

Cimarex Energy Co.

Eddy County (NM27E)

Sec 11-T25S-R26E

Grynberg 11 Fed #3

Wellbore #1

Survey: MWD Surveys

Standard Survey Report

11 August, 2009

Great White Directional Services

Survey Report

Company:	Cimarex Energy Co.	Local Co-ordinate Reference:	Site Sec 11-T25S-R26E
Project:	Eddy County (NM27E)	TVD Reference:	WELL @ 3347.0usft (Original Well Elev)
Site:	Sec 11-T25S-R26E	MD Reference:	WELL @ 3347.0usft (Original Well Elev)
Well:	Grynberg 11 Fed #3	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Eddy County (NM27E)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site		Sec 11-T25S-R26E			
Site Position:		Northing:	415,062.70 usft	Latitude:	32° 8' 27.985 N
From:	Map	Easting:	520,332.00 usft	Longitude:	104° 16' 3.520 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.03 °

Well	Grynberg 11 Fed #3					
Well Position	+N-S	0.0 usft	Northing:	415,062.70 usfi	Latitude:	32° 8' 27.985 N
	+E-W	0.0 usft	Easting:	520,332.00 usfi	Longitude:	104° 16' 3.520 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usfi	Ground Level:	3,328.0 usfi

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	2009/06/02	8.13	60.05	48,720

Design		Wellbore #1			
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	358.75	

Survey Program	Date 2009/08/11			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	4,567.0	GYRO (Wellbore #1)	MWD	MWD - Standard
4,567.0	8,186.0	MWD Surveys (Wellbore #1)	MWD	MWD - Standard

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
4,567.0	0.76	152.17	4,566.0	-30.2	45.0	-31.2	0.00	0.00	0.00	
4,581.0	0.70	190.60	4,580.0	-30.4	45.0	-31.3	3.46	-0.43	274.50	
First MWD Survey										
4,613.0	9.50	346.50	4,611.9	-28.0	44.4	-28.9	31.70	27.50	487.19	
4,641.0	18.40	345.00	4,639.1	-21.5	42.7	-22.4	31.81	31.79	-5.36	
4,673.0	27.70	346.40	4,668.5	-9.3	39.6	-10.2	29.11	29.06	4.38	
4,704.0	35.00	345.60	4,694.9	6.3	35.7	5.5	23.59	23.55	-2.58	
4,736.0	41.70	345.90	4,720.0	25.5	30.8	24.9	20.95	20.94	0.94	
4,767.0	48.10	346.60	4,742.0	46.8	25.6	46.2	20.71	20.65	2.26	
4,799.0	54.10	351.60	4,762.0	71.2	21.0	70.8	22.34	18.75	15.63	

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Well:	Grynberg 11 Fed #3	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,830.0	61.00	355.20	4,778.7	97.2	18.0	96.8	24.31	22.26	11.61
4,862.0	67.90	355.20	4,792.5	126.0	15.6	125.6	21.56	21.56	0.00
4,894.0	75.60	356.20	4,802.5	156.2	13.3	155.9	24.24	24.06	3.13
4,925.0	82.20	358.30	4,808.4	186.6	11.9	186.3	22.30	21.29	6.77
4,956.0	90.80	355.40	4,810.3	217.5	10.2	217.2	29.27	27.74	-9.35
4,987.0	90.90	355.20	4,809.9	248.4	7.6	248.1	0.72	0.32	-0.65
5,019.0	90.00	355.20	4,809.6	280.2	5.0	280.1	2.81	-2.81	0.00
5,050.0	90.60	355.70	4,809.5	311.1	2.5	311.0	2.52	1.94	1.61
5,082.0	87.60	355.60	4,810.0	343.0	0.1	343.0	9.38	-9.38	-0.31
5,113.0	84.90	354.90	4,812.0	373.9	-2.5	373.8	9.00	-8.71	-2.26
5,145.0	85.30	354.80	4,814.7	405.6	-5.4	405.6	1.29	1.25	-0.31
5,177.0	85.90	354.60	4,817.2	437.4	-8.3	437.5	1.98	1.88	-0.63
5,208.0	86.90	354.30	4,819.1	468.2	-11.3	468.3	3.37	3.23	-0.97
5,239.0	87.90	353.50	4,820.5	499.0	-14.6	499.2	4.13	3.23	-2.58
5,271.0	87.90	353.10	4,821.7	530.7	-18.3	531.0	1.25	0.00	-1.25
5,302.0	88.50	353.60	4,822.7	561.5	-21.9	561.9	2.52	1.94	1.61
5,334.0	88.70	354.10	4,823.5	593.3	-25.3	593.7	1.68	0.63	1.56
5,365.0	89.50	354.90	4,824.0	624.2	-28.3	624.6	3.65	2.58	2.58
5,397.0	91.90	355.20	4,823.6	656.0	-31.1	656.6	7.56	7.50	0.94
5,428.0	90.70	353.40	4,822.9	686.9	-34.1	687.5	6.98	-3.87	-5.81
5,460.0	89.80	352.80	4,822.7	718.7	-38.0	719.3	3.38	-2.81	-1.88
5,492.0	89.60	352.40	4,822.9	750.4	-42.1	751.1	1.40	-0.63	-1.25
5,523.0	92.20	353.50	4,822.4	781.1	-45.9	782.0	9.11	8.39	3.55
5,555.0	92.60	353.90	4,821.1	812.9	-49.4	813.8	1.77	1.25	1.25
5,587.0	92.60	353.60	4,819.6	844.7	-52.9	845.6	0.94	0.00	-0.94
5,619.0	92.10	353.20	4,818.3	876.5	-56.6	877.5	2.00	-1.56	-1.25
5,650.0	92.20	353.20	4,817.1	907.2	-60.2	908.3	0.32	0.32	0.00
5,682.0	90.30	353.00	4,816.4	939.0	-64.1	940.2	5.97	-5.94	-0.63
5,713.0	90.90	353.10	4,816.1	969.7	-67.8	971.0	1.96	1.94	0.32
5,745.0	90.90	353.40	4,815.6	1,001.5	-71.6	1,002.8	0.94	0.00	0.94
5,775.0	90.10	352.40	4,815.3	1,031.3	-75.3	1,032.7	4.27	-2.67	-3.33
5,807.0	89.20	354.60	4,815.5	1,063.1	-78.9	1,064.5	7.43	-2.81	6.88
5,838.0	89.30	354.90	4,815.9	1,094.0	-81.8	1,095.5	1.02	0.32	0.97
5,869.0	90.40	355.70	4,816.0	1,124.8	-84.3	1,126.4	4.39	3.55	2.58
5,901.0	91.00	356.10	4,815.6	1,156.8	-86.6	1,158.4	2.25	1.88	1.25
5,932.0	92.40	356.60	4,814.7	1,187.7	-88.6	1,189.3	4.80	4.52	1.61
5,964.0	92.90	356.50	4,813.2	1,219.6	-90.5	1,221.3	1.59	1.56	-0.31
5,995.0	92.80	358.90	4,811.7	1,250.5	-91.7	1,252.2	7.74	-0.32	7.74
6,026.0	93.30	358.90	4,810.0	1,281.5	-92.3	1,283.2	1.61	1.61	0.00
6,058.0	91.50	0.40	4,808.7	1,313.4	-92.5	1,315.1	7.32	-5.63	4.69
6,090.0	90.00	0.30	4,808.3	1,345.4	-92.3	1,347.1	4.70	-4.69	-0.31
6,121.0	89.70	0.40	4,808.4	1,376.4	-92.1	1,378.1	1.02	-0.97	0.32
6,152.0	88.20	0.80	4,808.9	1,407.4	-91.8	1,409.1	5.01	-4.84	1.29

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6,183.0	89.20	1.70	4,809.6	1,438.4	-91.1	1,440.1	4.34	3.23	2.90	
6,214.0	89.00	1.20	4,810.1	1,469.4	-90.4	1,471.0	1.74	-0.65	-1.61	
6,246.0	88.70	1.00	4,810.8	1,501.4	-89.7	1,503.0	1.13	-0.94	-0.63	
6,277.0	89.50	1.50	4,811.3	1,532.4	-89.1	1,534.0	3.04	2.58	1.61	
6,309.0	89.20	1.60	4,811.6	1,564.4	-88.2	1,565.9	0.99	-0.94	0.31	
6,340.0	90.90	1.60	4,811.6	1,595.4	-87.3	1,596.9	5.48	5.48	0.00	
6,372.0	91.70	2.40	4,810.9	1,627.3	-86.2	1,628.8	3.54	2.50	2.50	
6,404.0	91.40	2.20	4,810.0	1,659.3	-84.9	1,660.7	1.13	-0.94	-0.63	
6,435.0	91.70	2.40	4,809.2	1,690.2	-83.7	1,691.7	1.16	0.97	0.65	
6,467.0	93.60	3.80	4,807.7	1,722.2	-82.0	1,723.5	7.37	5.94	4.38	
6,499.0	93.10	3.00	4,805.8	1,754.1	-80.1	1,755.4	2.94	-1.56	-2.50	
6,530.0	92.90	2.90	4,804.2	1,785.0	-78.5	1,786.3	0.72	-0.65	-0.32	
6,562.0	93.20	3.20	4,802.5	1,816.9	-76.8	1,818.1	1.32	0.94	0.94	
6,593.0	93.10	3.30	4,800.8	1,847.8	-75.0	1,849.0	0.46	-0.32	0.32	
6,625.0	91.30	2.60	4,799.6	1,879.7	-73.4	1,880.9	6.03	-5.63	-2.19	
6,657.0	91.70	2.10	4,798.7	1,911.7	-72.1	1,912.8	2.00	1.25	-1.56	
6,687.0	90.90	1.70	4,798.0	1,941.7	-71.1	1,942.7	2.98	-2.67	-1.33	
6,718.0	91.10	1.80	4,797.5	1,972.6	-70.1	1,973.7	0.72	0.65	0.32	
6,750.0	91.50	2.30	4,796.8	2,004.6	-69.0	2,005.6	2.00	1.25	1.56	
6,782.0	91.80	2.20	4,795.9	2,036.6	-67.7	2,037.6	0.99	0.94	-0.31	
6,813.0	90.60	1.40	4,795.2	2,067.5	-66.7	2,068.5	4.65	-3.87	-2.58	
6,844.0	91.20	1.40	4,794.7	2,098.5	-66.0	2,099.5	1.94	1.94	0.00	
6,876.0	91.20	1.10	4,794.0	2,130.5	-65.3	2,131.4	0.94	0.00	-0.94	
6,908.0	89.80	0.60	4,793.8	2,162.5	-64.8	2,163.4	4.65	-4.38	-1.56	
6,939.0	89.50	0.10	4,794.0	2,193.5	-64.6	2,194.4	1.88	-0.97	-1.61	
6,971.0	89.50	0.10	4,794.2	2,225.5	-64.6	2,226.4	0.00	0.00	0.00	
7,002.0	90.20	1.50	4,794.3	2,256.5	-64.1	2,257.4	5.05	2.26	4.52	
7,034.0	91.90	3.10	4,793.7	2,288.5	-62.9	2,289.3	7.29	5.31	5.00	
7,065.0	92.50	3.60	4,792.5	2,319.4	-61.0	2,320.2	2.52	1.94	1.61	
7,095.0	92.00	2.40	4,791.4	2,349.3	-59.5	2,350.1	4.33	-1.67	-4.00	
7,127.0	92.40	3.90	4,790.1	2,381.3	-57.7	2,381.9	4.85	1.25	4.69	
7,158.0	90.90	2.40	4,789.2	2,412.2	-56.0	2,412.8	6.84	-4.84	-4.84	
7,190.0	90.70	1.60	4,788.8	2,444.2	-54.9	2,444.8	2.58	-0.63	-2.50	
7,221.0	88.90	359.60	4,788.9	2,475.2	-54.6	2,475.8	8.68	-5.81	-6.45	
7,253.0	88.60	359.70	4,789.6	2,507.2	-54.8	2,507.8	0.99	-0.94	0.31	
7,284.0	89.00	358.80	4,790.2	2,538.2	-55.2	2,538.8	3.18	1.29	-2.90	
7,316.0	90.20	358.50	4,790.5	2,570.1	-55.9	2,570.7	3.87	3.75	-0.94	
7,347.0	90.20	357.50	4,790.4	2,601.1	-57.0	2,601.7	3.23	0.00	-3.23	
7,376.0	91.60	358.20	4,789.9	2,630.1	-58.1	2,630.7	5.40	4.83	2.41	
7,408.0	92.90	358.60	4,788.7	2,662.1	-59.0	2,662.7	4.25	4.06	1.25	
7,439.0	90.50	358.00	4,787.7	2,693.0	-59.9	2,693.7	7.98	-7.74	-1.94	
7,470.0	89.60	359.00	4,787.7	2,724.0	-60.7	2,724.7	4.34	-2.90	3.23	
7,502.0	87.90	357.90	4,788.4	2,756.0	-61.6	2,756.7	6.33	-5.31	-3.44	

Great White Directional Services

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Project:	Eddy County (NM27E)	TVD Reference:	WELL @ 3347.0usft (Original Well Elev)
Site:	Sec 11-T25S-R26E	MD Reference:	WELL @ 3347.0usft (Original Well Elev)
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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,534.0	88.50	358.10	4,789.4	2,788.0	-62.7	2,788.7	1.98	1.88	0.63
7,565.0	89.10	358.20	4,790.1	2,818.9	-63.7	2,819.7	1.96	1.94	0.32
7,597.0	89.10	357.50	4,790.6	2,850.9	-64.9	2,851.6	2.19	0.00	-2.19
7,628.0	89.80	357.50	4,790.9	2,881.9	-66.3	2,882.6	2.26	2.26	0.00
7,660.0	90.80	357.90	4,790.7	2,913.9	-67.5	2,914.6	3.37	3.13	1.25
7,691.0	91.00	357.00	4,790.2	2,944.8	-68.9	2,945.6	2.97	0.65	-2.90
7,722.0	91.00	357.00	4,789.7	2,975.8	-70.5	2,976.6	0.00	0.00	0.00
7,754.0	90.00	355.80	4,789.4	3,007.7	-72.5	3,008.6	4.88	-3.13	-3.75
7,786.0	89.80	354.40	4,789.4	3,039.6	-75.3	3,040.5	4.42	-0.63	-4.38
7,817.0	90.70	354.50	4,789.3	3,070.4	-78.3	3,071.4	2.92	2.90	0.32
7,849.0	90.40	353.90	4,789.0	3,102.3	-81.5	3,103.3	2.10	-0.94	-1.88
7,880.0	91.10	354.60	4,788.6	3,133.1	-84.6	3,134.2	3.19	2.26	2.26
7,912.0	90.90	354.20	4,788.0	3,165.0	-87.7	3,166.1	1.40	-0.63	-1.25
7,944.0	92.00	355.90	4,787.2	3,196.8	-90.5	3,198.0	6.33	3.44	5.31
7,975.0	93.50	356.90	4,785.7	3,227.7	-92.4	3,229.0	5.81	4.84	3.23
8,007.0	93.10	356.50	4,783.9	3,259.6	-94.3	3,260.9	1.77	-1.25	-1.25
8,038.0	93.60	356.50	4,782.1	3,290.5	-96.2	3,291.8	1.61	1.61	0.00
8,070.0	93.30	356.50	4,780.2	3,322.4	-98.1	3,323.7	0.94	-0.94	0.00
8,101.0	92.80	357.20	4,778.5	3,353.3	-99.8	3,354.7	2.77	-1.61	2.26
8,132.0	93.70	357.30	4,776.7	3,384.2	-101.3	3,385.6	2.92	2.90	0.32
8,145.0	93.80	357.10	4,775.9	3,397.2	-101.9	3,398.6	1.72	0.77	-1.54
Last MWD Survey									
8,186.0	93.80	357.10	4,773.2	3,438.0	-104.0	3,439.5	0.00	0.00	0.00
Projection to TD - Drilling Corridor - Grynberg 11 Fed #3 PBHL									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,581.0	4,580.0	-30.4	45.0	First MWD Survey
8,145.0	4,775.9	3,397.2	-101.9	Last MWD Survey
8,186.0	4,773.2	3,438.0	-104.0	Projection to TD

Checked By: _____ Approved By: _____ Date: _____