

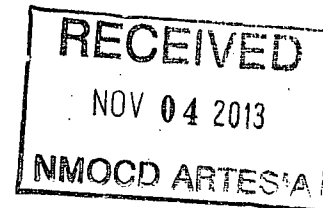


PO Box 261021
Corpus Christi, Texas 78426
(361) 767-0602 • (800) 606-GYRO • Fax (361) 767-0612

15-41384

June 24, 2013

COG Operating LLC (Concho)
One Concho Center
600 W. Illinois Avenue
Midland, TX 79701



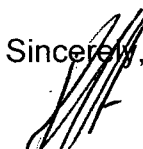
Attn: Kanicia Castillo

Re: **Noose Federal Com No 002H**

Please find enclosed a copy of the survey from 0' to 2,256' ran on the above referenced well.

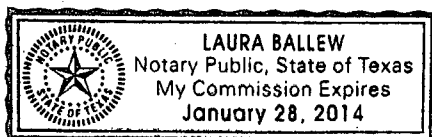
If I can be of any further service, please do not hesitate to call me at 800-606-4976.

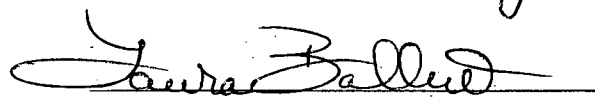
Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
§
COUNTY OF NUECES §

This instrument was acknowledged before me on the 24th day of June, A.D., 2013, by Keith Havelka.




Laura Ballew
Notary Public, State of Texas



Company: COG Operating LLC (Concho)
Lease/Well: Moose Federal Com/No 002H
Location: Sec 35 R19S T25E
Rig Name: JW 4
State/County: New Mexico/Eddy
Latitude: 32.61, Longitude: -104.46
GRID North is 0.07 Degrees West of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB 13 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: Moose Federal Com #2H.ut

Minimum Curvature Method

Report Date/Time: 6/24/2013 / 14:32

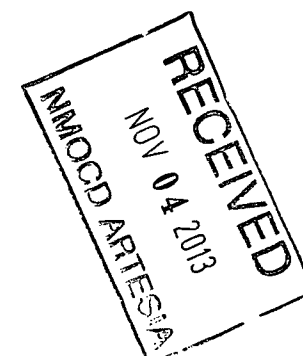
Vaughn Energy Services

Gardendale, Texas

Surveyor: Chris Bankson

432-563-5444

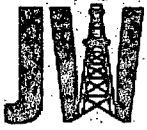
Moose Federal Com No 002H / API 30-015-41384



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	0.99	340.10	100.00	0.81	-0.29	0.81	0.86	340.10	0.99
200.00	1.11	340.99	199.98	2.54	-0.90	2.54	2.70	340.42	0.13
300.00	1.20	343.77	299.96	4.46	-1.51	4.46	4.71	341.28	0.10
400.00	1.28	348.08	399.93	6.55	-2.03	6.55	6.86	342.76	0.12
500.00	1.35	355.72	499.91	8.82	-2.35	8.82	9.13	345.07	0.19
600.00	0.87	354.85	599.89	10.75	-2.51	10.75	11.04	346.87	0.49
700.00	0.75	352.98	699.88	12.16	-2.65	12.16	12.44	347.68	0.12
800.00	0.61	353.02	799.87	13.34	-2.80	13.34	13.63	348.14	0.14
900.00	0.58	358.51	899.87	14.37	-2.88	14.37	14.66	348.68	0.06
1000.00	0.44	359.64	999.86	15.26	-2.89	15.26	15.53	349.26	0.14
1100.00	0.20	353.61	1099.86	15.81	-2.92	15.81	16.08	349.56	0.24
1200.00	0.37	354.22	1199.86	16.31	-2.97	16.31	16.57	349.69	0.17
1300.00	0.29	333.18	1299.86	16.85	-3.11	16.85	17.13	349.54	0.14
1400.00	0.31	322.06	1399.86	17.28	-3.39	17.28	17.61	348.90	0.06
1500.00	0.26	312.01	1499.86	17.65	-3.73	17.65	18.04	348.08	0.07
1600.00	0.34	285.88	1599.85	17.88	-4.18	17.88	18.36	346.84	0.16
1700.00	0.36	280.73	1699.85	18.02	-4.77	18.02	18.64	345.16	0.04
1800.00	0.25	275.00	1799.85	18.10	-5.30	18.10	18.86	343.67	0.11

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	0.17	226.40	1899.85	18.01	-5.63	18.01	18.87	342.65	0.19
2000.00	0.19	239.82	1999.85	17.83	-5.88	17.83	18.77	341.75	0.04
2100.00	0.28	300.11	2099.85	17.87	-6.24	17.87	18.93	340.76	0.25
2200.00	0.37	321.81	2199.85	18.25	-6.65	18.25	19.42	339.98	0.15
2256.00	0.51	325.53	2255.85	18.60	-6.90	18.60	19.83	339.64	0.27

RECEIVED
NOV 04 2013
NMCCD ARTESIA



DRILLING INC. Oil Well Drilling Contractor

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

June 27, 2013

COG Operating, LLC
One Concho Center, 600 W. Illinois Ave.
Midland, Texas 79701

Re: Moose Federal Com #2H
Sec. 35, T-19-S, R-25-E
Eddy County, New Mexico

Attn: Jim Evans

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

225' - 1.25°	601' - 0.75°	1230' - 0.5°	2165' - 0.25°
369' - 1.25°	1030' - 0.5°	1697' - 0.75°	



Sincerely,

Gary W. Chappell
Contracts Manager

STATE OF NEW MEXICO)
COUNTY OF EDDY)

The foregoing was acknowledged before me this 27th day of June, 2013 by Gary W. Chappell.

NOTARY PUBLIC



OFFICIAL SEAL
CLARISSA CABEZUELA
NOTARY PUBLIC-STATE OF NEW MEXICO

My commission expires: 10/2/16



COG Operating LLC

Eddy County, New Mexico (NAD 27 NME)

Noose Federal

#2H

OH/Job #1310721

Survey: Phoenix MWD Survey

Phoenix Final Survey Report

27 June, 2013





Phoenix Technology Services
Phoenix Final Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, New Mexico (NAD 27 NME)	TVD Reference:	KB @ 3491.00usft (JW 4)
Site:	Noose Federal	MD Reference:	KB @ 3491.00usft (JW 4)
Well:	#2H	North Reference:	Grid
Wellbore:	OH/Job #1310721	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (JW 4)	Database:	GCR/DB

Project:	Eddy County, New Mexico (NAD 27 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:	Noose Federal		
Site Position:	Map	Northing:	585,657.00 usft
From:	Map	Easting:	460,945.50 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 36' 36.041529 N
		Longitude:	104° 27' 36.592406 W
		Grid Convergence:	-0.07 °

Well	#2H					
Well Position	+N/-S	0.00 usft	Northing:	585,657.00 usft	Latitude:	32° 36' 36.041529 N
	+E/-W	0.00 usft	Easting:	460,945.50 usft	Longitude:	104° 27' 36.592406 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,478.00 usft

Wellbore:	OH/Job #1310721				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	06/12/13	7.78	60.34	48,550

Design:		Surveys (JW 4)				
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	359.17	

Survey Program	Date: 06/27/13				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	2,256.00	VES Gyro (OH/Job #1310721)	VES-ISCWSA-GYRO-3	Biaxial Semi-Cont. Gyro	
2,321.00	7,475.00	Phoenix MWD Survey (OH/Job #1310721)	MWD	MWD - Standard	

Survey	MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
	2,256.00	0.51	325.53	2,255.85	18.61	-6.90	18.71	0.00
Tie-on to VES Gyro:	2,321.00	0.50	330.20	2,320.84	19.10	-7.20	19.20	0.07
First Phoenix MWD Survey:	2,352.00	1.80	347.70	2,351.84	19.69	-7.38	19.80	4.30
	2,383.00	4.80	349.20	2,382.78	21.44	-7.72	21.55	9.68
	2,414.00	9.00	347.50	2,413.55	25.08	-8.49	25.21	13.56
	2,446.00	13.30	348.50	2,444.94	31.14	-9.77	31.28	13.45
	2,477.00	16.80	349.20	2,474.87	39.04	-11.32	39.20	11.31
	2,508.00	20.00	350.20	2,504.28	48.66	-13.06	48.85	10.37
	2,539.00	23.00	351.10	2,533.12	59.87	-14.90	60.08	9.74



Phoenix Technology Services

Phoenix Final Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, New Mexico (NAD 27 NME)	TVD Reference:	KB @ 3491.00usft (JW 4)
Site:	Noose Federal	MD Reference:	KB @ 3491.00usft (JW 4)
Well:	#2H	North Reference:	Grid
Wellbore:	OH/Job #1310721	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (JW 4)	Database:	GCR DB

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLog (°/100usft)
2,570.00	26.10	351.70	2,561.32	72.61	-16.82	72.84	10.03
2,602.00	29.20	351.20	2,589.66	87.29	-19.03	87.56	9.71
2,633.00	32.40	350.70	2,616.28	102.96	-21.53	103.26	10.36
2,664.00	35.30	350.60	2,642.03	120.00	-24.34	120.34	9.36
2,696.00	38.00	350.50	2,667.70	138.84	-27.47	139.22	8.44
2,727.00	40.90	351.10	2,691.63	158.28	-30.62	158.71	9.44
2,759.00	43.60	351.80	2,715.32	179.56	-33.82	180.03	8.56
2,791.00	46.30	352.90	2,737.96	201.96	-36.82	202.47	8.78
2,822.00	49.10	352.80	2,758.82	224.71	-39.67	225.26	9.04
2,853.00	51.80	352.80	2,778.56	248.42	-42.67	249.01	8.71
2,884.00	54.50	353.10	2,797.15	273.04	-45.71	273.67	8.74
2,915.00	57.30	353.10	2,814.53	298.52	-48.80	299.20	9.03
2,946.00	60.00	353.30	2,830.66	324.81	-51.93	325.52	8.73
2,978.00	62.40	354.20	2,846.07	352.68	-54.98	353.44	7.89
3,009.00	64.80	355.00	2,859.85	380.32	-57.59	381.11	8.08
3,040.00	67.50	355.70	2,872.39	408.58	-59.89	409.40	8.95
3,071.00	70.50	356.50	2,883.50	437.45	-61.85	438.30	9.97
3,102.00	73.70	356.90	2,893.02	466.89	-63.55	467.77	10.40
3,134.00	76.30	357.50	2,901.30	497.76	-65.06	498.65	8.32
3,165.00	79.00	357.30	2,907.93	528.01	-66.43	528.92	8.73
3,196.00	82.10	357.00	2,913.02	558.55	-67.95	559.48	10.05
3,227.00	84.80	357.40	2,916.56	589.31	-69.46	590.25	8.80
3,258.00	87.50	357.90	2,918.64	620.21	-70.72	621.17	8.86
3,290.00	88.70	358.70	2,919.70	652.18	-71.67	653.15	4.51
3,352.00	90.30	359.10	2,920.24	714.16	-72.86	715.14	2.66
3,446.00	92.60	358.50	2,917.86	808.10	-74.83	809.10	2.53
3,539.00	90.90	359.10	2,915.02	901.04	-76.78	902.05	1.94
3,633.00	91.30	358.10	2,913.22	994.99	-79.07	996.03	1.15
3,727.00	90.20	359.40	2,911.99	1,088.96	-81.12	1,090.02	1.81
3,820.00	90.60	359.30	2,911.34	1,181.95	-82.18	1,183.01	0.44
3,914.00	89.70	1.30	2,911.09	1,275.94	-81.69	1,276.99	2.33
4,007.00	90.50	1.60	2,910.93	1,368.91	-79.33	1,369.91	0.92
4,101.00	90.70	2.20	2,909.95	1,462.85	-76.22	1,463.80	0.67
4,194.00	89.90	0.60	2,909.46	1,555.82	-73.95	1,556.73	1.92
4,288.00	90.10	358.40	2,909.46	1,649.81	-74.77	1,650.72	2.35
4,381.00	90.20	358.10	2,909.22	1,742.77	-77.61	1,743.71	0.34
4,475.00	90.60	357.90	2,908.56	1,836.71	-80.89	1,837.68	0.48
4,568.00	90.50	359.70	2,907.67	1,929.68	-82.83	1,930.67	1.94
4,661.00	91.00	359.10	2,906.45	2,022.66	-83.81	2,023.66	0.84
4,755.00	89.80	0.40	2,905.79	2,116.66	-84.22	2,117.65	1.88
4,849.00	89.70	0.00	2,906.20	2,210.65	-83.89	2,211.64	0.44
4,942.00	90.20	1.40	2,906.28	2,303.64	-82.75	2,304.60	1.60
5,036.00	90.60	1.00	2,905.63	2,397.62	-80.78	2,398.54	0.60
5,129.00	90.90	0.90	2,904.41	2,490.60	-79.24	2,491.49	0.34



Phoenix Technology Services
Phoenix Final Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, New Mexico (NAD 27 NME)	TVD Reference:	KB @ 3491.00usft (JW 4)
Site:	Noose Federal	MD Reference:	KB @ 3491.00usft (JW 4)
Well:	#2H	North Reference:	Grid
Wellbore:	OH/Job #1310721	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (JW 4)	Database:	GCR/DB

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
5,223.00	91.30	0.80	2,902.61	2,584.57	-77.85	2,585.43	0.44
5,316.00	89.50	0.70	2,901.96	2,677.56	-76.63	2,678.39	1.94
5,409.00	89.80	1.30	2,902.53	2,770.54	-75.01	2,771.34	0.72
5,503.00	90.10	1.50	2,902.61	2,864.51	-72.71	2,865.27	0.38
5,596.00	90.20	1.40	2,902.36	2,957.48	-70.36	2,958.19	0.15
5,690.00	90.60	1.10	2,901.71	3,051.46	-68.31	3,052.13	0.53
5,783.00	90.90	0.90	2,900.49	3,144.44	-66.68	3,145.07	0.39
5,877.00	91.10	1.10	2,898.85	3,238.41	-65.04	3,239.01	0.30
5,970.00	90.30	359.90	2,897.71	3,331.40	-64.23	3,331.98	1.55
6,064.00	90.70	359.70	2,896.89	3,425.39	-64.56	3,425.97	0.48
6,157.00	91.00	359.90	2,895.51	3,518.38	-64.89	3,518.95	0.39
6,251.00	91.30	0.10	2,893.63	3,612.36	-64.89	3,612.92	0.38
6,344.00	89.90	358.40	2,892.65	3,705.34	-66.10	3,705.91	2.37
6,438.00	89.90	358.10	2,892.82	3,799.30	-68.97	3,799.90	0.32
6,531.00	89.80	358.00	2,893.06	3,892.24	-72.14	3,892.88	0.15
6,625.00	89.60	357.60	2,893.55	3,986.17	-75.75	3,986.85	0.48
6,719.00	90.20	358.50	2,893.72	4,080.12	-78.95	4,080.83	1.15
6,812.00	89.90	0.20	2,893.64	4,173.11	-80.00	4,173.83	1.86
6,905.00	91.40	0.70	2,892.58	4,266.10	-79.27	4,266.80	1.70
6,999.00	91.20	1.00	2,890.45	4,360.06	-77.88	4,360.73	0.38
7,093.00	90.70	1.40	2,888.89	4,454.03	-75.91	4,454.66	0.68
7,186.00	90.40	1.80	2,888.00	4,546.99	-73.31	4,547.57	0.54
7,280.00	90.00	0.00	2,887.67	4,640.97	-71.83	4,641.52	1.96
7,373.00	89.50	359.90	2,888.07	4,733.97	-71.92	4,734.51	0.55
7,423.00	89.40	359.90	2,888.55	4,783.97	-72.00	4,784.51	0.20
Last Phoenix MWD Survey							
7,475.00	89.40	359.90	2,889.10	4,835.96	-72.09	4,836.50	0.00
Projection to TD							

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/S (usft)	+E/W (usft)	
2,256.00	2,255.85	18.61	-6.90	Tie-on to VES Gyro
2,321.00	2,320.84	19.10	-7.20	First Phoenix MWD Survey
7,423.00	2,888.55	4,783.97	-72.00	Last Phoenix MWD Survey
7,475.00	2,889.10	4,835.96	-72.09	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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