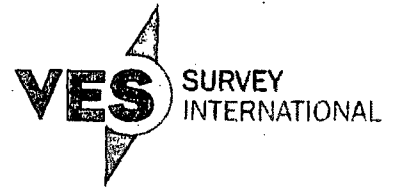


3001542917



NM OIL CONSERVATION
ARTESIA DISTRICT

JUN 11 2015

RECEIVED

March 2, 2015

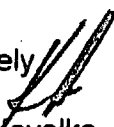
Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

Attn: Kanicia Castillo

RE: Churchmouse 1 Fed Com 18H

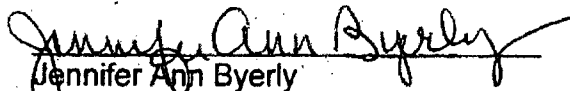
Please find enclosed a copy of the survey from 0' to 3708' ran on the above referenced well.

Sincerely,

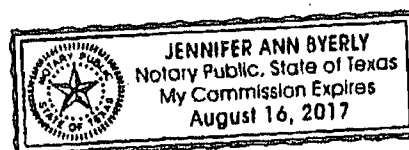

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 2 day of March
A.D., 2015, by Keith Havelka.

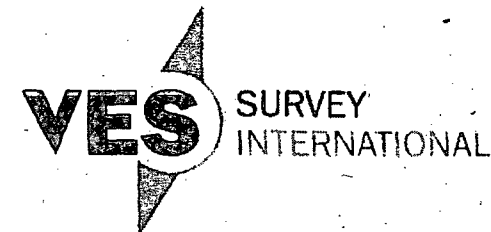

Jennifer Ann Byerly
Notary Public, State of Texas

VES Survey International
P.O. Box 261021 Corpus Christi, TX 78426
T (361) 767-0602 F (361) 767-0612
www.vessurvey.com





Company: Concho
Lease/Well: Churchmouse 1 Fed Com/18H
Location: S1 T17S R29E
Rig Name: United 43
State/County: New Mexico/Eddy
Latitude: 32.86, Longitude: -104.02
GRID North is 0.17 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB = 12.5

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 3/2/2015 / 15:51

VES Survey International
Midland, TX
432-563-5444

Surveyor: Andrew Askew
Churchmouse 1 Fed Com 18H / API 30-015-42917

NM OIL CONSERVATION
ARTESIA DISTRICT

JUN 11 2015

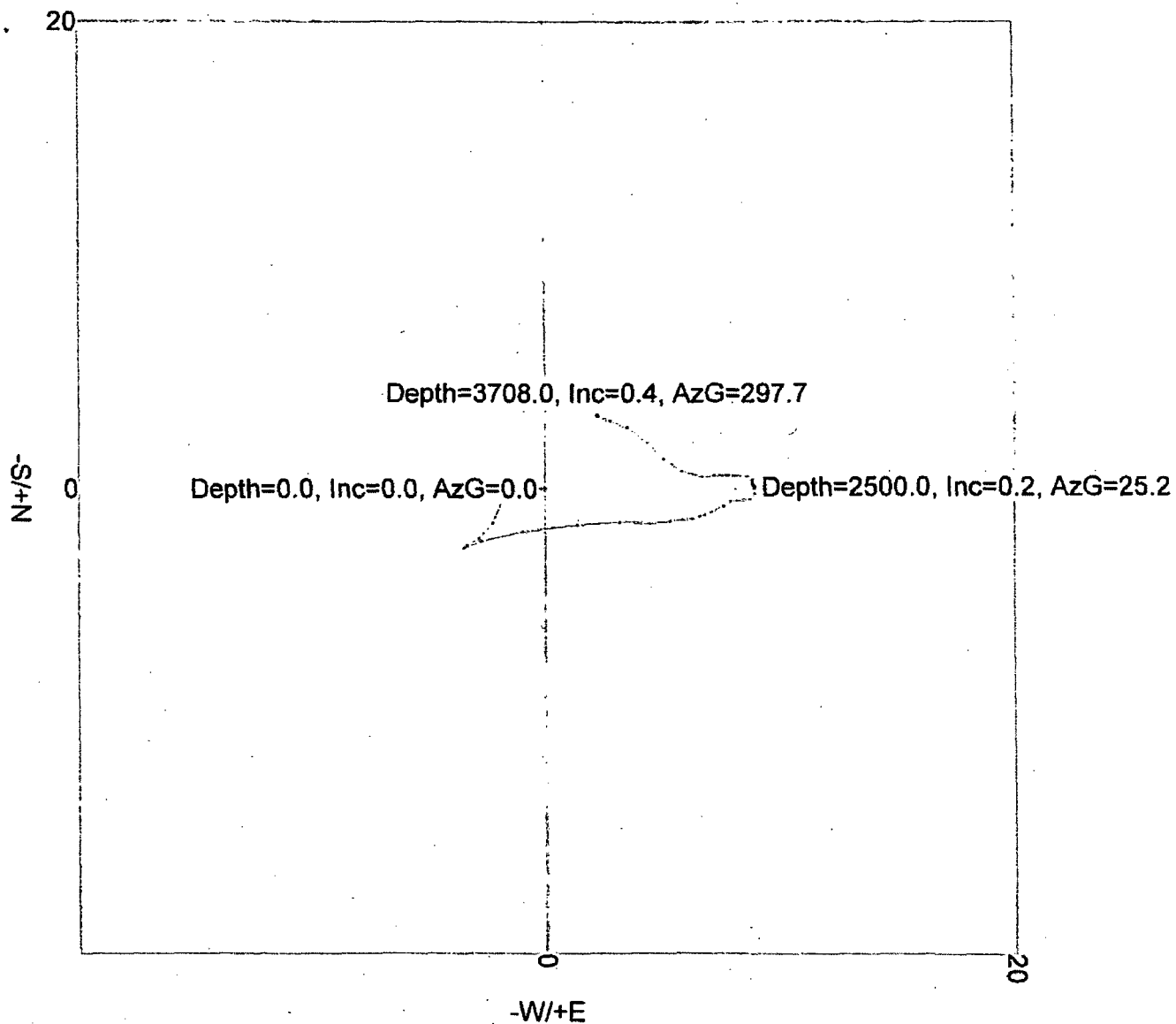
RECEIVED

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section 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	0.00	****
100.00	0.21	277.81	100.00	0.02	-0.18	0.02	0.18	277.81	0.21
200.00	0.65	287.22	200.00	0.02	-0.93	0.02	0.93	271.34	0.45
300.00	0.63	213.59	299.99	-0.46	-1.80	-0.46	1.86	255.62	0.58
400.00	0.68	193.77	399.98	-1.50	-2.25	-1.50	2.70	236.36	0.23
500.00	0.56	259.97	499.98	-2.16	-2.87	-2.16	3.59	233.04	0.68
600.00	0.24	179.85	599.98	-2.45	-3.34	-2.45	4.15	233.75	0.57
700.00	0.18	294.59	699.98	-2.60	-3.48	-2.60	4.35	233.28	0.35
800.00	0.19	110.43	799.98	-2.59	-3.47	-2.59	4.33	233.27	0.36
900.00	0.77	58.04	899.97	-2.29	-2.75	-2.29	3.58	230.18	0.67
1000.00	1.40	86.09	999.96	-1.85	-0.96	-1.85	2.08	207.36	0.80
1100.00	1.31	79.43	1099.93	-1.56	1.38	-1.56	2.08	138.44	0.18
1200.00	0.81	96.34	1199.91	-1.43	3.20	-1.43	3.51	114.00	0.58
1300.00	0.66	88.47	1299.90	-1.49	4.49	-1.49	4.73	108.36	0.18
1400.00	0.34	74.46	1399.90	-1.39	5.35	-1.39	5.53	104.60	0.34
1500.00	0.29	95.26	1499.90	-1.34	5.89	-1.34	6.04	102.79	0.12
1600.00	0.21	66.90	1599.90	-1.29	6.32	-1.29	6.45	101.53	0.16
1700.00	0.15	72.86	1699.90	-1.18	6.61	-1.18	6.72	100.11	0.06
1800.00	0.08	74.78	1799.90	-1.12	6.81	-1.12	6.90	99.35	0.07

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.27	68.42	1899.90	-1.02	7.10	-1.02	7.17	98.14	0.19
2000.00	0.41	60.89	1999.89	-0.75	7.83	-0.75	7.87	95.65	0.14
2100.00	0.06	321.61	2099.89	-0.54	7.91	-0.54	7.93	93.92	0.42
2200.00	0.36	94.21	2199.89	-0.52	8.18	-0.52	8.20	93.67	0.39
2300.00	0.30	72.56	2299.89	-0.47	8.75	-0.47	8.76	93.06	0.13
2400.00	0.18	340.53	2399.89	-0.24	8.95	-0.24	8.95	91.52	0.36
2500.00	0.19	25.17	2499.89	0.06	8.96	0.06	8.96	89.59	0.14
2600.00	0.19	270.83	2599.89	0.22	8.87	0.22	8.87	88.60	0.32
2700.00	0.25	45.68	2699.89	0.37	8.86	0.37	8.87	87.61	0.40
2800.00	0.44	273.18	2799.89	0.54	8.64	0.54	8.65	86.40	0.63
2900.00	0.51	272.89	2899.88	0.59	7.81	0.59	7.83	85.70	0.08
3000.00	0.16	251.37	2999.88	0.56	7.23	0.56	7.25	85.53	0.37
3100.00	0.44	271.14	3099.88	0.53	6.71	0.53	6.73	85.51	0.29
3200.00	0.60	295.08	3199.88	0.76	5.86	0.76	5.90	82.65	0.26
3300.00	0.49	313.63	3299.87	1.27	5.07	1.27	5.23	75.90	0.20
3400.00	0.62	316.59	3399.87	1.97	4.39	1.97	4.81	65.83	0.13
3500.00	0.62	296.16	3499.86	2.60	3.52	2.60	4.38	53.52	0.22
3600.00	0.26	282.64	3599.86	2.89	2.81	2.89	4.04	44.19	0.38
3708.00	0.43	297.65	3707.86	3.14	2.22	3.14	3.84	35.24	0.18



VES Survey International
Midland, TX
432-563-5444
Surveyor: Andrew Askew
Churchmouse 1 Fed Com 18H / API 30-015-42917



V.E.S. Survey Date: 2/21/2015

JUN 11 2015

1 of 2

RECEIVED

WELL NAME AND NUMBER Churchmouse 1 Fed Com PDK No. 18H
 LOCATION Section 1, T17S, R29E, Unit P, 350 FSL, 180 FEL, Eddy County
 OPERATOR COG Operating LLC
 DRILLING CONTRACTOR United Drilling, Inc.

The undersigned hereby certifies that he is an authorized representative of the drilling contractor who drilled the above described well and had conducted deviation test and obtained the following results:

Degrees @ Depth	Degrees @ Depth	Degrees @ Depth
.5° @ 325'	16.4° @ 4003'	77.9° @ 4634'
.2° @ 913'	20.3° @ 4034'	80.2° @ 4665'
1.3° @ 958'	24.0° @ 4066'	82.1° @ 4697'
1.4° @ 1080'	27.2° @ 4098'	8.38° @ 4728'
.3° @ 1370'	30.1° @ 4129'	86.6° @ 4760'
.2° @ 1654'	30.0° @ 4161'	89.8° @ 4796'
.2° @ 1990'	36.5° @ 4192'	89.8° @ 4861'
.1° @ 2290'	39.6° @ 4224'	94.1° @ 4917'
.2° @ 2590'	42.5° @ 4255'	92.1° @ 5011'
.3° @ 2906'	44.2° @ 4287'	92.0° @ 5106'
.4° @ 3222'	46.9° @ 4319'	91.9° @ 5201'
.5° @ 3511'	49.8° @ 4350'	91.6° @ 5296'
.8° @ 3783'	55.3° @ 4413'	91.3° @ 5391'
.6° @ 3814'	58.2° @ 4445'	90.9° @ 5675'
3.8° @ 3877'	61.5° @ 4476'	90.7° @ 5769'
6.5° @ 3908'	64.3° @ 4508'	90.6° @ 5864'
9.6° @ 3940'	67.7° @ 4539'	90.2° @ 5959'
12.9° @ 3972'	71.3° @ 4571'	91.2° @ 6053'

Drilling Contractor- UNITED DRILLING, INC.

By: Angel Salazar
 (Angel Salazar)

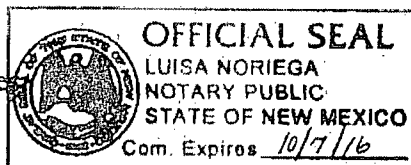
Title: Vice President

Subscribed and sworn to before me this 2nd day of March 2015.

Luisa Noriega
 Notary Public

Chaves NM
 County State

My Commission Expires



JUN 11 2015

2 of 2

RECEIVED

WELL NAME AND NUMBER Churchmouse 1 Fed Com PDK No. 18H
LOCATION Section 1, T17S, R29E, Unit P, 350 FSL, 180 FEL, Eddy County
OPERATOR COG Operating LLC
DRILLING CONTRACTOR United Drilling, Inc.

The undersigned hereby certifies that he is an authorized representative of the drilling contractor who drilled the above described well and had conducted deviation test and obtained the following results:

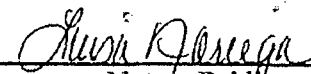
Degrees @ Depth	Degrees @ Depth	Degrees @ Depth
90.7° @ 6242'	90.2° @ 8042'	
90.4° @ 6337'	90.0° @ 8136'	
91.6° @ 6432'	90.0° @ 8231'	
91.3° @ 6527'	89.8° @ 8326'	
91.3° @ 6621'	89.7° @ 8420'	
91.1° @ 6717'	91.7° @ 8515'	
91.5° @ 6811'	92.0° @ 8609'	
90.4° @ 6906'	92.3° @ 8702'	
90.5° @ 7001'	92.7° @ 8796'	
90.6° @ 7095'	92.7° @ 8844'	
91.1° @ 7190'		
90.6° @ 7285'		
90.7° @ 7379'		
90.7° @ 7474'		
91.0° @ 7568'		
91.0° @ 7663'		
91.2° @ 7758'		
91.6° @ 7853'		

Drilling Contractor- UNITED DRILLING, INC.

By: 
(Angel Salazar)

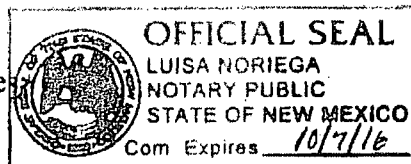
Title: Vice President

Subscribed and sworn to before me this 2nd day of March 2015.


Notary Public

Chaves NM
County State

My Commission Expires



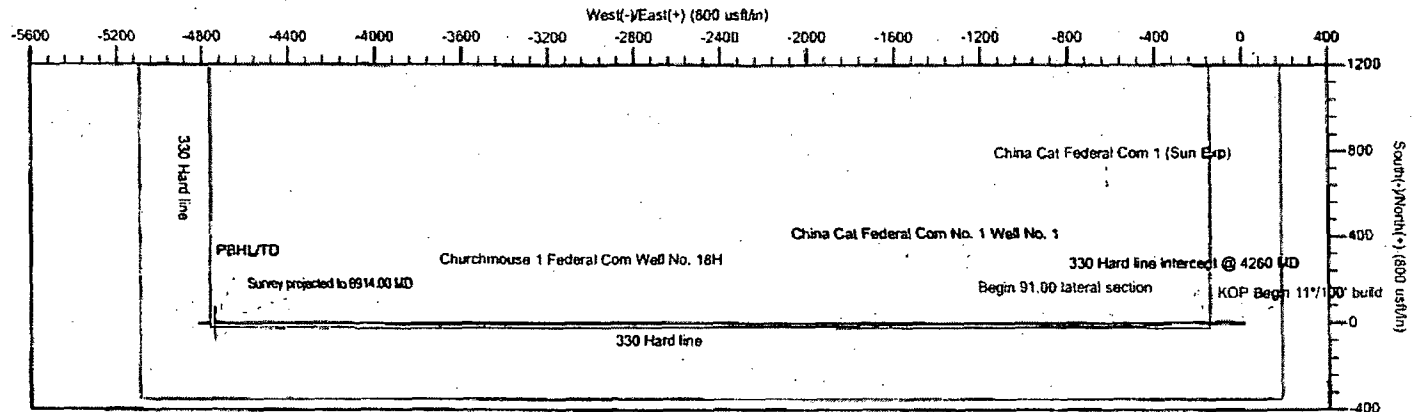
COG Operating LLC



Well: Churchmouse 1 Federal Com Well No. 18H
 Site: Churchmouse 1 Federal Com
 Project: Eddy County, New Mexico
 Design: rev1
 Rig: United 43



Azimuths to Grid North
 True North: -0.17°
 Magnetic North: 7.22°
 Magnetic Field
 Strength: 48576 Gauss
 Dip Angle: 60.6°
 Date: 2/23/2015
 Model: IGRF2010



Surface Location: RKB=3672+12 @ 3684.00usft (United 43)
 US State Plane 1927 (Exact solution)
 New Mexico East 3001
 Northing Easting Latitude Longitude
 675674.30 596294.60 32.85711944 -104.01974887

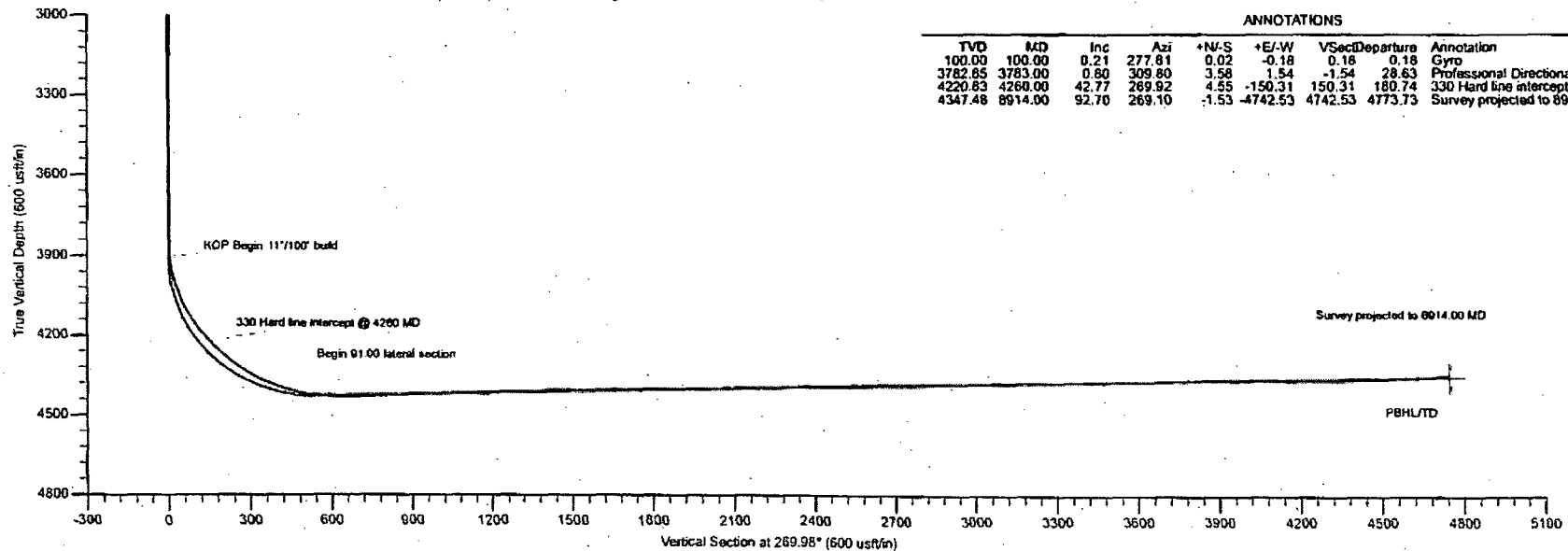
Total Correction (M => G) To convert a Magnetic Direction to a Grid Direction, Add 7.22°

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dipg	TFace	VSec	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3904.21	0.00	0.00	3904.21	0.00	0.00	0.00	0.00	0.00	KOP Begin 11 1/100' build
3	4731.49	91.00	269.98	4425.00	-0.14	-529.97	11.00	269.98	529.97	Begin 91.00 lateral section
4	8946.57	91.00	269.98	4351.35	-1.27	-4744.40	0.00	0.00	4744.40	PBHL/TD

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Departure	Annotation
100.00	100.00	0.21	277.81	0.02	-0.18	0.18	0.18	Gyro
3782.85	3783.00	0.50	309.80	3.56	1.54	-1.54	28.63	Professional Directional Ltd MWD survey
4220.93	4260.00	42.77	269.92	4.55	-150.31	150.31	180.74	330 Hard line intercept @ 4260 MD
4347.48	8914.00	92.70	269.10	-1.53	-4742.53	4742.53	4773.73	Survey projected to 8914.00 MD





Standard_report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Churchmouse, 1 Federal Com Well No. 18H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3672+12 @ 3684.00usft (United 43)
Site:	Churchmouse, 1 Federal Com	NID Reference:	RKB=3672+12 @ 3684.00usft (United 43)
Well:	Churchmouse, 1 Federal Com Well No. 18H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	Dbase Nov0914

Project: Eddy County, New Mexico			
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		Churchmouse, 1: Federal Com									
Site Position:		Northing:		675,674.30 usft		Latitude:		32.85711944			
From:		Map		Easting:		596,294.60 usft		Longitude:		-104.01974887	
Position Uncertainty:		0.00 usft		Slot Radius:		13-3/16 "		Grid Convergence:		0.17 °	

Well:	Churchmouse, 1 Federal Com Well No. 18H, Surf Loc: 350 FSL 180 FEL Sect 1-T175-R29E Unit P					
Well Position	+N-S	0.00 usft	Northing:	675,674.30 usft	Latitude:	32.85711944
	+E-W	0.00 usft	Easting:	596,294.60 usft	Longitude:	-104.01974887
Position Uncertainty	0.00 usft		Wellhead Elevation:	usft	Ground Level:	3,672.00 usft

Wellbore	Original Hole				
Magnetico	Model Name	Sample Date	Declination ($^{\circ}$)	Dip Angle ($^{\circ}$)	Field Strength (nT)
	IGRF2010	2/11/2015	7.39	60.60	48,580
	IGRF2010	2/21/2015	7.39	60.60	48,577

Design: Surveys Original Hole				
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	269.98



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Churchmouse 1 Federal Com Well No. 18H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3672+12 @ 3684.00usft (United 43)
Site:	Churchmouse 1 Federal Com	MD Reference:	RKB=3672+12 @ 3684.00usft (United 43)
Well:	Churchmouse 1 Federal Com Well No. 18H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	Dbase Nov0814

Survey Program		Date: 3/2/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	3,708.00	Gyro (Original Hole)	NS-GYRO-MS	North sensing gyrocompassing m/s
3,783.00	8,914.00	MWD (Original Hole)	MWD	MWD - Standard

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	NS (usft)	EW (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	675,674.30	596,294.60
100.00	0.21	277.81	100.00	0.02	-0.18	0.21	0.18	675,674.32	596,294.42
Gyro									
200.00	0.65	267.22	200.00	0.02	-0.93	0.45	0.93	675,674.32	596,293.67
300.00	0.63	213.59	299.99	-0.46	-1.80	0.58	1.80	675,673.84	596,292.80
400.00	0.68	193.77	399.98	-1.50	-2.25	0.23	2.25	675,672.80	596,292.35
500.00	0.56	259.97	499.98	-2.16	-2.87	0.68	2.87	675,672.14	596,291.73
600.00	0.24	179.85	599.98	-2.45	-3.35	0.57	3.35	675,671.85	596,291.25
700.00	0.18	294.59	699.98	-2.60	-3.49	0.36	3.49	675,671.70	596,291.11
800.00	0.19	110.43	799.98	-2.59	-3.48	0.37	3.48	675,671.71	596,291.12
900.00	0.77	58.04	899.97	-2.29	-2.75	0.67	2.75	675,672.01	596,291.85
1,000.00	1.40	86.09	999.96	-1.85	-0.96	0.81	0.96	675,672.45	596,293.64
1,100.00	1.31	79.43	1,099.93	-1.56	1.38	0.18	-1.38	675,672.74	596,295.98
1,200.00	0.81	96.34	1,199.91	-1.43	3.20	0.58	-3.20	675,672.87	596,297.80
1,300.00	0.66	88.47	1,299.90	-1.49	4.48	0.18	-4.48	675,672.81	596,299.08
1,400.00	0.34	74.46	1,399.90	-1.40	5.34	0.34	-5.34	675,672.90	596,299.94
1,500.00	0.29	95.26	1,499.90	-1.34	5.88	0.12	-5.88	675,672.96	596,300.48
1,600.00	0.21	66.90	1,599.90	-1.29	6.30	0.14	-6.30	675,673.01	596,300.90
1,700.00	0.15	72.86	1,699.90	-1.18	6.60	0.06	-6.60	675,673.12	596,301.20
1,800.00	0.08	74.78	1,799.90	-1.12	6.79	0.07	-6.79	675,673.18	596,301.39
1,900.00	0.27	68.42	1,899.90	-1.02	7.08	0.19	-7.07	675,673.28	596,301.68



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Churchmouse 1 Federal Com Well No. 18H
Project:	Eddy County New Mexico	TVD Reference:	RKB=3672+12 @ 3684.00usft (United 43)
Site:	Churchmouse 1 Federal Com	MD Reference:	RKB=3672+12 @ 3684.00usft (United 43)
Well:	Churchmouse 1 Federal Com Well No. 18H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	Obase Nov0814

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	NS (usft)	EW (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
2,000.00	0.41	60.89	1,999.89	-0.76	7.61	0.15	-7.61	675,673.54	596,302.21
2,100.00	0.06	321.61	2,099.89	-0.54	7.89	0.42	-7.89	675,673.76	596,302.49
2,200.00	0.35	94.21	2,199.89	-0.52	8.16	0.39	-8.16	675,673.78	596,302.76
2,300.00	0.30	72.56	2,299.89	-0.47	8.71	0.13	-8.71	675,673.83	596,303.31
2,400.00	0.18	340.53	2,399.89	-0.24	8.91	0.36	-8.91	675,674.06	596,303.51
2,500.00	0.19	25.17	2,499.89	0.06	8.93	0.14	-8.93	675,674.36	596,303.53
2,600.00	0.19	270.83	2,599.89	0.21	8.83	0.32	-8.83	675,674.51	596,303.43
2,700.00	0.25	45.68	2,699.89	0.36	8.82	0.41	-8.82	675,674.66	596,303.42
2,800.00	0.44	273.18	2,799.89	0.54	8.60	0.64	-8.60	675,674.84	596,303.20
2,900.00	0.51	272.89	2,899.88	0.58	7.77	0.07	-7.77	675,674.88	596,302.37
3,000.00	0.16	251.37	2,999.88	0.56	7.19	0.37	-7.19	675,674.86	596,301.79
3,100.00	0.44	271.14	3,099.88	0.52	6.68	0.29	-6.68	675,674.82	596,301.28
3,200.00	0.60	295.08	3,199.88	0.75	5.82	0.27	-5.82	675,675.05	596,300.42
3,300.00	0.49	313.63	3,299.87	1.27	5.03	0.21	-5.03	675,675.57	596,299.63
3,400.00	0.62	316.59	3,399.87	1.96	4.35	0.13	-4.35	675,676.26	596,298.95
3,500.00	0.62	296.16	3,499.86	2.59	3.50	0.22	-3.50	675,676.89	596,298.10
3,600.00	0.26	282.64	3,599.86	2.88	2.79	0.37	-2.79	675,677.18	596,297.39
3,708.00	0.43	297.65	3,707.86	3.12	2.19	0.18	-2.19	675,677.42	596,296.79
3,783.00	0.80	309.80	3,782.85	3.58	1.54	0.52	-1.54	675,677.88	596,296.14
Professional Directional Ltd MWD surveys									
3,814.00	0.60	313.50	3,813.85	3.83	1.25	0.66	-1.26	675,678.13	596,295.85
3,846.00	1.40	284.50	3,845.65	4.05	0.75	2.88	-0.76	675,678.35	596,295.35
3,877.00	3.80	271.90	3,876.81	4.18	-0.64	7.91	0.64	675,678.48	596,293.96
3,908.00	6.50	269.50	3,907.68	4.19	-3.42	8.74	3.42	675,678.49	596,291.18
3,940.00	9.60	271.20	3,939.36	4.23	-7.90	9.71	7.90	675,678.53	596,286.70
3,972.00	12.90	272.50	3,970.75	4.45	-14.14	10.34	14.14	675,678.75	596,280.46
4,003.00	16.40	273.00	4,000.73	4.83	-21.97	11.30	21.97	675,679.13	596,272.63



Standard_report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Churchmouse, 1 Federal Com Well No. 18H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3672+12 @ 3684.00usft (United 43)
Site:	Churchmouse, 1 Federal Com	MD Reference:	RKB=3672+12 @ 3684.00usft (United 43)
Well:	Churchmouse, 1 Federal Com Well No. 18H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	Dbase Nov0914

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	EW (usft)	DLog (°/100usft)	V.Sec (usft)	Northing (usft)	Easting (usft)
4.034.00	20.30	272.80	4.030.15	5.32	-31.71	12.58	31.71	675,679.62	596,262.89
4.066.00	24.00	271.50	4.059.78	5.76	-43.77	11.66	43.77	675,680.06	596,250.83
4.098.00	27.20	270.50	4.088.64	5.99	-57.59	10.09	57.59	675,680.29	596,237.01
4.129.00	30.10	269.70	4.115.84	6.02	-72.45	9.44	72.45	675,680.32	596,222.15
4.161.00	33.00	268.70	4.143.11	5.78	-89.19	9.21	89.19	675,680.08	596,205.41
4.192.00	36.50	268.30	4.168.58	5.31	-106.85	11.31	106.85	675,679.61	596,187.75
4.224.00	39.60	268.70	4.193.77	4.80	-126.57	9.72	126.56	675,679.10	596,168.03
4.255.00	42.50	269.90	4.217.15	4.55	-146.92	9.69	146.92	675,678.85	596,147.88
4.260.00	42.77	269.92	4.220.83	4.55	-150.31	5.32	150.31	675,678.85	596,144.29
330 Hard line Intercept @ 4260 MD									
4.287.00	44.20	270.00	4.240.42	4.54	-168.89	5.32	168.88	675,678.84	596,125.71
4.319.00	46.90	269.90	4.262.82	4.51	-191.73	8.44	191.73	675,678.81	596,102.87
4.350.00	49.80	268.70	4.283.42	4.23	-214.89	9.79	214.88	675,678.53	596,079.71
4.382.00	52.30	266.90	4.303.54	3.26	-239.75	8.95	239.75	675,677.56	596,054.85
4.413.00	55.30	266.10	4.321.85	1.73	-264.72	9.90	264.71	675,676.03	596,029.88
4.445.00	58.20	266.40	4.339.39	-0.01	-291.42	9.10	291.42	675,674.29	596,003.18
4.476.00	61.50	267.40	4.354.96	-1.46	-318.18	11.00	318.18	675,672.84	595,976.42
4.508.00	64.30	267.70	4.369.53	-2.68	-346.64	8.79	346.64	675,671.62	595,947.96
4.539.00	67.70	266.90	4.382.14	-4.01	-374.92	11.22	374.92	675,670.29	595,919.68
4.571.00	71.30	267.20	4.393.35	-5.55	-404.85	11.28	404.85	675,668.75	595,889.75
4.602.00	74.90	266.90	4.402.36	-7.08	-434.47	11.65	434.47	675,667.22	595,860.13
4.634.00	77.90	267.50	4.409.86	-8.60	-465.53	9.55	465.53	675,665.70	595,829.07
4.665.00	80.20	268.40	4.415.77	-9.69	-495.94	7.95	495.95	675,664.61	595,798.66
4.697.00	82.10	269.40	4.420.69	-10.29	-527.55	6.69	527.56	675,664.01	595,767.05
4.728.00	83.80	269.90	4.424.50	-10.48	-558.32	5.71	558.32	675,663.82	595,736.28
4.760.00	86.60	270.00	4.427.17	-10.51	-590.20	8.76	590.21	675,663.79	595,704.40
4.796.00	88.50	270.20	4.428.71	-10.45	-626.17	5.31	626.17	675,663.85	595,668.43



Standard_report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Churchmouse 1 Federal Com Well No. 18H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3672+12 @ 3684.00usft (United 43)
Site:	Churchmouse 1 Federal Com	MD Reference:	RKB=3672+12 @ 3684.00usft (United 43)
Well:	Churchmouse 1 Federal Com Well No. 18H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	Dbase Nov0814

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	EW (usft)	CLog (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
4,828.00	89.80	270.50	4,429.19	-10.25	-658.16	4.17	658.17	675,664.05	595,636.44
4,859.00	92.20	271.20	4,428.65	-9.79	-689.15	8.06	689.16	675,664.51	595,605.45
4,917.00	94.10	271.40	4,425.46	-8.48	-747.05	3.29	747.05	675,665.82	595,547.55
5,011.00	92.10	270.90	4,420.38	-6.59	-840.89	2.19	840.89	675,667.71	595,453.71
5,106.00	92.00	270.50	4,416.98	-5.43	-935.82	0.43	935.82	675,668.87	595,358.78
5,201.00	91.90	270.30	4,413.75	-4.77	-1,030.76	0.24	1,030.76	675,669.53	595,263.84
5,296.00	91.60	270.10	4,410.84	-4.44	-1,125.72	0.38	1,125.72	675,669.86	595,168.88
5,391.00	91.30	270.40	4,408.44	-4.03	-1,220.68	0.45	1,220.69	675,670.27	595,073.92
5,485.00	91.10	270.40	4,406.47	-3.37	-1,314.66	0.21	1,314.66	675,670.93	594,979.94
5,580.00	91.10	270.00	4,404.65	-3.04	-1,409.64	0.42	1,409.64	675,671.26	594,884.96
5,675.00	90.90	269.60	4,402.99	-3.37	-1,504.63	0.47	1,504.63	675,670.93	594,789.97
5,769.00	90.70	269.30	4,401.68	-4.27	-1,598.61	0.38	1,598.61	675,670.03	594,695.99
5,864.00	90.60	269.10	4,400.60	-5.60	-1,693.60	0.24	1,693.60	675,668.70	594,601.00
5,959.00	90.20	269.00	4,399.94	-7.17	-1,788.58	0.43	1,788.58	675,667.13	594,506.02
6,053.00	91.20	269.80	4,398.79	-8.16	-1,882.57	1.36	1,882.57	675,666.14	594,412.03
6,148.00	91.10	269.40	4,396.88	-8.82	-1,977.55	0.43	1,977.55	675,665.48	594,317.05
6,242.00	90.70	270.40	4,395.40	-8.98	-2,071.53	1.15	2,071.54	675,665.32	594,223.07
6,337.00	90.40	269.90	4,394.49	-8.74	-2,166.53	0.61	2,166.53	675,665.56	594,128.07
6,432.00	91.60	272.00	4,392.83	-7.16	-2,261.49	2.55	2,261.50	675,667.14	594,033.11
6,527.00	91.30	271.90	4,390.43	-3.93	-2,356.41	0.33	2,356.41	675,670.37	593,938.19
6,621.00	91.30	271.90	4,388.30	-0.81	-2,450.33	0.00	2,450.33	675,673.49	593,844.27
6,717.00	91.10	271.10	4,386.29	1.70	-2,546.28	0.86	2,546.28	675,676.00	593,748.32
6,811.00	91.50	271.10	4,384.15	3.50	-2,640.24	0.43	2,640.23	675,677.80	593,654.36
6,906.00	90.40	269.80	4,382.58	4.25	-2,735.22	1.79	2,735.21	675,678.55	593,559.38
7,001.00	90.50	269.20	4,381.83	3.42	-2,830.21	0.64	2,830.21	675,677.72	593,464.39
7,095.00	90.60	269.40	4,380.93	2.27	-2,924.20	0.24	2,924.20	675,676.57	593,370.40
7,190.00	91.10	269.00	4,379.52	0.94	-3,019.18	0.67	3,019.18	675,675.24	593,275.42



Standard_report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Churchmouse, 1 Federal Com Well No. 18H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3672+12 @ 3684.00usft (United 43)
Site:	Churchmouse 1 Federal Com	MD Reference:	RKB=3672+12 @ 3684.00usft (United 43)
Well:	Churchmouse 1 Federal Com Well No. 18H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	Obase Nov0914

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	EW (usft)	DLeg (°/100usft)	V. Soc (usft)	Northing (usft)	Easting (usft)
7,285.00	90.60	268.90	4,378.11	-0.80	-3,114.15	0.54	3,114.15	675,673.50	593,180.45
7,379.00	90.70	268.80	4,377.05	-2.68	-3,208.13	0.15	3,208.13	675,671.62	593,086.47
7,474.00	90.70	268.30	4,375.89	-5.09	-3,303.09	0.53	3,303.09	675,669.21	592,991.51
7,568.00	91.00	270.20	4,374.49	-6.32	-3,397.07	2.05	3,397.07	675,667.98	592,897.53
7,663.00	91.00	270.20	4,372.83	-5.99	-3,492.05	0.00	3,492.05	675,668.31	592,802.55
7,758.00	91.20	269.80	4,371.01	-5.99	-3,587.03	0.47	3,587.03	675,668.31	592,707.57
7,853.00	91.60	269.40	4,368.69	-6.65	-3,682.00	0.60	3,682.00	675,667.65	592,612.60
7,947.00	91.70	269.40	4,365.98	-7.63	-3,775.96	0.11	3,775.96	675,666.67	592,518.64
8,042.00	90.20	271.00	4,364.41	-7.30	-3,870.94	2.31	3,870.94	675,667.00	592,423.66
8,136.00	90.00	271.00	4,364.24	-5.66	-3,964.92	0.21	3,964.93	675,668.64	592,329.68
8,231.00	90.00	270.80	4,364.24	-4.17	-4,059.91	0.21	4,059.91	675,670.13	592,234.69
8,326.00	89.80	270.60	4,364.41	-3.01	-4,154.90	0.30	4,154.91	675,671.29	592,139.70
8,420.00	89.70	270.60	4,364.82	-2.02	-4,248.90	0.11	4,248.90	675,672.28	592,045.70
8,515.00	91.70	270.50	4,363.66	-1.11	-4,343.88	2.11	4,343.88	675,673.19	591,950.72
8,609.00	92.00	270.60	4,360.62	-0.21	-4,437.83	0.34	4,437.83	675,674.09	591,856.77
8,702.00	92.30	270.10	4,357.13	0.36	-4,530.76	0.63	4,530.76	675,674.66	591,763.84
8,796.00	92.70	269.60	4,353.03	0.11	-4,624.67	0.68	4,624.67	675,674.41	591,669.93
8,844.00	92.70	269.10	4,350.77	-0.43	-4,672.61	1.04	4,672.61	675,673.87	591,621.99
8,914.00	92.70	269.10	4,347.48	-1.53	-4,742.53	0.00	4,742.53	675,672.77	591,552.07

Survey projected to 8914.00 MD



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Churchmouse 1 Federal Com Well No. 18H1
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3672+12 @ 3684.00usft (United 43)
Site:	Churchmouse 1 Federal Com	MD Reference:	RKB=3672+12 @ 3684.00usft (United 43)
Well:	Churchmouse 1 Federal Com Well No. 18H1	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	Dbase Nov0914

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N-S (usft)	+E-W (usft)	
100.00	100.00	0.02	-0.18	Gyro
3783.00	3782.85	3.58	1.54	Professional Directional Ltd MWD surveys
4260.00	4220.83	4.55	-150.31	330 Hard line intercept @ 4260 MD
8914.00	4347.48	-1.53	-4742.53	Survey projected to 8914.00 MD