

OPERATOR: COG Operating, LLC
WELL/LEASE: Loving Falcon 28 # 1H
COUNTY: Eddy Co., New Mexico
Sec. 28, T23S, R28E

30-015-37000

STATE OF NEW MEXICO
DEVIATION REPORT

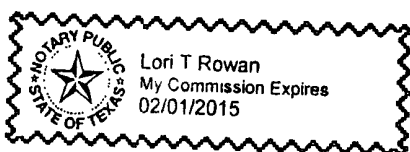
Depth	Deviation	Depth	Deviation
882	3 3/4	5,067	3/4
913	2	5,162	1/2
1,134	1 1/2	5,257	1/4
1,261	2	5,353	1/2
1,356	2	5,448	1/2
1,452	1 3/4	5,543	3/4
1,547	1 1/2	5,639	1/2
1,642	1 1/2	5,734	1/2
1,738	1 1/4	5,830	1/4
1,833	1 1/2	5,928	1/2
1,928	2 1/2	6,053	1/2
2,023	2 3/4	6,179	1
2,119	2 1/4	6,306	1 1/4
2,214	3 1/2	6,434	2 1/2
2,309	2 1/2	6,529	3 1/4
2,397	1 3/4	6,590	2 3/4
4,431	1	6,624	2 3/4
4,495	1 1/5	6,639	2 1/2
4,590	1 1/4	6,671	2 3/4
4,686	1 1/2	6,703	5 3/4
4,781	1 1/2	6,735	9 1/4
4,876	1 1/4		
4,971	1		

Patriot Drilling, LLC

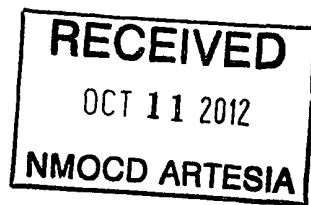

M. Leroy Peterson, Executive Vice-
President

The foregoing instrument was acknowledged before me on this 26st day of March, 2012 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2015




Lori T. Rowan
Notary Public for Ector Co., Texas



COG OPERATING

Culebra Bluff
Eddy County, NM
Falcon "28" #1H
VH - Job #32K0312287

Survey: Gyro

SDI Standard Survey Report

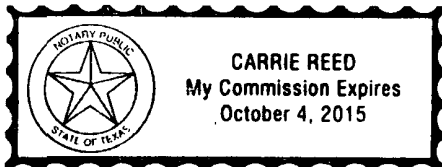
This survey is correct to the best of my knowledge and is supported by actual field data.

[Signature]

Notarized this date 2nd of April, 2012.

Carrie Reed

Notary Signature
County of Midland
State of Texas



Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Falcon "28" #1H
Project:	Culebra Bluff	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Falcon "28" #1H	North Reference:	Grid
Wellbore:	VH - Job #32K0312287	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0312287	Database:	EDM-Regulatory

Project		Culebra Bluff	
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site		Eddy County, NM			
Site Position:		Northing:	486,501 49 usft	Latitude:	32° 20' 13 338 N
From:	Lat/Long	Easting:	642,576 22 usft	Longitude:	104° 0' 19 945 W
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0 18 °

Well	Falcon "28" #1H, Directional (Pathfinder)					
Well Position	+N/-S	0 0 usft	Northing:	464,958 10 usft	Latitude:	32° 16' 40 800 N
	+E/-W	0 0 usft	Easting:	618,084 80 usft	Longitude:	104° 5' 6 000 W
Position Uncertainty		0 0 usft	Wellhead Elevation:	usft	Ground Level:	0 0 usft

Wellbore		VH - Job #32K0312287			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/12/2012	7 74	60 13	48,543

Design	VH - Job #32K0312287			
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	268 97

Survey Program		Date	4/10/2012		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100 0	6,590 0	Gyro (VH - Job #32K0312287)	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 00		0 0
100 0	0 55	244 92	100 0	-0 2	-0 4	244 92		0 5
200 0	0 67	226 74	200 0	-0 8	-1 3	238 06		1 5
300 0	1 93	228 65	300 0	-2 3	-3 0	232 14		3 8
400 0	2 74	228 83	399 9	-5 0	-6 0	230 38		7 9
500 0	3 36	199 72	499 7	-9 3	-8 8	223 42		12 9
600 0	3 04	221 06	599 6	-14 1	-11 6	219 37		18 2
700 0	3 68	266 21	699 4	-16 3	-16 5	225 35		23 2
800 0	4 01	326 00	799 2	-13 6	-21 7	237 85		25 6
900 0	1 98	31 65	899 1	-9 3	-22 7	247 85		24 5
1,000 0	1 11	107 95	999 1	-8 1	-20 9	248 86		22 4
1,100 0	1 20	143 80	1,099 1	-9 2	-19 4	244 52		21 4

Scientific Drilling International, Inc.

SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Falcon "28" #1H
Project:	Culebra Bluff	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Falcon "28" #1H	North Reference:	Grid
Wellbore:	VH - Job #32K0312287	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0312287	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	1 36	155 40	1,199 1	-11 1	-18 2	238 57	21 4
1,300 0	1 43	158 78	1,299 0	-13 4	-17 3	232 26	21 9
1,400 0	1 36	158 62	1,399 0	-15 7	-16 4	226 35	22 7
1,500 0	1 25	162 70	1,499 0	-17 8	-15 7	221 32	23 7
1,600 0	1 06	157 41	1,599 0	-19 7	-15 0	217 24	24 7
1,700 0	1 06	158 32	1,698 9	-21 4	-14 3	213 69	25 7
1,800 0	1 01	144 59	1,798 9	-23 0	-13 4	210 28	26 6
1,900 0	1 82	120 30	1,898 9	-24 5	-11 5	205 22	27 1
2,000 0	2 21	108 13	1,998 8	-25 9	-8 3	197 84	27 2
2,100 0	2 10	79 25	2,098 8	-26 2	-4 7	190 20	26 6
2,200 0	2 94	84 97	2,198 7	-25 6	-0 4	180 79	25 6
2,300 0	2 23	121 45	2,298 6	-26 4	3 9	171 67	26 7
2,400 0	1 47	127 01	2,398 5	-28 2	6 5	166 92	28 9
2,500 0	0 81	123 72	2,498 5	-29 3	8 2	164 46	30 5
2,600 0	0 41	91 10	2,598 5	-29 7	9 1	162 98	31 1
2,700 0	0 47	86 27	2,698 5	-29 7	9 9	161 63	31 3
2,800 0	0 43	73 98	2,798 5	-29 6	10 6	160 22	31 4
2,900 0	0 35	65 93	2,898 5	-29 4	11 3	158 98	31 5
3,000 0	0 33	69 98	2,998 5	-29 1	11 8	157 90	31 5
3,100 0	0 28	53 84	3,098 5	-28 9	12 3	156 95	31 4
3,200 0	0 25	50 81	3,198 5	-28 6	12 7	156 13	31 3
3,300 0	0 25	51 68	3,298 5	-28 3	13 0	155 35	31 2
3,400 0	0 14	28 01	3,398 5	-28 1	13 2	154 78	31 1
3,500 0	0 18	41 01	3,498 5	-27 9	13 4	154 33	30 9
3,600 0	0 14	43 64	3,598 5	-27 7	13 6	153 85	30 8
3,700 0	0 17	29 23	3,698 5	-27 4	13 7	153 41	30 7
3,800 0	0 15	20 29	3,798 5	-27 2	13 9	153 00	30 5
3,900 0	0 25	346 87	3,898 5	-26 9	13 9	152 72	30 2
4,000 0	0 27	336 36	3,998 5	-26 4	13 7	152 59	29 8
4,100 0	0 22	327 58	4,098 5	-26 1	13 5	152 59	29 4
4,200 0	0 22	325 21	4,198 5	-25 7	13 3	152 67	29 0
4,300 0	0 19	310 05	4,298 5	-25 5	13 1	152 85	28 6
4,400 0	0 22	306 76	4,398 5	-25 3	12 8	153 15	28 3
4,500 0	1 06	116 49	4,498 5	-25 5	13 5	152 23	28 9
4,600 0	1 13	111 51	4,598 4	-26 3	15 2	149 99	30 4
4,700 0	1 22	113 80	4,698 4	-27 1	17 1	147 77	32 1
4,800 0	1 04	114 69	4,798 4	-27 9	18 9	145 92	33 7
4,900 0	0 88	118 54	4,898 4	-28 7	20 4	144 58	35 2
5,000 0	0 62	112 93	4,998 4	-29 2	21 6	143 60	36 3
5,100 0	0 47	112 38	5,098 4	-29 6	22 4	142 85	37 2
5,200 0	0 35	109 73	5,198 4	-29 9	23 1	142 28	37 8
5,300 0	0 32	96 80	5,298 4	-30 0	23 7	141 73	38 2
5,400 0	0 33	66 18	5,398 4	-29 9	24 2	141 02	38 5
5,500 0	0 41	55 89	5,498 4	-29 6	24 8	140 08	38 6

Scientific Drilling International, Inc.

SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Falcon "28" #1H
Project:	Culebra Bluff	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Falcon "28" #1H	North Reference:	Grid
Wellbore:	VH - Job #32K0312287	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0312287	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 42	58 46	5,598 4	-29 2	25 4	139 02	38 7
5,700 0	0 18	19 41	5,698 4	-28 9	25 7	138 28	38 7
5,800 0	0 21	346 53	5,798 4	-28 5	25 8	137 95	38 4
5,900 0	0 19	320 66	5,898 4	-28 2	25 6	137 80	38 1
6,000 0	0 17	295 01	5,998 4	-28 1	25 4	137 88	37 8
6,100 0	0 30	237 94	6,098 4	-28 1	25 0	138 36	37 6
6,200 0	0 88	238 84	6,198 4	-28 7	24 1	139 91	37 5
6,300 0	1 18	251 95	6,298 3	-29 4	22 5	142 56	37 0
6,400 0	1 74	264 18	6,398 3	-29 9	20 0	146 17	35 9
6,500 0	2 86	297 24	6,498 2	-28 9	16 3	150 58	33 1
6,590 0	2 68	308 87	6,588 1	-26 5	12 6	154 51	29 4

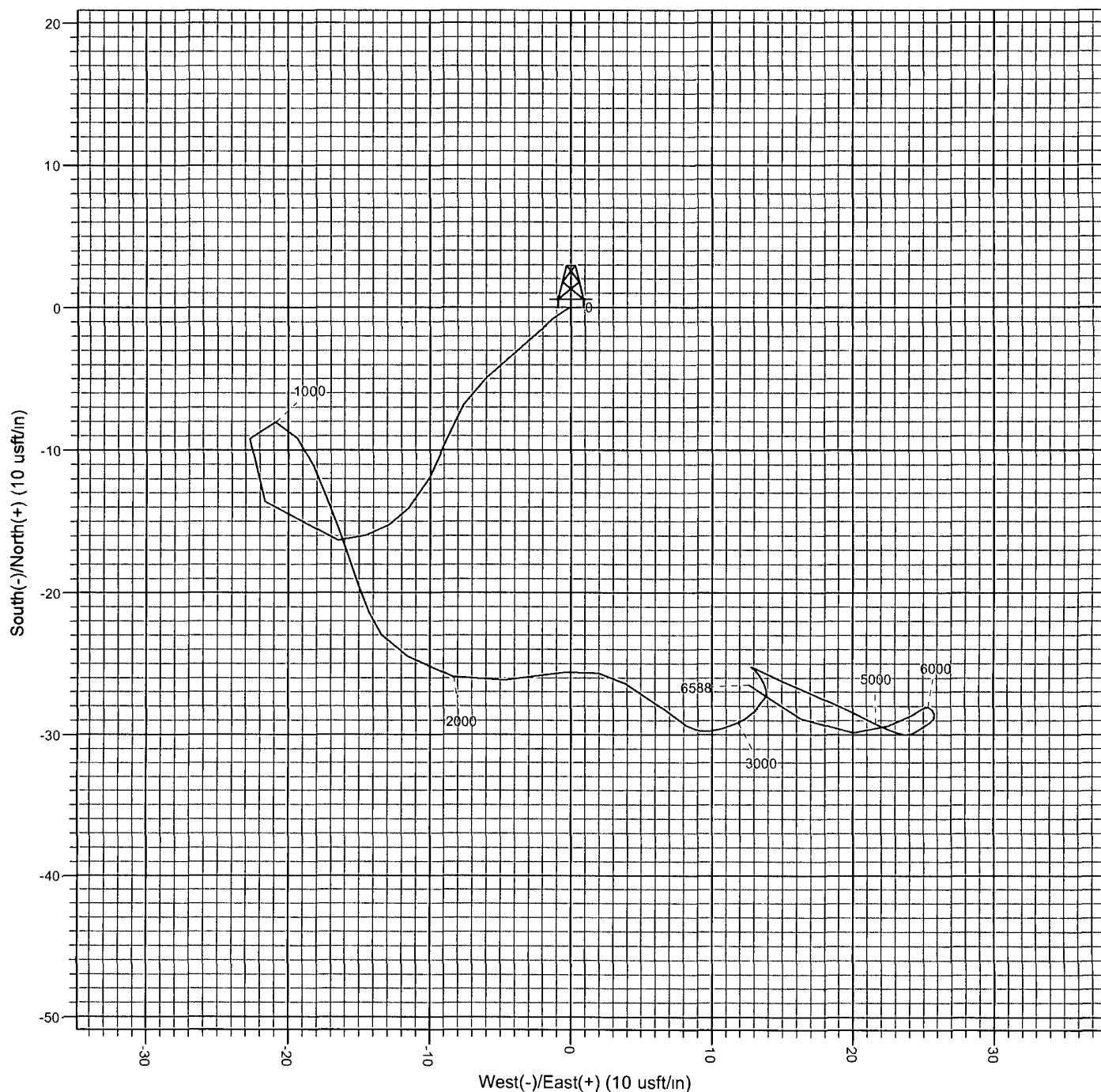


Scientific Drilling
Directional Drilling Operations

Project: Culebra Bluff
Eddy County, NM
Well: Falcon "28" #1H
Wellbore: VH - Job #32K0312287
Design: VH - Job #32K0312287

WELL DETAILS: Falcon "28" #1H
WELL @ 0.0usft (Original Well Elev)
Ground Level: 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0 0	464958.10	618084.80	32° 16' 40.800 N	104° 5' 6.000 W	



PROJECT DETAILS: Culebra Bluff
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level

SITE DETAILS: Eddy County, NM
Site Centre Latitude: 32° 20' 13.338 N
Longitude: 104° 0' 19.945 W
Positional Uncertainty: 0.0
Convergence: 0.18
Local North: Grid



COG Operating LLC

Eddy County(NAD83)

Loving Falcon "28"

#1H

OH

Design: OH

Pathfinder X & Y Report

23 March, 2012

PATHFINDER®

A Schlumberger Company



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County(NAD83)	TVD Reference:	KB = 18' @ 3067.0usft (Original Well Elev)
Site:	Loving Falcon "28"	MD Reference:	KB = 18' @ 3067.0usft (Original Well Elev)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Project	Eddy 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	Loving Falcon "28"		
Site Position:		Northing:	464,986.684 usft
From:	Map	Easting:	617,900.403 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 16' 41.087 N
		Longitude:	104° 5' 8.147 W
		Grid Convergence:	0.13 °

Well	#1H					
Well Position	+N/-S	0.0 usft	Northing:	464,986.684 usft	Latitude:	32° 16' 41.087 N
	+E/-W	0.0 usft	Easting:	617,900.403 usft	Longitude:	104° 5' 8.147 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,049.0 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	2/23/2012	7.73	60.16	48,565

Design	OH			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0 0	0.0	0.0	268.97



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County(NAD83)	TVD Reference:	KB = 18' @ 3067 0usft (Original Well Elev)
Site:	Loving Falcon "28"	MD Reference:	KB = 18' @ 3067.0usft (Original Well Elev)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey Program		Date	3/23/2012			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description		
100.0	6,590.0	Gyro #1 (OH)	NS-GYRO-MS	North sensing gyrocompassing m/s		
6,608 0	11,378 0	MWD #2 (OH)	MWD	MWD - Standard		

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
0.0	0.00	0.00	0.0	-3,067.0	0.0	0.0	0.0	0.00	464,986.68	617,900.40
100.0	0.55	244.92	100.0	-2,967.0	-0.2	-0.4	0.4	0.55	464,986.48	617,899.97
200.0	0.67	226.74	200.0	-2,867.0	-0.8	-1.3	1.3	0.23	464,985.88	617,899.11
300.0	1.93	228.65	300.0	-2,767.0	-2.3	-3.0	3.0	1.26	464,984.36	617,897.42
400.0	2.74	228.83	399.9	-2,667.1	-5.0	-6.0	6.1	0.81	464,981.68	617,894.35
500.0	3.36	199.72	499.7	-2,567.3	-9.3	-8.8	9.0	1.65	464,977.34	617,891.57
600.0	3.04	221.06	599.6	-2,467.4	-14.1	-11.6	11.8	1.23	464,972.59	617,888.84
700.0	3.68	266.21	699.4	-2,367.6	-16.3	-16.5	16.8	2.65	464,970.37	617,883.89
800.0	4.01	326.00	799.2	-2,267.8	-13.6	-21.7	21.9	3.84	464,973.06	617,878.73
900.0	1.98	31.65	899.1	-2,167.9	-9.3	-22.7	22.9	3.67	464,977.43	617,877.68
1,000.0	1.11	107.95	999.1	-2,067.9	-8.1	-20.9	21.0	2.03	464,978.61	617,879.51
1,100.0	1.20	143.80	1,099.1	-1,967.9	-9.2	-19.4	19.5	0.72	464,977.46	617,881.05
1,200.0	1.36	155.40	1,199.1	-1,867.9	-11.1	-18.2	18.4	0.30	464,975.54	617,882.16
1,300.0	1.43	158.78	1,299.0	-1,768.0	-13.4	-17.3	17.5	0.11	464,973.30	617,883.11
1,400.0	1.36	158.62	1,399.0	-1,668.0	-15.7	-16.4	16.7	0.07	464,971.03	617,883.99
1,500.0	1.25	162.70	1,499.0	-1,568.0	-17.8	-15.7	16.0	0.14	464,968.88	617,884.75
1,600.0	1.06	157.41	1,599.0	-1,468.0	-19.7	-15.0	15.3	0.22	464,966.99	617,885.43
1,700.0	1.06	158.32	1,698.9	-1,368.1	-21.4	-14.3	14.7	0.02	464,965.27	617,886.13
1,800.0	1.01	144.59	1,798.9	-1,268.1	-23.0	-13.4	13.8	0.25	464,963.69	617,886.98
1,900.0	1.82	120.30	1,898.9	-1,168.1	-24.5	-11.5	12.0	0.99	464,962.17	617,888.86
2,000.0	2.21	108.13	1,998.8	-1,068.2	-25.9	-8.3	8.8	0.58	464,960.77	617,892.06



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company: COG Operating LLC
Project: Eddy County(NAD83)
Site: Loving Falcon "28"
Well: #1H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #1H
TVD Reference: KB = 18' @ 3067.0usft (Original Well Elev)
MD Reference: KB = 18' @ 3067.0usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
2,100.0	2.10	79.25	2,098.8	-968.2	-26.2	-4.7	5.2	1.08	464,960.52	617,895.70	
2,200.0	2.94	84.97	2,198.7	-868.3	-25.6	-0.4	0.8	0.88	464,961.08	617,900.05	
2,300.0	2.23	121.45	2,298.6	-768.4	-26.4	3.9	-3.4	1.75	464,960.29	617,904.27	
2,400.0	1.47	127.01	2,398.5	-668.5	-28.2	6.5	-6.0	0.78	464,958.50	617,906.95	
2,500.0	0.81	123.72	2,498.5	-568.5	-29.3	8.2	-7.6	0.66	464,957.34	617,908.56	
2,600.0	0.41	91.10	2,598.5	-468.5	-29.7	9.1	-8.6	0.51	464,956.94	617,909.51	
2,700.0	0.47	86.27	2,698.5	-368.5	-29.7	9.9	-9.3	0.07	464,956.96	617,910.27	
2,800.0	0.43	73.98	2,798.5	-268.5	-29.6	10.6	-10.1	0.10	464,957.09	617,911.04	
2,900.0	0.35	65.93	2,898.5	-168.5	-29.4	11.3	-10.8	0.10	464,957.32	617,911.68	
3,000.0	0.33	69.98	2,998.5	-68.5	-29.1	11.8	-11.3	0.03	464,957.54	617,912.23	
3,100.0	0.28	53.84	3,098.5	31.5	-28.9	12.3	-11.8	0.10	464,957.78	617,912.70	
3,200.0	0.25	50.81	3,198.5	131.5	-28.6	12.7	-12.1	0.03	464,958.07	617,913.07	
3,300.0	0.25	51.68	3,298.5	231.5	-28.3	13.0	-12.5	0.00	464,958.34	617,913.41	
3,400.0	0.14	28.01	3,398.5	331.5	-28.1	13.2	-12.7	0.13	464,958.58	617,913.64	
3,500.0	0.18	41.01	3,498.5	431.5	-27.9	13.4	-12.9	0.05	464,958.81	617,913.80	
3,600.0	0.14	43.64	3,598.5	531.5	-27.7	13.6	-13.1	0.04	464,959.02	617,913.98	
3,700.0	0.17	29.23	3,698.5	631.5	-27.4	13.7	-13.2	0.05	464,959.23	617,914.14	
3,800.0	0.15	20.29	3,798.5	731.5	-27.2	13.9	-13.4	0.03	464,959.49	617,914.26	
3,900.0	0.25	346.87	3,898.5	831.5	-26.9	13.9	-13.4	0.15	464,959.82	617,914.26	
4,000.0	0.27	336.36	3,998.5	931.5	-26.4	13.7	-13.2	0.05	464,960.25	617,914.11	
4,100.0	0.22	327.58	4,098.5	1,031.5	-26.1	13.5	-13.0	0.06	464,960.63	617,913.91	
4,200.0	0.22	325.21	4,198.5	1,131.5	-25.7	13.3	-12.8	0.01	464,960.95	617,913.70	
4,300.0	0.19	310.05	4,298.5	1,231.5	-25.5	13.1	-12.6	0.06	464,961.21	617,913.46	
4,400.0	0.22	306.76	4,398.5	1,331.5	-25.3	12.8	-12.3	0.03	464,961.43	617,913.18	
4,500.0	1.06	116.49	4,498.5	1,431.5	-25.5	13.5	-13.0	1.28	464,961.14	617,913.86	
4,600.0	1.13	111.51	4,598.4	1,531.4	-26.3	15.2	-14.7	0.12	464,960.36	617,915.60	
4,700.0	1.22	113.80	4,698.4	1,631.4	-27.1	17.1	-16.6	0.10	464,959.57	617,917.49	



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County(NAD83)	TVD Reference:	KB = 18' @ 3067.0usft (Original Well Elev)
Site:	Loving Falcon "28"	MD Reference:	KB = 18' @ 3067.0usft (Original Well Elev)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
4,800.0	1.04	114.69	4,798.4	1,731.4	-27.9	18.9	-18.4	0.18	464,958.76	617,919.29
4,900.0	0.88	118.54	4,898.4	1,831.4	-28.7	20.4	-19.9	0.17	464,958.02	617,920.79
5,000.0	0.62	112.93	4,998.4	1,931.4	-29.2	21.6	-21.0	0.27	464,957.44	617,921.97
5,100.0	0.47	112.38	5,098.4	2,031.4	-29.6	22.4	-21.9	0.15	464,957.07	617,922.84
5,200.0	0.35	109.73	5,198.4	2,131.4	-29.9	23.1	-22.6	0.12	464,956.81	617,923.51
5,300.0	0.32	96.80	5,298.4	2,231.4	-30.0	23.7	-23.1	0.08	464,956.68	617,924.07
5,400.0	0.33	66.18	5,398.4	2,331.4	-29.9	24.2	-23.7	0.17	464,956.76	617,924.62
5,500.0	0.41	55.89	5,498.4	2,431.4	-29.6	24.8	-24.2	0.10	464,957.08	617,925.17
5,600.0	0.42	58.46	5,598.4	2,531.4	-29.2	25.4	-24.9	0.02	464,957.47	617,925.78
5,700.0	0.18	19.41	5,698.4	2,631.4	-28.9	25.7	-25.2	0.30	464,957.81	617,926.15
5,800.0	0.21	346.53	5,798.4	2,731.4	-28.5	25.8	-25.2	0.11	464,958.13	617,926.16
5,900.0	0.19	320.66	5,898.4	2,831.4	-28.2	25.6	-25.1	0.09	464,958.44	617,926.01
6,000.0	0.17	295.01	5,998.4	2,931.4	-28.1	25.4	-24.9	0.08	464,958.63	617,925.77
6,100.0	0.30	237.94	6,098.4	3,031.4	-28.1	25.0	-24.5	0.25	464,958.56	617,925.41
6,200.0	0.88	238.84	6,198.4	3,131.4	-28.7	24.1	-23.6	0.58	464,958.02	617,924.53
6,300.0	1.18	251.95	6,298.3	3,231.3	-29.4	22.5	-22.0	0.38	464,957.30	617,922.90
6,400.0	1.74	264.18	6,398.3	3,331.3	-29.9	20.0	-19.5	0.64	464,956.83	617,920.41
6,500.0	2.86	297.24	6,498.2	3,431.2	-28.9	16.3	-15.8	1.69	464,957.82	617,916.68
6,590.0	2.68	308.87	6,588.1	3,521.1	-26.5	12.6	-12.2	0.65	464,960.17	617,913.05
6,608.0	2.37	315.24	6,606.1	3,539.1	-26.0	12.1	-11.6	2.32	464,960.69	617,912.46
6,639.0	2.46	314.66	6,637.1	3,570.1	-25.1	11.1	-10.7	0.30	464,961.62	617,911.53
6,671.0	2.64	293.07	6,669.0	3,602.0	-24.3	10.0	-9.5	3.03	464,962.39	617,910.37
6,703.0	5.72	263.12	6,701.0	3,634.0	-24.2	7.7	-7.3	11.49	464,962.49	617,908.10
KOP - 6703.0 'MD, 6701.0 'TVD, 263.12 'AZI, 5.72 'INC, -24.2 'N, 7.7 'E										
6,735.0	9.23	261.67	6,732.7	3,665.7	-24.8	3.6	-3.1	10.98	464,961.92	617,903.98
6,767.0	13.54	259.44	6,764.0	3,697.0	-25.8	-2.6	3.1	13.54	464,960.86	617,897.75
6,798.0	16.71	259.71	6,794.0	3,727.0	-27.3	-10.6	11.1	10.23	464,959.40	617,889.80



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County(NAD83)	TVD Reference:	KB = 18' @ 3067.0usft (Original Well Elev)
Site:	Loving Falcon "28"	MD Reference:	KB = 18' @ 3067.0usft (Original Well Elev)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
6,830.0	19.35	264.36	6,824.4	3,757.4	-28.6	-20.4	20.9	9.39	464,958.06	617,880.00
6,862.0	22.77	265.09	6,854.3	3,787.3	-29.7	-31.9	32.4	10.72	464,957.01	617,868.55
6,894.0	26.64	265.96	6,883.3	3,816.3	-30.7	-45.2	45.7	12.15	464,955.97	617,855.22
6,926.0	31.13	265.69	6,911.3	3,844.3	-31.8	-60.6	61.2	14.04	464,954.85	617,839.80
6,957.0	34.82	265.21	6,937.3	3,870.3	-33.2	-77.4	78.0	11.93	464,953.50	617,822.99
6,989.0	38.43	263.79	6,963.0	3,896.0	-35.0	-96.4	97.0	11.59	464,951.66	617,803.99
7,021.0	40.27	261.90	6,987.8	3,920.8	-37.6	-116.5	117.2	6.86	464,949.13	617,783.86
7,053.0	44.14	263.43	7,011.5	3,944.5	-40.3	-137.9	138.6	12.51	464,946.40	617,762.54
7,085.0	46.60	264.78	7,033.9	3,966.9	-42.6	-160.5	161.2	8.25	464,944.06	617,739.89
7,117.0	49.77	264.94	7,055.3	3,988.3	-44.8	-184.3	185.0	9.91	464,941.93	617,716.14
7,148.0	51.09	263.78	7,075.0	4,008.0	-47.1	-208.0	208.9	5.14	464,939.58	617,692.36
7,180.0	52.58	263.39	7,094.8	4,027.8	-49.9	-233.0	233.9	4.75	464,936.77	617,667.36
7,212.0	54.61	262.62	7,113.8	4,046.8	-53.1	-258.6	259.5	6.63	464,933.63	617,641.80
7,244.0	58.04	261.75	7,131.5	4,064.5	-56.7	-285.0	286.0	10.95	464,930.00	617,615.42
7,275.0	62.08	261.19	7,147.0	4,080.0	-60.7	-311.5	312.6	13.13	464,926.02	617,588.86
7,307.0	66.24	263.00	7,160.9	4,093.9	-64.6	-340.1	341.2	13.96	464,922.07	617,560.34
7,339.0	66.13	264.07	7,173.9	4,106.9	-67.9	-369.1	370.3	3.08	464,918.77	617,531.26
7,371.0	68.32	265.04	7,186.2	4,119.2	-70.7	-398.5	399.7	7.39	464,915.97	617,501.89
7,403.0	72.63	266.00	7,196.9	4,129.9	-73.1	-428.6	429.8	13.76	464,913.62	617,471.83
7,434.0	76.85	265.86	7,205.1	4,138.1	-75.2	-458.4	459.7	13.62	464,911.50	617,442.00
7,466.0	79.76	266.81	7,211.6	4,144.6	-77.2	-489.7	491.0	9.55	464,909.50	617,410.73
7,498.0	81.07	266.39	7,216.9	4,149.9	-79.1	-521.2	522.5	4.29	464,907.62	617,379.24
7,530.0	83.36	266.55	7,221.2	4,154.2	-81.0	-552.8	554.2	7.17	464,905.67	617,347.59
7,561.0	85.65	266.59	7,224.2	4,157.2	-82.9	-583.6	585.0	7.39	464,903.83	617,316.79
7,592.0	88.81	267.31	7,225.7	4,158.7	-84.5	-614.5	615.9	10.45	464,902.18	617,285.88
7,624.0	89.43	267.48	7,226.2	4,159.2	-86.0	-646.5	647.9	2.01	464,900.73	617,253.91



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County(NAD83)	TVD Reference:	KB = 18' @ 3067.0usft (Original Well Elev)
Site:	Loving Falcon "28"	MD Reference:	KB = 18' @ 3067.0usft (Original Well Elev)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)		TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
7,656.0	89.34	266.98		7,226.5	4,159.5	-87.5	-678.5	679.9	1.59	464,899.18	617,221.95
LP - 7656.0 'MD, 7226.5 'TVD, 266.98 'AZI, 89.34 'INC, -87.5 'N, -678.5 'E											
7,752.0	92.15	266.50		7,225.3	4,158.3	-93.0	-774.3	775.8	2.97	464,893.72	617,126.13
7,847.0	92.51	266.40		7,221.4	4,154.4	-98.8	-869.0	870.6	0.39	464,887.84	617,031.39
7,942.0	92.42	265.78		7,217.4	4,150.4	-105.3	-963.7	965.4	0.66	464,881.37	616,936.70
8,038.0	92.68	265.34		7,213.1	4,146.1	-112.7	-1,059.3	1,061.2	0.53	464,873.95	616,841.08
8,133.0	92.24	265.93		7,209.0	4,142.0	-120.0	-1,154.0	1,155.9	0.77	464,866.72	616,746.44
8,229.0	91.80	267.40		7,205.6	4,138.6	-125.5	-1,249.7	1,251.8	1.60	464,861.14	616,650.67
8,324.0	92.07	267.25		7,202.4	4,135.4	-130.0	-1,344.6	1,346.7	0.33	464,856.71	616,555.83
8,420.0	91.54	268.84		7,199.4	4,132.4	-133.2	-1,440.5	1,442.6	1.75	464,853.44	616,459.93
8,515.0	92.07	268.62		7,196.4	4,129.4	-135.4	-1,535.4	1,537.6	0.60	464,851.33	616,365.00
8,610.0	91.10	269.65		7,193.8	4,126.8	-136.8	-1,630.3	1,632.5	1.49	464,849.90	616,270.05
8,704.0	91.36	269.24		7,191.7	4,124.7	-137.7	-1,724.3	1,726.5	0.52	464,848.99	616,176.08
8,800.0	90.84	268.21		7,189.9	4,122.9	-139.8	-1,820.3	1,822.5	1.20	464,846.85	616,080.12
8,895.0	90.66	267.57		7,188.7	4,121.7	-143.3	-1,915.2	1,917.5	0.70	464,843.36	615,985.20
8,990.0	90.75	267.52		7,187.5	4,120.5	-147.4	-2,010.1	2,012.4	0.11	464,839.29	615,890.29
9,086.0	91.01	267.32		7,186.0	4,119.0	-151.7	-2,106.0	2,108.4	0.34	464,834.97	615,794.40
9,181.0	90.84	266.80		7,184.5	4,117.5	-156.6	-2,200.9	2,203.3	0.58	464,830.09	615,699.54
9,276.0	90.66	269.23		7,183.2	4,116.2	-159.9	-2,295.8	2,298.3	2.56	464,826.80	615,604.61
9,371.0	91.98	269.74		7,181.1	4,114.1	-160.7	-2,390.8	2,393.3	1.49	464,825.95	615,509.64
9,466.0	92.15	269.68		7,177.6	4,110.6	-161.2	-2,485.7	2,488.2	0.19	464,825.47	615,414.70
9,561.0	92.51	269.07		7,173.8	4,106.8	-162.2	-2,580.6	2,583.1	0.75	464,824.44	615,319.79
9,657.0	93.21	268.84		7,169.0	4,102.0	-164.0	-2,676.5	2,679.0	0.77	464,822.69	615,223.92
9,752.0	93.74	268.42		7,163.2	4,096.2	-166.3	-2,771.3	2,773.8	0.71	464,820.42	615,129.13
9,847.0	94.00	268.81		7,156.8	4,089.8	-168.6	-2,866.0	2,868.6	0.49	464,818.13	615,034.37
9,943.0	92.95	269.51		7,151.0	4,084.0	-170.0	-2,961.8	2,964.4	1.31	464,816.72	614,938.56
10,038.0	92.77	269.45		7,146.2	4,079.2	-170.8	-3,056.7	3,059.3	0.20	464,815.86	614,843.68



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County(NAD83)	TVD Reference:	KB = 18' @ 3067.0usft (Original Well Elev)
Site:	Loving Falcon "28"	MD Reference:	KB = 18' @ 3067.0usft (Original Well Elev)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
10,133.0	93.56	269.10	7,141.0	4,074.0	-172.0	-3,151.6	3,154.1	0.91	464,814.66	614,748.84
10,229.0	94.35	269.06	7,134.4	4,067.4	-173.6	-3,247.3	3,249.9	0.82	464,813.13	614,653.08
10,324.0	94.35	270.49	7,127.2	4,060.2	-173.9	-3,342.0	3,344.6	1.50	464,812.75	614,558.35
10,420.0	91.71	270.29	7,122.1	4,055.1	-173.3	-3,437.9	3,440.5	2.76	464,813.41	614,462.50
10,515.0	91.36	269.93	7,119.6	4,052.6	-173.1	-3,532.9	3,535.4	0.53	464,813.59	614,367.53
10,610.0	91.19	268.84	7,117.4	4,050.4	-174.1	-3,627.8	3,630.4	1.16	464,812.57	614,272.56
10,705.0	90.84	267.65	7,115.8	4,048.8	-177.0	-3,722.8	3,725.4	1.31	464,809.66	614,177.63
10,801.0	91.10	266.97	7,114.1	4,047.1	-181.5	-3,818.7	3,821.3	0.76	464,805.15	614,081.75
10,896.0	92.07	266.42	7,111.5	4,044.5	-187.0	-3,913.5	3,916.2	1.17	464,799.68	613,986.94
10,991.0	92.86	266.02	7,107.4	4,040.4	-193.3	-4,008.2	4,011.0	0.93	464,793.42	613,892.24
11,086.0	93.83	264.85	7,101.9	4,034.9	-200.8	-4,102.7	4,105.6	1.60	464,785.88	613,797.70
11,182.0	93.47	266.39	7,095.8	4,028.8	-208.1	-4,198.2	4,201.3	1.64	464,778.56	613,702.18
11,301.0	92.68	267.59	7,089.4	4,022.4	-214.4	-4,316.9	4,320.0	1.21	464,772.32	613,583.52
11,378.0	92.68	267.59	7,085.8	4,018.8	-217.6	-4,393.7	4,396.9	0.00	464,769.09	613,506.67
BHL - 11378.0 'MD, 7085.8 'TVD, 267.59 'AZI, 92.68 'INC, -217.6 'N, -4393.7 'E										

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,703.0	6,701.0	-24.2	7.7	KOP - 6703.0 'MD, 6701.0 'TVD, 263.12 'AZI, 5.72 'INC, -24.2 'N, 7.7 'E
7,656.0	7,226.5	-87.5	-678.5	LP - 7656.0 'MD, 7226.5 'TVD, 266.98 'AZI, 89.34 'INC, -87.5 'N, -678.5 'E
11,378.0	7,085.8	-217.6	-4,393.7	BHL - 11378.0 'MD, 7085.8 'TVD, 267.59 'AZI, 92.68 'INC, -217.6 'N, -4393.7 'E

Checked By: _____	Approved By: _____	Date: _____
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Project: Eddy County(NAD83)
Site: Loving Falcon "28"

Well: #1H

Wellbore: OH

Plan: Post Gyro Plan #2 (#1H/OH)



Azimuths to Grid North
True North: -0.13°
Magnetic North: 7.60°

Magnetic Field
Strength: 48565.5nT
Dip Angle: 60.16°
Date: 2/23/2012
Model: IGRF200510



A Schlumberger Company

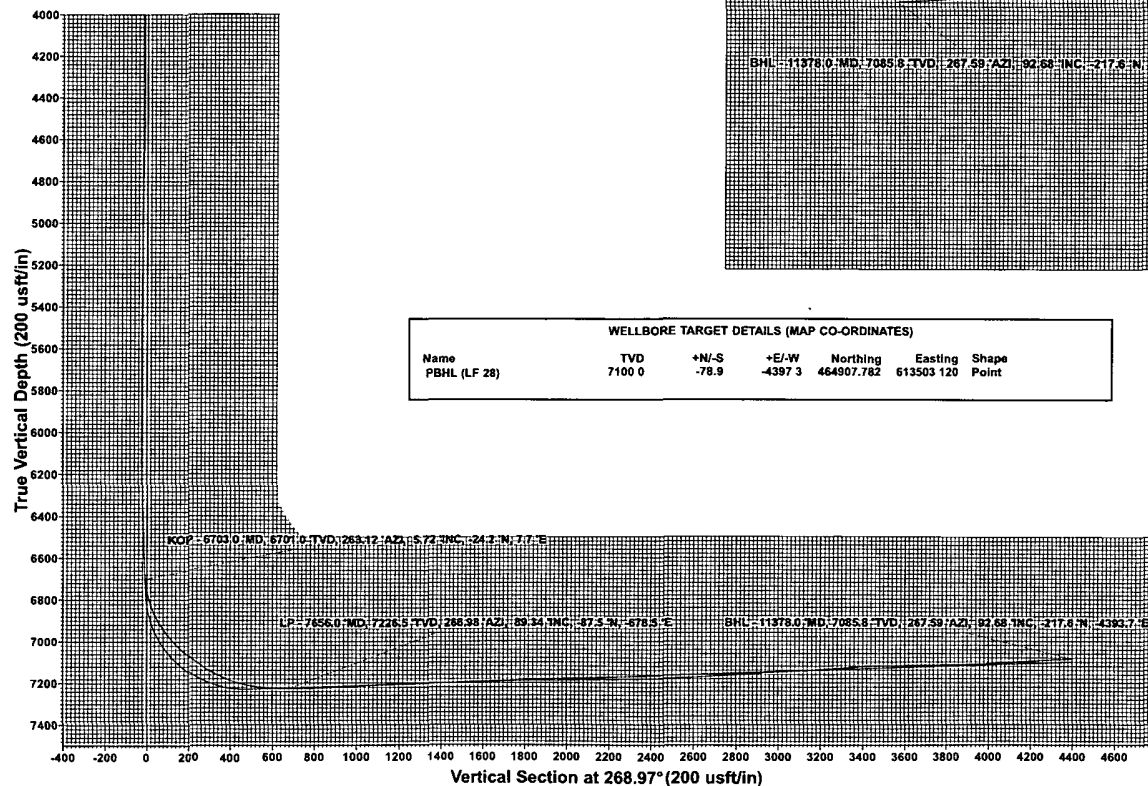
WELL DETAILS #1H

Ground Elevation 3049.0
RKB Elevation KB = 18' @ 3067.0usft (Original Well Elev)
Rig Name. Original Well Elev

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	464986.684	617900.403	32° 16' 41.087 N	104° 5' 8.147 W	

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	6590.0	2.68	308.87	6588.1	-26.5	12.6	0.00	0.00	-12.2	
2	6772.2	2.68	308.87	6770.1	-21.2	6.0	0.00	0.00	-5.6	
3	7520.9	91.90	269.86	7230.0	-15.0	-487.2	12.00	-39.78	487.4	
4	11433.7	91.90	269.86	7100.0	-78.9	-4397.3	0.00	0.00	4398.0	PBHL (LF 28)



WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
PBHL (LF 28)	7100.0	-78.9	-4397.3	464907.782	613503.120	Point

EOW

PROJECT DETAILS: Eddy County(NAD83)
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level
Local North: Grid

Plan Post Gyro Plan #2 (#1H/OH)

Created By: Michael Trout Date: 10/12, March 23/2012

Checked: _____ Date: _____