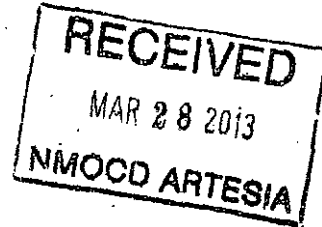




A GYRO TECHNOLOGIES INC. COMPANY

PO Box 261021
Corpus Christi, Texas 78426
(361) 767-0602 • (800) 606-GYRO • Fax (361) 767-0612

30-015-40652



October 31, 2012

COG Operating LLC (Concho)
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

Attn: Kanica Castillo

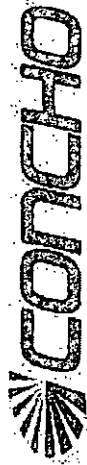
RE: **Reposado 2 State Com No. 003H**

Please find enclosed a copy of the survey from 0.00' to 9510.00' ran on the above referenced well.

If I can be of any further service please do not hesitate to call me at 800-606-4976.

Sincerely,

Keith Havelka
Operations



Company: COG Operating LLC (Concho)
Lease/Well: Reposado 2 State Com / No. 003H
Location: Sec 02 T-26S R-29E
Rig Name: Patriot 3
State/County: New Mexico / Eddy
Latitude: 32.06, Longitude: -103.96
GRID North is 0.20 Degrees East of True North
VS-Azi: 0.00 Degrees



RECEIVED
MAR 28 2013
ANMOCD ARTESIA

Depth Reference : RKB = 18 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: reposado 2 state com #3h_ed.ut

Minimum Curvature Method

Report Date/Time: 10/31/2012 / 08:16

Vaughn Energy Services
Bossier City, Louisiana

318-549-3860

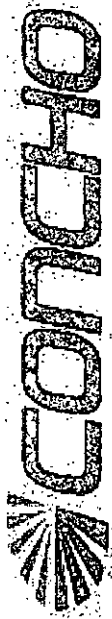
Surveyor: Clayton Addison

Reposado 2 State Com No. 003H / API 30-015-40652

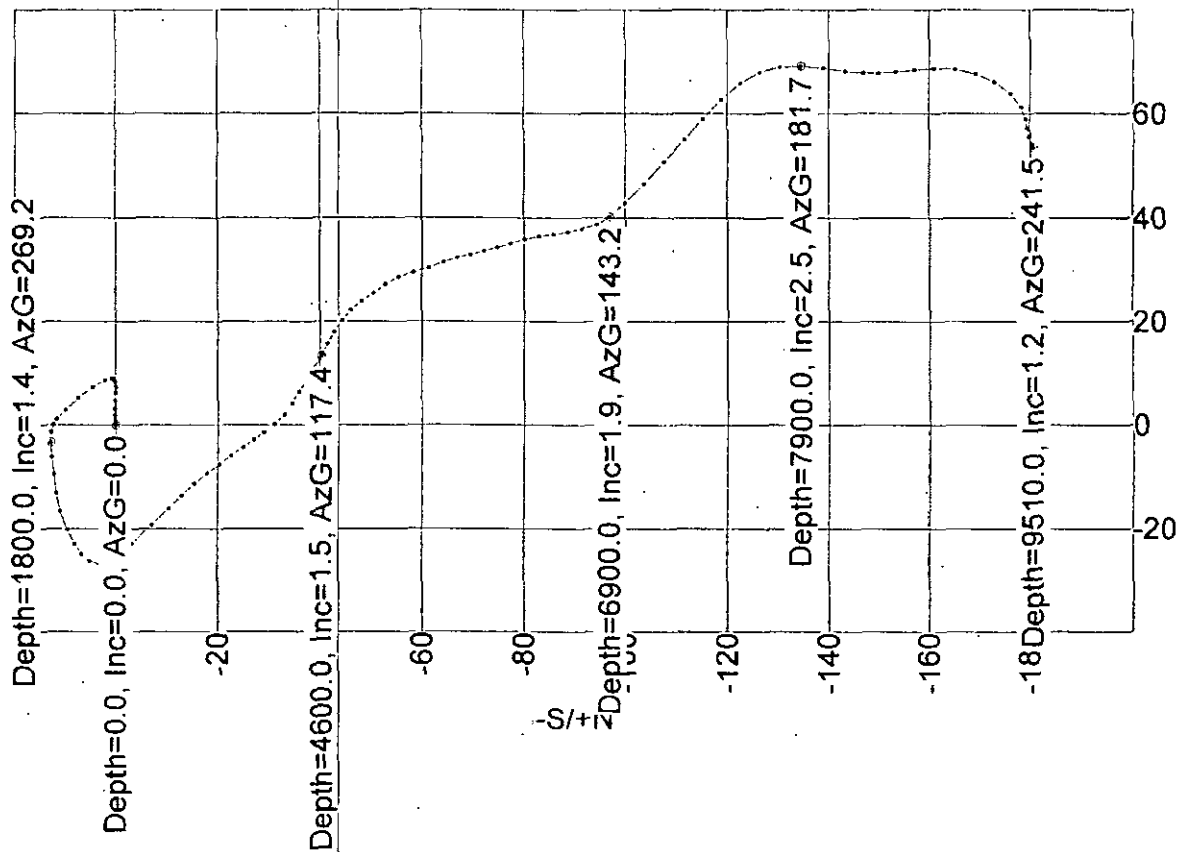
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***
100.00	0.41	86.46	100.00	0.02	0.35	0.35	86.46	0.41
200.00	0.30	81.11	200.00	0.08	0.97	0.97	85.01	0.11
300.00	0.68	88.69	299.99	0.14	1.82	1.83	85.64	0.38
400.00	0.83	88.20	399.98	0.18	3.13	3.14	86.80	0.15
500.00	0.96	96.53	499.97	0.10	4.68	4.69	88.74	0.18
600.00	0.74	99.48	599.96	-0.10	6.15	6.15	90.91	0.22
700.00	0.60	88.67	699.95	-0.19	7.31	7.31	91.50	0.19
800.00	0.52	71.73	799.95	-0.04	8.27	8.27	90.26	0.18
900.00	0.18	40.42	899.95	0.22	8.80	8.80	88.55	0.38
1000.00	0.45	5.91	999.95	0.73	8.94	8.97	85.35	0.32
1100.00	1.13	338.38	1099.94	2.03	8.61	8.85	76.71	0.76
1200.00	2.03	327.47	1199.90	4.44	7.30	8.55	58.67	0.94
1300.00	2.13	322.16	1299.83	7.40	5.21	9.05	35.16	0.22
1400.00	2.00	316.42	1399.77	10.13	2.87	10.53	15.82	0.24
1500.00	0.80	309.45	1499.74	11.84	1.13	11.89	5.43	1.21
1600.00	0.67	291.27	1599.73	12.49	0.04	12.49	0.19	0.27
1700.00	0.92	279.52	1699.72	12.84	-1.29	12.90	354.25	0.30
1800.00	1.37	269.16	1799.70	12.95	-3.28	13.36	345.80	0.49

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	1.84	263.28	1899.66	12.75	-6.07	14.12	334.54	0.50
2000.00	2.07	262.92	1999.60	12.34	-9.45	15.54	322.54	0.22
2100.00	2.09	262.41	2099.53	11.87	-13.05	17.64	312.30	0.03
2200.00	2.12	253.48	2199.47	11.11	-16.63	20.00	303.74	0.33
2300.00	2.25	242.62	2299.40	9.68	-20.15	22.35	295.66	0.43
2400.00	1.57	241.62	2399.34	8.12	-23.10	24.48	289.38	0.68
2500.00	1.18	224.74	2499.31	6.74	-25.03	25.92	285.07	0.56
2600.00	1.19	210.12	2599.29	5.11	-26.27	26.76	281.01	0.30
2700.00	1.32	185.85	2699.27	3.07	-26.91	27.08	276.52	0.54
2800.00	2.30	145.24	2799.22	0.28	-25.88	25.88	270.62	1.56
2900.00	3.05	137.40	2899.11	-3.33	-22.94	23.18	261.75	0.84
3000.00	2.99	136.11	2998.97	-7.16	-19.33	20.61	249.67	0.09
3100.00	2.25	136.81	3098.87	-10.47	-16.18	19.27	237.09	0.74
3200.00	1.89	132.60	3198.80	-13.02	-13.62	18.84	226.30	0.39
3300.00	1.90	139.19	3298.75	-15.39	-11.33	19.11	216.35	0.22
3400.00	1.79	145.19	3398.69	-17.92	-9.35	20.22	207.56	0.22
3500.00	1.66	144.45	3498.65	-20.38	-7.62	21.76	200.50	0.13
3600.00	1.62	142.84	3598.61	-22.69	-5.92	23.45	194.63	0.06
3700.00	1.48	143.98	3698.57	-24.86	-4.31	25.23	189.83	0.14
3800.00	1.44	144.75	3798.54	-26.93	-2.82	27.08	185.98	0.05
3900.00	1.41	143.78	3898.51	-28.95	-1.37	28.98	182.71	0.04
4000.00	1.51	142.93	3998.48	-30.99	0.15	30.99	179.73	0.10
4100.00	1.53	130.03	4098.44	-32.90	1.96	32.96	176.59	0.34
4200.00	1.54	121.73	4198.40	-34.46	4.13	34.71	173.17	0.22
4300.00	1.51	122.99	4298.37	-35.89	6.38	36.45	169.92	0.05
4400.00	1.60	126.19	4398.33	-37.43	8.61	38.41	167.05	0.12
4500.00	1.60	122.20	4498.29	-39.00	10.91	40.49	164.37	0.11
4600.00	1.47	117.36	4598.26	-40.33	13.23	42.44	161.84	0.18
4700.00	1.55	116.52	4698.22	-41.52	15.58	44.35	159.43	0.09
4800.00	1.54	120.24	4798.19	-42.80	17.95	46.42	157.24	0.10
4900.00	1.59	129.30	4898.15	-44.36	20.19	48.74	155.53	0.25
5000.00	1.56	133.24	4998.11	-46.17	22.26	51.26	154.26	0.11
5100.00	1.60	149.12	5098.07	-48.31	23.97	53.92	153.61	0.44
5200.00	1.61	142.68	5198.04	-50.62	25.53	56.69	153.23	0.18
5300.00	1.65	145.70	5297.99	-52.92	27.19	59.50	152.80	0.10
5400.00	1.76	159.40	5397.95	-55.55	28.55	62.45	152.80	0.42
5500.00	1.73	164.97	5497.90	-58.44	29.48	65.46	153.23	0.17
5600.00	1.74	162.19	5597.86	-61.34	30.33	68.43	153.69	0.08
5700.00	1.77	157.51	5697.81	-64.21	31.38	71.47	153.95	0.15

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	1.51	166.41	5797.77	-66.92	32.28	74.30	154.24	0.36
5900.00	1.52	168.35	5897.74	-69.50	32.86	76.88	154.69	0.05
6000.00	1.53	162.50	5997.70	-72.08	33.53	79.50	155.05	0.16
6100.00	1.57	167.30	6097.66	-74.68	34.23	82.16	155.37	0.14
6200.00	1.59	160.78	6197.63	-77.33	34.99	84.88	155.65	0.18
6300.00	1.70	163.35	6297.59	-80.07	35.88	87.74	155.86	0.13
6400.00	1.64	174.96	6397.54	-82.91	36.43	90.56	156.28	0.34
6500.00	1.66	171.95	6497.50	-85.77	36.75	93.31	156.80	0.09
6600.00	1.64	166.66	6597.46	-88.60	37.29	96.12	157.18	0.15
6700.00	1.66	169.31	6697.42	-91.41	37.89	98.95	157.49	0.08
6800.00	1.74	169.37	6797.37	-94.26	38.69	101.89	157.68	0.30
6900.00	1.87	143.19	6897.33	-96.98	40.20	104.98	157.49	0.52
7000.00	2.72	135.87	6997.25	-99.98	42.82	108.77	156.81	0.90
7100.00	3.31	134.00	7097.11	-103.69	46.55	113.66	155.82	0.60
7200.00	3.31	130.11	7196.94	-107.56	50.84	118.97	154.70	0.22
7300.00	3.26	136.77	7296.78	-111.50	55.00	124.32	153.74	0.39
7400.00	3.00	130.07	7396.63	-115.25	58.95	129.45	152.91	0.45
7500.00	2.94	136.74	7496.49	-118.80	62.71	134.34	152.17	0.36
7600.00	2.66	144.03	7596.37	-122.55	65.83	139.12	151.76	0.46
7700.00	2.41	159.26	7696.28	-126.40	67.94	143.50	151.74	0.71
7800.00	2.29	172.60	7796.19	-130.34	68.94	147.45	152.12	0.56
7900.00	2.50	181.74	7896.11	-134.50	69.13	151.23	152.80	0.43
8000.00	2.57	187.47	7996.01	-138.91	68.78	155.00	153.66	0.26
8100.00	2.38	188.12	8095.91	-143.19	68.19	158.60	154.53	0.19
8200.00	1.80	182.13	8195.85	-146.82	67.84	161.73	155.20	0.62
8300.00	1.68	180.42	8295.80	-149.85	67.77	164.47	155.67	0.13
8400.00	2.16	172.52	8395.75	-153.19	68.00	167.60	156.06	0.55
8500.00	2.29	174.38	8495.67	-157.04	68.44	171.31	156.45	0.15
8600.00	2.21	177.78	8595.59	-160.94	68.71	175.00	156.88	0.16
8700.00	2.57	186.72	8695.51	-165.10	68.53	178.76	157.46	0.52
8800.00	2.31	198.35	8795.42	-169.24	67.63	182.25	158.22	0.56
8900.00	2.26	206.76	8895.34	-172.92	66.11	186.12	159.08	0.34
9000.00	2.30	223.19	8995.26	-176.14	63.85	187.35	160.08	0.65
9100.00	1.63	239.25	9095.20	-178.32	61.26	188.55	161.04	0.86
9200.00	1.27	259.11	9195.17	-179.26	58.95	188.70	161.80	0.61
9300.00	0.77	266.37	9295.15	-179.51	57.19	188.40	162.33	0.52
9400.00	1.08	256.76	9395.14	-179.77	55.61	188.17	162.81	0.35
9500.00	1.17	241.22	9495.12	-180.48	53.79	188.32	163.40	0.32
9510.00	1.25	241.50	9505.12	-180.58	53.61	188.37	163.47	0.77



Vaughn Energy Services
Bossier City, Louisiana
318-549-3860
Surveyor: Clayton Addison
Reposado 2 State Com No. 003H / API 30-015-40652



-W/+E
VES Survey Date: 10/23/2012



Survey Certification Sheet

COG Operatig,LLC
Company

WT-12792
Job Number

2/28/13
Date

Sec2, T26E, R29E
Lease

Reposado 2 State #3H Lateral #2
Well Name

Eddy, NM
County & State

API: 30-015-40652

Surveyed from a depth of: 7100 feet to 12279 feet MD

Type of Survey: MWD

Directional Supervisor/Surveyor: David Martinez

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by **The Directional Drilling Company (DDC)**. This report represents a true and correct Directional survey of this well based on the original data obtained at the well site. Wellbore Coordinates are calculated using minimum curvature.

Digitally signed by Larry Wright
DN: cn=Larry Wright, o=The
Directional Drilling Company,
ou=GM of Guidance Services,
email=larryw@directionaldrillers.co
m, c=US
Date: 2013.03.01 11:56:59 -06'00'

Larry Wright
MWD General Manager



COG Operating, LLC

Eddy County, NM (NAD 27)

Sec 2, T-26-E, R-29-E

Reposado 2 State #3H

Lateral #2

Survey: MWD

DDC Survey Report

28 February, 2013





DDC Survey Report



Company: COG Operating, LLC
Project: Eddy County, NM (NAD 27)
Site: Sec 2, T-26-E, R-29-E
Well: Reposado 2 State #3H
Wellbore: Lateral #2
Design: Lateral #2

Local Co-ordinate Reference: Well Reposado 2 State #3H
TVD Reference: WELL @ 3034.0usft (Patriot #3)
MD Reference: WELL @ 3034.0usft (Patriot #3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project	Eddy County, NM (NAD 27)		
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	Sec 2, T-26-E, R-29-E		
Site Position:	Northing:	387,594.30 usft	Latitude: 32° 3' 54.186 N
From: Map	Easting:	616,739.60 usft	Longitude: 103° 57' 23.337 W
Position Uncertainty: 0.0 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0.20 °	

Well	Reposado 2 State #3H		
Well Position	+N/-S 0.0 usft	Northing: 387,594.30 usft	Latitude: 32° 3' 54.186 N
	+E/-W 0.0 usft	Easting: 616,739.60 usft	Longitude: 103° 57' 23.337 W
Position Uncertainty 0.0 usft	Wellhead Elevation: usft	Ground Level: 3,017.0 usft	

Wellbore		Lateral #2			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/6/2012	7.60	59.94	48,358

Design	Lateral #2		
Audit Notes:			
Version: 1.0	Phase: ACTUAL	Tie On Depth:	7,100.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	357.52

Survey Program		Date	11/30/2012	
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	7,100.0	VES Gyro Survey (Pilot Hole)	Good_gyro	Good Gyro
7,233.0	12,279.0	MVWD (Lateral #2)		

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)
TIE ON @ 7100' MD / 7097.1' TVD									
7,100.0	3.31	134.00	7,097.1	-103.7	46.6	-105.6	0.00	0.00	0.00
7,233.0	4.30	348.40	7,230.0	-101.5	48.3	-103.5	5.47	0.74	-109.47
7,264.0	9.00	344.00	7,260.8	-98.0	47.4	-100.0	15.24	15.16	-14.19
7,296.0	13.00	344.90	7,292.2	-92.1	45.8	-94.0	12.51	12.50	2.81
7,327.0	16.90	346.10	7,322.1	-84.4	43.8	-86.2	12.62	12.58	3.87
7,359.0	18.90	346.30	7,352.6	-74.8	41.5	-76.6	6.25	6.25	0.63
7,391.0	21.20	347.50	7,382.6	-64.2	39.0	-65.8	7.30	7.19	3.75
7,422.0	24.80	348.20	7,411.2	-52.3	36.4	-53.8	11.65	11.61	2.26
7,454.0	28.70	348.20	7,439.7	-38.2	33.5	-39.6	12.19	12.19	0.00



DDC
Survey Report



Company: COG Operating, LLC
Project: Eddy County, NM (NAD 27)
Site: Sec 2, T-26-E, R-29-E
Well: Reposado 2 State #3H
Wellbore: Lateral #2
Design: Lateral #2

Local Co-ordinate Reference: Well Reposado 2 State #3H
TVD Reference: WELL @ 3034.0usft (Patriot #3)
MD Reference: WELL @ 3034.0usft (Patriot #3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single 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)
CROSSED HARDLINE @7471' MD / 7454.3 TVD									
7,470.8	30.64	348.09	7,454.3	-30.1	31.8	-31.4	11.57	11.56	-0.66
7,486.0	32.40	348.00	7,467.3	-22.3	30.2	-23.6	11.57	11.56	-0.59
7,517.0	35.40	348.60	7,493.0	-5.4	26.6	-6.5	9.74	9.68	1.94
7,546.0	37.90	349.60	7,516.3	11.6	23.4	10.6	8.86	8.62	3.45
7,577.0	40.40	353.50	7,540.3	31.0	20.5	30.1	11.32	8.06	12.58
7,609.0	44.80	356.00	7,563.9	52.5	18.6	51.7	14.73	13.75	7.81
7,640.0	49.90	356.30	7,584.9	75.3	17.0	74.5	16.47	16.45	0.97
7,672.0	53.10	356.30	7,604.8	100.3	15.4	99.5	10.00	10.00	0.00
7,703.0	57.30	356.80	7,622.5	125.7	13.9	124.9	13.61	13.55	1.61
7,735.0	60.60	357.20	7,639.0	153.0	12.5	152.4	10.37	10.31	1.25
7,766.0	64.80	357.50	7,653.2	180.6	11.2	179.9	13.58	13.55	0.97
7,798.0	69.80	358.10	7,665.5	210.0	10.1	209.4	15.72	15.63	1.88
7,830.0	75.40	357.70	7,675.1	240.5	8.9	239.9	17.54	17.50	-1.25
7,861.0	82.40	356.50	7,681.1	270.9	7.4	270.3	22.90	22.58	-3.87
7,956.0	93.60	357.50	7,684.4	365.6	2.4	365.1	11.84	11.79	1.05
8,019.0	93.50	357.00	7,680.5	428.4	-0.6	428.0	0.81	-0.16	-0.79
8,051.0	91.60	357.40	7,679.0	460.3	-2.1	460.0	6.07	-5.94	1.25
8,114.0	90.00	357.00	7,678.2	523.2	-5.2	523.0	2.62	-2.54	-0.63
8,178.0	89.80	357.20	7,678.3	587.1	-8.5	587.0	0.44	-0.31	0.31
8,239.0	89.50	357.40	7,678.7	648.1	-11.3	648.0	0.59	-0.49	0.33
8,302.0	89.90	357.20	7,679.0	711.0	-14.3	710.9	0.71	0.63	-0.32
8,365.0	89.60	356.70	7,679.3	773.9	-17.7	773.9	0.93	-0.48	-0.79
8,460.0	89.40	357.50	7,680.1	868.8	-22.5	868.9	0.87	-0.21	0.84
8,555.0	90.50	357.90	7,680.2	963.7	-26.3	963.9	1.23	1.16	0.42
8,650.0	90.20	357.00	7,679.6	1,058.6	-30.5	1,058.9	1.00	-0.32	-0.95
8,745.0	90.30	355.60	7,679.2	1,153.4	-36.6	1,153.9	1.48	0.11	-1.47
8,840.0	90.80	355.60	7,678.3	1,248.1	-43.9	1,248.8	0.53	0.53	0.00
8,934.0	90.70	356.30	7,677.0	1,341.9	-50.6	1,342.8	0.75	-0.11	0.74
9,028.0	90.50	356.30	7,676.0	1,435.7	-56.6	1,436.8	0.21	-0.21	0.00
9,122.0	90.40	356.70	7,675.3	1,529.5	-62.4	1,530.8	0.44	-0.11	0.43
9,216.0	90.80	356.70	7,674.3	1,623.3	-67.8	1,624.7	0.43	0.43	0.00
9,310.0	91.40	356.50	7,672.5	1,717.2	-73.3	1,718.7	0.67	0.64	-0.21
9,373.0	91.70	357.20	7,670.8	1,780.0	-76.8	1,781.7	1.21	0.48	1.11
9,467.0	91.30	357.90	7,668.4	1,873.9	-80.8	1,875.7	0.86	-0.43	0.74
9,562.0	90.60	356.70	7,666.8	1,968.8	-85.3	1,970.6	1.46	-0.74	-1.26
9,656.0	89.80	357.40	7,666.5	2,062.7	-90.1	2,064.6	1.13	-0.85	0.74
9,750.0	91.00	356.50	7,665.8	2,156.5	-95.1	2,158.6	1.60	1.28	-0.96
9,845.0	91.40	355.30	7,663.8	2,251.3	-101.9	2,253.6	1.33	0.42	-1.26
9,939.0	89.90	354.90	7,662.7	2,344.9	-110.0	2,347.5	1.65	-1.60	-0.43
10,034.0	90.20	355.60	7,662.7	2,439.6	-117.8	2,442.4	0.80	0.32	0.74
10,128.0	91.70	355.30	7,661.1	2,533.3	-125.3	2,536.3	1.63	1.60	-0.32
10,222.0	90.10	355.30	7,659.6	2,626.9	-133.0	2,630.2	1.70	-1.70	0.00



DDC
Survey Report



Company: COG Operating, LLC
Project: Eddy County, NM (NAD 27)
Site: Sec 2, T-26-E, R-29-E
Well: Reposado 2 State #3H
Wellbore: Lateral #2
Design: Lateral #2

Local Co-ordinate Reference: Well Reposado 2 State #3H
TVD Reference: WELL @ 3034.0usft (Patriot #3)
MD Reference: WELL @ 3034.0usft (Patriot #3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single 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)
10,316.0	91.40	356.50	7,658.4	2,720.7	-139.7	2,724.2	1.88	1.38	1.28
10,411.0	92.80	359.00	7,654.9	2,815.5	-143.4	2,819.1	3.01	1.47	2.63
10,474.0	91.60	359.50	7,652.5	2,878.5	-144.2	2,882.0	2.06	-1.90	0.79
10,537.0	90.60	359.70	7,651.3	2,941.5	-144.7	2,945.0	1.62	-1.59	0.32
10,600.0	89.10	359.50	7,651.4	3,004.5	-145.1	3,007.9	2.40	-2.38	-0.32
10,663.0	89.00	359.80	7,652.5	3,067.5	-145.5	3,070.9	0.50	-0.16	0.48
10,726.0	88.50	358.40	7,653.9	3,130.4	-146.5	3,133.8	2.36	-0.79	-2.22
10,820.0	89.20	359.10	7,655.8	3,224.4	-148.6	3,227.8	1.05	0.74	0.74
10,914.0	87.90	358.80	7,658.1	3,318.3	-150.3	3,321.7	1.42	-1.38	-0.32
10,977.0	88.60	358.40	7,660.1	3,381.3	-151.8	3,384.7	1.28	1.11	-0.63
11,039.0	89.50	358.60	7,661.1	3,443.3	-153.4	3,446.7	1.49	1.45	0.32
11,101.0	89.60	357.40	7,661.6	3,505.2	-155.6	3,508.7	1.94	0.16	-1.94
11,196.0	90.50	357.20	7,661.5	3,600.1	-160.1	3,603.7	0.97	0.95	-0.21
11,290.0	88.30	356.70	7,662.5	3,694.0	-165.1	3,697.7	2.40	-2.34	-0.53
11,353.0	88.30	356.10	7,664.3	3,756.8	-169.0	3,760.6	0.95	0.00	-0.95
11,415.0	89.10	356.00	7,665.7	3,818.7	-173.3	3,822.6	1.30	1.29	-0.16
11,478.0	90.60	357.00	7,665.9	3,881.5	-177.1	3,885.6	2.86	2.38	1.59
11,540.0	91.20	357.00	7,664.9	3,943.4	-180.4	3,947.6	0.97	0.97	0.00
11,634.0	91.40	357.40	7,662.8	4,037.3	-185.0	4,041.5	0.48	0.21	0.43
11,729.0	91.20	357.00	7,660.7	4,132.2	-189.6	4,136.5	0.47	-0.21	-0.42
11,823.0	92.50	357.20	7,657.6	4,226.0	-194.4	4,230.5	1.40	1.38	0.21
11,886.0	92.20	357.50	7,655.0	4,288.9	-197.3	4,293.4	0.67	-0.48	0.48
11,948.0	92.50	357.70	7,652.5	4,350.8	-199.9	4,355.3	0.58	0.48	0.32
12,011.0	90.60	358.80	7,650.8	4,413.7	-201.8	4,418.3	3.48	-3.02	1.75
12,105.0	90.30	0.00	7,650.0	4,507.7	-202.8	4,512.3	1.32	-0.32	1.28
12,227.0	92.40	0.00	7,647.2	4,629.7	-202.8	4,634.1	1.72	1.72	0.00
BIT PROJECTION @ 12279' MD / 7645' TVD									
12,279.0	92.40	0.00	7,645.0	4,681.6	-202.8	4,686.0	0.00	0.00	0.00

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,100.0	7,097.1	-103.7	46.6	TIE ON @ 7100' MD / 7097.1' TVD
7,470.8	7,454.3	-30.1	31.8	CROSSED HARDLINE @ 7471' MD / 7454.3 TVD
12,279.0	7,645.0	4,681.6	-202.8	BIT PROJECTION @ 12279' MD / 7645' TVD

Checked By: _____ Approved By: _____ Date: _____



Survey Certification Sheet

COG Operatig,LLC
Company

WT-12792
Job Number

2/28/13
Date

Sec2, T26E, R29E
Lease

Reposado 2 State #3H Lateral #1
Well Name

Eddy, NM
County & State

API: 30-015-40652

Surveyed from a depth of: 8200 feet to 13400 feet MD

Type of Survey: MWD

Directional Supervisor/Surveyor: David Martinez

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by **The Directional Drilling Company (DDC)**. This report represents a true and correct Directional survey of this well based on the original data obtained at the well site. Wellbore Coordinates are calculated using minimum curvature.

Digitally signed by Larry Wright
DN: cn=Larry Wright, o=The
Directional Drilling Company, ou=GM
of Guidance Services,
email=larryw@directionaldrillers.com,
c=US
Date: 2013.03.01 11:55:41 -06:00

Larry Wright
MWD General Manager



COG Operating, LLC

Eddy County, NM (NAD 27)

Sec 2, T-26-E, R-29-E

Reposado 2 State #3H

Lateral #1

Survey: MWD

DDC Survey Report

28 February, 2013





DDC
Survey Report



Company: COG Operating, LLC
Project: Eddy County, NM (NAD 27)
Site: Sec 2, T-26-E, R-29-E
Well: Reposado 2 State #3H
Wellbore: Lateral #1
Design: Lateral #1

Local Co-ordinate Reference: Well Reposado 2 State #3H
TVD Reference: WELL @ 3034.0usft (Patriot #3)
MD Reference: WELL @ 3034.0usft (Patriot #3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project	Eddy County, NM (NAD 27)		
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	Sec 2, T-26-E, R-29-E		
Site Position:	Northing:	387,594.30 usft	Latitude: 32° 3' 54.186 N
From: Map	Easting:	616,739.60 usft	Longitude: 103° 57' 23.337 W
Position Uncertainty:	0.0 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0.20 °

Well	Reposado 2 State #3H		
Well Position	+N/-S	0.0 usft	Northing: 387,594.30 usft
	+E/-W	0.0 usft	Easting: 616,739.60 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
			Ground Level: 3,017.0 usft

Wellbore	Lateral #1		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010	10/24/2012	(°)
			7.58
			Dip Angle (°)
			59.94
			Field Strength (nT)
			48,345

Design	Lateral #1		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	8,200.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction (°)
			357.30

Survey Program	Date 2/28/2013		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
100.0	8,200.0	VES Gyro Survey (Pilot Hole)	Good_gyro
8,271.0	13,400.0	MWD (Lateral #1)	MWD default
			Description
			Good Gyro
			MWD - Standard

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)	
TIE IN @ 8200' MD / 8195.8' TVD										
8,200.0	1.80	182.13	8,195.8	-146.8	67.9	-149.9	0.00	0.00	0.00	
8,271.0	0.90	183.50	8,266.8	-148.5	67.8	-151.5	1.27	-1.27	1.93	
8,302.0	3.70	10.00	8,297.8	-147.8	67.9	-150.8	14.82	9.03	-559.68	
8,334.0	9.60	7.20	8,329.6	-144.1	68.5	-147.1	18.46	18.44	-8.75	
8,366.0	13.40	13.50	8,360.9	-137.8	69.7	-141.0	12.49	11.88	19.69	
8,397.0	16.80	9.90	8,390.9	-129.9	71.3	-133.1	11.37	10.97	-11.61	
8,429.0	20.00	10.60	8,421.2	-120.0	73.1	-123.3	10.02	10.00	2.19	
8,461.0	22.00	10.00	8,451.1	-108.7	75.1	-112.1	6.29	6.25	-1.88	
8,492.0	26.80	7.70	8,479.3	-96.0	77.1	-99.6	15.78	15.48	-7.42	



DDC
Survey Report



Company: COG Operating, LLC
Project: Eddy County, NM (NAD 27)
Site: Sec 2, T-26-E, R-29-E
Well: Reposado 2 State #3H
Wellbore: Lateral #1
Design: Lateral #1

Local Co-ordinate Reference: Well Reposado 2 State #3H
TVD Reference: WELL @ 3034.0usft (Patriot #3)
MD Reference: WELL @ 3034.0usft (Patriot #3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single 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)
8,524.0	31.70	4.80	8,507.2	-80.5	78.7	-84.1	15.94	15.31	-9.06
8,556.0	36.30	2.10	8,533.8	-62.7	79.8	-66.3	15.13	14.38	-8.44
8,587.0	39.50	0.90	8,558.2	-43.6	80.3	-47.4	10.59	10.32	-3.87
8,619.0	42.10	0.90	8,582.4	-22.7	80.6	-26.5	8.13	8.13	0.00
8,650.0	43.80	2.50	8,605.1	-1.6	81.2	-5.4	6.51	5.48	5.16
8,682.0	45.40	2.60	8,627.9	20.8	82.2	16.9	5.00	5.00	0.31
8,714.0	49.20	0.70	8,649.6	44.3	82.9	40.4	12.65	11.88	-5.94
8,745.0	53.10	0.20	8,669.0	68.5	83.1	64.5	12.64	12.58	-1.61
8,777.0	58.20	359.50	8,687.1	94.9	83.0	90.9	16.04	15.94	-2.19
8,809.0	61.10	358.40	8,703.3	122.5	82.5	118.5	9.54	9.06	-3.44
8,840.0	64.50	356.80	8,717.4	150.0	81.3	146.0	11.89	10.97	-5.16
8,872.0	66.10	355.60	8,730.8	179.0	79.4	175.1	6.05	5.00	-3.75
8,903.0	68.20	355.40	8,742.8	207.5	77.2	203.7	6.80	6.77	-0.65
8,935.0	70.70	355.40	8,754.1	237.4	74.8	233.6	7.81	7.81	0.00
8,967.0	73.70	354.70	8,763.9	267.7	72.1	264.0	9.60	9.38	-2.19
8,998.0	75.40	354.20	8,772.1	297.5	69.2	293.9	5.70	5.48	-1.61
9,030.0	77.80	353.30	8,779.5	328.4	65.9	324.9	7.98	7.50	-2.81
9,062.0	80.20	353.50	8,785.6	359.6	62.2	356.3	7.53	7.50	0.63
9,093.0	82.50	354.90	8,790.3	390.1	59.2	386.9	8.66	7.42	4.52
9,124.0	82.80	354.70	8,794.3	420.7	56.4	417.6	1.16	0.97	-0.65
9,155.0	85.10	355.10	8,797.5	451.4	53.6	448.4	7.53	7.42	1.29
9,190.0	87.30	356.00	8,799.8	486.2	50.9	483.3	6.79	6.29	2.57
9,253.0	88.60	355.10	8,802.1	549.0	46.0	546.2	2.51	2.06	-1.43
9,316.0	91.40	354.70	8,802.1	611.8	40.4	609.2	4.49	4.44	-0.63
9,379.0	91.50	355.30	8,800.5	674.5	34.9	672.1	0.97	0.16	0.95
9,445.0	90.70	355.30	8,799.2	740.3	29.5	738.0	1.21	-1.21	0.00
9,537.0	90.60	355.60	8,798.2	832.0	22.2	830.0	0.34	-0.11	0.33
9,632.0	90.30	355.30	8,797.5	926.7	14.7	924.9	0.45	-0.32	-0.32
9,727.0	90.90	355.30	8,796.5	1,021.3	6.9	1,019.9	0.63	0.63	0.00
9,821.0	89.30	354.90	8,796.3	1,115.0	-1.1	1,113.8	1.75	-1.70	-0.43
9,916.0	89.30	354.90	8,797.5	1,209.6	-9.6	1,208.7	0.00	0.00	0.00
10,011.0	88.80	354.40	8,799.0	1,304.2	-18.4	1,303.6	0.74	-0.53	-0.53
10,105.0	90.30	354.90	8,799.8	1,397.8	-27.2	1,397.5	1.68	1.60	0.53
10,200.0	90.00	354.00	8,799.5	1,492.3	-36.4	1,492.4	1.00	-0.32	-0.95
10,295.0	89.90	353.10	8,799.6	1,586.7	-47.0	1,587.2	0.95	-0.11	-0.95
10,358.0	90.10	354.40	8,799.6	1,649.3	-53.9	1,650.0	2.09	0.32	2.06
10,422.0	90.20	355.30	8,799.4	1,713.1	-59.6	1,714.0	1.41	0.16	1.41
10,516.0	90.20	357.20	8,799.1	1,806.9	-65.8	1,808.0	2.02	0.00	2.02
10,611.0	90.00	357.40	8,798.9	1,901.8	-70.3	1,903.0	0.30	-0.21	0.21
10,705.0	91.00	358.10	8,798.1	1,995.7	-74.0	1,997.0	1.30	1.06	0.74
10,800.0	91.30	356.10	8,796.2	2,090.5	-78.8	2,091.9	2.13	0.32	-2.11
10,864.0	90.30	356.30	8,795.3	2,154.4	-83.0	2,155.9	1.59	-1.56	0.31
10,959.0	89.00	356.10	8,795.9	2,249.2	-89.3	2,250.9	1.38	-1.37	-0.21



DDC
Survey Report



Company: COG Operating, LLC
Project: Eddy County, NM (NAD 27)
Site: Sec 2, T-26-E, R-29-E
Well: Reposado 2 State #3H
Wellbore: Lateral #1
Design: Lateral #1

Local Co-ordinate Reference: Well Reposado 2 State #3H
TVD Reference: WELL @ 3034.0usft (Patriot #3)
MD Reference: WELL @ 3034.0usft (Patriot #3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single 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)
11,021.0	88.80	356.10	8,797.1	2,311.0	-93.5	2,312.9	0.32	-0.32	0.00
11,116.0	88.10	355.80	8,799.7	2,405.8	-100.2	2,407.8	0.80	-0.74	-0.32
11,179.0	88.90	356.00	8,801.3	2,468.6	-104.7	2,470.8	1.31	1.27	0.32
11,243.0	90.80	356.80	8,801.5	2,532.4	-108.7	2,534.8	3.22	2.97	1.25
11,337.0	91.10	357.20	8,799.9	2,626.3	-113.7	2,628.7	0.53	0.32	0.43
11,401.0	91.10	357.20	8,798.7	2,690.2	-116.8	2,692.7	0.00	0.00	0.00
11,496.0	89.40	357.50	8,798.3	2,785.1	-121.2	2,787.7	1.82	-1.79	0.32
11,590.0	88.90	357.20	8,799.7	2,879.0	-125.5	2,881.7	0.62	-0.53	-0.32
11,685.0	89.70	358.80	8,800.8	2,973.9	-128.8	2,976.7	1.88	0.84	1.68
11,780.0	89.50	357.20	8,801.5	3,068.9	-132.2	3,071.7	1.70	-0.21	-1.68
11,874.0	92.20	358.10	8,800.1	3,162.8	-136.0	3,165.7	3.03	2.87	0.96
11,937.0	89.50	357.00	8,799.2	3,225.7	-138.7	3,228.6	4.63	-4.29	-1.75
12,032.0	89.70	358.10	8,799.8	3,320.6	-142.8	3,323.6	1.18	0.21	1.16
12,126.0	90.00	358.80	8,800.1	3,414.6	-145.3	3,417.6	0.81	0.32	0.74
12,189.0	91.70	358.10	8,799.1	3,477.5	-147.0	3,480.6	2.92	2.70	-1.11
12,253.0	92.10	357.40	8,797.0	3,541.4	-149.5	3,544.6	1.26	0.63	-1.09
12,316.0	89.10	356.50	8,796.4	3,604.3	-152.9	3,607.5	4.97	-4.76	-1.43
12,379.0	88.60	358.10	8,797.6	3,667.3	-155.8	3,670.5	2.66	-0.79	2.54
12,442.0	88.10	357.70	8,799.4	3,730.2	-158.1	3,733.5	1.02	-0.79	-0.63
12,505.0	89.70	358.40	8,800.6	3,793.1	-160.3	3,796.5	2.77	2.54	1.11
12,568.0	89.70	358.80	8,801.0	3,856.1	-161.8	3,859.5	0.63	0.00	0.63
12,631.0	88.80	358.30	8,801.8	3,919.1	-163.4	3,922.4	1.63	-1.43	-0.79
12,695.0	88.50	357.20	8,803.3	3,983.0	-165.9	3,986.4	1.78	-0.47	-1.72
12,758.0	88.60	356.80	8,804.9	4,045.9	-169.2	4,049.4	0.65	0.16	-0.63
12,821.0	88.50	356.80	8,806.5	4,108.8	-172.7	4,112.4	0.16	-0.16	0.00
12,884.0	89.70	357.00	8,807.5	4,171.7	-176.1	4,175.4	1.93	1.90	0.32
12,948.0	90.60	356.70	8,807.3	4,235.6	-179.7	4,239.4	1.48	1.41	-0.47
13,011.0	88.40	356.10	8,807.9	4,298.5	-183.6	4,302.4	3.62	-3.49	-0.95
13,074.0	87.50	356.50	8,810.1	4,361.3	-187.7	4,365.3	1.56	-1.43	0.63
13,137.0	86.60	356.30	8,813.4	4,424.1	-191.6	4,428.2	1.46	-1.43	-0.32
13,200.0	86.30	356.30	8,817.3	4,486.8	-195.7	4,491.1	0.48	-0.48	0.00
13,263.0	88.60	357.50	8,820.1	4,549.7	-199.1	4,554.0	4.12	3.65	1.90
13,348.0	89.30	357.70	8,821.6	4,634.6	-202.7	4,639.0	0.86	0.82	0.24
TD @ 13400' MD / 8822.3' TVD									
13,400.0	89.30	357.70	8,822.3	4,686.5	-204.7	4,691.0	0.00	0.00	0.00

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
8,200.0	8,195.8	-146.8	67.9	TIE IN @ 8200' MD / 8195.8' TVD
13,400.0	8,822.3	4,686.5	-204.7	TD @ 13400' MD / 8822.3' TVD



DDC
Survey Report



Company: COG Operating, LLC
Project: Eddy County, NM (NAD 27)
Site: Sec 2, T-26-E, R-29-E
Well: Reposado 2 State #3H
Wellbore: Lateral #1
Design: Lateral #1

Local Co-ordinate Reference: Well Reposado 2 State #3H
TVD Reference: WELL @ 3034.0usft (Patriot #3)
MD Reference: WELL @ 3034.0usft (Patriot #3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Checked By: _____ Approved By: _____ Date: _____