



30-015-42129

COG Operating, LLC

Eddy County, NM (NAD 27)

Sec 17, T26S, R28E

SRO State Com #65H

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

07 July, 2014

NM OIL CONSERVATION
ARTESIA DISTRICT

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Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SRO State Com #65H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3107.0usft (Scandriil Freedom)
Site:	Sec 17, T26S, R28E	MD Reference:	Well @ 3107.0usft (Scandriil Freedom)
Well:	SRO State Com #65H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM Compass

Project	Eddy County, NM (NAD 27)		
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	Sec 17, T26S, R28E		
Site Position:		Northing:	381,689.10 usft
From:	Map	Easting:	570,092.60 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 2' 57.035 N
		Longitude:	104° 6' 25.573 W
		Grid Convergence:	0.12 °

Well	SRO State Com #65H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft
		Latitude:	32° 2' 57.035 N
		Longitude:	104° 6' 25.573 W
		Ground Level:	3,081.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2010	5/29/2014	7.46
			Dip Angle (°)
			59.86
			Field Strength (nT)
			48,160

Design	Wellbore #1		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.0	0.0	0.0
			Direction (°)
			179.51

Survey Program	Date 7/7/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
135.0	18,963.0	MWD (Wellbore #1)	MWD default
			Description
			MWD - Standard

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	381,689.10	570,092.60	32° 2' 57.035 N	104° 6' 25.573 W
135.0	0.20	183.50	135.0	-0.2	0.0	381,688.86	570,092.59	32° 2' 57.033 N	104° 6' 25.574 W
First MWD @ 135' MD / 135' TVD									
216.0	0.50	221.10	216.0	-0.6	-0.3	381,688.46	570,092.35	32° 2' 57.029 N	104° 6' 25.576 W
308.0	1.00	178.20	308.0	-1.7	-0.5	381,687.35	570,092.11	32° 2' 57.018 N	104° 6' 25.579 W
378.0	0.80	179.00	378.0	-2.8	-0.5	381,686.25	570,092.14	32° 2' 57.007 N	104° 6' 25.579 W
468.0	1.10	222.30	468.0	-4.1	-1.0	381,684.98	570,091.57	32° 2' 56.994 N	104° 6' 25.586 W
558.0	1.10	281.60	558.0	-4.6	-2.5	381,684.52	570,090.14	32° 2' 56.990 N	104° 6' 25.602 W
649.0	1.20	347.30	648.9	-3.5	-3.5	381,685.62	570,089.07	32° 2' 57.001 N	104° 6' 25.615 W
741.0	1.40	27.50	740.9	-1.5	-3.2	381,687.56	570,089.38	32° 2' 57.020 N	104° 6' 25.611 W
832.0	1.50	31.30	831.9	0.5	-2.1	381,689.57	570,090.51	32° 2' 57.040 N	104° 6' 25.598 W
924.0	1.60	30.90	923.9	2.6	-0.8	381,691.70	570,091.80	32° 2' 57.061 N	104° 6' 25.583 W



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Site:	Sec 17, T26S, R28E	MD Reference:	Well @ 3107.0usft (Scandril Freedom)
Well:	SRO State Com #65H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,015.0	1.80	33.90	1,014.8	4.9	0.6	381,693.97	570,093.25	32° 2' 57.083 N	104° 6' 25.566 W
1,107.0	0.70	33.00	1,106.8	6.5	1.8	381,695.64	570,094.36	32° 2' 57.100 N	104° 6' 25.553 W
1,197.0	0.90	333.60	1,196.8	7.6	1.7	381,696.74	570,094.34	32° 2' 57.111 N	104° 6' 25.553 W
1,287.0	0.80	281.00	1,286.8	8.4	0.8	381,697.49	570,093.41	32° 2' 57.118 N	104° 6' 25.564 W
1,382.0	1.30	248.20	1,381.8	8.1	-0.8	381,697.22	570,091.76	32° 2' 57.115 N	104° 6' 25.583 W
1,477.0	1.90	253.00	1,476.7	7.3	-3.3	381,696.36	570,089.25	32° 2' 57.107 N	104° 6' 25.612 W
1,571.0	1.90	238.80	1,570.7	6.0	-6.2	381,695.09	570,086.43	32° 2' 57.095 N	104° 6' 25.645 W
1,666.0	1.00	204.40	1,665.6	4.4	-7.9	381,693.52	570,084.74	32° 2' 57.079 N	104° 6' 25.665 W
1,761.0	1.10	108.90	1,760.6	3.4	-7.3	381,692.47	570,085.26	32° 2' 57.069 N	104° 6' 25.659 W
1,848.0	1.10	263.50	1,847.6	3.0	-7.4	381,692.11	570,085.22	32° 2' 57.065 N	104° 6' 25.659 W
1,942.0	1.90	281.60	1,941.6	3.2	-9.8	381,692.32	570,082.80	32° 2' 57.067 N	104° 6' 25.687 W
2,037.0	0.10	174.70	2,036.6	3.5	-11.3	381,692.55	570,081.26	32° 2' 57.069 N	104° 6' 25.705 W
2,132.0	1.60	132.10	2,131.6	2.5	-10.3	381,691.58	570,082.26	32° 2' 57.060 N	104° 6' 25.694 W
2,226.0	2.30	136.20	2,225.5	0.2	-8.1	381,689.34	570,084.54	32° 2' 57.038 N	104° 6' 25.667 W
2,321.0	1.20	141.10	2,320.5	-1.9	-6.1	381,687.19	570,086.48	32° 2' 57.016 N	104° 6' 25.645 W
2,390.0	1.00	148.10	2,389.5	-3.0	-5.4	381,686.12	570,087.25	32° 2' 57.006 N	104° 6' 25.636 W
2,466.0	1.10	146.40	2,465.4	-4.2	-4.6	381,684.95	570,088.01	32° 2' 56.994 N	104° 6' 25.627 W
2,560.0	1.10	153.40	2,559.4	-5.7	-3.7	381,683.39	570,088.91	32° 2' 56.979 N	104° 6' 25.616 W
2,655.0	1.10	149.00	2,654.4	-7.3	-2.8	381,681.79	570,089.79	32° 2' 56.963 N	104° 6' 25.606 W
2,749.0	1.00	159.90	2,748.4	-8.9	-2.1	381,680.25	570,090.53	32° 2' 56.948 N	104° 6' 25.598 W
2,939.0	1.20	165.20	2,938.4	-12.3	-1.0	381,676.77	570,091.61	32° 2' 56.913 N	104° 6' 25.585 W
3,128.0	0.70	340.30	3,127.3	-13.2	-0.9	381,675.94	570,091.73	32° 2' 56.905 N	104° 6' 25.584 W
3,317.0	0.50	338.00	3,316.3	-11.3	-1.6	381,677.79	570,091.03	32° 2' 56.923 N	104° 6' 25.592 W
3,506.0	0.50	327.80	3,505.3	-9.8	-2.3	381,679.25	570,090.28	32° 2' 56.938 N	104° 6' 25.601 W
3,695.0	0.50	336.00	3,694.3	-8.4	-3.1	381,680.70	570,089.51	32° 2' 56.952 N	104° 6' 25.610 W
3,885.0	0.40	321.30	3,884.3	-7.1	-3.8	381,681.98	570,088.75	32° 2' 56.965 N	104° 6' 25.618 W
4,074.0	0.60	280.30	4,073.3	-6.4	-5.2	381,682.67	570,087.37	32° 2' 56.972 N	104° 6' 25.634 W
4,263.0	0.70	261.00	4,262.3	-6.4	-7.3	381,682.67	570,085.25	32° 2' 56.972 N	104° 6' 25.659 W
4,452.0	0.70	42.10	4,451.3	-5.8	-7.7	381,683.34	570,084.89	32° 2' 56.978 N	104° 6' 25.663 W
4,641.0	0.80	52.50	4,640.3	-4.1	-5.9	381,685.00	570,086.71	32° 2' 56.995 N	104° 6' 25.642 W
4,830.0	0.50	100.30	4,829.3	-3.4	-4.0	381,685.66	570,088.57	32° 2' 57.001 N	104° 6' 25.620 W
5,020.0	0.50	118.60	5,019.3	-4.0	-2.5	381,685.11	570,090.11	32° 2' 56.996 N	104° 6' 25.602 W
5,209.0	0.90	134.60	5,208.2	-5.4	-0.7	381,683.68	570,091.89	32° 2' 56.981 N	104° 6' 25.582 W
5,398.0	0.50	90.00	5,397.2	-6.5	1.2	381,682.63	570,093.77	32° 2' 56.971 N	104° 6' 25.560 W
5,587.0	0.80	111.20	5,586.2	-6.9	3.2	381,682.16	570,095.83	32° 2' 56.966 N	104° 6' 25.536 W
5,776.0	0.70	121.40	5,775.2	-8.0	5.4	381,681.08	570,098.04	32° 2' 56.956 N	104° 6' 25.510 W
5,965.0	0.30	294.20	5,964.2	-8.4	6.0	381,680.68	570,098.58	32° 2' 56.952 N	104° 6' 25.504 W
6,154.0	0.40	279.80	6,153.2	-8.1	4.9	381,681.00	570,097.48	32° 2' 56.955 N	104° 6' 25.517 W
6,344.0	0.90	247.60	6,343.2	-8.6	2.8	381,680.54	570,095.44	32° 2' 56.950 N	104° 6' 25.541 W
6,533.0	0.90	328.50	6,532.2	-7.9	0.7	381,681.24	570,093.30	32° 2' 56.957 N	104° 6' 25.566 W
6,722.0	1.90	294.70	6,721.1	-5.3	-2.9	381,683.81	570,089.67	32° 2' 56.983 N	104° 6' 25.608 W
6,912.0	2.30	317.20	6,911.0	-1.2	-8.4	381,687.93	570,084.22	32° 2' 57.024 N	104° 6' 25.671 W
7,101.0	1.00	294.70	7,099.9	2.3	-12.5	381,691.40	570,080.15	32° 2' 57.058 N	104° 6' 25.718 W
7,290.0	1.00	20.70	7,288.9	4.5	-13.4	381,693.63	570,079.23	32° 2' 57.080 N	104° 6' 25.729 W
7,479.0	1.00	28.40	7,477.9	7.5	-12.0	381,696.63	570,080.60	32° 2' 57.110 N	104° 6' 25.713 W
7,669.0	0.30	280.90	7,667.8	9.1	-11.7	381,698.18	570,080.90	32° 2' 57.125 N	104° 6' 25.709 W
7,859.0	1.00	80.80	7,857.8	9.4	-10.6	381,698.54	570,082.05	32° 2' 57.129 N	104° 6' 25.696 W
8,048.0	1.20	81.20	8,046.8	10.0	-7.0	381,699.10	570,085.63	32° 2' 57.134 N	104° 6' 25.654 W
8,237.0	1.30	132.90	8,235.8	8.8	-3.4	381,697.95	570,089.16	32° 2' 57.123 N	104° 6' 25.613 W
8,426.0	0.90	126.70	8,424.7	6.5	-0.7	381,695.60	570,091.92	32° 2' 57.099 N	104° 6' 25.581 W
8,521.0	0.70	146.20	8,519.7	5.6	0.2	381,694.67	570,092.84	32° 2' 57.090 N	104° 6' 25.571 W
8,571.0	1.10	137.80	8,569.7	5.0	0.7	381,694.06	570,093.33	32° 2' 57.084 N	104° 6' 25.565 W
8,602.0	2.90	136.00	8,600.7	4.2	1.5	381,693.28	570,094.08	32° 2' 57.076 N	104° 6' 25.556 W
8,634.0	5.40	143.40	8,632.6	2.4	2.9	381,691.49	570,095.54	32° 2' 57.059 N	104° 6' 25.539 W
8,665.0	9.40	146.40	8,663.3	-0.9	5.2	381,688.21	570,097.81	32° 2' 57.026 N	104° 6' 25.513 W



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Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SRO State Com #65H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3107.0usft (Scandriil Freedom)
Site:	Sec 17, T26S, R28E	MD Reference:	Well @ 3107.0usft (Scandriil Freedom)
Well:	SRO State Com #65H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,697.0	12.30	149.20	8,694.8	-6.0	8.4	381,683.10	570,101.00	32° 2' 56.976 N	104° 6' 25.476 W
8,729.0	15.20	150.80	8,725.8	-12.6	12.2	381,676.51	570,104.79	32° 2' 56.910 N	104° 6' 25.432 W
8,760.0	18.50	157.10	8,755.5	-20.7	16.1	381,668.43	570,108.69	32° 2' 56.830 N	104° 6' 25.387 W
8,791.0	21.70	164.30	8,784.6	-30.7	19.6	381,658.38	570,112.16	32° 2' 56.731 N	104° 6' 25.347 W
8,823.0	22.20	167.30	8,814.3	-42.3	22.5	381,646.78	570,115.09	32° 2' 56.616 N	104° 6' 25.313 W
8,854.0	25.60	170.30	8,842.6	-54.6	24.9	381,634.46	570,117.50	32° 2' 56.494 N	104° 6' 25.285 W
8,886.0	30.00	171.20	8,870.9	-69.4	27.3	381,619.74	570,119.89	32° 2' 56.348 N	104° 6' 25.258 W
8,917.0	34.40	172.20	8,897.2	-85.7	29.7	381,603.39	570,122.27	32° 2' 56.186 N	104° 6' 25.231 W
8,949.0	39.20	174.30	8,922.8	-104.7	31.9	381,584.36	570,124.50	32° 2' 55.998 N	104° 6' 25.205 W
8,981.0	41.90	176.60	8,947.1	-125.5	33.5	381,563.63	570,126.14	32° 2' 55.793 N	104° 6' 25.187 W
9,002.2	43.47	177.57	8,962.7	-139.8	34.3	381,549.28	570,126.87	32° 2' 55.651 N	104° 6' 25.179 W
Crossed 330' Hard Line @ 9002' MD / 8963' TVD									
9,012.0	44.20	178.00	8,969.8	-146.6	34.5	381,542.49	570,127.13	32° 2' 55.583 N	104° 6' 25.176 W
9,044.0	45.90	181.40	8,992.4	-169.2	34.6	381,519.85	570,127.24	32° 2' 55.359 N	104° 6' 25.175 W
9,075.0	48.00	182.40	9,013.5	-191.9	33.9	381,497.22	570,126.48	32° 2' 55.135 N	104° 6' 25.184 W
9,106.0	50.40	181.70	9,033.8	-215.3	33.0	381,473.77	570,125.65	32° 2' 54.903 N	104° 6' 25.195 W
9,138.0	54.20	179.40	9,053.3	-240.6	32.8	381,448.45	570,125.42	32° 2' 54.653 N	104° 6' 25.198 W
9,169.0	57.50	178.20	9,070.7	-266.3	33.4	381,422.81	570,125.96	32° 2' 54.399 N	104° 6' 25.192 W
9,201.0	60.80	178.40	9,087.2	-293.7	34.2	381,395.35	570,126.77	32° 2' 54.127 N	104° 6' 25.184 W
9,231.0	62.60	179.80	9,101.4	-320.2	34.6	381,368.94	570,127.19	32° 2' 53.866 N	104° 6' 25.179 W
9,263.0	64.60	181.40	9,115.6	-348.8	34.3	381,340.29	570,126.88	32° 2' 53.582 N	104° 6' 25.184 W
9,294.0	67.00	183.60	9,128.3	-377.1	33.0	381,312.04	570,125.64	32° 2' 53.303 N	104° 6' 25.199 W
9,327.0	70.50	185.20	9,140.3	-407.7	30.7	381,281.38	570,123.28	32° 2' 52.999 N	104° 6' 25.227 W
9,358.0	74.50	186.60	9,149.6	-437.1	27.6	381,251.98	570,120.24	32° 2' 52.709 N	104° 6' 25.263 W
9,390.0	78.10	187.00	9,157.2	-468.0	24.0	381,221.12	570,116.56	32° 2' 52.403 N	104° 6' 25.306 W
9,421.0	82.40	186.60	9,162.4	-498.3	20.3	381,190.79	570,112.94	32° 2' 52.103 N	104° 6' 25.349 W
9,453.0	86.30	185.60	9,165.6	-530.0	17.0	381,159.13	570,109.56	32° 2' 51.790 N	104° 6' 25.389 W
9,488.0	89.20	183.60	9,166.9	-564.8	14.2	381,124.27	570,106.75	32° 2' 51.445 N	104° 6' 25.423 W
9,519.0	89.70	183.10	9,167.2	-595.8	12.3	381,093.33	570,104.94	32° 2' 51.139 N	104° 6' 25.445 W
9,614.0	90.80	182.40	9,166.8	-690.7	7.8	380,998.44	570,100.38	32° 2' 50.200 N	104° 6' 25.500 W
9,707.0	91.30	181.20	9,165.1	-783.6	4.9	380,905.50	570,097.46	32° 2' 49.280 N	104° 6' 25.536 W
9,801.0	91.20	180.80	9,163.1	-877.6	3.2	380,811.54	570,095.82	32° 2' 48.350 N	104° 6' 25.557 W
9,896.0	89.90	180.50	9,162.2	-972.5	2.1	380,716.55	570,094.75	32° 2' 47.410 N	104° 6' 25.572 W
9,990.0	90.10	181.50	9,162.2	-1,066.5	0.5	380,622.57	570,093.11	32° 2' 46.480 N	104° 6' 25.594 W
10,085.0	89.50	182.20	9,162.5	-1,161.5	-2.6	380,527.62	570,090.04	32° 2' 45.540 N	104° 6' 25.631 W
10,179.0	89.30	180.00	9,163.5	-1,255.5	-4.4	380,433.65	570,088.23	32° 2' 44.610 N	104° 6' 25.655 W
10,274.0	89.90	178.60	9,164.1	-1,350.4	-3.2	380,338.66	570,089.40	32° 2' 43.670 N	104° 6' 25.644 W
10,368.0	90.70	179.30	9,163.6	-1,444.4	-1.5	380,244.68	570,091.12	32° 2' 42.740 N	104° 6' 25.626 W
10,463.0	90.50	178.90	9,162.6	-1,539.4	0.0	380,149.70	570,092.61	32° 2' 41.800 N	104° 6' 25.611 W
10,557.0	90.60	178.40	9,161.7	-1,633.4	2.2	380,055.73	570,094.82	32° 2' 40.870 N	104° 6' 25.587 W
10,652.0	90.80	177.30	9,160.6	-1,728.3	5.8	379,960.80	570,098.39	32° 2' 39.931 N	104° 6' 25.548 W
10,746.0	91.20	177.70	9,158.9	-1,822.2	9.9	379,866.91	570,102.49	32° 2' 39.001 N	104° 6' 25.503 W
10,841.0	90.10	178.20	9,157.9	-1,917.1	13.3	379,771.97	570,105.89	32° 2' 38.062 N	104° 6' 25.466 W
10,935.0	90.50	179.10	9,157.4	-2,011.1	15.5	379,678.00	570,108.10	32° 2' 37.132 N	104° 6' 25.442 W
11,030.0	90.90	179.40	9,156.2	-2,106.1	16.7	379,583.02	570,109.34	32° 2' 36.192 N	104° 6' 25.430 W
11,124.0	91.20	179.40	9,154.5	-2,200.1	17.7	379,489.04	570,110.33	32° 2' 35.262 N	104° 6' 25.421 W
11,219.0	90.40	179.80	9,153.2	-2,295.0	18.4	379,394.05	570,110.99	32° 2' 34.322 N	104° 6' 25.416 W
11,313.0	89.70	180.00	9,153.1	-2,389.0	18.6	379,300.05	570,111.16	32° 2' 33.391 N	104° 6' 25.416 W
11,407.0	90.80	180.10	9,152.7	-2,483.0	18.5	379,206.06	570,111.07	32° 2' 32.461 N	104° 6' 25.419 W
11,501.0	90.00	178.40	9,152.0	-2,577.0	19.7	379,112.07	570,112.30	32° 2' 31.531 N	104° 6' 25.407 W
11,595.0	88.80	178.60	9,153.0	-2,671.0	22.2	379,018.11	570,114.76	32° 2' 30.601 N	104° 6' 25.381 W
11,689.0	89.10	178.60	9,154.7	-2,764.9	24.5	378,924.15	570,117.06	32° 2' 29.671 N	104° 6' 25.357 W
11,783.0	89.50	179.10	9,155.9	-2,858.9	26.3	378,830.18	570,118.95	32° 2' 28.741 N	104° 6' 25.337 W
11,877.0	89.50	178.90	9,156.7	-2,952.9	28.0	378,736.20	570,120.59	32° 2' 27.811 N	104° 6' 25.320 W
11,972.0	90.00	178.60	9,157.1	-3,047.9	30.1	378,641.22	570,122.66	32° 2' 26.871 N	104° 6' 25.298 W

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SRO State Com #65H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3107.0usft (Scandrift Freedom)
Site:	Sec 17, T26S, R28E	MD Reference:	Well @ 3107.0usft (Scandrift Freedom)
Well:	SRO State Com #65H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
12,066.0	89.60	179.30	9,157.4	-3,141.9	31.8	378,547.24	570,124.38	32° 2' 25.941 N	104° 6' 25.281 W	
12,160.0	90.60	179.40	9,157.3	-3,235.9	32.8	378,453.25	570,125.45	32° 2' 25.010 N	104° 6' 25.271 W	
12,255.0	91.40	179.60	9,155.6	-3,330.8	33.7	378,358.26	570,126.28	32° 2' 24.070 N	104° 6' 25.263 W	
12,349.0	90.00	179.60	9,154.5	-3,424.8	34.3	378,264.28	570,126.93	32° 2' 23.140 N	104° 6' 25.258 W	
12,443.0	89.50	179.40	9,154.9	-3,518.8	35.2	378,170.28	570,127.75	32° 2' 22.210 N	104° 6' 25.251 W	
12,537.0	90.10	179.40	9,155.2	-3,612.8	36.1	378,076.29	570,128.74	32° 2' 21.280 N	104° 6' 25.242 W	
12,632.0	90.90	180.10	9,154.4	-3,707.8	36.5	377,981.29	570,129.15	32° 2' 20.340 N	104° 6' 25.239 W	
12,725.0	90.60	180.50	9,153.2	-3,800.8	36.1	377,888.30	570,128.67	32° 2' 19.419 N	104° 6' 25.247 W	
12,820.0	91.00	180.50	9,151.8	-3,895.8	35.2	377,793.32	570,127.84	32° 2' 18.479 N	104° 6' 25.259 W	
12,914.0	90.30	181.00	9,150.8	-3,989.8	34.0	377,699.33	570,126.61	32° 2' 17.549 N	104° 6' 25.275 W	
13,007.0	90.00	180.00	9,150.5	-4,082.8	33.2	377,606.34	570,125.79	32° 2' 16.629 N	104° 6' 25.287 W	
13,102.0	90.90	179.60	9,149.8	-4,177.8	33.5	377,511.34	570,126.13	32° 2' 15.689 N	104° 6' 25.286 W	
13,196.0	90.00	179.60	9,149.0	-4,271.8	34.2	377,417.35	570,126.78	32° 2' 14.759 N	104° 6' 25.280 W	
13,290.0	88.90	179.40	9,149.9	-4,365.7	35.0	377,323.36	570,127.60	32° 2' 13.828 N	104° 6' 25.273 W	
13,384.0	89.10	179.10	9,151.6	-4,459.7	36.2	377,229.38	570,128.83	32° 2' 12.898 N	104° 6' 25.261 W	
13,478.0	88.70	178.70	9,153.4	-4,553.7	38.0	377,135.41	570,130.64	32° 2' 11.968 N	104° 6' 25.242 W	
13,572.0	88.40	178.20	9,155.8	-4,647.6	40.6	377,041.48	570,133.18	32° 2' 11.039 N	104° 6' 25.215 W	
13,666.0	88.80	178.70	9,158.1	-4,741.6	43.1	376,947.54	570,135.72	32° 2' 10.109 N	104° 6' 25.188 W	
13,760.0	89.30	179.10	9,159.6	-4,835.5	44.9	376,853.57	570,137.53	32° 2' 9.179 N	104° 6' 25.169 W	
13,854.0	90.10	179.30	9,160.1	-4,929.5	46.2	376,759.58	570,138.84	32° 2' 8.249 N	104° 6' 25.156 W	
13,947.0	90.80	179.10	9,159.4	-5,022.5	47.5	376,666.60	570,140.14	32° 2' 7.328 N	104° 6' 25.143 W	
14,020.6	90.10	178.40	9,158.8	-5,096.1	49.1	376,593.02	570,141.74	32° 2' 6.600 N	104° 6' 25.127 W	
Crossed Section Line @ 14021' MD / 9159' TVD										
14,041.0	89.90	178.20	9,158.8	-5,116.5	49.7	376,572.63	570,142.35	32° 2' 6.398 N	104° 6' 25.120 W	
14,136.0	90.80	179.30	9,158.2	-5,211.4	51.8	376,477.65	570,144.42	32° 2' 5.458 N	104° 6' 25.098 W	
14,230.0	91.00	180.10	9,156.7	-5,305.4	52.3	376,383.67	570,144.92	32° 2' 4.528 N	104° 6' 25.095 W	
14,324.0	91.10	179.60	9,155.0	-5,399.4	52.6	376,289.68	570,145.16	32° 2' 3.598 N	104° 6' 25.094 W	
14,418.0	91.40	179.30	9,153.0	-5,493.4	53.5	376,195.71	570,146.06	32° 2' 2.668 N	104° 6' 25.086 W	
14,512.0	91.10	180.10	9,150.9	-5,587.4	54.0	376,101.73	570,146.56	32° 2' 1.738 N	104° 6' 25.083 W	
14,606.0	91.20	179.80	9,149.0	-5,681.3	54.0	376,007.75	570,146.64	32° 2' 0.808 N	104° 6' 25.084 W	
14,701.0	90.10	178.90	9,148.0	-5,776.3	55.1	375,912.77	570,147.71	32° 1' 59.868 N	104° 6' 25.074 W	
14,795.0	89.70	177.90	9,148.1	-5,870.3	57.7	375,818.81	570,150.34	32° 1' 58.938 N	104° 6' 25.046 W	
14,889.0	89.70	178.00	9,148.6	-5,964.2	61.1	375,724.87	570,153.70	32° 1' 58.008 N	104° 6' 25.009 W	
14,983.0	89.10	178.60	9,149.6	-6,058.2	63.9	375,630.91	570,156.49	32° 1' 57.078 N	104° 6' 24.979 W	
15,077.0	89.20	180.30	9,151.0	-6,152.2	64.8	375,536.93	570,157.39	32° 1' 56.148 N	104° 6' 24.970 W	
15,171.0	90.00	181.40	9,151.7	-6,246.2	63.4	375,442.95	570,156.00	32° 1' 55.218 N	104° 6' 24.989 W	
15,265.0	90.40	180.70	9,151.3	-6,340.1	61.7	375,348.96	570,154.28	32° 1' 54.288 N	104° 6' 25.011 W	
15,360.0	90.80	180.50	9,150.3	-6,435.1	60.7	375,253.98	570,153.28	32° 1' 53.348 N	104° 6' 25.025 W	
15,454.0	91.00	181.20	9,148.9	-6,529.1	59.3	375,160.00	570,151.89	32° 1' 52.418 N	104° 6' 25.044 W	
15,548.0	90.90	181.70	9,147.3	-6,623.1	56.9	375,066.04	570,149.51	32° 1' 51.488 N	104° 6' 25.074 W	
15,642.0	90.40	180.00	9,146.2	-6,717.0	55.5	374,972.06	570,148.11	32° 1' 50.558 N	104° 6' 25.092 W	
15,736.0	89.90	179.60	9,146.0	-6,811.0	55.8	374,878.06	570,148.44	32° 1' 49.628 N	104° 6' 25.090 W	
15,829.0	89.40	179.10	9,146.6	-6,904.0	56.9	374,785.07	570,149.50	32° 1' 48.708 N	104° 6' 25.080 W	
15,923.0	90.40	178.90	9,146.7	-6,998.0	58.5	374,691.09	570,151.14	32° 1' 47.777 N	104° 6' 25.064 W	
16,018.0	91.70	178.60	9,145.0	-7,093.0	60.6	374,596.13	570,153.21	32° 1' 46.838 N	104° 6' 25.042 W	
16,112.0	90.80	179.60	9,142.9	-7,186.9	62.1	374,502.16	570,154.69	32° 1' 45.908 N	104° 6' 25.027 W	
16,206.0	91.70	179.60	9,140.9	-7,280.9	62.7	374,408.19	570,155.34	32° 1' 44.978 N	104° 6' 25.022 W	
16,300.0	91.20	179.80	9,138.5	-7,374.9	63.2	374,314.22	570,155.83	32° 1' 44.048 N	104° 6' 25.018 W	
16,394.0	90.60	179.80	9,137.0	-7,468.9	63.6	374,220.23	570,156.16	32° 1' 43.117 N	104° 6' 25.017 W	
16,488.0	89.80	179.30	9,136.7	-7,562.9	64.3	374,126.24	570,156.90	32° 1' 42.187 N	104° 6' 25.011 W	
16,582.0	91.10	178.90	9,136.0	-7,656.8	65.8	374,032.25	570,158.38	32° 1' 41.257 N	104° 6' 24.996 W	
16,676.0	90.50	179.30	9,134.6	-7,750.8	67.2	373,938.28	570,159.85	32° 1' 40.327 N	104° 6' 24.981 W	
16,770.0	89.40	179.60	9,134.7	-7,844.8	68.2	373,844.28	570,160.76	32° 1' 39.397 N	104° 6' 24.973 W	
16,865.0	90.90	179.30	9,134.5	-7,939.8	69.1	373,749.29	570,161.67	32° 1' 38.457 N	104° 6' 24.964 W	
16,959.0	90.00	179.30	9,133.7	-8,033.8	70.2	373,655.30	570,162.82	32° 1' 37.526 N	104° 6' 24.953 W	



Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SRO State Com #65H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3107.0usft (Scandril Freedom)
Site:	Sec 17, T26S, R28E	MD Reference:	Well @ 3107.0usft (Scandril Freedom)
Well:	SRO State Com #65H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
17,053.0	89.30	179.10	9,134.3	-8,127.8	71.5	373,561.31	570,164.13	32° 1' 36.596 N	104° 6' 24.940 W
17,147.0	90.00	178.70	9,134.9	-8,221.8	73.3	373,467.33	570,165.93	32° 1' 35.666 N	104° 6' 24.922 W
17,241.0	89.10	178.90	9,135.6	-8,315.7	75.3	373,373.36	570,167.90	32° 1' 34.736 N	104° 6' 24.901 W
17,335.0	89.20	180.10	9,137.0	-8,409.7	76.1	373,279.37	570,168.72	32° 1' 33.806 N	104° 6' 24.894 W
17,429.0	90.10	180.10	9,137.6	-8,503.7	76.0	373,185.38	570,168.56	32° 1' 32.876 N	104° 6' 24.898 W
17,523.0	91.00	180.10	9,136.7	-8,597.7	75.8	373,091.38	570,168.39	32° 1' 31.945 N	104° 6' 24.902 W
17,617.0	90.40	180.00	9,135.5	-8,691.7	75.7	372,997.39	570,168.31	32° 1' 31.015 N	104° 6' 24.905 W
17,712.0	90.80	179.60	9,134.5	-8,786.7	76.0	372,902.39	570,168.64	32° 1' 30.075 N	104° 6' 24.904 W
17,806.0	90.20	180.50	9,133.7	-8,880.7	76.0	372,808.40	570,168.56	32° 1' 29.145 N	104° 6' 24.907 W
17,900.0	89.30	180.50	9,134.1	-8,974.7	75.1	372,714.40	570,167.74	32° 1' 28.215 N	104° 6' 24.919 W
17,994.0	90.00	180.30	9,134.7	-9,068.7	74.5	372,620.41	570,167.08	32° 1' 27.284 N	104° 6' 24.929 W
18,088.0	89.80	180.10	9,134.9	-9,162.7	74.2	372,526.41	570,166.76	32° 1' 26.354 N	104° 6' 24.935 W
18,182.0	90.80	180.00	9,134.4	-9,256.7	74.1	372,432.41	570,166.67	32° 1' 25.424 N	104° 6' 24.938 W
18,276.0	90.10	179.60	9,133.6	-9,350.7	74.4	372,338.42	570,167.00	32° 1' 24.494 N	104° 6' 24.937 W
18,370.0	91.40	179.60	9,132.4	-9,444.7	75.1	372,244.43	570,167.66	32° 1' 23.563 N	104° 6' 24.931 W
18,464.0	90.00	179.30	9,131.3	-9,538.7	76.0	372,150.44	570,168.56	32° 1' 22.633 N	104° 6' 24.923 W
18,558.0	89.30	178.70	9,131.8	-9,632.6	77.6	372,056.46	570,170.20	32° 1' 21.703 N	104° 6' 24.906 W
18,652.0	89.90	178.70	9,132.5	-9,726.6	79.7	371,962.49	570,172.33	32° 1' 20.773 N	104° 6' 24.884 W
18,746.0	90.60	178.70	9,132.1	-9,820.6	81.9	371,868.51	570,174.47	32° 1' 19.843 N	104° 6' 24.861 W
18,840.0	90.50	179.40	9,131.2	-9,914.6	83.4	371,774.53	570,176.02	32° 1' 18.913 N	104° 6' 24.846 W
18,915.0	91.30	179.30	9,130.0	-9,989.6	84.3	371,699.55	570,176.87	32° 1' 18.171 N	104° 6' 24.838 W
18,963.0	91.30	179.30	9,128.9	-10,037.5	84.9	371,651.56	570,177.46	32° 1' 17.696 N	104° 6' 24.832 W

TD @ 18963' MD / 9129' TVD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
135.0	135.0	-0.2	0.0	First MWD @ 135' MD / 135' TVD
9,002.2	8,962.7	-139.8	34.3	Crossed 330' Hard Line @ 9002' MD / 8963' TVD
14,020.6	9,158.8	-5,096.1	49.1	Crossed Section Line @ 14021' MD / 9159' TVD
18,963.0	9,128.9	-10,037.5	84.9	TD @ 18963' MD / 9129' TVD

Checked By: _____ Approved By: _____ Date: _____



DIRECTIONAL REPORT

WELLNAME: SRO STATE COM #65H

FIELD: HAY HOLLOW

AFE NO.: 005397

WELL ID NO.: 30-015-42129

API NO.: 30-015-42129

SURVEY TYPE: MWD-0

MD: 8.580

ANGLE: 70.00

AZIMUTH: 146.20

TVD: 8.578

N/S: -5.00

E/W: 55.00

VS: 8578.00

TARGET: 25.00

MEASURED DEPTH	INCLINATION ANGLE	AZIMUTH ANGLE	TVD	+NORTH -SOUTH	+EAST -WEST	VERTICAL SECTION	DOGLEG SEVERITY
135	0.20		135	-1.76	0.60	0.66	0.15
216	0.50		216	-1.27	0.60	0.64	0.37
308	1.00		308	-0.07	0.60	0.60	0.54
378	0.80		378	1.03	0.60	0.56	0.29
468	1.10		468	2.53	0.60	0.51	0.33
558	1.10		558	4.25	0.60	0.45	0.00
649	1.20		649	6.08	0.60	0.39	0.11
741	1.40		741	8.17	0.60	0.32	0.22
832	1.50		832	10.47	0.60	0.23	0.11
924	1.60		924	12.96	0.60	0.15	0.11
1,015	1.80		1,015	15.66	0.60	0.05	0.22
1,107	0.70		1,107	17.67	0.60	-0.02	1.20
1,197	0.90		1,197	18.92	0.60	-0.06	0.22
1,287	0.80		1,287	20.26	0.60	-0.11	0.11
1,334	0.80		1,334	22.91	0.00	22.91	0.00
1,761	1.10		1,761	28.12	0.60	-0.38	0.06
1,848	1.10		1,848	29.79	0.60	-0.44	0.00
1,855	2.00		1,855	32.66	0.00	32.66	0.96
1,942	1.90		1,942	32.25	0.60	-0.53	0.85
1,950	3.60		1,950	37.30	0.00	37.30	1.68
2,037	0.10		2,037	33.91	0.60	-0.58	1.90
2,132	1.60		2,132	35.31	0.60	-0.63	1.58
2,139	4.30		2,138	50.32	0.00	50.32	0.37
2,226	2.30		2,226	38.51	0.60	-0.74	0.74
2,233	5.60		2,232	58.43	0.00	58.43	1.38
2,321	1.20		2,321	41.41	0.60	-0.85	1.16
2,390	1.00		2,390	42.74	0.60	-0.89	0.29
2,466	1.10		2,465	44.13	0.60	-0.94	0.13
2,560	1.10		2,559	45.94	0.60	-1.00	0.00
2,655	1.10		2,654	47.76	0.60	-1.07	0.00
2,749	1.00		2,748	49.48	0.60	-1.13	0.11
2,939	1.20		2,938	53.13	0.60	-1.25	0.10
3,128	0.70		3,127	56.26	0.60	-1.36	0.27
3,317	0.50		3,316	58.24	0.60	-1.43	0.11
3,506	0.50		3,505	59.89	0.60	-1.49	0.00
3,695	0.50		3,694	61.54	0.60	-1.55	0.00
3,884	0.40		3,883	63.02	0.60	-1.60	0.05
4,074	0.60		4,073	64.68	0.60	-1.66	0.10
4,263	0.70		4,262	66.83	0.60	-1.73	0.05
4,452	0.70		4,451	69.14	0.60	-1.81	0.00
4,641	0.80		4,640	71.61	0.60	-1.90	0.05
4,830	0.50		4,829	73.75	0.60	-1.97	0.16
5,020	0.50		5,019	75.41	0.60	-2.03	0.00
5,115	0.60		5,114	76.32	0.60	-2.06	0.10
5,209	0.90		5,208	77.56	0.60	-2.11	0.32
5,398	0.50		5,397	79.86	0.60	-2.19	0.21
5,587	0.80	111.20	5,586	80.21	1.83	-0.97	0.57
5,776	0.70	121.40	5,775	79.13	4.05	1.28	0.09
5,965	0.30	294.20	5,964	78.73	4.58	1.83	0.53
6,154	0.40	279.80	6,153	79.05	3.48	0.72	0.07
6,344	0.90	247.60	6,343	78.59	1.45	-1.30	0.32
6,533	0.90	328.50	6,532	79.29	-0.70	-3.47	0.62
6,722	1.90	294.70	6,721	81.87	-4.33	-7.18	0.67
6,816	2.50	310.70	6,815	83.86	-7.29	-10.22	0.91
6,912	2.30	317.20	6,911	86.64	-10.19	-13.21	0.35
7,101	1.00	294.70	7,100	90.11	-14.27	-17.40	0.76
7,290	1.00	20.70	7,289	92.34	-15.18	-18.39	0.72
7,479	1.00	28.40	7,478	95.33	-13.81	-17.13	0.07
7,669	0.30	280.90	7,668	96.89	-13.51	-16.89	0.59
7,859	1.00	80.80	7,858	97.24	-12.37	-15.75	0.68
8,048	1.20	81.20	8,047	97.81	-8.78	-12.19	0.11
8,237	1.30	132.90	8,236	96.65	-5.26	-8.63	0.58
8,426	0.90	126.70	8,425	94.31	-2.50	-5.79	0.22
8,521	0.70	146.20	8,520	93.38	-1.57	-4.83	0.35
8,571	1.10	137.80	8,570	92.77	-1.08	-4.32	0.84
8,602	2.90	136.00	8,595	-15.18	61.95	12.42	305.21
8,634	5.40	143.40	8,627	-16.97	63.41	11.41	7.97
8,665	9.40	146.40	8,657	-20.25	65.68	9.40	12.96
8,697	12.30	149.20	8,689	-25.36	68.88	6.12	9.21