

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

SW NE SEC. 26 T7N R63W 6th P.M.

BROWN NORTH 26-28-6HN

ORIGINAL WELLBORE

18 April, 2018

Plan: PROPOSAL #2





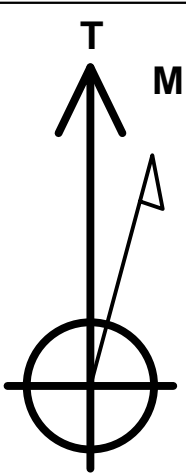
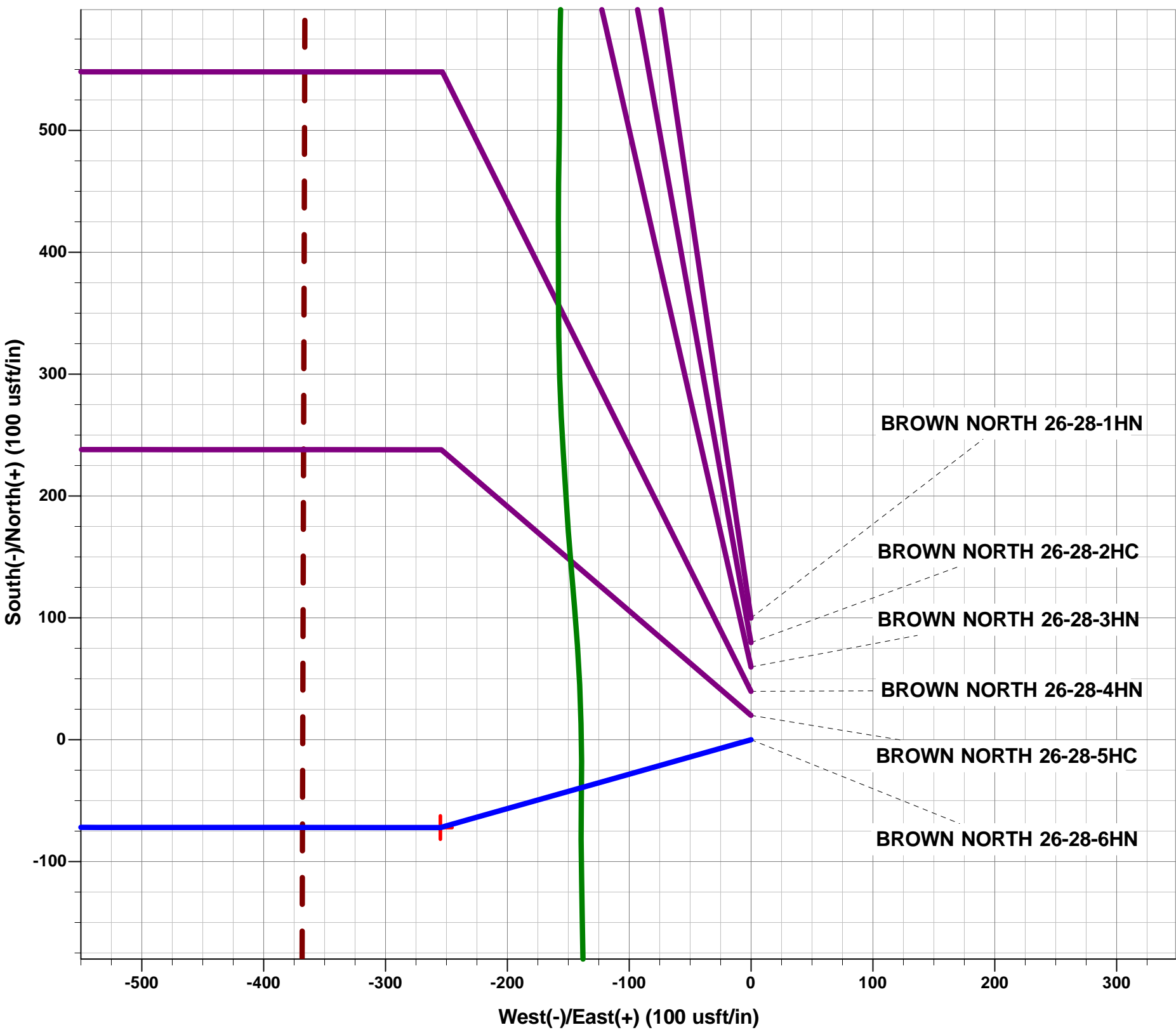
Project: WELD COUNTY, COLORADO (NAD 83)
Site: SW NE SEC. 26 T7N R63W 6th P.M.
Well: BROWN NORTH 26-28-6HN
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #2

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Dep	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 2264ft FNL & 2279ft FEL of Sec 26
100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)
695.62	700.00	12.00	254.22	-17.02	-60.24	60.33	62.60	EOB TO 12° INC
1353.05	1372.11	12.00	254.22	-55.03	-194.72	194.99	202.34	END OF TANGENT
1948.67	1972.11	0.00	0.00	-72.05	-254.96	255.31	264.94	EOD TO VERTICAL
6133.04	6156.48	0.00	0.00	-72.05	-254.96	255.31	264.94	KOP (10°/100ft DGLG)
6706.00	7056.49	90.00	270.03	-71.75	-827.93	828.27	837.91	HZ LP: 2330ft FNL & 2187ft FWL of Sec 26
6705.94	19425.86	90.00	270.03	-65.25	-13197.29	13197.46	13207.28	BHL: 2330ft FNL & 460ft FWL of Sec 28

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - BROWN NORTH 26-28-5HN (P2)	6133.04	-72.05	-254.96	40.545786	-104.403010
HZ LP - BROWN NORTH 26-28-5HN (P2)	6706.00	-71.75	-827.92	40.545787	-104.405072
BHL - BROWN NORTH 26-28-5HN (P2)	6706.00	-65.31	-13197.29	40.545795	-104.449579



Azimuths to True North
Magnetic North: 7.94°

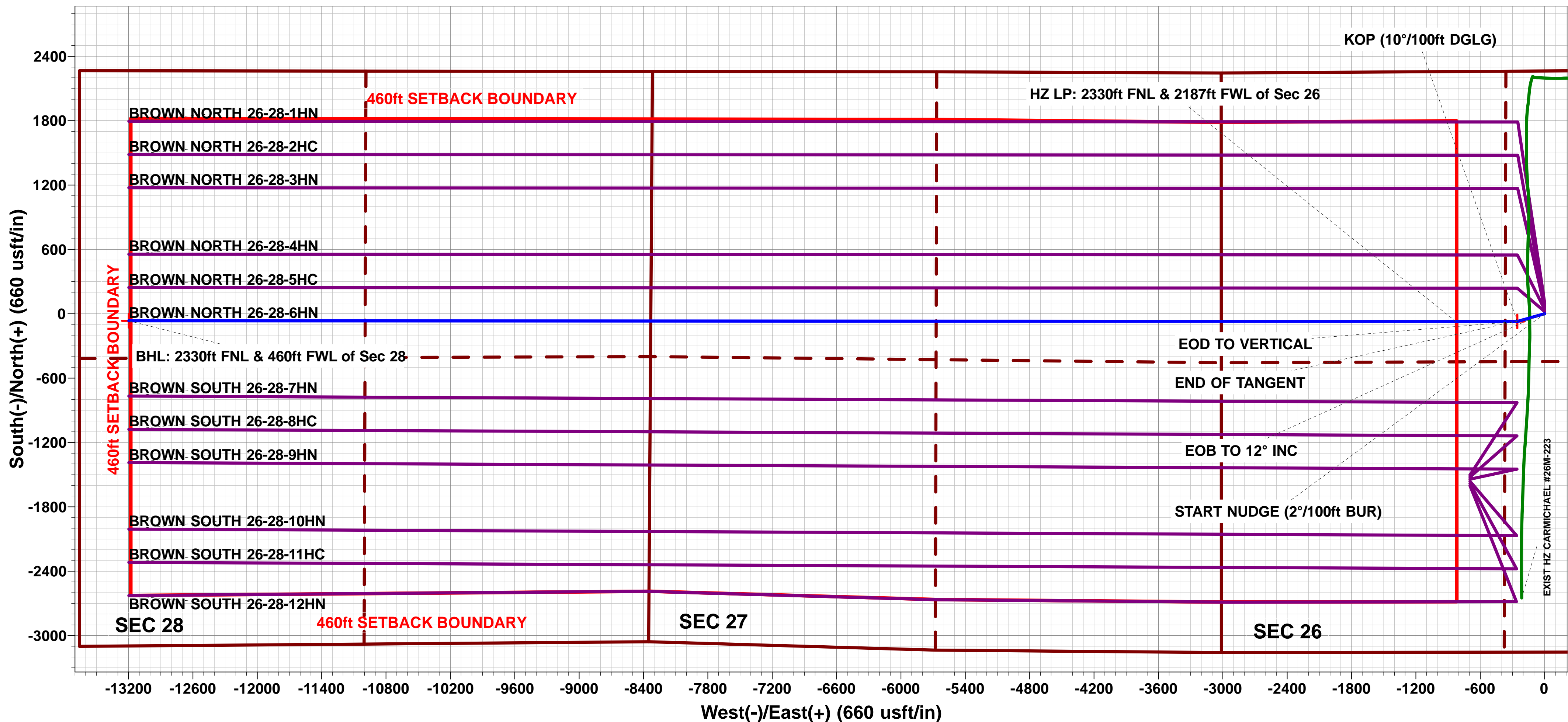
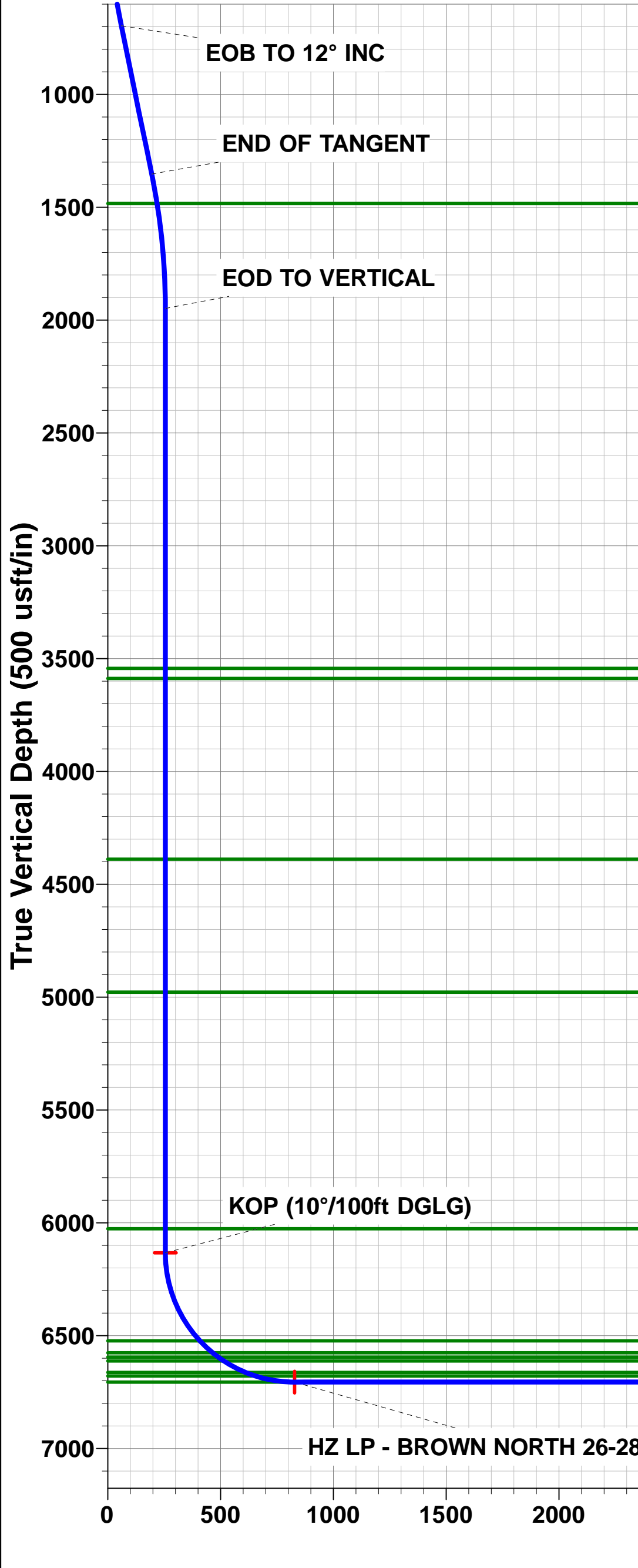
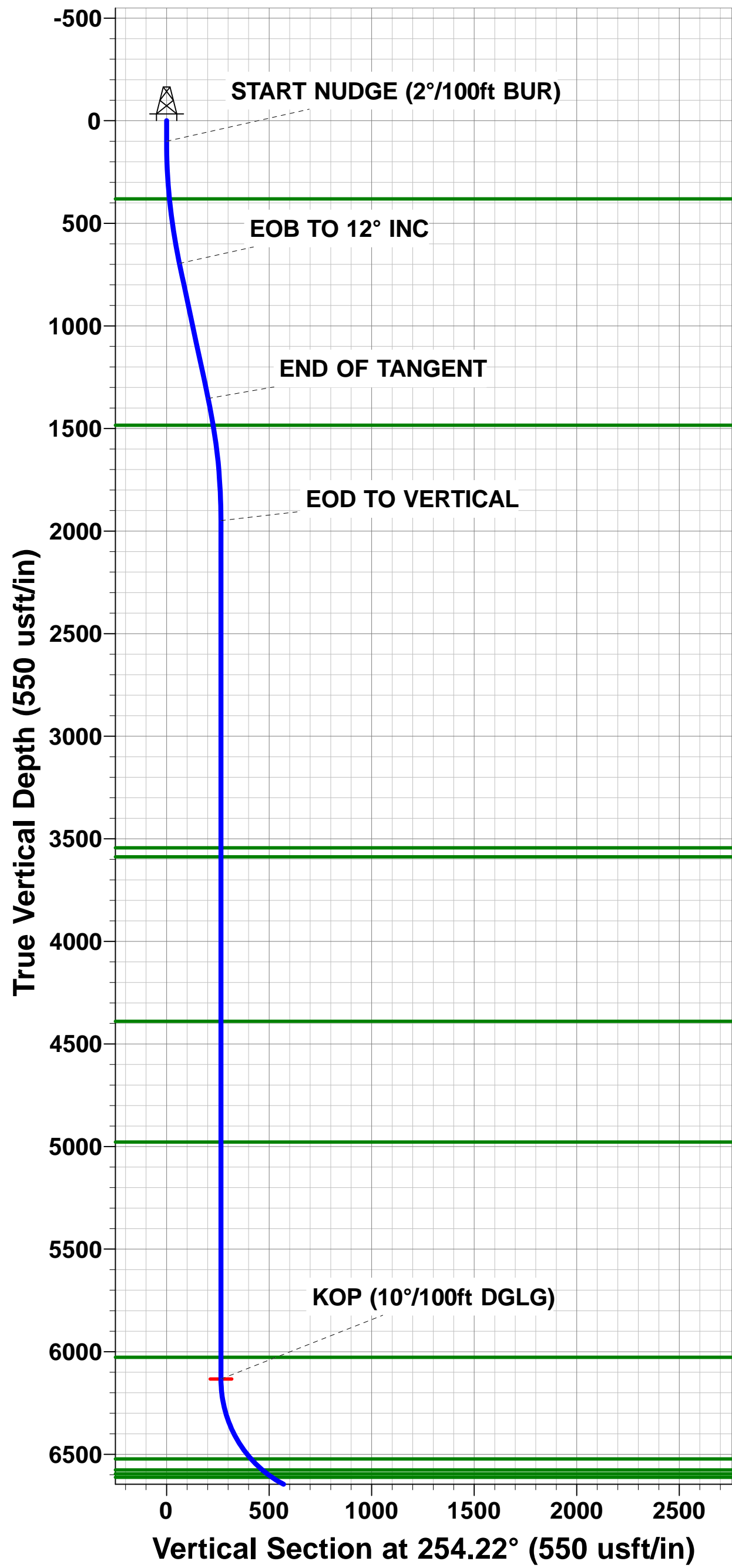
Magnetic Field
Strength: 52412.9snT
Dip Angle: 67.00°
Date: 10/04/2018
Model: IGRF2015

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
381.00	381.45	Fox Hills Base
1484.00	1505.38	Pierre Shale Top
3544.00	3567.44	Richard Sandstone
3588.00	3611.44	Parkman Sandstone
4389.00	4412.44	Sussex Sandstone
4978.00	5001.44	Shannon Sandstone
6027.00	6050.44	TeePee Buttes
6523.00	6585.39	Sharon Springs
6576.00	6662.82	Niobrara Top
6595.00	6693.81	Niobrara A Chalk
6612.00	6723.62	Niobrara A Chalk Base
6663.00	6833.09	Niobrara B1 Chalk Top
6679.00	6879.89	Niobrara B1 Chalk Base
6706.00	7056.49	Niobrara B2 Chalk Top (Target)

PROPOSED LOCAL COORDINATES:

SHL: 2264ft FNL & 2279ft FEL of Sec 26
HZ LP: 2330ft FNL & 2187ft FWL of Sec 26
BHL: 2330ft FNL & 460ft FWL of Sec 28



BHL - BROWN NORTH 26-28-5HN (P2)

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well BROWN NORTH 26-28-6HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4776.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4776.00usft
Site:	SW NE SEC. 26 T7N R63W 6th P.M.	North Reference:	True
Well:	BROWN NORTH 26-28-6HN	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	SW NE SEC. 26 T7N R63W 6th P.M.		
Site Position:		Northing:	1,443,907.34 usft
From:	Lat/Long	Easting:	3,305,042.09 usft
Position Uncertainty:	0.00 usft	Slot Radius:	1.10000ft
		Latitude:	40.546743
		Longitude:	-104.402333
		Grid Convergence:	0.71 °

Well	BROWN NORTH 26-28-6HN		
Well Position	+N/-S	-276.53 usft	Northing: 1,443,631.67 usft
	+E/-W	66.70 usft	Easting: 3,305,112.21 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	40.545984
		Longitude:	-104.402093
		Ground Level:	4,756.00 usft

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/04/2018	7.94	67.00	52,413

Design	PROPOSAL #2			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	6,706.00	0.00	0.00	269.72

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
0.00	0.00	0.00	0.00	-4,776.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	-4,676.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	12.00	254.22	695.62	-4,080.38	-17.02	-60.24	2.00	2.00	0.00	254.22	
1,372.11	12.00	254.22	1,353.05	-3,422.95	-55.03	-194.72	0.00	0.00	0.00	0.00	
1,972.11	0.00	0.00	1,948.67	-2,827.33	-72.05	-254.96	2.00	-2.00	0.00	180.00	
6,156.48	0.00	0.00	6,133.04	1,357.04	-72.05	-254.96	0.00	0.00	0.00	0.00	KOP - BROWN NO
7,056.49	90.00	270.03	6,706.00	1,930.00	-71.75	-827.92	10.00	10.00	-10.00	270.03	HZ LP - BROWN N
19,425.86	90.00	270.03	6,706.00	1,930.00	-65.31	-13,197.29	0.00	0.00	0.00	0.00	BHL - BROWN NOI

Planning Report



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Site:	SW NE SEC. 26 T7N R63W 6th P.M.	North Reference:	True
Well:	BROWN NORTH 26-28-6HN	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: 2264ft FNL & 2279ft FEL of Sec 26										
0.00	0.00	0.00	0.00	4,776.00	0.00	0.00	0.00	0.00	0.00	0.00
START NUDGE (2°/100ft BUR)										
100.00	0.00	0.00	100.00	4,676.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	2.00	254.22	199.98	4,576.02	-0.47	-1.68	1.68	2.00	2.00	0.00
300.00	4.00	254.22	299.84	4,476.16	-1.90	-6.72	6.72	2.00	2.00	0.00
Fox Hills Base										
381.45	5.63	254.22	381.00	4,395.00	-3.76	-13.29	13.31	2.00	2.00	0.00
400.00	6.00	254.22	399.45	4,376.55	-4.27	-15.10	15.12	2.00	2.00	0.00
500.00	8.00	254.22	498.70	4,277.30	-7.58	-26.83	26.87	2.00	2.00	0.00
600.00	10.00	254.22	597.47	4,178.53	-11.84	-41.88	41.94	2.00	2.00	0.00
EOB TO 12° INC										
700.00	12.00	254.22	695.62	4,080.38	-17.02	-60.24	60.33	2.00	2.00	0.00
800.00	12.00	254.22	793.44	3,982.56	-22.68	-80.25	80.36	0.00	0.00	0.00
900.00	12.00	254.22	891.25	3,884.75	-28.33	-100.26	100.40	0.00	0.00	0.00
1,000.00	12.00	254.22	989.07	3,786.93	-33.99	-120.27	120.43	0.00	0.00	0.00
1,100.00	12.00	254.22	1,086.88	3,689.12	-39.64	-140.27	140.47	0.00	0.00	0.00
1,200.00	12.00	254.22	1,184.70	3,591.30	-45.29	-160.28	160.50	0.00	0.00	0.00
1,300.00	12.00	254.22	1,282.51	3,493.49	-50.95	-180.29	180.54	0.00	0.00	0.00
END OF TANGENT										
1,372.11	12.00	254.22	1,353.05	3,422.95	-55.03	-194.72	194.99	0.00	0.00	0.00
1,400.00	11.44	254.22	1,380.35	3,395.65	-56.57	-200.17	200.45	2.00	-2.00	0.00
1,500.00	9.44	254.22	1,478.69	3,297.31	-61.49	-217.61	217.91	2.00	-2.00	0.00
Pierre Shale Top										
1,505.38	9.33	254.22	1,484.00	3,292.00	-61.73	-218.45	218.76	2.00	-2.00	0.00
1,600.00	7.44	254.22	1,577.60	3,198.40	-65.49	-231.74	232.06	2.00	-2.00	0.00
1,700.00	5.44	254.22	1,676.97	3,099.03	-68.54	-242.53	242.87	2.00	-2.00	0.00
1,800.00	3.44	254.22	1,776.66	2,999.34	-70.64	-249.99	250.33	2.00	-2.00	0.00
1,900.00	1.44	254.22	1,876.57	2,899.43	-71.80	-254.09	254.44	2.00	-2.00	0.00
EOD TO VERTICAL										
1,972.11	0.00	0.00	1,948.67	2,827.33	-72.05	-254.96	255.31	2.00	-2.00	146.69
2,000.00	0.00	0.00	1,976.56	2,799.44	-72.05	-254.96	255.31	0.00	0.00	0.00
2,100.00	0.00	0.00	2,076.56	2,699.44	-72.05	-254.96	255.31	0.00	0.00	0.00
2,200.00	0.00	0.00	2,176.56	2,599.44	-72.05	-254.96	255.31	0.00	0.00	0.00
2,300.00	0.00	0.00	2,276.56	2,499.44	-72.05	-254.96	255.31	0.00	0.00	0.00
2,400.00	0.00	0.00	2,376.56	2,399.44	-72.05	-254.96	255.31	0.00	0.00	0.00
2,500.00	0.00	0.00	2,476.56	2,299.44	-72.05	-254.96	255.31	0.00	0.00	0.00
2,600.00	0.00	0.00	2,576.56	2,199.44	-72.05	-254.96	255.31	0.00	0.00	0.00
2,700.00	0.00	0.00	2,676.56	2,099.44	-72.05	-254.96	255.31	0.00	0.00	0.00
2,800.00	0.00	0.00	2,776.56	1,999.44	-72.05	-254.96	255.31	0.00	0.00	0.00
2,900.00	0.00	0.00	2,876.56	1,899.44	-72.05	-254.96	255.31	0.00	0.00	0.00
3,000.00	0.00	0.00	2,976.56	1,799.44	-72.05	-254.96	255.31	0.00	0.00	0.00
3,100.00	0.00	0.00	3,076.56	1,699.44	-72.05	-254.96	255.31	0.00	0.00	0.00
3,200.00	0.00	0.00	3,176.56	1,599.44	-72.05	-254.96	255.31	0.00	0.00	0.00
3,300.00	0.00	0.00	3,276.56	1,499.44	-72.05	-254.96	255.31	0.00	0.00	0.00
3,400.00	0.00	0.00	3,376.56	1,399.44	-72.05	-254.96	255.31	0.00	0.00	0.00
3,500.00	0.00	0.00	3,476.56	1,299.44	-72.05	-254.96	255.31	0.00	0.00	0.00
Richard Sandstone										
3,567.44	0.00	0.00	3,544.00	1,232.00	-72.05	-254.96	255.31	0.00	0.00	0.00
3,600.00	0.00	0.00	3,576.56	1,199.44	-72.05	-254.96	255.31	0.00	0.00	0.00
Parkman Sandstone										
3,611.44	0.00	0.00	3,588.00	1,188.00	-72.05	-254.96	255.31	0.00	0.00	0.00
3,700.00	0.00	0.00	3,676.56	1,099.44	-72.05	-254.96	255.31	0.00	0.00	0.00

Planning Report



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Site:	SW NE SEC. 26 T7N R63W 6th P.M.	North Reference:	True
Well:	BROWN NORTH 26-28-6HN	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	3,776.56	999.44	-72.05	-254.96	255.31	0.00	0.00	0.00
3,900.00	0.00	0.00	3,876.56	899.44	-72.05	-254.96	255.31	0.00	0.00	0.00
4,000.00	0.00	0.00	3,976.56	799.44	-72.05	-254.96	255.31	0.00	0.00	0.00
4,100.00	0.00	0.00	4,076.56	699.44	-72.05	-254.96	255.31	0.00	0.00	0.00
4,200.00	0.00	0.00	4,176.56	599.44	-72.05	-254.96	255.31	0.00	0.00	0.00
4,300.00	0.00	0.00	4,276.56	499.44	-72.05	-254.96	255.31	0.00	0.00	0.00
4,400.00	0.00	0.00	4,376.56	399.44	-72.05	-254.96	255.31	0.00	0.00	0.00
Sussex Sandstone										
4,412.44	0.00	0.00	4,389.00	387.00	-72.05	-254.96	255.31	0.00	0.00	0.00
4,500.00	0.00	0.00	4,476.56	299.44	-72.05	-254.96	255.31	0.00	0.00	0.00
4,600.00	0.00	0.00	4,576.56	199.44	-72.05	-254.96	255.31	0.00	0.00	0.00
4,700.00	0.00	0.00	4,676.56	99.44	-72.05	-254.96	255.31	0.00	0.00	0.00
4,800.00	0.00	0.00	4,776.56	-0.56	-72.05	-254.96	255.31	0.00	0.00	0.00
4,900.00	0.00	0.00	4,876.56	-100.56	-72.05	-254.96	255.31	0.00	0.00	0.00
5,000.00	0.00	0.00	4,976.56	-200.56	-72.05	-254.96	255.31	0.00	0.00	0.00
Shannon Sandstone										
5,001.44	0.00	0.00	4,978.00	-202.00	-72.05	-254.96	255.31	0.00	0.00	0.00
5,100.00	0.00	0.00	5,076.56	-300.56	-72.05	-254.96	255.31	0.00	0.00	0.00
5,200.00	0.00	0.00	5,176.56	-400.56	-72.05	-254.96	255.31	0.00	0.00	0.00
5,300.00	0.00	0.00	5,276.56	-500.56	-72.05	-254.96	255.31	0.00	0.00	0.00
5,400.00	0.00	0.00	5,376.56	-600.56	-72.05	-254.96	255.31	0.00	0.00	0.00
5,500.00	0.00	0.00	5,476.56	-700.56	-72.05	-254.96	255.31	0.00	0.00	0.00
5,600.00	0.00	0.00	5,576.56	-800.56	-72.05	-254.96	255.31	0.00	0.00	0.00
5,700.00	0.00	0.00	5,676.56	-900.56	-72.05	-254.96	255.31	0.00	0.00	0.00
5,800.00	0.00	0.00	5,776.56	-1,000.56	-72.05	-254.96	255.31	0.00	0.00	0.00
5,900.00	0.00	0.00	5,876.56	-1,100.56	-72.05	-254.96	255.31	0.00	0.00	0.00
6,000.00	0.00	0.00	5,976.56	-1,200.56	-72.05	-254.96	255.31	0.00	0.00	0.00
TeePee Buttes										
6,050.44	0.00	0.00	6,027.00	-1,251.00	-72.05	-254.96	255.31	0.00	0.00	0.00
6,100.00	0.00	0.00	6,076.56	-1,300.56	-72.05	-254.96	255.31	0.00	0.00	0.00
KOP (10°/100ft DGLG)										
6,156.48	0.00	0.00	6,133.04	-1,357.04	-72.05	-254.96	255.31	0.00	0.00	0.00
6,200.00	4.35	270.03	6,176.52	-1,400.52	-72.05	-256.61	256.97	10.00	10.00	0.00
6,300.00	14.35	270.03	6,275.06	-1,499.06	-72.04	-272.84	273.19	10.00	10.00	0.00
6,400.00	24.35	270.03	6,369.29	-1,593.29	-72.02	-305.94	306.29	10.00	10.00	0.00
6,500.00	34.35	270.03	6,456.35	-1,680.35	-72.00	-354.89	355.24	10.00	10.00	0.00
Sharon Springs										
6,585.39	42.89	270.03	6,523.00	-1,747.00	-71.97	-408.14	408.49	10.00	10.00	0.00
6,600.00	44.35	270.03	6,533.57	-1,757.57	-71.96	-418.22	418.57	10.00	10.00	0.00
Niobrara Top										
6,662.82	50.63	270.03	6,576.00	-1,800.00	-71.94	-464.51	464.86	10.00	10.00	0.00
Niobrara A Chalk										
6,693.81	53.73	270.03	6,595.00	-1,819.00	-71.93	-488.99	489.34	10.00	10.00	0.00
6,700.00	54.35	270.03	6,598.63	-1,822.63	-71.92	-493.99	494.34	10.00	10.00	0.00
Niobrara A Chalk Base										
6,723.62	56.71	270.03	6,612.00	-1,836.00	-71.91	-513.47	513.82	10.00	10.00	0.00
6,800.00	64.35	270.03	6,649.54	-1,873.54	-71.88	-579.92	580.26	10.00	10.00	0.00
Niobrara B1 Chalk Top										
6,833.09	67.66	270.03	6,663.00	-1,887.00	-71.86	-610.15	610.49	10.00	10.00	0.00
Niobrara B1 Chalk Base										
6,879.89	72.34	270.03	6,679.00	-1,903.00	-71.84	-654.11	654.45	10.00	10.00	0.00
6,900.00	74.35	270.03	6,684.76	-1,908.76	-71.83	-673.37	673.72	10.00	10.00	0.00

Planning Report



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Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4776.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4776.00usft
Site:	SW NE SEC. 26 T7N R63W 6th P.M.	North Reference:	True
Well:	BROWN NORTH 26-28-6HN	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)
7,000.00	84.35	270.03	6,703.22	-1,927.22	-71.78	-771.53	771.87	10.00	10.00	0.00
HZ LP: 2330ft FNL & 2187ft FWL of Sec 26 - Niobrara B2 Chalk Top (Target)										
7,056.49	90.00	270.03	6,706.00	-1,930.00	-71.75	-827.92	828.27	10.00	10.00	0.00
7,100.00	90.00	270.03	6,706.00	-1,930.00	-71.73	-871.44	871.78	0.00	0.00	0.00
7,200.00	90.00	270.03	6,706.00	-1,930.00	-71.67	-971.44	971.78	0.00	0.00	0.00
7,300.00	90.00	270.03	6,706.00	-1,930.00	-71.62	-1,071.44	1,071.78	0.00	0.00	0.00
7,400.00	90.00	270.03	6,706.00	-1,930.00	-71.57	-1,171.44	1,171.78	0.00	0.00	0.00
7,500.00	90.00	270.03	6,706.00	-1,930.00	-71.52	-1,271.44	1,271.77	0.00	0.00	0.00
7,600.00	90.00	270.03	6,706.00	-1,930.00	-71.46	-1,371.44	1,371.77	0.00	0.00	0.00
7,700.00	90.00	270.03	6,706.00	-1,930.00	-71.41	-1,471.44	1,471.77	0.00	0.00	0.00
7,800.00	90.00	270.03	6,706.00	-1,930.00	-71.36	-1,571.44	1,571.77	0.00	0.00	0.00
7,900.00	90.00	270.03	6,706.00	-1,930.00	-71.31	-1,671.44	1,671.77	0.00	0.00	0.00
8,000.00	90.00	270.03	6,706.00	-1,930.00	-71.25	-1,771.44	1,771.77	0.00	0.00	0.00
8,100.00	90.00	270.03	6,705.99	-1,929.99	-71.20	-1,871.44	1,871.76	0.00	0.00	0.00
8,200.00	90.00	270.03	6,705.99	-1,929.99	-71.15	-1,971.44	1,971.76	0.00	0.00	0.00
8,300.00	90.00	270.03	6,705.99	-1,929.99	-71.10	-2,071.44	2,071.76	0.00	0.00	0.00
8,400.00	90.00	270.03	6,705.99	-1,929.99	-71.04	-2,171.44	2,171.76	0.00	0.00	0.00
8,500.00	90.00	270.03	6,705.99	-1,929.99	-70.99	-2,271.44	2,271.76	0.00	0.00	0.00
8,600.00	90.00	270.03	6,705.99	-1,929.99	-70.94	-2,371.44	2,371.76	0.00	0.00	0.00
8,700.00	90.00	270.03	6,705.99	-1,929.99	-70.89	-2,471.44	2,471.76	0.00	0.00	0.00
8,800.00	90.00	270.03	6,705.99	-1,929.99	-70.83	-2,571.44	2,571.75	0.00	0.00	0.00
8,900.00	90.00	270.03	6,705.99	-1,929.99	-70.78	-2,671.44	2,671.75	0.00	0.00	0.00
9,000.00	90.00	270.03	6,705.99	-1,929.99	-70.73	-2,771.44	2,771.75	0.00	0.00	0.00
9,100.00	90.00	270.03	6,705.99	-1,929.99	-70.68	-2,871.44	2,871.75	0.00	0.00	0.00
9,200.00	90.00	270.03	6,705.99	-1,929.99	-70.62	-2,971.44	2,971.75	0.00	0.00	0.00
9,300.00	90.00	270.03	6,705.99	-1,929.99	-70.57	-3,071.44	3,071.75	0.00	0.00	0.00
9,400.00	90.00	270.03	6,705.99	-1,929.99	-70.52	-3,171.44	3,171.75	0.00	0.00	0.00
9,500.00	90.00	270.03	6,705.99	-1,929.99	-70.47	-3,271.44	3,271.74	0.00	0.00	0.00
9,600.00	90.00	270.03	6,705.99	-1,929.99	-70.41	-3,371.44	3,371.74	0.00	0.00	0.00
9,700.00	90.00	270.03	6,705.99	-1,929.99	-70.36	-3,471.44	3,471.74	0.00	0.00	0.00
9,800.00	90.00	270.03	6,705.99	-1,929.99	-70.31	-3,571.44	3,571.74	0.00	0.00	0.00
9,900.00	90.00	270.03	6,705.99	-1,929.99	-70.26	-3,671.44	3,671.74	0.00	0.00	0.00
10,000.00	90.00	270.03	6,705.98	-1,929.98	-70.20	-3,771.44	3,771.74	0.00	0.00	0.00
10,100.00	90.00	270.03	6,705.98	-1,929.98	-70.15	-3,871.44	3,871.73	0.00	0.00	0.00
10,200.00	90.00	270.03	6,705.98	-1,929.98	-70.10	-3,971.44	3,971.73	0.00	0.00	0.00
10,300.00	90.00	270.03	6,705.98	-1,929.98	-70.05	-4,071.43	4,071.73	0.00	0.00	0.00
10,400.00	90.00	270.03	6,705.98	-1,929.98	-69.99	-4,171.43	4,171.73	0.00	0.00	0.00
10,500.00	90.00	270.03	6,705.98	-1,929.98	-69.94	-4,271.43	4,271.73	0.00	0.00	0.00
10,600.00	90.00	270.03	6,705.98	-1,929.98	-69.89	-4,371.43	4,371.73	0.00	0.00	0.00
10,700.00	90.00	270.03	6,705.98	-1,929.98	-69.84	-4,471.43	4,471.73	0.00	0.00	0.00
10,800.00	90.00	270.03	6,705.98	-1,929.98	-69.78	-4,571.43	4,571.72	0.00	0.00	0.00
10,900.00	90.00	270.03	6,705.98	-1,929.98	-69.73	-4,671.43	4,671.72	0.00	0.00	0.00
11,000.00	90.00	270.03	6,705.98	-1,929.98	-69.68	-4,771.43	4,771.72	0.00	0.00	0.00
11,100.00	90.00	270.03	6,705.98	-1,929.98	-69.63	-4,871.43	4,871.72	0.00	0.00	0.00
11,200.00	90.00	270.03	6,705.98	-1,929.98	-69.57	-4,971.43	4,971.72	0.00	0.00	0.00
11,300.00	90.00	270.03	6,705.98	-1,929.98	-69.52	-5,071.43	5,071.72	0.00	0.00	0.00
11,400.00	90.00	270.03	6,705.98	-1,929.98	-69.47	-5,171.43	5,171.72	0.00	0.00	0.00
11,500.00	90.00	270.03	6,705.98	-1,929.98	-69.42	-5,271.43	5,271.71	0.00	0.00	0.00
11,600.00	90.00	270.03	6,705.98	-1,929.98	-69.36	-5,371.43	5,371.71	0.00	0.00	0.00
11,700.00	90.00	270.03	6,705.98	-1,929.98	-69.31	-5,471.43	5,471.71	0.00	0.00	0.00
11,800.00	90.00	270.03	6,705.98	-1,929.98	-69.26	-5,571.43	5,571.71	0.00	0.00	0.00
11,900.00	90.00	270.03	6,705.98	-1,929.98	-69.21	-5,671.43	5,671.71	0.00	0.00	0.00
12,000.00	90.00	270.03	6,705.97	-1,929.97	-69.15	-5,771.43	5,771.71	0.00	0.00	0.00
12,100.00	90.00	270.03	6,705.97	-1,929.97	-69.10	-5,871.43	5,871.70	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well BROWN NORTH 26-28-6HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4776.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4776.00usft
Site:	SW NE SEC. 26 T7N R63W 6th P.M.	North Reference:	True
Well:	BROWN NORTH 26-28-6HN	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)
12,200.00	90.00	270.03	6,705.97	-1,929.97	-69.05	-5,971.43	5,971.70	0.00	0.00	0.00
12,300.00	90.00	270.03	6,705.97	-1,929.97	-69.00	-6,071.43	6,071.70	0.00	0.00	0.00
12,400.00	90.00	270.03	6,705.97	-1,929.97	-68.94	-6,171.43	6,171.70	0.00	0.00	0.00
12,500.00	90.00	270.03	6,705.97	-1,929.97	-68.89	-6,271.43	6,271.70	0.00	0.00	0.00
12,600.00	90.00	270.03	6,705.97	-1,929.97	-68.84	-6,371.43	6,371.70	0.00	0.00	0.00
12,700.00	90.00	270.03	6,705.97	-1,929.97	-68.79	-6,471.43	6,471.70	0.00	0.00	0.00
12,800.00	90.00	270.03	6,705.97	-1,929.97	-68.73	-6,571.43	6,571.69	0.00	0.00	0.00
12,900.00	90.00	270.03	6,705.97	-1,929.97	-68.68	-6,671.43	6,671.69	0.00	0.00	0.00
13,000.00	90.00	270.03	6,705.97	-1,929.97	-68.63	-6,771.43	6,771.69	0.00	0.00	0.00
13,100.00	90.00	270.03	6,705.97	-1,929.97	-68.58	-6,871.43	6,871.69	0.00	0.00	0.00
13,200.00	90.00	270.03	6,705.97	-1,929.97	-68.52	-6,971.43	6,971.69	0.00	0.00	0.00
13,300.00	90.00	270.03	6,705.97	-1,929.97	-68.47	-7,071.43	7,071.69	0.00	0.00	0.00
13,400.00	90.00	270.03	6,705.97	-1,929.97	-68.42	-7,171.43	7,171.69	0.00	0.00	0.00
13,500.00	90.00	270.03	6,705.97	-1,929.97	-68.37	-7,271.43	7,271.68	0.00	0.00	0.00
13,600.00	90.00	270.03	6,705.97	-1,929.97	-68.31	-7,371.43	7,371.68	0.00	0.00	0.00
13,700.00	90.00	270.03	6,705.97	-1,929.97	-68.26	-7,471.43	7,471.68	0.00	0.00	0.00
13,800.00	90.00	270.03	6,705.97	-1,929.97	-68.21	-7,571.43	7,571.68	0.00	0.00	0.00
13,900.00	90.00	270.03	6,705.96	-1,929.96	-68.16	-7,671.43	7,671.68	0.00	0.00	0.00
14,000.00	90.00	270.03	6,705.96	-1,929.96	-68.10	-7,771.43	7,771.68	0.00	0.00	0.00
14,100.00	90.00	270.03	6,705.96	-1,929.96	-68.05	-7,871.43	7,871.67	0.00	0.00	0.00
14,200.00	90.00	270.03	6,705.96	-1,929.96	-68.00	-7,971.43	7,971.67	0.00	0.00	0.00
14,300.00	90.00	270.03	6,705.96	-1,929.96	-67.95	-8,071.43	8,071.67	0.00	0.00	0.00
14,400.00	90.00	270.03	6,705.96	-1,929.96	-67.89	-8,171.43	8,171.67	0.00	0.00	0.00
14,500.00	90.00	270.03	6,705.96	-1,929.96	-67.84	-8,271.43	8,271.67	0.00	0.00	0.00
14,600.00	90.00	270.03	6,705.96	-1,929.96	-67.79	-8,371.43	8,371.67	0.00	0.00	0.00
14,700.00	90.00	270.03	6,705.96	-1,929.96	-67.74	-8,471.43	8,471.67	0.00	0.00	0.00
14,800.00	90.00	270.03	6,705.96	-1,929.96	-67.68	-8,571.43	8,571.66	0.00	0.00	0.00
14,900.00	90.00	270.03	6,705.96	-1,929.96	-67.63	-8,671.43	8,671.66	0.00	0.00	0.00
15,000.00	90.00	270.03	6,705.96	-1,929.96	-67.58	-8,771.43	8,771.66	0.00	0.00	0.00
15,100.00	90.00	270.03	6,705.96	-1,929.96	-67.53	-8,871.43	8,871.66	0.00	0.00	0.00
15,200.00	90.00	270.03	6,705.96	-1,929.96	-67.47	-8,971.43	8,971.66	0.00	0.00	0.00
15,300.00	90.00	270.03	6,705.96	-1,929.96	-67.42	-9,071.43	9,071.66	0.00	0.00	0.00
15,400.00	90.00	270.03	6,705.96	-1,929.96	-67.37	-9,171.43	9,171.66	0.00	0.00	0.00
15,500.00	90.00	270.03	6,705.96	-1,929.96	-67.32	-9,271.43	9,271.65	0.00	0.00	0.00
15,600.00	90.00	270.03	6,705.96	-1,929.96	-67.26	-9,371.43	9,371.65	0.00	0.00	0.00
15,700.00	90.00	270.03	6,705.96	-1,929.96	-67.21	-9,471.43	9,471.65	0.00	0.00	0.00
15,800.00	90.00	270.03	6,705.95	-1,929.95	-67.16	-9,571.43	9,571.65	0.00	0.00	0.00
15,900.00	90.00	270.03	6,705.95	-1,929.95	-67.11	-9,671.43	9,671.65	0.00	0.00	0.00
16,000.00	90.00	270.03	6,705.95	-1,929.95	-67.05	-9,771.43	9,771.65	0.00	0.00	0.00
16,100.00	90.00	270.03	6,705.95	-1,929.95	-67.00	-9,871.43	9,871.64	0.00	0.00	0.00
16,200.00	90.00	270.03	6,705.95	-1,929.95	-66.95	-9,971.43	9,971.64	0.00	0.00	0.00
16,300.00	90.00	270.03	6,705.95	-1,929.95	-66.90	-10,071.43	10,071.64	0.00	0.00	0.00
16,400.00	90.00	270.03	6,705.95	-1,929.95	-66.84	-10,171.43	10,171.64	0.00	0.00	0.00
16,500.00	90.00	270.03	6,705.95	-1,929.95	-66.79	-10,271.43	10,271.64	0.00	0.00	0.00
16,600.00	90.00	270.03	6,705.95	-1,929.95	-66.74	-10,371.43	10,371.64	0.00	0.00	0.00
16,700.00	90.00	270.03	6,705.95	-1,929.95	-66.69	-10,471.43	10,471.64	0.00	0.00	0.00
16,800.00	90.00	270.03	6,705.95	-1,929.95	-66.63	-10,571.43	10,571.63	0.00	0.00	0.00
16,900.00	90.00	270.03	6,705.95	-1,929.95	-66.58	-10,671.43	10,671.63	0.00	0.00	0.00
17,000.00	90.00	270.03	6,705.95	-1,929.95	-66.53	-10,771.43	10,771.63	0.00	0.00	0.00
17,100.00	90.00	270.03	6,705.95	-1,929.95	-66.48	-10,871.43	10,871.63	0.00	0.00	0.00
17,200.00	90.00	270.03	6,705.95	-1,929.95	-66.42	-10,971.43	10,971.63	0.00	0.00	0.00
17,300.00	90.00	270.03	6,705.95	-1,929.95	-66.37	-11,071.43	11,071.63	0.00	0.00	0.00
17,400.00	90.00	270.03	6,705.95	-1,929.95	-66.32	-11,171.43	11,171.63	0.00	0.00	0.00
17,500.00	90.00	270.03	6,705.95	-1,929.95	-66.27	-11,271.43	11,271.62	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well BROWN NORTH 26-28-6HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4776.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4776.00usft
Site:	SW NE SEC. 26 T7N R63W 6th P.M.	North Reference:	True
Well:	BROWN NORTH 26-28-6HN	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)
17,600.00	90.00	270.03	6,705.95	-1,929.95	-66.21	-11,371.43	11,371.62	0.00	0.00	0.00
17,700.00	90.00	270.03	6,705.95	-1,929.95	-66.16	-11,471.43	11,471.62	0.00	0.00	0.00
17,800.00	90.00	270.03	6,705.94	-1,929.94	-66.11	-11,571.43	11,571.62	0.00	0.00	0.00
17,900.00	90.00	270.03	6,705.94	-1,929.94	-66.06	-11,671.43	11,671.62	0.00	0.00	0.00
18,000.00	90.00	270.03	6,705.94	-1,929.94	-66.00	-11,771.43	11,771.62	0.00	0.00	0.00
18,100.00	90.00	270.03	6,705.94	-1,929.94	-65.95	-11,871.43	11,871.61	0.00	0.00	0.00
18,200.00	90.00	270.03	6,705.94	-1,929.94	-65.90	-11,971.43	11,971.61	0.00	0.00	0.00
18,300.00	90.00	270.03	6,705.94	-1,929.94	-65.85	-12,071.43	12,071.61	0.00	0.00	0.00
18,400.00	90.00	270.03	6,705.94	-1,929.94	-65.79	-12,171.43	12,171.61	0.00	0.00	0.00
18,500.00	90.00	270.03	6,705.94	-1,929.94	-65.74	-12,271.43	12,271.61	0.00	0.00	0.00
18,600.00	90.00	270.03	6,705.94	-1,929.94	-65.69	-12,371.43	12,371.61	0.00	0.00	0.00
18,700.00	90.00	270.03	6,705.94	-1,929.94	-65.64	-12,471.43	12,471.61	0.00	0.00	0.00
18,800.00	90.00	270.03	6,705.94	-1,929.94	-65.58	-12,571.43	12,571.60	0.00	0.00	0.00
18,900.00	90.00	270.03	6,705.94	-1,929.94	-65.53	-12,671.43	12,671.60	0.00	0.00	0.00
19,000.00	90.00	270.03	6,705.94	-1,929.94	-65.48	-12,771.43	12,771.60	0.00	0.00	0.00
19,100.00	90.00	270.03	6,705.94	-1,929.94	-65.43	-12,871.43	12,871.60	0.00	0.00	0.00
19,200.00	90.00	270.03	6,705.94	-1,929.94	-65.37	-12,971.43	12,971.60	0.00	0.00	0.00
19,300.00	90.00	270.03	6,705.94	-1,929.94	-65.32	-13,071.43	13,071.60	0.00	0.00	0.00
19,400.00	90.00	270.03	6,705.94	-1,929.94	-65.27	-13,171.43	13,171.60	0.00	0.00	0.00
BHL: 2330ft FNL & 460ft FWL of Sec 28										
19,425.86	90.00	270.03	6,705.94	-1,929.94	-65.25	-13,197.29	13,197.46	0.00	0.00	0.00

Formations

MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
381.45	381.00	Fox Hills Base			
1,505.38	1,484.00	Pierre Shale Top			
3,567.44	3,544.00	Richard Sandstone			
3,611.44	3,588.00	Parkman Sandstone			
4,412.44	4,389.00	Sussex Sandstone			
5,001.44	4,978.00	Shannon Sandstone			
6,050.44	6,027.00	TeePee Buttes			
6,585.39	6,523.00	Sharon Springs			
6,662.82	6,576.00	Niobrara Top			
6,693.81	6,595.00	Niobrara A Chalk			
6,723.62	6,612.00	Niobrara A Chalk Base			
6,833.09	6,663.00	Niobrara B1 Chalk Top			
6,879.89	6,679.00	Niobrara B1 Chalk Base			
7,056.49	6,706.00	Niobrara B2 Chalk Top (Target)			

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well BROWN NORTH 26-28-6HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4776.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4776.00usft
Site:	SW NE SEC. 26 T7N R63W 6th P.M.	North Reference:	True
Well:	BROWN NORTH 26-28-6HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #2		

Plan Annotations				
Local Coordinates				
MD (usft)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Comment
0.00	0.00	0.00	0.00	SHL: 2264ft FNL & 2279ft FEL of Sec 26
100.00	100.00	0.00	0.00	START NUDGE (2°/100ft BUR)
700.00	695.62	-17.02	-60.24	EOB TO 12° INC
1,372.11	1,353.05	-55.03	-194.72	END OF TANGENT
1,972.11	1,948.67	-72.05	-254.96	EOD TO VERTICAL
6,156.48	6,133.04	-72.05	-254.96	KOP (10°/100ft DGLG)
7,056.49	6,706.00	-71.75	-827.93	HZ LP: 2330ft FNL & 2187ft FWL of Sec 26
19,425.86	6,705.94	-65.25	-13,197.29	BHL: 2330ft FNL & 460ft FWL of Sec 28