

Results of Directional Survey

API number:	30-025-40888		
OGRID:		Operator:	COG OPERATING LLC
		Property:	PAN HEAD FEE # 4H

surface	ULSTR:	C	11	T 17S	R 32E
				330 FNL	2320 FWL

BH Loc	ULSTR:	C	14	T 17S	R 32E
11550	MD	5851.4	TVD	959 FNL	2307 FWL
				6239 FNL	

Top Perf/OH	ULSTR:	C	11	T 17S	R 32E
5985	MD	5806.9	TVD	689 FNL	2176 FWL

Bot Perf/OH	ULSTR:	C	14	T 17S	R 32E
11386	MD	5850.9	TVD	795 FNL	2307 FWL
				6075 FNL	

	MD	N/S	E/W	VD
	5940	-317.03	-136.02	5792.34
TOP PERFS/OH	5985	-358.84	-144.02	5806.92
	5972	-346.76	-141.71	5802.71
	11237	-5595.80	-11.40	5851.10
BOT PERFS/OH	11386	-5744.80	-12.83	5850.94
	11331	-5689.80	-12.30	5851.00

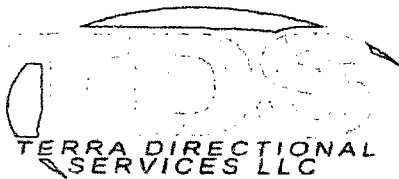
NEXT TO LAST	11505	-5863.80	-13.10	5851.20
LAST READING	11550	-5908.80	-13.30	5851.40
TD	11550	-5908.80	-13.30	5851.40

Surface Location	330	FN	2320	FW
Projected BHL	6239	FN	2307	FW
Location of				
Top Perfs/OH	689	FN	2176	FW
Bottom Perfs/OH	6075	FN	2307	FW

SUMMARY of Subsurface Locations

Surface Location	C-11-17S-32E	330	FN	2320	FW	Vert. Depth
Top Perfs/OH	C-11-17S-32E	689	FN	2176	FW	5806.92
Bottom Perfs/OH	C-14-17S-32E	6075	FN	2307	FW	5850.94
Projected TD	C-14-17S-32E	6239	FN	2307	FW	5851.40

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State of New Mexico
County of Lea

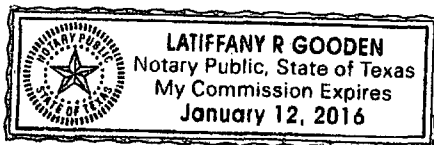
I, Michael K. Baber, certify that: I am employed by Terra Directional Services LLC; that I did on the day(s) of 1/7/14 through 1/19/14 conduct or supervise the taking of a MWD survey from a depth of 5215 feet to a depth 11550 feet; that the data is true, correct, complete and within the limitations of 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 & Gas for the Pan Head Fee #4H Well API 30-025-40888 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 Brewer

Before me, a notary public, on this day personally appeared Michael 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



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MAY 12 2014

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Customer Name: Concho Oil & Gas
Well Name: Pan Head Fee #4H
API Number: 30-025-40888
County / Parish: Lea County NM

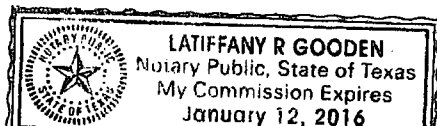
M.W.D. Operator: Luis Natividad
Directional Driller: Donnie Hale
Total Magnetic Correction: 7.08
Job #: NM-401

Vertical Section: 180.00

Tie In Survey(s) Provided By:

Vaughn Energy Services

	Meas. Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	Dist.	Angle	DLS
Tie - In										
0	5174.00	0.42	314.20	5173.20	-8.40	8.40	-13.20	15.68	302.55	0.39
1	5215.00	0.50	299.10	5214.20	-8.59	8.59	-13.46	15.97	302.54	0.35
2	5246.00	0.60	253.50	5245.20	-8.61	8.61	-13.74	16.21	302.08	1.41
3	5278.00	1.70	224.30	5277.19	-8.22	8.22	-14.23	16.44	300.03	3.79
4	5309.00	3.20	217.10	5308.16	-7.20	7.20	-15.07	16.71	295.55	4.93
5	5341.00	5.70	206.60	5340.06	-5.07	5.07	-16.32	17.09	287.26	8.18
6	5372.00	9.50	200.40	5370.79	-1.30	1.30	-17.91	17.95	274.14	12.52
7	5404.00	13.30	198.30	5402.15	4.68	-4.68	-19.98	20.52	256.83	11.94
8	5436.00	16.90	197.50	5433.04	12.61	-12.61	-22.54	25.83	240.77	11.27
9	5467.00	20.60	197.10	5462.39	22.12	-22.12	-25.50	33.76	229.05	11.94
10	5499.00	23.60	197.10	5492.03	33.63	-33.63	-29.04	44.43	220.81	9.38
11	5530.00	25.10	197.80	5520.28	45.82	-45.82	-32.87	56.39	215.66	4.93
12	5562.00	27.30	201.00	5548.99	59.14	-59.14	-37.58	70.07	212.43	8.17
13	5593.00	31.10	203.60	5576.04	73.12	-73.12	-43.33	84.99	210.65	12.92
14	5625.00	34.80	206.60	5602.89	88.86	-88.86	-50.73	102.32	209.72	12.63
15	5656.00	37.80	207.50	5627.88	105.20	-105.20	-59.08	120.66	209.32	9.83
16	5688.00	40.50	206.20	5652.69	123.23	-123.23	-68.20	140.84	208.96	8.82
17	5720.00	43.80	205.90	5676.41	142.52	-142.52	-77.63	162.29	208.58	10.33
18	5751.00	47.70	204.70	5698.04	162.59	-162.59	-87.11	184.46	208.18	12.88
19	5783.00	52.00	202.50	5718.67	185.00	-185.00	-96.88	208.84	207.64	14.43
20	5814.00	56.20	199.60	5736.84	208.44	-208.44	-105.88	233.79	206.93	15.52
21	5846.00	60.40	197.10	5753.66	234.27	-234.27	-114.44	260.73	206.03	14.71
22	5877.00	64.40	195.50	5768.02	260.64	-260.64	-122.14	287.84	205.11	13.69
23	5909.00	67.40	193.90	5781.08	288.89	-288.89	-129.55	316.60	204.15	10.43
24	5940.00	70.00	192.00	5792.34	317.03	-317.03	-136.02	344.98	203.22	10.15
25	5972.00	72.20	189.70	5802.71	346.76	-346.76	-141.71	374.60	202.23	9.67
26	6003.00	74.30	187.60	5811.64	376.11	-376.11	-146.17	403.51	201.24	9.38
27	6034.00	76.80	186.40	5819.38	405.90	-405.90	-149.83	432.67	200.26	8.89
28	6065.00	78.60	185.70	5825.98	436.02	-436.02	-153.02	462.09	199.34	6.21
29	6097.00	80.30	185.30	5831.84	467.33	-467.33	-156.03	492.69	198.46	5.45
30	6129.00	82.70	184.40	5836.57	498.86	-498.86	-158.71	523.50	197.65	8.00
31	6161.00	85.70	184.40	5839.81	530.60	-530.60	-161.15	554.53	196.89	9.38
32	6192.00	88.10	184.30	5841.48	561.46	-561.46	-163.50	584.79	196.24	7.75
33	6224.00	89.20	182.90	5842.24	593.39	-593.39	-165.51	616.04	195.58	5.56
34	6255.00	90.00	182.00	5842.45	624.36	-624.36	-166.83	646.27	194.96	3.88
35	6287.00	90.40	180.80	5842.34	656.35	-656.35	-167.61	677.41	194.33	3.95
36	6318.00	90.50	179.60	5842.10	687.35	-687.35	-167.72	707.52	193.71	3.88
37	6349.00	89.30	178.00	5842.15	718.34	-718.34	-167.07	737.51	193.09	6.45
38	6381.00	88.10	176.60	5842.88	750.30	-750.30	-165.57	768.35	192.44	5.76
39	6412.00	87.80	175.30	5843.99	781.20	-781.20	-163.38	798.10	191.81	4.30
40	6444.00	88.00	174.60	5845.16	813.05	-813.05	-160.56	828.75	191.17	2.27
41	6475.00	87.80	174.00	5846.29	843.88	-843.88	-157.49	858.45	190.57	2.04
42	6507.00	87.20	173.10	5847.69	875.64	-875.64	-153.89	889.07	189.97	3.38
43	6538.00	87.10	172.10	5849.23	906.35	-906.35	-149.91	918.66	189.39	3.24
44	6570.00	87.10	171.30	5850.85	937.97	-937.97	-145.29	949.16	188.81	2.50
45	6601.00	87.30	170.10	5852.37	968.53	-968.53	-140.29	978.63	188.24	3.92



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46	6633.00	88.10	169.30	5853.65	999.99	-999.99	-134.57	1009.00	187.66	3.53
47	6665.00	88.70	168.70	5854.54	1031.39	-1031.39	-128.47	1039.36	187.10	2.65
48	6696.00	88.70	167.90	5855.25	1061.73	-1061.73	-122.18	1068.74	186.56	2.58
49	6728.00	88.90	167.40	5855.92	1092.99	-1092.99	-115.34	1099.05	186.02	1.68
50	6760.00	89.30	167.40	5856.42	1124.21	-1124.21	-108.36	1129.42	185.51	1.25
51	6791.00	90.00	167.50	5856.61	1154.47	-1154.47	-101.63	1158.93	185.03	2.28
52	6823.00	91.00	168.30	5856.33	1185.76	-1185.76	-94.92	1189.55	184.58	4.00
53	6854.00	91.70	169.10	5855.60	1216.15	-1216.15	-88.85	1219.39	184.18	3.43
54	6886.00	91.50	170.20	5854.71	1247.61	-1247.61	-83.10	1250.38	183.81	3.49
55	6917.00	91.50	171.30	5853.89	1278.20	-1278.20	-78.12	1280.58	183.50	3.55
56	6949.00	91.50	172.10	5853.06	1309.85	-1309.85	-73.50	1311.91	183.21	2.50
57	6981.00	91.60	172.80	5852.19	1341.56	-1341.56	-69.30	1343.35	182.96	2.21
58	7012.00	91.90	173.20	5851.24	1372.32	-1372.32	-65.52	1373.88	182.73	1.61
59	7044.00	91.30	174.40	5850.35	1404.12	-1404.12	-62.07	1405.49	182.53	4.19
60	7075.00	91.20	175.60	5849.67	1434.99	-1434.99	-59.37	1436.22	182.37	3.88
61	7107.00	91.10	176.40	5849.03	1466.91	-1466.91	-57.13	1468.02	182.23	2.52
62	7138.00	90.70	177.00	5848.54	1497.85	-1497.85	-55.35	1498.87	182.12	2.33
63	7170.00	90.30	177.60	5848.27	1529.82	-1529.82	-53.84	1530.76	182.02	2.25
64	7201.00	90.30	177.50	5848.10	1560.79	-1560.79	-52.52	1561.67	181.93	0.32
65	7232.00	90.60	177.30	5847.86	1591.75	-1591.75	-51.11	1592.57	181.84	1.16
66	7295.00	90.20	177.80	5847.42	1654.69	-1654.69	-48.42	1655.40	181.68	1.02
67	7358.00	90.00	178.90	5847.31	1717.67	-1717.67	-46.60	1718.30	181.55	1.77
68	7421.00	90.00	178.70	5847.31	1780.65	-1780.65	-45.28	1781.23	181.46	0.32
69	7485.00	90.20	178.60	5847.20	1844.64	-1844.64	-43.78	1845.15	181.36	0.35
70	7548.00	90.20	178.60	5846.98	1907.62	-1907.62	-42.24	1908.08	181.27	0.00
71	7642.00	89.80	178.40	5846.98	2001.58	-2001.58	-39.78	2001.98	181.14	0.48
72	7737.00	89.90	177.20	5847.23	2096.51	-2096.51	-36.13	2096.82	180.99	1.27
73	7831.00	90.00	179.00	5847.31	2190.46	-2190.46	-33.01	2190.70	180.86	1.92
74	7926.00	88.40	177.80	5848.64	2285.40	-2285.40	-30.36	2285.61	180.76	2.11
75	8020.00	89.40	179.30	5850.44	2379.35	-2379.35	-27.98	2379.52	180.67	1.92
76	8115.00	90.50	179.30	5850.52	2474.34	-2474.34	-26.82	2474.49	180.62	1.16
77	8210.00	90.30	179.30	5849.86	2569.34	-2569.34	-25.66	2569.46	180.57	0.21
78	8304.00	90.40	179.90	5849.29	2663.33	-2663.33	-25.01	2663.45	180.54	0.65
79	8399.00	90.70	180.50	5848.37	2758.33	-2758.33	-25.34	2758.44	180.53	0.71
80	8493.00	90.10	179.70	5847.72	2852.32	-2852.32	-25.50	2852.44	180.51	1.06
81	8588.00	91.20	179.60	5846.64	2947.31	-2947.31	-24.92	2947.42	180.48	1.16
82	8683.00	89.70	179.30	5845.89	3042.30	-3042.30	-24.01	3042.40	180.45	1.61
83	8777.00	90.00	179.50	5846.14	3136.30	-3136.30	-23.03	3136.38	180.42	0.38
84	8872.00	89.40	179.30	5846.64	3231.29	-3231.29	-22.03	3231.36	180.39	0.67
85	8967.00	89.20	179.30	5847.80	3326.28	-3326.28	-20.87	3326.34	180.36	0.21
86	9062.00	88.50	178.90	5849.70	3421.24	-3421.24	-19.38	3421.30	180.32	0.85
87	9156.00	89.50	180.50	5851.34	3515.22	-3515.22	-18.89	3515.27	180.31	2.01
88	9251.00	88.80	180.50	5852.75	3610.21	-3610.21	-19.72	3610.26	180.31	0.74
89	9345.00	89.10	180.50	5854.48	3704.19	-3704.19	-20.54	3704.25	180.32	0.32
90	9440.00	89.70	179.30	5855.47	3799.18	-3799.18	-20.37	3799.24	180.31	1.41
91	9535.00	90.90	179.00	5854.97	3894.17	-3894.17	-18.96	3894.21	180.28	1.30
92	9627.00	91.40	178.60	5853.13	3986.13	-3986.13	-17.03	3986.17	180.24	0.70
93	9722.00	90.70	179.20	5851.39	4081.10	-4081.10	-15.21	4081.12	180.21	0.97
94	9816.00	91.50	179.20	5849.58	4175.07	-4175.07	-13.90	4175.09	180.19	0.85
95	9911.00	90.00	179.10	5848.34	4270.05	-4270.05	-12.49	4270.06	180.17	1.58
96	10005.00	90.50	179.00	5847.93	4364.03	-4364.03	-10.93	4364.05	180.14	0.54
97	10100.00	89.80	179.20	5847.68	4459.02	-4459.02	-9.44	4459.03	180.12	0.77
98	10195.00	89.60	178.80	5848.18	4554.00	-4554.00	-7.78	4554.01	180.10	0.47
99	10289.00	90.40	178.70	5848.18	4647.98	-4647.98	-5.73	4647.98	180.07	0.86
100	10383.00	89.80	178.70	5848.01	4741.96	-4741.96	-3.60	4741.96	180.04	0.64
101	10478.00	89.70	179.60	5848.43	4836.94	-4836.94	-2.19	4836.94	180.03	0.95
102	10573.00	89.70	180.80	5848.93	4931.94	-4931.94	-2.52	4931.94	180.03	1.26
103	10667.00	89.80	180.30	5849.34	5025.93	-5025.93	-3.42	5025.94	180.04	0.54
104	10762.00	89.70	181.10	5849.75	5120.93	-5120.93	-4.58	5120.93	180.05	0.85
105	10857.00	89.90	180.90	5850.08	5215.91	-5215.91	-6.24	5215.91	180.07	0.80

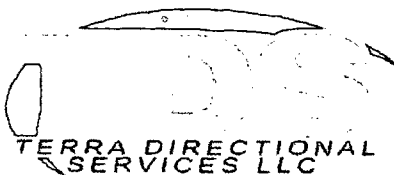


106	10952.00	89.80	180.80	5850.33	5310.90	-5310.90	-7.65	5310.91	180.08	0.15
107	11047.00	90.00	180.70	5850.50	5405.89	-5405.89	-8.89	5405.90	180.09	0.24
108	11142.00	90.00	180.80	5850.50	5500.88	-5500.88	-10.14	5500.89	180.11	0.11
109	11237.00	90.00	180.60	5850.50	5595.88	-5595.88	-11.30	5595.89	180.12	0.21
110	11331.00	90.10	180.40	5850.41	5689.87	-5689.87	-12.12	5689.89	180.12	0.24
111	11426.00	89.90	180.20	5850.41	5784.87	-5784.87	-12.62	5784.88	180.12	0.30
112	11505.00	89.80	180.30	5850.62	5863.87	-5863.87	-12.96	5863.88	180.13	0.18
PTB	11550.00	89.80	180.30	5850.78	5908.87	-5908.87	-13.20	5908.88	180.13	0.00



A handwritten signature in black ink, appearing to be "L. Gooden", written over a horizontal line.

A handwritten signature in black ink, appearing to be "J. Smith", written over a horizontal line.



HOBBS OCD

MAY 12 2014

RECEIVED

State of New Mexico
County of Lea

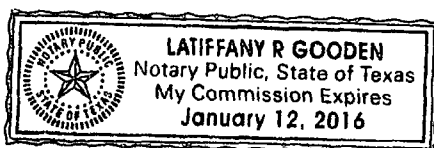
I, Michael K. Baber, certify that: I am employed by Terra Directional Services LLC; that I did on the day(s) of 1/7/14 through 1/19/14 conduct or supervise the taking of a MWD survey from a depth of 5215 feet to a depth 11550 feet; that the data is true, correct, complete and within the limitations of 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 & Gas for the Pan Head Fee #4H Well API 30-025-40888 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 Brewer

Before me, a notary public, on this day personally appeared Michael 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





HOBBS OCD

MAY 12 2014

RECEIVED

Customer Name: Concho Oil & Gas
 Well Name: Pan Head Fee #4H
 API Number: 30-025-40888
 County / Parish: Lea County NM

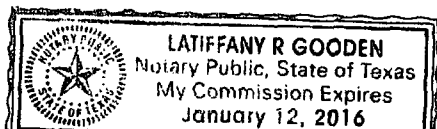
M.W.D. Operator: Luis Natividad
 Directional Driller: Donnie Hale
 Total Magnetic Correction: 7.08
 Job #: NM-401

Vertical Section: 180.00

Tie In Survey(s) Provided By:

Vaughn Energy Services

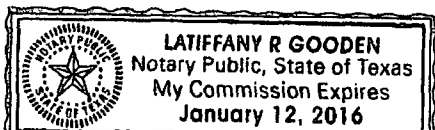
	Meas. Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	Dist.	Angle	DLS
Tie - In										
0	5174.00	0.42	314.20	5173.20	-8.40	8.40	-13.20	15.68	302.55	0.39
1	5215.00	0.50	299.10	5214.20	-8.59	8.59	-13.46	15.97	302.54	0.35
2	5246.00	0.60	253.50	5245.20	-8.61	8.61	-13.74	16.21	302.08	1.41
3	5278.00	1.70	224.30	5277.19	-8.22	8.22	-14.23	16.44	300.03	3.79
4	5309.00	3.20	217.10	5308.16	-7.20	7.20	-15.07	16.71	295.55	4.93
5	5341.00	5.70	206.60	5340.06	-5.07	5.07	-16.32	17.09	287.26	8.18
6	5372.00	9.50	200.40	5370.79	-1.30	1.30	-17.91	17.95	274.14	12.52
7	5404.00	13.30	198.30	5402.15	4.68	-4.68	-19.98	20.52	256.83	11.94
8	5436.00	16.90	197.50	5433.04	12.61	-12.61	-22.54	25.83	240.77	11.27
9	5467.00	20.60	197.10	5462.39	22.12	-22.12	-25.50	33.76	229.05	11.94
10	5499.00	23.60	197.10	5492.03	33.63	-33.63	-29.04	44.43	220.81	9.38
11	5530.00	25.10	197.80	5520.28	45.82	-45.82	-32.87	56.39	215.66	4.93
12	5562.00	27.30	201.00	5548.99	59.14	-59.14	-37.58	70.07	212.43	8.17
13	5593.00	31.10	203.60	5576.04	73.12	-73.12	-43.33	84.99	210.65	12.92
14	5625.00	34.80	206.60	5602.89	88.86	-88.86	-50.73	102.32	209.72	12.63
15	5656.00	37.80	207.50	5627.88	105.20	-105.20	-59.08	120.66	209.32	9.83
16	5688.00	40.50	206.20	5652.69	123.23	-123.23	-68.20	140.84	208.96	8.82
17	5720.00	43.80	205.90	5676.41	142.52	-142.52	-77.63	162.29	208.58	10.33
18	5751.00	47.70	204.70	5698.04	162.59	-162.59	-87.11	184.46	208.18	12.88
19	5783.00	52.00	202.50	5718.67	185.00	-185.00	-96.88	208.84	207.64	14.43
20	5814.00	56.20	199.60	5736.84	208.44	-208.44	-105.88	233.79	206.93	15.52
21	5846.00	60.40	197.10	5753.66	234.27	-234.27	-114.44	260.73	206.03	14.71
22	5877.00	64.40	195.50	5768.02	260.64	-260.64	-122.14	287.84	205.11	13.69
23	5909.00	67.40	193.90	5781.08	288.89	-288.89	-129.55	316.60	204.15	10.43
24	5940.00	70.00	192.00	5792.34	317.03	-317.03	-136.02	344.98	203.22	10.15
25	5972.00	72.20	189.70	5802.71	346.76	-346.76	-141.71	374.60	202.23	9.67
26	6003.00	74.30	187.60	5811.64	376.11	-376.11	-146.17	403.51	201.24	9.38
27	6034.00	76.80	186.40	5819.38	405.90	-405.90	-149.83	432.67	200.26	8.89
28	6065.00	78.60	185.70	5825.98	436.02	-436.02	-153.02	462.09	199.34	6.21
29	6097.00	80.30	185.30	5831.84	467.33	-467.33	-156.03	492.69	198.46	5.45
30	6129.00	82.70	184.40	5836.57	498.86	-498.86	-158.71	523.50	197.65	8.00
31	6161.00	85.70	184.40	5839.81	530.60	-530.60	-161.15	554.53	196.89	9.38
32	6192.00	88.10	184.30	5841.48	561.46	-561.46	-163.50	584.79	196.24	7.75
33	6224.00	89.20	182.90	5842.24	593.39	-593.39	-165.51	616.04	195.58	5.56
34	6255.00	90.00	182.00	5842.45	624.36	-624.36	-166.83	646.27	194.96	3.88
35	6287.00	90.40	180.80	5842.34	656.35	-656.35	-167.61	677.41	194.33	3.95
36	6318.00	90.50	179.60	5842.10	687.35	-687.35	-167.72	707.52	193.71	3.88
37	6349.00	89.30	178.00	5842.15	718.34	-718.34	-167.07	737.51	193.09	6.45
38	6381.00	88.10	176.60	5842.88	750.30	-750.30	-165.57	768.35	192.44	5.76
39	6412.00	87.80	175.30	5843.99	781.20	-781.20	-163.38	798.10	191.81	4.30
40	6444.00	88.00	174.60	5845.16	813.05	-813.05	-160.56	828.75	191.17	2.27
41	6475.00	87.80	174.00	5846.29	843.88	-843.88	-157.49	858.45	190.57	2.04
42	6507.00	87.20	173.10	5847.69	875.64	-875.64	-153.89	889.07	189.97	3.38
43	6538.00	87.10	172.10	5849.23	906.35	-906.35	-149.91	918.66	189.39	3.24
44	6570.00	87.10	171.30	5850.85	937.97	-937.97	-145.29	949.16	188.81	2.50
45	6601.00	87.30	170.10	5852.37	968.53	-968.53	-140.29	978.63	188.24	3.92



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46	6633.00	88.10	169.30	5853.65	999.99	-999.99	-134.57	1009.00	187.66	3.53
47	6665.00	88.70	168.70	5854.54	1031.39	-1031.39	-128.47	1039.36	187.10	2.65
48	6696.00	88.70	167.90	5855.25	1061.73	-1061.73	-122.18	1068.74	186.56	2.58
49	6728.00	88.90	167.40	5855.92	1092.99	-1092.99	-115.34	1099.05	186.02	1.68
50	6760.00	89.30	167.40	5856.42	1124.21	-1124.21	-108.36	1129.42	185.51	1.25
51	6791.00	90.00	167.50	5856.61	1154.47	-1154.47	-101.63	1158.93	185.03	2.28
52	6823.00	91.00	168.30	5856.33	1185.76	-1185.76	-94.92	1189.55	184.58	4.00
53	6854.00	91.70	169.10	5855.60	1216.15	-1216.15	-88.85	1219.39	184.18	3.43
54	6886.00	91.50	170.20	5854.71	1247.61	-1247.61	-83.10	1250.38	183.81	3.49
55	6917.00	91.50	171.30	5853.89	1278.20	-1278.20	-78.12	1280.58	183.50	3.55
56	6949.00	91.50	172.10	5853.06	1309.85	-1309.85	-73.50	1311.91	183.21	2.50
57	6981.00	91.60	172.80	5852.19	1341.56	-1341.56	-69.30	1343.35	182.96	2.21
58	7012.00	91.90	173.20	5851.24	1372.32	-1372.32	-65.52	1373.88	182.73	1.61
59	7044.00	91.30	174.40	5850.35	1404.12	-1404.12	-62.07	1405.49	182.53	4.19
60	7075.00	91.20	175.60	5849.67	1434.99	-1434.99	-59.37	1436.22	182.37	3.88
61	7107.00	91.10	176.40	5849.03	1466.91	-1466.91	-57.13	1468.02	182.23	2.52
62	7138.00	90.70	177.00	5848.54	1497.85	-1497.85	-55.35	1498.87	182.12	2.33
63	7170.00	90.30	177.60	5848.27	1529.82	-1529.82	-53.84	1530.76	182.02	2.25
64	7201.00	90.30	177.50	5848.10	1560.79	-1560.79	-52.52	1561.67	181.93	0.32
65	7232.00	90.60	177.30	5847.86	1591.75	-1591.75	-51.11	1592.57	181.84	1.16
66	7295.00	90.20	177.80	5847.42	1654.69	-1654.69	-48.42	1655.40	181.68	1.02
67	7358.00	90.00	178.90	5847.31	1717.67	-1717.67	-46.60	1718.30	181.55	1.77
68	7421.00	90.00	178.70	5847.31	1780.65	-1780.65	-45.28	1781.23	181.46	0.32
69	7485.00	90.20	178.60	5847.20	1844.64	-1844.64	-43.78	1845.15	181.36	0.35
70	7548.00	90.20	178.60	5846.98	1907.62	-1907.62	-42.24	1908.08	181.27	0.00
71	7642.00	89.80	178.40	5846.98	2001.58	-2001.58	-39.78	2001.98	181.14	0.48
72	7737.00	89.90	177.20	5847.23	2096.51	-2096.51	-36.13	2096.82	180.99	1.27
73	7831.00	90.00	179.00	5847.31	2190.46	-2190.46	-33.01	2190.70	180.86	1.92
74	7926.00	88.40	177.80	5848.64	2285.40	-2285.40	-30.36	2285.61	180.76	2.11
75	8020.00	89.40	179.30	5850.44	2379.35	-2379.35	-27.98	2379.52	180.67	1.92
76	8115.00	90.50	179.30	5850.52	2474.34	-2474.34	-26.82	2474.49	180.62	1.16
77	8210.00	90.30	179.30	5849.86	2569.34	-2569.34	-25.66	2569.46	180.57	0.21
78	8304.00	90.40	179.90	5849.29	2663.33	-2663.33	-25.01	2663.45	180.54	0.65
79	8399.00	90.70	180.50	5848.37	2758.33	-2758.33	-25.34	2758.44	180.53	0.71
80	8493.00	90.10	179.70	5847.72	2852.32	-2852.32	-25.50	2852.44	180.51	1.06
81	8588.00	91.20	179.60	5846.64	2947.31	-2947.31	-24.92	2947.42	180.48	1.16
82	8683.00	89.70	179.30	5845.89	3042.30	-3042.30	-24.01	3042.40	180.45	1.61
83	8777.00	90.00	179.50	5846.14	3136.30	-3136.30	-23.03	3136.38	180.42	0.38
84	8872.00	89.40	179.30	5846.64	3231.29	-3231.29	-22.03	3231.36	180.39	0.67
85	8967.00	89.20	179.30	5847.80	3326.28	-3326.28	-20.87	3326.34	180.36	0.21
86	9062.00	88.50	178.90	5849.70	3421.24	-3421.24	-19.38	3421.30	180.32	0.85
87	9156.00	89.50	180.50	5851.34	3515.22	-3515.22	-18.89	3515.27	180.31	2.01
88	9251.00	88.80	180.50	5852.75	3610.21	-3610.21	-19.72	3610.26	180.31	0.74
89	9345.00	89.10	180.50	5854.48	3704.19	-3704.19	-20.54	3704.25	180.32	0.32
90	9440.00	89.70	179.30	5855.47	3799.18	-3799.18	-20.37	3799.24	180.31	1.41
91	9535.00	90.90	179.00	5854.97	3894.17	-3894.17	-18.96	3894.21	180.28	1.30
92	9627.00	91.40	178.60	5853.13	3986.13	-3986.13	-17.03	3986.17	180.24	0.70
93	9722.00	90.70	179.20	5851.39	4081.10	-4081.10	-15.21	4081.12	180.21	0.97
94	9816.00	91.50	179.20	5849.58	4175.07	-4175.07	-13.90	4175.09	180.19	0.85
95	9911.00	90.00	179.10	5848.34	4270.05	-4270.05	-12.49	4270.06	180.17	1.58
96	10005.00	90.50	179.00	5847.93	4364.03	-4364.03	-10.93	4364.05	180.14	0.54
97	10100.00	89.80	179.20	5847.68	4459.02	-4459.02	-9.44	4459.03	180.12	0.77
98	10195.00	89.60	178.80	5848.18	4554.00	-4554.00	-7.78	4554.01	180.10	0.47
99	10289.00	90.40	178.70	5848.18	4647.98	-4647.98	-5.73	4647.98	180.07	0.86
100	10383.00	89.80	178.70	5848.01	4741.96	-4741.96	-3.60	4741.96	180.04	0.64
101	10478.00	89.70	179.60	5848.43	4836.94	-4836.94	-2.19	4836.94	180.03	0.95
102	10573.00	89.70	180.80	5848.93	4931.94	-4931.94	-2.52	4931.94	180.03	1.26
103	10667.00	89.80	180.30	5849.34	5025.93	-5025.93	-3.42	5025.94	180.04	0.54
104	10762.00	89.70	181.10	5849.75	5120.93	-5120.93	-4.58	5120.93	180.05	0.85
105	10857.00	89.90	180.90	5850.08	5215.91	-5215.91	-6.24	5215.91	180.07	0.30



106	10952.00	89.80	180.80	5850.33	5310.90	-5310.90	-7.65	5310.91	180.08	0.15
107	11047.00	90.00	180.70	5850.50	5405.89	-5405.89	-8.89	5405.90	180.09	0.24
108	11142.00	90.00	180.80	5850.50	5500.88	-5500.88	-10.14	5500.89	180.11	0.11
109	11237.00	90.00	180.60	5850.50	5595.88	-5595.88	-11.30	5595.89	180.12	0.21
110	11331.00	90.10	180.40	5850.41	5689.87	-5689.87	-12.12	5689.89	180.12	0.24
111	11426.00	89.90	180.20	5850.41	5784.87	-5784.87	-12.62	5784.88	180.12	0.30
112	11505.00	89.80	180.30	5850.62	5863.87	-5863.87	-12.96	5863.88	180.13	0.18
PTB	11550.00	89.80	180.30	5850.78	5908.87	-5908.87	-13.20	5908.88	180.13	0.00



A handwritten signature in black ink, appearing to be "L. Gooden".

A handwritten signature in black ink, appearing to be "J. Smith".



HOBBS OCD

MAY 12 2014

RECEIVED

COG Operating LLC

Lea County, NM

Pan Head Fee #4H

Surface : 330'FNI, 2320'FWL, SEC 11, T17S, R32E, Unit C

BHL: 980'FNL, 2306'FWL, Sec. 14, T17S, R32E, Unit C

Survey: MWD #1

Standard Survey Report

20 January, 2014



Wellplanning Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Surface : 330'FNL, 2320'FWL, SEC 11, T17S, R32E, Unit C
Project:	Lea County, NM	TVD Reference:	WELL @ 4176.5usft (Original Well Elev)
Site:	Pan Head Fee #4H	MD Reference:	WELL @ 4176.5usft (Original Well Elev)
Well:	Surface : 330'FNL, 2320'FWL, SEC 11, T17S, R32E, Unit C	North Reference:	Grid
Wellbore:	BHL: 980'FNL, 2306'FWL, Sec. 14, T17S, R32E, Unit C	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	EDM 5000.1 Single User Db

Project	Lea 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:	Pan Head Fee #4H		
Site Position:		Northing:	675,386.60 usft
From:	Map	Easting:	682,929.80 usft
Position Uncertainty:	2.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 51' 19.093 N
		Longitude:	103° 44' 15.489 W
		Grid Convergence:	0.32 °

Well#	Surface : 330'FNL, 2320'FWL, SEC:11, T17S, R32E, Unit-C					
Well Position	+N/-S	0.0 usft	Northing:	675,386.60 usft	Latitude:	32° 51' 19.093 N
	+E/-W	0.0 usft	Easting:	682,929.80 usft	Longitude:	103° 44' 15.489 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,163.0 usft

Wellbore:	BHL: 980'FNL, 2306'FWL, Sec. 14, T17S, R32E, Unit C				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	12/17/2013	7.40	60.68	48,721

Design:	As Drilled				
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	179.80	

Survey Program		Date	1/20/2014	
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
100.0	5,174.0	GYRO (BHL: 980'FNL, 2306'FWL, Sec. 14	MWD	MWD - Standard
5,215.0	11,550.0	MWD #1 (BHL: 980'FNL, 2306'FWL, Sec.	MWD	MWD - Standard

Survey	Measured	Inclination	Azimuth	Vertical	+N-S	+E-W	Vertical	Dogleg	Build	Turn
	Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate
	(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)
	5,174.0	0.42	314.20	5,173.2	8.4	-13.2	-8.5	0.00	0.00	0.00
	5,215.0	0.50	299.10	5,214.2	8.6	-13.5	-8.6	0.35	0.20	-36.83
	5,246.0	0.60	253.50	5,245.2	8.6	-13.7	-8.7	1.41	0.32	-147.10
	KOP - 5246.0 MD, 0.60° INC, 253.50° AZI									
	5,278.0	1.70	224.30	5,277.2	8.2	-14.2	-8.3	3.79	3.44	-91.25
	5,309.0	3.20	217.10	5,308.1	7.2	-15.1	-7.3	4.93	4.84	-23.23
	5,341.0	5.70	206.60	5,340.0	5.1	-16.3	-5.1	8.18	7.81	-32.81



Wellplanning Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Surface : 330'FNL, 2320'FWL, SEC 11, T17S, R32E, Unit C
Project:	Lea County, NM	TVD Reference:	WELL @ 4176.5usft (Original Well Elev)
Site:	Pan Head Fee #4H	MD Reference:	WELL @ 4176.5usft (Original Well Elev)
Well:	Surface : 330'FNL, 2320'FWL, SEC 11, T17S, R32E, Unit C	North Reference:	Grid
Wellbore:	BHL 980'FNL, 2306'FWL, Sec. 14, T17S, R32E, Unit C	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	EDM 5000.1 Single User Db

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)
5,372.0	9.50	200.40	5,370.8	1.3	-17.9	-1.4	12.52	12.26	-20.00
5,404.0	13.30	198.30	5,402.1	-4.7	-20.0	4.6	11.94	11.88	-6.56
5,436.0	16.90	197.50	5,433.0	-12.6	-22.5	12.5	11.27	11.25	-2.50
5,467.0	20.60	197.10	5,462.4	-22.1	-25.5	22.0	11.94	11.94	-1.29
5,499.0	23.60	197.10	5,492.0	-33.6	-29.0	33.5	9.38	9.38	0.00
5,530.0	25.10	197.80	5,520.3	-45.8	-32.9	45.7	4.93	4.84	2.26
5,562.0	27.30	201.00	5,549.0	-59.1	-37.6	59.0	8.17	6.88	10.00
5,593.0	31.10	203.60	5,576.0	-73.1	-43.3	73.0	12.92	12.26	8.39
5,625.0	34.80	206.60	5,602.9	-88.9	-50.7	88.7	12.63	11.56	9.38
5,656.0	37.80	207.50	5,627.9	-105.2	-59.1	105.0	9.83	9.68	2.90
5,688.0	40.50	206.20	5,652.7	-123.2	-68.2	123.0	8.82	8.44	-4.06
5,720.0	43.80	205.90	5,676.4	-142.5	-77.6	142.2	10.33	10.31	-0.94
5,751.0	47.70	204.70	5,698.0	-162.6	-87.1	162.3	12.88	12.58	-3.87
5,783.0	52.00	202.50	5,718.7	-185.0	-96.9	184.7	14.43	13.44	-6.88
5,814.0	56.20	199.60	5,736.8	-208.4	-105.9	208.1	15.52	13.55	-9.35
5,846.0	60.40	197.10	5,753.6	-234.3	-114.4	233.9	14.71	13.13	-7.81
5,877.0	64.40	195.50	5,768.0	-260.6	-122.1	260.2	13.69	12.90	-5.16
5,909.0	67.40	193.90	5,781.1	-288.9	-129.6	288.4	10.43	9.38	-5.00
5,940.0	70.00	192.00	5,792.3	-317.0	-136.0	316.5	10.15	8.39	-6.13
5,972.0	72.20	189.70	5,802.7	-346.8	-141.7	346.3	9.67	6.88	-7.19
6,003.0	74.30	187.60	5,811.6	-376.1	-146.2	375.6	9.38	6.77	-6.77
6,034.0	76.80	186.40	5,819.4	-405.9	-149.8	405.4	8.89	8.06	-3.87
6,065.0	78.60	185.70	5,826.0	-436.0	-153.0	435.5	6.21	5.81	-2.26
6,097.0	80.30	185.30	5,831.8	-467.3	-156.0	466.8	5.45	5.31	-1.25
6,129.0	82.70	184.40	5,836.6	-498.9	-158.7	498.3	8.00	7.50	-2.81
6,161.0	85.70	184.40	5,839.8	-530.6	-161.2	530.0	9.38	9.38	0.00
6,192.0	88.10	184.30	5,841.5	-561.5	-163.5	560.9	7.75	7.74	-0.32
6,224.0	89.20	182.90	5,842.2	-593.4	-165.5	592.8	5.56	3.44	-4.38
6,255.0	90.00	182.00	5,842.4	-624.4	-166.8	623.8	3.88	2.58	-2.90
EOC- 6255.0 'MD, 90.00° INC, 182.00° AZI									
6,287.0	90.40	180.80	5,842.3	-656.3	-167.6	655.8	3.95	1.25	-3.75
6,318.0	90.50	179.60	5,842.1	-687.3	-167.7	686.8	3.88	0.32	-3.87
6,349.0	89.30	178.00	5,842.1	-718.3	-167.1	717.7	6.45	-3.87	-5.16
6,381.0	88.10	176.60	5,842.9	-750.3	-165.6	749.7	5.76	-3.75	-4.38
6,412.0	87.80	175.30	5,844.0	-781.2	-163.4	780.6	4.30	-0.97	-4.19
6,444.0	88.00	174.60	5,845.1	-813.0	-160.6	812.5	2.27	0.63	-2.19
6,475.0	87.80	174.00	5,846.3	-843.9	-157.5	843.3	2.04	-0.65	-1.94
6,507.0	87.20	173.10	5,847.7	-875.6	-153.9	875.1	3.38	-1.88	-2.81
6,538.0	87.10	172.10	5,849.2	-906.3	-149.9	905.8	3.24	-0.32	-3.23
6,570.0	87.10	171.30	5,850.8	-938.0	-145.3	937.5	2.50	0.00	-2.50
6,601.0	87.30	170.10	5,852.4	-968.5	-140.3	968.0	3.92	0.65	-3.87
6,633.0	88.10	169.30	5,853.6	-1,000.0	-134.6	999.5	3.53	2.50	-2.50



Wellplanning Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Surface: 330'FNL, 2320'FWL, SEC 11, T17S, R32E, Unit C
Project:	Lea County, NM	TVD Reference:	WELL @ 4176.5usft (Original Well Elev)
Site:	Pan Head Fee #4H	MD Reference:	WELL @ 4176.5usft (Original Well Elev)
Well:	Surface: 330'FNL, 2320'FWL, SEC 11, T17S, R32E, Unit C	North Reference:	Grid
Wellbore:	BHL: 980'FNL, 2306'FWL, Sec. 14, T17S, R32E, Unit C	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	EDM 5000.1 Single User Db

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)
6,665.0	88.70	168.70	5,854.5	-1,031.4	-128.5	1,030.9	2.65	1.88	-1.88
6,696.0	88.70	167.90	5,855.2	-1,061.7	-122.2	1,061.3	2.58	0.00	-2.58
6,728.0	88.90	167.40	5,855.9	-1,093.0	-115.3	1,092.6	1.68	0.63	-1.56
6,760.0	89.30	167.40	5,856.4	-1,124.2	-108.4	1,123.8	1.25	1.25	0.00
6,791.0	90.00	167.50	5,856.6	-1,154.5	-101.6	1,154.1	2.28	2.26	0.32
6,823.0	91.00	168.10	5,856.3	-1,185.7	-94.9	1,185.4	3.64	3.13	1.88
6,854.0	91.70	169.10	5,855.6	-1,216.1	-88.7	1,215.8	3.94	2.26	3.23
6,886.0	91.50	170.20	5,854.7	-1,247.6	-83.0	1,247.3	3.49	-0.63	3.44
6,917.0	91.50	171.30	5,853.9	-1,278.2	-78.0	1,277.9	3.55	0.00	3.55
6,949.0	91.50	172.10	5,853.0	-1,309.8	-73.4	1,309.6	2.50	0.00	2.50
6,981.0	91.60	172.80	5,852.2	-1,341.5	-69.2	1,341.3	2.21	0.31	2.19
7,012.0	91.90	173.20	5,851.2	-1,372.3	-65.4	1,372.1	1.61	0.97	1.29
7,044.0	91.30	174.40	5,850.3	-1,404.1	-62.0	1,403.9	4.19	-1.88	3.75
7,075.0	91.20	175.60	5,849.7	-1,435.0	-59.3	1,434.7	3.88	-0.32	3.87
7,107.0	91.10	176.40	5,849.0	-1,466.9	-57.0	1,466.7	2.52	-0.31	2.50
7,138.0	90.70	177.00	5,848.5	-1,497.8	-55.2	1,497.6	2.33	-1.29	1.94
7,170.0	90.30	177.60	5,848.3	-1,529.8	-53.7	1,529.6	2.25	-1.25	1.88
7,201.0	90.30	177.50	5,848.1	-1,560.8	-52.4	1,560.6	0.32	0.00	-0.32
7,232.0	90.60	177.30	5,847.8	-1,591.7	-51.0	1,591.5	1.16	0.97	-0.65
7,295.0	90.20	177.80	5,847.4	-1,654.7	-48.3	1,654.5	1.02	-0.63	0.79
7,358.0	90.00	178.90	5,847.3	-1,717.6	-46.5	1,717.5	1.77	-0.32	1.75
7,421.0	90.00	178.70	5,847.3	-1,780.6	-45.2	1,780.5	0.32	0.00	-0.32
7,485.0	90.20	178.60	5,847.2	-1,844.6	-43.7	1,844.4	0.35	0.31	-0.16
7,548.0	90.20	178.60	5,847.0	-1,907.6	-42.1	1,907.4	0.00	0.00	0.00
7,642.0	89.80	178.40	5,847.0	-2,001.6	-39.7	2,001.4	0.48	-0.43	-0.21
7,737.0	89.90	177.20	5,847.2	-2,096.5	-36.0	2,096.3	1.27	0.11	-1.26
7,782.0	90.00	179.00	5,847.3	-2,141.5	-34.5	2,141.3	4.01	0.22	4.00
7,926.0	88.40	177.80	5,849.3	-2,285.4	-30.5	2,285.3	1.39	-1.11	-0.83
8,020.0	89.40	179.30	5,851.1	-2,379.3	-28.1	2,379.2	1.92	1.06	1.60
8,115.0	90.50	179.30	5,851.1	-2,474.3	-27.0	2,474.2	1.16	1.16	0.00
8,210.0	90.30	179.30	5,850.5	-2,569.3	-25.8	2,569.2	0.21	-0.21	0.00
8,304.0	90.40	179.90	5,849.9	-2,663.3	-25.2	2,663.2	0.65	0.11	0.64
8,399.0	90.70	180.50	5,849.0	-2,758.3	-25.5	2,758.2	0.71	0.32	0.63
8,493.0	90.10	179.70	5,848.3	-2,852.3	-25.7	2,852.2	1.06	-0.64	-0.85
8,588.0	91.20	179.60	5,847.3	-2,947.3	-25.1	2,947.2	1.16	1.16	-0.11
8,683.0	89.70	179.30	5,846.5	-3,042.3	-24.2	3,042.2	1.61	-1.58	-0.32
8,777.0	90.00	179.50	5,846.8	-3,136.3	-23.2	3,136.2	0.38	0.32	0.21
8,872.0	89.40	179.30	5,847.3	-3,231.3	-22.2	3,231.2	0.67	-0.63	-0.21
8,967.0	89.20	179.30	5,848.4	-3,326.2	-21.0	3,326.2	0.21	-0.21	0.00
9,062.0	88.50	178.90	5,850.3	-3,421.2	-19.5	3,421.1	0.85	-0.74	-0.42
9,156.0	89.50	180.50	5,852.0	-3,515.2	-19.0	3,515.1	2.01	1.06	1.70
9,251.0	88.80	180.50	5,853.4	-3,610.2	-19.9	3,610.1	0.74	-0.74	0.00



Wellplanning Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Surface : 330'FNI, 2320'FWL, SEC 11, T17S, R32E, Unit C
Project:	Lea County, NM	TVD Reference:	WELL @ 4176.5usft (Original Well Elev)
Site:	Pan Head Fee #4H	MD Reference:	WELL @ 4176.5usft (Original Well Elev)
Well:	Surface : 330'FNI, 2320'FWL, SEC 11, T17S, R32E, Unit C	North Reference:	Grid
Wellbore:	BHL: 980'FNL, 2306'FWL, Sec. 14, T17S, R32E, Unit C	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	EDM 5000.1 Single User Db

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)
9,345.0	89.10	180.50	5,855.1	-3,704.2	-20.7	3,704.1	0.32	0.32	0.00
9,440.0	89.70	179.30	5,856.1	-3,799.2	-20.5	3,799.1	1.41	0.63	-1.26
9,535.0	90.90	179.00	5,855.6	-3,894.1	-19.1	3,894.1	1.30	1.26	-0.32
9,627.0	91.40	178.60	5,853.8	-3,986.1	-17.2	3,986.0	0.70	0.54	-0.43
9,722.0	90.70	179.20	5,852.0	-4,081.1	-15.4	4,081.0	0.97	-0.74	0.63
9,816.0	91.50	179.20	5,850.2	-4,175.0	-14.1	4,175.0	0.85	0.85	0.00
9,911.0	90.00	179.10	5,849.0	-4,270.0	-12.6	4,269.9	1.58	-1.58	-0.11
10,005.0	90.50	179.00	5,848.6	-4,364.0	-11.1	4,363.9	0.54	0.53	-0.11
10,100.0	89.80	179.20	5,848.3	-4,459.0	-9.6	4,458.9	0.77	-0.74	0.21
10,195.0	89.60	178.80	5,848.8	-4,554.0	-7.9	4,553.9	0.47	-0.21	-0.42
10,289.0	90.40	178.70	5,848.8	-4,648.0	-5.9	4,647.9	0.86	0.85	-0.11
10,383.0	89.80	178.70	5,848.6	-4,741.9	-3.7	4,741.9	0.64	-0.64	0.00
10,478.0	89.70	179.60	5,849.1	-4,836.9	-2.3	4,836.9	0.95	-0.11	0.95
10,573.0	89.70	180.80	5,849.6	-4,931.9	-2.7	4,931.9	1.26	0.00	1.26
10,667.0	89.80	180.30	5,850.0	-5,025.9	-3.6	5,025.9	0.54	0.11	-0.53
10,762.0	89.70	181.10	5,850.4	-5,120.9	-4.7	5,120.9	0.85	-0.11	0.84
10,857.0	89.90	180.90	5,850.7	-5,215.9	-6.4	5,215.8	0.30	0.21	-0.21
10,952.0	89.80	180.80	5,851.0	-5,310.9	-7.8	5,310.8	0.15	-0.11	-0.11
11,047.0	90.00	180.70	5,851.1	-5,405.9	-9.0	5,405.8	0.24	0.21	-0.11
11,142.0	90.00	180.80	5,851.1	-5,500.9	-10.3	5,500.8	0.11	0.00	0.11
11,237.0	90.00	180.60	5,851.1	-5,595.8	-11.4	5,595.8	0.21	0.00	-0.21
11,331.0	90.10	180.40	5,851.0	-5,689.8	-12.3	5,689.8	0.24	0.11	-0.21
11,426.0	89.90	180.20	5,851.0	-5,784.8	-12.8	5,784.8	0.30	-0.21	-0.21
11,505.0	89.80	180.30	5,851.2	-5,863.8	-13.1	5,863.8	0.18	-0.13	0.13
11,550.0	89.80	180.30	5,851.4	-5,908.8	-13.3	5,908.8	0.00	0.00	0.00
BHL- 11550.0 'MD, 89.80° INC, 180.30° AZI - PBHL(Pan Fee #4H)									

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates	+N/-S (usft)	+E/-W (usft)	Comment
5,246.0	5,245.2	8.6	-13.7		KOP - 5246.0 'MD, 0.60° INC, 253.50° AZI
6,255.0	5,842.4	-624.4	-166.8		EOC- 6255.0 'MD, 90.00° INC, 182.00° AZI
11,550.0	5,851.4	-5,908.8	-13.3		BHL- 11550.0 'MD, 89.80° INC, 180.30° AZI

Checked By: _____	Approved By: _____	Date: _____
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A GYRO TECHNOLOGIES INC. COMPANY

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

HOBBS OCD

January 23, 2014

MAY 12 2014

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

RECEIVED

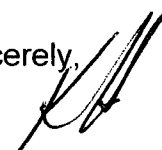
Attn: Kanicia Castillo

Re: **Pan Head Fee No 004H**

Please find enclosed a copy of the survey from 0' to 5,174' ran on the above referenced well.

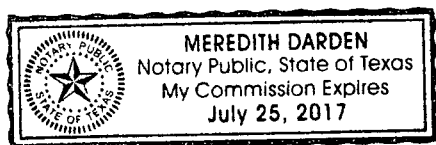
If I can be of any further service, please do not hesitate to call me at 800-606-4976.

Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 23rd day of January A.D., 2014, by Keith Havelka.




Meredith Darden
Notary Public, State of Texas



Company: COG Operating-Concho
Lease/Well: Pan Head Fee/No 004H
Location: S11 T17s R32e
Rig Name: UDI #43
State/County: New Mexico/Lea
Latitude: 32.86, Longitude: -103.74
GRID North is 0.32 Degrees East of True North
VS-Azi: 0.00 Degrees



RKB : 12.5 Feet

HOBBS OCD

DRILLOG HA GYRO SURVEY CALCULATIONS

MAY 12 2014

Filename: pan head fee #4h gyro survey.ut

Minimum Curvature Method

Report Date/Time: 1/23/2014 / 09:18

RECEIVED

Vaughn Energy Services

(432) 563-5444

Gardendale, TX

Surveyor: Dustin Wedel

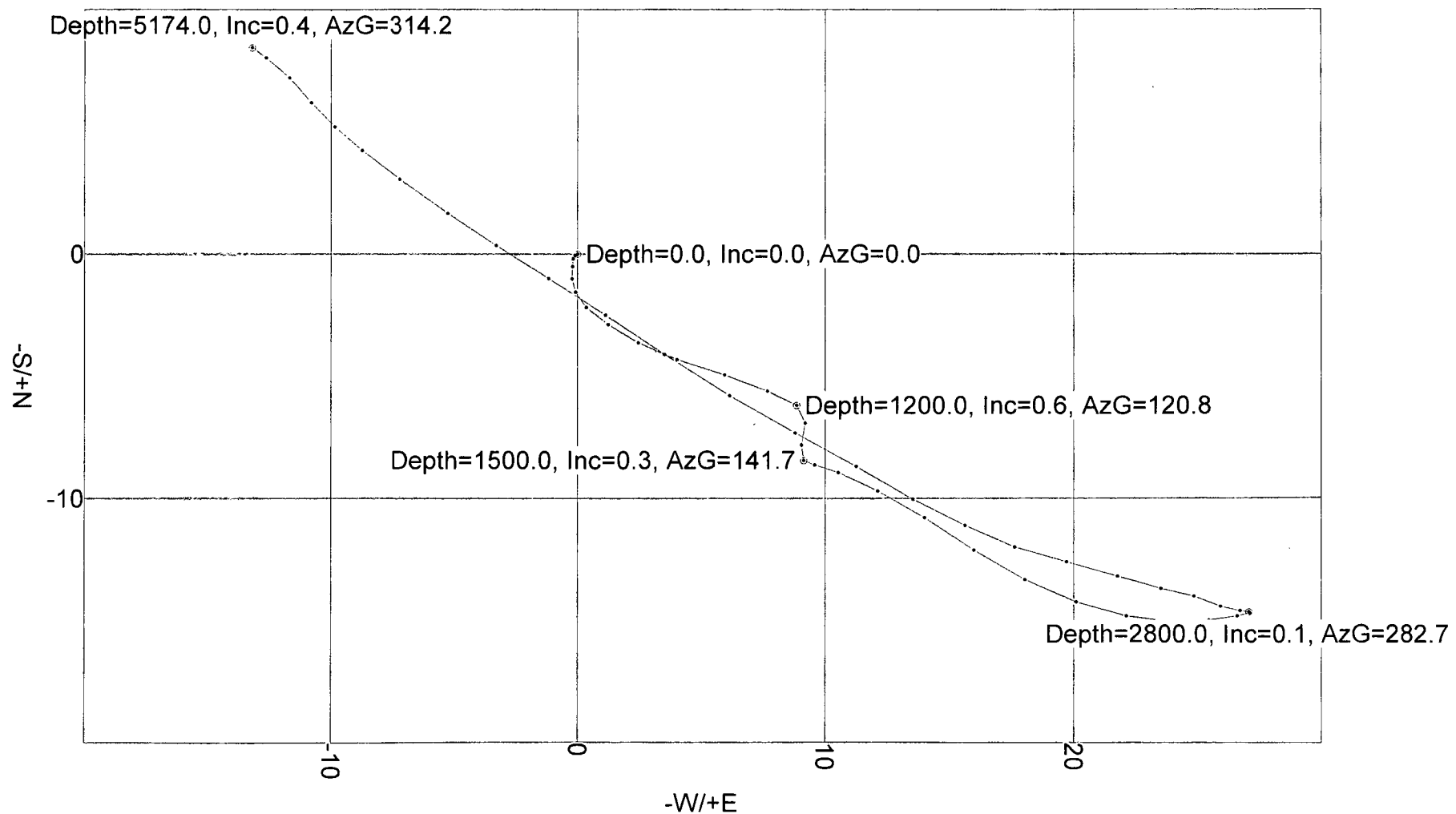
Pan Head Fee No 004H / API 30-025-40888

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	0.13	237.49	100.00	-0.06	-0.09	0.11	237.49	0.13
200.00	0.09	174.14	200.00	-0.20	-0.18	0.27	222.36	0.12
300.00	0.28	186.07	300.00	-0.52	-0.20	0.55	201.02	0.19
400.00	0.30	178.92	400.00	-1.01	-0.22	1.04	192.19	0.04
500.00	0.37	155.46	500.00	-1.56	-0.08	1.56	183.00	0.15
600.00	0.52	138.39	599.99	-2.19	0.35	2.22	170.88	0.20
700.00	0.78	122.12	699.99	-2.89	1.23	3.14	156.98	0.32
800.00	0.86	121.20	799.98	-3.64	2.45	4.39	146.10	0.08
900.00	1.10	107.54	899.96	-4.32	4.01	5.89	137.15	0.34
1000.00	1.22	108.73	999.94	-4.95	5.93	7.73	129.85	0.12
1100.00	0.92	113.51	1099.92	-5.61	7.67	9.51	126.18	0.31
1200.00	0.59	120.77	1199.92	-6.19	8.85	10.80	124.99	0.35
1300.00	0.54	191.54	1299.91	-6.92	9.20	11.51	126.95	0.65
1400.00	0.50	187.43	1399.91	-7.81	9.05	11.95	130.81	0.05
1500.00	0.28	141.71	1499.91	-8.44	9.14	12.44	132.71	0.36
1600.00	0.33	89.13	1599.90	-8.63	9.59	12.90	131.99	0.28
1700.00	0.83	115.41	1699.90	-8.94	10.53	13.81	130.32	0.56
1800.00	1.18	115.80	1799.88	-9.70	12.11	15.52	128.67	0.34

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	1.32	124.03	1899.86	-10.79	13.99	17.67	127.63	0.23
2000.00	1.41	123.25	1999.83	-12.10	15.97	20.04	127.16	0.09
2100.00	1.33	118.10	2099.80	-13.32	18.02	22.41	126.48	0.14
2200.00	1.27	109.46	2199.78	-14.24	20.10	24.63	125.32	0.20
2300.00	1.14	102.55	2299.75	-14.83	22.12	26.63	123.84	0.20
2400.00	0.93	90.37	2399.74	-15.05	23.90	28.25	122.20	0.31
2500.00	0.83	83.75	2499.73	-14.98	25.43	29.51	120.50	0.14
2600.00	0.50	78.54	2599.72	-14.81	26.58	30.43	119.13	0.33
2700.00	0.09	67.61	2699.72	-14.70	27.08	30.81	118.49	0.41
2800.00	0.12	282.73	2799.72	-14.64	27.05	30.76	118.43	0.20
2900.00	0.29	275.70	2899.72	-14.59	26.69	30.42	118.67	0.18
3000.00	0.64	286.24	2999.71	-14.41	25.90	29.64	119.10	0.36
3100.00	0.66	296.13	3099.71	-14.00	24.84	28.51	119.41	0.11
3200.00	0.93	273.98	3199.70	-13.69	23.51	27.21	120.21	0.40
3300.00	1.19	295.53	3299.68	-13.18	21.76	25.44	121.21	0.47
3400.00	1.28	277.18	3399.66	-12.60	19.71	23.39	122.58	0.40
3500.00	1.26	295.42	3499.63	-11.98	17.61	21.30	124.23	0.40
3600.00	1.24	292.28	3599.61	-11.10	15.62	19.16	125.41	0.07
3700.00	1.47	301.21	3699.58	-10.03	13.52	16.84	126.56	0.31
3800.00	1.56	299.95	3799.55	-8.69	11.25	14.22	127.67	0.10
3900.00	1.66	298.37	3899.51	-7.32	8.80	11.44	129.76	0.11
4000.00	1.85	301.23	3999.46	-5.79	6.14	8.44	133.34	0.21
4100.00	1.73	304.04	4099.41	-4.11	3.51	5.40	139.53	0.15
4200.00	1.56	304.01	4199.37	-2.50	1.13	2.74	155.79	0.17
4300.00	1.57	302.82	4299.33	-1.00	-1.16	1.53	229.17	0.03
4400.00	1.30	302.60	4399.30	0.35	-3.26	3.28	276.21	0.27
4500.00	1.40	304.75	4499.27	1.66	-5.22	5.48	287.66	0.11
4600.00	1.35	306.12	4599.25	3.05	-7.17	7.79	293.04	0.06
4700.00	0.89	308.08	4699.23	4.22	-8.73	9.70	295.80	0.46
4800.00	0.81	313.31	4799.22	5.18	-9.86	11.14	297.75	0.11
4900.00	0.77	319.39	4899.21	6.18	-10.81	12.45	299.76	0.09
5000.00	0.77	318.36	4999.20	7.20	-11.70	13.73	301.60	0.01
5100.00	0.68	301.96	5099.19	8.01	-12.65	14.97	302.36	0.23
5174.00	0.42	314.20	5173.19	8.44	-13.22	15.68	302.55	0.39



Vaughn Energy Services
(432) 563-5444
Gardendale, TX
Surveyor: Dustin Wedel
Pan Head Fee No 004H / API 30-025-40888



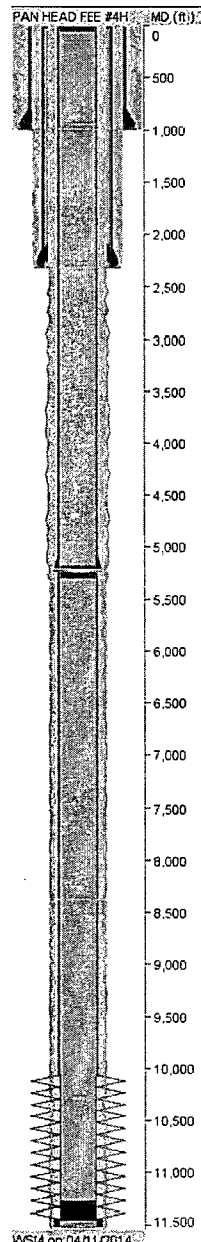
VES Survey Date: 01/07/2014

ID: 30-025-40888

Well Name: PAN HEAD FEE #4H

Event#: 2

Report Dates: 04/11/2014



PIPE SPECIFICATION

STRING NAME	SECTION NAME	JOINT COUNT	START DEPTH	END DEPTH	LENGTH	OD SIZE	ID SIZE	WT GRDNT	GRD	CONN
SURFACE	FLOAT SHOE		988.00	990.00	2.00	13.38	12.62	54.5	J-55	STC
SURFACE	CASING	1	942.88	988.00	45.12	13.38	12.62	54.5	J-55	STC
SURFACE	FLOAT COLLAR		940.88	942.88	2.00	13.38	12.62	54.5	J-55	STC
SURFACE	CASING	21	13.87	940.88	946.01	13.38	12.62	54.5	J-55	STC
PRODUCTION	FLOAT SHOE		11508.28	11511.78	3.50	5.50	4.89	17.0	L-80	LTC
PRODUCTION	CASING	1	11464.10	11508.28	44.18	5.50	4.89	17.0	L-80	LTC
PRODUCTION	FLOAT COLLAR		11461.60	11464.10	2.50	5.50	4.89	17.0	L-80	LTC
PRODUCTION	CASING	143	5241.58	11461.60	6220.02	5.50	4.89	17.0	L-80	LTC
PRODUCTION	MARKER JOINT		5222.56	5241.58	19.02	5.50	4.89	17.0	L-80	LTC
PRODUCTION	CASING	120	12.50	5222.56	5226.56	5.50	4.89	17.0	L-80	LTC
PRODUCTION				12.50	12.50					
INTERMEDIATE	FLOAT SHOE		2318.00	2320.00	2.00	9.63	8.84	40.0	J-55	LTC
INTERMEDIATE	CASING	1	2274.11	2318.00	43.89	9.63	8.84	40.0	J-55	LTC
INTERMEDIATE	FLOAT COLLAR		2272.11	2274.11	2.00	9.63	8.84	40.0	J-55	LTC
INTERMEDIATE	CASING	52	12.50	2272.11	2276.76	9.63	8.84	40.0	J-55	LTC

CEMENTING

STRING NAME	STAGE #	LEAD TOP (est) (ft)	LEAD TOP (ver) (ft)	TAIL TOP (est) (ft)	TAIL TOP (ver) (ft)
SURFACE	1	0.0	0.0	0.0	0.0
PRODUCTION	1	0.0	0.0	0.0	0.0
INTERMEDIATE	1	0.0	0.0	0.0	0.0

BHA STRING

DRILL EQUIP CODE	DESCRIPTION	LENGTH	OD SIZE	ID SIZE
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PERFORATION

ZONE	JOB REPORT DATE	ZONE NAME	TOP DEPTH	BOTTOM DEPTH	HOLE SIZE	PEN SIZE	SQUEEZED
1	01/29/2014	PADDOCK	10121.00	10122.00	0.43	23.54	
1	01/29/2014	PADDOCK	10236.00	10237.00	0.43	23.54	N
1	01/29/2014	PADDOCK	10351.00	10352.00	0.43	23.54	N
1	01/29/2014	PADDOCK	10456.00	10458.00	0.43	23.54	N
1	01/29/2014	PADDOCK	10578.00	10579.00	0.43	23.54	
1	01/29/2014	PADDOCK	10696.00	10697.00	0.43	23.54	N
1	01/29/2014	PADDOCK	10808.00	10809.00	0.43	23.54	N
1	01/29/2014	PADDOCK	10926.00	10927.00	0.43	23.54	N
1	01/29/2014	PADDOCK	11041.00	11042.00	0.43	23.54	
1	01/29/2014	PADDOCK	11156.00	11157.00	0.43	23.54	N
1	01/29/2014	PADDOCK	11271.00	11272.00	0.43	23.54	N
1	01/29/2014	PADDOCK	11386.00	11387.00	0.43	23.54	N