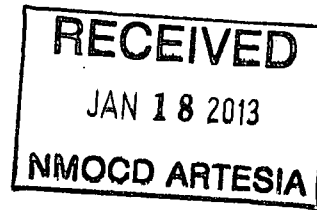


15-39573



COG Operating LLC

Eddy County, NM

Burch Keerly Unit 182H 939H

Burch Keerly Unit 182H

Wellbore #1

Survey: MWD Surveys

Standard Survey Report

23 July, 2012



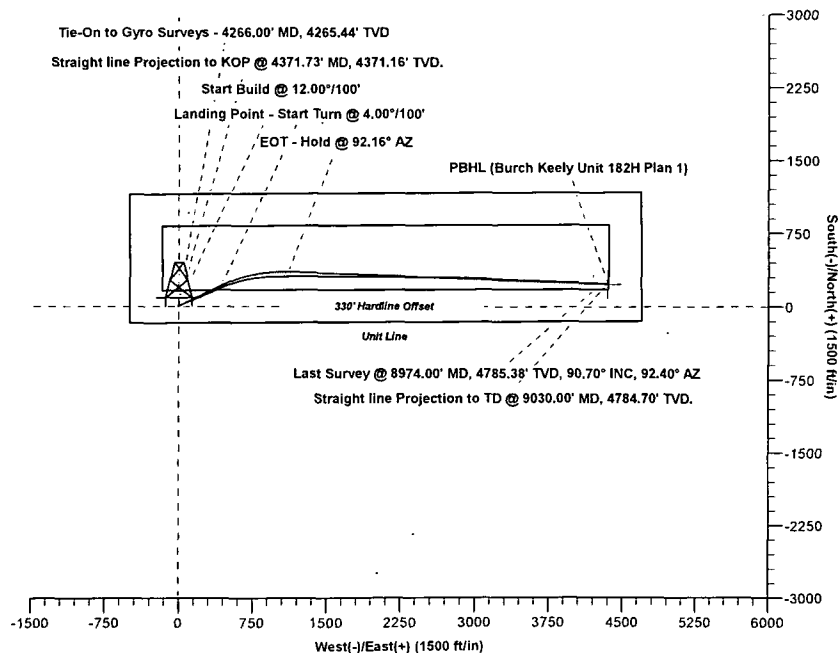
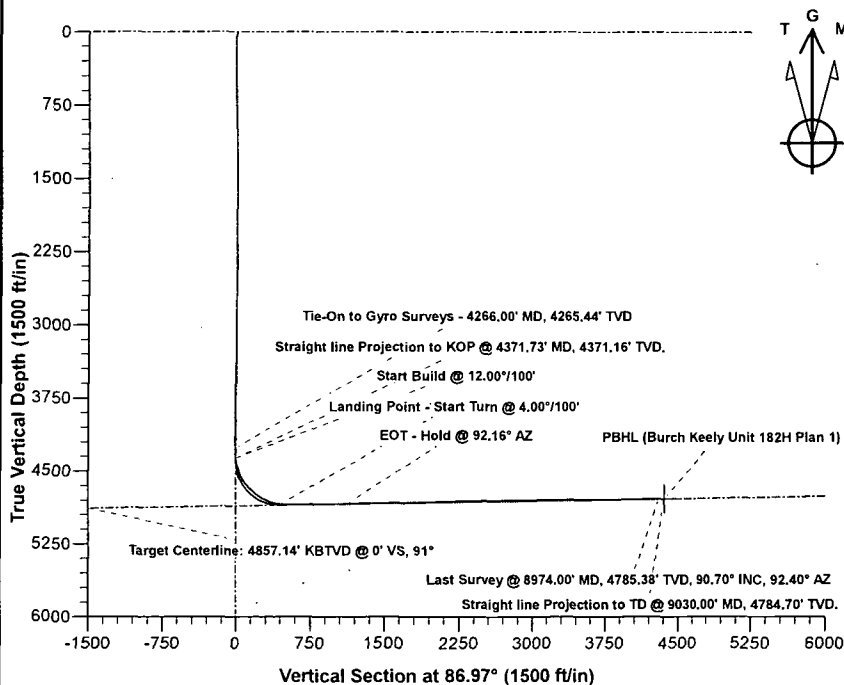
COG Operating LLC
Burch Keely Unit 182H
Eddy County, NM
Plan #2



Surface Location		Ground Elev: 3639.00 WELL @ 3657.50ft (JW #2)			
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	668904.600	596995.100	32.838502	-104.017538

TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL (Burch Keely Unit 182H Plan 1)	4781.00	230.70	4355.70	669135.300	601350.800	32.839100	-104.003354

SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation	
1	4266.00	0.49	175.17	4265.44	5.29	-8.52	0.00	0.00	-8.23	Tie-On to Gyro Surveys - 4266.00' MD, 4265.44' TVD	
2	4371.73	0.49	175.17	4371.16	4.39	-8.44	0.00	0.00	-8.28	Start Build @ 12.00°/100'	
3	5131.52	91.00	64.24	4850.00	212.02	430.77	12.00	-110.92	441.38	Landing Point - Start Turn @ 4.00°/100'	
4	5829.45	91.00	92.16	4837.59	353.30	1107.10	4.00	89.76	1124.24	EOT - Hold @ 92.16° AZ	
5	9080.85	91.00	92.16	4781.00	230.70	-4355.70	0.00	0.00	4361.81	TD @ 9080.85' MD, 4781.00' TVD	



Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Burch Keerly Unit 182H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3657.50ft (JW #2)
Site:	Burch Keerly Unit 182H	MD Reference:	WELL @ 3657.50ft (JW #2)
Well:	Burch Keerly Unit 182H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Houston R5000 Database

Project	Eddy County, NM		
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 Keerly Unit 182H			
Site Position:		Northing:	668,904.600 ft	Latitude:	32.838502
From:	Map	Easting:	596,995.100 ft	Longitude:	-104.017538
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.17 °

Well:	Burch Keerly Unit 182H					
Well Position	+N/-S	0.00 ft	Northing:	668,904.600 ft	Latitude:	32.838502
	+E/-W	0.00 ft	Easting:	596,995.100 ft	Longitude:	-104.017538
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	3,639.00 ft

Wellbore		Wellbore #1			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/21/2012	7.71	60.65	48,833

Design:	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL		Tie On Depth: 0.00
Vertical Section:	Depth From (TVD):	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	86.97	

Survey Program		Date: 7/23/2012		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
100.00	4,266.00	Gyro Surveys (Wellbore #1)	MWD	MWD - Standard
4,288.00	9,030.00	MWD Surveys (Wellbore #1)	MWD	MWD - Standard

Survey									
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(°/100ft)	(°/100ft)	(°/100ft)
4,266.00	0.49	175.17	4,265.44	5.29	-8.52	-8.23	0.00	0.00	0.00
4,288.00	0.70	193.30	4,287.43	5.07	-8.54	-8.26	1.27	0.95	82.41
4,319.00	0.70	159.60	4,318.43	4.71	-8.52	-8.26	1.31	0.00	-108.71
4,350.00	2.40	90.70	4,349.42	4.52	-7.80	-7.55	7.24	5.48	-222.26
4,381.00	6.30	75.70	4,380.33	4.94	-5.50	-5.24	13.00	12.58	-48.39
4,413.00	10.30	71.40	4,411.99	6.28	-1.09	-0.76	12.64	12.50	-13.44
4,444.00	14.90	64.60	4,442.23	8.88	5.14	5.60	15.57	14.84	-21.94
4,475.00	19.50	62.40	4,471.84	12.99	13.33	14.00	14.98	14.84	-7.10
4,505.00	23.10	62.50	4,499.78	18.03	22.99	23.91	12.00	12.00	0.33
4,536.00	26.00	64.10	4,527.98	23.80	34.50	35.71	9.60	9.35	5.16

Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Burch Keerly Unit 182H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3657.50ft (JW #2)
Site:	Burch Keerly Unit 182H	MD Reference:	WELL @ 3657.50ft (JW #2)
Well:	Burch Keerly Unit 182H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Houston R5000 Database

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	N/S (ft)	E/W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,567.00	28.80	66.50	4,555.50	29.75	47.46	48.97	9.71	9.03	7.74
4,598.00	31.90	68.80	4,582.25	35.69	61.95	63.75	10.68	10.00	7.42
4,630.00	35.20	69.60	4,608.91	41.96	78.48	80.59	10.40	10.31	2.50
4,661.00	38.30	69.20	4,633.75	48.49	95.84	98.27	10.03	10.00	-1.29
4,693.00	41.50	68.50	4,658.30	55.90	114.98	117.78	10.10	10.00	-2.19
4,724.00	44.70	67.70	4,680.93	63.80	134.63	137.82	10.47	10.32	-2.58
4,756.00	47.70	67.70	4,703.08	72.57	156.00	159.61	9.38	9.38	0.00
4,787.00	50.90	67.60	4,723.29	81.50	177.73	181.79	10.33	10.32	-0.32
4,818.00	53.90	67.40	4,742.20	90.90	200.42	204.94	9.69	9.68	-0.65
4,849.00	56.80	67.40	4,759.82	100.70	223.96	228.97	9.35	9.35	0.00
4,881.00	60.00	67.90	4,776.59	111.06	249.17	254.69	10.09	10.00	1.56
4,912.00	63.10	68.10	4,791.36	121.27	274.43	280.46	10.02	10.00	0.65
4,943.00	66.50	67.70	4,804.55	131.82	300.42	306.97	11.03	10.97	-1.29
4,975.00	70.00	66.90	4,816.41	143.29	327.83	334.95	11.18	10.94	-2.50
5,006.00	73.70	65.90	4,826.06	155.09	354.82	362.52	12.32	11.94	-3.23
5,038.00	77.60	65.70	4,833.99	167.79	383.09	391.43	12.20	12.19	-0.63
5,069.00	81.00	65.70	4,839.75	180.33	410.85	419.81	10.97	10.97	0.00
5,100.00	84.00	66.00	4,843.79	192.90	438.89	448.47	9.72	9.68	0.97
5,130.00	87.10	66.90	4,846.12	204.85	466.31	476.48	10.76	10.33	3.00
5,161.00	90.20	68.10	4,846.85	216.71	494.93	505.70	10.72	10.00	3.87
5,192.00	90.40	70.50	4,846.69	227.66	523.93	535.23	7.77	0.65	7.74
5,224.00	90.40	71.60	4,846.47	238.05	554.20	566.00	3.44	0.00	3.44
5,255.00	90.20	73.20	4,846.30	247.43	583.74	596.01	5.20	-0.65	5.16
5,287.00	90.50	74.30	4,846.11	256.38	614.46	627.16	3.56	0.94	3.44
5,318.00	90.50	75.80	4,845.84	264.38	644.41	657.49	4.84	0.00	4.84
5,349.00	90.90	77.40	4,845.46	271.56	674.57	687.98	5.32	1.29	5.16
5,381.00	91.00	78.80	4,844.93	278.16	705.87	719.59	4.39	0.31	4.38
5,412.00	91.50	79.90	4,844.25	283.89	736.33	750.31	3.90	1.61	3.55
5,443.00	91.70	81.00	4,843.39	289.03	766.89	781.09	3.61	0.65	3.55
5,474.00	92.40	82.40	4,842.28	293.50	797.54	811.94	5.05	2.26	4.52
5,505.00	91.80	83.70	4,841.14	297.25	828.29	842.85	4.62	-1.94	4.19
5,537.00	91.50	84.50	4,840.22	300.54	860.11	874.79	2.67	-0.94	2.50
5,569.00	90.50	85.80	4,839.66	303.24	891.99	906.77	5.12	-3.13	4.06
5,600.00	90.40	86.60	4,839.42	305.30	922.92	937.77	2.60	-0.32	2.58
5,631.00	90.20	87.90	4,839.26	306.78	953.88	968.77	4.24	-0.65	4.19
5,662.00	90.50	89.20	4,839.07	307.57	984.87	999.75	4.30	0.97	4.19
5,693.00	91.00	90.20	4,838.66	307.73	1,015.87	1,030.72	3.61	1.61	3.23
5,756.00	91.10	90.20	4,837.51	307.51	1,078.86	1,093.60	0.16	0.16	0.00
5,818.00	91.30	89.90	4,836.21	307.46	1,140.84	1,155.50	0.58	0.32	-0.48
5,880.00	91.20	89.50	4,834.86	307.78	1,202.83	1,217.42	0.66	-0.16	-0.65
5,973.00	91.00	90.10	4,833.07	308.10	1,295.81	1,310.29	0.68	-0.22	0.65
6,067.00	91.30	89.30	4,831.18	308.60	1,389.79	1,404.16	0.91	0.32	-0.85
6,160.00	91.80	90.80	4,828.67	308.52	1,482.75	1,496.99	1.70	0.54	1.61

Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Burch Keerly Unit 182H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3657.50ft (JW #2)
Site:	Burch Keerly Unit 182H	MD Reference:	WELL @ 3657.50ft (JW #2)
Well:	Burch Keerly Unit 182H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Houston R5000 Database

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
6,254.00	91.30	90.60	4,826.12	307.37	1,576.71	1,590.75	0.57	-0.53	-0.21	
6,348.00	91.20	90.60	4,824.07	306.38	1,670.68	1,684.54	0.11	-0.11	0.00	
6,442.00	91.20	90.10	4,822.11	305.81	1,764.66	1,778.36	0.53	0.00	-0.53	
6,536.00	91.00	89.50	4,820.30	306.14	1,858.64	1,872.23	0.67	-0.21	-0.64	
6,630.00	90.70	90.50	4,818.91	306.14	1,952.63	1,966.08	1.11	-0.32	1.06	
6,724.00	91.30	90.90	4,817.27	304.99	2,046.61	2,059.87	0.77	0.64	0.43	
6,818.00	92.00	90.40	4,814.56	303.92	2,140.56	2,153.64	0.92	0.74	-0.53	
6,911.00	90.90	90.00	4,812.21	303.60	2,233.53	2,246.46	1.26	-1.18	-0.43	
7,006.00	91.10	90.10	4,810.55	303.52	2,328.52	2,341.30	0.24	0.21	0.11	
7,099.00	91.30	89.70	4,808.60	303.68	2,421.50	2,434.16	0.48	0.22	-0.43	
7,192.00	91.40	90.20	4,806.41	303.76	2,514.47	2,527.01	0.55	0.11	0.54	
7,286.00	91.00	91.30	4,804.44	302.53	2,608.44	2,620.78	1.24	-0.43	1.17	
7,379.00	91.20	91.30	4,802.66	300.42	2,701.40	2,713.50	0.22	0.22	0.00	
7,473.00	91.20	91.40	4,800.69	298.21	2,795.35	2,807.21	0.11	0.00	0.11	
7,567.00	91.20	91.50	4,798.72	295.83	2,889.30	2,900.90	0.11	0.00	0.11	
7,661.00	91.40	91.70	4,796.59	293.20	2,983.24	2,994.57	0.30	0.21	0.21	
7,755.00	91.20	91.30	4,794.45	290.74	3,077.18	3,088.25	0.48	-0.21	-0.43	
7,849.00	90.40	92.40	4,793.14	287.71	3,171.12	3,181.90	1.45	-0.85	1.17	
7,943.00	90.10	92.30	4,792.73	283.86	3,265.04	3,275.48	0.34	-0.32	-0.11	
8,037.00	89.80	92.30	4,792.81	280.08	3,358.97	3,369.08	0.32	-0.32	0.00	
8,131.00	90.30	93.10	4,792.73	275.65	3,452.86	3,462.61	1.00	0.53	0.85	
8,225.00	90.90	93.10	4,791.75	270.57	3,546.72	3,556.06	0.64	0.64	0.00	
8,319.00	90.50	92.70	4,790.60	265.82	3,640.59	3,649.55	0.60	-0.43	-0.43	
8,413.00	90.50	92.30	4,789.78	261.72	3,734.50	3,743.11	0.43	0.00	-0.43	
8,507.00	90.60	92.60	4,788.88	257.70	3,828.41	3,836.68	0.34	0.11	0.32	
8,600.00	90.50	92.40	4,787.98	253.64	3,921.31	3,929.24	0.24	-0.11	-0.22	
8,695.00	90.20	92.00	4,787.40	250.00	4,016.24	4,023.84	0.53	-0.32	-0.42	
8,789.00	90.30	92.10	4,786.99	246.63	4,110.18	4,117.47	0.15	0.11	0.11	
8,883.00	90.50	92.10	4,786.34	243.19	4,204.12	4,211.09	0.21	0.21	0.00	
8,974.00	90.70	92.40	4,785.38	239.62	4,295.04	4,301.70	0.40	0.22	0.33	
Last Survey @ 8974.00' MD, 4785.38' TVD, 90.70° INC, 92.40° AZ										
9,030.00	90.70	92.40	4,784.70	237.27	4,350.99	4,357.45	0.00	0.00	0.00	
Straight line Projection to TD @ 9030.00' MD, 4784.70' TVD.										

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
8,974.00	4,785.38	239.62	4,295.04	Last Survey @ 8974.00' MD, 4785.38' TVD, 90.70° INC, 92.40° AZ	
9,030.00	4,784.70	237.27	4,350.99	Straight line Projection to TD @ 9030.00' MD, 4784.70' TVD.	

Checked By: _____ Approved By: _____ Date: _____



Company: COG Operating, LLC (Concho)

Lease/Well: Burch Keely Unit/ No.182H 939H

Location: Sec 18 T 175 R 30 E LOT 1

Rig Name: JW #2

State/County: New Mexico/Eddy

Latitude: 32.84

GRID North is 0.18 Degrees East of True North

VS-Azi: 0.00 Degrees



Depth Reference : 18'

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: burch keely unit 182h_ed.ut

Minimum Curvature Method

Report Date/Time: 7/9/2012 / 10:50

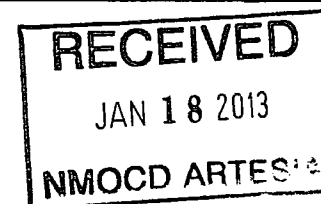
Vaughn Energy Services

Fort Worth, Texas

817-741-3610

Surveyor: Jason Wilson

Burch Keely Unit No.182H / API 30-015-39573

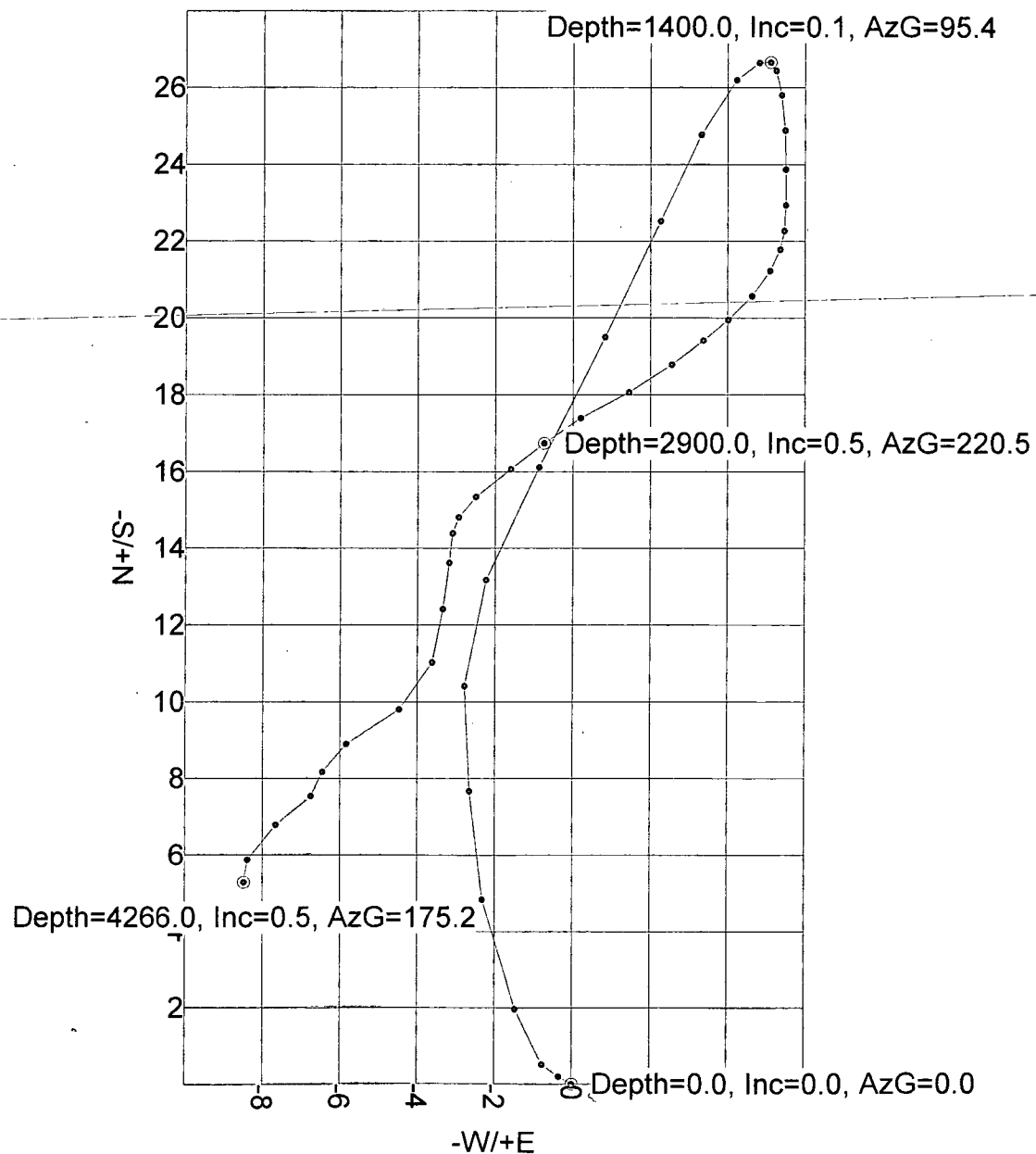


Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.45	300.88	100.00	0.20	-0.33	0.39	300.88	0.45
200.00	0.17	320.69	200.00	0.51	-0.76	0.92	303.97	0.29
300.00	1.69	335.58	299.98	1.97	-1.46	2.45	323.37	1.53
400.00	1.77	350.95	399.94	4.83	-2.31	5.36	334.41	0.47
500.00	1.51	356.06	499.90	7.67	-2.65	8.11	340.96	0.30
600.00	1.64	358.13	599.86	10.41	-2.78	10.78	345.03	0.14
700.00	1.68	24.27	699.82	13.17	-2.23	13.36	350.39	0.75
800.00	2.04	25.28	799.76	16.12	-0.87	16.14	356.91	0.37
900.00	2.30	27.70	899.69	19.50	0.82	19.52	2.42	0.28
1000.00	1.54	22.15	999.64	22.53	2.26	22.64	5.74	0.78
1100.00	1.30	28.16	1099.61	24.77	3.31	24.99	7.60	0.29
1200.00	0.66	42.07	1199.59	26.20	4.23	26.54	9.17	0.67
1300.00	0.23	84.36	1299.59	26.65	4.82	27.08	10.25	0.52
1400.00	0.10	95.38	1399.59	26.66	5.11	27.14	10.85	0.13
1500.00	0.25	164.79	1499.59	26.44	5.26	26.95	11.25	0.24
1600.00	0.49	169.27	1599.58	25.80	5.39	26.36	11.81	0.24
1700.00	0.57	178.51	1699.58	24.89	5.49	25.48	12.43	0.12
1800.00	0.60	179.41	1799.57	23.86	5.51	24.49	12.99	0.04

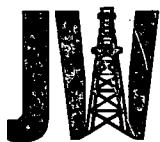
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.46	181.17	1899.57	22.94	5.50	23.59	13.49	0.15
2000.00	0.31	185.73	1999.57	22.27	5.47	22.93	13.79	0.15
2100.00	0.27	200.31	2099.57	21.79	5.36	22.44	13.82	0.08
2200.00	0.45	208.56	2199.56	21.23	5.09	21.83	13.50	0.19
2300.00	0.48	221.15	2299.56	20.57	4.63	21.09	12.69	0.11
2400.00	0.53	229.27	2399.56	19.95	4.01	20.35	11.36	0.08
2500.00	0.43	230.15	2499.55	19.41	3.37	19.70	9.85	0.09
2600.00	0.75	233.60	2599.55	18.79	2.56	18.96	7.75	0.32
2700.00	0.78	240.32	2699.54	18.06	1.44	18.12	4.57	0.09
2800.00	0.85	243.05	2799.53	17.39	0.20	17.39	0.65	0.08
2900.00	0.49	220.52	2899.52	16.73	-0.74	16.75	357.47	0.44
3000.00	0.77	239.10	2999.52	16.06	-1.59	16.14	354.33	0.35
3100.00	0.57	220.59	3099.51	15.34	-2.50	15.54	350.76	0.30
3200.00	0.23	218.08	3199.51	14.81	-2.94	15.10	348.76	0.34
3300.00	0.30	187.30	3299.51	14.39	-3.10	14.72	347.85	0.16
3400.00	0.59	185.53	3399.50	13.62	-3.18	13.98	346.85	0.29
3500.00	0.80	189.47	3499.50	12.41	-3.35	12.86	344.91	0.21
3600.00	0.82	193.01	3599.49	11.03	-3.62	11.61	341.81	0.05
3700.00	0.99	232.41	3699.47	9.80	-4.47	10.77	335.49	0.63
3800.00	0.89	240.96	3799.46	8.90	-5.83	10.64	326.74	0.17
3900.00	0.40	170.02	3899.46	8.17	-6.46	10.41	321.70	0.85
4000.00	0.52	230.79	3999.45	7.54	-6.75	10.12	318.17	0.48
4100.00	0.83	230.36	4099.45	6.79	-7.66	10.24	311.55	0.30
4200.00	0.56	200.71	4199.44	5.87	-8.39	10.24	304.98	0.44
4266.00	0.49	175.17	4265.44	5.28	-8.48	9.99	301.92	0.37



Vaughn Energy Services
Fort Worth, Texas
817-741-3610
Surveyor: Jason Wilson
Burch Keely Unit No.182H / API 30-015-39573



VES Survey Date: 07/02/2012



DRILLING INC. Oil Well Drilling Contractor

Post Office Box 160 Artesia, New Mexico 88211-0160 Office (575) 748-8704 Fax (575) 748-8719

July 23, 2012

COG Operating, LLC
550 W. Texas, Suite 1300
Midland, Texas 79701

Re: Burch Keely Unit 18 Federal # 2H #939H
Sec. 18, T-17-S, R-30-E
Eddy County, New Mexico

Attn: Jim Evans

The following is a Deviation Survey on the referenced well in Eddy County, New Mexico:

319' - 1.75°	1023' - 1.75°	1671' - 0.75°	2640' - 1°	3575' - 0.75°
686' - 1.25°	1200' - 1°	2149' - 0.00°	3107' - 1°	4094' - 0.75°

Sincerely,

Gary W. Chappell
Contracts Manager

STATE OF NEW MEXICO)
COUNTY OF EDDY)

The foregoing was acknowledged before me this 23rd day of July, 2012 by Gary W. Chappell.

NOTARY PUBLIC

