



Company: COG OPERATING LLC (CONCHO)
Lease/Well: BURCH KEELY UNIT/625

Rig Name: SILVER OAK #5
State/County: NEW MEXICO/EDDY
Latitude: 32.82

GRID North is 0.17 Degrees East of True North
VS-Azi: 0.00 Degrees



DRILLOG HA GYRO SURVEY CALCULATIONS

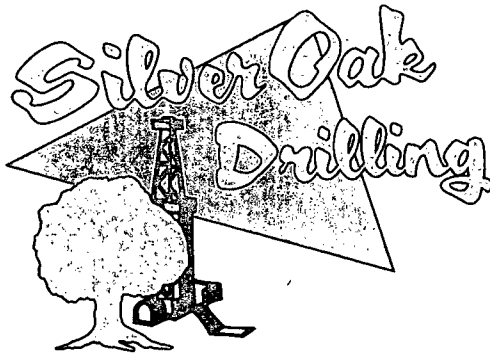
Filename: burch keely unit #625_ed.ut
Minimum Curvature Method
Report Date/Time: 8/22/2012 / 14:42

Vaughn Energy Services
Midland, TX
432-563-5444

Surveyor: Danny Spring
Burch Keely Unit 625 / API 30-015-40326

RECEIVED
JAN 09 2013
NMOCD ARTESIA

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	0.84	131.53	100.00	-0.49	0.55	0.73	131.53	0.84
200.00	1.02	134.28	199.98	-1.59	1.74	2.36	132.57	0.19
300.00	0.86	155.50	299.97	-2.90	2.69	3.96	137.21	0.38
400.00	0.94	152.48	399.96	-4.32	3.38	5.48	141.95	0.09
500.00	0.87	103.00	499.95	-5.22	4.50	6.89	139.23	0.76
600.00	0.79	121.33	599.94	-5.75	5.83	8.19	134.59	0.28
700.00	1.23	93.62	699.92	-6.18	7.49	9.71	129.50	0.64
800.00	1.76	89.08	799.89	-6.22	10.10	11.86	121.62	0.55
900.00	1.72	86.25	899.84	-6.10	13.14	14.49	114.89	0.10
980.00	1.41	99.97	979.81	-6.19	15.31	16.52	112.01	0.61



PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288

August 20, 2012

COG, LLC
Fasken Center, Tower II
550 West Texas Ave, Suite 1300
Midland, TX 79701

RE: Burch Keely Unit #625
2373' FNL & 1883' FEL
Sec. 24, T17S, R29E
Eddy County, New Mexico

Dear Sir,

The attached is the Deviation Survey for the above captioned well.

Very truly yours,

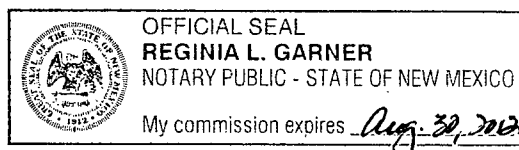
A handwritten signature in cursive script, appearing to read "Chris Graham".

Chris Graham
Drilling Superintendent

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 20th day of August, 2012.

A handwritten signature in cursive script, appearing to read "Regina L. Garner".

Notary Public

Burch Keely Unit #625

Date	Depth	Dev/Inc	Dir/AZ
8/12/2012	223	1.00	
8/14/2012	458	1.00	
8/14/2012	889	1.30	
8/15/2012	1065	1.41	75.91
8/15/2012	1129	1.67	81.71
8/15/2012	1192	2.02	99.81
8/15/2012	1256	2.99	106.40
8/15/2012	1320	3.78	106.30
8/15/2012	1384	4.04	111.80
8/15/2012	1447	5.10	108.40
8/16/2012	1511	5.45	99.02
8/16/2012	1575	5.89	96.74
8/16/2012	1639	6.66	93.47
8/16/2012	1702	6.95	94.72
8/16/2012	1766	7.65	96.91
8/16/2012	1861	7.74	102.40
8/16/2012	1957	8.18	106.60
8/16/2012	2053	7.21	105.50
8/16/2012	2148	7.30	104.30
8/16/2012	2244	7.30	108.90
8/16/2012	2339	2.21	108.70
8/16/2012	2403	8.09	107.70
8/16/2012	2467	8.44	108.30
8/16/2012	2530	7.91	108.10
8/16/2012	2626	7.67	107.90
8/16/2012	2722	8.35	106.90
8/16/2012	2818	8.00	100.50
8/16/2012	2913	8.53	100.40
8/17/2012	3009	7.92	101.80
8/17/2012	3104	8.42	99.67
8/17/2012	3200	8.60	99.75
8/17/2012	3295	8.00	101.50
8/17/2012	3391	8.18	100.80
8/17/2012	3486	7.92	102.90
8/17/2012	3582	8.00	101.30
8/17/2012	3677	7.47	101.30
8/17/2012	3773	7.30	104.00
8/17/2012	3869	7.56	106.00
8/17/2012	3964	7.30	105.40
8/17/2012	4060	2.74	105.90
8/17/2012	4156	7.39	103.70
8/17/2012	4251	7.37	104.80
8/17/2012	4347	7.21	106.90
8/17/2012	4443	6.93	104.80
8/17/2012	4538	7.56	101.80
8/17/2012	4634	7.65	98.76
8/18/2012	4680	7.74	98.67



COG Operating LLC

Eddy County, NM (NAD27 NME)

Burch Keely Unit

#625

OH - Job #32D08121009

Survey: MWD

SDI Standard Survey Report

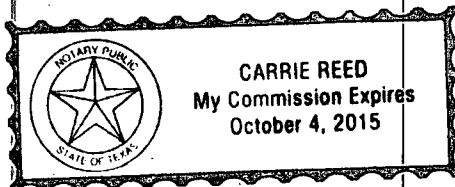
This survey is correct to the best of my knowledge and is supported by actual field data.

Luhanth

Notarized this date 21st of August, 2012.

Carrie Reed

Notary Signature
County of Midland
State of Texas





Scientific Drilling International, Inc.

SDI Standard Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #625
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RF @ 3631.00usft (SO #5)
Site:	Burch Keely Unit	MD Reference:	RF @ 3631.00usft (SO #5)
Well:	#625	North Reference:	Grid
Wellbore:	OH - Job #32D08121009	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		
Site Position:		Northing:	661,490.10 usft
From:	Map	Easting:	589,648.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"
		Latitude:	32° 49' 5.462 N
		Longitude:	104° 2' 29.475 W
		Grid Convergence:	0.16 °

Well	#625		
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' 14.328 N
		Longitude:	104° 1' 30.981 W
		Ground Level:	3,619.00 usft

Wellbore	OH - Job #32D08121009		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	08/15/12	7.70
			Dip Angle
			(°)
			60.63
			Field Strength
			(nT)
			48,807

Design	Actual		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
		Direction	(°)
		103.74	

Survey Program	Date 08/18/12		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.00	980.00	VES Gyro (OH - Job #32D08121009)	UNKNOWN
1,065.00	4,730.00	MWD (OH - Job #32D08121009)	MWD
			Description
			Unknown survey
			MWD - Standard

Survey			
Measured Depth	Inclination	Azimuth	True Vertical
(usft)	(°)	(°)	Depth
980.00	1.41	99.97	979.81
South HL-BKU #625 - East HL-BKU #625			
1,065.00	1.41	75.91	1,064.79
1,129.00	1.67	81.71	1,128.76
1,192.00	2.02	99.81	1,191.73
1,256.00	2.99	106.49	1,255.67
1,320.00	3.78	106.32	1,319.56
1,384.00	4.04	111.85	1,383.41
1,447.00	5.10	108.43	1,446.21
1,511.00	5.45	99.02	1,509.94
1,575.00	5.89	96.74	1,573.62
			North/South
			(usft)
			-6.17
			-6.10
			-5.77
			-5.83
			-6.50
			-7.56
			-9.00
			-10.71
			-12.08
			-12.94
			East/West
			(usft)
			15.29
			17.33
			19.02
			21.02
			23.73
			27.36
			31.48
			36.19
			41.89
			48.16
			Closure Azimuth
			(°)
			111.99
			109.39
			106.89
			105.50
			105.31
			105.45
			105.95
			106.48
			106.09
			105.05
			Closure Distance
			(usft)
			16.49
			18.37
			19.88
			21.82
			24.61
			28.38
			32.74
			37.74
			43.60
			49.87



Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #625
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RF @ 3631.00usft (SO #5)
Site:	Burch Keely Unit	MD Reference:	RF @ 3631.00usft (SO #5)
Well:	#625	North Reference:	Grid
Wellbore:	OH - Job #32D08121009	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)
1,639.00	6.66	93.47	1,637.24	-13.55	55.12	103.82	56.76
1,702.00	6.95	94.72	1,699.80	-14.09	62.57	102.69	64.13
1,766.00	7.65	96.91	1,763.28	-14.92	70.65	101.92	72.21
1,861.00	7.74	102.45	1,857.42	-17.06	83.18	101.59	84.91
1,957.00	8.18	106.67	1,952.50	-20.41	96.03	102.00	98.18
2,053.00	7.21	105.53	2,047.63	-23.99	108.38	102.48	111.00
2,148.00	7.30	104.38	2,141.87	-27.08	119.97	102.72	122.99
2,244.00	7.30	108.95	2,237.10	-30.58	131.65	103.08	135.15
2,339.00	7.21	108.78	2,331.33	-34.46	143.00	103.55	147.09
2,403.00	8.09	107.72	2,394.76	-37.12	151.09	103.80	155.59
2,467.00	8.44	108.34	2,458.10	-39.97	159.84	104.04	164.76
2,530.00	7.91	108.16	2,520.46	-42.77	168.35	104.26	173.70
2,626.00	7.67	107.92	2,615.57	-46.80	180.72	104.52	186.68
2,722.00	8.35	106.93	2,710.64	-50.80	193.49	104.71	200.04
2,818.00	8.00	100.52	2,805.66	-54.05	206.72	104.65	213.67
2,913.00	8.53	100.43	2,899.68	-56.54	220.15	104.40	227.29
3,009.00	7.92	101.86	2,994.69	-59.18	233.63	104.22	241.01
3,104.00	8.42	99.67	3,088.72	-61.70	246.89	104.03	254.48
3,200.00	8.60	99.75	3,183.67	-64.09	260.89	103.80	268.65
3,295.00	8.00	101.57	3,277.67	-66.62	274.37	103.65	282.34
3,391.00	8.18	100.87	3,372.72	-69.25	287.62	103.54	295.84
3,486.00	7.92	102.94	3,466.78	-71.99	300.64	103.47	309.13
3,582.00	8.00	101.39	3,561.85	-74.79	313.63	103.41	322.42
3,677.00	7.47	101.31	3,655.99	-77.31	326.17	103.33	335.20
3,773.00	7.30	104.03	3,751.19	-80.01	338.20	103.31	347.54
3,869.00	7.56	106.05	3,846.39	-83.24	350.19	103.37	359.94
3,964.00	7.30	105.44	3,940.59	-86.57	362.01	103.45	372.22
4,060.00	7.74	105.97	4,035.76	-89.97	374.11	103.52	384.77
4,156.00	7.39	103.77	4,130.93	-93.22	386.32	103.57	397.41
4,251.00	7.37	104.85	4,225.14	-96.24	398.14	103.59	409.61
4,347.00	7.21	106.93	4,320.37	-99.57	409.86	103.65	421.78
4,443.00	6.93	104.87	4,415.64	-102.81	421.22	103.72	433.58
4,538.00	7.56	99.90	4,509.88	-105.35	432.91	103.68	445.55
4,634.00	7.65	98.76	4,605.03	-107.41	445.45	103.56	458.22
4,680.00	7.74	98.67	4,650.62	-108.35	451.54	103.49	464.35
Last MWD Survey							
4,730.00	7.74	98.67	4,700.16	-109.36	458.19	103.42	471.06
Projection to Bit - PBHL-BKU #625							



Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well #625
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RF @ 3631.00usft (SO #5)
Site:	Burch Keely Unit	MD Reference:	RF @ 3631.00usft (SO #5)
Well:	#625	North Reference:	Grid
Wellbore:	OH - Job #32D08121009	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,680.00	4,650.62	-108.35	451.54	Last MWD Survey
4,730.00	4,700.16	-109.36	458.19	Projection to Bit

Checked By: _____	Approved By: _____	Date: _____
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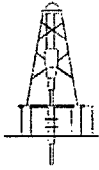
Scientific Drilling



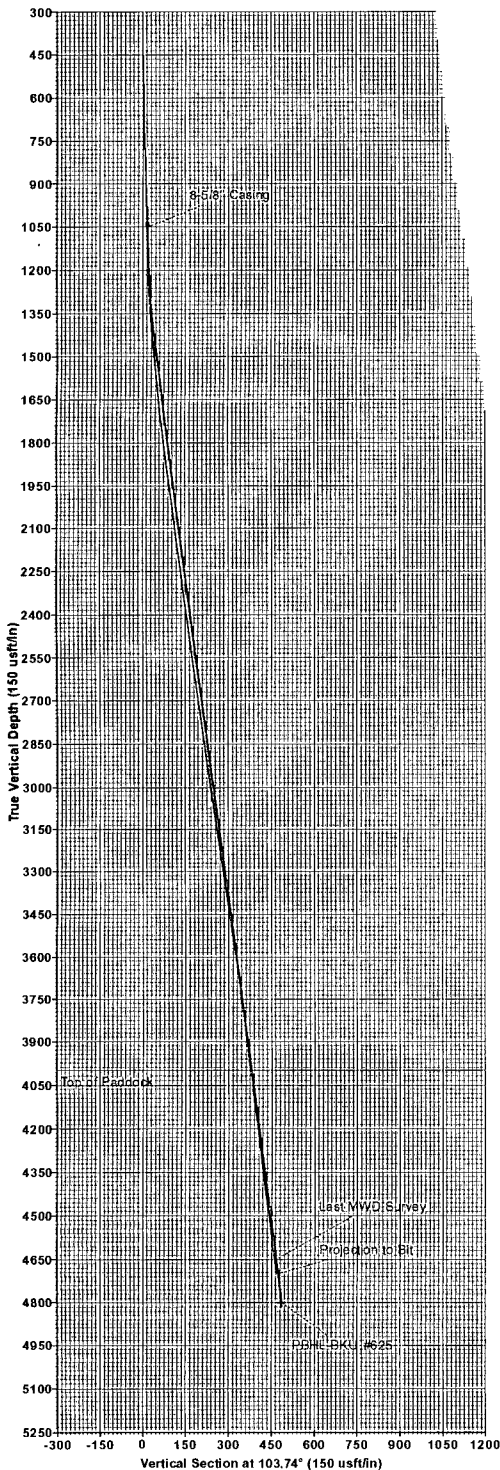
Azimuths to Grid North
True North: -0.17°
Magnetic North: 7.53°

Magnetic Field
Strength: 48806.9nT
Dip Angle: 60.63°
Date: 06/15/2012
Model: IGRF2010

Burch Keely Unit #625
Eddy County, NM (NAD27 NME)
Northing: 662400.20
Easting: 594637.10
Plan #2 vs Actual - 8-3/4" Hole



RF @ 3631.00usft (SO #5)
Ground Level 519.00



WELL DETAILS:					
Ground Level: 3619.00					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	662400.20	594637.10	32° 49' 14.328 N	104° 1' 30.981 W

SECTION DETAILS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
980.00	1.41	99.97	979.81	-6.17	15.29	0.00	0.00	16.32	
1150.00	1.41	99.97	1149.76	-6.90	19.41	0.00	0.00	20.49	
1457.04	7.55	103.51	1455.72	-12.27	42.76	2.00	4.35	44.45	
4830.55	7.55	103.51	4800.00	-115.80	473.60	0.00	0.00	487.55	PBHL-BKU #625

DESIGN TARGET DETAILS					
Name	TVD	+N/-S	+E/-W	Northing	Easting
East HL-BKU #625	12.00	-125.80	483.60	662274.40	595120.70
South HL-BKU #625	12.00	-125.80	483.60	662274.40	595120.70
PBHL-BKU #625	4800.00	-115.80	473.60	662284.40	595110.70

SITE DETAILS: Burch Keely Unit
Site Centre Northing: 661490.10
Easting: 589648.00

Positional Uncertainty: 0.00
Convergence: 0.16
Local North: Grid

PROJECT DETAILS: Eddy County, NM (NAD27 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

CASING DETAILS			
TVD	MD	Name	Size
1050.00	1050.28	5/8" Casing	8-5/8

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

Local Origin: Well #625, Grid North

Latitude: 32° 49' 14.328 N
Longitude: 104° 1' 30.981 W

Grid East: 594637.10
Grid North: 662400.20
Scale Factor: 1.000

Geomagnetic Model: IGRF2010
Sample Date: 15-Aug-12
Magnetic Declination: 7.70°
Dip Angle from Horizontal: 60.63°
Magnetic Field Strength: 48807

To convert a Magnetic Direction to a Grid Direction, Add 7.53°
To convert a Magnetic Direction to a True Direction, Add 7.70° East
To convert a True Direction to a Grid Direction, Subtract 0.17°

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4000.00	4023.56	Top of Paddock

