

Results of Directional Survey

API number:	30-025-40352			
OGRID:		Operator:	COG OPERATING LLC	
		Property:	PYGMY 27 STATE	# 1H

surface	ULSTR:	D	27	T 21S	R 33E
				330 FNL	190 FWL

BH Loc	ULSTR:	M	27	T 21S	R 33E
15303	MD	10997.7	TVD	325 FSL	400 FWL
				4955 FNL	

Top Perf/OH	ULSTR:	E	27	T 21S	R 33E
13235	MD	11000.4	TVD	2393 FNL	410 FWL
				2887 FSL	

Bot Perf/OH	ULSTR:	M	27	T 21S	R 33E
15190	MD	10999.5	TVD	438 FSL	398 FWL
				4842 FNL	

	MD	N/S	E/W	VD
	13215	-2537.33	220.23	11000.28
TOP PERFS/OH	13235	-2557.33	219.92	11000.38
	13309	-2631.31	218.76	11000.77
	15188	-4509.65	208.37	10999.49
BOT PERFS/OH	15190	-4511.65	208.41	10999.46
	15242	-4563.63	209.36	10998.59

NEXT TO LAST	15242	-4563.63	209.36	10998.59
LAST READING	15285	-4606.62	210.03	10997.99
TD	15303	-4624.62	210.31	10997.74

Surface Location	330	FN	190	FW
Projected BHL	4955	FN	400	FW
Location of				
Top Perfs/OH	2887	FN	410	FW
Bottom Perfs/OH	4842	FN	398	FW

SUMMARY of Subsurface Locations

Surface Location	D-27-21S-33E	330	FN	190	FW	Vert. Depth
Top Perfs/OH	E-27-21S-33E	2887	FN	410	FW	11000.38
Bottom Perfs/OH	M-27-21S-33E	4842	FN	398	FW	10999.46
Projected TD	M-27-21S-33E	4955	FN	400	FW	10997.74

JUL 15 2014



State of New Mexico
County of Lea

HOBBS OCD

JUN 06 2014

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I, Michael K. Baber, certify that: I am employed by Terra Directional Services LLC; that I did on the day(s) of 3/11/14 through 3/27/14 conduct or supervise the taking of a MWD survey from a depth of 10360 feet to a depth 15285 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Terra Directional Services LLC; that I am authorized and qualified to make this report; that this survey was conducted at the request of Concho Oil and Gas for the Pygmy 27 Com 1H Well API 30-025-40352 in Lea County, New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Terra Directional Services LLC.

Michael K. Baber
MWD Operations Coordinator

State of Texas

County of Dallas

Before me, a notary public, on this day personally appeared Michael K. Baber, known to me to be the person whose name is subscribed to the foregoing document and, being by me first duly sworn, declared that the statements therein contained are true and correct.


Notary Public's Signature



Customer Name: COG LLC.
Well Name: Pygmy 27 COM 1H
AFE/P.O. Number: 30-025-40352
County / Parish: Lea County, New Mex.

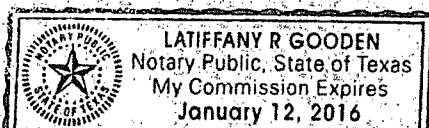
M.W.D. Operator: Richard Page
Directional Driller: Brett Nichols
Total Magnetic Correction: 6.85
Job #: NM 415

Vertical Section: 177.11

Tie In Survey(s) Provided By:

Gyro Data

	Meas. Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	Dist.	Angle	DLS
Tie - In										
0	10300.00	1.87	145.36	10297.24	30.48	-28.44	41.11	0.00	0.00	0.00
1	10360.00	1.60	146.90	10357.21	32.03	-29.95	42.12	51.68	125.41	0.46
2	10392.00	6.50	131.90	10389.12	33.70	-31.53	43.72	53.90	125.80	15.54
3	10423.00	12.70	131.00	10419.67	37.30	-34.94	47.60	59.05	126.28	20.01
4	10455.00	18.20	130.20	10450.51	43.16	-40.48	54.08	67.55	126.82	17.20
5	10486.00	21.90	133.40	10479.62	50.64	-47.58	61.98	78.13	127.51	12.44
6	10517.00	24.40	137.10	10508.13	59.73	-56.24	70.54	90.22	128.57	9.33
7	10549.00	27.70	138.20	10536.87	70.58	-66.63	80.00	104.11	129.79	10.42
8	10580.00	29.90	138.70	10564.04	82.24	-77.81	89.90	118.90	130.88	7.14
9	10611.00	32.80	139.60	10590.51	94.96	-90.01	100.44	134.88	131.87	9.48
10	10643.00	35.70	141.50	10616.96	109.43	-103.92	111.88	152.70	132.89	9.66
11	10672.00	38.20	142.10	10640.13	123.66	-117.62	122.65	169.94	133.80	8.71
12	10704.00	40.30	143.50	10664.91	140.38	-133.75	134.89	189.96	134.76	7.12
13	10736.00	40.40	149.30	10689.31	158.18	-150.99	146.34	210.27	135.90	11.74
14	10765.00	43.50	152.00	10710.87	175.54	-167.89	155.83	229.07	137.13	12.37
15	10798.00	46.10	155.00	10734.29	196.84	-188.70	166.19	251.45	138.63	10.15
16	10829.00	48.70	158.70	10755.27	218.24	-209.68	175.14	273.21	140.13	12.14
17	10861.00	51.70	161.00	10775.76	241.72	-232.76	183.60	296.46	141.73	10.88
18	10892.00	55.60	163.50	10794.13	265.85	-256.54	191.20	319.95	143.30	14.16
19	10923.00	57.80	166.00	10811.15	291.15	-281.53	198.00	344.19	144.88	9.79
20	10954.00	59.70	167.70	10827.23	317.23	-307.34	204.03	368.89	146.42	7.72
21	10985.00	60.20	170.70	10842.76	343.80	-333.69	209.05	393.77	147.93	8.53
22	11017.00	61.60	171.90	10858.32	371.62	-361.33	213.28	419.58	149.45	5.47
23	11046.00	63.40	172.00	10871.71	397.24	-386.80	216.88	443.45	150.72	6.21
24	11080.00	65.70	173.30	10886.32	427.84	-417.24	220.81	472.07	152.11	7.59
25	11111.00	68.00	173.50	10898.51	456.29	-445.55	224.08	498.73	153.30	7.44
26	11140.00	69.20	174.30	10909.09	483.24	-472.40	226.95	524.09	154.34	4.87
27	11181.00	73.00	175.20	10922.37	521.99	-511.02	230.50	560.60	155.72	9.50
28	11212.00	75.30	175.60	10930.83	551.80	-540.74	232.89	588.76	156.70	7.52
29	11241.00	77.90	175.20	10937.55	579.99	-568.86	235.15	615.55	157.54	9.07
30	11274.00	79.50	175.20	10944.02	612.34	-601.11	237.86	646.46	158.41	4.85
31	11305.00	79.70	175.60	10949.62	642.81	-631.50	240.30	675.68	159.17	1.42
32	11335.00	79.50	176.00	10955.03	672.31	-660.93	242.46	704.00	159.85	1.47
33	11368.00	79.00	175.20	10961.19	704.72	-693.25	244.95	735.25	160.54	2.82
34	11400.00	81.50	176.30	10966.61	736.25	-724.70	247.29	765.73	161.16	8.52
35	11429.00	84.10	177.40	10970.24	765.02	-753.43	248.87	793.46	161.72	9.72
36	11462.00	85.20	177.70	10973.32	797.87	-786.25	250.27	825.12	162.34	3.45
37	11494.00	85.70	177.40	10975.86	829.77	-818.12	251.63	855.95	162.90	1.82
38	11523.00	86.20	177.40	10977.90	858.70	-847.02	252.95	883.98	163.37	1.72
39	11556.00	88.00	178.10	10979.57	891.65	-879.95	254.24	915.94	163.88	5.85
40	11587.00	88.20	177.70	10980.60	922.63	-910.91	255.38	946.03	164.34	1.44



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41	11619.00	88.00	178.10	10981.66	954.61	-942.87	256.55	977.15	164.78	1.40
42	11712.00	90.80	178.80	10982.64	1047.57	-1035.82	259.06	1067.73	165.96	3.10
43	11806.00	90.40	179.50	10981.65	1141.50	-1129.81	260.46	1159.44	167.02	0.86
44	11900.00	89.70	179.80	10981.57	1235.41	-1223.81	261.03	1251.33	167.96	0.81
45	11962.00	88.50	180.50	10982.54	1297.31	-1285.80	260.87	1311.99	168.53	2.24
46	11993.00	88.50	181.60	10983.36	1328.23	-1316.78	260.30	1342.26	168.82	3.55
47	12087.00	89.70	182.30	10984.83	1421.88	-1410.71	257.10	1433.95	169.67	1.48
48	12182.00	89.00	182.30	10985.91	1516.48	-1505.63	253.29	1526.78	170.45	0.74
49	12276.00	91.70	182.60	10985.34	1610.07	-1599.53	249.27	1618.84	171.14	2.89
50	12370.00	91.30	183.00	10982.87	1703.57	-1693.39	244.68	1710.97	171.78	0.60
51	12463.00	90.60	183.70	10981.33	1796.00	-1786.21	239.25	1802.17	172.37	1.06
52	12557.00	89.00	183.70	10981.66	1889.38	-1880.01	233.18	1894.42	172.93	1.70
53	12651.00	88.00	184.00	10984.12	1982.70	-1973.77	226.87	1986.76	173.44	1.11
54	12745.00	87.10	180.90	10988.14	2076.19	-2067.58	222.86	2079.56	173.85	3.43
55	12839.00	86.90	179.10	10993.06	2169.94	-2161.45	222.86	2172.91	174.11	1.92
56	12933.00	88.50	180.50	10996.83	2263.75	-2255.37	223.19	2266.39	174.35	2.26
57	13027.00	89.60	180.20	10998.39	2357.59	-2349.35	222.61	2359.88	174.59	1.21
58	13121.00	89.20	180.90	10999.38	2451.41	-2443.34	221.71	2453.38	174.82	0.86
59	13215.00	89.70	180.90	11000.28	2545.20	-2537.33	220.23	2546.87	175.04	0.53
60	13309.00	89.70	180.90	11000.77	2639.00	-2631.31	218.76	2640.39	175.25	0.00
61	13403.00	90.60	181.60	11000.52	2732.75	-2725.29	216.71	2733.89	175.45	1.21
62	13497.00	90.10	180.50	10999.95	2826.52	-2819.27	214.98	2827.46	175.64	1.29
63	13590.00	88.70	181.60	11000.92	2919.30	-2912.25	213.28	2920.05	175.81	1.91
64	13685.00	87.30	180.90	11004.24	3013.99	-3007.16	211.21	3014.57	175.98	1.65
65	13779.00	88.00	180.90	11008.09	3107.70	-3101.07	209.73	3108.16	176.13	0.74
66	13873.00	88.20	179.80	11011.21	3201.50	-3195.02	209.16	3201.86	176.25	1.19
67	13967.00	89.60	179.10	11013.02	3295.40	-3288.99	210.06	3295.69	176.35	1.67
68	14061.00	89.70	180.20	11013.59	3389.30	-3382.99	210.64	3389.54	176.44	1.18
69	14155.00	90.60	180.90	11013.34	3483.13	-3476.98	209.73	3483.30	176.55	1.21
70	14249.00	90.10	181.20	11012.77	3576.91	-3570.96	208.01	3577.02	176.67	0.62
71	14343.00	89.70	180.50	11012.93	3670.71	-3664.95	206.62	3670.77	176.77	0.86
72	14437.00	91.50	179.50	11011.95	3764.58	-3758.94	206.62	3764.62	176.85	2.19
73	14530.00	91.10	179.10	11009.84	3857.49	-3851.91	207.75	3857.51	176.91	0.61
74	14624.00	89.90	179.80	11009.02	3951.40	-3945.90	208.65	3951.41	176.97	1.48
75	14718.00	90.60	181.60	11008.61	4045.21	-4039.89	207.51	4045.21	177.06	2.05
76	14812.00	91.10	180.50	11007.21	4138.98	-4133.86	205.78	4138.98	177.15	1.29
77	14906.00	90.80	181.60	11005.66	4232.74	-4227.83	204.06	4232.75	177.24	1.21
78	14999.00	90.60	179.80	11004.52	4325.55	-4320.81	202.92	4325.57	177.31	1.95
80	15093.00	92.20	177.40	11002.22	4419.48	-4414.75	205.22	4419.51	177.34	3.07
81	15188.00	91.10	178.80	10999.49	4514.42	-4509.65	208.37	4514.46	177.35	1.87
82	15242.00	90.80	179.10	10998.59	4568.39	-4563.63	209.36	4568.43	177.37	0.79
PTB	15285.00	90.80	179.10	10997.99	4611.36	-4606.62	210.03	4611.41	177.39	0.00

