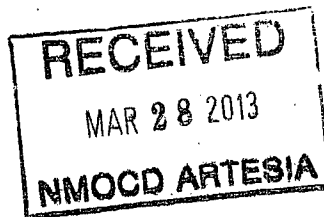




A GYRO TECHNOLOGIES INC. COMPANY

PO Box 261021
Corpus Christi, Texas 78426
(361) 767-0602 • (800) 606-GYRO • Fax (361) 767-0612



January 14, 2013

COG Operating LLC (Concho)
One Concho Center
600 W. Illinois Avenue
Midland, TX 79701

30-015-39585

Attn: Kanicia Castillo

Re: **Moody 18 State Com No 001H**

Please find enclosed a copy of the survey from 0' to 7,500' ran on the above referenced well.

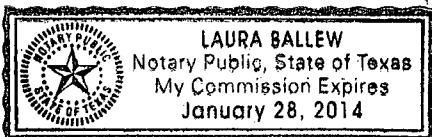
If I can be of any further service, please do not hesitate to call me at 800-606-4976.

Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 14th day of January, A.D., 2013, by Keith Havelka.

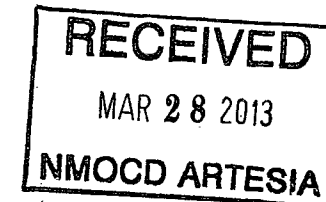


Laura Balley
Notary Public, State of Texas

Company: COG Operating, LLC (Concho)
Lease/Well: Moody 18 State Com/No 001H



Rig Name: Patriot 2
State/County: New Mexico/Eddy
Latitude: 32.14, Longitude: -104.13
GRID North is 0.11 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB = 16 Ft

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: final.ut
Minimum Curvature Method
Report Date/Time: 1/14/2013 / 09:11

Vaughn Energy Services
Fort Worth, Texas
817-741-3610

Surveyor: Jay Carroll
Moody 18 State Com No 001H / API 30-015-39585

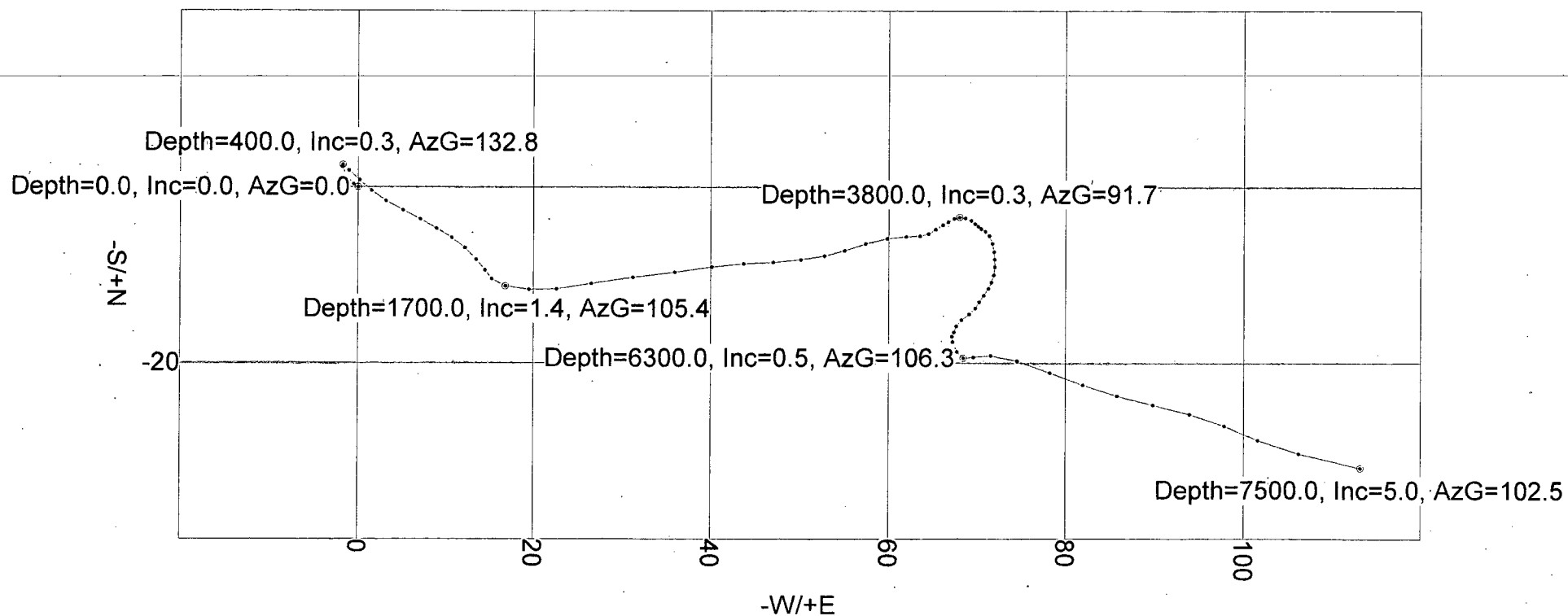
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.69	302.73	100.00	0.33	-0.51	0.60	302.73	0.69
200.00	0.82	330.37	199.99	1.27	-1.37	1.87	312.93	0.38
300.00	0.47	343.99	299.98	2.29	-1.83	2.93	321.31	0.37
400.00	0.27	132.79	399.98	2.52	-1.77	3.08	324.93	0.72
500.00	0.84	132.47	499.98	1.87	-1.05	2.14	330.52	0.57
600.00	1.02	131.21	599.96	0.78	0.16	0.80	11.28	0.18
700.00	1.07	131.14	699.95	-0.42	1.53	1.59	105.30	0.05
800.00	1.26	119.85	799.93	-1.58	3.19	3.56	116.38	0.30
900.00	1.29	116.09	899.90	-2.63	5.16	5.79	116.98	0.09
1000.00	1.25	119.54	999.88	-3.66	7.12	8.00	117.21	0.09
1100.00	1.21	120.06	1099.85	-4.72	8.98	10.14	117.75	0.04
1200.00	1.10	121.91	1199.83	-5.76	10.70	12.15	118.28	0.11
1300.00	1.06	132.12	1299.82	-6.89	12.21	14.02	119.44	0.20
1400.00	1.06	139.91	1399.80	-8.22	13.50	15.80	121.35	0.14
1500.00	0.76	140.68	1499.79	-9.44	14.51	17.31	123.05	0.31
1600.00	0.72	140.87	1599.78	-10.44	15.32	18.54	124.26	0.04
1700.00	1.37	105.44	1699.76	-11.24	16.87	20.27	123.68	0.89
1800.00	1.71	92.85	1799.73	-11.63	19.51	22.72	120.81	0.48

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	1.86	85.49	1899.68	-11.58	22.62	25.41	117.12	0.27
2000.00	2.68	78.12	1999.60	-10.97	26.52	28.70	112.48	0.87
2100.00	2.81	84.53	2099.48	-10.26	31.24	32.88	108.18	0.33
2200.00	2.63	81.49	2199.37	-9.69	35.95	37.23	105.08	0.22
2300.00	2.21	81.60	2299.28	-9.06	40.12	41.14	102.73	0.43
2400.00	1.94	87.20	2399.22	-8.70	43.72	44.58	101.25	0.34
2500.00	1.88	87.04	2499.16	-8.53	47.05	47.82	100.28	0.06
2600.00	1.70	82.34	2599.11	-8.25	50.15	50.83	99.34	0.23
2700.00	1.36	77.49	2699.08	-7.80	52.78	53.35	98.40	0.37
2800.00	1.30	73.10	2799.05	-7.21	55.02	55.49	97.46	0.12
2900.00	1.54	70.29	2899.02	-6.43	57.37	57.73	96.39	0.24
3000.00	1.38	82.62	2998.99	-5.82	59.83	60.11	95.56	0.35
3100.00	1.09	87.21	3098.96	-5.62	61.96	62.22	95.18	0.31
3200.00	0.71	84.35	3198.95	-5.51	63.52	63.76	94.96	0.38
3300.00	0.42	63.58	3298.95	-5.29	64.46	64.68	94.69	0.35
3400.00	0.70	55.78	3398.94	-4.79	65.29	65.47	94.19	0.29
3500.00	0.40	59.13	3498.94	-4.26	66.10	66.23	93.69	0.29
3600.00	0.38	60.02	3598.93	-3.92	66.69	66.80	93.36	0.02
3700.00	0.46	62.78	3698.93	-3.57	67.34	67.43	93.03	0.08
3800.00	0.30	91.74	3798.93	-3.39	67.96	68.04	92.86	0.24
3900.00	0.47	102.10	3898.93	-3.49	68.62	68.71	92.91	0.18
4000.00	0.37	129.14	3998.92	-3.77	69.27	69.38	93.12	0.22
4100.00	0.28	131.70	4098.92	-4.14	69.70	69.83	93.40	0.09
4200.00	0.23	129.38	4198.92	-4.42	70.04	70.18	93.61	0.05
4300.00	0.30	128.14	4298.92	-4.71	70.40	70.56	93.83	0.08
4400.00	0.34	111.78	4398.92	-4.99	70.88	71.06	94.02	0.10
4500.00	0.51	154.29	4498.92	-5.50	71.35	71.56	94.41	0.35
4600.00	0.58	162.64	4598.91	-6.38	71.69	71.97	95.09	0.10
4700.00	0.53	175.30	4698.91	-7.33	71.88	72.25	95.82	0.13
4800.00	0.43	177.53	4798.90	-8.17	71.93	72.40	96.48	0.10
4900.00	0.55	178.52	4898.90	-9.03	71.96	72.53	97.15	0.12
5000.00	0.56	195.54	4998.90	-9.98	71.84	72.53	97.91	0.17
5100.00	0.43	202.98	5098.89	-10.80	71.56	72.38	98.58	0.15
5200.00	0.47	209.17	5198.89	-11.51	71.22	72.14	99.18	0.06
5300.00	0.62	215.58	5298.88	-12.31	70.70	71.77	99.88	0.16
5400.00	0.41	213.08	5398.88	-13.04	70.19	71.40	100.53	0.21
5500.00	0.58	211.35	5498.88	-13.77	69.74	71.09	101.17	0.17
5600.00	0.55	239.41	5598.87	-14.44	69.06	70.56	101.81	0.27
5700.00	0.69	227.61	5698.87	-15.09	68.21	69.86	102.48	0.19

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	0.39	206.56	5798.86	-15.81	67.61	69.43	103.16	0.35
5900.00	0.44	195.18	5898.86	-16.49	67.35	69.34	103.75	0.10
6000.00	0.22	230.84	5998.86	-16.98	67.10	69.22	104.20	0.29
6100.00	0.61	155.49	6098.86	-17.59	67.17	69.44	104.67	0.59
6200.00	0.79	153.58	6198.85	-18.69	67.70	70.23	105.43	0.18
6300.00	0.47	106.32	6298.84	-19.42	68.40	71.11	105.85	0.58
6400.00	0.92	73.91	6398.83	-19.32	69.57	72.20	105.52	0.58
6500.00	1.35	91.80	6498.82	-19.13	71.52	74.04	104.98	0.56
6600.00	2.19	107.53	6598.77	-19.75	74.52	77.10	104.84	0.96
6700.00	2.30	111.95	6698.69	-21.07	78.21	81.00	105.08	0.21
6800.00	2.26	109.00	6798.61	-22.47	81.94	84.97	105.33	0.12
6900.00	2.34	106.78	6898.53	-23.70	85.76	88.98	105.45	0.11
7000.00	2.44	102.39	6998.44	-24.74	89.79	93.14	105.41	0.21
7100.00	2.45	106.08	7098.35	-25.79	93.93	97.40	105.36	0.16
7200.00	2.26	112.10	7198.27	-27.13	97.81	101.50	105.50	0.32
7300.00	2.45	114.27	7298.18	-28.75	101.58	105.57	105.80	0.22
7400.00	3.17	103.98	7398.06	-30.29	106.21	110.45	105.92	0.87
7500.00	5.02	102.50	7497.80	-31.91	113.16	117.57	105.75	1.85



Vaughn Energy Services
Fort Worth, Texas
817-741-3610
Surveyor: Jay Carroll
Moody 18 State Com No 001H / API 30-015-39585



Archer

COG Operating, LLC

Eddy County (NM83E)

Sec.18-T25S-R29E

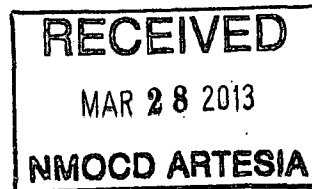
Moody 18 State Com #1H

Wellbore #1

Design: Wellbore #1

Standard Survey Report

09 January, 2013



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Moody 18 State Com #1H
Project:	Eddy County (NM83E)	TVD Reference:	WELL @ 3073.00usft (Original Well Elev)
Site:	Sec.18-T25S-R29E	MD Reference:	WELL @ 3073.00usft (Original Well Elev)
Well:	Moody 18 State Com #1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDMDBBW

Project	Eddy County (NM83E)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site		Sec.18-T25S-R29E			
Site Position:		Northing:	413,428.780 usft	Latitude:	32° 8' 11.177 N
From:	Map	Easting:	602,920.890 usft	Longitude:	104° 8' 3.748 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.11 °

Well	Moody 18 State Com #1H					
Well Position	+N/-S	0.00 usft	Northing:	413,428.780 usft	Latitude:	32° 8' 11.177 N
	+E/-W	0.00 usft	Easting:	602,920.890 usft	Longitude:	104° 8' 3.748 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,056.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/20/12	7.65	59.97	48,352

Design		Wellbore #1			
Audit Notes:					
Version:		1.0	Phase:		
		ACTUAL		Tie On Depth: 0.00	
Vertical Section:		Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
		0.00	0.00	0.00	179.13

Survey Program		Date	01/09/13		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	7,500.00	VES Gyro (Wellbore #1)	MWD	MWD - Standard	
7,347.00	12,297.00	Archer MWD Survey (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 (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.69	302.73	100.00	0.33	-0.51	-0.33	0.69	0.69	0.00	
200.00	0.82	330.37	199.99	1.27	-1.37	-1.29	0.38	0.13	27.64	
300.00	0.47	343.99	299.98	2.29	-1.83	-2.32	0.38	-0.35	13.62	
400.00	0.27	132.79	399.98	2.52	-1.77	-2.55	0.71	-0.20	148.80	
500.00	0.84	132.47	499.98	1.87	-1.06	-1.88	0.57	0.57	-0.32	
600.00	1.02	131.21	599.96	0.79	0.15	-0.78	0.18	0.18	-1.26	
700.00	1.07	131.14	699.95	-0.41	1.52	0.44	0.05	0.05	-0.07	
800.00	1.26	119.85	799.93	-1.57	3.18	1.62	0.30	0.19	-11.29	
900.00	1.29	116.09	899.90	-2.62	5.14	2.70	0.09	0.03	-3.76	
1,000.00	1.25	119.54	999.88	-3.65	7.10	3.76	0.09	-0.04	3.45	
1,100.00	1.21	120.06	1,099.85	-4.72	8.97	4.85	0.04	-0.04	0.52	

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Moody 18 State Com #1H
Project:	Eddy County (NM83E)	TVD Reference:	WELL @ 3073.00usft (Original Well Elev)
Site:	Sec.18-T25S-R29E	MD Reference:	WELL @ 3073.00usft (Original Well Elev)
Well:	Moody 18 State Com #1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDMDBBW

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)	
1,200.00	1.10	121.91	1,199.83	-5.75	10.70	5.92	0.12	-0.11	1.85	
1,300.00	1.06	132.12	1,299.82	-6.88	12.20	7.07	0.20	-0.04	10.21	
1,400.00	1.06	139.91	1,399.80	-8.21	13.48	8.41	0.14	0.00	7.79	
1,500.00	0.76	140.68	1,499.79	-9.43	14.49	9.65	0.30	-0.30	0.77	
1,600.00	0.72	140.87	1,599.78	-10.43	15.31	10.66	0.04	-0.04	0.19	
1,700.00	1.37	105.44	1,699.76	-11.24	16.86	11.49	0.89	0.65	-35.43	
1,800.00	1.71	92.85	1,799.73	-11.63	19.50	11.92	0.48	0.34	-12.59	
1,900.00	1.86	85.49	1,899.68	-11.57	22.61	11.92	0.27	0.15	-7.36	
2,000.00	2.68	78.12	1,999.60	-10.97	26.52	11.37	0.87	0.82	-7.37	
2,100.00	2.81	84.53	2,099.48	-10.25	31.24	10.73	0.33	0.13	6.41	
2,200.00	2.63	81.49	2,199.37	-9.68	35.95	10.22	0.23	-0.18	-3.04	
2,300.00	2.21	81.60	2,299.28	-9.06	40.13	9.67	0.42	-0.42	0.11	
2,400.00	1.94	87.20	2,399.22	-8.69	43.73	9.36	0.34	-0.27	5.60	
2,500.00	1.88	87.04	2,499.16	-8.52	47.06	9.24	0.06	-0.06	-0.16	
2,600.00	1.70	82.34	2,599.11	-8.24	50.16	9.00	0.23	-0.18	-4.70	
2,700.00	1.36	77.49	2,699.08	-7.79	52.79	8.59	0.36	-0.34	-4.85	
2,800.00	1.30	73.10	2,799.05	-7.20	55.04	8.04	0.12	-0.06	-4.39	
2,900.00	1.54	70.29	2,899.02	-6.42	57.39	7.29	0.25	0.24	-2.81	
3,000.00	1.38	82.62	2,998.99	-5.81	59.85	6.72	0.35	-0.16	12.33	
3,100.00	1.09	87.21	3,098.96	-5.61	61.99	6.55	0.31	-0.29	4.59	
3,200.00	0.71	84.35	3,198.95	-5.50	63.56	6.47	0.38	-0.38	-2.86	
3,300.00	0.42	83.58	3,298.95	-5.28	64.50	6.26	0.35	-0.29	-20.77	
3,400.00	0.70	55.78	3,398.94	-4.77	65.34	5.76	0.29	0.28	-7.80	
3,500.00	0.40	59.13	3,498.94	-4.25	66.14	5.25	0.30	-0.30	3.35	
3,600.00	0.38	60.02	3,598.93	-3.90	66.73	4.92	0.02	-0.02	0.89	
3,700.00	0.46	62.78	3,698.93	-3.55	67.37	4.58	0.08	0.08	2.76	
3,800.00	0.30	91.74	3,798.93	-3.38	67.99	4.41	0.25	-0.16	28.96	
3,900.00	0.47	102.10	3,898.93	-3.47	68.65	4.52	0.18	0.17	10.36	
4,000.00	0.37	129.14	3,998.92	-3.76	69.30	4.82	0.22	-0.10	27.04	
4,100.00	0.28	131.70	4,098.92	-4.13	69.74	5.19	0.09	-0.09	2.56	
4,200.00	0.23	129.38	4,198.92	-4.42	70.07	5.48	0.05	-0.05	-2.32	
4,300.00	0.30	128.14	4,298.92	-4.71	70.44	5.78	0.07	0.07	-1.24	
4,400.00	0.34	111.78	4,398.92	-4.98	70.92	6.06	0.10	0.04	-16.36	
4,500.00	0.51	154.29	4,498.92	-5.49	71.39	6.58	0.35	0.17	42.51	
4,600.00	0.58	162.64	4,598.91	-6.37	71.73	7.47	0.11	0.07	8.35	
4,700.00	0.53	175.30	4,698.91	-7.32	71.92	8.41	0.13	-0.05	12.66	
4,800.00	0.43	177.53	4,798.90	-8.15	71.97	9.25	0.10	-0.10	2.23	
4,900.00	0.55	178.52	4,898.90	-9.01	72.00	10.10	0.12	0.12	0.99	
5,000.00	0.56	195.54	4,998.89	-9.96	71.88	11.05	0.16	0.01	17.02	
5,100.00	0.43	202.98	5,098.89	-10.78	71.61	11.86	0.14	-0.13	7.44	
5,200.00	0.47	209.17	5,198.89	-11.48	71.26	12.56	0.06	0.04	6.19	
5,300.00	0.62	215.58	5,298.88	-12.28	70.74	13.35	0.16	0.15	6.41	
5,400.00	0.41	213.08	5,398.88	-13.02	70.23	14.09	0.21	-0.21	-2.50	
5,500.00	0.58	211.35	5,498.88	-13.75	69.78	14.81	0.17	0.17	-1.73	
5,600.00	0.55	239.41	5,598.87	-14.43	69.10	15.48	0.28	-0.03	28.06	
5,700.00	0.69	227.61	5,698.87	-15.08	68.24	16.11	0.19	0.14	-11.80	
5,800.00	0.39	206.56	5,798.86	-15.79	67.64	16.81	0.35	-0.30	-21.05	
5,900.00	0.44	195.18	5,898.86	-16.46	67.39	17.49	0.10	0.05	-11.38	
6,000.00	0.22	230.84	5,998.86	-16.95	67.14	17.97	0.29	-0.22	35.66	
6,100.00	0.61	155.49	6,098.85	-17.56	67.21	18.58	0.59	0.39	-75.35	
6,200.00	0.79	153.58	6,198.85	-18.66	67.74	19.69	0.18	0.18	-1.91	
6,300.00	0.47	106.32	6,298.84	-19.39	68.44	20.43	0.58	-0.32	-47.26	
6,400.00	0.92	73.91	6,398.83	-19.29	69.61	20.34	0.58	0.45	-32.41	
6,500.00	1.35	91.80	6,498.81	-19.10	71.56	20.19	0.55	0.43	17.89	

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Moody 18 State Com #1H
Project:	Eddy County (NM83E)	TVD Reference:	WELL @ 3073.00usft (Original Well Elev)
Site:	Sec.18-T25S-R29E	MD Reference:	WELL @ 3073.00usft (Original Well Elev)
Well:	Moody 18 State Com #1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDMDBBW

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)	
6,600.00	2.19	107.53	6,598.77	-19.71	74.56	20.85	0.96	0.84	15.73	
6,700.00	2.30	111.95	6,698.69	-21.04	78.24	22.23	0.21	0.11	4.42	
6,800.00	2.26	109.00	6,798.61	-22.43	81.96	23.68	0.12	-0.04	-2.95	
6,900.00	2.34	106.78	6,898.53	-23.66	85.78	24.96	0.12	0.08	-2.22	
7,000.00	2.44	102.39	6,998.44	-24.71	89.82	26.07	0.21	0.10	-4.39	
7,100.00	2.45	106.08	7,098.35	-25.76	93.95	27.18	0.16	0.01	3.69	
7,200.00	2.26	112.10	7,198.27	-27.09	97.83	28.58	0.31	-0.19	6.02	
7,300.00	2.45	114.27	7,298.18	-28.71	101.60	30.25	0.21	0.19	2.17	
First Archer Survey										
7,347.00	3.20	119.40	7,345.13	-29.77	103.66	31.34	1.68	1.60	10.91	
7,379.00	9.50	127.90	7,376.91	-31.83	106.53	33.45	19.85	19.69	26.56	
7,410.00	14.20	138.90	7,407.25	-36.27	111.05	37.96	16.76	15.16	35.48	
7,442.00	18.00	147.60	7,437.99	-43.41	116.28	45.17	14.04	11.87	27.19	
7,474.00	20.40	151.20	7,468.21	-52.47	121.62	54.32	8.36	7.50	11.25	
7,506.00	22.50	151.20	7,497.99	-62.72	127.26	64.65	6.56	6.56	0.00	
7,537.00	25.80	148.60	7,526.28	-73.68	133.63	75.71	11.18	10.65	-8.39	
7,569.00	29.30	151.80	7,554.65	-86.53	140.96	88.67	11.87	10.94	10.00	
7,601.00	31.40	154.20	7,582.26	-100.94	148.29	103.19	7.58	6.56	7.50	
7,633.00	32.90	155.10	7,609.35	-116.33	155.58	118.68	4.92	4.69	2.81	
7,664.00	34.80	158.50	7,635.10	-132.20	162.37	134.66	8.65	6.13	10.97	
7,696.00	36.20	164.20	7,661.16	-149.79	168.29	152.34	11.23	4.37	17.81	
7,728.00	36.60	170.30	7,686.92	-168.30	172.47	170.90	11.38	1.25	19.06	
7,761.00	38.50	174.60	7,713.09	-188.22	175.09	190.87	9.81	5.76	13.03	
7,793.00	42.70	175.80	7,737.38	-208.97	176.83	211.64	13.35	13.12	3.75	
7,824.00	47.20	175.20	7,759.31	-230.80	178.55	233.49	14.58	14.52	-1.94	
7,856.00	50.90	175.40	7,780.28	-254.88	180.53	257.60	11.57	11.56	0.62	
7,888.00	54.00	177.30	7,799.78	-280.20	182.13	282.94	10.77	9.69	5.94	
7,920.00	58.50	178.50	7,817.56	-306.78	183.10	309.53	14.40	14.06	3.75	
7,951.00	62.80	179.60	7,832.75	-333.79	183.54	336.54	14.21	13.87	3.55	
7,983.00	68.60	179.20	7,845.91	-362.94	183.85	365.70	18.16	18.12	-1.25	
8,015.00	70.60	180.70	7,857.07	-392.93	183.88	395.68	7.64	6.25	4.69	
8,047.00	72.80	180.90	7,867.11	-423.31	183.45	426.05	6.90	6.87	0.62	
8,078.00	74.10	181.10	7,875.94	-453.02	182.93	455.75	4.24	4.19	0.65	
8,110.00	75.50	180.10	7,884.33	-483.90	182.61	486.62	5.31	4.37	-3.12	
8,142.00	77.50	179.20	7,891.80	-515.01	182.80	517.73	6.82	6.25	-2.81	
8,174.00	80.30	178.20	7,897.96	-546.40	183.51	549.13	9.27	8.75	-3.12	
8,205.00	83.40	177.30	7,902.36	-577.06	184.72	579.80	10.40	10.00	-2.90	
8,237.00	86.40	176.30	7,905.20	-608.88	186.50	611.65	9.88	9.37	-3.12	
8,269.00	89.80	175.90	7,906.26	-640.78	188.68	643.58	10.70	10.62	-1.25	
8,300.00	90.90	177.20	7,908.07	-671.72	190.54	674.55	5.49	3.55	4.19	
8,395.00	91.70	181.50	7,903.92	-766.67	191.62	769.50	4.60	0.84	4.53	
8,490.00	93.00	181.70	7,900.02	-861.55	188.97	864.33	1.38	1.37	0.21	
8,584.00	92.30	182.70	7,895.68	-955.38	185.36	958.09	1.30	-0.74	1.06	
8,679.00	90.90	183.50	7,893.02	-1,050.20	180.23	1,052.82	1.70	-1.47	0.84	
8,774.00	89.40	182.90	7,892.78	-1,145.05	174.92	1,147.58	1.70	-1.58	-0.63	
8,869.00	89.90	183.20	7,893.36	-1,239.91	169.87	1,242.35	0.61	0.53	0.32	
8,964.00	88.50	184.00	7,894.68	-1,334.71	163.91	1,337.05	1.70	-1.47	0.84	
9,059.00	88.70	184.50	7,897.00	-1,429.42	156.87	1,431.64	0.57	0.21	0.53	
9,155.00	88.70	184.60	7,899.18	-1,525.09	149.25	1,527.19	0.10	0.00	0.10	
9,250.00	89.60	185.10	7,900.59	-1,619.74	141.22	1,621.70	1.08	0.95	0.53	
9,345.00	90.60	184.90	7,900.42	-1,714.38	132.94	1,716.20	1.07	1.05	-0.21	
9,441.00	89.80	185.40	7,900.09	-1,809.99	124.33	1,811.67	0.98	-0.83	0.52	
9,536.00	90.40	185.60	7,899.92	-1,904.55	115.22	1,906.09	0.67	0.63	0.21	
9,631.00	88.90	185.40	7,900.50	-1,999.11	106.12	2,000.49	1.59	-1.58	-0.21	



Archer
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Moody 18 State Com #1H
Project:	Eddy County (NM83E)	TVD Reference:	WELL @ 3073.00usft (Original Well Elev)
Site:	Sec.18-T25S-R29E	MD Reference:	WELL @ 3073.00usft (Original Well Elev)
Well:	Moody 18 State Com #1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDMDBBW

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)
9,726.00	89.20	185.70	7,902.08	-2,093.65	96.93	2,094.88	0.45	0.32	0.32
9,821.00	88.40	184.40	7,904.07	-2,188.26	88.57	2,189.35	1.61	-0.84	-1.37
9,916.00	88.70	183.00	7,906.47	-2,283.03	82.44	2,284.02	1.51	0.32	-1.47
10,010.00	87.40	182.50	7,909.67	-2,376.86	77.93	2,377.77	1.48	-1.38	-0.53
10,105.00	87.60	180.40	7,913.82	-2,471.74	75.53	2,472.60	2.22	0.21	-2.21
10,201.00	89.10	180.00	7,916.58	-2,567.69	75.20	2,568.54	1.62	1.56	-0.42
10,295.00	90.60	178.80	7,916.83	-2,661.68	76.18	2,662.54	2.04	1.60	-1.28
10,390.00	90.40	178.80	7,916.00	-2,756.66	78.17	2,757.53	0.21	-0.21	0.00
10,486.00	92.10	178.10	7,913.90	-2,852.60	80.77	2,853.50	1.92	1.77	-0.73
10,581.00	92.70	178.40	7,909.92	-2,947.47	83.67	2,948.40	0.71	0.63	0.32
10,676.00	91.40	178.90	7,906.53	-3,042.38	85.90	3,043.34	1.47	-1.37	0.53
10,772.00	91.30	178.30	7,904.26	-3,138.32	88.25	3,139.30	0.63	-0.10	-0.62
10,867.00	88.00	178.40	7,904.84	-3,233.27	90.98	3,234.28	3.48	-3.47	0.11
10,962.00	88.80	180.10	7,907.50	-3,328.22	92.22	3,329.24	1.98	0.84	1.79
11,057.00	89.10	180.20	7,909.24	-3,423.20	91.98	3,424.21	0.33	0.32	0.11
11,152.00	89.80	180.40	7,910.15	-3,518.20	91.48	3,519.18	0.77	0.74	0.21
11,247.00	90.20	180.60	7,910.15	-3,613.19	90.65	3,614.16	0.47	0.42	0.21
11,343.00	89.90	180.20	7,910.07	-3,709.19	89.98	3,710.13	0.52	-0.31	-0.42
11,437.00	90.50	180.30	7,909.74	-3,803.19	89.57	3,804.11	0.65	0.64	0.11
11,533.00	90.90	180.70	7,908.57	-3,899.18	88.73	3,900.08	0.59	0.42	0.42
11,627.00	89.90	180.10	7,907.91	-3,993.17	88.08	3,994.05	1.24	-1.06	-0.64
11,722.00	90.50	180.40	7,907.58	-4,088.17	87.66	4,089.03	0.71	0.63	0.32
11,817.00	90.90	180.90	7,906.42	-4,183.16	86.58	4,183.99	0.67	0.42	0.53
11,912.00	89.40	179.60	7,906.17	-4,278.15	86.17	4,278.97	2.09	-1.58	-1.37
12,006.00	89.90	179.40	7,906.74	-4,372.14	86.99	4,372.96	0.57	0.53	-0.21
12,101.00	91.40	178.80	7,905.67	-4,467.12	88.48	4,467.95	1.70	1.58	-0.63
Last Archer Survey									
12,245.00	92.10	179.10	7,901.27	-4,611.03	91.12	4,611.88	0.53	0.49	0.21
Proj. to TD									
12,297.00	92.10	179.10	7,899.36	-4,662.99	91.93	4,663.85	0.00	0.00	0.00

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		
		+N/-S (usft)	+E/-W (usft)	Comment
7,347.00	7,345.13	-29.77	103.66	First Archer Survey
12,245.00	7,901.27	-4,611.03	91.12	Last Archer Survey
12,297.00	7,899.36	-4,662.99	91.93	Proj. to TD

Checked By: _____ Approved By: _____ Date: _____



Project: Eddy County (NM83E)
Site: Sec.18-T25S-R29E
Well: Moody 18 State Com #1H
Wellbore: Wellbore #1
Design: Design #3
Lat: 32° 8' 11.177 N
Long: 104° 8' 3.748 W
GL: 3056.00
KB: WELL @ 3073.00usft (Original Well Elev)

Archer

SECTION DETAILS

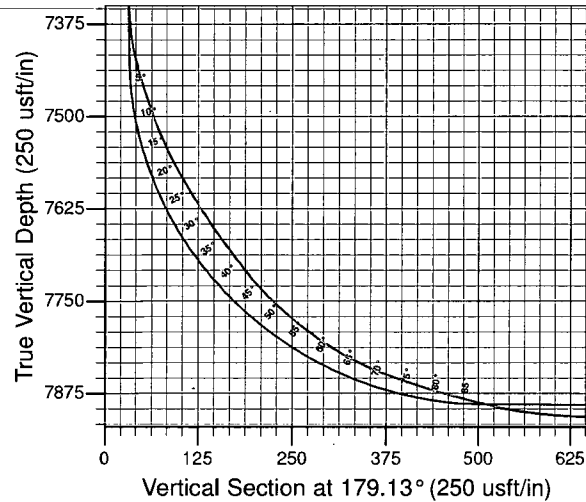
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
7400.00	3.17	103.98	7398.06	-30.26	106.24	0.00	0.00	31.87	Tie On
7421.90	3.57	103.53	7419.92	-30.56	107.49	1.83	-4.01	32.20	KOP Build 12°/100'
8164.19	89.86	180.80	7889.97	-507.17	129.34	12.00	77.31	509.08	EOC / Hold to TD
12320.84	89.86	180.80	7900.13	-4663.40	71.00	0.00	0.00	4663.94	TD at 12320.84

WELL DETAILS: Moody 18 State Com #1H

+N/-S	+E/-W	Northing	Ground Level:	3056.00	Longitude	Slot
0.00	0.00	413428.780	Easting	602920.890	32° 8' 11.177 N	104° 8' 3.748 W

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Moody 18 State Com #1H PBHL	7900.00	-4663.40	71.00	32° 7' 25.026 N	104° 8' 3.023 W	Point



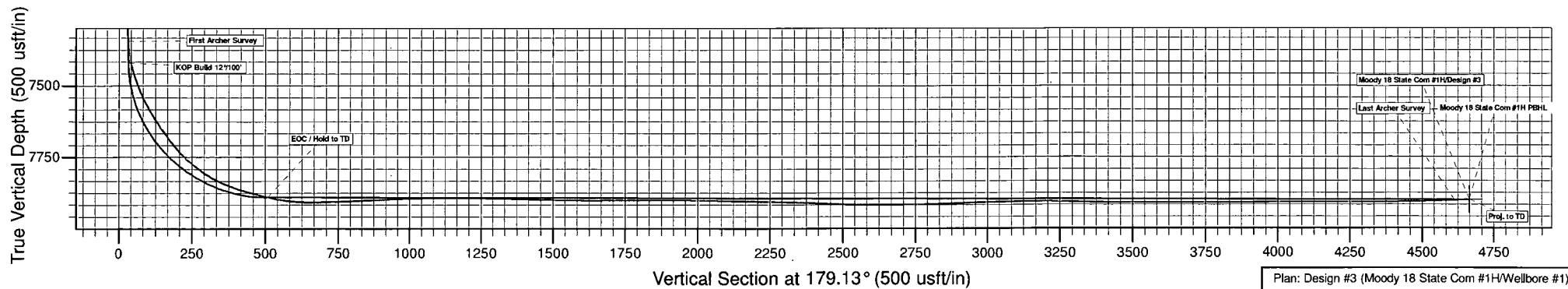
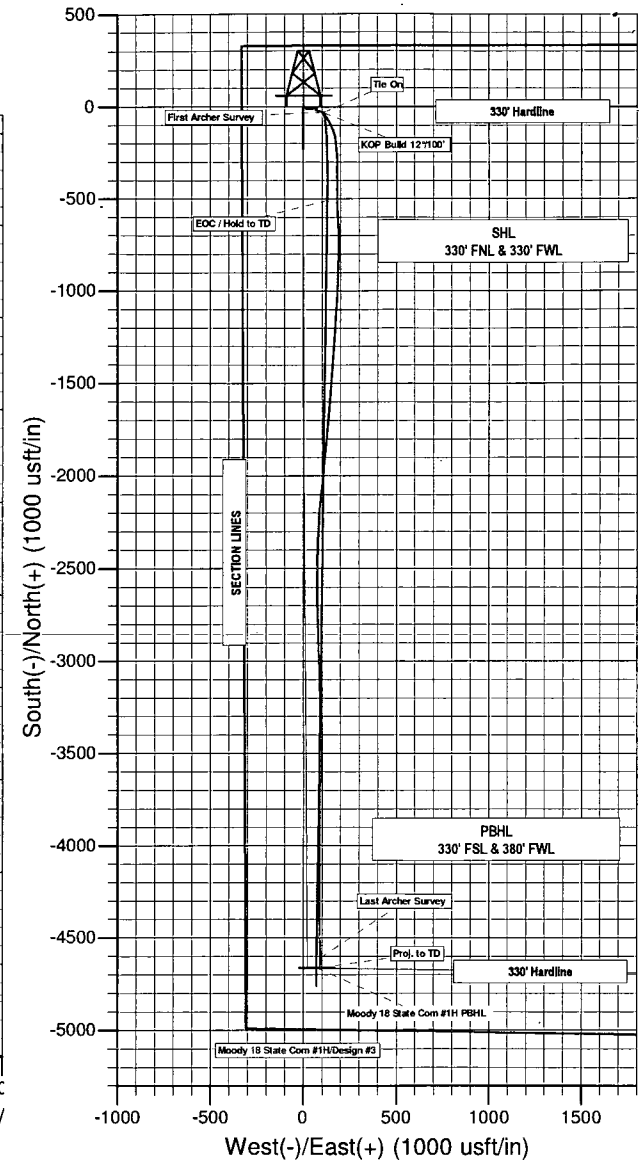
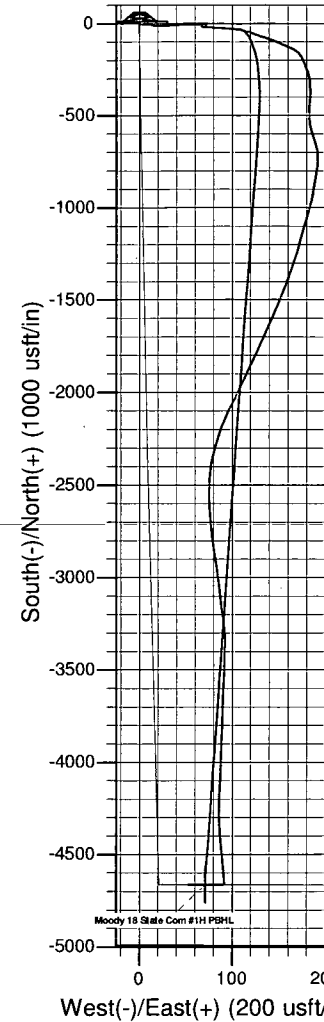
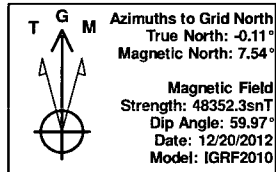
PROJECT DETAILS: Eddy County (NM83E)

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level

SITE DETAILS: Sec.18-T25S-R29E

Site Centre Latitude: 32° 8' 11.177 N
Longitude: 104° 8' 3.748 W

Positional Uncertainty: 0.00
Convergence: 0.11
Local North: Grid



Plan: Design #3 (Moody 18 State Com #1H/Wellbore #1)

Created By:Dusty Moyer Date: 7:32, January 09 2013