

# Noble Energy (Rockies)

Garfield County, CO

Sec. 35-T7S-R95W (SGV 35D2 PAD)

BM 35-11B - A 4

Wellbore #1

Plan: Plan #1 Proposal

## Sperry Drilling Services Proposal Report

20 October, 2009

Well Coordinates: 579,174.48 N, 1,301,240.42 E (39° 23' 51.05" N, 107° 58' 22.41" W)

Ground Level: 8,846.00 ft

Local Coordinate Origin:

Centered on Well BM 35-11B - Slot A 4

Viewing Datum:

RKB - 24' @ 8870.00ft

TVDs to System:

N

North Reference:

Grid

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

**HALLIBURTON**

**Plan Report for BM 35-11B - 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
<b>Kickoff at 225.00ft</b>										
300.00	1.50	29.49	299.99	0.85	0.48	0.98	2.00	2.00	0.00	29.49
400.00	3.50	29.49	399.89	4.65	2.63	5.34	2.00	2.00	0.00	0.00
430.00	4.10	29.49	429.83	6.38	3.61	7.33	2.00	2.00	0.00	0.00
<b>Build Rate = 2.00°/100ft</b>										
500.00	5.50	29.49	499.58	11.48	6.49	13.18	2.00	2.00	0.00	0.00
600.00	7.50	29.49	598.93	21.33	12.06	24.49	2.00	2.00	0.00	0.00
642.35	8.35	29.49	640.88	26.42	14.94	30.33	2.00	2.00	0.00	0.00
<b>End Build at 642.35ft</b>										
700.00	8.35	29.49	697.91	33.70	19.06	38.69	0.00	0.00	0.00	0.00
800.00	8.35	29.49	796.86	46.34	26.20	53.20	0.00	0.00	0.00	0.00
900.00	8.35	29.49	895.80	58.97	33.35	67.71	0.00	0.00	0.00	0.00
1,000.00	8.35	29.49	994.74	71.61	40.49	82.22	0.00	0.00	0.00	0.00
1,100.00	8.35	29.49	1,093.68	84.25	47.64	96.73	0.00	0.00	0.00	0.00
1,200.00	8.35	29.49	1,192.62	96.88	54.78	111.24	0.00	0.00	0.00	0.00
1,300.00	8.35	29.49	1,291.56	109.52	61.93	125.75	0.00	0.00	0.00	0.00
1,400.00	8.35	29.49	1,390.50	122.16	69.07	140.25	0.00	0.00	0.00	0.00
1,500.00	8.35	29.49	1,489.44	134.79	76.22	154.76	0.00	0.00	0.00	0.00
1,600.00	8.35	29.49	1,588.38	147.43	83.36	169.27	0.00	0.00	0.00	0.00
1,700.00	8.35	29.49	1,687.32	160.07	90.51	183.78	0.00	0.00	0.00	0.00
1,800.00	8.35	29.49	1,786.26	172.70	97.65	198.29	0.00	0.00	0.00	0.00
1,900.00	8.35	29.49	1,885.20	185.34	104.80	212.80	0.00	0.00	0.00	0.00
2,000.00	8.35	29.49	1,984.14	197.98	111.95	227.31	0.00	0.00	0.00	0.00
2,100.00	8.35	29.49	2,083.08	210.61	119.09	241.81	0.00	0.00	0.00	0.00
2,200.00	8.35	29.49	2,182.02	223.25	126.24	256.32	0.00	0.00	0.00	0.00
2,300.00	8.35	29.49	2,280.97	235.89	133.38	270.83	0.00	0.00	0.00	0.00
2,380.00	8.35	29.49	2,360.12	246.00	139.10	282.44	0.00	0.00	0.00	0.00
<b>8 5/8" Casing Pt.</b>										
2,400.00	8.35	29.49	2,379.91	248.52	140.53	285.34	0.00	0.00	0.00	0.00
2,500.00	8.35	29.49	2,478.85	261.16	147.67	299.85	0.00	0.00	0.00	0.00
2,600.00	8.35	29.49	2,577.79	273.80	154.82	314.36	0.00	0.00	0.00	0.00
2,700.00	8.35	29.49	2,676.73	286.43	161.96	328.87	0.00	0.00	0.00	0.00
2,800.00	8.35	29.49	2,775.67	299.07	169.11	343.38	0.00	0.00	0.00	0.00
2,900.00	8.35	29.49	2,874.61	311.71	176.25	357.88	0.00	0.00	0.00	0.00
3,000.00	8.35	29.49	2,973.55	324.34	183.40	372.39	0.00	0.00	0.00	0.00
3,100.00	8.35	29.49	3,072.49	336.98	190.54	386.90	0.00	0.00	0.00	0.00
3,200.00	8.35	29.49	3,171.43	349.62	197.69	401.41	0.00	0.00	0.00	0.00
3,300.00	8.35	29.49	3,270.37	362.25	204.83	415.92	0.00	0.00	0.00	0.00
3,400.00	8.35	29.49	3,369.31	374.89	211.98	430.43	0.00	0.00	0.00	0.00
3,470.00	8.35	29.49	3,438.57	383.74	216.98	440.58	0.00	0.00	0.00	0.00
<b>8.35 Inclination</b>										
3,500.00	8.35	29.49	3,468.25	387.53	219.13	444.94	0.00	0.00	0.00	0.00
3,600.00	8.35	29.49	3,567.19	400.16	226.27	459.44	0.00	0.00	0.00	0.00
3,700.00	8.35	29.49	3,666.14	412.80	233.42	473.95	0.00	0.00	0.00	0.00
3,800.00	8.35	29.49	3,765.08	425.44	240.56	488.46	0.00	0.00	0.00	0.00
3,900.00	8.35	29.49	3,864.02	438.07	247.71	502.97	0.00	0.00	0.00	0.00
4,000.00	8.35	29.49	3,962.96	450.71	254.85	517.48	0.00	0.00	0.00	0.00
4,100.00	8.35	29.49	4,061.90	463.35	262.00	531.99	0.00	0.00	0.00	0.00
4,200.00	8.35	29.49	4,160.84	475.98	269.14	546.50	0.00	0.00	0.00	0.00
4,300.00	8.35	29.49	4,259.78	488.62	276.29	561.00	0.00	0.00	0.00	0.00
4,400.00	8.35	29.49	4,358.72	501.26	283.43	575.51	0.00	0.00	0.00	0.00
4,500.00	8.35	29.49	4,457.66	513.89	290.58	590.02	0.00	0.00	0.00	0.00
4,600.00	8.35	29.49	4,556.60	526.53	297.72	604.53	0.00	0.00	0.00	0.00
4,700.00	8.35	29.49	4,655.54	539.17	304.87	619.04	0.00	0.00	0.00	0.00

## Plan Report for BM 35-11B - 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 (°)
4,800.00	8.35	29.49	4,754.48	551.80	312.02	633.55	0.00	0.00	0.00	0.00
4,900.00	8.35	29.49	4,853.42	564.44	319.16	648.06	0.00	0.00	0.00	0.00
5,000.00	8.35	29.49	4,952.36	577.08	326.31	662.57	0.00	0.00	0.00	0.00
5,100.00	8.35	29.49	5,051.30	589.71	333.45	677.07	0.00	0.00	0.00	0.00
5,200.00	8.35	29.49	5,150.25	602.35	340.60	691.58	0.00	0.00	0.00	0.00
5,300.00	8.35	29.49	5,249.19	614.99	347.74	706.09	0.00	0.00	0.00	0.00
5,400.00	8.35	29.49	5,348.13	627.62	354.89	720.60	0.00	0.00	0.00	0.00
5,500.00	8.35	29.49	5,447.07	640.26	362.03	735.11	0.00	0.00	0.00	0.00
5,600.00	8.35	29.49	5,546.01	652.90	369.18	749.62	0.00	0.00	0.00	0.00
5,700.00	8.35	29.49	5,644.95	665.53	376.32	764.13	0.00	0.00	0.00	0.00
5,800.00	8.35	29.49	5,743.89	678.17	383.47	778.63	0.00	0.00	0.00	0.00
5,900.00	8.35	29.49	5,842.83	690.80	390.61	793.14	0.00	0.00	0.00	0.00
6,000.00	8.35	29.49	5,941.77	703.44	397.76	807.65	0.00	0.00	0.00	0.00
6,100.00	8.35	29.49	6,040.71	716.08	404.90	822.16	0.00	0.00	0.00	0.00
6,200.00	8.35	29.49	6,139.65	728.71	412.05	836.67	0.00	0.00	0.00	0.00
6,216.01	8.35	29.49	6,155.49	730.74	413.19	838.99	0.00	0.00	0.00	0.00
Begin Drop at 6216.01ft										
6,300.00	7.09	29.49	6,238.72	740.56	418.74	850.26	1.50	-1.50	0.00	180.00
6,400.00	5.59	29.49	6,338.11	750.16	424.18	861.30	1.50	-1.50	0.00	180.00
6,440.00	4.99	29.49	6,377.94	753.37	425.99	864.98	1.50	-1.50	0.00	-180.00
Drop Rate = 1.50°/100ft										
6,500.00	4.09	29.49	6,437.75	757.50	428.33	869.72	1.50	-1.50	0.00	180.00
6,600.00	2.59	29.49	6,537.58	762.57	431.19	875.54	1.50	-1.50	0.00	180.00
6,700.00	1.09	29.49	6,637.52	765.36	432.77	878.74	1.50	-1.50	0.00	180.00
6,772.48	0.00	0.00	6,710.00	765.96	433.11	879.43	1.50	-1.50	0.00	-180.00
End Drop at 6772.48ft - Williams Fork - BM 35-11B Plan #1 Driller's Tgt										
6,772.49	0.00	63.43	6,710.01	765.96	433.11	879.43	0.00	0.00	0.00	63.43
BM 35-11B Plan #1 Zone Tgt										
6,800.00	0.02	63.43	6,737.52	765.96	433.11	879.44	0.08	0.08	0.00	63.43
6,900.00	0.10	63.43	6,837.52	766.01	433.21	879.53	0.08	0.08	0.00	0.00
7,000.00	0.18	63.43	6,937.52	766.12	433.43	879.74	0.08	0.08	0.00	0.00
7,100.00	0.26	63.43	7,037.52	766.29	433.78	880.07	0.08	0.08	0.00	0.00
7,200.00	0.34	63.43	7,137.51	766.53	434.25	880.51	0.08	0.08	0.00	0.00
7,300.00	0.42	63.43	7,237.51	766.83	434.85	881.08	0.08	0.08	0.00	0.00
7,400.00	0.50	63.43	7,337.51	767.19	435.57	881.76	0.08	0.08	0.00	0.00
7,500.00	0.58	63.43	7,437.50	767.61	436.41	882.57	0.08	0.08	0.00	0.00
7,600.00	0.66	63.43	7,537.50	768.10	437.39	883.49	0.08	0.08	0.00	0.00
7,700.00	0.74	63.43	7,637.49	768.65	438.48	884.52	0.08	0.08	0.00	0.00
7,754.51	0.79	63.43	7,692.00	768.97	439.13	885.14	0.08	0.08	0.00	0.00
Top of Gas										
7,800.00	0.82	63.43	7,737.48	769.26	439.70	885.68	0.08	0.08	0.00	0.00
7,900.00	0.90	63.43	7,837.47	769.93	441.05	886.96	0.08	0.08	0.00	0.00
8,000.00	0.98	63.43	7,937.46	770.66	442.52	888.35	0.08	0.08	0.00	0.00
8,100.00	1.06	63.43	8,037.44	771.46	444.11	889.86	0.08	0.08	0.00	0.00
8,200.00	1.14	63.43	8,137.42	772.32	445.83	891.49	0.08	0.08	0.00	0.00
8,300.00	1.22	63.43	8,237.40	773.25	447.68	893.24	0.08	0.08	0.00	0.00
8,400.00	1.30	63.43	8,337.38	774.23	449.65	895.11	0.08	0.08	0.00	0.00
8,500.00	1.38	63.43	8,437.35	775.28	451.74	897.10	0.08	0.08	0.00	0.00
8,600.00	1.46	63.43	8,537.32	776.39	453.96	899.20	0.08	0.08	0.00	0.00
8,700.00	1.54	63.43	8,637.28	777.56	456.31	901.42	0.08	0.08	0.00	0.00
8,748.37	1.58	63.43	8,685.64	778.15	457.49	902.54	0.08	0.08	0.00	0.00
8,800.00	1.54	63.43	8,737.25	778.78	458.74	903.73	0.08	-0.08	0.00	180.00
8,900.00	1.47	63.43	8,837.21	779.95	461.09	905.96	0.08	-0.08	0.00	180.00
9,000.00	1.39	63.43	8,937.18	781.07	463.32	908.07	0.08	-0.08	0.00	180.00
9,100.00	1.31	63.43	9,037.15	782.12	465.43	910.07	0.08	-0.08	0.00	180.00
9,200.00	1.24	63.43	9,137.13	783.12	467.42	911.96	0.08	-0.08	0.00	180.00
9,300.00	1.16	63.43	9,237.11	784.05	469.29	913.73	0.08	-0.08	0.00	180.00
9,315.90	1.15	63.43	9,253.00	784.19	469.58	914.00	0.08	-0.08	0.00	-180.00
Cameo										



**Plan Report for BM 35-11B - 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 (°)
9,400.00	1.08	63.43	9,337.09	784.93	471.04	915.39	0.08	-0.08	0.00	180.00
9,500.00	1.01	63.43	9,437.07	785.74	472.68	916.94	0.08	-0.08	0.00	180.00
9,600.00	0.93	63.43	9,537.06	786.50	474.19	918.38	0.08	-0.08	0.00	180.00
9,688.95	0.86	63.43	9,626.00	787.13	475.44	919.56	0.08	-0.08	0.00	-180.00
<b>Rollins</b>										
9,700.00	0.86	63.43	9,637.04	787.20	475.59	919.70	0.08	-0.08	0.00	180.00
9,800.00	0.78	63.43	9,737.03	787.84	476.86	920.91	0.08	-0.08	0.00	-180.00
9,900.00	0.70	63.43	9,837.03	788.42	478.02	922.01	0.08	-0.08	0.00	180.00
10,000.00	0.63	63.43	9,937.02	788.94	479.06	922.99	0.08	-0.08	0.00	180.00
10,036.98	0.60	63.43	9,974.00	789.12	479.42	923.33	0.08	-0.08	0.00	-180.00
<b>Cozzette</b>										
10,100.00	0.55	63.43	10,037.01	789.40	479.98	923.87	0.08	-0.08	0.00	180.00
10,200.00	0.48	63.43	10,137.01	789.80	480.78	924.63	0.08	-0.08	0.00	180.00
10,300.00	0.40	63.43	10,237.01	790.14	481.47	925.28	0.08	-0.08	0.00	-180.00
10,333.99	0.37	63.43	10,271.00	790.24	481.67	925.47	0.08	-0.08	0.00	180.00
<b>Corcora</b>										
10,400.00	0.32	63.43	10,337.00	790.42	482.03	925.81	0.08	-0.08	0.00	-180.00
10,500.00	0.25	63.43	10,437.00	790.65	482.48	926.23	0.08	-0.08	0.00	180.00
10,575.00	0.19	63.43	10,512.00	790.77	482.73	926.48	0.08	-0.08	0.00	-180.00
<b>Mancos</b>										
10,600.00	0.17	63.43	10,537.00	790.81	482.80	926.54	0.08	-0.08	0.00	180.00
10,700.00	0.10	63.43	10,637.00	790.91	483.01	926.74	0.08	-0.08	0.00	180.00
10,800.00	0.02	63.43	10,737.00	790.96	483.10	926.82	0.08	-0.08	0.00	180.00
10,825.00	0.00	360.00	10,762.00	790.96	483.11	926.83	0.08	-0.08	0.00	-180.00
<b>BM 35-11B Plan #1 BH Tgt</b>										

**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
430.00	429.83	6.38	3.61	Build Rate = 2.00°/100ft
642.35	640.88	26.42	14.94	End Build at 642.35ft
3,470.00	3,438.57	383.74	216.98	8.35 Inclination
6,216.01	6,155.49	730.74	413.19	Begin Drop at 6216.01ft
6,440.00	6,377.94	753.37	425.99	Drop Rate = 1.50°/100ft
6,772.48	6,710.00	765.96	433.11	End Drop at 6772.48ft
10,825.00	10,762.00	790.96	483.11	Total Depth = 10825.00ft

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	BM 35-11B Plan #1 BH Tgt	31.42	Slot	0.00	0.00	0.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	10,825.00	Plan #1 Proposal	MWD

## Plan Report for BM 35-11B - Plan #1 Proposal

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
2,380.00	2,360.12	8 5/8" Casing Pt.	8-5/8	11

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,772.48	6,710.00	Williams Fork		0.00	
7,754.51	7,692.00	Top of Gas		0.00	
9,315.90	9,253.00	Cameo		0.00	
9,688.95	9,626.00	Rollins		0.00	
10,036.98	9,974.00	Cozzette		0.00	
10,333.99	10,271.00	Corcora		0.00	
10,575.00	10,512.00	Mancos		0.00	

*Targets associated with this wellbore*

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
BM 35-11B Plan #1 BH Tgt	10,762.00	790.96	483.11	Point
BM 35-11B Plan #1 Driller's Tgt	6,710.00	765.96	433.11	Rectangle
BM 35-11B Plan #1 Zone Tgt	6,710.00	790.96	483.11	Rectangle

**North Reference Sheet for Sec. 35-T7S-R95W (SGV 35D2 PAD) - BM 35-11B - Wellbore #1**

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

Vertical Depths are relative to RKB - 24' @ 8870.00ft. Northing and Easting are relative to BM 35-11B - Slot A 4

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: 0.99994927

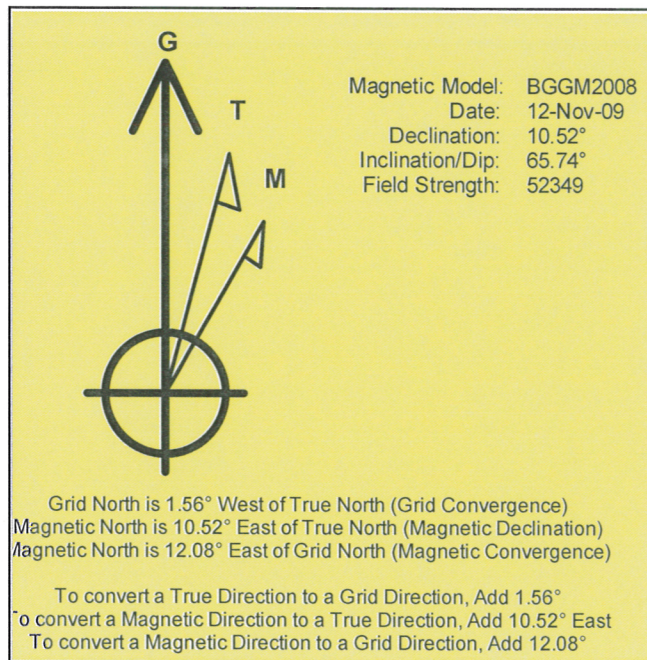
Grid Coordinates of Well: 579,174.48 ft N, 1,301,240.42 ft E

Geographical Coordinates of Well: 39° 23' 51.05" N, 107° 58' 22.41" W

Grid Convergence at Surface is: -1.56°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,825.00ft  
the Bottom Hole Displacement is 926.83ft in the Direction of 31.42° (Grid).

Magnetic Convergence at surface is: -12.08° (12 November 2009, , BGGM2008)



Project: Garfield County, CO  
Site: Sec. 35-T7S-R95W (SGV 35D2 PAD)  
Well: BM 35-11B  
Wellbore: Wellbore #1  
Plan: Plan #1 Proposal

# Noble Energy (Rockies)

HALLIBURTON

## SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	DLeg	TFace	VSec
0.00	0.00	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
642.35	8.35	29.49	640.88	26.42	14.94	2.00	29.49	30.33
6216.01	8.35	29.49	6155.50	730.74	413.19	0.00	0.00	838.99
6772.48	0.00	0.00	6710.00	765.96	433.11	1.50	180.00	879.43
8748.37	1.58	63.43	8685.64	778.15	457.49	0.08	63.43	902.54
10825.00	0.00	360.00	10762.00	790.96	483.11	0.08	180.00	926.83

BM 35-11B Plan #1 Driller's Tgt

BM 35-11B Plan #1 BH Tgt

## WELL DETAILS: BM 35-11B

Ground Level:	8846.00	Latitude	39° 23' 51.054 N	Longitude	107° 58' 22.412 W	A 4
North	579174.48	East	1301240.42			

## WELLBORE TARGET DETAILS

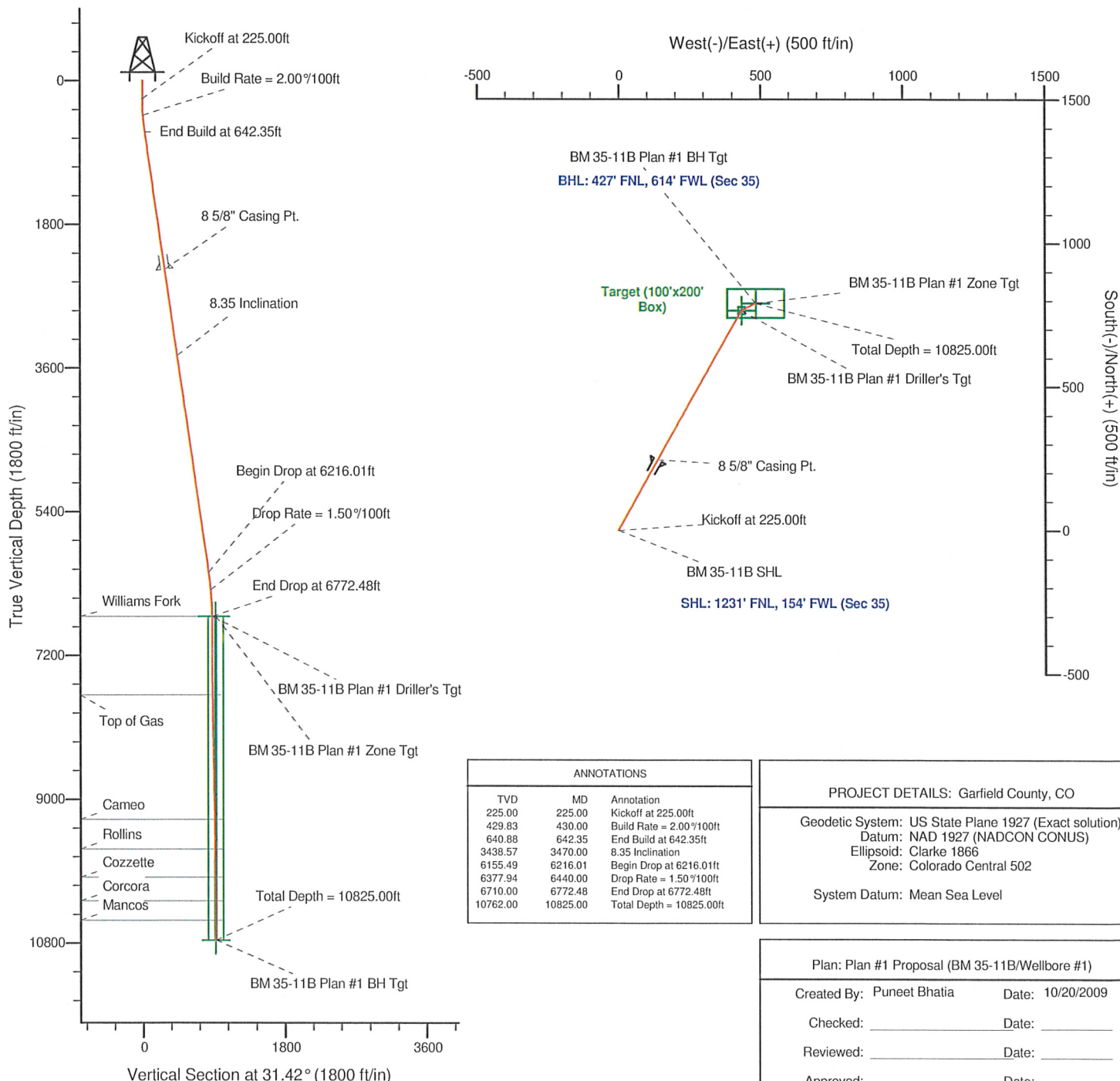
Name	TVD	+N-S	+E-W	Shape
BM 35-11B Plan #1 Driller's Tgt	6710.00	765.96	433.11	Rectangle (Sides: L25.00 W25.00)
BM 35-11B Plan #1 Zone Tgt	6710.00	790.96	483.11	Rectangle (Sides: L100.00 W200.00)
BM 35-11B Plan #1 BH Tgt	10762.00	790.96	483.11	Point

## FORMATION TOP DETAILS

TVDPath	MDPath	Formation
6710.00	6772.48	Williams Fork
7692.00	7754.51	Top of Gas
9253.00	9315.90	Cameo
9626.00	9688.95	Rollins
9974.00	10036.98	Cozzette
10271.00	10333.99	Corcora
10512.00	10575.00	Mancos



Azimuths to Grid North  
True North: 1.56°  
Magnetic North: 12.08°  
Magnetic Field  
Strength: 52348.8snT  
Dip Angle: 65.74°  
Date: 11/12/2009  
Model: BGGM2008



## ANNOTATIONS

TVD	MD	Annotation
225.00	225.00	Kickoff at 225.00ft
429.83	430.00	Build Rate = 2.00°/100ft
640.88	642.35	End Build at 642.35ft
3438.57	3470.00	8.35 Inclusion
6155.49	6216.01	Begin Drop at 6216.01ft
6377.94	6440.00	Drop Rate = 1.50°/100ft
6710.00	6772.48	End Drop at 6772.48ft
10762.00	10825.00	Total Depth = 10825.00ft

## 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 (BM 35-11B/Wellbore #1)

Created By: Puneet Bhatia Date: 10/20/2009  
Checked: \_\_\_\_\_ Date: \_\_\_\_\_  
Reviewed: \_\_\_\_\_ Date: \_\_\_\_\_  
Approved: \_\_\_\_\_ Date: \_\_\_\_\_