

DRILLING INC. Oil Well Drilling Contractor

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

July 16, 2012

30-015-39781

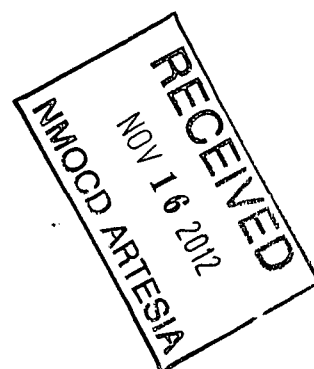
COG Operating, LLC.
550 W. Texas, Suite 1300
Midland, Texas 79701

Re: Pinto 36 State Com #1H
Sec. 36, T-18-S, R-25-E
Eddy County, New Mexico

Attn: Jim Evans

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

255' - 0.5°	1201' - 1°	2129' - 1°	3429' - 1°
506' - 0.25°	1477' - 1°	2556' - 1°	3866' - 0.75°
952' - 0.75°	1757' - 0.75°	2992' - 1°	



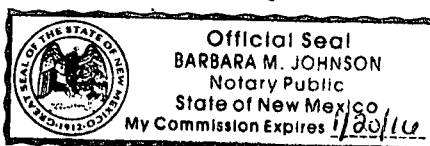
Sincerely,

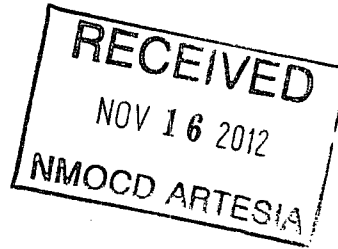
Gary W. Chappell
Contracts Manager

STATE OF NEW MEXICO)
COUNTY OF EDDY)

The foregoing was acknowledged before me this 16th day of July, 2012 by Gary W. Chappell.

NOTARY PUBLIC





COG Operating LLC

Eddy County, NM

Pinto 36 State Com 1H

Pinto 36 State Com 1H

Wellbore #1

Survey: MWD Surveys

Standard Survey Report

03 July, 2012

Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Pinto 36 State Com 1H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3508.00ft (JW #4)
Site:	Pinto 36 State Com 1H	MD Reference:	WELL @ 3508.00ft (JW #4)
Well:	Pinto 36 State Com 1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Houston R5000 Database

Project:	Eddy County, NM	System Datum:	Mean Sea Level
Map System:	US State Plane 1927 (Exact solution)		
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site:	Pinto 36 State Com 1H				
Site Position:		Northing:	617,475.10 ft	Latitude:	32.69748401
From:	Map	Easting:	465,570.10 ft	Longitude:	-104.44525793
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	-0.06 °

Well: Pinto 36 State Com 1H						
Well Position	+N/-S	0.00 ft	Northing:	617,475.10 ft	Latitude:	32.69748401
	+E/-W	0.00 ft	Easting:	465,570.10 ft	Longitude:	-104.44525793
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	3,495.00 ft

Wellbore:	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	6/7/2012	7.90	60.45	48,705

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	1.08	

Survey Program	Date	7/3/2012			
From	To	Survey (Wellbore)	Tool Name	Description	
(ft)	(ft)				
100.00	1,800.00	Gyro Surveys (Wellbore #1)	MWD	MWD - Standard	
1,851.00	6,938.00	MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

Survey										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn	
Depth	(°)	(°)	Depth	(ft)	(ft)	Section	Rate	Rate	Rate	
(ft)			(ft)			(ft)	(°/100ft)	(°/100ft)	(°/100ft)	
1,800.00	0.25	169.57	1,799.92	-12.59	-8.54	-12.75	0.00	0.00	0.00	
1,851.00	0.20	116.20	1,850.92	-12.74	-8.44	-12.90	0.41	-0.10	-104.65	
1,883.00	1.40	12.50	1,882.92	-12.39	-8.31	-12.54	4.56	3.75	-324.06	
1,914.00	5.10	10.20	1,913.86	-10.66	-7.98	-10.81	11.94	11.94	-7.42	
1,945.00	8.80	10.90	1,944.63	-6.97	-7.29	-7.11	11.94	11.94	2.26	
1,977.00	12.30	9.70	1,976.08	-1.21	-6.25	-1.33	10.96	10.94	-3.75	
2,008.00	15.30	6.00	2,006.18	6.12	-5.27	6.02	10.08	9.68	-11.94	
2,039.00	18.70	3.40	2,035.83	15.15	-4.54	15.06	11.24	10.97	-8.39	
2,070.00	22.20	4.60	2,064.87	25.95	-3.78	25.87	11.37	11.29	3.87	
2,101.00	25.50	5.90	2,093.22	38.43	-2.62	38.37	10.78	10.65	4.19	

Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Pinto 36 State Com 1H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3508.00ft (JW #4)
Site:	Pinto 36 State Com 1H	MD Reference:	WELL @ 3508.00ft (JW #4)
Well:	Pinto 36 State Com 1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Houston R5000 Database

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,132.00	28.90	5.10	2,120.78	52.53	-1.27	52.50	11.03	10.97	-2.58
2,164.00	32.00	3.70	2,148.37	68.70	-0.04	68.68	9.94	9.69	-4.38
2,195.00	34.80	2.90	2,174.25	85.73	0.94	85.74	9.14	9.03	-2.58
2,226.00	38.00	3.00	2,199.19	104.10	1.89	104.12	10.32	10.32	0.32
2,257.00	41.20	3.60	2,223.08	123.83	3.03	123.86	10.40	10.32	1.94
2,288.00	44.50	3.40	2,245.80	144.87	4.32	144.92	10.65	10.65	-0.65
2,319.00	47.50	2.90	2,267.33	167.13	5.54	167.20	9.75	9.68	-1.61
2,350.00	50.90	2.50	2,287.59	190.57	6.64	190.66	11.01	10.97	-1.29
2,382.00	54.70	2.50	2,306.93	216.03	7.75	216.13	11.88	11.88	0.00
2,413.00	57.50	3.40	2,324.22	241.72	9.08	241.85	9.35	9.03	2.90
2,444.00	60.40	3.60	2,340.21	268.23	10.70	268.38	9.37	9.35	0.65
2,475.00	63.30	2.50	2,354.83	295.52	12.15	295.69	9.86	9.35	-3.55
2,506.00	66.20	1.50	2,368.05	323.53	13.13	323.72	9.80	9.35	-3.23
2,538.00	69.70	0.09	2,380.06	353.19	13.53	353.38	11.67	10.94	-4.41
2,569.00	73.70	0.80	2,389.80	382.61	13.77	382.80	13.09	12.90	2.29
2,600.00	77.90	1.10	2,397.40	412.65	14.26	412.85	13.58	13.55	0.97
2,631.00	81.30	1.60	2,402.99	443.13	14.98	443.33	11.08	10.97	1.61
2,661.00	83.90	2.30	2,406.86	472.86	16.00	473.08	8.97	8.67	2.33
2,693.00	86.20	2.50	2,409.62	504.71	17.33	504.95	7.21	7.19	0.63
2,724.00	89.30	2.30	2,410.84	535.66	18.63	535.91	10.02	10.00	-0.65
2,755.00	90.60	1.60	2,410.86	566.64	19.68	566.91	4.76	4.19	-2.26
2,848.00	92.70	0.80	2,408.19	659.57	21.63	659.86	2.42	2.26	-0.86
2,942.00	92.70	0.60	2,403.76	753.46	22.78	753.76	0.21	0.00	-0.21
3,036.00	90.40	0.00	2,401.21	847.42	23.27	847.71	2.53	-2.45	-0.64
3,130.00	89.70	0.00	2,401.13	941.42	23.27	941.69	0.74	-0.74	0.00
3,223.00	90.60	0.40	2,400.89	1,034.42	23.59	1,034.68	1.06	0.97	0.43
3,316.00	91.70	2.20	2,399.02	1,127.37	25.70	1,127.65	2.27	1.18	1.94
3,410.00	91.50	2.50	2,396.40	1,221.25	29.56	1,221.59	0.38	-0.21	0.32
3,503.00	91.10	1.10	2,394.29	1,314.18	32.48	1,314.56	1.57	-0.43	-1.51
3,597.00	90.80	1.50	2,392.73	1,408.14	34.61	1,408.54	0.53	-0.32	0.43
3,690.00	91.80	359.90	2,390.62	1,501.11	35.74	1,501.51	2.03	1.08	-1.72
3,784.00	91.30	0.00	2,388.08	1,595.07	35.66	1,595.46	0.54	-0.53	0.11
3,879.00	91.10	0.20	2,386.09	1,690.05	35.83	1,690.43	0.30	-0.21	0.21
3,971.00	91.30	0.40	2,384.16	1,782.03	36.31	1,782.40	0.31	0.22	0.22
4,065.00	91.30	0.60	2,382.03	1,876.00	37.13	1,876.37	0.21	0.00	0.21
4,158.00	91.10	0.80	2,380.08	1,968.98	38.27	1,969.35	0.30	-0.22	0.22
4,252.00	91.10	0.80	2,378.28	2,062.95	39.58	2,063.33	0.00	0.00	0.00
4,345.00	91.10	0.90	2,376.49	2,155.92	40.96	2,156.31	0.11	0.00	0.11
4,439.00	91.50	0.90	2,374.36	2,249.89	42.43	2,250.29	0.43	0.43	0.00
4,532.00	91.50	0.80	2,371.92	2,342.84	43.81	2,343.25	0.11	0.00	-0.11
4,626.00	91.50	1.10	2,369.46	2,436.80	45.37	2,437.22	0.32	0.00	0.32
4,719.00	91.70	0.90	2,366.87	2,529.75	46.99	2,530.18	0.30	0.22	-0.22
4,814.00	91.80	0.90	2,363.96	2,624.69	48.48	2,625.14	0.11	0.11	0.00

Survey Report

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Well:	Pinto 36 State Com 1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Houston R5000 Database

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,907.00	92.20	0.60	2,360.72	2,717.63	49.70	2,718.08	0.54	0.43	-0.32
5,001.00	90.80	1.30	2,358.26	2,811.58	51.26	2,812.05	1.67	-1.49	0.74
5,094.00	91.10	1.50	2,356.72	2,904.54	53.53	2,905.03	0.39	0.32	0.22
5,188.00	91.10	1.60	2,354.91	2,998.49	56.07	2,999.01	0.11	0.00	0.11
5,281.00	91.30	2.20	2,352.96	3,091.41	59.16	3,091.98	0.68	0.22	0.65
5,375.00	92.20	1.60	2,350.09	3,185.32	62.27	3,185.92	1.15	0.96	-0.64
5,469.00	90.30	0.60	2,348.04	3,279.27	64.07	3,279.90	2.28	-2.02	-1.06
5,562.00	90.10	0.60	2,347.72	3,372.27	65.05	3,372.89	0.22	-0.22	0.00
5,656.00	90.30	0.60	2,347.39	3,466.26	66.03	3,466.89	0.21	0.21	0.00
5,750.00	90.30	0.80	2,346.90	3,560.25	67.18	3,560.89	0.21	0.00	0.21
5,843.00	90.10	1.10	2,346.57	3,653.24	68.72	3,653.88	0.39	-0.22	0.32
5,937.00	90.40	1.60	2,346.16	3,747.21	70.94	3,747.88	0.62	0.32	0.53
6,031.00	90.60	1.80	2,345.34	3,841.17	73.73	3,841.87	0.30	0.21	0.21
6,124.00	90.40	1.80	2,344.53	3,934.12	76.65	3,934.86	0.22	-0.22	0.00
6,218.00	91.80	1.10	2,342.73	4,028.07	79.03	4,028.84	1.67	1.49	-0.74
6,311.00	92.40	1.50	2,339.32	4,120.98	81.13	4,121.78	0.78	0.65	0.43
6,406.00	92.60	1.50	2,335.18	4,215.86	83.62	4,216.68	0.21	0.21	0.00
6,499.00	91.30	1.10	2,332.01	4,308.78	85.73	4,309.63	1.46	-1.40	-0.43
6,592.00	91.30	0.80	2,329.90	4,401.74	87.27	4,402.60	0.32	0.00	-0.32
6,686.00	91.10	0.90	2,327.93	4,495.71	88.66	4,496.58	0.24	-0.21	0.11
6,781.00	91.10	0.80	2,326.11	4,590.68	90.07	4,591.56	0.11	0.00	-0.11
6,874.00	91.00	0.40	2,324.40	4,683.66	91.05	4,684.54	0.44	-0.11	-0.43
6,890.00	91.10	0.60	2,324.11	4,699.66	91.19	4,700.54	1.40	0.63	1.25
Last Survey @ 6890.00' MD, 2324.11' TVD, 91.10° INC, 0.60° AZ									
6,938.00	91.10	0.60	2,323.19	4,747.64	91.69	4,748.53	0.00	0.00	0.00
Straight line Projection to TD @ 6938.00' MD, 2323.19' TVD.									

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
6,890.00	2,324.11	4,699.66	91.19	Last Survey @ 6890.00' MD, 2324.11' TVD, 91.10° INC, 0.60° AZ
6,938.00	2,323.19	4,747.64	91.69	Straight line Projection to TD @ 6938.00' MD, 2323.19' TVD.

Checked By: _____	Approved By: _____	Date: _____
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CRESCENT

DIRECTIONAL DRILLING

Minimum Curvature Calculation

Client: COG Operating LLC
 Well: Pinto 36 State Com 1H
 County: Eddy
 Rig: JW #4

M.W.D. OPERATORS: M. Rainey / R. Foust
 DIRECTIONAL DRILLERS: D. Patterson / D. Palmer
 Tool Azimuth to Grid North: 7.96
 Job #: PB-12343

Vertical Section Angle: 1.08

API#: 30-015-39781

Sur #	Meas. Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N/-S	+E/-W	DLS
Tie In	1800.00	0.25	169.57	1799.92	-12.60	-12.60	-8.53	0.00
1	1851.00	0.20	116.20	1850.92	-12.91	-12.75	-8.43	0.41
2	1883.00	1.40	12.50	1882.92	-12.55	-12.39	-8.30	4.56
3	1914.00	5.10	10.20	1913.86	-10.81	-10.67	-7.97	11.94
4	1945.00	8.80	10.90	1944.63	-7.12	-6.98	-7.28	11.94
5	1977.00	12.30	9.70	1976.08	-1.33	-1.21	-6.24	10.96
6	2008.00	15.30	6.00	2006.18	6.01	6.11	-5.25	10.08
7	2039.00	18.70	3.40	2035.83	15.05	15.14	-4.53	11.24
8	2070.00	22.20	4.60	2064.87	25.87	25.94	-3.77	11.37
9	2101.00	25.50	5.90	2093.22	38.37	38.42	-2.61	10.78
10	2132.00	28.90	5.10	2120.79	52.49	52.52	-1.26	11.03
11	2164.00	32.00	3.70	2148.37	68.68	68.69	-0.02	9.94
12	2195.00	34.80	2.90	2174.25	85.73	85.73	0.95	9.14
13	2226.00	38.00	3.00	2199.19	104.11	104.10	1.90	10.32
14	2257.00	41.20	3.60	2223.08	123.86	123.82	3.04	10.40
15	2288.00	44.50	3.40	2245.80	144.92	144.86	4.33	10.65
16	2319.00	47.50	2.90	2267.33	167.20	167.12	5.55	9.75
17	2350.00	50.90	2.50	2287.59	190.65	190.56	6.65	11.01
18	2382.00	54.70	2.50	2306.93	216.13	216.02	7.76	11.88
19	2413.00	57.50	3.40	2324.22	241.84	241.71	9.09	9.35
20	2444.00	60.40	3.60	2340.21	268.37	268.22	10.71	9.37
21	2475.00	63.30	2.50	2354.83	295.69	295.51	12.16	9.86
22	2506.00	66.20	1.50	2368.05	323.72	323.53	13.14	9.80
23	2538.00	69.70	0.90	2380.06	353.37	353.18	13.76	11.07
24	2569.00	73.70	0.80	2389.80	382.80	382.60	14.19	12.91
25	2600.00	77.90	1.10	2397.40	412.85	412.64	14.69	13.58
26	2631.00	81.30	1.60	2402.99	443.33	443.12	15.41	11.08
27	2661.00	83.90	2.30	2406.86	473.08	472.85	16.43	8.97
28	2693.00	86.20	2.50	2409.62	504.95	504.70	17.76	7.21
29	2724.00	89.30	2.30	2410.84	535.91	535.65	19.06	10.02
30	2755.00	90.60	1.60	2410.86	566.91	566.63	20.11	4.76
31	2848.00	92.70	0.80	2408.19	659.86	659.56	22.06	2.42
32	2942.00	92.70	0.60	2403.76	753.75	753.45	23.21	0.21
33	3036.00	90.40	0.00	2401.22	847.70	847.41	23.70	2.53
34	3130.00	89.70	0.00	2401.13	941.69	941.41	23.70	0.74
35	3223.00	90.60	0.40	2400.89	1034.67	1034.41	24.02	1.06
36	3316.00	91.70	2.20	2399.02	1127.65	1127.36	26.13	2.27
37	3410.00	91.50	2.50	2396.40	1221.59	1221.24	29.98	0.38
38	3503.00	91.10	1.10	2394.29	1314.56	1314.17	32.91	1.57
39	3597.00	90.80	1.50	2392.73	1408.54	1408.13	35.04	0.53

CRESCENT

DIRECTIONAL DRILLING

Minimum Curvature Calculation

Client: COG Operating LLC
 Well: Pinto 36 State Com 1H
 County: Eddy
 Rig: JW #4

M.W.D. OPERATORS: M. Rainey / R. Foust
 DIRECTIONAL DRILLERS: D. Patterson / D. Palmer
 Tool Azimuth to Grid North: 7.96
 Job #: PB-12343

Vertical Section Angle: 1.08

API#: 30-015-39781

Sur #	Meas. Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	DLS
40	3690.00	91.80	359.90	2390.62	1501.51	1501.10	36.17	2.03
41	3784.00	91.30	0.00	2388.08	1595.46	1595.06	36.09	0.54
42	3879.00	91.10	0.20	2386.09	1690.42	1690.04	36.26	0.30
43	3971.00	91.30	0.40	2384.16	1782.40	1782.02	36.74	0.31
44	4065.00	91.30	0.60	2382.03	1876.37	1875.99	37.56	0.21
45	4158.00	91.10	0.80	2380.08	1969.34	1968.96	38.69	0.30
46	4252.00	91.10	0.80	2378.28	2063.33	2062.94	40.01	0.00
47	4345.00	91.10	0.90	2376.49	2156.31	2155.91	41.39	0.11
48	4439.00	91.50	0.90	2374.36	2250.28	2249.87	42.86	0.43
49	4532.00	91.50	0.80	2371.92	2343.25	2342.83	44.24	0.11
50	4626.00	91.50	1.10	2369.46	2437.22	2436.79	45.80	0.32
51	4719.00	91.70	0.90	2366.87	2530.18	2529.74	47.42	0.30
52	4814.00	91.80	0.90	2363.97	2625.14	2624.68	48.91	0.11
53	4907.00	92.20	0.60	2360.72	2718.08	2717.62	50.13	0.54
54	5001.00	90.80	1.30	2358.26	2812.04	2811.57	51.69	1.67
55	5094.00	91.10	1.50	2356.72	2905.03	2904.53	53.96	0.39
56	5188.00	91.10	1.60	2354.91	2999.01	2998.47	56.50	0.11
57	5281.00	91.30	2.20	2352.96	3091.98	3091.40	59.59	0.68
58	5375.00	92.20	1.60	2350.09	3185.92	3185.31	62.70	1.15
59	5469.00	90.30	0.60	2348.04	3279.89	3279.26	64.50	2.28
60	5562.00	90.10	0.60	2347.72	3372.89	3372.26	65.48	0.22
61	5656.00	90.30	0.60	2347.39	3466.89	3466.25	66.46	0.21
62	5750.00	90.30	0.80	2346.90	3560.88	3560.24	67.61	0.21
63	5843.00	90.10	1.10	2346.57	3653.88	3653.23	69.15	0.39
64	5937.00	90.40	1.60	2346.16	3747.88	3747.20	71.37	0.62
65	6031.00	90.60	1.80	2345.34	3841.87	3841.16	74.16	0.30
66	6124.00	90.40	1.80	2344.53	3934.86	3934.11	77.08	0.22
67	6218.00	91.80	1.10	2342.73	4028.84	4028.06	79.46	1.67
68	6311.00	92.40	1.50	2339.32	4121.77	4120.97	81.56	0.78
69	6406.00	92.60	1.50	2335.18	4216.68	4215.85	84.05	0.21
70	6499.00	91.30	1.10	2332.01	4309.62	4308.77	86.16	1.46
71	6592.00	91.30	0.80	2329.90	4402.60	4401.73	87.70	0.32
72	6686.00	91.10	0.90	2327.93	4496.58	4495.70	89.09	0.24
73	6781.00	91.10	0.80	2326.11	4591.56	4590.67	90.50	0.11
74	6874.00	91.00	0.40	2324.40	4684.54	4683.65	91.47	0.44
75	6890.00	91.10	0.60	2324.11	4700.54	4699.65	91.61	1.40
BHL	6938.00	91.10	0.60	2323.19	4748.53	4747.63	92.12	0.00