



# **MALLARD EXPLORATION**

**WELD COUNTY, COLORADO (NAD 83)**

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

**HUNT FED 8-60 19-24-4**

**ORIGINAL WELLBORE**

**06 April, 2020**

**Plan: PROPOSAL #1**





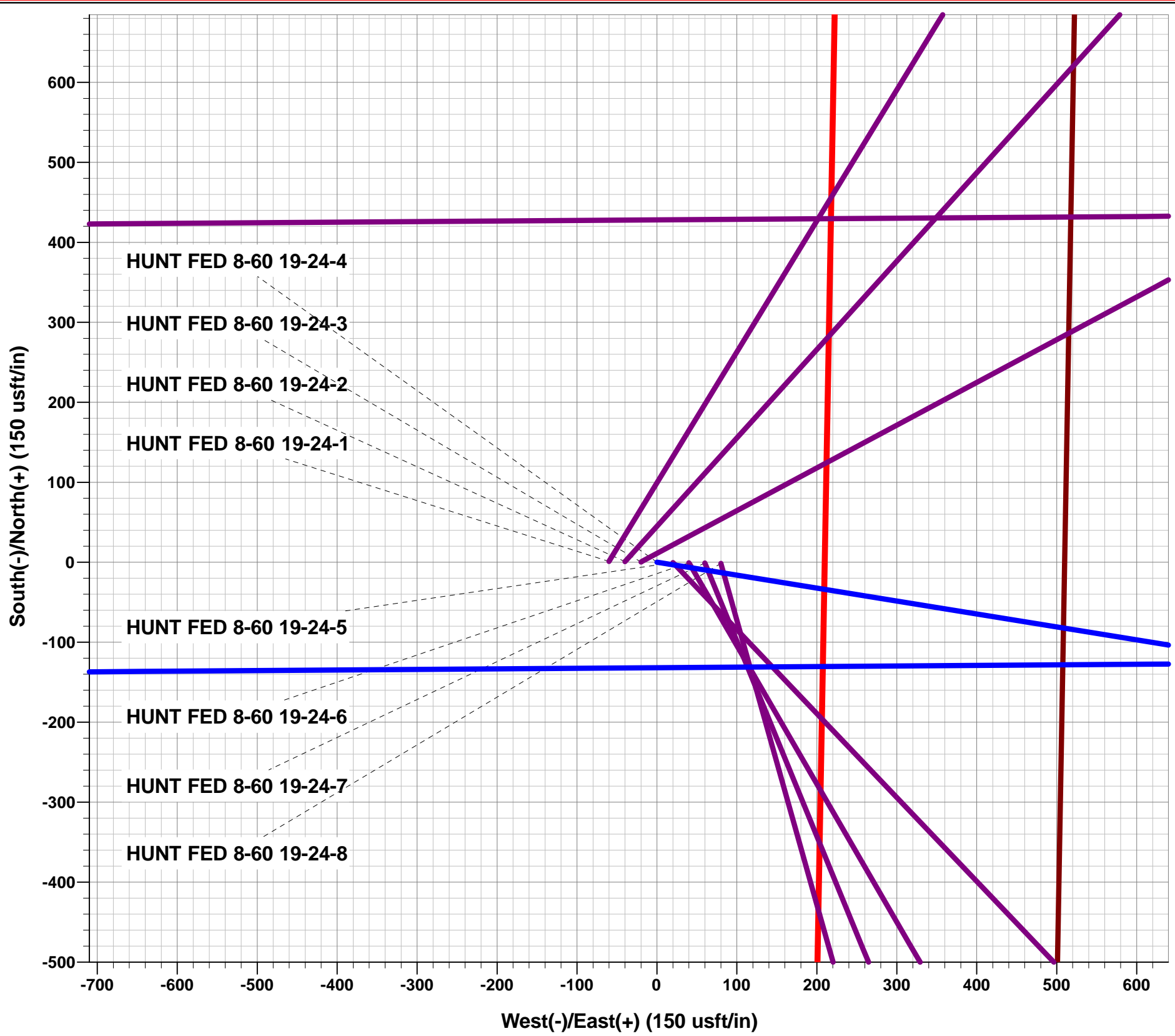
Project: WELD COUNTY, COLORADO (NAD 83)  
Site: SE NE SEC. 19 T8N R60W 6th P.M.  
Well: HUNT FED 8-60 19-24-4  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL #1

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: 1723ft FNL & 510ft FEL of Sec 19
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1100.00	12.00	99.19	1095.62	-10.00	61.80	-61.58	62.60	EOB TO 12° INC
4302.07	12.00	99.19	4227.72	-116.32	719.00	-716.46	728.35	END OF TANGENT
4902.07	0.00	0.00	4823.34	-126.32	780.80	-778.04	790.95	EOD TO VERTICAL
5950.17	0.00	0.00	5871.44	-126.32	780.80	-778.04	790.95	KOP (10°/100ft BUR)
6850.19	90.00	269.59	6444.40	-130.42	207.84	-205.11	1363.93	HZ LP: 1855ft FNL & 300ft FEL of Sec 19
16825.35	90.00	269.60	6444.40	-200.98	-9767.08	9769.15	11339.09	BHL: 1855ft FNL & 300ft FWL of Sec 24

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - HUNT FED 8-60 19-24-4	5871.44	-126.32	780.80	40.649951	-104.124118
HZ LP - HUNT FED 8-60 19-24-4	6444.40	-130.42	207.84	40.649940	-104.126183
BHL - HUNT FED 8-60 19-24-4	6444.40	-200.98	-9767.08	40.649741	-104.162130



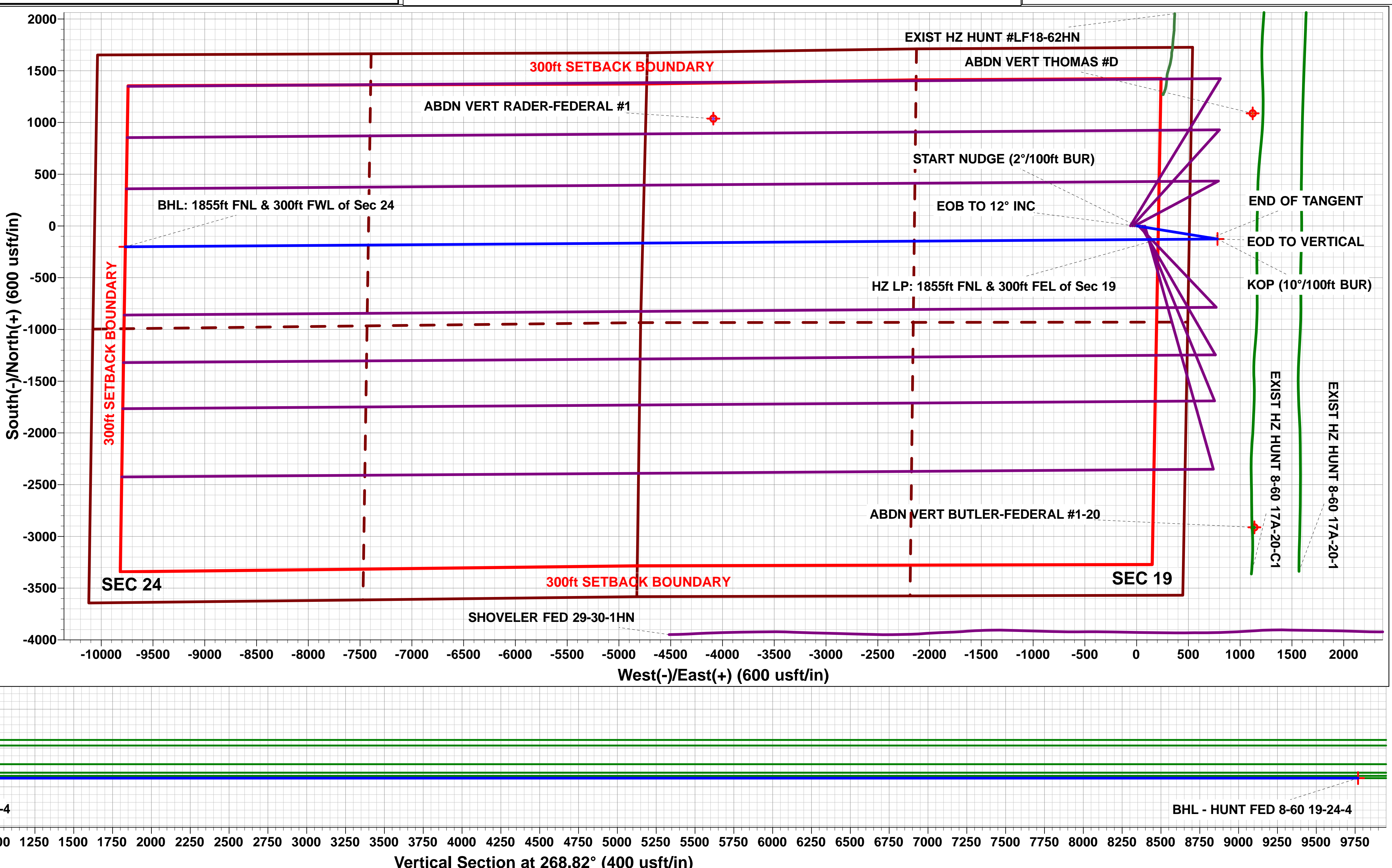
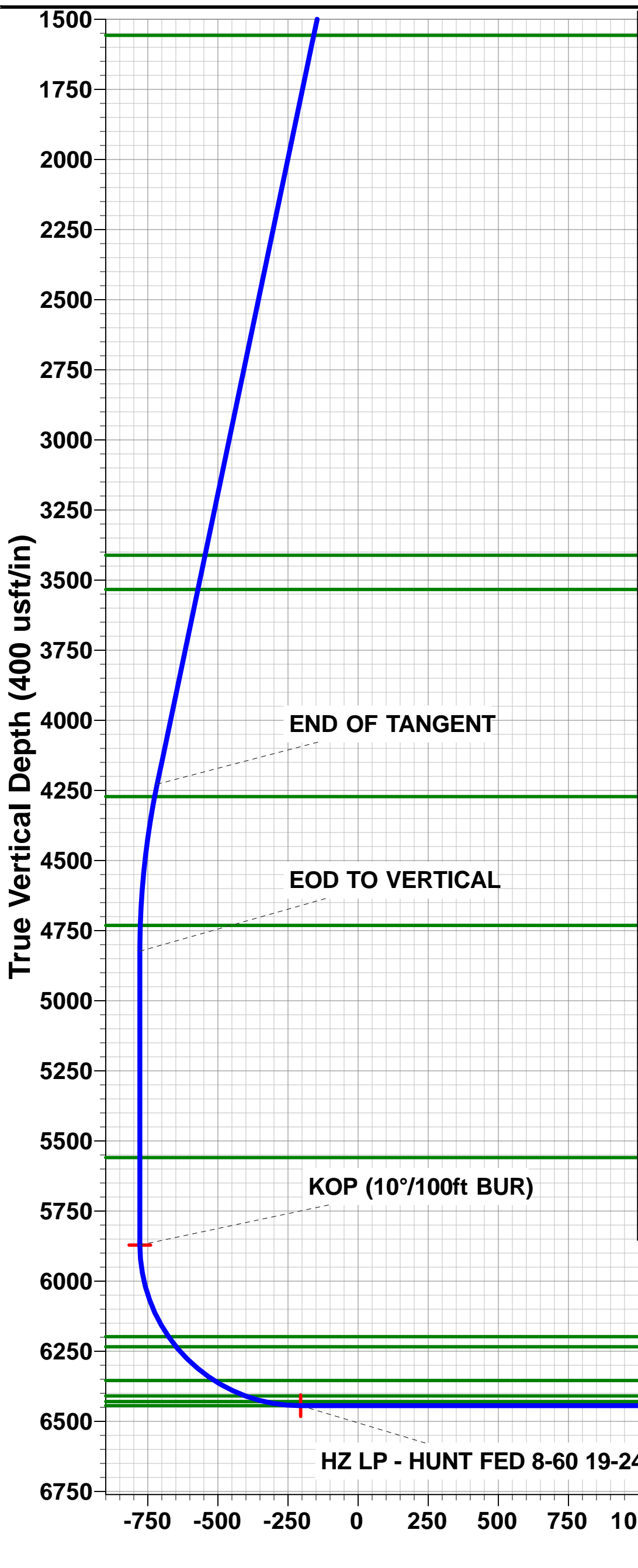
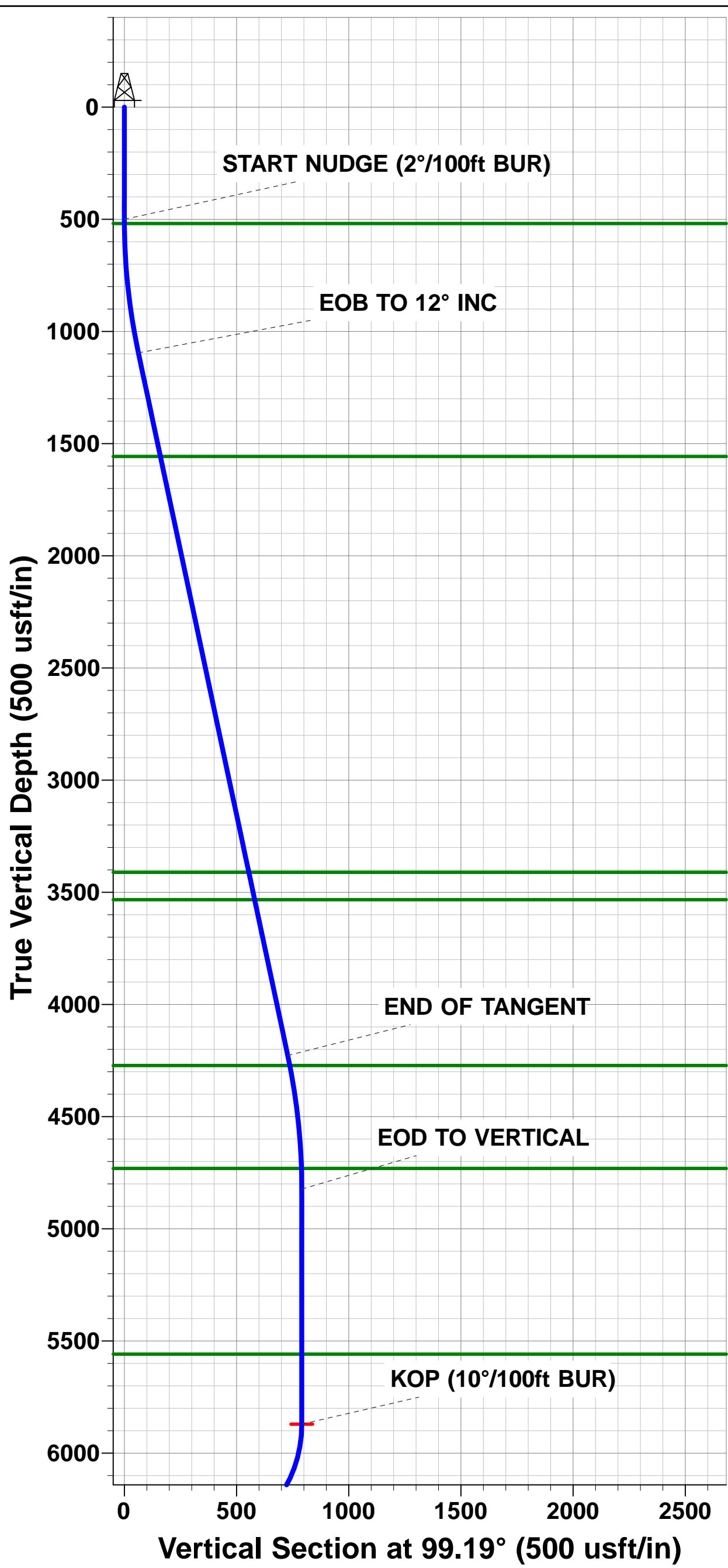
Azimuths to True North  
Magnetic North: 7.65°  
Magnetic Field  
Strength: 52273.6nT  
Dip Angle: 66.99°  
Date: 2020-04-06  
Model: IGRF2020

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
519.40	519.40	Fox Hills Base
1557.40	1572.09	Pierre Shale Top
3411.40	3467.51	Richard Sandstone
3533.40	3592.24	Parkman Sandstone
4272.40	4347.67	Sussex Sandstone
4731.40	4810.11	Shannon Sandstone
5559.40	5638.13	TeePee Buttes
6198.40	6298.12	Sharon Springs
6234.40	6343.24	Niobrara Top
6354.40	6524.67	Niobrara B2 Chalk Target Top
6409.40	6648.87	Niobrara C Chalk Top
6429.40	6718.78	Niobrara C Chalk Target Top
6444.40	6850.19	Niobrara C Chalk Landing Point

PROPOSED LOCAL COORDINATES:

SHL: 1723ft FNL & 510ft FEL of Sec 19  
HZ LP: 1855ft FNL & 300ft FEL of Sec 19  
BHL: 1855ft FNL & 300ft FWL of Sec 24



# Planning Report

<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well HUNT FED 8-60 19-24-4
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 27' @ 4959.40usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 27' @ 4959.40usft
<b>Site:</b>	SE NE SEC. 19 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	HUNT FED 8-60 19-24-4	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

<b>Project</b>	WELD COUNTY, COLORADO (NAD 83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

<b>Site</b>	SE NE SEC. 19 T8N R60W 6th P.M.		
<b>Site Position:</b>		<b>Northing:</b>	1,482,695.84 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,380,926.54 usft
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	1.10 ft
		<b>Latitude:</b>	40.650301
		<b>Longitude:</b>	-104.127148
		<b>Grid Convergence:</b>	0.89 °

<b>Well</b>	HUNT FED 8-60 19-24-4		
<b>Well Position</b>	<b>+N/-S</b>	-1.10 usft	<b>Northing:</b>
	<b>+E/-W</b>	59.94 usft	<b>Easting:</b>
<b>Position Uncertainty</b>	0.00 usft		<b>Wellhead Elevation:</b>
			<b>Ground Level:</b>
			4,932.40 usft

<b>Wellbore</b>	ORIGINAL WELLBORE				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2020	2020-04-06	7.65	66.99	52,273.63224430

<b>Design</b>	PROPOSAL #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	6,444.40	0.00	0.00	268.82

<b>Plan Sections</b>											
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	-4,959.40	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	-4,459.40	0.00	0.00	0.00	0.00	0.00	0.00	
1,100.00	12.00	99.19	1,095.62	-3,863.78	-10.00	61.80	2.00	2.00	0.00	99.19	
4,302.07	12.00	99.19	4,227.72	-731.68	-116.32	719.00	0.00	0.00	0.00	0.00	
4,902.07	0.00	0.00	4,823.34	-136.06	-126.32	780.80	2.00	-2.00	0.00	180.00	
5,950.17	0.00	0.00	5,871.44	912.04	-126.32	780.80	0.00	0.00	0.00	0.00	KOP - HUNT FED 8
6,850.19	90.00	269.59	6,444.40	1,485.00	-130.42	207.84	10.00	10.00	-10.05	269.59	HZ LP - HUNT FED 8
16,825.35	90.00	269.60	6,444.40	1,485.00	-200.98	-9,767.08	0.00	0.00	0.00	108.33	BHL - HUNT FED 8

# Planning Report

<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well HUNT FED 8-60 19-24-4
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 27' @ 4959.40usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 27' @ 4959.40usft
<b>Site:</b>	SE NE SEC. 19 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	HUNT FED 8-60 19-24-4	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	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)
<b>SHL: 1723ft FNL &amp; 510ft FEL of Sec 19</b>										
0.00	0.00	0.00	0.00	4,959.40	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,859.40	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4,759.40	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	4,659.40	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	4,559.40	0.00	0.00	0.00	0.00	0.00	0.00
<b>START NUDGE (2°/100ft BUR)</b>										
500.00	0.00	0.00	500.00	4,459.40	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fox Hills Base</b>										
519.40	0.39	99.19	519.40	4,440.00	-0.01	0.06	-0.06	2.00	2.00	0.00
600.00	2.00	99.19	599.98	4,359.42	-0.28	1.72	-1.72	2.00	2.00	0.00
700.00	4.00	99.19	699.84	4,259.56	-1.11	6.89	-6.86	2.00	2.00	0.00
800.00	6.00	99.19	799.45	4,159.95	-2.51	15.49	-15.44	2.00	2.00	0.00
900.00	8.00	99.19	898.70	4,060.70	-4.45	27.52	-27.42	2.00	2.00	0.00
1,000.00	10.00	99.19	997.47	3,961.93	-6.95	42.96	-42.81	2.00	2.00	0.00
<b>EOB TO 12° INC</b>										
1,100.00	12.00	99.19	1,095.62	3,863.78	-10.00	61.80	-61.58	2.00	2.00	0.00
1,200.00	12.00	99.19	1,193.44	3,765.96	-13.32	82.32	-82.03	0.00	0.00	0.00
1,300.00	12.00	99.19	1,291.25	3,668.15	-16.64	102.85	-102.48	0.00	0.00	0.00
1,400.00	12.00	99.19	1,389.07	3,570.33	-19.96	123.37	-122.94	0.00	0.00	0.00
1,500.00	12.00	99.19	1,486.88	3,472.52	-23.28	143.90	-143.39	0.00	0.00	0.00
<b>Pierre Shale Top</b>										
1,572.09	12.00	99.19	1,557.40	3,402.00	-25.67	158.69	-158.13	0.00	0.00	0.00
1,600.00	12.00	99.19	1,584.70	3,374.70	-26.60	164.42	-163.84	0.00	0.00	0.00
1,700.00	12.00	99.19	1,682.51	3,276.89	-29.92	184.94	-184.29	0.00	0.00	0.00
1,800.00	12.00	99.19	1,780.33	3,179.07	-33.24	205.47	-204.74	0.00	0.00	0.00
1,900.00	12.00	99.19	1,878.14	3,081.26	-36.56	225.99	-225.19	0.00	0.00	0.00
2,000.00	12.00	99.19	1,975.96	2,983.44	-39.88	246.52	-245.65	0.00	0.00	0.00
2,100.00	12.00	99.19	2,073.77	2,885.63	-43.20	267.04	-266.10	0.00	0.00	0.00
2,200.00	12.00	99.19	2,171.59	2,787.81	-46.52	287.57	-286.55	0.00	0.00	0.00
2,300.00	12.00	99.19	2,269.40	2,690.00	-49.84	308.09	-307.00	0.00	0.00	0.00
2,400.00	12.00	99.19	2,367.22	2,592.18	-53.16	328.61	-327.45	0.00	0.00	0.00
2,500.00	12.00	99.19	2,465.03	2,494.37	-56.48	349.14	-347.90	0.00	0.00	0.00
2,600.00	12.00	99.19	2,562.84	2,396.56	-59.81	369.66	-368.35	0.00	0.00	0.00
2,700.00	12.00	99.19	2,660.66	2,298.74	-63.13	390.19	-388.81	0.00	0.00	0.00
2,800.00	12.00	99.19	2,758.47	2,200.93	-66.45	410.71	-409.26	0.00	0.00	0.00
2,900.00	12.00	99.19	2,856.29	2,103.11	-69.77	431.24	-429.71	0.00	0.00	0.00
3,000.00	12.00	99.19	2,954.10	2,005.30	-73.09	451.76	-450.16	0.00	0.00	0.00
3,100.00	12.00	99.19	3,051.92	1,907.48	-76.41	472.29	-470.61	0.00	0.00	0.00
3,200.00	12.00	99.19	3,149.73	1,809.67	-79.73	492.81	-491.06	0.00	0.00	0.00
3,300.00	12.00	99.19	3,247.55	1,711.85	-83.05	513.33	-511.52	0.00	0.00	0.00
3,400.00	12.00	99.19	3,345.36	1,614.04	-86.37	533.86	-531.97	0.00	0.00	0.00
<b>Richard Sandstone</b>										
3,467.51	12.00	99.19	3,411.40	1,548.00	-88.61	547.71	-545.78	0.00	0.00	0.00
3,500.00	12.00	99.19	3,443.18	1,516.22	-89.69	554.38	-552.42	0.00	0.00	0.00
<b>Parkman Sandstone</b>										
3,592.24	12.00	99.19	3,533.40	1,426.00	-92.75	573.31	-571.28	0.00	0.00	0.00
3,600.00	12.00	99.19	3,540.99	1,418.41	-93.01	574.91	-572.87	0.00	0.00	0.00
3,700.00	12.00	99.19	3,638.81	1,320.59	-96.33	595.43	-593.32	0.00	0.00	0.00
3,800.00	12.00	99.19	3,736.62	1,222.78	-99.65	615.96	-613.77	0.00	0.00	0.00
3,900.00	12.00	99.19	3,834.44	1,124.96	-102.97	636.48	-634.23	0.00	0.00	0.00
4,000.00	12.00	99.19	3,932.25	1,027.15	-106.29	657.00	-654.68	0.00	0.00	0.00
4,100.00	12.00	99.19	4,030.07	929.33	-109.61	677.53	-675.13	0.00	0.00	0.00



# Planning Report

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<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 27' @ 4959.40usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 27' @ 4959.40usft
<b>Site:</b>	SE NE SEC. 19 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	HUNT FED 8-60 19-24-4	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	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	12.00	99.19	4,127.88	831.52	-112.93	698.05	-695.58	0.00	0.00	0.00
4,300.00	12.00	99.19	4,225.70	733.70	-116.25	718.58	-716.03	0.00	0.00	0.00
<b>END OF TANGENT</b>										
<b>4,302.07</b>	<b>12.00</b>	<b>99.19</b>	<b>4,227.72</b>	<b>731.68</b>	<b>-116.32</b>	<b>719.00</b>	<b>-716.46</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Sussex Sandstone</b>										
<b>4,347.67</b>	<b>11.09</b>	<b>99.19</b>	<b>4,272.40</b>	<b>687.00</b>	<b>-117.78</b>	<b>728.01</b>	<b>-725.43</b>	<b>2.00</b>	<b>-2.00</b>	<b>0.00</b>
4,400.00	10.04	99.19	4,323.84	635.56	-119.31	737.48	-734.87	2.00	-2.00	0.00
4,500.00	8.04	99.19	4,422.59	536.81	-121.82	752.99	-750.33	2.00	-2.00	0.00
4,600.00	6.04	99.19	4,521.83	437.57	-123.78	765.09	-762.39	2.00	-2.00	0.00
4,700.00	4.04	99.19	4,621.44	337.96	-125.18	773.77	-771.03	2.00	-2.00	0.00
4,800.00	2.04	99.19	4,721.29	238.11	-126.03	779.01	-776.25	2.00	-2.00	0.00
<b>Shannon Sandstone</b>										
<b>4,810.11</b>	<b>1.84</b>	<b>99.19</b>	<b>4,731.40</b>	<b>228.00</b>	<b>-126.08</b>	<b>779.34</b>	<b>-776.58</b>	<b>2.00</b>	<b>-2.00</b>	<b>0.00</b>
4,900.00	0.04	99.19	4,821.27	138.13	-126.32	780.80	-778.04	2.00	-2.00	0.00
<b>EOD TO VERTICAL</b>										
<b>4,902.07</b>	<b>0.00</b>	<b>0.00</b>	<b>4,823.34</b>	<b>136.06</b>	<b>-126.32</b>	<b>780.80</b>	<b>-778.04</b>	<b>2.00</b>	<b>-2.00</b>	<b>0.00</b>
5,000.00	0.00	0.00	4,921.27	38.13	-126.32	780.80	-778.04	0.00	0.00	0.00
5,100.00	0.00	0.00	5,021.27	-61.87	-126.32	780.80	-778.04	0.00	0.00	0.00
5,200.00	0.00	0.00	5,121.27	-161.87	-126.32	780.80	-778.04	0.00	0.00	0.00
5,300.00	0.00	0.00	5,221.27	-261.87	-126.32	780.80	-778.04	0.00	0.00	0.00
5,400.00	0.00	0.00	5,321.27	-361.87	-126.32	780.80	-778.04	0.00	0.00	0.00
5,500.00	0.00	0.00	5,421.27	-461.87	-126.32	780.80	-778.04	0.00	0.00	0.00
5,600.00	0.00	0.00	5,521.27	-561.87	-126.32	780.80	-778.04	0.00	0.00	0.00
<b>TeePee Buttes</b>										
<b>5,638.13</b>	<b>0.00</b>	<b>0.00</b>	<b>5,559.40</b>	<b>-600.00</b>	<b>-126.32</b>	<b>780.80</b>	<b>-778.04</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
5,700.00	0.00	0.00	5,621.27	-661.87	-126.32	780.80	-778.04	0.00	0.00	0.00
5,800.00	0.00	0.00	5,721.27	-761.87	-126.32	780.80	-778.04	0.00	0.00	0.00
5,900.00	0.00	0.00	5,821.27	-861.87	-126.32	780.80	-778.04	0.00	0.00	0.00
<b>KOP (10°/100ft BUR)</b>										
<b>5,950.17</b>	<b>0.00</b>	<b>0.00</b>	<b>5,871.44</b>	<b>-912.04</b>	<b>-126.32</b>	<b>780.80</b>	<b>-778.04</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
6,000.00	4.98	269.59	5,921.21	-961.81	-126.34	778.63	-775.87	10.00	10.00	0.00
6,100.00	14.98	269.59	6,019.57	-1,060.17	-126.46	761.32	-758.56	10.00	10.00	0.00
6,200.00	24.98	269.59	6,113.43	-1,154.03	-126.70	727.19	-724.43	10.00	10.00	0.00
<b>Sharon Springs</b>										
<b>6,298.12</b>	<b>34.80</b>	<b>269.59</b>	<b>6,198.40</b>	<b>-1,239.00</b>	<b>-127.05</b>	<b>678.35</b>	<b>-675.60</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,300.00	34.98	269.59	6,199.94	-1,240.54	-127.06	677.28	-674.52	10.00	10.00	0.00
<b>Niobrara Top</b>										
<b>6,343.24</b>	<b>39.31</b>	<b>269.59</b>	<b>6,234.40</b>	<b>-1,275.00</b>	<b>-127.25</b>	<b>651.18</b>	<b>-648.42</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,400.00	44.98	269.59	6,276.46	-1,317.06	-127.52	613.11	-610.35	10.00	10.00	0.00
6,500.00	54.98	269.59	6,340.68	-1,381.28	-128.07	536.62	-533.87	10.00	10.00	0.00
<b>Niobrara B2 Chalk Target Top</b>										
<b>6,524.67</b>	<b>57.45</b>	<b>269.59</b>	<b>6,354.40</b>	<b>-1,395.00</b>	<b>-128.21</b>	<b>516.12</b>	<b>-513.37</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,600.00	64.98	269.59	6,390.65	-1,431.25	-128.69	450.15	-447.40	10.00	10.00	0.00
<b>Niobrara C Chalk Top</b>										
<b>6,648.87</b>	<b>69.87</b>	<b>269.59</b>	<b>6,409.40</b>	<b>-1,450.00</b>	<b>-129.01</b>	<b>405.04</b>	<b>-402.30</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,700.00	74.98	269.59	6,424.83	-1,465.43	-129.36	356.31	-353.57	10.00	10.00	0.00
<b>Niobrara C Chalk Target Top</b>										
<b>6,718.78</b>	<b>76.86</b>	<b>269.59</b>	<b>6,429.40</b>	<b>-1,470.00</b>	<b>-129.49</b>	<b>338.10</b>	<b>-335.36</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,800.00	84.98	269.59	6,442.20	-1,482.80	-130.06	257.96	-255.23	10.00	10.00	0.00
<b>HZ LP: 1855ft FNL &amp; 300ft FEL of Sec 19 - Niobrara C Chalk Landing Point</b>										
<b>6,850.19</b>	<b>90.00</b>	<b>269.59</b>	<b>6,444.40</b>	<b>-1,485.00</b>	<b>-130.42</b>	<b>207.84</b>	<b>-205.11</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,900.00	90.00	269.59	6,444.40	-1,485.00	-130.78	158.03	-155.30	0.00	0.00	0.00

# Planning Report

<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well HUNT FED 8-60 19-24-4
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 27' @ 4959.40usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 27' @ 4959.40usft
<b>Site:</b>	SE NE SEC. 19 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	HUNT FED 8-60 19-24-4	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	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)
7,000.00	90.00	269.59	6,444.40	-1,485.00	-131.49	58.03	-55.31	0.00	0.00	0.00
7,100.00	90.00	269.59	6,444.39	-1,484.99	-132.21	-41.97	44.68	0.00	0.00	0.00
7,200.00	90.00	269.59	6,444.39	-1,484.99	-132.92	-141.97	144.67	0.00	0.00	0.00
7,300.00	90.00	269.59	6,444.39	-1,484.99	-133.64	-241.96	244.66	0.00	0.00	0.00
7,400.00	90.00	269.59	6,444.39	-1,484.99	-134.35	-341.96	344.65	0.00	0.00	0.00
7,500.00	90.00	269.59	6,444.38	-1,484.98	-135.07	-441.96	444.64	0.00	0.00	0.00
7,600.00	90.00	269.59	6,444.38	-1,484.98	-135.78	-541.96	544.63	0.00	0.00	0.00
7,700.00	90.00	269.59	6,444.38	-1,484.98	-136.50	-641.95	644.63	0.00	0.00	0.00
7,800.00	90.00	269.59	6,444.38	-1,484.98	-137.21	-741.95	744.62	0.00	0.00	0.00
7,900.00	90.00	269.59	6,444.37	-1,484.97	-137.92	-841.95	844.61	0.00	0.00	0.00
8,000.00	90.00	269.59	6,444.37	-1,484.97	-138.64	-941.95	944.60	0.00	0.00	0.00
8,100.00	90.00	269.59	6,444.37	-1,484.97	-139.35	-1,041.94	1,044.59	0.00	0.00	0.00
8,200.00	90.00	269.59	6,444.37	-1,484.97	-140.06	-1,141.94	1,144.58	0.00	0.00	0.00
8,300.00	90.00	269.59	6,444.37	-1,484.97	-140.78	-1,241.94	1,244.57	0.00	0.00	0.00
8,400.00	90.00	269.59	6,444.36	-1,484.96	-141.49	-1,341.94	1,344.56	0.00	0.00	0.00
8,500.00	90.00	269.59	6,444.36	-1,484.96	-142.20	-1,441.93	1,444.55	0.00	0.00	0.00
8,600.00	90.00	269.59	6,444.36	-1,484.96	-142.92	-1,541.93	1,544.54	0.00	0.00	0.00
8,700.00	90.00	269.59	6,444.36	-1,484.96	-143.63	-1,641.93	1,644.54	0.00	0.00	0.00
8,800.00	90.00	269.59	6,444.36	-1,484.96	-144.34	-1,741.93	1,744.53	0.00	0.00	0.00
8,900.00	90.00	269.59	6,444.36	-1,484.96	-145.05	-1,841.92	1,844.52	0.00	0.00	0.00
9,000.00	90.00	269.59	6,444.35	-1,484.95	-145.77	-1,941.92	1,944.51	0.00	0.00	0.00
9,100.00	90.00	269.59	6,444.35	-1,484.95	-146.48	-2,041.92	2,044.50	0.00	0.00	0.00
9,200.00	90.00	269.59	6,444.35	-1,484.95	-147.19	-2,141.92	2,144.49	0.00	0.00	0.00
9,300.00	90.00	269.59	6,444.35	-1,484.95	-147.90	-2,241.91	2,244.48	0.00	0.00	0.00
9,400.00	90.00	269.59	6,444.35	-1,484.95	-148.61	-2,341.91	2,344.47	0.00	0.00	0.00
9,500.00	90.00	269.59	6,444.35	-1,484.95	-149.32	-2,441.91	2,444.46	0.00	0.00	0.00
9,600.00	90.00	269.59	6,444.35	-1,484.95	-150.04	-2,541.91	2,544.45	0.00	0.00	0.00
9,700.00	90.00	269.59	6,444.34	-1,484.94	-150.75	-2,641.90	2,644.44	0.00	0.00	0.00
9,800.00	90.00	269.59	6,444.34	-1,484.94	-151.46	-2,741.90	2,744.44	0.00	0.00	0.00
9,900.00	90.00	269.59	6,444.34	-1,484.94	-152.17	-2,841.90	2,844.43	0.00	0.00	0.00
10,000.00	90.00	269.59	6,444.34	-1,484.94	-152.88	-2,941.90	2,944.42	0.00	0.00	0.00
10,100.00	90.00	269.59	6,444.34	-1,484.94	-153.59	-3,041.89	3,044.41	0.00	0.00	0.00
10,200.00	90.00	269.59	6,444.34	-1,484.94	-154.30	-3,141.89	3,144.40	0.00	0.00	0.00
10,300.00	90.00	269.59	6,444.34	-1,484.94	-155.01	-3,241.89	3,244.39	0.00	0.00	0.00
10,400.00	90.00	269.59	6,444.34	-1,484.94	-155.72	-3,341.89	3,344.38	0.00	0.00	0.00
10,500.00	90.00	269.59	6,444.34	-1,484.94	-156.43	-3,441.88	3,444.37	0.00	0.00	0.00
10,600.00	90.00	269.59	6,444.34	-1,484.94	-157.14	-3,541.88	3,544.36	0.00	0.00	0.00
10,700.00	90.00	269.59	6,444.34	-1,484.94	-157.85	-3,641.88	3,644.35	0.00	0.00	0.00
10,800.00	90.00	269.59	6,444.34	-1,484.94	-158.56	-3,741.88	3,744.35	0.00	0.00	0.00
10,900.00	90.00	269.59	6,444.33	-1,484.93	-159.27	-3,841.87	3,844.34	0.00	0.00	0.00
11,000.00	90.00	269.59	6,444.33	-1,484.93	-159.97	-3,941.87	3,944.33	0.00	0.00	0.00
11,100.00	90.00	269.59	6,444.33	-1,484.93	-160.68	-4,041.87	4,044.32	0.00	0.00	0.00
11,200.00	90.00	269.59	6,444.33	-1,484.93	-161.39	-4,141.86	4,144.31	0.00	0.00	0.00
11,300.00	90.00	269.59	6,444.33	-1,484.93	-162.10	-4,241.86	4,244.30	0.00	0.00	0.00
11,400.00	90.00	269.59	6,444.33	-1,484.93	-162.81	-4,341.86	4,344.29	0.00	0.00	0.00
11,500.00	90.00	269.59	6,444.33	-1,484.93	-163.52	-4,441.86	4,444.28	0.00	0.00	0.00
11,600.00	90.00	269.59	6,444.33	-1,484.93	-164.22	-4,541.85	4,544.27	0.00	0.00	0.00
11,700.00	90.00	269.59	6,444.33	-1,484.93	-164.93	-4,641.85	4,644.26	0.00	0.00	0.00
11,800.00	90.00	269.59	6,444.33	-1,484.93	-165.64	-4,741.85	4,744.25	0.00	0.00	0.00
11,900.00	90.00	269.59	6,444.33	-1,484.93	-166.35	-4,841.85	4,844.24	0.00	0.00	0.00
12,000.00	90.00	269.59	6,444.33	-1,484.93	-167.05	-4,941.84	4,944.24	0.00	0.00	0.00
12,100.00	90.00	269.59	6,444.33	-1,484.93	-167.76	-5,041.84	5,044.23	0.00	0.00	0.00
12,200.00	90.00	269.60	6,444.33	-1,484.93	-168.47	-5,141.84	5,144.22	0.00	0.00	0.00
12,300.00	90.00	269.60	6,444.33	-1,484.93	-169.17	-5,241.84	5,244.21	0.00	0.00	0.00

# Planning Report

<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well HUNT FED 8-60 19-24-4
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 27' @ 4959.40usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 27' @ 4959.40usft
<b>Site:</b>	SE NE SEC. 19 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	HUNT FED 8-60 19-24-4	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	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)
12,400.00	90.00	269.60	6,444.33	-1,484.93	-169.88	-5,341.83	5,344.20	0.00	0.00	0.00
12,500.00	90.00	269.60	6,444.33	-1,484.93	-170.59	-5,441.83	5,444.19	0.00	0.00	0.00
12,600.00	90.00	269.60	6,444.33	-1,484.93	-171.29	-5,541.83	5,544.18	0.00	0.00	0.00
12,700.00	90.00	269.60	6,444.33	-1,484.93	-172.00	-5,641.83	5,644.17	0.00	0.00	0.00
12,800.00	90.00	269.60	6,444.33	-1,484.93	-172.71	-5,741.82	5,744.16	0.00	0.00	0.00
12,900.00	90.00	269.60	6,444.34	-1,484.94	-173.41	-5,841.82	5,844.15	0.00	0.00	0.00
13,000.00	90.00	269.60	6,444.34	-1,484.94	-174.12	-5,941.82	5,944.14	0.00	0.00	0.00
13,100.00	90.00	269.60	6,444.34	-1,484.94	-174.82	-6,041.82	6,044.14	0.00	0.00	0.00
13,200.00	90.00	269.60	6,444.34	-1,484.94	-175.53	-6,141.82	6,144.13	0.00	0.00	0.00
13,300.00	90.00	269.60	6,444.34	-1,484.94	-176.23	-6,241.81	6,244.12	0.00	0.00	0.00
13,400.00	90.00	269.60	6,444.34	-1,484.94	-176.94	-6,341.81	6,344.11	0.00	0.00	0.00
13,500.00	90.00	269.60	6,444.34	-1,484.94	-177.64	-6,441.81	6,444.10	0.00	0.00	0.00
13,600.00	90.00	269.60	6,444.34	-1,484.94	-178.35	-6,541.81	6,544.09	0.00	0.00	0.00
13,700.00	90.00	269.60	6,444.34	-1,484.94	-179.05	-6,641.80	6,644.08	0.00	0.00	0.00
13,800.00	90.00	269.60	6,444.34	-1,484.94	-179.76	-6,741.80	6,744.07	0.00	0.00	0.00
13,900.00	90.00	269.60	6,444.34	-1,484.94	-180.46	-6,841.80	6,844.06	0.00	0.00	0.00
14,000.00	90.00	269.60	6,444.34	-1,484.94	-181.16	-6,941.80	6,944.05	0.00	0.00	0.00
14,100.00	90.00	269.60	6,444.35	-1,484.95	-181.87	-7,041.79	7,044.04	0.00	0.00	0.00
14,200.00	90.00	269.60	6,444.35	-1,484.95	-182.57	-7,141.79	7,144.03	0.00	0.00	0.00
14,300.00	90.00	269.60	6,444.35	-1,484.95	-183.27	-7,241.79	7,244.03	0.00	0.00	0.00
14,400.00	90.00	269.60	6,444.35	-1,484.95	-183.98	-7,341.79	7,344.02	0.00	0.00	0.00
14,500.00	90.00	269.60	6,444.35	-1,484.95	-184.68	-7,441.78	7,444.01	0.00	0.00	0.00
14,600.00	90.00	269.60	6,444.35	-1,484.95	-185.38	-7,541.78	7,544.00	0.00	0.00	0.00
14,700.00	90.00	269.60	6,444.35	-1,484.95	-186.09	-7,641.78	7,643.99	0.00	0.00	0.00
14,800.00	90.00	269.60	6,444.36	-1,484.96	-186.79	-7,741.78	7,743.98	0.00	0.00	0.00
14,900.00	90.00	269.60	6,444.36	-1,484.96	-187.49	-7,841.77	7,843.97	0.00	0.00	0.00
15,000.00	90.00	269.60	6,444.36	-1,484.96	-188.19	-7,941.77	7,943.96	0.00	0.00	0.00
15,100.00	90.00	269.60	6,444.36	-1,484.96	-188.90	-8,041.77	8,043.95	0.00	0.00	0.00
15,200.00	90.00	269.60	6,444.36	-1,484.96	-189.60	-8,141.77	8,143.94	0.00	0.00	0.00
15,300.00	90.00	269.60	6,444.36	-1,484.96	-190.30	-8,241.76	8,243.93	0.00	0.00	0.00
15,400.00	90.00	269.60	6,444.37	-1,484.97	-191.00	-8,341.76	8,343.92	0.00	0.00	0.00
15,500.00	90.00	269.60	6,444.37	-1,484.97	-191.70	-8,441.76	8,443.92	0.00	0.00	0.00
15,600.00	90.00	269.60	6,444.37	-1,484.97	-192.40	-8,541.76	8,543.91	0.00	0.00	0.00
15,700.00	90.00	269.60	6,444.37	-1,484.97	-193.11	-8,641.75	8,643.90	0.00	0.00	0.00
15,800.00	90.00	269.60	6,444.37	-1,484.97	-193.81	-8,741.75	8,743.89	0.00	0.00	0.00
15,900.00	90.00	269.60	6,444.38	-1,484.98	-194.51	-8,841.75	8,843.88	0.00	0.00	0.00
16,000.00	90.00	269.60	6,444.38	-1,484.98	-195.21	-8,941.75	8,943.87	0.00	0.00	0.00
16,100.00	90.00	269.60	6,444.38	-1,484.98	-195.91	-9,041.74	9,043.86	0.00	0.00	0.00
16,200.00	90.00	269.60	6,444.38	-1,484.98	-196.61	-9,141.74	9,143.85	0.00	0.00	0.00
16,300.00	90.00	269.60	6,444.39	-1,484.99	-197.31	-9,241.74	9,243.84	0.00	0.00	0.00
16,400.00	90.00	269.60	6,444.39	-1,484.99	-198.01	-9,341.74	9,343.83	0.00	0.00	0.00
16,500.00	90.00	269.60	6,444.39	-1,484.99	-198.71	-9,441.73	9,443.82	0.00	0.00	0.00
16,600.00	90.00	269.60	6,444.39	-1,484.99	-199.41	-9,541.73	9,543.81	0.00	0.00	0.00
16,700.00	90.00	269.60	6,444.40	-1,485.00	-200.11	-9,641.73	9,643.80	0.00	0.00	0.00
16,800.00	90.00	269.60	6,444.40	-1,485.00	-200.81	-9,741.73	9,743.80	0.00	0.00	0.00
<b>BHL: 1855ft FNL &amp; 300ft FWL of Sec 24</b>										
<b>16,825.35</b>	<b>90.00</b>	<b>269.60</b>	<b>6,444.40</b>	<b>-1,485.00</b>	<b>-200.98</b>	<b>-9,767.08</b>	<b>9,769.15</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

# Planning Report

<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well HUNT FED 8-60 19-24-4
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 27' @ 4959.40usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 27' @ 4959.40usft
<b>Site:</b>	SE NE SEC. 19 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	HUNT FED 8-60 19-24-4	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
519.40	519.40	Fox Hills Base		0.00	
1,572.09	1,557.40	Pierre Shale Top		0.00	
3,467.51	3,411.40	Richard Sandstone		0.00	
3,592.24	3,533.40	Parkman Sandstone		0.00	
4,347.67	4,272.40	Sussex Sandstone		0.00	
4,810.11	4,731.40	Shannon Sandstone		0.00	
5,638.13	5,559.40	TeePee Buttes		0.00	
6,298.12	6,198.40	Sharon Springs		0.00	
6,343.24	6,234.40	Niobrara Top		0.00	
6,524.67	6,354.40	Niobrara B2 Chalk Target Top		0.00	
6,648.87	6,409.40	Niobrara C Chalk Top		0.00	
6,718.78	6,429.40	Niobrara C Chalk Target Top		0.00	
6,850.19	6,444.40	Niobrara C 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: 1723ft FNL & 510ft FEL of Sec 19
500.00	500.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1,100.00	1,095.62	-10.00	61.80	EOB TO 12° INC
4,302.07	4,227.72	-116.32	719.00	END OF TANGENT
4,902.07	4,823.34	-126.32	780.80	EOD TO VERTICAL
5,950.17	5,871.44	-126.32	780.80	KOP (10°/100ft BUR)
6,850.19	6,444.40	-130.42	207.84	HZ LP: 1855ft FNL & 300ft FEL of Sec 19
16,825.35	6,444.40	-200.98	-9,767.08	BHL: 1855ft FNL & 300ft FWL of Sec 24