

Noble Energy

Garfield County, CO

Sec. 20-T7S-R94W

Long 20-23C

Plan #1

Plan: Plan #1 Proposal

Sperry Drilling Services

Proposal Report

22 January, 2009

Well Coordinates: 589,013.27 N, 1,317,894.03 E (39° 25' 32.69" N, 107° 54' 53.67" W)

Ground Level: 7,906.00 ft

Local Coordinate Origin:

Centered on Well Long 20-23C

Viewing Datum:

RKB 25' @ 7931.00ft (Original Well Elev)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 42

HALLIBURTON

Plan Report for Long 20-23C - Plan #1 Proposal

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.00	0.00	0.00	225.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kickoff at 225.00ft										
300.00	1.50	148.43	299.99	-0.84	0.51	0.98	2.00	2.00	0.00	148.43
400.00	3.50	148.43	399.89	-4.55	2.80	5.34	2.00	2.00	0.00	0.00
500.00	5.50	148.43	499.58	-11.24	6.91	13.19	2.00	2.00	0.00	0.00
600.00	7.50	148.43	598.93	-20.88	12.83	24.50	2.00	2.00	0.00	0.00
610.00	7.70	148.43	608.84	-22.01	13.53	25.82	2.00	2.00	0.00	0.00
Build Rate = 2.00°/100ft										
700.00	9.50	148.43	697.83	-33.47	20.57	39.28	2.00	2.00	0.00	0.00
800.00	11.50	148.43	796.15	-49.00	30.11	57.50	2.00	2.00	0.00	0.00
900.00	13.50	148.43	893.77	-67.44	41.45	79.13	2.00	2.00	0.00	0.00
984.92	15.20	148.43	976.04	-85.37	52.46	100.17	2.00	2.00	0.00	0.00
End Build at 984.92ft										
1,000.00	15.20	148.43	990.59	-88.73	54.53	104.13	0.00	0.00	0.00	0.00
1,100.00	15.20	148.43	1,087.09	-111.07	68.26	130.34	0.00	0.00	0.00	0.00
1,200.00	15.20	148.43	1,183.60	-133.40	81.99	156.54	0.00	0.00	0.00	0.00
1,300.00	15.20	148.43	1,280.10	-155.74	95.71	182.75	0.00	0.00	0.00	0.00
1,400.00	15.20	148.43	1,376.60	-178.08	109.44	208.96	0.00	0.00	0.00	0.00
1,500.00	15.20	148.43	1,473.10	-200.41	123.17	235.17	0.00	0.00	0.00	0.00
1,600.00	15.20	148.43	1,569.61	-222.75	136.90	261.38	0.00	0.00	0.00	0.00
1,700.00	15.20	148.43	1,666.11	-245.08	150.62	287.59	0.00	0.00	0.00	0.00
1,800.00	15.20	148.43	1,762.61	-267.42	164.35	313.80	0.00	0.00	0.00	0.00
1,900.00	15.20	148.43	1,859.11	-289.75	178.08	340.01	0.00	0.00	0.00	0.00
2,000.00	15.20	148.43	1,955.62	-312.09	191.80	366.22	0.00	0.00	0.00	0.00
2,100.00	15.20	148.43	2,052.12	-334.42	205.53	392.43	0.00	0.00	0.00	0.00
2,200.00	15.20	148.43	2,148.62	-356.76	219.26	418.64	0.00	0.00	0.00	0.00
2,300.00	15.20	148.43	2,245.12	-379.09	232.98	444.85	0.00	0.00	0.00	0.00
2,400.00	15.20	148.43	2,341.63	-401.43	246.71	471.06	0.00	0.00	0.00	0.00
2,500.00	15.20	148.43	2,438.13	-423.76	260.44	497.27	0.00	0.00	0.00	0.00
8 5/8" Casing Pt.										
2,600.00	15.20	148.43	2,534.63	-446.10	274.16	523.48	0.00	0.00	0.00	0.00
2,700.00	15.20	148.43	2,631.13	-468.43	287.89	549.69	0.00	0.00	0.00	0.00
2,800.00	15.20	148.43	2,727.63	-490.77	301.62	575.90	0.00	0.00	0.00	0.00
2,900.00	15.20	148.43	2,824.14	-513.10	315.34	602.10	0.00	0.00	0.00	0.00
3,000.00	15.20	148.43	2,920.64	-535.44	329.07	628.31	0.00	0.00	0.00	0.00
3,100.00	15.20	148.43	3,017.14	-557.78	342.80	654.52	0.00	0.00	0.00	0.00
3,200.00	15.20	148.43	3,113.64	-580.11	356.52	680.73	0.00	0.00	0.00	0.00
3,300.00	15.20	148.43	3,210.15	-602.45	370.25	706.94	0.00	0.00	0.00	0.00
15.20 Inclination										
3,400.00	15.20	148.43	3,306.65	-624.78	383.98	733.15	0.00	0.00	0.00	0.00
3,500.00	15.20	148.43	3,403.15	-647.12	397.70	759.36	0.00	0.00	0.00	0.00
3,600.00	15.20	148.43	3,499.65	-669.45	411.43	785.57	0.00	0.00	0.00	0.00
3,700.00	15.20	148.43	3,596.16	-691.79	425.16	811.78	0.00	0.00	0.00	0.00
3,800.00	15.20	148.43	3,692.66	-714.12	438.89	837.99	0.00	0.00	0.00	0.00
3,900.00	15.20	148.43	3,789.16	-736.46	452.61	864.20	0.00	0.00	0.00	0.00
4,000.00	15.20	148.43	3,885.66	-758.79	466.34	890.41	0.00	0.00	0.00	0.00
4,100.00	15.20	148.43	3,982.17	-781.13	480.07	916.62	0.00	0.00	0.00	0.00
4,200.00	15.20	148.43	4,078.67	-803.46	493.79	942.83	0.00	0.00	0.00	0.00
4,300.00	15.20	148.43	4,175.17	-825.80	507.52	969.04	0.00	0.00	0.00	0.00
4,400.00	15.20	148.43	4,271.67	-848.13	521.25	995.25	0.00	0.00	0.00	0.00
4,500.00	15.20	148.43	4,368.18	-870.47	534.97	1,021.46	0.00	0.00	0.00	0.00
4,600.00	15.20	148.43	4,464.68	-892.80	548.70	1,047.66	0.00	0.00	0.00	0.00
4,700.00	15.20	148.43	4,561.18	-915.14	562.43	1,073.87	0.00	0.00	0.00	0.00
4,800.00	15.20	148.43	4,657.68	-937.47	576.15	1,100.08	0.00	0.00	0.00	0.00
4,900.00	15.20	148.43	4,754.19	-959.81	589.88	1,126.29	0.00	0.00	0.00	0.00

Plan Report for Long 20-23C - Plan #1 Proposal

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
5,000.00	15.20	148.43	4,850.69	-982.15	603.61	1,152.50	0.00	0.00	0.00	0.00
5,100.00	15.20	148.43	4,947.19	-1,004.48	617.33	1,178.71	0.00	0.00	0.00	0.00
5,200.00	15.20	148.43	5,043.69	-1,026.82	631.06	1,204.92	0.00	0.00	0.00	0.00
5,300.00	15.20	148.43	5,140.19	-1,049.15	644.79	1,231.13	0.00	0.00	0.00	0.00
5,400.00	15.20	148.43	5,236.70	-1,071.49	658.51	1,257.34	0.00	0.00	0.00	0.00
5,500.00	15.20	148.43	5,333.20	-1,093.82	672.24	1,283.55	0.00	0.00	0.00	0.00
5,600.00	15.20	148.43	5,429.70	-1,116.16	685.97	1,309.76	0.00	0.00	0.00	0.00
5,600.95	15.20	148.43	5,430.62	-1,116.37	686.10	1,310.01	0.00	0.00	0.00	0.00
Begin Drop at 5600.95ft										
5,700.00	13.71	148.43	5,526.53	-1,137.43	699.04	1,334.73	1.50	-1.50	0.00	180.00
5,800.00	12.21	148.43	5,623.98	-1,156.54	710.79	1,357.15	1.50	-1.50	0.00	180.00
5,900.00	10.71	148.43	5,721.98	-1,173.47	721.19	1,377.02	1.50	-1.50	0.00	180.00
6,000.00	9.21	148.43	5,820.47	-1,188.21	730.25	1,394.31	1.50	-1.50	0.00	180.00
6,100.00	7.71	148.43	5,919.38	-1,200.75	737.96	1,409.03	1.50	-1.50	0.00	-180.00
Drop Rate = 1.50°/100ft										
6,200.00	6.21	148.43	6,018.64	-1,211.08	744.30	1,421.14	1.50	-1.50	0.00	180.00
6,300.00	4.71	148.43	6,118.18	-1,219.19	749.29	1,430.66	1.50	-1.50	0.00	180.00
6,400.00	3.21	148.43	6,217.94	-1,225.08	752.91	1,437.57	1.50	-1.50	0.00	180.00
6,500.00	1.71	148.43	6,317.84	-1,228.74	755.16	1,441.87	1.50	-1.50	0.00	180.00
6,600.00	0.21	148.43	6,417.83	-1,230.17	756.04	1,443.54	1.50	-1.50	0.00	180.00
6,614.17	0.00	0.00	6,432.00	-1,230.19	756.05	1,443.57	1.50	-1.50	-1,047.31	-180.00
End Drop at 6614.17ft - Williams Fork - Long 20-23C Plan #1 Driller's Tgt										
6,700.00	0.07	223.23	6,517.83	-1,230.23	756.01	1,443.59	0.08	0.08	-159.36	-136.77
6,800.00	0.15	223.23	6,617.83	-1,230.37	755.88	1,443.64	0.08	0.08	0.00	0.00
6,900.00	0.23	223.23	6,717.83	-1,230.61	755.66	1,443.73	0.08	0.08	0.00	0.00
7,000.00	0.31	223.23	6,817.83	-1,230.95	755.34	1,443.87	0.08	0.08	0.00	0.00
7,100.00	0.39	223.23	6,917.82	-1,231.39	754.92	1,444.04	0.08	0.08	0.00	0.00
7,200.00	0.47	223.23	7,017.82	-1,231.94	754.41	1,444.25	0.08	0.08	0.00	0.00
7,300.00	0.55	223.23	7,117.82	-1,232.58	753.80	1,444.50	0.08	0.08	0.00	0.00
7,400.00	0.63	223.23	7,217.81	-1,233.33	753.10	1,444.80	0.08	0.08	0.00	0.00
7,432.19	0.65	223.23	7,250.00	-1,233.59	752.85	1,444.90	0.08	0.08	0.00	0.00
Top of Gas										
7,500.00	0.71	223.23	7,317.81	-1,234.18	752.30	1,445.13	0.08	0.08	0.00	0.00
7,600.00	0.79	223.23	7,417.80	-1,235.13	751.40	1,445.50	0.08	0.08	0.00	0.00
7,700.00	0.87	223.23	7,517.79	-1,236.19	750.41	1,445.91	0.08	0.08	0.00	0.00
7,800.00	0.95	223.23	7,617.77	-1,237.34	749.33	1,446.36	0.08	0.08	0.00	0.00
7,858.77	1.00	223.23	7,676.53	-1,238.07	748.64	1,446.64	0.08	0.08	0.00	0.00
7,900.00	0.98	223.23	7,717.76	-1,238.59	748.16	1,446.85	0.04	-0.04	0.00	-180.00
8,000.00	0.94	223.23	7,817.75	-1,239.81	747.01	1,447.32	0.04	-0.04	0.00	180.00
8,100.00	0.91	223.23	7,917.73	-1,240.99	745.90	1,447.78	0.04	-0.04	0.00	180.00
8,200.00	0.87	223.23	8,017.72	-1,242.12	744.84	1,448.22	0.04	-0.04	0.00	180.00
8,300.00	0.83	223.23	8,117.71	-1,243.20	743.82	1,448.64	0.04	-0.04	0.00	180.00
8,400.00	0.80	223.23	8,217.70	-1,244.24	742.85	1,449.05	0.04	-0.04	0.00	-180.00
8,500.00	0.76	223.23	8,317.69	-1,245.23	741.92	1,449.43	0.04	-0.04	0.00	180.00
8,600.00	0.72	223.23	8,417.68	-1,246.17	741.03	1,449.80	0.04	-0.04	0.00	-180.00
8,700.00	0.69	223.23	8,517.67	-1,247.06	740.19	1,450.15	0.04	-0.04	0.00	180.00
8,800.00	0.65	223.23	8,617.67	-1,247.91	739.39	1,450.48	0.04	-0.04	0.00	180.00
8,900.00	0.61	223.23	8,717.66	-1,248.72	738.64	1,450.79	0.04	-0.04	0.00	180.00
9,000.00	0.58	223.23	8,817.66	-1,249.47	737.93	1,451.09	0.04	-0.04	0.00	180.00
9,100.00	0.54	223.23	8,917.65	-1,250.18	737.26	1,451.36	0.04	-0.04	0.00	180.00
9,200.00	0.50	223.23	9,017.65	-1,250.84	736.64	1,451.62	0.04	-0.04	0.00	180.00
9,205.35	0.50	223.23	9,023.00	-1,250.88	736.61	1,451.64	0.03	-0.03	0.00	-180.00
Cameo										
9,300.00	0.47	223.23	9,117.64	-1,251.46	736.06	1,451.86	0.04	-0.04	0.00	180.00
9,400.00	0.43	223.23	9,217.64	-1,252.02	735.53	1,452.08	0.04	-0.04	0.00	180.00
9,500.00	0.39	223.23	9,317.64	-1,252.55	735.04	1,452.29	0.04	-0.04	0.00	180.00
9,600.00	0.35	223.23	9,417.64	-1,253.02	734.59	1,452.47	0.04	-0.04	0.00	180.00
9,665.37	0.33	223.23	9,483.00	-1,253.30	734.32	1,452.58	0.04	-0.04	0.00	180.00
Rollins										

Plan Report for Long 20-23C - Plan #1 Proposal

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
9,700.00	0.32	223.23	9,517.63	-1,253.45	734.19	1,452.64	0.04	-0.04	0.00	-180.00
9,800.00	0.28	223.23	9,617.63	-1,253.83	733.83	1,452.79	0.04	-0.04	0.00	180.00
9,900.00	0.24	223.23	9,717.63	-1,254.16	733.52	1,452.92	0.04	-0.04	0.00	180.00
10,000.00	0.21	223.23	9,817.63	-1,254.45	733.25	1,453.03	0.04	-0.04	0.00	180.00
10,004.37	0.21	223.23	9,822.00	-1,254.46	733.24	1,453.03	0.05	-0.05	0.00	180.00
Cozzette										
10,100.00	0.17	223.23	9,917.63	-1,254.69	733.02	1,453.12	0.04	-0.04	0.00	-180.00
10,200.00	0.13	223.23	10,017.63	-1,254.88	732.84	1,453.20	0.04	-0.04	0.00	-180.00
10,283.37	0.10	223.23	10,101.00	-1,255.01	732.72	1,453.25	0.04	-0.04	0.00	180.00
Corcoran										
10,300.00	0.10	223.23	10,117.63	-1,255.03	732.70	1,453.26	0.04	-0.04	0.00	-180.00
10,400.00	0.06	223.23	10,217.63	-1,255.13	732.61	1,453.29	0.04	-0.04	0.00	180.00
10,413.37	0.06	223.23	10,231.00	-1,255.14	732.60	1,453.30	0.04	-0.04	0.00	-180.00
Mancos										
10,500.00	0.02	223.23	10,317.63	-1,255.18	732.56	1,453.32	0.04	-0.04	0.00	180.00
10,563.37	0.00	0.00	10,381.00	-1,255.19	732.55	1,453.32	0.04	-0.04	215.83	180.00
Total Depth = 10563.37ft - Long 20-23C Plan #1 BH Tgt										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
225.00	225.00	0.00	0.00	Kickoff at 225.00ft
610.00	608.84	-22.01	13.53	Build Rate = 2.00°/100ft
984.92	976.04	-85.37	52.46	End Build at 984.92ft
3,300.00	3,210.15	-602.45	370.25	15.20 Inclination
5,600.95	5,430.62	-1,116.37	686.10	Begin Drop at 5600.95ft
6,100.00	5,919.38	-1,200.75	737.96	Drop Rate = 1.50°/100ft
6,614.17	6,432.00	-1,230.19	756.05	End Drop at 6614.17ft
10,563.37	10,381.00	-1,255.19	732.55	Total Depth = 10563.37ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	+E/-W (ft)	Start TVD (ft)
Target	Long 20-23C Plan #1 BH Tgt	149.73	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	10,563.37	Plan #1 Proposal	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
2,500.00	2,438.13	8 5/8" Casing Pt.	8-5/8	11

Plan Report for Long 20-23C - Plan #1 Proposal

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,614.17	6,432.00	Williams Fork		0.00	
7,432.19	7,250.00	Top of Gas		0.00	
9,205.35	9,023.00	Cameo		0.00	
9,665.37	9,483.00	Rollins		0.00	
10,004.37	9,822.00	Cozzette		0.00	
10,283.37	10,101.00	Corcoran		0.00	
10,413.37	10,231.00	Mancos		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Long 20-23C Plan #1 BH Tgt	10,381.00	-1,255.19	732.55	Point
Long 20-23C Plan #1 Driller's Tgt	6,432.00	-1,230.19	756.05	Rectangle
Long 20-23C Plan #1 Zone Tgt	7,250.00	-1,255.19	732.55	Rectangle
Long 20-23C Hardline	0.00	0.00	0.00	Polygon

North Reference Sheet for Sec. 20-T7S-R94W - Long 20-23C - Plan #1

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB 25' @ 7931.00ft (Original Well Elev). Northing and Easting are relative to Long 20-23C

Coordinate System is US State Plane 1927 (Exact solution), Colorado Central 502 using datum NAD 1927 (NADCON CONUS), ellipsoid Clarke 1866

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.50°, Longitude Origin: 0° 0' 0.000 E°, Latitude Origin: 39° 45' 0.000 N°

False Easting: 2,000,000.00ft, False Northing: 0.00ft, Scale Reduction: 0.99995193

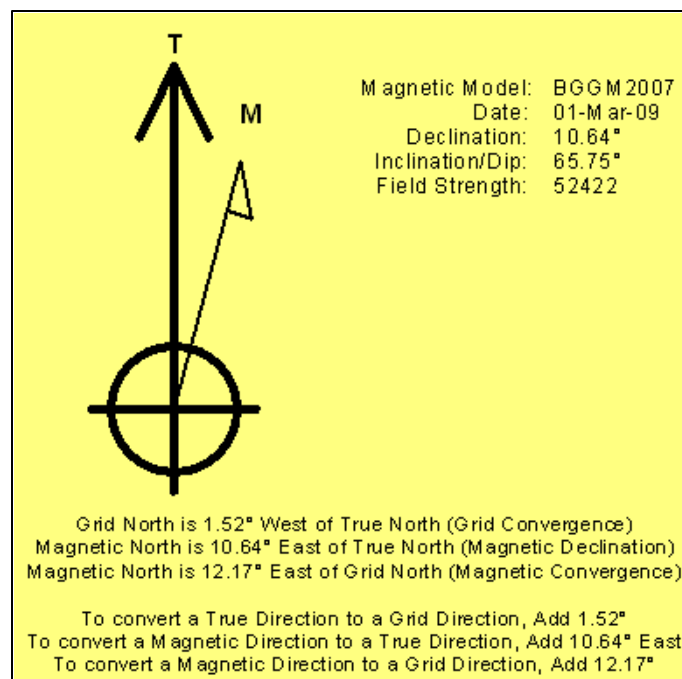
Grid Coordinates of Well: 589,013.27 ft N, 1,317,894.03 ft E

Geographical Coordinates of Well: 39° 25' 32.69" N, 107° 54' 53.67" W

Grid Convergence at Surface is: -1.52°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,563.37ft
the Bottom Hole Displacement is 1,453.32ft in the Direction of 149.73° (True).

Magnetic Convergence at surface is: -12.17° (1 March 2009, , BGGM2007)



Project: Garfield County, CO
Site: Sec. 20-T7S-R94W
Well: Long 20-23C
Wellbore: Plan #1
Plan: Plan #1 Proposal

Noble Energy

HALLIBURTON

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	225.00	0.00	0.00	225.00	0.00	0.00	0.00	0.00	0.00
3	984.92	15.20	148.43	976.04	-85.37	52.46	2.00	148.43	100.17
4	5600.95	15.20	148.43	5430.61	-1116.37	686.10	0.00	0.00	1310.01
5	6614.17	0.00	0.00	6432.00	-1230.19	756.05	1.50	180.00	1443.57
6	7858.77	1.00	223.23	7676.53	-1238.07	748.64	0.08	223.23	1446.64
7	10563.37	0.00	0.00	10381.00	-1255.19	732.55	0.04	180.00	1453.32

Long 20-23C Plan #1 Driller's Tgt

Long 20-23C Plan #1 BH Tgt

WELL DETAILS: Long 20-23C

Northing	Easting	Ground Level:	Latitude	Longitude
589013.27	1317894.03	7906.00	39° 25' 32.693 N	107° 54' 53.672 W

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
6432.00	6614.17	Williams Fork
7250.00	7432.19	Top of Gas
9023.00	9205.35	Cameo
9483.00	9665.37	Rollins
9822.00	10004.37	Cozzette
10101.00	10283.37	Corcoran
10231.00	10413.37	Mancos

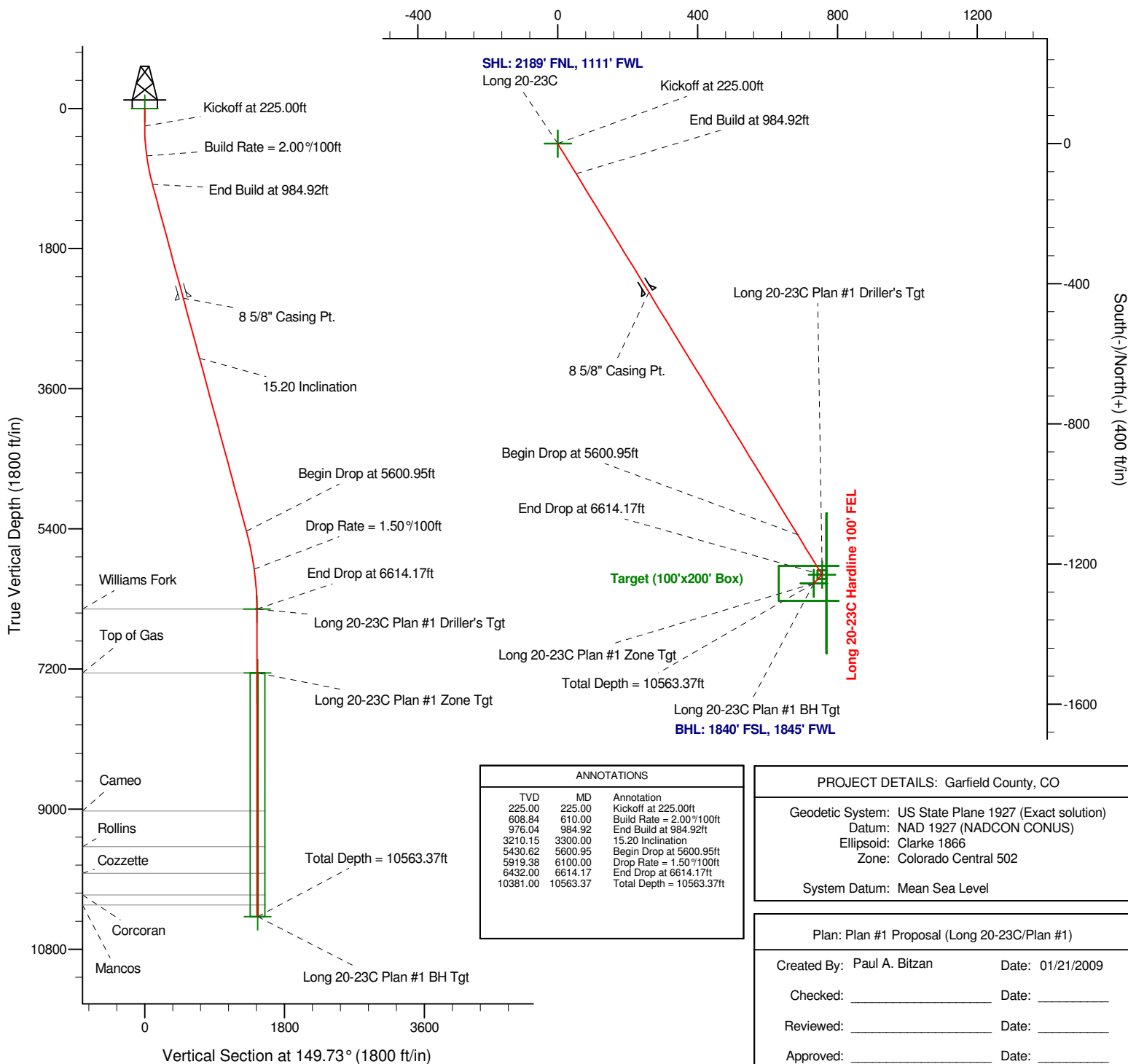
WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
Long 20-23C Hardline	0.00	0.00	0.00	Polygon
Long 20-23C Plan #1 Driller's Tgt	6432.00	-1230.19	756.05	Rectangle (Sides: L25.00 W25.00)
Long 20-23C Plan #1 Zone Tgt	7250.00	-1255.19	732.55	Rectangle (Sides: L100.00 W200.00)
Long 20-23C Plan #1 BH Tgt	10381.00	-1255.19	732.55	Point



Azimuths to True North
Magnetic North: 10.64°
Magnetic Field
Strength: 52422.0snT
Dip Angle: 65.75°
Date: 3/1/2009
Model: BGGM2007

West(-)/East(+) (400 ft/in)



ANNOTATIONS

TVD	MD	Annotation
225.00	225.00	Kickoff at 225.00ft
608.84	610.00	Build Rate = 2.00%/100ft
976.04	984.92	End Build at 984.92ft
3210.15	3300.00	15.20 Inclination
5430.62	5600.95	Begin Drop at 5600.95ft
5919.38	6100.00	Drop Rate = 1.50%/100ft
6432.00	6614.17	End Drop at 6614.17ft
10381.00	10563.37	Total Depth = 10563.37ft

PROJECT DETAILS: Garfield County, CO

Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: Colorado Central 502

System Datum: Mean Sea Level

Plan: Plan #1 Proposal (Long 20-23C/Plan #1)

Created By: Paul A. Bitzan Date: 01/21/2009
Checked: _____ Date: _____
Reviewed: _____ Date: _____
Approved: _____ Date: _____