

**McVAY DRILLING COMPANY**

P.O. Box 2450
Hobbs, New Mexico 88241
(575) 397-3311
FAX: 39-DRILL

HOBBS OGD

AUG 31 2015

Well Name and Num: Macho Nacho State Com #6
Location: SEC 7, T24S, R33E
Operator: COG
Drilling Contractor: McVay Drilling Company

RECEIVED

The undersigned certifies that he is an authorized representative of the drilling contractor who drilled the above described well and that he has conducted deviation tests and obtained the following results:

<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>
0.10	298	0.30	5685	89.00	11378		
0.10	601	0.30	6063	91.50	11850		
0.30	871	2.60	6457	91.10	12228		
0.10	1179	1.20	6440	87.80	12417		
0.10	1312	1.20	6818	88.00	12888		
0.60	1689	2.10	7195	91.00	13361		
0.40	2067	1.60	7573	89.40	13550		
0.40	2444	1.10	8943	90.30	14021		
0.30	2633	9.10	9037	91.10	14115		
0.30	3011	19.40	9132				
0.20	3389	41.20	9321				
0.20	3766	65.10	9509				
0.40	4144	68.30	9538				
0.90	4522	82.70	9774				
1.60	4967	87.60	10246				
1.10	5115	89.40	10623				
2.60	5309	88.70	11284				

By: MachitoSubscribed and sworn to before me this 9th day of June, 2015Tina Flemens
Notary Public, Lea County, New Mexico

SEP 00 2015

fm



June 4, 2015

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

Attn: Kanicia Castillo

RE: **Macho Nacho State Com 6H**

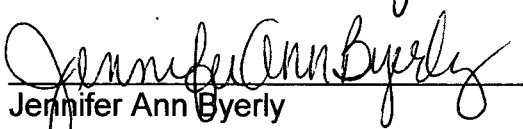
Please find enclosed a copy of the survey from 0' to 8790' ran on the above referenced well.

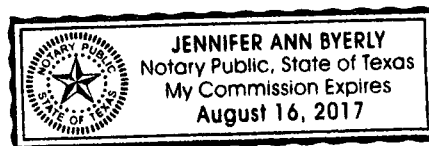
Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 4 day of June,
A.D., 2015, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating
Lease/Well: Macho Nacho State Com/6H

Rig Name: McVay 8
State/County: New Mexico/Lea
VS-Azi: 0.00 Degrees
Latitude: 32.22530, Longitude: -103.60930
Grid Convergence Applied = -0.39 degs
Grid North = True North -0.39 degs



Depth Reference : RKB= 26 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: macho nacho state com 6h.ut

Minimum Curvature Method

Report Date/Time: 6/4/2015 / 16:25

VES Survey International

Midland, Texas

Surveyor: Eric Warner

(432) 563.5444

Macho Nacho State Com 6H / API 30-025-42488

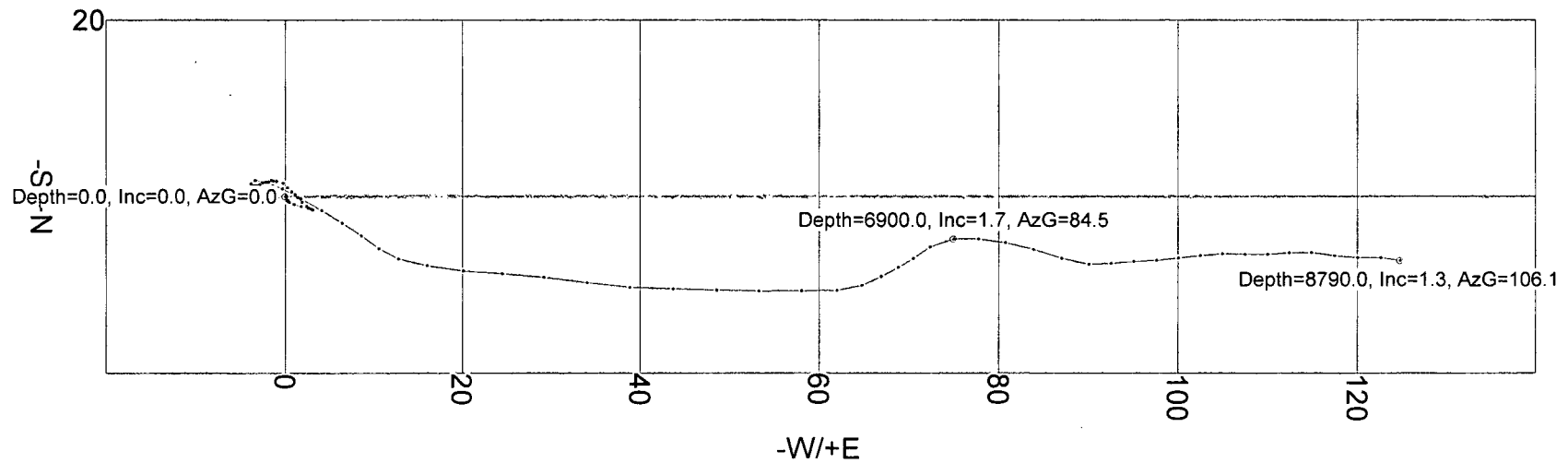
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.17	146.27	100.00	-0.12	0.08	-0.12	0.15	146.27	0.17
200.00	0.08	310.29	200.00	-0.20	0.11	-0.20	0.23	151.10	0.25
300.00	0.17	151.34	300.00	-0.28	0.13	-0.28	0.31	155.82	0.24
400.00	0.04	210.89	400.00	-0.44	0.18	-0.44	0.48	157.99	0.15
500.00	0.08	59.32	500.00	-0.44	0.22	-0.44	0.49	153.13	0.12
600.00	0.05	172.04	600.00	-0.44	0.29	-0.44	0.53	146.94	0.11
700.00	0.08	201.44	700.00	-0.55	0.27	-0.55	0.62	154.10	0.05
800.00	0.22	97.18	800.00	-0.64	0.43	-0.64	0.77	146.33	0.25
900.00	0.47	121.17	900.00	-0.88	0.97	-0.88	1.31	132.29	0.29
1000.00	0.49	97.55	999.99	-1.15	1.74	-1.15	2.09	123.43	0.20
1100.00	0.46	104.90	1099.99	-1.31	2.56	-1.31	2.88	117.15	0.07
1200.00	0.11	150.35	1199.99	-1.50	3.00	-1.50	3.35	116.57	0.40
1300.00	0.08	12.33	1299.99	-1.52	3.06	-1.52	3.41	116.35	0.18
1400.00	0.16	278.25	1399.99	-1.43	2.93	-1.43	3.26	115.96	0.19
1500.00	0.13	311.61	1499.99	-1.33	2.71	-1.33	3.02	116.22	0.09
1600.00	0.34	305.64	1599.99	-1.09	2.38	-1.09	2.62	114.52	0.22

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
1700.00	0.45	315.22	1699.99	-0.63	1.86	-0.63	1.97	108.79	0.12
1800.00	0.36	315.34	1799.98	-0.13	1.37	-0.13	1.37	95.54	0.09
1900.00	0.16	342.57	1899.98	0.23	1.10	0.23	1.13	78.39	0.23
2000.00	0.48	299.04	1999.98	0.57	0.70	0.57	0.90	50.94	0.38
2100.00	0.29	336.57	2099.98	1.00	0.23	1.00	1.03	12.98	0.30
2200.00	0.54	304.55	2199.98	1.50	-0.26	1.50	1.52	350.32	0.33
2300.00	0.42	264.72	2299.97	1.73	-1.01	1.73	2.00	329.80	0.34
2400.00	0.10	352.02	2399.97	1.79	-1.39	1.79	2.26	322.20	0.43
2500.00	0.20	259.71	2499.97	1.84	-1.57	1.84	2.42	319.52	0.23
2600.00	0.24	225.96	2599.97	1.66	-1.90	1.66	2.53	311.20	0.14
2700.00	0.21	304.67	2699.97	1.62	-2.21	1.62	2.74	306.32	0.29
2800.00	0.27	234.85	2799.97	1.59	-2.55	1.59	3.01	301.95	0.28
2900.00	0.21	232.43	2899.97	1.35	-2.89	1.35	3.19	294.97	0.06
3000.00	0.19	249.10	2999.97	1.18	-3.19	1.18	3.40	290.27	0.06
3100.00	0.16	310.39	3099.97	1.21	-3.44	1.21	3.65	289.31	0.18
3200.00	0.16	234.90	3199.97	1.21	-3.67	1.21	3.86	288.33	0.20
3300.00	0.18	261.33	3299.97	1.11	-3.94	1.11	4.09	285.72	0.08
3400.00	0.06	90.57	3399.97	1.08	-4.04	1.08	4.19	285.00	0.24
3500.00	0.04	93.00	3499.97	1.08	-3.96	1.08	4.11	285.27	0.02
3600.00	0.09	213.00	3599.97	1.01	-3.97	1.01	4.10	284.29	0.12
3700.00	0.08	180.65	3699.97	0.88	-4.02	0.88	4.11	282.30	0.05
3800.00	0.12	126.55	3799.97	0.75	-3.94	0.75	4.01	280.77	0.09
3900.00	0.01	221.06	3899.97	0.68	-3.86	0.68	3.92	280.02	0.12
4000.00	0.16	257.97	3999.97	0.65	-4.01	0.65	4.06	279.17	0.16
4100.00	0.08	172.30	4099.97	0.55	-4.14	0.55	4.17	277.55	0.18
4200.00	0.42	12.44	4199.96	0.83	-4.05	0.83	4.13	281.64	0.49
4300.00	0.31	16.83	4299.96	1.45	-3.89	1.45	4.15	290.42	0.11
4400.00	0.51	73.92	4399.96	1.83	-3.39	1.83	3.85	298.43	0.43
4500.00	1.04	110.34	4499.95	1.64	-2.10	1.64	2.67	307.91	0.70
4600.00	1.15	116.95	4599.93	0.87	-0.36	0.87	0.94	337.63	0.16
4700.00	1.57	119.48	4699.90	-0.26	1.73	-0.26	1.75	98.59	0.43
4800.00	1.53	119.91	4799.87	-1.60	4.08	-1.60	4.39	111.43	0.04
4900.00	1.58	122.82	4899.83	-3.02	6.40	-3.02	7.07	115.23	0.09
5000.00	1.40	124.68	4999.80	-4.46	8.56	-4.46	9.65	117.50	0.18
5100.00	1.41	127.37	5099.77	-5.90	10.54	-5.90	12.08	119.22	0.07
5200.00	1.52	108.81	5199.74	-7.07	12.78	-7.07	14.61	118.96	0.49
5300.00	2.28	99.37	5299.68	-7.83	16.00	-7.83	17.81	116.06	0.82
5400.00	2.50	97.51	5399.59	-8.43	20.13	-8.43	21.83	112.73	0.24
5500.00	2.61	90.54	5499.49	-8.74	24.57	-8.74	26.08	109.58	0.33

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
5600.00	2.78	98.95	5599.38	-9.14	29.25	-9.14	30.64	107.36	0.43
5700.00	2.81	96.11	5699.26	-9.78	34.08	-9.78	35.45	106.01	0.14
5800.00	2.67	95.58	5799.15	-10.27	38.83	-10.27	40.17	104.81	0.14
5900.00	2.88	89.49	5899.03	-10.47	43.66	-10.47	44.90	103.49	0.36
6000.00	2.66	93.32	5998.92	-10.58	48.49	-10.58	49.63	102.31	0.29
6100.00	2.73	89.24	6098.80	-10.69	53.19	-10.69	54.26	101.36	0.21
6200.00	2.76	90.38	6198.69	-10.67	57.98	-10.67	58.96	100.43	0.06
6300.00	1.83	87.35	6298.61	-10.61	61.98	-10.61	62.89	99.72	0.94
6400.00	1.50	68.80	6398.57	-10.07	64.79	-10.07	65.57	98.83	0.63
6500.00	1.23	60.72	6498.54	-9.07	66.95	-9.07	67.56	97.71	0.33
6600.00	1.21	61.83	6598.52	-8.04	68.82	-8.04	69.29	96.67	0.03
6700.00	1.06	54.43	6698.50	-7.01	70.50	-7.01	70.85	95.68	0.21
6800.00	1.58	56.56	6798.47	-5.71	72.40	-5.71	72.63	94.51	0.53
6900.00	1.68	84.47	6898.43	-4.81	75.02	-4.81	75.17	93.67	0.79
7000.00	1.50	97.04	6998.39	-4.83	77.78	-4.83	77.93	93.55	0.39
7100.00	1.93	98.79	7098.35	-5.24	80.75	-5.24	80.92	93.72	0.43
7200.00	1.74	108.84	7198.30	-5.99	83.85	-5.99	84.06	94.09	0.37
7300.00	2.03	106.48	7298.24	-6.99	86.99	-6.99	87.27	94.59	0.30
7400.00	1.52	97.49	7398.19	-7.67	90.01	-7.67	90.34	94.87	0.58
7500.00	1.39	77.64	7498.16	-7.58	92.52	-7.58	92.83	94.68	0.52
7600.00	1.53	91.48	7598.13	-7.35	95.04	-7.35	95.32	94.42	0.38
7700.00	1.44	83.07	7698.10	-7.24	97.62	-7.24	97.89	94.24	0.23
7800.00	1.37	84.38	7798.07	-6.97	100.05	-6.97	100.30	93.98	0.08
7900.00	1.43	83.14	7898.04	-6.70	102.48	-6.70	102.70	93.74	0.07
8000.00	1.45	87.81	7998.00	-6.50	104.98	-6.50	105.18	93.55	0.12
8100.00	1.46	93.69	8097.97	-6.54	107.51	-6.54	107.71	93.48	0.15
8200.00	1.42	87.70	8197.94	-6.57	110.03	-6.57	110.22	93.42	0.16
8300.00	1.38	83.61	8297.91	-6.39	112.46	-6.39	112.65	93.25	0.11
8400.00	1.43	95.34	8397.88	-6.37	114.90	-6.37	115.08	93.17	0.29
8500.00	1.54	101.08	8497.85	-6.74	117.46	-6.74	117.65	93.29	0.18
8600.00	1.46	87.91	8597.81	-6.95	120.05	-6.95	120.25	93.32	0.35
8700.00	1.48	91.35	8697.78	-6.94	122.62	-6.94	122.81	93.24	0.09
8790.00	1.34	106.08	8787.75	-7.26	124.80	-7.26	125.01	93.33	0.43



VES Survey International
Midland, Texas
Surveyor: Eric Warner
(432) 563.5444
Macho Nacho State Com 6H / API 30-025-42488



VES Survey Date: 5/29/2015



COG Operating, LLC

Lea County, NM

Sec 7,T24S,R33E

Macho Nacho State #6H

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

09 June, 2015





HP
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Macho Nacho State #6H
Project:	Lea County, NM	TVD Reference:	Well @ 3597.0usft (McVay #8)
Site:	Sec 7, T24S, R33E	MD Reference:	Well @ 3597.0usft (McVay #8)
Well:	Macho Nacho State #6H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

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	Sec 7, T24S, R33E				
Site Position:		Northing:	446,452.30 usft	Latitude:	32° 13' 31.228 N
From:	Map	Easting:	723,874.70 usft	Longitude:	103° 36' 33.756 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.39 °

Well	Macho Nacho State #6H					
Well Position	+N/-S	0.0 usft	Northing:	446,452.30 usft	Latitude:	32° 13' 31.228 N
	+E/-W	0.0 usft	Easting:	723,874.70 usft	Longitude:	103° 36' 33.756 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,571.0 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	5/18/2015	7.20	60.08	48,148

Design	Wellbore #1				
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	7.26	

Survey Program	Date 6/9/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	8,790.0	Gyro (Wellbore #1)	Good_gyro	Good Gyro
8,896.0	14,247.0	MWD (Wellbore #1)	MWD default.	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
0.0	0.00	0.00	0.0	0.0	0.0	446,452.30	723,874.70	32° 13' 31.228 N	103° 36' 33.756 W
100.0	0.17	146.27	100.0	-0.1	0.1	446,452.18	723,874.78	32° 13' 31.227 N	103° 36' 33.755 W
200.0	0.08	310.29	200.0	-0.2	0.1	446,452.10	723,874.81	32° 13' 31.226 N	103° 36' 33.755 W
300.0	0.17	151.34	300.0	-0.3	0.1	446,452.01	723,874.83	32° 13' 31.225 N	103° 36' 33.755 W
400.0	0.04	210.89	400.0	-0.4	0.2	446,451.85	723,874.88	32° 13' 31.223 N	103° 36' 33.754 W
500.0	0.08	59.32	500.0	-0.4	0.2	446,451.86	723,874.92	32° 13' 31.223 N	103° 36' 33.754 W
600.0	0.05	172.04	600.0	-0.4	0.3	446,451.85	723,874.99	32° 13' 31.223 N	103° 36' 33.753 W
700.0	0.08	201.44	700.0	-0.6	0.3	446,451.74	723,874.97	32° 13' 31.222 N	103° 36' 33.753 W
800.0	0.22	97.18	800.0	-0.6	0.4	446,451.65	723,875.13	32° 13' 31.221 N	103° 36' 33.751 W
900.0	0.47	121.17	900.0	-0.9	1.0	446,451.42	723,875.67	32° 13' 31.219 N	103° 36' 33.745 W
1,000.0	0.49	97.55	1,000.0	-1.2	1.8	446,451.15	723,876.45	32° 13' 31.216 N	103° 36' 33.736 W



HP
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Macho Nacho State #6H
Project:	Lea County, NM	TVD Reference:	Well @ 3597.0usft (McVay #8)
Site:	Sec 7, T24S, R33E	MD Reference:	Well @ 3597.0usft (McVay #8)
Well:	Macho Nacho State #6H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,100.0	0.46	104.90	1,100.0	-1.3	2.6	446,450.99	723,877.26	32° 13' 31.215 N	103° 36' 33.727 W
1,200.0	0.11	150.35	1,200.0	-1.5	3.0	446,450.80	723,877.70	32° 13' 31.213 N	103° 36' 33.721 W
1,300.0	0.08	12.33	1,300.0	-1.5	3.1	446,450.79	723,877.76	32° 13' 31.213 N	103° 36' 33.721 W
1,400.0	0.16	278.25	1,400.0	-1.4	2.9	446,450.88	723,877.64	32° 13' 31.213 N	103° 36' 33.722 W
1,500.0	0.13	311.61	1,500.0	-1.3	2.7	446,450.97	723,877.41	32° 13' 31.214 N	103° 36' 33.725 W
1,600.0	0.34	305.64	1,600.0	-1.1	2.4	446,451.22	723,877.09	32° 13' 31.217 N	103° 36' 33.729 W
1,700.0	0.45	315.22	1,700.0	-0.6	1.9	446,451.67	723,876.57	32° 13' 31.221 N	103° 36' 33.735 W
1,800.0	0.36	315.34	1,800.0	-0.1	1.4	446,452.17	723,876.07	32° 13' 31.226 N	103° 36' 33.740 W
1,900.0	0.16	342.57	1,900.0	0.2	1.1	446,452.53	723,875.81	32° 13' 31.230 N	103° 36' 33.743 W
2,000.0	0.48	299.04	2,000.0	0.6	0.7	446,452.87	723,875.40	32° 13' 31.233 N	103° 36' 33.748 W
2,100.0	0.29	336.57	2,100.0	1.0	0.2	446,453.30	723,874.93	32° 13' 31.238 N	103° 36' 33.753 W
2,200.0	0.54	304.55	2,200.0	1.5	-0.3	446,453.80	723,874.44	32° 13' 31.243 N	103° 36' 33.759 W
2,300.0	0.42	264.72	2,300.0	1.7	-1.0	446,454.04	723,873.69	32° 13' 31.245 N	103° 36' 33.768 W
2,400.0	0.10	352.02	2,400.0	1.8	-1.4	446,454.09	723,873.31	32° 13' 31.246 N	103° 36' 33.772 W
2,500.0	0.20	259.71	2,500.0	1.8	-1.6	446,454.14	723,873.13	32° 13' 31.246 N	103° 36' 33.774 W
2,600.0	0.24	225.96	2,600.0	1.7	-1.9	446,453.97	723,872.81	32° 13' 31.244 N	103° 36' 33.778 W
2,700.0	0.21	304.67	2,700.0	1.6	-2.2	446,453.93	723,872.51	32° 13' 31.244 N	103° 36' 33.782 W
2,800.0	0.27	234.85	2,800.0	1.6	-2.5	446,453.89	723,872.16	32° 13' 31.244 N	103° 36' 33.786 W
2,900.0	0.21	232.43	2,900.0	1.3	-2.9	446,453.65	723,871.83	32° 13' 31.241 N	103° 36' 33.790 W
3,000.0	0.19	249.10	3,000.0	1.2	-3.2	446,453.48	723,871.53	32° 13' 31.240 N	103° 36' 33.793 W
3,100.0	0.16	310.39	3,100.0	1.2	-3.4	446,453.51	723,871.26	32° 13' 31.240 N	103° 36' 33.796 W
3,200.0	0.16	234.90	3,200.0	1.2	-3.7	446,453.52	723,871.04	32° 13' 31.240 N	103° 36' 33.799 W
3,300.0	0.18	261.33	3,300.0	1.1	-3.9	446,453.41	723,870.77	32° 13' 31.239 N	103° 36' 33.802 W
3,400.0	0.06	90.57	3,400.0	1.1	-4.0	446,453.39	723,870.67	32° 13' 31.239 N	103° 36' 33.803 W
3,500.0	0.04	93.00	3,500.0	1.1	-3.9	446,453.39	723,870.76	32° 13' 31.239 N	103° 36' 33.802 W
3,600.0	0.09	213.00	3,600.0	1.0	-3.9	446,453.32	723,870.75	32° 13' 31.238 N	103° 36' 33.802 W
3,700.0	0.08	180.65	3,700.0	0.9	-4.0	446,453.18	723,870.71	32° 13' 31.237 N	103° 36' 33.803 W
3,800.0	0.12	126.55	3,800.0	0.8	-3.9	446,453.05	723,870.79	32° 13' 31.235 N	103° 36' 33.802 W
3,900.0	0.01	221.06	3,900.0	0.7	-3.8	446,452.98	723,870.87	32° 13' 31.235 N	103° 36' 33.801 W
4,000.0	0.16	257.97	4,000.0	0.6	-4.0	446,452.95	723,870.73	32° 13' 31.234 N	103° 36' 33.802 W
4,100.0	0.08	172.30	4,100.0	0.5	-4.1	446,452.85	723,870.60	32° 13' 31.233 N	103° 36' 33.804 W
4,200.0	0.42	12.44	4,200.0	0.8	-4.0	446,453.14	723,870.69	32° 13' 31.236 N	103° 36' 33.803 W
4,300.0	0.31	16.83	4,300.0	1.5	-3.9	446,453.75	723,870.84	32° 13' 31.242 N	103° 36' 33.801 W
4,400.0	0.51	73.92	4,400.0	1.8	-3.3	446,454.14	723,871.35	32° 13' 31.246 N	103° 36' 33.795 W
4,500.0	1.04	110.34	4,500.0	1.6	-2.1	446,453.94	723,872.63	32° 13' 31.244 N	103° 36' 33.780 W
4,600.0	1.15	116.95	4,599.9	0.9	-0.3	446,453.17	723,874.38	32° 13' 31.236 N	103° 36' 33.760 W
4,700.0	1.57	119.48	4,699.9	-0.3	1.8	446,452.04	723,876.46	32° 13' 31.225 N	103° 36' 33.736 W
4,800.0	1.53	119.91	4,799.9	-1.6	4.1	446,450.70	723,878.81	32° 13' 31.212 N	103° 36' 33.708 W
4,900.0	1.58	122.82	4,899.8	-3.0	6.4	446,449.29	723,881.13	32° 13' 31.198 N	103° 36' 33.682 W
5,000.0	1.40	124.68	4,999.8	-4.5	8.6	446,447.85	723,883.29	32° 13' 31.183 N	103° 36' 33.657 W
5,100.0	1.41	127.37	5,099.8	-5.9	10.6	446,446.41	723,885.27	32° 13' 31.169 N	103° 36' 33.634 W
5,200.0	1.52	108.81	5,199.7	-7.1	12.8	446,445.23	723,887.51	32° 13' 31.157 N	103° 36' 33.608 W
5,300.0	2.28	99.37	5,299.7	-7.8	16.0	446,444.48	723,890.72	32° 13' 31.149 N	103° 36' 33.570 W
5,400.0	2.50	97.51	5,399.6	-8.4	20.2	446,443.87	723,894.85	32° 13' 31.143 N	103° 36' 33.522 W
5,500.0	2.61	90.54	5,499.5	-8.7	24.6	446,443.57	723,899.29	32° 13' 31.140 N	103° 36' 33.471 W
5,600.0	2.78	98.95	5,599.4	-9.1	29.3	446,443.17	723,903.96	32° 13' 31.135 N	103° 36' 33.416 W
5,700.0	2.81	96.11	5,699.3	-9.8	34.1	446,442.53	723,908.79	32° 13' 31.129 N	103° 36' 33.360 W
5,800.0	2.67	95.58	5,799.2	-10.3	38.9	446,442.04	723,913.55	32° 13' 31.124 N	103° 36' 33.305 W
5,900.0	2.88	89.49	5,899.0	-10.5	43.7	446,441.84	723,918.38	32° 13' 31.121 N	103° 36' 33.249 W
6,000.0	2.66	93.32	5,998.9	-10.6	48.5	446,441.73	723,923.21	32° 13' 31.120 N	103° 36' 33.192 W
6,100.0	2.73	89.24	6,098.8	-10.7	53.2	446,441.62	723,927.91	32° 13' 31.119 N	103° 36' 33.138 W
6,200.0	2.76	90.38	6,198.7	-10.7	58.0	446,441.64	723,932.69	32° 13' 31.118 N	103° 36' 33.082 W
6,300.0	1.83	87.35	6,298.6	-10.6	62.0	446,441.70	723,936.70	32° 13' 31.119 N	103° 36' 33.035 W
6,400.0	1.50	68.80	6,398.6	-10.1	64.8	446,442.24	723,939.51	32° 13' 31.124 N	103° 36' 33.003 W
6,500.0	1.23	60.72	6,498.5	-9.1	67.0	446,443.24	723,941.67	32° 13' 31.134 N	103° 36' 32.977 W



HP
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Macho Nacho State #6H
Project:	Lea County, NM	TVD Reference:	Well @ 3597.0usft (McVay #8)
Site:	Sec 7, T24S, R33E	MD Reference:	Well @ 3597.0usft (McVay #8)
Well:	Macho Nacho State #6H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,600.0	1.21	61.83	6,598.5	-8.0	68.8	446,444.27	723,943.54	32° 13' 31.144 N	103° 36' 32.956 W
6,700.0	1.06	54.43	6,698.5	-7.0	70.5	446,445.30	723,945.22	32° 13' 31.154 N	103° 36' 32.936 W
6,800.0	1.58	56.56	6,798.5	-5.7	72.4	446,446.60	723,947.12	32° 13' 31.167 N	103° 36' 32.914 W
6,900.0	1.68	84.47	6,898.4	-4.8	75.0	446,447.50	723,949.73	32° 13' 31.175 N	103° 36' 32.883 W
7,000.0	1.50	97.04	6,998.4	-4.8	77.8	446,447.48	723,952.49	32° 13' 31.175 N	103° 36' 32.851 W
7,100.0	1.93	98.79	7,098.3	-5.2	80.8	446,447.06	723,955.45	32° 13' 31.171 N	103° 36' 32.817 W
7,200.0	1.74	108.84	7,198.3	-6.0	83.9	446,446.32	723,958.55	32° 13' 31.163 N	103° 36' 32.781 W
7,300.0	2.03	106.48	7,298.2	-7.0	87.0	446,445.32	723,961.69	32° 13' 31.153 N	103° 36' 32.744 W
7,400.0	1.52	97.49	7,398.2	-7.7	90.0	446,444.65	723,964.70	32° 13' 31.146 N	103° 36' 32.709 W
7,500.0	1.39	77.64	7,498.2	-7.6	92.5	446,444.73	723,967.20	32° 13' 31.147 N	103° 36' 32.680 W
7,600.0	1.53	91.48	7,598.1	-7.3	95.0	446,444.96	723,969.72	32° 13' 31.149 N	103° 36' 32.651 W
7,700.0	1.44	83.07	7,698.1	-7.2	97.6	446,445.08	723,972.30	32° 13' 31.150 N	103° 36' 32.621 W
7,800.0	1.37	84.38	7,798.1	-7.0	100.0	446,445.35	723,974.74	32° 13' 31.152 N	103° 36' 32.592 W
7,900.0	1.43	83.14	7,898.0	-6.7	102.5	446,445.61	723,977.17	32° 13' 31.155 N	103° 36' 32.564 W
8,000.0	1.45	87.81	7,998.0	-6.5	105.0	446,445.81	723,979.67	32° 13' 31.157 N	103° 36' 32.535 W
8,100.0	1.46	93.69	8,098.0	-6.5	107.5	446,445.78	723,982.21	32° 13' 31.156 N	103° 36' 32.505 W
8,200.0	1.42	87.70	8,197.9	-6.6	110.0	446,445.74	723,984.72	32° 13' 31.156 N	103° 36' 32.476 W
8,300.0	1.38	83.61	8,297.9	-6.4	112.5	446,445.93	723,987.15	32° 13' 31.157 N	103° 36' 32.448 W
8,400.0	1.43	95.34	8,397.9	-6.4	114.9	446,445.94	723,989.59	32° 13' 31.157 N	103° 36' 32.419 W
8,500.0	1.54	101.08	8,497.8	-6.7	117.5	446,445.57	723,992.15	32° 13' 31.153 N	103° 36' 32.390 W
8,600.0	1.46	87.91	8,597.8	-6.9	120.0	446,445.36	723,994.74	32° 13' 31.151 N	103° 36' 32.359 W
8,700.0	1.48	91.35	8,697.8	-6.9	122.6	446,445.37	723,997.31	32° 13' 31.151 N	103° 36' 32.330 W
8,790.0	1.34	106.08	8,787.8	-7.2	124.8	446,445.06	723,999.48	32° 13' 31.148 N	103° 36' 32.304 W
Tie In @ 8790' MD / 8788' TVD									
8,896.0	1.20	114.40	8,893.7	-8.0	127.0	446,444.25	724,001.68	32° 13' 31.140 N	103° 36' 32.279 W
8,943.0	1.10	106.70	8,940.7	-8.4	127.9	446,443.92	724,002.56	32° 13' 31.136 N	103° 36' 32.268 W
8,990.0	4.80	88.70	8,987.7	-8.5	130.3	446,443.84	724,004.96	32° 13' 31.135 N	103° 36' 32.241 W
9,037.0	9.10	58.10	9,034.3	-6.5	135.4	446,445.85	724,010.09	32° 13' 31.155 N	103° 36' 32.181 W
9,085.0	15.30	54.60	9,081.2	-0.8	143.8	446,451.53	724,018.48	32° 13' 31.211 N	103° 36' 32.083 W
9,132.0	19.40	47.60	9,126.1	8.1	154.6	446,460.39	724,029.30	32° 13' 31.297 N	103° 36' 31.956 W
9,179.0	24.10	37.40	9,169.7	21.0	166.2	446,473.29	724,040.91	32° 13' 31.424 N	103° 36' 31.820 W
9,226.0	29.00	31.80	9,211.8	38.3	178.1	446,490.60	724,052.75	32° 13' 31.595 N	103° 36' 31.681 W
9,274.0	35.20	30.00	9,252.4	60.2	191.1	446,512.50	724,065.81	32° 13' 31.811 N	103° 36' 31.527 W
9,321.0	41.20	28.30	9,289.3	85.6	205.2	446,537.88	724,079.94	32° 13' 32.061 N	103° 36' 31.360 W
9,368.0	48.40	27.50	9,322.6	114.8	220.7	446,567.14	724,095.41	32° 13' 32.349 N	103° 36' 31.178 W
9,415.0	55.10	27.90	9,351.7	147.5	237.9	446,599.79	724,112.56	32° 13' 32.671 N	103° 36' 30.976 W
9,462.0	60.40	27.20	9,376.8	182.7	256.2	446,635.03	724,130.93	32° 13' 33.019 N	103° 36' 30.759 W
9,509.0	65.10	27.50	9,398.3	219.8	275.4	446,672.13	724,150.13	32° 13' 33.385 N	103° 36' 30.533 W
9,538.0	68.30	27.50	9,409.8	243.5	287.7	446,695.75	724,162.42	32° 13' 33.618 N	103° 36' 30.388 W
9,585.0	70.40	27.50	9,426.4	282.5	308.0	446,734.76	724,182.73	32° 13' 34.002 N	103° 36' 30.148 W
9,632.0	70.20	27.90	9,442.2	321.6	328.6	446,773.94	724,203.30	32° 13' 34.389 N	103° 36' 29.906 W
9,680.0	73.60	27.90	9,457.1	362.0	349.9	446,814.25	724,224.65	32° 13' 34.786 N	103° 36' 29.654 W
9,727.0	78.50	27.90	9,468.4	402.3	371.3	446,854.55	724,245.98	32° 13' 35.184 N	103° 36' 29.403 W
9,774.0	82.70	27.90	9,476.1	443.2	393.0	446,895.52	724,267.68	32° 13' 35.587 N	103° 36' 29.147 W
9,868.0	85.90	27.50	9,485.4	526.0	436.5	446,978.33	724,311.15	32° 13' 36.404 N	103° 36' 28.634 W
9,963.0	88.90	29.00	9,489.8	609.6	481.4	447,061.91	724,356.06	32° 13' 37.228 N	103° 36' 28.105 W
10,057.0	89.40	26.10	9,491.1	692.9	524.8	447,145.24	724,399.53	32° 13' 38.050 N	103° 36' 27.592 W
10,152.0	89.00	21.90	9,492.5	779.7	563.5	447,231.99	724,438.16	32° 13' 38.906 N	103° 36' 27.136 W
10,246.0	87.60	15.60	9,495.3	868.6	593.6	447,320.92	724,468.34	32° 13' 39.784 N	103° 36' 26.777 W
10,264.5	87.74	14.64	9,496.0	886.5	598.5	447,338.76	724,473.17	32° 13' 39.960 N	103° 36' 26.720 W
Entered Hard Line Box @ 10265' MD / 9496' TVD									
10,340.0	88.30	10.70	9,498.6	960.1	615.0	447,412.37	724,489.71	32° 13' 40.687 N	103° 36' 26.522 W
10,435.0	89.20	6.80	9,500.7	1,053.9	629.5	447,506.22	724,504.15	32° 13' 41.615 N	103° 36' 26.346 W
10,529.0	89.60	0.80	9,501.7	1,147.7	635.7	447,599.97	724,510.38	32° 13' 42.542 N	103° 36' 26.266 W
10,623.0	89.40	0.80	9,502.5	1,241.7	637.0	447,693.95	724,511.69	32° 13' 43.472 N	103° 36' 26.243 W



HP
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Macho Nacho State #6H
Project:	Lea County, NM	TVD Reference:	Well @ 3597.0usft (McVay #8)
Site:	Sec 7,T24S,R33E	MD Reference:	Well @ 3597.0usft (McVay #8)
Well:	Macho Nacho State #6H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,718.0	90.60	359.80	9,502.5	1,336.6	637.5	447,788.95	724,512.19	32° 13' 44.412 N	103° 36' 26.230 W
10,812.0	90.60	1.90	9,501.5	1,430.6	638.9	447,882.93	724,513.58	32° 13' 45.342 N	103° 36' 26.207 W
10,906.0	89.90	1.90	9,501.1	1,524.6	642.0	447,976.87	724,516.70	32° 13' 46.271 N	103° 36' 26.163 W
11,001.0	90.80	1.50	9,500.5	1,619.5	644.8	448,071.83	724,519.52	32° 13' 47.211 N	103° 36' 26.123 W
11,095.0	90.10	0.80	9,499.8	1,713.5	646.7	448,165.81	724,521.40	32° 13' 48.141 N	103° 36' 26.093 W
11,189.0	87.10	1.90	9,502.1	1,807.4	648.9	448,259.74	724,523.62	32° 13' 49.070 N	103° 36' 26.060 W
11,284.0	88.70	0.10	9,505.6	1,902.4	650.6	448,354.66	724,525.27	32° 13' 50.009 N	103° 36' 26.033 W
11,378.0	89.00	1.20	9,507.5	1,996.3	651.6	448,448.63	724,526.34	32° 13' 50.939 N	103° 36' 26.014 W
11,472.0	90.10	358.70	9,508.2	2,090.3	651.6	448,542.62	724,526.26	32° 13' 51.869 N	103° 36' 26.007 W
11,567.0	89.40	357.70	9,508.6	2,185.3	648.6	448,637.57	724,523.27	32° 13' 52.809 N	103° 36' 26.034 W
11,662.0	90.10	358.00	9,509.0	2,280.2	645.0	448,732.50	724,519.71	32° 13' 53.749 N	103° 36' 26.068 W
11,756.0	91.00	357.30	9,508.1	2,374.1	641.2	448,826.41	724,515.86	32° 13' 54.678 N	103° 36' 26.106 W
11,850.0	91.50	357.70	9,506.1	2,468.0	637.1	448,920.30	724,511.76	32° 13' 55.608 N	103° 36' 26.146 W
11,945.0	92.00	357.00	9,503.2	2,562.9	632.7	449,015.15	724,507.37	32° 13' 56.546 N	103° 36' 26.190 W
12,039.0	90.30	358.40	9,501.3	2,656.8	628.9	449,109.05	724,503.60	32° 13' 57.476 N	103° 36' 26.226 W
12,133.0	90.80	358.00	9,500.4	2,750.7	625.9	449,203.00	724,500.64	32° 13' 58.406 N	103° 36' 26.253 W
12,228.0	91.10	357.30	9,498.8	2,845.6	622.1	449,297.91	724,496.75	32° 13' 59.345 N	103° 36' 26.291 W
12,322.0	89.70	359.80	9,498.2	2,939.6	619.7	449,391.87	724,494.37	32° 14' 0.275 N	103° 36' 26.312 W
12,417.0	87.80	0.50	9,500.2	3,034.5	619.9	449,486.84	724,494.62	32° 14' 1.215 N	103° 36' 26.301 W
12,511.0	87.80	0.50	9,503.8	3,128.5	620.7	449,580.77	724,495.44	32° 14' 2.144 N	103° 36' 26.284 W
12,605.0	88.30	0.10	9,507.0	3,222.4	621.2	449,674.71	724,495.93	32° 14' 3.074 N	103° 36' 26.271 W
12,700.0	88.70	359.10	9,509.5	3,317.4	620.6	449,769.67	724,495.27	32° 14' 4.014 N	103° 36' 26.271 W
12,794.0	89.40	359.40	9,511.1	3,411.4	619.3	449,863.65	724,494.04	32° 14' 4.944 N	103° 36' 26.278 W
12,888.0	88.00	0.10	9,513.2	3,505.3	618.9	449,957.62	724,493.63	32° 14' 5.874 N	103° 36' 26.276 W
12,983.0	87.60	0.10	9,516.9	3,600.3	619.1	450,052.55	724,493.79	32° 14' 6.813 N	103° 36' 26.266 W
13,077.0	88.00	0.10	9,520.5	3,694.2	619.3	450,146.48	724,493.96	32° 14' 7.743 N	103° 36' 26.257 W
13,172.0	88.00	359.80	9,523.8	3,789.1	619.2	450,241.43	724,493.87	32° 14' 8.682 N	103° 36' 26.250 W
13,266.0	89.40	0.80	9,525.9	3,883.1	619.7	450,335.40	724,494.37	32° 14' 9.612 N	103° 36' 26.237 W
13,361.0	91.00	0.50	9,525.6	3,978.1	620.7	450,430.39	724,495.44	32° 14' 10.552 N	103° 36' 26.217 W
13,455.0	91.70	0.50	9,523.4	4,072.1	621.6	450,524.36	724,496.26	32° 14' 11.482 N	103° 36' 26.200 W
13,550.0	89.70	1.50	9,522.2	4,167.0	623.2	450,619.33	724,497.92	32° 14' 12.421 N	103° 36' 26.174 W
13,644.0	88.50	1.50	9,523.7	4,261.0	625.7	450,713.28	724,500.38	32° 14' 13.351 N	103° 36' 26.138 W
13,738.0	89.20	0.50	9,525.6	4,354.9	627.3	450,807.25	724,502.02	32° 14' 14.281 N	103° 36' 26.111 W
13,833.0	88.90	359.10	9,527.1	4,449.9	627.0	450,902.23	724,501.69	32° 14' 15.221 N	103° 36' 26.107 W
13,927.0	88.30	358.00	9,529.4	4,543.9	624.6	450,996.17	724,499.31	32° 14' 16.150 N	103° 36' 26.128 W
14,021.0	90.30	0.50	9,530.6	4,637.8	623.4	451,090.15	724,498.08	32° 14' 17.080 N	103° 36' 26.135 W
14,115.0	91.10	358.40	9,529.4	4,731.8	622.5	451,184.13	724,497.18	32° 14' 18.010 N	103° 36' 26.138 W
14,147.3	91.10	358.40	9,528.8	4,764.1	621.6	451,216.41	724,496.28	32° 14' 18.330 N	103° 36' 26.146 W
Exited Hard Line Box @ 14147' MD / 9529' TVD									
14,247.0	91.10	358.40	9,526.9	4,863.8	618.8	451,316.05	724,493.50	32° 14' 19.316 N	103° 36' 26.170 W
TD @ 14247' MD / 9527' TVD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
8,790.0	8,787.8	-7.2	124.8	Tie In @ 8790' MD / 8788' TVD
10,264.5	9,496.0	868.5	598.5	Entered Hard Line Box @ 10265' MD / 9496' TVD
14,147.3	9,528.8	4,764.1	621.6	Exited Hard Line Box @ 14147' MD / 9529' TVD
14,247.0	9,526.9	4,863.8	618.8	TD @ 14247' MD / 9527' TVD