



NM OIL CONSERVATION
ARTESIA DISTRICT

MAY 17 2015

RECEIVED

March 2, 2015

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

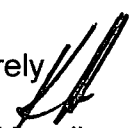
15-42917

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,

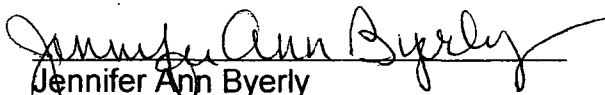

Keith Havelka
Operations

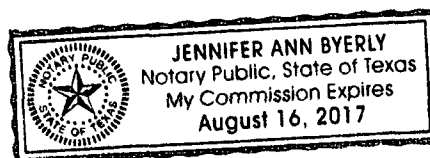
STATE OF TEXAS §

§

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





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
MAY 07 2015

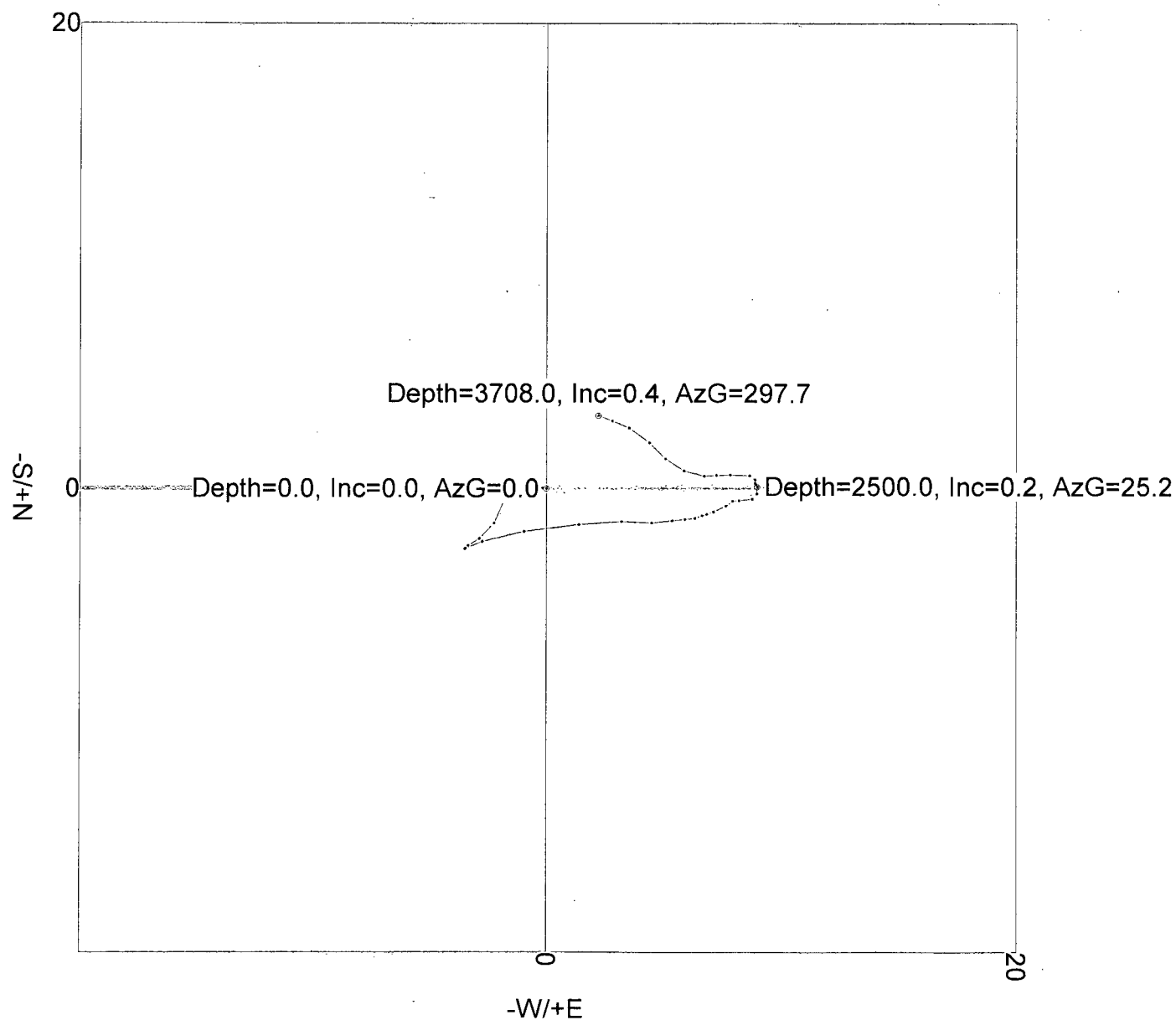
RECEIVED

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	267.22	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	0.15
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	7.63	-0.75	7.67	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	0.35	94.21	2199.89	-0.52	8.19	-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

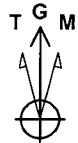


V.E.S. Survey Date: 2/21/2015

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

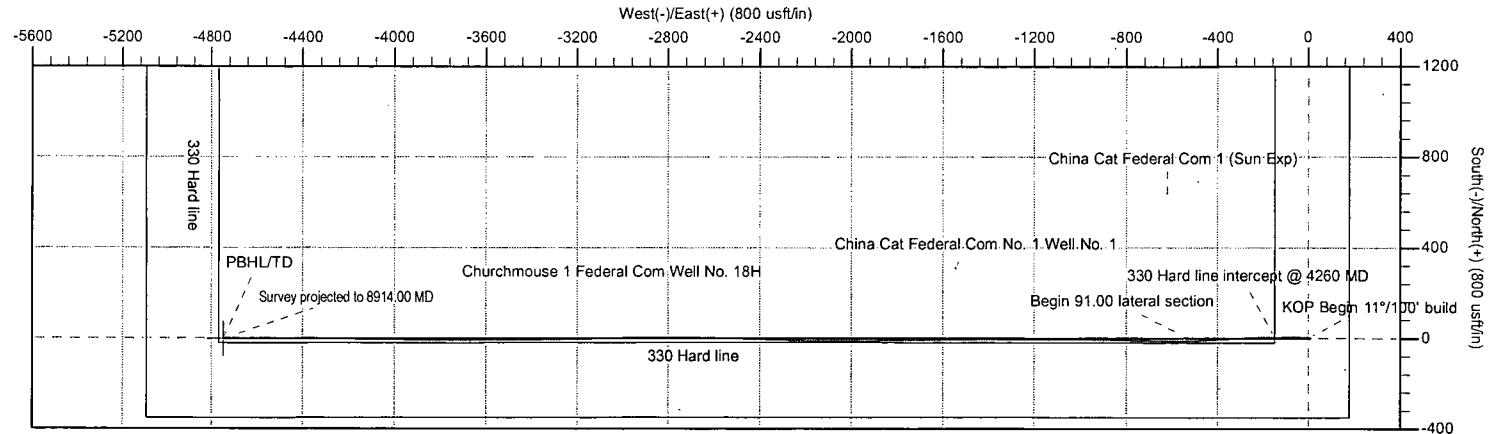


Azimuths to Grid North
 True North: -0.17°
 Magnetic North: 7.22°

Magnetic Field
 Strength: 48576.8nT
 Dip Angle: 60.60°
 Date: 2/21/2015
 Model: IGRF2010

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

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

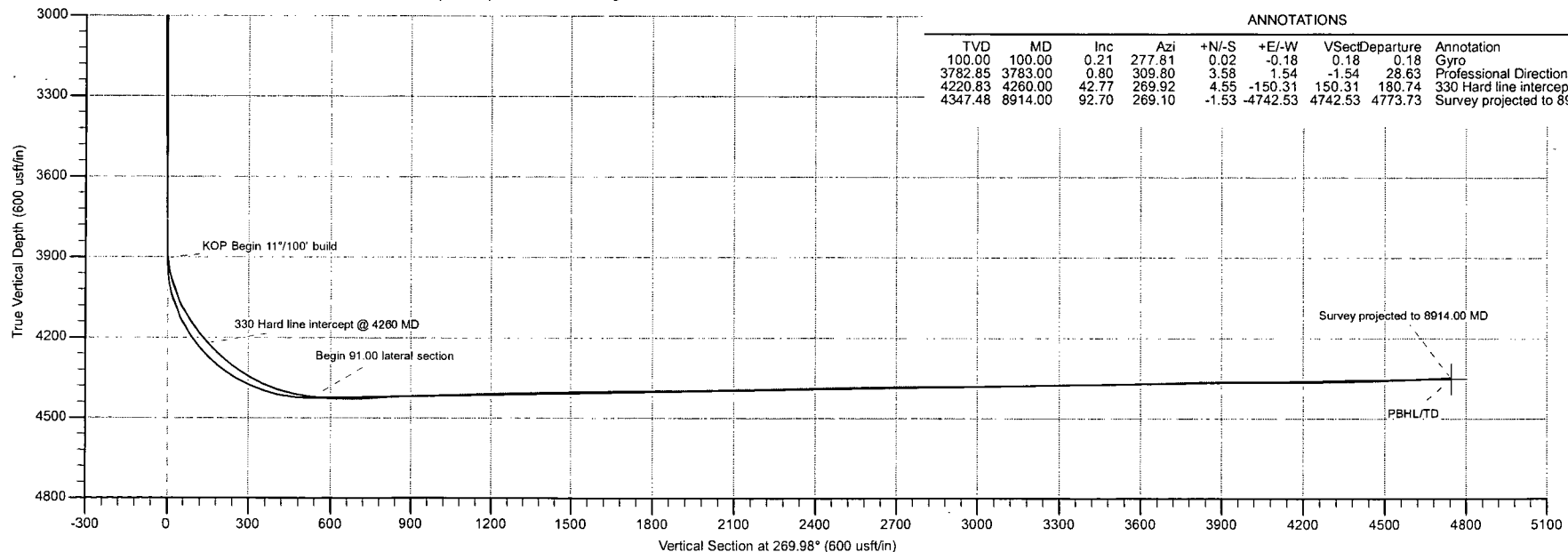


SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dlog	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°/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	0.80	309.80	3.58	1.54	-1.54	28.63	Professional Directional Ltd MWD survey
4220.83	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	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

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
From:	Map	Easting:	596,294.60 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32.85711944
		Longitude:	-104.01974887
		Grid Convergence:	0.17 °

Well	Churchmouse 1 Federal Com Well No 18H Surr Loc 350 FSL 180 FEL Sect 1 T17S 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				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	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: Nov0914

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)	N/S (usft)	E/W (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:	Dbase Nov0914

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (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	3,845.85	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	



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

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (%/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	596,147.68	
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	4,409.88	-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/Nov0914

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/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:	Dbase: Nov0914

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (%/100usft)	V. Sec (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										



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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

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
3,783.00	3,782.85	3.58	1.54	Professional Directional Ltd MWD surveys
4,260.00	4,220.83	4.55	-150.31	330 Hard line intercept @ 4260 MD
8,914.00	4,347.48	-1.53	-4,742.53	Survey projected to 8914.00 MD