

Results of Directional Survey

API number:	30-025-39883		
OGRID:		Operator:	COG OPERATING LLC
		Property:	MACHO NACHO STATE # 2H

surface	ULSTR:	H	07	T	24S	R	33E
				1870	FNL	330	FEL

5224

BH Loc	ULSTR:	E	07	T	24S	R	33E
15337	MD	10893.4	TVD	1894	FNL	354	FWL
						4870	FEL

Top Perf/OH	ULSTR:	H	07	T	24S	R	33E
11126	MD	10946.1	TVD	1885	FNL	668	FEL

Bot Perf/OH	ULSTR:	E	07	T	24S	R	33E
15237	MD	10894.9	TVD	1891	FNL	454	FWL
						4770	FEL

	MD	N/S	E/W	VD
	11094	-15.35	-307.99	10936.45
TOP PERFS/OH	11126	-15.45	-338.48	10946.13
	11126	-15.45	-338.48	10946.13
	15126	-18.62	-4329.07	10895.34
BOT PERFS/OH	15237	-21.43	-4440.03	10894.86
	15281	-22.55	-4484.01	10894.67

NEXT TO LAST	15281	-22.55	-4484.01	10894.67
LAST READING	15337	-24.21	-4539.98	10893.40
TD	15337	-24.21	-4539.98	10893.40

Surface Location	1870	FN	330	FE
Projected BHL	1894	FN	4870	FE
Location of				
Top Perfs/OH	1885	FN	668	FE
Bottom Perfs/OH	1891	FN	4770	FE

SUMMARY of Subsurface Locations

Surface Location	H-07-24S-33E	1870	FN	330	FE	Vert. Depth
Top Perfs/OH	H-07-24S-33E	1885	FN	668	FE	10946.13
Bottom Perfs/OH	E-07-24S-33E	1891	FN	4770	FE	10894.86
Projected TD	E-07-24S-33E	1894	FN	4870	FE	10893.40

OCT 30 2013

OPERATOR COG Operating LLC
WELL/LEASE Macho Nacho ST 2H
COUNTY Lea, NM

STATE OF NEW MEXICO
DEVIATION REPORT

350	1.03
750	0.64
1050	0.51
1262	1.00
1085	0.70
1690	0.70
2820	0.70
3396	1.80
5410	1.40
5903	0.90
6370	0.50
6880	0.30
7384	0.80
7857	1.00
8000	1.30
8300	0.49
8800	0.98
9100	0.64
9400	1.30
9681	1.58
9969	1.90
10324	0.87
10352	0.90
10354	1.10
10368	1.00
10399	1.00
10431	5.50
10461	11.10

HOBBS OCD

OCT 24 2013

RECEIVED

SIGNED BY: *Ron Scandolari*

RON SCANDOLARI, VP-CONTRACT DRILLING

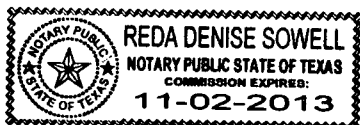
STATE OF TEXAS

COUNTY OF MIDLAND

ON THIS 10 DAY OF October, 2013, BEFORE ME, R SOWELL, A NOTARY PUBLIC, PERSONALLY APPEARED RON SCANDOLARI, WHO ACKNOWLEDGED AND EXECUTED THIS DOCUMENT. WITNESS MY HAND AND OFFICIAL SEAL.

(SEAL)

Reda Denise Sowell
NOTARY PUBLIC



OPERATOR COG Operating LLC
WELL/LEASE Macho Nacho ST 2H
COUNTY Lea, NM

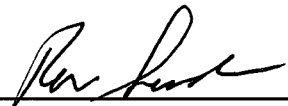
STATE OF NEW MEXICO
DEVIATION REPORT

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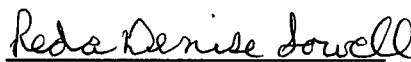
RON SCNADOLARI, VP-CONTRACT DRILLING

STATE OF TEXAS
COUNTY OF MIDLAND

ON THIS 10 DAY OF October, 2013, BEFORE ME, R SOWELL, A NOTARY
PUBLIC, PERSONALLY APPEARED RON SCANDOLARI, WHO ACKNOWLEDGED AND EXECUTED
THIS DOCUMENT. WITNESS MY HAND AND OFFICIAL SEAL.

(SEAL)




NOTARY PUBLIC

OPERATOR COG Operating LLC
WELL/LEASE Macho Nacho ST 2H
COUNTY Lea, NM

STATE OF NEW MEXICO
DEVIATION REPORT

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HOBBS OCD

OCT 24 2013

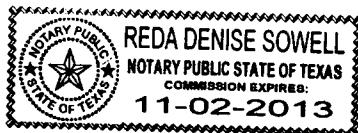
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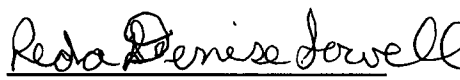
SIGNED BY: 
RON SCNADOLARI, VP-CONTRACT DRILLING

STATE OF TEXAS
COUNTY OF MIDLAND

ON THIS 10 DAY OF October, 2013, BEFORE ME, R SOWELL, A NOTARY
PUBLIC, PERSONALLY APPEARED RON SCANDOLARI, WHO ACKNOWLEDGED AND EXECUTED
THIS DOCUMENT. WITNESS MY HAND AND OFFICIAL SEAL.

(SEAL)




NOTARY PUBLIC



A GYRO TECHNOLOGIES INC. COMPANY

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

July 2, 2013

HOBBS OCD

OCT 24 2013

RECEIVED

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

Attn: Kanicia Castillo

RE: **Macho Nacho State No. 002H**

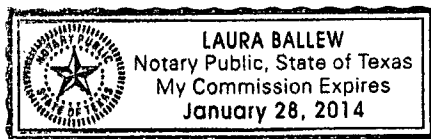
Please find enclosed a copy of the survey from 0.00' to 10325.00' ran on the above referenced well.

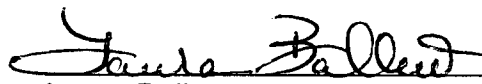
Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 2nd day of July, A.D., 2013, by Keith Havelka.





Laura Ballew
Notary Public, State of Texas



Company: COG Operating LLC (Concho)
Lease/Well: Macho Nacho State/No. 002H
Location: S7 T24s R33e
Rig Name: Basic 46
State/County: New Mexico/Lea
Latitude: 32.23, Longitude: -103.67
GRID North is 0.35 Degrees East of True North
VS-Azi: 0.00 Degrees



RKB : 22 Feet

HOBBS OCD

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ...acho state #2h gyro survey.ut

Minimum Curvature Method

Report Date/Time: 7/2/2013 / 11:33

Vaughn Energy Services

Gardendale, TX 79758

(432) 563-5444

Surveyor: Dustin Wedel

Macho Nacho State No. 002H / API 30-025-39886

OCT 24 2013

RECEIVED

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	0.26	76.01	100.00	0.06	0.22	0.23	76.01	0.26
200.00	0.34	67.94	200.00	0.22	0.72	0.75	72.82	0.09
300.00	0.37	104.39	300.00	0.25	1.31	1.33	79.00	0.22
400.00	0.40	140.85	399.99	-0.10	1.84	1.84	92.96	0.24
500.00	0.44	146.82	499.99	-0.69	2.27	2.37	106.87	0.06
600.00	0.49	152.79	599.99	-1.39	2.68	3.02	117.48	0.07
700.00	0.48	142.30	699.98	-2.10	3.13	3.77	123.90	0.09
800.00	0.46	139.81	799.98	-2.74	3.64	4.56	126.93	0.03
900.00	0.62	164.38	899.98	-3.57	4.05	5.39	131.38	0.28
1000.00	0.78	188.96	999.97	-4.76	4.09	6.27	139.35	0.34
1100.00	0.71	200.52	1099.96	-6.02	3.76	7.10	147.97	0.16
1200.00	0.65	212.08	1199.95	-7.08	3.25	7.78	155.35	0.15
1300.00	0.44	228.54	1299.95	-7.81	2.66	8.25	161.21	0.25
1400.00	0.24	245.01	1399.95	-8.15	2.18	8.44	165.05	0.22
1500.00	0.37	301.61	1499.95	-8.07	1.71	8.25	168.01	0.31
1600.00	0.49	358.20	1599.94	-7.48	1.43	7.61	169.18	0.42
1700.00	0.61	2.96	1699.94	-6.52	1.44	6.68	167.52	0.12
1800.00	0.72	7.72	1799.93	-5.37	1.56	5.59	163.85	0.13

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	0.72	10.30	1899.93	-4.13	1.75	4.48	156.99	0.03
2000.00	0.73	4.87	1999.92	-2.87	1.92	3.45	146.23	0.07
2100.00	0.73	2.91	2099.91	-1.60	2.01	2.57	128.64	0.02
2200.00	0.73	8.96	2199.90	-0.34	2.14	2.16	99.07	0.08
2300.00	0.70	5.81	2299.89	0.89	2.30	2.46	68.79	0.05
2400.00	0.67	18.66	2399.89	2.05	2.54	3.27	51.19	0.16
2500.00	0.68	24.89	2499.88	3.13	2.98	4.32	43.56	0.07
2600.00	0.69	37.12	2599.87	4.15	3.59	5.49	40.88	0.15
2700.00	0.78	34.58	2699.86	5.19	4.34	6.76	39.91	0.10
2800.00	0.87	28.04	2799.85	6.42	5.08	8.19	38.38	0.13
2900.00	0.87	39.95	2899.84	7.67	5.93	9.69	37.69	0.18
3000.00	0.86	47.86	2999.83	8.76	6.97	11.19	38.53	0.12
3100.00	1.11	57.27	3099.82	9.79	8.35	12.86	40.46	0.29
3200.00	1.36	66.68	3199.79	10.78	10.25	14.87	43.55	0.32
3300.00	1.36	68.21	3299.76	11.69	12.44	17.07	46.78	0.04
3400.00	1.37	65.75	3399.74	12.62	14.64	19.33	49.22	0.06
3500.00	1.31	70.22	3499.71	13.50	16.81	21.56	51.22	0.12
3600.00	1.25	78.70	3599.68	14.10	18.95	23.62	53.35	0.20
3700.00	0.71	27.80	3699.67	14.86	20.31	25.17	53.80	0.97
3800.00	0.17	308.90	3799.67	15.50	20.49	25.69	52.89	0.70
3900.00	0.37	296.39	3899.67	15.74	20.08	25.52	51.91	0.21
4000.00	0.58	283.88	3999.66	16.01	19.30	25.07	50.33	0.23
4100.00	0.61	266.36	4099.66	16.09	18.28	24.35	48.64	0.18
4200.00	0.63	248.84	4199.65	15.86	17.24	23.43	47.38	0.19
4300.00	1.14	196.08	4299.64	14.70	16.45	22.06	48.21	0.91
4400.00	1.66	163.32	4399.61	12.36	16.59	20.69	53.31	0.93
4500.00	2.28	140.79	4499.55	9.44	18.26	20.55	62.67	0.98
4600.00	2.90	130.26	4599.45	6.26	21.45	22.34	73.72	0.78
4700.00	2.69	124.55	4699.33	3.30	25.31	25.52	82.57	0.35
4800.00	2.48	118.85	4799.23	0.93	29.13	29.15	88.18	0.33
4900.00	2.10	100.14	4899.15	-0.44	32.83	32.83	90.77	0.83
5000.00	1.72	81.42	4999.10	-0.54	36.11	36.11	90.85	0.72
5100.00	1.55	64.58	5099.06	0.27	38.81	38.81	89.61	0.51
5200.00	1.38	47.74	5199.03	1.66	40.92	40.96	87.68	0.46
5300.00	1.28	54.23	5299.00	3.12	42.72	42.83	85.82	0.18
5400.00	1.17	52.72	5398.98	4.39	44.44	44.66	84.36	0.11
5500.00	1.09	55.15	5498.96	5.56	46.03	46.37	83.12	0.10
5600.00	1.01	57.59	5598.94	6.57	47.56	48.01	82.13	0.09
5700.00	0.84	71.12	5698.93	7.28	48.99	49.53	81.55	0.27

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
5800.00	0.67	84.65	5798.92	7.57	50.27	50.84	81.43	0.24
5900.00	0.45	9.71	5898.92	8.01	50.92	51.55	81.06	0.71
6000.00	0.23	294.77	5998.91	8.49	50.81	51.51	80.52	0.45
6100.00	0.34	282.14	6098.91	8.63	50.34	51.07	80.27	0.13
6200.00	0.46	263.51	6198.91	8.65	49.65	50.39	80.11	0.17
6300.00	0.47	261.31	6298.91	8.54	48.84	49.58	80.08	0.02
6400.00	0.49	257.11	6398.90	8.39	48.02	48.74	80.09	0.04
6500.00	0.44	253.21	6498.90	8.18	47.23	47.93	80.18	0.06
6600.00	0.40	251.31	6598.90	7.96	46.53	47.20	80.30	0.05
6700.00	0.42	240.51	6698.90	7.66	45.88	46.52	80.52	0.08
6800.00	0.44	247.70	6798.89	7.34	45.21	45.80	80.78	0.06
6900.00	0.48	218.58	6898.89	6.87	44.60	45.13	81.24	0.23
7000.00	0.52	189.46	6998.89	6.10	44.27	44.68	82.16	0.25
7100.00	0.53	177.26	7098.88	5.19	44.21	44.52	83.30	0.11
7200.00	0.53	169.06	7198.88	4.28	44.32	44.53	84.49	0.08
7300.00	0.83	179.32	7298.87	3.10	44.42	44.53	86.01	0.32
7400.00	1.12	189.58	7398.86	1.41	44.27	44.29	88.17	0.34
7500.00	1.03	167.00	7498.84	-0.42	44.31	44.31	90.55	0.43
7600.00	0.93	144.43	7598.82	-1.96	44.98	45.02	92.49	0.39
7700.00	1.05	149.38	7698.81	-3.40	45.92	46.04	94.24	0.15
7800.00	1.17	146.33	7798.79	-5.04	46.95	47.22	96.13	0.13
7900.00	1.26	144.81	7898.77	-6.78	48.15	48.62	98.02	0.10
8000.00	1.35	139.28	7998.74	-8.58	49.55	50.29	99.82	0.16
8100.00	1.32	123.83	8098.72	-10.11	51.27	52.26	101.15	0.36
8200.00	1.28	108.39	8198.69	-11.10	53.29	54.43	101.77	0.35
8300.00	1.33	119.64	8298.66	-12.03	55.36	56.65	102.26	0.26
8400.00	1.38	126.89	8398.64	-13.33	57.33	58.86	103.08	0.18
8500.00	1.44	121.77	8498.61	-14.71	59.36	61.15	103.92	0.14
8600.00	1.49	118.65	8598.57	-15.99	61.57	63.61	104.56	0.10
8700.00	1.31	121.19	8698.54	-17.21	63.69	65.97	105.12	0.20
8800.00	1.12	123.73	8798.52	-18.34	65.48	68.00	105.65	0.19
8900.00	1.05	99.32	8898.50	-19.04	67.20	69.84	105.82	0.47
9000.00	0.99	74.92	8998.49	-18.96	68.94	71.50	105.38	0.44
9100.00	0.77	91.07	9098.48	-18.75	70.45	72.90	104.90	0.32
9200.00	0.56	107.22	9198.47	-18.91	71.59	74.05	104.79	0.28
9300.00	0.84	48.40	9298.46	-18.57	72.61	74.94	104.34	0.73
9400.00	1.12	349.59	9398.45	-17.12	72.98	74.96	103.20	0.99
9500.00	0.79	327.09	9498.44	-15.58	72.43	74.09	102.14	0.49
9600.00	0.46	304.60	9598.43	-14.78	71.73	73.24	101.64	0.40

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
9700.00	0.82	280.63	9698.43	-14.42	70.70	72.15	101.53	0.45
9800.00	1.19	272.67	9798.41	-14.24	68.95	70.41	101.67	0.39
9900.00	0.90	248.06	9898.39	-14.49	67.19	68.73	102.17	0.53
10000.00	0.62	223.45	9998.39	-15.18	66.08	67.80	102.93	0.43
10200.00	0.91	33.36	10198.38	-14.64	66.21	67.81	102.47	0.76
10300.00	1.13	43.87	10298.36	-13.27	67.33	68.62	101.15	0.29
10325.00	0.84	58.11	10323.36	-12.99	67.65	68.89	100.87	1.49



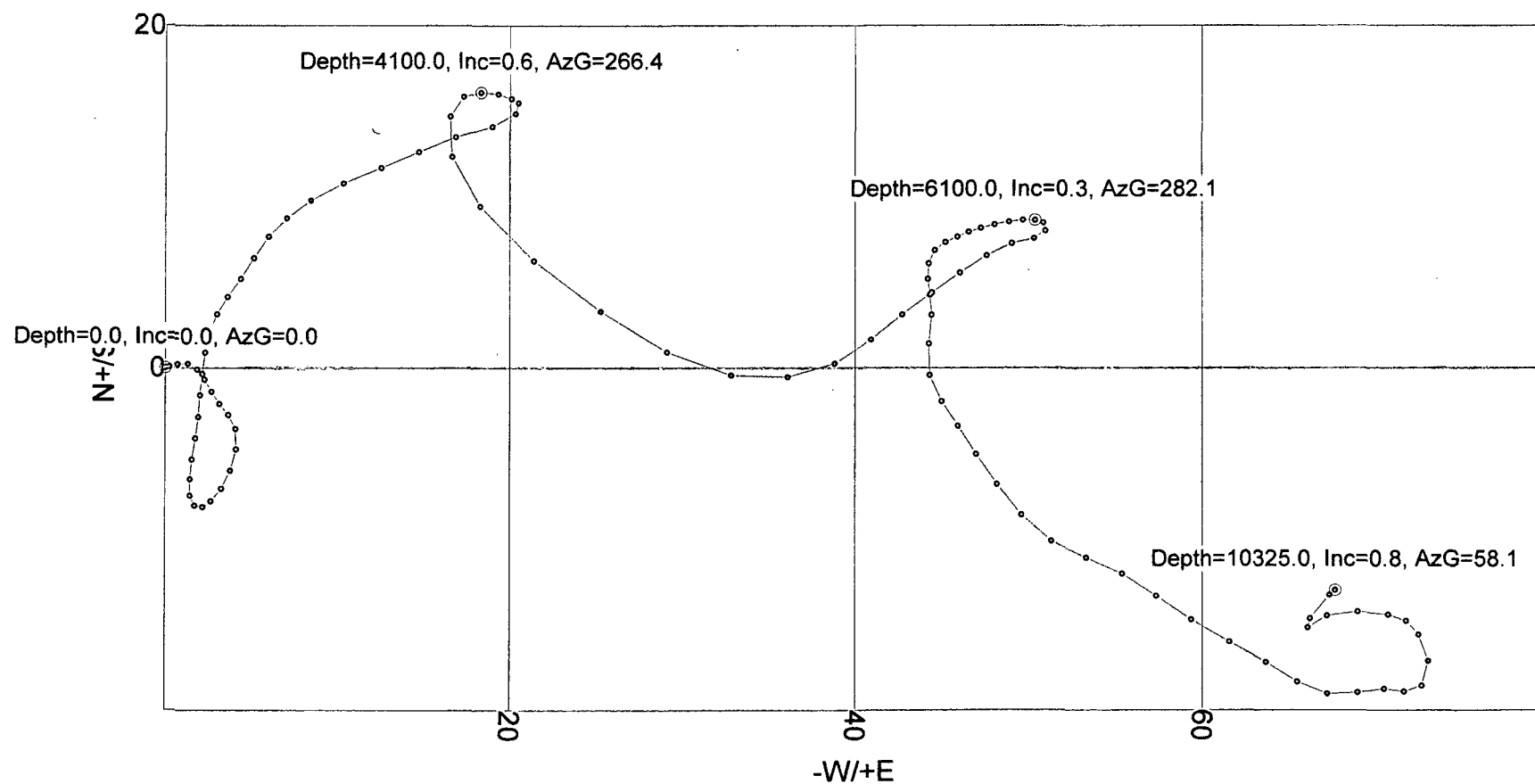
Vaughn Energy Services
Gardendale, TX 79758
(432) 563-5444
Surveyor: Dustin Wedel
Macho Nacho State No. 002H / API 30-025-39886



HOBBS OCD

OCT 24 2013

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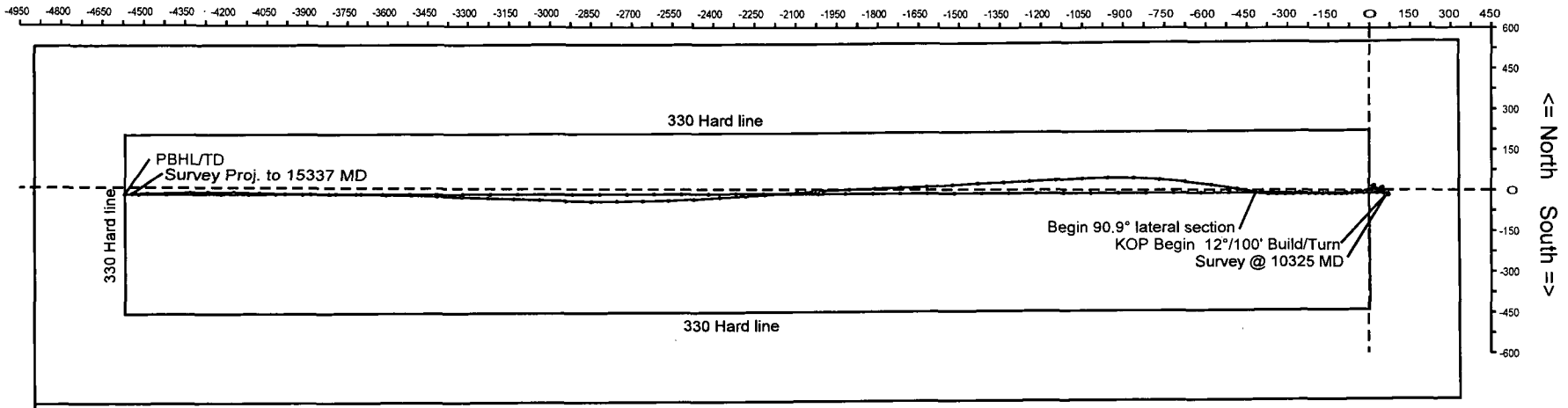


VES Survey Date: 06/24/2013



Macho Nacho State 2H (Basic 46)
Lea County, New Mexico

1 inch = 600 ft <= West East ==>



WELL PROFILE DATA rev3

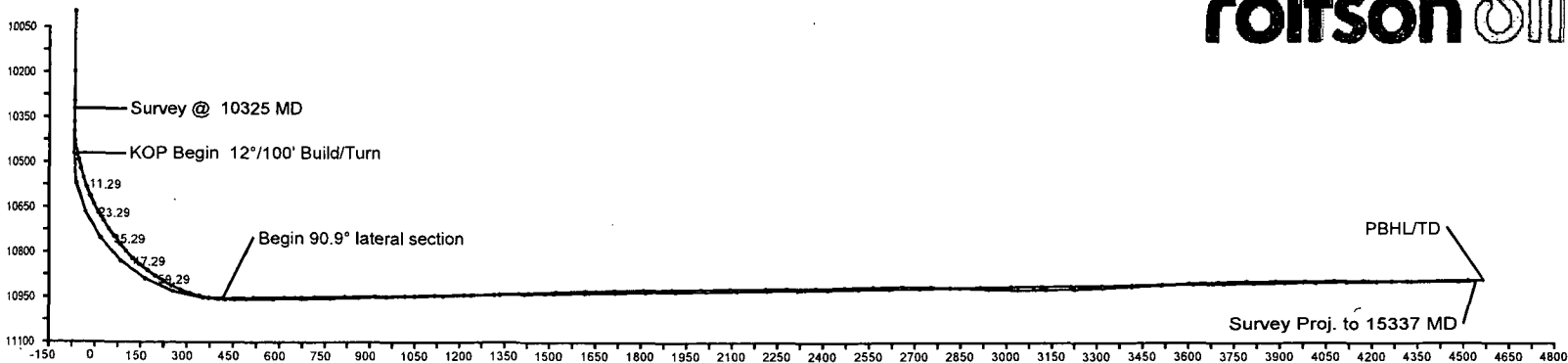
MD	Inc.	Azi.	TVD	N-S	E-W	DLS	Comment	06-25-2013
10325	0.84	58.11	10323	-13	68	0.00	Survey @ 10325 MD	
10473	0.84	58.11	10472	-12	69	0.00	KOP Begin 12°/100' Build/Turn	
11237	90.90	269.77	10955	-10	-415	12.00	Begin 90.9° lateral section	
15388	90.90	269.77	10890	-27	-4566	0.00	PBHL/TD	

Surface Location	NAD27 NM East
Lat: N 32.234188°	Long: W 103.603479°
x: 725676.6	y: 449683.1
Model IGRF2011	Date: 3-May-2013
Declination (MN to TN):	7.37° East
Dip:	60.14
Field Strength:	48426.1
Total Corr. (MN to GN):	6.96° East

WELL PROFILE DATA svys

MD	Inc.	Azi.	TVD	N-S	E-W	DLS	Comment	07-09-2013
15337	91.50	268.20	10893	-24	-4540	0.80	Survey Proj. to 15337 MD	

True Vertical Depth 1 inch = 600 ft



Vertical Section on 269.98 deg azimuth with reference 0.00 N, 0.00 E

rolfson oil

Rolfson Oilfield Services, Inc.

Company: COG Operating, LLC

Well: Macho Nacho State 2H

Location: Lea County, New Mexico Sect7-24S-33E

Date: 9-Jul-2013

Surveys

Page 1

Job# : 7297

NAD27 NM East gr elev=3614 RKB=3636

MD (feet)	Inclination (degrees)	Azimuth (degrees)	TVD RKB (feet)	N-S (feet)	E-W (feet)	DLS (deg/100')	VS @ 269.66° Az (feet)	Grid Y	Grid X	Comments
Surface Location								449683.10	725676.60	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	449683.10	725676.60	Gyro
100.00	0.26	76.01	100.00	0.05	0.22	0.26	-0.22	449683.15	725676.82	
200.00	0.34	67.94	200.00	0.22	0.72	0.09	-0.72	449683.32	725677.32	
300.00	0.37	104.39	300.00	0.25	1.30	0.22	-1.30	449683.35	725677.90	
400.00	0.40	140.85	399.99	-0.10	1.84	0.24	-1.84	449683.00	725678.44	
500.00	0.44	146.82	499.99	-0.69	2.27	0.06	-2.26	449682.41	725678.87	
600.00	0.49	152.79	599.99	-1.39	2.67	0.07	-2.66	449681.71	725679.27	
700.00	0.48	142.30	699.98	-2.10	3.12	0.09	-3.11	449681.00	725679.72	
800.00	0.46	139.81	799.98	-2.74	3.64	0.03	-3.62	449680.36	725680.24	
900.00	0.62	164.38	899.98	-3.57	4.04	0.28	-4.02	449679.53	725680.64	
1000.00	0.78	188.96	999.97	-4.76	4.08	0.34	-4.06	449678.34	725680.68	
1100.00	0.71	200.52	1099.96	-6.02	3.76	0.17	-3.72	449677.08	725680.36	
1200.00	0.65	212.08	1199.95	-7.08	3.24	0.15	-3.20	449676.02	725679.84	
1300.00	0.44	228.54	1299.95	-7.81	2.65	0.26	-2.61	449675.29	725679.25	
1400.00	0.24	245.01	1399.95	-8.15	2.18	0.22	-2.13	449674.95	725678.78	
1500.00	0.37	301.61	1499.95	-8.07	1.71	0.31	-1.66	449675.03	725678.31	
1600.00	0.49	358.20	1599.94	-7.48	1.42	0.42	-1.38	449675.62	725678.02	
1700.00	0.61	2.96	1699.94	-6.52	1.44	0.13	-1.40	449676.58	725678.04	
1800.00	0.72	7.72	1799.93	-5.36	1.55	0.12	-1.52	449677.74	725678.15	
1900.00	0.72	10.30	1899.93	-4.12	1.74	0.03	-1.72	449678.98	725678.34	
2000.00	0.73	4.87	1999.92	-2.87	1.91	0.07	-1.89	449680.23	725678.51	
2100.00	0.73	2.91	2099.91	-1.60	2.00	0.02	-1.99	449681.50	725678.60	
2200.00	0.73	8.96	2199.90	-0.33	2.13	0.08	-2.13	449682.77	725678.73	
2300.00	0.70	5.81	2299.89	0.90	2.29	0.05	-2.30	449684.00	725678.89	
2400.00	0.67	18.66	2399.89	2.07	2.54	0.16	-2.55	449685.17	725679.14	
2500.00	0.68	24.89	2499.88	3.16	2.98	0.07	-2.99	449686.26	725679.58	
2600.00	0.69	37.12	2599.87	4.18	3.59	0.15	-3.61	449687.28	725680.19	
2700.00	0.78	34.58	2699.86	5.22	4.34	0.10	-4.37	449688.32	725680.94	
2800.00	0.87	28.04	2799.85	6.45	5.08	0.13	-5.12	449689.55	725681.68	
2900.00	0.87	39.95	2899.84	7.70	5.93	0.18	-5.97	449690.80	725682.53	

Rolfson Oilfield Services, Inc.

Company: COG Operating, LLC
Well: Macho Nacho State 2H
Location: Lea County, New Mexico Sect7-24S-33E

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NAD27 NM East gr elev=3614 RKB=3636

MD (feet)	Inclination (degrees)	Azimuth (degrees)	TVD RKB (feet)	N-S (feet)	E-W (feet)	DLS (deg/100')	VS @ 269.66° Az (feet)	Grid Y	Grid X	Comments
3000.00	0.86	47.86	2999.83	8.78	6.97	0.12	-7.02	449691.88	725683.57	
3100.00	1.11	57.27	3099.82	9.81	8.34	0.30	-8.40	449692.91	725684.94	
3200.00	1.36	66.68	3199.79	10.80	10.25	0.32	-10.31	449693.90	725686.85	
3300.00	1.36	68.21	3299.76	11.72	12.44	0.04	-12.51	449694.82	725689.04	
3400.00	1.37	65.75	3399.74	12.65	14.63	0.06	-14.70	449695.75	725691.23	
3500.00	1.31	70.22	3499.71	13.52	16.80	0.12	-16.88	449696.62	725693.40	
3600.00	1.25	78.70	3599.68	14.13	18.94	0.20	-19.02	449697.23	725695.54	
3700.00	0.71	27.80	3699.67	14.89	20.30	0.97	-20.39	449697.99	725696.90	
3800.00	0.17	308.90	3799.67	15.53	20.47	0.70	-20.56	449698.63	725697.07	
3900.00	0.37	296.39	3899.67	15.76	20.07	0.21	-20.16	449698.86	725696.67	
4000.00	0.58	283.88	3999.66	16.03	19.29	0.23	-19.38	449699.13	725695.89	
4100.00	0.61	266.36	4099.66	16.12	18.26	0.18	-18.36	449699.22	725694.86	
4200.00	0.63	248.84	4199.65	15.89	17.22	0.19	-17.31	449698.99	725693.82	
4300.00	1.14	196.08	4299.64	14.73	16.43	0.91	-16.52	449697.83	725693.03	
4400.00	1.66	163.32	4399.61	12.39	16.57	0.93	-16.65	449695.49	725693.17	
4500.00	2.28	140.79	4499.55	9.46	18.25	0.98	-18.30	449692.56	725694.85	
4600.00	2.90	130.26	4599.45	6.28	21.43	0.78	-21.47	449689.38	725698.03	
4700.00	2.69	124.55	4699.33	3.32	25.30	0.35	-25.32	449686.42	725701.90	
4800.00	2.48	118.85	4799.23	0.94	29.13	0.33	-29.13	449684.04	725705.73	
4900.00	2.10	100.14	4899.15	-0.42	32.82	0.83	-32.82	449682.68	725709.42	
5000.00	1.72	81.42	4999.10	-0.52	36.11	0.73	-36.11	449682.58	725712.71	
5100.00	1.55	64.58	5099.06	0.28	38.82	0.51	-38.82	449683.38	725715.42	
5200.00	1.38	47.74	5199.03	1.67	40.93	0.46	-40.94	449684.77	725717.53	
5300.00	1.28	54.23	5299.00	3.13	42.73	0.18	-42.74	449686.23	725719.33	
5400.00	1.17	52.72	5398.98	4.41	44.45	0.11	-44.47	449687.51	725721.05	
5500.00	1.09	55.15	5498.96	5.57	46.04	0.09	-46.07	449688.67	725722.64	
5600.00	1.01	57.59	5598.94	6.58	47.56	0.09	-47.60	449689.68	725724.16	
5700.00	0.84	71.12	5698.93	7.29	49.00	0.28	-49.04	449690.39	725725.60	
5800.00	0.67	84.65	5798.92	7.58	50.28	0.25	-50.32	449690.68	725726.88	
5900.00	0.45	9.71	5898.91	8.03	50.92	0.70	-50.97	449691.13	725727.52	

Rolfson Oilfield Services, Inc.

Company: COG Operating, LLC
Well: Macho Nacho State 2H
Location: Lea County, New Mexico Sect7-24S-33E

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MD (feet)	Inclination (degrees)	Azimuth (degrees)	TVD RKB (feet)	N-S (feet)	E-W (feet)	DLS (deg/100')	VS @ 269.66° Az (feet)	Grid Y	Grid X	NAD27 NM East gr elev=3614 RKB=3636 Comments
6000.00	0.23	294.77	5998.91	8.50	50.81	0.45	-50.86	449691.60	725727.41	
6100.00	0.34	282.14	6098.91	8.64	50.34	0.13	-50.39	449691.74	725726.94	
6200.00	0.46	263.51	6198.91	8.66	49.65	0.18	-49.70	449691.76	725726.25	
6300.00	0.47	261.31	6298.91	8.55	48.84	0.02	-48.89	449691.65	725725.44	
6400.00	0.49	257.11	6398.90	8.40	48.02	0.04	-48.07	449691.50	725724.62	
6500.00	0.44	253.21	6498.90	8.19	47.24	0.06	-47.28	449691.29	725723.84	
6600.00	0.40	251.31	6598.90	7.97	46.54	0.04	-46.58	449691.07	725723.14	
6700.00	0.42	240.51	6698.89	7.67	45.89	0.08	-45.93	449690.77	725722.49	
6800.00	0.44	247.70	6798.89	7.35	45.21	0.06	-45.26	449690.45	725721.81	
6900.00	0.48	218.58	6898.89	6.88	44.60	0.23	-44.64	449689.98	725721.20	
7000.00	0.52	189.46	6998.88	6.10	44.26	0.25	-44.30	449689.20	725720.86	
7100.00	0.53	177.26	7098.88	5.19	44.21	0.11	-44.24	449688.29	725720.81	
7200.00	0.53	169.06	7198.88	4.27	44.32	0.08	-44.34	449687.37	725720.92	
7300.00	0.83	179.32	7298.87	3.10	44.42	0.32	-44.43	449686.20	725721.02	
7400.00	1.12	189.58	7398.85	1.41	44.26	0.34	-44.27	449684.51	725720.86	
7500.00	1.03	167.00	7498.84	-0.43	44.30	0.43	-44.30	449682.67	725720.90	
7600.00	0.93	144.43	7598.82	-1.97	44.98	0.40	-44.96	449681.13	725721.58	
7700.00	1.05	149.38	7698.81	-3.42	45.91	0.15	-45.89	449679.68	725722.51	
7800.00	1.17	146.33	7798.79	-5.05	46.95	0.13	-46.92	449678.05	725723.55	
7900.00	1.26	144.81	7898.77	-6.80	48.15	0.10	-48.11	449676.30	725724.75	
8000.00	1.35	139.28	7998.74	-8.59	49.55	0.15	-49.50	449674.51	725726.15	
8100.00	1.32	123.83	8098.71	-10.13	51.27	0.36	-51.21	449672.97	725727.87	
8200.00	1.28	108.39	8198.69	-11.12	53.29	0.35	-53.22	449671.98	725729.89	
8300.00	1.33	119.64	8298.66	-12.05	55.36	0.26	-55.29	449671.05	725731.96	
8400.00	1.38	126.89	8398.64	-13.34	57.33	0.18	-57.25	449669.76	725733.93	
8500.00	1.44	121.77	8498.61	-14.73	59.36	0.14	-59.27	449668.37	725735.96	
8600.00	1.49	118.65	8598.57	-16.01	61.57	0.09	-61.48	449667.09	725738.17	
8700.00	1.31	121.19	8698.54	-17.23	63.69	0.19	-63.59	449665.87	725740.29	
8800.00	1.12	123.73	8798.52	-18.36	65.48	0.20	-65.37	449664.74	725742.08	
8900.00	1.05	99.32	8898.50	-19.05	67.20	0.46	-67.08	449664.05	725743.80	

Rolfson Oilfield Services, Inc.

Company: COG Operating, LLC
Well: Macho Nacho State 2H
Location: Lea County, New Mexico Sect7-24S-33E

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MD (feet)	Inclination (degrees)	Azimuth (degrees)	TVD RKB (feet)	N-S (feet)	E-W (feet)	DLS (deg/100')	VS @ 269.66° Az (feet)	Grid Y	NAD27 NM East gr elev=3614 RKB=3636 Grid X	Comments
9000.00	0.99	74.92	8998.49	-18.98	68.94	0.44	-68.82	449664.12	725745.54	
9100.00	0.77	91.07	9098.48	-18.77	70.44	0.33	-70.33	449664.33	725747.04	
9200.00	0.56	107.22	9198.47	-18.92	71.58	0.28	-71.47	449664.18	725748.18	
9300.00	0.84	48.40	9298.46	-18.58	72.60	0.73	-72.48	449664.52	725749.20	
9400.00	1.12	349.59	9398.45	-17.13	72.97	0.99	-72.86	449665.97	725749.57	
9500.00	0.79	327.09	9498.44	-15.59	72.42	0.49	-72.32	449667.51	725749.02	
9600.00	0.46	304.60	9598.43	-14.79	71.71	0.41	-71.62	449668.31	725748.31	
9700.00	0.82	280.63	9698.42	-14.43	70.68	0.44	-70.59	449668.67	725747.28	
9800.00	1.19	272.67	9798.41	-14.25	68.94	0.39	-68.85	449668.85	725745.54	
9900.00	0.90	248.06	9898.39	-14.49	67.17	0.53	-67.08	449668.61	725743.77	
10000.00	0.62	223.45	9998.38	-15.18	66.07	0.42	-65.98	449667.92	725742.67	
10200.00	0.91	33.36	10198.38	-14.64	66.20	0.76	-66.11	449668.46	725742.80	
10300.00	1.13	43.87	10298.36	-13.26	67.32	0.29	-67.24	449669.84	725743.92	
10325.00	0.84	58.11	10323.36	-12.99	67.65	1.51	-67.57	449670.11	725744.25	
10370.00	1.00	48.80	10368.35	-12.55	68.22	0.49	-68.15	449670.55	725744.82	MWD surveys
10401.00	1.00	349.10	10399.35	-12.11	68.37	3.21	-68.30	449670.99	725744.97	
10433.00	5.50	287.70	10431.29	-11.37	66.86	15.93	-66.79	449671.73	725743.46	
10464.00	11.10	281.60	10461.96	-10.32	62.52	18.26	-62.46	449672.78	725739.12	
10496.00	16.00	282.70	10493.06	-8.73	55.19	15.33	-55.14	449674.37	725731.79	
10527.00	17.10	284.30	10522.77	-6.66	46.61	3.84	-46.57	449676.44	725723.21	
10559.00	18.50	284.20	10553.24	-4.25	37.13	4.38	-37.10	449678.85	725713.73	
10590.00	19.60	279.50	10582.54	-2.19	27.23	6.09	-27.22	449680.91	725703.83	
10622.00	21.70	272.10	10612.49	-1.09	16.02	10.46	-16.02	449682.01	725692.62	
10653.00	25.10	265.50	10640.94	-1.39	3.73	13.83	-3.73	449681.71	725680.33	
10685.00	30.40	259.40	10669.26	-3.42	-11.00	18.77	11.02	449679.68	725665.60	
10716.00	33.40	258.80	10695.57	-6.52	-27.09	9.73	27.13	449676.58	725649.51	
10748.00	34.90	261.00	10722.05	-9.66	-44.77	6.07	44.83	449673.44	725631.83	
10779.00	35.80	264.60	10747.34	-11.90	-62.56	7.32	62.63	449671.20	725614.04	
10811.00	37.50	267.30	10773.02	-13.24	-81.61	7.32	81.69	449669.86	725594.99	
10842.00	40.70	268.10	10797.07	-14.02	-101.14	10.45	101.22	449669.08	725575.46	

Rolfson Oilfield Services, Inc.

Company: COG Operating, LLC
Well: Macho Nacho State 2H
Location: Lea County, New Mexico Sect7-24S-33E

Date: 9-Jul-2013
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NAD27 NM East gr elev=3614 RKB=3636

MD (feet)	Inclination (degrees)	Azimuth (degrees)	TVD RKB (feet)	N-S (feet)	E-W (feet)	DLS (deg/100')	VS @ 269.66° Az (feet)	Grid Y	Grid X	Comments
10874.00	45.20	270.70	10820.49	-14.23	-122.93	15.11	123.02	449668.87	725553.67	
10905.00	50.40	271.20	10841.30	-13.84	-145.89	16.82	145.97	449669.26	725530.71	
10937.00	53.80	271.00	10860.96	-13.36	-171.13	10.64	171.21	449669.74	725505.47	
10968.00	55.30	270.60	10878.94	-13.01	-196.38	4.95	196.45	449670.09	725480.22	
11000.00	58.20	269.40	10896.48	-13.01	-223.14	9.59	223.21	449670.09	725453.46	
11031.00	63.00	268.10	10911.70	-13.61	-250.13	15.91	250.21	449669.49	725426.47	
11063.00	67.20	268.00	10925.17	-14.60	-279.13	13.13	279.21	449668.50	725397.47	
11094.00	70.10	269.00	10936.45	-15.35	-307.99	9.83	308.08	449667.75	725368.61	
11126.00	74.70	270.60	10946.13	-15.45	-338.48	15.14	338.57	449667.65	725338.12	
11158.00	79.80	272.30	10953.19	-14.66	-369.67	16.76	369.75	449668.44	725306.93	
11188.00	85.20	280.10	10957.11	-11.44	-399.21	31.43	399.27	449671.66	725277.39	
11212.00	89.80	281.40	10958.15	-6.96	-422.76	19.92	422.79	449676.14	725253.84	
11244.00	90.60	279.70	10958.04	-1.11	-454.21	5.87	454.21	449681.99	725222.39	
11275.00	90.60	279.00	10957.72	3.93	-484.80	2.26	484.77	449687.03	725191.80	
11370.00	90.40	278.50	10956.89	18.38	-578.69	0.57	578.57	449701.48	725097.91	
11465.00	91.30	275.50	10955.48	29.96	-672.96	3.30	672.77	449713.06	725003.64	
11560.00	90.90	274.80	10953.65	38.48	-767.56	0.85	767.32	449721.58	724909.04	
11654.00	92.00	271.70	10951.27	43.81	-861.36	3.50	861.09	449726.91	724815.24	
11748.00	90.90	269.10	10948.90	44.47	-955.32	3.00	955.04	449727.57	724721.28	
11842.00	91.00	266.80	10947.34	41.10	-1049.24	2.45	1048.98	449724.20	724627.36	
11937.00	90.80	266.60	10945.84	35.64	-1144.07	0.30	1143.84	449718.74	724532.53	
12032.00	92.00	267.50	10943.52	30.75	-1238.92	1.58	1238.71	449713.85	724437.68	
12127.00	91.90	267.00	10940.29	26.19	-1333.75	0.54	1333.57	449709.29	724342.85	
12223.00	92.50	267.40	10936.61	21.51	-1429.57	0.75	1429.41	449704.61	724247.03	
12317.00	92.30	265.80	10932.67	15.94	-1523.32	1.71	1523.19	449699.04	724153.28	
12412.00	91.50	267.00	10929.52	9.97	-1618.07	1.52	1617.99	449693.07	724058.53	
12507.00	90.80	267.80	10927.61	5.67	-1712.95	1.12	1712.89	449688.77	723963.65	
12602.00	90.90	268.10	10926.20	2.27	-1807.88	0.33	1807.84	449685.37	723868.72	
12696.00	90.70	268.00	10924.89	-0.93	-1901.82	0.24	1901.79	449682.17	723774.78	
12791.00	90.80	266.20	10923.65	-5.74	-1996.69	1.90	1996.68	449677.36	723679.91	

Company: COG Operating, LLC
Well: Macho Nacho State 2H
Location: Lea County, New Mexico Sect7-24S-33E

Job# : 7297

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