



NM OIL CONSERVATION

ARTESIAN DISTRICT

FEB 27 2017

RECEIVED

COG Operating LLC

Eddy County, NM (NAD-27 2015)

Skelly Unit #422H

API #: 30-015-43832

SHL: 20' FNL, 2510' FWL, Sec 22, T17S, R31E, Unit C

PP: 438' FSL, 2970' FWL, Sec 15, T17S, R31E, Unit O

BHL: 996' FNL, 1650' FWL, Sec 14, T17S, R31E, Unit C

Design: BHL: 990' FNL, 1650' FWL, Sec 14, T17S, R31E, Unit C

Standard Survey Report

12 December, 2016





TDS
Survey Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Skelly Unit #422H
Well: SHL: 20' FNL, 2510' FWL, Sec 22, T17S, R31E, Unit C
Wellbore: BHL: 990' FNL, 1650' FWL, Sec 14, T17S, R31E, Unit C
Design: BHL: 990' FNL, 1650' FWL, Sec 14, T17S, R31E, Unit C

Local Co-ordinate Reference: Well SHL: 20' FNL, 2510' FWL, Sec 22, T17S, R31E, Unit C
TVD Reference: KB @ 3873.00usft (Patriot 6)
MD Reference: KB @ 3873.00usft (Patriot 6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project Eddy County, NM (NAD-27 2015)
Map System: US State Plane 1927 (Exact solution)
Geo Datum: NAD 1927 (NADCON CONUS)
Map Zone: New Mexico East 3001
System Datum: Mean Sea Level

Site Skelly Unit #422H
Site Position:
From: Map
Position Uncertainty: 0.00 usft
Northing: 664,973.50 usft
Easting: 646,200.00 usft
Slot Radius: 13.20 in
Latitude: 32° 49' 37.899 N
Longitude: 103° 51' 26.613 W
Grid Convergence: 0.26 °

Well SHL: 20' FNL, 2510' FWL, Sec 22, T17S, R31E, Unit C
Well Position
+N/-S 0.00 usft
+E/-W 0.00 usft
Position Uncertainty 0.00 usft
Northing: 664,973.50 usft
Easting: 646,200.00 usft
Wellhead Elevation: 0.00 usft
Latitude: 32° 49' 37.899 N
Longitude: 103° 51' 26.613 W
Ground Level: 3,855.00 usft

Wellbore BHL: 990' FNL, 1650' FWL, Sec 14, T17S, R31E, Unit C
Magnetics
Model Name IGRF2015
Sample Date 3/6/2016
Declination (°) 7.27
Dip Angle (°) 60.59
Field Strength (nT) 48,395

Design BHL: 990' FNL, 1650' FWL, Sec 14, T17S, R31E, Unit C
Audit Notes:
Version: 1.0
Phase: ACTUAL
Tie On Depth: 0.00
Vertical Section:
Depth From (TVD) (usft) 0.00
+N/-S (usft) 0.00
+E/-W (usft) 0.00
Direction (°) 45.41

Survey Program Date 12/12/2016
From (usft) 100.00
To (usft) 1,743.00
Survey (Wellbore) Scientific Gyro #1 (BHL: 990' FNL, 1650' F)
TDS MWD #2 (BHL: 990' FNL, 1650' FWL)
Tool Name Scientific Gyro
MWD
Description Scientific Drilling Intl
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	0.50	330.78	100.00	0.38	-0.21	0.12	0.50	0.50	0.00
125.00	0.63	312.79	125.00	0.57	-0.37	0.14	0.87	0.52	-71.96
150.00	0.54	337.44	150.00	0.77	-0.51	0.18	1.06	-0.36	98.60
175.00	0.58	325.20	175.00	0.98	-0.63	0.24	0.50	0.16	-48.96
200.00	0.62	328.64	199.99	1.20	-0.77	0.29	0.22	0.16	13.76
225.00	0.58	345.00	224.99	1.44	-0.88	0.39	0.70	-0.16	65.44



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KB @ 3873.00usft (Patriot 6)

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KB @ 3873.00usft (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)	Buird Rate (°/100usft)	Turn Rate (°/100usft)
250.00	0.55	334.92	249.99	1.67	-0.96	0.49	0.41	-0.12	-40.32
275.00	0.64	342.79	274.99	1.91	-1.05	0.59	0.49	0.36	31.48
300.00	0.49	327.65	299.99	2.14	-1.15	0.68	0.84	-0.60	-60.56
325.00	0.47	328.15	324.99	2.32	-1.26	0.73	0.08	-0.08	2.00
350.00	0.33	314.66	349.99	2.45	-1.37	0.75	0.67	-0.56	-53.96
375.00	0.33	319.96	374.99	2.56	-1.46	0.75	0.12	0.00	21.20
400.00	0.30	307.17	399.99	2.65	-1.56	0.75	0.30	-0.12	-51.16
425.00	0.26	292.51	424.99	2.71	-1.67	0.72	0.33	-0.16	-58.64
450.00	0.45	303.02	449.99	2.79	-1.80	0.67	0.80	0.76	42.04
475.00	0.45	312.95	474.98	2.91	-1.96	0.65	0.31	0.00	39.72
500.00	0.42	323.53	499.98	3.05	-2.08	0.66	0.34	-0.12	42.32
525.00	0.36	310.74	524.98	3.18	-2.20	0.66	0.42	-0.24	-51.16
550.00	0.22	310.39	549.98	3.26	-2.29	0.65	0.56	-0.56	-1.40
575.00	0.42	333.30	574.98	3.37	-2.37	0.68	0.93	0.80	91.64
600.00	0.31	319.54	599.98	3.50	-2.46	0.71	0.56	-0.44	-55.04
625.00	0.33	333.10	624.98	3.62	-2.53	0.74	0.31	0.08	54.24
650.00	0.28	347.48	649.98	3.74	-2.58	0.79	0.36	-0.20	57.52
675.00	0.20	345.13	674.98	3.85	-2.60	0.85	0.32	-0.32	-9.40
700.00	0.36	0.56	699.98	3.97	-2.61	0.92	0.70	0.64	61.72
725.00	0.19	351.83	724.98	4.09	-2.62	1.00	0.70	-0.68	-34.92
750.00	0.18	332.18	749.98	4.16	-2.64	1.04	0.26	-0.04	-78.60
775.00	0.31	329.48	774.98	4.25	-2.69	1.07	0.52	0.52	-10.80
800.00	0.40	335.56	799.98	4.39	-2.77	1.11	0.39	0.36	24.32
825.00	0.29	322.64	824.98	4.52	-2.84	1.15	0.54	-0.44	-51.68
850.00	0.35	321.44	849.98	4.63	-2.93	1.17	0.24	0.24	-4.80
875.00	0.42	345.80	874.98	4.78	-3.00	1.22	0.71	0.28	97.44
900.00	0.43	336.34	899.98	4.96	-3.06	1.30	0.28	0.04	-37.84
925.00	0.36	335.52	924.98	5.11	-3.13	1.36	0.28	-0.28	-3.28
950.00	0.24	349.94	949.98	5.24	-3.17	1.42	0.56	-0.48	57.68
975.00	0.36	355.39	974.98	5.37	-3.18	1.50	0.49	0.48	21.80
1,000.00	0.24	14.65	999.98	5.49	-3.18	1.60	0.62	-0.48	77.04
1,025.00	0.40	21.51	1,024.98	5.63	-3.13	1.72	0.66	0.64	27.44
1,050.00	0.50	32.25	1,049.97	5.80	-3.04	1.91	0.52	0.40	42.96
1,075.00	0.52	35.60	1,074.97	5.98	-2.92	2.12	0.14	0.08	13.40
1,100.00	0.54	41.03	1,099.97	6.17	-2.77	2.35	0.22	0.08	21.72
1,125.00	0.72	52.63	1,124.97	6.35	-2.57	2.63	0.88	0.72	46.40
1,150.00	0.85	60.21	1,149.97	6.54	-2.29	2.96	0.66	0.52	30.32
1,175.00	0.89	58.30	1,174.97	6.73	-1.96	3.33	0.20	0.16	-7.64
1,200.00	1.02	56.09	1,199.96	6.96	-1.61	3.74	0.54	0.52	-8.84
1,225.00	1.16	53.25	1,224.96	7.23	-1.22	4.21	0.60	0.56	-11.36
1,250.00	1.46	47.72	1,249.95	7.60	-0.78	4.78	1.30	1.20	-22.12



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1,275.00	1.63	46.58	1,274.94	8.06	-0.29	5.45	0.69	0.68	-4.56
1,300.00	1.77	47.38	1,299.93	8.56	0.25	6.19	0.57	0.56	3.20
1,325.00	1.91	46.60	1,324.92	9.11	0.84	6.99	0.57	0.56	-3.12
1,350.00	2.00	47.38	1,349.90	9.69	1.46	7.85	0.38	0.36	3.12
1,375.00	2.12	47.09	1,374.89	10.30	2.12	8.74	0.48	0.48	-1.16
1,400.00	2.13	48.27	1,399.87	10.93	2.81	9.67	0.18	0.04	4.72
1,425.00	2.29	51.19	1,424.85	11.55	3.54	10.63	0.78	0.64	11.68
1,450.00	2.25	53.12	1,449.83	12.16	4.33	11.62	0.35	-0.16	7.72
1,475.00	2.23	53.28	1,474.81	12.74	5.11	12.58	0.08	-0.08	0.64
1,500.00	2.19	54.59	1,499.79	13.31	5.89	13.54	0.26	-0.16	5.24
1,525.00	2.15	57.42	1,524.78	13.84	6.67	14.47	0.46	-0.16	11.32
1,550.00	2.13	61.84	1,549.76	14.31	7.48	15.37	0.66	-0.08	17.68
1,575.00	2.16	61.77	1,574.74	14.75	8.30	16.27	0.12	0.12	-0.28
1,600.00	2.12	61.72	1,599.72	15.19	9.12	17.16	0.16	-0.16	-0.20
1,625.00	1.98	63.04	1,624.71	15.61	9.92	18.02	0.59	-0.56	5.28
1,650.00	1.92	61.88	1,649.69	16.00	10.67	18.83	0.29	-0.24	-4.64
1,675.00	1.68	69.89	1,674.68	16.33	11.38	19.57	1.39	-0.96	32.04
1,700.00	1.87	66.00	1,699.67	16.62	12.10	20.28	0.90	0.76	-15.56
1,725.00	1.90	56.99	1,724.66	17.01	12.82	21.07	1.19	0.12	-36.04
1,743.00	1.51	60.67	1,742.65	17.29	13.28	21.59	2.25	-2.17	20.44
Tie-In to Scientific Gyro									
1,861.00	1.80	72.80	1,860.60	18.60	16.40	24.74	0.38	0.25	10.28
First TDS MWD Survey									
1,966.00	1.30	84.50	1,965.56	19.20	19.16	27.13	0.56	-0.48	11.14
2,061.00	1.40	153.00	2,060.54	18.27	20.76	27.61	1.60	0.11	72.11
2,156.00	1.70	196.90	2,155.51	15.89	20.88	26.02	1.25	0.32	46.21
2,250.00	0.90	260.70	2,249.49	14.43	19.75	24.20	1.63	-0.85	67.87
2,345.00	1.00	245.80	2,344.47	13.97	18.25	22.81	0.28	0.11	-15.68
2,439.00	1.10	246.10	2,438.46	13.27	16.68	21.20	0.11	0.11	0.32
2,533.00	1.10	238.80	2,532.44	12.44	15.09	19.47	0.15	0.00	-7.77
2,628.00	1.20	234.90	2,627.42	11.39	13.49	17.61	0.13	0.11	-4.11
2,723.00	1.10	261.40	2,722.40	10.69	11.78	15.89	0.56	-0.11	27.89
2,818.00	1.10	244.20	2,817.39	10.15	10.05	14.29	0.35	0.00	-18.11
2,912.00	1.20	233.10	2,911.37	9.17	8.45	12.46	0.26	0.11	-11.81
3,007.00	1.30	227.80	3,006.35	7.85	6.86	10.39	0.16	0.11	-5.58
3,102.00	0.70	299.20	3,101.33	7.41	5.55	9.16	1.33	-0.63	75.16
3,196.00	0.70	289.40	3,195.33	7.88	4.51	8.74	0.13	0.00	-10.43
3,291.00	0.70	277.20	3,290.32	8.14	3.39	8.13	0.16	0.00	-12.84
3,386.00	0.70	266.60	3,385.31	8.18	2.23	7.33	0.14	0.00	-11.16
3,480.00	0.70	267.50	3,479.31	8.12	1.09	6.48	0.01	0.00	0.96
3,574.00	0.80	279.80	3,573.30	8.21	-0.13	5.67	0.20	0.11	13.09



TDS
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3,669.00	1.10	266.20	3,668.28	8.26	-1.70	4.59	0.39	0.32	-14.32
3,763.00	1.20	260.40	3,762.27	8.04	-3.57	3.10	0.16	0.11	-6.17
3,857.00	1.10	265.90	3,856.25	7.81	-5.44	1.61	0.16	-0.11	5.85
3,952.00	1.10	270.90	3,951.23	7.76	-7.26	0.28	0.10	0.00	5.26
4,047.00	1.10	227.40	4,046.21	7.15	-8.84	-1.27	0.86	0.00	-45.79
4,140.00	1.10	227.60	4,139.20	5.95	-10.16	-3.06	0.00	0.00	0.22
4,235.00	1.20	227.80	4,234.18	4.67	-11.57	-4.96	0.11	0.11	0.21
4,329.00	1.10	233.20	4,328.16	3.46	-13.02	-6.84	0.16	-0.11	5.74
4,424.00	0.80	168.70	4,423.15	2.27	-13.62	-8.11	1.10	-0.32	-67.89
4,518.00	0.90	179.50	4,517.14	0.89	-13.49	-8.98	0.20	0.11	11.49
4,613.00	0.90	188.20	4,612.13	-0.60	-13.59	-10.10	0.14	0.00	9.16
4,708.00	0.90	195.00	4,707.11	-2.06	-13.89	-11.33	0.11	0.00	7.16
4,803.00	1.00	204.20	4,802.10	-3.53	-14.42	-12.75	0.19	0.11	9.68
4,898.00	1.10	207.40	4,897.08	-5.10	-15.18	-14.39	0.12	0.11	3.37
4,993.00	0.50	249.20	4,992.08	-6.06	-15.98	-15.64	0.84	-0.63	44.00
5,088.00	0.40	265.90	5,087.07	-6.23	-16.70	-16.27	0.17	-0.11	17.58
5,119.00	0.40	6.00	5,118.07	-6.13	-16.80	-16.27	1.98	0.00	322.90
5,151.00	2.50	41.20	5,150.06	-5.49	-16.33	-15.48	6.83	6.56	110.00
5,182.00	5.50	47.10	5,180.98	-3.97	-14.79	-13.32	9.76	9.68	19.03
5,213.00	8.10	47.60	5,211.76	-1.49	-12.09	-9.66	8.39	8.39	1.61
5,245.00	10.60	45.90	5,243.33	2.08	-8.31	-4.46	7.86	7.81	-5.31
5,276.00	13.30	41.60	5,273.66	6.73	-3.90	1.95	9.17	8.71	-13.87
5,307.00	15.90	41.50	5,303.66	12.58	1.28	9.75	8.39	8.39	-0.32
5,339.00	19.70	43.60	5,334.12	19.77	7.91	19.51	12.04	11.88	6.56
5,370.00	24.90	47.60	5,362.79	27.96	16.34	31.27	17.47	16.77	12.90
5,402.00	29.10	50.90	5,391.30	37.42	27.36	45.75	13.93	13.13	10.31
5,433.00	32.20	51.60	5,417.97	47.30	39.68	61.47	10.07	10.00	2.26
5,465.00	35.10	50.80	5,444.60	58.42	53.50	79.11	9.17	9.06	-2.50
5,497.00	38.30	48.80	5,470.25	70.77	68.09	98.17	10.67	10.00	-6.25
5,529.00	41.10	47.60	5,494.87	84.40	83.33	118.59	9.07	8.75	-3.75
5,560.00	43.10	47.80	5,517.87	98.38	98.70	139.35	6.47	6.45	0.65
5,592.00	45.40	47.40	5,540.79	113.44	115.18	161.66	7.24	7.19	-1.25
5,624.00	46.20	46.60	5,563.10	129.08	131.96	184.60	3.08	2.50	-2.50
5,655.00	45.90	46.80	5,584.62	144.39	148.20	206.91	1.07	-0.97	0.65
5,687.00	45.60	47.40	5,606.95	159.99	164.99	229.82	1.64	-0.94	1.88
5,718.00	45.40	46.20	5,628.68	175.13	181.11	251.92	2.84	-0.65	-3.87
5,750.00	45.30	44.80	5,651.17	191.08	197.35	274.69	3.13	-0.31	-4.38
5,781.00	45.20	44.60	5,672.99	206.73	212.83	296.70	0.56	-0.32	-0.65
5,812.00	45.90	42.40	5,694.70	222.79	228.06	318.82	5.55	2.26	-7.10
5,843.00	49.20	42.30	5,715.62	239.69	243.47	341.65	10.65	10.65	-0.32
5,875.00	52.50	43.10	5,735.82	257.92	260.30	366.44	10.49	10.31	2.50



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MD Reference:

KB @ 3873.00usft (Patriot 6)

Well: SHL: 20' FNL, 2510' FWL, Sec 22, T17S, R31E, Unit C

North Reference:

Grid

Wellbore: BHL: 990' FNL, 1650' FWL, Sec 14, T17S, R31E, Unit C

Survey Calculation Method:

Minimum Curvature

Design: BHL: 990' FNL, 1650' FWL, Sec 14, T17S, R31E, Unit C

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)
5,906.00	55.40	43.80	5,754.06	276.11	277.54	391.49	9.53	9.35	2.26
5,937.00	58.70	44.50	5,770.92	294.77	295.66	417.49	10.81	10.65	2.26
5,968.00	62.40	44.40	5,786.16	314.04	314.56	444.47	11.94	11.94	-0.32
6,000.00	65.90	43.80	5,800.11	334.72	334.59	473.26	11.07	10.94	-1.88
6,031.00	69.30	43.90	5,811.92	355.38	354.44	501.91	10.97	10.97	0.32
6,062.00	72.80	44.20	5,821.99	376.45	374.83	531.21	11.33	11.29	0.97
6,093.00	76.00	44.50	5,830.32	397.80	395.70	561.06	10.36	10.32	0.97
6,125.00	78.90	44.50	5,837.28	420.08	417.59	592.29	9.06	9.06	0.00
6,156.00	81.80	44.70	5,842.47	441.83	439.04	622.85	9.38	9.35	0.65
6,181.42	84.42	45.10	5,845.52	459.71	456.86	648.08	10.43	10.31	1.56
As-Drilled PP									
6,188.00	85.10	45.20	5,846.12	464.33	461.50	654.63	10.43	10.31	1.55
6,219.00	88.90	45.00	5,847.74	486.18	483.43	685.58	12.27	12.26	-0.65
6,251.00	89.80	45.10	5,848.11	508.78	506.07	717.58	2.83	2.81	0.31
6,282.00	89.60	45.40	5,848.27	530.61	528.09	748.58	1.16	-0.65	0.97
6,314.00	89.50	45.40	5,848.52	553.08	550.87	780.58	0.31	-0.31	0.00
6,341.00	89.30	45.50	5,848.80	572.02	570.11	807.58	0.83	-0.74	0.37
6,436.00	90.70	45.60	5,848.80	638.54	637.93	902.57	1.48	1.47	0.11
6,530.00	90.60	45.80	5,847.74	704.19	705.20	996.57	0.24	-0.11	0.21
6,625.00	90.40	45.90	5,846.91	770.36	773.36	1,091.56	0.24	-0.21	0.11
6,719.00	90.90	45.40	5,845.84	836.06	840.57	1,185.55	0.75	0.53	-0.53
6,813.00	91.10	44.60	5,844.20	902.52	907.03	1,279.54	0.88	0.21	-0.85
6,907.00	90.00	45.30	5,843.30	969.04	973.44	1,373.53	1.39	-1.17	0.74
7,001.00	90.70	45.70	5,842.72	1,034.93	1,040.48	1,467.52	0.86	0.74	0.43
7,095.00	89.10	45.60	5,842.89	1,100.63	1,107.69	1,561.52	1.71	-1.70	-0.11
7,190.00	88.70	45.90	5,844.71	1,166.91	1,175.73	1,656.50	0.53	-0.42	0.32
7,284.00	87.90	46.20	5,847.50	1,232.12	1,243.37	1,750.45	0.91	-0.85	0.32
7,378.00	88.50	45.20	5,850.45	1,297.74	1,310.62	1,844.40	1.24	0.64	-1.06
7,472.00	89.90	45.50	5,851.77	1,363.79	1,377.48	1,938.39	1.52	1.49	0.32
7,566.00	90.00	45.70	5,851.85	1,429.56	1,444.64	2,032.39	0.24	0.11	0.21
7,661.00	89.90	46.10	5,851.93	1,495.67	1,512.86	2,127.39	0.43	-0.11	0.42
7,756.00	90.30	45.60	5,851.76	1,561.84	1,581.03	2,222.38	0.67	0.42	-0.53
7,850.00	90.30	44.90	5,851.27	1,628.02	1,647.78	2,316.38	0.74	0.00	-0.74
7,945.00	90.40	45.40	5,850.69	1,695.02	1,715.13	2,411.38	0.54	0.11	0.53
8,040.00	90.00	44.50	5,850.36	1,762.25	1,782.25	2,506.37	1.04	-0.42	-0.95
8,134.00	90.20	45.10	5,850.20	1,828.95	1,848.48	2,600.37	0.67	0.21	0.64
8,229.00	90.10	45.30	5,849.95	1,895.89	1,915.89	2,695.37	0.24	-0.11	0.21
8,325.00	90.00	45.30	5,849.86	1,963.41	1,984.13	2,791.37	0.10	-0.10	0.00
8,420.00	89.40	45.40	5,850.36	2,030.17	2,051.71	2,886.36	0.64	-0.63	0.11
8,515.00	89.00	45.60	5,851.69	2,096.75	2,119.46	2,981.35	0.47	-0.42	0.21
8,610.00	88.40	45.70	5,853.84	2,163.15	2,187.38	3,076.33	0.64	-0.63	0.11



TDS
Survey Report



Company: COG Operating LLC

Local Co-ordinate Reference: Well SHL: 20' FNL, 2510' FWL, Sec 22, T17S, R31E, Unit C

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

TVD Reference: KB @ 3873.00usft (Patriot 6)

Site: Skelly Unit #422H

MD Reference: KB @ 3873.00usft (Patriot 6)

Well: SHL: 20' FNL, 2510' FWL, Sec 22, T17S, R31E, Unit C

North Reference: Grid

Wellbore: BHL: 990' FNL, 1650' FWL, Sec 14, T17S, R31E, Unit C

Survey Calculation Method: Minimum Curvature

Design: BHL: 990' FNL, 1650' FWL, Sec 14, T17S, R31E, Unit C

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)
8,705.00	89.30	46.50	5,855.75	2,229.00	2,255.81	3,171.30	1.27	0.95	0.84
8,800.00	90.10	45.70	5,856.25	2,294.88	2,324.27	3,266.29	1.19	0.84	-0.84
8,896.00	90.40	44.50	5,855.83	2,362.64	2,392.26	3,362.29	1.29	0.31	-1.25
8,990.00	90.50	45.00	5,855.09	2,429.39	2,458.44	3,456.28	0.54	0.11	0.53
9,088.00	90.20	45.40	5,854.49	2,498.45	2,527.98	3,554.27	0.51	-0.31	0.41
9,182.00	90.50	45.40	5,853.92	2,564.45	2,594.90	3,648.27	0.32	0.32	0.00
9,277.00	90.60	46.00	5,853.01	2,630.79	2,662.89	3,743.27	0.64	0.11	0.63
9,372.00	90.50	44.80	5,852.09	2,697.49	2,730.53	3,838.26	1.27	-0.11	-1.26
9,467.00	90.80	44.50	5,851.02	2,765.07	2,797.29	3,933.25	0.45	0.32	-0.32
9,563.00	90.90	45.00	5,849.59	2,833.24	2,864.87	4,029.23	0.53	0.10	0.52
9,658.00	90.90	45.70	5,848.10	2,900.00	2,932.44	4,124.22	0.74	0.00	0.74
9,753.00	90.90	45.30	5,846.61	2,966.58	3,000.19	4,219.20	0.42	0.00	-0.42
9,848.00	90.00	45.50	5,845.86	3,033.28	3,067.83	4,314.20	0.97	-0.95	0.21
9,941.00	90.20	45.90	5,845.70	3,098.23	3,134.39	4,407.20	0.48	0.22	0.43
10,035.00	90.30	45.40	5,845.29	3,163.94	3,201.61	4,501.20	0.54	0.11	-0.53
10,128.00	89.80	45.30	5,845.21	3,229.30	3,267.77	4,594.20	0.55	-0.54	-0.11
10,222.00	90.10	45.60	5,845.29	3,295.24	3,334.76	4,688.20	0.45	0.32	0.32
10,316.00	89.70	45.00	5,845.45	3,361.36	3,401.57	4,782.20	0.77	-0.43	-0.64
10,410.00	89.80	45.90	5,845.86	3,427.30	3,468.56	4,876.19	0.96	0.11	0.96
10,503.00	89.80	46.60	5,846.19	3,491.61	3,535.74	4,969.18	0.75	0.00	0.75
10,597.00	89.80	45.90	5,846.52	3,556.61	3,603.64	5,063.17	0.74	0.00	-0.74
10,690.00	89.70	45.00	5,846.92	3,621.85	3,669.91	5,156.17	0.97	-0.11	-0.97
10,784.00	89.90	45.60	5,847.25	3,687.97	3,736.73	5,250.17	0.67	0.21	0.64
10,879.00	89.20	45.20	5,848.00	3,754.67	3,804.37	5,345.16	0.85	-0.74	-0.42
10,974.00	89.80	44.90	5,848.83	3,821.79	3,871.60	5,440.16	0.71	0.63	-0.32
11,068.00	90.50	45.60	5,848.58	3,887.96	3,938.35	5,534.16	1.05	0.74	0.74
11,163.00	89.60	44.60	5,848.50	3,955.02	4,005.65	5,629.15	1.42	-0.95	-1.05
11,258.00	89.70	45.40	5,849.08	4,022.19	4,072.82	5,724.15	0.85	0.11	0.84
11,353.00	89.90	45.80	5,849.41	4,088.66	4,140.69	5,819.15	0.47	0.21	0.42
11,448.00	90.50	46.50	5,849.08	4,154.47	4,209.20	5,914.14	0.97	0.63	0.74
11,543.00	91.10	47.40	5,847.75	4,219.32	4,278.62	6,009.09	1.14	0.63	0.95
11,638.00	91.40	47.50	5,845.68	4,283.54	4,348.58	6,104.01	0.33	0.32	0.11
Last TDS MWD Survey									
11,704.00	91.40	47.50	5,844.07	4,328.12	4,397.23	6,169.95	0.00	0.00	0.00
Projection to Bit/TD									



TDS
Survey Report

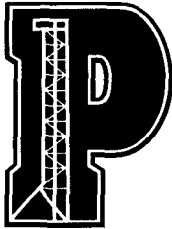


Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 20' FNL, 2510' FWL, Sec 22, T17S, R31E, Unit C
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3873.00usft (Patriot 6)
Site:	Skelly Unit #422H	MD Reference:	KB @ 3873.00usft (Patriot 6)
Well:	SHL: 20' FNL, 2510' FWL, Sec 22, T17S, R31E, Unit C	North Reference:	Grid
Wellbore:	BHL: 990' FNL, 1650' FWL, Sec 14, T17S, R31E, Unit C	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 990' FNL, 1650' FWL, Sec 14, T17S, R31E, Unit C	Database:	EDM 5000.1 Single User Db

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,743.00	1,742.65	17.29	13.28	Tie-In to Scientific Gyro
1,861.00	1,860.60	18.60	16.40	First TDS MWD Survey
6,181.42	5,845.52	459.71	456.86	As-Drilled PP
11,638.00	5,845.68	4,283.54	4,348.58	Last TDS MWD Survey
11,704.00	5,844.07	4,328.12	4,397.23	Projection to Bit/TD

Checked By: _____	Approved By: _____	Date: _____
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OPERATOR: COG Operating, LLC
WELL/LEASE: Skelly Unit # 422 H
COUNTY: Lea County New Mexico
Section 22, T17S R31E

NEW OIL CONSERVATION
JAMES H. HAYES

FEB 27 2019

RECEIVED

PATRIOT DRILLING, LLC

**STATE OF NEW MEXICO
DEVIATION REPORT**

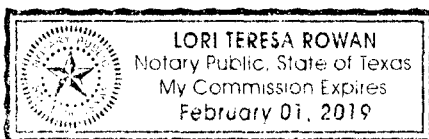
<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
261	1/4	1,472	2 1/4
472	3/4	1,602	2
1,001	1/2	1,665	1 1/2

Patriot Drilling, LLC


M. Leroy Peterson, Executive Vice-
President

The foregoing instrument was acknowledged before me on this 14th day of December, 2016 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