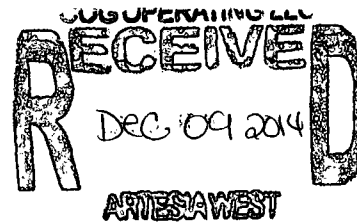


**McVAY DRILLING COMPANY**

P.O. Box 2450
 Hobbs, New Mexico 88241
 (575) 397-3311
 FAX: 39-DRILL



Well Name and Num: Lizard Pot Fed #5H
 Location: Sec 36, T19S, R31E
 Operator: COG
 Drilling Contractor: McVay Drilling Company

15-42455

The undersigned certifies that he is an authorized representative of the drilling contractor who drilled the above described well and that he has conducted deviation tests and obtained the following results:

<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>
1.30	297	0.90	7370	88.80	12546
1.53	657	1.30	7559	87.40	12832
3.70	1069	1.50	7747	90.60	13021
1.00	1455	0.60	8219	90.00	13398
1.10	1915	0.50	8408	88.90	13715
1.40	2290	0.40	8657	89.00	14057
1.10	2573	10.20	8916	88.80	14151
1.40	2780	40.20	9197	89.80	14246
1.00	3345	70.60	9415	90.50	14622
3.70	3847	89.80	9776	90.40	15190
2.90	4287	88.40	10152	90.40	15285
2.30	4547	88.80	10434	88.50	15562
1.40	5019	88.50	10717		
1.10	5583	90.20	11095		
1.10	6101	89.80	11470		
0.20	6571	89.10	11752		
0.70	6901	89.20	12224		

NM OIL CONSERVATION

ARTESIA DISTRICT

FEB 26 2015

RECEIVED

By: Mario A. Garcia S.Subscribed and sworn to before me this 8th day of December, 2014

Tina Flemens
 Notary Public, Lea County, New Mexico





December 2, 2014

NM OIL CONSERVATION
ARTESIA DISTRICT

FEB 26 2015

RECEIVED

Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

Attn: Kanicia Castillo

RE: Lizard Pot Federal #5H

Please find enclosed a copy of the survey from 0.00' to 8580.00' ran on the above referenced well.

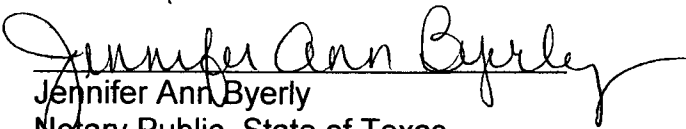
If I can be of any further service, please do not hesitate to call me at 800-606-4976.

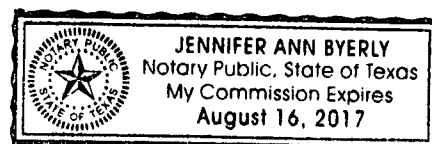
Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 2 day of December A.D., 2014, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating
Lease/Well: Lizard Pot Federal/5H

Rig Name: McVay #6
State/County: New Mexico/Eddy
Latitude: 32.61, Longitude: -103.82
GRID North is 0.28 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB= 18 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ...ot federal #5h gyro survey.ut
Minimum Curvature Method
Report Date/Time: 12/2/2014 / 13:04

VES Survey International
Fort Worth, Texas
817-741-3610
Surveyor: Logan Henry
Lizard Pot Federal 5H / API 30-015-42455

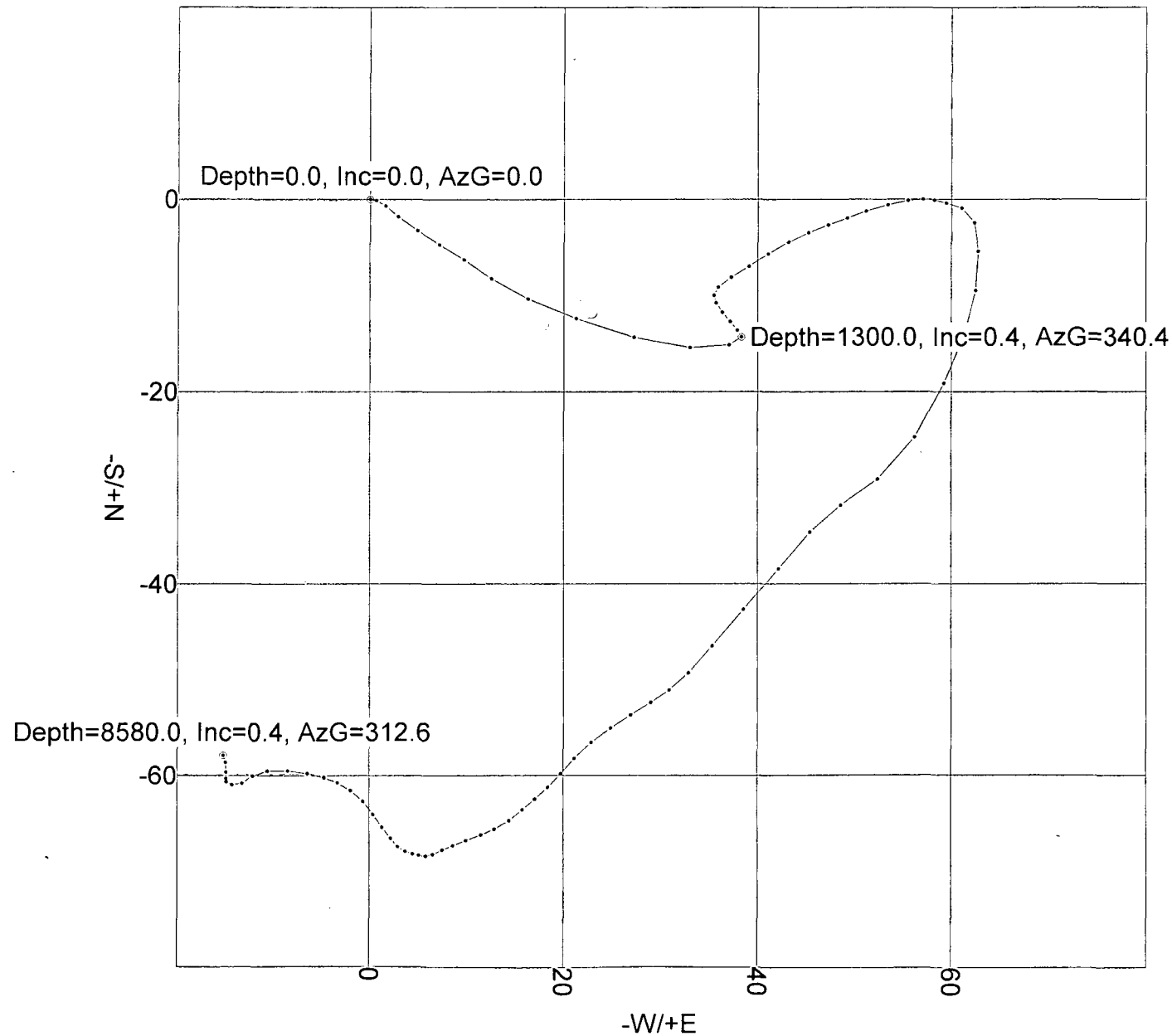
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.70	100.25	100.00	-0.11	0.60	-0.11	0.61	100.25	0.70
200.00	0.68	138.54	199.99	-0.66	1.60	-0.66	1.73	112.45	0.45
300.00	1.31	127.10	299.98	-1.79	2.90	-1.79	3.41	121.72	0.67
400.00	1.51	125.15	399.94	-3.24	4.89	-3.24	5.87	123.54	0.20
500.00	1.63	119.26	499.91	-4.70	7.21	-4.70	8.60	123.08	0.20
600.00	1.76	123.75	599.86	-6.24	9.73	-6.24	11.56	122.70	0.18
700.00	2.21	126.53	699.80	-8.24	12.55	-8.24	15.02	123.30	0.46
800.00	2.74	112.93	799.71	-10.32	16.30	-10.32	19.30	122.34	0.79
900.00	3.45	111.82	899.56	-12.37	21.29	-12.37	24.63	120.15	0.71
1000.00	3.77	105.11	999.37	-14.34	27.26	-14.34	30.80	117.76	0.53
1100.00	3.03	94.65	1099.19	-15.42	33.06	-15.42	36.48	115.00	0.97
1200.00	1.67	69.56	1199.11	-15.12	37.06	-15.12	40.03	112.20	1.67
1300.00	0.38	340.36	1299.09	-14.30	38.31	-14.30	40.90	110.47	1.71
1400.00	0.56	320.84	1399.09	-13.61	37.89	-13.61	40.26	109.76	0.24
1500.00	0.75	321.02	1499.08	-12.72	37.17	-12.72	39.29	108.89	0.19
1600.00	0.71	319.67	1599.07	-11.74	36.36	-11.74	38.21	107.89	0.04
1700.00	0.62	335.77	1699.07	-10.77	35.73	-10.77	37.32	106.77	0.21
1800.00	0.32	1.84	1799.06	-9.99	35.52	-9.99	36.90	105.71	0.36

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.79	36.98	1899.06	-9.16	35.94	-9.16	37.09	104.29	0.56
2000.00	1.19	61.57	1999.04	-8.11	37.27	-8.11	38.15	102.28	0.57
2100.00	1.29	55.05	2099.02	-6.97	39.11	-6.97	39.73	100.11	0.17
2200.00	1.40	57.60	2198.99	-5.67	41.07	-5.67	41.46	97.86	0.13
2300.00	1.36	61.80	2298.96	-4.45	43.15	-4.45	43.38	95.89	0.11
2400.00	1.24	67.34	2398.94	-3.47	45.19	-3.47	45.33	94.40	0.18
2500.00	1.28	70.10	2498.91	-2.68	47.24	-2.68	47.32	93.24	0.08
2600.00	1.10	68.89	2598.89	-1.95	49.19	-1.95	49.23	92.27	0.18
2700.00	1.29	70.87	2698.87	-1.23	51.16	-1.23	51.17	91.38	0.20
2800.00	1.37	76.65	2798.84	-0.59	53.38	-0.59	53.39	90.63	0.15
2900.00	1.05	79.07	2898.82	-0.14	55.44	-0.14	55.44	90.14	0.32
3000.00	0.76	91.63	2998.81	0.02	57.01	0.02	57.01	89.98	0.35
3100.00	0.60	99.66	3098.80	-0.09	58.19	-0.09	58.19	90.09	0.19
3200.00	0.88	106.49	3198.79	-0.39	59.43	-0.39	59.43	90.38	0.29
3300.00	1.07	108.98	3298.78	-0.91	61.05	-0.91	61.05	90.86	0.20
3400.00	1.48	160.76	3398.76	-2.43	62.35	-2.43	62.40	92.23	1.17
3500.00	2.02	179.50	3498.71	-5.41	62.79	-5.41	63.02	94.92	0.78
3600.00	2.66	187.73	3598.63	-9.47	62.49	-9.47	63.21	98.62	0.73
3700.00	2.75	199.80	3698.52	-14.03	61.37	-14.03	62.95	102.88	0.57
3800.00	3.59	205.23	3798.36	-19.11	59.22	-19.11	62.23	107.89	0.89
3900.00	3.71	210.61	3898.16	-24.73	56.24	-24.73	61.44	113.73	0.36
4000.00	3.12	233.95	3997.99	-29.11	52.40	-29.11	59.94	119.06	1.50
4100.00	2.24	235.60	4097.88	-31.82	48.59	-31.82	58.08	123.22	0.88
4200.00	2.66	222.81	4197.79	-34.62	45.40	-34.62	57.09	127.33	0.69
4300.00	3.10	218.65	4297.66	-38.43	42.14	-38.43	57.03	132.36	0.49
4400.00	3.26	221.66	4397.51	-42.67	38.56	-42.67	57.51	137.89	0.23
4500.00	2.44	218.23	4497.38	-46.46	35.35	-46.46	58.38	142.73	0.84
4600.00	1.81	224.26	4597.31	-49.26	32.93	-49.26	59.26	146.24	0.66
4700.00	1.28	234.27	4697.28	-51.05	30.92	-51.05	59.69	148.80	0.59
4800.00	1.36	237.88	4797.25	-52.34	29.01	-52.34	59.84	151.01	0.11
4900.00	1.44	238.14	4897.22	-53.63	26.93	-53.63	60.01	153.33	0.08
5000.00	1.42	234.40	4997.19	-55.01	24.86	-55.01	60.37	155.68	0.10
5100.00	1.45	231.88	5097.16	-56.51	22.86	-56.51	60.96	157.97	0.07
5200.00	1.31	218.57	5197.13	-58.19	21.15	-58.19	61.92	160.02	0.35
5300.00	1.12	223.52	5297.11	-59.79	19.77	-59.79	62.98	161.70	0.22
5400.00	1.15	222.85	5397.09	-61.23	18.42	-61.23	63.94	163.26	0.04
5500.00	0.97	232.95	5497.07	-62.48	17.06	-62.48	64.76	164.72	0.26
5600.00	0.97	225.32	5597.06	-63.58	15.79	-63.58	65.51	166.06	0.13
5700.00	1.07	236.83	5697.04	-64.69	14.40	-64.69	66.27	167.45	0.23

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	0.95	242.47	5797.02	-65.58	12.88	-65.58	66.84	168.89	0.15
5900.00	0.78	252.49	5897.01	-66.17	11.50	-66.17	67.16	170.14	0.23
6000.00	1.10	247.43	5997.00	-66.74	9.97	-66.74	67.48	171.50	0.33
6100.00	0.58	248.37	6096.99	-67.30	8.61	-67.30	67.85	172.71	0.52
6200.00	0.77	246.54	6196.98	-67.75	7.52	-67.75	68.17	173.66	0.19
6300.00	0.46	240.74	6296.98	-68.22	6.56	-68.22	68.53	174.51	0.31
6400.00	0.42	275.99	6396.97	-68.37	5.84	-68.37	68.62	175.12	0.27
6500.00	0.40	276.22	6496.97	-68.30	5.12	-68.30	68.49	175.71	0.02
6600.00	0.34	290.69	6596.97	-68.15	4.49	-68.15	68.30	176.23	0.11
6700.00	0.60	289.10	6696.96	-67.88	3.72	-67.88	67.98	176.87	0.25
6800.00	0.49	319.39	6796.96	-67.38	2.95	-67.38	67.45	177.49	0.30
6900.00	0.82	321.55	6896.95	-66.50	2.23	-66.50	66.54	178.08	0.33
7000.00	0.85	322.54	6996.94	-65.35	1.33	-65.35	65.37	178.83	0.04
7100.00	1.02	327.18	7096.93	-64.01	0.40	-64.01	64.01	179.65	0.19
7200.00	0.93	318.16	7196.92	-62.66	-0.63	-62.66	62.66	180.57	0.18
7300.00	1.03	306.32	7296.90	-61.52	-1.89	-61.52	61.55	181.76	0.22
7400.00	0.79	292.24	7396.89	-60.73	-3.25	-60.73	60.82	183.06	0.33
7500.00	0.96	288.98	7496.88	-60.20	-4.67	-60.20	60.38	184.44	0.18
7600.00	1.10	281.02	7596.86	-59.75	-6.40	-59.75	60.09	186.12	0.20
7700.00	1.29	274.87	7696.84	-59.47	-8.47	-59.47	60.07	188.10	0.23
7800.00	1.17	263.45	7796.82	-59.49	-10.60	-59.49	60.43	190.10	0.27
7900.00	0.77	232.36	7896.80	-60.02	-12.15	-60.02	61.23	191.44	0.65
8000.00	0.78	236.56	7996.79	-60.80	-13.25	-60.80	62.23	192.30	0.06
8100.00	0.64	295.50	8096.79	-60.94	-14.32	-60.94	62.60	193.23	0.71
8200.00	0.12	303.66	8196.78	-60.64	-14.91	-60.64	62.45	193.82	0.52
8300.00	0.34	11.95	8296.78	-60.29	-14.94	-60.29	62.12	193.92	0.32
8400.00	0.43	352.71	8396.78	-59.63	-14.93	-59.63	61.47	194.05	0.16
8500.00	0.76	358.83	8496.78	-58.59	-14.99	-58.59	60.48	194.35	0.33
8580.00	0.44	312.55	8576.77	-57.85	-15.22	-57.85	59.82	194.74	0.70



VES Survey International
Fort Worth, Texas
817-741-3610
Surveyor: Logan Henry
Lizard Pot Federal 5H / API 30-015-42455



VES Survey Date: 11/21/2014

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 5H
Project:	Eddy County, NM	TVD Reference:	3485'GK+19'KB @ 3504.00usft (Planning)
Site:	Lizard Pot Fed 5H	MD Reference:	3485'GK+19'KB @ 3504.00usft (Planning)
Well:	5H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

Project	Eddy County, NM		
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	Lizard Pot Fed 5H		
Site Position:		Northing:	587,509.90 usft
From:	Map	Easting:	657,809.80 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in
		Latitude:	32° 36' 50.84 N
		Longitude:	103° 49' 14.95 W
		Grid Convergence:	0.28 °

Well	5H		
Well Position	+N/-S	0.00 usft	Northing: 587,509.90 usft
	+E/-W	0.00 usft	Easting: 657,809.80 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 36' 50.84 N
		Longitude:	103° 49' 14.95 W
		Ground Level:	3,485.00 usft

Wellbore	Lateral		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	11/11/2014	7.55
			Dip Angle (°) 60.60
			Field Strength (nT) 48,646

Design	Surveys		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°) 177.46

Survey Program	Date 12/3/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
100.00	8,580.00	Survey #2 (Lateral)	GYRO-NS
8,664.00	15,562.00	Survey #3 (Lateral)	MWD+HDGM
15,620.00	15,620.00	Survey #4 (Lateral)	Project
			Description
			Gyrocompass Gyro
			OWSG MWD + HDGM
			Projection

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lizard Pot 1H Surface									
2.68	0.02	100.25	2.68	0.00	0.00	0.00	0.70	0.70	0.00
Lizard Pot 1H PP									
100.00	0.70	100.25	100.00	-0.11	0.60	0.14	0.70	0.70	0.00
200.00	0.68	138.54	199.99	-0.66	1.60	0.73	0.45	-0.02	38.29
300.00	1.31	127.10	299.98	-1.80	2.90	1.92	0.66	0.63	-11.44
400.00	1.51	125.15	399.94	-3.24	4.89	3.46	0.21	0.20	-1.95

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 5H
Project:	Eddy County, NM	TVD Reference:	3485'GK+19'KB @ 3504.00usft (Planning)
Site:	Lizard Pot Fed 5H	MD Reference:	3485'GK+19'KB @ 3504.00usft (Planning)
Well:	5H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM.R5000.1 MULTI

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)
500.00	1.63	119.26	499.91	-4.70	7.21	5.01	0.20	0.12	-5.89
600.00	1.76	123.75	599.86	-6.25	9.72	6.67	0.19	0.13	4.49
700.00	2.21	126.53	699.80	-8.25	12.55	8.80	0.46	0.45	2.78
800.00	2.74	112.93	799.71	-10.33	16.30	11.04	0.79	0.53	-13.60
900.00	3.45	111.82	899.56	-12.38	21.30	13.31	0.71	0.71	-1.11
1,000.00	3.77	105.11	999.37	-14.35	27.26	15.55	0.53	0.32	-6.71
1,100.00	3.03	94.65	1,099.19	-15.42	33.07	16.87	0.96	-0.74	-10.46
1,200.00	1.67	69.56	1,199.11	-15.13	37.07	16.76	1.67	-1.36	-25.09
1,300.00	0.38	340.36	1,299.09	-14.31	38.33	15.99	1.71	-1.29	-89.20
1,400.00	0.56	320.84	1,399.09	-13.62	37.91	15.28	0.24	0.18	-19.52
1,500.00	0.75	321.02	1,499.08	-12.73	37.19	14.36	0.19	0.19	0.18
1,600.00	0.71	319.67	1,599.07	-11.75	36.37	13.35	0.04	-0.04	-1.35
1,700.00	0.62	335.77	1,699.07	-10.78	35.75	12.36	0.21	-0.09	16.10
1,800.00	0.32	1.84	1,799.06	-10.01	35.54	11.57	0.36	-0.30	26.07
1,900.00	0.79	36.98	1,899.06	-9.18	35.96	10.76	0.56	0.47	35.14
2,000.00	1.19	61.57	1,999.04	-8.13	37.29	9.78	0.57	0.40	24.59
2,100.00	1.29	55.05	2,099.02	-6.99	39.12	8.72	0.17	0.10	-6.52
2,200.00	1.40	57.60	2,198.99	-5.69	41.08	7.51	0.13	0.11	2.55
2,300.00	1.36	61.80	2,298.96	-4.48	43.16	6.39	0.11	-0.04	4.20
2,400.00	1.24	67.34	2,398.94	-3.50	45.20	5.50	0.17	-0.12	5.54
2,500.00	1.28	70.10	2,498.91	-2.70	47.25	4.80	0.07	0.04	2.76
2,600.00	1.10	68.89	2,598.89	-1.98	49.19	4.16	0.18	-0.18	-1.21
2,700.00	1.29	70.87	2,698.87	-1.26	51.15	3.53	0.19	0.19	1.98
2,800.00	1.37	76.65	2,798.84	-0.62	53.38	2.99	0.16	0.08	5.78
2,900.00	1.05	79.07	2,898.82	-0.17	55.44	2.63	0.32	-0.32	2.42
3,000.00	0.76	91.63	2,998.81	-0.01	57.00	2.54	0.35	-0.29	12.56
3,100.00	0.60	99.66	3,098.80	-0.12	58.18	2.70	0.19	-0.16	8.03
3,200.00	0.88	106.49	3,198.79	-0.43	59.44	3.06	0.29	0.28	6.83
3,300.00	1.07	108.98	3,298.78	-0.95	61.06	3.65	0.19	0.19	2.49
3,400.00	1.48	160.76	3,398.76	-2.47	62.36	5.23	1.17	0.41	51.78
3,500.00	2.02	179.50	3,498.71	-5.45	62.81	8.23	0.78	0.54	18.74
3,600.00	2.66	187.73	3,598.63	-9.52	62.51	12.28	0.72	0.64	8.23
3,700.00	2.75	199.80	3,698.52	-14.07	61.38	16.78	0.58	0.09	12.07
3,800.00	3.59	205.23	3,798.36	-19.16	59.24	21.77	0.89	0.84	5.43
3,900.00	3.71	210.61	3,898.16	-24.78	56.25	27.25	0.36	0.12	5.38
4,000.00	3.12	233.95	3,997.99	-29.16	52.41	31.46	1.50	-0.59	23.34
4,100.00	2.24	235.60	4,097.88	-31.87	48.59	33.99	0.88	-0.88	1.65
4,200.00	2.66	222.81	4,197.79	-34.68	45.40	36.65	0.69	0.42	-12.79
4,300.00	3.10	218.65	4,297.66	-38.49	42.14	40.32	0.49	0.44	-4.16
4,400.00	3.26	221.66	4,397.51	-42.73	38.56	44.39	0.23	0.16	3.01
4,500.00	2.44	218.23	4,497.38	-46.52	35.35	48.04	0.84	-0.82	-3.43
4,600.00	1.81	224.26	4,597.31	-49.33	32.93	50.74	0.67	-0.63	6.03
4,700.00	1.28	234.27	4,697.28	-51.11	30.92	52.43	0.59	-0.53	10.01
4,800.00	1.36	237.88	4,797.25	-52.39	29.01	53.63	0.12	0.08	3.61

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 5H
Project:	Eddy County, NM	TVD Reference:	3485'GK+19'KB @ 3504.00usft (Planning)
Site:	Lizard Pot Fed 5H	MD Reference:	3485'GK+19'KB @ 3504.00usft (Planning)
Well:	5H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

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)	
4,900.00	1.44	238.14	4,897.22	-53.69	26.94	54.83	0.08	0.08	0.26	
5,000.00	1.42	234.40	4,997.19	-55.07	24.87	56.12	0.10	-0.02	-3.74	
5,100.00	1.45	231.88	5,097.16	-56.57	22.86	57.53	0.07	0.03	-2.52	
5,200.00	1.31	218.57	5,197.13	-58.25	21.15	59.13	0.35	-0.14	-13.31	
5,300.00	1.12	223.52	5,297.11	-59.85	19.77	60.67	0.22	-0.19	4.95	
5,400.00	1.15	222.85	5,397.09	-61.30	18.41	62.05	0.03	0.03	-0.67	
5,500.00	0.97	232.95	5,497.07	-62.54	17.06	63.24	0.26	-0.18	10.10	
5,600.00	0.97	225.32	5,597.05	-63.65	15.78	64.28	0.13	0.00	-7.63	
5,700.00	1.07	236.83	5,697.04	-64.75	14.39	65.33	0.23	0.10	11.51	
5,800.00	0.95	242.47	5,797.02	-65.65	12.88	66.15	0.16	-0.12	5.64	
5,900.00	0.78	252.49	5,897.01	-66.23	11.49	66.68	0.23	-0.17	10.02	
6,000.00	1.10	247.43	5,997.00	-66.81	9.96	67.18	0.33	0.32	-5.06	
6,100.00	0.58	248.37	6,096.99	-67.36	8.60	67.68	0.52	-0.52	0.94	
6,200.00	0.77	246.54	6,196.98	-67.82	7.51	68.08	0.19	0.19	-1.83	
6,300.00	0.46	240.74	6,296.97	-68.28	6.55	68.50	0.32	-0.31	-5.80	
6,400.00	0.42	275.99	6,396.97	-68.44	5.83	68.63	0.27	-0.04	35.25	
6,500.00	0.40	276.22	6,496.97	-68.36	5.12	68.52	0.02	-0.02	0.23	
6,600.00	0.34	290.69	6,596.97	-68.22	4.50	68.35	0.11	-0.06	14.47	
6,700.00	0.60	289.10	6,696.96	-67.94	3.72	68.04	0.26	0.26	-1.59	
6,800.00	0.49	319.39	6,796.96	-67.45	2.95	67.51	0.30	-0.11	30.29	
6,900.00	0.82	321.55	6,896.95	-66.56	2.23	66.60	0.33	0.33	2.16	
7,000.00	0.85	322.54	6,996.94	-65.41	1.33	65.41	0.03	0.03	0.99	
7,100.00	1.02	327.18	7,096.93	-64.08	0.40	64.03	0.19	0.17	4.64	
7,200.00	0.93	318.16	7,196.91	-62.72	-0.63	62.63	0.18	-0.09	-9.02	
7,300.00	1.03	306.32	7,296.90	-61.59	-1.89	61.44	0.23	0.10	-11.84	
7,400.00	0.79	292.24	7,396.89	-60.79	-3.25	60.59	0.33	-0.24	-14.08	
7,500.00	0.96	288.98	7,496.88	-60.26	-4.68	59.99	0.18	0.17	-3.26	
7,600.00	1.10	281.02	7,596.86	-59.80	-6.42	59.46	0.20	0.14	-7.96	
7,700.00	1.29	274.87	7,696.84	-59.53	-8.48	59.09	0.23	0.19	-6.15	
7,800.00	1.17	263.45	7,796.81	-59.55	-10.62	59.02	0.27	-0.12	-11.42	
7,900.00	0.77	232.36	7,896.80	-60.07	-12.16	59.47	0.65	-0.40	-31.09	
8,000.00	0.78	236.56	7,996.79	-60.86	-13.26	60.21	0.06	0.01	4.20	
8,100.00	0.64	295.50	8,096.78	-60.99	-14.34	60.30	0.71	-0.14	58.94	
8,200.00	0.12	303.66	8,196.78	-60.69	-14.93	59.97	0.52	-0.52	8.16	
8,300.00	0.34	11.95	8,296.78	-60.35	-14.95	59.62	-0.32	0.22	68.29	
8,400.00	0.43	352.71	8,396.78	-59.68	-14.94	58.96	0.16	0.09	-19.24	
8,500.00	0.76	358.83	8,496.77	-58.65	-15.00	57.93	0.34	0.33	6.12	
8,580.00	0.44	312.55	8,576.77	-57.91	-15.24	57.18	0.69	-0.40	-57.85	
8,664.00	0.40	309.40	8,660.77	-57.51	-15.70	56.75	0.05	-0.05	-3.75	
8,696.00	0.40	316.80	8,692.77	-57.35	-15.86	56.59	0.16	0.00	23.13	
8,727.00	0.50	170.90	8,723.77	-57.41	-15.92	56.65	2.78	0.32	-470.65	
8,759.00	4.40	160.10	8,755.73	-58.70	-15.48	57.96	12.22	12.19	-33.75	
8,790.00	5.70	168.20	8,786.61	-61.33	-14.76	60.61	4.77	4.19	26.13	

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 5H
Project:	Eddy County, NM	TVD Reference:	3485'GK+19'KB @ 3504.00usft (Planning)
Site:	Lizard Pot Fed 5H	MD Reference:	3485'GK+19'KB @ 3504.00usft (Planning)
Well:	5H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

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)
8,821.00	4.30	176.00	8,817.49	-63.99	-14.36	63.29	5.01	-4.52	25.16
8,853.00	5.50	169.50	8,849.37	-66.70	-14.00	66.01	4.13	3.75	-20.31
8,884.00	7.80	166.90	8,880.16	-70.21	-13.25	69.55	7.48	7.42	-8.39
8,916.00	10.20	169.00	8,911.77	-75.10	-12.22	74.49	7.57	7.50	6.56
8,947.00	13.80	172.50	8,942.09	-81.47	-11.21	80.89	11.84	11.61	11.29
8,978.00	16.30	171.50	8,972.02	-89.44	-10.08	88.90	8.11	8.06	-3.23
9,010.00	19.10	170.30	9,002.50	-99.04	-8.54	98.56	8.82	8.75	-3.75
9,041.00	22.40	170.20	9,031.49	-109.86	-6.68	109.46	10.65	10.65	-0.32
9,072.00	25.80	170.90	9,059.78	-122.35	-4.61	122.02	11.01	10.97	2.26
9,103.00	29.80	171.60	9,087.20	-136.64	-2.41	136.39	12.95	12.90	2.26
9,135.00	33.60	170.50	9,114.42	-153.24	0.21	153.10	12.01	11.88	-3.44
9,166.00	37.20	171.40	9,139.68	-170.97	3.03	170.94	11.73	11.61	2.90
9,197.00	40.20	173.10	9,163.88	-190.18	5.63	190.24	10.27	9.68	5.48
9,228.00	44.10	174.40	9,186.85	-210.85	7.89	210.99	12.89	12.58	4.19
9,259.00	47.60	174.50	9,208.44	-232.99	10.04	233.20	11.29	11.29	0.32
9,290.00	51.70	174.50	9,228.51	-256.50	12.30	256.79	13.23	13.23	0.00
9,322.00	56.10	175.20	9,247.36	-282.24	14.62	282.61	13.86	13.75	2.19
9,353.00	61.00	176.70	9,263.53	-308.61	16.48	309.04	16.34	15.81	4.84
9,384.00	65.60	177.60	9,277.46	-336.27	17.85	336.73	15.06	14.84	2.90
9,415.00	70.60	178.20	9,289.02	-365.00	18.90	365.48	16.23	16.13	1.94
9,433.00	73.60	178.20	9,294.55	-382.12	19.44	382.61	16.67	16.67	0.00
9,464.00	78.10	179.70	9,302.12	-412.17	19.99	412.65	15.26	14.52	4.84
9,495.00	79.30	179.40	9,308.20	-442.56	20.22	443.02	3.99	3.87	-0.97
9,526.00	80.70	181.60	9,313.58	-473.09	19.96	473.51	8.32	4.52	7.10
9,557.00	81.80	182.50	9,318.30	-503.71	18.86	504.05	4.56	3.55	2.90
9,589.00	83.30	184.30	9,322.45	-535.38	16.98	535.60	7.29	4.69	5.63
9,620.00	84.70	186.40	9,325.69	-566.07	14.10	566.14	8.11	4.52	6.77
9,651.00	86.90	186.80	9,327.96	-596.78	10.55	596.66	7.21	7.10	1.29
9,682.00	89.50	186.30	9,328.93	-627.56	7.02	627.26	8.54	8.39	-1.61
9,776.00	89.80	182.40	9,329.51	-721.27	-0.11	720.56	4.16	0.32	-4.15
9,870.00	89.80	178.10	9,329.83	-815.25	-0.52	814.42	4.57	0.00	-4.57
9,964.00	90.10	175.10	9,329.92	-909.07	5.05	908.40	3.21	0.32	-3.19
10,059.00	90.20	174.30	9,329.67	-1,003.66	13.83	1,003.29	0.85	0.11	-0.84
10,152.00	88.40	176.00	9,330.80	-1,096.32	21.69	1,096.20	2.66	-1.94	1.83
10,246.00	89.80	175.50	9,332.28	-1,190.04	28.65	1,190.14	1.58	1.49	-0.53
10,340.00	89.50	175.40	9,332.85	-1,283.75	36.11	1,284.08	0.34	-0.32	-0.11
10,434.00	88.80	176.10	9,334.25	-1,377.48	43.08	1,378.03	1.05	-0.74	0.74
10,529.00	90.20	176.00	9,335.08	-1,472.24	49.62	1,473.00	1.48	1.47	-0.11
10,623.00	89.70	175.90	9,335.16	-1,566.01	56.26	1,566.96	0.54	-0.53	-0.11
10,717.00	88.50	175.40	9,336.64	-1,659.72	63.39	1,660.90	1.38	-1.28	-0.53
10,811.00	89.90	174.80	9,337.95	-1,753.37	71.42	1,754.81	1.62	1.49	-0.64
10,906.00	89.10	176.10	9,338.78	-1,848.06	78.95	1,849.75	1.61	-0.84	1.37
11,001.00	88.90	177.10	9,340.44	-1,942.88	84.58	1,944.72	1.07	-0.21	1.05

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 5H
Project:	Eddy County, NM	TVD Reference:	3485'GK+19'KB @ 3504.00usft (Planning)
Site:	Lizard Pot Fed 5H	MD Reference:	3485'GK+19'KB @ 3504.00usft (Planning)
Well:	5H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

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)
11,095.00	90.20	177.40	9,341.17	-2,036.77	89.09	2,038.71	1.42	1.38	0.32
11,189.00	89.40	177.70	9,341.50	-2,130.68	93.11	2,132.71	0.91	-0.85	0.32
11,283.00	88.70	177.40	9,343.06	-2,224.58	97.13	2,226.70	0.81	-0.74	-0.32
11,377.00	90.10	177.50	9,344.04	-2,318.48	101.31	2,320.69	1.49	1.49	0.11
11,470.00	89.80	176.80	9,344.13	-2,411.36	105.94	2,413.69	0.82	-0.32	-0.75
11,565.00	88.70	176.40	9,345.37	-2,506.19	111.57	2,508.67	1.23	-1.16	-0.42
11,659.00	90.10	175.80	9,346.35	-2,599.96	117.96	2,602.63	1.62	1.49	-0.64
11,752.00	89.10	174.70	9,347.00	-2,692.64	125.66	2,695.56	1.60	-1.08	-1.18
11,846.00	88.60	175.20	9,348.89	-2,786.25	133.94	2,789.45	0.75	-0.53	0.53
11,941.00	89.80	174.70	9,350.22	-2,880.87	142.30	2,884.35	1.37	1.26	-0.53
12,035.00	88.50	175.10	9,351.61	-2,974.49	150.65	2,978.24	1.45	-1.38	0.43
12,130.00	89.80	174.80	9,353.02	-3,069.11	159.01	3,073.14	1.40	1.37	-0.32
12,224.00	89.20	175.30	9,353.84	-3,162.75	167.12	3,167.05	0.83	-0.64	0.53
12,318.00	88.30	176.30	9,355.89	-3,256.48	174.01	3,260.99	1.43	-0.96	1.06
12,362.00	88.70	176.80	9,357.04	-3,300.38	176.65	3,304.97	1.45	0.91	1.14
12,456.00	88.80	175.50	9,359.09	-3,394.14	182.96	3,398.92	1.39	0.11	-1.38
12,550.00	87.30	177.10	9,362.29	-3,487.89	189.03	3,492.84	2.33	-1.60	1.70
12,645.00	87.30	176.80	9,366.77	-3,582.65	194.08	3,587.73	0.32	0.00	-0.32
12,739.00	86.60	177.80	9,371.77	-3,676.41	198.50	3,681.59	1.30	-0.74	1.06
12,832.00	87.40	178.20	9,376.64	-3,769.22	201.74	3,774.46	0.96	0.86	0.43
12,926.00	88.40	179.40	9,380.08	-3,863.14	203.71	3,868.37	1.66	1.06	1.28
13,021.00	90.60	179.40	9,380.91	-3,958.12	204.70	3,963.31	2.32	2.32	0.00
13,115.00	90.60	178.80	9,379.93	-4,052.11	206.18	4,057.26	0.64	0.00	-0.64
13,209.00	89.90	178.60	9,379.51	-4,146.08	208.31	4,151.24	0.77	-0.74	-0.21
13,303.00	90.00	178.10	9,379.60	-4,240.04	211.02	4,245.23	0.54	0.11	-0.53
13,398.00	90.00	178.20	9,379.60	-4,334.99	214.08	4,340.22	0.11	0.00	0.11
13,492.00	90.20	178.30	9,379.43	-4,428.95	216.95	4,434.21	0.24	0.21	0.11
13,586.00	89.80	177.40	9,379.43	-4,522.88	220.48	4,528.21	1.05	-0.43	-0.96
13,680.00	89.40	177.70	9,380.09	-4,616.79	224.50	4,622.20	0.53	-0.43	0.32
13,775.00	88.90	177.10	9,381.50	-4,711.68	228.81	4,717.19	0.82	-0.53	-0.63
13,868.00	88.60	177.30	9,383.53	-4,804.55	233.35	4,810.17	0.39	-0.32	0.22
13,963.00	88.40	177.00	9,386.01	-4,899.40	238.07	4,905.14	0.38	-0.21	-0.32
14,057.00	89.00	177.90	9,388.15	-4,993.28	242.25	4,999.11	1.15	0.64	0.96
14,151.00	88.80	177.40	9,389.95	-5,087.18	246.10	5,093.09	0.57	-0.21	-0.53
14,246.00	89.80	178.60	9,391.11	-5,182.11	249.42	5,188.08	1.64	1.05	1.26
14,340.00	89.90	178.70	9,391.36	-5,276.09	251.63	5,282.06	0.15	0.11	0.11
14,434.00	89.00	179.20	9,392.26	-5,370.07	253.36	5,376.02	1.10	-0.96	0.53
14,528.00	89.80	179.80	9,393.24	-5,464.06	254.18	5,469.95	1.06	0.85	0.64
14,622.00	90.50	178.80	9,393.00	-5,558.05	255.33	5,563.90	1.30	0.74	-1.06
14,715.00	90.20	178.50	9,392.43	-5,651.02	257.52	5,656.88	0.46	-0.32	-0.32
14,810.00	90.30	178.60	9,392.02	-5,745.99	259.92	5,751.86	0.15	0.11	0.11
14,905.00	89.80	177.40	9,391.93	-5,840.93	263.24	5,846.86	1.37	-0.53	-1.26
15,000.00	89.20	177.50	9,392.76	-5,935.83	267.46	5,941.85	0.64	-0.63	0.11
15,095.00	90.30	178.00	9,393.18	-6,030.76	271.19	6,036.85	1.27	1.16	0.53

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 5H
Project:	Eddy County, NM	TVD Reference:	3485'GK+19'KB @ 3504.00usft (Planning)
Site:	Lizard Pot Fed 5H	MD Reference:	3485'GK+19'KB @ 3504.00usft (Planning)
Well:	5H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

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)
15,190.00	90.40	177.60	9,392.60	-6,125.68	274.84	6,131.84	0.43	0.11	-0.42
15,285.00	90.40	177.70	9,391.93	-6,220.60	278.73	6,226.84	0.11	0.00	0.11
15,380.00	89.10	177.70	9,392.35	-6,315.52	282.55	6,321.84	1.37	-1.37	0.00
15,476.00	88.70	176.10	9,394.19	-6,411.36	287.74	6,417.81	1.72	-0.42	-1.67
15,562.00	88.50	175.10	9,396.29	-6,497.08	294.33	6,503.74	1.19	-0.23	-1.16
15,620.00	88.50	175.10	9,397.81	-6,554.85	299.28	6,561.67	0.00	0.00	0.00
Lizard Pot 1H PBHL - Lizard Pot 1H BHL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Lizard Pot 1H Surface	0.00	0.00	0.00	0.00	0.00	587,509.90	657,809.80	32° 36' 50.84 N	103° 49' 14.95 W
- hit/miss target									
- actual wellpath hits target center									
- Point									
Lizard Pot 1H BHL	0.00	0.00	9,397.81	-6,554.85	299.28	580,955.06	658,109.09	32° 35' 45.97 N	103° 49' 11.82 W
- actual wellpath hits target center									
- Point									

COG OPERATING, LLC

Field: Eddy County, NM
Site: Lizard Pot Fed 5H
Well: 5H
Wellbore: Lateral
Plan: Surveys



TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Lizard Pot 1H Surface	0.00	0.00	0.00	587509.90	657809.80	32° 36' 50.84 N	103° 49' 14.95 W	Point
Lizard Pot 1H BHL	9397.81	-6554.85	299.28	580955.05	658109.08	32° 35' 45.97 N	103° 49' 11.82 W	Point

