

Noble Energy

Garfield County, CO

Sec. 20-T7S-R94W

Long 20-22A

Plan #1

Plan: Plan #1 Proposal

Sperry Drilling Services

Proposal Report

21 January, 2009

Well Coordinates: 589,022.77 N, 1,317,901.53 E (39° 25' 32.79" N, 107° 54' 53.58" W)

Ground Level: 7,906.00 ft

Local Coordinate Origin:

Centered on Well Long 20-22A

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 20-22A - 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	46.54	299.99	0.68	0.71	0.98	2.00	2.00	0.00	46.54
400.00	3.50	46.54	399.89	3.68	3.88	5.34	2.00	2.00	0.00	0.00
485.00	5.20	46.54	484.64	8.11	8.56	11.79	2.00	2.00	0.00	0.00
Build Rate = 2.00°/100ft										
500.00	5.50	46.54	499.58	9.07	9.57	13.19	2.00	2.00	0.00	0.00
600.00	7.50	46.54	598.93	16.86	17.79	24.51	2.00	2.00	0.00	0.00
700.00	9.50	46.54	697.83	27.02	28.52	39.29	2.00	2.00	0.00	0.00
745.98	10.42	46.54	743.11	32.49	34.29	47.24	2.00	2.00	0.00	0.00
End Build at 745.98ft										
800.00	10.42	46.54	796.24	39.21	41.38	57.01	0.00	0.00	0.00	0.00
900.00	10.42	46.54	894.59	51.65	54.51	75.10	0.00	0.00	0.00	0.00
1,000.00	10.42	46.54	992.94	64.09	67.64	93.18	0.00	0.00	0.00	0.00
1,100.00	10.42	46.54	1,091.30	76.53	80.77	111.27	0.00	0.00	0.00	0.00
1,200.00	10.42	46.54	1,189.65	88.97	93.89	129.35	0.00	0.00	0.00	0.00
1,300.00	10.42	46.54	1,288.00	101.41	107.02	147.44	0.00	0.00	0.00	0.00
1,400.00	10.42	46.54	1,386.35	113.85	120.15	165.52	0.00	0.00	0.00	0.00
1,500.00	10.42	46.54	1,484.70	126.29	133.28	183.61	0.00	0.00	0.00	0.00
1,600.00	10.42	46.54	1,583.05	138.73	146.40	201.70	0.00	0.00	0.00	0.00
1,700.00	10.42	46.54	1,681.40	151.17	159.53	219.78	0.00	0.00	0.00	0.00
1,800.00	10.42	46.54	1,779.75	163.61	172.66	237.87	0.00	0.00	0.00	0.00
1,900.00	10.42	46.54	1,878.10	176.05	185.79	255.95	0.00	0.00	0.00	0.00
2,000.00	10.42	46.54	1,976.45	188.49	198.92	274.04	0.00	0.00	0.00	0.00
2,100.00	10.42	46.54	2,074.80	200.93	212.04	292.12	0.00	0.00	0.00	0.00
2,200.00	10.42	46.54	2,173.16	213.37	225.17	310.21	0.00	0.00	0.00	0.00
2,300.00	10.42	46.54	2,271.51	225.81	238.30	328.29	0.00	0.00	0.00	0.00
2,400.00	10.42	46.54	2,369.86	238.25	251.43	346.38	0.00	0.00	0.00	0.00
2,500.00	10.42	46.54	2,468.21	250.69	264.55	364.47	0.00	0.00	0.00	0.00
8 5/8" Casing Pt.										
2,600.00	10.42	46.54	2,566.56	263.13	277.68	382.55	0.00	0.00	0.00	0.00
2,700.00	10.42	46.54	2,664.91	275.58	290.81	400.64	0.00	0.00	0.00	0.00
2,800.00	10.42	46.54	2,763.26	288.02	303.94	418.72	0.00	0.00	0.00	0.00
2,900.00	10.42	46.54	2,861.61	300.46	317.07	436.81	0.00	0.00	0.00	0.00
3,000.00	10.42	46.54	2,959.96	312.90	330.19	454.89	0.00	0.00	0.00	0.00
3,100.00	10.42	46.54	3,058.31	325.34	343.32	472.98	0.00	0.00	0.00	0.00
3,200.00	10.42	46.54	3,156.66	337.78	356.45	491.06	0.00	0.00	0.00	0.00
3,300.00	10.42	46.54	3,255.02	350.22	369.58	509.15	0.00	0.00	0.00	0.00
10.42 Inclination										
3,400.00	10.42	46.54	3,353.37	362.66	382.70	527.24	0.00	0.00	0.00	0.00
3,500.00	10.42	46.54	3,451.72	375.10	395.83	545.32	0.00	0.00	0.00	0.00
3,600.00	10.42	46.54	3,550.07	387.54	408.96	563.41	0.00	0.00	0.00	0.00
3,700.00	10.42	46.54	3,648.42	399.98	422.09	581.49	0.00	0.00	0.00	0.00
3,800.00	10.42	46.54	3,746.77	412.42	435.21	599.58	0.00	0.00	0.00	0.00
3,900.00	10.42	46.54	3,845.12	424.86	448.34	617.66	0.00	0.00	0.00	0.00
4,000.00	10.42	46.54	3,943.47	437.30	461.47	635.75	0.00	0.00	0.00	0.00
4,100.00	10.42	46.54	4,041.82	449.74	474.60	653.83	0.00	0.00	0.00	0.00
4,200.00	10.42	46.54	4,140.17	462.18	487.73	671.92	0.00	0.00	0.00	0.00
4,300.00	10.42	46.54	4,238.53	474.62	500.85	690.01	0.00	0.00	0.00	0.00
4,400.00	10.42	46.54	4,336.88	487.06	513.98	708.09	0.00	0.00	0.00	0.00
4,500.00	10.42	46.54	4,435.23	499.50	527.11	726.18	0.00	0.00	0.00	0.00
4,600.00	10.42	46.54	4,533.58	511.94	540.24	744.26	0.00	0.00	0.00	0.00
4,700.00	10.42	46.54	4,631.93	524.38	553.36	762.35	0.00	0.00	0.00	0.00
4,800.00	10.42	46.54	4,730.28	536.82	566.49	780.43	0.00	0.00	0.00	0.00
4,900.00	10.42	46.54	4,828.63	549.26	579.62	798.52	0.00	0.00	0.00	0.00

Plan Report for Long 20-22A - 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	10.42	46.54	4,926.98	561.70	592.75	816.61	0.00	0.00	0.00	0.00
5,100.00	10.42	46.54	5,025.33	574.14	605.88	834.69	0.00	0.00	0.00	0.00
5,200.00	10.42	46.54	5,123.68	586.58	619.00	852.78	0.00	0.00	0.00	0.00
5,300.00	10.42	46.54	5,222.03	599.02	632.13	870.86	0.00	0.00	0.00	0.00
5,400.00	10.42	46.54	5,320.39	611.46	645.26	888.95	0.00	0.00	0.00	0.00
5,500.00	10.42	46.54	5,418.74	623.90	658.39	907.03	0.00	0.00	0.00	0.00
5,600.00	10.42	46.54	5,517.09	636.34	671.51	925.12	0.00	0.00	0.00	0.00
5,700.00	10.42	46.54	5,615.44	648.78	684.64	943.20	0.00	0.00	0.00	0.00
5,800.00	10.42	46.54	5,713.79	661.22	697.77	961.29	0.00	0.00	0.00	0.00
5,900.00	10.42	46.54	5,812.14	673.66	710.90	979.38	0.00	0.00	0.00	0.00
5,939.69	10.42	46.54	5,851.18	678.59	716.11	986.55	0.00	0.00	0.00	0.00
Begin Drop at 5939.69ft										
6,000.00	9.52	46.54	5,910.57	685.77	723.69	996.99	1.50	-1.50	0.00	180.00
6,100.00	8.02	46.54	6,009.40	696.25	734.75	1,012.23	1.50	-1.50	0.00	180.00
6,200.00	6.52	46.54	6,108.60	704.95	743.92	1,024.88	1.50	-1.50	0.00	180.00
6,280.00	5.32	46.54	6,188.17	710.62	749.91	1,033.12	1.50	-1.50	0.00	180.00
Drop Rate = 1.50°/100ft										
6,300.00	5.02	46.54	6,208.09	711.86	751.22	1,034.92	1.50	-1.50	0.00	-180.00
6,400.00	3.52	46.54	6,307.81	716.98	756.61	1,042.36	1.50	-1.50	0.00	180.00
6,500.00	2.02	46.54	6,407.69	720.30	760.12	1,047.18	1.50	-1.50	0.00	180.00
6,600.00	0.52	46.54	6,507.66	721.81	761.72	1,049.39	1.50	-1.50	0.00	180.00
6,634.34	0.00	0.00	6,542.00	721.92	761.83	1,049.54	1.50	-1.50	0.00	-180.00
End Drop at 6634.34ft - Williams Fork - Long 20-22A Plan #1 Driller's Tgt										
6,700.00	0.04	231.56	6,607.66	721.91	761.81	1,049.52	0.06	0.06	0.00	231.56
6,800.00	0.10	231.56	6,707.66	721.83	761.72	1,049.40	0.06	0.06	0.00	0.00
6,900.00	0.16	231.56	6,807.66	721.69	761.54	1,049.17	0.06	0.06	0.00	0.00
7,000.00	0.22	231.56	6,907.66	721.48	761.28	1,048.85	0.06	0.06	0.00	0.00
7,100.00	0.28	231.56	7,007.66	721.21	760.94	1,048.41	0.06	0.06	0.00	0.00
7,200.00	0.34	231.56	7,107.66	720.88	760.52	1,047.87	0.06	0.06	0.00	0.00
7,300.00	0.40	231.56	7,207.66	720.48	760.01	1,047.23	0.06	0.06	0.00	0.00
7,400.00	0.46	231.56	7,307.66	720.01	759.43	1,046.49	0.06	0.06	0.00	0.00
7,452.35	0.49	231.56	7,360.00	719.74	759.09	1,046.05	0.06	0.06	0.00	0.00
Top of Gas										
7,500.00	0.52	231.56	7,407.65	719.48	758.76	1,045.64	0.06	0.06	0.00	0.00
7,600.00	0.58	231.56	7,507.65	718.88	758.01	1,044.68	0.06	0.06	0.00	0.00
7,700.00	0.64	231.56	7,607.64	718.22	757.17	1,043.62	0.06	0.06	0.00	0.00
7,800.00	0.70	231.56	7,707.63	717.50	756.26	1,042.46	0.06	0.06	0.00	0.00
7,900.00	0.76	231.56	7,807.63	716.71	755.26	1,041.19	0.06	0.06	0.00	0.00
8,000.00	0.82	231.56	7,907.62	715.85	754.18	1,039.82	0.06	0.06	0.00	0.00
8,100.00	0.88	231.56	8,007.61	714.93	753.02	1,038.34	0.06	0.06	0.00	0.00
8,200.00	0.94	231.56	8,107.59	713.94	751.78	1,036.76	0.06	0.06	0.00	0.00
8,300.00	1.00	231.56	8,207.58	712.89	750.45	1,035.08	0.06	0.06	0.00	0.00
8,400.00	1.06	231.56	8,307.56	711.77	749.04	1,033.29	0.06	0.06	0.00	0.00
8,500.00	1.12	231.56	8,407.54	710.59	747.55	1,031.39	0.06	0.06	0.00	0.00
8,578.96	1.17	231.56	8,486.49	709.61	746.32	1,029.83	0.06	0.06	0.00	0.00
8,600.00	1.15	231.56	8,507.52	709.35	745.99	1,029.40	0.06	-0.06	0.00	180.00
8,700.00	1.10	231.56	8,607.51	708.13	744.45	1,027.45	0.06	-0.06	0.00	180.00
8,800.00	1.04	231.56	8,707.49	706.97	742.99	1,025.59	0.06	-0.06	0.00	180.00
8,900.00	0.98	231.56	8,807.47	705.87	741.61	1,023.84	0.06	-0.06	0.00	180.00
9,000.00	0.92	231.56	8,907.46	704.84	740.31	1,022.18	0.06	-0.06	0.00	180.00
9,100.00	0.86	231.56	9,007.45	703.87	739.09	1,020.63	0.06	-0.06	0.00	180.00
9,200.00	0.81	231.56	9,107.44	702.97	737.95	1,019.18	0.06	-0.06	0.00	180.00
9,225.57	0.79	231.56	9,133.00	702.75	737.67	1,018.83	0.06	-0.06	0.00	180.00
Cameo										
9,300.00	0.75	231.56	9,207.43	702.13	736.89	1,017.83	0.06	-0.06	0.00	-180.00
9,400.00	0.69	231.56	9,307.42	701.35	735.91	1,016.59	0.06	-0.06	0.00	180.00
9,500.00	0.63	231.56	9,407.41	700.63	735.00	1,015.44	0.06	-0.06	0.00	180.00
9,600.00	0.57	231.56	9,507.41	699.98	734.18	1,014.39	0.06	-0.06	0.00	180.00
9,685.60	0.52	231.56	9,593.00	699.47	733.54	1,013.58	0.06	-0.06	0.00	180.00

Plan Report for Long 20-22A - 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 (°)
Rollins										
9,700.00	0.51	231.56	9,607.40	699.39	733.44	1,013.45	0.06	-0.06	0.00	-180.00
9,800.00	0.46	231.56	9,707.40	698.86	732.78	1,012.61	0.06	-0.06	0.00	180.00
9,900.00	0.40	231.56	9,807.40	698.40	732.19	1,011.86	0.06	-0.06	0.00	180.00
10,000.00	0.34	231.56	9,907.39	698.00	731.69	1,011.22	0.06	-0.06	0.00	180.00
10,024.61	0.33	231.56	9,932.00	697.91	731.58	1,011.08	0.06	-0.06	0.00	-180.00
Cozzette										
10,100.00	0.28	231.56	10,007.39	697.66	731.26	1,010.68	0.06	-0.06	0.00	180.00
10,200.00	0.22	231.56	10,107.39	697.39	730.92	1,010.24	0.06	-0.06	0.00	180.00
10,300.00	0.17	231.56	10,207.39	697.18	730.65	1,009.91	0.06	-0.06	0.00	180.00
10,303.61	0.16	231.56	10,211.00	697.17	730.64	1,009.90	0.06	-0.06	0.00	180.00
Corcoran										
10,400.00	0.11	231.56	10,307.39	697.03	730.47	1,009.67	0.06	-0.06	0.00	-180.00
10,433.61	0.09	231.56	10,341.00	696.99	730.42	1,009.61	0.06	-0.06	0.00	-180.00
Mancos										
10,500.00	0.05	231.56	10,407.39	696.95	730.36	1,009.53	0.06	-0.06	0.00	180.00
10,583.61	0.00	0.00	10,491.00	696.92	730.33	1,009.50	0.06	-0.06	0.00	180.00
Long 20-22A Plan #1 BH Tgt										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
225.00	225.00	0.00	0.00	Kickoff at 225.00ft
485.00	484.64	8.11	8.56	Build Rate = 2.00°/100ft
745.98	743.11	32.49	34.29	End Build at 745.98ft
3,300.00	3,255.02	350.22	369.58	10.42 Inclination
5,939.69	5,851.18	678.59	716.11	Begin Drop at 5939.69ft
6,280.00	6,188.17	710.62	749.91	Drop Rate = 1.50°/100ft
6,634.34	6,542.00	721.92	761.83	End Drop at 6634.34ft
10,583.61	10,491.00	696.92	730.33	Total Depth = 10583.61ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Long 20-22A Plan #1 BH Tgt	46.34	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	10,583.61	Plan #1 Proposal	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
2,500.00	2,468.21	8 5/8" Casing Pt.	8-5/8	11

Plan Report for Long 20-22A - Plan #1 Proposal

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,634.34	6,542.00	Williams Fork		0.00	
7,452.35	7,360.00	Top of Gas		0.00	
9,225.57	9,133.00	Cameo		0.00	
9,685.60	9,593.00	Rollins		0.00	
10,024.61	9,932.00	Cozzette		0.00	
10,303.61	10,211.00	Corcoran		0.00	
10,433.61	10,341.00	Mancos		0.00	

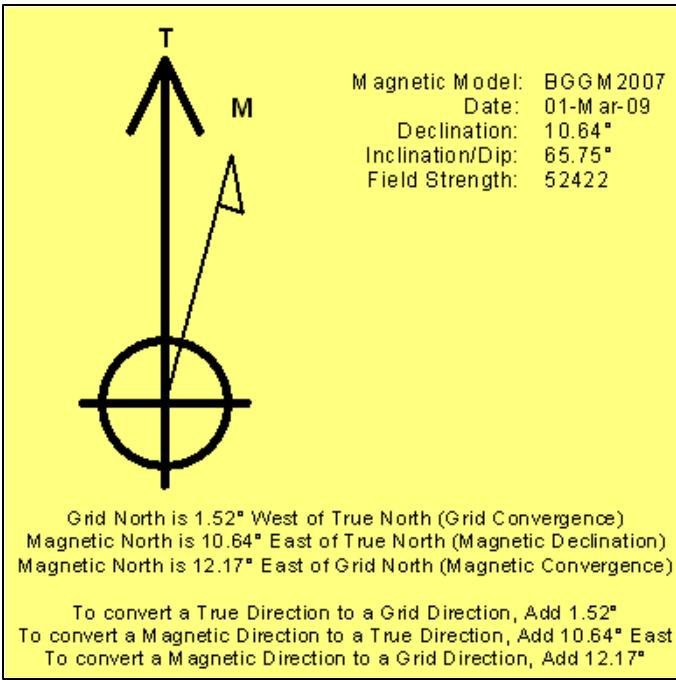
Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Long 20-22A Plan #1 Zone Tgt	7,360.00	696.92	730.33	Rectangle
Long 20-22A Plan #1 BH Tgt	10,491.00	696.92	730.33	Point
Long 20-22A N. Hardline	0.00	0.00	0.00	Polygon
Long 20-22A E. Hardline	0.00	0.00	0.00	Polygon
Long 20-22A Plan #1 Driller's Tgt	6,542.00	721.92	761.83	Rectangle

North Reference Sheet for Sec. 20-T7S-R94W - Long 20-22A - 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 20-22A
 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: 589,022.77 ft N, 1,317,901.53 ft E
 Geographical Coordinates of Well: 39° 25' 32.79" N, 107° 54' 53.58" W
 Grid Convergence at Surface is: -1.52°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,583.61ft
 the Bottom Hole Displacement is 1,009.50ft in the Direction of 46.34° (True).
 Magnetic Convergence at surface is: -12.17° (1 March 2009, , BGGM2007)



Project: Garfield County, CO
Site: Sec. 20-T7S-R94W
Well: Long 20-22A
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	745.98	10.42	46.54	743.12	32.49	34.29	2.00	46.54	47.24	
4	5939.69	10.42	46.54	5851.18	678.59	716.11	0.00	0.00	986.55	Long 20-22A Plan #1 Driller's Tgt
5	6634.34	0.00	0.00	6542.00	721.92	761.83	1.50	180.00	1049.54	
6	8578.96	1.17	231.56	8486.49	709.61	746.32	0.06	231.56	1029.83	
7	10583.61	0.00	0.00	10491.00	696.92	730.33	0.06	180.00	1009.50	Long 20-22A Plan #1 BH Tgt

WELL DETAILS: Long 20-22A

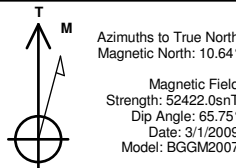
Northing	Easting	Ground Level:	Latitude	Longitude
589022.77	1317901.53	7906.00	39° 25' 32.789 N	107° 54' 53.580 W

FORMATION TOP DETAILS

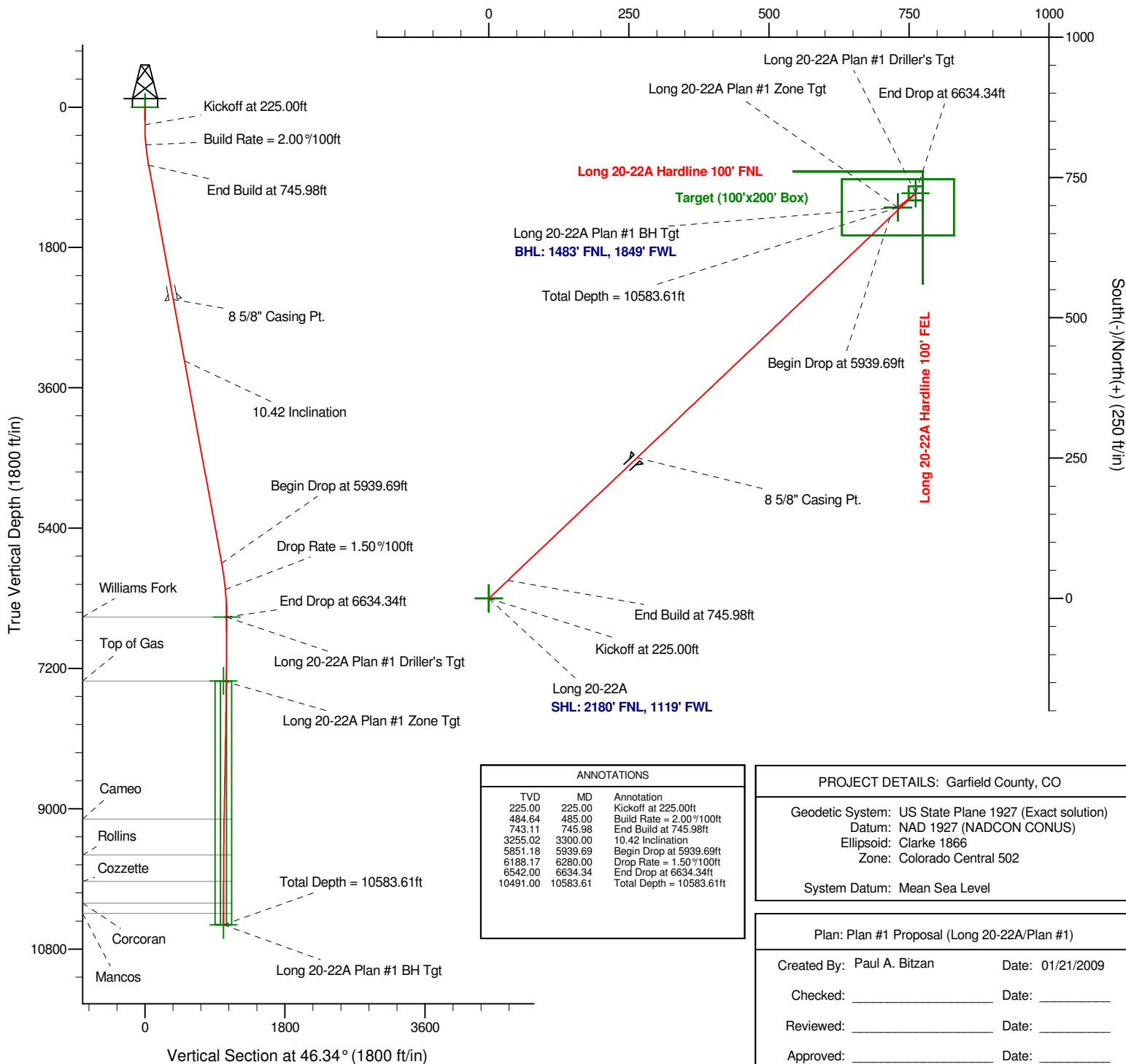
TVDPath	MDPath	Formation
6542.00	6634.34	Williams Fork
7360.00	7452.35	Top of Gas
9133.00	9225.57	Cameo
9593.00	9685.60	Rollins
9932.00	10024.61	Cozzette
10211.00	10303.61	Corcoran
10341.00	10433.61	Mancos

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
Long 20-22A E. Hardline	0.00	0.00	0.00	Polygon
Long 20-22A N. Hardline	0.00	0.00	0.00	Polygon
Long 20-22A Plan #1 Driller's Tgt	6542.00	721.92	761.83	Rectangle (Sides: L25.00 W25.00)
Long 20-22A Plan #1 Zone Tgt	7360.00	696.92	730.33	Rectangle (Sides: L100.00 W200.00)
Long 20-22A Plan #1 BH Tgt	10491.00	696.92	730.33	Point



West(-)/East(+) (250 ft/in)



ANNOTATIONS

TVD	MD	Annotation
225.00	225.00	Kickoff at 225.00ft
484.64	485.00	Build Rate = 2.00°/100ft
743.11	745.98	End Build at 745.98ft
3255.02	3300.00	10.42 Incline
5851.18	5939.69	Begin Drop at 5939.69ft
6188.17	6280.00	Drop Rate = 1.50°/100ft
6542.00	6634.34	End Drop at 6634.34ft
10491.00	10583.61	Total Depth = 10583.61ft

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 20-22A/Plan #1)

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