

Results of Directional Survey

API number:	30-025-40126		
OGRID:		Operator:	COG OPERATING LLC
		Property:	ESTACADO 18 STATE COM # 1H

surface	ULSTR:	M	18	T 14S	R 35E
				330 FSL	330 FWL

BH Loc	ULSTR:	P	18	T 14S	R 35E
14110	MD	9790.4	TVD	410 FSL	4939 FWL

Top Perf/OH	ULSTR:	M	18	T 14S	R 35E
10139	MD	9773.7	TVD	377 FSL	980 FWL

Bot Perf/OH	ULSTR:	P	18	T 14S	R 35E
14045	MD	9790.4	TVD	414 FSL	4874 FWL

	MD	N/S	E/W	VD
	10096	47.16	607.46	9774.22
TOP PERFS/OH	10139	47.49	650.45	9773.69
	10159	47.65	670.45	9773.44
	14039	84.57	4537.86	9790.43
BOT PERFS/OH	14045	84.22	4543.85	9790.43
	14110	80.42	4608.73	9790.39

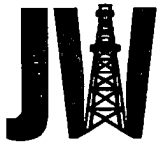
NEXT TO LAST	14039	84.57	4537.86	9790.43
LAST READING	14110	80.42	4608.73	9790.39
TD	14110	80.42	4608.73	9790.39

Surface Location	330	FS	330	FW
Projected BHL	410	FS	4939	FW
Location of				
Top Perfs/OH	377	FS	980	FW
Bottom Perfs/OH	414	FS	4874	FW

SUMMARY of Subsurface Locations

Surface Location	M-18-14S-35E	330	FS	330	FW	Vert. Depth
Top Perfs/OH	M-18-14S-35E	377	FS	980	FW	9773.69
Bottom Perfs/OH	P-18-14S-35E	414	FS	4874	FW	9790.43
Projected TD	P-18-14S-35E	410	FS	4939	FW	9790.39

FEB 02 2012



DRILLING INC. Oil Well Drilling Contractor

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

July 7, 2011

HOBBS OCD

OCT 25 2011

SUR: M-18-14s-35e, 330/S & 330/W
BHL: P-18-14s-35e, 410/S & 4939/W
API # 30-025-40126

COG Operating, LLC
500 W. Texas, Suite 1300
Midland, Texas 79701

RECEIVED

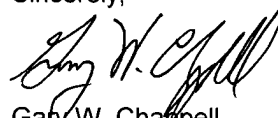
Re: Estacado 18 State 001H
Sec. 18, T-14-S, R-35-E
Lea County, New Mexico

Attn: John Coffman

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

275' - 1°	1610' - 1°	3448' - 1.25°	5785' - 0.5°	8534' - 1.25°
395' - 1°	1922' - 1°	3760' - 1.25°	6161' - 0.25°	9045' - 1°
615' - 0.75°	2293' - 0.75°	4139' - 0.75°	6655' - 1°	9313' - 0.25°
890' - 1.25°	2605' - 1°	4460' - 0.5°	7124' - 0.75°	9629' - 1°
1172' - 0.75°	2918' - 1°	4826' - 1°	7586' - 0.5°	
1356' - 1°	3135' - 0.75°	5320' - 0.5°	8055' - 0.25°	

Sincerely,


Gary W. Chappell
Contracts Manager

STATE OF NEW MEXICO)
COUNTY OF EDDY)

The foregoing was acknowledged before me this 7th day of July, 2011 by Gary W. Chappell.


NOTARY PUBLIC



OFFICIAL SEAL
CHERYL A. BARTLETT
NOTARY PUBLIC-STATE OF NEW MEXICO

My commission expires: 4-29-12

HOBBS OCD

JAN 31 2012

RECEIVED



SUR: M-18-14s-35e, 330/S & 330/W
BHL: P-18-14s-35e, 410/S & 4939/W
API # 30-025-40126

Survey Certification Form

State of New Mexico
County of Lea

I, Eric Fitzgerald, certify that; I am employed by LEAM Drilling Systems, Inc., that I did on the day(s) of July 1, 2011 through July 17, 2011 conduct or supervise the taking of MWD Survey from a depth of 9,202' to 14,110' MD; that the data is true, correct, complete and within the limitations of the tools as set forth by LEAM Drilling Systems, Inc., that I am authorized and qualified to make this report; that this survey was conducted at the request of COG Operating for the Estacado 18 State Com #1 in Lea CO., New Mexico; and that I reviewed this report and find that it conforms to the principals and procedures as set forth by LEAM Drilling Systems, Inc.

A handwritten signature of Eric Fitzgerald in cursive script, written over a horizontal line.

Eric Fitzgerald
MWD Operator

LEAM Drilling Systems, Inc.

Survey Report



Company: C O G Operating LLC
 Project: Lea County (NAD83)
 Site: Estacado "18" State Com
 Well: #1H
 Wellbore: OH
 Design: OH

Local Co-ordinate Reference: Site Estacado "18" State Com
 TVD Reference: WELL @ 4089 50usft (Original Well Elev)
 MD Reference: WELL @ 4089 50usft (Original Well Elev)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000 1 MULTI User DB

Project	Lea County (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Estacado "18" State Com		
Site Position:	Northing:	764,423.47 usft	Latitude: 33° 5' 53.836 N
From: Map	Easting:	810,459.59 usft	Longitudo: 103° 27' 16.350 W
Position Uncertainty:	0 00 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0 48 °

Well	#1H		
Well Position	+N/-S	0 00 usft	Northing: 764,423.47 usft
	+E/-W	0 00 usft	Easting: 810,459.59 usft
Position Uncertainty	0 00 usft	Wellhead Elevation:	0.00 usft
			Ground Level: 4,070.50 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	.GRF2010	6/9/2011	7.60
			Dip Angle (°)
			61.01
			Field Strength (nT)
			49,153

Design	OH		
Audit Notes:			
Version	1.0	Phase:	ACTUAL
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0 00	0 00	0 00
			Direction (°)
			88.97

Survey Program	Date 1/25/2012		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
100.00	9,100.00	Survey #1 - SDI (Pilot)	Gyroscope
9,202.00	14,039.00	Survey #1 - Learn (OH)	MWD
14,110.00	14,110.00	Survey #2 - PTB (OH)	Project
			Description
			Gyroscope
			MWD - Standard
			Projection

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0 00	0 00	0 00	0 00	0.00	0 00	0.00	0 00	0 00	0 00
100 00	0 41	314.19	100 00	0.25	-0.26	-0.25	0 41	0 41	0 00
200 00	0 33	327.86	200 00	0 74	-0 67	-0 65	0 12	-0 08	13 67
300 00	0 24	340 38	300 00	1 18	-0 89	-0 87	0 11	-0 09	12 52
400 00	0 11	313 93	400 00	1 45	-1 03	-1 00	0 15	-0 13	-26 45
500 00	0 12	301 82	500 00	1 57	-1 19	-1 16	0 03	0 01	-12 11
600 00	0 16	19 78	600 00	1 71	-1 25	-1 22	0 14	-0 02	77 96
700 00	0 10	346 84	699 99	1 87	-1 24	-1 20	0 06	0 00	-32 94
800 00	0 24	358 02	799 99	2 17	-1 26	1 23	0 14	0 14	11 18

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 Design: CH

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 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000 1 MULTI User DB

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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
900.00	0.30	6.06	899.99	2.64	-1.24	-1.20	0.07	0.06	8.04
1,000.00	0.26	0.76	999.99	3.13	-1.21	-1.16	0.05	-0.04	-5.30
1,100.00	0.24	6.50	1,099.99	3.56	-1.19	-1.12	0.03	-0.02	5.74
1,200.00	0.39	7.90	1,199.99	4.11	-1.12	-1.04	0.15	0.15	1.40
1,300.00	0.32	355.06	1,299.99	4.72	-1.09	-1.01	0.11	-0.07	-12.84
1,400.00	0.34	336.27	1,399.99	5.27	-1.24	-1.14	0.11	0.02	-16.79
1,500.00	0.33	328.78	1,499.98	5.79	-1.51	-1.40	0.04	-0.01	-7.49
1,600.00	0.35	316.24	1,599.98	6.26	-1.87	-1.75	0.08	0.02	-12.54
1,700.00	0.28	329.56	1,699.98	6.69	-2.20	-2.08	0.10	-0.07	13.32
1,800.00	0.27	324.78	1,799.98	7.09	-2.46	-2.33	0.03	-0.01	-4.78
1,900.00	0.21	304.77	1,899.98	7.39	-2.75	-2.61	0.10	-0.06	-20.01
2,000.00	0.22	321.61	1,999.98	7.64	-3.02	-2.88	0.06	0.01	16.84
2,100.00	0.23	291.76	2,099.98	7.87	-3.32	-3.18	0.12	0.01	-29.85
2,200.00	0.21	294.39	2,199.98	8.02	-3.68	-3.53	0.02	-0.02	2.63
2,300.00	0.22	293.36	2,299.98	8.17	-4.02	-3.87	0.01	0.01	-1.01
2,400.00	0.27	291.59	2,399.98	8.33	-4.41	-4.26	0.05	0.05	-1.79
2,500.00	0.24	289.87	2,499.97	8.49	-4.83	-4.68	0.03	-0.03	-1.72
2,600.00	0.18	331.79	2,599.97	8.70	-5.10	-4.94	0.16	-0.06	41.92
2,700.00	0.26	355.65	2,699.97	9.06	-5.19	-5.03	0.12	0.08	23.85
2,800.00	0.40	25.78	2,799.97	9.60	-5.06	-4.86	0.22	0.14	30.13
2,900.00	0.70	44.08	2,899.97	10.36	-4.48	-4.29	0.34	0.30	18.30
3,000.00	0.98	44.27	2,999.96	11.41	-3.45	-3.25	0.29	0.29	0.19
3,100.00	1.28	45.28	3,099.94	12.82	-2.06	-1.83	0.29	0.29	1.01
3,200.00	1.32	47.58	3,199.91	14.38	-0.41	-0.15	0.07	0.04	2.30
3,300.00	1.15	52.41	3,299.89	15.77	1.23	1.52	0.20	-0.17	4.83
3,400.00	1.18	60.27	3,399.87	16.89	2.92	3.22	0.16	0.03	7.86
3,500.00	1.03	60.81	3,499.85	17.84	4.60	4.92	0.15	-0.15	0.54
3,600.00	0.95	65.93	3,599.83	18.62	6.14	6.48	0.12	-0.08	5.12
3,700.00	1.02	71.60	3,699.82	19.24	7.74	8.09	0.12	0.07	5.67
3,800.00	0.87	71.49	3,799.80	19.76	9.31	9.66	0.15	-0.15	0.11
3,900.00	0.70	68.65	3,899.80	20.23	10.59	10.96	0.18	-0.17	-3.44
4,000.00	0.71	64.10	3,999.79	20.73	11.72	12.09	0.05	0.01	-3.95
4,100.00	0.60	61.52	4,099.78	21.25	12.74	13.12	0.11	-0.11	-2.58
4,200.00	0.45	52.70	4,199.78	21.74	13.51	13.90	0.17	-0.15	-8.82
4,300.00	0.46	48.94	4,299.77	22.25	14.14	14.53	0.04	0.03	-3.76
4,400.00	0.42	53.61	4,399.77	22.74	14.75	15.15	0.07	-0.06	4.67
4,500.00	0.51	49.48	4,499.77	23.25	15.38	15.80	0.10	0.09	-4.13
4,600.00	0.46	38.50	4,599.76	23.85	15.97	16.40	0.11	-0.05	-10.98
4,700.00	0.47	44.94	4,699.76	24.46	16.51	16.95	0.03	0.01	6.44
4,800.00	0.46	38.57	4,799.76	25.07	17.06	17.51	0.05	0.01	-6.37
4,900.00	0.44	33.11	4,899.75	25.72	17.53	17.99	0.06	-0.04	-5.46
5,000.00	0.55	35.94	4,999.75	26.43	18.02	18.49	0.11	0.11	2.83
5,100.00	0.60	27.14	5,099.74	27.29	18.54	19.03	0.10	0.05	-8.80

LEAM Drilling Systems, Inc.

Survey Report



Company: C O G. Operating LLC
 Project: Lea County (NAD83)
 Site: Estacado "18" State Com
 Well: #1H
 Wellbore: OH
 Design: OH

Local Co-ordinate Reference: Site Estacado "18" State Com
 TVD Reference: WELL @ 4089 50usft (Original Well Elev)
 MD Reference: WELL @ 4089 50usft (Original Well Elev)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000 1 MULTI User DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,200.00	0.43	22.53	5,199.74	28.10	18.93	19.43	0.17	-0.17	-4.31
5,300.00	0.52	26.16	5,299.74	28.85	19.27	19.79	0.09	0.09	3.33
5,400.00	0.45	27.45	5,399.73	29.61	19.65	20.16	0.07	-0.07	1.29
5,500.00	0.47	25.79	5,499.73	30.33	20.01	20.56	0.02	0.02	-1.66
5,600.00	0.51	21.46	5,599.73	31.11	20.35	20.91	0.05	0.04	-4.33
5,700.00	0.32	34.01	5,699.72	31.76	20.67	21.24	0.21	-0.18	12.55
5,800.00	0.32	19.06	5,799.72	32.25	20.92	21.50	0.06	0.00	-14.95
5,900.00	0.23	358.22	5,899.72	32.72	21.01	21.59	0.13	-0.09	-20.84
6,000.00	0.21	43.75	5,999.72	33.05	21.13	21.72	0.17	-0.02	45.53
6,100.00	0.23	354.46	6,099.72	33.42	21.23	21.83	0.21	0.07	-49.29
6,200.00	0.34	5.54	6,199.72	33.96	21.23	21.84	0.08	0.06	11.08
6,300.00	0.35	9.61	6,299.72	34.59	21.32	21.94	0.05	0.04	4.07
6,400.00	0.56	39.02	6,399.71	35.31	21.69	22.32	0.31	0.20	29.41
6,500.00	0.53	34.52	6,499.71	36.12	22.30	22.94	0.05	0.00	-4.50
6,600.00	0.62	32.12	6,599.70	36.99	22.87	23.53	0.05	0.04	-2.40
6,700.00	0.65	31.83	6,699.70	37.93	23.46	24.14	0.03	0.03	-0.29
6,800.00	0.60	33.69	6,799.69	38.85	24.05	24.74	0.05	-0.05	1.86
6,900.00	0.59	31.51	6,899.69	39.71	24.62	25.33	0.01	-0.01	-0.18
7,000.00	0.51	31.49	6,999.68	40.52	25.14	25.86	0.08	-0.06	-2.02
7,100.00	0.53	29.62	7,099.68	41.30	25.60	26.34	0.03	0.02	-1.87
7,200.00	0.57	35.25	7,199.67	42.11	26.12	26.87	0.07	0.04	5.63
7,300.00	0.49	41.74	7,299.67	42.84	26.69	27.45	0.10	-0.08	6.49
7,400.00	0.44	36.41	7,399.66	43.47	27.20	27.98	0.07	-0.05	-5.33
7,500.00	0.31	33.58	7,499.66	44.00	27.58	28.37	0.13	-0.13	-2.83
7,600.00	0.43	36.52	7,599.66	44.53	27.95	28.75	0.12	0.12	2.94
7,700.00	0.33	39.74	7,699.66	45.05	28.36	29.16	0.10	-0.10	3.22
7,730.00	0.40	38.64	7,720.66	45.20	28.48	29.29	0.23	0.23	-3.67
7,749.20	0.54	45.47	7,748.86	45.31	28.59	29.40	0.78	0.73	35.57
7,800.00	0.53	52.93	7,799.65	45.63	28.96	29.77	0.15	0.04	14.69
7,900.00	0.55	57.29	7,899.65	46.19	29.75	30.57	0.04	-0.01	4.36
8,000.00	0.47	55.93	7,999.65	46.67	30.49	31.33	0.06	-0.08	-1.36
8,100.00	0.63	56.65	8,099.64	47.20	31.29	32.14	0.16	0.16	0.92
8,200.00	0.52	63.35	8,199.64	47.71	32.16	33.01	0.13	-0.11	6.50
8,300.00	0.74	93.17	8,299.63	47.88	33.21	34.06	0.39	0.22	29.82
8,400.00	0.70	93.46	8,399.62	47.81	34.46	35.32	0.13	-0.04	-9.71
8,500.00	0.68	98.02	8,499.61	47.87	35.83	36.68	0.27	0.18	14.56
8,600.00	0.74	111.71	8,599.60	47.53	37.19	38.04	0.24	-0.14	13.69
8,700.00	0.70	113.41	8,699.60	47.05	38.35	39.19	0.05	-0.04	1.70
8,800.00	0.55	102.22	8,799.59	46.70	39.38	40.21	0.19	-0.15	-11.19
8,900.00	0.40	120.92	8,899.59	46.42	40.15	40.97	0.21	-0.15	18.70
9,000.00	0.48	88.78	8,999.58	46.25	40.86	41.69	0.28	0.06	-32.14
9,100.00	0.68	95.25	9,099.58	46.20	41.87	42.70	0.21	0.20	6.47
9,202.00	0.62	91.67	9,201.57	46.13	43.03	43.85	0.07	-0.06	-3.51

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9,233.00	3.17	89.39	9,232.55	46.14	44.05	44.88	8.23	8.23	-7.35
9,265.00	6.42	89.21	9,264.44	46.17	46.73	47.55	10.16	10.16	-0.56
9,297.00	9.32	89.74	9,296.13	48.21	51.11	51.93	9.07	9.06	1.68
9,329.00	12.86	89.03	9,327.54	46.28	57.21	58.03	10.45	10.44	-2.22
9,361.00	15.65	90.79	9,358.56	46.28	65.03	65.85	9.44	9.34	5.50
9,393.00	18.47	91.14	9,389.15	46.12	74.42	75.23	8.82	8.81	1.09
9,425.00	21.19	89.56	9,419.25	46.06	85.27	86.08	8.68	8.50	-4.94
9,457.00	23.74	90.79	9,448.82	46.02	97.50	98.31	8.10	7.97	3.84
9,489.00	26.82	90.26	9,477.75	45.90	111.16	111.97	9.85	9.63	-1.68
9,521.00	30.43	90.62	9,505.84	45.78	126.49	127.29	11.29	11.28	1.13
9,553.00	34.21	90.62	9,532.88	45.59	143.59	144.39	11.81	11.81	0.00
9,585.00	37.89	89.91	9,558.73	45.51	162.44	163.23	11.88	11.81	-2.22
9,617.00	41.94	89.56	9,583.25	45.61	182.99	183.78	12.36	12.34	-1.09
9,649.00	45.46	89.56	9,606.38	45.78	205.10	205.89	11.00	11.00	0.00
9,681.00	48.10	89.74	9,628.29	45.92	228.41	229.20	8.26	8.25	0.56
9,712.00	51.18	89.74	9,648.36	46.02	252.03	252.82	9.94	9.94	0.00
9,745.00	54.78	89.74	9,668.23	46.14	278.38	279.16	10.91	10.91	0.00
9,777.00	58.92	89.91	9,685.72	46.23	305.16	305.94	12.95	12.94	0.53
9,809.00	61.82	89.74	9,701.54	46.31	332.97	333.75	9.07	9.06	-0.53
9,841.00	64.46	89.21	9,716.00	46.57	361.52	362.30	8.38	8.25	-1.66
9,873.00	67.18	89.74	9,729.11	46.84	390.71	391.48	8.63	8.50	1.66
9,905.00	69.82	90.03	9,740.83	46.88	420.48	421.25	8.31	8.25	1.09
9,937.00	72.98	89.91	9,751.04	46.88	450.80	451.57	9.89	9.88	-0.56
9,969.00	76.06	89.56	9,759.58	47.03	481.64	482.40	9.68	9.63	-1.09
10,001.00	79.94	89.56	9,766.26	47.27	512.92	513.69	11.81	11.81	0.00
10,032.00	83.54	90.09	9,770.74	47.36	543.59	544.36	12.05	11.94	1.71
10,098.00	90.22	90.26	9,774.22	47.16	607.46	608.21	10.44	10.44	0.27
10,159.00	91.19	83.88	9,773.44	47.65	670.45	671.20	2.70	1.54	-2.22
10,222.00	92.42	87.45	9,771.46	49.68	733.39	734.16	2.97	1.95	-2.24
10,286.00	92.15	85.22	9,768.91	53.21	797.24	798.06	1.97	-0.42	-1.92
10,350.00	91.01	87.98	9,767.14	56.44	861.13	862.00	3.28	-1.78	2.75
10,414.00	90.40	89.39	9,766.36	57.91	925.10	925.99	2.40	-0.95	2.20
10,478.00	90.04	90.79	9,766.11	57.81	989.10	989.98	2.25	-0.56	2.19
10,542.00	90.04	91.67	9,766.07	56.44	1,053.09	1,053.93	1.37	0.00	1.38
10,606.00	90.22	89.91	9,765.92	55.55	1,117.08	1,117.89	2.76	0.28	-2.75
10,669.00	90.31	89.03	9,765.63	56.14	1,180.07	1,180.89	1.40	0.14	-1.40
10,733.00	90.31	86.40	9,765.28	58.60	1,244.01	1,244.87	4.11	0.00	-4.11
10,797.00	91.36	84.11	9,764.35	63.88	1,307.78	1,308.72	3.94	1.64	-3.58
10,861.00	92.59	83.94	9,762.14	70.84	1,371.40	1,372.45	1.94	1.92	-0.27
10,924.00	92.42	85.87	9,759.39	76.23	1,434.09	1,435.22	3.07	-0.27	3.06
10,988.00	91.89	87.63	9,756.98	79.85	1,497.93	1,499.13	2.87	-0.83	2.75
11,052.00	91.45	89.03	9,755.12	81.72	1,561.86	1,563.09	2.29	-0.69	2.19
11,116.00	91.69	90.97	9,753.25	81.72	1,625.85	1,627.05	3.11	0.69	3.03
11,180.00	91.58	93.25	9,751.09	79.36	1,689.76	1,690.92	3.56	0.14	3.56

LEAM Drilling Systems, Inc.

Survey Report



Company: C O G Operating LLC
 Project: Lea County (NAD83)
 Site: Estacado "18" State Com
 Well: #1H
 Wellbore: OH
 Design: OH

Local Co-ordinate Reference: Site Estacado "18" State Com
 TVD Reference: WELL @ 4089 50usft (Original Well Elev)
 MD Reference: WELL @ 4089 50usft (Original Well Elev)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000 1 MULTI User DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,243.00	92.15	95.19	9,748.82	74.73	1,752.55	1,753.81	3.09	0.27	3.08
11,307.00	91.80	92.73	9,746.62	70.31	1,816.35	1,817.32	3.88	-0.55	-3.84
11,370.00	90.75	90.62	9,745.21	68.47	1,879.31	1,880.23	3.74	-1.67	-3.35
11,433.00	90.57	88.68	9,744.49	68.86	1,942.30	1,943.22	3.09	-0.29	-3.08
11,497.00	91.71	87.28	9,743.21	71.11	2,006.24	2,007.20	2.82	1.78	-2.19
11,561.00	92.07	87.28	9,741.10	74.15	2,070.14	2,071.13	0.56	0.56	0.00
11,625.00	92.07	90.44	9,738.79	75.42	2,134.07	2,135.08	4.93	0.00	4.64
11,689.00	91.54	91.32	9,736.74	74.42	2,199.03	2,200.02	1.58	-0.82	1.35
11,753.00	91.63	89.91	9,735.00	73.75	2,262.00	2,262.96	2.24	0.14	-2.24
11,817.00	92.77	89.03	9,732.54	74.34	2,325.95	2,326.91	2.25	1.78	-1.38
11,881.00	93.39	88.33	9,729.11	75.81	2,389.84	2,390.82	1.46	0.97	-1.09
11,945.00	94.00	87.28	9,724.98	78.26	2,453.66	2,454.67	1.89	0.95	-1.64
12,008.00	95.14	87.93	9,719.96	80.85	2,516.41	2,517.45	2.12	1.81	1.11
12,072.00	94.16	89.03	9,714.76	82.52	2,580.17	2,581.24	2.22	-1.50	1.64
12,136.00	92.68	90.44	9,710.93	82.81	2,644.05	2,645.11	3.21	-2.34	2.20
12,199.00	90.75	92.37	9,709.05	81.27	2,707.00	2,708.02	4.33	-3.06	3.06
12,262.00	88.55	92.55	9,709.43	78.56	2,769.94	2,770.90	3.50	-3.49	0.29
12,325.00	87.85	91.85	9,711.41	76.15	2,832.86	2,833.77	1.57	-1.11	-1.11
12,389.00	85.47	90.97	9,715.14	74.57	2,896.72	2,897.60	3.96	-3.72	-1.38
12,453.00	81.69	90.09	9,722.29	73.98	2,960.31	2,961.16	6.06	-5.81	-1.38
12,516.00	79.40	90.25	9,732.64	73.79	3,022.45	3,023.29	3.64	-3.63	0.27
12,580.00	78.88	89.39	9,738.67	73.89	3,085.87	3,086.71	3.13	-1.63	-2.72
12,644.00	78.00	88.86	9,745.08	74.37	3,149.22	3,150.06	3.19	-2.75	-1.66
12,708.00	77.03	88.86	9,759.14	75.63	3,212.67	3,213.52	1.49	-1.49	0.00
12,772.00	79.93	88.16	9,771.92	77.26	3,276.13	3,277.02	4.66	4.53	-1.09
12,836.00	82.13	88.33	9,781.89	79.20	3,339.54	3,340.43	3.45	3.44	0.27
12,900.00	82.66	87.93	9,790.36	81.24	3,402.94	3,403.86	0.99	0.83	-0.55
12,964.00	84.24	87.80	9,797.55	83.55	3,466.35	3,467.24	2.52	2.51	-0.29
13,028.00	86.79	88.68	9,802.56	85.51	3,529.75	3,530.63	4.21	3.98	1.38
13,092.00	88.99	88.16	9,804.91	87.27	3,593.16	3,594.08	3.53	3.44	-0.81
13,156.00	89.08	88.68	9,805.99	89.03	3,656.56	3,657.47	0.82	0.14	0.81
13,220.00	89.43	88.68	9,806.81	90.48	3,720.01	3,720.91	0.56	0.56	0.00
13,284.00	89.69	88.68	9,807.30	91.96	3,783.41	3,784.31	0.41	0.41	0.00
13,348.00	89.96	88.33	9,807.50	93.63	3,846.81	3,847.71	0.69	0.42	-0.55
13,412.00	90.04	88.33	9,807.50	95.46	3,910.21	3,911.11	0.13	0.13	0.00
13,476.00	90.31	88.51	9,807.30	97.23	3,973.61	3,974.51	0.51	0.47	0.28
13,540.00	90.04	88.33	9,807.10	98.99	4,037.01	4,037.91	0.51	-0.42	-0.28
13,604.00	90.84	88.86	9,806.61	100.56	4,100.41	4,101.31	1.50	1.25	0.83
13,668.00	90.57	88.86	9,805.83	101.84	4,163.81	4,164.71	0.42	-0.42	0.00
13,732.00	90.40	89.91	9,804.76	103.19	4,227.21	4,228.11	0.84	-0.13	0.83
13,796.00	92.07	91.14	9,803.40	102.31	4,290.61	4,291.51	3.29	2.65	1.95
13,860.00	94.00	93.96	9,800.01	99.77	4,354.01	4,354.91	5.33	3.02	4.41
13,924.00	94.00	94.83	9,795.55	94.88	4,417.41	4,418.31	1.36	0.00	1.36

LEAM Drilling Systems, Inc.

Survey Report



Company: C.O.G. Operating LLC
 Project: Lea County (NAD83)
 Site: Estacado "18" State Com
 Well: #1H
 Wellbore: OH
 Design: OH

Local Co-ordinate Reference: Site Estacado "18" State Com
 TVD Reference: WELL @ 4089.50usft (Original Well Elev)
 MD Reference: WELL @ 4089.50usft (Original Well Elev)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000 1 MULTI User DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,983.00	92.33	95.35	9,792.01	89.20	4,482.07	4,482.95	2.74	-2.61	0.83
14,039.00	90.92	94.13	9,780.43	84.57	4,537.86	4,538.64	3.34	-2.52	-2.20
14,110.00	89.13	92.57	9,780.39	80.42	4,608.73	4,609.43	3.34	-2.52	-2.20

BHL - 14110.0'MD, 89.13°INC, 92.57°AZI, 9790.4'TVD, 80.4°N, 4608.7'E - PBHL(EST)

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
14,110.00	9,780.39	80.42	4,608.73	BHL - 14110.0'MD, 89.13°INC, 92.57°AZI, 9790.4'TVD, 80.4°N, 4608.7'E

Checked By: _____ Approved By: _____ Date: _____

SUR: M-18-14s-35e, 330/S & 330/W
BHL: P-18-14s-35e, 410/S & 4939/W
API # 30-025-40126

COG OPERATING

Wildcat (Lea County, NM)

Lea County, NM

Estacado 18 State #1H

VH - Job #32K0611540

HOBBS OCD

OCT 25 2011

RECEIVED

Survey: Actual

SDI Standard Survey Report

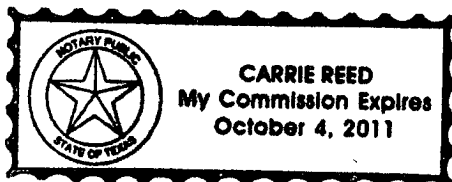
This survey is correct to the best of my knowledge and is supported by actual field data.

[Signature]

Notarized this date 22nd of July, 2011.

[Signature]

Notary Signature
County of Midland
State of Texas



Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Estacado 18 State #1H
Project:	Wildcat (Lea County, NM)	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Lea County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Estacado 18 State #1H	North Reference:	Grid
Wellbore:	VH - Job #32K0611540	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0611540	Database:	EDM-Regulatory

Project	Wildcat (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	Lea County, NM		
Site Position:		Northing:	764,295 41 usft
From:	Lat/Long	Easting:	769,294 77 usft
Position Uncertainty:	0 0 usft	Slot Radius:	0"
		Latitude:	33° 5' 52 800 N
		Longitude:	103° 27' 14 400 W
		Grid Convergence:	0 48 °

Well	Estacado 18 State #1H, Directional (Learn)		
Well Position	+N/-S	0 0 usft	Northing: 764,295 41 usft
	+E/-W	0 0 usft	Easting: 769,294 77 usft
Position Uncertainty	0 0 usft	Wellhead Elevation:	usft
		Latitude:	33° 5' 52 800 N
		Longitude:	103° 27' 14 400 W
		Ground Level:	0 0 usft

Wellbore	VH - Job #32K0611540				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/21/2011	7 60	61 01	49,180

Design	VH - Job #32K0611540			
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	89 22

Survey Program	Date	7/21/2011			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100 0	7,730 0	Actual (VH - Job #32K0611540)	Keeper	Keeper Gyro	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)		
0 0	0 00	0 00	0 0	0 0	0 0	0 0	0 00		0 0
100 0	0 41	314 19	100 0	0 2	-0 3	314 19			0 4
200 0	0 33	327 86	200 0	0 7	-0 7	318 10			1 0
300 0	0 24	340 38	300 0	1 2	-0 9	323 07			1 5
400 0	0 11	313 93	400 0	1 4	-1 0	324 59			1 8
500 0	0 12	301 82	500 0	1 6	-1 2	322 89			2 0
600 0	0 10	19 78	600 0	1 7	-1 2	323 85			2 1
700 0	0 10	346 84	700 0	1 9	-1 2	326 57			2 2
800 0	0 24	358 02	800 0	2 2	-1 3	329 75			2 5
900 0	0 30	6 06	900 0	2 6	-1 2	334 75			2 9
1,000 0	0 26	0 76	1,000 0	3 1	-1 2	338 78			3 4
1,100 0	0 24	6 50	1,100 0	3 6	-1 2	341 57			3 8

Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Estacado 18 State #1H
Project:	Wildcat (Lea County, NM)	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Lea County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Estacado 18 State #1H	North Reference:	Grid
Wellbore:	VH - Job #32K0611540	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0611540	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 0	0 39	7 90	1,200 0	4 1	-1 1	344 79	4 3
1,300 0	0 32	355 06	1,300 0	4 7	-1 1	346 96	4 8
1,400 0	0 34	336 27	1,400 0	5 3	-1 2	346 79	5 4
1,500 0	0 33	328 78	1,500 0	5 8	-1 5	345 42	6 0
1,600 0	0 35	316 24	1,600 0	6 3	-1 9	343 39	6 5
1,700 0	0 28	329 56	1,700 0	6 7	-2 2	341 78	7 0
1,800 0	0 27	324 78	1,800 0	7 1	-2 5	340 86	7 5
1,900 0	0 21	304 77	1,900 0	7 4	-2 7	339 60	7 9
2,000 0	0 22	321 61	2,000 0	7 6	-3 0	338 46	8 2
2,100 0	0 23	291 76	2,100 0	7 9	-3 3	337 10	8 5
2,200 0	0 21	294 39	2,200 0	8 0	-3 7	335 37	8 8
2,300 0	0 22	293 38	2,300 0	8 2	-4 0	333 80	9 1
2,400 0	0 27	291 59	2,400 0	8 3	-4 4	332 08	9 4
2,500 0	0 24	289 87	2,500 0	8 5	-4 8	330 36	9 8
2,600 0	0 18	331 79	2,600 0	8 7	-5 1	329 61	10 1
2,700 0	0 26	355 65	2,700 0	9 1	-5 2	330 19	10 4
2,800 0	0 40	25 78	2,800 0	9 6	-5 1	332 22	10 9
2,900 0	0 70	44 08	2,900 0	10 4	-4 5	336 60	11 3
3,000 0	0 99	44 27	3,000 0	11 4	-3 5	343 17	11 9
3,100 0	1 28	45 28	3,099 9	12 8	-2 1	350 88	13 0
3,200 0	1 32	47 58	3,199 9	14 4	-0 4	358 35	14 4
3,300 0	1 15	52 41	3,299 9	15 8	1 2	4 47	15 8
3,400 0	1 18	60 27	3,399 9	16 9	2 9	9 81	17 1
3,500 0	1 03	60 81	3,499 8	17 8	4 6	14 46	18 4
3,600 0	0 95	65 93	3,599 8	18 6	6 1	18 26	19 6
3,700 0	1 02	71 60	3,699 8	19 2	7 7	21 93	20 7
3,800 0	0 87	71 49	3,799 8	19 8	9 3	25 22	21 8
3,900 0	0 70	68 05	3,899 8	20 2	10 6	27 64	22 8
4,000 0	0 71	64 10	3,999 8	20 7	11 7	29 48	23 8
4,100 0	0 60	61 52	4,099 8	21 2	12 7	30 94	24 8
4,200 0	0 45	52 70	4,199 8	21 7	13 5	31 86	25 6
4,300 0	0 48	48 94	4,299 8	22 2	14 1	32 43	26 4
4,400 0	0 42	53 61	4,399 8	22 7	14 7	32 96	27 1
4,500 0	0 51	49 48	4,499 8	23 2	15 4	33 49	27 9
4,600 0	0 46	38 50	4,599 8	23 9	16 0	33 80	28 7
4,700 0	0 47	44 94	4,699 8	24 5	16 5	34 02	29 5
4,800 0	0 48	38 57	4,799 8	25 1	17 1	34 23	30 3
4,900 0	0 44	33 11	4,899 8	25 7	17 5	34 27	31 1
5,000 0	0 55	35 94	4,999 7	26 4	18 0	34 29	32 0
5,100 0	0 60	27 14	5,099 7	27 3	18 5	34 20	33 0
5,200 0	0 43	22 83	5,199 7	28 1	18 9	33 96	33 9
5,300 0	0 52	26 16	5,299 7	28 9	19 3	33 74	34 7
5,400 0	0 45	27 45	5,399 7	29 6	19 7	33 58	35 5
5,500 0	0 47	25 79	5,499 7	30 3	20 0	33 42	36 3

Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Estacado 18 State #1H
Project:	Wildcat (Lea County, NM)	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Lea County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Estacado 18 State #1H	North Reference:	Grid
Wellbore:	VH - Job #32K0611540	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0611540	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 0	0 51	21 46	5,599 7	31 1	20 4	33 20	37 2
5,700 0	0 32	34 01	5,699 7	31 8	20 7	33 06	37 9
5,800 0	0 32	19 06	5,799 7	32 3	20 9	32 97	38 4
5,900 0	0 23	358 22	5,899 7	32 7	21 0	32 70	38 9
6,000 0	0 21	43 75	5,999 7	33 0	21 1	32 59	39 2
6,100 0	0 28	354 46	6,099 7	33 4	21 2	32 42	39 6
6,200 0	0 34	5 54	6,199 7	34 0	21 2	32 01	40 1
6,300 0	0 38	9 61	6,299 7	34 6	21 3	31 65	40 6
6,400 0	0 58	39 02	6,399 7	35 3	21 7	31 57	41 4
6,500 0	0 58	34 52	6,499 7	36 1	22 3	31 69	42 4
6,600 0	0 62	32 12	6,599 7	37 0	22 9	31 73	43 5
6,700 0	0 65	31 83	6,699 7	37 9	23 5	31 74	44 6
6,800 0	0 60	33 69	6,799 7	38 8	24 0	31 76	45 7
6,900 0	0 59	33 51	6,899 7	39 7	24 6	31 80	46 7
7,000 0	0 51	31 49	6,999 7	40 5	25 1	31 82	47 7
7,100 0	0 53	29 62	7,099 7	41 3	25 6	31 79	48 6
7,200 0	0 57	35 25	7,199 7	42 1	26 1	31 81	49 6
7,300 0	0 49	41 74	7,299 7	42 8	26 7	31 92	50 5
7,400 0	0 44	36 41	7,399 7	43 5	27 2	32 04	51 3
7,500 0	0 31	33 58	7,499 7	44 0	27 6	32 08	51 9
7,600 0	0 43	36 52	7,599 7	44 5	28 0	32 12	52 6
7,700 0	0 33	39 74	7,699 7	45 0	28 4	32 19	53 2
7,730 0	0 40	38 64	7,729 7	45 2	28 5	32 22	53 4



Scientific Drilling
Directional Drilling Operations

Project: Wildcat (Lea County, NM)
Lea County, NM
Well: Estacado 18 State #1H
Wellbore: VH - Job #32K0611540
Design: VH - Job #32K0611540

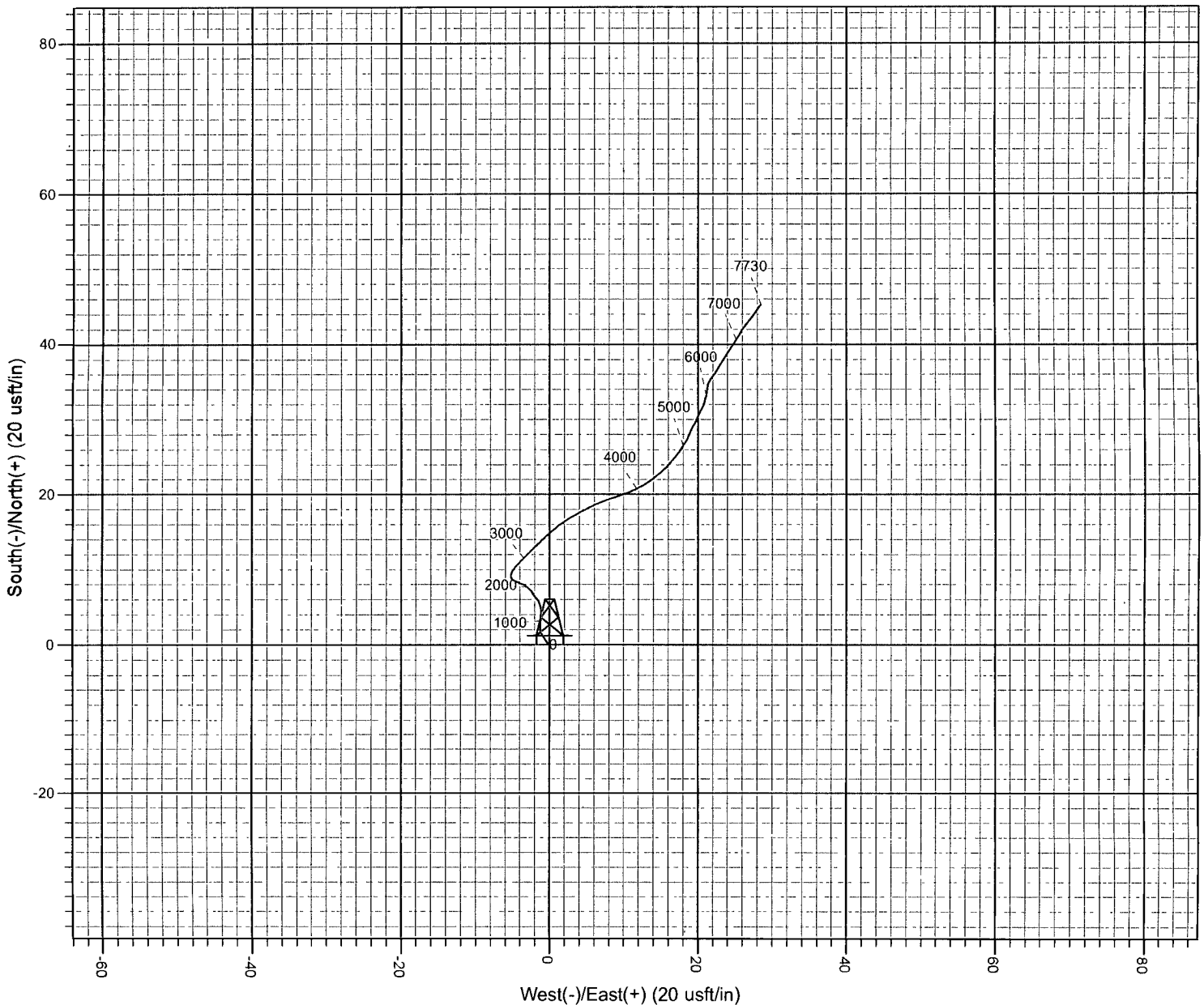


Azimuths to Grid North
True North -0 48°
Magnetic North 7 12°

Magnetic Field
Strength 49180 4snT
Dip Angle 61 01°
Date 6/21/2011
Model IGRF2010

WELL DETAILS: Estacado 18 State #1H
WELL @ 0.0usft (Original Well Elev)
Ground Level: 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	764295.41	769294.77	33° 5' 52.800 N	103° 27' 14.400 W	



PROJECT DETAILS: Wildcat (Lea County, NM)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

SITE DETAILS: Lea County, NM
Site Centre Latitude: 33° 5' 52.800 N
Longitude: 103° 27' 14.400 W
Positional Uncertainty: 0.0
Convergence: 0 48
Local North: Grid