



CONCHO

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COG Operating LLC

Lea County, NM (NAD-27 2015)

Flat Head Federal Com #25H

API #: 30-025-43109

SHL: 1015' FNL, 2310' FEL, Sec 14, T17S, R32E, Unit B

PP: 980' FNL, 2271' FEL, Sec 14, T17S, R32E, Unit B

BHL: 222' FNL, 2288' FEL, Sec 11, T17S, R32E, Unit B

Design: BHL: 220' FNL, 2290' FEL, Sec 11, T17S, R32E, Unit B

Standard Survey Report

23 January, 2017



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 1015' FNL, 2310' FEL, Sec 14, T17S, R32E, Unit B
Project:	Lea County, NM (NAD-27 2015)	TVD Reference:	KB @ 4106.00usft (Patriot 6)
Site:	Flat Head Federal Com #25H	MD Reference:	KB @ 4106.00usft (Patriot 6)
Well:	SHL: 1015' FNL, 2310' FEL, Sec 14, T17S, R32E, Unit B	North Reference:	Grid
Wellbore:	BHL: 220' FNL, 2290' FEL, Sec 11, T17S, R32E, Unit B	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 220' FNL, 2290' FEL, Sec 11, T17S, R32E, Unit B	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		Flat Head Federal Com #25H			
Site Position:		Northing:	669,419.60 usft	Latitude:	32° 50' 20.012 N
From:	Map	Easting:	683,615.20 usft	Longitude:	103° 44' 7.850 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	0.32 °

Well	SHL: 1015' FNL, 2310' FEL, Sec 14, T17S, R32E, Unit B					
Well Position	+N/-S	0.00 usft	Northing:	669,419.60 usft	Latitude:	32° 50' 20.012 N
	+E/-W	0.00 usft	Easting:	683,615.20 usft	Longitude:	103° 44' 7.850 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,088.00 usft

Wellbore	BHL: 220' FNL, 2290' FEL, Sec 11, T17S, R32E, Unit B				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/10/2016	7.14	60.61	48,343

Design	BHL: 220' FNL, 2290' FEL, Sec 11, T17S, R32E, Unit B				
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	359.82	

Survey Program	Date	1/23/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
25.00	2,725.00	VES Gyro #1 (BHL: 220' FNL, 2290' FEL,	VES-ISCWSA-GYRO-3	Biaxial Semi-Cont. Gyro	
2,842.00	12,600.00	TDS MWD #2 (BHL: 220' FNL, 2290' FEL,	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	
25.00	0.17	81.14	25.00	0.01	0.04	0.01	0.68	0.68	0.00	
50.00	0.29	69.33	50.00	0.03	0.13	0.03	0.51	0.48	-47.24	
75.00	0.25	78.39	75.00	0.07	0.25	0.07	0.23	-0.16	36.24	
100.00	0.19	82.55	100.00	0.08	0.34	0.08	0.25	-0.24	16.64	
125.00	0.26	91.73	125.00	0.09	0.44	0.09	0.31	0.28	36.72	
150.00	0.28	82.48	150.00	0.09	0.55	0.09	0.19	0.08	-37.00	

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Site:	Flat Head Federal Com #25H	MD Reference:	KB @ 4106.00usft (Patriot 6)
Well:	SHL: 1015' FNL, 2310' FEL, Sec 14, T17S, R32E, Unit B	North Reference:	Grid
Wellbore:	BHL: 220' FNL, 2290' FEL, Sec 11, T17S, R32E, Unit B	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 220' FNL, 2290' FEL, Sec 11, T17S, R32E, Unit B	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)
175.00	0.23	58.82	175.00	0.13	0.66	0.13	0.46	-0.20	-94.64
200.00	0.27	52.08	200.00	0.19	0.75	0.19	0.20	0.16	-26.96
225.00	0.24	60.99	225.00	0.25	0.84	0.25	0.20	-0.12	35.64
250.00	0.21	48.71	250.00	0.31	0.92	0.30	0.23	-0.12	-49.12
275.00	0.21	67.91	275.00	0.35	1.00	0.35	0.28	0.00	76.80
300.00	0.23	70.86	300.00	0.39	1.09	0.38	0.09	0.08	11.80
325.00	0.17	85.84	325.00	0.41	1.17	0.40	0.32	-0.24	59.92
350.00	0.17	109.34	350.00	0.40	1.24	0.39	0.28	0.00	94.00
375.00	0.32	88.76	375.00	0.39	1.35	0.38	0.69	0.60	-82.32
400.00	0.37	93.88	400.00	0.38	1.50	0.38	0.23	0.20	20.48
425.00	0.38	74.73	425.00	0.40	1.66	0.39	0.50	0.04	-76.60
450.00	0.37	64.85	450.00	0.46	1.81	0.45	0.26	-0.04	-39.52
475.00	0.40	72.60	475.00	0.52	1.97	0.51	0.24	0.12	31.00
500.00	0.43	72.60	499.99	0.57	2.14	0.56	0.12	0.12	0.00
525.00	0.28	61.99	524.99	0.63	2.28	0.62	0.65	-0.60	-42.44
550.00	0.34	56.90	549.99	0.70	2.40	0.69	0.26	0.24	-20.36
575.00	0.24	48.83	574.99	0.77	2.50	0.76	0.43	-0.40	-32.28
600.00	0.26	41.81	599.99	0.85	2.58	0.84	0.15	0.08	-28.08
625.00	0.32	54.13	624.99	0.93	2.67	0.92	0.34	0.24	49.28
650.00	0.23	59.42	649.99	1.00	2.77	0.99	0.37	-0.36	21.16
675.00	0.27	63.23	674.99	1.05	2.87	1.04	0.17	0.16	15.24
700.00	0.26	68.80	699.99	1.10	2.97	1.09	0.11	-0.04	22.28
725.00	0.21	68.38	724.99	1.13	3.07	1.12	0.20	-0.20	-1.68
750.00	0.19	65.37	749.99	1.17	3.15	1.16	0.09	-0.08	-12.04
775.00	0.19	51.02	774.99	1.21	3.22	1.20	0.19	0.00	-57.40
800.00	0.18	55.14	799.99	1.26	3.28	1.25	0.07	-0.04	16.48
825.00	0.11	112.36	824.99	1.27	3.34	1.26	0.61	-0.28	228.88
850.00	0.07	154.13	849.99	1.25	3.37	1.24	0.30	-0.16	167.08
875.00	0.14	153.22	874.99	1.21	3.39	1.20	0.28	0.28	-3.64
900.00	0.05	142.61	899.99	1.17	3.41	1.16	0.37	-0.36	-42.44
925.00	0.08	153.63	924.99	1.15	3.42	1.14	0.13	0.12	44.08
950.00	0.09	147.36	949.99	1.12	3.44	1.11	0.05	0.04	-25.08
975.00	0.11	159.81	974.99	1.08	3.46	1.07	0.12	0.08	49.80
1,000.00	0.30	150.38	999.99	1.00	3.50	0.99	0.77	0.76	-37.72
1,025.00	0.39	166.30	1,024.99	0.86	3.55	0.85	0.52	0.36	63.68
1,050.00	0.34	170.03	1,049.99	0.70	3.59	0.69	0.22	-0.20	14.92
1,075.00	0.41	187.15	1,074.99	0.54	3.59	0.53	0.53	0.28	68.48
1,100.00	0.47	182.79	1,099.99	0.35	3.57	0.34	0.27	0.24	-17.44
1,125.00	0.43	184.46	1,124.99	0.15	3.56	0.14	0.17	-0.16	6.68
1,150.00	0.41	195.96	1,149.99	-0.03	3.53	-0.04	0.35	-0.08	46.00
1,175.00	0.32	205.13	1,174.99	-0.17	3.47	-0.19	0.43	-0.36	36.68

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1,200.00	0.30	193.30	1,199.99	-0.30	3.43	-0.31	0.27	-0.08	-47.32
1,225.00	0.23	235.78	1,224.99	-0.39	3.37	-0.40	0.81	-0.28	169.92
1,250.00	0.14	166.79	1,249.99	-0.45	3.34	-0.46	0.89	-0.36	-275.96
1,275.00	0.17	180.51	1,274.99	-0.52	3.34	-0.53	0.19	0.12	54.88
1,300.00	0.18	214.20	1,299.99	-0.59	3.32	-0.60	0.41	0.04	134.76
1,325.00	0.18	195.09	1,324.99	-0.66	3.29	-0.67	0.24	0.00	-76.44
1,350.00	0.13	231.05	1,349.99	-0.71	3.26	-0.72	0.43	-0.20	143.84
1,375.00	0.16	184.99	1,374.99	-0.77	3.23	-0.78	0.47	0.12	-184.24
1,400.00	0.06	296.31	1,399.99	-0.80	3.22	-0.81	0.76	-0.40	445.28
1,425.00	0.07	38.57	1,424.99	-0.78	3.22	-0.79	0.41	0.04	409.04
1,450.00	0.02	186.58	1,449.99	-0.77	3.22	-0.78	0.35	-0.20	592.04
1,475.00	0.08	294.38	1,474.99	-0.77	3.21	-0.78	0.35	0.24	431.20
1,500.00	0.06	308.70	1,499.99	-0.75	3.18	-0.76	0.11	-0.08	57.28
1,525.00	0.08	283.15	1,524.99	-0.74	3.15	-0.75	0.15	0.08	-102.20
1,550.00	0.25	289.42	1,549.99	-0.72	3.09	-0.73	0.68	0.68	25.08
1,575.00	0.42	302.10	1,574.98	-0.65	2.96	-0.66	0.74	0.68	50.72
1,600.00	0.53	329.28	1,599.98	-0.50	2.82	-0.51	0.99	0.44	108.72
1,625.00	0.70	342.31	1,624.98	-0.26	2.72	-0.27	0.88	0.68	52.12
1,650.00	0.85	354.33	1,649.98	0.07	2.65	0.06	0.88	0.60	48.08
1,675.00	0.93	0.53	1,674.98	0.46	2.63	0.45	0.50	0.32	24.80
1,700.00	0.96	4.24	1,699.97	0.87	2.65	0.86	0.27	0.12	14.84
1,725.00	1.12	13.62	1,724.97	1.32	2.72	1.31	0.93	0.64	37.52
1,750.00	1.01	25.42	1,749.97	1.75	2.88	1.74	0.98	-0.44	47.20
1,775.00	0.92	24.23	1,774.96	2.14	3.05	2.13	0.37	-0.36	-4.76
1,800.00	0.93	25.00	1,799.96	2.50	3.22	2.49	0.06	0.04	3.08
1,825.00	1.03	26.36	1,824.95	2.89	3.41	2.88	0.41	0.40	5.44
1,850.00	1.05	27.51	1,849.95	3.29	3.61	3.28	0.12	0.08	4.60
1,875.00	1.19	25.38	1,874.95	3.73	3.83	3.72	0.58	0.56	-8.52
1,900.00	1.24	25.21	1,899.94	4.21	4.06	4.20	0.20	0.20	-0.68
1,925.00	1.27	27.08	1,924.93	4.70	4.30	4.69	0.20	0.12	7.48
1,950.00	1.45	25.09	1,949.93	5.23	4.56	5.22	0.74	0.72	-7.96
1,975.00	1.69	26.73	1,974.92	5.85	4.86	5.83	0.98	0.96	6.56
2,000.00	1.82	30.05	1,999.91	6.52	5.22	6.51	0.66	0.52	13.28
2,025.00	1.72	28.66	2,024.89	7.20	5.60	7.18	0.44	-0.40	-5.56
2,050.00	1.76	31.76	2,049.88	7.85	5.98	7.83	0.41	0.16	12.40
2,075.00	1.85	29.78	2,074.87	8.53	6.39	8.51	0.44	0.36	-7.92
2,100.00	1.88	31.84	2,099.86	9.23	6.80	9.21	0.29	0.12	8.24
2,125.00	1.93	35.92	2,124.84	9.92	7.27	9.89	0.58	0.20	16.32
2,150.00	1.88	32.44	2,149.83	10.60	7.73	10.58	0.50	-0.20	-13.92
2,175.00	1.87	27.33	2,174.82	11.31	8.14	11.29	0.67	-0.04	-20.44
2,200.00	1.87	26.18	2,199.80	12.04	8.51	12.01	0.15	0.00	-4.60

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2,225.00	1.77	31.84	2,224.79	12.73	8.89	12.71	0.82	-0.40	22.64
2,250.00	1.71	37.02	2,249.78	13.36	9.32	13.33	0.67	-0.24	20.72
2,275.00	1.62	36.84	2,274.77	13.94	9.76	13.91	0.36	-0.36	-0.72
2,300.00	1.52	30.81	2,299.76	14.51	10.14	14.48	0.77	-0.40	-24.12
2,325.00	1.52	35.23	2,324.75	15.06	10.50	15.03	0.47	0.00	17.68
2,350.00	1.34	38.06	2,349.74	15.56	10.87	15.53	0.77	-0.72	11.32
2,375.00	1.35	38.07	2,374.74	16.03	11.23	15.99	0.04	0.04	0.04
2,400.00	1.27	37.40	2,399.73	16.48	11.58	16.44	0.33	-0.32	-2.68
2,425.00	1.20	33.08	2,424.72	16.92	11.89	16.88	0.47	-0.28	-17.28
2,450.00	1.21	26.03	2,449.72	17.37	12.15	17.34	0.59	0.04	-28.20
2,475.00	1.19	35.73	2,474.71	17.82	12.42	17.78	0.82	-0.08	38.80
2,500.00	1.05	28.26	2,499.71	18.23	12.68	18.20	0.81	-0.56	-29.88
2,525.00	1.02	33.05	2,524.70	18.62	12.91	18.58	0.37	-0.12	19.16
2,550.00	0.90	34.00	2,549.70	18.97	13.14	18.93	0.48	-0.48	3.80
2,575.00	0.74	36.01	2,574.70	19.27	13.34	19.22	0.65	-0.64	8.04
2,600.00	0.61	27.49	2,599.70	19.51	13.50	19.47	0.66	-0.52	-34.08
2,625.00	0.50	27.19	2,624.69	19.73	13.61	19.69	0.44	-0.44	-1.20
2,650.00	0.44	10.86	2,649.69	19.92	13.68	19.88	0.58	-0.24	-65.32
2,675.00	0.50	352.73	2,674.69	20.12	13.68	20.08	0.64	0.24	-72.52
2,700.00	0.52	347.76	2,699.69	20.34	13.65	20.30	0.19	0.08	-19.88
2,725.00	0.65	8.25	2,724.69	20.59	13.64	20.55	0.98	0.52	81.96
Tie-In to VES Gyro									
2,842.00	0.20	276.60	2,841.69	21.27	13.54	21.23	0.59	-0.38	-78.33
First TDS MWD Survey									
2,906.00	0.70	215.70	2,905.69	20.97	13.20	20.93	0.98	0.78	-95.16
3,000.00	2.70	191.20	2,999.64	18.33	12.43	18.29	2.22	2.13	-26.06
3,094.00	4.60	182.20	3,093.45	12.39	11.86	12.35	2.11	2.02	-9.57
3,190.00	5.80	184.20	3,189.05	3.71	11.35	3.67	1.26	1.25	2.08
3,284.00	4.90	168.10	3,282.64	-4.96	11.83	-5.00	1.85	-0.96	-17.13
3,379.00	4.60	167.30	3,377.32	-12.65	13.51	-12.69	0.32	-0.32	-0.84
3,473.00	6.50	177.30	3,470.87	-21.64	14.59	-21.68	2.26	2.02	10.64
3,568.00	6.30	182.80	3,565.28	-32.22	14.59	-32.26	0.68	-0.21	5.79
3,662.00	6.30	182.00	3,658.72	-42.52	14.15	-42.57	0.09	0.00	-0.85
3,757.00	6.90	175.30	3,753.09	-53.42	14.44	-53.46	1.03	0.63	-7.05
3,851.00	6.80	175.10	3,846.42	-64.59	15.38	-64.64	0.11	-0.11	-0.21
3,946.00	7.40	172.90	3,940.69	-76.26	16.61	-76.32	0.69	0.63	-2.32
4,041.00	7.10	173.20	4,034.93	-88.17	18.06	-88.22	0.32	-0.32	0.32
4,135.00	7.00	167.60	4,128.22	-99.53	19.98	-99.59	0.74	-0.11	-5.96
4,229.00	6.80	167.60	4,221.54	-110.56	22.41	-110.63	0.21	-0.21	0.00
4,324.00	6.30	168.50	4,315.92	-121.16	24.65	-121.23	0.54	-0.53	0.95
4,418.00	5.90	169.70	4,409.38	-130.97	26.55	-131.05	0.45	-0.43	1.28

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Project:	Lea County, NM (NAD-27 2015)	TVD Reference:	KB @ 4106.00usft (Patriot 6)
Site:	Flat Head Federal Com #25H	MD Reference:	KB @ 4106.00usft (Patriot 6)
Well:	SHL: 1015' FNL, 2310' FEL, Sec 14, T17S, R32E, Unit B	North Reference:	Grid
Wellbore:	BHL: 220' FNL, 2290' FEL, Sec 11, T17S, R32E, Unit B	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 220' FNL, 2290' FEL, Sec 11, T17S, R32E, Unit B	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)	
4,512.00	5.60	169.90	4,502.91	-140.23	28.21	-140.32	0.32	-0.32	0.21	
4,606.00	7.00	170.90	4,596.34	-150.41	29.93	-150.50	1.49	1.49	1.06	
4,701.00	8.40	170.60	4,690.48	-162.97	31.97	-163.07	1.47	1.47	-0.32	
4,796.00	8.20	171.90	4,784.49	-176.52	34.06	-176.63	0.29	-0.21	1.37	
4,891.00	7.70	172.70	4,878.57	-189.54	35.83	-189.65	0.54	-0.53	0.84	
4,985.00	7.30	174.20	4,971.77	-201.73	37.23	-201.84	0.47	-0.43	1.60	
5,080.00	7.10	175.90	5,066.02	-213.59	38.26	-213.71	0.31	-0.21	1.79	
5,175.00	6.80	179.00	5,160.32	-225.07	38.78	-225.19	0.51	-0.32	3.26	
5,269.00	6.50	180.10	5,253.69	-235.95	38.86	-236.07	0.35	-0.32	1.17	
5,364.00	6.40	180.70	5,348.09	-246.63	38.79	-246.75	0.13	-0.11	0.63	
5,459.00	6.00	173.40	5,442.54	-256.85	39.30	-256.97	0.93	-0.42	-7.68	
5,554.00	4.20	169.50	5,537.16	-265.21	40.50	-265.33	1.93	-1.89	-4.11	
5,648.00	1.80	175.00	5,631.02	-270.06	41.26	-270.19	2.57	-2.55	5.85	
5,743.00	1.10	180.80	5,725.99	-272.46	41.37	-272.59	0.75	-0.74	6.11	
5,838.00	0.80	196.20	5,820.98	-274.01	41.18	-274.14	0.41	-0.32	16.21	
5,870.00	0.70	344.70	5,852.98	-274.04	41.06	-274.16	4.51	-0.31	464.06	
5,902.00	3.60	3.80	5,884.95	-272.84	41.08	-272.97	9.21	9.06	59.69	
5,933.00	6.90	5.40	5,915.82	-270.02	41.32	-270.15	10.65	10.65	5.16	
5,965.00	9.90	2.90	5,947.47	-265.36	41.64	-265.48	9.44	9.38	-7.81	
5,996.00	13.20	1.00	5,977.84	-259.15	41.83	-259.28	10.71	10.65	-6.13	
6,028.00	16.70	1.60	6,008.75	-250.90	42.03	-251.03	10.95	10.94	1.88	
6,059.00	20.00	3.70	6,038.17	-241.16	42.49	-241.29	10.86	10.65	6.77	
6,091.00	23.40	3.10	6,067.90	-229.35	43.19	-229.48	10.65	10.63	-1.88	
6,122.00	26.30	1.00	6,096.02	-216.33	43.64	-216.47	9.78	9.35	-6.77	
6,154.00	29.10	359.20	6,124.35	-201.46	43.66	-201.59	9.13	8.75	-5.63	
6,185.00	31.90	358.00	6,151.06	-185.73	43.27	-185.87	9.24	9.03	-3.87	
6,217.00	35.40	358.00	6,177.70	-168.01	42.65	-168.15	10.94	10.94	0.00	
6,248.00	39.00	358.50	6,202.38	-149.28	42.08	-149.41	11.65	11.61	1.61	
6,280.00	42.40	358.60	6,226.64	-128.43	41.55	-128.56	10.63	10.63	0.31	
6,312.00	44.90	358.70	6,249.79	-106.35	41.03	-106.47	7.82	7.81	0.31	
6,344.00	45.20	358.70	6,272.40	-83.70	40.52	-83.83	0.94	0.94	0.00	
6,375.00	45.10	358.90	6,294.26	-61.73	40.06	-61.86	0.56	-0.32	0.65	
6,406.00	44.80	359.10	6,316.20	-39.83	39.68	-39.96	1.07	-0.97	0.65	
6,438.00	44.50	359.20	6,338.97	-17.35	39.34	-17.47	0.96	-0.94	0.31	
6,470.00	44.20	359.30	6,361.85	5.02	39.05	4.90	0.96	-0.94	0.31	
6,501.00	44.00	359.30	6,384.11	26.59	38.79	26.47	0.65	-0.65	0.00	
6,513.54	44.67	359.30	6,393.08	35.35	38.68	35.23	5.31	5.31	0.00	
As-Drilled PP										
6,533.00	45.70	359.30	6,406.80	49.16	38.51	49.04	5.31	5.31	0.00	
6,564.00	48.80	359.10	6,427.84	71.92	38.19	71.80	10.01	10.00	-0.65	
6,596.00	53.10	359.30	6,447.99	96.76	37.85	96.64	13.45	13.44	0.63	

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 1015' FNL, 2310' FEL, Sec 14, T17S, R32E, Unit B
Project:	Lea County, NM (NAD-27 2015)	TVD Reference:	KB @ 4106.00usft (Patriot 6)
Site:	Flat Head Federal Com #25H	MD Reference:	KB @ 4106.00usft (Patriot 6)
Well:	SHL: 1015' FNL, 2310' FEL, Sec 14, T17S, R32E, Unit B	North Reference:	Grid
Wellbore:	BHL: 220' FNL, 2290' FEL, Sec 11, T17S, R32E, Unit B	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 220' FNL, 2290' FEL, Sec 11, T17S, R32E, Unit B	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)
6,628.00	57.00	359.80	6,466.32	122.98	37.64	122.86	12.25	12.19	1.56
6,659.00	60.60	0.20	6,482.38	149.49	37.64	149.38	11.67	11.61	1.29
6,691.00	64.20	0.70	6,497.20	177.85	37.87	177.73	11.33	11.25	1.56
6,723.00	67.70	0.50	6,510.24	207.06	38.17	206.94	10.95	10.94	-0.63
6,754.00	70.70	0.30	6,521.25	236.04	38.38	235.92	9.70	9.68	-0.65
6,786.00	73.10	0.10	6,531.19	266.45	38.48	266.33	7.52	7.50	-0.63
6,818.00	76.70	0.70	6,539.52	297.34	38.70	297.22	11.39	11.25	1.88
6,850.00	81.40	1.20	6,545.60	328.74	39.22	328.62	14.77	14.69	1.56
6,881.00	86.20	1.10	6,548.95	359.55	39.84	359.42	15.49	15.48	-0.32
6,913.00	89.90	0.80	6,550.04	391.52	40.37	391.39	11.60	11.56	-0.94
6,944.00	90.50	0.80	6,549.93	422.52	40.80	422.39	1.94	1.94	0.00
6,975.00	90.40	1.00	6,549.68	453.51	41.29	453.38	0.72	-0.32	0.65
7,007.00	90.20	0.90	6,549.52	485.51	41.82	485.37	0.70	-0.63	-0.31
7,098.00	89.70	359.20	6,549.60	576.50	41.90	576.37	1.95	-0.55	-1.87
7,192.00	90.20	359.30	6,549.68	670.49	40.67	670.36	0.54	0.53	0.11
7,287.00	90.20	359.60	6,549.35	765.49	39.76	765.36	0.32	0.00	0.32
7,382.00	90.10	359.10	6,549.10	860.48	38.68	860.36	0.54	-0.11	-0.53
7,476.00	89.40	359.10	6,549.51	954.47	37.20	954.35	0.74	-0.74	0.00
7,570.00	90.20	359.20	6,549.84	1,048.46	35.81	1,048.34	0.86	0.85	0.11
7,665.00	90.10	359.50	6,549.59	1,143.45	34.73	1,143.34	0.33	-0.11	0.32
7,759.00	89.70	359.90	6,549.75	1,237.45	34.24	1,237.34	0.60	-0.43	0.43
7,853.00	90.50	358.80	6,549.59	1,331.44	33.17	1,331.33	1.45	0.85	-1.17
7,947.00	90.10	359.30	6,549.10	1,425.43	31.61	1,425.32	0.68	-0.43	0.53
8,042.00	89.50	359.60	6,549.43	1,520.42	30.70	1,520.32	0.71	-0.63	0.32
8,137.00	90.40	358.80	6,549.51	1,615.41	29.37	1,615.31	1.27	0.95	-0.84
8,232.00	90.20	359.00	6,549.01	1,710.39	27.55	1,710.30	0.30	-0.21	0.21
8,327.00	89.80	359.20	6,549.01	1,805.38	26.06	1,805.29	0.47	-0.42	0.21
8,421.00	89.30	359.30	6,549.75	1,899.37	24.83	1,899.28	0.54	-0.53	0.11
8,516.00	90.20	359.60	6,550.17	1,994.36	23.92	1,994.28	1.00	0.95	0.32
8,611.00	89.70	359.80	6,550.25	2,089.36	23.42	2,089.28	0.57	-0.53	0.21
8,706.00	90.30	359.10	6,550.25	2,184.35	22.51	2,184.27	0.97	0.63	-0.74
8,799.00	90.10	359.30	6,549.92	2,277.34	21.21	2,277.27	0.30	-0.22	0.22
8,894.00	89.60	359.60	6,550.17	2,372.34	20.30	2,372.26	0.61	-0.53	0.32
8,989.00	90.20	359.00	6,550.34	2,467.33	19.14	2,467.26	0.89	0.63	-0.63
9,082.00	89.70	359.20	6,550.42	2,560.32	17.68	2,560.25	0.58	-0.54	0.22
9,177.00	90.70	358.60	6,550.09	2,655.30	15.85	2,655.24	1.23	1.05	-0.63
9,270.00	90.30	359.00	6,549.28	2,748.28	13.90	2,748.22	0.61	-0.43	0.43
9,364.00	89.90	359.60	6,549.11	2,842.27	12.76	2,842.21	0.77	-0.43	0.64
9,459.00	89.80	0.00	6,549.36	2,937.27	12.42	2,937.21	0.43	-0.11	0.42
9,552.00	89.20	0.10	6,550.17	3,030.26	12.51	3,030.21	0.65	-0.65	0.11
9,647.00	89.80	359.50	6,551.00	3,125.26	12.17	3,125.20	0.89	0.63	-0.63

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 1015' FNL, 2310' FEL, Sec 14, T17S, R32E, Unit B
Project:	Lea County, NM (NAD-27 2015)	TVD Reference:	KB @ 4106.00usft (Patriot 6)
Site:	Flat Head Federal Com #25H	MD Reference:	KB @ 4106.00usft (Patriot 6)
Well:	SHL: 1015' FNL, 2310' FEL, Sec 14, T17S, R32E, Unit B	North Reference:	Grid
Wellbore:	BHL: 220' FNL, 2290' FEL, Sec 11, T17S, R32E, Unit B	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 220' FNL, 2290' FEL, Sec 11, T17S, R32E, Unit B	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)
9,742.00	90.50	359.90	6,550.75	3,220.26	11.68	3,220.20	0.85	0.74	0.42
9,835.00	90.50	0.40	6,549.94	3,313.25	11.92	3,313.20	0.54	0.00	0.54
9,930.00	90.80	359.80	6,548.86	3,408.24	12.09	3,408.19	0.71	0.32	-0.63
10,023.00	90.80	359.40	6,547.56	3,501.23	11.44	3,501.18	0.43	0.00	-0.43
10,118.00	90.70	358.60	6,546.32	3,596.21	9.78	3,596.16	0.85	-0.11	-0.84
10,212.00	90.60	358.60	6,545.26	3,690.18	7.48	3,690.13	0.11	-0.11	0.00
10,306.00	90.50	359.20	6,544.35	3,784.15	5.68	3,784.12	0.65	-0.11	0.64
10,400.00	90.00	359.70	6,543.94	3,878.15	4.78	3,878.11	0.75	-0.53	0.53
10,495.00	89.60	0.20	6,544.27	3,973.15	4.69	3,973.11	0.67	-0.42	0.53
10,588.00	89.80	358.90	6,544.76	4,066.14	3.96	4,066.11	1.41	0.22	-1.40
10,683.00	89.10	359.10	6,545.67	4,161.12	2.30	4,161.09	0.77	-0.74	0.21
10,778.00	89.50	359.90	6,546.83	4,256.11	1.48	4,256.08	0.94	0.42	0.84
10,873.00	90.00	359.20	6,547.25	4,351.10	0.73	4,351.08	0.91	0.53	-0.74
10,968.00	89.10	359.60	6,547.99	4,446.10	-0.27	4,446.07	1.04	-0.95	0.42
11,063.00	90.20	359.30	6,548.57	4,541.09	-1.18	4,541.07	1.20	1.16	-0.32
11,157.00	89.20	359.30	6,549.07	4,635.08	-2.33	4,635.06	1.06	-1.06	0.00
11,252.00	90.90	0.10	6,548.98	4,730.07	-2.82	4,730.06	1.98	1.79	0.84
11,347.00	90.40	0.70	6,547.91	4,825.06	-2.16	4,825.05	0.82	-0.53	0.63
11,442.00	90.00	359.20	6,547.57	4,920.06	-2.24	4,920.04	1.63	-0.42	-1.58
11,537.00	89.30	359.90	6,548.15	5,015.05	-2.99	5,015.04	1.04	-0.74	0.74
11,632.00	89.90	359.20	6,548.82	5,110.05	-3.74	5,110.03	0.97	0.63	-0.74
11,726.00	90.30	358.60	6,548.65	5,204.03	-5.54	5,204.02	0.77	0.43	-0.64
11,820.00	89.90	359.30	6,548.49	5,298.01	-7.26	5,298.01	0.86	-0.43	0.74
11,915.00	90.50	358.60	6,548.16	5,393.00	-9.00	5,393.00	0.97	0.63	-0.74
12,010.00	90.00	359.40	6,547.74	5,487.98	-10.66	5,487.99	0.99	-0.53	0.84
12,104.00	89.50	0.10	6,548.15	5,581.98	-11.07	5,581.98	0.92	-0.53	0.74
12,198.00	89.30	358.60	6,549.14	5,675.96	-12.14	5,675.97	1.61	-0.21	-1.60
12,293.00	90.20	359.10	6,549.55	5,770.94	-14.04	5,770.96	1.08	0.95	0.53
12,388.00	89.60	359.40	6,549.72	5,865.93	-15.29	5,865.95	0.71	-0.63	0.32
12,482.00	89.10	359.60	6,550.79	5,959.92	-16.11	5,959.94	0.57	-0.53	0.21
12,545.00	89.00	359.90	6,551.83	6,022.91	-16.38	6,022.93	0.50	-0.16	0.48
Last TDS MWD Survey									
12,600.00	89.00	359.90	6,552.79	6,077.90	-16.48	6,077.93	0.00	0.00	0.00
Projection to Bit/TD									

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 1015' FNL, 2310' FEL, Sec 14, T17S, R32E, Unit B
Project:	Lea County, NM (NAD-27 2015)	TVD Reference:	KB @ 4106.00usft (Patriot 6)
Site:	Flat Head Federal Com #25H	MD Reference:	KB @ 4106.00usft (Patriot 6)
Well:	SHL: 1015' FNL, 2310' FEL, Sec 14, T17S, R32E, Unit B	North Reference:	Grid
Wellbore:	BHL: 220' FNL, 2290' FEL, Sec 11, T17S, R32E, Unit B	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 220' FNL, 2290' FEL, Sec 11, T17S, R32E, Unit B	Database:	EDM 5000.1 Single User Db

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,725.00	2,724.69	20.59	13.64	Tie-In to VES Gyro
2,842.00	2,841.69	21.27	13.54	First TDS MWD Survey
6,513.54	6,393.08	35.35	38.68	As-Drilled PP
12,545.00	6,551.83	6,022.91	-16.38	Last TDS MWD Survey
12,600.00	6,552.79	6,077.90	-16.48	Projection to Bit/TD

Checked By: _____	Approved By: _____	Date: _____
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January 19, 2017

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

Attn: Kanicia Castillo

RE: **Flat Head Federal Com No. 025H**

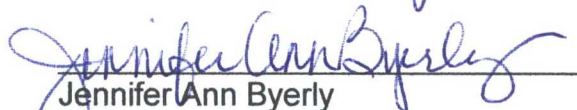
Please find enclosed a copy of the survey from 0' to 2725' ran on the above referenced well.

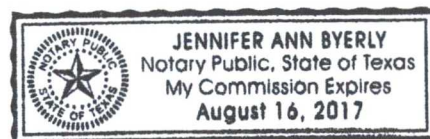
Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 19 day of January,
A.D., 2017, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas



Company: COG OPERATING
Lease/Well: FLAT HEAD FEDERAL COM No./025H



Rig Name: PATRIOT 6
State/County: NEW MEXICO/LEA
VS-Azi: 0.00 Degrees
Latitude: 32.83916, Longitude: -103.73637
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: eline-de_01.ut
Minimum Curvature Method
Report Date/Time: 1/19/2017 / 15:03

VES Survey International
West Texas
432-563-5444
Surveyor: Dustin Byers
Flat Head Federal Com No. 025H / API 30-025-43109

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	****
25.00	0.17	81.14	25.00	0.01	0.04	0.01	0.04	81.14	0.68
50.00	0.29	69.33	50.00	0.03	0.13	0.03	0.14	75.69	0.52
75.00	0.25	78.39	75.00	0.07	0.24	0.07	0.25	74.68	0.24
100.00	0.19	82.55	100.00	0.08	0.34	0.08	0.35	76.18	0.24
125.00	0.26	91.73	125.00	0.09	0.44	0.09	0.45	78.75	0.33
150.00	0.28	82.48	150.00	0.09	0.55	0.09	0.56	80.47	0.19
175.00	0.23	58.82	175.00	0.13	0.66	0.13	0.67	79.09	0.46
200.00	0.27	52.08	200.00	0.19	0.75	0.19	0.77	75.80	0.22
225.00	0.24	60.99	225.00	0.25	0.84	0.25	0.88	73.36	0.22
250.00	0.21	48.71	250.00	0.31	0.92	0.31	0.97	71.59	0.22
275.00	0.21	67.91	275.00	0.35	0.99	0.35	1.05	70.47	0.28
300.00	0.23	70.86	300.00	0.39	1.08	0.39	1.15	70.39	0.10
325.00	0.17	85.84	325.00	0.40	1.17	0.40	1.24	70.88	0.30
350.00	0.17	109.34	350.00	0.40	1.24	0.40	1.30	72.32	0.28
375.00	0.32	88.76	375.00	0.38	1.34	0.38	1.40	74.04	0.68
400.00	0.37	93.88	400.00	0.38	1.49	0.38	1.54	75.71	0.23

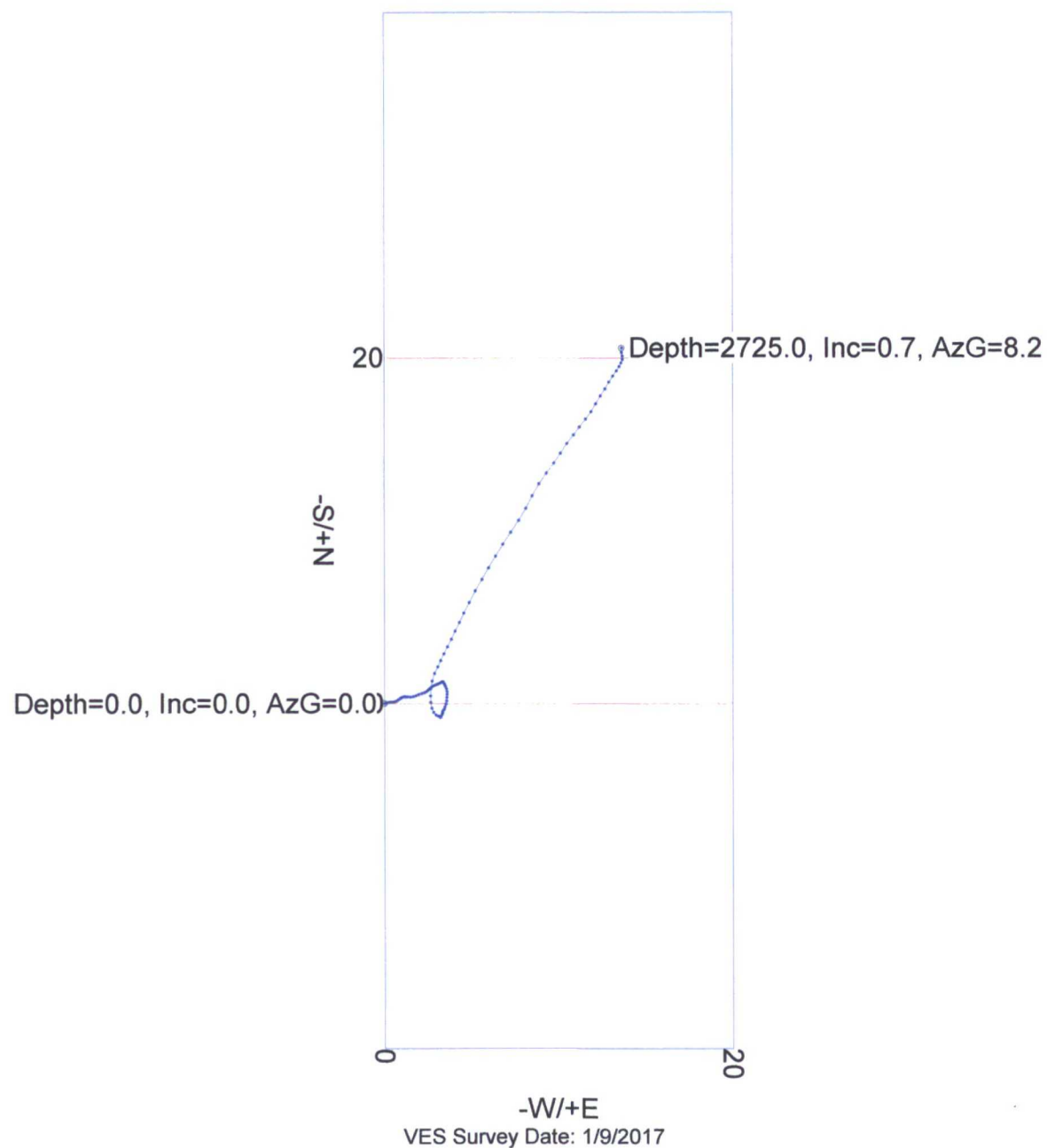
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
425.00	0.38	74.73	425.00	0.40	1.65	0.40	1.70	76.50	0.50
450.00	0.37	64.85	450.00	0.45	1.81	0.45	1.86	75.92	0.26
475.00	0.40	72.60	475.00	0.51	1.96	0.51	2.03	75.35	0.25
500.00	0.43	72.60	499.99	0.57	2.13	0.57	2.21	75.12	0.13
525.00	0.28	61.99	524.99	0.62	2.28	0.62	2.36	74.68	0.65
550.00	0.34	56.90	549.99	0.69	2.40	0.69	2.49	73.85	0.26
575.00	0.24	48.83	574.99	0.77	2.50	0.77	2.61	72.88	0.43
600.00	0.26	41.81	599.99	0.85	2.58	0.85	2.71	71.79	0.15
625.00	0.32	54.13	624.99	0.93	2.67	0.93	2.83	70.79	0.33
650.00	0.23	59.42	649.99	1.00	2.77	1.00	2.95	70.21	0.35
675.00	0.27	63.23	674.99	1.05	2.87	1.05	3.05	69.89	0.16
700.00	0.26	68.80	699.99	1.10	2.97	1.10	3.17	69.75	0.12
725.00	0.21	68.38	724.99	1.13	3.07	1.13	3.27	69.72	0.17
750.00	0.19	65.37	749.99	1.17	3.15	1.17	3.36	69.65	0.11
775.00	0.19	51.02	774.99	1.21	3.22	1.21	3.44	69.38	0.19
800.00	0.18	55.14	799.99	1.26	3.28	1.26	3.51	69.00	0.06
825.00	0.11	112.36	824.99	1.27	3.34	1.27	3.57	69.11	0.62
850.00	0.07	154.13	849.99	1.25	3.36	1.25	3.59	69.62	0.29
875.00	0.14	153.22	874.99	1.21	3.38	1.21	3.59	70.36	0.26
900.00	0.05	142.61	899.99	1.17	3.41	1.17	3.60	71.01	0.34
925.00	0.08	153.63	924.99	1.15	3.42	1.15	3.61	71.48	0.13
950.00	0.09	147.36	949.99	1.11	3.44	1.11	3.62	72.08	0.06
975.00	0.11	159.81	974.99	1.07	3.46	1.07	3.62	72.77	0.11
1000.00	0.30	150.38	999.99	0.99	3.50	0.99	3.64	74.16	0.77
1025.00	0.39	166.30	1024.99	0.85	3.55	0.85	3.65	76.49	0.51
1050.00	0.34	170.03	1049.99	0.70	3.59	0.70	3.65	78.98	0.21
1075.00	0.41	187.15	1074.99	0.54	3.59	0.54	3.63	81.50	0.53
1100.00	0.47	182.79	1099.99	0.34	3.57	0.34	3.59	84.49	0.27
1125.00	0.43	184.46	1124.99	0.15	3.56	0.15	3.56	87.61	0.16
1150.00	0.41	195.96	1149.99	-0.03	3.53	-0.03	3.53	90.52	0.35
1175.00	0.32	205.13	1174.99	-0.18	3.47	-0.18	3.48	93.00	0.43
1200.00	0.30	193.30	1199.99	-0.31	3.43	-0.31	3.44	95.14	0.28
1225.00	0.23	235.78	1224.99	-0.40	3.37	-0.40	3.39	96.76	0.80
1250.00	0.14	166.79	1249.99	-0.46	3.34	-0.46	3.37	97.82	0.90
1275.00	0.17	180.51	1274.99	-0.53	3.34	-0.53	3.38	98.94	0.20
1300.00	0.18	214.20	1299.99	-0.60	3.32	-0.60	3.37	100.18	0.41
1325.00	0.18	195.09	1324.99	-0.67	3.29	-0.67	3.35	101.49	0.24
1350.00	0.13	231.05	1349.99	-0.72	3.26	-0.72	3.33	102.54	0.44
1375.00	0.16	184.99	1374.99	-0.78	3.23	-0.78	3.32	103.52	0.48

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
1400.00	0.06	296.31	1399.99	-0.81	3.22	-0.81	3.32	104.08	0.77
1425.00	0.07	38.57	1424.99	-0.79	3.21	-0.79	3.31	103.80	0.40
1450.00	0.02	186.58	1449.99	-0.78	3.22	-0.78	3.32	103.64	0.35
1475.00	0.08	294.38	1474.99	-0.78	3.21	-0.78	3.30	103.66	0.35
1500.00	0.06	308.70	1499.99	-0.76	3.18	-0.76	3.27	103.50	0.11
1525.00	0.08	283.15	1524.99	-0.75	3.15	-0.75	3.24	103.41	0.15
1550.00	0.25	289.42	1549.99	-0.73	3.08	-0.73	3.17	103.31	0.69
1575.00	0.42	302.10	1574.98	-0.66	2.96	-0.66	3.03	102.64	0.71
1600.00	0.53	329.28	1599.98	-0.52	2.82	-0.52	2.87	100.37	0.98
1625.00	0.70	342.31	1624.98	-0.27	2.72	-0.27	2.73	95.74	0.88
1650.00	0.85	354.33	1649.98	0.06	2.65	0.06	2.65	88.77	0.90
1675.00	0.93	0.53	1674.98	0.45	2.63	0.45	2.67	80.40	0.50
1700.00	0.96	4.24	1699.97	0.86	2.65	0.86	2.79	72.07	0.28
1725.00	1.12	13.62	1724.97	1.31	2.73	1.31	3.02	64.41	0.93
1750.00	1.01	25.42	1749.97	1.74	2.88	1.74	3.36	58.81	0.98
1775.00	0.92	24.23	1774.96	2.12	3.05	2.12	3.72	55.18	0.35
1800.00	0.93	25.00	1799.96	2.49	3.22	2.49	4.07	52.30	0.05
1825.00	1.03	26.36	1824.95	2.88	3.41	2.88	4.46	49.84	0.44
1850.00	1.05	27.51	1849.95	3.28	3.61	3.28	4.88	47.76	0.10
1875.00	1.19	25.38	1874.95	3.72	3.83	3.72	5.34	45.85	0.60
1900.00	1.24	25.21	1899.94	4.20	4.06	4.20	5.84	44.03	0.20
1925.00	1.27	27.08	1924.93	4.69	4.30	4.69	6.36	42.51	0.19
1950.00	1.45	25.09	1949.93	5.22	4.56	5.22	6.93	41.12	0.76
1975.00	1.69	26.73	1974.92	5.84	4.86	5.84	7.59	39.77	0.96
2000.00	1.82	30.05	1999.91	6.51	5.22	6.51	8.34	38.74	0.66
2025.00	1.72	28.66	2024.89	7.18	5.60	7.18	9.11	37.95	0.41
2050.00	1.76	31.76	2049.88	7.84	5.98	7.84	9.86	37.36	0.40
2075.00	1.85	29.78	2074.87	8.51	6.39	8.51	10.64	36.87	0.45
2100.00	1.88	31.84	2099.86	9.21	6.80	9.21	11.45	36.44	0.28
2125.00	1.93	35.92	2124.84	9.90	7.26	9.90	12.28	36.27	0.58
2150.00	1.88	32.44	2149.83	10.58	7.73	10.58	13.11	36.14	0.50
2175.00	1.87	27.33	2174.82	11.29	8.14	11.29	13.92	35.78	0.67
2200.00	1.87	26.18	2199.80	12.02	8.50	12.02	14.72	35.28	0.15
2225.00	1.77	31.84	2224.79	12.72	8.89	12.72	15.51	34.95	0.84
2250.00	1.71	37.02	2249.78	13.34	9.32	13.34	16.27	34.93	0.67
2275.00	1.62	36.84	2274.77	13.92	9.75	13.92	17.00	35.01	0.34
2300.00	1.52	30.81	2299.76	14.49	10.13	14.49	17.68	34.97	0.78
2325.00	1.52	35.23	2324.75	15.04	10.50	15.04	18.34	34.90	0.47
2350.00	1.34	38.06	2349.74	15.54	10.87	15.54	18.97	34.95	0.79

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
2375.00	1.35	38.07	2374.74	16.01	11.23	16.01	19.55	35.05	0.07
2400.00	1.27	37.40	2399.73	16.46	11.58	16.46	20.12	35.12	0.33
2425.00	1.20	33.08	2424.72	16.90	11.89	16.90	20.66	35.13	0.47
2450.00	1.21	26.03	2449.72	17.36	12.15	17.36	21.19	34.99	0.59
2475.00	1.19	35.73	2474.71	17.80	12.42	17.80	21.71	34.89	0.81
2500.00	1.05	28.26	2499.71	18.22	12.68	18.22	22.19	34.83	0.80
2525.00	1.02	33.05	2524.70	18.60	12.91	18.60	22.64	34.75	0.36
2550.00	0.90	34.00	2549.70	18.96	13.14	18.96	23.06	34.73	0.48
2575.00	0.74	36.01	2574.70	19.25	13.34	19.25	23.42	34.73	0.66
2600.00	0.61	27.49	2599.70	19.50	13.50	19.50	23.72	34.70	0.67
2625.00	0.50	27.19	2624.69	19.71	13.61	19.71	23.96	34.62	0.43
2650.00	0.44	10.86	2649.69	19.90	13.68	19.90	24.15	34.50	0.58
2675.00	0.50	352.73	2674.69	20.11	13.68	20.11	24.32	34.24	0.63
2700.00	0.52	347.76	2699.69	20.33	13.65	20.33	24.48	33.88	0.20
2725.00	0.65	8.25	2724.69	20.58	13.64	20.58	24.69	33.54	0.98



VES Survey International
West Texas
432-563-5444
Surveyor: Dustin Byers
Flat Head Federal Com No. 025H / API 30-025-43109





I Dustin Byers certify that I am employed by VES Survey International. That I did on the day(s) of 01/10/17 through 01/10/17 conduct or supervise the taking of a Rate Gyro survey from a depth of 0.00 feet to a depth of 2,725.00 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 COG Operating for the Flat Head Fed Com Well # 25H API # 30-025-43109 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 VES Survey International.

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

Dustin Byers
Service Technician
VES Survey International



PATRIOT DRILLING, LLC

OPERATOR: COG Operating, LLC
WELL/LEASE: Flat Head Fed Con # 25 H
COUNTY: Lea County New Mexico
Section 11 & 14, T17S, R32E

**STATE OF NEW MEXICO
DEVIATION REPORT**

<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
322	1/2	1,913	1 1/4
562	1/4	2,452	1
1,056	3/4	2,750	1 1/2
1,597	1	2,906	3/4

Patriot Drilling, LLC

M. Leroy Peterson, Executive Vice-President

The foregoing instrument was acknowledged before me on this 25th day of January, 2017 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling,

My Commission Expires: 02/01/2019

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

