



COG Operating LLC

Lea County
Chicken Hawk 21 State Com
#1
OH

RECEIVED

MAY 24 2010
HOBBSOCD

Plan: Plan #1

Pathfinder X & Y Planning Report

20 May, 2010

PATHFINDER

30-025-39757



Pathfinder
Pathfinder X & Y Planning Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1
Project:	Lea County	TVD Reference:	WELL @ 4353.00ft (Original Well Elev)
Site:	Chicken Hawk 21 State Com	MD Reference:	WELL @ 4353.00ft (Original Well Elev)
Well:	#1	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	Midland Database

Project	Lea 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						Chicken Hawk 21 State Com					
Site Position:				Northing:		691,943 200 ft		Latitude:		32° 54' 3.589 N	
From:		Map		Easting:		670,493 700 ft		Longitude:		103° 46' 40.251 W	
Position Uncertainty:		0 00 ft		Slot Radius:		"		Grid Convergence:		0.30 °	

Well		#1				
Well Position	+N/-S	0.00 ft	Northing:	691,943.200 ft	Latitude:	32° 54' 3.589 N
	+E/-W	0.00 ft	Easting:	670,493.700 ft	Longitude:	103° 46' 40.251 W
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,336.00 ft	

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	05/20/2010	7.85	60.82	49,132

Design					Plan #1				
Audit Notes:									
Version:		Phase:		PLAN		Tie On Depth:		0.00	
Vertical Section:		Depth From (TVD)		+N/-S		+E/-W		Direction	
		(ft)		(ft)		(ft)		(°)	
		0.00		0.00		0.00		357.08	

Survey Tool Program		Date 05/20/2010		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0 00	13,504.84	Plan #1 (OH)		



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Planned Survey											
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)	
0.00	0.00	0.00	0.00	-4,353.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
100.00	0.00	0.00	100.00	-4,253.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
200.00	0.00	0.00	200.00	-4,153.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
300.00	0.00	0.00	300.00	-4,053.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
400.00	0.00	0.00	400.00	-3,953.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
500.00	0.00	0.00	500.00	-3,853.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
600.00	0.00	0.00	600.00	-3,753.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
700.00	0.00	0.00	700.00	-3,653.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
800.00	0.00	0.00	800.00	-3,553.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
900.00	0.00	0.00	900.00	-3,453.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
1,000.00	0.00	0.00	1,000.00	-3,353.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
1,100.00	0.00	0.00	1,100.00	-3,253.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
1,200.00	0.00	0.00	1,200.00	-3,153.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
1,300.00	0.00	0.00	1,300.00	-3,053.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
1,400.00	0.00	0.00	1,400.00	-2,953.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
1,500.00	0.00	0.00	1,500.00	-2,853.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
1,600.00	0.00	0.00	1,600.00	-2,753.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
1,700.00	0.00	0.00	1,700.00	-2,653.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
1,800.00	0.00	0.00	1,800.00	-2,553.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
1,900.00	0.00	0.00	1,900.00	-2,453.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
2,000.00	0.00	0.00	2,000.00	-2,353.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
2,100.00	0.00	0.00	2,100.00	-2,253.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
2,200.00	0.00	0.00	2,200.00	-2,153.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
2,300.00	0.00	0.00	2,300.00	-2,053.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
2,400.00	0.00	0.00	2,400.00	-1,953.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
2,500.00	0.00	0.00	2,500.00	-1,853.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
2,600.00	0.00	0.00	2,600.00	-1,753.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	



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2,700.00	0.00	0.00	2,700.00	-1,653.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
2,800.00	0.00	0.00	2,800.00	-1,553.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
2,900.00	0.00	0.00	2,900.00	-1,453.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
3,000.00	0.00	0.00	3,000.00	-1,353.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
3,100.00	0.00	0.00	3,100.00	-1,253.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
3,200.00	0.00	0.00	3,200.00	-1,153.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
3,300.00	0.00	0.00	3,300.00	-1,053.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
3,400.00	0.00	0.00	3,400.00	-953.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
3,500.00	0.00	0.00	3,500.00	-853.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
3,600.00	0.00	0.00	3,600.00	-753.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
3,700.00	0.00	0.00	3,700.00	-653.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
3,800.00	0.00	0.00	3,800.00	-553.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
3,900.00	0.00	0.00	3,900.00	-453.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
4,000.00	0.00	0.00	4,000.00	-353.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
4,100.00	0.00	0.00	4,100.00	-253.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
4,200.00	0.00	0.00	4,200.00	-153.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
4,300.00	0.00	0.00	4,300.00	-53.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
4,400.00	0.00	0.00	4,400.00	47.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
4,500.00	0.00	0.00	4,500.00	147.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
4,600.00	0.00	0.00	4,600.00	247.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
4,700.00	0.00	0.00	4,700.00	347.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
4,800.00	0.00	0.00	4,800.00	447.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
4,900.00	0.00	0.00	4,900.00	547.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
5,000.00	0.00	0.00	5,000.00	647.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
5,100.00	0.00	0.00	5,100.00	747.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
5,200.00	0.00	0.00	5,200.00	847.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
5,300.00	0.00	0.00	5,300.00	947.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	



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5,400.00	0.00	0.00	5,400.00	1,047.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
5,500.00	0.00	0.00	5,500.00	1,147.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
5,600.00	0.00	0.00	5,600.00	1,247.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
5,700.00	0.00	0.00	5,700.00	1,347.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
5,800.00	0.00	0.00	5,800.00	1,447.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
5,900.00	0.00	0.00	5,900.00	1,547.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
6,000.00	0.00	0.00	6,000.00	1,647.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
6,100.00	0.00	0.00	6,100.00	1,747.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
6,200.00	0.00	0.00	6,200.00	1,847.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
6,300.00	0.00	0.00	6,300.00	1,947.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
6,400.00	0.00	0.00	6,400.00	2,047.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
6,500.00	0.00	0.00	6,500.00	2,147.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
6,600.00	0.00	0.00	6,600.00	2,247.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
6,700.00	0.00	0.00	6,700.00	2,347.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
6,800.00	0.00	0.00	6,800.00	2,447.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
6,900.00	0.00	0.00	6,900.00	2,547.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
7,000.00	0.00	0.00	7,000.00	2,647.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
7,100.00	0.00	0.00	7,100.00	2,747.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
7,200.00	0.00	0.00	7,200.00	2,847.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
7,300.00	0.00	0.00	7,300.00	2,947.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
7,400.00	0.00	0.00	7,400.00	3,047.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
7,500.00	0.00	0.00	7,500.00	3,147.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
7,600.00	0.00	0.00	7,600.00	3,247.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
7,700.00	0.00	0.00	7,700.00	3,347.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
7,800.00	0.00	0.00	7,800.00	3,447.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
7,900.00	0.00	0.00	7,900.00	3,547.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	
8,000.00	0.00	0.00	8,000.00	3,647.00	0.00	0.00	0.00	0.00	691,943.20	670,493.70	



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8,100.00	0 00	0 00	8,100.00	3,747.00	0 00	0.00	0.00	0.00	691,943.20	670,493.70
8,200.00	0 00	0 00	8,200.00	3,847.00	0 00	0.00	0.00	0.00	691,943.20	670,493.70
8,300.00	0.00	0 00	8,300.00	3,947.00	0 00	0.00	0.00	0.00	691,943.20	670,493.70
8,400.00	0.00	0.00	8,400.00	4,047.00	0 00	0.00	0.00	0.00	691,943.20	670,493.70
8,500.00	0.00	0 00	8,500.00	4,147.00	0 00	0.00	0.00	0.00	691,943.20	670,493.70
8,600.00	0 00	0 00	8,600.00	4,247.00	0.00	0.00	0 00	0.00	691,943.20	670,493.70
8,707.50	0.00	0.00	8,707.50	4,354.50	0.00	0 00	0 00	0 00	691,943.20	670,493.70
8,725.00	2 10	357.08	8,725.00	4,372.00	0.32	-0.02	0.32	12.00	691,943.52	670,493.68
8,750.00	5 10	357.08	8,749.94	4,396.94	1.89	-0.10	1.89	12.00	691,945.09	670,493.60
8,775.00	8.10	357.08	8,774.78	4,421.78	4.76	-0.24	4.76	12.00	691,947.96	670,493.46
8,800.00	11 10	357.08	8,799.42	4,446.42	8.92	-0.45	8.93	12.00	691,952.12	670,493.25
8,825.00	14 10	357.08	8,823.82	4,470.82	14.36	-0.73	14.38	12.00	691,957.56	670,492.97
8,850.00	17 10	357.08	8,847.89	4,494.89	21.08	-1.08	21.10	12.00	691,964.28	670,492.62
8,875.00	20.10	357.08	8,871.59	4,518.59	29.04	-1.48	29.08	12.00	691,972.24	670,492.22
8,900.00	23 10	357.08	8,894.83	4,541.83	38.23	-1.95	38.28	12.00	691,981.43	670,491.75
8,925.00	26 10	357.08	8,917.56	4,564.56	48.62	-2.48	48.68	12.00	691,991.82	670,491.22
8,950.00	29 10	357.08	8,939.71	4,586.71	60.18	-3.07	60.26	12.00	692,003.38	670,490.63
8,975.00	32.10	357.08	8,961.23	4,608.23	72.89	-3.72	72.98	12.00	692,016.09	670,489.98
9,000.00	35.09	357.08	8,982.05	4,629.05	86.70	-4.42	86.81	12.00	692,029.90	670,489.28
9,025.00	38.09	357.08	9,002.12	4,649.12	101.58	-5.18	101.72	12.00	692,044.78	670,488.52
9,050.00	41.09	357.08	9,021.38	4,668.38	117.50	-5.99	117.65	12.00	692,060.70	670,487.71
9,075.00	44.09	357.08	9,039.78	4,686.78	134.39	-6.86	134.57	12.00	692,077.59	670,486.84
9,100.00	47.09	357.08	9,057.28	4,704.28	152.23	-7.76	152.42	12.00	692,095.43	670,485.94
9,125.00	50.09	357.08	9,073.81	4,720.81	170.95	-8.72	171.17	12.00	692,114.15	670,484.98
9,150.00	53.09	357.08	9,089.34	4,736.34	190.51	-9.72	190.76	12.00	692,133.71	670,483.98
9,175.00	56.09	357.08	9,103.82	4,750.82	210.86	-10.76	211.13	12.00	692,154.06	670,482.94
9,200.00	59.09	357.08	9,117.22	4,764.22	231.94	-11.83	232.24	12.00	692,175.14	670,481.87



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9,225.00	62.09	357.08	9,129.49	4,776.49	253.68	-12.94	254.01	12.00	692,196.88	670,480.76
9,250.00	65.09	357.08	9,140.61	4,787.61	276.04	-14.08	276.40	12.00	692,219.24	670,479.62
9,275.00	68.09	357.08	9,150.54	4,797.54	298.95	-15.25	299.34	12.00	692,242.15	670,478.45
9,300.00	71.09	357.08	9,159.26	4,806.26	322.35	-16.44	322.77	12.00	692,265.55	670,477.26
9,325.00	74.09	357.08	9,166.74	4,813.74	346.17	-17.66	346.62	12.00	692,289.37	670,476.04
9,350.00	77.09	357.08	9,172.96	4,819.96	370.35	-18.89	370.83	12.00	692,313.55	670,474.81
9,375.00	80.09	357.08	9,177.91	4,824.91	394.82	-20.14	395.34	12.00	692,338.02	670,473.56
9,400.00	83.09	357.08	9,181.57	4,828.57	419.52	-21.40	420.06	12.00	692,362.72	670,472.30
9,425.00	86.09	357.08	9,183.92	4,830.92	444.37	-22.67	444.95	12.00	692,387.57	670,471.03
9,450.00	89.09	357.08	9,184.98	4,831.98	469.31	-23.94	469.92	12.00	692,412.51	670,469.76
9,463.53	90.71	357.08	9,185.00	4,832.00	482.83	-24.63	483.45	12.00	692,426.03	670,469.07
9,500.00	90.71	357.08	9,184.55	4,831.55	519.25	-26.49	519.92	0.00	692,462.45	670,467.21
9,600.00	90.71	357.08	9,183.31	4,830.31	619.11	-31.58	619.91	0.00	692,562.31	670,462.12
9,700.00	90.71	357.08	9,182.07	4,829.07	718.97	-36.67	719.91	0.00	692,662.17	670,457.03
9,800.00	90.71	357.08	9,180.83	4,827.83	818.83	-41.77	819.90	0.00	692,762.03	670,451.93
9,900.00	90.71	357.08	9,179.59	4,826.59	918.70	-46.86	919.89	0.00	692,861.90	670,446.84
10,000.00	90.71	357.08	9,178.35	4,825.35	1,018.56	-51.95	1,019.88	0.00	692,961.76	670,441.75
10,100.00	90.71	357.08	9,177.11	4,824.11	1,118.42	-57.05	1,119.87	0.00	693,061.62	670,436.65
10,200.00	90.71	357.08	9,175.87	4,822.87	1,218.28	-62.14	1,219.87	0.00	693,161.48	670,431.56
10,300.00	90.71	357.08	9,174.63	4,821.63	1,318.15	-67.24	1,319.86	0.00	693,261.35	670,426.46
10,400.00	90.71	357.08	9,173.40	4,820.40	1,418.01	-72.33	1,419.85	0.00	693,361.21	670,421.37
10,500.00	90.71	357.08	9,172.16	4,819.16	1,517.87	-77.42	1,519.84	0.00	693,461.07	670,416.28
10,600.00	90.71	357.08	9,170.92	4,817.92	1,617.73	-82.52	1,619.84	0.00	693,560.93	670,411.18
10,700.00	90.71	357.08	9,169.68	4,816.68	1,717.60	-87.61	1,719.83	0.00	693,660.80	670,406.09
10,800.00	90.71	357.08	9,168.44	4,815.44	1,817.46	-92.70	1,819.82	0.00	693,760.66	670,401.00
10,900.00	90.71	357.08	9,167.20	4,814.20	1,917.32	-97.80	1,919.81	0.00	693,860.52	670,395.90
11,000.00	90.71	357.08	9,165.96	4,812.96	2,017.18	-102.89	2,019.81	0.00	693,960.38	670,390.81



Pathfinder
Pathfinder X & Y Planning Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1
Project:	Lea County	TVD Reference:	WELL @ 4353.00ft (Original Well Elev)
Site:	Chicken Hawk 21 State Com	MD Reference:	WELL @ 4353.00ft (Original Well Elev)
Well:	#1	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	Midland Database

Planned Survey											
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)	
11,100.00	90.71	357.08	9,164.72	4,811.72	2,117.05	-107.99	2,119.80	0.00	694,060.25	670,385.71	
11,200.00	90.71	357.08	9,163.48	4,810.48	2,216.91	-113.08	2,219.79	0.00	694,160.11	670,380.62	
11,300.00	90.71	357.08	9,162.24	4,809.24	2,316.77	-118.17	2,319.78	0.00	694,259.97	670,375.53	
11,400.00	90.71	357.08	9,161.00	4,808.00	2,416.63	-123.27	2,419.77	0.00	694,359.83	670,370.43	
11,500.00	90.71	357.08	9,159.77	4,806.77	2,516.50	-128.36	2,519.77	0.00	694,459.70	670,365.34	
11,600.00	90.71	357.08	9,158.53	4,805.53	2,616.36	-133.45	2,619.76	0.00	694,559.56	670,360.25	
11,700.00	90.71	357.08	9,157.29	4,804.29	2,716.22	-138.55	2,719.75	0.00	694,659.42	670,355.15	
11,800.00	90.71	357.08	9,156.05	4,803.05	2,816.08	-143.64	2,819.74	0.00	694,759.28	670,350.06	
11,900.00	90.71	357.08	9,154.81	4,801.81	2,915.95	-148.74	2,919.74	0.00	694,859.15	670,344.96	
12,000.00	90.71	357.08	9,153.57	4,800.57	3,015.81	-153.83	3,019.73	0.00	694,959.01	670,339.87	
12,100.00	90.71	357.08	9,152.33	4,799.33	3,115.67	-158.92	3,119.72	0.00	695,058.87	670,334.78	
12,200.00	90.71	357.08	9,151.09	4,798.09	3,215.53	-164.02	3,219.71	0.00	695,158.73	670,329.68	
12,300.00	90.71	357.08	9,149.85	4,796.85	3,315.40	-169.11	3,319.71	0.00	695,258.60	670,324.59	
12,400.00	90.71	357.08	9,148.61	4,795.61	3,415.26	-174.20	3,419.70	0.00	695,358.46	670,319.50	
12,500.00	90.71	357.08	9,147.37	4,794.37	3,515.12	-179.30	3,519.69	0.00	695,458.32	670,314.40	
12,600.00	90.71	357.08	9,146.13	4,793.13	3,614.98	-184.39	3,619.68	0.00	695,558.18	670,309.31	
12,700.00	90.71	357.08	9,144.90	4,791.90	3,714.85	-189.49	3,719.68	0.00	695,658.05	670,304.21	
12,800.00	90.71	357.08	9,143.66	4,790.66	3,814.71	-194.58	3,819.67	0.00	695,757.91	670,299.12	
12,900.00	90.71	357.08	9,142.42	4,789.42	3,914.57	-199.67	3,919.66	0.00	695,857.77	670,294.03	
13,000.00	90.71	357.08	9,141.18	4,788.18	4,014.43	-204.77	4,019.65	0.00	695,957.63	670,288.93	
13,100.00	90.71	357.08	9,139.94	4,786.94	4,114.30	-209.86	4,119.64	0.00	696,057.50	670,283.84	
13,200.00	90.71	357.08	9,138.70	4,785.70	4,214.16	-214.95	4,219.64	0.00	696,157.36	670,278.75	
13,300.00	90.71	357.08	9,137.46	4,784.46	4,314.02	-220.05	4,319.63	0.00	696,257.22	670,273.65	
13,400.00	90.71	357.08	9,136.22	4,783.22	4,413.88	-225.14	4,419.62	0.00	696,357.08	670,268.56	
13,504.84	90.71	357.08	9,134.92	4,781.92	4,513.74	-230.24	4,524.45	0.00	696,456.94	670,263.47	



Pathfinder
Pathfinder X & Y Planning Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1
Project:	Lea County	TVD Reference:	WELL @ 4353.00ft (Original Well Elev)
Site:	Chicken Hawk 21 State Com	MD Reference:	WELL @ 4353.00ft (Original Well Elev)
Well:	#1	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	Midland Database

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL(CH#1)	0.00	0 00	9,135 00	4,518 60	-230 10	696,461.800	670,263.600	32° 54' 48.311 N	103° 46' 42 671 W
- plan hits target center									
- Point									

Checked By: _____ Approved By: _____ Date: _____



Project: Lea County
Site: Chicken Hawk 21 State
Well: #1
Wellbore: OH
Plan: Plan #1 (#1/OH)



Azimuths to Grid North
True North: -0.30°
Magnetic North: 7.55°

Magnetic Field
Strength: 49132.4snT
Dip Angle: 60.82°
Date: 05/20/2010
Model: IGRF200510

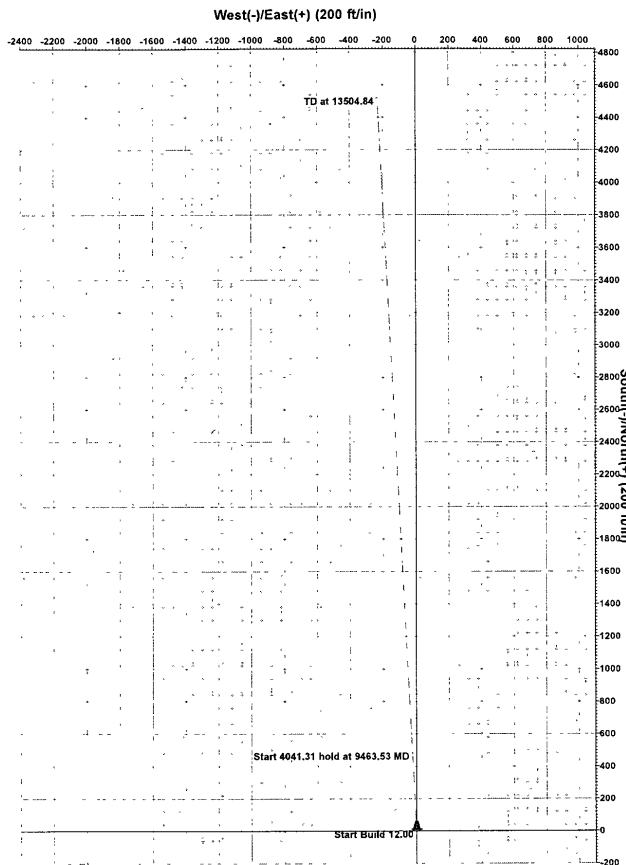
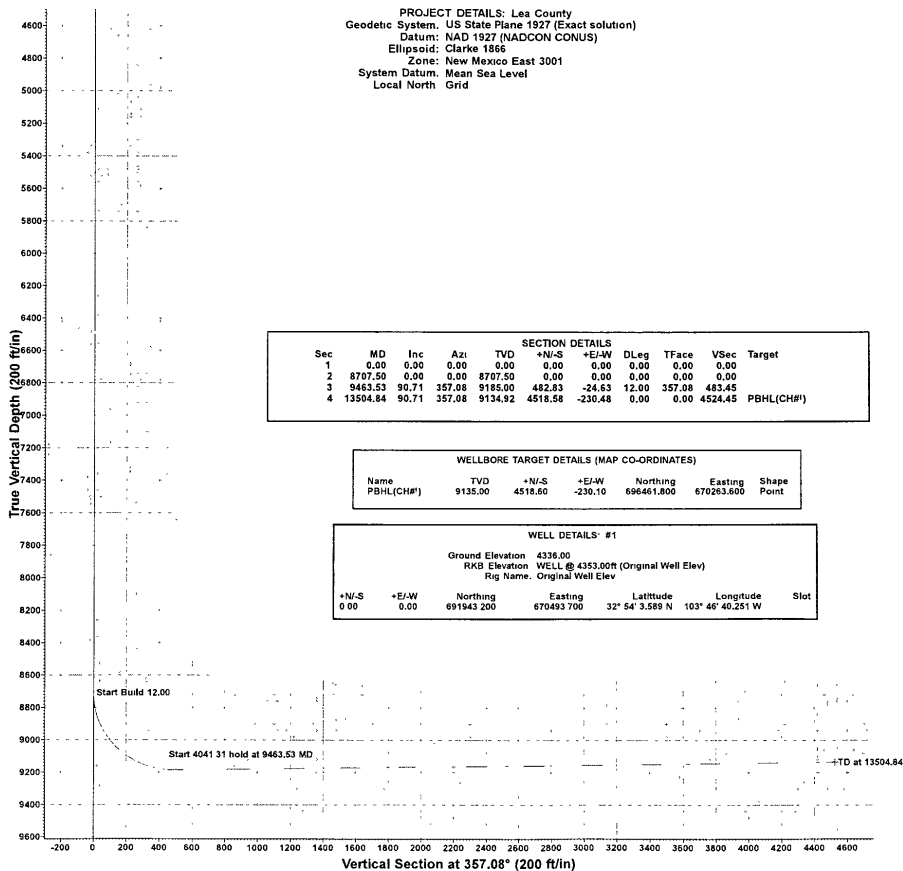


PROJECT DETAILS: Lea County
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	8707.50	0.00	0.00	8707.50	0.00	0.00	0.00	0.00	0.00	
3	9463.53	90.71	357.08	9185.00	482.83	-24.63	12.00	357.08	483.45	
4	13504.84	90.71	357.08	9134.92	4518.58	-230.48	0.00	0.00	4524.45	PBHL(CH#)

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)					
Name	TVD	+N/-S	+E/-W	Northing	Easting
PBHL(CH#)	9135.00	4518.60	-230.10	696461.800	670263.500

WELL DETAILS: #1						
Ground Elevation: 4336.00						
RKB Elevation: WELL @ 4353.00ft (Original Well Elev)						
Rig Name: Original Well Elev						
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	691943.200	670493.700	32° 54' 3.589 N	103° 46' 40.291 W	



Plan: Plan #1 (#1/OH)	
Created By: Nate Bingham	Date: 2115, May 20 2010
Checked: _____	Date: _____