



MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

SE NE SEC. 19 T8N R60W 6th P.M.

HUNT FED 8-60 19-24-5

ORIGINAL WELLBORE

06 April, 2020

Plan: PROPOSAL #1





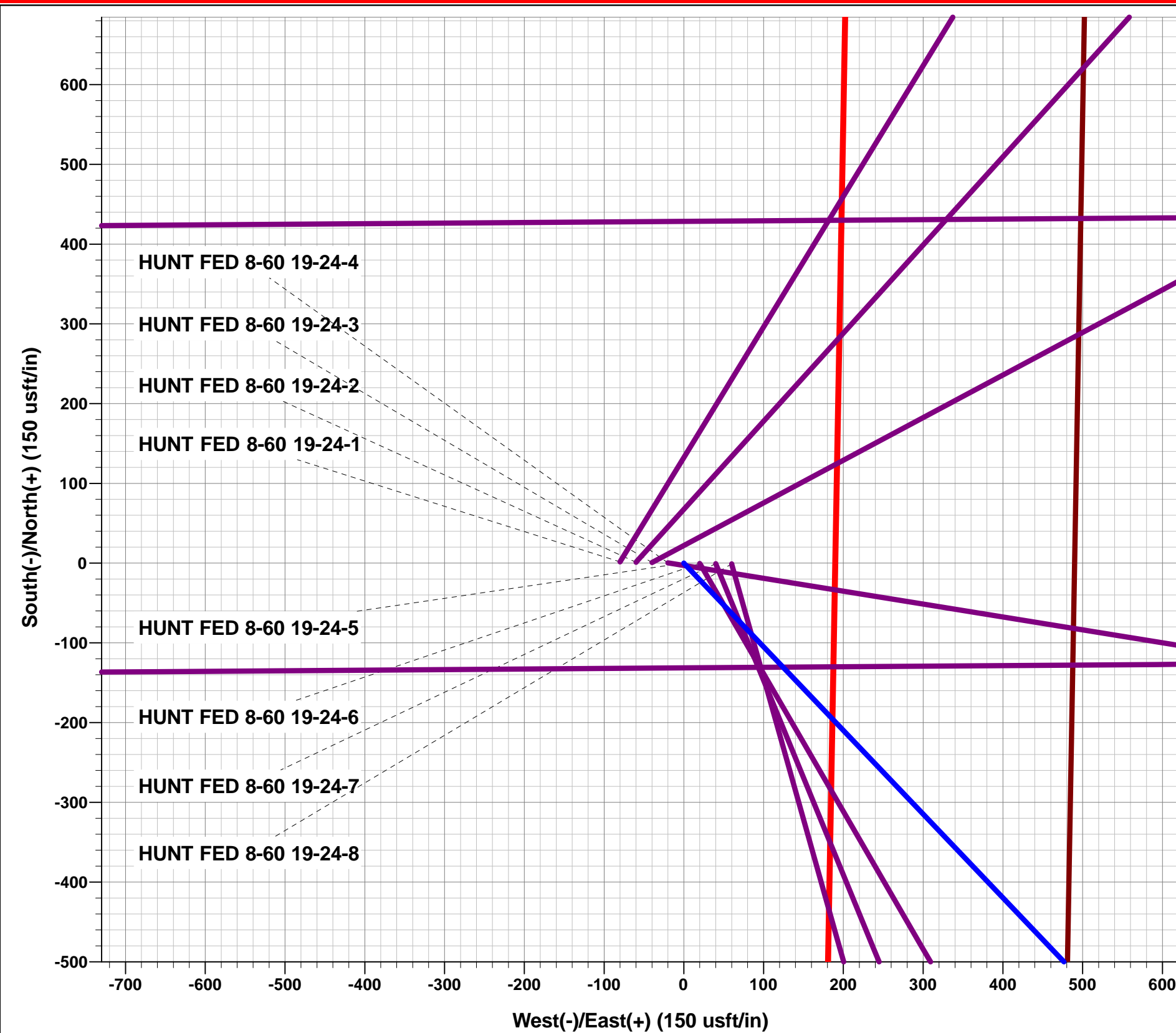
Project: WELD COUNTY, COLORADO (NAD 83)
Site: SE NE SEC. 19 T8N R60W 6th P.M.
Well: HUNT FED 8-60 19-24-5
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #1

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: 1724ft FNL & 490ft FEL of Sec 19
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1060.66	13.21	136.38	1054.82	-54.90	52.32	-47.32	75.84	EOB TO 13.21° INC
5145.91	13.21	136.38	5031.92	-730.85	696.57	-629.94	1009.63	END OF TANGENT
5806.57	0.00	0.00	5686.74	-785.75	748.89	-677.26	1085.47	EOD TO VERTICAL
5906.57	0.00	0.00	5786.74	-785.75	748.89	-677.26	1085.47	KOP (10°/100ft BUR)
6806.59	90.00	269.59	6359.70	-789.85	175.93	-106.14	1658.44	HZ LP: 2515ft FNL & 300ft FEL of Sec 19
16781.19	90.00	269.60	6359.70	-860.77	-9798.42	9836.15	11633.04	BHL: 2515ft FNL & 300ft FWL of Sec 24

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - HUNT FED 8-60 19-24-5	5786.74	-785.75	748.89	40.648140	-104.124161
HZ LP - HUNT FED 8-60 19-24-5	6359.70	-789.85	175.93	40.648129	-104.126226
BHL - HUNT FED 8-60 19-24-5	6359.70	-860.77	-9798.42	40.647929	-104.162170

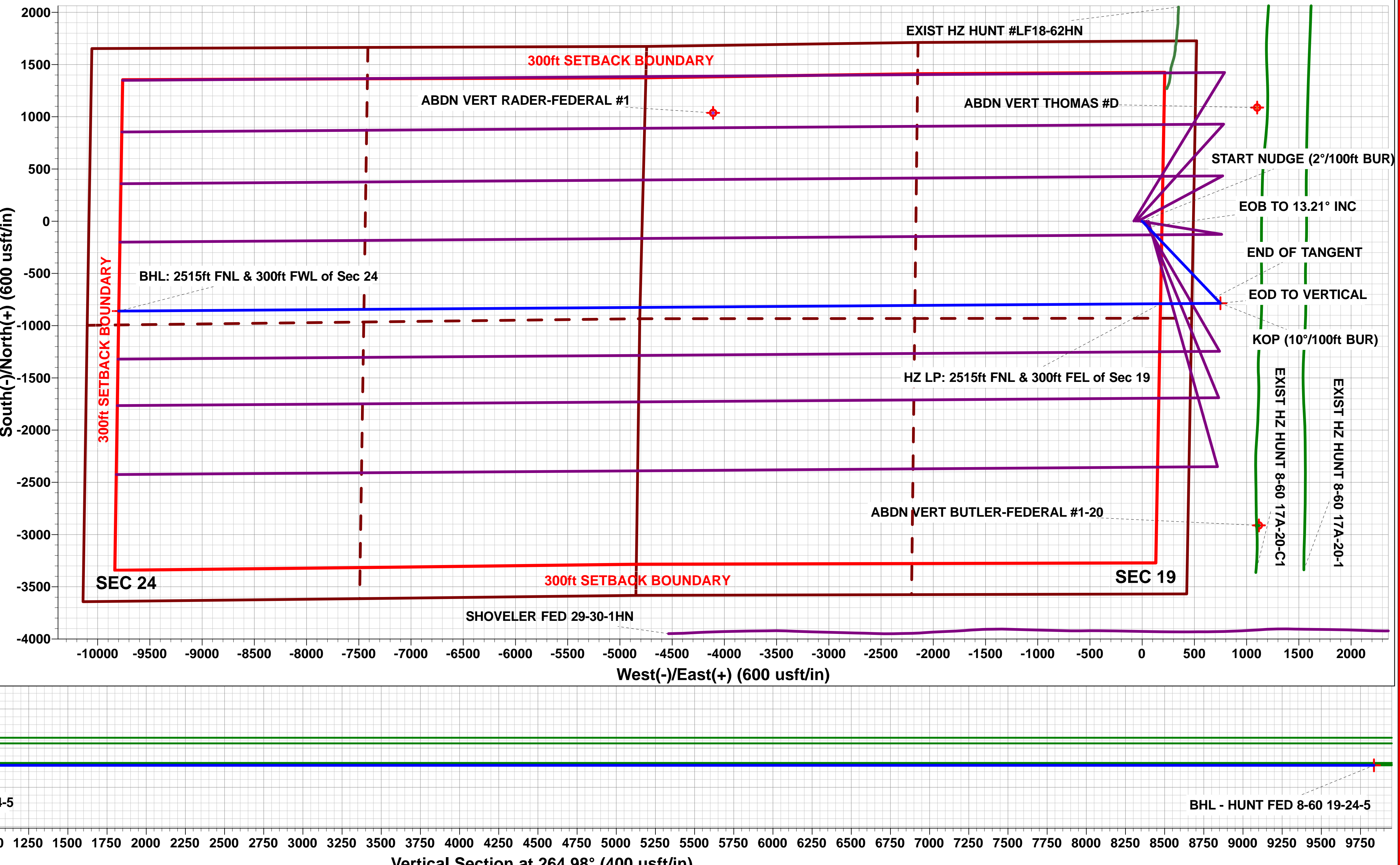
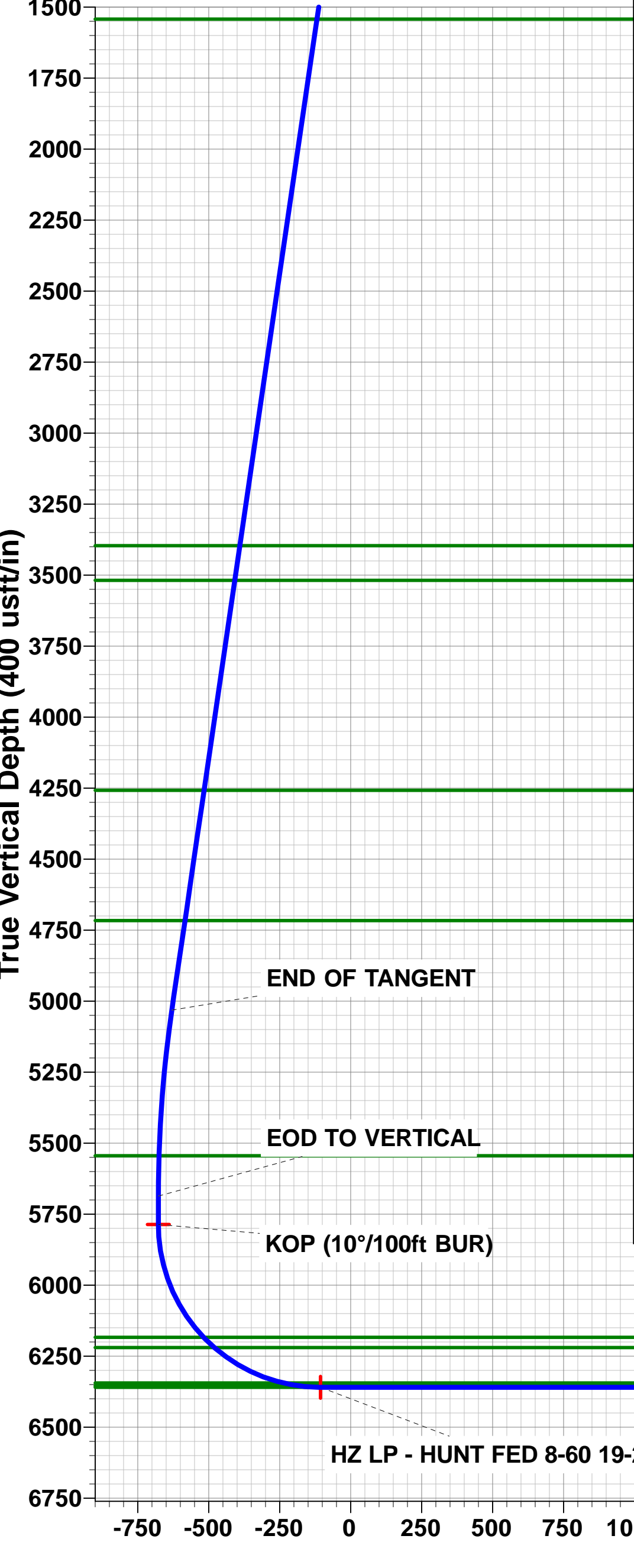
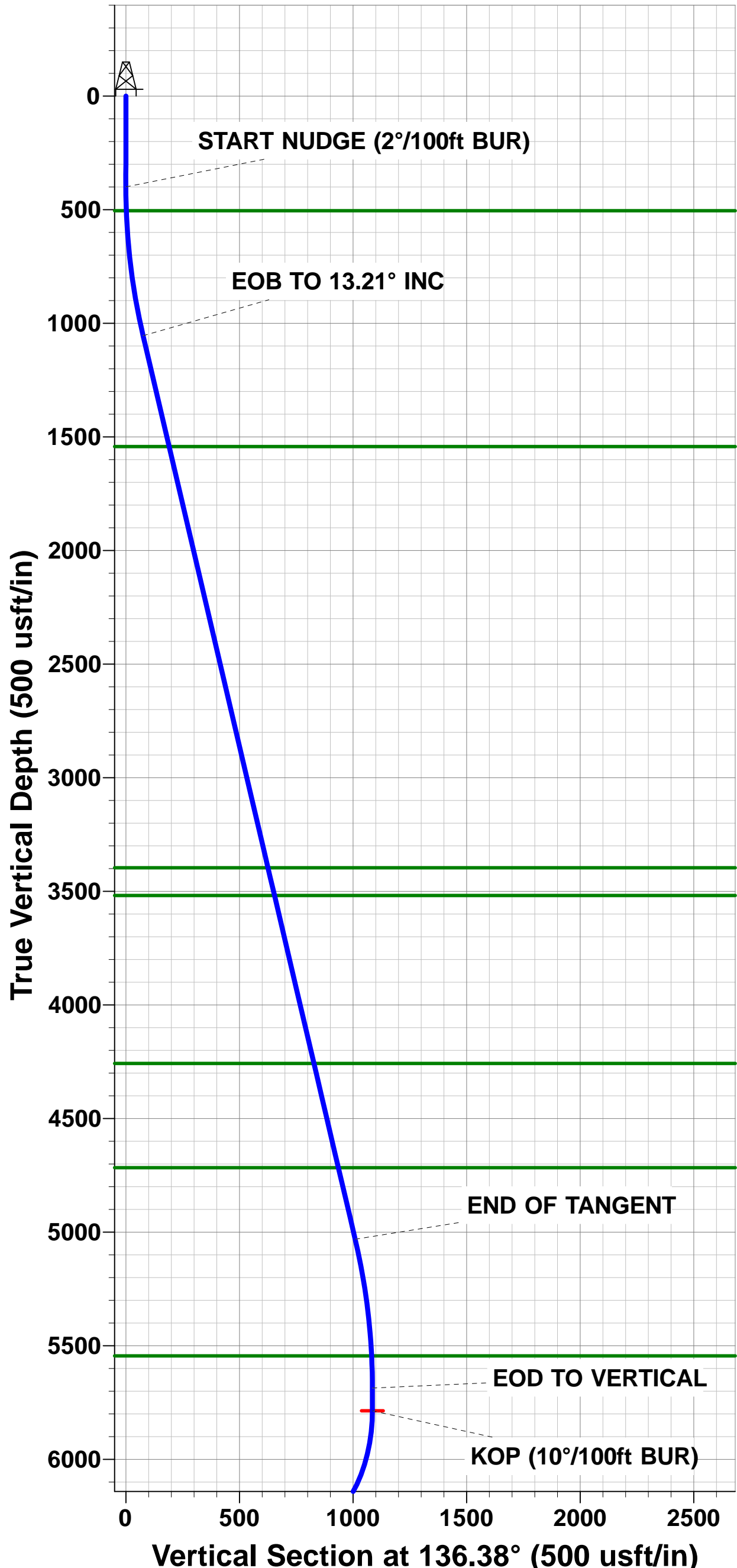


FORMATION TOP DETAILS

TVDPath	MDPath	Formation
504.70	504.72	Fox Hills Base
1542.70	1561.81	Pierre Shale Top
3396.70	3466.22	Richard Sandstone
3518.70	3591.54	Parkman Sandstone
4257.70	4350.64	Sussex Sandstone
4716.70	4822.12	Shannon Sandstone
5544.70	5664.47	TeePee Buttes
6183.70	6345.11	Sharon Springs
6219.70	6397.40	Niobrara Top
6344.70	6675.18	Niobrara B2 Chalk Top
6354.70	6730.83	Niobrara B2 Chalk Target Top
6359.70	6806.59	Niobrara B2 Chalk Landing Point

PROPOSED LOCAL COORDINATES:

SHL: 1724ft FNL & 490ft FEL of Sec 19
HZ LP: 2515ft FNL & 300ft FEL of Sec 19
BHL: 2515ft FNL & 300ft FWL of Sec 24



Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well HUNT FED 8-60 19-24-5
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4959.70usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4959.70usft
Site:	SE NE SEC. 19 T8N R60W 6th P.M.	North Reference:	True
Well:	HUNT FED 8-60 19-24-5	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	SE NE SEC. 19 T8N R60W 6th P.M.				
Site Position:		Northing:	1,482,695.84 usft	Latitude:	40.650301
From:	Lat/Long	Easting:	3,380,926.54 usft	Longitude:	-104.127148
Position Uncertainty:	0.00 usft	Slot Radius:	1.10 ft	Grid Convergence:	0.89 °

Well	HUNT FED 8-60 19-24-5					
Well Position	+N-S	-1.47 usft	Northing:	1,482,695.61 usft	Latitude:	40.650297
	+E-W	79.92 usft	Easting:	3,381,006.47 usft	Longitude:	-104.126860
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,932.70 usft

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	2020-04-06	7.65	66.99	52,273.63649041

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 (°)
	6,359.70	0.00	0.00	264.98

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	-4,959.70	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	-4,559.70	0.00	0.00	0.00	0.00	0.00	0.00	
1,060.66	13.21	136.38	1,054.82	-3,904.88	-54.90	52.32	2.00	2.00	0.00	136.38	
5,145.91	13.21	136.38	5,031.92	72.22	-730.85	696.57	0.00	0.00	0.00	0.00	
5,806.57	0.00	0.00	5,686.74	727.04	-785.75	748.89	2.00	-2.00	0.00	180.00	
5,906.57	0.00	0.00	5,786.74	827.04	-785.75	748.89	0.00	0.00	0.00	0.00	KOP - HUNT FED 8
6,806.59	90.00	269.59	6,359.70	1,400.00	-789.85	175.93	10.00	10.00	-10.05	269.59	HZ LP - HUNT FED 8
16,781.19	90.00	269.60	6,359.70	1,400.00	-860.77	-9,798.42	0.00	0.00	0.00	112.71	BHL - HUNT FED 8

Planning Report

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Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4959.70usft
Site:	SE NE SEC. 19 T8N R60W 6th P.M.	North Reference:	True
Well:	HUNT FED 8-60 19-24-5	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: 1724ft FNL & 490ft FEL of Sec 19										
0.00	0.00	0.00	0.00	4,959.70	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,859.70	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4,759.70	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	4,659.70	0.00	0.00	0.00	0.00	0.00	0.00
START NUDGE (2°/100ft BUR)										
400.00	0.00	0.00	400.00	4,559.70	0.00	0.00	0.00	0.00	0.00	0.00
500.00	2.00	136.38	499.98	4,459.72	-1.26	1.20	-1.09	2.00	2.00	0.00
Fox Hills Base										
504.72	2.09	136.38	504.70	4,455.00	-1.39	1.32	-1.19	2.00	2.00	0.00
600.00	4.00	136.38	599.84	4,359.86	-5.05	4.81	-4.35	2.00	2.00	0.00
700.00	6.00	136.38	699.45	4,260.25	-11.36	10.83	-9.79	2.00	2.00	0.00
800.00	8.00	136.38	798.70	4,161.00	-20.18	19.24	-17.40	2.00	2.00	0.00
900.00	10.00	136.38	897.47	4,062.23	-31.51	30.03	-27.16	2.00	2.00	0.00
1,000.00	12.00	136.38	995.62	3,964.08	-45.32	43.19	-39.06	2.00	2.00	0.00
EOB TO 13.21° INC										
1,060.66	13.21	136.38	1,054.82	3,904.88	-54.90	52.32	-47.32	2.00	2.00	0.00
1,100.00	13.21	136.38	1,093.12	3,866.58	-61.41	58.53	-52.93	0.00	0.00	0.00
1,200.00	13.21	136.38	1,190.47	3,769.23	-77.96	74.30	-67.19	0.00	0.00	0.00
1,300.00	13.21	136.38	1,287.82	3,671.88	-94.50	90.07	-81.45	0.00	0.00	0.00
1,400.00	13.21	136.38	1,385.18	3,574.52	-111.05	105.84	-95.71	0.00	0.00	0.00
1,500.00	13.21	136.38	1,482.53	3,477.17	-127.59	121.61	-109.98	0.00	0.00	0.00
Pierre Shale Top										
1,561.81	13.21	136.38	1,542.70	3,417.00	-137.82	131.36	-118.79	0.00	0.00	0.00
1,600.00	13.21	136.38	1,579.88	3,379.82	-144.14	137.38	-124.24	0.00	0.00	0.00
1,700.00	13.21	136.38	1,677.23	3,282.47	-160.69	153.15	-138.50	0.00	0.00	0.00
1,800.00	13.21	136.38	1,774.59	3,185.11	-177.23	168.92	-152.76	0.00	0.00	0.00
1,900.00	13.21	136.38	1,871.94	3,087.76	-193.78	184.69	-167.02	0.00	0.00	0.00
2,000.00	13.21	136.38	1,969.29	2,990.41	-210.32	200.46	-181.28	0.00	0.00	0.00
2,100.00	13.21	136.38	2,066.64	2,893.06	-226.87	216.23	-195.54	0.00	0.00	0.00
2,200.00	13.21	136.38	2,164.00	2,795.70	-243.42	232.00	-209.81	0.00	0.00	0.00
2,300.00	13.21	136.38	2,261.35	2,698.35	-259.96	247.77	-224.07	0.00	0.00	0.00
2,400.00	13.21	136.38	2,358.70	2,601.00	-276.51	263.54	-238.33	0.00	0.00	0.00
2,500.00	13.21	136.38	2,456.06	2,503.64	-293.05	279.31	-252.59	0.00	0.00	0.00
2,600.00	13.21	136.38	2,553.41	2,406.29	-309.60	295.08	-266.85	0.00	0.00	0.00
2,700.00	13.21	136.38	2,650.76	2,308.94	-326.15	310.85	-281.11	0.00	0.00	0.00
2,800.00	13.21	136.38	2,748.11	2,211.59	-342.69	326.62	-295.37	0.00	0.00	0.00
2,900.00	13.21	136.38	2,845.47	2,114.23	-359.24	342.39	-309.64	0.00	0.00	0.00
3,000.00	13.21	136.38	2,942.82	2,016.88	-375.79	358.16	-323.90	0.00	0.00	0.00
3,100.00	13.21	136.38	3,040.17	1,919.53	-392.33	373.93	-338.16	0.00	0.00	0.00
3,200.00	13.21	136.38	3,137.52	1,822.18	-408.88	389.70	-352.42	0.00	0.00	0.00
3,300.00	13.21	136.38	3,234.88	1,724.82	-425.42	405.47	-366.68	0.00	0.00	0.00
3,400.00	13.21	136.38	3,332.23	1,627.47	-441.97	421.24	-380.94	0.00	0.00	0.00
Richard Sandstone										
3,466.22	13.21	136.38	3,396.70	1,563.00	-452.93	431.68	-390.39	0.00	0.00	0.00
3,500.00	13.21	136.38	3,429.58	1,530.12	-458.52	437.01	-395.20	0.00	0.00	0.00
Parkman Sandstone										
3,591.54	13.21	136.38	3,518.70	1,441.00	-473.66	451.44	-408.26	0.00	0.00	0.00
3,600.00	13.21	136.38	3,526.93	1,432.77	-475.06	452.78	-409.47	0.00	0.00	0.00
3,700.00	13.21	136.38	3,624.29	1,335.41	-491.61	468.55	-423.73	0.00	0.00	0.00
3,800.00	13.21	136.38	3,721.64	1,238.06	-508.15	484.32	-437.99	0.00	0.00	0.00
3,900.00	13.21	136.38	3,818.99	1,140.71	-524.70	500.09	-452.25	0.00	0.00	0.00
4,000.00	13.21	136.38	3,916.34	1,043.36	-541.25	515.86	-466.51	0.00	0.00	0.00

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Site:	SE NE SEC. 19 T8N R60W 6th P.M.	North Reference:	True
Well:	HUNT FED 8-60 19-24-5	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)
4,100.00	13.21	136.38	4,013.70	946.00	-557.79	531.63	-480.77	0.00	0.00	0.00
4,200.00	13.21	136.38	4,111.05	848.65	-574.34	547.40	-495.03	0.00	0.00	0.00
4,300.00	13.21	136.38	4,208.40	751.30	-590.88	563.17	-509.30	0.00	0.00	0.00
Sussex Sandstone										
4,350.64	13.21	136.38	4,257.70	702.00	-599.26	571.15	-516.52	0.00	0.00	0.00
4,400.00	13.21	136.38	4,305.76	653.94	-607.43	578.94	-523.56	0.00	0.00	0.00
4,500.00	13.21	136.38	4,403.11	556.59	-623.98	594.71	-537.82	0.00	0.00	0.00
4,600.00	13.21	136.38	4,500.46	459.24	-640.52	610.48	-552.08	0.00	0.00	0.00
4,700.00	13.21	136.38	4,597.81	361.89	-657.07	626.25	-566.34	0.00	0.00	0.00
4,800.00	13.21	136.38	4,695.17	264.53	-673.61	642.02	-580.60	0.00	0.00	0.00
Shannon Sandstone										
4,822.12	13.21	136.38	4,716.70	243.00	-677.27	645.50	-583.76	0.00	0.00	0.00
4,900.00	13.21	136.38	4,792.52	167.18	-690.16	657.78	-594.87	0.00	0.00	0.00
5,000.00	13.21	136.38	4,889.87	69.83	-706.71	673.55	-609.13	0.00	0.00	0.00
5,100.00	13.21	136.38	4,987.22	-27.52	-723.25	689.32	-623.39	0.00	0.00	0.00
END OF TANGENT										
5,145.91	13.21	136.38	5,031.92	-72.22	-730.85	696.57	-629.94	0.00	0.00	0.00
5,200.00	12.13	136.38	5,084.69	-124.99	-739.44	704.75	-637.34	2.00	-2.00	0.00
5,300.00	10.13	136.38	5,182.80	-223.10	-753.41	718.07	-649.38	2.00	-2.00	0.00
5,400.00	8.13	136.38	5,281.53	-321.83	-764.90	729.02	-659.29	2.00	-2.00	0.00
5,500.00	6.13	136.38	5,380.75	-421.05	-773.89	737.58	-667.03	2.00	-2.00	0.00
5,600.00	4.13	136.38	5,480.35	-520.65	-780.36	743.75	-672.61	2.00	-2.00	0.00
TeePee Buttes										
5,664.47	2.84	136.38	5,544.70	-585.00	-783.20	746.46	-675.06	2.00	-2.00	0.00
5,700.00	2.13	136.38	5,580.19	-620.49	-784.32	747.52	-676.02	2.00	-2.00	0.00
5,800.00	0.13	136.38	5,680.17	-720.47	-785.74	748.88	-677.25	2.00	-2.00	0.00
EOD TO VERTICAL										
5,806.57	0.00	0.00	5,686.74	-727.04	-785.75	748.89	-677.26	2.00	-2.00	0.00
5,900.00	0.00	0.00	5,780.17	-820.47	-785.75	748.89	-677.26	0.00	0.00	0.00
KOP (10°/100ft BUR)										
5,906.57	0.00	0.00	5,786.74	-827.04	-785.75	748.89	-677.26	0.00	0.00	0.00
6,000.00	9.34	269.59	5,879.75	-920.05	-785.80	741.29	-669.68	10.00	10.00	0.00
6,100.00	19.34	269.59	5,976.51	-1,016.81	-785.98	716.55	-645.02	10.00	10.00	0.00
6,200.00	29.34	269.59	6,067.51	-1,107.81	-786.28	675.38	-603.99	10.00	10.00	0.00
6,300.00	39.34	269.59	6,149.97	-1,190.27	-786.68	619.04	-547.82	10.00	10.00	0.00
Sharon Springs										
6,345.11	43.85	269.59	6,183.70	-1,224.00	-786.89	589.10	-517.98	10.00	10.00	0.00
Niobrara Top										
6,397.40	49.08	269.59	6,219.70	-1,260.00	-787.17	551.21	-480.21	10.00	10.00	0.00
6,400.00	49.34	269.59	6,221.40	-1,261.70	-787.18	549.24	-478.24	10.00	10.00	0.00
6,500.00	59.34	269.59	6,279.62	-1,319.92	-787.76	468.09	-397.36	10.00	10.00	0.00
6,600.00	69.34	269.59	6,322.86	-1,363.16	-788.41	378.07	-307.62	10.00	10.00	0.00
Niobrara B2 Chalk Top										
6,675.18	76.86	269.59	6,344.70	-1,385.00	-788.92	306.19	-235.97	10.00	10.00	0.00
6,700.00	79.34	269.59	6,349.82	-1,390.12	-789.09	281.90	-211.77	10.00	10.00	0.00
Niobrara B2 Chalk Target Top										
6,730.83	82.43	269.59	6,354.70	-1,395.00	-789.31	251.47	-181.43	10.00	10.00	0.00
6,800.00	89.34	269.59	6,359.66	-1,399.96	-789.81	182.52	-112.70	10.00	10.00	0.00
HZ LP: 2515ft FNL & 300ft FEL of Sec 19 - Niobrara B2 Chalk Landing Point										
6,806.59	90.00	269.59	6,359.70	-1,400.00	-789.85	175.93	-106.14	10.00	10.00	0.00
6,900.00	90.00	269.59	6,359.70	-1,400.00	-790.52	82.52	-13.03	0.00	0.00	0.00
7,000.00	90.00	269.59	6,359.70	-1,400.00	-791.24	-17.47	86.65	0.00	0.00	0.00
7,100.00	90.00	269.59	6,359.69	-1,399.99	-791.95	-117.47	186.33	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well HUNT FED 8-60 19-24-5
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4959.70usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4959.70usft
Site:	SE NE SEC. 19 T8N R60W 6th P.M.	North Reference:	True
Well:	HUNT FED 8-60 19-24-5	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)
7,200.00	90.00	269.59	6,359.69	-1,399.99	-792.67	-217.47	286.00	0.00	0.00	0.00
7,300.00	90.00	269.59	6,359.69	-1,399.99	-793.38	-317.47	385.68	0.00	0.00	0.00
7,400.00	90.00	269.59	6,359.69	-1,399.99	-794.10	-417.46	485.36	0.00	0.00	0.00
7,500.00	90.00	269.59	6,359.69	-1,399.99	-794.81	-517.46	585.03	0.00	0.00	0.00
7,600.00	90.00	269.59	6,359.68	-1,399.98	-795.53	-617.46	684.71	0.00	0.00	0.00
7,700.00	90.00	269.59	6,359.68	-1,399.98	-796.25	-717.46	784.38	0.00	0.00	0.00
7,800.00	90.00	269.59	6,359.68	-1,399.98	-796.96	-817.45	884.06	0.00	0.00	0.00
7,900.00	90.00	269.59	6,359.68	-1,399.98	-797.68	-917.45	983.74	0.00	0.00	0.00
8,000.00	90.00	269.59	6,359.68	-1,399.98	-798.39	-1,017.45	1,083.41	0.00	0.00	0.00
8,100.00	90.00	269.59	6,359.68	-1,399.98	-799.10	-1,117.45	1,183.09	0.00	0.00	0.00
8,200.00	90.00	269.59	6,359.67	-1,399.97	-799.82	-1,217.44	1,282.77	0.00	0.00	0.00
8,300.00	90.00	269.59	6,359.67	-1,399.97	-800.53	-1,317.44	1,382.44	0.00	0.00	0.00
8,400.00	90.00	269.59	6,359.67	-1,399.97	-801.25	-1,417.44	1,482.12	0.00	0.00	0.00
8,500.00	90.00	269.59	6,359.67	-1,399.97	-801.96	-1,517.44	1,581.80	0.00	0.00	0.00
8,600.00	90.00	269.59	6,359.67	-1,399.97	-802.68	-1,617.43	1,681.47	0.00	0.00	0.00
8,700.00	90.00	269.59	6,359.67	-1,399.97	-803.39	-1,717.43	1,781.15	0.00	0.00	0.00
8,800.00	90.00	269.59	6,359.67	-1,399.97	-804.11	-1,817.43	1,880.82	0.00	0.00	0.00
8,900.00	90.00	269.59	6,359.67	-1,399.97	-804.82	-1,917.43	1,980.50	0.00	0.00	0.00
9,000.00	90.00	269.59	6,359.66	-1,399.96	-805.53	-2,017.42	2,080.18	0.00	0.00	0.00
9,100.00	90.00	269.59	6,359.66	-1,399.96	-806.25	-2,117.42	2,179.85	0.00	0.00	0.00
9,200.00	90.00	269.59	6,359.66	-1,399.96	-806.96	-2,217.42	2,279.53	0.00	0.00	0.00
9,300.00	90.00	269.59	6,359.66	-1,399.96	-807.67	-2,317.42	2,379.21	0.00	0.00	0.00
9,400.00	90.00	269.59	6,359.66	-1,399.96	-808.39	-2,417.41	2,478.88	0.00	0.00	0.00
9,500.00	90.00	269.59	6,359.66	-1,399.96	-809.10	-2,517.41	2,578.56	0.00	0.00	0.00
9,600.00	90.00	269.59	6,359.66	-1,399.96	-809.81	-2,617.41	2,678.23	0.00	0.00	0.00
9,700.00	90.00	269.59	6,359.66	-1,399.96	-810.53	-2,717.41	2,777.91	0.00	0.00	0.00
9,800.00	90.00	269.59	6,359.66	-1,399.96	-811.24	-2,817.40	2,877.59	0.00	0.00	0.00
9,900.00	90.00	269.59	6,359.65	-1,399.95	-811.95	-2,917.40	2,977.26	0.00	0.00	0.00
10,000.00	90.00	269.59	6,359.65	-1,399.95	-812.67	-3,017.40	3,076.94	0.00	0.00	0.00
10,100.00	90.00	269.59	6,359.65	-1,399.95	-813.38	-3,117.40	3,176.62	0.00	0.00	0.00
10,200.00	90.00	269.59	6,359.65	-1,399.95	-814.09	-3,217.39	3,276.29	0.00	0.00	0.00
10,300.00	90.00	269.59	6,359.65	-1,399.95	-814.80	-3,317.39	3,375.97	0.00	0.00	0.00
10,400.00	90.00	269.59	6,359.65	-1,399.95	-815.52	-3,417.39	3,475.64	0.00	0.00	0.00
10,500.00	90.00	269.59	6,359.65	-1,399.95	-816.23	-3,517.39	3,575.32	0.00	0.00	0.00
10,600.00	90.00	269.59	6,359.65	-1,399.95	-816.94	-3,617.38	3,675.00	0.00	0.00	0.00
10,700.00	90.00	269.59	6,359.65	-1,399.95	-817.65	-3,717.38	3,774.67	0.00	0.00	0.00
10,800.00	90.00	269.59	6,359.65	-1,399.95	-818.36	-3,817.38	3,874.35	0.00	0.00	0.00
10,900.00	90.00	269.59	6,359.65	-1,399.95	-819.08	-3,917.38	3,974.02	0.00	0.00	0.00
11,000.00	90.00	269.59	6,359.65	-1,399.95	-819.79	-4,017.37	4,073.70	0.00	0.00	0.00
11,100.00	90.00	269.59	6,359.65	-1,399.95	-820.50	-4,117.37	4,173.38	0.00	0.00	0.00
11,200.00	90.00	269.59	6,359.65	-1,399.95	-821.21	-4,217.37	4,273.05	0.00	0.00	0.00
11,300.00	90.00	269.59	6,359.65	-1,399.95	-821.92	-4,317.37	4,372.73	0.00	0.00	0.00
11,400.00	90.00	269.59	6,359.65	-1,399.95	-822.63	-4,417.36	4,472.41	0.00	0.00	0.00
11,500.00	90.00	269.59	6,359.65	-1,399.95	-823.35	-4,517.36	4,572.08	0.00	0.00	0.00
11,600.00	90.00	269.59	6,359.65	-1,399.95	-824.06	-4,617.36	4,671.76	0.00	0.00	0.00
11,700.00	90.00	269.59	6,359.65	-1,399.95	-824.77	-4,717.36	4,771.43	0.00	0.00	0.00
11,800.00	90.00	269.59	6,359.65	-1,399.95	-825.48	-4,817.35	4,871.11	0.00	0.00	0.00
11,900.00	90.00	269.59	6,359.65	-1,399.95	-826.19	-4,917.35	4,970.79	0.00	0.00	0.00
12,000.00	90.00	269.59	6,359.65	-1,399.95	-826.90	-5,017.35	5,070.46	0.00	0.00	0.00
12,100.00	90.00	269.59	6,359.65	-1,399.95	-827.61	-5,117.35	5,170.14	0.00	0.00	0.00
12,200.00	90.00	269.59	6,359.65	-1,399.95	-828.32	-5,217.34	5,269.81	0.00	0.00	0.00
12,300.00	90.00	269.59	6,359.65	-1,399.95	-829.03	-5,317.34	5,369.49	0.00	0.00	0.00
12,400.00	90.00	269.59	6,359.65	-1,399.95	-829.74	-5,417.34	5,469.17	0.00	0.00	0.00
12,500.00	90.00	269.59	6,359.65	-1,399.95	-830.45	-5,517.34	5,568.84	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well HUNT FED 8-60 19-24-5
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4959.70usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4959.70usft
Site:	SE NE SEC. 19 T8N R60W 6th P.M.	North Reference:	True
Well:	HUNT FED 8-60 19-24-5	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)
12,600.00	90.00	269.59	6,359.65	-1,399.95	-831.16	-5,617.33	5,668.52	0.00	0.00	0.00
12,700.00	90.00	269.59	6,359.65	-1,399.95	-831.87	-5,717.33	5,768.19	0.00	0.00	0.00
12,800.00	90.00	269.59	6,359.65	-1,399.95	-832.58	-5,817.33	5,867.87	0.00	0.00	0.00
12,900.00	90.00	269.59	6,359.65	-1,399.95	-833.29	-5,917.33	5,967.55	0.00	0.00	0.00
13,000.00	90.00	269.59	6,359.65	-1,399.95	-834.00	-6,017.32	6,067.22	0.00	0.00	0.00
13,100.00	90.00	269.59	6,359.65	-1,399.95	-834.71	-6,117.32	6,166.90	0.00	0.00	0.00
13,200.00	90.00	269.59	6,359.65	-1,399.95	-835.42	-6,217.32	6,266.57	0.00	0.00	0.00
13,300.00	90.00	269.59	6,359.65	-1,399.95	-836.13	-6,317.31	6,366.25	0.00	0.00	0.00
13,400.00	90.00	269.59	6,359.65	-1,399.95	-836.84	-6,417.31	6,465.93	0.00	0.00	0.00
13,500.00	90.00	269.59	6,359.65	-1,399.95	-837.55	-6,517.31	6,565.60	0.00	0.00	0.00
13,600.00	90.00	269.59	6,359.65	-1,399.95	-838.26	-6,617.31	6,665.28	0.00	0.00	0.00
13,700.00	90.00	269.59	6,359.66	-1,399.96	-838.97	-6,717.30	6,764.95	0.00	0.00	0.00
13,800.00	90.00	269.59	6,359.66	-1,399.96	-839.68	-6,817.30	6,864.63	0.00	0.00	0.00
13,900.00	90.00	269.59	6,359.66	-1,399.96	-840.39	-6,917.30	6,964.31	0.00	0.00	0.00
14,000.00	90.00	269.59	6,359.66	-1,399.96	-841.10	-7,017.30	7,063.98	0.00	0.00	0.00
14,100.00	90.00	269.59	6,359.66	-1,399.96	-841.80	-7,117.29	7,163.66	0.00	0.00	0.00
14,200.00	90.00	269.59	6,359.66	-1,399.96	-842.51	-7,217.29	7,263.33	0.00	0.00	0.00
14,300.00	90.00	269.59	6,359.66	-1,399.96	-843.22	-7,317.29	7,363.01	0.00	0.00	0.00
14,400.00	90.00	269.59	6,359.66	-1,399.96	-843.93	-7,417.29	7,462.68	0.00	0.00	0.00
14,500.00	90.00	269.59	6,359.66	-1,399.96	-844.64	-7,517.28	7,562.36	0.00	0.00	0.00
14,600.00	90.00	269.59	6,359.66	-1,399.96	-845.35	-7,617.28	7,662.04	0.00	0.00	0.00
14,700.00	90.00	269.59	6,359.67	-1,399.97	-846.05	-7,717.28	7,761.71	0.00	0.00	0.00
14,800.00	90.00	269.59	6,359.67	-1,399.97	-846.76	-7,817.28	7,861.39	0.00	0.00	0.00
14,900.00	90.00	269.59	6,359.67	-1,399.97	-847.47	-7,917.27	7,961.06	0.00	0.00	0.00
15,000.00	90.00	269.59	6,359.67	-1,399.97	-848.18	-8,017.27	8,060.74	0.00	0.00	0.00
15,100.00	90.00	269.59	6,359.67	-1,399.97	-848.89	-8,117.27	8,160.42	0.00	0.00	0.00
15,200.00	90.00	269.59	6,359.67	-1,399.97	-849.59	-8,217.27	8,260.09	0.00	0.00	0.00
15,300.00	90.00	269.59	6,359.67	-1,399.97	-850.30	-8,317.26	8,359.77	0.00	0.00	0.00
15,400.00	90.00	269.59	6,359.67	-1,399.97	-851.01	-8,417.26	8,459.44	0.00	0.00	0.00
15,500.00	90.00	269.59	6,359.68	-1,399.98	-851.72	-8,517.26	8,559.12	0.00	0.00	0.00
15,600.00	90.00	269.59	6,359.68	-1,399.98	-852.42	-8,617.26	8,658.79	0.00	0.00	0.00
15,700.00	90.00	269.59	6,359.68	-1,399.98	-853.13	-8,717.25	8,758.47	0.00	0.00	0.00
15,800.00	90.00	269.59	6,359.68	-1,399.98	-853.84	-8,817.25	8,858.15	0.00	0.00	0.00
15,900.00	90.00	269.60	6,359.68	-1,399.98	-854.54	-8,917.25	8,957.82	0.00	0.00	0.00
16,000.00	90.00	269.60	6,359.68	-1,399.98	-855.25	-9,017.25	9,057.50	0.00	0.00	0.00
16,100.00	90.00	269.60	6,359.69	-1,399.99	-855.96	-9,117.24	9,157.17	0.00	0.00	0.00
16,200.00	90.00	269.60	6,359.69	-1,399.99	-856.66	-9,217.24	9,256.85	0.00	0.00	0.00
16,300.00	90.00	269.60	6,359.69	-1,399.99	-857.37	-9,317.24	9,356.52	0.00	0.00	0.00
16,400.00	90.00	269.60	6,359.69	-1,399.99	-858.08	-9,417.24	9,456.20	0.00	0.00	0.00
16,500.00	90.00	269.60	6,359.69	-1,399.99	-858.78	-9,517.23	9,555.88	0.00	0.00	0.00
16,600.00	90.00	269.60	6,359.70	-1,400.00	-859.49	-9,617.23	9,655.55	0.00	0.00	0.00
16,700.00	90.00	269.60	6,359.70	-1,400.00	-860.19	-9,717.23	9,755.23	0.00	0.00	0.00
BHL: 2515ft FNL & 300ft FWL of Sec 24										
16,781.19	90.00	269.60	6,359.70	-1,400.00	-860.77	-9,798.42	9,836.15	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well HUNT FED 8-60 19-24-5
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4959.70usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4959.70usft
Site:	SE NE SEC. 19 T8N R60W 6th P.M.	North Reference:	True
Well:	HUNT FED 8-60 19-24-5	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
504.72	504.70	Fox Hills Base		0.00	
1,561.81	1,542.70	Pierre Shale Top		0.00	
3,466.22	3,396.70	Richard Sandstone		0.00	
3,591.54	3,518.70	Parkman Sandstone		0.00	
4,350.64	4,257.70	Sussex Sandstone		0.00	
4,822.12	4,716.70	Shannon Sandstone		0.00	
5,664.47	5,544.70	TeePee Buttes		0.00	
6,345.11	6,183.70	Sharon Springs		0.00	
6,397.40	6,219.70	Niobrara Top		0.00	
6,675.18	6,344.70	Niobrara B2 Chalk Top		0.00	
6,730.83	6,354.70	Niobrara B2 Chalk Target Top		0.00	
6,806.59	6,359.70	Niobrara B2 Chalk Landing Point		0.00	

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.00	0.00	0.00	0.00	SHL: 1724ft FNL & 490ft FEL of Sec 19
400.00	400.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1,060.66	1,054.82	-54.90	52.32	EOB TO 13.21° INC
5,145.91	5,031.92	-730.85	696.57	END OF TANGENT
5,806.57	5,686.74	-785.75	748.89	EOD TO VERTICAL
5,906.57	5,786.74	-785.75	748.89	KOP (10°/100ft BUR)
6,806.59	6,359.70	-789.85	175.93	HZ LP: 2515ft FNL & 300ft FEL of Sec 19
16,781.19	6,359.70	-860.77	-9,798.42	BHL: 2515ft FNL & 300ft FWL of Sec 24