



PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288

30-015-39697

July 9, 2012

COG, LLC
Fasken Center, Tower II
550 West Texas Ave, Suite 1300
Midland, TX 79701

RE: Skelly Unit #659
638' FSL & 588' FEL
Sec. 14, T17S, R31E
Eddy County, New Mexico

Dear Sir,

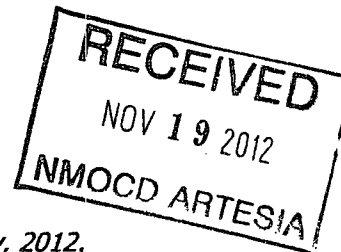
The attached is the Deviation Survey for the above captioned well.

Very truly yours,

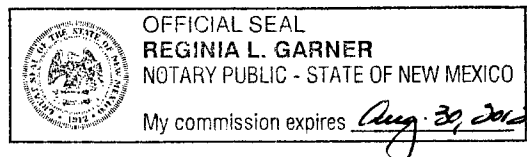

Eddie C. LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 9th day of July, 2012.




Regina L. Garner
Notary Public



Skelly Unit #659

Date	Depth	Deviation	Direction
6/29/2012	184	1.10	
6/29/2012	312	0.90	
6/29/2012	460	1.10	
6/29/2012	578	1.40	
7/1/2012	827	1.00	
7/1/2012	1300	1.10	
7/1/2012	1895	2.50	
7/2/2012	1960	1.90	63.40
7/3/2012	2023	2.10	69.60
7/3/2012	2087	2.50	55.60
7/3/2012	2149	3.50	52.30
7/3/2012	2338	5.00	33.60
7/3/2012	2432	5.10	27.70
7/3/2012	2527	4.40	26.40
7/3/2012	2587	4.10	27.50
7/3/2012	2692	3.60	27.00
7/3/2012	2755	4.20	29.50
7/3/2012	2819	5.20	20.00
7/3/2012	2913	4.90	70.60
7/3/2012	3007	4.70	22.00
7/4/2012	3103	4.10	22.20
7/4/2012	3196	4.70	23.00
7/4/2012	3291	5.20	24.10
7/4/2012	3386	4.70	24.70
7/4/2012	3481	4.70	24.10
7/4/2012	3574	4.70	24.50
7/4/2012	3668	4.70	30.50
7/4/2012	3762	4.70	29.70
7/4/2012	3857	4.70	29.50
7/4/2012	3953	4.40	29.20
7/4/2012	4047	4.40	30.90
7/4/2012	4141	4.30	30.70
7/4/2012	4236	4.40	30.70
7/4/2012	4330	4.40	29.30
7/4/2012	4425	4.20	27.70
7/4/2012	4520	4.00	27.50
7/4/2012	4615	4.90	30.00
7/5/2012	4710	4.90	30.20
7/5/2012	4804	4.70	29.40
7/5/2012	4900	4.70	29.50
7/5/2012	4931	4.50	28.40
7/5/2012	4994	4.50	27.70
7/5/2012	5090	4.60	29.90

Date	Depth	Deviation	Direction
7/5/2012	5185	4.40	26.70
7/5/2012	5278	4.40	26.60
7/5/2012	5373	4.40	29.30
7/6/2012	5468	4.30	29.20
7/6/2012	5562	4.30	28.80
7/6/2012	5657	4.40	28.20
7/6/2012	5752	4.30	27.00
7/6/2012	5847	4.40	28.80
7/6/2012	5943	4.40	28.70
7/6/2012	6038	4.40	27.50
7/6/2012	6132	4.30	26.80
7/6/2012	6228	4.30	27.50
7/6/2012	6291	4.00	27.90
7/6/2012	6387	3.00	24.20
7/6/2012	6750	2.80	18.40
7/7/2012	6506	2.60	6.30
7/7/2012	6602	4.40	19.40
7/7/2012	6665	4.70	22.80
7/7/2012	6729	5.40	25.70
7/7/2012	6791	5.60	26.90
7/7/2012	6880	5.20	28.01



COG Operating LLC

Eddy County(NM27E)

Sec 14-T17S-R31E

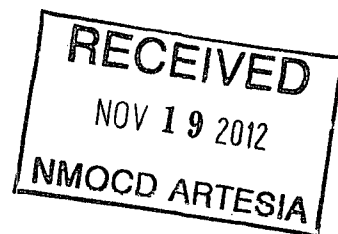
Skelly Unit # 659

Wellbore #1

Survey: Gyro/MWD Survey

Standard Survey Report

09 July, 2012



Archer
The well company



Great White Directional Services

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Skelly Unit # 659
Project:	Eddy County(NM27E)	TVD Reference:	WELL @ 3906.0usft (Original Well Elev)
Site:	Sec 14-T17S-R31E	MD Reference:	WELL @ 3906.0usft (Original Well Elev)
Well:	Skelly Unit # 659	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), Surface Location: 915'FSL & 400'FWL, Top of Paddock 4000'TVD		
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 14-T17S-R31E				
Site Position:		Northing:	666,634.90 usft	Latitude:	32° 49' 54.162 N
From:	Map	Easting:	650,096.70 usft	Longitude:	103° 50' 40.857 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.26 °

Well	Skelly Unit # 659					
Well Position	+N-S	0.0 usft	Northing:	665,677.00 usft	Latitude:	32° 49' 44.519 N
	+E-W	0.0 usft	Easting:	653,659.20 usft	Longitude:	103° 49' 59.158 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,906.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2012/05/04	7.64	60.68	48,860

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)	
	0.0	0.0	0.0	61.00	

Survey Program	Date	2012/07/09			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	6,925.0	Gyro/MWD Survey (Wellbore #1)	MWD	MWD - Standard	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.25	307.77	100.0	0.1	-0.2	-0.1	0.25	0.25	0.00
200.0	0.60	9.33	200.0	0.8	-0.3	0.2	0.53	0.35	61.56
300.0	0.29	314.67	300.0	1.5	-0.4	0.4	0.49	-0.31	-54.66
400.0	0.59	27.39	400.0	2.1	-0.3	0.8	0.57	0.30	72.72
500.0	0.27	92.76	500.0	2.6	0.2	1.4	0.54	-0.32	65.37
600.0	0.33	131.26	600.0	2.4	0.6	1.7	0.21	0.06	38.50
700.0	0.26	153.06	700.0	2.0	0.9	1.8	0.13	-0.07	21.80
800.0	0.45	192.80	800.0	1.4	1.0	1.5	0.30	0.19	39.74
900.0	0.28	162.51	900.0	0.8	0.9	1.2	0.25	-0.17	-30.29



Great White Directional Services

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Well:	Skelly Unit # 659	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 (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
1,000.0	0.47	173.69	1,000.0	0.1	1.1	1.0	0.20	0.19	11.18	
1,100.0	0.31	187.36	1,100.0	-0.6	1.1	0.7	0.18	-0.16	13.67	
1,200.0	0.25	160.46	1,200.0	-1.0	1.1	0.5	0.14	-0.06	-26.90	
1,300.0	0.21	155.88	1,300.0	-1.4	1.3	0.4	0.04	-0.04	-4.58	
1,400.0	0.80	72.33	1,400.0	-1.4	2.0	1.1	0.80	0.59	-83.55	
1,500.0	1.28	66.91	1,500.0	-0.7	3.7	2.9	0.49	0.48	-5.42	
1,600.0	1.71	65.60	1,599.9	0.4	6.1	5.5	0.43	0.43	-1.31	
1,700.0	1.64	71.00	1,699.9	1.4	8.8	8.4	0.17	-0.07	5.40	
1,800.0	1.63	74.08	1,799.8	2.3	11.5	11.2	0.09	-0.01	3.08	
1,861.0	2.51	58.62	1,860.8	3.2	13.5	13.4	1.70	1.44	-25.34	
Last Gyro										
1,960.0	1.90	63.40	1,959.7	5.1	16.8	17.2	0.64	-0.62	4.83	
2,023.0	2.10	69.60	2,022.7	6.0	18.8	19.3	0.47	0.32	9.84	
2,087.0	2.50	55.60	2,086.6	7.2	21.1	21.9	1.07	0.63	-21.88	
2,149.0	3.50	52.30	2,148.5	9.1	23.7	25.1	1.64	1.61	-5.32	
2,244.0	4.80	33.70	2,243.3	14.2	28.2	31.5	1.95	1.37	-19.58	
2,338.0	5.00	33.60	2,337.0	20.8	32.6	38.6	0.21	0.21	-0.11	
2,432.0	5.10	27.70	2,430.6	27.9	36.8	45.8	0.56	0.11	-6.28	
2,527.0	4.40	26.40	2,525.3	35.0	40.4	52.3	0.75	-0.74	-1.37	
2,589.0	4.10	27.50	2,587.1	39.0	42.5	56.1	0.50	-0.48	1.77	
2,692.0	3.60	27.00	2,689.9	45.2	45.7	61.9	0.49	-0.49	-0.49	
2,755.0	4.20	29.50	2,752.7	49.0	47.7	65.5	0.99	0.95	3.97	
2,819.0	5.20	19.90	2,816.5	53.7	49.9	69.7	1.98	1.56	-15.00	
2,913.0	4.90	20.60	2,910.1	61.5	52.7	75.9	0.33	-0.32	0.74	
3,007.0	4.70	22.00	3,003.8	68.8	55.6	82.0	0.25	-0.21	1.49	
3,103.0	4.10	22.20	3,099.5	75.6	58.3	87.7	0.63	-0.63	0.21	
3,196.0	4.70	23.00	3,192.3	82.2	61.1	93.3	0.65	0.65	0.86	
3,291.0	5.20	24.10	3,286.9	89.7	64.4	99.8	0.54	0.53	1.16	
3,386.0	4.70	24.70	3,381.5	97.2	67.7	106.4	0.53	-0.53	0.63	
3,481.0	4.70	24.10	3,476.2	104.3	71.0	112.6	0.05	0.00	-0.63	
3,574.0	4.70	24.50	3,568.9	111.2	74.1	118.7	0.04	0.00	0.43	
3,668.0	4.70	30.50	3,662.6	118.1	77.7	125.2	0.52	0.00	6.38	
3,762.0	4.70	29.70	3,756.3	124.7	81.5	131.8	0.07	0.00	-0.85	
3,857.0	4.70	29.50	3,851.0	131.5	85.4	138.4	0.02	0.00	-0.21	
3,953.0	4.40	29.20	3,946.7	138.1	89.1	144.9	0.31	-0.31	-0.31	
4,047.0	4.40	30.90	4,040.4	144.4	92.7	151.1	0.14	0.00	1.81	
4,141.0	4.30	30.70	4,134.1	150.5	96.4	157.2	0.11	-0.11	-0.21	
4,236.0	4.40	30.70	4,228.8	156.7	100.0	163.5	0.11	0.11	0.00	
4,330.0	4.40	29.30	4,322.6	162.9	103.6	169.6	0.11	0.00	-1.49	
4,425.0	4.20	27.70	4,417.3	169.2	107.0	175.6	0.25	-0.21	-1.68	
4,520.0	4.00	27.50	4,512.0	175.2	110.2	181.3	0.21	-0.21	-0.21	
4,615.0	4.90	30.00	4,606.8	181.7	113.7	187.6	0.97	0.95	2.63	
4,710.0	4.90	30.20	4,701.4	188.7	117.8	194.5	0.02	0.00	0.21	
4,803.0	4.70	29.40	4,794.1	195.4	121.7	201.2	0.23	-0.22	-0.86	



Great White Directional Services

Survey Report



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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,900.0	4.70	29.50	4,890.8	202.4	125.6	208.0	0.01	0.00	0.10
4,994.0	4.50	27.70	4,984.5	209.0	129.2	214.3	0.26	-0.21	-1.91
5,090.0	4.60	29.90	5,080.2	215.7	132.9	220.8	0.21	0.10	2.29
5,184.0	4.40	26.70	5,173.9	222.1	136.4	227.0	0.34	-0.21	-3.40
5,278.0	4.40	26.60	5,267.6	228.6	139.6	232.9	0.01	0.00	-0.11
5,373.0	4.40	29.30	5,362.3	235.0	143.0	239.0	0.22	0.00	2.84
5,468.0	4.30	29.20	5,457.0	241.3	146.5	245.2	0.11	-0.11	-0.11
5,562.0	4.30	28.80	5,550.8	247.5	150.0	251.1	0.03	0.00	-0.43
5,657.0	4.40	28.20	5,645.5	253.8	153.4	257.2	0.12	0.11	-0.63
5,752.0	4.30	27.00	5,740.2	260.2	156.7	263.2	0.14	-0.11	-1.26
5,847.0	4.40	28.80	5,834.9	266.6	160.1	269.3	0.18	0.11	1.89
5,943.0	4.40	28.70	5,930.7	273.0	163.6	275.5	0.01	0.00	-0.10
6,038.0	4.40	27.50	6,025.4	279.5	167.1	281.6	0.10	0.00	-1.26
6,132.0	4.30	26.80	6,119.1	285.8	170.3	287.5	0.12	-0.11	-0.74
6,228.0	4.30	27.50	6,214.8	292.2	173.6	293.5	0.05	0.00	0.73
6,291.0	4.00	27.90	6,277.7	296.2	175.7	297.3	0.48	-0.48	0.63
6,386.0	3.00	24.20	6,372.5	301.4	178.3	302.1	1.08	-1.05	-3.89
6,450.0	2.80	18.40	6,436.4	304.4	179.5	304.6	0.55	-0.31	-9.06
6,506.0	2.60	6.30	6,492.4	307.0	180.1	306.3	1.08	-0.36	-21.61
6,602.0	4.40	19.40	6,588.2	312.6	181.5	310.3	2.04	1.88	13.65
6,665.0	4.70	22.80	6,651.0	317.3	183.3	314.2	0.64	0.48	5.40
6,774.0	5.40	25.70	6,759.6	326.0	187.3	321.9	0.68	0.64	2.66
6,791.0	5.60	26.90	6,776.5	327.5	188.0	323.2	1.36	1.18	7.06
6,880.0	5.20	28.10	6,865.1	334.9	191.9	330.2	0.47	-0.45	1.35
Last MWD Survey									
6,925.0	5.20	28.10	6,909.9	338.5	193.8	333.6	0.00	0.00	0.00
Projection to TD									

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,861.0	1,860.8	3.2	13.5	Last Gyro
6,880.0	6,865.1	334.9	191.9	Last MWD Survey
6,925.0	6,909.9	338.5	193.8	Projection to TD

Checked By: _____ Approved By: _____ Date: _____