



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

HOBBS OCD
JUL 30 2015
RECEIVED

30-025-42453

May 4, 2015

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

RE: Macho Nacho State Com #10H
190' FSL & 685' FWL
Sec. 7, T24S, R33E
Lea County, New Mexico

Dear Sir,

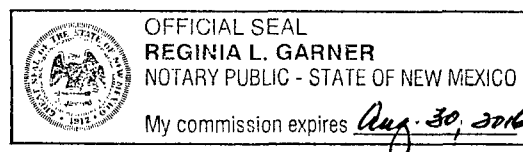
The attached is the Deviation Survey for the above captioned well.

Very truly yours,

Eddie C. LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 4th day of May, 2015.

Notary Public

AUG 03 2015

Macho Nacho St Com #10H

Date	Depth	Deviation	Direction	TVD
4/12/2015	241	0.50	0.00	0.00
4/12/2015	425	1.20	0.00	0.00
4/12/2015	713	1.80	0.00	0.00
4/12/2015	966	0.30	0.00	0.00
4/13/2015	1164	0.60	0.00	0.00
4/15/2015	1547	0.80	261.20	0.00
4/15/2015	1832	0.50	291.60	0.00
4/15/2015	2117	0.70	293.00	0.00
4/15/2015	2407	0.70	0.00	0.00
4/15/2015	2687	0.40	0.00	0.00
4/15/2015	2971	0.20	0.00	0.00
4/15/2015	3255	0.20	0.00	0.00
4/15/2015	3540	0.10	0.00	0.00
4/16/2015	3823	0.30	286.00	0.00
4/16/2015	4109	1.50	0.00	0.00
4/16/2015	4393	0.70	52.50	4392.00
4/16/2015	4724	2.10	120.20	4676.00
4/17/2015	4957	1.10	124.90	0.00
4/19/2015	5235	0.80	0.00	0.00
4/19/2015	5511	0.10	0.00	0.00
4/19/2015	5795	0.40	0.00	0.00
4/19/2015	6111	0.10	0.00	0.00
4/19/2015	6427	0.20	0.00	0.00
4/20/2015	6744	0.10	0.00	0.00
4/20/2015	7060	0.90	0.00	0.00
4/20/2015	7345	0.60	0.00	0.00
4/20/2015	7662	0.40	0.00	0.00
4/20/2015	7978	1.20	0.00	0.00
4/21/2015	8295	1.90	0.00	0.00
4/21/2015	8579	2.50	0.00	0.00
4/21/2015	8864	1.60	0.00	0.00
4/22/2015	8882	1.40	201.00	8880.00
4/22/2015	8914	1.00	328.60	8912.00
4/22/2015	8945	4.20	358.90	8943.00
4/22/2015	8977	6.10	9.50	8975.00
4/23/2015	9034	11.60	15.70	0.00
4/23/2015	9066	13.20	16.40	0.00
4/23/2015	9097	14.90	13.20	9093.00
4/23/2015	9129	17.50	7.30	9124.00
4/23/2015	9160	20.70	3.30	9153.00
4/23/2015	9192	24.20	359.90	9182.00
4/23/2015	9223	27.60	327.50	9210.00
4/23/2015	9255	31.00	354.70	9238.00

Date	Depth	Deviation	Direction	TVD
4/23/2015	9282	34.40	351.70	9265.00
4/23/2015	9319	37.70	348.20	9291.00
4/23/2015	9351	41.50	345.90	9316.00
4/23/2015	9382	45.40	343.80	9338.00
4/23/2015	9414	49.10	342.30	9360.00
4/23/2015	9445	52.60	340.30	9379.00
4/24/2015	9477	56.50	338.60	0.00
4/24/2015	9509	60.20	357.10	0.00
4/24/2015	9540	64.40	335.80	0.00
4/24/2015	9572	68.50	334.70	0.00
4/24/2015	9603	72.30	334.00	0.00
4/24/2015	9635	79.40	333.80	0.00
4/24/2015	9667	81.10	333.80	9467.00
4/24/2015	9698	85.80	334.20	9471.00
4/24/2015	9756	89.90	332.50	9773.00
4/25/2015	9851	91.50	332.80	0.00
4/25/2015	9946	87.90	331.70	0.00
4/25/2015	10040	88.50	3353.40	0.00
4/25/2015	10140	87.90	338.70	9478.00
4/26/2015	10204	86.00	343.70	0.00
4/26/2015	10293	88.50	352.50	9486.00
4/27/2015	10419	92.30	1.90	0.00
4/27/2015	10514	92.00	3.40	9481.00
4/27/2015	10609	91.90	3.20	9478.00
4/27/2015	10704	90.20	2.30	9476.00
4/27/2015	10799	88.40	2.20	9477.00
4/27/2015	10894	89.20	2.30	9479.00
4/28/2015	10988	88.80	1.20	0.00
4/28/2015	11083	90.10	2.30	0.00
4/28/2015	11178	90.90	1.60	0.00
4/28/2015	11273	91.20	0.70	0.00
4/28/2015	11368	90.50	1.50	0.00
4/28/2015	11463	90.50	2.10	0.00
4/28/2015	11588	91.00	2.00	0.00
4/28/2015	11652	90.10	3.30	0.00
4/28/2015	11747	89.50	3.50	9475.00
4/28/2015	11842	89.10	2.30	9476.00
4/28/2015	11937	90.00	1.90	9477.00
4/28/2015	12032	89.20	1.90	9478.00
4/28/2015	12127	89.70	1.50	9479.00
4/28/2015	12222	91.20	1.80	9478.00
4/29/2015	12317	90.90	1.70	0.00
4/29/2015	12412	90.20	0.50	0.00
4/29/2015	12507	90.20	0.10	0.00
4/29/2015	12602	89.10	359.40	0.00

Date	Depth	Deviation	Direction	TVD
4/29/2015	12792	89.50	359.00	0.00
4/29/2015	12887	90.30	358.10	0.00
4/29/2015	12982	88.60	357.90	0.00
4/29/2015	13077	89.80	358.30	0.00
4/29/2015	13267	90.70	358.00	9477.75
4/29/2015	13361	90.10	357.80	9477.09
4/30/2015	13551	89.10	357.10	9477.00
4/30/2015	13646	89.30	357.60	9478.00
4/30/2015	13741	89.40	359.00	9479.00
4/30/2015	13838	89.80	358.00	9480.00
4/30/2015	13931	89.50	357.50	0.00
4/30/2015	14052	91.50	356.80	0.00



April 24, 2015

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

Attn: Kanicia Castillo

RE: **Macho Nacho State Com 10H**

Please find enclosed a copy of the survey from 0' to 8813' ran on the above referenced well.

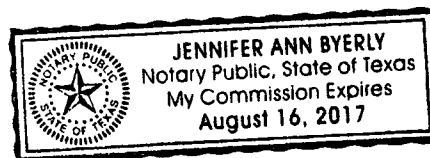
Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 24 day of April,
A.D., 2015, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: Concho
Lease/Well: Macho Nacho State Com/10H

Rig Name: Silver Oak 12
State/County: New Mexico/Lea
VS-Azi: 0.00 Degrees
Latitude: 32.22534, Longitude: -103.61710
Grid Convergence Applied = -0.38 degs (NAD 83)
Grid North = True North -0.38 degs



Depth Reference : RKB = 18 feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: Macho Nacho State Com 10H.ut

Minimum Curvature Method

Report Date/Time: 4/24/2015 / 13:14

VES Survey International

Midland, Texas

432-563-5444

Surveyor: Adam Askew

Macho Nacho State Com 10H / API 30-025-42453

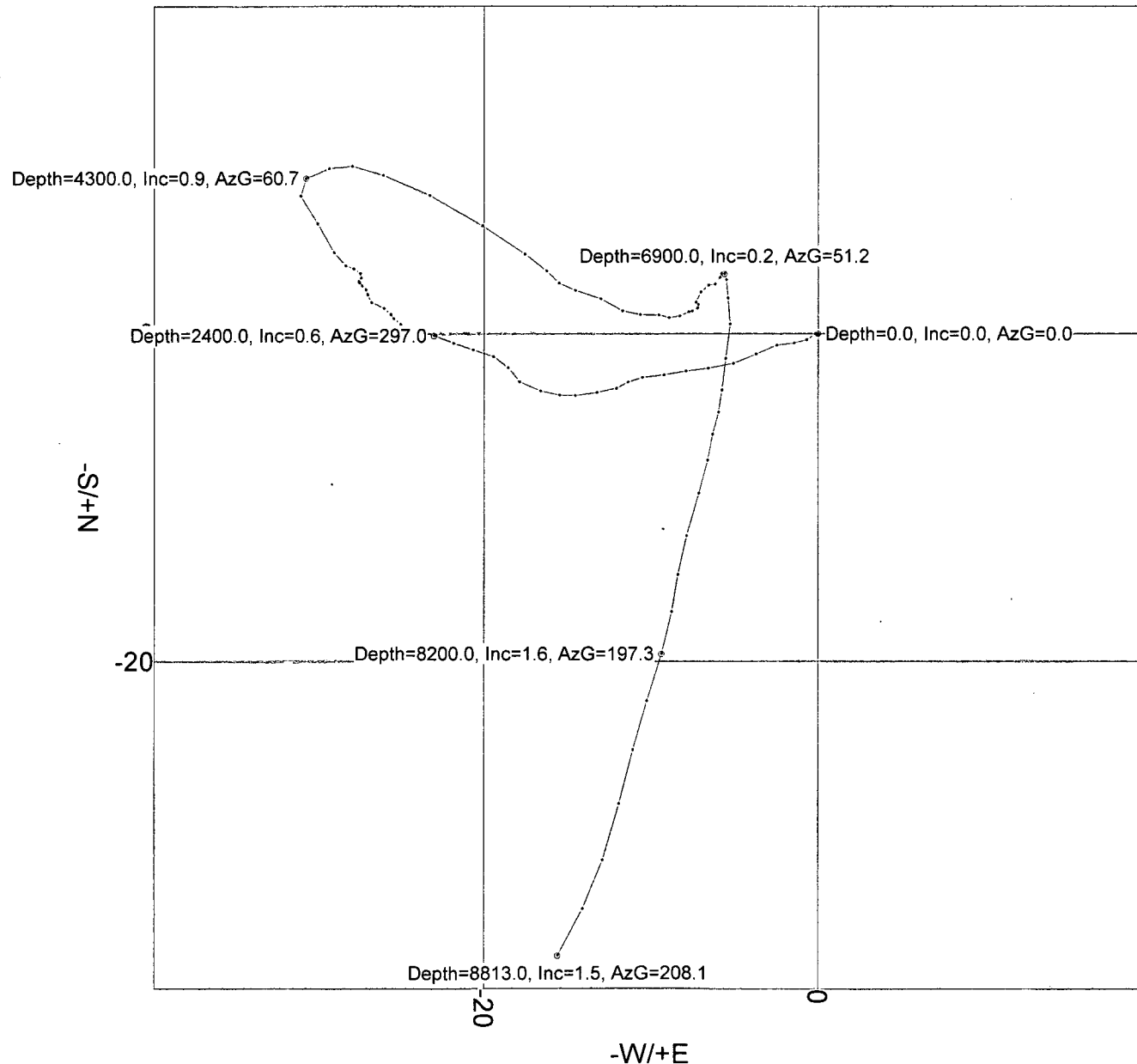
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.12	175.12	100.00	-0.10	0.01	-0.10	0.10	175.12	0.12
200.00	0.14	358.71	200.00	-0.09	0.01	-0.09	0.09	170.35	0.25
300.00	0.18	259.43	300.00	0.00	-0.14	0.00	0.14	270.50	0.24
400.00	0.60	227.68	400.00	-0.38	-0.69	-0.38	0.79	241.04	0.46
500.00	0.46	293.26	499.99	-0.58	-1.45	-0.58	1.56	248.30	0.59
600.00	0.82	246.52	599.99	-0.70	-2.48	-0.70	2.58	254.15	0.61
700.00	0.72	245.33	699.98	-1.25	-3.71	-1.25	3.91	251.34	0.11
800.00	0.94	248.97	799.97	-1.81	-5.05	-1.81	5.36	250.27	0.23
900.00	0.86	269.57	899.96	-2.11	-6.56	-2.11	6.90	252.18	0.33
1000.00	0.67	254.21	999.95	-2.28	-7.88	-2.28	8.20	253.89	0.28
1100.00	0.85	263.52	1099.94	-2.52	-9.18	-2.52	9.52	254.66	0.22
1200.00	0.65	264.21	1199.93	-2.66	-10.49	-2.66	10.82	255.77	0.20
1300.00	0.42	231.76	1299.93	-2.95	-11.35	-2.95	11.72	255.44	0.37
1400.00	0.49	248.94	1399.92	-3.33	-12.04	-3.33	12.49	254.54	0.15
1500.00	0.89	262.34	1499.91	-3.59	-13.20	-3.59	13.68	254.81	0.43
1600.00	0.63	261.36	1599.91	-3.77	-14.51	-3.77	15.00	255.43	0.26
1700.00	0.48	284.94	1699.90	-3.75	-15.47	-3.75	15.91	256.39	0.27
1800.00	0.84	281.18	1799.89	-3.49	-16.59	-3.49	16.96	258.11	0.36

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	0.81	306.65	1899.88	-2.93	-17.88	-2.93	18.12	260.69	0.36
2000.00	0.52	345.12	1999.88	-2.08	-18.56	-2.08	18.68	263.62	0.51
2100.00	0.92	287.61	2099.87	-1.40	-19.44	-1.40	19.49	265.89	0.78
2200.00	0.57	291.32	2199.86	-0.97	-20.67	-0.97	20.70	267.31	0.36
2300.00	0.84	287.40	2299.85	-0.57	-21.83	-0.57	21.84	268.49	0.28
2400.00	0.60	296.97	2399.85	-0.12	-23.00	-0.12	23.00	269.71	0.26
2500.00	0.75	274.48	2499.84	0.17	-24.12	0.17	24.12	270.41	0.30
2600.00	0.49	325.77	2599.83	0.58	-25.01	0.58	25.02	271.32	0.58
2700.00	0.21	269.50	2699.83	0.93	-25.43	0.93	25.45	272.08	0.41
2800.00	0.29	7.25	2799.83	1.18	-25.58	1.18	25.61	272.64	0.38
2900.00	0.54	284.97	2899.83	1.55	-26.00	1.55	26.05	273.42	0.58
3000.00	0.44	309.08	2999.83	1.92	-26.75	1.92	26.82	274.10	0.23
3100.00	0.27	15.45	3099.83	2.38	-26.99	2.38	27.09	275.05	0.41
3200.00	0.20	295.09	3199.82	2.68	-27.08	2.68	27.21	275.66	0.31
3300.00	0.22	335.05	3299.82	2.93	-27.31	2.93	27.47	276.11	0.14
3400.00	0.08	284.37	3399.82	3.12	-27.46	3.12	27.64	276.47	0.18
3500.00	0.08	3.02	3499.82	3.20	-27.53	3.20	27.72	276.63	0.10
3600.00	0.25	45.40	3599.82	3.42	-27.37	3.42	27.58	277.13	0.20
3700.00	0.27	295.51	3699.82	3.68	-27.42	3.68	27.67	277.64	0.43
3800.00	0.29	314.75	3799.82	3.96	-27.82	3.96	28.10	278.11	0.10
3900.00	0.35	270.73	3899.82	4.15	-28.30	4.15	28.61	278.34	0.24
4000.00	1.02	335.28	3999.81	4.96	-28.98	4.96	29.40	279.71	0.92
4100.00	1.35	324.00	4099.79	6.72	-30.04	6.72	30.78	282.60	0.40
4200.00	0.90	336.06	4199.77	8.38	-31.05	8.38	32.16	285.11	0.50
4300.00	0.87	60.67	4299.76	9.47	-30.71	9.47	32.13	287.14	1.19
4400.00	0.92	73.44	4399.75	10.07	-29.28	10.07	30.96	288.98	0.20
4500.00	0.70	97.48	4499.74	10.22	-27.91	10.22	29.72	290.11	0.40
4600.00	1.53	111.04	4599.72	9.66	-26.06	9.66	27.79	290.34	0.86
4700.00	1.96	115.80	4699.68	8.44	-23.27	8.44	24.75	289.92	0.46
4800.00	2.24	124.23	4799.61	6.59	-20.11	6.59	21.16	288.14	0.42
4900.00	1.29	123.34	4899.56	4.87	-17.55	4.87	18.22	285.51	0.96
5000.00	0.64	138.79	4999.55	3.83	-16.24	3.83	16.69	283.27	0.69
5100.00	0.57	129.39	5099.54	3.09	-15.49	3.09	15.80	281.29	0.12
5200.00	0.70	101.94	5199.53	2.65	-14.51	2.65	14.75	280.35	0.33
5300.00	1.16	112.66	5299.52	2.14	-12.98	2.14	13.16	279.34	0.49
5400.00	0.59	132.81	5399.51	1.40	-11.68	1.40	11.76	276.83	0.64
5500.00	0.81	79.74	5499.50	1.18	-10.61	1.18	10.67	276.33	0.65
5600.00	0.51	109.33	5599.50	1.16	-9.49	1.16	9.56	276.94	0.44
5700.00	0.22	99.17	5699.49	0.98	-8.88	0.98	8.94	276.28	0.29

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
5800.00	0.53	72.42	5799.49	1.09	-8.25	1.09	8.32	277.51	0.35
5900.00	0.17	42.24	5899.49	1.34	-7.71	1.34	7.82	279.83	0.40
6000.00	0.15	116.60	5999.49	1.39	-7.49	1.39	7.62	280.48	0.19
6100.00	0.36	39.36	6099.49	1.57	-7.18	1.57	7.35	282.34	0.36
6200.00	0.18	254.35	6199.49	1.77	-7.13	1.77	7.35	283.94	0.52
6300.00	0.23	1.70	6299.49	1.93	-7.28	1.93	7.53	284.86	0.34
6400.00	0.57	34.54	6399.49	2.54	-6.99	2.54	7.44	289.96	0.39
6500.00	0.20	84.08	6499.48	2.96	-6.54	2.96	7.18	294.40	0.46
6600.00	0.26	78.49	6599.48	3.03	-6.14	3.03	6.84	296.26	0.06
6700.00	0.42	9.44	6699.48	3.43	-5.86	3.43	6.79	300.36	0.40
6800.00	0.15	164.17	6799.48	3.66	-5.76	3.66	6.83	302.43	0.56
6900.00	0.21	51.24	6899.48	3.65	-5.58	3.65	6.67	303.19	0.31
7000.00	0.54	184.16	6999.48	3.29	-5.47	3.29	6.38	301.06	0.71
7100.00	0.74	168.67	7099.47	2.18	-5.37	2.18	5.80	292.10	0.26
7200.00	1.10	180.08	7199.46	0.58	-5.25	0.58	5.28	276.35	0.40
7300.00	1.33	192.30	7299.44	-1.51	-5.50	-1.51	5.70	254.63	0.34
7400.00	0.92	179.76	7399.42	-3.44	-5.74	-3.44	6.69	239.04	0.48
7500.00	0.67	200.35	7499.41	-4.79	-5.94	-4.79	7.63	231.13	0.37
7600.00	0.94	190.56	7599.40	-6.14	-6.29	-6.14	8.79	225.70	0.31
7700.00	0.90	190.11	7699.39	-7.72	-6.58	-7.72	10.14	220.44	0.04
7800.00	1.50	197.59	7799.36	-9.74	-7.11	-9.74	12.06	216.14	0.62
7900.00	1.59	193.87	7899.33	-12.33	-7.84	-12.33	14.61	212.45	0.13
8000.00	1.19	190.38	7999.30	-14.70	-8.36	-14.70	16.91	209.63	0.40
8100.00	1.43	188.40	8099.27	-16.96	-8.73	-16.96	19.07	207.24	0.24
8200.00	1.60	197.27	8199.24	-19.53	-9.33	-19.53	21.64	205.53	0.29
8300.00	1.84	196.80	8299.19	-22.40	-10.21	-22.40	24.62	204.49	0.24
8400.00	1.74	194.27	8399.14	-25.41	-11.04	-25.41	27.71	203.49	0.13
8500.00	2.17	194.07	8499.08	-28.71	-11.88	-28.71	31.07	202.47	0.43
8600.00	1.94	197.73	8599.02	-32.16	-12.85	-32.16	34.64	201.78	0.26
8700.00	1.73	207.35	8698.97	-35.12	-14.06	-35.12	37.83	201.82	0.37
8813.00	1.54	208.11	8811.92	-37.97	-15.56	-37.97	41.04	202.29	0.17



VES Survey International
Midland, Texas
432-563-5444
Surveyor: Adam Askew
Macho Nacho State Com 10H / API 30-025-42453



-W/+E
VES Survey Date: 4/21/2015



COG Production LLC

Lea County, NM

Macho Nacho State

#10H

OH

Survey: MWD #1

Survey Report - Geographic

04 May, 2015



Wellplanning
Survey Report - Geographic

Company:	COG Production LLC	Local Co-ordinate Reference:	Well #10H
Project:	Lea County, NM	TVD Reference:	WELL @ 3591.9usft (Original Well Elev)
Site:	Macho Nacho State	MD Reference:	WELL @ 3591.9usft (Original Well Elev)
Well:	#10H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Project	Lea 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	Macho Nacho State				
Site Position:		Northing:	446,603.70 usft	Latitude:	32° 13' 32.594 N
From:	Map	Easting:	725,838.70 usft	Longitude:	103° 36' 10.882 W
Position Uncertainty:	3.0 usft	Slot Radius:	12-1/4 "	Grid Convergence:	0.39 °

Well	#10H					
Well Position	+N/-S	0.0 usft	Northing:	446,437.70 usft	Latitude:	32° 13' 31.242 N
	+E/-W	0.0 usft	Easting:	721,485.20 usft	Longitude:	103° 37' 1.573 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,573.9 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/25/2015	7.14	60.09	48,233

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	356.00	

Survey Program	Date 5/4/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	8,813.0	GYRO (OH)	MWD	MWD - Standard
8,882.0	14,097.0	MWD #1 (OH)	MWD	MWD - Standard

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,813.0	1.54	208.11	8,811.9	-37.9	-15.5	446,399.79	721,469.66	32° 13' 30.868 N	103° 37' 1.757 W
8,882.0	1.40	201.50	8,880.9	-39.5	-16.3	446,398.19	721,468.91	32° 13' 30.852 N	103° 37' 1.766 W
8,914.0	1.00	328.60	8,912.9	-39.6	-16.6	446,398.06	721,468.62	32° 13' 30.851 N	103° 37' 1.769 W
8,945.0	4.20	358.90	8,943.9	-38.3	-16.7	446,399.43	721,468.46	32° 13' 30.864 N	103° 37' 1.771 W
8,977.0	6.10	9.50	8,975.7	-35.4	-16.5	446,402.27	721,468.72	32° 13' 30.892 N	103° 37' 1.768 W
9,008.0	9.20	13.70	9,006.5	-31.4	-15.6	446,406.31	721,469.58	32° 13' 30.932 N	103° 37' 1.757 W
9,034.0	11.60	15.70	9,032.0	-26.9	-14.4	446,410.84	721,470.78	32° 13' 30.977 N	103° 37' 1.743 W
9,065.0	13.20	16.40	9,062.3	-20.5	-12.6	446,417.24	721,472.62	32° 13' 31.040 N	103° 37' 1.721 W
9,097.0	14.90	13.20	9,093.3	-12.9	-10.6	446,424.75	721,474.59	32° 13' 31.114 N	103° 37' 1.697 W
9,129.0	17.50	7.30	9,124.1	-4.2	-9.1	446,433.53	721,476.14	32° 13' 31.201 N	103° 37' 1.679 W
9,160.0	20.70	3.30	9,153.4	5.9	-8.1	446,443.63	721,477.05	32° 13' 31.301 N	103° 37' 1.667 W



Wellplanning
Survey Report - Geographic

Company:	COG Production LLC	Local Co-ordinate Reference:	Well #10H
Project:	Lea County, NM	TVD Reference:	WELL @ 3591.9usft (Original Well Elev)
Site:	Macho Nacho State	MD Reference:	WELL @ 3591.9usft (Original Well Elev)
Well:	#10H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,192.0	24.20	359.90	9,182.9	18.1	-7.8	446,455.84	721,477.36	32° 13' 31.422 N	103° 37' 1.663 W
9,223.0	27.60	357.50	9,210.8	31.7	-8.2	446,469.37	721,477.04	32° 13' 31.556 N	103° 37' 1.665 W
9,255.0	31.00	354.70	9,238.7	47.3	-9.2	446,484.99	721,475.95	32° 13' 31.710 N	103° 37' 1.677 W
9,287.0	34.40	351.70	9,265.6	64.4	-11.3	446,502.14	721,473.89	32° 13' 31.880 N	103° 37' 1.700 W
9,320.0	37.70	348.20	9,292.3	83.6	-14.7	446,521.25	721,470.48	32° 13' 32.070 N	103° 37' 1.738 W
9,351.0	41.50	345.90	9,316.2	102.8	-19.2	446,540.50	721,466.03	32° 13' 32.260 N	103° 37' 1.788 W
9,382.0	45.40	343.80	9,338.7	123.4	-24.7	446,561.07	721,460.45	32° 13' 32.464 N	103° 37' 1.851 W
9,414.0	49.10	342.30	9,360.4	145.8	-31.6	446,583.54	721,453.59	32° 13' 32.687 N	103° 37' 1.930 W
9,445.0	52.60	340.30	9,380.0	168.6	-39.3	446,606.30	721,445.88	32° 13' 32.913 N	103° 37' 2.018 W
9,477.0	56.50	338.60	9,398.6	193.0	-48.5	446,630.70	721,436.72	32° 13' 33.155 N	103° 37' 2.122 W
9,509.0	60.20	337.10	9,415.3	218.2	-58.8	446,655.92	721,426.45	32° 13' 33.405 N	103° 37' 2.240 W
9,540.0	64.40	335.80	9,429.8	243.4	-69.7	446,681.07	721,415.48	32° 13' 33.655 N	103° 37' 2.366 W
9,572.0	68.50	334.70	9,442.5	270.0	-82.0	446,707.70	721,403.19	32° 13' 33.919 N	103° 37' 2.507 W
9,603.0	72.30	334.00	9,452.9	296.3	-94.6	446,734.02	721,390.55	32° 13' 34.180 N	103° 37' 2.652 W
9,635.0	76.40	333.80	9,461.6	324.0	-108.2	446,761.69	721,377.00	32° 13' 34.455 N	103° 37' 2.807 W
9,667.0	81.10	333.80	9,467.8	352.1	-122.0	446,789.84	721,363.15	32° 13' 34.734 N	103° 37' 2.966 W
9,698.0	85.80	334.20	9,471.3	379.8	-135.5	446,817.52	721,349.65	32° 13' 35.009 N	103° 37' 3.121 W
9,756.0	89.90	332.50	9,473.5	431.6	-161.5	446,869.30	721,323.66	32° 13' 35.523 N	103° 37' 3.420 W
9,851.0	91.50	332.80	9,472.4	516.0	-205.2	446,953.68	721,280.02	32° 13' 36.361 N	103° 37' 3.921 W
9,946.0	87.90	331.90	9,472.9	600.1	-249.3	447,037.81	721,235.94	32° 13' 37.197 N	103° 37' 4.428 W
10,040.0	88.50	333.40	9,475.8	683.6	-292.4	447,121.26	721,192.78	32° 13' 38.025 N	103° 37' 4.924 W
10,140.0	87.90	338.70	9,478.9	774.9	-333.0	447,212.57	721,152.22	32° 13' 38.932 N	103° 37' 5.389 W
10,204.0	86.00	343.70	9,482.4	835.3	-353.6	447,273.05	721,131.63	32° 13' 39.531 N	103° 37' 5.624 W
10,228.1	85.30	345.49	9,484.2	858.5	-360.0	447,296.21	721,125.24	32° 13' 39.761 N	103° 37' 5.697 W
Cross out of 330° HL- 10228.1° MD, 85.30° INC, 345.49° AZI									
10,235.0	85.10	346.00	9,484.8	865.2	-361.6	447,302.88	721,123.55	32° 13' 39.827 N	103° 37' 5.716 W
10,293.0	88.50	352.50	9,488.0	922.0	-372.4	447,359.73	721,112.76	32° 13' 40.390 N	103° 37' 5.837 W
10,387.0	91.80	1.90	9,487.8	1,015.8	-377.0	447,453.50	721,108.17	32° 13' 41.319 N	103° 37' 5.883 W
10,419.0	92.30	1.90	9,486.6	1,047.8	-376.0	447,485.46	721,109.23	32° 13' 41.635 N	103° 37' 5.868 W
10,514.0	92.00	3.40	9,483.0	1,142.6	-371.6	447,580.29	721,113.62	32° 13' 42.573 N	103° 37' 5.810 W
10,609.0	91.90	3.20	9,479.8	1,237.4	-366.1	447,675.08	721,119.09	32° 13' 43.511 N	103° 37' 5.739 W
10,675.0	90.72	2.57	9,478.3	1,303.3	-362.8	447,740.98	721,122.41	32° 13' 44.162 N	103° 37' 5.695 W
Cross into 330° HL- 10675.0° MD, 90.72° INC, 2.57° AZI									
10,704.0	90.20	2.30	9,478.1	1,332.3	-361.6	447,769.95	721,123.65	32° 13' 44.449 N	103° 37' 5.678 W
10,799.0	88.40	2.20	9,479.2	1,427.2	-357.8	447,864.87	721,127.37	32° 13' 45.388 N	103° 37' 5.628 W
10,894.0	89.20	2.30	9,481.2	1,522.1	-354.1	447,959.77	721,131.10	32° 13' 46.327 N	103° 37' 5.577 W
10,988.0	88.80	1.20	9,482.9	1,616.0	-351.2	448,053.71	721,133.97	32° 13' 47.256 N	103° 37' 5.536 W
11,083.0	90.10	2.30	9,483.8	1,711.0	-348.3	448,148.66	721,136.87	32° 13' 48.196 N	103° 37' 5.495 W
11,178.0	90.90	1.60	9,482.9	1,805.9	-345.1	448,243.60	721,140.11	32° 13' 49.135 N	103° 37' 5.450 W
11,273.0	91.20	0.70	9,481.2	1,900.9	-343.2	448,338.56	721,142.01	32° 13' 50.075 N	103° 37' 5.421 W
11,368.0	90.50	1.50	9,479.8	1,995.8	-341.4	448,433.53	721,143.84	32° 13' 51.014 N	103° 37' 5.392 W
11,463.0	90.50	2.10	9,479.0	2,090.8	-338.4	448,528.48	721,146.82	32° 13' 51.954 N	103° 37' 5.350 W
11,558.0	91.00	2.00	9,477.7	2,185.7	-335.0	448,623.41	721,150.22	32° 13' 52.893 N	103° 37' 5.303 W
11,652.0	90.10	3.30	9,476.8	2,279.6	-330.6	448,717.31	721,154.57	32° 13' 53.822 N	103° 37' 5.245 W
11,747.0	89.50	3.50	9,477.2	2,374.4	-325.0	448,812.14	721,160.20	32° 13' 54.760 N	103° 37' 5.172 W
11,842.0	89.10	2.30	9,478.3	2,469.3	-320.2	448,907.01	721,165.00	32° 13' 55.698 N	103° 37' 5.109 W
11,937.0	90.00	1.90	9,479.1	2,564.2	-316.7	449,001.94	721,168.49	32° 13' 56.637 N	103° 37' 5.061 W
12,032.0	89.20	1.90	9,479.7	2,659.2	-313.6	449,096.88	721,171.64	32° 13' 57.577 N	103° 37' 5.017 W
12,127.0	89.70	1.50	9,480.6	2,754.1	-310.7	449,191.84	721,174.45	32° 13' 58.516 N	103° 37' 4.977 W
12,222.0	91.20	1.80	9,479.9	2,849.1	-308.0	449,286.79	721,177.19	32° 13' 59.456 N	103° 37' 4.938 W
12,317.0	90.90	1.70	9,478.1	2,944.0	-305.1	449,381.73	721,180.09	32° 14' 0.395 N	103° 37' 4.896 W
12,412.0	90.20	0.50	9,477.2	3,039.0	-303.3	449,476.71	721,181.91	32° 14' 1.335 N	103° 37' 4.868 W
12,507.0	90.20	0.10	9,476.9	3,134.0	-302.8	449,571.71	721,182.41	32° 14' 2.275 N	103° 37' 4.855 W
12,602.0	89.10	359.40	9,477.5	3,229.0	-303.2	449,666.70	721,182.00	32° 14' 3.215 N	103° 37' 4.852 W
12,697.0	89.90	359.30	9,478.3	3,324.0	-304.3	449,761.69	721,180.92	32° 14' 4.155 N	103° 37' 4.857 W



Wellplanning
Survey Report - Geographic

Company:	COG Production LLC	Local Co-ordinate Reference:	Well #10H
Project:	Lea County, NM	TVD Reference:	WELL @ 3591.9usft (Original Well Elev)
Site:	Macho Nacho State	MD Reference:	WELL @ 3591.9usft (Original Well Elev)
Well:	#10H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
12,792.0	89.50	359.00	9,478.8	3,419.0	-305.7	449,856.68	721,179.51	32° 14' 5.095 N	103° 37' 4.866 W
12,887.0	90.30	358.10	9,479.0	3,513.9	-308.1	449,951.65	721,177.11	32° 14' 6.035 N	103° 37' 4.887 W
12,982.0	88.60	357.90	9,479.9	3,608.9	-311.4	450,046.58	721,173.79	32° 14' 6.974 N	103° 37' 4.918 W
13,077.0	89.80	358.30	9,481.2	3,703.8	-314.6	450,141.52	721,170.64	32° 14' 7.914 N	103° 37' 4.948 W
13,172.0	91.00	358.90	9,480.6	3,798.8	-316.9	450,236.48	721,168.32	32° 14' 8.854 N	103° 37' 4.967 W
13,267.0	90.70	358.00	9,479.1	3,893.7	-319.4	450,331.44	721,165.75	32° 14' 9.794 N	103° 37' 4.990 W
13,361.0	90.10	357.80	9,478.5	3,987.7	-322.9	450,425.37	721,162.31	32° 14' 10.723 N	103° 37' 5.023 W
13,456.0	90.30	357.20	9,478.2	4,082.6	-327.0	450,520.28	721,158.16	32° 14' 11.663 N	103° 37' 5.063 W
13,551.0	89.10	357.10	9,478.7	4,177.5	-331.8	450,615.16	721,153.44	32° 14' 12.602 N	103° 37' 5.111 W
13,646.0	89.30	357.60	9,480.0	4,272.3	-336.1	450,710.05	721,149.05	32° 14' 13.541 N	103° 37' 5.155 W
13,741.0	89.40	357.00	9,481.1	4,367.2	-340.6	450,804.94	721,144.57	32° 14' 14.481 N	103° 37' 5.200 W
13,836.0	89.80	358.00	9,481.7	4,462.1	-344.8	450,899.84	721,140.43	32° 14' 15.420 N	103° 37' 5.240 W
13,931.0	89.50	357.50	9,482.3	4,557.1	-348.5	450,994.77	721,136.70	32° 14' 16.360 N	103° 37' 5.277 W
14,022.0	91.50	356.80	9,481.2	4,677.9	-354.5	451,115.61	721,130.68	32° 14' 17.556 N	103° 37' 5.337 W
14,097.0	91.50	356.80	9,480.1	4,722.8	-357.0	451,160.52	721,128.17	32° 14' 18.000 N	103° 37' 5.363 W
PBHL(MN#10H)									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,228.1	9,484.2	858.5	-360.0	Cross out of 330' HL- 10228.1 'MD, 85.30° INC, 345.49° AZI
10,675.0	9,478.3	1,303.3	-362.8	Cross into 330' HL- 10675.0 'MD, 90.72° INC, 2.57° AZI

Checked By: _____ Approved By: _____ Date: _____