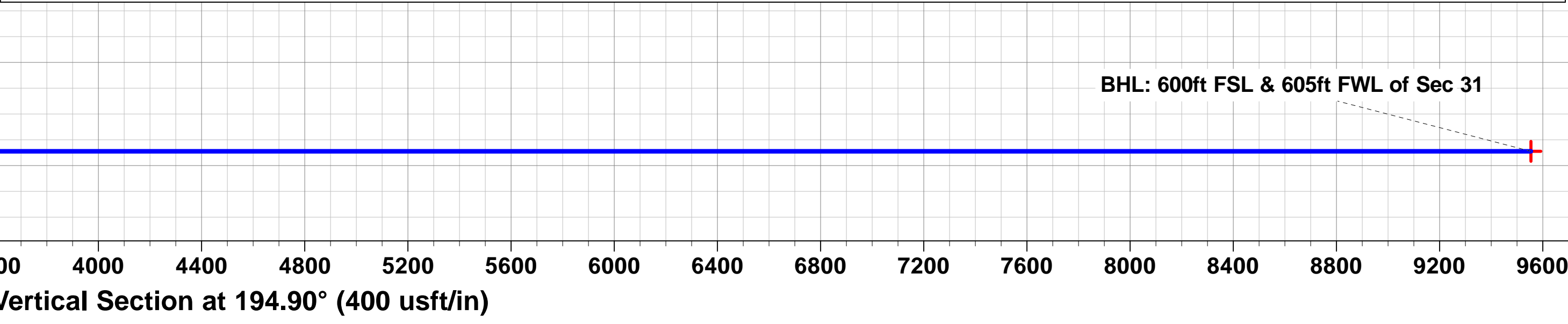
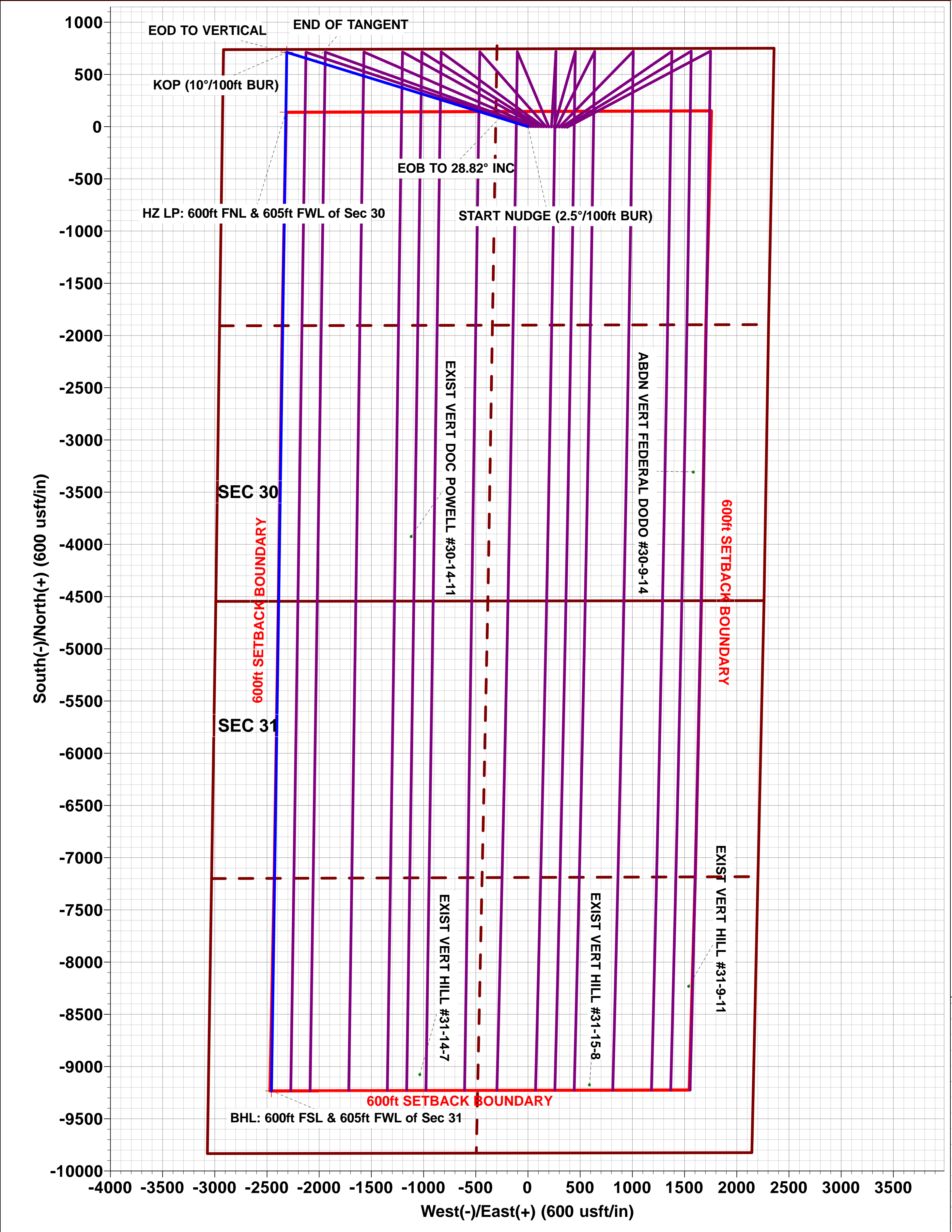
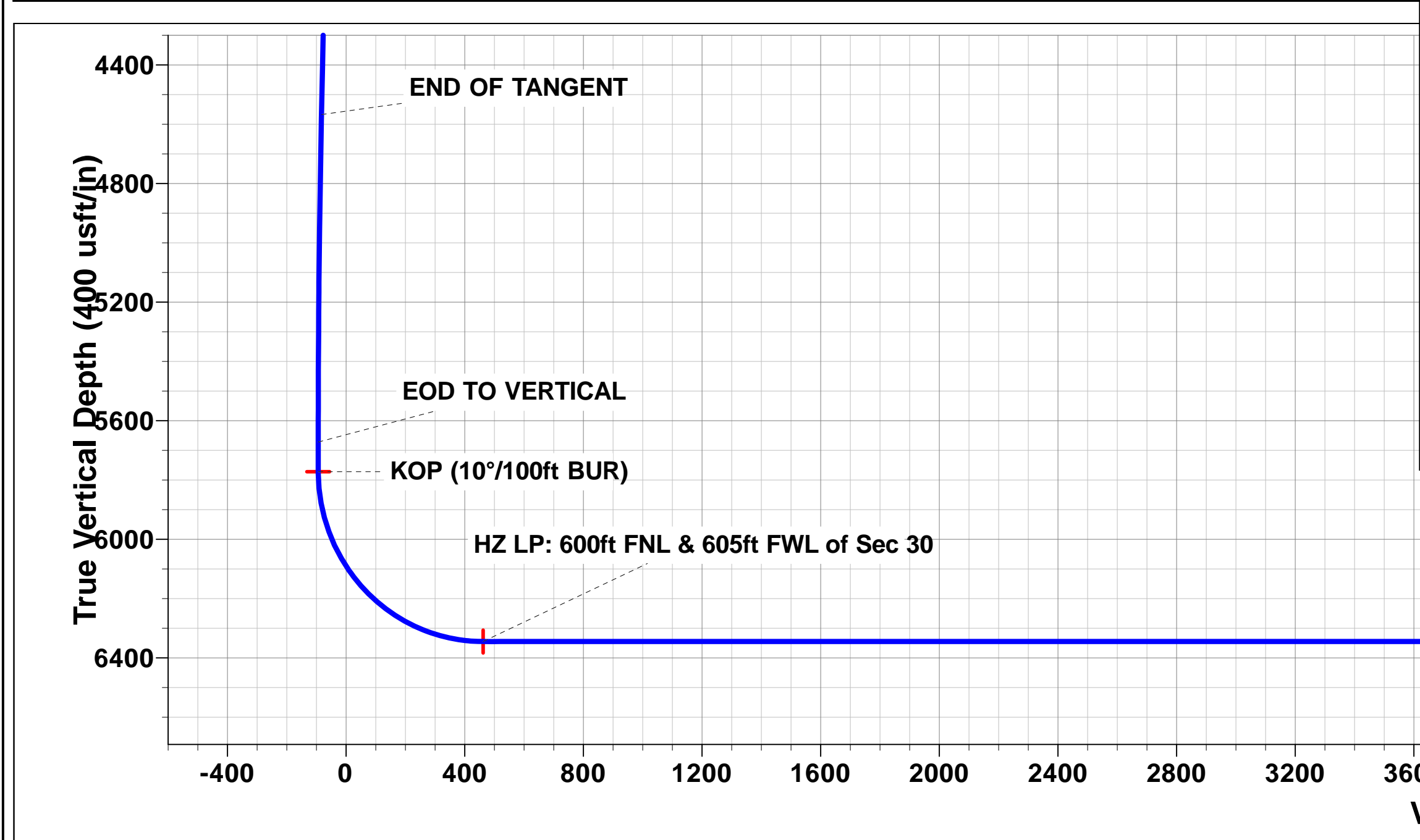
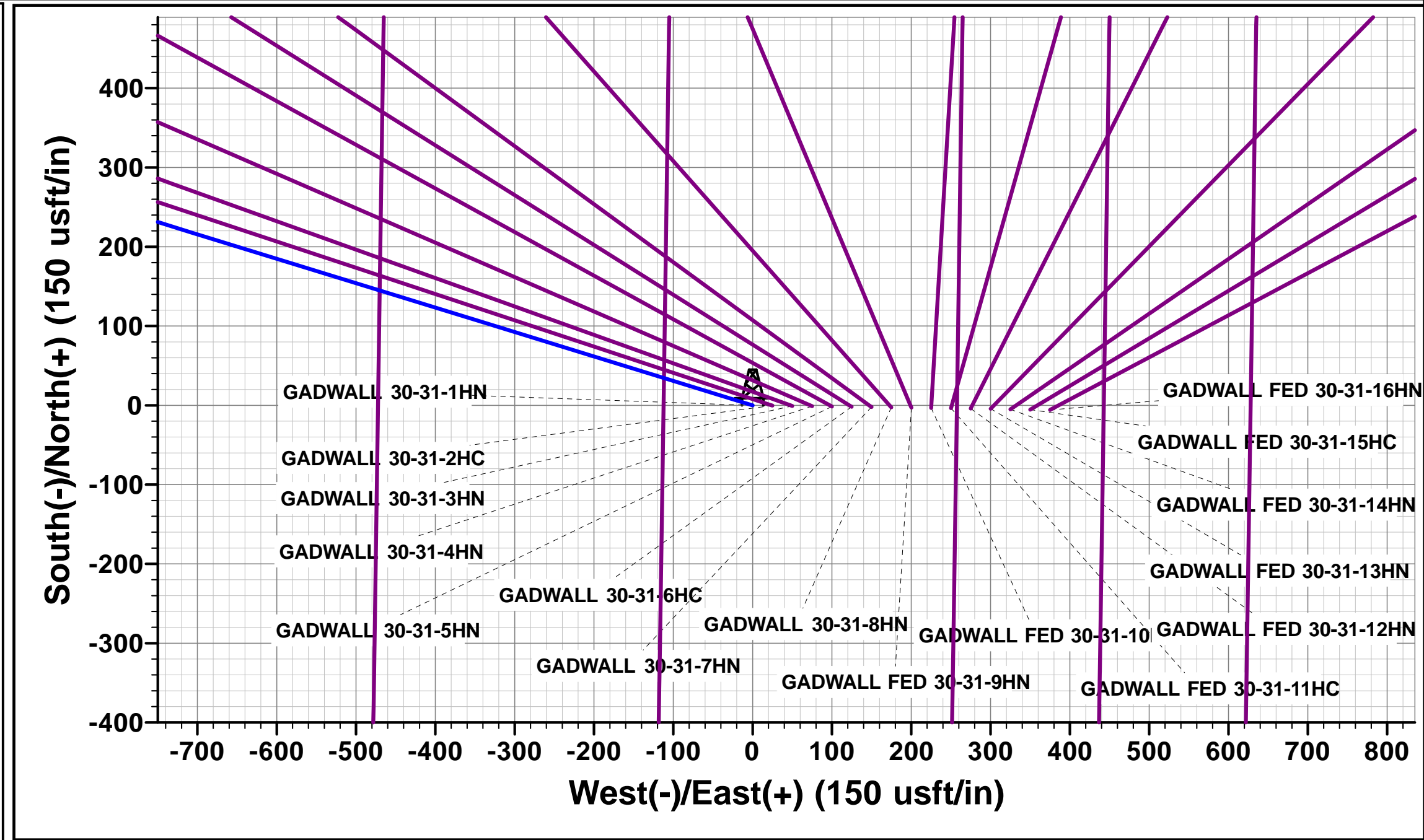
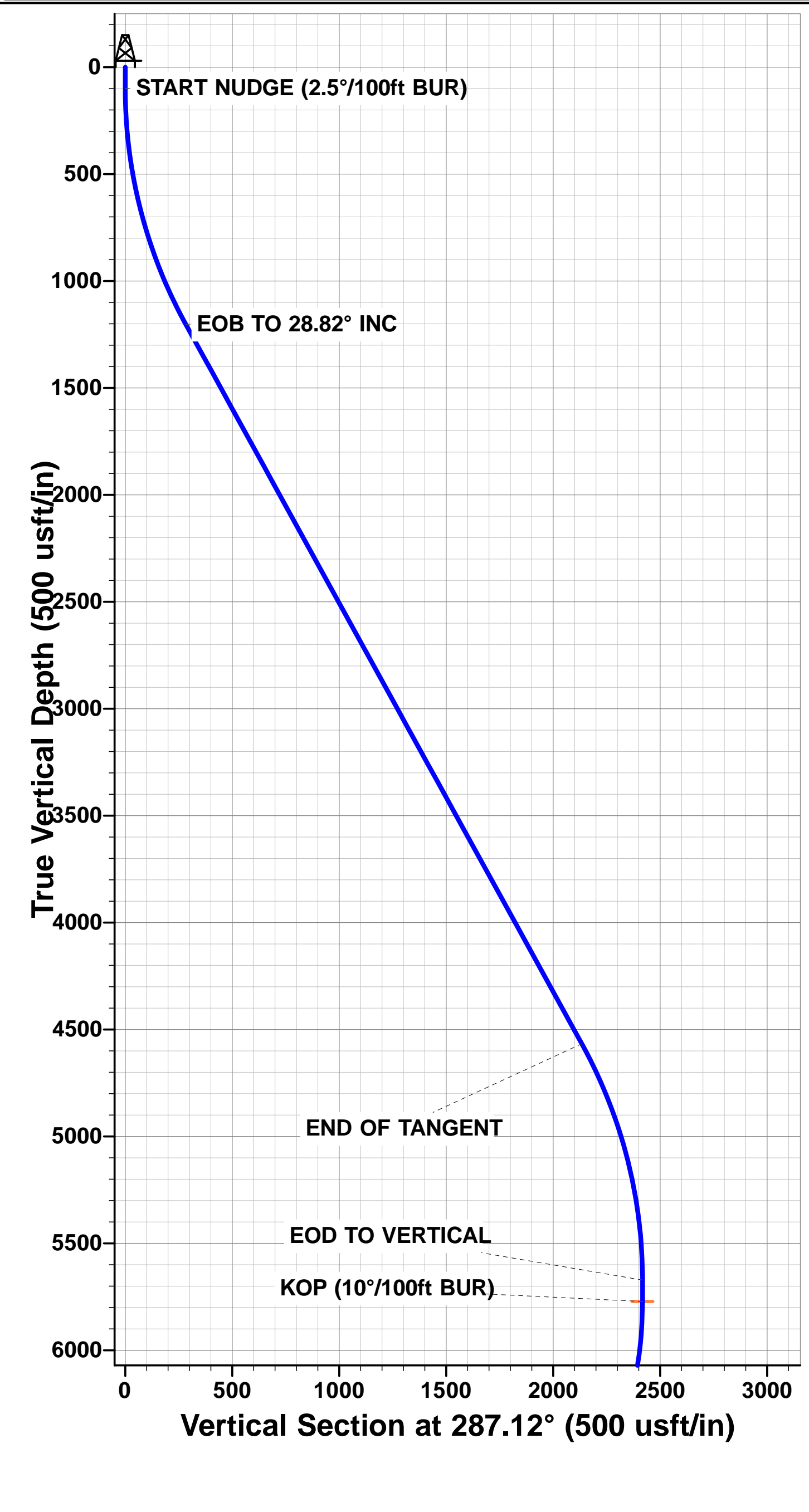
PROPOSED LOCAL COORDINATES:

SHL: 745ft FNL & 2342ft FEL of Sec 30

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

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

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP: GADWALL 30-31-1HN	5772.0	711.8	-2310.6	40.640393	-104.142142
HZ LP: GADWALL 30-31-1HN	6345.0	138.9	-2319.9	40.638821	-104.142175
BHL: GADWALL 30-31-1HN	6345.0	-9233.0	-2456.8	40.613097	-104.142665



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL 30-31-1HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-1HN	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 30-31-1HN					
Well Position	+N/-S	0.0 usft	Northing:	1,478,346.58 usft	Latitude:	40.638440
	+E/-W	0.0 usft	Easting:	3,379,143.09 usft	Longitude:	-104.133816
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,947.0 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	194.90

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	-4,963.0	0.0	0.0	0.00	0.00	0.00	0.00	
100.0	0.00	0.00	100.0	-4,863.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,252.8	28.82	287.12	1,204.8	-3,758.2	83.6	-271.3	2.50	2.50	0.00	287.12	
5,090.6	28.82	287.12	4,567.2	-395.8	628.2	-2,039.3	0.00	0.00	0.00	0.00	
6,243.3	0.00	0.00	5,672.0	709.0	711.8	-2,310.6	2.50	-2.50	0.00	180.00	
6,343.3	0.00	0.00	5,772.0	809.0	711.8	-2,310.6	0.00	0.00	0.00	0.00	KOP: GADWALL 30-3
7,243.3	90.00	180.84	6,345.0	1,382.0	138.9	-2,319.0	10.00	10.00	0.00	180.84	
16,616.2	90.00	180.85	6,345.0	1,382.0	-9,233.0	-2,456.8	0.00	0.00	0.00	95.56	BHL: GADWALL 30-3

Planning Report



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Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-1HN	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: 745ft FNL & 2342ft FEL of Sec 30										
0.0	0.00	0.00	0.0	4,963.00	0.0	0.0	0.0	0.00	0.00	0.00
START NUDGE (2.5°/100ft BUR)										
100.0	0.00	0.00	100.0	4,863.00	0.0	0.0	0.0	0.00	0.00	0.00
200.0	2.50	287.12	200.0	4,763.03	0.6	-2.1	-0.1	2.50	2.50	0.00
300.0	5.00	287.12	299.7	4,663.25	2.6	-8.3	-0.3	2.50	2.50	0.00
400.0	7.50	287.12	399.1	4,563.86	5.8	-18.7	-0.8	2.50	2.50	0.00
500.0	10.00	287.12	498.0	4,465.03	10.3	-33.3	-1.3	2.50	2.50	0.00
600.0	12.50	287.12	596.0	4,366.96	16.0	-51.9	-2.1	2.50	2.50	0.00
700.0	15.00	287.12	693.2	4,269.83	23.0	-74.6	-3.0	2.50	2.50	0.00
800.0	17.50	287.12	789.2	4,173.83	31.2	-101.4	-4.1	2.50	2.50	0.00
900.0	20.00	287.12	883.9	4,079.15	40.7	-132.1	-5.4	2.50	2.50	0.00
1,000.0	22.50	287.12	977.0	3,985.95	51.4	-166.7	-6.8	2.50	2.50	0.00
1,100.0	25.00	287.12	1,068.6	3,894.43	63.2	-205.2	-8.3	2.50	2.50	0.00
1,200.0	27.50	287.12	1,158.2	3,804.75	76.2	-247.5	-10.0	2.50	2.50	0.00
EOB TO 28.82° INC										
1,252.8	28.82	287.12	1,204.8	3,758.21	83.6	-271.3	-11.0	2.50	2.50	0.00
1,300.0	28.82	287.12	1,246.2	3,716.85	90.3	-293.0	-11.9	0.00	0.00	0.00
1,400.0	28.82	287.12	1,333.8	3,629.23	104.5	-339.1	-13.8	0.00	0.00	0.00
1,500.0	28.82	287.12	1,421.4	3,541.62	118.7	-385.2	-15.6	0.00	0.00	0.00
1,600.0	28.82	287.12	1,509.0	3,454.01	132.8	-431.2	-17.5	0.00	0.00	0.00
FOX HILLS BASE										
1,636.5	28.82	287.12	1,541.0	3,422.00	138.0	-448.1	-18.2	0.00	0.00	0.00
1,700.0	28.82	287.12	1,596.6	3,366.39	147.0	-477.3	-19.4	0.00	0.00	0.00
1,800.0	28.82	287.12	1,684.2	3,278.78	161.2	-523.4	-21.2	0.00	0.00	0.00
1,900.0	28.82	287.12	1,771.8	3,191.16	175.4	-569.4	-23.1	0.00	0.00	0.00
2,000.0	28.82	287.12	1,859.5	3,103.55	189.6	-615.5	-25.0	0.00	0.00	0.00
2,100.0	28.82	287.12	1,947.1	3,015.94	203.8	-661.6	-26.8	0.00	0.00	0.00
2,200.0	28.82	287.12	2,034.7	2,928.32	218.0	-707.7	-28.7	0.00	0.00	0.00
2,300.0	28.82	287.12	2,122.3	2,840.71	232.2	-753.7	-30.6	0.00	0.00	0.00
2,400.0	28.82	287.12	2,209.9	2,753.09	246.4	-799.8	-32.4	0.00	0.00	0.00
2,500.0	28.82	287.12	2,297.5	2,665.48	260.6	-845.9	-34.3	0.00	0.00	0.00
2,600.0	28.82	287.12	2,385.1	2,577.87	274.8	-891.9	-36.2	0.00	0.00	0.00
2,700.0	28.82	287.12	2,472.7	2,490.25	289.0	-938.0	-38.0	0.00	0.00	0.00
2,800.0	28.82	287.12	2,560.4	2,402.64	303.2	-984.1	-39.9	0.00	0.00	0.00
2,900.0	28.82	287.12	2,648.0	2,315.02	317.3	-1,030.1	-41.8	0.00	0.00	0.00
3,000.0	28.82	287.12	2,735.6	2,227.41	331.5	-1,076.2	-43.6	0.00	0.00	0.00
3,100.0	28.82	287.12	2,823.2	2,139.80	345.7	-1,122.3	-45.5	0.00	0.00	0.00
3,200.0	28.82	287.12	2,910.8	2,052.18	359.9	-1,168.3	-47.4	0.00	0.00	0.00
3,300.0	28.82	287.12	2,998.4	1,964.57	374.1	-1,214.4	-49.2	0.00	0.00	0.00
3,400.0	28.82	287.12	3,086.0	1,876.95	388.3	-1,260.5	-51.1	0.00	0.00	0.00
3,500.0	28.82	287.12	3,173.7	1,789.34	402.5	-1,306.6	-53.0	0.00	0.00	0.00
3,600.0	28.82	287.12	3,261.3	1,701.73	416.7	-1,352.6	-54.9	0.00	0.00	0.00
3,700.0	28.82	287.12	3,348.9	1,614.11	430.9	-1,398.7	-56.7	0.00	0.00	0.00
RICHARD SNADSTONE										
3,752.6	28.82	287.12	3,395.0	1,568.00	438.3	-1,422.9	-57.7	0.00	0.00	0.00
3,800.0	28.82	287.12	3,436.5	1,526.50	445.1	-1,444.8	-58.6	0.00	0.00	0.00
PARKMAN SANDSTONE										
3,882.7	28.82	287.12	3,509.0	1,454.00	456.8	-1,482.9	-60.1	0.00	0.00	0.00
3,900.0	28.82	287.12	3,524.1	1,438.88	459.3	-1,490.8	-60.5	0.00	0.00	0.00
4,000.0	28.82	287.12	3,611.7	1,351.27	473.5	-1,536.9	-62.3	0.00	0.00	0.00
4,100.0	28.82	287.12	3,699.3	1,263.66	487.6	-1,583.0	-64.2	0.00	0.00	0.00
4,200.0	28.82	287.12	3,787.0	1,176.04	501.8	-1,629.0	-66.1	0.00	0.00	0.00

Planning Report



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Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-1HN	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	28.82	287.12	3,874.6	1,088.43	516.0	-1,675.1	-67.9	0.00	0.00	0.00
4,400.0	28.82	287.12	3,962.2	1,000.81	530.2	-1,721.2	-69.8	0.00	0.00	0.00
4,500.0	28.82	287.12	4,049.8	913.20	544.4	-1,767.3	-71.7	0.00	0.00	0.00
4,600.0	28.82	287.12	4,137.4	825.59	558.6	-1,813.3	-73.5	0.00	0.00	0.00
4,700.0	28.82	287.12	4,225.0	737.97	572.8	-1,859.4	-75.4	0.00	0.00	0.00
SUSSEX SANDSTONE										
4,735.4	28.82	287.12	4,256.0	707.00	577.8	-1,875.7	-76.1	0.00	0.00	0.00
4,800.0	28.82	287.12	4,312.6	650.36	587.0	-1,905.5	-77.3	0.00	0.00	0.00
4,900.0	28.82	287.12	4,400.3	562.74	601.2	-1,951.5	-79.1	0.00	0.00	0.00
5,000.0	28.82	287.12	4,487.9	475.13	615.4	-1,997.6	-81.0	0.00	0.00	0.00
END OF TANGENT										
5,090.6	28.82	287.12	4,567.2	395.79	628.2	-2,039.3	-82.7	0.00	0.00	0.00
5,100.0	28.58	287.12	4,575.5	387.51	629.6	-2,043.7	-82.9	2.50	-2.50	0.00
5,200.0	26.08	287.12	4,664.3	298.68	643.1	-2,087.5	-84.7	2.50	-2.50	0.00
SHANNON SANDSTONE										
5,253.9	24.74	287.12	4,713.0	250.00	649.9	-2,109.6	-85.6	2.50	-2.50	0.00
5,300.0	23.58	287.12	4,755.1	207.93	655.4	-2,127.7	-86.3	2.50	-2.50	0.00
5,400.0	21.08	287.12	4,847.6	115.44	666.6	-2,164.0	-87.8	2.50	-2.50	0.00
5,500.0	18.58	287.12	4,941.6	21.38	676.6	-2,196.4	-89.1	2.50	-2.50	0.00
5,600.0	16.08	287.12	5,037.1	-74.07	685.4	-2,224.9	-90.2	2.50	-2.50	0.00
5,700.0	13.58	287.12	5,133.7	-170.73	692.9	-2,249.3	-91.2	2.50	-2.50	0.00
5,800.0	11.08	287.12	5,231.4	-268.41	699.2	-2,269.7	-92.0	2.50	-2.50	0.00
5,900.0	8.58	287.12	5,329.9	-366.94	704.2	-2,286.1	-92.7	2.50	-2.50	0.00
6,000.0	6.08	287.12	5,429.1	-466.11	708.0	-2,298.3	-93.2	2.50	-2.50	0.00
6,100.0	3.58	287.12	5,528.7	-565.75	710.5	-2,306.3	-93.5	2.50	-2.50	0.00
6,200.0	1.08	287.12	5,628.7	-665.66	711.7	-2,310.2	-93.7	2.50	-2.50	0.00
EOD TO VERTICAL										
6,243.3	0.00	0.00	5,672.0	-709.00	711.8	-2,310.6	-93.7	2.50	-2.50	0.00
6,300.0	0.00	0.00	5,728.7	-765.65	711.8	-2,310.6	-93.7	0.00	0.00	0.00
KOP (10°/100ft BUR)										
6,343.3	0.00	0.00	5,772.0	-809.00	711.8	-2,310.6	-93.7	0.00	0.00	0.00
6,400.0	5.67	180.84	5,828.6	-865.56	709.0	-2,310.6	-91.0	10.00	10.00	0.00
6,500.0	15.67	180.84	5,926.7	-963.71	690.5	-2,310.9	-73.1	10.00	10.00	0.00
6,600.0	25.67	180.84	6,020.2	-1,057.16	655.3	-2,311.4	-38.9	10.00	10.00	0.00
6,700.0	35.67	180.84	6,106.1	-1,143.06	604.3	-2,312.2	10.5	10.00	10.00	0.00
SHARON SPRINGS										
6,781.9	43.86	180.84	6,169.0	-1,206.00	552.0	-2,312.9	61.3	10.00	10.00	0.00
6,800.0	45.67	180.84	6,181.8	-1,218.82	539.3	-2,313.1	73.7	10.00	10.00	0.00
NIOBRARA A CHALK										
6,899.8	55.64	180.84	6,245.0	-1,282.00	462.2	-2,314.3	148.4	10.00	10.00	0.00
6,900.0	55.67	180.84	6,245.1	-1,282.12	462.0	-2,314.3	148.6	10.00	10.00	0.00
NIOBRARA A CHALK BASE										
6,953.1	60.98	180.84	6,273.0	-1,310.00	416.9	-2,314.9	192.4	10.00	10.00	0.00
7,000.0	65.67	180.84	6,294.1	-1,331.05	375.0	-2,315.5	233.1	10.00	10.00	0.00
NIOBRARA B1 CHALK TOP										
7,033.6	69.03	180.84	6,307.0	-1,344.00	344.0	-2,316.0	263.2	10.00	10.00	0.00
NIOBRARA B1 CHALK BASE										
7,084.2	74.09	180.84	6,323.0	-1,360.00	296.0	-2,316.7	309.7	10.00	10.00	0.00
7,100.0	75.67	180.84	6,327.1	-1,364.12	280.7	-2,316.9	324.5	10.00	10.00	0.00
7,200.0	85.67	180.84	6,343.3	-1,380.32	182.2	-2,318.4	420.1	10.00	10.00	0.00
HZ LP: 600ft FNL & 605ft FWL of Sec 30 - NIOBRARA B2 CHALK TOP										
7,243.3	90.00	180.84	6,345.0	-1,382.00	138.9	-2,319.0	462.1	10.00	10.00	0.00
7,300.0	90.00	180.84	6,345.0	-1,381.96	82.3	-2,319.8	517.0	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL 30-31-1HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-1HN	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)
7,400.0	90.00	180.84	6,345.0	-1,381.96	-17.7	-2,321.3	614.0	0.00	0.00	0.00
7,500.0	90.00	180.84	6,345.0	-1,381.96	-117.7	-2,322.8	711.1	0.00	0.00	0.00
7,600.0	90.00	180.84	6,345.0	-1,381.96	-217.7	-2,324.2	808.1	0.00	0.00	0.00
7,700.0	90.00	180.84	6,345.0	-1,381.96	-317.7	-2,325.7	905.1	0.00	0.00	0.00
7,800.0	90.00	180.84	6,345.0	-1,381.96	-417.7	-2,327.2	1,002.1	0.00	0.00	0.00
7,900.0	90.00	180.84	6,345.0	-1,381.96	-517.7	-2,328.6	1,099.1	0.00	0.00	0.00
8,000.0	90.00	180.84	6,345.0	-1,381.96	-617.7	-2,330.1	1,196.1	0.00	0.00	0.00
8,100.0	90.00	180.84	6,345.0	-1,381.96	-717.7	-2,331.6	1,293.1	0.00	0.00	0.00
8,200.0	90.00	180.84	6,345.0	-1,381.96	-817.6	-2,333.0	1,390.1	0.00	0.00	0.00
8,300.0	90.00	180.84	6,345.0	-1,381.96	-917.6	-2,334.5	1,487.1	0.00	0.00	0.00
8,400.0	90.00	180.84	6,345.0	-1,381.96	-1,017.6	-2,336.0	1,584.1	0.00	0.00	0.00
8,500.0	90.00	180.84	6,345.0	-1,381.96	-1,117.6	-2,337.4	1,681.1	0.00	0.00	0.00
8,600.0	90.00	180.84	6,345.0	-1,381.96	-1,217.6	-2,338.9	1,778.1	0.00	0.00	0.00
8,700.0	90.00	180.84	6,345.0	-1,381.96	-1,317.6	-2,340.4	1,875.1	0.00	0.00	0.00
8,800.0	90.00	180.84	6,345.0	-1,381.96	-1,417.6	-2,341.8	1,972.1	0.00	0.00	0.00
8,900.0	90.00	180.84	6,345.0	-1,381.96	-1,517.6	-2,343.3	2,069.1	0.00	0.00	0.00
9,000.0	90.00	180.84	6,345.0	-1,381.96	-1,617.6	-2,344.8	2,166.1	0.00	0.00	0.00
9,100.0	90.00	180.84	6,345.0	-1,381.96	-1,717.5	-2,346.2	2,263.1	0.00	0.00	0.00
9,200.0	90.00	180.84	6,345.0	-1,381.96	-1,817.5	-2,347.7	2,360.1	0.00	0.00	0.00
9,300.0	90.00	180.84	6,345.0	-1,381.96	-1,917.5	-2,349.2	2,457.1	0.00	0.00	0.00
9,400.0	90.00	180.84	6,345.0	-1,381.96	-2,017.5	-2,350.6	2,554.1	0.00	0.00	0.00
9,500.0	90.00	180.84	6,345.0	-1,381.96	-2,117.5	-2,352.1	2,651.1	0.00	0.00	0.00
9,600.0	90.00	180.84	6,345.0	-1,381.96	-2,217.5	-2,353.6	2,748.1	0.00	0.00	0.00
9,700.0	90.00	180.84	6,345.0	-1,381.96	-2,317.5	-2,355.0	2,845.1	0.00	0.00	0.00
9,800.0	90.00	180.84	6,345.0	-1,381.96	-2,417.5	-2,356.5	2,942.1	0.00	0.00	0.00
9,900.0	90.00	180.84	6,345.0	-1,381.96	-2,517.5	-2,358.0	3,039.2	0.00	0.00	0.00
10,000.0	90.00	180.84	6,345.0	-1,381.96	-2,617.5	-2,359.5	3,136.2	0.00	0.00	0.00
10,100.0	90.00	180.84	6,345.0	-1,381.96	-2,717.4	-2,360.9	3,233.2	0.00	0.00	0.00
10,200.0	90.00	180.84	6,345.0	-1,381.96	-2,817.4	-2,362.4	3,330.2	0.00	0.00	0.00
10,300.0	90.00	180.84	6,345.0	-1,381.96	-2,917.4	-2,363.9	3,427.2	0.00	0.00	0.00
10,400.0	90.00	180.84	6,345.0	-1,381.96	-3,017.4	-2,365.3	3,524.2	0.00	0.00	0.00
10,500.0	90.00	180.84	6,345.0	-1,381.96	-3,117.4	-2,366.8	3,621.2	0.00	0.00	0.00
10,600.0	90.00	180.84	6,345.0	-1,381.96	-3,217.4	-2,368.3	3,718.2	0.00	0.00	0.00
10,700.0	90.00	180.84	6,345.0	-1,381.96	-3,317.4	-2,369.7	3,815.2	0.00	0.00	0.00
10,800.0	90.00	180.84	6,345.0	-1,381.96	-3,417.4	-2,371.2	3,912.2	0.00	0.00	0.00
10,900.0	90.00	180.84	6,345.0	-1,381.96	-3,517.4	-2,372.7	4,009.2	0.00	0.00	0.00
11,000.0	90.00	180.84	6,345.0	-1,381.96	-3,617.3	-2,374.1	4,106.2	0.00	0.00	0.00
11,100.0	90.00	180.84	6,345.0	-1,381.96	-3,717.3	-2,375.6	4,203.2	0.00	0.00	0.00
11,200.0	90.00	180.84	6,345.0	-1,381.97	-3,817.3	-2,377.1	4,300.2	0.00	0.00	0.00
11,300.0	90.00	180.84	6,345.0	-1,381.97	-3,917.3	-2,378.6	4,397.2	0.00	0.00	0.00
11,400.0	90.00	180.84	6,345.0	-1,381.97	-4,017.3	-2,380.0	4,494.2	0.00	0.00	0.00
11,500.0	90.00	180.84	6,345.0	-1,381.97	-4,117.3	-2,381.5	4,591.2	0.00	0.00	0.00
11,600.0	90.00	180.84	6,345.0	-1,381.97	-4,217.3	-2,383.0	4,688.2	0.00	0.00	0.00
11,700.0	90.00	180.84	6,345.0	-1,381.97	-4,317.3	-2,384.4	4,785.2	0.00	0.00	0.00
11,800.0	90.00	180.84	6,345.0	-1,381.97	-4,417.3	-2,385.9	4,882.2	0.00	0.00	0.00
11,900.0	90.00	180.84	6,345.0	-1,381.97	-4,517.2	-2,387.4	4,979.2	0.00	0.00	0.00
12,000.0	90.00	180.84	6,345.0	-1,381.97	-4,617.2	-2,388.8	5,076.3	0.00	0.00	0.00
12,100.0	90.00	180.84	6,345.0	-1,381.97	-4,717.2	-2,390.3	5,173.3	0.00	0.00	0.00
12,200.0	90.00	180.84	6,345.0	-1,381.97	-4,817.2	-2,391.8	5,270.3	0.00	0.00	0.00
12,300.0	90.00	180.84	6,345.0	-1,381.97	-4,917.2	-2,393.3	5,367.3	0.00	0.00	0.00
12,400.0	90.00	180.84	6,345.0	-1,381.97	-5,017.2	-2,394.7	5,464.3	0.00	0.00	0.00
12,500.0	90.00	180.84	6,345.0	-1,381.97	-5,117.2	-2,396.2	5,561.3	0.00	0.00	0.00
12,600.0	90.00	180.84	6,345.0	-1,381.97	-5,217.2	-2,397.7	5,658.3	0.00	0.00	0.00
12,700.0	90.00	180.84	6,345.0	-1,381.97	-5,317.2	-2,399.1	5,755.3	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL 30-31-1HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-1HN	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)
12,800.0	90.00	180.84	6,345.0	-1,381.97	-5,417.2	-2,400.6	5,852.3	0.00	0.00	0.00
12,900.0	90.00	180.84	6,345.0	-1,381.97	-5,517.1	-2,402.1	5,949.3	0.00	0.00	0.00
13,000.0	90.00	180.84	6,345.0	-1,381.97	-5,617.1	-2,403.6	6,046.3	0.00	0.00	0.00
13,100.0	90.00	180.84	6,345.0	-1,381.97	-5,717.1	-2,405.0	6,143.3	0.00	0.00	0.00
13,200.0	90.00	180.84	6,345.0	-1,381.97	-5,817.1	-2,406.5	6,240.3	0.00	0.00	0.00
13,300.0	90.00	180.84	6,345.0	-1,381.98	-5,917.1	-2,408.0	6,337.3	0.00	0.00	0.00
13,400.0	90.00	180.84	6,345.0	-1,381.98	-6,017.1	-2,409.4	6,434.3	0.00	0.00	0.00
13,500.0	90.00	180.84	6,345.0	-1,381.98	-6,117.1	-2,410.9	6,531.3	0.00	0.00	0.00
13,600.0	90.00	180.84	6,345.0	-1,381.98	-6,217.1	-2,412.4	6,628.3	0.00	0.00	0.00
13,700.0	90.00	180.84	6,345.0	-1,381.98	-6,317.1	-2,413.9	6,725.3	0.00	0.00	0.00
13,800.0	90.00	180.84	6,345.0	-1,381.98	-6,417.0	-2,415.3	6,822.3	0.00	0.00	0.00
13,900.0	90.00	180.84	6,345.0	-1,381.98	-6,517.0	-2,416.8	6,919.4	0.00	0.00	0.00
14,000.0	90.00	180.84	6,345.0	-1,381.98	-6,617.0	-2,418.3	7,016.4	0.00	0.00	0.00
14,100.0	90.00	180.84	6,345.0	-1,381.98	-6,717.0	-2,419.8	7,113.4	0.00	0.00	0.00
14,200.0	90.00	180.84	6,345.0	-1,381.98	-6,817.0	-2,421.2	7,210.4	0.00	0.00	0.00
14,300.0	90.00	180.84	6,345.0	-1,381.98	-6,917.0	-2,422.7	7,307.4	0.00	0.00	0.00
14,400.0	90.00	180.84	6,345.0	-1,381.98	-7,017.0	-2,424.2	7,404.4	0.00	0.00	0.00
14,500.0	90.00	180.84	6,345.0	-1,381.98	-7,117.0	-2,425.6	7,501.4	0.00	0.00	0.00
14,600.0	90.00	180.84	6,345.0	-1,381.98	-7,217.0	-2,427.1	7,598.4	0.00	0.00	0.00
14,700.0	90.00	180.84	6,345.0	-1,381.98	-7,316.9	-2,428.6	7,695.4	0.00	0.00	0.00
14,800.0	90.00	180.84	6,345.0	-1,381.99	-7,416.9	-2,430.1	7,792.4	0.00	0.00	0.00
14,900.0	90.00	180.84	6,345.0	-1,381.99	-7,516.9	-2,431.5	7,889.4	0.00	0.00	0.00
15,000.0	90.00	180.84	6,345.0	-1,381.99	-7,616.9	-2,433.0	7,986.4	0.00	0.00	0.00
15,100.0	90.00	180.84	6,345.0	-1,381.99	-7,716.9	-2,434.5	8,083.4	0.00	0.00	0.00
15,200.0	90.00	180.84	6,345.0	-1,381.99	-7,816.9	-2,436.0	8,180.4	0.00	0.00	0.00
15,300.0	90.00	180.84	6,345.0	-1,381.99	-7,916.9	-2,437.4	8,277.4	0.00	0.00	0.00
15,400.0	90.00	180.84	6,345.0	-1,381.99	-8,016.9	-2,438.9	8,374.4	0.00	0.00	0.00
15,500.0	90.00	180.84	6,345.0	-1,381.99	-8,116.9	-2,440.4	8,471.4	0.00	0.00	0.00
15,600.0	90.00	180.84	6,345.0	-1,381.99	-8,216.8	-2,441.9	8,568.4	0.00	0.00	0.00
15,700.0	90.00	180.84	6,345.0	-1,381.99	-8,316.8	-2,443.3	8,665.5	0.00	0.00	0.00
15,800.0	90.00	180.84	6,345.0	-1,381.99	-8,416.8	-2,444.8	8,762.5	0.00	0.00	0.00
15,900.0	90.00	180.84	6,345.0	-1,381.99	-8,516.8	-2,446.3	8,859.5	0.00	0.00	0.00
16,000.0	90.00	180.84	6,345.0	-1,381.99	-8,616.8	-2,447.8	8,956.5	0.00	0.00	0.00
16,100.0	90.00	180.85	6,345.0	-1,382.00	-8,716.8	-2,449.2	9,053.5	0.00	0.00	0.00
16,200.0	90.00	180.85	6,345.0	-1,382.00	-8,816.8	-2,450.7	9,150.5	0.00	0.00	0.00
16,300.0	90.00	180.85	6,345.0	-1,382.00	-8,916.8	-2,452.2	9,247.5	0.00	0.00	0.00
16,400.0	90.00	180.85	6,345.0	-1,382.00	-9,016.8	-2,453.7	9,344.5	0.00	0.00	0.00
16,500.0	90.00	180.85	6,345.0	-1,382.00	-9,116.7	-2,455.1	9,441.5	0.00	0.00	0.00
16,600.0	90.00	180.85	6,345.0	-1,382.00	-9,216.7	-2,456.6	9,538.5	0.00	0.00	0.00
BHL: 600ft FSL & 605ft FWL of Sec 31										
16,616.2	90.00	180.85	6,345.0	-1,382.00	-9,233.0	-2,456.8	9,554.3	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL 30-31-1HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-1HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,636.5	1,541.0	FOX HILLS BASE			
3,752.6	3,395.0	RICHARD SNADSTONE			
3,882.7	3,509.0	PARKMAN SANDSTONE			
4,735.4	4,256.0	SUSSEX SANDSTONE			
5,253.9	4,713.0	SHANNON SANDSTONE			
6,781.9	6,169.0	SHARON SPRINGS			
6,899.8	6,245.0	NIOBRARA A CHALK			
6,953.1	6,273.0	NIOBRARA A CHALK BASE			
7,033.6	6,307.0	NIOBRARA B1 CHALK TOP			
7,084.2	6,323.0	NIOBRARA B1 CHALK BASE			
7,243.3	6,345.0	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: 745ft FNL & 2342ft FEL of Sec 30
100.0	100.0	0.0	0.0	START NUDGE (2.5°/100ft BUR)
1,252.8	1,204.8	83.6	-271.3	EOB TO 28.82° INC
5,090.6	4,567.2	628.2	-2,039.3	END OF TANGENT
6,243.3	5,672.0	711.8	-2,310.6	EOD TO VERTICAL
6,343.3	5,772.0	711.8	-2,310.6	KOP (10°/100ft BUR)
7,243.3	6,345.0	138.9	-2,319.0	HZ LP: 600ft FNL & 605ft FWL of Sec 30
16,616.2	6,345.0	-9,233.0	-2,456.8	BHL: 600ft FSL & 605ft FWL of Sec 31