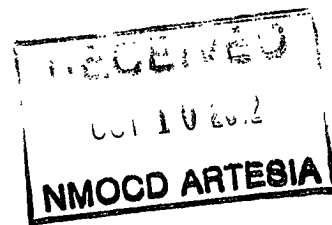


OPERATOR _____ COG _____
WELL/LEASE Burch Keely Unit 603
COUNTY Eddy



STATE OF NEW MEXICO
DEVIATION REPORT

30-015-40275

136	0.22
232	0.39
317	0.65
621	0.10
959	1.02
1054	0.60
1117	0.63
1181	1.14
1244	1.85
1308	2.53
1370	3.34
1434	4.04
1497	4.90
1561	5.54
1624	6.19
1688	6.86
2130	6.53
2225	6.90
2321	6.77
2416	6.99
2700	7.12
2794	7.47
2888	7.12
2983	6.86
3079	7.21
3174	6.51
3269	6.60
3460	6.95
3588	5.93
3619	5.83
3683	5.19
3740	4.27
3810	3.25
4000	0.79
4063	0.18
4159	0.44
4255	0.79
4349	1.06
4445	0.53
4568	0.79

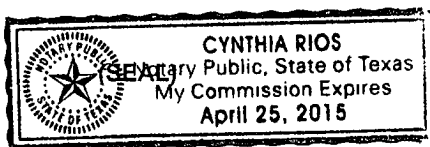
SIGNED BY: _____

RON SCANDOLARI, VP-CONTRACT DRILLING

STATE OF TEXAS

COUNTY OF MIDLAND

ON THIS 3rd DAY OF July, 2012, BEFORE ME, C RIOS, A NOTARY
PUBLIC, PERSONALLY APPEARED RON SCANDOLARI, WHO ACKNOWLEDGED AND EXECUTED
THIS DOCUMENT. WITNESS MY HAND AND OFFICIAL SEAL.



Cynthia Rios
NOTARY PUBLIC



RECEIVED

OCT 10 2012

NMOCD ARTESIA

COG Operating LLC

Eddy County, NM (NAD27 NME)

Burch Keely Unit #603 / As-Drilled

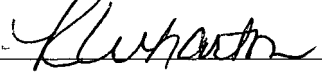
Burch Keely Unit #603

OH - Job #32DO612750

Design: Actual

SDI Standard Survey Report

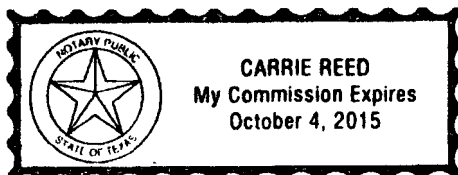
This survey is correct to the best of my knowledge and is supported by actual field data.



Notarized this date 10th of July, 2012.



Notary Signature
County of Midland
State of Texas





Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Burch Keely Unit #603 / As-Drilled
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RF @ 3599 00usft (Basic #35)
Site:	Burch Keely Unit #603 / As-Drilled	MD Reference:	RF @ 3599 00usft (Basic #35)
Well:	Burch Keely Unit #603	North Reference:	Grid
Wellbore:	OH - Job #32DO612750	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Project	Eddy County, NM (NAD27 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	Burch Keely Unit #603 / As-Drilled		
Site Position:		Northing:	662,082 70 usft
From:	Map	Easting:	590,212 80 usft
Position Uncertainty:	0 00 usft	Slot Radius:	13-3/16"
		Latitude:	32° 49' 11 310 N
		Longitude:	104° 2' 22 838 W
		Grid Convergence:	0 16 °

Well	Burch Keely Unit #603		
Well Position	+N/-S	0 00 usft	Northing:
	+E/-W	0 00 usft	Easting:
Position Uncertainty	0 00 usft	Wellhead Elevation:	usft
		Latitude:	32° 49' 11 310 N
		Longitude:	104° 2' 22 838 W
		Ground Level:	3,587 00 usft

Wellbore	OH - Job #32DO612750				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	06/22/12	7 72	60 63	48,820

Design	Actual			
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	276 34

Survey Program	Date	06/25/12		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100 00	927 00	Gyro (OH - Job #32DO612750)	Keeper	Standard Wireline Keeper ver 1 0 2
1,054 00	4,618 00	MWD (OH - Job #32DO612750)	MWD	MWD - Standard

Survey								
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)	
0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
100 00	0 23	299 76	100 00	0 10	-0 17	299 76	0 20	
200 00	0 45	244 80	200 00	0 03	-0 70	272 61	0 70	
300 00	0 39	224 10	300 00	-0 38	-1 30	253 68	1 35	
400 00	0 63	268 17	399 99	-0 64	-2 08	252 88	2 18	
500 00	0 50	284 62	499 99	-0 55	-3 05	259 81	3 10	
600 00	0 40	2 15	599 98	-0 09	-3 46	268 51	3 46	
700 00	1 06	16 23	699 98	1 15	-3 19	289 77	3 39	
800 00	0 91	46 69	799 96	2 58	-2 36	317 61	3 49	
900 00	1 09	28 25	899 95	3 96	-1 33	341 48	4 18	



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SDI Standard Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Burch Keely Unit #603 / As-Drilled
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RF @ 3599 00usft (Basic #35)
Site:	Burch Keely Unit #603 / As-Drilled	MD Reference:	RF @ 3599 00usft (Basic #35)
Well:	Burch Keely Unit #603	North Reference:	Grid
Wellbore:	OH - Job #32DO612750	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
927 00	1 34	24 35	926 94	4 48	-1 08	346 49	4 60
Gyro Tie-in							
1,054 00	0 60	47 13	1,053 92	6 28	0 02	0 22	6 28
1,117 00	0 63	10 19	1,116 92	6 85	0 33	2 74	6 85
1,181 00	1 14	324 14	1,180 91	7 71	0 02	0 12	7 71
1,244 00	1 85	296 72	1,243 89	8 67	-1 26	351 74	8 77
1,308 00	2 53	283 64	1,307 84	9 47	-3 55	339 43	10 12
1,370 00	3 34	285 21	1,369 76	10 27	-6 63	327 16	12 22
1,434 00	4 04	287 67	1,433 63	11 44	-10 57	317 26	15 58
1,497 00	4 90	282 31	1,496 44	12 69	-15 32	309 64	19 89
1,561 00	5 54	271 41	1,560 17	13 35	-21 08	302 35	24 95
1,624 00	6 19	265 54	1,622 84	13 16	-27 50	295 57	30 49
1,688 00	6 86	265 08	1,686 43	12 56	-34 75	289 87	36 95
1,751 00	7 21	271 50	1,748 95	12 34	-42 45	286 21	44 21
1,846 00	6 77	274 75	1,843 25	12 96	-53 99	283 50	55 53
1,942 00	6 24	276 95	1,938 63	14 06	-64 81	282 24	66 32
2,037 00	6 77	271 15	2,033 02	14 80	-75 53	281 09	76 97
2,130 00	6 53	268 17	2,125 39	14 74	-86 30	279 69	87 55
2,225 00	6 90	277 11	2,219 75	15 28	-97 36	278 92	98 55
2,321 00	6 77	281 14	2,315 06	17 08	-108 64	278 94	109 97
2,416 00	6 99	278 15	2,409 38	18 98	-119 85	279 00	121 35
2,511 00	7 20	276 24	2,503 65	20 45	-131 49	278 84	133 07
2,606 00	7 56	279 06	2,597 87	22 08	-143 58	278 74	145 27
2,701 00	7 12	277 39	2,692 09	23 82	-155 59	278 70	157 41
2,794 00	7 47	277 12	2,784 33	25 31	-167 31	278 60	169 21
2,888 00	7 12	274 66	2,877 57	26 54	-179 18	278 43	181 13
2,983 00	6 86	272 38	2,971 87	27 26	-190 71	278 13	192 65
3,079 00	7 21	273 61	3,067 14	27 88	-202 45	277 84	204 36
3,174 00	6 51	272 73	3,161 46	28 51	-213 78	277 60	215 67
3,269 00	6 60	272 02	3,255 84	28 96	-224 62	277 35	226 48
3,365 00	6 68	272 29	3,351 20	29 37	-235 71	277 10	237 53
3,460 00	6 95	271 85	3,445 53	29 78	-246 98	276 88	248 77
3,556 00	5 93	273 15	3,540 92	30 24	-257 73	276 69	259 50
3,619 00	5 83	272 71	3,603 59	30 57	-264 18	276 60	265 94
3,683 00	5 19	272 29	3,667 29	30 84	-270 32	276 51	272 07
3,746 00	4 27	270 56	3,730 08	30 98	-275 51	276 41	277 25
3,810 00	3 25	264 64	3,793 94	30 83	-279 70	276 29	281 39
3,873 00	2 64	264 16	3,856 86	30 52	-282 92	276 16	284 56
3,937 00	1 76	275 72	3,920 81	30 46	-285 37	276 09	286 99
4,000 00	0 79	300 33	3,983 79	30 78	-286 70	276 13	288 35
4,028 22	0 48	309 17	4,012 01	30 95	-286 96	276 16	288 63
TG1-BKU #603							
4,063 00	0 18	5 36	4,046 79	31 10	-287 07	276 18	288 75
4,159 00	0 44	53 44	4,142 79	31 47	-286 76	276 26	288 48
4,255 00	1 06	44 12	4,238 78	32 32	-285 84	276 45	287 67



Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Burch Keely Unit #603 / As-Drilled
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RF @ 3599 00usft (Basic #35)
Site:	Burch Keely Unit #603 / As-Drilled	MD Reference:	RF @ 3599 00usft (Basic #35)
Well:	Burch Keely Unit #603	North Reference:	Grid
Wellbore:	OH - Job #32DO612750	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
4,445 00	0 53	10 02	4,428 76	34 45	-284 47	276 91	286 55
4,508 00	0 53	359 04	4,491 76	35 03	-284 42	277 02	286 57
4,568 00	0 79	0 00	4,551 76	35 72	-284 43	277 16	286 66
Last MWD Survey							
4,618 00	0 79	0 00	4,601 75	36 41	-284 43	277 29	286 75
Projection to Bit - PBHL-BKU #603							

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
927 00	926 94	4 48	-1 08	Gyro Tie-in
4,568 00	4,551 76	35 72	-284 43	Last MWD Survey
4,618 00	4,601 75	36 41	-284 43	Projection to Bit



Azimuth to Grid North
True North -0.10°
Magnetic North 7.66°
Magnetic Field
Strength 48619.8nT
Dip Angle 60.63°
Date 06/22/2012
Model IGSF2010

Burch Keely Unit #603
Eddy County, NM (NAN27 NME)
Northing (Y) 662082.70
Easting (X) 590212.80
Plan #2 vs Actual 8-3/4" Hole

WELL DETAILS

Burch Keely Unit #603									
+N/S	+E/W	Ground Level	3587.00	Latitude	Longitude	Slat			
0.00	0.00	Northing	662082.70	32° 49' 11.310 N	104° 2' 22.838 W				

SITE DETAILS

Burch Keely Unit #603
Site Centre Northing 662082.70
Easting 590212.80
Positional Uncertainty 0.00
Convergence 0.16
Local North Grid

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/S	+E/W	Dleg	TFace	VSeal	Target
1	927.00	1.34	24.35	929.94	4.48	-1.08	0.00	0.00	1.56	
2	1150.00	1.34	24.35	1149.68	9.73	-1.67	0.00	0.00	-0.05	
3	1511.10	8.64	273.72	1510.20	14.44	-18.05	2.00	-120.56	19.33	
4	3894.19	8.64	273.72	3898.70	30.75	-288.82	0.00	0.00	270.57	
5	4016.23	0.00	0.00	4000.00	32.00	-288.00	2.00	180.00	289.77	TG1-BKU #603
6	4816.23	0.00	0.00	4800.00	32.00	-288.00	0.00	0.00	289.77	PBHL-BKU #603

DESIGN TARGET DETAILS

Name	TVD	+N/S	+E/W	Northing	Easting	Latitude	Longitude	Shape
TG1-BKU #603	4000.00	32.00	-288.00	662114.70	589924.80	32° 49' 11.635 N	104° 2' 29.211 W	Point
PBHL-BKU #603	4800.00	32.00	-288.00	662114.70	589924.80	32° 49' 11.635 N	104° 2' 25.211 W	Circle (Radius 10.00)

Map System US State Plane 1927 (Exact solution)
Datum NAD 1927 (NADCON CONUS)
Ellipsoid Clarke 1866
Zone Name New Mexico East 3001

Local Origin Site Burch Keely Unit #603 Grid North

Latitude 32° 49' 11.310 N

Longitude 104° 2' 22.838 W

Grid East 590212.80

Grid North 662082.70

Scale Factor 1.000

Geometric Model IGRF2010

Sample Date 22 Jan 12

Magnetic Declination 7.72°

Dip Angle from Horizontal 60.63°

Magnetic Field Strength 48620

To convert Magnetic North to Grid Add 7.58°

To convert Magnetic North to True North Add 7.72° East

To convert True North to Grid, Subtract 0.16°

FORMATION TOP DETAILS

TVD Path	MD Path	Formation	Dip Angle	Dip Dir
4000.00	4016.23	Top of Paddock	0.00	

CASING DETAILS

TVD	MD	Name	Size
1029.00		8-5/8" Casing	8.58

PROJECT DETAILS

Eddy County, NM (NAN27 NME)
Geodetic System US State Plane 1927 (Exact solution)
Datum NAD 1927 (NADCON CONUS)
Ellipsoid Clarke 1866
Zone New Mexico East 3001
System Datum Mean Sea Level

