

MALLARD EXPLORATION

WELD COUNTY

SEC 30-T8N-R60W

GADWALL FED 30-31-8HN

OWB

Plan: PROPOSAL 1

Standard Planning Report

19 May, 2022



Project: WELD COUNTY
Site: SEC 30-T8N-R60W
Well: GADWALL FED 30-31-8HN
Wellbore: OWB
Design: PROPOSAL 1

PROJECT DETAILS: WELD COUNTY
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone
System Datum: Mean Sea Level



Azimuths to True North
Magnetic North: 7.44°
Magnetic Field
Strength: 52043.8nT
Dip Angle: 66.89°
Date: 5/16/2022
Model: IGRF2020

WELL DETAILS: GADWALL FED 30-31-8HN

+N/-S	+E/-W	Northing	Easting	4947.00	Latitude	Longitude	Slot
0.00	0.00	1478346.82	3379443.13		40.638428°N	104.132735°W	

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	
3	1075.92	17.52	74.66	1062.34	35.15	128.14	2.00	74.66	-14.16	
4	6026.96	17.52	74.66	5783.75	429.44	1565.37	0.00	0.00	-173.04	
5	6975.98	90.00	181.15	6379.00	-144.93	1734.02	10.00	105.77	420.93	LP-GADWELL FED 8HN
6	16353.24	90.00	181.15	6379.00	-9520.29	1545.61	0.00	0.00	9644.94	PBHL-GADWELL FED 8HN

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
162.00	162.00	*Laramie Base
607.00	608.38	*Laramie Fox Hills Base
912.00	919.54	*Pierre Shale Base
1697.00	1741.45	*Upper Pierre Shale Base (SFC min depth)
3399.00	3526.23	Richard Sandstone
3519.00	3652.07	Parkman Sandstone
3879.00	4029.58	Parkman Sandstone Base
6184.00	6477.20	Sharon Springs
6224.00	6534.35	Niobrara Top
6364.00	6841.67	Niobrara B2 Chalk Top
6374.00	6898.55	Niobrara B2 Chalk Target Top
6379.00	6975.98	Niobrara B2 Chalk Landing Point

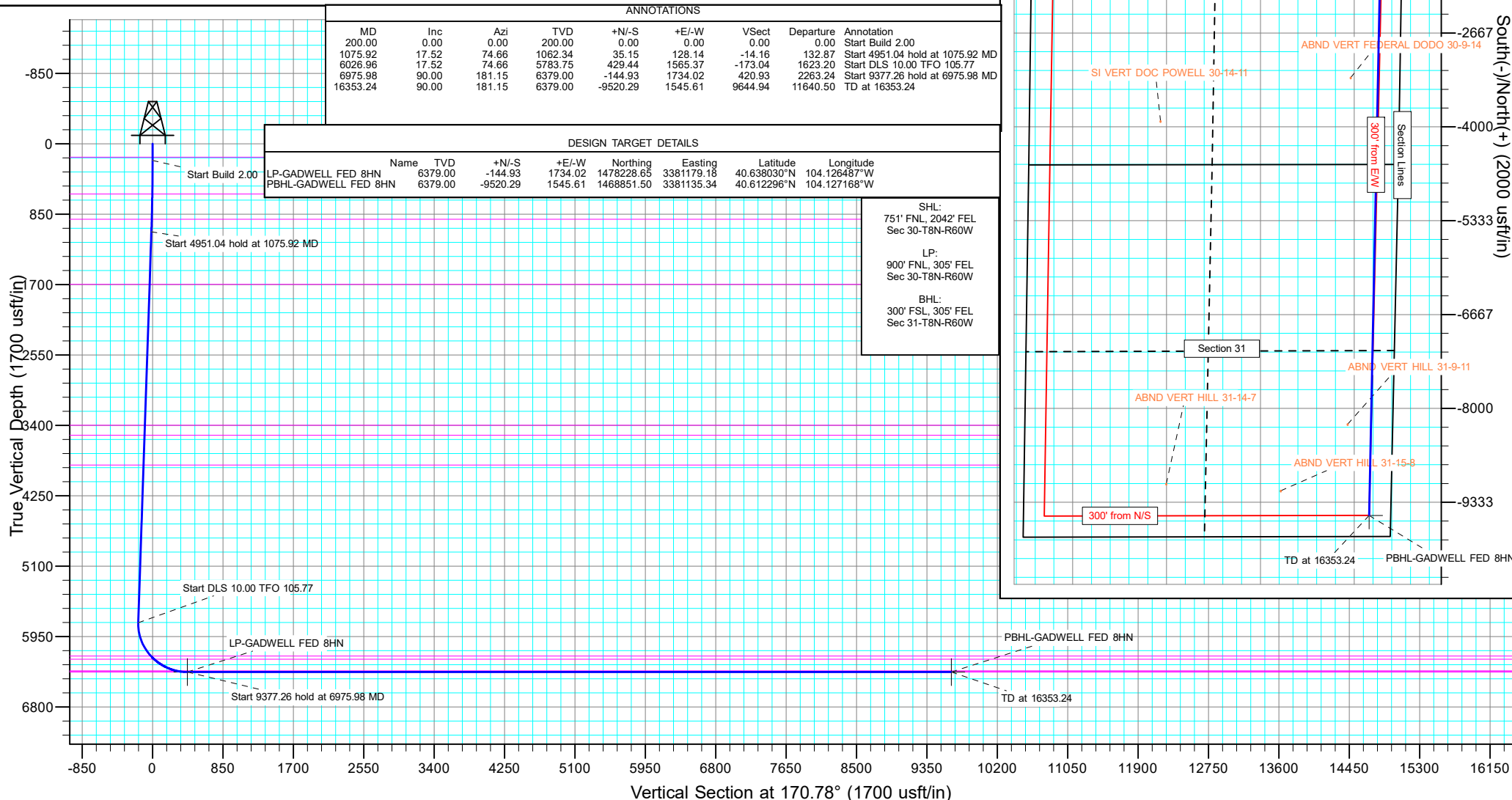
ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	Start Build 2.00
1075.92	17.52	74.66	1062.34	35.15	128.14	-14.16	132.87	Start 4951.04 hold at 1075.92 MD
6026.96	17.52	74.66	5783.75	429.44	1565.37	-173.04	1623.20	Start DLS 10.00 TFO 105.77
6975.98	90.00	181.15	6379.00	-144.93	1734.02	420.93	2263.24	Start 9377.26 hold at 6975.98 MD
16353.24	90.00	181.15	6379.00	-9520.29	1545.61	9644.94	11640.50	TD at 16353.24

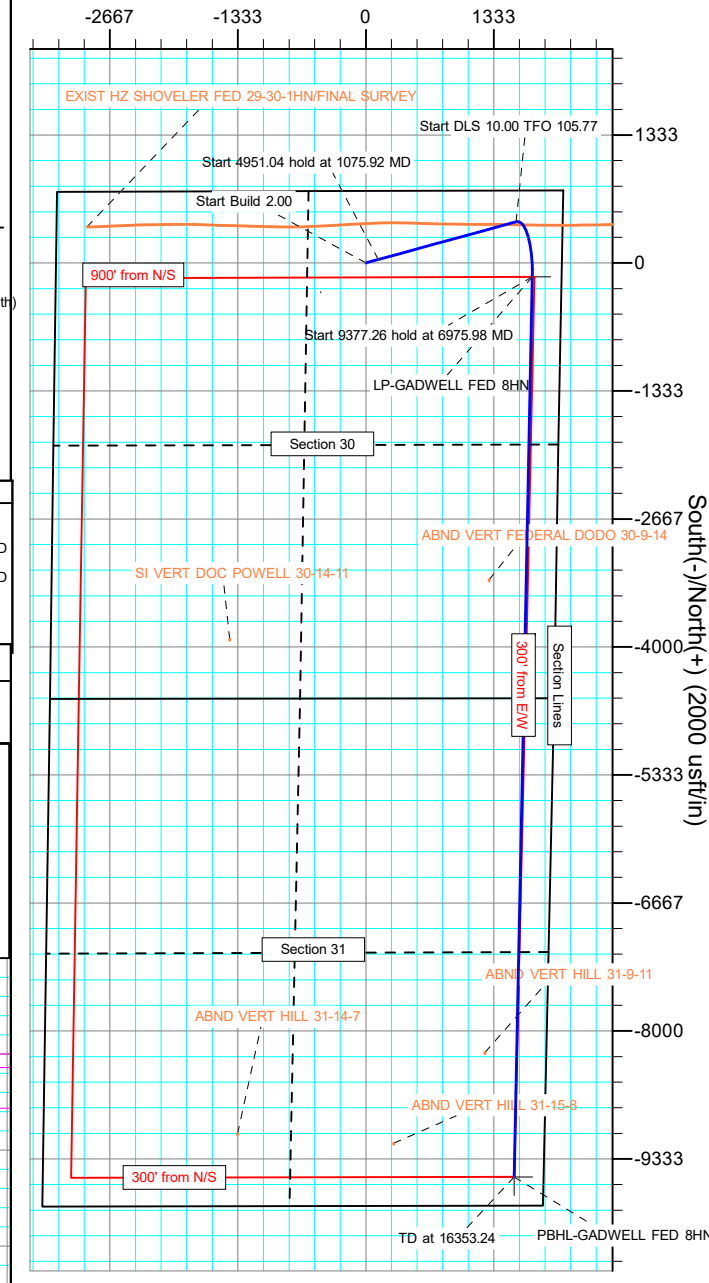
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
LP-GADWELL FED 8HN	6379.00	-144.93	1734.02	1478228.65	3381179.18	40.638030°N	104.126487°W
PBHL-GADWELL FED 8HN	6379.00	-9520.29	1545.61	1468851.50	3381135.34	40.612296°N	104.127168°W

SHL:
751' FNL, 2042' FEL
Sec 30-T8N-R60W
LP:
900' FNL, 305' FEL
Sec 30-T8N-R60W
BHL:
300' FSL, 305' FEL
Sec 31-T8N-R60W



West(-)/East(+) (2000 usft/in)



Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-8HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4974.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 4974.00usft
Site:	SEC 30-T8N-R60W	North Reference:	True
Well:	GADWALL FED 30-31-8HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Project	WELD COUNTY		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		SEC 30-T8N-R60W			
Site Position:		Northing:	1,479,134.50 usft	Latitude:	40.640503°N
From:	Lat/Long	Easting:	3,381,487.66 usft	Longitude:	104.125325°W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in		

Well		GADWALL FED 30-31-8HN				
Well Position	+N/-S	0.00 usft	Northing:	1,478,346.83 usft	Latitude:	40.638428°N
	+E/-W	0.00 usft	Easting:	3,379,443.12 usft	Longitude:	104.132735°W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,947.00 usft
Grid Convergence:		0.88 °				

Wellbore	OWB				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	5/16/2022	7.44	66.89	52,043.80879234

Design	PROPOSAL 1				
Audit Notes:					
Version:		Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	170.78	

Plan Survey Tool Program	Date	5/19/2022			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	16,353.24 PROPOSAL 1 (OWB)	MWD		
			OWSG MWD - Standard		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,075.92	17.52	74.66	1,062.34	35.15	128.14	2.00	2.00	0.00	74.66	
6,026.96	17.52	74.66	5,783.75	429.44	1,565.37	0.00	0.00	0.00	0.00	
6,975.98	90.00	181.15	6,379.00	-144.93	1,734.02	10.00	7.64	11.22	105.77	LP-GADWELL FED 8
16,353.24	90.00	181.15	6,379.00	-9,520.29	1,545.61	0.00	0.00	0.00	0.00	PBHL-GADWELL FEI

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Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4974.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 4974.00usft
Site:	SEC 30-T8N-R60W	North Reference:	True
Well:	GADWALL FED 30-31-8HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
162.00	0.00	0.00	162.00	0.00	0.00	0.00	0.00	0.00	0.00
*Laramie Base									
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
300.00	2.00	74.66	299.98	0.46	1.68	-0.19	2.00	2.00	0.00
400.00	4.00	74.66	399.84	1.85	6.73	-0.74	2.00	2.00	0.00
500.00	6.00	74.66	499.45	4.15	15.13	-1.67	2.00	2.00	0.00
600.00	8.00	74.66	598.70	7.38	26.89	-2.97	2.00	2.00	0.00
608.38	8.17	74.66	607.00	7.69	28.02	-3.10	2.00	2.00	0.00
*Laramie Fox Hills Base									
700.00	10.00	74.66	697.47	11.51	41.97	-4.64	2.00	2.00	0.00
800.00	12.00	74.66	795.62	16.56	60.37	-6.67	2.00	2.00	0.00
900.00	14.00	74.66	893.06	22.51	82.06	-9.07	2.00	2.00	0.00
919.54	14.39	74.66	912.00	23.78	86.69	-9.58	2.00	2.00	0.00
*Pierre Shale Base									
1,000.00	16.00	74.66	989.64	29.36	107.02	-11.83	2.00	2.00	0.00
1,075.92	17.52	74.66	1,062.34	35.15	128.14	-14.16	2.00	2.00	0.00
Start 4951.04 hold at 1075.92 MD									
1,100.00	17.52	74.66	1,085.30	37.07	135.12	-14.94	0.00	0.00	0.00
1,200.00	17.52	74.66	1,180.66	45.03	164.15	-18.15	0.00	0.00	0.00
1,300.00	17.52	74.66	1,276.02	53.00	193.18	-21.35	0.00	0.00	0.00
1,400.00	17.52	74.66	1,371.39	60.96	222.21	-24.56	0.00	0.00	0.00
1,500.00	17.52	74.66	1,466.75	68.92	251.24	-27.77	0.00	0.00	0.00
1,600.00	17.52	74.66	1,562.11	76.89	280.27	-30.98	0.00	0.00	0.00
1,700.00	17.52	74.66	1,657.47	84.85	309.30	-34.19	0.00	0.00	0.00
1,741.45	17.52	74.66	1,697.00	88.15	321.33	-35.52	0.00	0.00	0.00
*Upper Pierre Shale Base (SFC min depth)									
1,800.00	17.52	74.66	1,752.83	92.82	338.33	-37.40	0.00	0.00	0.00
1,900.00	17.52	74.66	1,848.19	100.78	367.35	-40.61	0.00	0.00	0.00
2,000.00	17.52	74.66	1,943.56	108.74	396.38	-43.82	0.00	0.00	0.00
2,100.00	17.52	74.66	2,038.92	116.71	425.41	-47.03	0.00	0.00	0.00
2,200.00	17.52	74.66	2,134.28	124.67	454.44	-50.23	0.00	0.00	0.00
2,300.00	17.52	74.66	2,229.64	132.63	483.47	-53.44	0.00	0.00	0.00
2,400.00	17.52	74.66	2,325.00	140.60	512.50	-56.65	0.00	0.00	0.00
2,500.00	17.52	74.66	2,420.37	148.56	541.53	-59.86	0.00	0.00	0.00
2,600.00	17.52	74.66	2,515.73	156.53	570.56	-63.07	0.00	0.00	0.00
2,700.00	17.52	74.66	2,611.09	164.49	599.59	-66.28	0.00	0.00	0.00
2,800.00	17.52	74.66	2,706.45	172.45	628.61	-69.49	0.00	0.00	0.00
2,900.00	17.52	74.66	2,801.81	180.42	657.64	-72.70	0.00	0.00	0.00
3,000.00	17.52	74.66	2,897.18	188.38	686.67	-75.91	0.00	0.00	0.00
3,100.00	17.52	74.66	2,992.54	196.34	715.70	-79.11	0.00	0.00	0.00
3,200.00	17.52	74.66	3,087.90	204.31	744.73	-82.32	0.00	0.00	0.00
3,300.00	17.52	74.66	3,183.26	212.27	773.76	-85.53	0.00	0.00	0.00
3,400.00	17.52	74.66	3,278.62	220.24	802.79	-88.74	0.00	0.00	0.00
3,500.00	17.52	74.66	3,373.99	228.20	831.82	-91.95	0.00	0.00	0.00
3,526.23	17.52	74.66	3,399.00	230.29	839.43	-92.79	0.00	0.00	0.00
Richard Sandstone									
3,600.00	17.52	74.66	3,469.35	236.16	860.85	-95.16	0.00	0.00	0.00
3,652.07	17.52	74.66	3,519.00	240.31	875.96	-96.83	0.00	0.00	0.00
Parkman Sandstone									
3,700.00	17.52	74.66	3,564.71	244.13	889.87	-98.37	0.00	0.00	0.00
3,800.00	17.52	74.66	3,660.07	252.09	918.90	-101.58	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-8HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4974.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 4974.00usft
Site:	SEC 30-T8N-R60W	North Reference:	True
Well:	GADWALL FED 30-31-8HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
3,900.00	17.52	74.66	3,755.43	260.05	947.93	-104.79	0.00	0.00	0.00	
4,000.00	17.52	74.66	3,850.80	268.02	976.96	-107.99	0.00	0.00	0.00	
4,029.58	17.52	74.66	3,879.00	270.37	985.55	-108.94	0.00	0.00	0.00	
Parkman Sandstone Base										
4,100.00	17.52	74.66	3,946.16	275.98	1,005.99	-111.20	0.00	0.00	0.00	
4,200.00	17.52	74.66	4,041.52	283.95	1,035.02	-114.41	0.00	0.00	0.00	
4,300.00	17.52	74.66	4,136.88	291.91	1,064.05	-117.62	0.00	0.00	0.00	
4,400.00	17.52	74.66	4,232.24	299.87	1,093.08	-120.83	0.00	0.00	0.00	
4,500.00	17.52	74.66	4,327.61	307.84	1,122.11	-124.04	0.00	0.00	0.00	
4,600.00	17.52	74.66	4,422.97	315.80	1,151.13	-127.25	0.00	0.00	0.00	
4,700.00	17.52	74.66	4,518.33	323.76	1,180.16	-130.46	0.00	0.00	0.00	
4,800.00	17.52	74.66	4,613.69	331.73	1,209.19	-133.67	0.00	0.00	0.00	
4,900.00	17.52	74.66	4,709.05	339.69	1,238.22	-136.87	0.00	0.00	0.00	
5,000.00	17.52	74.66	4,804.42	347.65	1,267.25	-140.08	0.00	0.00	0.00	
5,100.00	17.52	74.66	4,899.78	355.62	1,296.28	-143.29	0.00	0.00	0.00	
5,200.00	17.52	74.66	4,995.14	363.58	1,325.31	-146.50	0.00	0.00	0.00	
5,300.00	17.52	74.66	5,090.50	371.55	1,354.34	-149.71	0.00	0.00	0.00	
5,400.00	17.52	74.66	5,185.86	379.51	1,383.37	-152.92	0.00	0.00	0.00	
5,500.00	17.52	74.66	5,281.23	387.47	1,412.39	-156.13	0.00	0.00	0.00	
5,600.00	17.52	74.66	5,376.59	395.44	1,441.42	-159.34	0.00	0.00	0.00	
5,700.00	17.52	74.66	5,471.95	403.40	1,470.45	-162.55	0.00	0.00	0.00	
5,800.00	17.52	74.66	5,567.31	411.36	1,499.48	-165.76	0.00	0.00	0.00	
5,900.00	17.52	74.66	5,662.67	419.33	1,528.51	-168.96	0.00	0.00	0.00	
6,000.00	17.52	74.66	5,758.04	427.29	1,557.54	-172.17	0.00	0.00	0.00	
6,026.96	17.52	74.66	5,783.75	429.44	1,565.37	-173.04	0.00	0.00	0.00	
Start DLS 10.00 TFO 105.77										
6,100.00	17.00	99.39	5,853.59	430.61	1,586.53	-170.80	10.00	-0.70	33.86	
6,200.00	20.81	128.35	5,948.38	417.17	1,614.96	-152.98	10.00	3.80	28.96	
6,300.00	27.76	146.05	6,039.60	386.75	1,641.96	-118.63	10.00	6.96	17.70	
6,400.00	36.09	156.62	6,124.46	340.28	1,666.72	-68.79	10.00	8.33	10.56	
6,477.20	42.96	162.18	6,184.00	294.30	1,683.82	-20.66	10.00	8.89	7.21	
Sharon Springs										
6,500.00	45.03	163.55	6,200.40	279.17	1,688.48	-4.98	10.00	9.09	6.01	
6,534.35	48.18	165.44	6,224.00	255.12	1,695.14	19.82	10.00	9.17	5.49	
Niobrara Top										
6,600.00	54.27	168.58	6,265.10	205.27	1,706.58	70.86	10.00	9.28	4.78	
6,700.00	63.68	172.54	6,316.60	120.83	1,720.47	156.43	10.00	9.41	3.96	
6,800.00	73.18	175.90	6,353.33	28.43	1,729.74	249.13	10.00	9.50	3.36	
6,841.67	77.15	177.19	6,364.00	-11.77	1,732.16	289.20	10.00	9.54	3.10	
Niobrara B2 Chalk Top										
6,898.55	82.59	178.90	6,374.00	-67.72	1,734.06	344.73	10.00	9.56	2.99	
Niobrara B2 Chalk Target Top										
6,900.00	82.73	178.94	6,374.18	-69.15	1,734.09	346.15	10.00	9.56	2.94	
6,975.98	90.00	181.15	6,379.00	-144.93	1,734.02	420.93	10.00	9.57	2.91	
Start 9377.26 hold at 6975.98 MD - Niobrara B2 Chalk Landing Point										
7,000.00	90.00	181.15	6,379.00	-168.94	1,733.54	444.56	0.00	0.00	0.00	
7,100.00	90.00	181.15	6,379.00	-268.92	1,731.53	542.92	0.00	0.00	0.00	
7,200.00	90.00	181.15	6,379.00	-368.90	1,729.52	641.29	0.00	0.00	0.00	
7,300.00	90.00	181.15	6,379.00	-468.88	1,727.51	739.65	0.00	0.00	0.00	
7,400.00	90.00	181.15	6,379.00	-568.86	1,725.50	838.02	0.00	0.00	0.00	
7,500.00	90.00	181.15	6,379.00	-668.84	1,723.49	936.38	0.00	0.00	0.00	
7,600.00	90.00	181.15	6,379.00	-768.82	1,721.48	1,034.75	0.00	0.00	0.00	
7,700.00	90.00	181.15	6,379.00	-868.80	1,719.48	1,133.12	0.00	0.00	0.00	

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Project:	WELD COUNTY	MD Reference:	KB 27' @ 4974.00usft
Site:	SEC 30-T8N-R60W	North Reference:	True
Well:	GADWALL FED 30-31-8HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
7,800.00	90.00	181.15	6,379.00	-968.78	1,717.47	1,231.48	0.00	0.00	0.00	
7,900.00	90.00	181.15	6,379.00	-1,068.76	1,715.46	1,329.85	0.00	0.00	0.00	
8,000.00	90.00	181.15	6,379.00	-1,168.74	1,713.45	1,428.21	0.00	0.00	0.00	
8,100.00	90.00	181.15	6,379.00	-1,268.71	1,711.44	1,526.58	0.00	0.00	0.00	
8,200.00	90.00	181.15	6,379.00	-1,368.69	1,709.43	1,624.94	0.00	0.00	0.00	
8,300.00	90.00	181.15	6,379.00	-1,468.67	1,707.42	1,723.31	0.00	0.00	0.00	
8,400.00	90.00	181.15	6,379.00	-1,568.65	1,705.41	1,821.68	0.00	0.00	0.00	
8,500.00	90.00	181.15	6,379.00	-1,668.63	1,703.40	1,920.04	0.00	0.00	0.00	
8,600.00	90.00	181.15	6,379.00	-1,768.61	1,701.39	2,018.41	0.00	0.00	0.00	
8,700.00	90.00	181.15	6,379.00	-1,868.59	1,699.38	2,116.77	0.00	0.00	0.00	
8,800.00	90.00	181.15	6,379.00	-1,968.57	1,697.37	2,215.14	0.00	0.00	0.00	
8,900.00	90.00	181.15	6,379.00	-2,068.55	1,695.36	2,313.50	0.00	0.00	0.00	
9,000.00	90.00	181.15	6,379.00	-2,168.53	1,693.36	2,411.87	0.00	0.00	0.00	
9,100.00	90.00	181.15	6,379.00	-2,268.51	1,691.35	2,510.24	0.00	0.00	0.00	
9,200.00	90.00	181.15	6,379.00	-2,368.49	1,689.34	2,608.60	0.00	0.00	0.00	
9,300.00	90.00	181.15	6,379.00	-2,468.47	1,687.33	2,706.97	0.00	0.00	0.00	
9,400.00	90.00	181.15	6,379.00	-2,568.45	1,685.32	2,805.33	0.00	0.00	0.00	
9,500.00	90.00	181.15	6,379.00	-2,668.43	1,683.31	2,903.70	0.00	0.00	0.00	
9,600.00	90.00	181.15	6,379.00	-2,768.41	1,681.30	3,002.06	0.00	0.00	0.00	
9,700.00	90.00	181.15	6,379.00	-2,868.39	1,679.29	3,100.43	0.00	0.00	0.00	
9,800.00	90.00	181.15	6,379.00	-2,968.37	1,677.28	3,198.80	0.00	0.00	0.00	
9,900.00	90.00	181.15	6,379.00	-3,068.35	1,675.27	3,297.16	0.00	0.00	0.00	
10,000.00	90.00	181.15	6,379.00	-3,168.33	1,673.26	3,395.53	0.00	0.00	0.00	
10,100.00	90.00	181.15	6,379.00	-3,268.31	1,671.25	3,493.89	0.00	0.00	0.00	
10,200.00	90.00	181.15	6,379.00	-3,368.29	1,669.24	3,592.26	0.00	0.00	0.00	
10,300.00	90.00	181.15	6,379.00	-3,468.27	1,667.24	3,690.62	0.00	0.00	0.00	
10,400.00	90.00	181.15	6,379.00	-3,568.25	1,665.23	3,788.99	0.00	0.00	0.00	
10,500.00	90.00	181.15	6,379.00	-3,668.23	1,663.22	3,887.36	0.00	0.00	0.00	
10,600.00	90.00	181.15	6,379.00	-3,768.21	1,661.21	3,985.72	0.00	0.00	0.00	
10,700.00	90.00	181.15	6,379.00	-3,868.19	1,659.20	4,084.09	0.00	0.00	0.00	
10,800.00	90.00	181.15	6,379.00	-3,968.17	1,657.19	4,182.45	0.00	0.00	0.00	
10,900.00	90.00	181.15	6,379.00	-4,068.15	1,655.18	4,280.82	0.00	0.00	0.00	
11,000.00	90.00	181.15	6,379.00	-4,168.13	1,653.17	4,379.18	0.00	0.00	0.00	
11,100.00	90.00	181.15	6,379.00	-4,268.11	1,651.16	4,477.55	0.00	0.00	0.00	
11,200.00	90.00	181.15	6,379.00	-4,368.09	1,649.15	4,575.92	0.00	0.00	0.00	
11,300.00	90.00	181.15	6,379.00	-4,468.07	1,647.14	4,674.28	0.00	0.00	0.00	
11,400.00	90.00	181.15	6,379.00	-4,568.05	1,645.13	4,772.65	0.00	0.00	0.00	
11,500.00	90.00	181.15	6,379.00	-4,668.03	1,643.12	4,871.01	0.00	0.00	0.00	
11,600.00	90.00	181.15	6,379.00	-4,768.01	1,641.12	4,969.38	0.00	0.00	0.00	
11,700.00	90.00	181.15	6,379.00	-4,867.99	1,639.11	5,067.74	0.00	0.00	0.00	
11,800.00	90.00	181.15	6,379.00	-4,967.97	1,637.10	5,166.11	0.00	0.00	0.00	
11,900.00	90.00	181.15	6,379.00	-5,067.95	1,635.09	5,264.48	0.00	0.00	0.00	
12,000.00	90.00	181.15	6,379.00	-5,167.93	1,633.08	5,362.84	0.00	0.00	0.00	
12,100.00	90.00	181.15	6,379.00	-5,267.91	1,631.07	5,461.21	0.00	0.00	0.00	
12,200.00	90.00	181.15	6,379.00	-5,367.89	1,629.06	5,559.57	0.00	0.00	0.00	
12,300.00	90.00	181.15	6,379.00	-5,467.87	1,627.05	5,657.94	0.00	0.00	0.00	
12,400.00	90.00	181.15	6,379.00	-5,567.85	1,625.04	5,756.30	0.00	0.00	0.00	
12,500.00	90.00	181.15	6,379.00	-5,667.83	1,623.03	5,854.67	0.00	0.00	0.00	
12,600.00	90.00	181.15	6,379.00	-5,767.81	1,621.02	5,953.04	0.00	0.00	0.00	
12,700.00	90.00	181.15	6,379.00	-5,867.79	1,619.01	6,051.40	0.00	0.00	0.00	
12,800.00	90.00	181.15	6,379.00	-5,967.77	1,617.00	6,149.77	0.00	0.00	0.00	
12,900.00	90.00	181.15	6,379.00	-6,067.75	1,615.00	6,248.13	0.00	0.00	0.00	
13,000.00	90.00	181.15	6,379.00	-6,167.73	1,612.99	6,346.50	0.00	0.00	0.00	
13,100.00	90.00	181.15	6,379.00	-6,267.71	1,610.98	6,444.86	0.00	0.00	0.00	

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-8HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4974.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 4974.00usft
Site:	SEC 30-T8N-R60W	North Reference:	True
Well:	GADWALL FED 30-31-8HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
13,200.00	90.00	181.15	6,379.00	-6,367.69	1,608.97	6,543.23	0.00	0.00	0.00	
13,300.00	90.00	181.15	6,379.00	-6,467.67	1,606.96	6,641.60	0.00	0.00	0.00	
13,400.00	90.00	181.15	6,379.00	-6,567.65	1,604.95	6,739.96	0.00	0.00	0.00	
13,500.00	90.00	181.15	6,379.00	-6,667.62	1,602.94	6,838.33	0.00	0.00	0.00	
13,600.00	90.00	181.15	6,379.00	-6,767.60	1,600.93	6,936.69	0.00	0.00	0.00	
13,700.00	90.00	181.15	6,379.00	-6,867.58	1,598.92	7,035.06	0.00	0.00	0.00	
13,800.00	90.00	181.15	6,379.00	-6,967.56	1,596.91	7,133.42	0.00	0.00	0.00	
13,900.00	90.00	181.15	6,379.00	-7,067.54	1,594.90	7,231.79	0.00	0.00	0.00	
14,000.00	90.00	181.15	6,379.00	-7,167.52	1,592.89	7,330.16	0.00	0.00	0.00	
14,100.00	90.00	181.15	6,379.00	-7,267.50	1,590.88	7,428.52	0.00	0.00	0.00	
14,200.00	90.00	181.15	6,379.00	-7,367.48	1,588.88	7,526.89	0.00	0.00	0.00	
14,300.00	90.00	181.15	6,379.00	-7,467.46	1,586.87	7,625.25	0.00	0.00	0.00	
14,400.00	90.00	181.15	6,379.00	-7,567.44	1,584.86	7,723.62	0.00	0.00	0.00	
14,500.00	90.00	181.15	6,379.00	-7,667.42	1,582.85	7,821.98	0.00	0.00	0.00	
14,600.00	90.00	181.15	6,379.00	-7,767.40	1,580.84	7,920.35	0.00	0.00	0.00	
14,700.00	90.00	181.15	6,379.00	-7,867.38	1,578.83	8,018.72	0.00	0.00	0.00	
14,800.00	90.00	181.15	6,379.00	-7,967.36	1,576.82	8,117.08	0.00	0.00	0.00	
14,900.00	90.00	181.15	6,379.00	-8,067.34	1,574.81	8,215.45	0.00	0.00	0.00	
15,000.00	90.00	181.15	6,379.00	-8,167.32	1,572.80	8,313.81	0.00	0.00	0.00	
15,100.00	90.00	181.15	6,379.00	-8,267.30	1,570.79	8,412.18	0.00	0.00	0.00	
15,200.00	90.00	181.15	6,379.00	-8,367.28	1,568.78	8,510.54	0.00	0.00	0.00	
15,300.00	90.00	181.15	6,379.00	-8,467.26	1,566.77	8,608.91	0.00	0.00	0.00	
15,400.00	90.00	181.15	6,379.00	-8,567.24	1,564.76	8,707.28	0.00	0.00	0.00	
15,500.00	90.00	181.15	6,379.00	-8,667.22	1,562.76	8,805.64	0.00	0.00	0.00	
15,600.00	90.00	181.15	6,379.00	-8,767.20	1,560.75	8,904.01	0.00	0.00	0.00	
15,700.00	90.00	181.15	6,379.00	-8,867.18	1,558.74	9,002.37	0.00	0.00	0.00	
15,800.00	90.00	181.15	6,379.00	-8,967.16	1,556.73	9,100.74	0.00	0.00	0.00	
15,900.00	90.00	181.15	6,379.00	-9,067.14	1,554.72	9,199.10	0.00	0.00	0.00	
16,000.00	90.00	181.15	6,379.00	-9,167.12	1,552.71	9,297.47	0.00	0.00	0.00	
16,100.00	90.00	181.15	6,379.00	-9,267.10	1,550.70	9,395.84	0.00	0.00	0.00	
16,200.00	90.00	181.15	6,379.00	-9,367.08	1,548.69	9,494.20	0.00	0.00	0.00	
16,300.00	90.00	181.15	6,379.00	-9,467.06	1,546.68	9,592.57	0.00	0.00	0.00	
16,353.24	90.00	181.15	6,379.00	-9,520.29	1,545.61	9,644.94	0.00	0.00	0.00	
TD at 16353.24										

Design Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude Longitude		
PBHL-GADWELL FED 8 - plan hits target center - Point	0.00	0.00	6,379.00	-9,520.29	1,545.61	1,468,851.50	3,381,135.34	40.612296°N		104.127168°W
LP-GADWELL FED 8HN - plan hits target center - Point	0.00	0.00	6,379.00	-144.93	1,734.02	1,478,228.65	3,381,179.17	40.638030°N		104.126487°W

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-8HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4974.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 4974.00usft
Site:	SEC 30-T8N-R60W	North Reference:	True
Well:	GADWALL FED 30-31-8HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
162.00	162.00	*Laramie Base				
608.38	607.00	*Laramie Fox Hills Base				
919.54	912.00	*Pierre Shale Base				
1,741.45	1,697.00	*Upper Pierre Shale Base (SFC min dep:				
3,526.23	3,399.00	Richard Sandstone				
3,652.07	3,519.00	Parkman Sandstone				
4,029.58	3,879.00	Parkman Sandstone Base				
6,477.20	6,184.00	Sharon Springs				
6,534.35	6,224.00	Niobrara Top				
6,841.67	6,364.00	Niobrara B2 Chalk Top				
6,898.55	6,374.00	Niobrara B2 Chalk Target Top				
6,975.98	6,379.00	Niobrara B2 Chalk Landing Point				

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
200.00	200.00	0.00	0.00	Start Build 2.00
1,075.92	1,062.34	35.15	128.14	Start 4951.04 hold at 1075.92 MD
6,026.96	5,783.75	429.44	1,565.37	Start DLS 10.00 TFO 105.77
6,975.98	6,379.00	-144.93	1,734.02	Start 9377.26 hold at 6975.98 MD
16,353.24	6,379.00	-9,520.29	1,545.61	TD at 16353.24