

# **MALLARD EXPLORATION**

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

**SW SW SEC. 31 T8N R59W 6th P.M.**

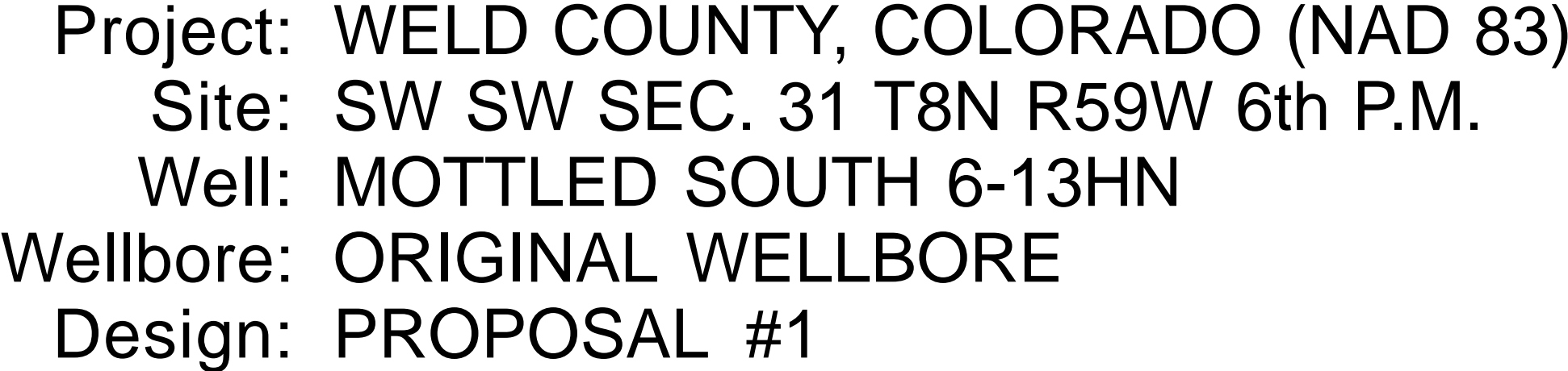
**MOTTLED SOUTH 6-13HN**

**ORIGINAL WELLBORE**

**19 April, 2018**

**Plan: 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: 550ft FSL & 1579ft FWL of Sec 31	
400.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)	
1678.57	1725.34	26.51	104.76	-76.72	291.21	190.03	301.14	EOB TO 26.51° INC	
5754.09	6279.60	26.51	104.76	-594.52	2256.73	1472.66	2333.73	KOP (10°/100ft DGLG)	
6217.00	7121.14	90.00	181.57	-1170.42	2465.85	2083.54	2979.83	HZ LP: 600ft FNL & 1345ft FEL of Sec 6	
6217.00	11153.17	90.00	181.57	-5200.95	2355.73	5709.58	7011.86	BHL: 600ft FSL & 1345ft FEL of Sec 6	

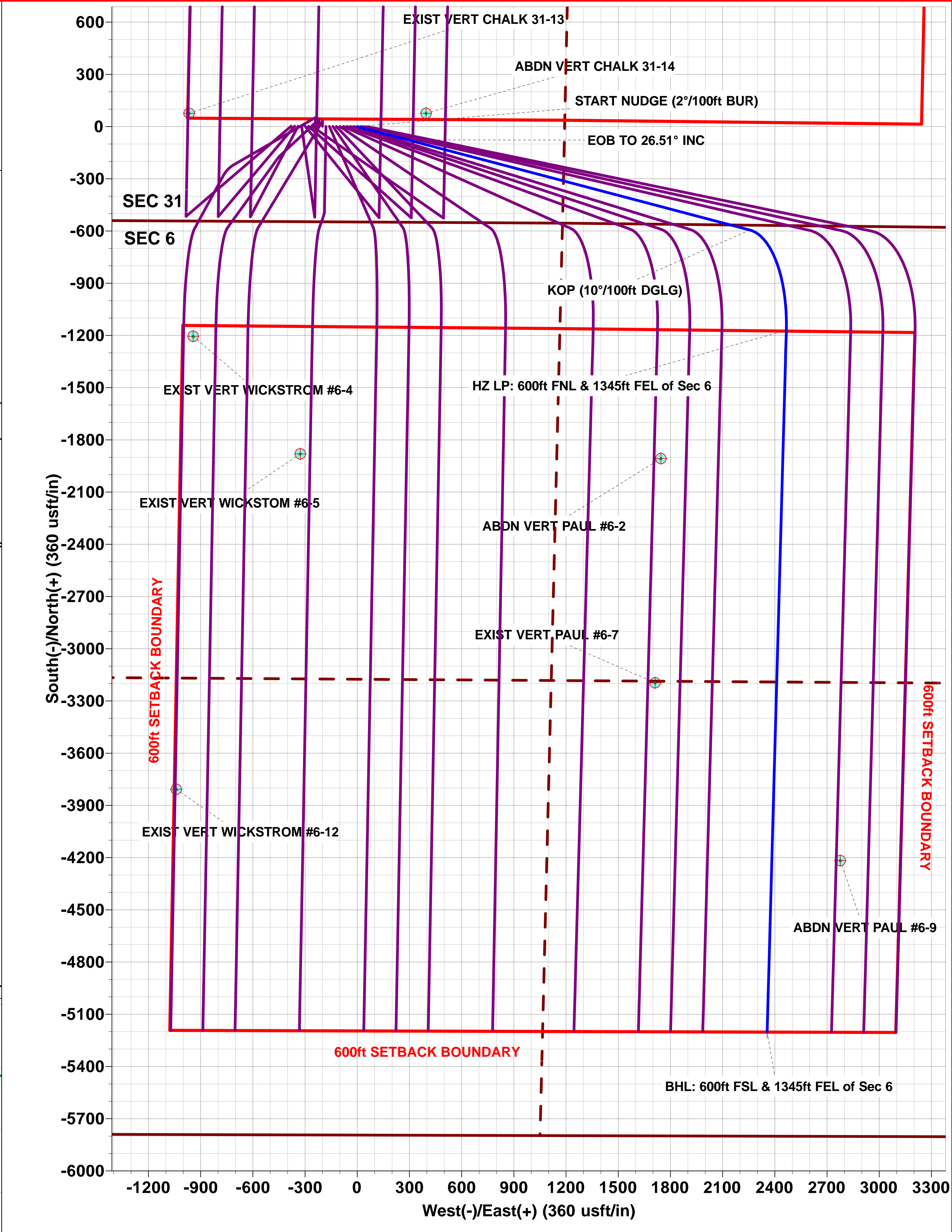
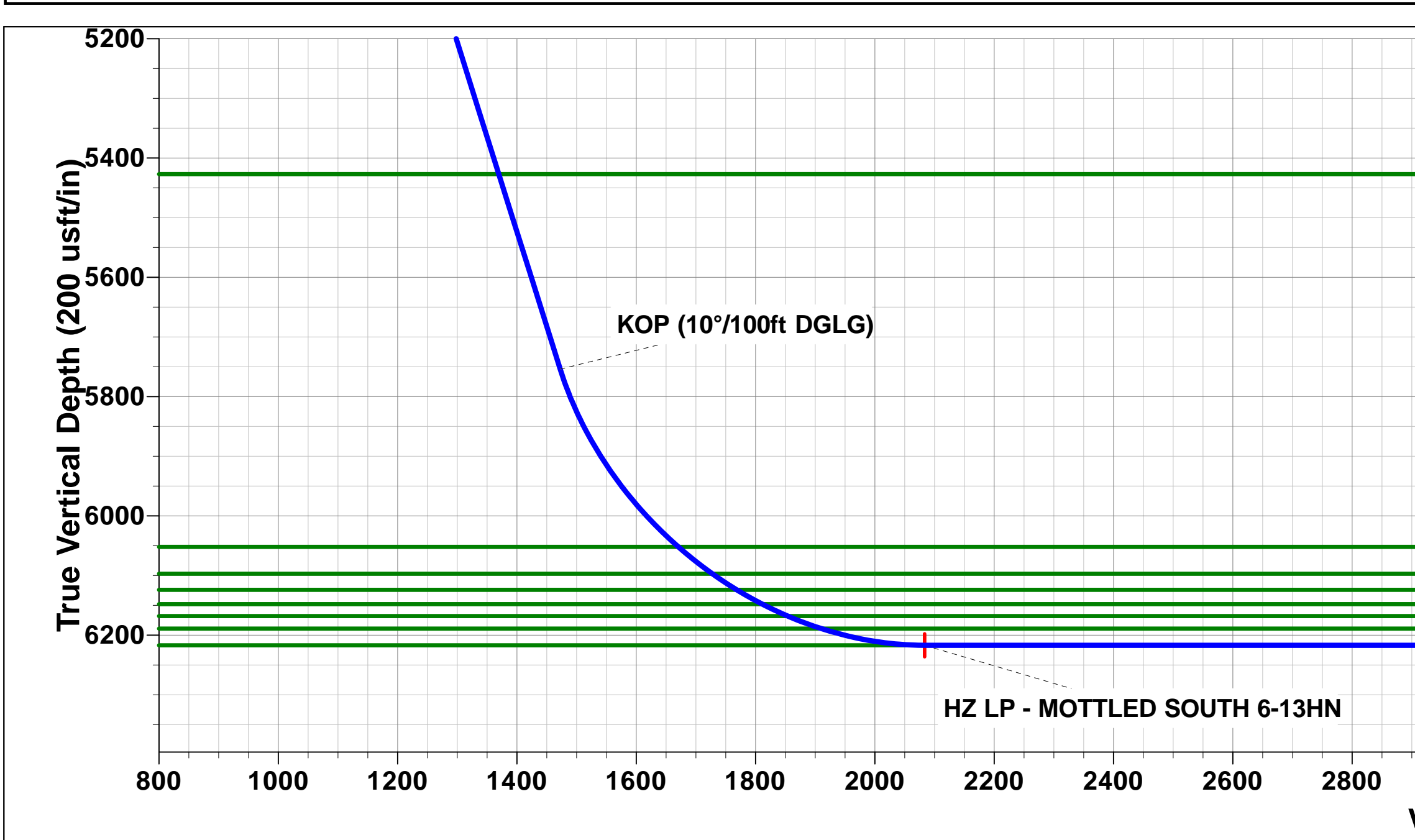
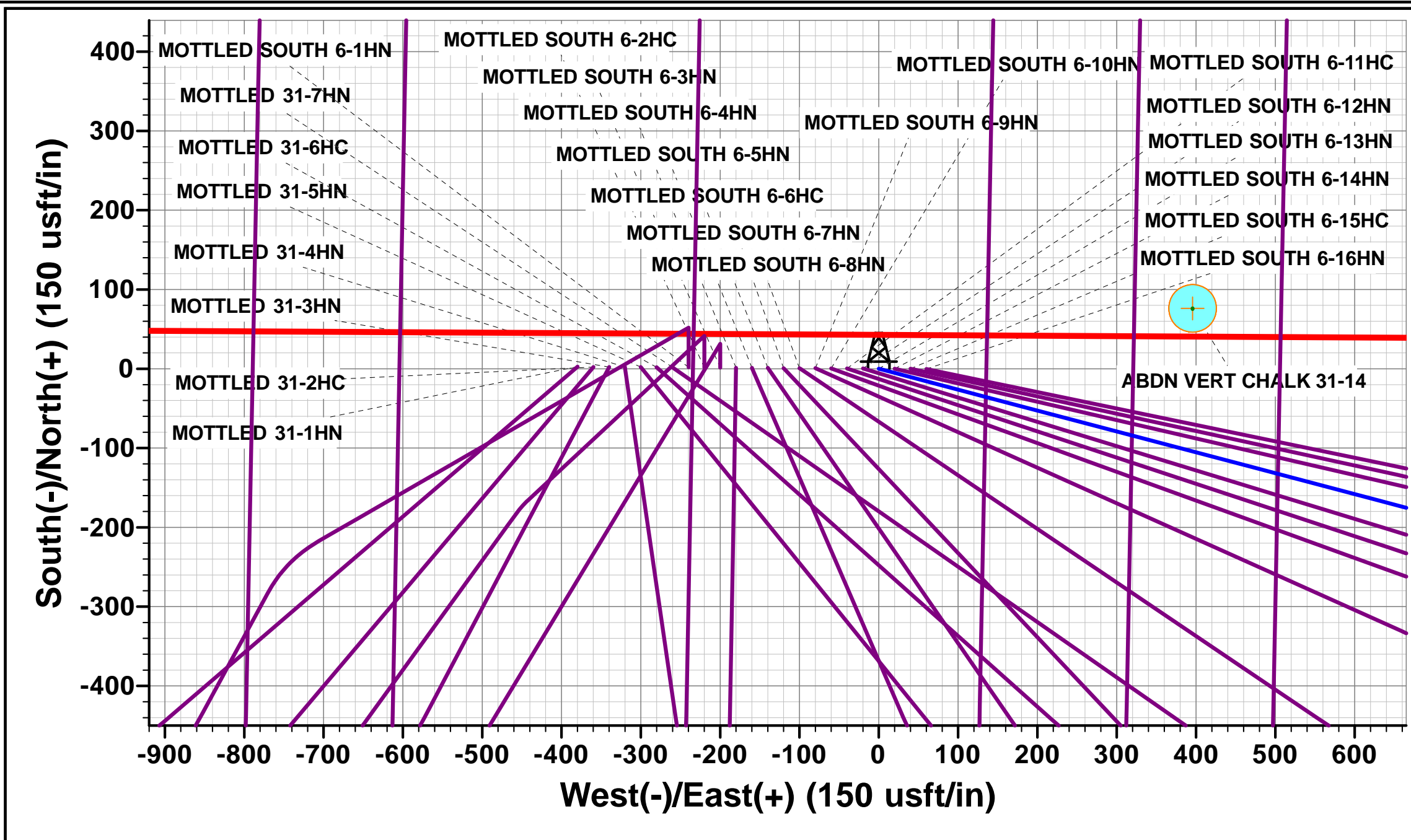
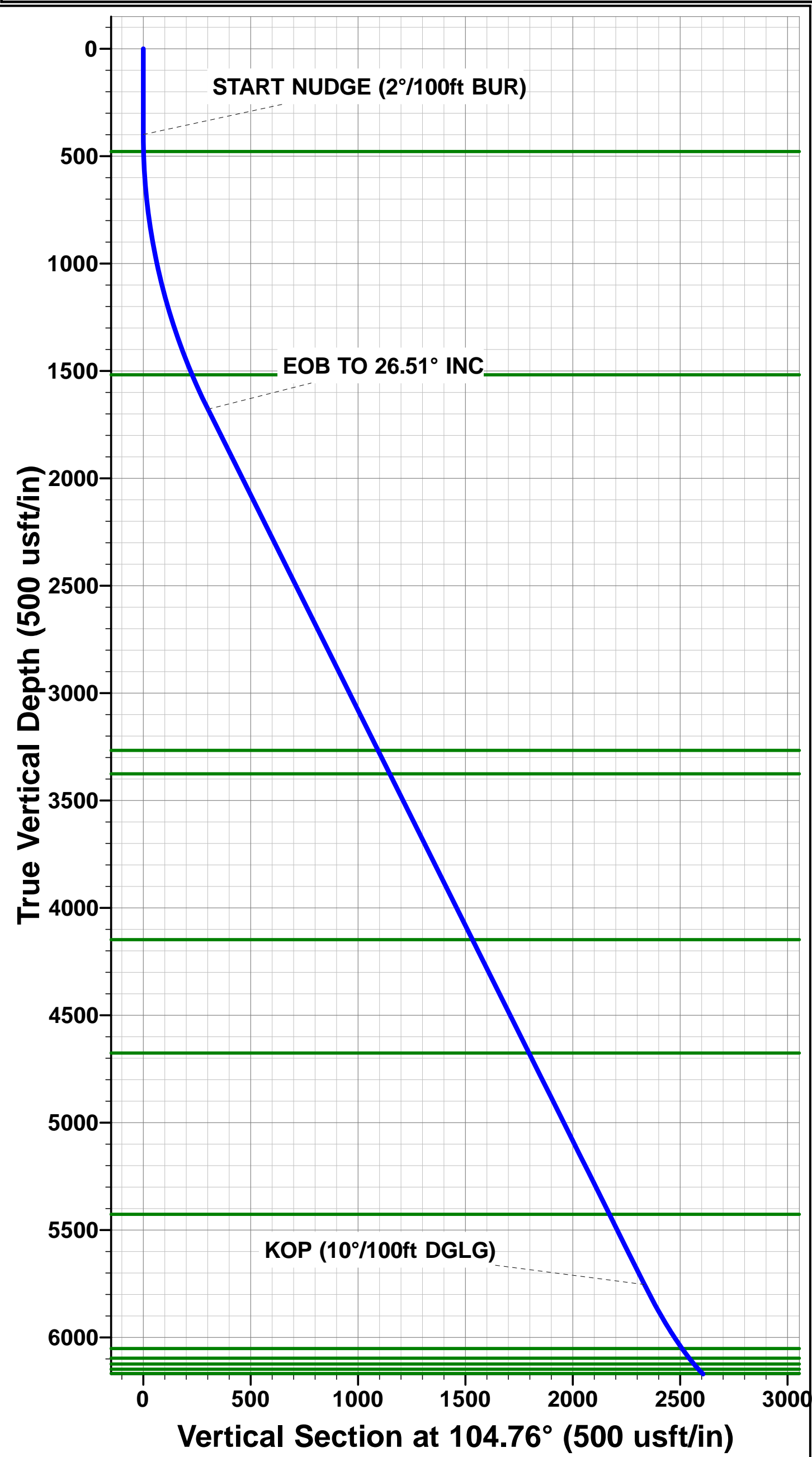
**PROPOSED LOCAL COORDINATES:**

**SHL: 550ft FSL & 1579ft FWL Sec 31**

**HZ LP: 600ft FNL & 1345ft FEL Sec 6**

**BHL: 600ft FSL & 1345ft FEL of Sec 6**

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
HZ LP - MOTTLED SOUTH 6-13HN	6217.00	-1170.42	2465.85	40.609868	-104.016104
BHL - MOTTLED SOUTH 6-13HN	6217.00	-5200.95	2355.73	40.598805	-104.016502



# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well MOTTLED SOUTH 6-13HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4988.00usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4988.00usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 31 T8N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	MOTTLED SOUTH 6-13HN	<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

Site	SW SW SEC. 31 T8N R59W 6th P.M.				
Site Position:		Northing:	1,469,589.22 usft	Latitude:	40.613088
From:	Lat/Long	Easting:	3,409,117.03 usft	Longitude:	-104.026353
Position Uncertainty:	0.00 usft	Slot Radius:	1.10000ft	Grid Convergence:	0.95 °

Well	MOTTLED SOUTH 6-13HN					
Well Position	+N-S	-2.58 usft	Northing:	1,469,592.95 usft	Latitude:	40.613081
	+E-W	379.81 usft	Easting:	3,409,496.83 usft	Longitude:	-104.024985
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,968.00 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>
	IGRF2015	19/04/2018	7.74	67.11	52,481

<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>
	6,217.00	0.00	0.00	155.63

<b>Plan Sections</b>											
MD (usft)	Inc (°)	Azi (°)	Vertical Depth	SS (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	-4,988.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	-4,588.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,725.34	26.51	104.76	1,678.57	-3,309.43	-76.72	291.21	2.00	2.00	0.00	104.76	
6,279.60	26.51	104.76	5,754.09	766.09	-594.52	2,256.73	0.00	0.00	0.00	0.00	
7,121.14	90.00	181.57	6,217.00	1,229.00	-1,170.42	2,465.85	10.00	7.54	9.13	78.15	HZ LP - MOTTLED
11,153.17	90.00	181.57	6,217.00	1,229.00	-5,200.95	2,355.73	0.00	0.00	0.00	0.00	BHL - MOTTLED S

# Planning Report



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<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4988.00usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4988.00usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 31 T8N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	MOTTLED SOUTH 6-13HN	<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: 550ft FSL &amp; 1579ft FWL of Sec 31</b>										
0.00	0.00	0.00	0.00	4,988.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,888.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4,788.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	4,688.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>START NUDGE (2°/100ft BUR)</b>										
400.00	0.00	0.00	400.00	4,588.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fox Hills Base</b>										
479.01	1.58	104.76	479.00	4,509.00	-0.28	1.05	0.69	2.00	2.00	0.00
500.00	2.00	104.76	499.98	4,488.02	-0.44	1.69	1.10	2.00	2.00	0.00
600.00	4.00	104.76	599.84	4,388.16	-1.78	6.75	4.40	2.00	2.00	0.00
700.00	6.00	104.76	699.45	4,288.55	-4.00	15.18	9.90	2.00	2.00	0.00
800.00	8.00	104.76	798.70	4,189.30	-7.10	26.96	17.59	2.00	2.00	0.00
900.00	10.00	104.76	897.47	4,090.53	-11.09	42.09	27.46	2.00	2.00	0.00
1,000.00	12.00	104.76	995.62	3,992.38	-15.95	60.54	39.50	2.00	2.00	0.00
1,100.00	14.00	104.76	1,093.06	3,894.94	-21.68	82.29	53.70	2.00	2.00	0.00
1,200.00	16.00	104.76	1,189.64	3,798.36	-28.27	107.32	70.03	2.00	2.00	0.00
1,300.00	18.00	104.76	1,285.27	3,702.73	-35.72	135.59	88.48	2.00	2.00	0.00
1,400.00	20.00	104.76	1,379.82	3,608.18	-44.01	167.07	109.02	2.00	2.00	0.00
1,500.00	22.00	104.76	1,473.17	3,514.83	-53.14	201.72	131.64	2.00	2.00	0.00
<b>Pierre Shale Top</b>										
1,548.52	22.97	104.76	1,518.00	3,470.00	-57.87	219.66	143.35	2.00	2.00	0.00
1,600.00	24.00	104.76	1,565.21	3,422.79	-63.09	239.50	156.29	2.00	2.00	0.00
1,700.00	26.00	104.76	1,655.84	3,332.16	-73.86	280.37	182.96	2.00	2.00	0.00
<b>EOB TO 26.51° INC</b>										
1,725.34	26.51	104.76	1,678.57	3,309.43	-76.72	291.21	190.03	2.00	2.00	0.00
1,800.00	26.51	104.76	1,745.38	3,242.62	-85.20	323.43	211.06	0.00	0.00	0.00
1,900.00	26.51	104.76	1,834.87	3,153.13	-96.57	366.59	239.22	0.00	0.00	0.00
2,000.00	26.51	104.76	1,924.36	3,063.64	-107.94	409.74	267.39	0.00	0.00	0.00
2,100.00	26.51	104.76	2,013.84	2,974.16	-119.31	452.90	295.55	0.00	0.00	0.00
2,200.00	26.51	104.76	2,103.33	2,884.67	-130.68	496.06	323.71	0.00	0.00	0.00
2,300.00	26.51	104.76	2,192.82	2,795.18	-142.05	539.22	351.88	0.00	0.00	0.00
2,400.00	26.51	104.76	2,282.31	2,705.69	-153.42	582.38	380.04	0.00	0.00	0.00
2,500.00	26.51	104.76	2,371.80	2,616.20	-164.79	625.53	408.20	0.00	0.00	0.00
2,600.00	26.51	104.76	2,461.28	2,526.72	-176.16	668.69	436.37	0.00	0.00	0.00
2,700.00	26.51	104.76	2,550.77	2,437.23	-187.53	711.85	464.53	0.00	0.00	0.00
2,800.00	26.51	104.76	2,640.26	2,347.74	-198.90	755.01	492.69	0.00	0.00	0.00
2,900.00	26.51	104.76	2,729.75	2,258.25	-210.27	798.17	520.85	0.00	0.00	0.00
3,000.00	26.51	104.76	2,819.24	2,168.76	-221.64	841.32	549.02	0.00	0.00	0.00
3,100.00	26.51	104.76	2,908.72	2,079.28	-233.01	884.48	577.18	0.00	0.00	0.00
3,200.00	26.51	104.76	2,998.21	1,989.79	-244.38	927.64	605.34	0.00	0.00	0.00
3,300.00	26.51	104.76	3,087.70	1,900.30	-255.75	970.80	633.51	0.00	0.00	0.00
3,400.00	26.51	104.76	3,177.19	1,810.81	-267.12	1,013.95	661.67	0.00	0.00	0.00
3,500.00	26.51	104.76	3,266.68	1,721.32	-278.49	1,057.11	689.83	0.00	0.00	0.00
<b>Richard Sandstone</b>										
3,500.36	26.51	104.76	3,267.00	1,721.00	-278.53	1,057.27	689.94	0.00	0.00	0.00
3,600.00	26.51	104.76	3,356.17	1,631.83	-289.86	1,100.27	718.00	0.00	0.00	0.00
<b>Parkman Sandstone</b>										
3,622.16	26.51	104.76	3,376.00	1,612.00	-292.38	1,109.84	724.24	0.00	0.00	0.00
3,700.00	26.51	104.76	3,445.65	1,542.35	-301.23	1,143.43	746.16	0.00	0.00	0.00
3,800.00	26.51	104.76	3,535.14	1,452.86	-312.60	1,186.59	774.32	0.00	0.00	0.00
3,900.00	26.51	104.76	3,624.63	1,363.37	-323.97	1,229.74	802.49	0.00	0.00	0.00
4,000.00	26.51	104.76	3,714.12	1,273.88	-335.34	1,272.90	830.65	0.00	0.00	0.00



# Planning Report



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<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4988.00usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 31 T8N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	MOTTLED SOUTH 6-13HN	<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)
4,100.00	26.51	104.76	3,803.61	1,184.39	-346.70	1,316.06	858.81	0.00	0.00	0.00
4,200.00	26.51	104.76	3,893.09	1,094.91	-358.07	1,359.22	886.98	0.00	0.00	0.00
4,300.00	26.51	104.76	3,982.58	1,005.42	-369.44	1,402.38	915.14	0.00	0.00	0.00
4,400.00	26.51	104.76	4,072.07	915.93	-380.81	1,445.53	943.30	0.00	0.00	0.00
<b>Sussex Sandstone</b>										
<b>4,484.85</b>	<b>26.51</b>	<b>104.76</b>	<b>4,148.00</b>	<b>840.00</b>	<b>-390.46</b>	<b>1,482.15</b>	<b>967.20</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
4,500.00	26.51	104.76	4,161.56	826.44	-392.18	1,488.69	971.47	0.00	0.00	0.00
4,600.00	26.51	104.76	4,251.05	736.95	-403.55	1,531.85	999.63	0.00	0.00	0.00
4,700.00	26.51	104.76	4,340.54	647.46	-414.92	1,575.01	1,027.79	0.00	0.00	0.00
4,800.00	26.51	104.76	4,430.02	557.98	-426.29	1,618.16	1,055.96	0.00	0.00	0.00
4,900.00	26.51	104.76	4,519.51	468.49	-437.66	1,661.32	1,084.12	0.00	0.00	0.00
5,000.00	26.51	104.76	4,609.00	379.00	-449.03	1,704.48	1,112.28	0.00	0.00	0.00
<b>Shannon Sandstone</b>										
<b>5,074.87</b>	<b>26.51</b>	<b>104.76</b>	<b>4,676.00</b>	<b>312.00</b>	<b>-457.54</b>	<b>1,736.79</b>	<b>1,133.37</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
5,100.00	26.51	104.76	4,698.49	289.51	-460.40	1,747.64	1,140.45	0.00	0.00	0.00
5,200.00	26.51	104.76	4,787.98	200.02	-471.77	1,790.80	1,168.61	0.00	0.00	0.00
5,300.00	26.51	104.76	4,877.46	110.54	-483.14	1,833.95	1,196.77	0.00	0.00	0.00
5,400.00	26.51	104.76	4,966.95	21.05	-494.51	1,877.11	1,224.94	0.00	0.00	0.00
5,500.00	26.51	104.76	5,056.44	-68.44	-505.88	1,920.27	1,253.10	0.00	0.00	0.00
5,600.00	26.51	104.76	5,145.93	-157.93	-517.25	1,963.43	1,281.26	0.00	0.00	0.00
5,700.00	26.51	104.76	5,235.42	-247.42	-528.62	2,006.59	1,309.43	0.00	0.00	0.00
5,800.00	26.51	104.76	5,324.91	-336.91	-539.99	2,049.74	1,337.59	0.00	0.00	0.00
5,900.00	26.51	104.76	5,414.39	-426.39	-551.36	2,092.90	1,365.75	0.00	0.00	0.00
<b>TeePee Buttes</b>										
<b>5,914.09</b>	<b>26.51</b>	<b>104.76</b>	<b>5,427.00</b>	<b>-439.00</b>	<b>-552.96</b>	<b>2,098.98</b>	<b>1,369.72</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
6,000.00	26.51	104.76	5,503.88	-515.88	-562.73	2,136.06	1,393.92	0.00	0.00	0.00
6,100.00	26.51	104.76	5,593.37	-605.37	-574.10	2,179.22	1,422.08	0.00	0.00	0.00
6,200.00	26.51	104.76	5,682.86	-694.86	-585.47	2,222.37	1,450.24	0.00	0.00	0.00
<b>KOP (10°/100ft DGLG)</b>										
<b>6,279.60</b>	<b>26.51</b>	<b>104.76</b>	<b>5,754.09</b>	<b>-766.09</b>	<b>-594.52</b>	<b>2,256.73</b>	<b>1,472.66</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
6,300.00	26.99	109.16	5,772.31	-784.31	-597.20	2,265.50	1,478.72	10.00	2.39	21.58
6,400.00	31.12	128.02	5,859.89	-871.89	-620.62	2,307.41	1,517.35	10.00	4.13	18.86
6,500.00	37.34	142.03	5,942.66	-954.66	-660.55	2,346.52	1,569.86	10.00	6.21	14.00
6,600.00	44.77	152.26	6,018.10	-1,030.10	-715.76	2,381.66	1,634.65	10.00	7.43	10.23
<b>Sharon Springs</b>										
<b>6,649.47</b>	<b>48.72</b>	<b>156.34</b>	<b>6,052.00</b>	<b>-1,064.00</b>	<b>-748.22</b>	<b>2,397.24</b>	<b>1,670.65</b>	<b>10.00</b>	<b>8.00</b>	<b>8.25</b>
6,700.00	52.90	160.02	6,083.93	-1,095.93	-784.57	2,411.75	1,709.75	10.00	8.26	7.28
<b>Niobrara Top</b>										
<b>6,722.15</b>	<b>54.76</b>	<b>161.50</b>	<b>6,097.00</b>	<b>-1,109.00</b>	<b>-801.45</b>	<b>2,417.64</b>	<b>1,727.55</b>	<b>10.00</b>	<b>8.41</b>	<b>6.70</b>
<b>Niobrara A Chalk</b>										
<b>6,771.54</b>	<b>58.97</b>	<b>164.58</b>	<b>6,124.00</b>	<b>-1,136.00</b>	<b>-841.01</b>	<b>2,429.68</b>	<b>1,768.55</b>	<b>10.00</b>	<b>8.53</b>	<b>6.24</b>
6,800.00	61.43	166.23	6,138.14	-1,150.14	-864.90	2,435.89	1,792.88	10.00	8.64	5.80
<b>Niobrara A Chalk Base</b>										
<b>6,821.25</b>	<b>63.28</b>	<b>167.42</b>	<b>6,148.00</b>	<b>-1,160.00</b>	<b>-883.23</b>	<b>2,440.18</b>	<b>1,811.35</b>	<b>10.00</b>	<b>8.70</b>	<b>5.57</b>
<b>Niobrara B1 Chalk Top</b>										
<b>6,869.27</b>	<b>67.49</b>	<b>169.96</b>	<b>6,168.00</b>	<b>-1,180.00</b>	<b>-926.03</b>	<b>2,448.73</b>	<b>1,853.86</b>	<b>10.00</b>	<b>8.77</b>	<b>5.29</b>
6,900.00	70.21	171.50	6,179.09	-1,191.09	-954.31	2,453.34	1,881.53	10.00	8.84	5.02
<b>Niobrara B1 Chalk Base</b>										
<b>6,931.41</b>	<b>72.99</b>	<b>173.02</b>	<b>6,189.00</b>	<b>-1,201.00</b>	<b>-983.84</b>	<b>2,457.35</b>	<b>1,910.08</b>	<b>10.00</b>	<b>8.88</b>	<b>4.85</b>
7,000.00	79.12	176.21	6,205.52	-1,217.52	-1,050.08	2,463.56	1,972.98	10.00	8.93	4.64
7,100.00	88.10	180.64	6,216.65	-1,228.65	-1,149.29	2,466.26	2,064.47	10.00	8.98	4.43
<b>HZ LP: 600ft FNL &amp; 1345ft FEL of Sec 6 - Niobrara B2 Chalk Top (Target)</b>										
<b>7,121.14</b>	<b>90.00</b>	<b>181.57</b>	<b>6,217.00</b>	<b>-1,229.00</b>	<b>-1,170.42</b>	<b>2,465.85</b>	<b>2,083.54</b>	<b>10.00</b>	<b>9.00</b>	<b>4.37</b>

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well MOTTLED SOUTH 6-13HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4988.00usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4988.00usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 31 T8N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	MOTTLED SOUTH 6-13HN	<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)
7,200.00	90.00	181.57	6,217.00	-1,229.00	-1,249.25	2,463.70	2,154.47	0.00	0.00	0.00
7,300.00	90.00	181.57	6,217.00	-1,229.00	-1,349.22	2,460.97	2,244.40	0.00	0.00	0.00
7,400.00	90.00	181.57	6,217.00	-1,229.00	-1,449.18	2,458.23	2,334.33	0.00	0.00	0.00
7,500.00	90.00	181.57	6,217.00	-1,229.00	-1,549.14	2,455.50	2,424.26	0.00	0.00	0.00
7,600.00	90.00	181.57	6,217.00	-1,229.00	-1,649.11	2,452.77	2,514.19	0.00	0.00	0.00
7,700.00	90.00	181.57	6,217.00	-1,229.00	-1,749.07	2,450.04	2,604.12	0.00	0.00	0.00
7,800.00	90.00	181.57	6,217.00	-1,229.00	-1,849.03	2,447.31	2,694.05	0.00	0.00	0.00
7,900.00	90.00	181.57	6,217.00	-1,229.00	-1,948.99	2,444.58	2,783.98	0.00	0.00	0.00
8,000.00	90.00	181.57	6,217.00	-1,229.00	-2,048.96	2,441.85	2,873.91	0.00	0.00	0.00
8,100.00	90.00	181.57	6,217.00	-1,229.00	-2,148.92	2,439.12	2,963.84	0.00	0.00	0.00
8,200.00	90.00	181.57	6,217.00	-1,229.00	-2,248.88	2,436.38	3,053.78	0.00	0.00	0.00
8,300.00	90.00	181.57	6,217.00	-1,229.00	-2,348.84	2,433.65	3,143.71	0.00	0.00	0.00
8,400.00	90.00	181.57	6,217.00	-1,229.00	-2,448.81	2,430.92	3,233.64	0.00	0.00	0.00
8,500.00	90.00	181.57	6,217.00	-1,229.00	-2,548.77	2,428.19	3,323.57	0.00	0.00	0.00
8,600.00	90.00	181.57	6,217.00	-1,229.00	-2,648.73	2,425.46	3,413.50	0.00	0.00	0.00
8,700.00	90.00	181.57	6,217.00	-1,229.00	-2,748.69	2,422.73	3,503.43	0.00	0.00	0.00
8,800.00	90.00	181.57	6,217.00	-1,229.00	-2,848.66	2,420.00	3,593.36	0.00	0.00	0.00
8,900.00	90.00	181.57	6,217.00	-1,229.00	-2,948.62	2,417.27	3,683.29	0.00	0.00	0.00
9,000.00	90.00	181.57	6,217.00	-1,229.00	-3,048.58	2,414.54	3,773.22	0.00	0.00	0.00
9,100.00	90.00	181.57	6,217.00	-1,229.00	-3,148.55	2,411.80	3,863.15	0.00	0.00	0.00
9,200.00	90.00	181.57	6,217.00	-1,229.00	-3,248.51	2,409.07	3,953.08	0.00	0.00	0.00
9,300.00	90.00	181.57	6,217.00	-1,229.00	-3,348.47	2,406.34	4,043.01	0.00	0.00	0.00
9,400.00	90.00	181.57	6,217.00	-1,229.00	-3,448.43	2,403.61	4,132.94	0.00	0.00	0.00
9,500.00	90.00	181.57	6,217.00	-1,229.00	-3,548.40	2,400.88	4,222.88	0.00	0.00	0.00
9,600.00	90.00	181.57	6,217.00	-1,229.00	-3,648.36	2,398.15	4,312.81	0.00	0.00	0.00
9,700.00	90.00	181.57	6,217.00	-1,229.00	-3,748.32	2,395.42	4,402.74	0.00	0.00	0.00
9,800.00	90.00	181.57	6,217.00	-1,229.00	-3,848.28	2,392.69	4,492.67	0.00	0.00	0.00
9,900.00	90.00	181.57	6,217.00	-1,229.00	-3,948.25	2,389.96	4,582.60	0.00	0.00	0.00
10,000.00	90.00	181.57	6,217.00	-1,229.00	-4,048.21	2,387.22	4,672.53	0.00	0.00	0.00
10,100.00	90.00	181.57	6,217.00	-1,229.00	-4,148.17	2,384.49	4,762.46	0.00	0.00	0.00
10,200.00	90.00	181.57	6,217.00	-1,229.00	-4,248.14	2,381.76	4,852.39	0.00	0.00	0.00
10,300.00	90.00	181.57	6,217.00	-1,229.00	-4,348.10	2,379.03	4,942.32	0.00	0.00	0.00
10,400.00	90.00	181.57	6,217.00	-1,229.00	-4,448.06	2,376.30	5,032.25	0.00	0.00	0.00
10,500.00	90.00	181.57	6,217.00	-1,229.00	-4,548.02	2,373.57	5,122.18	0.00	0.00	0.00
10,600.00	90.00	181.57	6,217.00	-1,229.00	-4,647.99	2,370.84	5,212.11	0.00	0.00	0.00
10,700.00	90.00	181.57	6,217.00	-1,229.00	-4,747.95	2,368.11	5,302.04	0.00	0.00	0.00
10,800.00	90.00	181.57	6,217.00	-1,229.00	-4,847.91	2,365.37	5,391.97	0.00	0.00	0.00
10,900.00	90.00	181.57	6,217.00	-1,229.00	-4,947.87	2,362.64	5,481.91	0.00	0.00	0.00
11,000.00	90.00	181.57	6,217.00	-1,229.00	-5,047.84	2,359.91	5,571.84	0.00	0.00	0.00
11,100.00	90.00	181.57	6,217.00	-1,229.00	-5,147.80	2,357.18	5,661.77	0.00	0.00	0.00
<b>BHL: 600ft FSL &amp; 1345ft FEL of Sec 6</b>										
<b>11,153.17</b>	<b>90.00</b>	<b>181.57</b>	<b>6,217.00</b>	<b>-1,229.00</b>	<b>-5,200.95</b>	<b>2,355.73</b>	<b>5,709.58</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well MOTTLED SOUTH 6-13HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4988.00usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4988.00usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 31 T8N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	MOTTLED SOUTH 6-13HN	<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 (°)
479.01	479.00	Fox Hills Base			
1,548.52	1,518.00	Pierre Shale Top			
3,500.36	3,267.00	Richard Sandstone			
3,622.16	3,376.00	Parkman Sandstone			
4,484.85	4,148.00	Sussex Sandstone			
5,074.87	4,676.00	Shannon Sandstone			
5,914.09	5,427.00	TeePee Buttes			
6,649.47	6,052.00	Sharon Springs			
6,722.15	6,097.00	Niobrara Top			
6,771.54	6,124.00	Niobrara A Chalk			
6,821.25	6,148.00	Niobrara A Chalk Base			
6,869.27	6,168.00	Niobrara B1 Chalk Top			
6,931.41	6,189.00	Niobrara B1 Chalk Base			
7,121.14	6,217.00	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: 550ft FSL & 1579ft FWL of Sec 31
400.00	400.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1,725.34	1,678.57	-76.72	291.21	EOB TO 26.51° INC
6,279.60	5,754.09	-594.52	2,256.73	KOP (10°/100ft DGLG)
7,121.14	6,217.00	-1,170.42	2,465.85	HZ LP: 600ft FNL & 1345ft FEL of Sec 6
11,153.17	6,217.00	-5,200.95	2,355.73	BHL: 600ft FSL & 1345ft FEL of Sec 6