

Results of Directional Survey

API number:	30-025-39882		
OGRID:		Operator:	MARBOB ENERGY CORP
		Property:	MACHO NACHO STATE # 1H

surface	ULSTR:	A	07	T 24S	R 33E
				380 FNL	330 FEL

BH Loc	ULSTR:	D	07	T 24S	R 33E
15240 MD		10878.5	TVD	407 FNL	383 FWL
					4841 FEL

Top Perf/OH	ULSTR:	A	07	T 24S	R 33E
11106 MD		10932.7	TVD	460 FNL	715 FEL

Bot Perf/OH	ULSTR:	D	07	T 24S	R 33E
15208 MD		10878.4	TVD	408 FNL	415 FWL
					4809 FEL

	MD	N/S	E/W	VD
	11075	-76.71	-355.76	10924.05
TOP PERFS/OH	11106	-79.54	-385.39	10932.70
	11106	-79.54	-385.39	10932.70
	15086	-32.93	-4356.98	10877.97
BOT PERFS/OH	15208	-28.25	-4478.89	10878.39
	15240	-27.02	-4510.87	10878.50

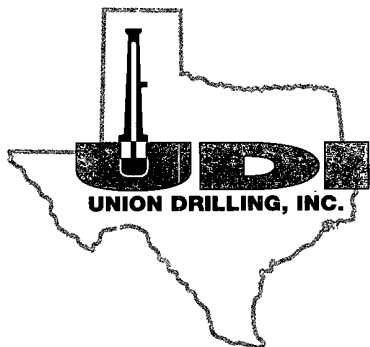
NEXT TO LAST	15086	-32.93	-4356.98	10877.97
LAST READING	15240	-27.02	-4510.87	10878.50
TD	15240	-27.02	-4510.87	10878.50

Surface Location	380 FN	330 FE
Projected BHL	407 FN	4841 FE
Location of		
Top Perfs/OH	460 FN	715 FE
Bottom Perfs/OH	408 FN	4809 FE

SUMMARY of Subsurface Locations

Surface Location	D 07-24S-33E	380 FN	330 FE	Vert. Depth
Top Perfs/OH	A 07-24S-33E	460 FN	715 FE	10932.70
Bottom Perfs/OH	D 07-24S-33E	408 FN	4809 FE	10878.39
Projected TD	D 07-24S-33E	407 FN	4841 FE	10878.50

OCT 25 2012



COG OPERATING, LLC
RECEIVED
JUL 23 2012
ARTESIA WEST

Well Name & Number: Macho Nacho State #1H

SUR: A-07-24S-33E, 380/N & 330/E
BHL: LOT 1 OR D, 07-24S-33E, 407/N & 4841/E
API # 30-025-39882

API Number: 30-025-39882

Location: 380 FNL & 330 FEL, Lot I, Sec. 7, Township 24-S, Range 33-E, Lea County, New Mexico

Operator: COG Operating, LLC

Drilling Contractor: Union Drilling, Inc.

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

RECORD OF INCLINATION

*11 Measured Depth (feet)	12 Course Length (Hundreds of feet)	*13 Angle of Inclination (Degrees)	14 Displacement per Hundred Feet (Sine of Angle X100)	15. Course Displacement (feet)	16 Accumulative Displacement (feet)
369	369	.6	1.05	3.86	3.86
1321	952	.7	1.22	11.63	15.49
2304	983	.8	1.40	13.73	29.22
3246	942	1.7	2.97	27.95	57.17
4116	870	1	1.75	15.18	72.35
4709	593	3.1	5.41	32.08	104.43
5403	694	1.1	1.92	13.32	117.76
6356	953	.1	0.17	1.66	119.42
7305	949	.3	0.52	4.97	124.39
8250	945	.4	0.70	6.60	130.99
8973	723	.6	1.05	7.57	138.56
9771	798	1.25	2.18	17.41	155.97
10721	950	.5	0.87	8.29	164.26
11700	979	.8	1.40	13.67	177.93
12454	754	2.5	4.36	32.90	210.82
DIRECTIONAL TOOK OVER					

Drilling Contractor: Union Drilling, Inc.

By:

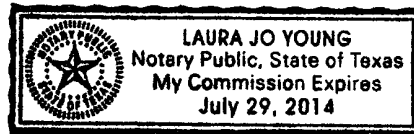
Jim Mayfield
Jim Mayfield

Title: Division Manager

Subscribed and sworn to before me this 11TH Day of July, 2012.

Laura Jo Young
Notary Public
My Commission Expires: July 29, 2014

COUNTY OF TAYLOR)
)
STATE OF TEXAS)



COG OPERATING, LLC
RECEIVED

JUL 09 2012

ARTESIA WEST

COG OPERATING

Triple X

Lea County, NM

Macho Nacho State #1H

VH - Job #32K0512592

HOBBS OCD

OCT 02 2012

RECEIVED

Survey: Gyro

SDI Standard Survey Report

This survey is correct to the best of my knowledge and is supported by actual field data.

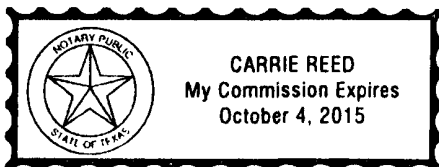
[Signature]

Notarized this date 15th of June, 2012.

[Signature]

Notary Signature
County of Midland
State of Texas

SUR: A-07-24S-33E, 380/N & 330/E
BHL: LOT 1 OR D, 07-24S-33E, 407/N & 4841/E
API # 30-025-39882



Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Macho Nacho State #1H
Project:	Triple X	TVD Reference:	WELL @ 0 00usft (Original Well Elev)
Site:	Lea County, NM	MD Reference:	WELL @ 0 00usft (Original Well Elev)
Well:	Macho Nacho State #1H	North Reference:	Grid
Wellbore:	VH - Job #32K0512592	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0512592	Database:	EDM-Regulatory

Project	Triple X		
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		Lea County, NM			
Site Position:		Northing:	451,172 69 usft	Latitude:	32° 14' 17 819 N
From:	Lat/Long	Easting:	725,665 94 usft	Longitude:	103° 36' 12 532 W
Position Uncertainty:	0 00 usft	Slot Radius:	13-3/16"	Grid Convergence:	0 39 °

Well	Macho Nacho State #1H, Directional (Cresent)					
Well Position	+N/-S	0 00 usft	Northing:	451,172 69 usft	Latitude:	32° 14' 17 819 N
	+E/-W	0 00 usft	Easting:	725,665 94 usft	Longitude:	103° 36' 12 532 W
Position Uncertainty		0 00 usft	Wellhead Elevation:	usft	Ground Level:	0 00 usft

Wellbore	VH - Job #32K0512592				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2012/05/22	7 49	60 17	48,554

Design		VH - Job #32K0512592			
Audit Notes:					
Version:		1 0	Phase:	ACTUAL	Tie On Depth: 0 00
Vertical Section:		Depth From (TVD)	+N/-S	+E/-W	Direction
		(usft)	(usft)	(usft)	(°)
		0 00	0 00	0 00	269 66

Survey Program		Date	2012/06/12		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100 00	10,373 83	Gyro (VH - Job #32K0512592)	Keeper	Keeper Gyro	

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
100 00	0 37	97 07	100 00	-0 04	0 32	97 07	0 32
200 00	0 49	81 90	200 00	-0 02	1 06	91 04	1 06
300 00	0 35	54 18	299 99	0 22	1 74	82 78	1 75
400 00	0 28	102 47	399 99	0 35	2 22	81 15	2 25
500 00	0 11	163 87	499 99	0 20	2 49	85 38	2 49
600 00	0 26	155 04	599 99	-0 10	2 61	92 13	2 61
700 00	0 14	172 63	699 99	-0 42	2 72	98 86	2 75
800 00	0 33	216 08	799 99	-0 78	2 57	106 86	2 68
900 00	0 32	243 91	899 99	-1 13	2 15	117 84	2 43
1,000 00	0 28	187 62	999 99	-1 50	1 86	128 81	2 39
1,100 00	0 39	204 55	1,099 99	-2 05	1 69	140 51	2 66

Scientific Drilling International, Inc.

SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Macho Nacho State #1H
Project:	Triple X	TVD Reference:	WELL @ 0 00usft (Original Well Elev)
Site:	Lea County, NM	MD Reference:	WELL @ 0 00usft (Original Well Elev)
Well:	Macho Nacho State #1H	North Reference:	Grid
Wellbore:	VH - Job #32K0512592	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0512592	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
1,200 00	0 43	206 66	1,199 98	-2 70	1 38	152 90	3 03
1,300 00	0 37	203 20	1,299 98	-3 33	1 08	161 96	3 50
1,400 00	0 61	326 17	1,399 98	-3 18	0 66	168 28	3 25
1,500 00	0 80	340 72	1,499 97	-2 08	0 13	176 33	2 08
1,600 00	0 64	351 39	1,599 96	-0 87	-0 18	191 74	0 89
1,700 00	0 42	73 37	1,699 96	-0 21	0 09	157 75	0 23
1,800 00	0 44	71 73	1,799 96	0 01	0 80	89 08	0 80
1,900 00	0 46	58 61	1,899 95	0 34	1 51	77 23	1 55
2,000 00	0 67	13 69	1,999 95	1 12	1 99	60 65	2 28
2,100 00	0 80	15 68	2,099 94	2 36	2 32	44 49	3 31
2,200 00	0 72	355 87	2,199 93	3 66	2 46	33 93	4 41
2,300 00	1 03	21 48	2,299 92	5 12	2 75	28 19	5 81
2,400 00	0 99	31 71	2,399 91	6 69	3 53	27 80	7 57
2,500 00	0 90	27 11	2,499 89	8 13	4 34	28 11	9 21
2,600 00	0 87	20 30	2,599 88	9 54	4 96	27 48	10 75
2,700 00	0 98	19 68	2,699 87	11 06	5 51	26 51	12 35
2,800 00	1 10	18 93	2,799 85	12 77	6 11	25 58	14 16
2,900 00	1 27	27 86	2,899 83	14 66	6 94	25 34	16 22
3,000 00	1 18	30 29	2,999 81	16 52	7 98	25 77	18 35
3,100 00	1 28	31 95	3,099 78	18 36	9 09	26 34	20 49
3,200 00	1 58	28 94	3,199 75	20 52	10 35	26 77	22 98
3,300 00	1 97	29 25	3,299 70	23 22	11 85	27 04	26 07
3,400 00	1 74	36 00	3,399 65	25 95	13 59	27 64	29 29
3,500 00	1 88	30 58	3,499 60	28 59	15 31	28 17	32 43
3,600 00	1 42	26 18	3,599 56	31 11	16 69	28 22	35 31
3,700 00	0 75	6 18	3,699 54	32 88	17 31	27 77	37 16
3,800 00	0 37	11 66	3,799 54	33 84	17 45	27 27	38 08
3,900 00	0 23	210 68	3,899 54	33 99	17 41	27 12	38 19
4,000 00	0 60	214 72	3,999 53	33 38	17 01	27 00	37 47
4,100 00	1 12	207 83	4,099 52	32 09	16 26	26 86	35 97
4,200 00	1 15	211 21	4,199 50	30 37	15 28	26 71	33 99
4,300 00	1 56	149 59	4,299 48	28 34	15 45	28 60	32 27
4,400 00	2 69	136 48	4,399 41	25 46	17 75	34 89	31 04
4,500 00	2 54	134 81	4,499 31	22 20	20 94	43 33	30 52
4,600 00	2 79	132 71	4,599 20	18 98	24 30	52 00	30 84
4,700 00	3 32	128 50	4,699 05	15 53	28 36	61 29	32 33
4,800 00	3 43	130 33	4,798 88	11 79	32 90	70 28	34 95
4,900 00	3 28	119 40	4,898 71	8 45	37 68	77 36	38 61
5,000 00	2 49	118 14	4,998 58	6 02	42 08	81 86	42 51
5,100 00	1 42	120 19	5,098 52	4 37	45 07	84 46	45 28
5,200 00	1 43	119 27	5,198 49	3 14	47 23	86 19	47 33
5,300 00	1 36	129 20	5,298 46	1 78	49 24	87 93	49 27
5,400 00	1 18	122 44	5,398 44	0 48	51 03	89 46	51 03
5,500 00	1 13	122 85	5,498 42	-0 61	52 72	90 66	52 73

Scientific Drilling International, Inc.

SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Macho Nacho State #1H
Project:	Truple X	TVD Reference:	WELL @ 0 00usft (Original Well Elev)
Site:	Lea County, NM	MD Reference:	WELL @ 0 00usft (Original Well Elev)
Well:	Macho Nacho State #1H	North Reference:	Grid
Wellbore:	VH - Job #32K0512592	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0512592	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
5,600 00	1 00	111 39	5,598 40	-1 46	54 36	91 54	54 38
5,700 00	0 73	95 41	5,698 39	-1 84	55 81	91 89	55 84
5,800 00	0 84	109 76	5,798 38	-2 15	57 14	92 15	57 18
5,900 00	0 82	92 06	5,898 37	-2 42	58 54	92 37	58 59
6,000 00	0 58	130 50	5,998 36	-2 78	59 64	92 66	59 70
6,100 00	0 63	135 60	6,098 36	-3 50	60 41	93 31	60 51
6,200 00	0 58	213 24	6,198 35	-4 31	60 52	94 08	60 67
6,300 00	0 43	239 90	6,298 35	-4 92	59 91	94 70	60 12
6,400 00	0 54	167 21	6,398 35	-5 57	59 69	95 33	59 95
6,500 00	0 24	288 48	6,498 35	-5 97	59 60	95 72	59 90
6,600 00	0 15	8 65	6,598 35	-5 77	59 42	95 55	59 70
6,700 00	0 19	308 72	6,698 34	-5 54	59 31	95 33	59 57
6,800 00	0 44	293 76	6,798 34	-5 28	58 83	95 13	59 07
6,900 00	0 47	282 99	6,898 34	-5 03	58 08	94 95	58 30
7,000 00	0 43	272 37	6,998 34	-4 92	57 31	94 91	57 52
7,100 00	0 65	277 88	7,098 33	-4 83	56 37	94 90	56 57
7,200 00	0 46	287 08	7,198 33	-4 63	55 42	94 78	55 62
7,300 00	0 48	278 87	7,298 32	-4 45	54 63	94 66	54 81
7,400 00	0 34	263 52	7,398 32	-4 42	53 92	94 69	54 10
7,500 00	0 31	211 44	7,498 32	-4 69	53 48	95 01	53 69
7,600 00	0 42	187 49	7,598 32	-5 28	53 29	95 66	53 55
7,700 00	0 36	197 97	7,698 32	-5 94	53 15	96 38	53 48
7,800 00	0 43	186 81	7,798 31	-6 61	53 01	97 11	53 42
7,900 00	0 53	194 58	7,898 31	-7 43	52 84	98 01	53 36
8,000 00	0 43	153 91	7,998 31	-8 22	52 89	98 83	53 53
8,100 00	0 32	165 69	8,098 30	-8 83	53 13	99 43	53 86
8,200 00	0 19	278 47	8,198 30	-9 07	53 03	99 71	53 80
8,300 00	0 47	247 92	8,298 30	-9 20	52 49	99 94	53 29
8,400 00	0 42	250 71	8,398 30	-9 48	51 76	100 37	52 62
8,500 00	0 53	308 39	8,498 30	-9 31	51 05	100 34	51 90
8,600 00	0 50	307 17	8,598 29	-8 76	50 34	99 87	51 10
8,700 00	0 79	283 05	8,698 29	-8 34	49 32	99 60	50 02
8,800 00	0 69	277 86	8,798 28	-8 10	48 06	99 57	48 73
8,900 00	0 56	279 13	8,898 27	-7 94	46 98	99 60	47 64
9,000 00	0 59	270 24	8,998 27	-7 86	45 98	99 70	46 65
9,100 00	0 57	276 63	9,098 26	-7 80	44 97	99 84	45 64
9,200 00	0 45	278 26	9,198 26	-7 69	44 09	99 89	44 75
9,300 00	0 67	266 08	9,298 25	-7 67	43 12	100 09	43 79
9,400 00	0 50	224 73	9,398 25	-8 02	42 23	100 76	42 98
9,500 00	0 57	173 77	9,498 24	-8 83	41 97	101 88	42 89
9,600 00	0 57	51 88	9,598 24	-9 01	42 42	102 00	43 37
9,700 00	0 29	26 03	9,698 24	-8 48	42 92	101 18	43 75
9,800 00	0 98	161 73	9,798 24	-9 06	43 30	101 82	44 24
9,900 00	3 50	120 57	9,898 15	-11 43	46 20	103 90	47 59

Scientific Drilling International, Inc.

SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Macho Nacho State #1H
Project:	Triple X	TVD Reference:	WELL @ 0 00usft (Original Well Elev)
Site:	Lea County, NM	MD Reference:	WELL @ 0 00usft (Original Well Elev)
Well:	Macho Nacho State #1H	North Reference:	Grid
Wellbore:	VH - Job #32K0512592	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0512592	Database:	EDM-Regulatory

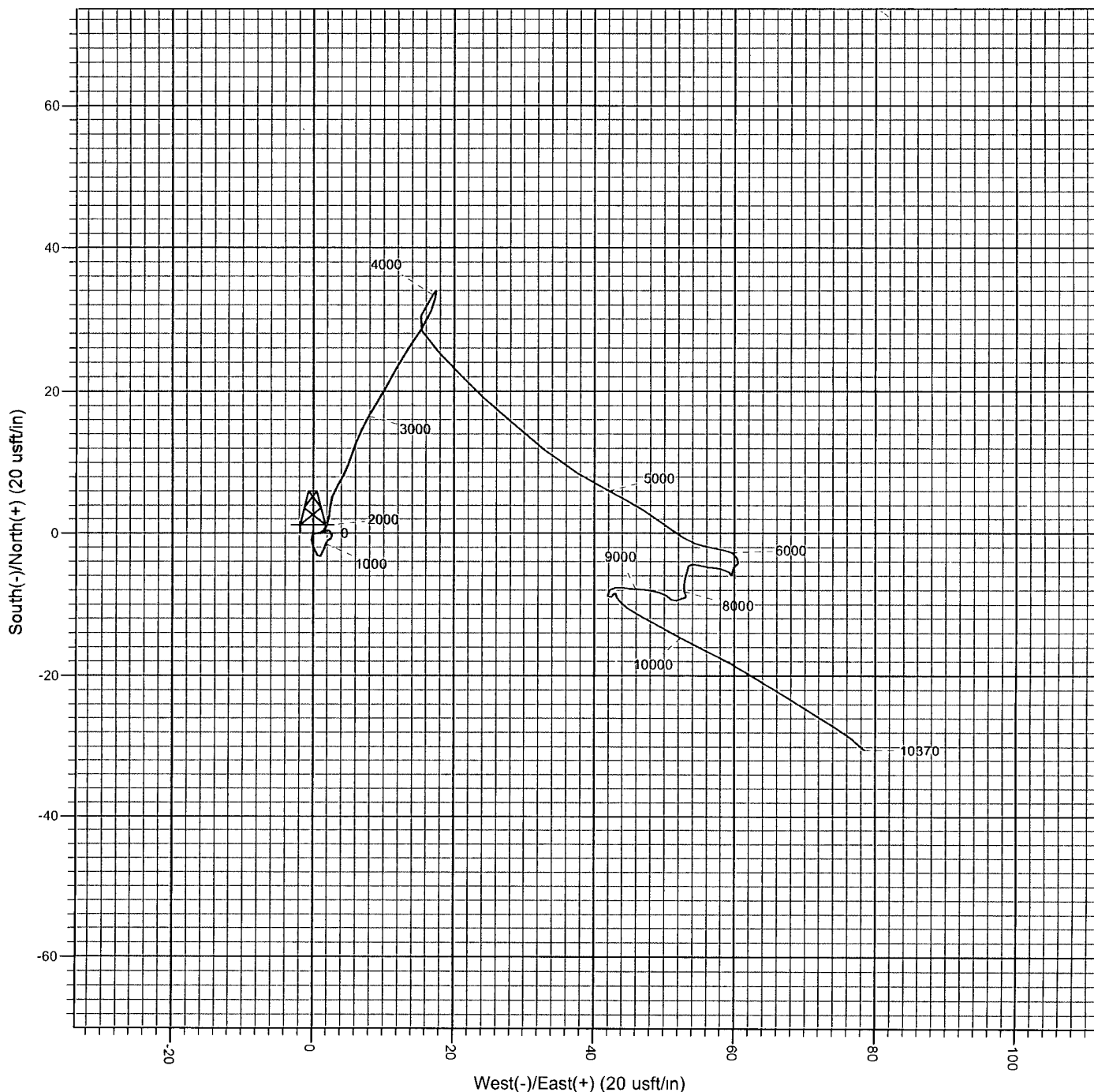
Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
10,000 00	4 38	115 65	9,997 92	-14 64	52 27	105 64	54 28
10,100 00	5 00	118 13	10,097 58	-18 34	59 55	107 12	62 31
10,200 00	5 02	122 40	10,197 20	-22 74	67 09	108 73	70 84
10,300 00	4 68	121 69	10,296 84	-27 23	74 26	110 14	79 09
10,373 83	3 77	133 45	10,370 47	-30 48	78 58	111 20	84 28



Project: Triple X
 Lea County, NM
 Well: Macho Nacho State #1H
 Wellbore: VH - Job #32K0512592
 Design: VH - Job #32K0512592

WELL DETAILS: Macho Nacho State #1H
 WELL @ 0.00usft (Original Well Elev)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	451172.69	725665.94	32° 14' 17.819 N	103° 36' 12.532 W	



PROJECT DETAILS: Triple X	SITE DETAILS: Lea County, NM
Geodetic System: US State Plane 1927 (Exact solution)	Site Centre Latitude: 32° 14' 17.819 N
Datum: NAD 1927 (NADCON CONUS)	Longitude: 103° 36' 12.532 W
Ellipsoid: Clarke 1866	Positional Uncertainty: 0.00
Zone: New Mexico East 3001	Convergence: 0.39
System Datum: Mean Sea Level	Local North: Grid

COG Operating LLC

Lea County, NM

Macho Nacho State 1H

Macho Nacho State 1H

Sidetrack 2

Survey: ST2 MWD Surveys

Standard Survey Report

27 June, 2012

HOBBS OCD

OCT 02 2012

RECEIVED

SUR: A-07-24S-33E, 380/N & 330/E

BHL: LOT 1 OR D, 07-24S-33E, 407/N & 4841/E

API # 30-025-39882

Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Macho Nacho State 1H
Project:	Lea County, NM	TVD Reference:	WELL @ 3647 50ft (Original Well Elev)
Site:	Macho Nacho State 1H	MD Reference:	WELL @ 3647 50ft (Original Well Elev)
Well:	Macho Nacho State 1H	North Reference:	Grid
Wellbore:	Sidetrack 2	Survey Calculation Method:	Minimum Curvature
Design:	Sidetrack 2	Database:	Houston R5000 Database

Project	Lea County, NM		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Macho Nacho State 1H		
Site Position:		Northing:	451,172 70 ft
From:	Map	Easting:	725,665 80 ft
Position Uncertainty:	0 00 ft	Slot Radius:	13 200 in
		Latitude:	32 23894083
		Longitude:	-103 73716111
		Grid Convergence:	0 32 °

Well	Macho Nacho State 1H		
Well Position	+N/-S	0 00 ft	Northing: 451,172 70 ft
	+E/-W	0 00 ft	Easting: 725,665 80 ft
Position Uncertainty	0 00 ft	Wellhead Elevation:	ft
		Latitude:	32 23894083
		Longitude:	-103.73716111
		Ground Level:	3,627 00 ft

Wellbore	Sidetrack 2		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF200510	6/12/2012	7 53
			Dip Angle (°)
			60 17
			Field Strength (nT)
			48,547

Design	Sidetrack 2		
Audit Notes:			
Version:	1 0	Phase:	ACTUAL
		Tie On Depth:	9,900 00
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)
	(ft)	(ft)	(ft)
	0 00	0 00	0.00
			Direction (°)
			269 66

Survey Program	Date 6/27/2012		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name
100 00	9,900 00	Gyro Surveys (Wellbore #1)	MWD
9,934 00	15,240 00	ST2 MWD Surveys (Sidetrack 2)	MWD
			Description
			MWD - Standard
			MWD - Standard

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)
9,900 00	3 50	120 57	9,898 16	-11 43	46 20	-46 13	0 00	0 00	0 00
9,934 00	2 30	223 60	9,932 13	-12 45	46 62	-46 55	13 53	-3 53	303 03
9,965 00	6 90	241 50	9,963 02	-13 79	44 55	-44 47	15 37	14 84	57 74
9,997 00	7 40	240 00	9,994 77	-15 74	41 08	-40 99	1 67	1 56	-4 69
10,029 00	7 30	237 10	10,026 51	-17 87	37 59	-37 48	1 20	-0 31	-9 06
10,060 00	7 00	233 30	10,057 27	-20 07	34 42	-34 30	1 81	-0 97	-12 26
10,092 00	7 10	230 50	10,089 03	-22 50	31 33	-31 20	1 12	0 31	-8 75
10,123 00	7 50	229 40	10,119 78	-25 03	28 32	-28 17	1 37	1 29	-3 55
10,155 00	8 00	229 80	10,151 48	-27 83	25 03	-24 86	1 57	1 56	1 25
10,187 00	8 60	230 80	10,183 15	-30 78	21 47	-21 29	1 93	1 88	3 13

Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Macho Nacho State 1H
Project:	Lea County, NM	TVD Reference:	WELL @ 3647 50ft (Original Well Elev)
Site:	Macho Nacho State 1H	MD Reference:	WELL @ 3647.50ft (Original Well Elev)
Well:	Macho Nacho State 1H	North Reference:	Grid
Wellbore:	Sidetrack 2	Survey Calculation Method:	Minimum Curvature
Design:	Sidetrack 2	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)
10,218 00	8 60	233 80	10,213 80	-33 61	17 81	-17 61	1 45	0 00	9 68
10,250 00	8 50	236 80	10,245 44	-36 32	13 90	-13 68	1 43	-0 31	9 38
10,281 00	8 60	240 10	10,276 10	-38 73	9 97	-9 74	1 61	0 32	10 65
10,313 00	9 30	247 30	10,307 71	-40 92	5 51	-5 27	4 12	2 19	22 50
10,344 00	9 90	253 30	10,338 28	-42 65	0 65	-0 40	3 76	1 94	19 35
10,376 00	9 10	253 00	10,369 84	-44 18	-4 41	4 67	2 50	-2 50	-0 94
10,407 00	8 40	256 60	10,400 48	-45 42	-8 95	9 22	2 87	-2 26	11 61
10,439 00	8 80	261 90	10,432 12	-46 31	-13 65	13 93	2 77	1 25	16 56
10,471 00	8 50	264 00	10,463 75	-46 90	-18 43	18 70	1 36	-0 94	6 56
10,502 00	7 70	263 00	10,494 44	-47 40	-22 77	23 05	2 62	-2 58	-3 23
10,534 00	9 10	262 10	10,526 10	-48 00	-27 40	27 68	4 39	4 38	-2 81
10,565 00	12 80	263 00	10,556 53	-48 76	-33 24	33 53	11 95	11 94	2 90
10,628 00	21 00	263 70	10,616 76	-50 85	-51 42	51 72	13 02	13 02	1 11
10,660 00	25 30	263 50	10,646 17	-52 26	-63 92	64 23	13 44	13 44	-0 63
10,691 00	29 00	263 20	10,673 75	-53 90	-77 96	78 28	11 94	11 94	-0 97
10,723 00	31 10	263 00	10,701 45	-55 82	-93 87	94 20	6 57	6 56	-0 63
10,755 00	34 20	263 20	10,728 39	-57 90	-111 01	111 35	9 69	9 69	0 63
10,786 00	37 80	263 70	10,753 47	-59 97	-129 11	129 46	11 65	11 61	1 61
10,818 00	39 80	264 60	10,778 41	-62 01	-149 05	149 42	6 49	6 25	2 81
10,849 00	41 90	264 90	10,801 85	-63 86	-169 24	169 62	6 80	6 77	0 97
10,881 00	45 70	265 30	10,824 95	-65 75	-191 31	191 69	11 91	11 88	1 25
10,912 00	50 00	266 10	10,845 74	-67 47	-214 22	214 62	14 00	13 87	2 58
10,944 00	54 50	266 70	10,865 33	-69 05	-239 47	239 87	14 14	14 06	1 88
10,976 00	58 90	267 00	10,882 89	-70 52	-266 17	266 58	13 77	13 75	0 94
11,007 00	63 10	266 70	10,897 92	-72 01	-293 23	293 65	13 57	13 55	-0 97
11,039 00	67 00	265 80	10,911 42	-73 91	-322 18	322 61	12 45	12 19	-2 81
11,075 00	71 90	264 70	10,924 05	-76 71	-355 76	356 21	13 91	13 61	-3 06
11,106 00	75 70	264 40	10,932 70	-79 54	-385 39	385 85	12 29	12 26	-0 97
11,138 00	78 10	264 50	10,939 95	-82 55	-416 41	416 89	7 51	7 50	0 31
11,169 00	80 10	264 10	10,945 81	-85 58	-446 70	447 20	6 57	6 45	-1 29
11,201 00	82 50	263 40	10,950 65	-89 02	-478 14	478 66	7 81	7 50	-2 19
11,233 00	85 40	262 60	10,954 02	-92 90	-509 72	510 26	9 40	9 06	-2 50
11,264 00	88 40	261 80	10,955 70	-97 10	-540 38	540 95	10 01	9 68	-2 58
11,292 00	90 80	262 50	10,955 89	-100 92	-568 12	568 71	8 93	8 57	2 50
11,359 00	91 30	262 70	10,954 67	-109 55	-634 55	635 19	0 80	0 75	0 30
11,454 00	91 50	262 60	10,952 35	-121 70	-728 74	729 45	0 24	0 21	-0 11
11,549 00	91 80	265 30	10,949 61	-131 71	-823 16	823 93	2 86	0 32	2 84
11,643 00	92 20	268 40	10,946 33	-136 87	-916 95	917 75	3 32	0 43	3 30
11,738 00	92 00	270 30	10,942 85	-137 95	-1,011 88	1,012 68	2 01	-0 21	2 00
11,832 00	92 00	270 50	10,939 57	-137 29	-1,105 82	1,106 61	0 21	0 00	0 21
11,927 00	92 10	270 90	10,936 17	-136 13	-1,200 75	1,201 54	0 43	0 11	0 42
12,022 00	92 90	271 20	10,932 02	-134 39	-1,295 64	1,296 42	0 90	0 84	0 32
12,117 00	91 50	271 90	10,928 38	-131 82	-1,390 53	1,391 29	1 65	-1 47	0 74

Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Macho Nacho State 1H
Project:	Lea County, NM	TVD Reference:	WELL @ 3647 50ft (Original Well Elev)
Site:	Macho Nacho State 1H	MD Reference:	WELL @ 3647 50ft (Original Well Elev)
Well:	Macho Nacho State 1H	North Reference:	Grid
Wellbore:	Sidetrack 2	Survey Calculation Method:	Minimum Curvature
Design:	Sidetrack 2	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)
12,211 00	91.50	272 00	10,925 92	-128 63	-1,484 45	1,485 18	0 11	0.00	0 11
12,306 00	90 70	272 10	10,924 09	-125 23	-1,579 37	1,580 08	0 85	-0 84	0 11
12,401 00	90 50	272 20	10,923 10	-121 66	-1,674 30	1,674 99	0 24	-0 21	0 11
12,496 00	90 70	271 70	10,922 10	-118 43	-1,769 24	1,769 91	0 57	0 21	-0 53
12,591 00	91 20	271 70	10,920 53	-115 61	-1,864 18	1,864 83	0 53	0 53	0 00
12,685 00	90 60	271 20	10,919 05	-113 24	-1,958 14	1,958 78	0 83	-0 64	-0 53
12,780 00	90 60	271 00	10,918 06	-111 41	-2,053 11	2,053 74	0 21	0 00	-0 21
12,875 00	90 70	270 90	10,916 98	-109 84	-2,148 10	2,148 71	0 15	0 11	-0 11
12,970 00	90 60	270 70	10,915 90	-108 51	-2,243 08	2,243 68	0 24	-0 11	-0 21
13,065 00	90 00	270 30	10,915 40	-107 68	-2,338 07	2,338 67	0 76	-0 63	-0 42
13,159 00	90 30	270 70	10,915 16	-106 86	-2,432 07	2,432 66	0 53	0 32	0 43
13,254 00	90 80	271 20	10,914 25	-105 29	-2,527 05	2,527 63	0 74	0 53	0 53
13,349 00	90 00	271 00	10,913 58	-103 46	-2,622 03	2,622 60	0 87	-0 84	-0 21
13,444 00	90 80	271 30	10,912 92	-101 56	-2,717 01	2,717 56	0 90	0 84	0 32
13,507 00	90 90	271 80	10,911 99	-99 85	-2,779 98	2,780 52	0 81	0 16	0 79
13,602 00	91 20	272 60	10,910 24	-96 21	-2,874 89	2,875 41	0 90	0 32	0 84
13,697 00	92 90	272 80	10,906 85	-91 73	-2,969 72	2,970 21	1 80	1 79	0 21
13,791 00	92 10	272 60	10,902 75	-87 31	-3,063 53	3,063 99	0 88	-0 85	-0 21
13,886 00	92 10	272 90	10,899 26	-82 76	-3,158 36	3,158 79	0 32	0 00	0 32
13,981 00	92 20	273 60	10,895 70	-77 37	-3,253 13	3,253 54	0 74	0 11	0 74
14,075 00	90 80	273 00	10,893 24	-71 96	-3,346 94	3,347 31	1 62	-1 49	-0 64
14,170 00	91 10	273 00	10,891 67	-66 99	-3,441 80	3,442 14	0 32	0 32	0 00
14,265 00	91 20	273 30	10,889 76	-61 77	-3,536 64	3,536 94	0 33	0 11	0 32
14,360 00	90 80	272 40	10,888 10	-57 05	-3,631 50	3,631 78	1 04	-0 42	-0 95
14,455 00	90 70	272 50	10,886 86	-52 99	-3,726 41	3,726 66	0 15	-0 11	0 11
14,550 00	90 00	272 20	10,886 28	-49 10	-3,821 33	3,821 55	0 80	-0 74	-0 32
14,644 00	92 10	271 80	10,884 55	-45 82	-3,915 25	3,915 45	2 27	2 23	-0 43
14,739 00	91 10	271 10	10,881 90	-43 41	-4,010 18	4,010 37	1 28	-1 05	-0 74
14,834 00	90 80	271 30	10,880 33	-41 42	-4,105 15	4,105 32	0 38	-0 32	0 21
14,928 00	90 90	272 00	10,878 93	-38 72	-4,199 10	4,199 25	0 75	0 11	0 74
15,086 00	89 80	272 20	10,877 97	-32 93	-4,356 98	4,357 10	0 71	-0 70	0 13
Current Survey @ 15086.00' MD, 10877.97' TVD, 89.80° INC, 272.20° AZ									
15,240 00	89 80	272 20	10,878 50	-27 02	-4,510 87	4,510 95	0 00	0 00	0 00
Straight line Projection to TD @ 15240.00' MD, 10878.50' TVD.									

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N-S (ft)	+E-W (ft)	
15,086 00	10,877 97	-32 93	-4,356 98	Current Survey @ 15086.00' MD, 10877.97' TVD, 89.80° INC, 272 20° AZ
15,240 00	10,878 50	-27 02	-4,510 87	Straight line Projection to TD @ 15240 00' MD, 10878 50' TVD

Checked By: _____

Approved By: _____

Date: _____



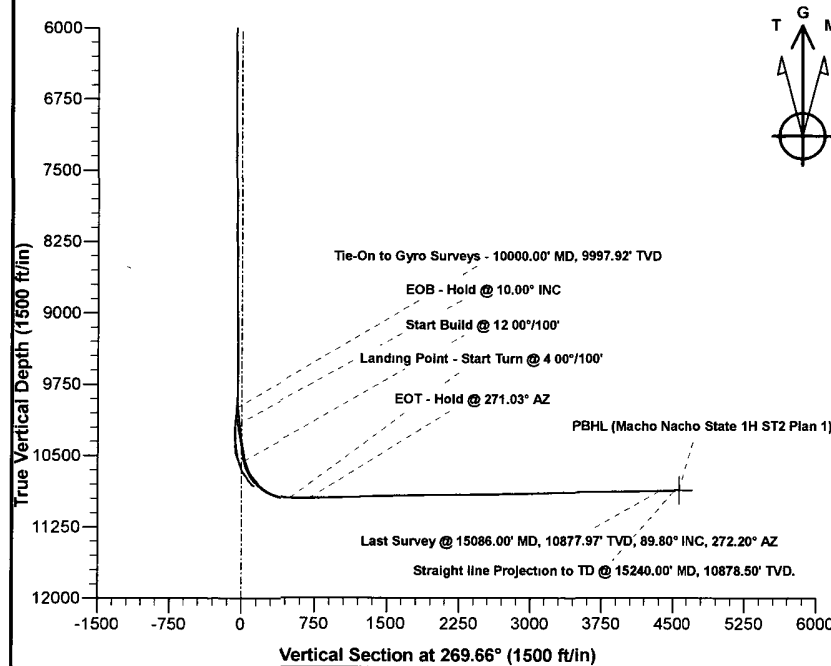
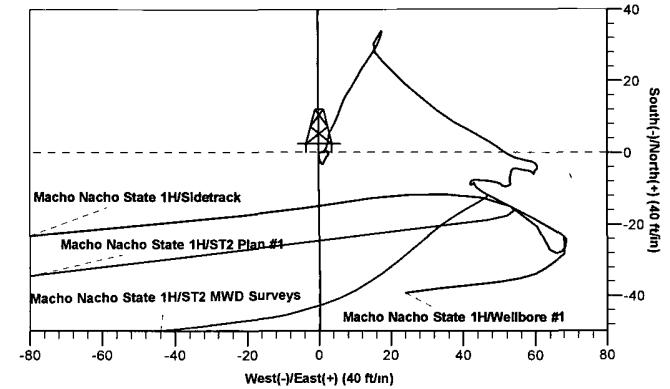
COG Operating LLC
Macho Nacho State 1H
Lea County, NM
ST2 Plan #1



Surface Location		Ground Elev: 3627.00 WELL @ 3647.50ft (Original Well Elev)			
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	451172.70	725665.80	32.23894084	-103.73716111

TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL (Macho Nacho State 1H ST2 Plan 1)	10870.00	-26.80	-4563.50	451145.90	721102.30	32.23893594	-103.75192072

SECTION DETAILS												
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation		
1	10000.00	4.38	115.65	9997.92	-14.64	52.27	0.00	0.00	-52.18	Tie-On to Gyro Surveys - 10000.00' MD, 9997.92' TVD		
2	10173.60	10.00	263.00	10170.80	-19.36	43.24	8.00	157.03	-43.12	EOB - Hold @ 10.00° INC		
3	10564.28	10.00	263.00	10555.54	-27.63	-24.10	0.00	0.00	24.26	Start Build @ 12.00°/100'		
4	11240.36	91.13	263.00	10950.00	-86.08	-500.15	12.00	0.00	500.65	Landing Point - Start Turn @ 4.00°/100'		
5	11441.17	91.13	271.03	10946.04	-96.52	-700.48	4.00	89.94	701.04	EOT - Hold @ 271.03° AZ		
6	15305.57	91.13	271.03	10870.00	-26.80	-4563.50	0.00	0.00	4563.58	TD @ 15305.57' MD, 10870.00' TVD		



Azimuths to Grid North
 True North -0 32°
 Magnetic North 7.22°

 Magnetic Field
 Strength 48546 9nT
 Dip Angle 60 17°
 Date 6/12/2012
 Model IGRF200510

