

# **MALLARD EXPLORATION**

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

**SE SW SEC. 35 T8N R60W 6th P.M.**

**CINNAMON TEAL FED 35-2HC**

**ORIGINAL WELLBORE**

**28 November, 2018**

**Plan: PROPOSAL #2**



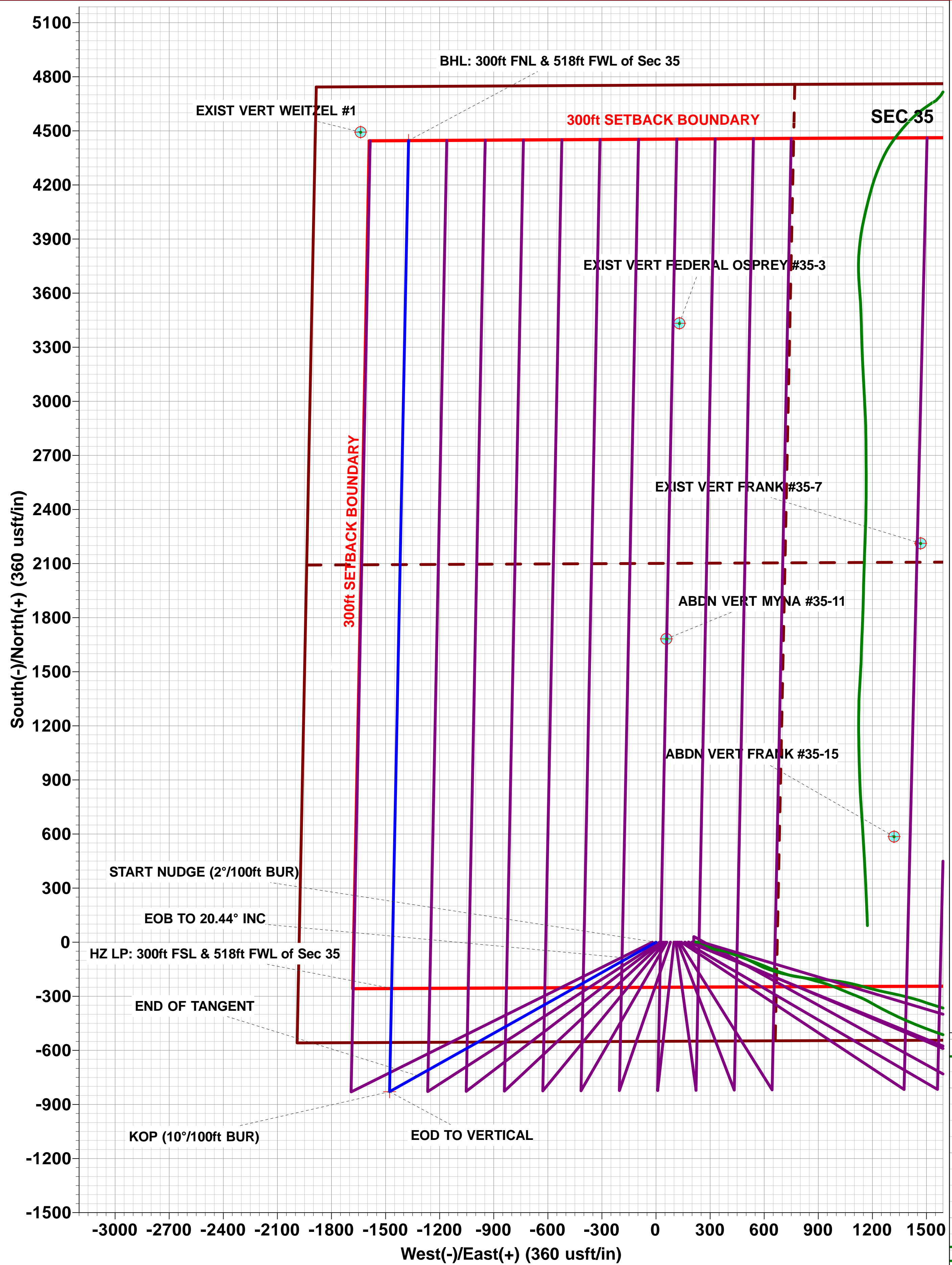
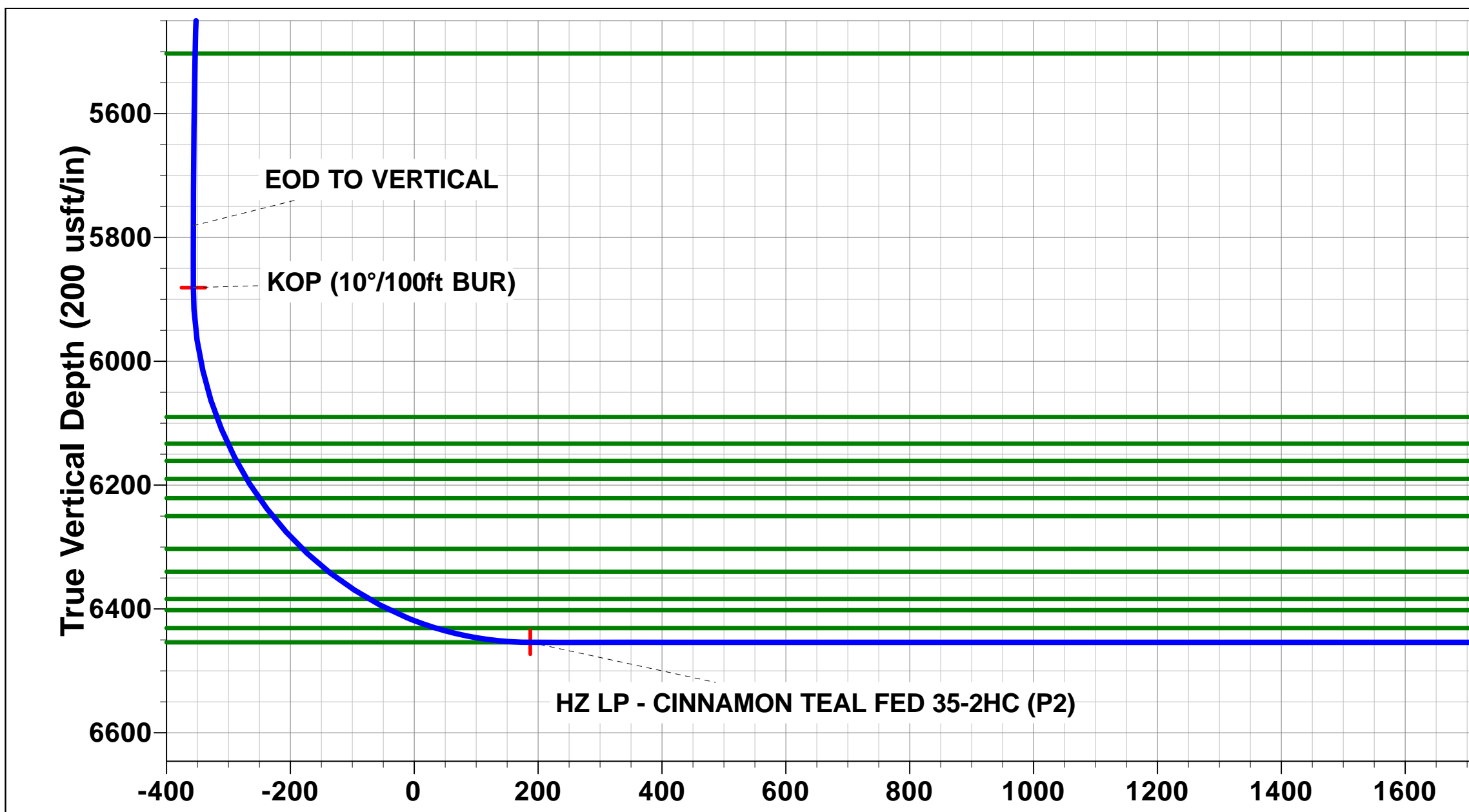
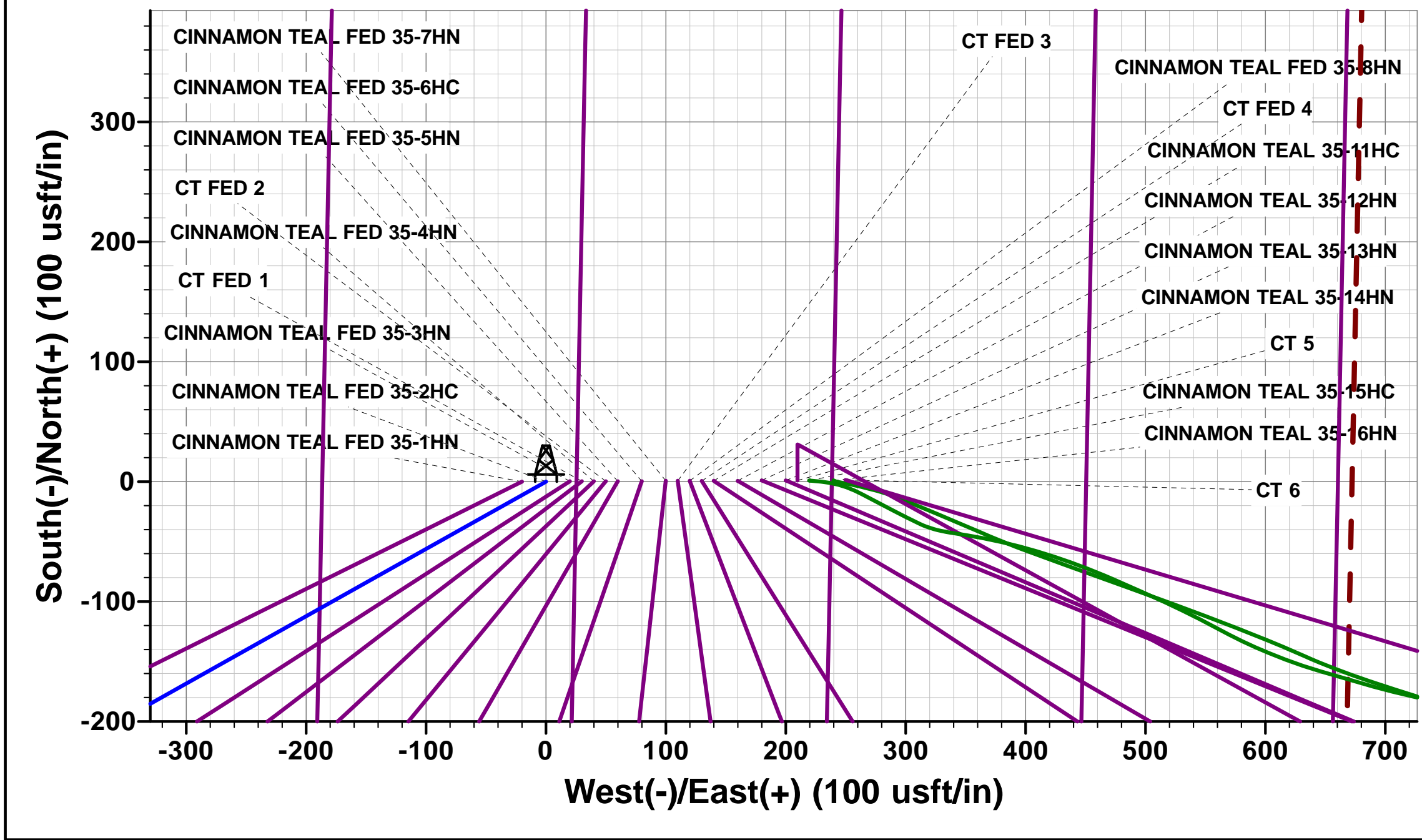
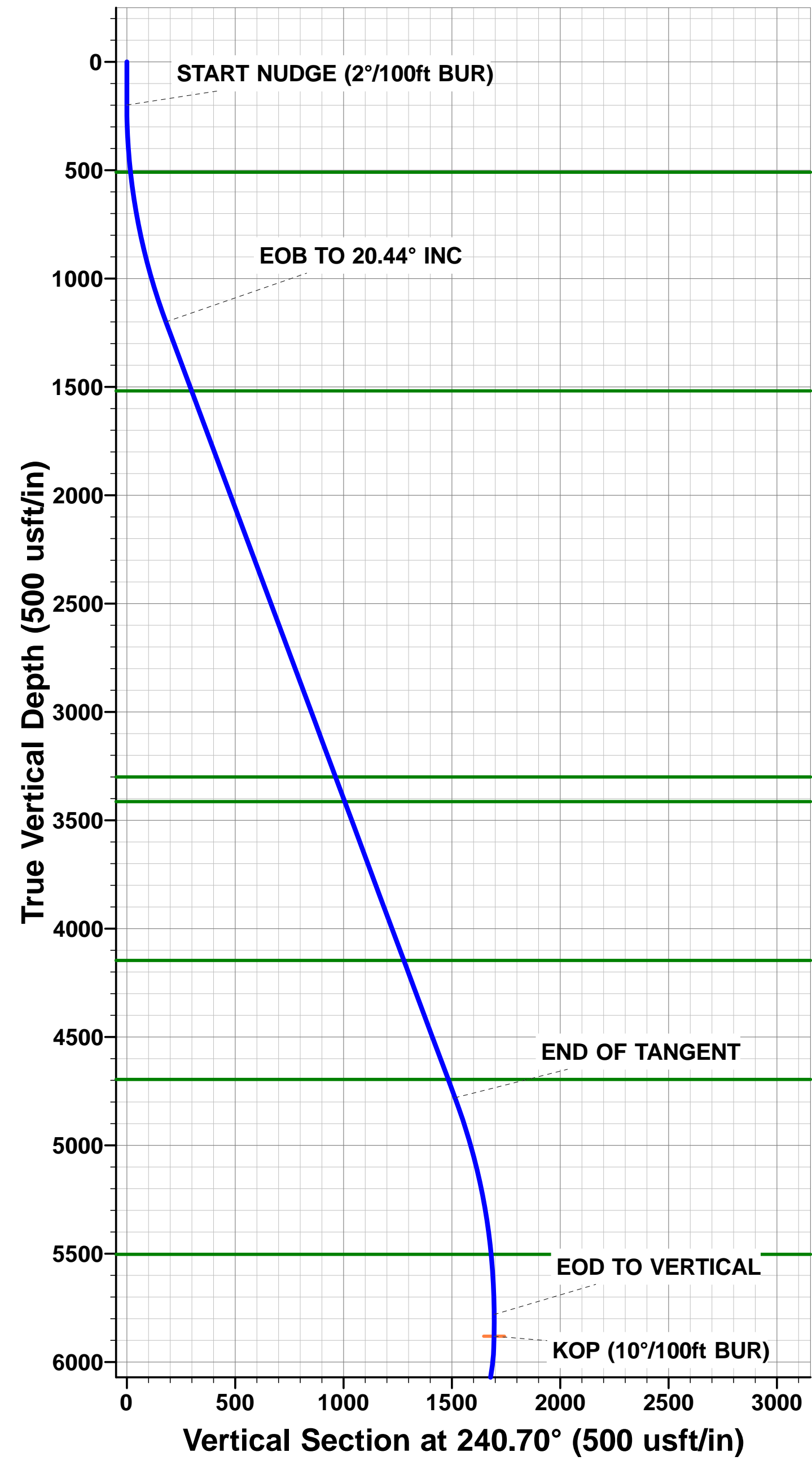


Project: WELD COUNTY, COLORADO (NAD 83)  
Site: SE SW SEC. 35 T8N R60W 6th P.M.  
Well: CINNAMON TEAL FED 35-2HC  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL #2

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 & 1980ft FWL of Sec 35	
200.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)	
1200.29	1221.82	20.44	240.70	-88.23	-157.25	-37.92	180.31	EOB TO 20.44° INC	
4780.75	5042.77	20.44	240.70	-741.03	-1320.77	-318.53	1514.45	END OF TANGENT	
5781.04	6064.58	0.00	240.70	-829.26	-1478.02	-356.45	1694.76	EOD TO VERTICAL	
5881.04	6164.58	0.00	0.00	-829.26	-1478.02	-356.45	1694.76	KOP (10°/100ft BUR)	
6454.00	7064.58	90.00	1.15	-256.42	-1466.52	187.51	2267.71	HZ LP: 300ft FSL & 518ft FWL of Sec 35	
6454.00	11768.23	90.00	1.14	4446.28	-1372.41	4653.27	6971.36	BHL: 300ft FNL & 518ft FWL of Sec 35	

PROPOSED LOCAL COORDINATES:  
  
SHL: 550ft FSL & 1980ft FWL Sec 35  
HZ LP: 300ft FSL & 518ft FWL Sec 35  
BHL: 300ft FNL & 518ft FWL of Sec 35

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - CINNAMON TEAL FED 35-2HC (P2)	5881.04	-829.26	-1478.02	40.610782	-104.067060
HZ LP - CINNAMON TEAL FED 35-2HC (P2)	6454.00	-256.42	-1466.52	40.612354	-104.067019
BHL - CINNAMON TEAL FED 35-2HC (P2)	6454.00	4446.28	-1372.41	40.625262	-104.066681



BHL: 300ft FNL & 518ft FWL of Sec 35

300ft SETBACK BOUNDARY

SEC 35

EXIST VERT WEITZEL #1

EXIST VERT FEDERAL OSPREY #35-3

EXIST VERT FRANK #35-7

ABDN VERT MYNA #35-11

ABDN VERT FRANK #35-15

START NUDGE (2°/100ft BUR)

EOB TO 20.44° INC

HZ LP: 300ft FSL & 518ft FWL of Sec 35

END OF TANGENT

KOP (10°/100ft BUR)

EOD TO VERTICAL

Vertical Section at 342.85° (200 usft/in)

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well CINNAMON TEAL FED 35-2HC
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4949.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4949.00usft
<b>Site:</b>	SE SW SEC. 35 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	CINNAMON TEAL FED 35-2HC	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

<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. 35 T8N R60W 6th P.M.		
<b>Site Position:</b>		<b>Northing:</b>	1,469,416.68 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,399,274.71 usft
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	1.10000ft
		<b>Latitude:</b>	40.613058
		<b>Longitude:</b>	-104.061809
		<b>Grid Convergence:</b>	0.93 °

<b>Well</b>	CINNAMON TEAL FED 35-2HC		
<b>Well Position</b>	<b>+N-S</b>	-0.02 usft	<b>Northing:</b>
	<b>+E-W</b>	19.99 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	28/11/2018	7.69	67.09	52,407

<b>Design</b>	PROPOSAL #2			
<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>
	6,454.00	0.00	0.00	342.85

<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	-4,949.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	-4,749.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,221.82	20.44	240.70	1,200.29	-3,748.71	-88.23	-157.25	2.00	2.00	0.00	240.70	
5,042.77	20.44	240.70	4,780.75	-168.25	-741.03	-1,320.77	0.00	0.00	0.00	0.00	
6,064.58	0.00	0.00	5,781.04	832.04	-829.26	-1,478.02	2.00	-2.00	0.00	180.00	
6,164.58	0.00	0.00	5,881.04	932.04	-829.26	-1,478.02	0.00	0.00	0.00	0.00	KOP - CINNAMON
7,064.58	90.00	1.15	6,454.00	1,505.00	-256.42	-1,466.52	10.00	10.00	0.13	1.15	HZ LP - CINNAMOI
11,768.23	90.00	1.14	6,454.00	1,505.00	4,446.28	-1,372.41	0.00	0.00	0.00	-76.49	BHL - CINNAMON

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well CINNAMON TEAL FED 35-2HC
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4949.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4949.00usft
<b>Site:</b>	SE SW SEC. 35 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	CINNAMON TEAL FED 35-2HC	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

## 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; 1980ft FWL of Sec 35</b>										
0.00	0.00	0.00	0.00	4,949.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,849.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>START NUDGE (2°/100ft BUR)</b>										
200.00	0.00	0.00	200.00	4,749.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	2.00	240.70	299.98	4,649.02	-0.85	-1.52	-0.37	2.00	2.00	0.00
400.00	4.00	240.70	399.84	4,549.16	-3.41	-6.09	-1.47	2.00	2.00	0.00
500.00	6.00	240.70	499.45	4,449.55	-7.68	-13.69	-3.30	2.00	2.00	0.00
<b>Fox Hills Base</b>										
510.61	6.21	240.70	510.00	4,439.00	-8.23	-14.67	-3.54	2.00	2.00	0.00
600.00	8.00	240.70	598.70	4,350.30	-13.64	-24.31	-5.86	2.00	2.00	0.00
700.00	10.00	240.70	697.47	4,251.53	-21.30	-37.96	-9.15	2.00	2.00	0.00
800.00	12.00	240.70	795.62	4,153.38	-30.63	-54.60	-13.17	2.00	2.00	0.00
900.00	14.00	240.70	893.06	4,055.94	-41.64	-74.21	-17.90	2.00	2.00	0.00
1,000.00	16.00	240.70	989.64	3,959.36	-54.30	-96.78	-23.34	2.00	2.00	0.00
1,100.00	18.00	240.70	1,085.27	3,863.73	-68.61	-122.28	-29.49	2.00	2.00	0.00
1,200.00	20.00	240.70	1,179.82	3,769.18	-84.54	-150.67	-36.34	2.00	2.00	0.00
<b>EOB TO 20.44° INC</b>										
1,221.82	20.44	240.70	1,200.29	3,748.71	-88.23	-157.25	-37.92	2.00	2.00	0.00
1,300.00	20.44	240.70	1,273.55	3,675.45	-101.58	-181.06	-43.67	0.00	0.00	0.00
1,400.00	20.44	240.70	1,367.26	3,581.74	-118.67	-211.51	-51.01	0.00	0.00	0.00
1,500.00	20.44	240.70	1,460.96	3,488.04	-135.75	-241.96	-58.35	0.00	0.00	0.00
<b>Pierre Shale Top</b>										
1,561.94	20.44	240.70	1,519.00	3,430.00	-146.34	-260.82	-62.90	0.00	0.00	0.00
1,600.00	20.44	240.70	1,554.67	3,394.33	-152.84	-272.41	-65.70	0.00	0.00	0.00
1,700.00	20.44	240.70	1,648.37	3,300.63	-169.92	-302.86	-73.04	0.00	0.00	0.00
1,800.00	20.44	240.70	1,742.08	3,206.92	-187.01	-333.31	-80.38	0.00	0.00	0.00
1,900.00	20.44	240.70	1,835.79	3,113.21	-204.09	-363.76	-87.73	0.00	0.00	0.00
2,000.00	20.44	240.70	1,929.49	3,019.51	-221.18	-394.21	-95.07	0.00	0.00	0.00
2,100.00	20.44	240.70	2,023.20	2,925.80	-238.26	-424.67	-102.42	0.00	0.00	0.00
2,200.00	20.44	240.70	2,116.91	2,832.09	-255.35	-455.12	-109.76	0.00	0.00	0.00
2,300.00	20.44	240.70	2,210.61	2,738.39	-272.43	-485.57	-117.10	0.00	0.00	0.00
2,400.00	20.44	240.70	2,304.32	2,644.68	-289.52	-516.02	-124.45	0.00	0.00	0.00
2,500.00	20.44	240.70	2,398.02	2,550.98	-306.60	-546.47	-131.79	0.00	0.00	0.00
2,600.00	20.44	240.70	2,491.73	2,457.27	-323.69	-576.92	-139.14	0.00	0.00	0.00
2,700.00	20.44	240.70	2,585.44	2,363.56	-340.77	-607.37	-146.48	0.00	0.00	0.00
2,800.00	20.44	240.70	2,679.14	2,269.86	-357.86	-637.82	-153.82	0.00	0.00	0.00
2,900.00	20.44	240.70	2,772.85	2,176.15	-374.94	-668.27	-161.17	0.00	0.00	0.00
3,000.00	20.44	240.70	2,866.55	2,082.45	-392.03	-698.73	-168.51	0.00	0.00	0.00
3,100.00	20.44	240.70	2,960.26	1,988.74	-409.11	-729.18	-175.85	0.00	0.00	0.00
3,200.00	20.44	240.70	3,053.97	1,895.03	-426.20	-759.63	-183.20	0.00	0.00	0.00
3,300.00	20.44	240.70	3,147.67	1,801.33	-443.28	-790.08	-190.54	0.00	0.00	0.00
3,400.00	20.44	240.70	3,241.38	1,707.62	-460.37	-820.53	-197.89	0.00	0.00	0.00
<b>Richard Sandstone</b>										
3,462.56	20.44	240.70	3,300.00	1,649.00	-471.06	-839.58	-202.48	0.00	0.00	0.00
3,500.00	20.44	240.70	3,335.08	1,613.92	-477.45	-850.98	-205.23	0.00	0.00	0.00
<b>Parkman Sandstone</b>										
3,584.22	20.44	240.70	3,414.00	1,535.00	-491.84	-876.63	-211.42	0.00	0.00	0.00
3,600.00	20.44	240.70	3,428.79	1,520.21	-494.54	-881.43	-212.57	0.00	0.00	0.00
3,700.00	20.44	240.70	3,522.50	1,426.50	-511.62	-911.88	-219.92	0.00	0.00	0.00
3,800.00	20.44	240.70	3,616.20	1,332.80	-528.71	-942.33	-227.26	0.00	0.00	0.00
3,900.00	20.44	240.70	3,709.91	1,239.09	-545.79	-972.79	-234.61	0.00	0.00	0.00
4,000.00	20.44	240.70	3,803.61	1,145.39	-562.88	-1,003.24	-241.95	0.00	0.00	0.00



# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well CINNAMON TEAL FED 35-2HC
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4949.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4949.00usft
<b>Site:</b>	SE SW SEC. 35 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	CINNAMON TEAL FED 35-2HC	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

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	20.44	240.70	3,897.32	1,051.68	-579.96	-1,033.69	-249.29	0.00	0.00	0.00
4,200.00	20.44	240.70	3,991.03	957.97	-597.05	-1,064.14	-256.64	0.00	0.00	0.00
4,300.00	20.44	240.70	4,084.73	864.27	-614.13	-1,094.59	-263.98	0.00	0.00	0.00
<b>Sussex Sandstone</b>										
<b>4,366.45</b>	<b>20.44</b>	<b>240.70</b>	<b>4,147.00</b>	<b>802.00</b>	<b>-625.49</b>	<b>-1,114.82</b>	<b>-268.86</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
4,400.00	20.44	240.70	4,178.44	770.56	-631.22	-1,125.04	-271.33	0.00	0.00	0.00
4,500.00	20.44	240.70	4,272.15	676.85	-648.30	-1,155.49	-278.67	0.00	0.00	0.00
4,600.00	20.44	240.70	4,365.85	583.15	-665.39	-1,185.94	-286.01	0.00	0.00	0.00
4,700.00	20.44	240.70	4,459.56	489.44	-682.47	-1,216.39	-293.36	0.00	0.00	0.00
4,800.00	20.44	240.70	4,553.26	395.74	-699.56	-1,246.85	-300.70	0.00	0.00	0.00
4,900.00	20.44	240.70	4,646.97	302.03	-716.64	-1,277.30	-308.04	0.00	0.00	0.00
<b>Shannon Sandstone</b>										
<b>4,952.32</b>	<b>20.44</b>	<b>240.70</b>	<b>4,696.00</b>	<b>253.00</b>	<b>-725.58</b>	<b>-1,293.23</b>	<b>-311.89</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
5,000.00	20.44	240.70	4,740.68	208.32	-733.73	-1,307.75	-315.39	0.00	0.00	0.00
<b>END OF TANGENT</b>										
<b>5,042.77</b>	<b>20.44</b>	<b>240.70</b>	<b>4,780.75</b>	<b>168.25</b>	<b>-741.03</b>	<b>-1,320.77</b>	<b>-318.53</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
5,100.00	19.29	240.70	4,834.58	114.42	-750.55	-1,337.73	-322.62	2.00	-2.00	0.00
5,200.00	17.29	240.70	4,929.52	19.48	-765.91	-1,365.10	-329.22	2.00	-2.00	0.00
5,300.00	15.29	240.70	5,025.50	-76.50	-779.63	-1,389.57	-335.12	2.00	-2.00	0.00
5,400.00	13.29	240.70	5,122.40	-173.40	-791.71	-1,411.09	-340.31	2.00	-2.00	0.00
5,500.00	11.29	240.70	5,220.10	-271.10	-802.13	-1,429.66	-344.79	2.00	-2.00	0.00
5,600.00	9.29	240.70	5,318.49	-369.49	-810.87	-1,445.24	-348.55	2.00	-2.00	0.00
5,700.00	7.29	240.70	5,417.44	-468.44	-817.92	-1,457.81	-351.58	2.00	-2.00	0.00
<b>TeePee Buttes</b>										
<b>5,786.11</b>	<b>5.57</b>	<b>240.70</b>	<b>5,503.00</b>	<b>-554.00</b>	<b>-822.64</b>	<b>-1,466.23</b>	<b>-353.61</b>	<b>2.00</b>	<b>-2.00</b>	<b>0.00</b>
5,800.00	5.29	240.70	5,516.83	-567.83	-823.29	-1,467.37	-353.88	2.00	-2.00	0.00
5,900.00	3.29	240.70	5,616.55	-667.55	-826.95	-1,473.90	-355.46	2.00	-2.00	0.00
6,000.00	1.29	240.70	5,716.46	-767.46	-828.90	-1,477.39	-356.30	2.00	-2.00	0.00
<b>EOD TO VERTICAL</b>										
<b>6,064.58</b>	<b>0.00</b>	<b>240.70</b>	<b>5,781.04</b>	<b>-832.04</b>	<b>-829.26</b>	<b>-1,478.02</b>	<b>-356.45</b>	<b>2.00</b>	<b>-2.00</b>	<b>0.00</b>
6,100.00	0.00	0.00	5,816.46	-867.46	-829.26	-1,478.02	-356.45	0.00	0.00	0.00
<b>KOP (10°/100ft BUR)</b>										
<b>6,164.58</b>	<b>0.00</b>	<b>0.00</b>	<b>5,881.04</b>	<b>-932.04</b>	<b>-829.26</b>	<b>-1,478.02</b>	<b>-356.45</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
6,200.00	3.54	1.15	5,916.43	-967.43	-828.17	-1,478.00	-355.41	10.00	10.00	0.00
6,300.00	13.54	1.15	6,015.20	-1,066.20	-813.34	-1,477.70	-341.33	10.00	10.00	0.00
<b>Sharon Springs</b>										
<b>6,378.48</b>	<b>21.39</b>	<b>1.15</b>	<b>6,090.00</b>	<b>-1,141.00</b>	<b>-789.80</b>	<b>-1,477.23</b>	<b>-318.99</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,400.00	23.54	1.15	6,109.89	-1,160.89	-781.58	-1,477.06	-311.18	10.00	10.00	0.00
<b>Niobrara Top</b>										
<b>6,425.47</b>	<b>26.09</b>	<b>1.15</b>	<b>6,133.00</b>	<b>-1,184.00</b>	<b>-770.90</b>	<b>-1,476.85</b>	<b>-301.03</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
<b>Niobrara A Chalk</b>										
<b>6,457.09</b>	<b>29.25</b>	<b>1.15</b>	<b>6,161.00</b>	<b>-1,212.00</b>	<b>-756.22</b>	<b>-1,476.55</b>	<b>-287.09</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
<b>Niobrara A Chalk Base</b>										
<b>6,490.90</b>	<b>32.63</b>	<b>1.15</b>	<b>6,190.00</b>	<b>-1,241.00</b>	<b>-738.84</b>	<b>-1,476.20</b>	<b>-270.59</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,500.00	33.54	1.15	6,197.62	-1,248.62	-733.87	-1,476.10	-265.87	10.00	10.00	0.00
<b>Niobrara B1 Chalk Top</b>										
<b>6,528.53</b>	<b>36.39</b>	<b>1.15</b>	<b>6,221.00</b>	<b>-1,272.00</b>	<b>-717.53</b>	<b>-1,475.78</b>	<b>-250.35</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
<b>Niobrara B1 Chalk Base</b>										
<b>6,565.46</b>	<b>40.09</b>	<b>1.15</b>	<b>6,250.00</b>	<b>-1,301.00</b>	<b>-694.68</b>	<b>-1,475.32</b>	<b>-228.65</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,600.00	43.54	1.15	6,275.74	-1,326.74	-671.66	-1,474.86	-206.79	10.00	10.00	0.00
<b>Niobrara B2 Chalk Base</b>										
<b>6,638.89</b>	<b>47.43</b>	<b>1.15</b>	<b>6,303.00</b>	<b>-1,354.00</b>	<b>-643.94</b>	<b>-1,474.30</b>	<b>-180.47</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well CINNAMON TEAL FED 35-2HC
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4949.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4949.00usft
<b>Site:</b>	SE SW SEC. 35 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	CINNAMON TEAL FED 35-2HC	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

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 C Chalk Top</b>										
6,696.88	53.23	1.15	6,340.00	-1,391.00	-599.33	-1,473.40	-138.11	10.00	10.00	0.00
6,700.00	53.54	1.15	6,341.86	-1,392.86	-596.82	-1,473.35	-135.73	10.00	10.00	0.00
<b>Niobrara C Chalk Base</b>										
6,778.40	61.38	1.15	6,384.00	-1,435.00	-530.79	-1,472.03	-73.03	10.00	10.00	0.00
6,800.00	63.54	1.15	6,393.99	-1,444.99	-511.65	-1,471.64	-54.85	10.00	10.00	0.00
<b>Niobrara D Chalk Top</b>										
6,818.60	65.40	1.15	6,402.00	-1,453.00	-494.87	-1,471.31	-38.92	10.00	10.00	0.00
6,900.00	73.54	1.15	6,430.52	-1,481.52	-418.72	-1,469.78	33.40	10.00	10.00	0.00
<b>Ft. Hays</b>										
6,901.69	73.71	1.15	6,431.00	-1,482.00	-417.09	-1,469.74	34.94	10.00	10.00	0.00
7,000.00	83.54	1.15	6,450.36	-1,501.36	-320.85	-1,467.81	126.33	10.00	10.00	0.00
<b>HZ LP: 300ft FSL &amp; 518ft FWL of Sec 35 - Codell (Target)</b>										
7,064.58	90.00	1.15	6,454.00	-1,505.00	-256.42	-1,466.52	187.51	10.00	10.00	0.00
7,100.00	90.00	1.15	6,454.00	-1,505.00	-221.01	-1,465.81	221.14	0.00	0.00	0.00
7,200.00	90.00	1.15	6,454.00	-1,505.00	-121.03	-1,463.80	316.08	0.00	0.00	0.00
7,300.00	90.00	1.15	6,454.00	-1,505.00	-21.05	-1,461.79	411.02	0.00	0.00	0.00
7,400.00	90.00	1.15	6,454.01	-1,505.01	78.93	-1,459.79	505.96	0.00	0.00	0.00
7,500.00	90.00	1.15	6,454.01	-1,505.01	178.91	-1,457.78	600.90	0.00	0.00	0.00
7,600.00	90.00	1.15	6,454.01	-1,505.01	278.89	-1,455.77	695.84	0.00	0.00	0.00
7,700.00	90.00	1.15	6,454.01	-1,505.01	378.87	-1,453.77	790.78	0.00	0.00	0.00
7,800.00	90.00	1.15	6,454.01	-1,505.01	478.85	-1,451.76	885.72	0.00	0.00	0.00
7,900.00	90.00	1.15	6,454.01	-1,505.01	578.83	-1,449.76	980.66	0.00	0.00	0.00
8,000.00	90.00	1.15	6,454.01	-1,505.01	678.81	-1,447.75	1,075.61	0.00	0.00	0.00
8,100.00	90.00	1.15	6,454.01	-1,505.01	778.79	-1,445.75	1,170.55	0.00	0.00	0.00
8,200.00	90.00	1.15	6,454.01	-1,505.01	878.77	-1,443.74	1,265.49	0.00	0.00	0.00
8,300.00	90.00	1.15	6,454.02	-1,505.02	978.75	-1,441.74	1,360.43	0.00	0.00	0.00
8,400.00	90.00	1.15	6,454.02	-1,505.02	1,078.73	-1,439.73	1,455.37	0.00	0.00	0.00
8,500.00	90.00	1.15	6,454.02	-1,505.02	1,178.71	-1,437.73	1,550.31	0.00	0.00	0.00
8,600.00	90.00	1.15	6,454.02	-1,505.02	1,278.69	-1,435.73	1,645.25	0.00	0.00	0.00
8,700.00	90.00	1.15	6,454.02	-1,505.02	1,378.67	-1,433.72	1,740.20	0.00	0.00	0.00
8,800.00	90.00	1.15	6,454.02	-1,505.02	1,478.65	-1,431.72	1,835.14	0.00	0.00	0.00
8,900.00	90.00	1.15	6,454.02	-1,505.02	1,578.63	-1,429.72	1,930.08	0.00	0.00	0.00
9,000.00	90.00	1.15	6,454.02	-1,505.02	1,678.61	-1,427.72	2,025.02	0.00	0.00	0.00
9,100.00	90.00	1.15	6,454.02	-1,505.02	1,778.59	-1,425.72	2,119.96	0.00	0.00	0.00
9,200.00	90.00	1.15	6,454.02	-1,505.02	1,878.57	-1,423.71	2,214.91	0.00	0.00	0.00
9,300.00	90.00	1.15	6,454.02	-1,505.02	1,978.55	-1,421.71	2,309.85	0.00	0.00	0.00
9,400.00	90.00	1.15	6,454.02	-1,505.02	2,078.53	-1,419.71	2,404.79	0.00	0.00	0.00
9,500.00	90.00	1.15	6,454.02	-1,505.02	2,178.51	-1,417.71	2,499.73	0.00	0.00	0.00
9,600.00	90.00	1.15	6,454.02	-1,505.02	2,278.49	-1,415.71	2,594.68	0.00	0.00	0.00
9,700.00	90.00	1.15	6,454.02	-1,505.02	2,378.47	-1,413.71	2,689.62	0.00	0.00	0.00
9,800.00	90.00	1.15	6,454.02	-1,505.02	2,478.45	-1,411.71	2,784.56	0.00	0.00	0.00
9,900.00	90.00	1.15	6,454.02	-1,505.02	2,578.43	-1,409.71	2,879.51	0.00	0.00	0.00
10,000.00	90.00	1.15	6,454.02	-1,505.02	2,678.41	-1,407.71	2,974.45	0.00	0.00	0.00
10,100.00	90.00	1.15	6,454.02	-1,505.02	2,778.39	-1,405.71	3,069.39	0.00	0.00	0.00
10,200.00	90.00	1.15	6,454.02	-1,505.02	2,878.37	-1,403.72	3,164.33	0.00	0.00	0.00
10,300.00	90.00	1.14	6,454.02	-1,505.02	2,978.35	-1,401.72	3,259.28	0.00	0.00	0.00
10,400.00	90.00	1.14	6,454.02	-1,505.02	3,078.33	-1,399.72	3,354.22	0.00	0.00	0.00
10,500.00	90.00	1.14	6,454.02	-1,505.02	3,178.31	-1,397.72	3,449.16	0.00	0.00	0.00
10,600.00	90.00	1.14	6,454.01	-1,505.01	3,278.29	-1,395.72	3,544.11	0.00	0.00	0.00
10,700.00	90.00	1.14	6,454.01	-1,505.01	3,378.27	-1,393.73	3,639.05	0.00	0.00	0.00
10,800.00	90.00	1.14	6,454.01	-1,505.01	3,478.25	-1,391.73	3,734.00	0.00	0.00	0.00
10,900.00	90.00	1.14	6,454.01	-1,505.01	3,578.23	-1,389.73	3,828.94	0.00	0.00	0.00
11,000.00	90.00	1.14	6,454.01	-1,505.01	3,678.21	-1,387.74	3,923.88	0.00	0.00	0.00

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well CINNAMON TEAL FED 35-2HC
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4949.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4949.00usft
<b>Site:</b>	SE SW SEC. 35 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	CINNAMON TEAL FED 35-2HC	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

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)
11,100.00	90.00	1.14	6,454.01	-1,505.01	3,778.19	-1,385.74	4,018.83	0.00	0.00	0.00
11,200.00	90.00	1.14	6,454.01	-1,505.01	3,878.17	-1,383.75	4,113.77	0.00	0.00	0.00
11,300.00	90.00	1.14	6,454.01	-1,505.01	3,978.15	-1,381.75	4,208.72	0.00	0.00	0.00
11,400.00	90.00	1.14	6,454.01	-1,505.01	4,078.13	-1,379.76	4,303.66	0.00	0.00	0.00
11,500.00	90.00	1.14	6,454.00	-1,505.00	4,178.11	-1,377.76	4,398.60	0.00	0.00	0.00
11,600.00	90.00	1.14	6,454.00	-1,505.00	4,278.09	-1,375.77	4,493.55	0.00	0.00	0.00
11,700.00	90.00	1.14	6,454.00	-1,505.00	4,378.07	-1,373.77	4,588.49	0.00	0.00	0.00
<b>BHL: 300ft FNL &amp; 518ft FWL of Sec 35</b>										
<b>11,768.23</b>	<b>90.00</b>	<b>1.14</b>	<b>6,454.00</b>	<b>-1,505.00</b>	<b>4,446.28</b>	<b>-1,372.41</b>	<b>4,653.27</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

Formations						
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
510.61	510.00	Fox Hills Base				
1,561.94	1,519.00	Pierre Shale Top				
3,462.56	3,300.00	Richard Sandstone				
3,584.22	3,414.00	Parkman Sandstone				
4,366.45	4,147.00	Sussex Sandstone				
4,952.32	4,696.00	Shannon Sandstone				
5,786.11	5,503.00	TeePee Buttes				
6,378.48	6,090.00	Sharon Springs				
6,425.47	6,133.00	Niobrara Top				
6,457.09	6,161.00	Niobrara A Chalk				
6,490.90	6,190.00	Niobrara A Chalk Base				
6,528.53	6,221.00	Niobrara B1 Chalk Top				
6,565.46	6,250.00	Niobrara B1 Chalk Base				
6,638.89	6,303.00	Niobrara B2 Chalk Base				
6,696.88	6,340.00	Niobrara C Chalk Top				
6,778.40	6,384.00	Niobrara C Chalk Base				
6,818.60	6,402.00	Niobrara D Chalk Top				
6,901.69	6,431.00	Ft. Hays				
7,064.58	6,454.00	Codell (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 & 1980ft FWL of Sec 35
200.00	200.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1,221.82	1,200.29	-88.23	-157.25	EOB TO 20.44° INC
5,042.77	4,780.75	-741.03	-1,320.77	END OF TANGENT
6,064.58	5,781.04	-829.26	-1,478.02	EOD TO VERTICAL
6,164.58	5,881.04	-829.26	-1,478.02	KOP (10°/100ft BUR)
7,064.58	6,454.00	-256.42	-1,466.52	HZ LP: 300ft FSL & 518ft FWL of Sec 35
11,768.23	6,454.00	4,446.28	-1,372.41	BHL: 300ft FNL & 518ft FWL of Sec 35