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AUG 25 2010

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COG Operating LLC

Eddy County, NM (NAN27 NME)

Skelly Unit #995

Skelly Unit #995

OH

Design: Actual

Standard Survey Report

10 June, 2010



Scientific Drilling
Directional Drilling Operations

Handwritten signature



Scientific Drilling
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Skelly Unit #995
Project:	Eddy County, NM (NAN27 NME)	TVD Reference:	RKB Elev (12') @ 3864.40ft (Basic #35)
Site:	Skelly Unit #995	MD Reference:	RKB Elev (12') @ 3864.40ft (Basic #35)
Well:	Skelly Unit #995	North Reference:	Gnd
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM 5000.1 Single User Db

Project	Eddy County, NM (NAN27 NME)		
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	Skelly Unit #995		
Site Position:		Northing:	665,964.50 ft
From:	Map	Easting:	644,545.10 ft
Position Uncertainty:	0.00 ft	Slot Radius:	0 "
		Latitude:	32° 49' 47.778 N
		Longitude:	103° 51' 45.955 W
		Grid Convergence:	0.26 °

Well	Skelly Unit #995		
Well Position	+N-S	0.00 ft	Northing:
	+E-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft
		Latitude:	32° 49' 47.778 N
		Longitude:	103° 51' 45.955 W
		Ground Level:	3,852.40 ft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
	IGRF200510	2010/06/01	(°)
			7.88
			Dip Angle
			(°)
			60.74
			Field Strength
			(nT)
			49,082

Design	Actual		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N-S	+E-W
	(ft)	(ft)	(ft)
	0.00	0.00	0.00
			Direction
			(°)
			268.35

Survey Program		Date		2010/06/10	
From	To	Survey (Wellbore)	Tool Name	Description	
(ft)	(ft)				
100.00	1,787.00	Gyro Survey (OH)	Keeper	Standard Wireline Keeper ver 1.0.2	
1,848.00	6,620.00	MWD Survey (OH)	MWD	MWD - Standard	

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Bulld Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.38	295.32	100.00	0.14	-0.30	0.30	0.38	0.38	0.00
200.00	0.41	281.06	200.00	0.35	-0.95	0.94	0.10	0.03	-14.26
300.00	0.47	290.36	299.99	0.56	-1.69	1.67	0.09	0.06	9.30
400.00	0.44	292.24	399.99	0.85	-2.43	2.40	0.03	-0.03	1.88
500.00	0.42	287.01	499.99	1.10	-3.13	3.10	0.04	-0.02	-5.23
600.00	0.41	279.56	599.99	1.27	-3.84	3.80	0.05	-0.01	-7.45
700.00	0.27	281.05	699.98	1.38	-4.42	4.38	0.14	-0.14	1.49
800.00	0.44	288.12	799.98	1.54	-5.02	4.97	0.18	0.17	7.07
900.00	0.38	293.70	899.98	1.79	-5.68	5.63	0.07	-0.06	5.58



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Survey Report



Company: COG Operating LLC
Project: Eddy County, NM (NAN27 NME)
Site: Skelly Unit #995
Well: Skelly Unit #995
Wellbore: OH
Design: Actual

Local Co-ordinate Reference: Site Skelly Unit #995
TVD Reference: RKB Elev (12') @ 3864.40ft (Basic #35)
MD Reference: RKB Elev (12') @ 3864.40ft (Basic #35)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey

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)
1,000.00	0.45	281.54	999.98	2.00	-6.37	6.31	0.11	0.07	-12.16
1,100.00	0.28	284.74	1,099.97	2.15	-6.99	6.93	0.17	-0.17	3.20
1,200.00	0.22	30.73	1,199.97	2.37	-7.13	7.06	0.40	-0.06	105.99
1,300.00	0.37	10.94	1,299.97	2.85	-6.97	6.89	0.18	0.15	-19.79
1,400.00	0.75	17.88	1,399.97	3.79	-6.71	6.60	0.39	0.38	6.94
1,500.00	1.00	25.34	1,499.96	5.21	-6.14	5.98	0.27	0.25	7.46
1,600.00	1.11	34.47	1,599.94	6.79	-5.21	5.02	0.20	0.11	9.13
1,700.00	1.15	24.57	1,699.92	8.50	-4.25	4.00	0.20	0.04	-9.90
1,787.00	0.94	33.43	1,786.91	9.89	-3.49	3.21	0.30	-0.24	10.18
Gyro tie-in									
1,848.00	0.71	30.55	1,847.90	10.64	-3.02	2.72	0.38	-0.38	-4.72
1,911.00	0.59	276.42	1,910.90	11.01	-3.15	2.83	1.73	-0.19	-181.16
1,975.00	1.31	271.04	1,974.89	11.06	-4.21	3.89	1.13	1.13	-8.41
2,039.00	1.93	274.50	2,038.86	11.16	-6.01	5.69	0.98	0.97	5.41
2,102.00	2.29	271.08	2,101.82	11.26	-8.33	8.00	0.61	0.57	-5.43
2,165.00	2.11	261.86	2,164.77	11.12	-10.74	10.41	0.63	-0.29	-14.63
2,229.00	2.52	262.93	2,228.72	10.78	-13.30	12.98	0.64	0.64	1.67
2,292.00	3.71	268.56	2,291.63	10.56	-16.71	16.40	1.95	1.89	8.94
2,355.00	3.72	258.30	2,354.49	10.10	-20.75	20.45	1.05	0.02	-16.29
2,418.00	5.13	255.97	2,417.31	9.00	-25.48	25.21	2.26	2.24	-3.70
2,481.00	6.31	258.00	2,479.99	7.60	-31.60	31.37	1.90	1.87	3.22
2,545.00	7.50	262.16	2,543.53	6.30	-39.18	38.98	2.02	1.86	6.50
2,608.00	8.40	262.08	2,605.92	5.10	-47.81	47.65	1.43	1.43	-0.13
2,672.00	8.33	263.11	2,669.24	3.90	-57.05	56.91	0.26	-0.11	1.61
2,736.00	8.67	263.88	2,732.54	2.83	-66.44	66.33	0.56	0.53	1.20
2,799.00	8.87	267.37	2,794.80	2.10	-76.02	75.93	0.90	0.32	5.54
2,863.00	8.80	270.13	2,858.04	1.89	-85.84	85.75	0.67	-0.11	4.31
2,927.00	8.40	267.86	2,921.32	1.72	-95.41	95.32	0.82	-0.63	-3.55
3,022.00	9.30	272.08	3,015.19	1.74	-110.01	109.92	1.17	0.95	4.44
3,116.00	8.70	271.39	3,108.03	2.19	-124.71	124.60	0.65	-0.64	-0.73
3,211.00	8.45	272.32	3,201.97	2.65	-138.87	138.74	0.30	-0.26	0.98
3,306.00	8.09	270.11	3,295.98	2.94	-152.53	152.38	0.51	-0.38	-2.33
3,400.00	7.89	269.46	3,389.07	2.89	-165.59	165.44	0.23	-0.21	-0.69
3,495.00	8.91	269.88	3,483.05	2.82	-179.47	179.32	1.08	1.07	0.44
3,590.00	8.50	269.82	3,576.95	2.78	-193.85	193.69	0.43	-0.43	-0.06
3,685.00	8.27	267.79	3,670.94	2.49	-207.70	207.54	0.39	-0.24	-2.14
3,781.00	8.15	262.07	3,765.96	1.29	-221.34	221.21	0.86	-0.13	-5.96
3,875.00	8.29	263.01	3,858.99	-0.46	-234.66	234.58	0.21	0.15	1.00
3,970.00	8.14	265.08	3,953.02	-1.87	-248.16	248.11	0.35	-0.16	2.18
4,065.00	8.30	264.32	4,047.04	-3.12	-261.68	261.67	0.20	0.17	-0.80
4,161.00	8.20	263.49	4,142.05	-4.58	-275.38	275.40	0.16	-0.10	-0.86
4,256.00	8.06	264.82	4,236.09	-5.95	-288.75	288.80	0.25	-0.15	1.40
4,350.00	7.89	264.90	4,329.18	-7.12	-301.74	301.81	0.18	-0.18	0.09



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Site: Skelly Unit #995
Well: Skelly Unit #995
Wellbore: OH
Design: Actual

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Site Skelly Unit #995
RKB Elev (12') @ 3864.40ft (Basic #35)
RKB Elev (12') @ 3864.40ft (Basic #35)
Grid
Minimum Curvature
EDM 5000.1 Single User Db

Survey

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)
4,446.00	7.84	264.36	4,424.28	-8.35	-314.81	314.92	0.09	-0.05	-0.56
4,541.00	8.02	266.39	4,518.37	-9.40	-327.88	328.01	0.35	0.19	2.14
4,636.00	7.91	267.74	4,612.46	-10.08	-341.02	341.17	0.23	-0.12	1.42
4,700.00	7.76	267.64	4,675.86	-10.43	-349.74	349.89	0.24	-0.23	-0.16
4,769.00	6.57	272.61	4,744.32	-10.44	-358.34	358.49	1.94	-1.72	7.20
4,833.00	5.84	267.92	4,807.94	-10.39	-365.25	365.40	1.39	-1.14	-7.33
4,896.00	5.24	260.16	4,870.65	-11.00	-371.29	371.45	1.52	-0.95	-12.32
4,960.00	4.03	264.66	4,934.44	-11.71	-376.41	376.59	1.97	-1.89	7.03
5,023.00	3.12	269.62	4,997.32	-11.93	-380.32	380.51	1.52	-1.44	7.87
5,118.00	3.10	270.47	5,092.18	-11.92	-385.48	385.66	0.05	-0.02	0.89
5,213.00	3.24	266.01	5,187.03	-12.09	-390.72	390.91	0.30	0.15	-4.69
5,308.00	3.41	268.53	5,281.87	-12.35	-396.23	396.42	0.24	0.18	2.65
5,403.00	3.28	270.02	5,376.71	-12.42	-401.77	401.96	0.16	-0.14	1.57
5,498.00	3.44	265.19	5,471.55	-12.66	-407.33	407.52	0.34	0.17	-5.08
5,593.00	2.51	254.88	5,566.42	-13.44	-412.18	412.39	1.13	-0.98	-10.85
5,657.00	2.64	262.38	5,630.35	-14.00	-414.99	415.22	0.56	0.20	11.72
5,720.00	2.52	279.98	5,693.29	-13.95	-417.79	418.02	1.27	-0.19	27.94
5,784.00	2.89	270.50	5,757.22	-13.70	-420.79	421.01	0.91	0.58	-14.81
5,880.00	2.79	269.97	5,853.10	-13.68	-425.55	425.76	0.11	-0.10	-0.55
5,975.00	3.02	267.53	5,947.98	-13.79	-430.36	430.58	0.27	0.24	-2.57
6,069.00	3.31	271.75	6,041.84	-13.81	-435.55	435.76	0.40	0.31	4.49
6,165.00	3.18	267.64	6,137.68	-13.83	-440.98	441.19	0.28	-0.14	-4.28
6,228.00	2.89	269.82	6,200.59	-13.91	-444.31	444.53	0.50	-0.46	3.46
6,324.00	2.69	276.88	6,296.48	-13.65	-448.97	449.17	0.41	-0.21	7.35
6,355.00	2.87	279.88	6,327.44	-13.43	-450.45	450.65	0.75	0.58	9.68
6,419.00	2.99	270.75	6,391.36	-13.13	-453.70	453.89	0.75	0.19	-14.27
6,515.00	3.35	268.16	6,487.21	-13.19	-459.01	459.20	0.40	0.38	-2.70
6,569.00	3.39	267.76	6,541.12	-13.30	-462.18	462.37	0.09	0.07	-0.74
MWD Survey									
6,620.00	3.39	267.76	6,592.03	-13.42	-465.19	465.39	0.00	0.00	0.00
Projection to Bit									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
1,787.00	1,786.91	9.89	-3.49	Gyro tie-in
6,569.00	6,541.12	-13.30	-462.18	MWD Survey
6,620.00	6,592.03	-13.42	-465.19	Projection to Bit

Checked By: _____ Approved By: _____ Date: _____