

Results of Directional Survey

API number:	30-025-40364		
OGRID:		Operator:	COG OPERATING LLC
		Property:	GADWALL 35 FEDERAL # 1H

surface	ULSTR:	A	35	T 24S	R 32E
				180 FNL	990 FEL

BH Loc	ULSTR:	P	35	T 24S	R 32E
14134	MD	9624.4	TVD	320 FSL	976 FEL
				4960 FNL	

Top Perf/OH	ULSTR:	A	35	T 24S	R 32E
9809	MD	9642.9	TVD	642 FNL	968 FEL

Bot Perf/OH	ULSTR:	P	35	T 24S	R 32E
14040	MD	9626.9	TVD	414 FSL	981 FEL
				4866 FNL	

	MD	N/S	E/W	VD
	9777	-431.12	22.72	9632.95
TOP PERFS/OH	9809	-461.52	21.72	9642.86
	9809	-461.52	21.72	9642.86
	14016	-4662.46	7.42	9627.49
BOT PERFS/OH	14040	-4686.42	8.67	9626.86
	14082	-4728.35	10.87	9625.76

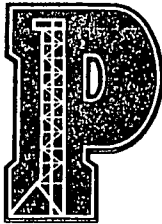
NEXT TO LAST	14016	-4662.46	7.42	9627.49
LAST READING	14082	-4728.35	10.87	9625.76
TD	14134	-4780.26	13.59	9624.40

Surface Location	180	FN	990	FE
Projected BHL	4960	FN	976	FE
Location of				
Top Perfs/OH	642	FN	968	FE
Bottom Perfs/OH	4866	FN	981	FE

SUMMARY of Subsurface Locations

Surface Location	A-35-24S-32E	180	FN	990	FE	Vert. Depth
Top Perfs/OH	A-35-24S-32E	642	FN	968	FE	9642.86
Bottom Perfs/OH	P-35-24S-32E	4866	FN	981	FE	9626.86
Projected TD	P-35-24S-32E	4960	FN	976	FE	9624.40

MAR 14 2013



PATRIOT DRILLING, LLC

OPERATOR: COG Operating, LLC
WELL/LEASE: Gadwell 35 Federal # 1 H
COUNTY: Lea Co., New Mexico
Sec. 35, T24S, R32E

HOBBS OCD

FEB 19 2013

STATE OF NEW MEXICO
DEVIATION REPORT

RECEIVED

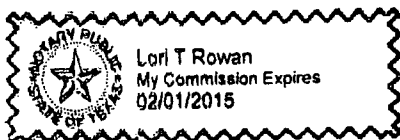
<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
260	1	3,806	3/4
547	3/4	3,965	1/2
825	1	4,218	2 1/2
1,207	1	4,691	3 3/4
1,335	3/4	5,024	2 1/4
1,464	3/4	5,435	1 1/2
1,590	3/4	5,909	1
1,812	1	6,699	3/4
2,033	3/4	7,182	1/2
2,268	1/4	7,660	1
2,477	1/2	8,168	3/4
2,698	1	8,720	1
2,934	1	8,993	1 1/2

Patriot Drilling, LLC

M. Leroy Peterson, Executive Vice-
President

The foregoing instrument was acknowledged before me on this 15th day of
October, 2012 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling,

My Commission Expires: 02/01/2015



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



A GYRO TECHNOLOGIES INC. COMPANY

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

October 1, 2012

HOBBS OCD

FEB 19 2013

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

RECEIVED

Attn: Kanica Castillo

RE: Gadwall 35 Federal 1H

Please find enclosed a copy of the survey from 0.00' to 10200.00' 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,

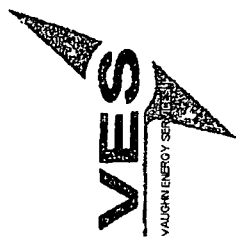
Keith Havelka
Operations



Company: COG Operating LLC (Concho)
Lease/Well: Gadwall 35 Federal / No. 001
Location: 25 miles E from Carlsbad

Rig Name: Patriot 2
State/County: New Mexico / Eddy
Latitude: 32.18, Longitude: -103.64

GRID North is 0.37 Degrees East of True North
VS-Azi: 0.00 Degrees



HOBBS OCD

RKB : 17'

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: final survey.ut
Minimum Curvature Method
Report Date/Time: 10/1/2012 / 16:34

Vaughn Energy Services
Gardendale, Texas
817-741-3810

Surveyor: Ray Seago

Gadwall 35 Federal No. 001 / API 30-025-40364

FEB 19 2013

RECEIVED

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Degleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.27	335.95	100.00	0.21	-0.09	0.23	335.95	0.27
200.00	0.53	311.91	200.00	0.74	-0.54	0.91	323.93	0.31
300.00	0.55	303.68	299.99	1.31	-1.28	1.83	315.71	0.08
400.00	0.56	295.46	399.99	1.79	-2.12	2.77	310.15	0.08
500.00	0.66	277.46	499.98	2.07	-3.13	3.75	303.49	0.21
600.00	0.76	259.46	599.97	2.02	-4.35	4.80	294.94	0.24
700.00	0.73	250.05	699.97	1.69	-5.60	5.85	286.77	0.13
800.00	0.69	240.63	799.98	1.17	-6.72	6.82	279.92	0.12
900.00	0.79	239.40	899.95	0.53	-7.84	7.86	273.85	0.10
1000.00	0.89	238.17	999.94	-0.23	-9.09	9.10	268.52	0.10
1100.00	0.88	232.89	1099.93	-1.11	-10.36	10.42	263.91	0.08
1200.00	0.86	227.82	1199.92	-2.07	-11.53	11.71	259.81	0.08
1300.00	0.70	244.64	1299.91	-2.84	-12.63	12.95	257.33	0.28
1400.00	0.54	261.65	1399.90	-3.17	-13.65	14.02	256.93	0.24
1500.00	0.68	279.90	1499.90	-3.14	-14.70	15.03	257.95	0.24
1600.00	0.81	298.15	1599.89	-2.70	-15.91	16.14	260.36	0.27
1700.00	0.76	307.27	1699.88	-1.97	-17.06	17.17	263.42	0.14
1800.00	0.70	316.38	1799.87	-1.12	-18.01	18.04	266.43	0.13

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	0.66	331.68	1899.86	-0.17	-18.70	18.70	269.47	0.19
2000.00	0.62	346.98	1999.86	0.86	-19.10	19.12	272.59	0.18
2100.00	0.39	358.23	2099.85	1.73	-19.23	19.31	275.15	0.25
2200.00	0.16	9.48	2199.85	2.21	-19.22	19.34	276.57	0.24
2300.00	0.33	82.51	2299.85	2.39	-18.91	19.06	277.20	0.32
2400.00	0.49	155.54	2399.85	2.04	-18.45	18.56	276.30	0.51
2500.00	0.67	158.36	2499.84	1.10	-18.06	18.09	273.48	0.18
2600.00	0.86	161.18	2599.83	-0.16	-17.60	17.60	269.48	0.19
2700.00	0.86	160.88	2699.82	-1.58	-17.11	17.18	264.73	0.01
2800.00	0.87	160.57	2799.81	-3.01	-16.61	16.88	259.74	0.01
2900.00	0.88	155.49	2899.80	-4.42	-16.04	16.64	254.59	0.08
3000.00	0.89	150.40	2999.79	-5.79	-15.34	16.40	249.32	0.08
3100.00	0.89	145.32	3099.78	-7.10	-14.61	16.16	243.93	0.08
3200.00	0.90	140.25	3199.76	-8.34	-13.57	15.93	238.42	0.08
3300.00	0.68	146.99	3299.76	-9.44	-12.75	15.86	233.48	0.23
3400.00	0.47	153.72	3399.75	-10.31	-12.24	16.00	229.92	0.23
3500.00	0.50	144.72	3499.76	-11.02	-11.81	16.16	226.99	0.08
3600.00	0.52	135.73	3599.74	-11.70	-11.25	16.23	223.86	0.09
3700.00	0.55	116.09	3699.74	-12.24	-10.49	16.12	220.59	0.19
3800.00	0.58	96.45	3799.73	-12.51	-8.55	15.74	217.36	0.20
3900.00	0.52	97.79	3899.73	-12.63	-8.60	15.28	214.26	0.07
4000.00	0.45	103.14	3999.73	-12.78	-7.77	14.96	211.31	0.08
4100.00	1.57	106.16	4099.71	-13.25	-6.08	14.58	204.65	1.12
4200.00	2.68	113.18	4199.64	-14.56	-2.61	14.79	190.18	1.15
4300.00	2.89	120.29	4299.62	-16.75	1.72	16.84	174.14	0.40
4400.00	3.10	127.41	4399.38	-19.67	6.05	20.57	162.91	0.43
4500.00	3.77	131.87	4499.20	-23.50	10.65	25.80	155.63	0.72
4600.00	4.44	136.33	4598.95	-28.50	15.77	32.57	151.05	0.74
4700.00	3.70	134.33	4698.69	-33.56	20.75	39.46	148.27	0.75
4800.00	2.96	132.33	4798.52	-37.55	24.97	45.10	146.38	0.75
4900.00	2.50	134.68	4898.41	-40.83	28.44	49.76	145.15	0.47
5000.00	2.05	137.03	4998.33	-43.67	31.20	53.67	144.45	0.47
5100.00	1.77	133.20	5098.27	-46.03	33.55	56.96	143.92	0.30
5200.00	1.49	129.37	5198.23	-47.92	35.68	59.74	143.33	0.30
5300.00	1.48	125.77	5298.20	-49.50	37.73	62.24	142.68	0.09
5400.00	1.46	122.16	5398.17	-50.93	39.86	64.67	141.95	0.09
5500.00	1.40	117.03	5498.14	-52.16	42.03	66.99	141.14	0.14
5600.00	1.34	111.90	5598.11	-53.15	44.19	69.13	140.26	0.14
5700.00	1.24	101.41	5698.08	-53.80	46.34	71.01	139.26	0.25

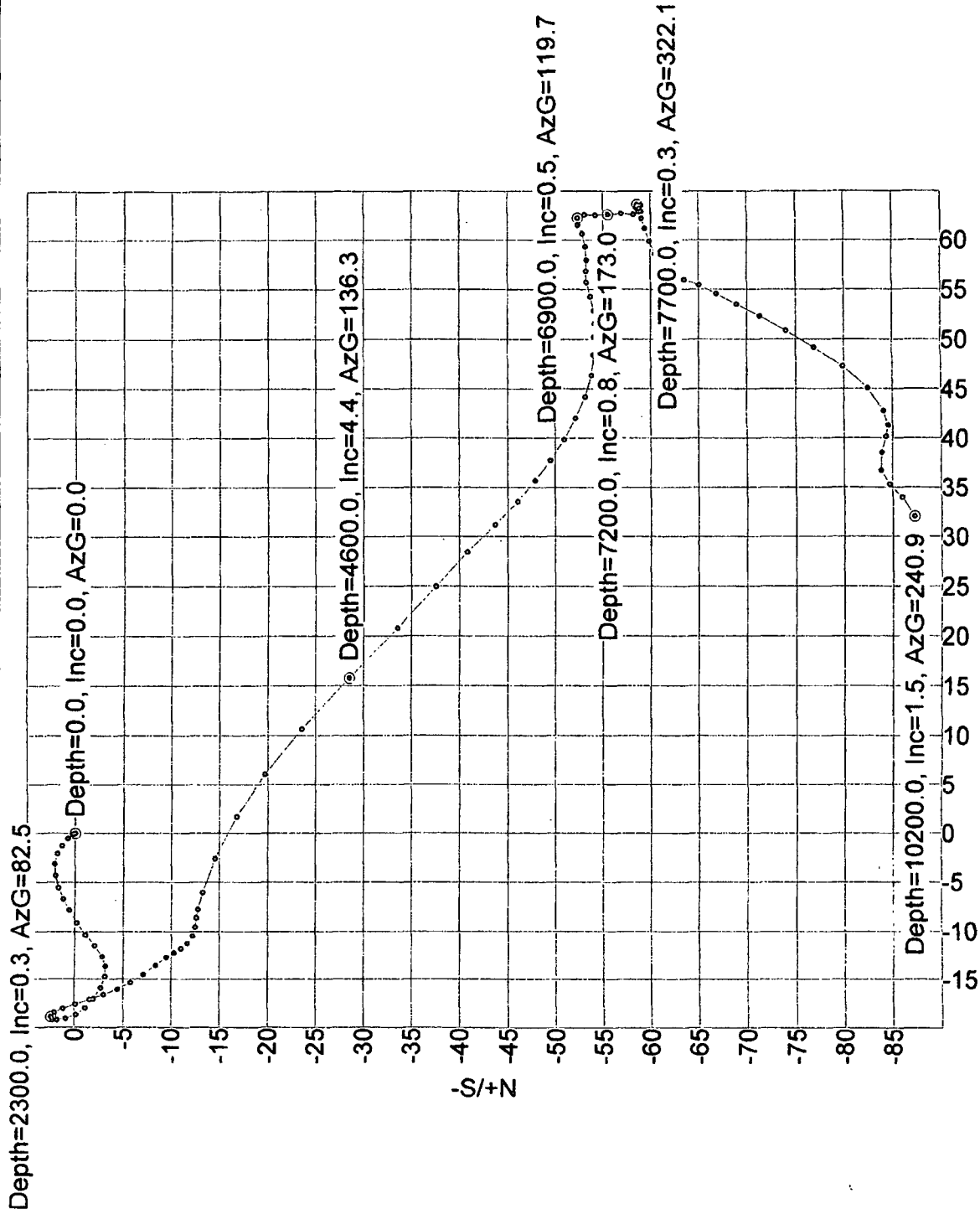
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	1.15	90.92	5798.06	-54.03	48.40	72.54	138.15	0.24
5900.00	0.90	91.91	5898.05	-54.07	50.19	73.78	137.13	0.25
6000.00	0.66	92.90	5998.04	-54.13	51.55	74.75	136.40	0.25
6100.00	0.80	81.50	6098.03	-54.06	52.82	75.58	135.56	0.20
6200.00	0.94	70.10	6198.02	-53.67	54.28	76.33	134.88	0.22
6300.00	0.74	82.91	6298.01	-53.32	55.69	77.10	133.75	0.27
6400.00	0.55	95.72	6398.00	-53.28	56.81	77.89	133.17	0.24
6500.00	0.72	88.97	6497.99	-53.32	57.91	78.72	132.64	0.19
6600.00	0.89	82.22	6597.98	-53.20	59.31	79.68	131.89	0.20
6700.00	0.68	67.58	6697.97	-52.87	60.64	80.45	131.09	0.29
6800.00	0.47	52.94	6797.97	-52.40	61.52	80.80	130.42	0.26
6900.00	0.52	119.72	6897.97	-52.37	62.24	81.34	130.08	0.55
7000.00	0.57	186.51	6997.96	-53.10	62.58	82.07	130.31	0.60
7100.00	0.70	179.77	7097.96	-54.20	62.52	82.75	130.92	0.14
7200.00	0.82	173.02	7197.95	-55.52	62.61	83.68	131.56	0.15
7300.00	0.77	180.66	7297.94	-56.90	62.69	84.66	132.23	0.12
7400.00	0.71	188.29	7397.93	-58.18	62.60	85.46	132.91	0.11
7500.00	0.53	116.74	7497.92	-59.01	62.92	86.26	133.16	0.74
7600.00	0.35	45.19	7597.92	-59.00	63.55	86.71	132.87	0.53
7700.00	0.27	322.09	7697.92	-58.60	63.62	86.49	132.65	0.42
7800.00	0.20	238.99	7797.92	-58.50	63.32	86.21	132.73	0.32
7900.00	0.36	244.76	7897.92	-58.72	62.88	86.04	133.04	0.16
8000.00	0.52	250.53	7997.92	-59.01	62.17	85.71	133.51	0.17
8100.00	0.70	250.06	8097.91	-59.37	61.16	85.24	134.15	0.17
8200.00	0.87	249.60	8197.90	-59.84	59.88	84.66	134.98	0.17
8300.00	0.82	240.05	8297.89	-60.46	58.55	84.17	135.92	0.15
8400.00	0.76	230.50	8397.88	-61.24	57.42	83.95	136.85	0.14
8500.00	0.79	213.47	8497.87	-62.24	56.52	84.08	137.76	0.23
8600.00	0.81	196.44	8597.86	-63.50	55.94	84.62	138.62	0.24
8700.00	1.03	202.04	8697.85	-65.01	55.40	85.42	139.56	0.24
8800.00	1.25	207.64	8797.83	-66.81	54.56	86.26	140.76	0.25
8900.00	1.44	206.81	8897.80	-68.90	53.49	87.23	142.18	0.19
9000.00	1.63	205.98	8997.77	-71.31	52.29	88.43	143.75	0.19
9100.00	1.83	209.29	9097.72	-73.98	50.89	89.79	145.48	0.22
9200.00	2.03	212.61	9197.66	-76.87	49.15	91.24	147.41	0.23
9300.00	2.01	211.09	9297.60	-79.86	47.29	92.81	149.37	0.06
9400.00	1.98	229.58	9397.54	-82.48	45.07	93.99	151.35	0.64
9500.00	1.26	243.02	9497.50	-84.10	42.78	94.35	153.04	0.81
9600.00	0.54	276.46	9597.49	-84.54	41.34	94.11	153.94	0.86

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
9700.00	0.83	282.05	9697.48	-84.34	40.16	93.41	154.54	0.30
9800.00	1.13	287.94	9797.47	-83.89	38.51	92.31	155.34	0.31
9900.00	1.03	254.38	9897.45	-83.83	36.71	91.52	156.35	0.62
10000.00	0.93	221.13	9997.44	-84.68	35.31	91.75	157.36	0.57
10100.00	1.19	231.03	10097.42	-85.94	33.97	92.41	158.43	0.32
10200.00	1.46	240.94	10197.39	-87.22	32.06	92.92	159.82	0.35



Vaughn Energy Services
Gardendale, Texas
817-741-3610

Surveyor: Ray Seago
Gadwall 35 Federal No. 001 / API 30-025-40364



RECEIVED

OCT 22 2012

Archer

Archer Directional Drilling Services.

911 Regional Park Drive

Houston, Texas 77060

Tel: 281-934-9600

Fax: 281-951-2101

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

October 19, 2012

Re: Gadwell 35 Fed #1H
Rig: Patriot #2
Eddy County, New Mexico
Well ID: 30-025-40364

Enclosed please find the original of the surveys performed on the referenced well by Archer Directional Drilling Services. Other information required by your office is as follows:

<u>Name & Title Of Surveyor</u>	<u>Wellhole Number</u>	<u>Survey Depths</u>	<u>Dates Performed</u>	<u>Type Survey</u>
Gerardo Davila Field Engineer	Straight Hole	1080-4691	09/12/12-10/14/12	MWD
	Lateral	9181-14082		

If additional information is required, please contact the undersigned at the letterhead address and phone number.



Martin Campbell
MWD Coordinator



Archer Directional Drilling Services.
911 Regional Park Drive
Houston, Texas 77060
Tel: 281-934-9600
Fax: 281-951-2101

MWD Survey Certification

State of New Mexico
County of Eddy

I, Martin Campbell, certify that; I am employed by Archer Directional Drilling Services; that I did on the day(s) of 09/12/12 through 10/14/12, conduct or supervise the taking of MWD surveys: **Straight Hole**: from a depth of 1080 feet to a depth of 4691 feet; **Lateral**: from a depth of 9181 feet to a depth of 14082 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Archer Directional Drilling Services; that I am authorized and qualified to make this report; that these surveys were conducted at the request of COG Operating, LLC for the Gadwell 35 Fed #1H (Well ID: 30-025-40364), Well located in Eddy County, New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Archer Directional Drilling Services.

A handwritten signature in black ink, appearing to read "McGill", written over a horizontal line.

Martin Campbell
MWD Coordinator



Company: COG Operating, LLC

Well: Gadwell 35 Fed #1H, Straight Hole

Location: Eddy County, New Mexico

Rig: Patriot 2

Job Date: 09/12/12 10/15/12

Job Number: 03894-433-22

Mag Decl.: 7.09

Dir Driller: Levi Galvin

MWD Eng: Gerardo Davila

Calculation Method

Proposed Azimuth

Depth Reference

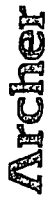
Tie Info: Assumed Vertical

Minimum Curvature

180.2

KBG

Survey Number	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	N/S (ft)	Coordinates E/W (ft)	Distance (ft)	Closure Direction Azimuth	Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
Tie In	0.00	0	0	0	0	0	0.00	0	0.00	0			
1	1080	1.1	218.9	1080	1079.93	8.09	8.07 S	6.51 W	10.37	218.90	0.10	0.10	20.27
2	1207	0.9	226.1	127	1206.91	9.74	9.71 S	7.99 W	12.58	219.47	0.19	-0.16	5.67
3	1335	0.7	249.1	128	1334.90	10.72	10.68 S	9.45 W	14.26	221.49	0.29	-0.16	17.97
4	1464	0.7	261.4	129	1463.89	11.12	11.08 S	10.96 W	15.59	224.69	0.12	0.00	9.53
5	1590	0.7	291.8	126	1589.88	10.96	10.91 S	12.44 W	16.55	228.74	0.29	0.00	24.13
6	1812	0.9	308.5	222	1811.86	9.38	9.32 S	15.06 W	17.72	238.24	0.14	0.09	7.52
7	2033	0.6	331.5	221	2032.84	7.29	7.23 S	16.97 W	18.45	246.94	0.19	-0.14	10.41
8	2255	0.1	357.5	222	2254.84	6.08	6.01 S	17.54 W	18.54	251.08	0.23	-0.23	11.71
9	2477	0.5	150.1	222	2476.84	6.72	6.66 S	17.06 W	18.32	248.69	0.27	0.18	-93.42
10	2698	0.9	165.3	221	2697.82	9.23	9.17 S	16.14 W	18.57	240.39	0.20	0.18	6.88
11	2921	1.1	154.1	223	2920.79	12.85	12.79 S	14.76 W	19.53	229.09	0.13	0.09	-5.02
12	3142	1.1	140.4	221	3141.74	16.38	16.33 S	12.48 W	20.56	217.39	0.12	0.00	-6.20
13	3363	0.7	148.1	221	3362.72	19.15	19.11 S	10.42 W	21.77	208.59	0.19	-0.18	3.48
14	3585	0.5	119.5	222	3584.71	20.78	20.74 S	8.86 W	22.56	203.12	0.16	-0.09	-12.88
15	3808	0.6	95.1	223	3807.70	21.35	21.33 S	6.85 W	22.40	197.80	0.11	0.04	-10.94
16	3996	0.4	144.1	188	3995.69	21.97	21.95 S	5.48 W	22.62	194.03	0.24	-0.11	26.06
17	4218	2.4	115.5	222	4217.61	24.58	24.57 S	0.83 W	24.59	181.94	0.93	0.90	-12.88
18	4439	3.6	124.1	221	4438.31	30.42	30.46 S	9.09 E	31.78	163.38	0.58	0.54	3.89
Proj.	4691	3.7	132.2	252	4689.80	40.27	40.35 S	21.66 E	45.80	151.77	0.21	0.04	3.21



Company: COG Operating, LLC
Well: Gadow 35 Fed # 1H, Lateral
Location: Eddy County, New Mexico
Rig: Patriot 2
Job Date: 09/12/12 - 09/15/12

Job Number:
Mag Decl.:
Dir Driller:
MWD Eng:

03894-433-22
7.09
Levi Galvin
Gerardo Davila

Calculation Method
Proposed Azimuth
Depth Reference
Tie Into: Previous MWD Survey

Minimum Curvature
179.7
KBG

Survey Number	Survey Depth (ft)	Inclination (deg)	Course Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
							N/S (ft)	E/W (ft)	Distance (ft)	Direction Azimuth			
Tie In	9100.00	1.83	209.29		9097.7	74.2	74.00 S	50.90 E					
1	9181	8.6	189.0	81	9178.32	81.37	81.12 S	49.32 E	94.93	148.70	8.53	8.36	-25.05
2	9213	13.1	194.5	32	9209.74	87.24	87.00 S	48.03 E	99.38	151.09	14.41	14.06	17.19
3	9244	17.3	186.1	31	9239.65	95.22	94.98 S	46.66 E	105.83	153.84	15.26	13.55	-27.10
4	9276	20.4	188.2	32	9269.94	105.47	105.24 S	45.36 E	114.60	156.68	9.92	9.69	6.56
5	9308	23.9	182.3	32	9299.57	117.46	117.24 S	44.31 E	125.33	159.30	12.95	10.94	-18.44
6	9340	25.7	184.3	32	9328.62	130.86	130.64 S	43.53 E	137.70	161.57	6.21	5.63	6.25
7	9371	28.1	181.7	31	9356.27	144.86	144.64 S	42.81 E	150.84	163.51	8.62	7.74	-8.39
8	9397	30.7	181.5	26	9378.92	157.61	157.40 S	42.45 E	163.02	164.91	10.01	10.00	-0.77
9	9429	34.7	185.6	32	9405.84	174.85	174.64 S	41.35 E	179.47	166.68	14.28	12.50	12.81
10	9461	38.7	185.1	32	9431.49	193.87	193.68 S	39.57 E	197.68	168.45	12.53	12.50	-1.56
11	9493	38.5	186.9	32	9456.50	213.72	213.53 S	37.48 E	216.79	170.04	3.56	-0.63	5.63
12	9525	38.8	185.9	32	9481.49	233.56	233.39 S	35.26 E	236.04	171.41	2.17	0.94	-3.13
13	9556	41.9	184.0	31	9505.12	253.55	253.38 S	33.53 E	255.59	172.46	10.76	10.00	-6.13
14	9588	45.8	184.3	32	9528.19	275.65	275.49 S	31.93 E	277.33	173.39	12.20	12.19	0.94
15	9619	49.4	183.8	31	9549.09	298.47	298.32 S	30.31 E	299.86	174.20	11.67	11.61	-1.61
16	9651	52.7	184.0	32	9569.20	323.29	323.14 S	28.62 E	324.41	174.94	10.32	10.31	0.62
17	9683	55.0	184.1	32	9588.08	349.05	348.92 S	26.80 E	349.94	175.61	7.19	7.19	0.31
18	9714	58.3	183.0	31	9605.12	374.88	374.76 S	25.20 E	375.61	176.15	11.05	10.65	-3.55
19	9745	63.7	182.4	31	9620.14	401.95	401.83 S	23.92 E	402.54	176.59	17.50	17.42	-1.94
20	9777	69.1	182.3	32	9632.95	431.23	431.12 S	22.72 E	431.72	176.98	16.88	16.88	-0.31
21	9809	74.8	181.5	32	9642.86	461.62	461.52 S	21.72 E	462.03	177.31	17.97	17.81	-2.50
22	9841	81.0	180.6	32	9649.57	492.88	492.78 S	21.15 E	493.24	177.54	19.57	19.38	-2.81
23	9873	87.8	179.1	32	9652.69	524.71	524.61 S	21.23 E	525.04	177.68	21.76	21.25	-4.69
24	9905	91.0	178.9	32	9653.02	556.70	556.60 S	21.79 E	557.03	177.76	10.02	10.00	-0.62
25	9936	90.5	178.8	31	9652.62	587.70	587.59 S	22.41 E	588.02	177.82	1.64	-1.61	-0.32
26	10032	92.9	178.7	96	9649.77	683.64	683.52 S	24.51 E	683.96	177.95	2.50	2.50	-0.10
27	10127	90.1	176.9	95	9647.28	778.54	778.40 S	28.15 E	778.91	177.93	3.50	-2.95	-1.89
28	10222	90.5	175.8	95	9646.78	873.37	873.21 S	34.20 E	873.88	177.76	1.23	0.42	-1.16
29	10317	91.1	175.0	95	9645.46	968.09	967.89 S	41.82 E	968.79	177.53	1.05	0.63	-0.84
30	10412	92.5	175.3	95	9642.47	1062.74	1062.50 S	49.85 E	1063.67	177.31	1.51	1.47	0.32
31	10507	91.3	175.3	95	9639.32	1157.41	1157.13 S	57.63 E	1158.56	177.15	1.26	-1.26	0.00
32	10603	89.5	175.0	96	9638.65	1253.10	1252.78 S	65.74 E	1254.50	177.00	1.90	-1.88	-0.31
33	10698	90.5	176.7	95	9638.65	1347.88	1347.53 S	72.62 E	1349.48	176.92	2.08	1.05	1.79
34	10794	90.7	180.2	96	9637.65	1443.83	1443.47 S	75.21 E	1445.43	177.02	3.65	0.21	3.65
35	10889	90.8	180.9	95	9636.40	1538.81	1538.46 S	74.30 E	1540.25	177.23	0.74	0.11	0.74
36	10983	88.3	181.2	94	9637.14	1632.78	1632.43 S	72.58 E	1634.04	177.45	2.68	-2.66	0.32



Company: COG Operating, LLC

Well: Gadwell 35 Fed # 1H, Lateral

Location: Eddy County, New Mexico

Rig: Patriot 2

Job Date: 09/12/12 - 09/15/12

Job Number:

Mag Decl.:

Dir Driller:

MWD Eng:

03894-433-22

7.09

Levi Galvin

Gerardo Davila

Calculation Method

Proposed Azimuth

Depth Reference

Tie Into: Previous MWD Survey

Minimum Curvature

179.7

KBG

Survey Number	Survey Depth (ft)	Inclination (deg)	Course Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Distance (ft)	Closure Direction Azimuth	Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
37	11053	86.8	181.7	70	9640.13	1702.68	N/S	E/W	1703.81	177.62	2.26	-2.14	0.71
38	11149	89.5	183.1	96	9643.23	1798.51	1702.34 S	70.81 E	1799.44	177.87	3.17	2.81	1.46
39	11244	90.9	184.0	95	9642.90	1893.29	1798.20 S	66.79 E	1893.99	178.16	1.75	1.47	0.95
40	11339	90.7	184.5	95	9641.58	1987.99	1893.01 S	60.91 E	1988.47	178.45	0.57	-0.21	0.53
41	11432	89.8	184.5	93	9641.17	2080.66	1987.74 S	53.87 E	2080.97	178.72	0.97	-0.97	0.00
42	11527	90.0	184.7	95	9641.34	2175.31	2080.45 S	46.57 E	2175.49	178.97	0.30	0.21	0.21
43	11621	90.2	183.8	94	9641.17	2269.02	2175.14 S	38.95 E	2269.11	179.19	0.98	0.21	-0.96
44	11716	89.5	183.8	95	9641.42	2363.78	2268.89 S	31.99 E	2363.81	179.38	0.74	-0.74	0.00
45	11811	90.6	183.5	95	9641.34	2458.55	2363.68 S	25.69 E	2458.56	179.54	1.20	1.16	-0.32
46	11906	89.3	182.8	95	9641.42	2553.38	2458.48 S	19.64 E	2553.38	179.68	1.55	-1.37	-0.74
47	12001	90.5	182.6	95	9641.59	2648.24	2553.33 S	14.42 E	2648.25	179.78	1.28	1.28	-0.21
48	12096	90.5	182.5	95	9640.76	2743.12	2648.23 S	9.95 E	2743.14	179.88	0.11	0.00	-0.11
49	12191	89.4	182.1	95	9640.84	2838.02	2743.13 S	5.72 E	2838.05	179.96	1.23	-1.16	-0.42
50	12286	89.5	180.2	95	9641.75	2932.99	2838.05 S	1.91 E	2933.02	180.00	2.00	0.11	-2.00
51	12380	89.5	179.9	94	9642.57	3026.98	2932.99 S	0.00 E	3027.02	180.00	0.32	0.00	-0.32
52	12475	89.8	179.0	95	9643.15	3121.98	3026.98 S	0.08 W	3122.01	179.98	1.00	0.32	-0.95
53	12569	89.8	180.0	94	9643.48	3215.97	3121.98 S	0.83 E	3216.01	179.97	1.06	0.00	1.06
54	12664	90.0	180.7	95	9643.65	3310.97	3215.97 S	1.65 E	3311.00	179.98	0.77	0.21	0.74
55	12758	90.9	181.4	94	9642.91	3404.94	3310.97 S	1.07 E	3404.98	180.01	1.21	0.96	0.74
56	12880	90.3	180.9	122	9641.63	3526.89	3404.94 S	0.65 W	3526.95	180.05	0.64	-0.49	-0.41
57	12975	89.6	180.7	95	9641.71	3621.87	3526.89 S	3.10 W	3621.95	180.07	0.77	-0.74	-0.21
58	13070	90.7	180.9	95	9641.47	3716.85	3621.87 S	4.42 W	3716.94	180.09	1.18	1.16	0.21
59	13164	90.2	179.9	94	9640.73	3810.84	3716.85 S	5.75 W	3810.93	180.10	1.19	-0.53	-1.06
60	13258	89.9	180.1	94	9640.64	3904.84	3810.84 S	6.41 W	3904.93	180.09	0.38	-0.32	0.21
61	13352	90.3	179.5	94	9640.48	3998.84	3904.84 S	6.08 W	3998.93	180.09	0.77	0.43	-0.64
62	13447	89.7	179.2	95	9640.48	4093.84	3998.84 S	5.00 W	4093.92	180.07	0.71	-0.63	-0.32
63	13542	89.5	178.8	95	9641.14	4188.83	4093.84 S	3.34 W	4188.90	180.05	0.47	-0.21	-0.42
64	13637	90.9	179.9	95	9640.81	4283.82	4188.83 S	2.26 W	4283.89	180.03	1.87	1.47	1.16
65	13731	91.6	179.4	94	9638.76	4377.80	4283.82 S	1.69 W	4377.86	180.02	0.92	0.74	-0.53
66	13826	92.3	178.9	95	9635.53	4472.74	4377.80 S	0.28 W	4472.80	180.00	0.91	0.74	-0.53
67	13921	92.6	177.5	95	9631.47	4567.62	4472.74 S	2.70 E	4567.66	179.97	1.51	0.32	-1.47
68	14016	92.2	176.8	95	9627.49	4662.44	4567.62 S	7.42 E	4662.47	179.91	0.85	-0.42	-0.74
Proj.	14082	90.8	177.2	66	9625.76	4728.34	4662.44 S	10.87 E	4728.36	179.87	2.21	-2.12	0.61

Archer

COG Operating, LLC

Lea County(NM27E)

Sec 35-T24S-R32E

Gadwall 35 FED 1H

Wellbore #1

Survey: MWD Survey

Survey Report - Geographic

23 October, 2012





Archer
Survey Report - Geographic



Company: COG Operating, LLC
Project: Lea County(NM27E)
Site: Sec 35-T24S-R32E
Well: Gadwall 35 FED 1H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Gadwall 35 FED 1H
TVD Reference: KB @ 3581.0usft
MD Reference: KB @ 3581.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDMDBBW

Project	Lea County(NM27E)		
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 35-T24S-R32E			
Site Position:		Northing:	430,167.80 usft	Latitude: 32° 10' 50.685 N
From:	Map	Easting:	714,626.30 usft	Longitude: 103° 38' 22.638 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence: 0.37 °

Well	Gadwall 35 FED 1H			
Well Position	+N/-S	0.0 usft	Northing:	430,167.80 usft
	+E/-W	0.0 usft	Easting:	714,626.30 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level: 3,564.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2012/09/07	7.46	60.10	48,459

Design	Wellbore #1			
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	179.71

Survey Program	Date	2012/10/23		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	9,100.0	VES Gyros (Wellbore #1)	MWD	MWD - Standard
9,181.0	14,134.0	MWD Survey (Wellbore #1)	MWD	MWD - Standard



Archer
Survey Report - Geographic



Company: COG Operating, LLC
Project: Lea County(NM27E)
Site: Sec 35-T24S-R32E
Well: Gadwall 35 FED 1H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Gadwall 35 FED 1H
TVD Reference: KB @ 3581.0usft
MD Reference: KB @ 3581.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDMDBBW

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
Tie on										
9,100.0	1.83	209.29	9,097.7	-74.0	50.9	430,093.84	714,677.17	32° 10' 49.950 N	103° 38' 22.052 W	
Firt Archer Survey										
9,181.0	8.60	189.00	9,178.3	-81.1	49.3	430,086.72	714,675.59	32° 10' 49.880 N	103° 38' 22.071 W	
9,213.0	13.10	194.50	9,209.8	-87.0	48.0	430,080.84	714,674.31	32° 10' 49.822 N	103° 38' 22.086 W	
9,244.0	17.30	186.10	9,239.7	-94.9	46.6	430,072.85	714,672.94	32° 10' 49.743 N	103° 38' 22.103 W	
9,276.0	20.40	188.20	9,270.0	-105.2	45.3	430,062.60	714,671.64	32° 10' 49.641 N	103° 38' 22.118 W	
9,308.0	23.90	182.30	9,299.6	-117.2	44.3	430,050.60	714,670.58	32° 10' 49.523 N	103° 38' 22.132 W	
9,340.0	25.70	184.30	9,328.6	-130.6	43.5	430,037.20	714,669.80	32° 10' 49.390 N	103° 38' 22.142 W	
9,371.0	28.10	181.70	9,356.3	-144.6	42.8	430,023.20	714,669.08	32° 10' 49.252 N	103° 38' 22.151 W	
9,397.0	30.70	181.50	9,378.9	-157.4	42.4	430,010.44	714,668.72	32° 10' 49.125 N	103° 38' 22.156 W	
9,429.0	34.70	185.60	9,405.9	-174.6	41.3	429,993.20	714,667.62	32° 10' 48.955 N	103° 38' 22.170 W	
9,461.0	38.70	185.10	9,431.5	-193.6	39.5	429,974.16	714,665.84	32° 10' 48.767 N	103° 38' 22.193 W	
9,493.0	38.50	186.90	9,456.5	-213.5	37.5	429,954.31	714,663.76	32° 10' 48.570 N	103° 38' 22.218 W	
9,525.0	38.80	185.90	9,481.5	-233.4	35.2	429,934.45	714,661.53	32° 10' 48.374 N	103° 38' 22.246 W	
9,556.0	41.90	184.00	9,505.1	-253.3	33.5	429,914.46	714,659.81	32° 10' 48.176 N	103° 38' 22.267 W	
9,588.0	45.80	184.30	9,528.2	-275.4	31.9	429,892.35	714,658.20	32° 10' 47.958 N	103° 38' 22.288 W	
9,619.0	49.40	183.80	9,549.1	-298.3	30.3	429,869.52	714,656.59	32° 10' 47.732 N	103° 38' 22.308 W	
9,651.0	52.70	184.00	9,569.2	-323.1	28.6	429,844.69	714,654.89	32° 10' 47.486 N	103° 38' 22.330 W	
9,683.0	55.00	184.10	9,588.1	-348.9	26.8	429,818.92	714,653.07	32° 10' 47.231 N	103° 38' 22.353 W	
9,714.0	58.30	183.00	9,605.1	-374.7	25.2	429,793.08	714,651.47	32° 10' 46.976 N	103° 38' 22.373 W	
9,745.0	63.70	182.40	9,620.2	-401.8	23.9	429,766.01	714,650.20	32° 10' 46.708 N	103° 38' 22.390 W	
9,777.0	69.10	182.30	9,633.0	-431.1	22.7	429,738.72	714,649.00	32° 10' 46.418 N	103° 38' 22.406 W	
9,809.0	74.80	181.50	9,642.9	-461.5	21.7	429,706.32	714,647.99	32° 10' 46.117 N	103° 38' 22.420 W	
9,841.0	81.00	180.60	9,649.6	-492.7	21.1	429,675.05	714,647.42	32° 10' 45.808 N	103° 38' 22.429 W	
9,873.0	87.80	179.10	9,652.7	-524.6	21.2	429,643.23	714,647.51	32° 10' 45.493 N	103° 38' 22.431 W	
9,905.0	91.00	178.90	9,653.0	-556.6	21.8	429,611.24	714,648.07	32° 10' 45.176 N	103° 38' 22.427 W	
9,936.0	90.50	178.80	9,652.6	-587.6	22.4	429,580.25	714,648.69	32° 10' 44.870 N	103° 38' 22.422 W	
10,032.0	92.90	178.70	9,649.8	-683.5	24.5	429,484.32	714,650.78	32° 10' 43.920 N	103° 38' 22.404 W	
10,127.0	90.10	176.90	9,647.3	-778.4	28.1	429,389.43	714,654.43	32° 10' 42.981 N	103° 38' 22.369 W	
10,222.0	90.50	175.80	9,646.8	-873.2	34.2	429,294.63	714,660.47	32° 10' 42.043 N	103° 38' 22.306 W	
10,317.0	91.10	175.00	9,645.5	-967.9	41.8	429,199.95	714,668.09	32° 10' 41.105 N	103° 38' 22.224 W	
10,412.0	92.50	175.30	9,642.5	-1,062.5	49.8	429,105.34	714,676.12	32° 10' 40.168 N	103° 38' 22.138 W	
10,507.0	91.30	175.30	9,639.3	-1,157.1	57.6	429,010.71	714,683.90	32° 10' 39.231 N	103° 38' 22.055 W	
10,603.0	89.50	175.00	9,638.7	-1,252.7	65.7	428,915.06	714,692.02	32° 10' 38.284 N	103° 38' 21.967 W	
10,698.0	90.50	176.70	9,638.7	-1,347.5	72.8	428,820.31	714,698.89	32° 10' 37.346 N	103° 38' 21.895 W	
10,794.0	90.70	180.20	9,637.7	-1,443.4	75.2	428,724.37	714,701.49	32° 10' 36.397 N	103° 38' 21.872 W	
10,889.0	90.80	180.90	9,636.4	-1,538.4	74.3	428,629.38	714,700.58	32° 10' 35.457 N	103° 38' 21.889 W	
10,983.0	88.30	181.20	9,637.2	-1,632.4	72.6	428,535.41	714,698.85	32° 10' 34.527 N	103° 38' 21.916 W	
11,053.0	86.80	181.70	9,640.2	-1,702.3	70.8	428,465.50	714,697.08	32° 10' 33.835 N	103° 38' 21.942 W	
11,149.0	89.50	183.10	9,643.3	-1,798.2	66.8	428,369.64	714,693.07	32° 10' 32.887 N	103° 38' 21.996 W	
11,244.0	90.90	184.00	9,642.9	-1,893.0	60.9	428,274.83	714,687.18	32° 10' 31.949 N	103° 38' 22.072 W	
11,339.0	90.70	184.50	9,641.6	-1,987.7	53.8	428,180.10	714,680.14	32° 10' 31.012 N	103° 38' 22.161 W	
11,432.0	89.80	184.50	9,641.2	-2,080.4	46.5	428,087.39	714,672.85	32° 10' 30.095 N	103° 38' 22.253 W	
11,527.0	90.00	184.70	9,641.4	-2,175.1	38.9	427,992.69	714,665.23	32° 10' 29.159 N	103° 38' 22.348 W	
11,621.0	90.20	183.80	9,641.2	-2,268.8	32.0	427,898.95	714,658.26	32° 10' 28.231 N	103° 38' 22.436 W	
11,716.0	89.50	183.80	9,641.4	-2,363.6	25.7	427,804.16	714,651.97	32° 10' 27.294 N	103° 38' 22.517 W	
11,811.0	90.60	183.50	9,641.4	-2,458.4	19.6	427,709.36	714,645.92	32° 10' 26.356 N	103° 38' 22.594 W	
11,906.0	89.30	182.80	9,641.4	-2,553.3	14.4	427,614.50	714,640.70	32° 10' 25.418 N	103° 38' 22.662 W	
12,001.0	90.50	182.60	9,641.6	-2,648.2	9.9	427,519.61	714,636.22	32° 10' 24.479 N	103° 38' 22.721 W	
12,096.0	90.50	182.50	9,640.8	-2,743.1	5.7	427,424.71	714,632.00	32° 10' 23.540 N	103° 38' 22.778 W	
12,191.0	89.40	182.10	9,640.9	-2,838.0	1.9	427,329.79	714,628.18	32° 10' 22.601 N	103° 38' 22.829 W	
12,286.0	89.50	180.20	9,641.8	-2,933.0	0.0	427,234.82	714,626.28	32° 10' 21.661 N	103° 38' 22.858 W	
12,380.0	89.50	179.90	9,642.6	-3,027.0	-0.1	427,140.82	714,626.20	32° 10' 20.731 N	103° 38' 22.866 W	
12,475.0	89.80	179.00	9,643.2	-3,122.0	0.8	427,045.83	714,627.11	32° 10' 19.791 N	103° 38' 22.863 W	



Archer
Survey Report - Geographic



Company: COG Operating, LLC
Project: Lea County(NM27E)
Site: Sec 35-T24S-R32E
Well: Gadwall 35 FED 1H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Gadwall 35 FED 1H
TVD Reference: KB @ 3581.0usft
MD Reference: KB @ 3581.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDMDBBW

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
12,569.0	89.80	180.00	9,643.5	-3,216.0	1.6	426,951.83	714,627.93	32° 10' 18.861 N	103° 38' 22.860 W
12,664.0	90.00	180.70	9,643.7	-3,311.0	1.0	426,856.83	714,627.35	32° 10' 17.921 N	103° 38' 22.874 W
12,758.0	90.90	181.40	9,642.9	-3,404.9	-0.7	426,762.85	714,625.63	32° 10' 16.991 N	103° 38' 22.901 W
12,880.0	90.30	180.90	9,641.7	-3,526.9	-3.1	426,640.89	714,623.18	32° 10' 15.784 N	103° 38' 22.939 W
12,975.0	89.60	180.70	9,641.7	-3,621.9	-4.4	426,545.90	714,621.85	32° 10' 14.844 N	103° 38' 22.962 W
13,070.0	90.70	180.90	9,641.5	-3,716.9	-5.8	426,450.91	714,620.52	32° 10' 13.904 N	103° 38' 22.984 W
13,164.0	90.20	179.90	9,640.7	-3,810.9	-6.4	426,356.91	714,619.87	32° 10' 12.974 N	103° 38' 22.999 W
13,258.0	89.90	180.10	9,640.7	-3,904.9	-6.4	426,262.91	714,619.87	32° 10' 12.044 N	103° 38' 23.006 W
13,352.0	90.30	179.50	9,640.5	-3,998.9	-6.1	426,168.92	714,620.20	32° 10' 11.114 N	103° 38' 23.009 W
13,447.0	89.70	179.20	9,640.5	-4,093.9	-5.0	426,073.92	714,621.27	32° 10' 10.174 N	103° 38' 23.004 W
13,542.0	89.50	178.80	9,641.2	-4,188.9	-3.4	425,978.94	714,622.93	32° 10' 9.234 N	103° 38' 22.991 W
13,637.0	90.90	179.90	9,640.8	-4,283.9	-2.3	425,883.95	714,624.01	32° 10' 8.294 N	103° 38' 22.986 W
13,731.0	91.60	179.40	9,638.8	-4,377.8	-1.7	425,789.97	714,624.58	32° 10' 7.364 N	103° 38' 22.986 W
13,826.0	92.30	178.90	9,635.6	-4,472.8	-0.3	425,695.04	714,625.99	32° 10' 6.424 N	103° 38' 22.977 W
13,921.0	92.60	177.50	9,631.5	-4,567.6	2.7	425,600.18	714,628.97	32° 10' 5.485 N	103° 38' 22.950 W
14,016.0	92.20	176.80	9,627.5	-4,662.4	7.4	425,505.38	714,633.69	32° 10' 4.547 N	103° 38' 22.902 W
Last Archer Survey									
14,082.0	90.80	177.20	9,625.8	-4,728.3	10.8	425,439.49	714,637.15	32° 10' 3.895 N	103° 38' 22.867 W
Proj. to TD									
14,134.0	90.80	177.20	9,625.1	-4,780.2	13.4	425,387.56	714,639.69	32° 10' 3.381 N	103° 38' 22.841 W

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		
		+N/-S (usft)	+E/-W (usft)	Comment
9,100.0	9,097.7	-74.0	50.9	Tie on
9,181.0	9,178.3	-81.1	49.3	Firt Archer Survey
14,082.0	9,625.8	-4,728.3	10.8	Last Archer Survey
14,134.0	9,625.1	-4,780.2	13.4	Proj. to TD

Checked By: _____

Approved By: _____

Date: _____