

March 17, 2015

NM OIL CONSERVATION
ARTESIA DISTRICT

JUN 11 2015

RECEIVED

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

Attn: Kanicia Castillo

3001541565
RE: Munds 1 Federal Com 12H

Please find enclosed a copy of the survey from 0.00' to 3795.00' 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.

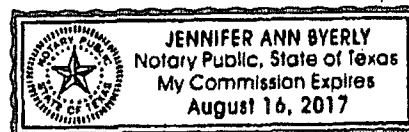
Sincerely,

Kim Moller
Kimberly D Moller
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 17 day of March, A.D., 2015, by Kimberly D Moller.

Jennifer Ann Byerly
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: COG Operating
Lease/Well: Munds 1 Federal Com/12H

Rig Name: United 43
State/County: New Mexico/Eddy
Latitude: 32.87, 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.ut
Minimum Curvature Method
Report Date/Time: 3/17/2015 / 14:15

VES Survey International
Midland, TX
(432)-563-5444
Surveyor: Tim Dillon
Munds 1 Federal Com 12H / API 30-015-41565

NM OIL CONSERVATION
ARTESIA DISTRICT

JUN 11 2015

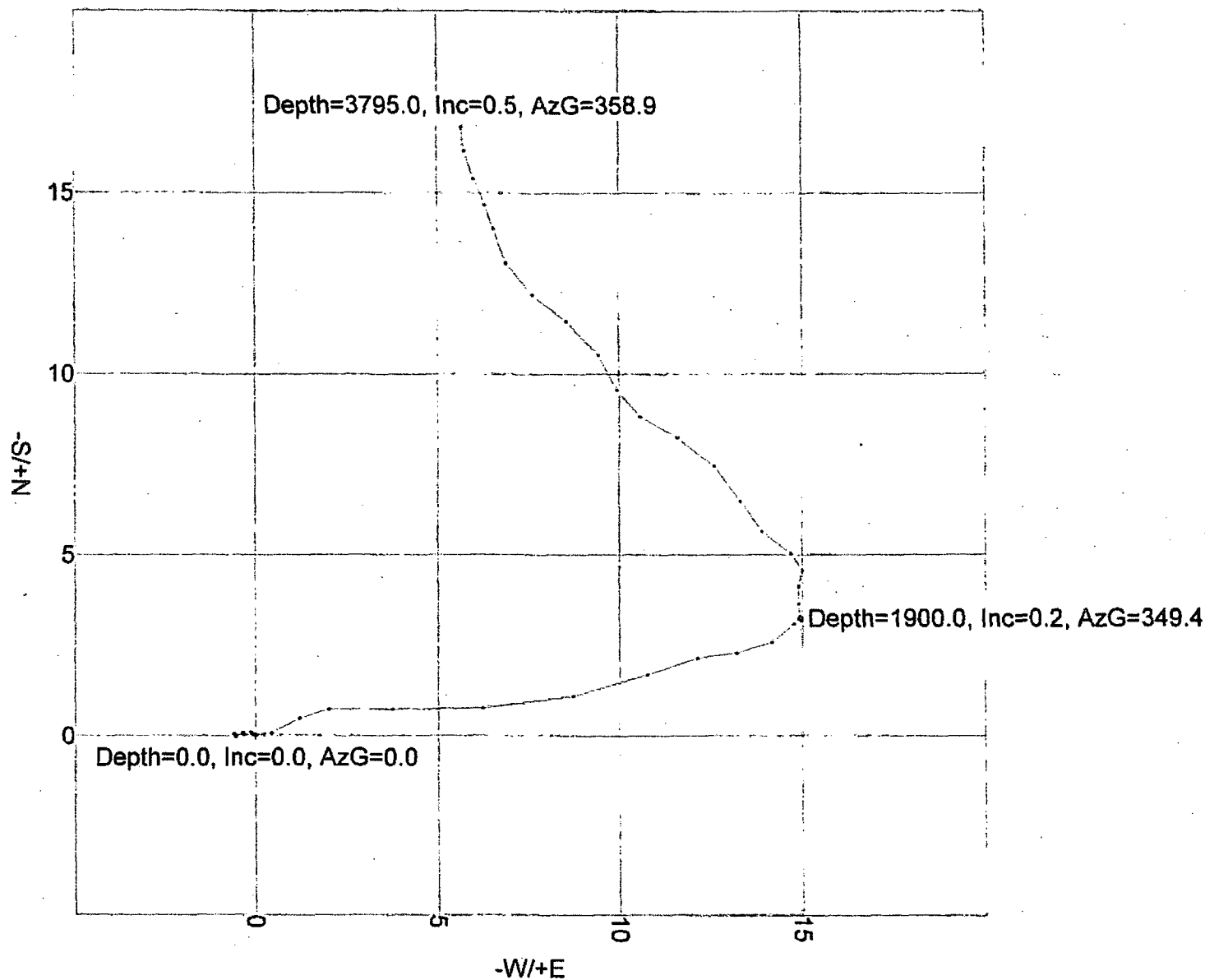
RECEIVED

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	0.18	312.43	100.00	0.11	-0.12	0.11	0.16	312.43	0.18
200.00	0.19	222.17	200.00	0.09	-0.34	0.09	0.36	284.86	0.26
300.00	0.09	270.24	300.00	-0.03	-0.53	-0.03	0.53	266.72	0.15
400.00	0.10	17.14	400.00	0.05	-0.58	0.05	0.59	274.82	0.15
500.00	0.31	111.12	500.00	0.03	-0.30	0.03	0.31	275.63	0.33
600.00	0.60	73.75	600.00	0.08	0.45	0.08	0.46	80.27	0.40
700.00	0.43	44.16	699.99	0.49	1.22	0.49	1.31	67.95	0.31
800.00	0.62	92.89	799.99	0.74	2.02	0.74	2.15	69.97	0.46
900.00	1.37	88.99	899.97	0.73	3.75	0.73	3.82	78.99	0.75
1000.00	1.48	89.52	999.94	0.76	6.23	0.76	6.28	83.03	0.11
1100.00	1.45	74.87	1099.91	1.10	8.74	1.10	8.81	82.81	0.37
1200.00	0.97	71.66	1199.89	1.70	10.76	1.70	10.90	81.03	0.49
1300.00	0.70	71.88	1299.88	2.15	12.14	2.15	12.33	79.94	0.27
1400.00	0.56	94.24	1399.87	2.31	13.21	2.31	13.41	80.10	0.28
1500.00	0.66	56.31	1499.86	2.59	14.18	2.59	14.42	79.66	0.41
1600.00	0.23	31.85	1599.86	3.08	14.76	3.08	15.08	78.23	0.46
1700.00	0.09	73.69	1699.86	3.27	14.95	3.27	15.30	77.66	0.17
1800.00	0.13	192.45	1799.86	3.18	15.00	3.18	15.33	78.03	0.19

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	0.20	349.39	1899.86	3.24	14.94	3.24	15.29	77.76	0.33
2000.00	0.25	0.03	1999.86	3.63	14.91	3.63	15.34	76.31	0.06
2100.00	0.32	359.07	2099.86	4.12	14.90	4.12	15.46	74.53	0.07
2200.00	0.23	35.19	2199.86	4.56	15.01	4.56	15.69	73.10	0.19
2300.00	0.60	304.35	2299.86	5.02	14.70	5.02	15.53	71.14	0.65
2400.00	0.56	312.98	2399.85	5.65	13.90	5.65	15.01	67.89	0.10
2500.00	0.64	337.24	2499.85	6.50	13.33	6.50	14.83	64.00	0.26
2600.00	0.77	311.32	2599.84	7.46	12.61	7.46	14.65	59.38	0.34
2700.00	0.70	303.15	2699.83	8.24	11.59	8.24	14.22	54.59	0.13
2800.00	0.63	297.16	2799.82	8.83	10.59	8.83	13.78	50.18	0.09
2900.00	0.58	342.35	2899.82	9.56	9.94	9.56	13.79	46.13	0.47
3000.00	0.71	324.05	2999.81	10.54	9.42	10.54	14.14	41.80	0.25
3100.00	0.75	311.11	3099.80	11.47	8.57	11.47	14.32	36.75	0.17
3200.00	0.62	304.45	3199.80	12.21	7.63	12.21	14.40	32.02	0.15
3300.00	0.72	333.86	3299.79	13.07	6.91	13.07	14.79	27.87	0.35
3400.00	0.47	346.99	3399.78	14.03	6.55	14.03	15.48	25.02	0.28
3500.00	0.31	332.79	3499.78	14.67	6.33	14.67	15.98	23.34	0.18
3600.00	0.58	338.15	3599.78	15.38	6.02	15.38	16.52	21.36	0.27
3700.00	0.35	346.41	3699.78	16.15	5.76	16.15	17.15	19.61	0.25
3795.00	0.45	358.85	3794.77	16.80	5.68	16.80	17.74	18.68	0.14



VES Survey International
Midland, TX
(432)-563-5444
Surveyor: Tim Dillon
Munds 1 Federal Com 12H / API 30-015-41565



VES Survey Date: 03/05/2015

JUN 11 2015

1 of 2

WELL NAME AND NUMBER Munds 1 Federal Com LBB No. 2H RECEIVED
LOCATION Section 1, T17S, R29E, Unit 1, 890 FNL, 295 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° @ 273'	24.9° @ 4129'	90.0° @ 5102'
.8° @ 371'	30.0° @ 4192'	90.5° @ 5291'
.6° @ 708'	31.5° @ 4223'	90.6° @ 5385'
1.3° @ 1028'	33.7° @ 4255'	92.2° @ 5480'
1.6° @ 1108'	37.4° @ 4287'	93.4° @ 5574'
.7° @ 1548'	46.9° @ 4381'	93.2° @ 5669'
.2° @ 1864'	49.7° @ 4412'	92.7° @ 5858'
.1° @ 2148'	52.4° @ 4444'	90.9° @ 6046'
.9° @ 2395'	61.8° @ 4530'	90.4° @ 6236'
.4° @ 2805'	64.1° @ 4569'	90.6° @ 6425'
.3° @ 3190'	67.3° @ 4601'	90.7° @ 6519'
.8° @ 3631'	71.0° @ 4632'	90.6° @ 6613'
.4° @ 3834'	72.8° @ 4664'	90.8° @ 6708'
.1° @ 3940'	75.1° @ 4695'	89.6° @ 6991'
.9° @ 3971'	77.9° @ 4727'	88.6° @ 7086'
5.0° @ 4003'	83.4° @ 4790'	89.1° @ 7180'
10.6° @ 4034'	89.2° @ 4944'	89.6° @ 7343'
21.0° @ 4097'	90.7° @ 5007'	90.1° @ 7370'

Drilling Contractor- UNITED DRILLING, INC.

By: *Angel Salazar*
(Angel Salazar)

Title: Vice President

Subscribed and sworn to before me this 17th day of March 2015.

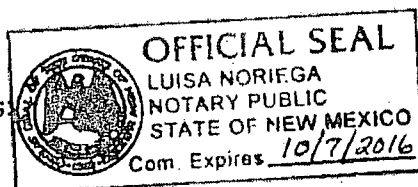
Luisa Noriega

Notary Public

Chavis NM

County State

My Commission Expires



2 of 2

WELL NAME AND NUMBER Munds 1 Federal Com LBB No. 2H
 LOCATION Section 1, T17S, R29E, Unit 1, 890 FNL, 295 FEL, Eddy County
 OPERATOR COG Operating LLC
 DRILLING CONTRACTOR United Drilling, Inc.

[illegible]

By: Angel Salazar
(Angel Salazar)

Subscribed and sworn to before me this 17th day of March 2015.

Neisa Pareja
Notary Public
Charles NM
County State

OFFICIAL SEAL
LUISA NORIEGA
NOTARY PUBLIC
STATE OF NEW MEXICO
 Com. Expires 10/7/16



Standard_report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Munds 1 Federal Com Well No. 12H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3692+12 @ 3704.00usft (United #43)
Site:	Munds 1 Federal Com	MD Reference:	RKB=3692+12 @ 3704.00usft (United #43)
Well:	Munds 1 Federal Com Well No. 12H	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)
Geo Datum:	NAD 1927 (NADCON CONUS)
Map Zone:	New Mexico East 3001
System Datum:	Mean Sea Level

Site:		Munds 1 Federal Com			
Site Position:		Northing:		680,292.40 usft	
From:		Easting:		596,285.40 usft	
Position Uncertainty:		Slot Radius:		13-3/16 "	
Map		Latitude:		32.86981315	
0.00 usft		Longitude:		-104.01973417	
		Grid Convergence:		0.17 "	

Well:	Munds 1 Federal Com Well No. 12H, Surf Loc: 690 FNL 295 FEL Sect 1-T17S-R29E Unit 1					
Well Position	+N-S	0.00 usft	Northing:	679,712.50 usft	Latitude:	32.86822006
	+E-W	0.00 usft	Easting:	596,180.20 usft	Longitude:	-104.02008240
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,692.00 usft

Wellbore		Original Hole			
Magnetics	Model Name	Sample Date	Declination (μ)	Dip Angle ($^{\circ}$)	Field Strength (nT)
	IGRF2010	2/23/2015	7.39	60.61	48,583
	IGRF2010	3/5/2015	7.38	60.61	48,580

Design:	Surveys Original Hole				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.00	0.00	0.00	269.00	



Standard_report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Munda 1 Federal Com Well No. 12H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3692+12 @ 3704.00usft (United #43)
Site:	Munda 1 Federal Com	MD Reference:	RKB=3692+12 @ 3704.00usft (United #43)
Well:	Munda 1 Federal Com Well No. 12H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	Obase Nov0914

Survey Program		Date: 3/16/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	3,795.00	Gyro (Original Hole)	NS-GYRO-MS	North sensing gyrocompassing m/s
3,908.00	8,892.00	MWD (Original Hole)	MWD	MWD - Standard

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	D Log (°/100usft)	V' Soc (usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	679,712.50	596,180.20
100.00	0.18	312.43	100.00	0.11	-0.12	0.18	0.11	679,712.61	596,180.08
Gyro									
200.00	0.19	222.17	200.00	0.09	-0.34	0.26	0.34	679,712.59	596,179.86
300.00	0.09	270.24	300.00	-0.03	-0.53	0.15	0.53	679,712.47	596,179.67
400.00	0.10	17.14	400.00	0.05	-0.59	0.15	0.58	679,712.55	596,179.61
500.00	0.31	111.12	500.00	0.04	-0.31	0.33	0.31	679,712.54	596,179.89
600.00	0.60	73.75	600.00	0.09	0.45	0.40	-0.45	679,712.59	596,180.65
700.00	0.43	44.16	699.99	0.50	1.21	0.31	-1.22	679,713.00	596,181.41
800.00	0.62	92.89	799.99	0.74	2.01	0.47	-2.03	679,713.24	596,182.21
900.00	1.37	86.99	899.97	0.74	3.75	0.75	-3.76	679,713.24	596,183.95
1,000.00	1.48	89.52	999.94	0.77	6.24	0.11	-6.25	679,713.27	596,186.44
1,100.00	1.45	74.87	1,099.91	1.11	8.75	0.37	-8.77	679,713.61	596,188.95
1,200.00	0.97	71.66	1,199.89	1.71	10.77	0.48	-10.80	679,714.21	596,190.97
1,300.00	0.70	71.88	1,299.88	2.16	12.16	0.27	-12.19	679,714.66	596,192.36
1,400.00	0.56	94.24	1,399.87	2.32	13.22	0.28	-13.26	679,714.82	596,193.42
1,500.00	0.66	56.31	1,499.86	2.60	14.19	0.41	-14.23	679,715.10	596,194.39
1,600.00	0.23	31.85	1,599.86	3.09	14.78	0.46	-14.83	679,715.59	596,194.98
1,700.00	0.09	73.69	1,699.86	3.28	14.96	0.17	-15.01	679,715.78	596,195.16
1,800.00	0.13	192.45	1,799.86	3.19	15.01	0.19	-15.06	679,715.69	596,195.21
1,900.00	0.20	349.39	1,899.86	3.25	14.95	0.32	-15.01	679,715.75	596,195.15



Standard_report



Company:	COG Operating LLC						Local Co-ordinate Reference:	Well Munda 1 Federal Com Well No. 12H
Project:	Eddy County, New Mexico						TVD Reference:	RKB=3692+12 @ 3704.00usft (United #43)
Site:	Munda 1 Federal Com						MD Reference:	RKB=3692+12 @ 3704.00usft (United #43)
Well:	Munda 1 Federal Com Well No. 12H						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)	DCog (°/100usft)	V.Sec (usft)	Northing (usft)	Easting (usft)	
2,000.00	0.25	0.03	1,999.86	3.64	14.92	0.06	-14.98	679,716.14	596,195.12	
2,100.00	0.32	359.07	2,099.86	4.14	14.92	0.07	-14.99	679,716.64	596,195.12	
2,200.00	0.23	35.19	2,199.86	4.58	15.03	0.19	-15.10	679,717.08	596,195.23	
2,300.00	0.60	304.35	2,299.86	5.04	14.71	0.65	-14.80	679,717.54	596,194.91	
2,400.00	0.56	312.98	2,399.85	5.67	13.92	0.10	-14.02	679,718.17	596,194.12	
2,500.00	0.64	337.24	2,499.84	6.52	13.35	0.26	-13.46	679,719.02	596,193.55	
2,600.00	0.77	311.32	2,599.84	7.48	12.63	0.34	-12.75	679,719.98	596,192.83	
2,700.00	0.70	303.15	2,699.83	8.26	11.61	0.13	-11.75	679,720.76	596,191.81	
2,800.00	0.63	297.16	2,799.82	8.84	10.61	0.10	-10.76	679,721.34	596,190.81	
2,900.00	0.58	342.35	2,899.82	9.58	9.97	0.47	-10.13	679,722.08	596,190.17	
3,000.00	0.71	324.05	2,999.81	10.56	9.45	0.24	-9.63	679,723.06	596,189.65	
3,100.00	0.75	311.11	3,099.80	11.49	8.59	0.17	-8.79	679,723.99	596,188.79	
3,200.00	0.62	304.45	3,199.80	12.23	7.65	0.15	-7.87	679,724.73	596,187.85	
3,300.00	0.72	333.86	3,299.79	13.10	6.93	0.35	-7.16	679,725.60	596,187.13	
3,400.00	0.47	346.99	3,399.78	14.06	6.56	0.28	-6.81	679,726.56	596,186.76	
3,500.00	0.31	332.79	3,499.78	14.70	6.35	0.19	-6.60	679,727.20	596,186.55	
3,600.00	0.58	338.15	3,599.78	15.41	6.03	0.27	-6.30	679,727.91	596,186.23	
3,700.00	0.35	346.41	3,699.78	16.18	5.77	0.24	-6.05	679,728.68	596,185.97	
3,795.00	0.45	358.85	3,794.77	16.83	5.70	0.14	-5.99	679,729.33	596,185.90	
3,908.00	0.10	342.30	3,907.77	17.37	5.66	0.31	-5.96	679,729.87	596,185.86	
Professional Directional Ltd MWD surveys										
3,940.00	0.10	118.20	3,939.77	17.38	5.67	0.58	-5.98	679,729.88	596,185.87	
3,971.00	0.90	241.00	3,970.77	17.25	5.49	3.09	-5.79	679,729.75	596,185.69	
4,003.00	5.00	255.20	4,002.72	16.78	3.92	12.92	-4.21	679,729.28	596,184.12	
4,034.00	10.60	259.20	4,033.42	15.80	-0.19	18.14	-0.08	679,728.40	596,180.01	
4,066.00	16.20	261.80	4,064.54	14.71	-7.51	17.60	7.25	679,727.21	596,172.69	
4,097.00	21.00	262.90	4,093.91	13.40	-17.31	15.52	17.07	679,725.90	596,162.89	



Standard_report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Munda 1 Federal Com Well No. 12H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3692+12 @ 3704.00usft (United #43)
Site:	Munda 1 Federal Com	MD Reference:	RKB=3692+12 @ 3704.00usft (United #43)
Well:	Munda 1 Federal Com Well No. 12H	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)	
4,129.00	24.90	262.70	4,123.37	11.84	-29.68	12.19	29.47	679,724.34	596,150.52	
4,142.00	26.16	262.96	4,135.10	11.14	-35.24	9.72	35.04	679,723.64	596,144.96	
330 Hard line intercept @ 4142 MD										
4,161.00	28.00	263.30	4,152.02	10.10	-43.83	9.72	43.65	679,722.60	596,136.37	
4,192.00	30.00	264.30	4,179.13	8.49	-58.77	6.64	58.61	679,720.99	596,121.43	
4,223.00	31.50	266.50	4,205.77	7.22	-74.57	6.05	74.43	679,719.72	596,105.63	
4,255.00	33.70	268.70	4,232.73	6.51	-91.79	7.81	91.66	679,719.01	596,088.41	
4,287.00	37.80	268.50	4,258.70	6.05	-110.47	12.82	110.35	679,718.55	596,069.73	
4,318.00	40.60	267.80	4,282.72	5.41	-130.05	9.14	129.94	679,717.91	596,050.15	
4,349.00	44.00	266.10	4,305.64	4.29	-150.88	11.57	150.79	679,716.79	596,029.32	
4,381.00	46.90	264.70	4,328.09	2.46	-173.61	9.58	173.54	679,714.96	596,006.59	
4,412.00	49.70	264.00	4,348.71	0.18	-196.64	9.19	196.61	679,712.68	595,983.56	
4,444.00	52.40	263.20	4,368.83	-2.60	-221.37	8.66	221.38	679,709.90	595,958.83	
4,475.00	55.70	262.80	4,387.02	-5.66	-246.27	10.70	246.33	679,706.84	595,933.93	
4,506.00	58.60	262.60	4,403.84	-8.97	-272.10	9.37	272.22	679,703.53	595,908.10	
4,538.00	61.80	262.50	4,419.74	-12.57	-299.63	10.00	299.81	679,699.93	595,880.57	
4,569.00	64.10	262.50	4,433.83	-16.17	-327.00	7.42	327.24	679,696.33	595,853.20	
4,601.00	67.30	261.40	4,447.00	-20.26	-355.88	10.48	356.18	679,692.24	595,824.32	
4,632.00	71.00	260.90	4,458.03	-24.72	-384.50	12.03	384.87	679,687.78	595,795.70	
4,664.00	72.80	260.40	4,467.97	-29.66	-414.51	5.82	414.96	679,682.84	595,765.69	
4,695.00	75.10	260.70	4,476.54	-34.55	-443.89	7.48	444.43	679,677.95	595,736.31	
4,727.00	77.90	260.10	4,484.01	-39.74	-474.57	8.94	475.19	679,672.76	595,705.63	
4,759.00	80.50	259.10	4,490.01	-45.41	-505.48	8.69	506.20	679,667.09	595,674.72	
4,790.00	83.40	259.50	4,494.35	-51.11	-535.64	9.44	536.45	679,661.39	595,644.56	
4,822.00	86.50	260.70	4,497.17	-56.59	-567.04	10.38	567.94	679,655.91	595,613.16	
4,852.00	89.10	261.80	4,498.32	-61.15	-596.66	9.41	597.64	679,651.35	595,583.54	
4,883.00	89.20	261.80	4,498.78	-65.57	-627.34	0.32	628.39	679,646.93	595,552.86	



Standard_report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Munds 1 Federal Com Well No. 12H
Project:	Eddy County New Mexico	TVD Reference:	RKB=3682+12 @ 3704.00usft (United #43)
Site:	Munds 1 Federal Com	MD Reference:	RKB=3682+12 @ 3704.00usft (United #43)
Well:	Munds 1 Federal Com Well No. 12H	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)	DLog (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
4,913.00	89.10	261.90	4,499.22	-69.82	-657.04	0.47	658.16	679,642.68	595,523.16
4,944.00	89.20	261.80	4,499.68	-74.22	-687.72	0.46	688.91	679,638.28	595,492.48
4,976.00	89.10	262.30	4,500.16	-78.64	-719.41	1.59	720.67	679,633.86	595,460.79
5,007.00	90.70	263.50	4,500.21	-82.48	-750.17	6.45	751.50	679,630.02	595,430.03
5,102.00	90.00	267.50	4,499.63	-89.93	-844.86	4.27	846.30	679,622.57	595,335.34
5,196.00	90.30	267.90	4,499.39	-93.70	-938.78	0.53	940.27	679,618.80	595,241.42
5,291.00	90.50	269.50	4,498.72	-95.85	-1,033.75	1.70	1,035.26	679,616.65	595,146.45
5,385.00	90.60	269.80	4,497.82	-96.43	-1,127.74	0.34	1,129.25	679,616.07	595,052.46
5,480.00	92.20	271.20	4,495.50	-95.60	-1,222.71	2.24	1,224.19	679,616.90	594,957.49
5,574.00	93.40	272.10	4,490.91	-92.90	-1,316.55	1.60	1,317.97	679,619.60	594,863.65
5,669.00	93.20	271.70	4,485.44	-89.75	-1,411.34	0.47	1,412.69	679,622.75	594,768.86
5,763.00	93.10	271.60	4,480.27	-87.05	-1,505.16	0.15	1,506.45	679,625.45	594,675.04
5,858.00	92.70	271.40	4,475.47	-84.57	-1,600.01	0.47	1,601.24	679,627.93	594,580.19
5,952.00	92.90	271.20	4,470.88	-82.44	-1,693.87	0.30	1,695.05	679,630.06	594,486.33
6,046.00	90.90	271.00	4,467.76	-80.63	-1,787.80	2.14	1,788.93	679,631.87	594,392.40
6,141.00	89.60	270.90	4,467.34	-79.06	-1,882.78	1.37	1,883.87	679,633.44	594,297.42
6,236.00	90.40	270.00	4,467.34	-78.31	-1,977.78	1.27	1,978.84	679,634.19	594,202.42
6,330.00	90.10	269.90	4,466.93	-78.39	-2,071.77	0.34	2,072.83	679,634.11	594,108.43
6,425.00	90.60	269.70	4,466.35	-78.73	-2,166.77	0.57	2,167.82	679,633.77	594,013.43
6,519.00	90.70	269.40	4,465.29	-79.46	-2,260.76	0.34	2,261.81	679,633.04	593,919.44
6,613.00	90.60	268.70	4,464.22	-81.02	-2,354.74	0.75	2,355.80	679,631.48	593,825.46
6,708.00	90.80	268.10	4,463.06	-83.67	-2,449.70	0.67	2,450.79	679,628.83	593,730.50
6,803.00	91.20	267.40	4,461.40	-87.40	-2,544.61	0.85	2,545.75	679,625.10	593,635.58
6,897.00	90.50	269.90	4,460.01	-89.62	-2,638.57	2.76	2,639.73	679,622.88	593,541.63
6,991.00	89.60	270.00	4,459.93	-89.70	-2,732.56	0.96	2,733.71	679,622.80	593,447.64
7,086.00	88.60	270.00	4,461.42	-89.70	-2,827.55	1.05	2,828.69	679,622.80	593,352.65
7,180.00	89.10	270.70	4,463.30	-89.13	-2,921.53	0.92	2,922.64	679,623.37	593,258.67



Standard_report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Munda, 1 Federal Com Well No. 12H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3692+12 @ 3704.00usft (United #43)
Site:	Munda, 1 Federal Com	MD Reference:	RKB=3692+12 @ 3704.00usft (United #43)
Well:	Munda, 1 Federal Com Well No. 12H	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)	DLog (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)	
7,275.00	89.60	270.60	4,464.38	-88.05	-3,016.52	0.54	3,017.59	679,624.45	593,163.68	
7,370.00	90.10	270.10	4,464.63	-87.47	-3,111.51	0.74	3,112.57	679,625.03	593,068.69	
7,464.00	90.60	270.80	4,464.08	-86.73	-3,205.51	0.92	3,206.53	679,625.77	592,974.69	
7,558.00	91.30	270.80	4,462.50	-85.42	-3,299.49	0.74	3,300.47	679,627.08	592,880.71	
7,653.00	91.90	270.70	4,459.85	-84.17	-3,394.44	0.64	3,395.39	679,628.33	592,785.76	
7,748.00	92.30	270.30	4,456.36	-83.35	-3,489.37	0.60	3,490.30	679,629.15	592,690.83	
7,842.00	93.10	270.60	4,451.94	-82.61	-3,583.27	0.91	3,584.16	679,629.89	592,596.93	
7,936.00	92.50	270.40	4,447.34	-81.79	-3,677.15	0.67	3,678.02	679,630.71	592,503.05	
8,030.00	91.60	270.20	4,443.98	-81.30	-3,771.09	0.98	3,771.93	679,631.20	592,409.11	
8,125.00	91.30	270.30	4,441.58	-80.88	-3,866.05	0.33	3,866.88	679,631.62	592,314.15	
8,220.00	91.30	269.50	4,439.42	-81.05	-3,961.03	0.84	3,961.84	679,631.45	592,219.17	
8,314.00	91.30	269.80	4,437.29	-81.62	-4,055.00	0.32	4,055.81	679,630.88	592,125.20	
8,409.00	90.90	269.30	4,435.47	-82.37	-4,149.98	0.67	4,150.79	679,630.13	592,030.22	
8,503.00	90.50	268.90	4,434.32	-83.85	-4,243.96	0.60	4,244.78	679,628.65	591,936.24	
8,598.00	91.10	270.50	4,432.99	-84.34	-4,338.95	1.80	4,339.78	679,628.16	591,841.25	
8,692.00	91.20	270.40	4,431.10	-83.60	-4,432.93	0.15	4,433.71	679,628.90	591,747.27	
8,787.00	91.30	270.40	4,429.03	-82.94	-4,527.90	0.11	4,528.66	679,629.56	591,652.30	
8,823.00	91.30	270.50	4,428.22	-82.66	-4,583.89	0.28	4,564.64	679,629.84	591,616.31	
8,892.00	91.30	270.50	4,426.65	-82.06	-4,632.87	0.00	4,633.60	679,630.44	591,547.33	
Survey projected to 8892.00 MD										



Standard_report



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Site:	Munds 1 Federal Com	MD Reference:	RKB=3692+12 @ 3704.00usft (United #43)
Well:	Munds 1 Federal Com Well No. 12H	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	0.11	-0.12	Gyro
3,908.00	3,907.77	17.37	5.66	Professional Directional Ltd MWD surveys
4,142.00	4,135.10	11.14	-35.24	330 Hard line intercept @ 4142 MD
8,892.00	4,426.65	-82.06	-4,632.87	Survey projected to 8892.00 MD