

# **MALLARD EXPLORATION**

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

**SE SW SEC. 31 T9N R59W 6th P.M.**

**ANDERSON FED 6-5-7HN**

**ORIGINAL WELLBORE**

**25 July, 2019**

**Plan: PROPOSAL #3**





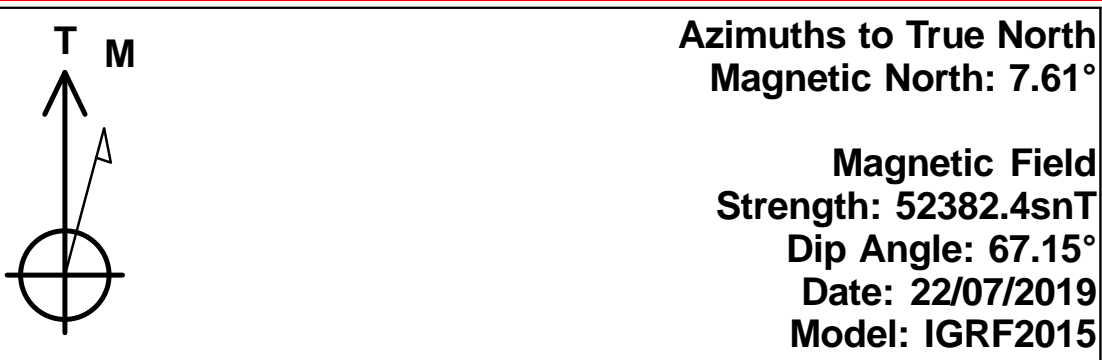
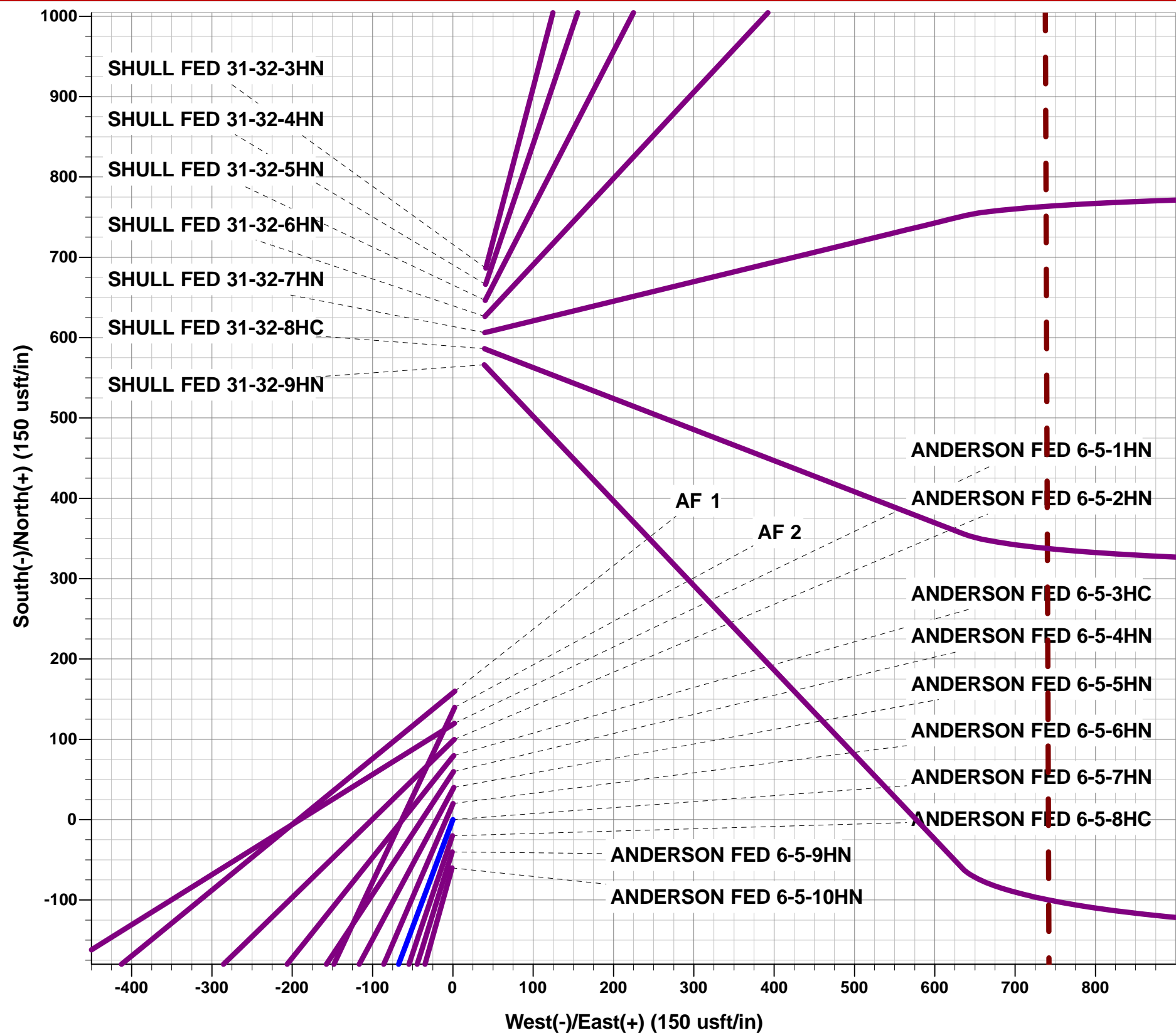
Project: WELD COUNTY, COLORADO (NAD 83)  
Site: SE SW SEC. 31 T9N R59W 6th P.M.  
Well: ANDERSON FED 6-5-7HN  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL #3

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: 582ft FSL & 1910ft FWL of Sec 31
400.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (3°/100ft BUR)
1671.00	1790.67	41.72	200.54	-453.55	-169.92	47.51	484.33	EOB TO 41.72° INC
5621.42	7083.26	41.72	200.54	-3751.83	-1405.64	393.01	4006.50	KOP (10°/100ft DGLG)
6160.00	8114.24	90.00	90.63	-4209.44	-852.58	1091.19	4839.80	LP *NEW*: 1775ft FSL & 600ft FWL of Sec 6
6160.00	17749.77	90.00	90.63	-4315.36	8782.37	9785.31	14475.33	BHL: 1775ft FSL & 300ft FEL of Sec 5

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
LP *NEW* - ANDERSON FED 6-5-7HN (P3)	6160.00	-4209.44	-852.58	40.689303	-104.026502
BHL - ANDERSON FED 6-5-7HN (P3)	6160.00	-4315.36	8782.37	40.689008	-103.991760



FORMATION TOP DETAILS

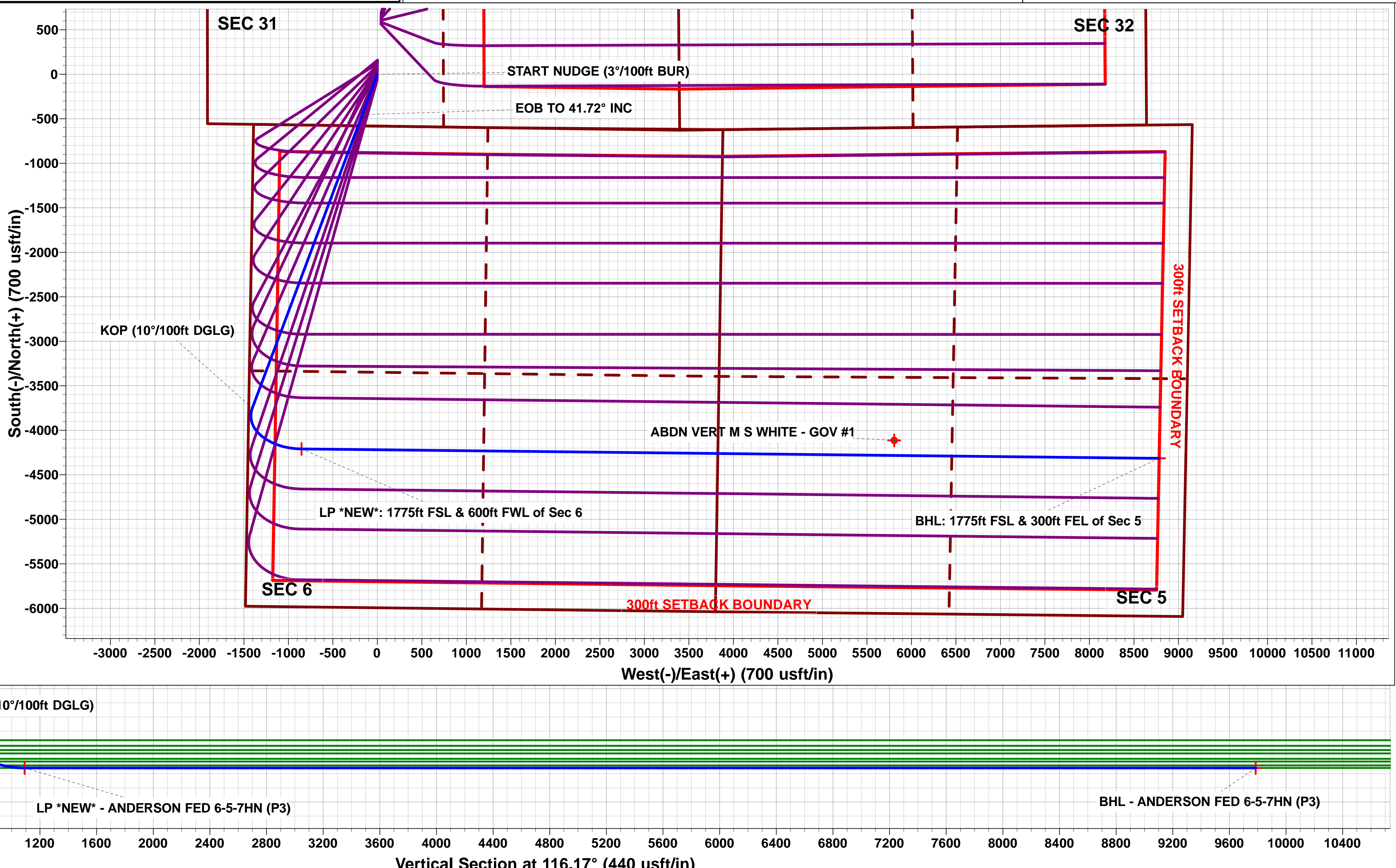
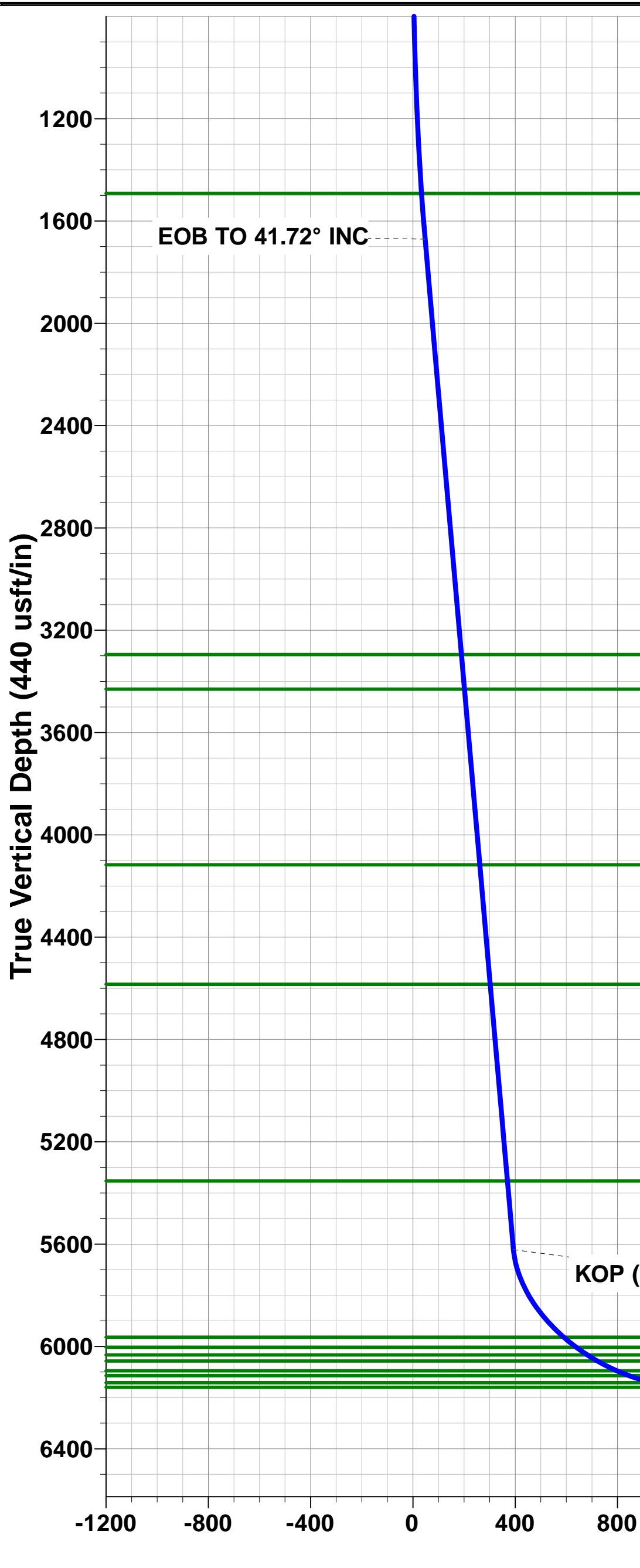
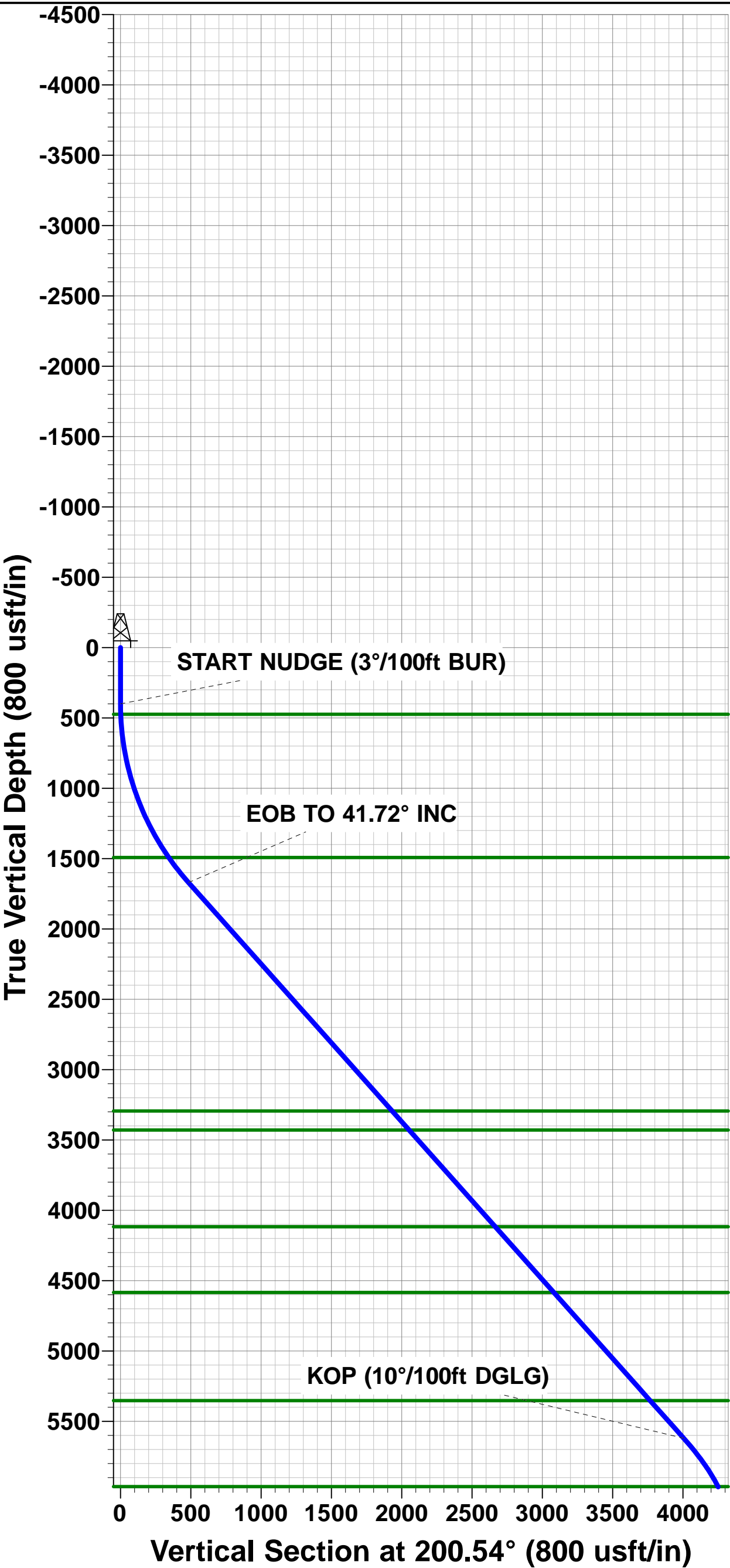
TVDPath	MDPath	Formation
475.00	475.02	Fox Hills Base
1492.00	1562.46	Pierre Shale Top
3295.00	3966.43	Richard Sandstone
3430.00	4147.30	Parkman Sandstone
4117.00	5067.71	Sussex Sandstone
4584.00	5693.38	Shannon Sandstone
5353.00	6723.65	TeePee Buttes
5964.00	7550.39	Sharon Springs
6003.00	7613.97	Niobrara Top
6033.00	7667.21	Niobrara A Chalk
6057.00	7713.68	Niobrara A Chalk Base
6095.00	7798.50	Niobrara B1 Chalk Top
6114.00	7849.62	Niobrara B1 Chalk Base
6142.00	7949.61	Niobrara B2 Chalk Target Top
6160.00	8114.24	Niobrara B2 Chalk Target Center

PROPOSED LOCAL COORDINATES:

SHL: 582ft FSL & 1910ft FWL of Sec 31

HZ LP \*NEW\*: 1775ft FSL & 600ft FWL of Sec 6

BHL: 1775ft FSL & 300ft FEL of Sec 5



# Planning Report



<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well ANDERSON FED 6-5-7HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4903.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4903.00usft
<b>Site:</b>	SE SW SEC. 31 T9N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	ANDERSON FED 6-5-7HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #3		

<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 SW SEC. 31 T9N R59W 6th P.M.		
<b>Site Position:</b>		<b>Northing:</b>	1,501,513.53 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,409,242.57 usft
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	1.10 ft
		<b>Latitude:</b>	40.700697
		<b>Longitude:</b>	-104.023987
		<b>Grid Convergence:</b>	0.95 °

<b>Well</b>	ANDERSON FED 6-5-7HN		
<b>Well Position</b>	<b>+N/-S</b>	58.28 usft	<b>Northing:</b>
	<b>+E/-W</b>	155.00 usft	<b>Easting:</b>
<b>Position Uncertainty</b>	0.00 usft		<b>Wellhead Elevation:</b>
			<b>Latitude:</b>
			<b>Longitude:</b>
			<b>Ground Level:</b>

<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>
	IGRF2015	22/07/2019	7.61	67.15	52,382

<b>Design</b>	PROPOSAL #3			
<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>
	6,160.00	0.00	0.00	116.17

<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	-4,903.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	-4,503.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,790.67	41.72	200.54	1,670.99	-3,232.01	-453.54	-169.92	3.00	3.00	0.00	200.54	
7,083.26	41.72	200.54	5,621.42	718.42	-3,751.83	-1,405.64	0.00	0.00	0.00	0.00	
8,114.24	90.00	90.63	6,160.00	1,257.00	-4,209.44	-852.58	10.00	4.68	-10.66	-105.13	LP *NEW* - ANDEF
17,749.77	90.00	90.63	6,160.00	1,257.00	-4,315.36	8,782.37	0.00	0.00	0.00	0.00	BHL - ANDERSON

# Planning Report



<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well ANDERSON FED 6-5-7HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4903.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4903.00usft
<b>Site:</b>	SE SW SEC. 31 T9N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	ANDERSON FED 6-5-7HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #3		

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: 582ft FSL &amp; 1910ft FWL of Sec 31</b>										
0.00	0.00	0.00	0.00	4,903.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,803.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4,703.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	4,603.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>START NUDGE (3°/100ft BUR)</b>										
400.00	0.00	0.00	400.00	4,503.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fox Hills Base</b>										
475.02	2.25	200.54	475.00	4,428.00	-1.38	-0.52	0.14	3.00	3.00	0.00
500.00	3.00	200.54	499.95	4,403.05	-2.45	-0.92	0.26	3.00	3.00	0.00
600.00	6.00	200.54	599.63	4,303.37	-9.80	-3.67	1.03	3.00	3.00	0.00
700.00	9.00	200.54	698.77	4,204.23	-22.02	-8.25	2.31	3.00	3.00	0.00
800.00	12.00	200.54	797.08	4,105.92	-39.08	-14.64	4.09	3.00	3.00	0.00
900.00	15.00	200.54	894.31	4,008.69	-60.94	-22.83	6.38	3.00	3.00	0.00
1,000.00	18.00	200.54	990.18	3,912.82	-87.53	-32.79	9.17	3.00	3.00	0.00
1,100.00	21.00	200.54	1,084.43	3,818.57	-118.79	-44.50	12.44	3.00	3.00	0.00
1,200.00	24.00	200.54	1,176.81	3,726.19	-154.62	-57.93	16.20	3.00	3.00	0.00
1,300.00	27.00	200.54	1,267.06	3,635.94	-194.93	-73.03	20.42	3.00	3.00	0.00
1,400.00	30.00	200.54	1,354.93	3,548.07	-239.61	-89.77	25.10	3.00	3.00	0.00
1,500.00	33.00	200.54	1,440.18	3,462.82	-288.53	-108.10	30.22	3.00	3.00	0.00
<b>Pierre Shale Top</b>										
1,562.46	34.87	200.54	1,492.00	3,411.00	-321.18	-120.33	33.64	3.00	3.00	0.00
1,600.00	36.00	200.54	1,522.59	3,380.41	-341.57	-127.97	35.78	3.00	3.00	0.00
1,700.00	39.00	200.54	1,601.91	3,301.09	-398.57	-149.32	41.75	3.00	3.00	0.00
<b>EOB TO 41.72° INC</b>										
1,790.67	41.72	200.54	1,671.00	3,232.00	-453.55	-169.92	47.51	3.00	3.00	0.00
1,800.00	41.72	200.54	1,677.96	3,225.04	-459.36	-172.10	48.12	0.00	0.00	0.00
1,900.00	41.72	200.54	1,752.60	3,150.40	-521.68	-195.45	54.65	0.00	0.00	0.00
2,000.00	41.72	200.54	1,827.24	3,075.76	-584.00	-218.80	61.17	0.00	0.00	0.00
2,100.00	41.72	200.54	1,901.88	3,001.12	-646.32	-242.14	67.70	0.00	0.00	0.00
2,200.00	41.72	200.54	1,976.52	2,926.48	-708.64	-265.49	74.23	0.00	0.00	0.00
2,300.00	41.72	200.54	2,051.16	2,851.84	-770.95	-288.84	80.76	0.00	0.00	0.00
2,400.00	41.72	200.54	2,125.80	2,777.20	-833.27	-312.19	87.29	0.00	0.00	0.00
2,500.00	41.72	200.54	2,200.44	2,702.56	-895.59	-335.54	93.81	0.00	0.00	0.00
2,600.00	41.72	200.54	2,275.09	2,627.91	-957.91	-358.88	100.34	0.00	0.00	0.00
2,700.00	41.72	200.54	2,349.73	2,553.27	-1,020.23	-382.23	106.87	0.00	0.00	0.00
2,800.00	41.72	200.54	2,424.37	2,478.63	-1,082.55	-405.58	113.40	0.00	0.00	0.00
2,900.00	41.72	200.54	2,499.01	2,403.99	-1,144.87	-428.93	119.93	0.00	0.00	0.00
3,000.00	41.72	200.54	2,573.65	2,329.35	-1,207.19	-452.28	126.45	0.00	0.00	0.00
3,100.00	41.72	200.54	2,648.29	2,254.71	-1,269.51	-475.62	132.98	0.00	0.00	0.00
3,200.00	41.72	200.54	2,722.93	2,180.07	-1,331.83	-498.97	139.51	0.00	0.00	0.00
3,300.00	41.72	200.54	2,797.57	2,105.43	-1,394.14	-522.32	146.04	0.00	0.00	0.00
3,400.00	41.72	200.54	2,872.21	2,030.79	-1,456.46	-545.67	152.57	0.00	0.00	0.00
3,500.00	41.72	200.54	2,946.85	1,956.15	-1,518.78	-569.02	159.09	0.00	0.00	0.00
3,600.00	41.72	200.54	3,021.49	1,881.51	-1,581.10	-592.36	165.62	0.00	0.00	0.00
3,700.00	41.72	200.54	3,096.13	1,806.87	-1,643.42	-615.71	172.15	0.00	0.00	0.00
3,800.00	41.72	200.54	3,170.77	1,732.23	-1,705.74	-639.06	178.68	0.00	0.00	0.00
3,900.00	41.72	200.54	3,245.41	1,657.59	-1,768.06	-662.41	185.21	0.00	0.00	0.00
<b>Richard Sandstone</b>										
3,966.43	41.72	200.54	3,295.00	1,608.00	-1,809.46	-677.92	189.54	0.00	0.00	0.00
4,000.00	41.72	200.54	3,320.05	1,582.95	-1,830.38	-685.76	191.73	0.00	0.00	0.00
4,100.00	41.72	200.54	3,394.69	1,508.31	-1,892.70	-709.10	198.26	0.00	0.00	0.00
<b>Parkman Sandstone</b>										



# Planning Report



<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well ANDERSON FED 6-5-7HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4903.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4903.00usft
<b>Site:</b>	SE SW SEC. 31 T9N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	ANDERSON FED 6-5-7HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #3		

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)
4,147.30	41.72	200.54	3,430.00	1,473.00	-1,922.17	-720.15	201.35	0.00	0.00	0.00
4,200.00	41.72	200.54	3,469.33	1,433.67	-1,955.02	-732.45	204.79	0.00	0.00	0.00
4,300.00	41.72	200.54	3,543.97	1,359.03	-2,017.33	-755.80	211.32	0.00	0.00	0.00
4,400.00	41.72	200.54	3,618.62	1,284.38	-2,079.65	-779.15	217.84	0.00	0.00	0.00
4,500.00	41.72	200.54	3,693.26	1,209.74	-2,141.97	-802.50	224.37	0.00	0.00	0.00
4,600.00	41.72	200.54	3,767.90	1,135.10	-2,204.29	-825.84	230.90	0.00	0.00	0.00
4,700.00	41.72	200.54	3,842.54	1,060.46	-2,266.61	-849.19	237.43	0.00	0.00	0.00
4,800.00	41.72	200.54	3,917.18	985.82	-2,328.93	-872.54	243.96	0.00	0.00	0.00
4,900.00	41.72	200.54	3,991.82	911.18	-2,391.25	-895.89	250.48	0.00	0.00	0.00
5,000.00	41.72	200.54	4,066.46	836.54	-2,453.57	-919.24	257.01	0.00	0.00	0.00
Sussex Sandstone										
5,067.71	41.72	200.54	4,117.00	786.00	-2,495.76	-935.05	261.43	0.00	0.00	0.00
5,100.00	41.72	200.54	4,141.10	761.90	-2,515.89	-942.58	263.54	0.00	0.00	0.00
5,200.00	41.72	200.54	4,215.74	687.26	-2,578.20	-965.93	270.07	0.00	0.00	0.00
5,300.00	41.72	200.54	4,290.38	612.62	-2,640.52	-989.28	276.60	0.00	0.00	0.00
5,400.00	41.72	200.54	4,365.02	537.98	-2,702.84	-1,012.63	283.12	0.00	0.00	0.00
5,500.00	41.72	200.54	4,439.66	463.34	-2,765.16	-1,035.98	289.65	0.00	0.00	0.00
5,600.00	41.72	200.54	4,514.30	388.70	-2,827.48	-1,059.32	296.18	0.00	0.00	0.00
Shannon Sandstone										
5,693.38	41.72	200.54	4,584.00	319.00	-2,885.67	-1,081.13	302.28	0.00	0.00	0.00
5,700.00	41.72	200.54	4,588.94	314.06	-2,889.80	-1,082.67	302.71	0.00	0.00	0.00
5,800.00	41.72	200.54	4,663.58	239.42	-2,952.12	-1,106.02	309.24	0.00	0.00	0.00
5,900.00	41.72	200.54	4,738.22	164.78	-3,014.44	-1,129.37	315.76	0.00	0.00	0.00
6,000.00	41.72	200.54	4,812.86	90.14	-3,076.76	-1,152.72	322.29	0.00	0.00	0.00
6,100.00	41.72	200.54	4,887.51	15.49	-3,139.08	-1,176.06	328.82	0.00	0.00	0.00
6,200.00	41.72	200.54	4,962.15	-59.15	-3,201.39	-1,199.41	335.35	0.00	0.00	0.00
6,300.00	41.72	200.54	5,036.79	-133.79	-3,263.71	-1,222.76	341.88	0.00	0.00	0.00
6,400.00	41.72	200.54	5,111.43	-208.43	-3,326.03	-1,246.11	348.40	0.00	0.00	0.00
6,500.00	41.72	200.54	5,186.07	-283.07	-3,388.35	-1,269.46	354.93	0.00	0.00	0.00
6,600.00	41.72	200.54	5,260.71	-357.71	-3,450.67	-1,292.80	361.46	0.00	0.00	0.00
6,700.00	41.72	200.54	5,335.35	-432.35	-3,512.99	-1,316.15	367.99	0.00	0.00	0.00
TeePee Buttes										
6,723.65	41.72	200.54	5,353.00	-450.00	-3,527.73	-1,321.67	369.53	0.00	0.00	0.00
6,800.00	41.72	200.54	5,409.99	-506.99	-3,575.31	-1,339.50	374.52	0.00	0.00	0.00
6,900.00	41.72	200.54	5,484.63	-581.63	-3,637.63	-1,362.85	381.04	0.00	0.00	0.00
7,000.00	41.72	200.54	5,559.27	-656.27	-3,699.95	-1,386.20	387.57	0.00	0.00	0.00
KOP (10°/100ft DGLG)										
7,083.26	41.72	200.54	5,621.42	-718.42	-3,751.83	-1,405.64	393.01	0.00	0.00	0.00
7,100.00	41.31	198.09	5,633.95	-730.95	-3,762.30	-1,409.31	394.33	10.00	-2.46	-14.63
7,200.00	39.99	182.85	5,710.01	-807.01	-3,825.93	-1,421.18	411.73	10.00	-1.31	-15.24
7,300.00	40.73	167.42	5,786.40	-883.40	-3,890.04	-1,415.65	444.96	10.00	0.74	-15.43
7,400.00	43.41	153.01	5,860.79	-957.79	-3,952.66	-1,392.90	493.00	10.00	2.68	-14.40
7,500.00	47.70	140.34	5,930.94	-1,027.94	-4,011.90	-1,353.60	554.40	10.00	4.29	-12.68
Sharon Springs										
7,550.39	50.34	134.65	5,964.00	-1,061.00	-4,039.90	-1,327.89	589.82	10.00	5.24	-11.29
7,600.00	53.19	129.48	5,994.71	-1,091.71	-4,065.96	-1,298.96	627.28	10.00	5.75	-10.42
Niobrara Top										
7,613.97	54.04	128.09	6,003.00	-1,100.00	-4,073.01	-1,290.19	638.26	10.00	6.03	-9.91
Niobrara A Chalk										
7,667.21	57.38	123.08	6,033.00	-1,130.00	-4,098.55	-1,254.42	681.62	10.00	6.28	-9.42
7,700.00	59.53	120.18	6,050.16	-1,147.16	-4,113.20	-1,230.63	709.44	10.00	6.57	-8.85
Niobrara A Chalk Base										
7,713.68	60.45	119.00	6,057.00	-1,154.00	-4,119.05	-1,220.32	721.27	10.00	6.71	-8.57

# Planning Report



<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well ANDERSON FED 6-5-7HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4903.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4903.00usft
<b>Site:</b>	SE SW SEC. 31 T9N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	ANDERSON FED 6-5-7HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #3		

## 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>Niobrara B1 Chalk Top</b>										
7,798.50	66.34	112.18	6,095.00	-1,192.00	-4,151.66	-1,151.96	797.00	10.00	6.95	-8.05
7,800.00	66.45	112.06	6,095.60	-1,192.60	-4,152.17	-1,150.69	798.38	10.00	7.13	-7.65
<b>Niobrara B1 Chalk Base</b>										
7,849.62	70.03	108.36	6,114.00	-1,211.00	-4,168.07	-1,107.45	844.20	10.00	7.22	-7.45
7,900.00	73.74	104.78	6,129.66	-1,226.66	-4,181.71	-1,061.57	891.39	10.00	7.37	-7.12
<b>Niobrara B2 Chalk Target Top</b>										
7,949.61	77.46	101.38	6,142.00	-1,239.00	-4,192.57	-1,014.77	938.17	10.00	7.48	-6.85
8,000.00	81.27	98.03	6,151.30	-1,248.30	-4,200.90	-965.98	985.64	10.00	7.57	-6.65
8,100.00	88.91	91.54	6,159.86	-1,256.86	-4,209.17	-866.81	1,078.29	10.00	7.64	-6.48
<b>LP *NEW*: 1775ft FSL &amp; 600ft FWL of Sec 6 - Niobrara B2 Chalk Target Center</b>										
8,114.24	90.00	90.63	6,160.00	-1,257.00	-4,209.44	-852.58	1,091.18	10.00	7.66	-6.43
8,200.00	90.00	90.63	6,160.00	-1,257.00	-4,210.38	-766.82	1,168.57	0.00	0.00	0.00
8,300.00	90.00	90.63	6,160.00	-1,257.00	-4,211.48	-666.83	1,258.80	0.00	0.00	0.00
8,400.00	90.00	90.63	6,160.00	-1,257.00	-4,212.58	-566.83	1,349.03	0.00	0.00	0.00
8,500.00	90.00	90.63	6,160.00	-1,257.00	-4,213.68	-466.84	1,439.26	0.00	0.00	0.00
8,600.00	90.00	90.63	6,160.00	-1,257.00	-4,214.78	-366.85	1,529.49	0.00	0.00	0.00
8,700.00	90.00	90.63	6,160.00	-1,257.00	-4,215.88	-266.85	1,619.72	0.00	0.00	0.00
8,800.00	90.00	90.63	6,160.00	-1,257.00	-4,216.98	-166.86	1,709.95	0.00	0.00	0.00
8,900.00	90.00	90.63	6,160.00	-1,257.00	-4,218.08	-66.86	1,800.18	0.00	0.00	0.00
9,000.00	90.00	90.63	6,160.00	-1,257.00	-4,219.18	33.13	1,890.41	0.00	0.00	0.00
9,100.00	90.00	90.63	6,160.00	-1,257.00	-4,220.28	133.12	1,980.64	0.00	0.00	0.00
9,200.00	90.00	90.63	6,160.00	-1,257.00	-4,221.38	233.12	2,070.87	0.00	0.00	0.00
9,300.00	90.00	90.63	6,160.00	-1,257.00	-4,222.47	333.11	2,161.10	0.00	0.00	0.00
9,400.00	90.00	90.63	6,160.00	-1,257.00	-4,223.57	433.10	2,251.33	0.00	0.00	0.00
9,500.00	90.00	90.63	6,160.00	-1,257.00	-4,224.67	533.10	2,341.55	0.00	0.00	0.00
9,600.00	90.00	90.63	6,160.00	-1,257.00	-4,225.77	633.09	2,431.78	0.00	0.00	0.00
9,700.00	90.00	90.63	6,160.00	-1,257.00	-4,226.87	733.09	2,522.01	0.00	0.00	0.00
9,800.00	90.00	90.63	6,160.00	-1,257.00	-4,227.97	833.08	2,612.24	0.00	0.00	0.00
9,900.00	90.00	90.63	6,160.00	-1,257.00	-4,229.07	933.07	2,702.47	0.00	0.00	0.00
10,000.00	90.00	90.63	6,160.00	-1,257.00	-4,230.17	1,033.07	2,792.70	0.00	0.00	0.00
10,100.00	90.00	90.63	6,160.00	-1,257.00	-4,231.27	1,133.06	2,882.93	0.00	0.00	0.00
10,200.00	90.00	90.63	6,160.00	-1,257.00	-4,232.37	1,233.06	2,973.16	0.00	0.00	0.00
10,300.00	90.00	90.63	6,160.00	-1,257.00	-4,233.47	1,333.05	3,063.39	0.00	0.00	0.00
10,400.00	90.00	90.63	6,160.00	-1,257.00	-4,234.57	1,433.04	3,153.62	0.00	0.00	0.00
10,500.00	90.00	90.63	6,160.00	-1,257.00	-4,235.67	1,533.04	3,243.85	0.00	0.00	0.00
10,600.00	90.00	90.63	6,160.00	-1,257.00	-4,236.76	1,633.03	3,334.08	0.00	0.00	0.00
10,700.00	90.00	90.63	6,160.00	-1,257.00	-4,237.86	1,733.03	3,424.31	0.00	0.00	0.00
10,800.00	90.00	90.63	6,160.00	-1,257.00	-4,238.96	1,833.02	3,514.54	0.00	0.00	0.00
10,900.00	90.00	90.63	6,160.00	-1,257.00	-4,240.06	1,933.01	3,604.77	0.00	0.00	0.00
11,000.00	90.00	90.63	6,160.00	-1,257.00	-4,241.16	2,033.01	3,695.00	0.00	0.00	0.00
11,100.00	90.00	90.63	6,160.00	-1,257.00	-4,242.26	2,133.00	3,785.23	0.00	0.00	0.00
11,200.00	90.00	90.63	6,160.00	-1,257.00	-4,243.36	2,233.00	3,875.46	0.00	0.00	0.00
11,300.00	90.00	90.63	6,160.00	-1,257.00	-4,244.46	2,332.99	3,965.69	0.00	0.00	0.00
11,400.00	90.00	90.63	6,160.00	-1,257.00	-4,245.56	2,432.98	4,055.92	0.00	0.00	0.00
11,500.00	90.00	90.63	6,160.00	-1,257.00	-4,246.66	2,532.98	4,146.15	0.00	0.00	0.00
11,600.00	90.00	90.63	6,160.00	-1,257.00	-4,247.76	2,632.97	4,236.38	0.00	0.00	0.00
11,700.00	90.00	90.63	6,160.00	-1,257.00	-4,248.86	2,732.97	4,326.61	0.00	0.00	0.00
11,800.00	90.00	90.63	6,160.00	-1,257.00	-4,249.96	2,832.96	4,416.84	0.00	0.00	0.00
11,900.00	90.00	90.63	6,160.00	-1,257.00	-4,251.06	2,932.95	4,507.07	0.00	0.00	0.00
12,000.00	90.00	90.63	6,160.00	-1,257.00	-4,252.15	3,032.95	4,597.30	0.00	0.00	0.00
12,100.00	90.00	90.63	6,160.00	-1,257.00	-4,253.25	3,132.94	4,687.53	0.00	0.00	0.00
12,200.00	90.00	90.63	6,160.00	-1,257.00	-4,254.35	3,232.94	4,777.76	0.00	0.00	0.00

# Planning Report



<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well ANDERSON FED 6-5-7HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4903.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4903.00usft
<b>Site:</b>	SE SW SEC. 31 T9N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	ANDERSON FED 6-5-7HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #3		

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)
12,300.00	90.00	90.63	6,160.00	-1,257.00	-4,255.45	3,332.93	4,867.99	0.00	0.00	0.00
12,400.00	90.00	90.63	6,160.00	-1,257.00	-4,256.55	3,432.92	4,958.22	0.00	0.00	0.00
12,500.00	90.00	90.63	6,160.00	-1,257.00	-4,257.65	3,532.92	5,048.45	0.00	0.00	0.00
12,600.00	90.00	90.63	6,160.00	-1,257.00	-4,258.75	3,632.91	5,138.68	0.00	0.00	0.00
12,700.00	90.00	90.63	6,160.00	-1,257.00	-4,259.85	3,732.91	5,228.91	0.00	0.00	0.00
12,800.00	90.00	90.63	6,160.00	-1,257.00	-4,260.95	3,832.90	5,319.14	0.00	0.00	0.00
12,900.00	90.00	90.63	6,160.00	-1,257.00	-4,262.05	3,932.89	5,409.37	0.00	0.00	0.00
13,000.00	90.00	90.63	6,160.00	-1,257.00	-4,263.15	4,032.89	5,499.60	0.00	0.00	0.00
13,100.00	90.00	90.63	6,160.00	-1,257.00	-4,264.25	4,132.88	5,589.83	0.00	0.00	0.00
13,200.00	90.00	90.63	6,160.00	-1,257.00	-4,265.35	4,232.88	5,680.06	0.00	0.00	0.00
13,300.00	90.00	90.63	6,160.00	-1,257.00	-4,266.44	4,332.87	5,770.29	0.00	0.00	0.00
13,400.00	90.00	90.63	6,160.00	-1,257.00	-4,267.54	4,432.86	5,860.52	0.00	0.00	0.00
13,500.00	90.00	90.63	6,160.00	-1,257.00	-4,268.64	4,532.86	5,950.75	0.00	0.00	0.00
13,600.00	90.00	90.63	6,160.00	-1,257.00	-4,269.74	4,632.85	6,040.98	0.00	0.00	0.00
13,700.00	90.00	90.63	6,160.00	-1,257.00	-4,270.84	4,732.85	6,131.21	0.00	0.00	0.00
13,800.00	90.00	90.63	6,160.00	-1,257.00	-4,271.94	4,832.84	6,221.44	0.00	0.00	0.00
13,900.00	90.00	90.63	6,160.00	-1,257.00	-4,273.04	4,932.83	6,311.67	0.00	0.00	0.00
14,000.00	90.00	90.63	6,160.00	-1,257.00	-4,274.14	5,032.83	6,401.90	0.00	0.00	0.00
14,100.00	90.00	90.63	6,160.00	-1,257.00	-4,275.24	5,132.82	6,492.13	0.00	0.00	0.00
14,200.00	90.00	90.63	6,160.00	-1,257.00	-4,276.34	5,232.81	6,582.36	0.00	0.00	0.00
14,300.00	90.00	90.63	6,160.00	-1,257.00	-4,277.44	5,332.81	6,672.59	0.00	0.00	0.00
14,400.00	90.00	90.63	6,160.00	-1,257.00	-4,278.54	5,432.80	6,762.82	0.00	0.00	0.00
14,500.00	90.00	90.63	6,160.00	-1,257.00	-4,279.64	5,532.80	6,853.05	0.00	0.00	0.00
14,600.00	90.00	90.63	6,160.00	-1,257.00	-4,280.73	5,632.79	6,943.28	0.00	0.00	0.00
14,700.00	90.00	90.63	6,160.00	-1,257.00	-4,281.83	5,732.78	7,033.51	0.00	0.00	0.00
14,800.00	90.00	90.63	6,160.00	-1,257.00	-4,282.93	5,832.78	7,123.74	0.00	0.00	0.00
14,900.00	90.00	90.63	6,160.00	-1,257.00	-4,284.03	5,932.77	7,213.97	0.00	0.00	0.00
15,000.00	90.00	90.63	6,160.00	-1,257.00	-4,285.13	6,032.77	7,304.20	0.00	0.00	0.00
15,100.00	90.00	90.63	6,160.00	-1,257.00	-4,286.23	6,132.76	7,394.43	0.00	0.00	0.00
15,200.00	90.00	90.63	6,160.00	-1,257.00	-4,287.33	6,232.75	7,484.66	0.00	0.00	0.00
15,300.00	90.00	90.63	6,160.00	-1,257.00	-4,288.43	6,332.75	7,574.89	0.00	0.00	0.00
15,400.00	90.00	90.63	6,160.00	-1,257.00	-4,289.53	6,432.74	7,665.12	0.00	0.00	0.00
15,500.00	90.00	90.63	6,160.00	-1,257.00	-4,290.63	6,532.74	7,755.35	0.00	0.00	0.00
15,600.00	90.00	90.63	6,160.00	-1,257.00	-4,291.73	6,632.73	7,845.58	0.00	0.00	0.00
15,700.00	90.00	90.63	6,160.00	-1,257.00	-4,292.83	6,732.72	7,935.81	0.00	0.00	0.00
15,800.00	90.00	90.63	6,160.00	-1,257.00	-4,293.93	6,832.72	8,026.04	0.00	0.00	0.00
15,900.00	90.00	90.63	6,160.00	-1,257.00	-4,295.03	6,932.71	8,116.27	0.00	0.00	0.00
16,000.00	90.00	90.63	6,160.00	-1,257.00	-4,296.12	7,032.71	8,206.50	0.00	0.00	0.00
16,100.00	90.00	90.63	6,160.00	-1,257.00	-4,297.22	7,132.70	8,296.73	0.00	0.00	0.00
16,200.00	90.00	90.63	6,160.00	-1,257.00	-4,298.32	7,232.69	8,386.96	0.00	0.00	0.00
16,300.00	90.00	90.63	6,160.00	-1,257.00	-4,299.42	7,332.69	8,477.19	0.00	0.00	0.00
16,400.00	90.00	90.63	6,160.00	-1,257.00	-4,300.52	7,432.68	8,567.42	0.00	0.00	0.00
16,500.00	90.00	90.63	6,160.00	-1,257.00	-4,301.62	7,532.68	8,657.65	0.00	0.00	0.00
16,600.00	90.00	90.63	6,160.00	-1,257.00	-4,302.72	7,632.67	8,747.88	0.00	0.00	0.00
16,700.00	90.00	90.63	6,160.00	-1,257.00	-4,303.82	7,732.66	8,838.11	0.00	0.00	0.00
16,800.00	90.00	90.63	6,160.00	-1,257.00	-4,304.92	7,832.66	8,928.34	0.00	0.00	0.00
16,900.00	90.00	90.63	6,160.00	-1,257.00	-4,306.02	7,932.65	9,018.57	0.00	0.00	0.00
17,000.00	90.00	90.63	6,160.00	-1,257.00	-4,307.12	8,032.65	9,108.80	0.00	0.00	0.00
17,100.00	90.00	90.63	6,160.00	-1,257.00	-4,308.22	8,132.64	9,199.03	0.00	0.00	0.00
17,200.00	90.00	90.63	6,160.00	-1,257.00	-4,309.32	8,232.63	9,289.26	0.00	0.00	0.00
17,300.00	90.00	90.63	6,160.00	-1,257.00	-4,310.41	8,332.63	9,379.49	0.00	0.00	0.00
17,400.00	90.00	90.63	6,160.00	-1,257.00	-4,311.51	8,432.62	9,469.72	0.00	0.00	0.00
17,500.00	90.00	90.63	6,160.00	-1,257.00	-4,312.61	8,532.62	9,559.95	0.00	0.00	0.00
17,600.00	90.00	90.63	6,160.00	-1,257.00	-4,313.71	8,632.61	9,650.18	0.00	0.00	0.00

# Planning Report



<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well ANDERSON FED 6-5-7HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4903.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4903.00usft
<b>Site:</b>	SE SW SEC. 31 T9N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	ANDERSON FED 6-5-7HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #3		

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)
17,700.00	90.00	90.63	6,160.00	-1,257.00	-4,314.81	8,732.60	9,740.41	0.00	0.00	0.00
<b>BHL: 1775ft FSL &amp; 300ft FEL of Sec 5</b>										
<b>17,749.77</b>	<b>90.00</b>	<b>90.63</b>	<b>6,160.00</b>	<b>-1,257.00</b>	<b>-4,315.36</b>	<b>8,782.37</b>	<b>9,785.31</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

Formations						
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
475.02	475.00	Fox Hills Base				
1,562.46	1,492.00	Pierre Shale Top				
3,966.43	3,295.00	Richard Sandstone				
4,147.30	3,430.00	Parkman Sandstone				
5,067.71	4,117.00	Sussex Sandstone				
5,693.38	4,584.00	Shannon Sandstone				
6,723.65	5,353.00	TeePee Buttes				
7,550.39	5,964.00	Sharon Springs				
7,613.97	6,003.00	Niobrara Top				
7,667.21	6,033.00	Niobrara A Chalk				
7,713.68	6,057.00	Niobrara A Chalk Base				
7,798.50	6,095.00	Niobrara B1 Chalk Top				
7,849.62	6,114.00	Niobrara B1 Chalk Base				
7,949.61	6,142.00	Niobrara B2 Chalk Target Top				
8,114.24	6,160.00	Niobrara B2 Chalk Target Center				

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.00	0.00	0.00	0.00	SHL: 582ft FSL & 1910ft FWL of Sec 31
400.00	400.00	0.00	0.00	START NUDGE (3°/100ft BUR)
1,790.67	1,671.00	-453.55	-169.92	EOB TO 41.72° INC
7,083.26	5,621.42	-3,751.83	-1,405.64	KOP (10°/100ft DGLG)
8,114.24	6,160.00	-4,209.44	-852.58	LP *NEW*: 1775ft FSL & 600ft FWL of Sec 6
17,749.77	6,160.00	-4,315.36	8,782.37	BHL: 1775ft FSL & 300ft FEL of Sec 5