



MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

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

GADWALL FED 30-31-5HN

ORIGINAL WELLBORE

05 March, 2020

Plan: PROPOSAL #2





Project: WELD COUNTY, COLORADO (NAD 83)
Site: NW NE SEC. 30 T8N R60W 6th P.M.
Well: GADWALL FED 30-31-5HN
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #2

ANNOTATIONS

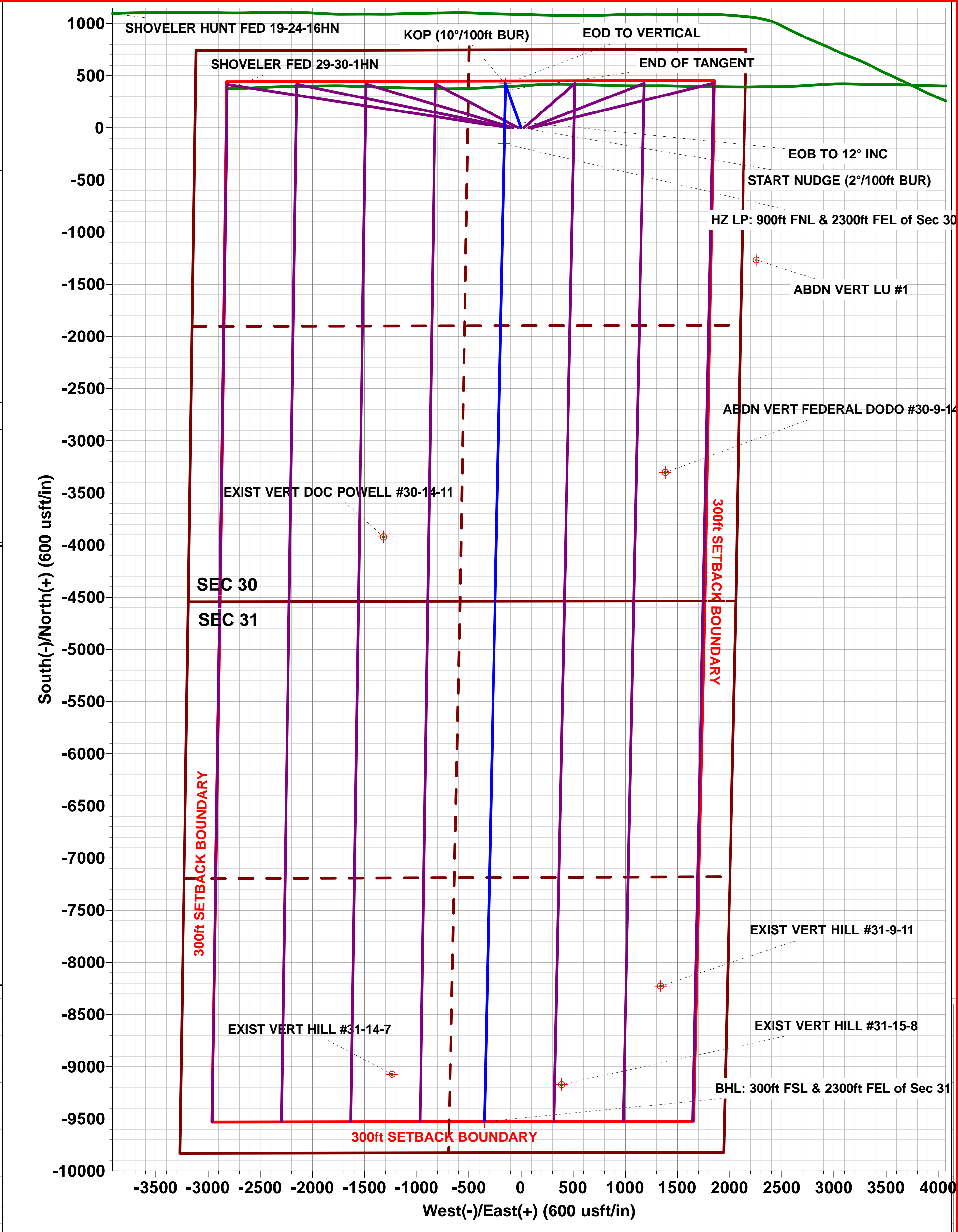
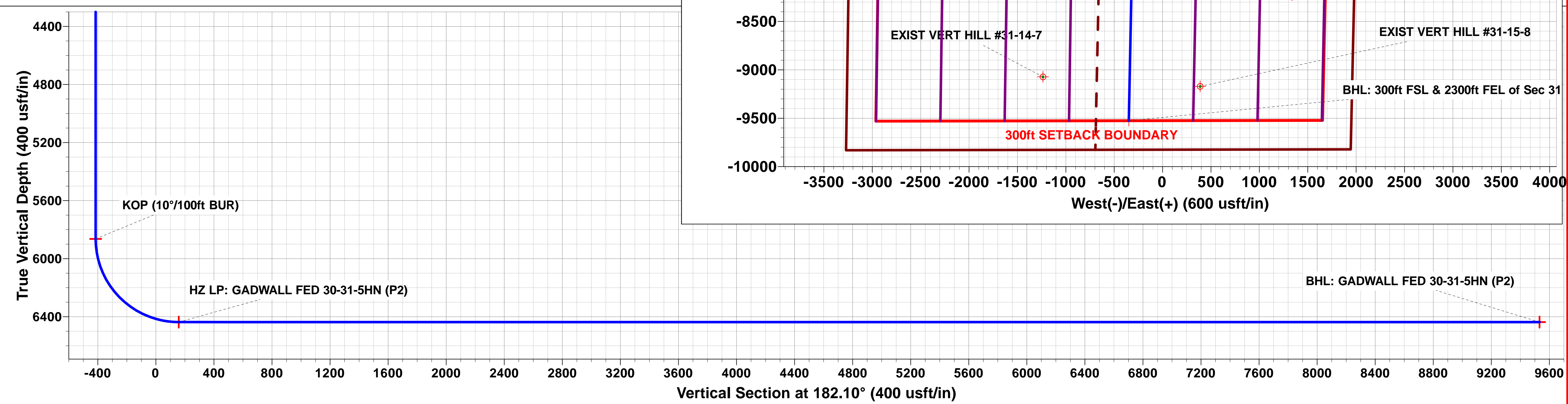
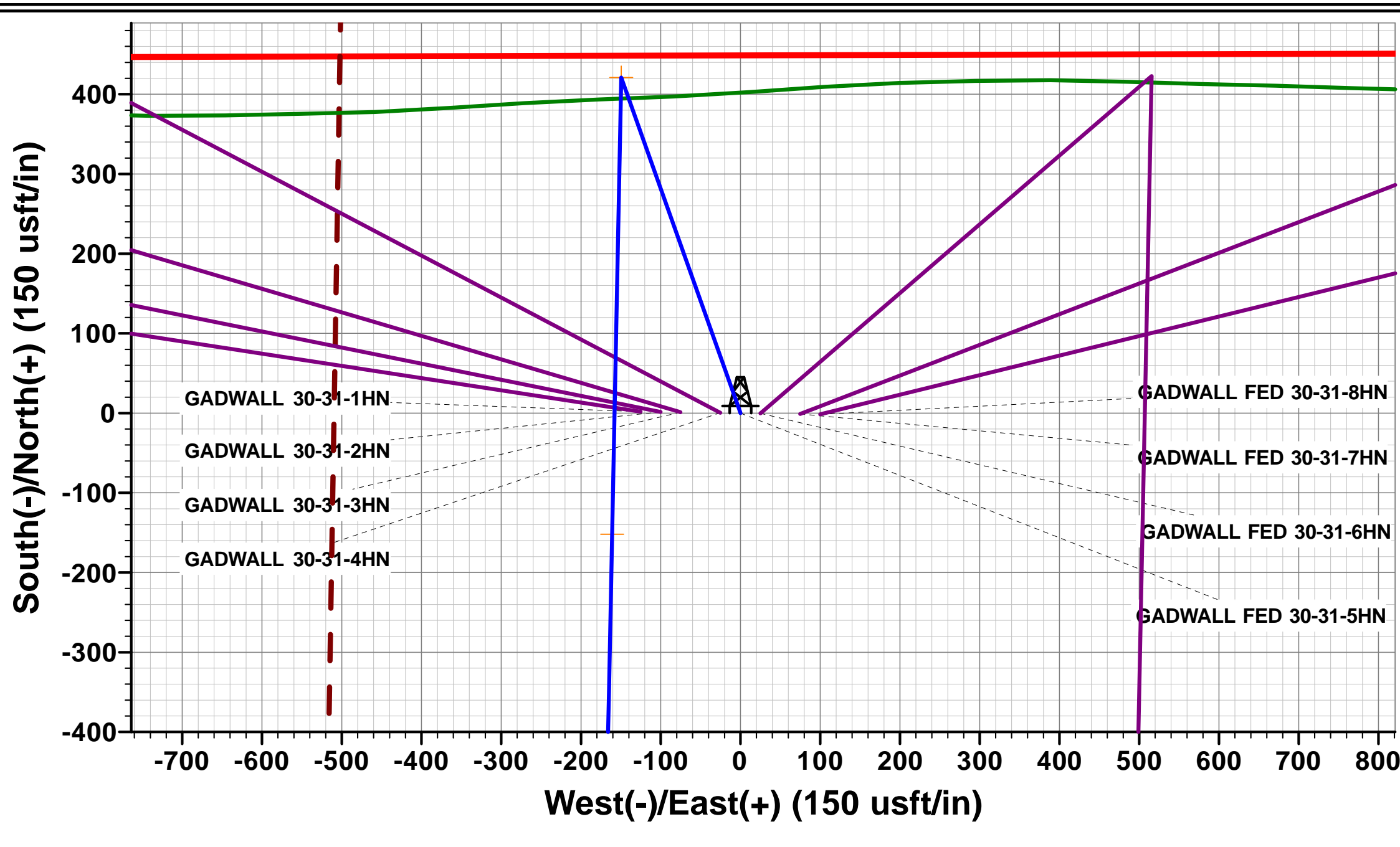
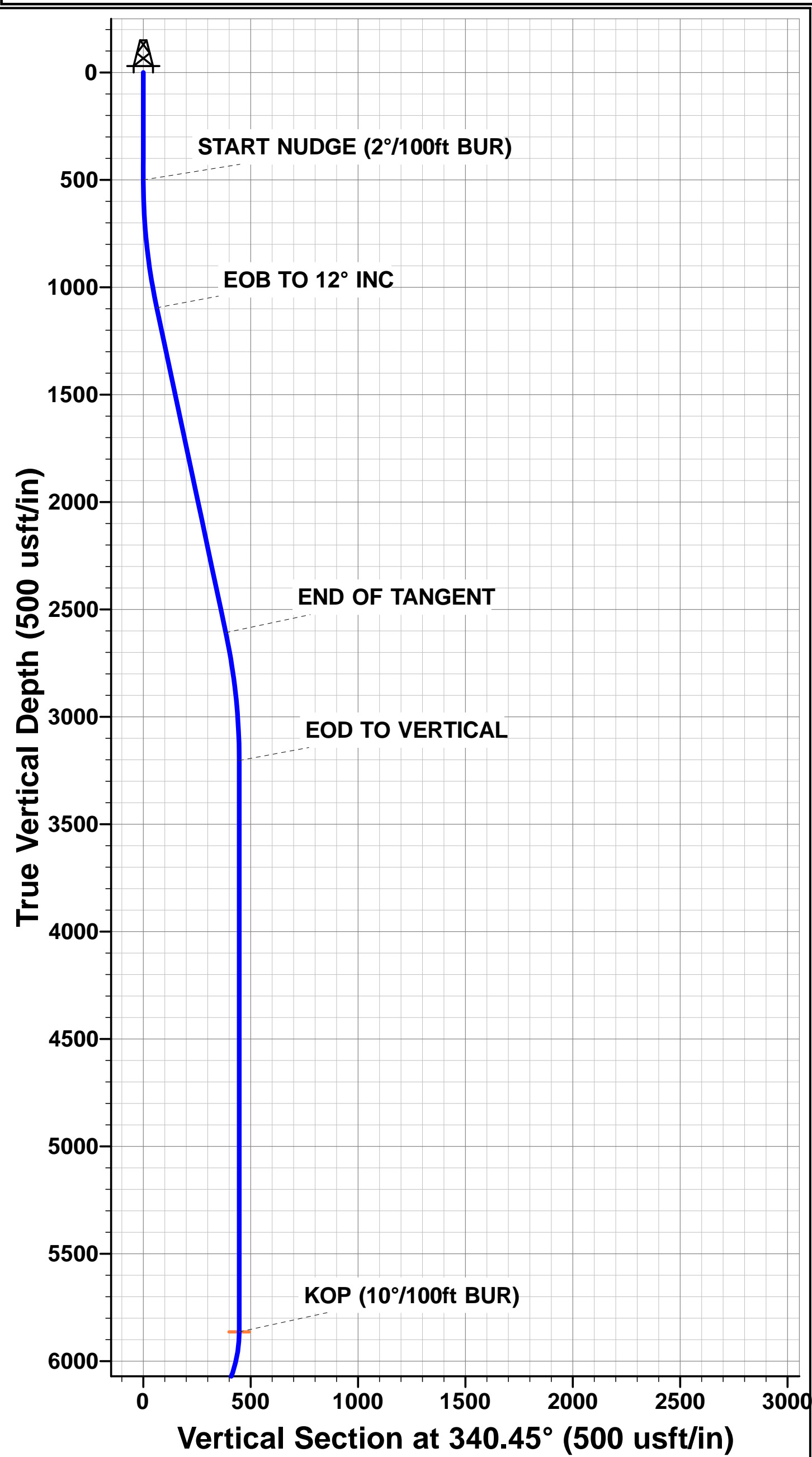
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Dep	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 749ft FNL & 2142ft FEL of Sec 30
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	START NUDGE (2"/100ft BUR)
1100.00	12.00	340.45	1095.62	58.99	-20.95	-58.19	62.60	EOB TO 12° INC
2646.17	12.00	340.45	2608.01	361.93	-128.52	-356.98	384.07	END OF TANGENT
3246.17	0.00	0.00	3203.63	420.92	-149.47	-415.16	446.67	EOD TO VERTICAL
5906.58	0.00	0.00	5864.04	420.92	-149.47	-415.16	446.67	KOP (10"/100ft BUR)
6806.58	90.00	181.15	6437.00	-151.92	-160.97	157.72	1019.63	HZ LP: 900ft FNL & 2300ft FEL of Sec 30
16182.18	90.00	181.15	6437.15	-9525.63	-349.19	9532.03	10395.23	BHL: 300ft FSL & 2300ft FEL of Sec 31

PROPOSED LOCAL COORDINATES:

SHL: 749ft FNL & 2142ft FEL Sec 30
HZ LP: 900ft FNL & 2300ft FEL Sec 30
BHL: 300ft FSL & 2300ft FEL of Sec 31

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP: GADWALL FED 30-31-5HN (P2)	5864.04	420.92	-149.47	40.639587	-104.133634
HZ LP: GADWALL FED 30-31-5HN (P2)	6437.00	-151.92	-160.97	40.638015	-104.133675
BHL: GADWALL FED 30-31-5HN (P2)	6437.00	-9525.63	-349.28	40.612286	-104.134353



Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well GADWALL FED 30-31-5HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4977.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4977.00usft
Site:	NW NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-5HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #2		

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	NW 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:	0.00 usft	Slot Radius:	1.10 ft	Grid Convergence:	0.88 °

Well	GADWALL FED 30-31-5HN					
Well Position	+N/-S	-2.92 usft	Northing:	1,478,346.74 usft	Latitude:	40.638432
	+E/-W	200.10 usft	Easting:	3,379,343.21 usft	Longitude:	-104.133095
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,950.00 usft

Wellbore	ORIGINAL WELLBORE				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	2020-03-05	7.66	66.99	52,275.99618513

Design	PROPOSAL #2				
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Audit Notes:					
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	6,437.00	0.00	0.00	182.10	

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	-4,977.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	-4,477.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,100.00	12.00	340.45	1,095.62	-3,881.38	58.99	-20.95	2.00	2.00	0.00	340.45	
2,646.17	12.00	340.45	2,608.00	-2,369.00	361.93	-128.52	0.00	0.00	0.00	0.00	
3,246.17	0.00	0.00	3,203.62	-1,773.38	420.92	-149.47	2.00	-2.00	0.00	180.00	
5,906.58	0.00	0.00	5,864.04	887.04	420.92	-149.47	0.00	0.00	0.00	0.00	KOP: GADWALL FE
6,806.58	90.00	181.15	6,437.00	1,460.00	-151.92	-160.97	10.00	10.00	-19.87	181.15	HZ LP: GADWALL I
16,182.18	90.00	181.15	6,437.00	1,460.00	-9,525.63	-349.28	0.00	0.00	0.00	0.00	BHL: GADWALL FE

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Well:	GADWALL FED 30-31-5HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #2		

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 & 2142ft FEL of Sec 30										
0.00	0.00	0.00	0.00	4,977.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,877.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4,777.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	4,677.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	4,577.00	0.00	0.00	0.00	0.00	0.00	0.00
START NUDGE (2°/100ft BUR)										
500.00	0.00	0.00	500.00	4,477.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Base										
522.00	0.44	340.45	522.00	4,455.00	0.08	-0.03	-0.08	2.00	2.00	0.00
600.00	2.00	340.45	599.98	4,377.02	1.64	-0.58	-1.62	2.00	2.00	0.00
700.00	4.00	340.45	699.84	4,277.16	6.58	-2.34	-6.49	2.00	2.00	0.00
800.00	6.00	340.45	799.45	4,177.55	14.79	-5.25	-14.59	2.00	2.00	0.00
900.00	8.00	340.45	898.70	4,078.30	26.27	-9.33	-25.91	2.00	2.00	0.00
1,000.00	10.00	340.45	997.47	3,979.53	41.01	-14.56	-40.45	2.00	2.00	0.00
EOB TO 12° INC										
1,100.00	12.00	340.45	1,095.62	3,881.38	58.99	-20.95	-58.19	2.00	2.00	0.00
1,200.00	12.00	340.45	1,193.44	3,783.56	78.59	-27.91	-77.51	0.00	0.00	0.00
1,300.00	12.00	340.45	1,291.25	3,685.75	98.18	-34.86	-96.84	0.00	0.00	0.00
1,400.00	12.00	340.45	1,389.07	3,587.93	117.77	-41.82	-116.16	0.00	0.00	0.00
1,500.00	12.00	340.45	1,486.88	3,490.12	137.36	-48.78	-135.48	0.00	0.00	0.00
Pierre Shale Top										
1,574.75	12.00	340.45	1,560.00	3,417.00	152.01	-53.98	-149.93	0.00	0.00	0.00
1,600.00	12.00	340.45	1,584.70	3,392.30	156.96	-55.74	-154.81	0.00	0.00	0.00
1,700.00	12.00	340.45	1,682.51	3,294.49	176.55	-62.69	-174.13	0.00	0.00	0.00
1,800.00	12.00	340.45	1,780.33	3,196.67	196.14	-69.65	-193.46	0.00	0.00	0.00
1,900.00	12.00	340.45	1,878.14	3,098.86	215.73	-76.61	-212.78	0.00	0.00	0.00
2,000.00	12.00	340.45	1,975.96	3,001.04	235.33	-83.57	-232.11	0.00	0.00	0.00
2,100.00	12.00	340.45	2,073.77	2,903.23	254.92	-90.52	-251.43	0.00	0.00	0.00
2,200.00	12.00	340.45	2,171.59	2,805.41	274.51	-97.48	-270.76	0.00	0.00	0.00
2,300.00	12.00	340.45	2,269.40	2,707.60	294.10	-104.44	-290.08	0.00	0.00	0.00
2,400.00	12.00	340.45	2,367.22	2,609.78	313.70	-111.39	-309.40	0.00	0.00	0.00
2,500.00	12.00	340.45	2,465.03	2,511.97	333.29	-118.35	-328.73	0.00	0.00	0.00
2,600.00	12.00	340.45	2,562.84	2,414.16	352.88	-125.31	-348.05	0.00	0.00	0.00
END OF TANGENT										
2,646.17	12.00	340.45	2,608.01	2,368.99	361.93	-128.52	-356.98	0.00	0.00	0.00
2,700.00	10.92	340.45	2,660.76	2,316.24	372.01	-132.10	-366.92	2.00	-2.00	0.00
2,800.00	8.92	340.45	2,759.26	2,217.74	388.25	-137.87	-382.93	2.00	-2.00	0.00
2,900.00	6.92	340.45	2,858.30	2,118.70	401.24	-142.48	-395.75	2.00	-2.00	0.00
3,000.00	4.92	340.45	2,957.76	2,019.24	410.96	-145.93	-405.34	2.00	-2.00	0.00
3,100.00	2.92	340.45	3,057.52	1,919.48	417.41	-148.22	-411.70	2.00	-2.00	0.00
3,200.00	0.92	340.45	3,157.46	1,819.54	420.57	-149.35	-414.81	2.00	-2.00	0.00
EOD TO VERTICAL										
3,246.17	0.00	0.00	3,203.63	1,773.37	420.92	-149.47	-415.16	2.00	-2.00	0.00
3,300.00	0.00	0.00	3,257.46	1,719.54	420.92	-149.47	-415.16	0.00	0.00	0.00
3,400.00	0.00	0.00	3,357.46	1,619.54	420.92	-149.47	-415.16	0.00	0.00	0.00
Richard Sandstone										
3,456.54	0.00	0.00	3,414.00	1,563.00	420.92	-149.47	-415.16	0.00	0.00	0.00
3,500.00	0.00	0.00	3,457.46	1,519.54	420.92	-149.47	-415.16	0.00	0.00	0.00
Parkman Sandstone										
3,578.54	0.00	0.00	3,536.00	1,441.00	420.92	-149.47	-415.16	0.00	0.00	0.00
3,600.00	0.00	0.00	3,557.46	1,419.54	420.92	-149.47	-415.16	0.00	0.00	0.00
3,700.00	0.00	0.00	3,657.46	1,319.54	420.92	-149.47	-415.16	0.00	0.00	0.00

Planning Report

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Site:	NW NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-5HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #2		

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)
3,800.00	0.00	0.00	3,757.46	1,219.54	420.92	-149.47	-415.16	0.00	0.00	0.00
3,900.00	0.00	0.00	3,857.46	1,119.54	420.92	-149.47	-415.16	0.00	0.00	0.00
4,000.00	0.00	0.00	3,957.46	1,019.54	420.92	-149.47	-415.16	0.00	0.00	0.00
4,100.00	0.00	0.00	4,057.46	919.54	420.92	-149.47	-415.16	0.00	0.00	0.00
4,200.00	0.00	0.00	4,157.46	819.54	420.92	-149.47	-415.16	0.00	0.00	0.00
4,300.00	0.00	0.00	4,257.46	719.54	420.92	-149.47	-415.16	0.00	0.00	0.00
Sussex Sandstone										
4,317.54	0.00	0.00	4,275.00	702.00	420.92	-149.47	-415.16	0.00	0.00	0.00
4,400.00	0.00	0.00	4,357.46	619.54	420.92	-149.47	-415.16	0.00	0.00	0.00
4,500.00	0.00	0.00	4,457.46	519.54	420.92	-149.47	-415.16	0.00	0.00	0.00
4,600.00	0.00	0.00	4,557.46	419.54	420.92	-149.47	-415.16	0.00	0.00	0.00
4,700.00	0.00	0.00	4,657.46	319.54	420.92	-149.47	-415.16	0.00	0.00	0.00
Shannon Sandstone										
4,776.54	0.00	0.00	4,734.00	243.00	420.92	-149.47	-415.16	0.00	0.00	0.00
4,800.00	0.00	0.00	4,757.46	219.54	420.92	-149.47	-415.16	0.00	0.00	0.00
4,900.00	0.00	0.00	4,857.46	119.54	420.92	-149.47	-415.16	0.00	0.00	0.00
5,000.00	0.00	0.00	4,957.46	19.54	420.92	-149.47	-415.16	0.00	0.00	0.00
5,100.00	0.00	0.00	5,057.46	-80.46	420.92	-149.47	-415.16	0.00	0.00	0.00
5,200.00	0.00	0.00	5,157.46	-180.46	420.92	-149.47	-415.16	0.00	0.00	0.00
5,300.00	0.00	0.00	5,257.46	-280.46	420.92	-149.47	-415.16	0.00	0.00	0.00
5,400.00	0.00	0.00	5,357.46	-380.46	420.92	-149.47	-415.16	0.00	0.00	0.00
5,500.00	0.00	0.00	5,457.46	-480.46	420.92	-149.47	-415.16	0.00	0.00	0.00
5,600.00	0.00	0.00	5,557.46	-580.46	420.92	-149.47	-415.16	0.00	0.00	0.00
TeePee Buttes										
5,604.54	0.00	0.00	5,562.00	-585.00	420.92	-149.47	-415.16	0.00	0.00	0.00
5,700.00	0.00	0.00	5,657.46	-680.46	420.92	-149.47	-415.16	0.00	0.00	0.00
5,800.00	0.00	0.00	5,757.46	-780.46	420.92	-149.47	-415.16	0.00	0.00	0.00
5,900.00	0.00	0.00	5,857.46	-880.46	420.92	-149.47	-415.16	0.00	0.00	0.00
KOP (10°/100ft BUR)										
5,906.58	0.00	0.00	5,864.04	-887.04	420.92	-149.47	-415.16	0.00	0.00	0.00
6,000.00	9.34	181.15	5,957.05	-980.05	413.32	-149.62	-407.56	10.00	10.00	0.00
6,100.00	19.34	181.15	6,053.81	-1,076.81	388.59	-150.12	-382.83	10.00	10.00	0.00
6,200.00	29.34	181.15	6,144.80	-1,167.80	347.43	-150.95	-341.67	10.00	10.00	0.00
Sharon Springs										
6,266.81	36.02	181.15	6,201.00	-1,224.00	311.38	-151.67	-305.62	10.00	10.00	0.00
6,300.00	39.34	181.15	6,227.26	-1,250.26	291.10	-152.08	-285.33	10.00	10.00	0.00
Niobrara Top										
6,312.70	40.61	181.15	6,237.00	-1,260.00	282.94	-152.24	-277.17	10.00	10.00	0.00
6,400.00	49.34	181.15	6,298.69	-1,321.69	221.31	-153.48	-215.54	10.00	10.00	0.00
Niobrara B2 Chalk Target Top										
6,454.18	54.76	181.15	6,332.00	-1,355.00	178.61	-154.34	-172.83	10.00	10.00	0.00
6,500.00	59.34	181.15	6,356.91	-1,379.91	140.18	-155.11	-134.40	10.00	10.00	0.00
6,600.00	69.34	181.15	6,400.16	-1,423.16	50.17	-156.91	-44.39	10.00	10.00	0.00
Niobrara C Chalk Top										
6,605.28	69.87	181.15	6,402.00	-1,425.00	45.22	-157.01	-39.44	10.00	10.00	0.00
Niobrara C Chalk Target Top										
6,675.19	76.86	181.15	6,422.00	-1,445.00	-21.71	-158.36	27.49	10.00	10.00	0.00
6,700.00	79.34	181.15	6,427.11	-1,450.11	-45.97	-158.84	51.76	10.00	10.00	0.00
6,800.00	89.34	181.15	6,436.96	-1,459.96	-145.34	-160.84	151.14	10.00	10.00	0.00
HZ LP: 900ft FNL & 2300ft FEL of Sec 30 - Niobrara C Chalk Landing Point										
6,806.58	90.00	181.15	6,437.00	-1,460.00	-151.92	-160.97	157.71	10.00	10.00	0.00
6,900.00	90.00	181.15	6,437.00	-1,460.00	-245.32	-162.85	251.12	0.00	0.00	0.00

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Design:	PROPOSAL #2		

Planned Survey										
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7,000.00	90.00	181.15	6,437.00	-1,460.00	-345.30	-164.86	351.11	0.00	0.00	0.00
7,100.00	90.00	181.15	6,437.00	-1,460.00	-445.28	-166.86	451.10	0.00	0.00	0.00
7,200.00	90.00	181.15	6,437.01	-1,460.01	-545.26	-168.87	551.08	0.00	0.00	0.00
7,300.00	90.00	181.15	6,437.01	-1,460.01	-645.24	-170.88	651.07	0.00	0.00	0.00
7,400.00	90.00	181.15	6,437.01	-1,460.01	-745.22	-172.89	751.05	0.00	0.00	0.00
7,500.00	90.00	181.15	6,437.01	-1,460.01	-845.20	-174.89	851.04	0.00	0.00	0.00
7,600.00	90.00	181.15	6,437.01	-1,460.01	-945.18	-176.90	951.03	0.00	0.00	0.00
7,700.00	90.00	181.15	6,437.01	-1,460.01	-1,045.16	-178.91	1,051.01	0.00	0.00	0.00
7,800.00	90.00	181.15	6,437.02	-1,460.02	-1,145.14	-180.92	1,151.00	0.00	0.00	0.00
7,900.00	90.00	181.15	6,437.02	-1,460.02	-1,245.12	-182.92	1,250.99	0.00	0.00	0.00
8,000.00	90.00	181.15	6,437.02	-1,460.02	-1,345.10	-184.93	1,350.97	0.00	0.00	0.00
8,100.00	90.00	181.15	6,437.02	-1,460.02	-1,445.08	-186.94	1,450.96	0.00	0.00	0.00
8,200.00	90.00	181.15	6,437.02	-1,460.02	-1,545.06	-188.95	1,550.94	0.00	0.00	0.00
8,300.00	90.00	181.15	6,437.02	-1,460.02	-1,645.04	-190.95	1,650.93	0.00	0.00	0.00
8,400.00	90.00	181.15	6,437.02	-1,460.02	-1,745.02	-192.96	1,750.92	0.00	0.00	0.00
8,500.00	90.00	181.15	6,437.03	-1,460.03	-1,845.00	-194.97	1,850.90	0.00	0.00	0.00
8,600.00	90.00	181.15	6,437.03	-1,460.03	-1,944.98	-196.98	1,950.89	0.00	0.00	0.00
8,700.00	90.00	181.15	6,437.03	-1,460.03	-2,044.96	-198.98	2,050.88	0.00	0.00	0.00
8,800.00	90.00	181.15	6,437.03	-1,460.03	-2,144.94	-200.99	2,150.86	0.00	0.00	0.00
8,900.00	90.00	181.15	6,437.03	-1,460.03	-2,244.92	-203.00	2,250.85	0.00	0.00	0.00
9,000.00	90.00	181.15	6,437.03	-1,460.03	-2,344.90	-205.01	2,350.83	0.00	0.00	0.00
9,100.00	90.00	181.15	6,437.04	-1,460.04	-2,444.88	-207.01	2,450.82	0.00	0.00	0.00
9,200.00	90.00	181.15	6,437.04	-1,460.04	-2,544.86	-209.02	2,550.81	0.00	0.00	0.00
9,300.00	90.00	181.15	6,437.04	-1,460.04	-2,644.84	-211.03	2,650.79	0.00	0.00	0.00
9,400.00	90.00	181.15	6,437.04	-1,460.04	-2,744.82	-213.04	2,750.78	0.00	0.00	0.00
9,500.00	90.00	181.15	6,437.04	-1,460.04	-2,844.80	-215.04	2,850.77	0.00	0.00	0.00
9,600.00	90.00	181.15	6,437.04	-1,460.04	-2,944.78	-217.05	2,950.75	0.00	0.00	0.00
9,700.00	90.00	181.15	6,437.05	-1,460.05	-3,044.76	-219.06	3,050.74	0.00	0.00	0.00
9,800.00	90.00	181.15	6,437.05	-1,460.05	-3,144.74	-221.07	3,150.73	0.00	0.00	0.00
9,900.00	90.00	181.15	6,437.05	-1,460.05	-3,244.72	-223.07	3,250.71	0.00	0.00	0.00
10,000.00	90.00	181.15	6,437.05	-1,460.05	-3,344.70	-225.08	3,350.70	0.00	0.00	0.00
10,100.00	90.00	181.15	6,437.05	-1,460.05	-3,444.68	-227.09	3,450.68	0.00	0.00	0.00
10,200.00	90.00	181.15	6,437.05	-1,460.05	-3,544.66	-229.10	3,550.67	0.00	0.00	0.00
10,300.00	90.00	181.15	6,437.05	-1,460.05	-3,644.64	-231.10	3,650.66	0.00	0.00	0.00
10,400.00	90.00	181.15	6,437.06	-1,460.06	-3,744.62	-233.11	3,750.64	0.00	0.00	0.00
10,500.00	90.00	181.15	6,437.06	-1,460.06	-3,844.60	-235.12	3,850.63	0.00	0.00	0.00
10,600.00	90.00	181.15	6,437.06	-1,460.06	-3,944.58	-237.13	3,950.62	0.00	0.00	0.00
10,700.00	90.00	181.15	6,437.06	-1,460.06	-4,044.56	-239.13	4,050.60	0.00	0.00	0.00
10,800.00	90.00	181.15	6,437.06	-1,460.06	-4,144.54	-241.14	4,150.59	0.00	0.00	0.00
10,900.00	90.00	181.15	6,437.06	-1,460.06	-4,244.51	-243.15	4,250.57	0.00	0.00	0.00
11,000.00	90.00	181.15	6,437.07	-1,460.07	-4,344.49	-245.16	4,350.56	0.00	0.00	0.00
11,100.00	90.00	181.15	6,437.07	-1,460.07	-4,444.47	-247.16	4,450.55	0.00	0.00	0.00
11,200.00	90.00	181.15	6,437.07	-1,460.07	-4,544.45	-249.17	4,550.53	0.00	0.00	0.00
11,300.00	90.00	181.15	6,437.07	-1,460.07	-4,644.43	-251.18	4,650.52	0.00	0.00	0.00
11,400.00	90.00	181.15	6,437.07	-1,460.07	-4,744.41	-253.19	4,750.51	0.00	0.00	0.00
11,500.00	90.00	181.15	6,437.07	-1,460.07	-4,844.39	-255.19	4,850.49	0.00	0.00	0.00
11,600.00	90.00	181.15	6,437.07	-1,460.07	-4,944.37	-257.20	4,950.48	0.00	0.00	0.00
11,700.00	90.00	181.15	6,437.08	-1,460.08	-5,044.35	-259.21	5,050.46	0.00	0.00	0.00
11,800.00	90.00	181.15	6,437.08	-1,460.08	-5,144.33	-261.22	5,150.45	0.00	0.00	0.00
11,900.00	90.00	181.15	6,437.08	-1,460.08	-5,244.31	-263.22	5,250.44	0.00	0.00	0.00
12,000.00	90.00	181.15	6,437.08	-1,460.08	-5,344.29	-265.23	5,350.42	0.00	0.00	0.00
12,100.00	90.00	181.15	6,437.08	-1,460.08	-5,444.27	-267.24	5,450.41	0.00	0.00	0.00
12,200.00	90.00	181.15	6,437.08	-1,460.08	-5,544.25	-269.25	5,550.40	0.00	0.00	0.00
12,300.00	90.00	181.15	6,437.09	-1,460.09	-5,644.23	-271.25	5,650.38	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well GADWALL FED 30-31-5HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4977.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4977.00usft
Site:	NW NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-5HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #2		

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)
12,400.00	90.00	181.15	6,437.09	-1,460.09	-5,744.21	-273.26	5,750.37	0.00	0.00	0.00
12,500.00	90.00	181.15	6,437.09	-1,460.09	-5,844.19	-275.27	5,850.35	0.00	0.00	0.00
12,600.00	90.00	181.15	6,437.09	-1,460.09	-5,944.17	-277.28	5,950.34	0.00	0.00	0.00
12,700.00	90.00	181.15	6,437.09	-1,460.09	-6,044.15	-279.28	6,050.33	0.00	0.00	0.00
12,800.00	90.00	181.15	6,437.09	-1,460.09	-6,144.13	-281.29	6,150.31	0.00	0.00	0.00
12,900.00	90.00	181.15	6,437.10	-1,460.10	-6,244.11	-283.30	6,250.30	0.00	0.00	0.00
13,000.00	90.00	181.15	6,437.10	-1,460.10	-6,344.09	-285.31	6,350.29	0.00	0.00	0.00
13,100.00	90.00	181.15	6,437.10	-1,460.10	-6,444.07	-287.31	6,450.27	0.00	0.00	0.00
13,200.00	90.00	181.15	6,437.10	-1,460.10	-6,544.05	-289.32	6,550.26	0.00	0.00	0.00
13,300.00	90.00	181.15	6,437.10	-1,460.10	-6,644.03	-291.33	6,650.24	0.00	0.00	0.00
13,400.00	90.00	181.15	6,437.10	-1,460.10	-6,744.01	-293.34	6,750.23	0.00	0.00	0.00
13,500.00	90.00	181.15	6,437.10	-1,460.10	-6,843.99	-295.34	6,850.22	0.00	0.00	0.00
13,600.00	90.00	181.15	6,437.11	-1,460.11	-6,943.97	-297.35	6,950.20	0.00	0.00	0.00
13,700.00	90.00	181.15	6,437.11	-1,460.11	-7,043.95	-299.36	7,050.19	0.00	0.00	0.00
13,800.00	90.00	181.15	6,437.11	-1,460.11	-7,143.93	-301.37	7,150.18	0.00	0.00	0.00
13,900.00	90.00	181.15	6,437.11	-1,460.11	-7,243.91	-303.37	7,250.16	0.00	0.00	0.00
14,000.00	90.00	181.15	6,437.11	-1,460.11	-7,343.89	-305.38	7,350.15	0.00	0.00	0.00
14,100.00	90.00	181.15	6,437.11	-1,460.11	-7,443.87	-307.39	7,450.13	0.00	0.00	0.00
14,200.00	90.00	181.15	6,437.12	-1,460.12	-7,543.85	-309.40	7,550.12	0.00	0.00	0.00
14,300.00	90.00	181.15	6,437.12	-1,460.12	-7,643.83	-311.40	7,650.11	0.00	0.00	0.00
14,400.00	90.00	181.15	6,437.12	-1,460.12	-7,743.81	-313.41	7,750.09	0.00	0.00	0.00
14,500.00	90.00	181.15	6,437.12	-1,460.12	-7,843.79	-315.42	7,850.08	0.00	0.00	0.00
14,600.00	90.00	181.15	6,437.12	-1,460.12	-7,943.77	-317.43	7,950.07	0.00	0.00	0.00
14,700.00	90.00	181.15	6,437.12	-1,460.12	-8,043.75	-319.43	8,050.05	0.00	0.00	0.00
14,800.00	90.00	181.15	6,437.12	-1,460.12	-8,143.73	-321.44	8,150.04	0.00	0.00	0.00
14,900.00	90.00	181.15	6,437.13	-1,460.13	-8,243.71	-323.45	8,250.02	0.00	0.00	0.00
15,000.00	90.00	181.15	6,437.13	-1,460.13	-8,343.69	-325.46	8,350.01	0.00	0.00	0.00
15,100.00	90.00	181.15	6,437.13	-1,460.13	-8,443.67	-327.46	8,450.00	0.00	0.00	0.00
15,200.00	90.00	181.15	6,437.13	-1,460.13	-8,543.65	-329.47	8,549.98	0.00	0.00	0.00
15,300.00	90.00	181.15	6,437.13	-1,460.13	-8,643.63	-331.48	8,649.97	0.00	0.00	0.00
15,400.00	90.00	181.15	6,437.13	-1,460.13	-8,743.61	-333.49	8,749.96	0.00	0.00	0.00
15,500.00	90.00	181.15	6,437.14	-1,460.14	-8,843.59	-335.49	8,849.94	0.00	0.00	0.00
15,600.00	90.00	181.15	6,437.14	-1,460.14	-8,943.57	-337.50	8,949.93	0.00	0.00	0.00
15,700.00	90.00	181.15	6,437.14	-1,460.14	-9,043.55	-339.51	9,049.91	0.00	0.00	0.00
15,800.00	90.00	181.15	6,437.14	-1,460.14	-9,143.53	-341.52	9,149.90	0.00	0.00	0.00
15,900.00	90.00	181.15	6,437.14	-1,460.14	-9,243.51	-343.52	9,249.89	0.00	0.00	0.00
16,000.00	90.00	181.15	6,437.14	-1,460.14	-9,343.49	-345.53	9,349.87	0.00	0.00	0.00
16,100.00	90.00	181.15	6,437.15	-1,460.15	-9,443.47	-347.54	9,449.86	0.00	0.00	0.00
BHL: 300ft FSL & 2300ft FEL of Sec 31										
16,182.18	90.00	181.15	6,437.15	-1,460.15	-9,525.63	-349.19	9,532.03	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well GADWALL FED 30-31-5HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4977.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4977.00usft
Site:	NW NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-5HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #2		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
522.00	522.00	Fox Hills Base			
1,574.75	1,560.00	Pierre Shale Top			
3,456.54	3,414.00	Richard Sandstone			
3,578.54	3,536.00	Parkman Sandstone			
4,317.54	4,275.00	Sussex Sandstone			
4,776.54	4,734.00	Shannon Sandstone			
5,604.54	5,562.00	TeePee Buttes			
6,266.81	6,201.00	Sharon Springs			
6,312.70	6,237.00	Niobrara Top			
6,454.18	6,332.00	Niobrara B2 Chalk Target Top			
6,605.28	6,402.00	Niobrara C Chalk Top			
6,675.19	6,422.00	Niobrara C Chalk Target Top			
6,806.58	6,437.00	Niobrara C Chalk Landing Point			

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.00	0.00	0.00	0.00	SHL: 749ft FNL & 2142ft FEL of Sec 30
500.00	500.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1,100.00	1,095.62	58.99	-20.95	EOB TO 12° INC
2,646.17	2,608.01	361.93	-128.52	END OF TANGENT
3,246.17	3,203.63	420.92	-149.47	EOD TO VERTICAL
5,906.58	5,864.04	420.92	-149.47	KOP (10°/100ft BUR)
6,806.58	6,437.00	-151.92	-160.97	HZ LP: 900ft FNL & 2300ft FEL of Sec 30
16,182.18	6,437.15	-9,525.63	-349.19	BHL: 300ft FSL & 2300ft FEL of Sec 31