

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

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

GADWALL 30-31-5HN

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 30-31-5HN
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: 747ft FNL & 2242ft FEL of Sec 30		
500.0	500.0	0.00	0.00	0.0	0.0	0.0	0.0	START NUDGE (2°/100ft BUR)		
1457.7	1476.5	19.53	298.82	79.5	-144.4	-56.1	164.8	EOB TO 19.53° INC		
4716.4	4934.1	19.53	298.82	636.6	-1157.2	-449.7	1320.7	END OF TANGENT		
5674.1	5910.6	0.00	0.00	716.1	-1301.6	-505.8	1485.6	EOD TO VERTICAL		
5774.1	6010.6	0.00	0.00	716.1	-1301.6	-505.8	1485.6	KOP (10°/100ft BUR)		
6347.0	6910.6	90.00	180.84	143.2	-1310.0	61.4	2058.5	HZ LP: 600ft FNL & 1715ft FWL of Sec 30		
6347.0	16284.2	90.00	180.84	-9229.4	-1447.1	9342.2	11432.1	BHL: 600ft FSL & 1715ft FWL of Sec 31		

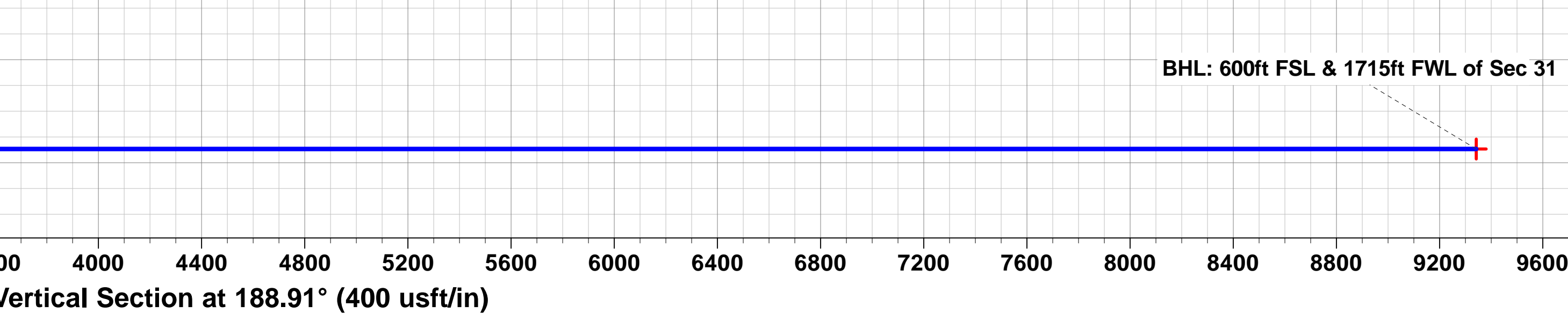
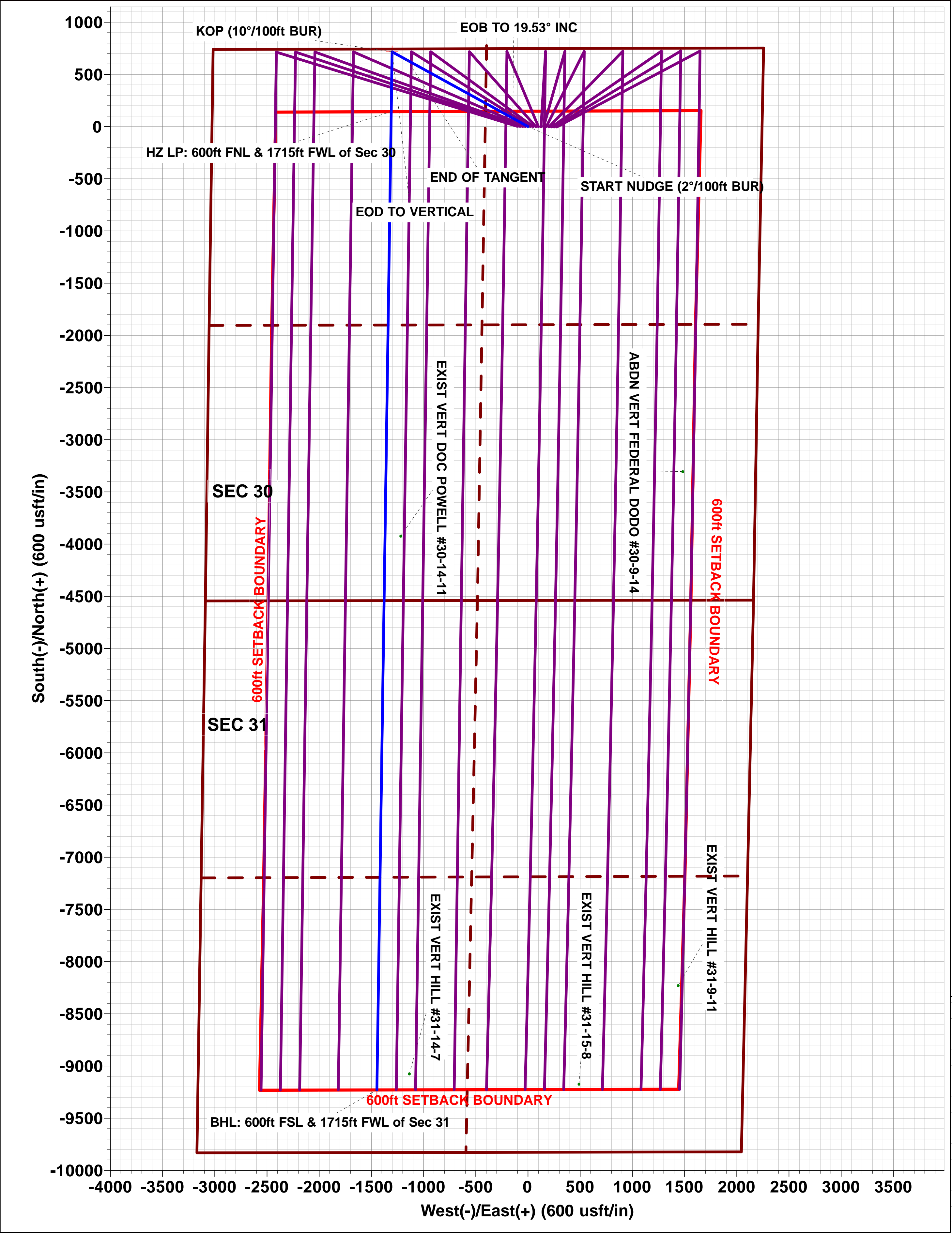
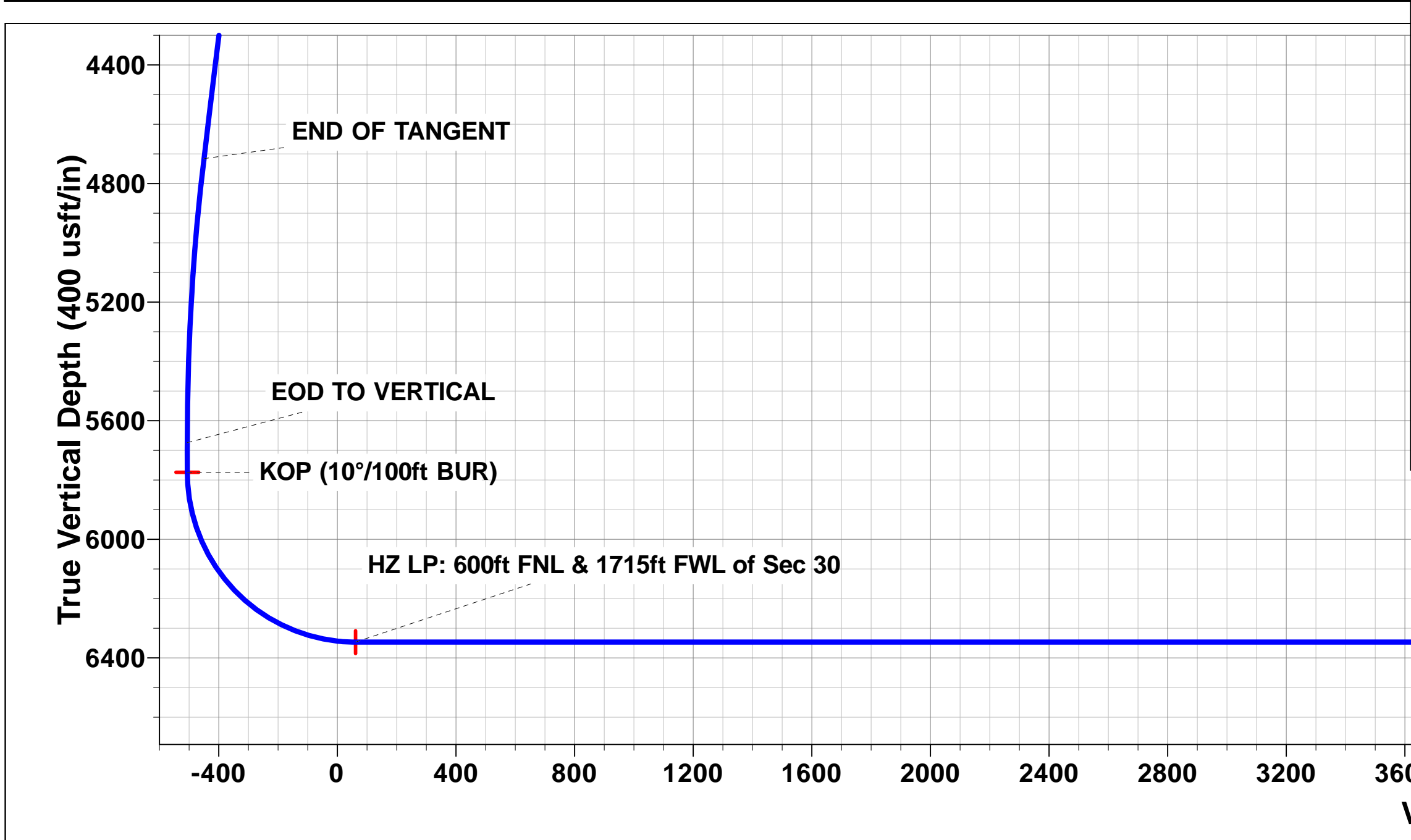
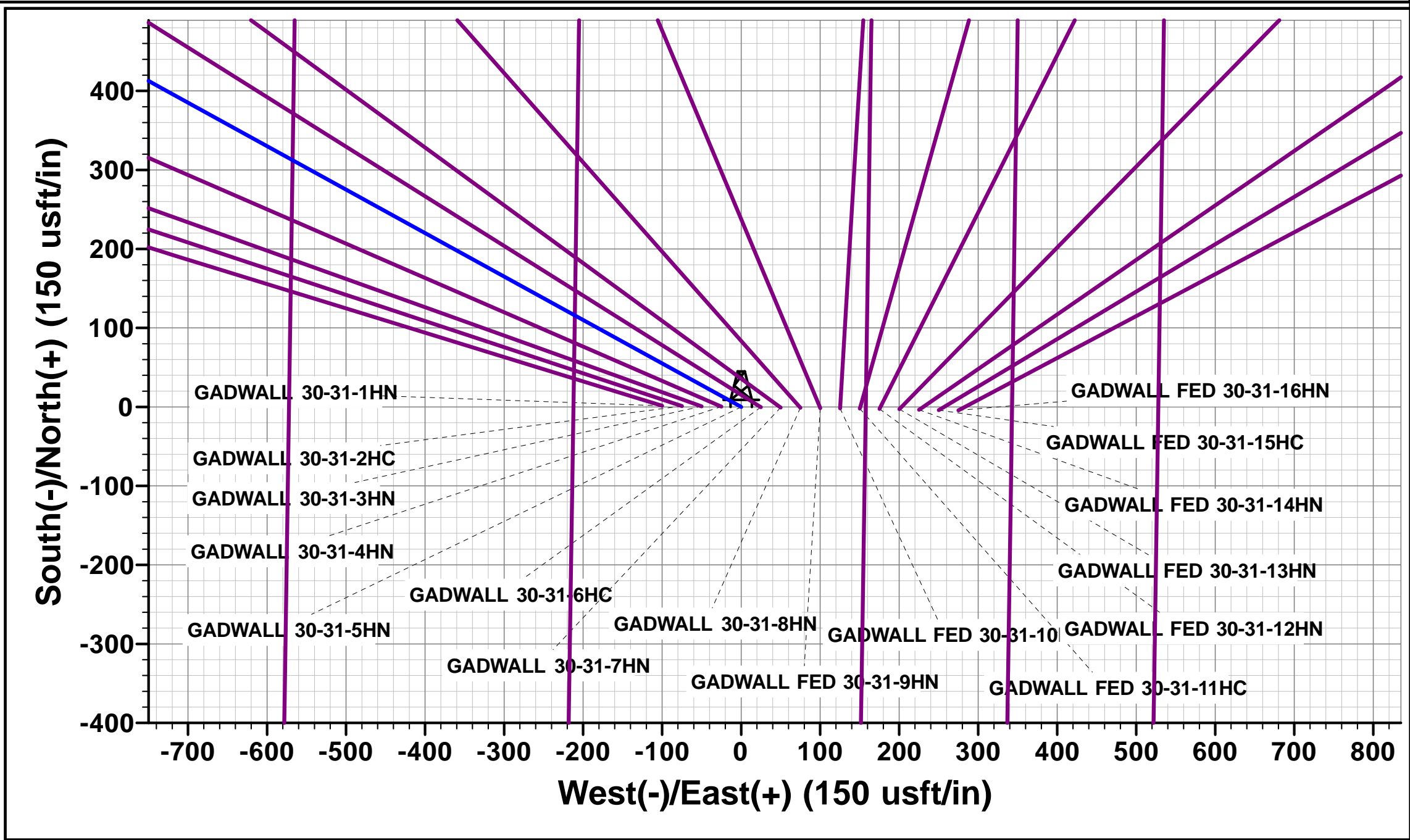
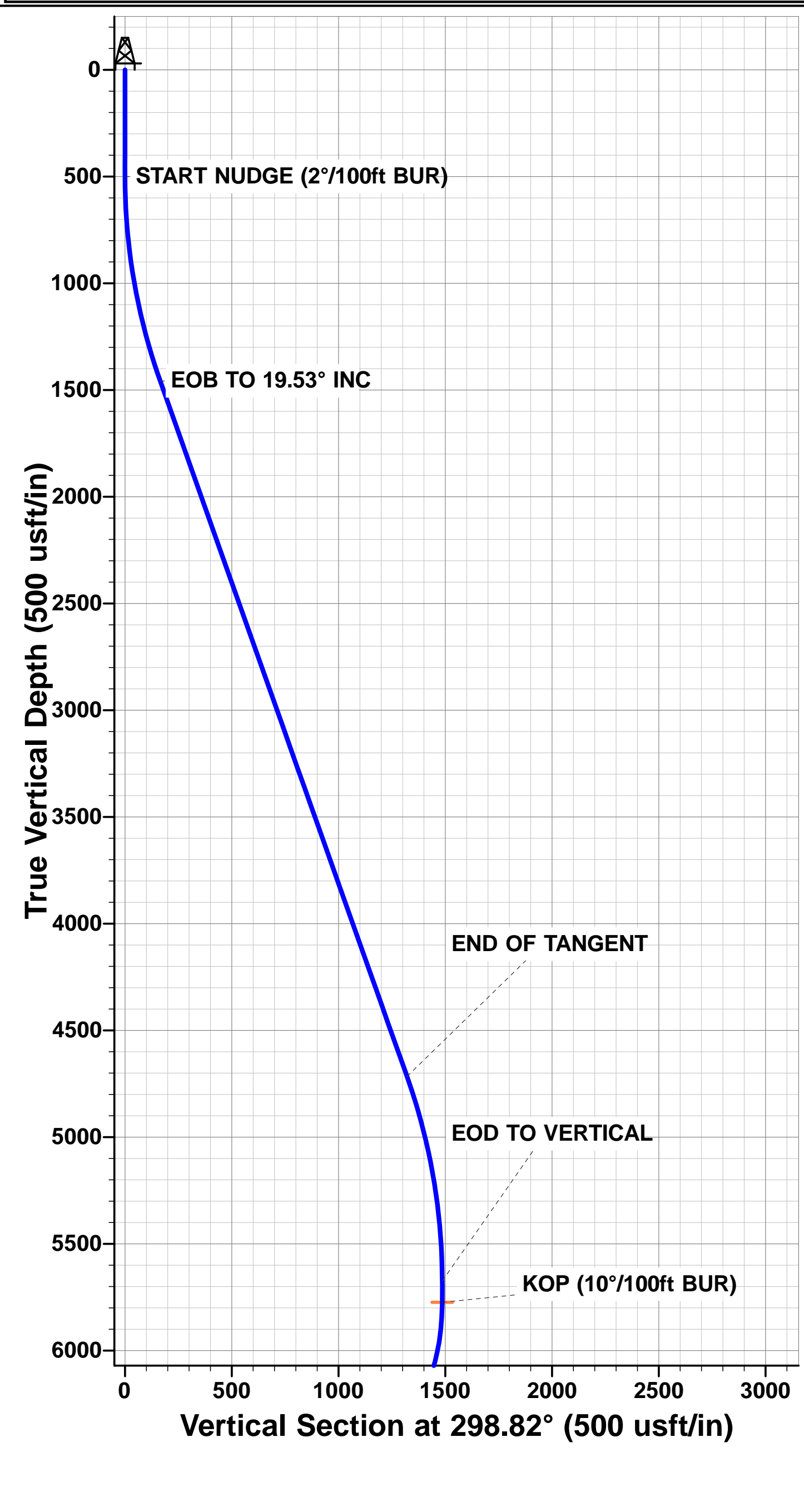
PROPOSED LOCAL COORDINATES:

SHL: 747ft FNL & 2242ft FEL of Sec 30

HZ LP: 600ft FNL & 1715ft FWL of Sec 30

BHL: 600ft FSL & 1715ft FWL of Sec 31

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP: GADWALL 30-31-5HN	5774.1	716.1	-1301.6	40.640401	-104.138146
HZ LP: GADWALL 30-31-5HN	6347.0	143.2	-1310.0	40.638829	-104.138176
BHL: GADWALL 30-31-5HN	6347.0	-9229.4	-1447.1	40.613103	-104.138668



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL 30-31-5HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4965.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4965.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-5HN	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 30-31-5HN					
Well Position	+N/-S	-1.5 usft	Northing:	1,478,346.66 usft	Latitude:	40.638436
	+E/-W	99.9 usft	Easting:	3,379,243.01 usft	Longitude:	-104.133456
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,949.0 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	188.91

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	-4,965.0	0.0	0.0	0.00	0.00	0.00	0.00	
500.0	0.00	0.00	500.0	-4,465.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,476.5	19.53	298.82	1,457.7	-3,507.3	79.5	-144.4	2.00	2.00	0.00	298.82	
4,934.1	19.53	298.82	4,716.4	-248.6	636.6	-1,157.2	0.00	0.00	0.00	0.00	
5,910.6	0.00	0.00	5,674.1	709.1	716.1	-1,301.6	2.00	-2.00	0.00	180.00	
6,010.6	0.00	0.00	5,774.1	809.1	716.1	-1,301.6	0.00	0.00	0.00	0.00	KOP: GADWALL 30-3
6,910.6	90.00	180.84	6,347.0	1,382.0	143.2	-1,310.0	10.00	10.00	-19.91	180.84	HZ LP: GADWALL 30
16,284.2	90.00	180.84	6,347.0	1,382.0	-9,229.4	-1,447.1	0.00	0.00	0.00	157.73	BHL: GADWALL 30-3

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL 30-31-5HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4965.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4965.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-5HN	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: 747ft FNL & 2242ft FEL of Sec 30										
0.0	0.00	0.00	0.0	4,965.00	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	4,865.00	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	4,765.00	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	4,665.00	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	4,565.00	0.0	0.0	0.0	0.00	0.00	0.00
START NUDGE (2°/100ft BUR)										
500.0	0.00	0.00	500.0	4,465.00	0.0	0.0	0.0	0.00	0.00	0.00
600.0	2.00	298.82	600.0	4,365.02	0.8	-1.5	-0.6	2.00	2.00	0.00
700.0	4.00	298.82	699.8	4,265.16	3.4	-6.1	-2.4	2.00	2.00	0.00
800.0	6.00	298.82	799.5	4,165.55	7.6	-13.8	-5.3	2.00	2.00	0.00
900.0	8.00	298.82	898.7	4,066.30	13.4	-24.4	-9.5	2.00	2.00	0.00
1,000.0	10.00	298.82	997.5	3,967.53	21.0	-38.1	-14.8	2.00	2.00	0.00
1,100.0	12.00	298.82	1,095.6	3,869.38	30.2	-54.8	-21.3	2.00	2.00	0.00
1,200.0	14.00	298.82	1,193.1	3,771.94	41.0	-74.6	-29.0	2.00	2.00	0.00
1,300.0	16.00	298.82	1,289.6	3,675.36	53.5	-97.2	-37.8	2.00	2.00	0.00
1,400.0	18.00	298.82	1,385.3	3,579.73	67.6	-122.8	-47.7	2.00	2.00	0.00
EOB TO 19.53° INC										
1,476.5	19.53	298.82	1,457.7	3,507.26	79.5	-144.4	-56.1	2.00	2.00	0.00
1,500.0	19.53	298.82	1,479.8	3,485.15	83.2	-151.3	-58.8	0.00	0.00	0.00
FOX HILLS BASE										
1,567.0	19.53	298.82	1,543.0	3,422.00	94.0	-170.9	-66.4	0.00	0.00	0.00
1,600.0	19.53	298.82	1,574.1	3,390.91	99.4	-180.6	-70.2	0.00	0.00	0.00
1,700.0	19.53	298.82	1,668.3	3,296.66	115.5	-209.9	-81.6	0.00	0.00	0.00
1,800.0	19.53	298.82	1,762.6	3,202.41	131.6	-239.2	-92.9	0.00	0.00	0.00
1,900.0	19.53	298.82	1,856.8	3,108.17	147.7	-268.5	-104.3	0.00	0.00	0.00
2,000.0	19.53	298.82	1,951.1	3,013.92	163.8	-297.7	-115.7	0.00	0.00	0.00
2,100.0	19.53	298.82	2,045.3	2,919.68	179.9	-327.0	-127.1	0.00	0.00	0.00
2,200.0	19.53	298.82	2,139.6	2,825.43	196.0	-356.3	-138.5	0.00	0.00	0.00
2,300.0	19.53	298.82	2,233.8	2,731.18	212.2	-385.6	-149.9	0.00	0.00	0.00
2,400.0	19.53	298.82	2,328.1	2,636.94	228.3	-414.9	-161.2	0.00	0.00	0.00
2,500.0	19.53	298.82	2,422.3	2,542.69	244.4	-444.2	-172.6	0.00	0.00	0.00
2,600.0	19.53	298.82	2,516.6	2,448.44	260.5	-473.5	-184.0	0.00	0.00	0.00
2,700.0	19.53	298.82	2,610.8	2,354.20	276.6	-502.8	-195.4	0.00	0.00	0.00
2,800.0	19.53	298.82	2,705.0	2,259.95	292.7	-532.1	-206.8	0.00	0.00	0.00
2,900.0	19.53	298.82	2,799.3	2,165.71	308.8	-561.4	-218.2	0.00	0.00	0.00
3,000.0	19.53	298.82	2,893.5	2,071.46	325.0	-590.7	-229.5	0.00	0.00	0.00
3,100.0	19.53	298.82	2,987.8	1,977.21	341.1	-619.9	-240.9	0.00	0.00	0.00
3,200.0	19.53	298.82	3,082.0	1,882.97	357.2	-649.2	-252.3	0.00	0.00	0.00
3,300.0	19.53	298.82	3,176.3	1,788.72	373.3	-678.5	-263.7	0.00	0.00	0.00
3,400.0	19.53	298.82	3,270.5	1,694.48	389.4	-707.8	-275.1	0.00	0.00	0.00
3,500.0	19.53	298.82	3,364.8	1,600.23	405.5	-737.1	-286.5	0.00	0.00	0.00
RICHARD SNADSTONE										
3,534.2	19.53	298.82	3,397.0	1,568.00	411.0	-747.1	-290.4	0.00	0.00	0.00
3,600.0	19.53	298.82	3,459.0	1,505.98	421.7	-766.4	-297.9	0.00	0.00	0.00
PARKMAN SANDSTONE										
3,655.2	19.53	298.82	3,511.0	1,454.00	430.5	-782.6	-304.1	0.00	0.00	0.00
3,700.0	19.53	298.82	3,553.3	1,411.74	437.8	-795.7	-309.2	0.00	0.00	0.00
3,800.0	19.53	298.82	3,647.5	1,317.49	453.9	-825.0	-320.6	0.00	0.00	0.00
3,900.0	19.53	298.82	3,741.8	1,223.24	470.0	-854.3	-332.0	0.00	0.00	0.00
4,000.0	19.53	298.82	3,836.0	1,129.00	486.1	-883.6	-343.4	0.00	0.00	0.00
4,100.0	19.53	298.82	3,930.2	1,034.75	502.2	-912.9	-354.8	0.00	0.00	0.00
4,200.0	19.53	298.82	4,024.5	940.51	518.3	-942.2	-366.2	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 30-31-5HN	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	19.53	298.82	4,118.7	846.26	534.5	-971.4	-377.5	0.00	0.00	0.00
4,400.0	19.53	298.82	4,213.0	752.01	550.6	-1,000.7	-388.9	0.00	0.00	0.00
SUSSEX SANDSTONE										
4,447.8	19.53	298.82	4,258.0	707.00	558.3	-1,014.7	-394.4	0.00	0.00	0.00
4,500.0	19.53	298.82	4,307.2	657.77	566.7	-1,030.0	-400.3	0.00	0.00	0.00
4,600.0	19.53	298.82	4,401.5	563.52	582.8	-1,059.3	-411.7	0.00	0.00	0.00
4,700.0	19.53	298.82	4,495.7	469.28	598.9	-1,088.6	-423.1	0.00	0.00	0.00
4,800.0	19.53	298.82	4,590.0	375.03	615.0	-1,117.9	-434.5	0.00	0.00	0.00
4,900.0	19.53	298.82	4,684.2	280.78	631.1	-1,147.2	-445.8	0.00	0.00	0.00
SHANNON SANDSTONE										
4,932.7	19.53	298.82	4,715.0	250.00	636.4	-1,156.8	-449.6	0.00	0.00	0.00
END OF TANGENT										
4,934.1	19.53	298.82	4,716.4	248.64	636.6	-1,157.2	-449.7	0.00	0.00	0.00
5,000.0	18.21	298.82	4,778.7	186.29	646.9	-1,175.9	-457.0	2.00	-2.00	0.00
5,100.0	16.21	298.82	4,874.2	90.77	661.2	-1,201.8	-467.1	2.00	-2.00	0.00
5,200.0	14.21	298.82	4,970.7	-5.72	673.8	-1,224.8	-476.0	2.00	-2.00	0.00
5,300.0	12.21	298.82	5,068.1	-103.07	684.8	-1,244.8	-483.8	2.00	-2.00	0.00
5,400.0	10.21	298.82	5,166.2	-201.15	694.2	-1,261.8	-490.4	2.00	-2.00	0.00
5,500.0	8.21	298.82	5,264.9	-299.86	701.9	-1,275.9	-495.8	2.00	-2.00	0.00
5,600.0	6.21	298.82	5,364.1	-399.06	708.0	-1,286.9	-500.1	2.00	-2.00	0.00
5,700.0	4.21	298.82	5,463.6	-498.64	712.4	-1,294.8	-503.2	2.00	-2.00	0.00
5,800.0	2.21	298.82	5,563.5	-598.48	715.1	-1,299.7	-505.1	2.00	-2.00	0.00
5,900.0	0.21	298.82	5,663.5	-698.45	716.1	-1,301.6	-505.8	2.00	-2.00	0.00
EOD TO VERTICAL										
5,910.6	0.00	0.00	5,674.1	-709.10	716.1	-1,301.6	-505.8	2.00	-2.00	0.00
6,000.0	0.00	0.00	5,763.5	-798.45	716.1	-1,301.6	-505.8	0.00	0.00	0.00
KOP (10°/100ft BUR)										
6,010.6	0.00	0.00	5,774.1	-809.10	716.1	-1,301.6	-505.8	0.00	0.00	0.00
6,100.0	8.94	180.84	5,863.1	-898.09	709.1	-1,301.7	-499.0	10.00	10.00	0.00
6,200.0	18.94	180.84	5,960.0	-995.02	685.1	-1,302.1	-475.1	10.00	10.00	0.00
6,300.0	28.94	180.84	6,051.3	-1,086.31	644.6	-1,302.6	-435.0	10.00	10.00	0.00
6,400.0	38.94	180.84	6,134.2	-1,169.16	588.8	-1,303.5	-379.8	10.00	10.00	0.00
SHARON SPRINGS										
6,449.1	43.85	180.84	6,171.0	-1,206.00	556.4	-1,303.9	-347.7	10.00	10.00	0.00
6,500.0	48.94	180.84	6,206.1	-1,241.08	519.5	-1,304.5	-311.2	10.00	10.00	0.00
NIOBRARA A CHALK										
6,566.9	55.63	180.84	6,247.0	-1,282.00	466.6	-1,305.2	-258.8	10.00	10.00	0.00
6,600.0	58.94	180.84	6,264.9	-1,299.87	438.8	-1,305.6	-231.3	10.00	10.00	0.00
NIOBRARA A CHALK BASE										
6,620.2	60.97	180.84	6,275.0	-1,310.00	421.3	-1,305.9	-213.9	10.00	10.00	0.00
6,700.0	68.94	180.84	6,308.7	-1,343.74	349.1	-1,307.0	-142.4	10.00	10.00	0.00
NIOBRARA B1 CHALK TOP										
6,700.7	69.01	180.84	6,309.0	-1,344.00	348.4	-1,307.0	-141.8	10.00	10.00	0.00
NIOBRARA B1 CHALK BASE										
6,751.3	74.07	180.84	6,325.0	-1,360.00	300.5	-1,307.7	-94.3	10.00	10.00	0.00
6,800.0	78.94	180.84	6,336.4	-1,371.37	253.1	-1,308.4	-47.4	10.00	10.00	0.00
6,900.0	88.94	180.84	6,346.9	-1,381.90	153.8	-1,309.8	50.9	10.00	10.00	0.00
HZ LP: 600ft FNL & 1715ft FWL of Sec 30 - NIOBRARA B2 CHALK TOP										
6,910.6	90.00	180.84	6,347.0	-1,382.00	143.2	-1,310.0	61.4	10.00	10.00	0.00
7,000.0	90.00	180.84	6,347.0	-1,381.99	53.8	-1,311.3	149.9	0.00	0.00	0.00
7,100.0	90.00	180.84	6,347.0	-1,381.99	-46.2	-1,312.7	248.9	0.00	0.00	0.00
7,200.0	90.00	180.84	6,347.0	-1,381.98	-146.2	-1,314.2	347.9	0.00	0.00	0.00
7,300.0	90.00	180.84	6,347.0	-1,381.98	-246.1	-1,315.6	447.0	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL 30-31-5HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4965.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4965.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-5HN	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	6,347.0	-1,381.97	-346.1	-1,317.1	546.0	0.00	0.00	0.00
7,500.0	90.00	180.84	6,347.0	-1,381.96	-446.1	-1,318.6	645.0	0.00	0.00	0.00
7,600.0	90.00	180.84	6,347.0	-1,381.96	-546.1	-1,320.0	744.0	0.00	0.00	0.00
7,700.0	90.00	180.84	6,347.0	-1,381.95	-646.1	-1,321.5	843.0	0.00	0.00	0.00
7,800.0	90.00	180.84	6,346.9	-1,381.95	-746.1	-1,323.0	942.0	0.00	0.00	0.00
7,900.0	90.00	180.84	6,346.9	-1,381.94	-846.1	-1,324.4	1,041.0	0.00	0.00	0.00
8,000.0	90.00	180.84	6,346.9	-1,381.94	-946.1	-1,325.9	1,140.0	0.00	0.00	0.00
8,100.0	90.00	180.84	6,346.9	-1,381.93	-1,046.1	-1,327.3	1,239.0	0.00	0.00	0.00
8,200.0	90.00	180.84	6,346.9	-1,381.93	-1,146.0	-1,328.8	1,338.0	0.00	0.00	0.00
8,300.0	90.00	180.84	6,346.9	-1,381.92	-1,246.0	-1,330.3	1,437.0	0.00	0.00	0.00
8,400.0	90.00	180.84	6,346.9	-1,381.92	-1,346.0	-1,331.7	1,536.1	0.00	0.00	0.00
8,500.0	90.00	180.84	6,346.9	-1,381.91	-1,446.0	-1,333.2	1,635.1	0.00	0.00	0.00
8,600.0	90.00	180.84	6,346.9	-1,381.91	-1,546.0	-1,334.6	1,734.1	0.00	0.00	0.00
8,700.0	90.00	180.84	6,346.9	-1,381.90	-1,646.0	-1,336.1	1,833.1	0.00	0.00	0.00
8,800.0	90.00	180.84	6,346.9	-1,381.90	-1,746.0	-1,337.6	1,932.1	0.00	0.00	0.00
8,900.0	90.00	180.84	6,346.9	-1,381.90	-1,846.0	-1,339.0	2,031.1	0.00	0.00	0.00
9,000.0	90.00	180.84	6,346.9	-1,381.89	-1,946.0	-1,340.5	2,130.1	0.00	0.00	0.00
9,100.0	90.00	180.84	6,346.9	-1,381.89	-2,045.9	-1,341.9	2,229.1	0.00	0.00	0.00
9,200.0	90.00	180.84	6,346.9	-1,381.89	-2,145.9	-1,343.4	2,328.1	0.00	0.00	0.00
9,300.0	90.00	180.84	6,346.9	-1,381.88	-2,245.9	-1,344.9	2,427.1	0.00	0.00	0.00
9,400.0	90.00	180.84	6,346.9	-1,381.88	-2,345.9	-1,346.3	2,526.1	0.00	0.00	0.00
9,500.0	90.00	180.84	6,346.9	-1,381.88	-2,445.9	-1,347.8	2,625.2	0.00	0.00	0.00
9,600.0	90.00	180.84	6,346.9	-1,381.87	-2,545.9	-1,349.2	2,724.2	0.00	0.00	0.00
9,700.0	90.00	180.84	6,346.9	-1,381.87	-2,645.9	-1,350.7	2,823.2	0.00	0.00	0.00
9,800.0	90.00	180.84	6,346.9	-1,381.87	-2,745.9	-1,352.2	2,922.2	0.00	0.00	0.00
9,900.0	90.00	180.84	6,346.9	-1,381.87	-2,845.9	-1,353.6	3,021.2	0.00	0.00	0.00
10,000.0	90.00	180.84	6,346.9	-1,381.86	-2,945.9	-1,355.1	3,120.2	0.00	0.00	0.00
10,100.0	90.00	180.84	6,346.9	-1,381.86	-3,045.8	-1,356.6	3,219.2	0.00	0.00	0.00
10,200.0	90.00	180.84	6,346.9	-1,381.86	-3,145.8	-1,358.0	3,318.2	0.00	0.00	0.00
10,300.0	90.00	180.84	6,346.9	-1,381.86	-3,245.8	-1,359.5	3,417.2	0.00	0.00	0.00
10,400.0	90.00	180.84	6,346.9	-1,381.86	-3,345.8	-1,360.9	3,516.2	0.00	0.00	0.00
10,500.0	90.00	180.84	6,346.9	-1,381.85	-3,445.8	-1,362.4	3,615.2	0.00	0.00	0.00
10,600.0	90.00	180.84	6,346.9	-1,381.85	-3,545.8	-1,363.9	3,714.3	0.00	0.00	0.00
10,700.0	90.00	180.84	6,346.9	-1,381.85	-3,645.8	-1,365.3	3,813.3	0.00	0.00	0.00
10,800.0	90.00	180.84	6,346.8	-1,381.85	-3,745.8	-1,366.8	3,912.3	0.00	0.00	0.00
10,900.0	90.00	180.84	6,346.8	-1,381.85	-3,845.8	-1,368.3	4,011.3	0.00	0.00	0.00
11,000.0	90.00	180.84	6,346.8	-1,381.85	-3,945.7	-1,369.7	4,110.3	0.00	0.00	0.00
11,100.0	90.00	180.84	6,346.8	-1,381.85	-4,045.7	-1,371.2	4,209.3	0.00	0.00	0.00
11,200.0	90.00	180.84	6,346.8	-1,381.85	-4,145.7	-1,372.6	4,308.3	0.00	0.00	0.00
11,300.0	90.00	180.84	6,346.8	-1,381.85	-4,245.7	-1,374.1	4,407.3	0.00	0.00	0.00
11,400.0	90.00	180.84	6,346.8	-1,381.85	-4,345.7	-1,375.6	4,506.3	0.00	0.00	0.00
11,500.0	90.00	180.84	6,346.8	-1,381.85	-4,445.7	-1,377.0	4,605.3	0.00	0.00	0.00
11,600.0	90.00	180.84	6,346.8	-1,381.85	-4,545.7	-1,378.5	4,704.3	0.00	0.00	0.00
11,700.0	90.00	180.84	6,346.8	-1,381.85	-4,645.7	-1,380.0	4,803.3	0.00	0.00	0.00
11,800.0	90.00	180.84	6,346.8	-1,381.85	-4,745.7	-1,381.4	4,902.4	0.00	0.00	0.00
11,900.0	90.00	180.84	6,346.8	-1,381.85	-4,845.6	-1,382.9	5,001.4	0.00	0.00	0.00
12,000.0	90.00	180.84	6,346.8	-1,381.85	-4,945.6	-1,384.3	5,100.4	0.00	0.00	0.00
12,100.0	90.00	180.84	6,346.8	-1,381.85	-5,045.6	-1,385.8	5,199.4	0.00	0.00	0.00
12,200.0	90.00	180.84	6,346.8	-1,381.85	-5,145.6	-1,387.3	5,298.4	0.00	0.00	0.00
12,300.0	90.00	180.84	6,346.8	-1,381.85	-5,245.6	-1,388.7	5,397.4	0.00	0.00	0.00
12,400.0	90.00	180.84	6,346.8	-1,381.85	-5,345.6	-1,390.2	5,496.4	0.00	0.00	0.00
12,500.0	90.00	180.84	6,346.9	-1,381.85	-5,445.6	-1,391.7	5,595.4	0.00	0.00	0.00
12,600.0	90.00	180.84	6,346.9	-1,381.85	-5,545.6	-1,393.1	5,694.4	0.00	0.00	0.00
12,700.0	90.00	180.84	6,346.9	-1,381.85	-5,645.6	-1,394.6	5,793.4	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL 30-31-5HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4965.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4965.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-5HN	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	6,346.9	-1,381.86	-5,745.6	-1,396.0	5,892.5	0.00	0.00	0.00
12,900.0	90.00	180.84	6,346.9	-1,381.86	-5,845.5	-1,397.5	5,991.5	0.00	0.00	0.00
13,000.0	90.00	180.84	6,346.9	-1,381.86	-5,945.5	-1,399.0	6,090.5	0.00	0.00	0.00
13,100.0	90.00	180.84	6,346.9	-1,381.86	-6,045.5	-1,400.4	6,189.5	0.00	0.00	0.00
13,200.0	90.00	180.84	6,346.9	-1,381.86	-6,145.5	-1,401.9	6,288.5	0.00	0.00	0.00
13,300.0	90.00	180.84	6,346.9	-1,381.87	-6,245.5	-1,403.4	6,387.5	0.00	0.00	0.00
13,400.0	90.00	180.84	6,346.9	-1,381.87	-6,345.5	-1,404.8	6,486.5	0.00	0.00	0.00
13,500.0	90.00	180.84	6,346.9	-1,381.87	-6,445.5	-1,406.3	6,585.5	0.00	0.00	0.00
13,600.0	90.00	180.84	6,346.9	-1,381.87	-6,545.5	-1,407.8	6,684.5	0.00	0.00	0.00
13,700.0	90.00	180.84	6,346.9	-1,381.88	-6,645.5	-1,409.2	6,783.5	0.00	0.00	0.00
13,800.0	90.00	180.84	6,346.9	-1,381.88	-6,745.4	-1,410.7	6,882.5	0.00	0.00	0.00
13,900.0	90.00	180.84	6,346.9	-1,381.88	-6,845.4	-1,412.1	6,981.6	0.00	0.00	0.00
14,000.0	90.00	180.84	6,346.9	-1,381.89	-6,945.4	-1,413.6	7,080.6	0.00	0.00	0.00
14,100.0	90.00	180.84	6,346.9	-1,381.89	-7,045.4	-1,415.1	7,179.6	0.00	0.00	0.00
14,200.0	90.00	180.84	6,346.9	-1,381.89	-7,145.4	-1,416.5	7,278.6	0.00	0.00	0.00
14,300.0	90.00	180.84	6,346.9	-1,381.90	-7,245.4	-1,418.0	7,377.6	0.00	0.00	0.00
14,400.0	90.00	180.84	6,346.9	-1,381.90	-7,345.4	-1,419.5	7,476.6	0.00	0.00	0.00
14,500.0	90.00	180.84	6,346.9	-1,381.90	-7,445.4	-1,420.9	7,575.6	0.00	0.00	0.00
14,600.0	90.00	180.84	6,346.9	-1,381.91	-7,545.4	-1,422.4	7,674.6	0.00	0.00	0.00
14,700.0	90.00	180.84	6,346.9	-1,381.91	-7,645.3	-1,423.9	7,773.6	0.00	0.00	0.00
14,800.0	90.00	180.84	6,346.9	-1,381.92	-7,745.3	-1,425.3	7,872.6	0.00	0.00	0.00
14,900.0	90.00	180.84	6,346.9	-1,381.92	-7,845.3	-1,426.8	7,971.6	0.00	0.00	0.00
15,000.0	90.00	180.84	6,346.9	-1,381.93	-7,945.3	-1,428.2	8,070.7	0.00	0.00	0.00
15,100.0	90.00	180.84	6,346.9	-1,381.93	-8,045.3	-1,429.7	8,169.7	0.00	0.00	0.00
15,200.0	90.00	180.84	6,346.9	-1,381.94	-8,145.3	-1,431.2	8,268.7	0.00	0.00	0.00
15,300.0	90.00	180.84	6,346.9	-1,381.94	-8,245.3	-1,432.6	8,367.7	0.00	0.00	0.00
15,400.0	90.00	180.84	6,346.9	-1,381.95	-8,345.3	-1,434.1	8,466.7	0.00	0.00	0.00
15,500.0	90.00	180.84	6,347.0	-1,381.95	-8,445.3	-1,435.6	8,565.7	0.00	0.00	0.00
15,600.0	90.00	180.84	6,347.0	-1,381.96	-8,545.3	-1,437.0	8,664.7	0.00	0.00	0.00
15,700.0	90.00	180.84	6,347.0	-1,381.96	-8,645.2	-1,438.5	8,763.7	0.00	0.00	0.00
15,800.0	90.00	180.84	6,347.0	-1,381.97	-8,745.2	-1,440.0	8,862.7	0.00	0.00	0.00
15,900.0	90.00	180.84	6,347.0	-1,381.98	-8,845.2	-1,441.4	8,961.7	0.00	0.00	0.00
16,000.0	90.00	180.84	6,347.0	-1,381.98	-8,945.2	-1,442.9	9,060.7	0.00	0.00	0.00
16,100.0	90.00	180.84	6,347.0	-1,381.99	-9,045.2	-1,444.4	9,159.8	0.00	0.00	0.00
16,200.0	90.00	180.84	6,347.0	-1,381.99	-9,145.2	-1,445.8	9,258.8	0.00	0.00	0.00
BHL: 600ft FSL & 1715ft FWL of Sec 31										
16,284.2	90.00	180.84	6,347.0	-1,382.00	-9,229.4	-1,447.1	9,342.2	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL 30-31-5HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4965.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4965.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-5HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,567.0	1,543.0	FOX HILLS BASE			
3,534.2	3,397.0	RICHARD SNADSTONE			
3,655.2	3,511.0	PARKMAN SANDSTONE			
4,447.8	4,258.0	SUSSEX SANDSTONE			
4,932.7	4,715.0	SHANNON SANDSTONE			
6,449.1	6,171.0	SHARON SPRINGS			
6,566.9	6,247.0	NIOBRARA A CHALK			
6,620.2	6,275.0	NIOBRARA A CHALK BASE			
6,700.7	6,309.0	NIOBRARA B1 CHALK TOP			
6,751.3	6,325.0	NIOBRARA B1 CHALK BASE			
6,910.6	6,347.0	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: 747ft FNL & 2242ft FEL of Sec 30
500.0	500.0	0.0	0.0	START NUDGE (2°/100ft BUR)
1,476.5	1,457.7	79.5	-144.4	EOB TO 19.53° INC
4,934.1	4,716.4	636.6	-1,157.2	END OF TANGENT
5,910.6	5,674.1	716.1	-1,301.6	EOD TO VERTICAL
6,010.6	5,774.1	716.1	-1,301.6	KOP (10°/100ft BUR)
6,910.6	6,347.0	143.2	-1,310.0	HZ LP: 600ft FNL & 1715ft FWL of Sec 30
16,284.2	6,347.0	-9,229.4	-1,447.1	BHL: 600ft FSL & 1715ft FWL of Sec 31