



HOBBS OCD

SEP 26 2016

RECEIVED

COG Operating LLC

Lea County, NM (NAD-27 2015)

Pan Head Fee #11H

API #: 30-025-42817

SHL: 195' FNL, 600' FWL, Sec 11, T17S, R32E, Unit D

PP: 330' FNL, 348' FWL, Sec 11, T17S, R32E, Unit D

BHL: 968' FNL, 345' FWL, Sec 14, T17S, R32E, Unit D

Design: BHL: 969' FNL, 350' FWL, Sec 14, T17S, R32E, Unit D

Standard Survey Report

13 June, 2016





TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Pan Head Fee #11H
Project:	Lea County, NM (NAD-27 2015)	TVD Reference:	KB @ 4188.00usft (Patriot 6)
Site:	Pan Head Fee #11H	MD Reference:	KB @ 4188.00usft (Patriot 6)
Well:	SHL: 195' FNL, 600' FWL, Sec 11, T17S, R32E, Unit D	North Reference:	Grid
Wellbore:	BHL: 969' FNL, 350' FWL, Sec 14, T17S, R32E, Unit D	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 969' FNL, 350' FWL, Sec 14, T17S, R32E, Unit D	Database:	EDM 5000.1 Single User Db

Project	Lea County, NM (NAD-27 2015)		
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 #11H, Sec 11, T-17S, R-32E, Unit D				
Site Position:		Northing:	675,514.10 usft	Latitude:	32° 51' 20.450 N
From:	Map	Easting:	681,209.30 usft	Longitude:	103° 44' 35.649 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	0.32 °

Well	SHL: 195' FNL, 600' FWL, Sec 11, T17S, R32E, Unit D					
Well Position	+N/-S	0.00 usft	Northing:	675,514.10 usft	Latitude:	32° 51' 20.450 N
	+E/-W	0.00 usft	Easting:	681,209.30 usft	Longitude:	103° 44' 35.649 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,170.00 usft

Wellbore	BHL: 969' FNL, 350' FWL, Sec 14, T17S, R32E, Unit D				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	5/17/2016	7.20	60.63	48,401

Design	BHL: 969' FNL, 350' FWL, Sec 14, T17S, R32E, Unit D				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	182.03	

Survey Program	Date	6/13/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	2,340.00	VES Gyro #1 (BHL: 969' FNL, 350' FWL,	VES-ISCWSA-GYRO-3	Biaxial Semi-Cont. Gyro	
2,472.00	11,857.00	TDS MWD #1 (BHL: 969' FNL, 350' FWL,	MWD	MWD - Standard	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.30	313.24	100.00	0.18	-0.19	-0.17	0.30	0.30	0.00	
200.00	0.39	342.14	200.00	0.68	-0.49	-0.66	0.19	0.09	28.90	
300.00	0.32	321.88	300.00	1.23	-0.76	-1.20	0.14	-0.07	-20.26	
400.00	0.42	328.69	399.99	1.76	-1.13	-1.72	0.11	0.10	6.81	
500.00	0.54	333.59	499.99	2.49	-1.53	-2.44	0.13	0.12	4.90	
600.00	0.58	329.22	599.99	3.35	-1.99	-3.28	0.06	0.04	-4.37	

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Wellbore:	BHL: 969' FNL, 350' FWL, Sec 14, T17S, R32E, Unit D	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 969' FNL, 350' FWL, Sec 14, T17S, R32E, Unit D	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
700.00	0.60	328.12	699.98	4.23	-2.53	-4.14	0.02	0.02	-1.10
800.00	0.31	327.86	799.98	4.90	-2.95	-4.80	0.29	-0.29	-0.26
900.00	0.23	324.10	899.98	5.30	-3.21	-5.18	0.08	-0.08	-3.76
1,000.00	0.19	321.77	999.98	5.59	-3.43	-5.46	0.04	-0.04	-2.33
1,100.00	0.27	281.57	1,099.97	5.77	-3.77	-5.63	0.18	0.08	-40.20
1,200.00	0.39	274.72	1,199.97	5.84	-4.34	-5.68	0.13	0.12	-6.85
1,300.00	0.56	243.46	1,299.97	5.65	-5.11	-5.47	0.30	0.17	-31.26
1,400.00	0.52	231.72	1,399.97	5.15	-5.91	-4.94	0.12	-0.04	-11.74
1,500.00	0.47	234.50	1,499.96	4.63	-6.60	-4.40	0.06	-0.05	2.78
1,600.00	0.58	209.45	1,599.96	3.95	-7.18	-3.70	0.25	0.11	-25.05
1,700.00	0.58	217.58	1,699.95	3.11	-7.74	-2.84	0.08	0.00	8.13
1,800.00	0.53	197.10	1,799.95	2.27	-8.18	-1.98	0.20	-0.05	-20.48
1,900.00	0.49	189.57	1,899.94	1.40	-8.39	-1.11	0.08	-0.04	-7.53
2,000.00	0.67	173.45	1,999.94	0.40	-8.39	-0.10	0.24	0.18	-16.12
2,100.00	0.53	151.83	2,099.93	-0.59	-8.11	0.87	0.26	-0.14	-21.62
2,200.00	0.65	155.35	2,199.93	-1.51	-7.65	1.78	0.13	0.12	3.52
2,300.00	0.44	151.36	2,299.92	-2.36	-7.23	2.62	0.21	-0.21	-3.99
2,340.00	0.70	148.27	2,339.92	-2.70	-7.03	2.95	0.65	0.65	-7.73
Tie-In to VES Gyro									
2,472.00	0.70	150.60	2,471.91	-4.09	-6.21	4.31	0.02	0.00	1.77
First TDS MWD Survey									
2,567.00	1.00	330.30	2,566.91	-3.88	-6.34	4.10	1.79	0.32	189.16
2,663.00	2.00	318.60	2,662.87	-1.89	-7.86	2.17	1.08	1.04	-12.19
2,758.00	4.10	310.20	2,757.73	1.54	-11.55	-1.13	2.25	2.21	-8.84
2,853.00	6.30	307.60	2,852.34	6.91	-18.27	-6.26	2.33	2.32	-2.74
2,948.00	7.80	306.70	2,946.62	13.95	-27.57	-12.96	1.58	1.58	-0.95
3,044.00	7.90	308.40	3,041.72	21.94	-37.97	-20.58	0.26	0.10	1.77
3,139.00	7.70	309.80	3,135.84	30.07	-47.97	-28.35	0.29	-0.21	1.47
3,234.00	7.90	311.40	3,229.96	38.46	-57.76	-36.39	0.31	0.21	1.68
3,329.00	7.70	310.20	3,324.08	46.89	-67.52	-44.46	0.27	-0.21	-1.26
3,425.00	7.70	306.40	3,419.22	54.85	-77.61	-52.07	0.53	0.00	-3.96
3,520.00	6.70	300.30	3,513.47	61.43	-87.51	-58.29	1.32	-1.05	-6.42
3,616.00	6.20	300.20	3,608.86	66.86	-96.83	-63.39	0.52	-0.52	-0.10
3,711.00	6.50	308.80	3,703.28	72.81	-105.45	-69.03	1.05	0.32	9.05
3,806.00	8.00	309.10	3,797.52	80.35	-114.77	-76.23	1.58	1.58	0.32
3,901.00	8.30	309.80	3,891.56	88.91	-125.17	-84.42	0.33	0.32	0.74
3,997.00	8.50	299.30	3,986.53	96.81	-136.68	-91.91	1.61	0.21	-10.94
4,092.00	7.80	298.80	4,080.57	103.36	-148.46	-98.03	0.74	-0.74	-0.53
4,187.00	8.20	299.90	4,174.65	109.84	-159.98	-104.10	0.45	0.42	1.16
4,283.00	7.10	299.60	4,269.79	116.18	-171.07	-110.05	1.15	-1.15	-0.31
4,378.00	7.20	299.60	4,364.05	122.02	-181.35	-115.52	0.11	0.11	0.00
4,473.00	6.80	299.60	4,458.34	127.74	-191.42	-120.88	0.42	-0.42	0.00

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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)	
4,568.00	7.20	299.00	4,552.64	133.41	-201.52	-126.18	0.43	0.42	-0.63	
4,663.00	6.90	303.90	4,646.92	139.47	-211.46	-131.90	0.71	-0.32	5.16	
4,758.00	5.80	312.70	4,741.34	145.91	-219.73	-138.04	1.54	-1.16	9.26	
4,854.00	5.50	316.30	4,836.87	152.53	-226.47	-144.41	0.48	-0.31	3.75	
4,949.00	5.80	319.20	4,931.41	159.45	-232.75	-151.11	0.44	0.32	3.05	
5,044.00	5.00	316.00	5,025.99	166.07	-238.76	-157.50	0.90	-0.84	-3.37	
5,139.00	3.40	302.70	5,120.73	170.57	-244.01	-161.82	1.96	-1.68	-14.00	
5,235.00	1.70	289.40	5,216.63	172.58	-247.75	-163.69	1.86	-1.77	-13.85	
5,298.00	1.00	231.40	5,279.62	172.54	-249.06	-163.61	2.29	-1.11	-92.06	
5,330.00	2.40	187.00	5,311.60	171.71	-249.36	-162.76	5.70	4.38	-138.75	
5,363.00	4.00	185.30	5,344.55	169.87	-249.55	-160.93	4.86	4.85	-5.15	
5,395.00	6.70	182.20	5,376.41	166.90	-249.73	-157.95	8.48	8.44	-9.69	
5,427.00	9.60	181.70	5,408.08	162.36	-249.88	-153.41	9.07	9.06	-1.56	
5,459.00	12.10	182.70	5,439.51	156.34	-250.11	-147.39	7.83	7.81	3.13	
5,490.00	15.80	179.10	5,469.59	148.88	-250.20	-139.92	12.25	11.94	-11.61	
5,522.00	20.20	179.10	5,500.02	138.99	-250.05	-130.05	13.75	13.75	0.00	
5,554.00	24.80	181.00	5,529.57	126.75	-250.08	-117.81	14.55	14.38	5.94	
5,585.00	28.00	181.90	5,557.34	112.97	-250.43	-104.03	10.40	10.32	2.90	
5,617.00	30.90	180.60	5,585.20	97.25	-250.77	-88.30	9.28	9.06	-4.06	
5,649.00	34.30	178.90	5,612.15	80.01	-250.68	-71.08	11.00	10.63	-5.31	
5,680.00	38.30	178.20	5,637.13	61.67	-250.21	-52.77	12.97	12.90	-2.26	
5,712.00	42.10	178.50	5,661.57	41.03	-249.62	-32.16	11.89	11.88	0.94	
5,744.00	45.30	178.90	5,684.70	18.93	-249.12	-10.09	10.04	10.00	1.25	
5,776.00	48.10	179.60	5,706.64	-4.36	-248.82	13.17	8.89	8.75	2.19	
5,807.00	50.90	180.50	5,726.78	-27.93	-248.84	36.73	9.30	9.03	2.90	
5,839.00	54.40	180.80	5,746.19	-53.36	-249.13	62.15	10.96	10.94	0.94	
5,871.00	57.20	181.40	5,764.17	-79.82	-249.64	88.61	8.89	8.75	1.88	
5,903.00	61.00	181.70	5,780.60	-107.26	-250.38	116.06	11.90	11.88	0.94	
5,934.00	64.40	181.40	5,794.82	-134.80	-251.13	143.61	11.00	10.97	-0.97	
5,935.40	64.55	181.38	5,795.42	-136.06	-251.16	144.87	11.03	10.94	-1.60	
As-Drilled PP										
5,966.00	67.90	180.90	5,807.76	-164.05	-251.71	172.87	11.03	10.94	-1.56	
5,998.00	71.30	180.60	5,818.91	-194.04	-252.11	202.85	10.66	10.63	-0.94	
6,030.00	74.40	180.10	5,828.34	-224.61	-252.29	233.41	9.80	9.69	-1.56	
6,061.00	77.20	179.90	5,835.95	-254.66	-252.29	263.44	9.05	9.03	-0.65	
6,093.00	80.80	179.80	5,842.05	-286.07	-252.21	294.82	11.25	11.25	-0.31	
6,130.00	85.30	178.30	5,846.53	-322.78	-251.60	331.49	12.81	12.16	-4.05	
6,191.00	88.60	177.60	5,849.77	-383.65	-249.42	392.24	5.53	5.41	-1.15	
6,287.00	89.50	179.90	5,851.36	-479.60	-247.32	488.06	2.57	0.94	2.40	
6,382.00	89.80	180.30	5,851.95	-574.60	-247.49	583.01	0.53	0.32	0.42	
6,477.00	89.60	180.60	5,852.44	-669.60	-248.24	677.97	0.38	-0.21	0.32	
6,572.00	90.30	178.60	5,852.53	-764.59	-247.57	772.88	2.23	0.74	-2.11	

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6,667.00	91.60	178.80	5,850.95	-859.55	-245.42	867.70	1.38	1.37	0.21	
6,762.00	89.40	178.50	5,850.12	-954.51	-243.18	962.53	2.34	-2.32	-0.32	
6,857.00	89.90	177.80	5,850.70	-1,049.46	-240.11	1,057.31	0.91	0.53	-0.74	
6,952.00	89.40	179.10	5,851.28	-1,144.42	-237.54	1,152.12	1.47	-0.53	1.37	
7,047.00	89.50	178.50	5,852.19	-1,239.40	-235.55	1,246.96	0.64	0.11	-0.63	
7,142.00	88.70	179.80	5,853.69	-1,334.37	-234.15	1,341.83	1.61	-0.84	1.37	
7,237.00	89.70	180.60	5,855.01	-1,429.36	-234.48	1,436.77	1.35	1.05	0.84	
7,332.00	89.70	180.00	5,855.51	-1,524.36	-234.97	1,531.72	0.63	0.00	-0.63	
7,428.00	89.80	181.30	5,855.93	-1,620.35	-236.06	1,627.69	1.36	0.10	1.35	
7,523.00	89.90	181.80	5,856.18	-1,715.31	-238.63	1,722.69	0.54	0.11	0.53	
7,618.00	90.90	179.80	5,855.51	-1,810.29	-239.96	1,817.66	2.35	1.05	-2.11	
7,713.00	91.20	179.80	5,853.77	-1,905.28	-239.63	1,912.57	0.32	0.32	0.00	
7,809.00	91.40	179.70	5,851.60	-2,001.25	-239.21	2,008.47	0.23	0.21	-0.10	
7,903.00	91.10	179.60	5,849.54	-2,095.23	-238.64	2,102.37	0.34	-0.32	-0.11	
7,999.00	88.70	179.30	5,849.71	-2,191.22	-237.71	2,198.26	2.52	-2.50	-0.31	
8,094.00	89.80	180.70	5,850.96	-2,286.20	-237.71	2,293.19	1.87	1.16	1.47	
8,189.00	90.50	181.00	5,850.71	-2,381.19	-239.12	2,388.17	0.80	0.74	0.32	
8,284.00	90.70	179.10	5,849.71	-2,476.18	-239.21	2,483.10	2.01	0.21	-2.00	
8,379.00	91.40	179.70	5,847.97	-2,571.16	-238.21	2,577.99	0.97	0.74	0.63	
8,504.00	89.80	179.60	5,846.66	-2,696.15	-237.45	2,702.87	1.28	-1.28	-0.08	
8,599.00	90.50	179.90	5,846.41	-2,791.15	-237.03	2,797.79	0.80	0.74	0.32	
8,694.00	89.70	179.20	5,846.25	-2,886.14	-236.29	2,892.70	1.12	-0.84	-0.74	
8,789.00	90.80	180.90	5,845.83	-2,981.14	-236.37	2,987.64	2.13	1.16	1.79	
8,885.00	90.70	179.30	5,844.58	-3,077.12	-236.54	3,083.57	1.67	-0.10	-1.67	
8,980.00	88.90	179.00	5,844.91	-3,172.11	-235.13	3,178.45	1.92	-1.89	-0.32	
9,075.00	89.50	179.30	5,846.23	-3,267.09	-233.72	3,273.32	0.71	0.63	0.32	
9,170.00	89.90	179.10	5,846.73	-3,362.08	-232.39	3,368.20	0.47	0.42	-0.21	
9,265.00	88.40	179.10	5,848.14	-3,457.05	-230.90	3,463.06	1.58	-1.58	0.00	
9,360.00	89.00	179.40	5,850.30	-3,552.02	-229.66	3,557.93	0.71	0.63	0.32	
9,455.00	89.20	179.80	5,851.79	-3,647.01	-228.99	3,652.83	0.47	0.21	0.42	
9,550.00	89.30	179.60	5,853.03	-3,742.00	-228.50	3,747.74	0.24	0.11	-0.21	
9,645.00	89.60	179.10	5,853.94	-3,836.99	-227.42	3,842.63	0.61	0.32	-0.53	
9,741.00	90.10	179.10	5,854.20	-3,932.97	-225.91	3,938.51	0.52	0.52	0.00	
9,836.00	90.30	178.70	5,853.86	-4,027.95	-224.09	4,033.36	0.47	0.21	-0.42	
9,931.00	90.40	180.10	5,853.28	-4,122.94	-223.09	4,128.26	1.48	0.11	1.47	
10,026.00	91.20	180.40	5,851.96	-4,217.93	-223.51	4,223.20	0.90	0.84	0.32	
10,121.00	89.50	179.60	5,851.38	-4,312.93	-223.51	4,318.14	1.98	-1.79	-0.84	
10,216.00	89.50	179.00	5,852.21	-4,407.92	-222.35	4,413.03	0.63	0.00	-0.63	
10,311.00	90.00	179.60	5,852.62	-4,502.91	-221.19	4,507.92	0.82	0.53	0.63	
10,406.00	90.50	179.80	5,852.21	-4,597.91	-220.69	4,602.84	0.57	0.53	0.21	
10,501.00	91.20	179.80	5,850.80	-4,692.89	-220.36	4,697.75	0.74	0.74	0.00	
10,596.00	91.90	180.10	5,848.23	-4,787.86	-220.27	4,792.66	0.80	0.74	0.32	



TDS
Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD-27 2015)
Site: Pan Head Fee #11H
Well: SHL: 195' FNL, 600' FWL, Sec 11, T17S, R32E, Unit D
Wellbore: BHL: 969' FNL, 350' FWL, Sec 14, T17S, R32E, Unit D
Design: BHL: 969' FNL, 350' FWL, Sec 14, T17S, R32E, Unit D

Local Co-ordinate Reference: Site Pan Head Fee #11H
TVD Reference: KB @ 4188.00usft (Patriot 6)
MD Reference: KB @ 4188.00usft (Patriot 6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

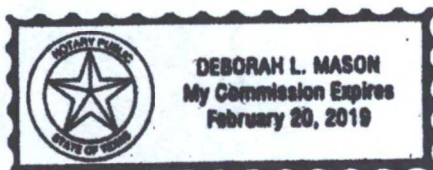
Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,692.00	90.20	179.70	5,846.47	-4,883.84	-220.11	4,888.57	1.82	-1.77	-0.42
10,787.00	90.70	180.10	5,845.72	-4,978.83	-219.94	4,983.50	0.67	0.53	0.42
10,882.00	89.10	179.80	5,845.89	-5,073.83	-219.86	5,078.44	1.71	-1.68	-0.32
10,986.00	89.80	180.10	5,846.89	-5,177.83	-219.77	5,182.36	0.73	0.67	0.29
11,081.00	90.50	180.10	5,846.64	-5,272.82	-219.93	5,277.31	0.74	0.74	0.00
11,176.00	89.60	179.80	5,846.55	-5,367.82	-219.85	5,372.24	1.00	-0.95	-0.32
11,271.00	90.20	180.60	5,846.72	-5,462.82	-220.18	5,467.19	1.05	0.63	0.84
11,367.00	89.80	179.50	5,846.72	-5,558.82	-220.27	5,563.13	1.22	-0.42	-1.15
11,462.00	90.30	179.90	5,846.64	-5,653.82	-219.77	5,658.05	0.67	0.53	0.42
11,557.00	88.70	179.30	5,847.47	-5,748.81	-219.11	5,752.96	1.80	-1.68	-0.63
11,652.00	89.30	179.80	5,849.12	-5,843.79	-218.36	5,847.86	0.82	0.63	0.53
11,747.00	90.20	180.30	5,849.54	-5,938.79	-218.44	5,942.80	1.08	0.95	0.53
11,798.00	90.70	180.60	5,849.14	-5,989.78	-218.84	5,993.78	1.14	0.98	0.59
Final MWD Survey									
11,857.00	90.70	180.60	5,848.42	-6,048.78	-219.46	6,052.76	0.00	0.00	0.00
Projection to Bit/VD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates	
		+N/-S (usft)	+E/-W (usft)
2,340.00	2,339.92	-2.70	-7.03
2,472.00	2,471.91	-4.09	-6.21
5,935.40	5,795.42	-136.06	-251.16
11,798.00	5,849.14	-5,989.78	-218.84
11,857.00	5,848.42	-6,048.78	-219.46

Checked By: Deborah L. Mason Approved By: [Signature] Date: 7/13/2016





7/13/16

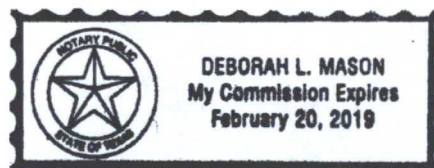
State of New Mexico
County of Lea

I, Donald D. Mason, certify that: I am employed by Terra Directional Services LLC; that I did on the day(s) of 06/01/2016 through 06/10/2016 conduct or supervise the taking of a MWD survey from a depth of 2472 feet to a depth of 11857 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 COG Operating LLC for the Pan Head Fee #11H Well API 30-025-42817 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.

Donald D. Mason
President

State of Texas
County of Burnet

Before me, a notary public, on this day personally appeared Donald D. mason, 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

SEP 26 2016

PATRIOT DRILLING, LLC

RECEIVED

OPERATOR: COG Operating, LLC
WELL/LEASE: Pan Head Fee 11H
COUNTY: Lea Co., New Mexico
Sec. 11, T 17S, R 32E

STATE OF NEW MEXICO
DEVIATION REPORT

<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
480	1/2	1,580	1/2
726	1/2	2,020	1/2
1,044	1/4		

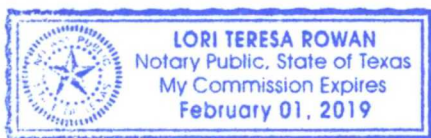
Patriot Drilling, LLC

M. Leroy Peterson, Executive Vice-President

The foregoing instrument was acknowledged before me on this 13th day of June 2016 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2019

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



June 3, 2016

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

HOBBS OGD
SEP 26 2016
RECEIVED

Attn: Kanicia Castillo

RE: **Pan Head Fee No 011H**

Please find enclosed a copy of the survey from 0' to 2340' ran on the above referenced well.

Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 3rd day of June,
A.D., 2016, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas



Company: Concho
Lease/Well: Pan Head Fee No/011H

Rig Name: Patriot 6
State/County: New Mexico/Lea
VS-Azi: 0.00 Degrees
Latitude: 32.85568, Longitude: -103.74324
Grid North = True North -0.32 degs (NAD 27)
Grid Correction Applied = -0.32 degs



Depth Reference : RKB = 18 feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 6/3/2016 / 09:17

VES Survey International
Midland, Texas
432-563-5444

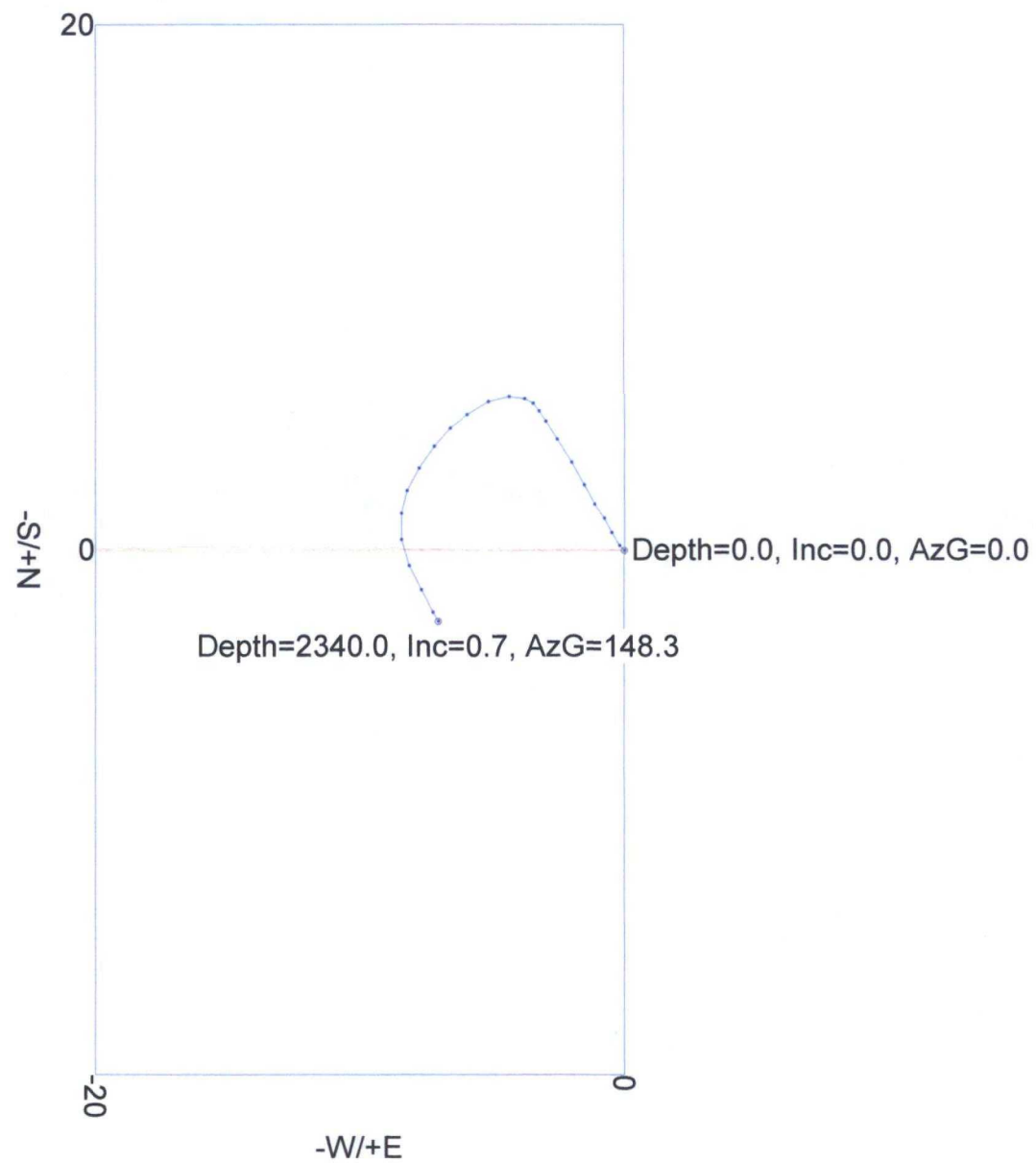
Surveyor: Adam Askew
Pan Head Fee No 011H / API 30-025-42817

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	0.30	313.24	100.00	0.18	-0.19	0.18	0.26	313.24	0.30
200.00	0.39	342.14	200.00	0.68	-0.48	0.68	0.83	324.59	0.19
300.00	0.32	321.88	300.00	1.22	-0.76	1.22	1.44	328.16	0.14
400.00	0.42	328.69	399.99	1.75	-1.12	1.75	2.08	327.43	0.12
500.00	0.54	333.59	499.99	2.49	-1.52	2.49	2.91	328.58	0.12
600.00	0.58	329.22	599.99	3.34	-1.99	3.34	3.89	329.27	0.06
700.00	0.60	328.12	699.98	4.22	-2.52	4.22	4.92	329.14	0.02
800.00	0.31	327.86	799.98	4.90	-2.94	4.90	5.71	328.99	0.29
900.00	0.23	324.10	899.98	5.29	-3.20	5.29	6.18	328.78	0.09
1000.00	0.19	321.77	999.98	5.57	-3.42	5.57	6.54	328.46	0.04
1100.00	0.27	281.57	1099.97	5.75	-3.75	5.75	6.86	326.89	0.17
1200.00	0.39	274.72	1199.97	5.82	-4.32	5.82	7.25	323.43	0.13
1300.00	0.56	243.46	1299.97	5.64	-5.10	5.64	7.60	317.86	0.30
1400.00	0.52	231.72	1399.97	5.14	-5.89	5.14	7.82	311.09	0.12
1500.00	0.47	234.50	1499.96	4.62	-6.58	4.62	8.04	305.08	0.06
1600.00	0.58	209.45	1599.96	3.94	-7.16	3.94	8.17	298.83	0.25

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
1700.00	0.58	217.58	1699.95	3.10	-7.72	3.10	8.32	291.86	0.08
1800.00	0.53	197.10	1799.95	2.25	-8.16	2.25	8.47	285.41	0.20
1900.00	0.49	189.57	1899.94	1.38	-8.37	1.38	8.48	279.38	0.08
2000.00	0.67	173.45	1999.94	0.38	-8.38	0.38	8.38	272.62	0.24
2100.00	0.53	151.83	2099.93	-0.60	-8.09	-0.60	8.11	265.74	0.26
2200.00	0.65	155.35	2199.93	-1.53	-7.64	-1.53	7.79	258.70	0.13
2300.00	0.44	151.36	2299.92	-2.38	-7.22	-2.38	7.60	251.75	0.21
2340.00	0.70	148.27	2339.92	-2.72	-7.01	-2.72	7.52	248.78	0.66



VES Survey International
Midland, Texas
432-563-5444
Surveyor: Adam Askew
Pan Head Fee No 011H / API 30-025-42817



VES Survey Date: 5/31/2016



I Adam Askew certify that I am employed by VES Survey International. That I did on the day(s) of 05/31/16 through 05/31/16 conduct or supervise the taking of a Rate Gyro survey from a depth of 0.00 feet to a depth of 2,340.00 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Vaughn Energy Services, that I am authorized and qualified to make this report; that this survey was conducted at the request of Concho for the Pan Head Fee Well # 11H API # 30-025-42817 in Lea County / Parish New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Vaughn Energy Services

A handwritten signature in blue ink, appearing to read "Adam Askew", is written over a horizontal line.

Adam Askew
Service Technician
Vaughn Energy Services