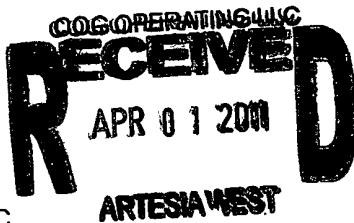


DRILLING INC. Oil Well Drilling Contractor

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

March 21, 2011



COG Operating, LLC
PO Box 1630
Artesia, NM 88211-1630

30-015-38071
Re: SRO State Unit 16H
Sec. 20, T-26-S, R-28-E
Eddy County, New Mexico

Attn: Sheryl Baker

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

160' - 1°	3867' - 1°
305' - 0.5°	4365' - 1°
545' - 0.5°	4866' - 2°
852' - 0.5°	5367' - 2°
1103' - 2.75°	5864' - 2.5°
1261' - 2°	
1511' - 0.5°	
1729' - 2°	
1979' - 3.5°	
2133' - 4°	
2275' - 3°	
2618' - 3°	
2867' - 2.75°	
3367' - 1.75°	

Sincerely,

Gary W. Chappell
Contracts Manager

STATE OF NEW MEXICO)

COUNTY OF EDDY)

The foregoing was acknowledged before me this 21st day of March, 2011 by Gary W. Chappell.

MY COMMISSION EXPIRES



Crisha Morgan

NOTARY PUBLIC-STATE OF NEW MEXICO

My commission expires: 10/28/2011

NOTARY PUBLIC

COG OPERATING

Hay Hollow
Eddy County, NM
SRO Unit State Com #16H
VH - Job #32K0311232

Survey: Actual

SDI Standard Survey Report

16 March, 2011

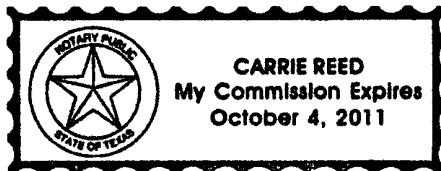
This survey is correct to the best of my knowledge and is supported by actual field data.

Richard

Notarized this date 7th of April, 2011.

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 SRO Unit State Com #16H
Project:	Hay Hollow	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	SRO Unit State Com #16H	North Reference:	Grid
Wellbore:	VH - Job #32K0311232	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0311232	Database:	EDM-Regulatory

Project	Hay Hollow		
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:	Eddy County, NM		
Site Position:		Northing:	386,239 33 usft
From:	Lat/Long	Easting:	572,312 98 usft
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16"
		Latitude:	32° 3' 42 020 N
		Longitude:	104° 5' 59 660 W
		Grid Convergence:	0 12 °

Well	SRO Unit State Com #16H, Directional (Pathfinder)		
Well Position	+N/-S	0 0 usft	Northing: 372,160 90 usft
	+E/-W	0 0 usft	Easting: 567,045 51 usft
Position Uncertainty	0 0 usft	Wellhead Elevation:	usft
		Latitude:	32° 1' 22 800 N
		Longitude:	104° 7' 1 200 W
		Ground Level:	0 0 usft

Wellbore	VH - Job #32K0311232				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2010	3/14/2011	7 91	59 91	48,511

Design	VH - Job #32K0311232			
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	0 61

Survey Program	Date	3/16/2011		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100 0	5,910 0	Actual (VH - Job #32K0311232)	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 28	132 88	100 0	-0 2	0 2	132 88	0 2	
200 0	0 28	147 14	200 0	-0 5	0 5	137 62	0 7	
300 0	0 36	140 51	300 0	-1 0	0 8	140 13	1 3	
400 0	0 43	148 52	400 0	-1 5	1 2	141 78	2 0	
500 0	0 39	135 53	500 0	-2 1	1 7	141 93	2 7	
600 0	0 60	166 54	600 0	-2 9	2 0	144 88	3 5	
700 0	1 08	163 86	700 0	-4 3	2 4	150 73	4 9	
800 0	1 51	169 17	800 0	-6 5	2 9	155 83	7 1	
900 0	1 96	183 12	899 9	-9 5	3 1	162 10	10 0	
1,000 0	2 12	193 49	999 8	-13 0	2 5	168 95	13 2	
1,100 0	2 29	214 14	1,099 8	-16 4	1 0	176 57	16 5	

Scientific Drilling International, Inc.

SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well SRO Unit State Com #16H
Project:	Hay Hollow	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	SRO Unit State Com #16H	North Reference:	Grid
Wellbore:	VH - Job #32K0311232	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0311232	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	2 29	230 14	1,199 7	-19 4	-1 7	184 93	19 4
1,300 0	1 97	235 66	1,299 6	-21 6	-4 6	192 07	22 1
1,400 0	1 90	234 46	1,399 6	-23 6	-7 4	197 42	24 7
1,500 0	1 15	246 60	1,499 5	-24 9	-9 7	201 19	26 7
1,600 0	0 73	172 39	1,599 5	-25 9	-10 5	202 03	28 0
1,700 0	1 98	110 89	1,699 5	-27 2	-8 8	197 93	28 6
1,800 0	2 17	106 71	1,799 4	-28 4	-5 4	190 73	28 9
1,900 0	3 13	104 77	1,899 3	-29 6	-0 9	181 78	29 6
2,000 0	4 65	99 56	1,999 1	-31 0	5 7	169 54	31 5
2,100 0	5 19	95 17	2,098 7	-32 0	14 2	156 07	35 1
2,200 0	4 55	96 70	2,198 4	-32 9	22 7	145 45	40 0
2,300 0	3 52	95 53	2,298 1	-33 7	29 7	138 63	44 9
2,400 0	2 83	92 31	2,398 0	-34 1	35 2	134 08	49 0
2,500 0	2 57	90 40	2,497 8	-34 2	39 9	130 60	52 5
2,600 0	2 29	84 82	2,597 8	-34 0	44 1	127 63	55 7
2,700 0	1 98	84 36	2,697 7	-33 7	47 8	125 14	58 5
2,800 0	1 97	80 53	2,797 6	-33 2	51 2	122 95	61 1
2,900 0	1 71	85 82	2,897 6	-32 8	54 4	121 09	63 6
3,000 0	1 41	94 69	2,997 5	-32 8	57 1	119 87	65 9
3,100 0	1 27	90 06	3,097 5	-32 9	59 5	118 96	68 0
3,200 0	1 07	93 39	3,197 5	-33 0	61 5	118 19	69 8
3,300 0	0 98	102 38	3,297 5	-33 2	63 3	117 69	71 5
3,400 0	0 84	96 02	3,397 5	-33 5	64 8	117 30	73 0
3,500 0	0 80	91 13	3,497 4	-33 6	66 3	116 86	74 3
3,600 0	0 56	116 43	3,597 4	-33 8	67 4	116 63	75 4
3,700 0	0 54	105 80	3,697 4	-34 1	68 3	116 56	76 4
3,800 0	0 48	117 34	3,797 4	-34 5	69 1	116 50	77 2
3,900 0	0 55	141 89	3,897 4	-35 0	69 8	116 65	78 1
4,000 0	0 50	126 28	3,997 4	-35 7	70 4	116 85	79 0
4,100 0	0 60	151 22	4,097 4	-36 4	71 0	117 12	79 8
4,200 0	0 65	156 95	4,197 4	-37 4	71 5	117 58	80 7
4,300 0	0 54	138 53	4,297 4	-38 2	72 1	117 96	81 6
4,400 0	0 45	157 80	4,397 4	-39 0	72 5	118 25	82 3
4,500 0	0 36	193 04	4,497 4	-39 6	72 6	118 63	82 7
4,600 0	0 47	206 16	4,597 4	-40 3	72 3	119 12	82 8
4,700 0	0 52	198 45	4,697 4	-41 1	72 0	119 71	82 9
4,800 0	0 59	194 05	4,797 4	-42 0	71 7	120 36	83 2
4,900 0	0 66	190 47	4,897 4	-43 1	71 5	121 07	83 5
5,000 0	0 52	189 98	4,997 4	-44 1	71 3	121 73	83 9
5,100 0	0 44	181 73	5,097 4	-44 9	71 2	122 24	84 2
5,200 0	0 58	173 73	5,197 4	-45 8	71 3	122 73	84 7
5,300 0	0 74	170 49	5,297 4	-47 0	71 5	123 32	85 5
5,400 0	0 95	161 06	5,397 4	-48 4	71 8	123 97	86 6
5,500 0	0 95	150 65	5,497 3	-49 9	72 5	124 53	88 0

Scientific Drilling International, Inc.

SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well SRO Unit State Com #16H
Project:	Hay Hollow	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	SRO Unit State Com #16H	North Reference:	Grid
Wellbore:	VH - Job #32K0311232	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0311232	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 88	165 20	5,597 3	-51 4	73 1	125 09	89 3
5,700 0	0 94	184 06	5,697 3	-52 9	73 2	125 85	90 4
5,800 0	1 21	199 68	5,797 3	-54 7	72 8	126 93	91 1
5,900 0	1 24	246 82	5,897 3	-56 2	71 5	128 15	90 9
5,910 0	1 25	251 25	5,907 3	-56 2	71 3	128 27	90 8



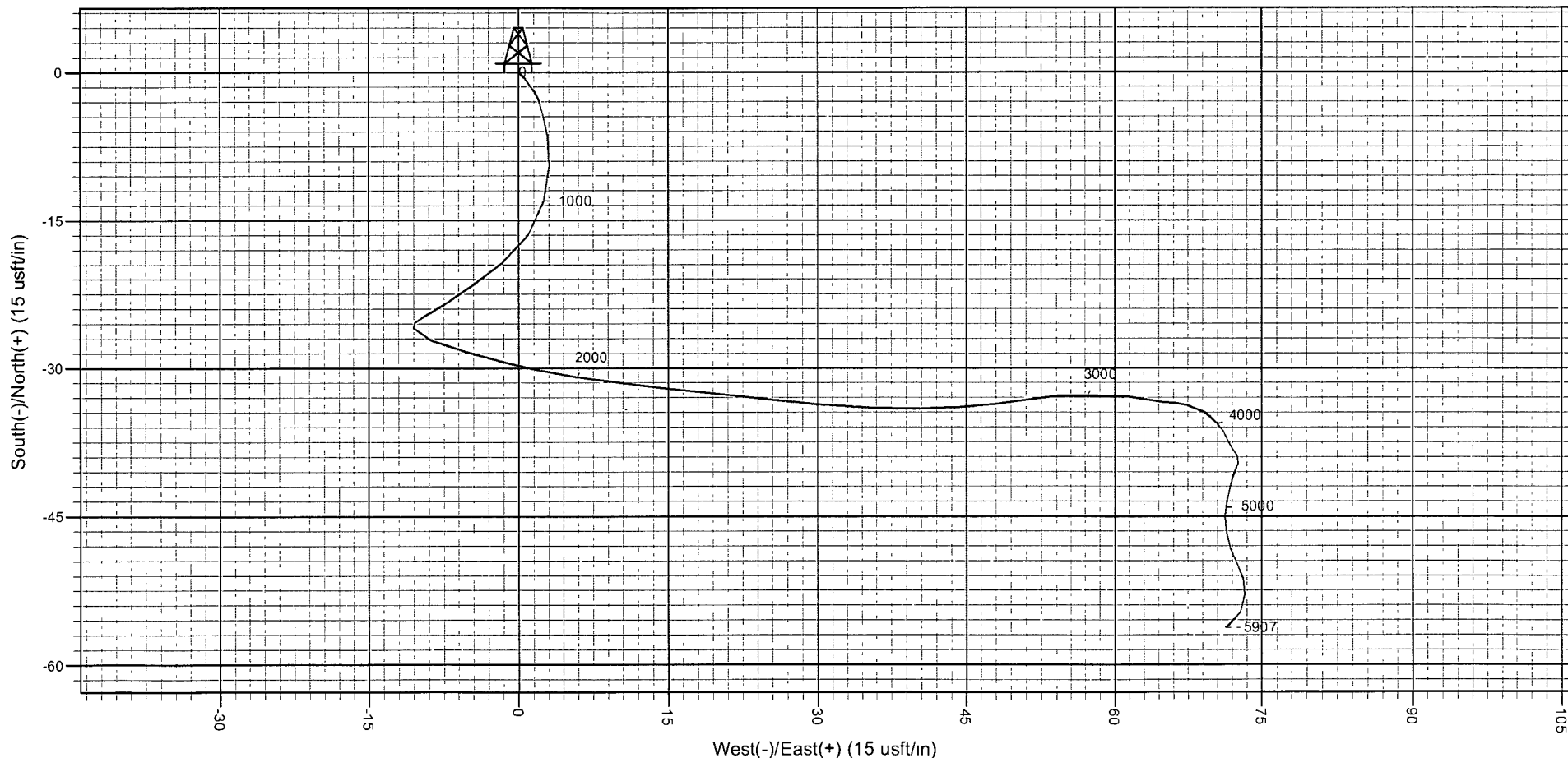
Project: Hay Hollow
Eddy County, NM
Well: SRO Unit State Com #16H
Wellbore: VH - Job #32K0311232
Design: VH - Job #32K0311232



Azimuths to Grid North
True North -0 12°
Magnetic North 7 79°
Magnetic Field
Strength 48510 9snT
Dip Angle 59 91°
Date 3/14/2011
Model BGM2010

WELL DETAILS: SRO Unit State Com #16H
WELL @ 0.0usft (Original Well Elev)
Ground Level: 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	372160.90	567045.51	32° 1' 22.800 N	104° 7' 1.200 W	



PROJECT DETAILS: Hay Hollow
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: Eddy County, NM
Site Centre Latitude: 32° 3' 42.020 N
Longitude: 104° 5' 59.660 W
Positional Uncertainty: 0.0
Convergence: 0.12
Local North: Grid



Cog Operating LLC- Eastern NM

Eddy County

SRO State Unit Com

#16H

OH

Survey: MWD #1

Pathfinder X & Y Survey Report

14 April, 2011

PATHFINDER®
A Schlumberger Company



Pathfinder
Pathfinder X & Y Survey Report



Company:	Cog Operating LLC- Eastern NM	Local Co-ordinate Reference:	Well #16H
Project:	Eddy County	TVD Reference:	RKB-19' @ 3038.00usft (JW #3)
Site:	SRO State Unit Com	MD Reference:	RKB-19' @ 3038.00usft (JW #3)
Well:	#16H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Project	Eddy County		
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	SRO State Unit Com		
Site Position:		Northing:	391,812.000 usft
From:	Map	Easting:	572,493.500 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 4' 37.166 N
		Longitude:	104° 5' 57.422 W
		Grid Convergence:	0.12 °

Well		#16H				
Well Position	+N/-S	0.00 usft	Northing:	371,999.100 usft	Latitude:	32° 1' 21.196 N
	+E/-W	0.00 usft	Easting:	567,193.500 usft	Longitude:	104° 6' 59.485 W
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,019.00 usft	

Wellbore						OH					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)						
	IGRF200510	03/13/11	7.84	59.93	48,499						

Design		OH		
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	0.62



Pathfinder
Pathfinder X & Y Survey Report

PATHFINDER
A Schlumberger Company

Company:	Cog Operating LLC- Eastern NM	Local Co-ordinate Reference:	Well #16H
Project:	Eddy County	TVD Reference:	RKB-19' @ 3038.00usft (JW #3)
Site:	SRO State Unit Com	MD Reference:	RKB-19' @ 3038.00usft (JW #3)
Well:	#16H	North Reference:	Gnd
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey Program		Date	04/14/11			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description		
100.00	5,910.00	GYRO (OH)	CB-GYRO-MS	Camera based gyro multishot		
5,964.00	10,684.99	MWD #1 (OH)	MWD	MWD - Standard		

Survey											
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
5,910.00	1.25	251.25	5,907.28	-2,869.28	-56.23	71.28	-55.46	0.00	371,942.87	567,264.78	
5,964.00	1.41	255.23	5,961.26	-2,923.26	-56.59	70.08	-55.83	0.34	371,942.51	567,263.58	
5,995.00	1.58	255.93	5,992.25	-2,954.25	-56.79	69.29	-56.04	0.55	371,942.31	567,262.79	
6,026.00	1.67	257.87	6,023.24	-2,985.24	-56.99	68.44	-56.25	0.34	371,942.11	567,261.94	
6,058.00	1.67	257.34	6,055.22	-3,017.22	-57.19	67.53	-56.46	0.05	371,941.91	567,261.03	
6,089.00	1.67	253.38	6,086.21	-3,048.21	-57.42	66.65	-56.69	0.37	371,941.68	567,260.15	
6,120.00	1.85	297.42	6,117.20	-3,079.20	-57.32	65.78	-56.60	4.29	371,941.78	567,259.28	
6,152.00	4.66	339.78	6,149.15	-3,111.15	-55.86	64.87	-55.15	11.00	371,943.24	567,258.37	
6,182.00	8.44	347.08	6,178.95	-3,140.95	-52.57	63.95	-51.87	12.88	371,946.53	567,257.45	
6,214.00	12.40	348.66	6,210.41	-3,172.41	-46.91	62.75	-46.23	12.41	371,952.19	567,256.25	
6,245.00	15.56	347.96	6,240.49	-3,202.49	-39.58	61.23	-38.91	10.21	371,959.52	567,254.73	
6,277.00	18.29	348.39	6,271.10	-3,233.10	-30.46	59.32	-29.81	8.54	371,968.64	567,252.82	
6,308.00	21.19	349.89	6,300.28	-3,262.28	-20.18	57.36	-19.55	9.50	371,978.92	567,250.86	
6,339.00	24.09	351.21	6,328.89	-3,290.89	-8.40	55.41	-7.80	9.50	371,990.70	567,248.91	
6,371.00	27.35	350.85	6,357.71	-3,319.71	5.31	53.24	5.89	10.20	372,004.41	567,246.74	
6,402.00	30.42	351.29	6,384.85	-3,346.85	20.10	50.92	20.65	9.93	372,019.20	567,244.42	
6,433.00	33.41	351.29	6,411.16	-3,373.16	36.30	48.44	36.82	9.65	372,035.40	567,241.94	
6,459.00	35.61	351.92	6,432.59	-3,394.59	50.87	46.29	51.37	8.57	372,049.97	567,239.79	
6,490.00	38.77	353.79	6,457.28	-3,419.28	69.46	43.97	69.93	10.83	372,068.56	567,237.47	
6,521.00	41.42	356.66	6,480.99	-3,442.99	89.35	42.33	89.81	10.42	372,088.45	567,235.83	
6,549.00	44.49	359.11	6,501.48	-3,463.48	108.41	41.63	108.86	12.48	372,107.51	567,235.13	



Pathfinder
Pathfinder X & Y Survey Report



Company: Cog Operating LLC- Eastern NM
Project: Eddy County
Site: SRO State Unit Com
Well: #16H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #16H
TVD Reference: RKB-19' @ 3038.00usft (JW #3)
MD Reference: RKB-19' @ 3038.00usft (JW #3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000 1 Single User Db

Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
6,581.00	48.72	359.13	6,523.46	-3,485.46	131.66	41.28	132.10	13.22	372,130.76	567,234.78
6,611.00	53.64	357.82	6,542.27	-3,504.27	155.02	40.65	155.45	16.75	372,154.12	567,234.15
6,642.00	58.74	357.21	6,559.51	-3,521.51	180.74	39.52	181.16	16.53	372,179.84	567,233.02
6,673.00	63.66	357.00	6,574.44	-3,536.44	207.86	38.15	208.26	15.88	372,206.96	567,231.65
6,705.00	69.12	358.03	6,587.25	-3,549.25	237.15	36.89	237.53	17.32	372,236.25	567,230.39
6,736.00	74.83	358.84	6,596.84	-3,558.84	266.60	36.09	266.98	18.59	372,265.70	567,229.59
6,768.00	79.76	359.64	6,603.88	-3,565.88	297.80	35.67	298.17	15.60	372,296.90	567,229.17
6,800.00	81.43	0.23	6,609.10	-3,571.10	329.37	35.64	329.74	5.53	372,328.47	567,229.14
6,829.00	82.83	0.62	6,613.08	-3,575.08	358.10	35.85	358.46	5.01	372,357.20	567,229.35
6,862.00	85.38	0.86	6,616.46	-3,578.46	390.92	36.28	391.29	7.76	372,390.02	567,229.78
6,892.00	87.85	1.11	6,618.24	-3,580.24	420.86	36.79	421.23	8.28	372,419.96	567,230.29
6,924.00	89.43	1.19	6,619.00	-3,581.00	452.84	37.43	453.22	4.94	372,451.94	567,230.93
6,955.00	88.55	1.18	6,619.54	-3,581.54	483.83	38.07	484.21	2.84	372,482.93	567,231.57
7,018.00	88.72	0.65	6,621.04	-3,583.04	546.80	39.08	547.20	0.88	372,545.90	567,232.58
7,080.00	89.78	1.82	6,621.85	-3,583.85	608.78	40.42	609.18	2.55	372,607.88	567,233.92
7,143.00	89.52	1.15	6,622.24	-3,584.24	671.76	42.05	672.18	1.14	372,670.86	567,235.55
7,238.00	88.99	1.25	6,623.47	-3,585.47	766.73	44.04	767.16	0.57	372,765.83	567,237.54
7,332.00	89.25	359.89	6,624.92	-3,586.92	860.71	44.97	861.15	1.47	372,859.81	567,238.47
7,426.00	90.13	0.51	6,625.43	-3,587.43	954.71	45.30	955.14	1.15	372,953.81	567,238.80
7,520.00	88.81	359.86	6,626.30	-3,588.30	1,048.70	45.60	1,049.13	1.57	373,047.80	567,239.10
7,614.00	89.52	359.14	6,627.67	-3,589.67	1,142.69	44.78	1,143.11	1.08	373,141.79	567,238.28
7,708.00	90.31	359.34	6,627.81	-3,589.81	1,236.68	43.54	1,237.08	0.87	373,235.78	567,237.04
7,802.00	91.01	359.77	6,626.72	-3,588.72	1,330.67	42.81	1,331.05	0.87	373,329.77	567,236.31
7,896.00	91.36	359.89	6,624.78	-3,586.78	1,424.65	42.53	1,425.02	0.39	373,423.75	567,236.03
7,990.00	89.34	359.11	6,624.20	-3,586.20	1,518.64	41.71	1,519.00	2.30	373,517.74	567,235.21
8,083.00	88.99	358.75	6,625.56	-3,587.56	1,611.61	39.97	1,611.95	0.54	373,610.71	567,233.47
8,177.00	89.16	0.20	6,627.08	-3,589.08	1,705.59	39.11	1,705.92	1.55	373,704.69	567,232.61



Pathfinder
Pathfinder X & Y Survey Report



Company:	Cog Operating LLC- Eastern NM	Local Co-ordinate Reference:	Well #16H
Project:	Eddy County	TVD Reference:	RKB-19' @ 3038.00usft (JW #3)
Site:	SRO State Unit Com	MD Reference:	RKB-19' @ 3038.00usft (JW #3)
Well:	#16H	North Reference:	Grd
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey											
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
8,271.00	91.01	0.75	6,626.94	-3,588.94	1,799.58	39.89	1,799.91	2.05	373,798.68	567,233.39	
8,365.00	91.10	0.65	6,625.21	-3,587.21	1,893.56	41.04	1,893.89	0.14	373,892.66	567,234.54	
8,458.00	90.75	359.92	6,623.71	-3,585.71	1,986.55	41.50	1,986.88	0.87	373,985.65	567,235.00	
8,552.00	91.19	359.81	6,622.11	-3,584.11	2,080.53	41.28	2,080.86	0.48	374,079.63	567,234.78	
8,614.00	91.01	359.12	6,620.92	-3,582.92	2,142.52	40.70	2,142.83	1.15	374,141.62	567,234.20	
8,677.00	89.78	358.90	6,620.49	-3,582.49	2,205.51	39.61	2,205.81	1.98	374,204.61	567,233.11	
8,771.00	89.43	358.85	6,621.14	-3,583.14	2,299.49	37.77	2,299.76	0.38	374,298.59	567,231.27	
8,865.00	88.46	359.32	6,622.87	-3,584.87	2,393.46	36.26	2,393.71	1.15	374,392.56	567,229.76	
8,959.00	89.52	359.50	6,624.53	-3,586.53	2,487.44	35.30	2,487.67	1.14	374,486.54	567,228.80	
9,053.00	89.60	358.86	6,625.25	-3,587.25	2,581.42	33.95	2,581.64	0.69	374,580.52	567,227.45	
9,146.00	89.78	0.57	6,625.75	-3,587.75	2,674.42	33.49	2,674.62	1.85	374,673.52	567,226.99	
9,240.00	89.78	0.95	6,626.11	-3,588.11	2,768.41	34.74	2,768.62	0.40	374,767.51	567,228.24	
9,335.00	90.22	0.80	6,626.11	-3,588.11	2,863.40	36.19	2,863.62	0.49	374,862.50	567,229.69	
9,429.00	90.48	359.61	6,625.54	-3,587.54	2,957.39	36.52	2,957.61	1.30	374,956.49	567,230.02	
9,522.00	90.13	0.27	6,625.04	-3,587.04	3,050.39	36.43	3,050.61	0.80	375,049.49	567,229.93	
9,616.00	90.75	0.00	6,624.32	-3,586.32	3,144.39	36.65	3,144.60	0.72	375,143.49	567,230.15	
9,711.00	88.99	359.70	6,624.54	-3,586.54	3,239.38	36.40	3,239.59	1.88	375,238.48	567,229.90	
9,803.00	89.16	0.30	6,626.02	-3,588.02	3,331.37	36.40	3,331.57	0.68	375,330.47	567,229.90	
9,897.00	90.04	359.81	6,626.68	-3,588.68	3,425.37	36.49	3,425.56	1.07	375,424.47	567,229.99	
9,991.00	89.52	0.92	6,627.04	-3,589.04	3,519.36	37.09	3,519.56	1.30	375,518.46	567,230.59	
10,083.00	90.04	0.31	6,627.39	-3,589.39	3,611.36	38.08	3,611.56	0.87	375,610.46	567,231.58	
10,177.00	90.04	1.64	6,627.33	-3,589.33	3,705.34	39.67	3,705.55	1.41	375,704.44	567,233.17	
10,271.00	90.40	1.02	6,626.96	-3,588.96	3,799.31	41.86	3,799.54	0.76	375,798.41	567,235.36	
10,364.00	90.04	0.10	6,626.61	-3,588.61	3,892.31	42.77	3,892.54	1.06	375,891.41	567,236.27	
10,458.00	90.40	359.54	6,626.25	-3,588.25	3,986.30	42.47	3,986.53	0.71	375,985.40	567,235.97	
10,551.00	89.96	359.18	6,625.95	-3,587.95	4,079.30	41.43	4,079.51	0.61	376,078.40	567,234.93	
10,631.00	89.96	358.83	6,626.01	-3,588.01	4,159.29	40.04	4,159.48	0.44	376,158.39	567,233.54	



Pathfinder
Pathfinder X & Y Survey Report



Company:	Cog Operating LLC- Eastern NM	Local Co-ordinate Reference:	Well #16H
Project:	Eddy County	TVD Reference:	RKB-19' @ 3038.00usft (JW #3)
Site:	SRO State Unit Com	MD Reference:	RKB-19' @ 3038.00usft (JW #3)
Well:	#16H	North Reference:	Grd
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
10,684.99	89.96	358.83	6,626.05	-3,588.05	4,213.26	38.94	4,213.44	0.00	376,212.36	567,232.44
BHL-10684.99°MD,89.96°INC,358.83°AZI, 6626.05°TVD, 4213.44°VS, 4213.26°N, 38.94°E										

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,684.99	6,626.05	4,213.26	38.94	BHL-10684.99°MD,89.96°INC,358.83°AZI, 6626.05°TVD, 4213.44°VS, 4213.26°N

Checked By: _____	Approved By: _____	Date: _____
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Project: Eddy County
Site: SRO State Unit Coi
Well: #16H
Wellbore: OH
Plan: Plan #3 (#16H/OH)



Azimuths to Grid North
True North: -0.12°
Magnetic North: 7.72°

Magnetic Field
Strength: 48498.7snT
Dip Angle: 59.93°
Date: 03/13/2011
Model: IGRF200510

PATHFINDER
A Schlumberger Company

