



NM OIL CONSERVATION
ARTESIA DISTRICT

MAY 30 2017

RECEIVED

COG Operating LLC

Eddy County, NM (NAD-27 2015)

Burch Keely Unit #964H

API #: 30-015-44149

SHL: 1485' FNL, 215' FEL, Sec 24, T17S, R29E, Unit H

PP: 1669' FNL, 330' FWL, Sec 19, T17S, R30E, Unit E

BHL: 1650' FNL, 10' FEL, Sec 19, T17S, R30E, Unit H

Plan: Design #1

Standard Planning Report

09 May, 2017





TDS
Planning Report



Database: EDM 5000.1 Single User Db
Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Burch Keely Unit #964H
Well: SHL: 1485' FNL, 215' FEL, Sec 24, T17S,
R29E, Unit H
Wellbore: BHL: 1650' FNL, 10' FEL, Sec 19, T17S,
R30E, Unit H
Design: Design #1

Local Co-ordinate Reference: Site Burch Keely Unit #964H
TVD Reference: KB @ 3639.00usft (Patriot 6)
MD Reference: KB @ 3639.00usft (Patriot 6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	Eddy 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	Burch Keely Unit #964H			
Site Position:		Northing:	663,291.90 usft	Latitude: 32° 49' 23.103 N
From:	Map	Easting:	596,299.90 usft	Longitude: 104° 1' 11.465 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence: 0.17 °

Well	SHL: 1485' FNL, 215' FEL, Sec 24, T17S, R29E, Unit H			
Well Position	+N/-S	0.00 usft	Northing:	663,291.90 usft
	+E/-W	0.00 usft	Easting:	596,299.90 usft
Position Uncertainty	0.00 usft		Wellhead Elevation:	0.00 usft
			Ground Level:	3,621.00 usft

Wellbore	BHL: 1650' FNL, 10' FEL, Sec 19, T17S, R30E, Unit H				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	5/9/2017	7.22	60.54	48,255

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	91.54

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,125.00	0.00	0.00	1,125.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,301.95	3.54	175.13	1,301.84	-5.44	0.46	2.00	2.00	0.00	175.13	
4,157.93	3.54	175.13	4,152.37	-181.11	15.42	0.00	0.00	0.00	0.00	
4,334.88	0.00	0.00	4,329.21	-186.55	15.88	2.00	-2.00	0.00	180.00	
4,434.88	0.00	0.00	4,429.21	-186.55	15.88	0.00	0.00	0.00	0.00	
5,262.19	91.00	89.56	4,950.00	-182.46	545.86	11.00	11.00	10.83	89.56	
10,118.52	91.00	89.56	4,864.94	-145.00	5,401.30	0.00	0.00	0.00	0.00	PBHL (BKU#964H/L1)



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Wellbore: BHL: 1650' FNL, 10' FEL, Sec 19, T17S, R30E, Unit H
Design: Design #1

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North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned 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	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,125.00	0.00	0.00	1,125.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
1,200.00	1.50	175.13	1,199.99	-0.98	0.08	0.11	2.00	2.00	0.00
1,301.95	3.54	175.13	1,301.84	-5.44	0.46	0.61	2.00	2.00	0.00
Start 2855.97 hold									
1,400.00	3.54	175.13	1,399.70	-11.47	0.98	1.28	0.00	0.00	0.00
1,500.00	3.54	175.13	1,499.51	-17.62	1.50	1.97	0.00	0.00	0.00
1,600.00	3.54	175.13	1,599.32	-23.78	2.02	2.66	0.00	0.00	0.00
1,700.00	3.54	175.13	1,699.13	-29.93	2.55	3.35	0.00	0.00	0.00
1,800.00	3.54	175.13	1,798.94	-36.08	3.07	4.04	0.00	0.00	0.00
1,900.00	3.54	175.13	1,898.75	-42.23	3.59	4.73	0.00	0.00	0.00
2,000.00	3.54	175.13	1,998.56	-48.38	4.12	5.41	0.00	0.00	0.00
2,100.00	3.54	175.13	2,098.37	-54.53	4.64	6.10	0.00	0.00	0.00
2,200.00	3.54	175.13	2,198.17	-60.68	5.17	6.79	0.00	0.00	0.00
2,300.00	3.54	175.13	2,297.98	-66.83	5.69	7.48	0.00	0.00	0.00
2,400.00	3.54	175.13	2,397.79	-72.98	6.21	8.17	0.00	0.00	0.00
2,500.00	3.54	175.13	2,497.60	-79.13	6.74	8.86	0.00	0.00	0.00
2,600.00	3.54	175.13	2,597.41	-85.28	7.26	9.55	0.00	0.00	0.00
2,700.00	3.54	175.13	2,697.22	-91.43	7.78	10.23	0.00	0.00	0.00
2,800.00	3.54	175.13	2,797.03	-97.58	8.31	10.92	0.00	0.00	0.00
2,900.00	3.54	175.13	2,896.84	-103.73	8.83	11.61	0.00	0.00	0.00
3,000.00	3.54	175.13	2,996.65	-109.89	9.35	12.30	0.00	0.00	0.00
3,100.00	3.54	175.13	3,096.46	-116.04	9.88	12.99	0.00	0.00	0.00
3,200.00	3.54	175.13	3,196.27	-122.19	10.40	13.68	0.00	0.00	0.00
3,300.00	3.54	175.13	3,296.08	-128.34	10.92	14.36	0.00	0.00	0.00
3,400.00	3.54	175.13	3,395.89	-134.49	11.45	15.05	0.00	0.00	0.00
3,500.00	3.54	175.13	3,495.70	-140.64	11.97	15.74	0.00	0.00	0.00
3,600.00	3.54	175.13	3,595.51	-146.79	12.50	16.43	0.00	0.00	0.00
3,700.00	3.54	175.13	3,695.31	-152.94	13.02	17.12	0.00	0.00	0.00
3,800.00	3.54	175.13	3,795.12	-159.09	13.54	17.81	0.00	0.00	0.00
3,900.00	3.54	175.13	3,894.93	-165.24	14.07	18.49	0.00	0.00	0.00
4,000.00	3.54	175.13	3,994.74	-171.39	14.59	19.18	0.00	0.00	0.00
4,100.00	3.54	175.13	4,094.55	-177.54	15.11	19.87	0.00	0.00	0.00
4,157.93	3.54	175.13	4,152.37	-181.11	15.42	20.27	0.00	0.00	0.00
Start Drop -2.00									
4,200.00	2.70	175.13	4,194.38	-183.39	15.61	20.53	2.00	-2.00	0.00
4,300.00	0.70	175.13	4,294.33	-186.34	15.86	20.86	2.00	-2.00	0.00
4,334.88	0.00	0.00	4,329.21	-186.55	15.88	20.88	2.00	-2.00	0.00
Start 100.00 hold									
4,400.00	0.00	0.00	4,394.33	-186.55	15.88	20.88	0.00	0.00	0.00



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Planned 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)
4,434.88	0.00	0.00	4,429.21	-186.55	15.88	20.88	0.00	0.00	0.00
Start DLS 11.00									
4,450.00	1.66	89.56	4,444.33	-186.55	16.10	21.10	11.00	11.00	0.00
4,500.00	7.16	89.56	4,494.16	-186.52	19.95	24.94	11.00	11.00	0.00
4,550.00	12.66	89.56	4,543.39	-186.45	28.55	33.54	11.00	11.00	0.00
4,600.00	18.16	89.56	4,591.58	-186.35	41.83	46.82	11.00	11.00	0.00
4,650.00	23.66	89.56	4,638.27	-186.21	59.67	64.65	11.00	11.00	0.00
4,700.00	29.16	89.56	4,683.03	-186.04	81.91	86.87	11.00	11.00	0.00
4,750.00	34.66	89.56	4,725.45	-185.84	108.33	113.27	11.00	11.00	0.00
4,800.00	40.16	89.56	4,765.15	-185.60	138.69	143.62	11.00	11.00	0.00
4,850.00	45.66	89.56	4,801.76	-185.34	172.72	177.63	11.00	11.00	0.00
4,900.00	51.16	89.56	4,834.93	-185.05	210.10	214.99	11.00	11.00	0.00
4,950.00	56.66	89.56	4,864.37	-184.74	250.49	255.36	11.00	11.00	0.00
5,000.00	62.16	89.56	4,889.81	-184.41	293.52	298.36	11.00	11.00	0.00
5,050.00	67.66	89.56	4,911.00	-184.06	338.78	343.60	11.00	11.00	0.00
5,100.00	73.16	89.56	4,927.75	-183.70	385.87	390.66	11.00	11.00	0.00
5,150.00	78.66	89.56	4,939.92	-183.32	434.35	439.11	11.00	11.00	0.00
5,200.00	84.16	89.56	4,947.38	-182.94	483.77	488.50	11.00	11.00	0.00
5,250.00	89.66	89.56	4,950.07	-182.56	533.67	538.38	11.00	11.00	0.00
5,262.19	91.00	89.56	4,950.00	-182.46	545.86	550.56	11.00	11.00	0.00
Start 4856.33 hold									
5,300.00	91.00	89.56	4,949.34	-182.17	583.66	588.34	0.00	0.00	0.00
5,400.00	91.00	89.56	4,947.59	-181.40	683.65	688.27	0.00	0.00	0.00
5,500.00	91.00	89.56	4,945.84	-180.63	783.63	788.19	0.00	0.00	0.00
5,600.00	91.00	89.56	4,944.08	-179.86	883.61	888.12	0.00	0.00	0.00
5,700.00	91.00	89.56	4,942.33	-179.08	983.59	988.04	0.00	0.00	0.00
5,800.00	91.00	89.56	4,940.58	-178.31	1,083.57	1,087.97	0.00	0.00	0.00
5,900.00	91.00	89.56	4,938.83	-177.54	1,183.55	1,187.89	0.00	0.00	0.00
6,000.00	91.00	89.56	4,937.08	-176.77	1,283.54	1,287.82	0.00	0.00	0.00
6,100.00	91.00	89.56	4,935.33	-176.00	1,383.52	1,387.74	0.00	0.00	0.00
6,200.00	91.00	89.56	4,933.57	-175.23	1,483.50	1,487.67	0.00	0.00	0.00
6,300.00	91.00	89.56	4,931.82	-174.46	1,583.48	1,587.59	0.00	0.00	0.00
6,400.00	91.00	89.56	4,930.07	-173.68	1,683.46	1,687.52	0.00	0.00	0.00
6,500.00	91.00	89.56	4,928.32	-172.91	1,783.44	1,787.44	0.00	0.00	0.00
6,600.00	91.00	89.56	4,926.57	-172.14	1,883.43	1,887.37	0.00	0.00	0.00
6,700.00	91.00	89.56	4,924.82	-171.37	1,983.41	1,987.29	0.00	0.00	0.00
6,800.00	91.00	89.56	4,923.07	-170.60	2,083.39	2,087.22	0.00	0.00	0.00
6,900.00	91.00	89.56	4,921.31	-169.83	2,183.37	2,187.14	0.00	0.00	0.00
7,000.00	91.00	89.56	4,919.56	-169.06	2,283.35	2,287.07	0.00	0.00	0.00
7,100.00	91.00	89.56	4,917.81	-168.28	2,383.33	2,386.99	0.00	0.00	0.00
7,200.00	91.00	89.56	4,916.06	-167.51	2,483.32	2,486.92	0.00	0.00	0.00
7,300.00	91.00	89.56	4,914.31	-166.74	2,583.30	2,586.84	0.00	0.00	0.00
7,400.00	91.00	89.56	4,912.56	-165.97	2,683.28	2,686.77	0.00	0.00	0.00
7,500.00	91.00	89.56	4,910.80	-165.20	2,783.26	2,786.69	0.00	0.00	0.00
7,600.00	91.00	89.56	4,909.05	-164.43	2,883.24	2,886.62	0.00	0.00	0.00
7,700.00	91.00	89.56	4,907.30	-163.66	2,983.22	2,986.54	0.00	0.00	0.00
7,800.00	91.00	89.56	4,905.55	-162.88	3,083.21	3,086.47	0.00	0.00	0.00
7,900.00	91.00	89.56	4,903.80	-162.11	3,183.19	3,186.39	0.00	0.00	0.00
8,000.00	91.00	89.56	4,902.05	-161.34	3,283.17	3,286.32	0.00	0.00	0.00
8,100.00	91.00	89.56	4,900.30	-160.57	3,383.15	3,386.24	0.00	0.00	0.00
8,200.00	91.00	89.56	4,898.54	-159.80	3,483.13	3,486.17	0.00	0.00	0.00
8,300.00	91.00	89.56	4,896.79	-159.03	3,583.11	3,586.09	0.00	0.00	0.00



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8,400.00	91.00	89.56	4,895.04	-158.26	3,683.10	3,686.02	0.00	0.00	0.00
8,500.00	91.00	89.56	4,893.29	-157.49	3,783.08	3,785.94	0.00	0.00	0.00
8,600.00	91.00	89.56	4,891.54	-156.71	3,883.06	3,885.87	0.00	0.00	0.00
8,700.00	91.00	89.56	4,889.79	-155.94	3,983.04	3,985.79	0.00	0.00	0.00
8,800.00	91.00	89.56	4,888.03	-155.17	4,083.02	4,085.72	0.00	0.00	0.00
8,900.00	91.00	89.56	4,886.28	-154.40	4,183.00	4,185.64	0.00	0.00	0.00
9,000.00	91.00	89.56	4,884.53	-153.63	4,282.99	4,285.57	0.00	0.00	0.00
9,100.00	91.00	89.56	4,882.78	-152.86	4,382.97	4,385.49	0.00	0.00	0.00
9,200.00	91.00	89.56	4,881.03	-152.09	4,482.95	4,485.42	0.00	0.00	0.00
9,300.00	91.00	89.56	4,879.28	-151.31	4,582.93	4,585.34	0.00	0.00	0.00
9,400.00	91.00	89.56	4,877.53	-150.54	4,682.91	4,685.27	0.00	0.00	0.00
9,500.00	91.00	89.56	4,875.77	-149.77	4,782.89	4,785.19	0.00	0.00	0.00
9,600.00	91.00	89.56	4,874.02	-149.00	4,882.88	4,885.12	0.00	0.00	0.00
9,700.00	91.00	89.56	4,872.27	-148.23	4,982.86	4,985.04	0.00	0.00	0.00
9,800.00	91.00	89.56	4,870.52	-147.46	5,082.84	5,084.97	0.00	0.00	0.00
9,900.00	91.00	89.56	4,868.77	-146.69	5,182.82	5,184.89	0.00	0.00	0.00
10,000.00	91.00	89.56	4,867.02	-145.91	5,282.80	5,284.82	0.00	0.00	0.00
10,100.00	91.00	89.56	4,865.26	-145.14	5,382.79	5,384.74	0.00	0.00	0.00
10,118.52	91.00	89.56	4,864.94	-145.00	5,401.30	5,403.25	0.00	0.00	0.00

TD at 10118.52

Design Targets

Target Name

- hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Max Dev 97.05' @ 4818 - plan misses target center by 4869.80usft at 9883.67usft MD (4869.05 TVD, -146.81 N, 5166.49 E) - Circle (radius 97.05)	0.00	0.00	0.00	-146.63	5,081.19	663,145.27	601,381.09	32° 49' 21.499 N	104° 0' 11.924 W
KOP (BKU#964H/L1) - plan hits target center - Point	0.00	0.00	4,429.21	-186.55	15.88	663,105.35	596,315.78	32° 49' 21.256 N	104° 1' 11.285 W
PBHL (BKU#964H/L1) - plan hits target center - Point	0.00	0.00	4,864.94	-145.00	5,401.30	663,146.90	601,701.20	32° 49' 21.505 N	104° 0' 8.173 W
EOC/PP (BKU#964H/L1) - plan hits target center - Point	0.00	0.00	4,950.00	-182.46	545.86	663,109.44	596,845.76	32° 49' 21.281 N	104° 1' 5.074 W

TDS
Planning Report



Database: EDM 5000.1 Single User Db
Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Burch Keely Unit #964H
Well: SHL: 1485' FNL, 215' FEL, Sec 24, T17S, R29E, Unit H
Wellbore: BHL: 1650' FNL, 10' FEL, Sec 19, T17S, R30E, Unit H
Design: Design #1

Local Co-ordinate Reference: Site Burch Keely Unit #964H
TVD Reference: KB @ 3639.00usft (Patriot 6)
MD Reference: KB @ 3639.00usft (Patriot 6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,125.00	1,125.00	0.00	0.00	Start Build 2.00
1,301.95	1,301.84	-5.44	0.46	Start 2855.97 hold
4,157.93	4,152.37	-181.11	15.42	Start Drop -2.00
4,334.88	4,329.21	-186.55	15.88	Start 100.00 hold
4,434.88	4,429.21	-186.55	15.88	Start DLS 11.00
5,262.19	4,950.00	-182.46	545.86	Start 4856.33 hold
10,118.52	4,864.94	-145.00	5,401.30	TD at 10118.52

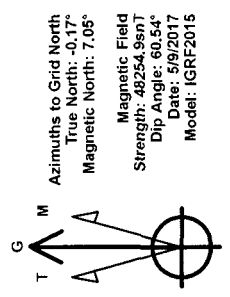
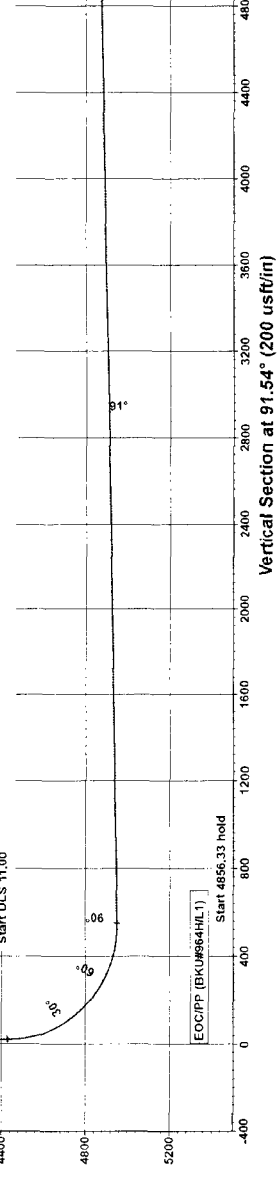
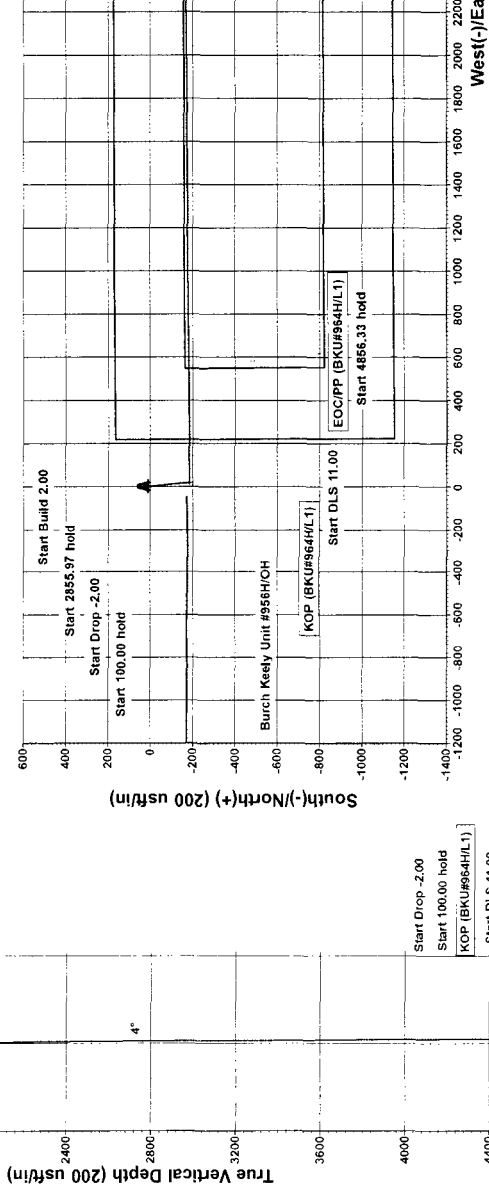
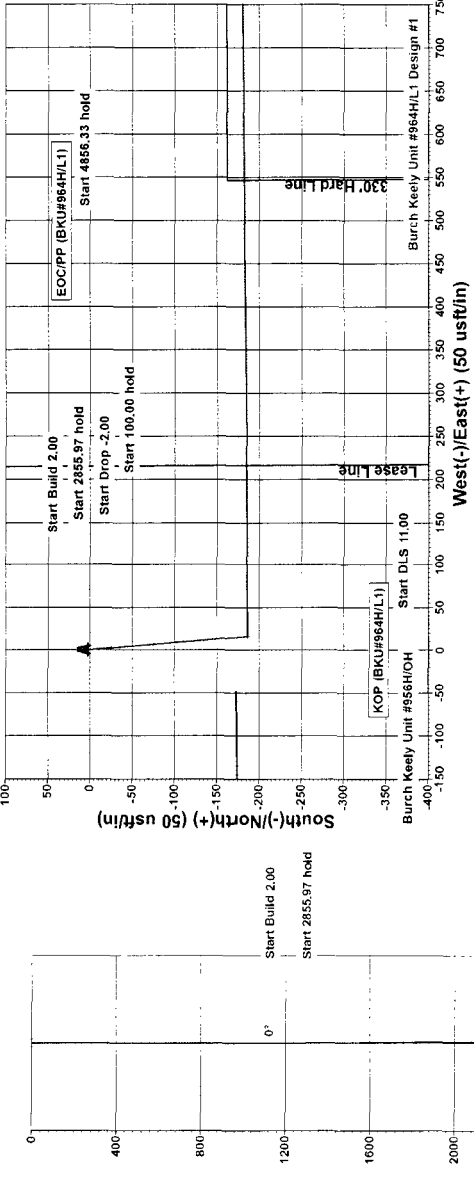
COG Operating, LLC
Project: Eddy County, NM (NAD-27 2015)

Well: SHL: 1485 FNL, 215 FEL, Sec 24, T17S, R29E, Unit H
Wellbore: BHL: 1650 FNL, 10' FEL, Sec 19, T17S, R30E, Unit H

Plan: Design #1 (SHL: 1485 FNL, 215 FEL, Sec 24, T17S, R29E, Unit H/BHL: 1650 FNL, 10' FEL, Sec 19, T17S, R30E, Unit H)

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSet	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1125.00	0.00	0.00	1125.00	0.00	0.00	0.00	0.00	0.00	
3	1301.95	3.54	175.13	1301.84	-5.44	0.46	2.00	175.13	0.61	
4	4157.93	3.54	175.13	4152.37	-181.11	15.42	0.00	0.00	20.27	
5	4334.88	0.00	0.00	4329.21	-186.55	15.88	2.00	180.00	20.88	
6	4434.88	0.00	0.00	4429.21	-186.55	15.88	0.00	0.00	20.88	
7	5262.19	91.00	89.56	4950.00	-182.46	545.86	11.00	89.56	550.56	
8	10118.52	91.00	89.56	4864.94	-145.00	5401.30	0.00	0.00	5403.25	PBHL (BKU#964H/L1)



PROJECT DETAILS: Eddy County, NM (NAD-27 2015)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid

Ground Elevation: 3621.00
RKB Elevation: KB @ 3639.00usft (Patriot 6)
Northing: 663291.90
Easting: 596299.90
Latitude: 32° 49' 23.103 N
Longitude: 104° 1' 11.465 W

Terra Directional Services LLC
3705 South County Road 1210, Midland, TX 79706
Phone: 432-618-1210

