



MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

NE NW SEC. 31 T9N R59W 6th P.M.

SHULL FED 9-59-31-2124CDE

ORIGINAL WELLBORE

04 November, 2019

Plan: PROPOSAL #1





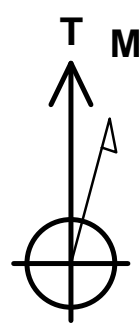
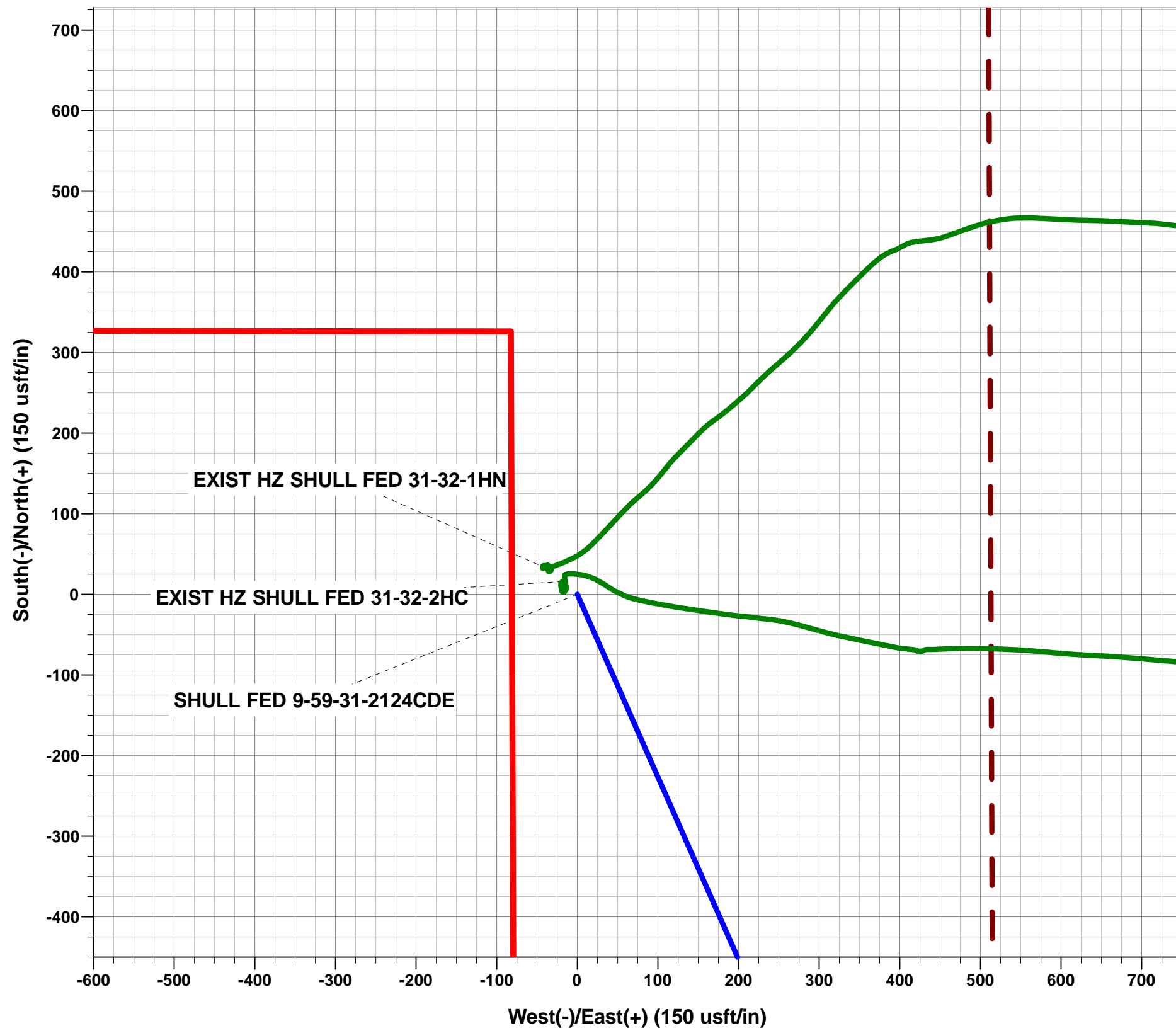
Project: WELD COUNTY, COLORADO (NAD 83)
Site: NE NW SEC. 31 T9N R59W 6th P.M.
Well: SHULL FED 9-59-31-2124CDE
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #1

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: 926ft FNL & 2128ft FWL of Sec 31
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)
664.25	11.29	156.19	660.61	-50.67	22.36	28.89	55.39	EOB TO 11.29° INC
5951.40	11.29	156.19	5845.54	-997.23	440.12	568.55	1090.03	KOP (10°/100ft DGLG)
6806.47	90.00	89.78	6365.00	-1090.05	1011.67	1147.37	1679.21	LP: 2015ft FNL & 2140ft FEL of Sec 31
13739.89	90.00	89.78	6365.00	-1063.65	7945.04	8015.92	8612.63	BHL: 2015ft FNL & 460ft FEL of Sec 32

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
LP - SHULL FED 9-59-31-2124CDE	6365.00	-1090.05	1011.67	40.708429	-104.019008
BHL - SHULL FED 9-59-31-2124CDE	6365.00	-1063.65	7945.04	40.708498	-103.994000



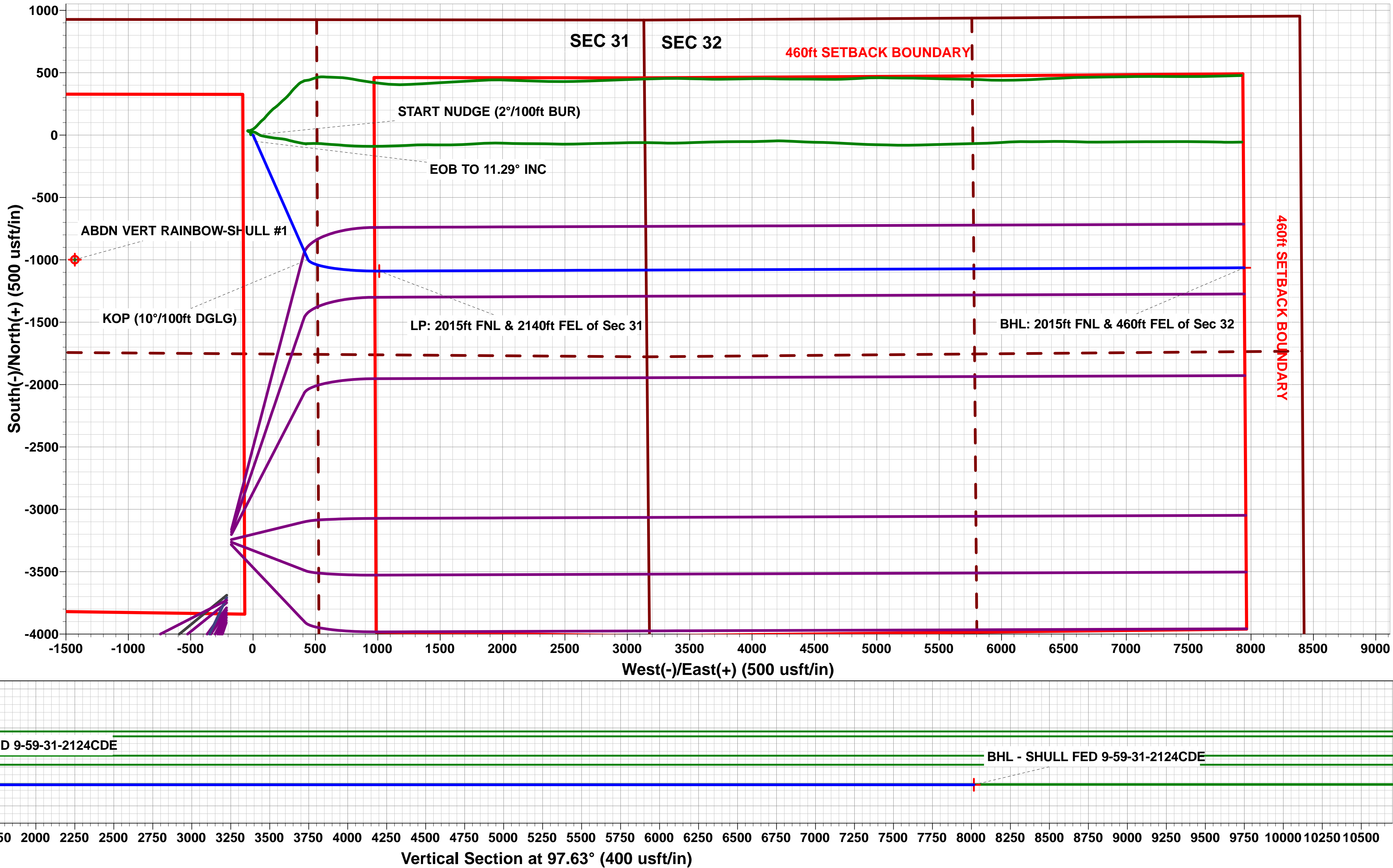
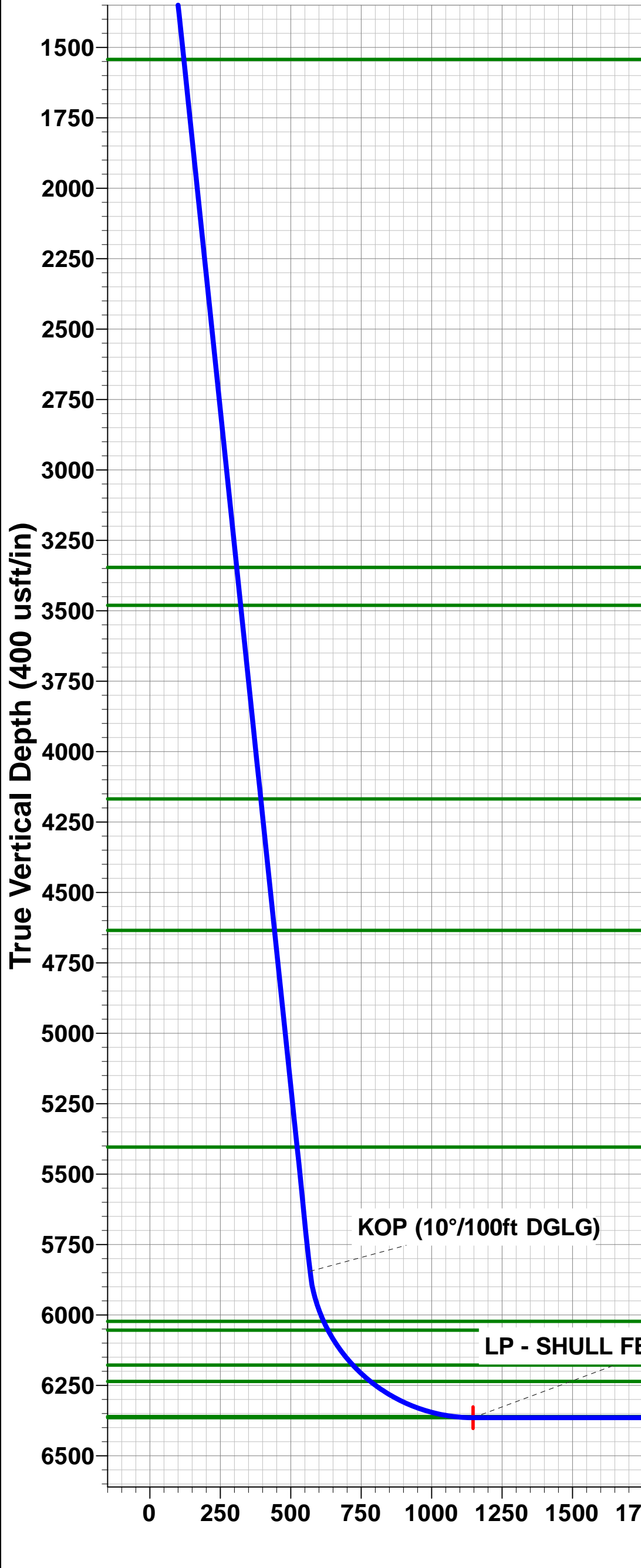
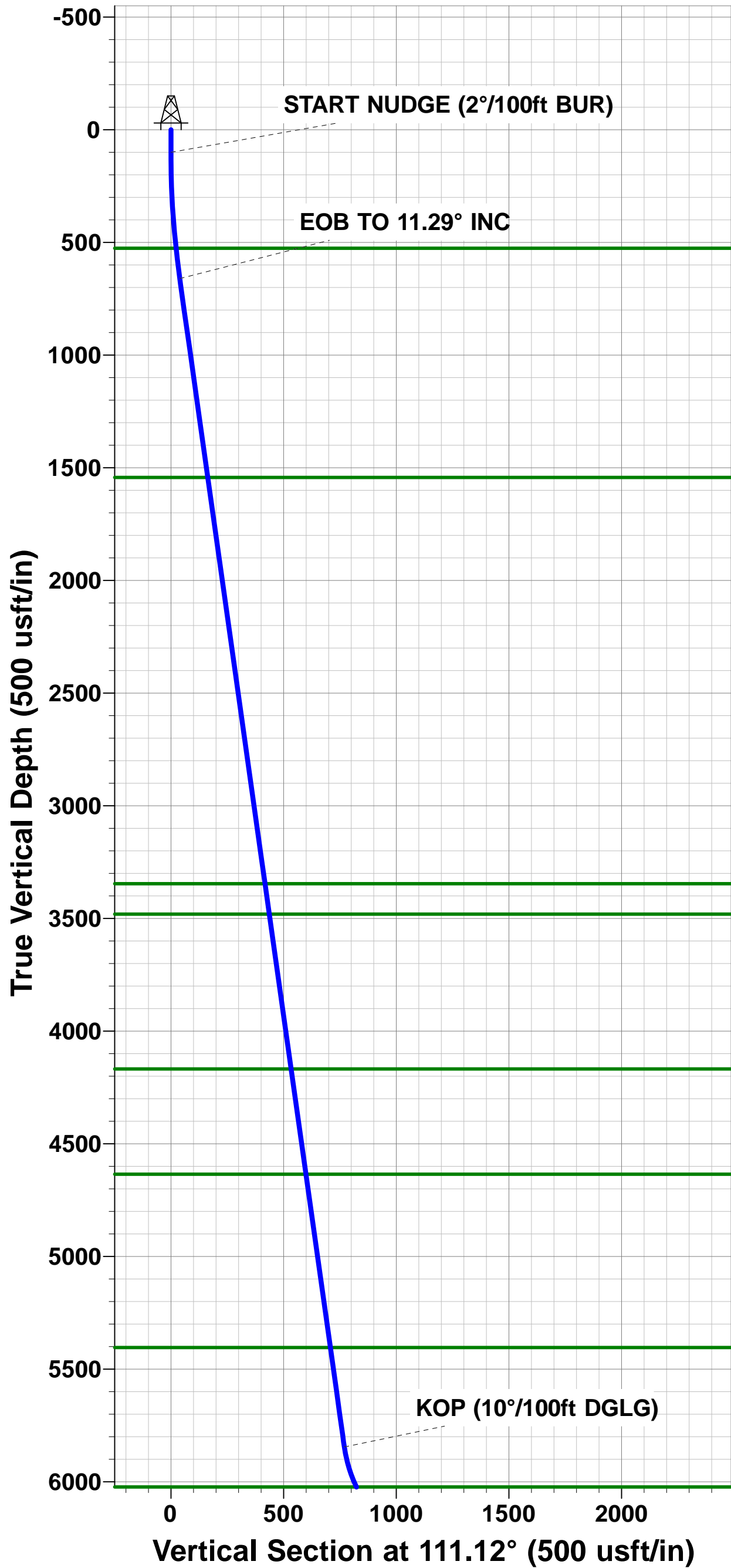
Azimuths to True North
Magnetic North: 7.58°
Magnetic Field
Strength: 52354.6nT
Dip Angle: 67.15°
Date: 2019-11-04
Model: IGRF2015

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
526.00	527.59	Fox Hills Base
1543.00	1564.04	Pierre Shale Top
3346.00	3402.59	Richard Sandstone
3481.00	3540.25	Parkman Sandstone
4168.00	4240.79	Sussex Sandstone
4635.00	4717.00	Shannon Sandstone
5404.00	5501.16	TeePee Buttes
6023.00	6138.01	Sharon Springs
6054.00	6172.76	Niobrara Top
6178.00	6325.77	Niobrara B2 Chalk Top
6236.00	6411.02	Niobrara C Chalk Top
6361.00	6738.17	Codell Top
6365.00	6806.47	Codell (Target)

PROPOSED LOCAL COORDINATES:

SHL: 926ft FNL & 2128ft FWL of Sec 31
HZ LP: 2015ft FNL & 2140ft FEL of Sec 31
BHL: 2015ft FNL & 460ft FEL of Sec 32



Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well SHULL FED 9-59-31-2124CDE
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4932.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4932.00usft
Site:	NE NW SEC. 31 T9N R59W 6th P.M.	North Reference:	True
Well:	SHULL FED 9-59-31-2124CDE	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

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

Site	NE NW SEC. 31 T9N R59W 6th P.M.		
Site Position:		Northing:	1,505,316.95 usft
From:	Lat/Long	Easting:	3,409,683.34 usft
Position Uncertainty:	0.00 usft	Slot Radius:	1.10 ft
		Latitude:	40.711115
		Longitude:	-104.022169
		Grid Convergence:	0.95 °

Well	SHULL FED 9-59-31-2124CDE		
Well Position	+N/-S	111.48 usft	Northing:
	+E/-W	-135.29 usft	Easting:
Position Uncertainty	0.00 usft		Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	2019-11-04	7.58	67.15	52,354.62035816

Design	PROPOSAL #1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	6,365.00	0.00	0.00	97.63

Plan Sections											
MD (usft)	Inc (°)	Azi (°)	Vertical Depth	SS (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100usf)	Turn Rate (°/100usf)	TFO (°)	Target
0.00	0.00	0.00	0.00	-4,932.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	-4,832.00	0.00	0.00	0.00	0.00	0.00	0.00	
664.25	11.29	156.19	660.61	-4,271.39	-50.67	22.36	2.00	2.00	0.00	156.19	
5,951.40	11.29	156.19	5,845.54	913.54	-997.23	440.12	0.00	0.00	0.00	0.00	
6,806.47	90.00	89.78	6,365.00	1,433.00	-1,090.05	1,011.67	10.00	9.21	-7.77	-66.81	LP - SHULL FED 9-
13,739.89	90.00	89.78	6,365.00	1,433.00	-1,063.65	7,945.04	0.00	0.00	0.00	0.00	BHL - SHULL FED

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well SHULL FED 9-59-31-2124CDE
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4932.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4932.00usft
Site:	NE NW SEC. 31 T9N R59W 6th P.M.	North Reference:	True
Well:	SHULL FED 9-59-31-2124CDE	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
SHL: 926ft FNL & 2128ft FWL of Sec 31										
0.00	0.00	0.00	0.00	4,932.00	0.00	0.00	0.00	0.00	0.00	0.00
START NUDGE (2°/100ft BUR)										
100.00	0.00	0.00	100.00	4,832.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	2.00	156.19	199.98	4,732.02	-1.60	0.70	0.91	2.00	2.00	0.00
300.00	4.00	156.19	299.84	4,632.16	-6.38	2.82	3.64	2.00	2.00	0.00
400.00	6.00	156.19	399.45	4,532.55	-14.36	6.34	8.19	2.00	2.00	0.00
500.00	8.00	156.19	498.70	4,433.30	-25.51	11.26	14.54	2.00	2.00	0.00
Fox Hills Base										
527.59	8.55	156.19	526.00	4,406.00	-29.14	12.86	16.61	2.00	2.00	0.00
600.00	10.00	156.19	597.47	4,334.53	-39.82	17.57	22.70	2.00	2.00	0.00
EOB TO 11.29° INC										
664.25	11.29	156.19	660.61	4,271.39	-50.67	22.36	28.89	2.00	2.00	0.00
700.00	11.29	156.19	695.67	4,236.33	-57.07	25.19	32.54	0.00	0.00	0.00
800.00	11.29	156.19	793.73	4,138.27	-74.98	33.09	42.75	0.00	0.00	0.00
900.00	11.29	156.19	891.80	4,040.20	-92.88	40.99	52.95	0.00	0.00	0.00
1,000.00	11.29	156.19	989.87	3,942.13	-110.78	48.89	63.16	0.00	0.00	0.00
1,100.00	11.29	156.19	1,087.93	3,844.07	-128.68	56.79	73.37	0.00	0.00	0.00
1,200.00	11.29	156.19	1,186.00	3,746.00	-146.59	64.69	83.57	0.00	0.00	0.00
1,300.00	11.29	156.19	1,284.07	3,647.93	-164.49	72.60	93.78	0.00	0.00	0.00
1,400.00	11.29	156.19	1,382.13	3,549.87	-182.39	80.50	103.99	0.00	0.00	0.00
1,500.00	11.29	156.19	1,480.20	3,451.80	-200.30	88.40	114.19	0.00	0.00	0.00
Pierre Shale Top										
1,564.04	11.29	156.19	1,543.00	3,389.00	-211.76	93.46	120.73	0.00	0.00	0.00
1,600.00	11.29	156.19	1,578.27	3,353.73	-218.20	96.30	124.40	0.00	0.00	0.00
1,700.00	11.29	156.19	1,676.33	3,255.67	-236.10	104.20	134.61	0.00	0.00	0.00
1,800.00	11.29	156.19	1,774.40	3,157.60	-254.01	112.10	144.82	0.00	0.00	0.00
1,900.00	11.29	156.19	1,872.47	3,059.53	-271.91	120.00	155.02	0.00	0.00	0.00
2,000.00	11.29	156.19	1,970.53	2,961.47	-289.81	127.91	165.23	0.00	0.00	0.00
2,100.00	11.29	156.19	2,068.60	2,863.40	-307.72	135.81	175.44	0.00	0.00	0.00
2,200.00	11.29	156.19	2,166.67	2,765.33	-325.62	143.71	185.64	0.00	0.00	0.00
2,300.00	11.29	156.19	2,264.73	2,667.27	-343.52	151.61	195.85	0.00	0.00	0.00
2,400.00	11.29	156.19	2,362.80	2,569.20	-361.42	159.51	206.06	0.00	0.00	0.00
2,500.00	11.29	156.19	2,460.87	2,471.13	-379.33	167.41	216.26	0.00	0.00	0.00
2,600.00	11.29	156.19	2,558.93	2,373.07	-397.23	175.31	226.47	0.00	0.00	0.00
2,700.00	11.29	156.19	2,657.00	2,275.00	-415.13	183.21	236.68	0.00	0.00	0.00
2,800.00	11.29	156.19	2,755.07	2,176.93	-433.04	191.12	246.89	0.00	0.00	0.00
2,900.00	11.29	156.19	2,853.13	2,078.87	-450.94	199.02	257.09	0.00	0.00	0.00
3,000.00	11.29	156.19	2,951.20	1,980.80	-468.84	206.92	267.30	0.00	0.00	0.00
3,100.00	11.29	156.19	3,049.27	1,882.73	-486.75	214.82	277.51	0.00	0.00	0.00
3,200.00	11.29	156.19	3,147.33	1,784.67	-504.65	222.72	287.71	0.00	0.00	0.00
3,300.00	11.29	156.19	3,245.40	1,686.60	-522.55	230.62	297.92	0.00	0.00	0.00
3,400.00	11.29	156.19	3,343.46	1,588.54	-540.45	238.52	308.13	0.00	0.00	0.00
Richard Sandstone										
3,402.59	11.29	156.19	3,346.00	1,586.00	-540.92	238.73	308.39	0.00	0.00	0.00
3,500.00	11.29	156.19	3,441.53	1,490.47	-558.36	246.42	318.33	0.00	0.00	0.00
Parkman Sandstone										
3,540.25	11.29	156.19	3,481.00	1,451.00	-565.56	249.60	322.44	0.00	0.00	0.00
3,600.00	11.29	156.19	3,539.60	1,392.40	-576.26	254.33	328.54	0.00	0.00	0.00
3,700.00	11.29	156.19	3,637.66	1,294.34	-594.16	262.23	338.75	0.00	0.00	0.00
3,800.00	11.29	156.19	3,735.73	1,196.27	-612.07	270.13	348.96	0.00	0.00	0.00
3,900.00	11.29	156.19	3,833.80	1,098.20	-629.97	278.03	359.16	0.00	0.00	0.00
4,000.00	11.29	156.19	3,931.86	1,000.14	-647.87	285.93	369.37	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well SHULL FED 9-59-31-2124CDE
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4932.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4932.00usft
Site:	NE NW SEC. 31 T9N R59W 6th P.M.	North Reference:	True
Well:	SHULL FED 9-59-31-2124CDE	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,100.00	11.29	156.19	4,029.93	902.07	-665.78	293.83	379.58	0.00	0.00	0.00
4,200.00	11.29	156.19	4,128.00	804.00	-683.68	301.73	389.78	0.00	0.00	0.00
Sussex Sandstone										
4,240.79	11.29	156.19	4,168.00	764.00	-690.98	304.96	393.95	0.00	0.00	0.00
4,300.00	11.29	156.19	4,226.06	705.94	-701.58	309.63	399.99	0.00	0.00	0.00
4,400.00	11.29	156.19	4,324.13	607.87	-719.49	317.54	410.20	0.00	0.00	0.00
4,500.00	11.29	156.19	4,422.20	509.80	-737.39	325.44	420.40	0.00	0.00	0.00
4,600.00	11.29	156.19	4,520.26	411.74	-755.29	333.34	430.61	0.00	0.00	0.00
4,700.00	11.29	156.19	4,618.33	313.67	-773.19	341.24	440.82	0.00	0.00	0.00
Shannon Sandstone										
4,717.00	11.29	156.19	4,635.00	297.00	-776.24	342.58	442.55	0.00	0.00	0.00
4,800.00	11.29	156.19	4,716.40	215.60	-791.10	349.14	451.03	0.00	0.00	0.00
4,900.00	11.29	156.19	4,814.46	117.54	-809.00	357.04	461.23	0.00	0.00	0.00
5,000.00	11.29	156.19	4,912.53	19.47	-826.90	364.94	471.44	0.00	0.00	0.00
5,100.00	11.29	156.19	5,010.60	-78.60	-844.81	372.84	481.65	0.00	0.00	0.00
5,200.00	11.29	156.19	5,108.66	-176.66	-862.71	380.75	491.85	0.00	0.00	0.00
5,300.00	11.29	156.19	5,206.73	-274.73	-880.61	388.65	502.06	0.00	0.00	0.00
5,400.00	11.29	156.19	5,304.80	-372.80	-898.52	396.55	512.27	0.00	0.00	0.00
5,500.00	11.29	156.19	5,402.86	-470.86	-916.42	404.45	522.47	0.00	0.00	0.00
TeePee Buttes										
5,501.16	11.29	156.19	5,404.00	-472.00	-916.63	404.54	522.59	0.00	0.00	0.00
5,600.00	11.29	156.19	5,500.93	-568.93	-934.32	412.35	532.68	0.00	0.00	0.00
5,700.00	11.29	156.19	5,599.00	-667.00	-952.22	420.25	542.89	0.00	0.00	0.00
5,800.00	11.29	156.19	5,697.06	-765.06	-970.13	428.15	553.10	0.00	0.00	0.00
5,900.00	11.29	156.19	5,795.13	-863.13	-988.03	436.06	563.30	0.00	0.00	0.00
KOP (10°/100ft DGLG)										
5,951.40	11.29	156.19	5,845.54	-913.54	-997.23	440.12	568.55	0.00	0.00	0.00
6,000.00	13.92	137.31	5,892.98	-960.98	-1,005.89	446.01	575.53	10.00	5.43	-38.85
6,100.00	21.86	116.90	5,988.16	-1,056.16	-1,023.20	470.83	602.44	10.00	7.93	-20.40
Sharon Springs										
6,138.01	25.25	112.60	6,023.00	-1,091.00	-1,029.52	484.63	616.95	10.00	8.92	-11.33
Niobrara Top										
6,172.76	28.44	109.52	6,054.00	-1,122.00	-1,035.13	499.27	632.21	10.00	9.17	-8.85
6,200.00	30.97	107.52	6,077.66	-1,145.66	-1,039.41	512.07	645.47	10.00	9.32	-7.34
6,300.00	40.48	102.15	6,158.77	-1,226.77	-1,054.02	568.49	703.32	10.00	9.50	-5.36
Niobrara B2 Chalk Top										
6,325.77	42.96	101.11	6,178.00	-1,246.00	-1,057.48	585.28	720.42	10.00	9.63	-4.06
6,400.00	50.15	98.56	6,229.02	-1,297.02	-1,066.60	638.35	774.24	10.00	9.69	-3.43
Niobrara C Chalk Top										
6,411.02	51.22	98.23	6,236.00	-1,304.00	-1,067.85	646.79	782.76	10.00	9.73	-3.01
6,500.00	59.90	95.87	6,286.27	-1,354.27	-1,076.77	719.55	856.07	10.00	9.76	-2.66
6,600.00	69.70	93.66	6,328.80	-1,396.80	-1,084.20	809.61	946.32	10.00	9.80	-2.21
6,700.00	79.53	91.72	6,355.30	-1,423.30	-1,088.68	905.80	1,042.25	10.00	9.82	-1.94
Codell Top										
6,738.17	83.28	91.02	6,361.00	-1,429.00	-1,089.58	943.53	1,079.76	10.00	9.83	-1.84
6,800.00	89.36	89.90	6,364.96	-1,432.96	-1,090.07	1,005.20	1,140.95	10.00	9.84	-1.81
LP: 2015ft FNL & 2140ft FEL of Sec 31 - Codell (Target)										
6,806.47	90.00	89.78	6,365.00	-1,433.00	-1,090.05	1,011.67	1,147.37	10.00	9.84	-1.80
6,900.00	90.00	89.78	6,365.00	-1,433.00	-1,089.69	1,105.20	1,240.02	0.00	0.00	0.00
7,000.00	90.00	89.78	6,365.00	-1,433.00	-1,089.31	1,205.20	1,339.08	0.00	0.00	0.00
7,100.00	90.00	89.78	6,365.00	-1,433.00	-1,088.93	1,305.19	1,438.15	0.00	0.00	0.00
7,200.00	90.00	89.78	6,365.00	-1,433.00	-1,088.55	1,405.19	1,537.21	0.00	0.00	0.00
7,300.00	90.00	89.78	6,365.00	-1,433.00	-1,088.17	1,505.19	1,636.27	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well SHULL FED 9-59-31-2124CDE
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4932.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4932.00usft
Site:	NE NW SEC. 31 T9N R59W 6th P.M.	North Reference:	True
Well:	SHULL FED 9-59-31-2124CDE	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,400.00	90.00	89.78	6,365.00	-1,433.00	-1,087.79	1,605.19	1,735.34	0.00	0.00	0.00
7,500.00	90.00	89.78	6,365.00	-1,433.00	-1,087.41	1,705.19	1,834.40	0.00	0.00	0.00
7,600.00	90.00	89.78	6,365.00	-1,433.00	-1,087.03	1,805.19	1,933.47	0.00	0.00	0.00
7,700.00	90.00	89.78	6,365.00	-1,433.00	-1,086.65	1,905.19	2,032.53	0.00	0.00	0.00
7,800.00	90.00	89.78	6,365.00	-1,433.00	-1,086.27	2,005.19	2,131.60	0.00	0.00	0.00
7,900.00	90.00	89.78	6,365.00	-1,433.00	-1,085.89	2,105.19	2,230.66	0.00	0.00	0.00
8,000.00	90.00	89.78	6,365.00	-1,433.00	-1,085.50	2,205.19	2,329.73	0.00	0.00	0.00
8,100.00	90.00	89.78	6,365.00	-1,433.00	-1,085.12	2,305.19	2,428.79	0.00	0.00	0.00
8,200.00	90.00	89.78	6,365.00	-1,433.00	-1,084.74	2,405.19	2,527.85	0.00	0.00	0.00
8,300.00	90.00	89.78	6,365.00	-1,433.00	-1,084.36	2,505.19	2,626.92	0.00	0.00	0.00
8,400.00	90.00	89.78	6,365.00	-1,433.00	-1,083.98	2,605.19	2,725.98	0.00	0.00	0.00
8,500.00	90.00	89.78	6,365.00	-1,433.00	-1,083.60	2,705.18	2,825.05	0.00	0.00	0.00
8,600.00	90.00	89.78	6,365.00	-1,433.00	-1,083.22	2,805.18	2,924.11	0.00	0.00	0.00
8,700.00	90.00	89.78	6,365.00	-1,433.00	-1,082.84	2,905.18	3,023.18	0.00	0.00	0.00
8,800.00	90.00	89.78	6,365.00	-1,433.00	-1,082.46	3,005.18	3,122.24	0.00	0.00	0.00
8,900.00	90.00	89.78	6,365.00	-1,433.00	-1,082.08	3,105.18	3,221.31	0.00	0.00	0.00
9,000.00	90.00	89.78	6,365.00	-1,433.00	-1,081.70	3,205.18	3,320.37	0.00	0.00	0.00
9,100.00	90.00	89.78	6,365.00	-1,433.00	-1,081.32	3,305.18	3,419.44	0.00	0.00	0.00
9,200.00	90.00	89.78	6,365.00	-1,433.00	-1,080.93	3,405.18	3,518.50	0.00	0.00	0.00
9,300.00	90.00	89.78	6,365.00	-1,433.00	-1,080.55	3,505.18	3,617.56	0.00	0.00	0.00
9,400.00	90.00	89.78	6,365.00	-1,433.00	-1,080.17	3,605.18	3,716.63	0.00	0.00	0.00
9,500.00	90.00	89.78	6,365.00	-1,433.00	-1,079.79	3,705.18	3,815.69	0.00	0.00	0.00
9,600.00	90.00	89.78	6,365.00	-1,433.00	-1,079.41	3,805.18	3,914.76	0.00	0.00	0.00
9,700.00	90.00	89.78	6,365.00	-1,433.00	-1,079.03	3,905.18	4,013.82	0.00	0.00	0.00
9,800.00	90.00	89.78	6,365.00	-1,433.00	-1,078.65	4,005.17	4,112.89	0.00	0.00	0.00
9,900.00	90.00	89.78	6,365.00	-1,433.00	-1,078.27	4,105.17	4,211.95	0.00	0.00	0.00
10,000.00	90.00	89.78	6,365.00	-1,433.00	-1,077.89	4,205.17	4,311.02	0.00	0.00	0.00
10,100.00	90.00	89.78	6,365.00	-1,433.00	-1,077.51	4,305.17	4,410.08	0.00	0.00	0.00
10,200.00	90.00	89.78	6,365.00	-1,433.00	-1,077.13	4,405.17	4,509.14	0.00	0.00	0.00
10,300.00	90.00	89.78	6,365.00	-1,433.00	-1,076.75	4,505.17	4,608.21	0.00	0.00	0.00
10,400.00	90.00	89.78	6,365.00	-1,433.00	-1,076.37	4,605.17	4,707.27	0.00	0.00	0.00
10,500.00	90.00	89.78	6,365.00	-1,433.00	-1,075.98	4,705.17	4,806.34	0.00	0.00	0.00
10,600.00	90.00	89.78	6,365.00	-1,433.00	-1,075.60	4,805.17	4,905.40	0.00	0.00	0.00
10,700.00	90.00	89.78	6,365.00	-1,433.00	-1,075.22	4,905.17	5,004.47	0.00	0.00	0.00
10,800.00	90.00	89.78	6,365.00	-1,433.00	-1,074.84	5,005.17	5,103.53	0.00	0.00	0.00
10,900.00	90.00	89.78	6,365.00	-1,433.00	-1,074.46	5,105.17	5,202.60	0.00	0.00	0.00
11,000.00	90.00	89.78	6,365.00	-1,433.00	-1,074.08	5,205.17	5,301.66	0.00	0.00	0.00
11,100.00	90.00	89.78	6,365.00	-1,433.00	-1,073.70	5,305.17	5,400.72	0.00	0.00	0.00
11,200.00	90.00	89.78	6,365.00	-1,433.00	-1,073.32	5,405.16	5,499.79	0.00	0.00	0.00
11,300.00	90.00	89.78	6,365.00	-1,433.00	-1,072.94	5,505.16	5,598.85	0.00	0.00	0.00
11,400.00	90.00	89.78	6,365.00	-1,433.00	-1,072.56	5,605.16	5,697.92	0.00	0.00	0.00
11,500.00	90.00	89.78	6,365.00	-1,433.00	-1,072.18	5,705.16	5,796.98	0.00	0.00	0.00
11,600.00	90.00	89.78	6,365.00	-1,433.00	-1,071.80	5,805.16	5,896.05	0.00	0.00	0.00
11,700.00	90.00	89.78	6,365.00	-1,433.00	-1,071.42	5,905.16	5,995.11	0.00	0.00	0.00
11,800.00	90.00	89.78	6,365.00	-1,433.00	-1,071.03	6,005.16	6,094.18	0.00	0.00	0.00
11,900.00	90.00	89.78	6,365.00	-1,433.00	-1,070.65	6,105.16	6,193.24	0.00	0.00	0.00
12,000.00	90.00	89.78	6,365.00	-1,433.00	-1,070.27	6,205.16	6,292.31	0.00	0.00	0.00
12,100.00	90.00	89.78	6,365.00	-1,433.00	-1,069.89	6,305.16	6,391.37	0.00	0.00	0.00
12,200.00	90.00	89.78	6,365.00	-1,433.00	-1,069.51	6,405.16	6,490.43	0.00	0.00	0.00
12,300.00	90.00	89.78	6,365.00	-1,433.00	-1,069.13	6,505.16	6,589.50	0.00	0.00	0.00
12,400.00	90.00	89.78	6,365.00	-1,433.00	-1,068.75	6,605.16	6,688.56	0.00	0.00	0.00
12,500.00	90.00	89.78	6,365.00	-1,433.00	-1,068.37	6,705.16	6,787.63	0.00	0.00	0.00
12,600.00	90.00	89.78	6,365.00	-1,433.00	-1,067.99	6,805.15	6,886.69	0.00	0.00	0.00
12,700.00	90.00	89.78	6,365.00	-1,433.00	-1,067.61	6,905.15	6,985.76	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well SHULL FED 9-59-31-2124CDE
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4932.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4932.00usft
Site:	NE NW SEC. 31 T9N R59W 6th P.M.	North Reference:	True
Well:	SHULL FED 9-59-31-2124CDE	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,800.00	90.00	89.78	6,365.00	-1,433.00	-1,067.23	7,005.15	7,084.82	0.00	0.00	0.00
12,900.00	90.00	89.78	6,365.00	-1,433.00	-1,066.85	7,105.15	7,183.89	0.00	0.00	0.00
13,000.00	90.00	89.78	6,365.00	-1,433.00	-1,066.46	7,205.15	7,282.95	0.00	0.00	0.00
13,100.00	90.00	89.78	6,365.00	-1,433.00	-1,066.08	7,305.15	7,382.01	0.00	0.00	0.00
13,200.00	90.00	89.78	6,365.00	-1,433.00	-1,065.70	7,405.15	7,481.08	0.00	0.00	0.00
13,300.00	90.00	89.78	6,365.00	-1,433.00	-1,065.32	7,505.15	7,580.14	0.00	0.00	0.00
13,400.00	90.00	89.78	6,365.00	-1,433.00	-1,064.94	7,605.15	7,679.21	0.00	0.00	0.00
13,500.00	90.00	89.78	6,365.00	-1,433.00	-1,064.56	7,705.15	7,778.27	0.00	0.00	0.00
13,600.00	90.00	89.78	6,365.00	-1,433.00	-1,064.18	7,805.15	7,877.34	0.00	0.00	0.00
13,700.00	90.00	89.78	6,365.00	-1,433.00	-1,063.80	7,905.15	7,976.40	0.00	0.00	0.00
BHL: 2015ft FNL & 460ft FEL of Sec 32										
13,739.89	90.00	89.78	6,365.00	-1,433.00	-1,063.65	7,945.04	8,015.92	0.00	0.00	0.00

Formations						
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
527.59	526.00	Fox Hills Base		0.00		
1,564.04	1,543.00	Pierre Shale Top		0.00		
3,402.59	3,346.00	Richard Sandstone		0.00		
3,540.25	3,481.00	Parkman Sandstone		0.00		
4,240.79	4,168.00	Sussex Sandstone		0.00		
4,717.00	4,635.00	Shannon Sandstone		0.00		
5,501.16	5,404.00	TeePee Buttes		0.00		
6,138.01	6,023.00	Sharon Springs		0.00		
6,172.76	6,054.00	Niobrara Top		0.00		
6,325.77	6,178.00	Niobrara B2 Chalk Top		0.00		
6,411.02	6,236.00	Niobrara C Chalk Top		0.00		
6,738.17	6,361.00	Codell Top		0.00		
6,806.47	6,365.00	Codell (Target)		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: 926ft FNL & 2128ft FWL of Sec 31	
100.00	100.00	0.00	0.00	START NUDGE (2°/100ft BUR)	
664.25	660.61	-50.67	22.36	EOB TO 11.29° INC	
5,951.40	5,845.54	-997.23	440.12	KOP (10°/100ft DGLG)	
6,806.47	6,365.00	-1,090.05	1,011.67	LP: 2015ft FNL & 2140ft FEL of Sec 31	
13,739.89	6,365.00	-1,063.65	7,945.04	BHL: 2015ft FNL & 460ft FEL of Sec 32	