

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

NW SW SEC. 32 T9N R60W 6th P.M.

CB5

ORIGINAL WELLBORE

08 November, 2018

Plan: PROPOSAL #1





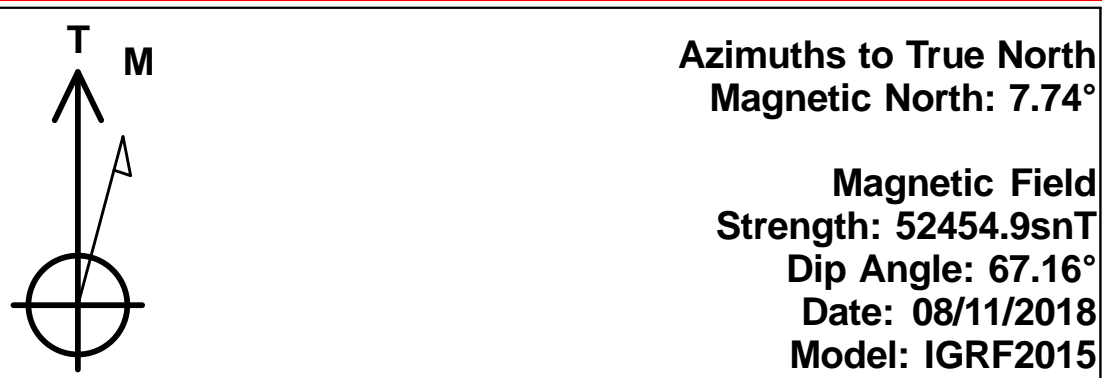
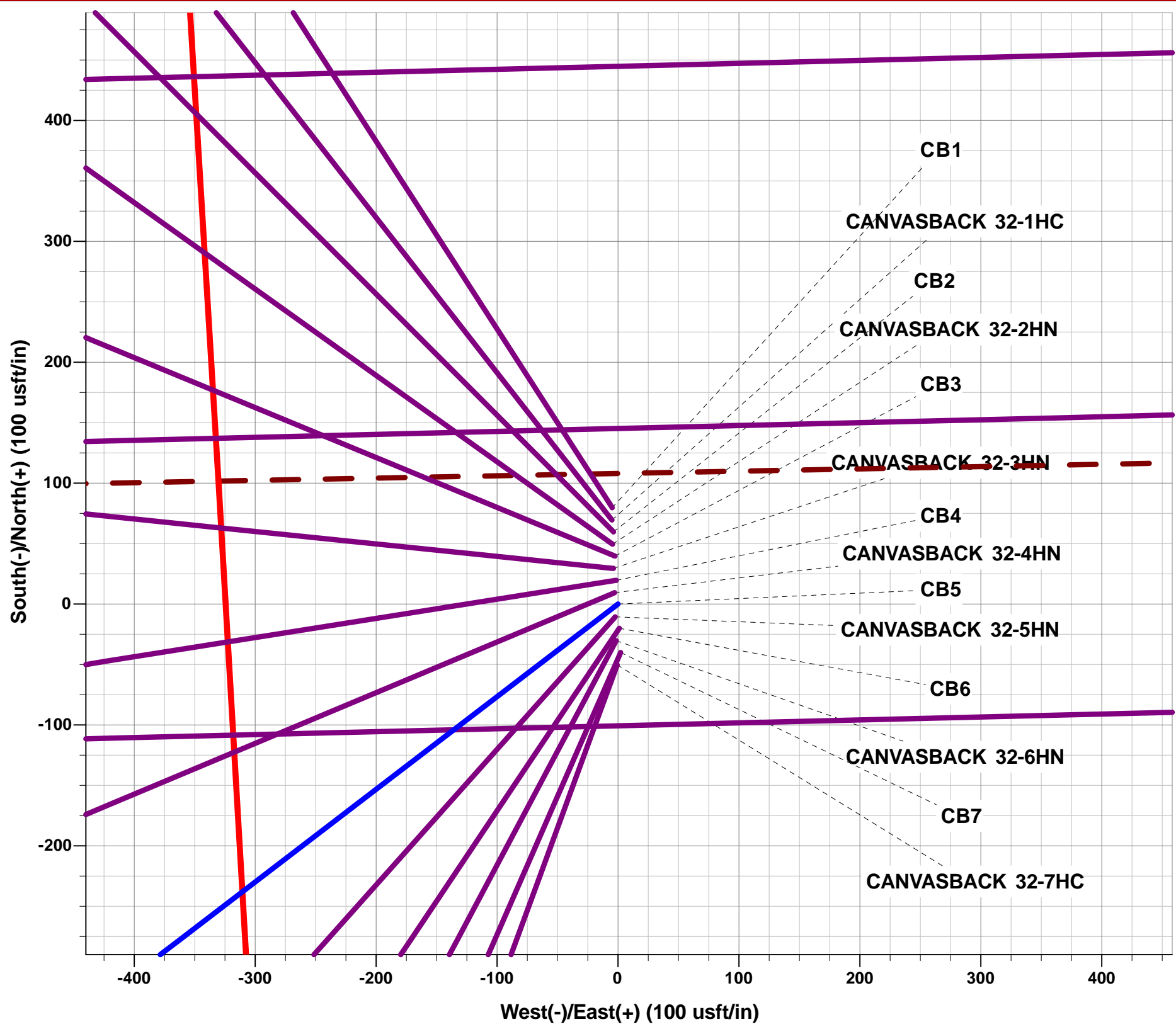
Project: WELD COUNTY, COLORADO (NAD 83)
Site: NW SW SEC. 32 T9N R60W 6th P.M.
Well: CB5
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #1

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: 2471ft FSL & 631ft FWL of Sec 32
350.00	350.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)
999.46	1005.15	13.10	232.53	-45.37	-59.20	-52.46	74.59	EOB TO 13.1° INC
5041.58	5155.33	13.10	232.53	-617.71	-805.96	-714.22	1015.45	END OF TANGENT
5691.04	5810.49	0.00	0.00	-663.08	-865.16	-766.68	1090.04	EOD TO VERTICAL
5791.04	5910.49	0.00	0.00	-663.08	-865.16	-766.68	1090.04	KOP (10°/100ft BUR)
6364.00	6810.48	90.00	89.38	-656.88	-292.24	-199.95	1662.99	HZ LP: 1817ft FSL & 301ft FWL of Sec 32
6364.00	11505.15	90.00	89.37	-605.84	4402.14	4443.64	6357.65	BHL: 1820ft FSL & 300ft FEL of Sec 32

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - CB5	5791.04	-663.08	-865.16	40.703629	-104.126782
HZ LP - CB5	6364.00	-656.88	-292.24	40.703646	-104.124716
BHL - CB5	6364.00	-605.84	4402.14	40.703785	-104.107785

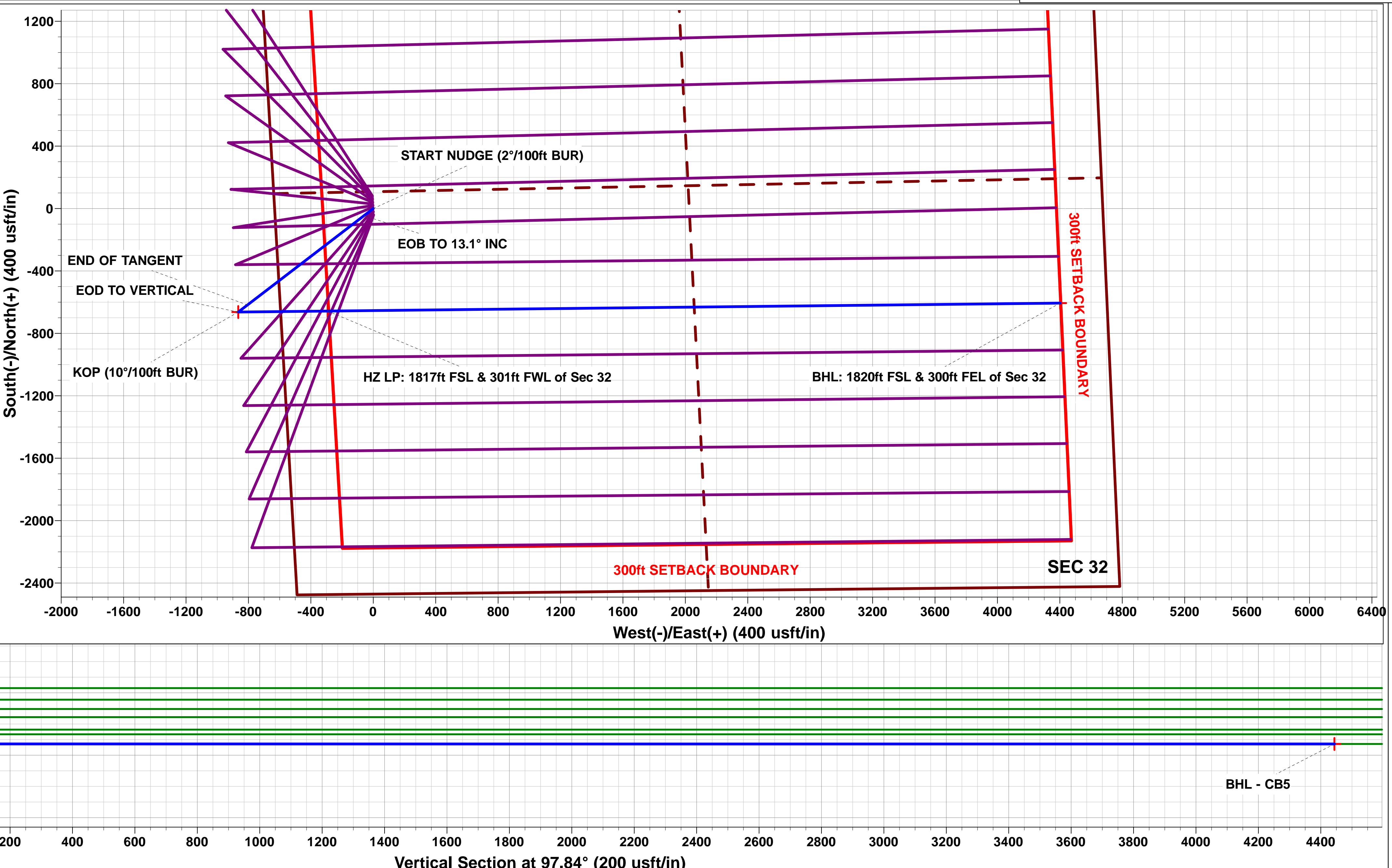
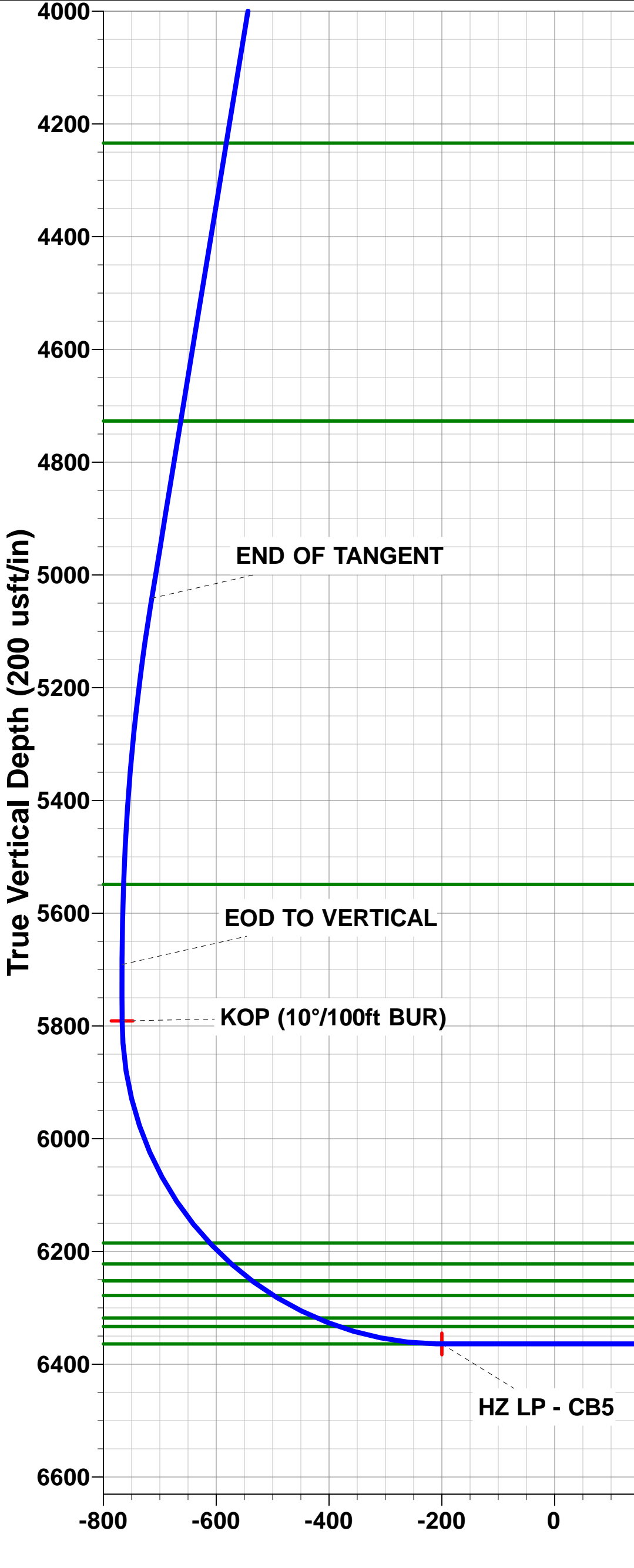
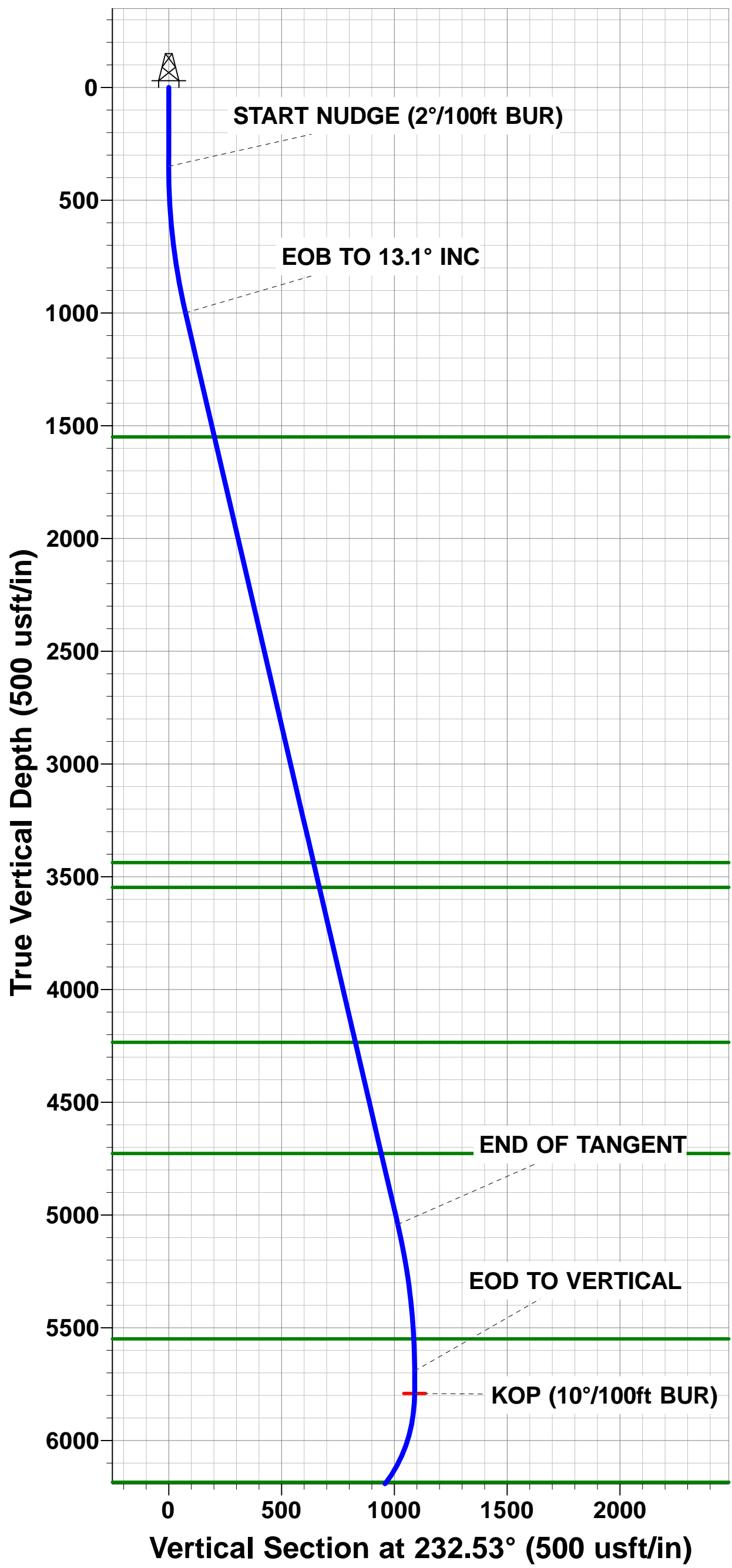


FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1550.00	1570.41	Pierre Shale Top
3437.00	3507.86	Richard Sandstone
3547.00	3620.80	Parkman Sandstone
4234.00	4326.16	Sussex Sandstone
4727.00	4832.34	Shannon Sandstone
5549.00	5668.39	TeePee Buttes
6185.00	6344.88	Sharon Springs
6222.00	6398.27	Niobrara Top
6252.00	6446.13	Niobrara A Chalk
6278.00	6492.50	Niobrara A Chalk Base
6318.00	6579.33	Niobrara B1 Chalk Top
6333.00	6621.15	Niobrara B1 Chalk Base
6364.00	6810.48	Niobrara B2 Chalk Top (Target)

PROPOSED LOCAL COORDINATES:

SHL: 2471ft FSL & 631ft FWL of Sec 32
HZ LP: 1817ft FSL & 301ft FWL of Sec 32
BHL: 1820ft FSL & 300ft FEL of Sec 32



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CB5
Company:	MALLARD EXPLORATION	TVD Reference:	KB 20' @ 4952.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 20' @ 4952.00usft (Original Well Elev)
Site:	NW SW SEC. 32 T9N R60W 6th P.M.	North Reference:	True
Well:	CB5	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	NW SW SEC. 32 T9N R60W 6th P.M.		
Site Position:		Northing:	1,503,686.24 usft
From:	Lat/Long	Easting:	3,381,532.92 usft
Position Uncertainty:	0.00 usft	Slot Radius:	1.10000ft
		Latitude:	40.707883
		Longitude:	-104.123789
		Grid Convergence:	0.89 °

Well	CB5		
Well Position	+N/-S	-886.79 usft	Northing: 1,502,800.11 usft
	+E/-W	35.21 usft	Easting: 3,381,581.89 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	40.705449
		Longitude:	-104.123662
		Ground Level:	4,932.00 usft

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	08/11/2018	7.74	67.16	52,455

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 (°)
	6,364.00	0.00	0.00	97.84

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	-4,952.00	0.00	0.00	0.00	0.00	0.00	0.00	
350.00	0.00	0.00	350.00	-4,602.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,005.15	13.10	232.53	999.46	-3,952.54	-45.37	-59.20	2.00	2.00	0.00	232.53	
5,155.33	13.10	232.53	5,041.58	89.58	-617.71	-805.96	0.00	0.00	0.00	0.00	
5,810.49	0.00	0.00	5,691.04	739.04	-663.08	-865.16	2.00	-2.00	0.00	180.00	
5,910.49	0.00	0.00	5,791.04	839.04	-663.08	-865.16	0.00	0.00	0.00	0.00	KOP - CB5
6,810.48	90.00	89.38	6,364.00	1,412.00	-656.88	-292.24	10.00	10.00	9.93	89.38	HZ LP - CB5
11,505.15	90.00	89.37	6,364.00	1,412.00	-605.84	4,402.14	0.00	0.00	0.00	-79.61	BHL - CB5

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Well:	CB5	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: 2471ft FSL & 631ft FWL of Sec 32										
0.00	0.00	0.00	0.00	4,952.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,852.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4,752.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	4,652.00	0.00	0.00	0.00	0.00	0.00	0.00
START NUDGE (2°/100ft BUR)										
350.00	0.00	0.00	350.00	4,602.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	1.00	232.53	400.00	4,552.00	-0.27	-0.35	-0.31	2.00	2.00	0.00
500.00	3.00	232.53	499.93	4,452.07	-2.39	-3.12	-2.76	2.00	2.00	0.00
600.00	5.00	232.53	599.68	4,352.32	-6.63	-8.65	-7.67	2.00	2.00	0.00
700.00	7.00	232.53	699.13	4,252.87	-12.99	-16.95	-15.02	2.00	2.00	0.00
800.00	9.00	232.53	798.15	4,153.85	-21.46	-27.99	-24.81	2.00	2.00	0.00
900.00	11.00	232.53	896.63	4,055.37	-32.02	-41.78	-37.02	2.00	2.00	0.00
1,000.00	13.00	232.53	994.44	3,957.56	-44.66	-58.28	-51.64	2.00	2.00	0.00
EOB TO 13.1° INC										
1,005.15	13.10	232.53	999.46	3,952.54	-45.37	-59.20	-52.46	2.00	2.00	0.00
1,100.00	13.10	232.53	1,091.83	3,860.17	-58.45	-76.27	-67.59	0.00	0.00	0.00
1,200.00	13.10	232.53	1,189.23	3,762.77	-72.24	-94.26	-83.53	0.00	0.00	0.00
1,300.00	13.10	232.53	1,286.63	3,665.37	-86.03	-112.25	-99.48	0.00	0.00	0.00
1,400.00	13.10	232.53	1,384.02	3,567.98	-99.82	-130.25	-115.42	0.00	0.00	0.00
1,500.00	13.10	232.53	1,481.42	3,470.58	-113.62	-148.24	-131.37	0.00	0.00	0.00
Pierre Shale Top										
1,570.41	13.10	232.53	1,550.00	3,402.00	-123.33	-160.91	-142.59	0.00	0.00	0.00
1,600.00	13.10	232.53	1,578.82	3,373.18	-127.41	-166.23	-147.31	0.00	0.00	0.00
1,700.00	13.10	232.53	1,676.21	3,275.79	-141.20	-184.23	-163.26	0.00	0.00	0.00
1,800.00	13.10	232.53	1,773.61	3,178.39	-154.99	-202.22	-179.20	0.00	0.00	0.00
1,900.00	13.10	232.53	1,871.01	3,080.99	-168.78	-220.21	-195.15	0.00	0.00	0.00
2,000.00	13.10	232.53	1,968.40	2,983.60	-182.57	-238.21	-211.09	0.00	0.00	0.00
2,100.00	13.10	232.53	2,065.80	2,886.20	-196.36	-256.20	-227.04	0.00	0.00	0.00
2,200.00	13.10	232.53	2,163.20	2,788.80	-210.15	-274.19	-242.98	0.00	0.00	0.00
2,300.00	13.10	232.53	2,260.59	2,691.41	-223.94	-292.19	-258.93	0.00	0.00	0.00
2,400.00	13.10	232.53	2,357.99	2,594.01	-237.73	-310.18	-274.87	0.00	0.00	0.00
2,500.00	13.10	232.53	2,455.38	2,496.62	-251.52	-328.17	-290.82	0.00	0.00	0.00
2,600.00	13.10	232.53	2,552.78	2,399.22	-265.31	-346.17	-306.76	0.00	0.00	0.00
2,700.00	13.10	232.53	2,650.18	2,301.82	-279.10	-364.16	-322.71	0.00	0.00	0.00
2,800.00	13.10	232.53	2,747.57	2,204.43	-292.89	-382.15	-338.65	0.00	0.00	0.00
2,900.00	13.10	232.53	2,844.97	2,107.03	-306.68	-400.15	-354.60	0.00	0.00	0.00
3,000.00	13.10	232.53	2,942.37	2,009.63	-320.47	-418.14	-370.54	0.00	0.00	0.00
3,100.00	13.10	232.53	3,039.76	1,912.24	-334.26	-436.13	-386.49	0.00	0.00	0.00
3,200.00	13.10	232.53	3,137.16	1,814.84	-348.06	-454.13	-402.43	0.00	0.00	0.00
3,300.00	13.10	232.53	3,234.56	1,717.44	-361.85	-472.12	-418.38	0.00	0.00	0.00
3,400.00	13.10	232.53	3,331.95	1,620.05	-375.64	-490.12	-434.32	0.00	0.00	0.00
3,500.00	13.10	232.53	3,429.35	1,522.65	-389.43	-508.11	-450.27	0.00	0.00	0.00
Richard Sandstone										
3,507.86	13.10	232.53	3,437.00	1,515.00	-390.51	-509.52	-451.52	0.00	0.00	0.00
3,600.00	13.10	232.53	3,526.74	1,425.26	-403.22	-526.10	-466.21	0.00	0.00	0.00
Parkman Sandstone										
3,620.80	13.10	232.53	3,547.00	1,405.00	-406.09	-529.84	-469.53	0.00	0.00	0.00
3,700.00	13.10	232.53	3,624.14	1,327.86	-417.01	-544.10	-482.16	0.00	0.00	0.00
3,800.00	13.10	232.53	3,721.54	1,230.46	-430.80	-562.09	-498.11	0.00	0.00	0.00
3,900.00	13.10	232.53	3,818.93	1,133.07	-444.59	-580.08	-514.05	0.00	0.00	0.00
4,000.00	13.10	232.53	3,916.33	1,035.67	-458.38	-598.08	-530.00	0.00	0.00	0.00
4,100.00	13.10	232.53	4,013.73	938.27	-472.17	-616.07	-545.94	0.00	0.00	0.00

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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)
4,200.00	13.10	232.53	4,111.12	840.88	-485.96	-634.06	-561.89	0.00	0.00	0.00
4,300.00	13.10	232.53	4,208.52	743.48	-499.75	-652.06	-577.83	0.00	0.00	0.00
Sussex Sandstone										
4,326.16	13.10	232.53	4,234.00	718.00	-503.36	-656.76	-582.00	0.00	0.00	0.00
4,400.00	13.10	232.53	4,305.92	646.08	-513.54	-670.05	-593.78	0.00	0.00	0.00
4,500.00	13.10	232.53	4,403.31	548.69	-527.33	-688.04	-609.72	0.00	0.00	0.00
4,600.00	13.10	232.53	4,500.71	451.29	-541.12	-706.04	-625.67	0.00	0.00	0.00
4,700.00	13.10	232.53	4,598.10	353.90	-554.91	-724.03	-641.61	0.00	0.00	0.00
4,800.00	13.10	232.53	4,695.50	256.50	-568.70	-742.02	-657.56	0.00	0.00	0.00
Shannon Sandstone										
4,832.34	13.10	232.53	4,727.00	225.00	-573.16	-747.84	-662.71	0.00	0.00	0.00
4,900.00	13.10	232.53	4,792.90	159.10	-582.50	-760.02	-673.50	0.00	0.00	0.00
5,000.00	13.10	232.53	4,890.29	61.71	-596.29	-778.01	-689.45	0.00	0.00	0.00
5,100.00	13.10	232.53	4,987.69	-35.69	-610.08	-796.00	-705.39	0.00	0.00	0.00
END OF TANGENT										
5,155.33	13.10	232.53	5,041.58	-89.58	-617.71	-805.96	-714.22	0.00	0.00	0.00
5,200.00	12.21	232.53	5,085.16	-133.16	-623.66	-813.73	-721.10	2.00	-2.00	0.00
5,300.00	10.21	232.53	5,183.25	-231.25	-635.49	-829.16	-734.77	2.00	-2.00	0.00
5,400.00	8.21	232.53	5,281.96	-329.96	-645.22	-841.86	-746.03	2.00	-2.00	0.00
5,500.00	6.21	232.53	5,381.16	-429.16	-652.86	-851.82	-754.85	2.00	-2.00	0.00
5,600.00	4.21	232.53	5,480.74	-528.74	-658.38	-859.03	-761.24	2.00	-2.00	0.00
TeePee Buttes										
5,668.39	2.84	232.53	5,549.00	-597.00	-660.94	-862.36	-764.20	2.00	-2.00	0.00
5,700.00	2.21	232.53	5,580.58	-628.58	-661.78	-863.47	-765.18	2.00	-2.00	0.00
5,800.00	0.21	232.53	5,680.55	-728.55	-663.07	-865.14	-766.66	2.00	-2.00	0.00
EOD TO VERTICAL										
5,810.49	0.00	0.00	5,691.04	-739.04	-663.08	-865.16	-766.68	2.00	-2.00	0.00
5,900.00	0.00	0.00	5,780.55	-828.55	-663.08	-865.16	-766.68	0.00	0.00	0.00
KOP (10°/100ft BUR)										
5,910.49	0.00	0.00	5,791.04	-839.04	-663.08	-865.16	-766.68	0.00	0.00	0.00
6,000.00	8.95	89.38	5,880.19	-928.19	-663.00	-858.18	-759.77	10.00	10.00	0.00
6,100.00	18.95	89.38	5,977.12	-1,025.12	-662.74	-834.10	-735.96	10.00	10.00	0.00
6,200.00	28.95	89.38	6,068.39	-1,116.39	-662.30	-793.56	-695.85	10.00	10.00	0.00
6,300.00	38.95	89.38	6,151.24	-1,199.24	-661.70	-737.79	-640.68	10.00	10.00	0.00
Sharon Springs										
6,344.88	43.44	89.38	6,185.00	-1,233.00	-661.38	-708.24	-611.45	10.00	10.00	0.00
Niobrara Top										
6,398.27	48.78	89.38	6,222.00	-1,270.00	-660.97	-669.78	-573.41	10.00	10.00	0.00
6,400.00	48.95	89.38	6,223.14	-1,271.14	-660.95	-668.48	-572.12	10.00	10.00	0.00
Niobrara A Chalk										
6,446.13	53.56	89.38	6,252.00	-1,300.00	-660.56	-632.51	-536.54	10.00	10.00	0.00
Niobrara A Chalk Base										
6,492.50	58.20	89.38	6,278.00	-1,326.00	-660.15	-594.13	-498.58	10.00	10.00	0.00
6,500.00	58.95	89.38	6,281.91	-1,329.91	-660.08	-587.73	-492.25	10.00	10.00	0.00
Niobrara B1 Chalk Top										
6,579.33	66.88	89.38	6,318.00	-1,366.00	-659.31	-517.16	-422.44	10.00	10.00	0.00
6,600.00	68.95	89.38	6,325.77	-1,373.77	-659.11	-498.01	-403.50	10.00	10.00	0.00
Niobrara B1 Chalk Base										
6,621.15	71.07	89.38	6,333.00	-1,381.00	-658.89	-478.13	-383.84	10.00	10.00	0.00
6,700.00	78.95	89.38	6,353.38	-1,401.38	-658.07	-402.03	-308.56	10.00	10.00	0.00
6,800.00	88.95	89.38	6,363.90	-1,411.90	-656.99	-302.72	-210.32	10.00	10.00	0.00
HZ LP: 1817ft FSL & 301ft FWL of Sec 32 - Niobrara B2 Chalk Top (Target)										

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CB5
Company:	MALLARD EXPLORATION	TVD Reference:	KB 20' @ 4952.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 20' @ 4952.00usft (Original Well Elev)
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Well:	CB5	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)
6,810.48	90.00	89.38	6,364.00	-1,412.00	-656.88	-292.24	-199.95	10.00	10.00	0.00
6,900.00	90.00	89.38	6,364.00	-1,412.00	-655.91	-202.73	-111.41	0.00	0.00	0.00
7,000.00	90.00	89.38	6,364.00	-1,412.00	-654.83	-102.73	-12.50	0.00	0.00	0.00
7,100.00	90.00	89.38	6,364.00	-1,412.00	-653.74	-2.74	86.42	0.00	0.00	0.00
7,200.00	90.00	89.38	6,364.00	-1,412.00	-652.66	97.25	185.33	0.00	0.00	0.00
7,300.00	90.00	89.38	6,364.00	-1,412.00	-651.58	197.25	284.24	0.00	0.00	0.00
7,400.00	90.00	89.38	6,364.00	-1,412.00	-650.49	297.24	383.15	0.00	0.00	0.00
7,500.00	90.00	89.38	6,364.01	-1,412.01	-649.41	397.24	482.07	0.00	0.00	0.00
7,600.00	90.00	89.38	6,364.01	-1,412.01	-648.33	497.23	580.98	0.00	0.00	0.00
7,700.00	90.00	89.38	6,364.01	-1,412.01	-647.24	597.22	679.89	0.00	0.00	0.00
7,800.00	90.00	89.38	6,364.01	-1,412.01	-646.16	697.22	778.81	0.00	0.00	0.00
7,900.00	90.00	89.38	6,364.01	-1,412.01	-645.07	797.21	877.72	0.00	0.00	0.00
8,000.00	90.00	89.38	6,364.01	-1,412.01	-643.99	897.21	976.63	0.00	0.00	0.00
8,100.00	90.00	89.38	6,364.01	-1,412.01	-642.90	997.20	1,075.54	0.00	0.00	0.00
8,200.00	90.00	89.38	6,364.01	-1,412.01	-641.82	1,097.20	1,174.46	0.00	0.00	0.00
8,300.00	90.00	89.38	6,364.01	-1,412.01	-640.73	1,197.19	1,273.37	0.00	0.00	0.00
8,400.00	90.00	89.38	6,364.01	-1,412.01	-639.65	1,297.18	1,372.28	0.00	0.00	0.00
8,500.00	90.00	89.38	6,364.01	-1,412.01	-638.56	1,397.18	1,471.19	0.00	0.00	0.00
8,600.00	90.00	89.38	6,364.01	-1,412.01	-637.48	1,497.17	1,570.10	0.00	0.00	0.00
8,700.00	90.00	89.38	6,364.01	-1,412.01	-636.39	1,597.17	1,669.02	0.00	0.00	0.00
8,800.00	90.00	89.38	6,364.01	-1,412.01	-635.30	1,697.16	1,767.93	0.00	0.00	0.00
8,900.00	90.00	89.38	6,364.01	-1,412.01	-634.22	1,797.15	1,866.84	0.00	0.00	0.00
9,000.00	90.00	89.38	6,364.01	-1,412.01	-633.13	1,897.15	1,965.75	0.00	0.00	0.00
9,100.00	90.00	89.38	6,364.01	-1,412.01	-632.04	1,997.14	2,064.67	0.00	0.00	0.00
9,200.00	90.00	89.38	6,364.01	-1,412.01	-630.96	2,097.14	2,163.58	0.00	0.00	0.00
9,300.00	90.00	89.38	6,364.01	-1,412.01	-629.87	2,197.13	2,262.49	0.00	0.00	0.00
9,400.00	90.00	89.38	6,364.01	-1,412.01	-628.78	2,297.12	2,361.40	0.00	0.00	0.00
9,500.00	90.00	89.38	6,364.01	-1,412.01	-627.70	2,397.12	2,460.31	0.00	0.00	0.00
9,600.00	90.00	89.38	6,364.01	-1,412.01	-626.61	2,497.11	2,559.23	0.00	0.00	0.00
9,700.00	90.00	89.38	6,364.01	-1,412.01	-625.52	2,597.11	2,658.14	0.00	0.00	0.00
9,800.00	90.00	89.38	6,364.01	-1,412.01	-624.43	2,697.10	2,757.05	0.00	0.00	0.00
9,900.00	90.00	89.38	6,364.01	-1,412.01	-623.34	2,797.09	2,855.96	0.00	0.00	0.00
10,000.00	90.00	89.38	6,364.01	-1,412.01	-622.25	2,897.09	2,954.87	0.00	0.00	0.00
10,100.00	90.00	89.38	6,364.01	-1,412.01	-621.17	2,997.08	3,053.79	0.00	0.00	0.00
10,200.00	90.00	89.38	6,364.01	-1,412.01	-620.08	3,097.08	3,152.70	0.00	0.00	0.00
10,300.00	90.00	89.38	6,364.01	-1,412.01	-618.99	3,197.07	3,251.61	0.00	0.00	0.00
10,400.00	90.00	89.38	6,364.01	-1,412.01	-617.90	3,297.07	3,350.52	0.00	0.00	0.00
10,500.00	90.00	89.38	6,364.01	-1,412.01	-616.81	3,397.06	3,449.43	0.00	0.00	0.00
10,600.00	90.00	89.38	6,364.01	-1,412.01	-615.72	3,497.05	3,548.35	0.00	0.00	0.00
10,700.00	90.00	89.38	6,364.01	-1,412.01	-614.63	3,597.05	3,647.26	0.00	0.00	0.00
10,800.00	90.00	89.38	6,364.01	-1,412.01	-613.54	3,697.04	3,746.17	0.00	0.00	0.00
10,900.00	90.00	89.38	6,364.00	-1,412.00	-612.45	3,797.04	3,845.08	0.00	0.00	0.00
11,000.00	90.00	89.38	6,364.00	-1,412.00	-611.36	3,897.03	3,943.99	0.00	0.00	0.00
11,100.00	90.00	89.37	6,364.00	-1,412.00	-610.27	3,997.02	4,042.90	0.00	0.00	0.00
11,200.00	90.00	89.37	6,364.00	-1,412.00	-609.17	4,097.02	4,141.81	0.00	0.00	0.00
11,300.00	90.00	89.37	6,364.00	-1,412.00	-608.08	4,197.01	4,240.73	0.00	0.00	0.00
11,400.00	90.00	89.37	6,364.00	-1,412.00	-606.99	4,297.01	4,339.64	0.00	0.00	0.00
11,500.00	90.00	89.37	6,364.00	-1,412.00	-605.90	4,397.00	4,438.55	0.00	0.00	0.00
BHL: 1820ft FSL & 300ft FEL of Sec 32										
11,505.15	90.00	89.37	6,364.00	-1,412.00	-605.84	4,402.14	4,443.64	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CB5
Company:	MALLARD EXPLORATION	TVD Reference:	KB 20' @ 4952.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 20' @ 4952.00usft (Original Well Elev)
Site:	NW SW SEC. 32 T9N R60W 6th P.M.	North Reference:	True
Well:	CB5	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Formations						
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,570.41	1,550.00	Pierre Shale Top				
3,507.86	3,437.00	Richard Sandstone				
3,620.80	3,547.00	Parkman Sandstone				
4,326.16	4,234.00	Sussex Sandstone				
4,832.34	4,727.00	Shannon Sandstone				
5,668.39	5,549.00	TeePee Buttes				
6,344.88	6,185.00	Sharon Springs				
6,398.27	6,222.00	Niobrara Top				
6,446.13	6,252.00	Niobrara A Chalk				
6,492.50	6,278.00	Niobrara A Chalk Base				
6,579.33	6,318.00	Niobrara B1 Chalk Top				
6,621.15	6,333.00	Niobrara B1 Chalk Base				
6,810.48	6,364.00	Niobrara B2 Chalk Top (Target)				

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.00	0.00	0.00	0.00	SHL: 2471ft FSL & 631ft FWL of Sec 32
350.00	350.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1,005.15	999.46	-45.37	-59.20	EOB TO 13.1° INC
5,155.33	5,041.58	-617.71	-805.96	END OF TANGENT
5,810.49	5,691.04	-663.08	-865.16	EOD TO VERTICAL
5,910.49	5,791.04	-663.08	-865.16	KOP (10°/100ft BUR)
6,810.48	6,364.00	-656.88	-292.24	HZ LP: 1817ft FSL & 301ft FWL of Sec 32
11,505.15	6,364.00	-605.84	4,402.14	BHL: 1820ft FSL & 300ft FEL of Sec 32