CONCHO

COG Operating LLC

Lea County, NM
Haas 6 Federal Com
#4H

OH
Plan #1

Anticollision Report

19 May, 2015

TDS
TERRA DIRECTIONAL SERVICES, L.L.C.

APR 25 2016

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #4H
Project:	Lea County, NM	**TVD Reference:**	KB @ 3678.0usft (McVay 6)
Reference Site:	Haas 6 Federal Com	**MD Reference:**	KB @ 3678.0usft (McVay 6)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Reference Plan #1

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0 usft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 5/19/2015

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	12,655.4	Plan #1 (OH)	MWD	MWD - Standard

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Haas 6 Federal Com						
#2H - OH - Plan #1	7,812.6	7,811.5	140.0	105.1	4.017	CC, ES
#2H - OH - Plan #1	7,825.0	7,823.9	140.2	105.3	4.016	SF
USA Continental A						
A-1 - OH - OH	9,266.4	8,228.4	373.2	320.7	7.102	CC, ES
A-1 - OH - OH	9,300.0	8,227.6	374.3	321.1	7.030	SF
USA Continental B						
B-1 - OH - OH	11,000.0	8,246.3	256.6	168.2	2.903	CC, ES, SF

Offset Design Haas 6 Federal Com - #2H - OH - Plan #1

Offset Site Error: 0.0 usft
Survey Program: 0-MWD
Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	89.84	0.4	140.0	140.0				
100.0	100.0	98.9	98.9	0.1	0.1	89.84	0.4	140.0	140.0	139.8	0.18	763.801	
200.0	200.0	198.9	198.9	0.3	0.3	89.84	0.4	140.0	140.0	139.4	0.63	221.742	
300.0	300.0	298.9	298.9	0.5	0.5	89.84	0.4	140.0	140.0	138.9	1.08	129.522	
400.0	400.0	398.9	398.9	0.8	0.8	89.84	0.4	140.0	140.0	138.5	1.53	91.478	
500.0	500.0	498.9	498.9	1.0	1.0	89.84	0.4	140.0	140.0	138.0	1.98	70.709	
600.0	600.0	598.9	598.9	1.2	1.2	89.84	0.4	140.0	140.0	137.6	2.43	57.625	
700.0	700.0	698.9	698.9	1.4	1.4	89.84	0.4	140.0	140.0	137.1	2.88	48.628	
800.0	800.0	798.9	798.9	1.7	1.7	89.84	0.4	140.0	140.0	136.7	3.33	42.060	
900.0	900.0	898.9	898.9	1.9	1.9	89.84	0.4	140.0	140.0	136.2	3.78	37.056	
1,000.0	1,000.0	998.9	998.9	2.1	2.1	89.84	0.4	140.0	140.0	135.8	4.23	33.116	
1,100.0	1,100.0	1,098.9	1,098.9	2.3	2.3	89.84	0.4	140.0	140.0	135.3	4.68	29.933	
1,200.0	1,200.0	1,198.9	1,198.9	2.6	2.6	89.84	0.4	140.0	140.0	134.9	5.13	27.308	
1,300.0	1,300.0	1,298.9	1,298.9	2.8	2.8	89.84	0.4	140.0	140.0	134.4	5.58	25.107	
1,400.0	1,400.0	1,398.9	1,398.9	3.0	3.0	89.84	0.4	140.0	140.0	134.0	6.03	23.234	
1,500.0	1,500.0	1,498.9	1,498.9	3.2	3.2	89.84	0.4	140.0	140.0	133.5	6.48	21.621	
1,600.0	1,600.0	1,598.9	1,598.9	3.5	3.5	89.84	0.4	140.0	140.0	133.1	6.92	20.217	
1,700.0	1,700.0	1,698.9	1,698.9	3.7	3.7	89.84	0.4	140.0	140.0	132.6	7.37	18.985	
1,800.0	1,800.0	1,798.9	1,798.9	3.9	3.9	89.84	0.4	140.0	140.0	132.2	7.82	17.894	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #4H
Project:	Lea County, NM	**TVD Reference:**	KB @ 3678.0usft (McVay 6)
Reference Site:	Haas 6 Federal Com	**MD Reference:**	KB @ 3678.0usft (McVay 6)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design Haas 6 Federal Com - #2H - OH - Plan #1 — Offset Site Error: 0.0 usft

Survey Program: 0-MWD — Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
1,900.0	1,900.0	1,898.9	1,898.9	4.1	4.1	89.84	0.4	140.0	140.0	131.7	8.27	16.922	
2,000.0	2,000.0	1,998.9	1,998.9	4.4	4.4	89.84	0.4	140.0	140.0	131.3	8.72	16.050	
2,100.0	2,100.0	2,098.9	2,098.9	4.6	4.6	89.84	0.4	140.0	140.0	130.8	9.17	15.263	
2,200.0	2,200.0	2,198.9	2,198.9	4.8	4.8	89.84	0.4	140.0	140.0	130.4	9.62	14.550	
2,300.0	2,300.0	2,298.9	2,298.9	5.0	5.0	89.84	0.4	140.0	140.0	129.9	10.07	13.901	
2,400.0	2,400.0	2,398.9	2,398.9	5.3	5.3	89.84	0.4	140.0	140.0	129.5	10.52	13.307	
2,500.0	2,500.0	2,498.9	2,498.9	5.5	5.5	89.84	0.4	140.0	140.0	129.0	10.97	12.761	
2,600.0	2,600.0	2,598.9	2,598.9	5.7	5.7	89.84	0.4	140.0	140.0	128.6	11.42	12.259	
2,700.0	2,700.0	2,698.9	2,698.9	5.9	5.9	89.84	0.4	140.0	140.0	128.1	11.87	11.795	
2,800.0	2,800.0	2,798.9	2,798.9	6.2	6.2	89.84	0.4	140.0	140.0	127.7	12.32	11.364	
2,900.0	2,900.0	2,898.9	2,898.9	6.4	6.4	89.84	0.4	140.0	140.0	127.2	12.77	10.964	
3,000.0	3,000.0	2,998.9	2,998.9	6.6	6.6	89.84	0.4	140.0	140.0	126.8	13.22	10.591	
3,100.0	3,100.0	3,098.9	3,098.9	6.8	6.8	89.84	0.4	140.0	140.0	126.3	13.67	10.243	
3,200.0	3,200.0	3,198.9	3,198.9	7.1	7.1	89.84	0.4	140.0	140.0	125.9	14.12	9.917	
3,300.0	3,300.0	3,298.9	3,298.9	7.3	7.3	89.84	0.4	140.0	140.0	125.4	14.57	9.611	
3,400.0	3,400.0	3,398.9	3,398.9	7.5	7.5	89.84	0.4	140.0	140.0	125.0	15.02	9.323	
3,500.0	3,500.0	3,498.9	3,498.9	7.7	7.7	89.84	0.4	140.0	140.0	124.5	15.47	9.052	
3,600.0	3,600.0	3,598.9	3,598.9	8.0	8.0	89.84	0.4	140.0	140.0	124.1	15.92	8.797	
3,700.0	3,700.0	3,698.9	3,698.9	8.2	8.2	89.84	0.4	140.0	140.0	123.6	16.36	8.555	
3,800.0	3,800.0	3,798.9	3,798.9	8.4	8.4	89.84	0.4	140.0	140.0	123.2	16.81	8.326	
3,900.0	3,900.0	3,898.9	3,898.9	8.6	8.6	89.84	0.4	140.0	140.0	122.7	17.26	8.109	
4,000.0	4,000.0	3,998.9	3,998.9	8.9	8.9	89.84	0.4	140.0	140.0	122.3	17.71	7.904	
4,100.0	4,100.0	4,098.9	4,098.9	9.1	9.1	89.84	0.4	140.0	140.0	121.8	18.16	7.708	
4,200.0	4,200.0	4,198.9	4,198.9	9.3	9.3	89.84	0.4	140.0	140.0	121.4	18.61	7.522	
4,300.0	4,300.0	4,298.9	4,298.9	9.5	9.5	89.84	0.4	140.0	140.0	120.9	19.06	7.344	
4,400.0	4,400.0	4,398.9	4,398.9	9.8	9.8	89.84	0.4	140.0	140.0	120.5	19.51	7.175	
4,500.0	4,500.0	4,498.9	4,498.9	10.0	10.0	89.84	0.4	140.0	140.0	120.0	19.96	7.014	
4,600.0	4,600.0	4,598.9	4,598.9	10.2	10.2	89.84	0.4	140.0	140.0	119.6	20.41	6.859	
4,700.0	4,700.0	4,698.9	4,698.9	10.4	10.4	89.84	0.4	140.0	140.0	119.1	20.86	6.711	
4,800.0	4,800.0	4,798.9	4,798.9	10.7	10.7	89.84	0.4	140.0	140.0	118.7	21.31	6.570	
4,900.0	4,900.0	4,898.9	4,898.9	10.9	10.9	89.84	0.4	140.0	140.0	118.2	21.76	6.434	
5,000.0	5,000.0	4,998.9	4,998.9	11.1	11.1	89.84	0.4	140.0	140.0	117.8	22.21	6.304	
5,100.0	5,100.0	5,098.9	5,098.9	11.3	11.3	89.84	0.4	140.0	140.0	117.3	22.66	6.179	
5,200.0	5,200.0	5,198.9	5,198.9	11.6	11.6	89.84	0.4	140.0	140.0	116.9	23.11	6.059	
5,300.0	5,300.0	5,298.9	5,298.9	11.8	11.8	89.84	0.4	140.0	140.0	116.4	23.56	5.943	
5,400.0	5,400.0	5,398.9	5,398.9	12.0	12.0	89.84	0.4	140.0	140.0	116.0	24.01	5.832	
5,500.0	5,500.0	5,498.9	5,498.9	12.2	12.2	89.84	0.4	140.0	140.0	115.5	24.46	5.724	
5,600.0	5,600.0	5,598.9	5,598.9	12.5	12.5	89.84	0.4	140.0	140.0	115.1	24.91	5.621	
5,700.0	5,700.0	5,698.9	5,698.9	12.7	12.7	89.84	0.4	140.0	140.0	114.6	25.36	5.521	
5,800.0	5,800.0	5,798.9	5,798.9	12.9	12.9	89.84	0.4	140.0	140.0	114.2	25.81	5.425	
5,900.0	5,900.0	5,898.9	5,898.9	13.1	13.1	89.84	0.4	140.0	140.0	113.7	26.25	5.332	
6,000.0	6,000.0	5,998.9	5,998.9	13.4	13.4	89.84	0.4	140.0	140.0	113.3	26.70	5.243	
6,100.0	6,100.0	6,098.9	6,098.9	13.6	13.6	89.84	0.4	140.0	140.0	112.8	27.15	5.156	
6,200.0	6,200.0	6,198.9	6,198.9	13.8	13.8	89.84	0.4	140.0	140.0	112.4	27.60	5.072	
6,300.0	6,300.0	6,298.9	6,298.9	14.0	14.0	89.84	0.4	140.0	140.0	111.9	28.05	4.991	
6,400.0	6,400.0	6,398.9	6,398.9	14.3	14.2	89.84	0.4	140.0	140.0	111.5	28.50	4.912	
6,500.0	6,500.0	6,498.9	6,498.9	14.5	14.5	89.84	0.4	140.0	140.0	111.0	28.95	4.836	
6,600.0	6,600.0	6,598.9	6,598.9	14.7	14.7	89.84	0.4	140.0	140.0	110.6	29.40	4.762	
6,700.0	6,700.0	6,698.9	6,698.9	14.9	14.9	89.84	0.4	140.0	140.0	110.1	29.85	4.690	
6,800.0	6,800.0	6,798.9	6,798.9	15.2	15.1	89.84	0.4	140.0	140.0	109.7	30.30	4.620	
6,900.0	6,900.0	6,898.9	6,898.9	15.4	15.4	89.84	0.4	140.0	140.0	109.3	30.75	4.553	
7,000.0	7,000.0	6,998.9	6,998.9	15.6	15.6	89.84	0.4	140.0	140.0	108.8	31.20	4.487	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #4H
Project:	Lea County, NM	**TVD Reference:**	KB @ 3678.0usft (McVay 6)
Reference Site:	Haas 6 Federal Com	**MD Reference:**	KB @ 3678.0usft (McVay 6)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design Haas 6 Federal Com - #2H - OH - Plan #1 — **Offset Site Error:** 0.0 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,100.0	7,100.0	7,098.9	7,098.9	15.8	15.8	89.84	0.4	140.0	140.0	108.4	31.65	4.424	
7,200.0	7,200.0	7,198.9	7,198.9	16.1	16.0	89.84	0.4	140.0	140.0	107.9	32.10	4.362	
7,300.0	7,300.0	7,298.9	7,298.9	16.3	16.3	89.84	0.4	140.0	140.0	107.5	32.55	4.301	
7,400.0	7,400.0	7,398.9	7,398.9	16.5	16.5	89.84	0.4	140.0	140.0	107.0	33.00	4.243	
7,500.0	7,500.0	7,498.9	7,498.9	16.7	16.7	89.84	0.4	140.0	140.0	106.6	33.45	4.186	
7,600.0	7,600.0	7,598.9	7,598.9	16.9	16.9	89.84	0.4	140.0	140.0	106.1	33.90	4.130	
7,700.0	7,700.0	7,698.9	7,698.9	17.2	17.2	89.84	0.4	140.0	140.0	105.7	34.35	4.076	
7,800.0	7,800.0	7,798.9	7,798.9	17.4	17.4	89.84	0.4	140.0	140.0	105.2	34.80	4.023	
7,812.6	7,812.6	7,811.5	7,811.5	17.4	17.4	89.84	0.4	140.0	140.0	105.1	34.85	4.017	CC, ES
7,825.0	7,825.0	7,823.9	7,823.9	17.5	17.5	-166.37	0.4	140.0	140.2	105.3	34.90	4.016	SF
7,850.0	7,850.0	7,848.9	7,848.9	17.5	17.5	-166.46	0.4	140.0	141.4	106.5	34.92	4.050	
7,875.0	7,874.8	7,873.7	7,873.7	17.5	17.6	-166.64	0.4	140.0	144.0	109.1	34.85	4.130	
7,900.0	7,899.5	7,898.4	7,898.4	17.6	17.6	-166.88	0.4	140.0	147.8	113.1	34.71	4.258	
7,925.0	7,924.0	7,922.9	7,922.9	17.6	17.7	-167.19	0.4	140.0	152.8	118.4	34.47	4.433	
7,950.0	7,948.1	7,947.0	7,947.0	17.7	17.7	-167.53	0.4	140.0	159.1	125.0	34.16	4.659	
7,975.0	7,971.9	7,970.8	7,970.8	17.8	17.8	-167.91	0.4	140.0	166.7	133.0	33.76	4.939	
8,000.0	7,995.2	7,994.1	7,994.1	17.8	17.8	-168.29	0.4	140.0	175.5	142.2	33.27	5.274	
8,025.0	8,018.1	8,017.0	8,017.0	17.9	17.9	-168.67	0.4	140.0	185.5	152.8	32.71	5.671	
8,050.0	8,040.3	8,039.2	8,039.2	17.9	17.9	-169.04	0.4	140.0	196.7	164.6	32.06	6.134	
8,075.0	8,062.0	8,060.9	8,060.9	18.0	18.0	-169.38	0.4	140.0	209.0	177.6	31.34	6.669	
8,100.0	8,083.0	8,081.9	8,081.9	18.1	18.0	-169.68	0.4	140.0	222.4	191.9	30.54	7.284	
8,125.0	8,103.2	8,102.1	8,102.1	18.1	18.1	-169.95	0.4	140.0	237.0	207.3	29.67	7.986	
8,150.0	8,122.6	8,121.5	8,121.5	18.2	18.1	-170.17	0.4	140.0	252.6	223.8	28.74	8.786	
8,175.0	8,141.2	8,140.1	8,140.1	18.3	18.2	-170.33	0.4	140.0	269.1	241.4	27.76	9.696	
8,200.0	8,158.9	8,157.8	8,157.8	18.4	18.2	-170.44	0.4	140.0	286.7	260.0	26.72	10.730	
8,225.0	8,175.6	8,174.5	8,174.5	18.5	18.2	-170.49	0.4	140.0	305.1	279.5	25.64	11.902	
8,250.0	8,191.3	8,190.2	8,190.2	18.6	18.3	-170.47	0.4	140.0	324.5	299.9	24.53	13.228	
8,275.0	8,206.0	8,204.9	8,204.9	18.8	18.3	-170.36	0.4	140.0	344.6	321.2	23.40	14.727	
8,300.0	8,219.7	8,218.6	8,218.6	18.9	18.3	-170.16	0.4	140.0	365.5	343.2	22.27	16.412	
8,325.0	8,232.2	8,231.1	8,231.1	19.1	18.4	-169.83	0.4	140.0	387.0	365.9	21.16	18.294	
8,350.0	8,243.5	8,242.4	8,242.4	19.3	18.4	-169.36	0.4	140.0	409.2	389.1	20.09	20.366	
8,375.0	8,253.7	8,252.6	8,252.6	19.5	18.4	-168.68	0.4	140.0	432.0	412.8	19.12	22.590	
8,400.0	8,262.6	8,261.5	8,261.5	19.7	18.4	-167.72	0.4	140.0	455.2	436.9	18.30	24.871	
8,425.0	8,270.4	8,269.3	8,269.3	20.0	18.5	-166.34	0.4	140.0	479.0	461.2	17.74	27.000	
8,450.0	8,276.8	8,275.7	8,275.7	20.3	18.5	-164.28	0.4	140.0	503.0	485.4	17.60	28.587	
8,475.0	8,282.1	8,281.0	8,281.0	20.5	18.5	-161.03	0.4	140.0	527.4	509.2	18.20	28.974	
8,500.0	8,286.0	8,284.9	8,284.9	20.8	18.5	-155.39	0.4	140.0	552.1	531.8	20.27	27.242	
8,525.0	8,288.6	8,287.5	8,287.5	21.2	18.5	-143.93	0.4	140.0	576.9	551.4	25.50	22.623	
8,550.0	8,289.9	8,288.8	8,288.8	21.5	18.5	-115.66	0.4	140.0	601.8	565.4	36.46	16.506	
8,570.3	8,290.0	8,288.9	8,288.9	21.8	18.5	-73.19	0.4	140.0	622.1	583.4	38.68	16.081	
8,600.0	8,289.5	8,288.4	8,288.4	22.2	18.5	-72.43	0.4	140.0	651.8	612.8	38.95	16.735	
8,700.0	8,287.9	8,286.8	8,286.8	23.8	18.5	-69.93	0.4	140.0	751.6	711.7	39.90	18.839	
8,800.0	8,286.3	8,285.2	8,285.2	25.5	18.5	-67.51	0.4	140.0	851.5	810.6	40.93	20.804	
8,900.0	8,284.7	8,283.6	8,283.6	27.4	18.5	-65.18	0.4	140.0	951.4	909.4	42.01	22.648	
9,000.0	8,283.1	10,145.3	9,268.9	29.4	34.2	-179.70	-227.7	-905.5	987.1	968.7	18.39	53.673	
9,100.0	8,281.5	10,245.3	9,267.0	31.5	36.3	-179.85	-249.0	-1,003.1	986.8	967.4	19.45	50.728	
9,120.3	8,281.2	10,265.6	9,266.6	32.0	36.8	-179.88	-253.4	-1,022.9	986.7	967.1	19.67	50.154	
9,200.0	8,279.9	10,345.4	9,265.1	33.7	38.6	-179.95	-268.0	-1,101.4	986.5	965.9	20.57	47.958	
9,300.0	8,278.3	10,445.4	9,263.2	36.0	40.9	179.96	-280.1	-1,200.7	986.2	964.5	21.73	45.388	
9,400.0	8,276.7	10,545.2	9,261.3	38.4	43.2	179.86	-285.3	-1,300.3	985.9	963.0	22.92	43.013	
9,440.2	8,276.0	10,585.5	9,260.6	39.3	44.2	179.86	-286.0	-1,340.5	985.8	962.4	23.41	42.107	
9,500.0	8,275.1	10,645.2	9,259.4	40.7	45.6	179.87	-287.1	-1,400.2	985.6	961.5	24.15	40.816	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #4H
Project:	Lea County, NM	**TVD Reference:**	KB @ 3678.0usft (McVay 6)
Reference Site:	Haas 6 Federal Com	**MD Reference:**	KB @ 3678.0usft (McVay 6)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design Haas 6 Federal Com - #2H - OH - Plan #1 — Offset Site Error: 0.0 usft

Survey Program: 0-MWD — Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,600.0	8,273.5	10,745.2	9,257.5	43.2	48.0	179.87	-288.9	-1,500.2	985.3	959.9	25.40	38.797	
9,700.0	8,271.9	10,845.2	9,255.6	45.6	50.5	179.87	-290.7	-1,600.2	985.0	958.3	26.67	36.936	
9,800.0	8,270.3	10,945.2	9,253.7	48.1	53.0	179.88	-292.5	-1,700.1	984.7	956.7	27.96	35.220	
9,900.0	8,268.7	11,045.2	9,251.8	50.7	55.5	179.88	-294.3	-1,800.1	984.4	955.1	29.26	33.637	
10,000.0	8,267.2	11,145.2	9,250.0	53.2	58.1	179.89	-296.2	-1,900.1	984.1	953.5	30.59	32.174	
10,100.0	8,265.6	11,245.2	9,248.1	55.8	60.6	179.89	-298.0	-2,000.0	983.8	951.9	31.92	30.820	
10,200.0	8,264.0	11,345.2	9,246.2	58.3	63.2	179.90	-299.8	-2,100.0	983.5	950.2	33.26	29.565	
10,300.0	8,262.4	11,445.2	9,244.3	60.9	65.8	179.90	-301.6	-2,200.0	983.2	948.5	34.62	28.399	
10,400.0	8,260.8	11,545.2	9,242.4	63.5	68.4	179.90	-303.4	-2,299.9	982.8	946.9	35.98	27.314	
10,500.0	8,259.2	11,645.2	9,240.5	66.2	71.0	179.91	-305.3	-2,399.9	982.5	945.2	37.35	26.304	
10,600.0	8,257.6	11,745.2	9,238.6	68.8	73.6	179.91	-307.1	-2,499.9	982.2	943.5	38.73	25.360	
10,700.0	8,256.0	11,845.2	9,236.7	71.4	76.3	179.92	-308.9	-2,599.8	981.9	941.8	40.12	24.477	
10,800.0	8,254.5	11,945.2	9,234.8	74.1	78.9	179.92	-310.7	-2,699.8	981.6	940.1	41.51	23.650	
10,900.0	8,252.9	12,045.2	9,232.9	76.7	81.5	179.93	-312.5	-2,799.8	981.3	938.4	42.90	22.874	
11,000.0	8,251.3	12,145.2	9,231.0	79.4	84.2	179.93	-314.3	-2,899.7	981.0	936.7	44.30	22.144	
11,100.0	8,249.7	12,245.2	9,229.1	82.1	86.9	179.93	-316.2	-2,999.7	980.7	935.0	45.70	21.457	
11,200.0	8,248.1	12,345.2	9,227.2	84.8	89.5	179.94	-318.0	-3,099.7	980.4	933.3	47.11	20.810	
11,300.0	8,246.5	12,445.2	9,225.3	87.4	92.2	179.94	-319.8	-3,199.6	980.1	931.6	48.52	20.198	
11,400.0	8,244.9	12,545.2	9,223.4	90.1	94.9	179.95	-321.6	-3,299.6	979.8	929.8	49.94	19.620	
11,500.0	8,243.3	12,645.2	9,221.5	92.8	97.6	179.95	-323.4	-3,399.5	979.5	928.1	51.35	19.073	
11,600.0	8,241.8	12,745.2	9,219.6	95.5	100.2	179.96	-325.3	-3,499.5	979.2	926.4	52.77	18.554	
11,700.0	8,240.2	12,845.2	9,217.7	98.2	102.9	179.96	-327.1	-3,599.5	978.9	924.7	54.20	18.061	
11,800.0	8,238.6	12,945.2	9,215.9	100.9	105.6	179.96	-328.9	-3,699.4	978.6	922.9	55.62	17.593	
11,900.0	8,237.0	13,045.2	9,214.0	103.6	108.3	179.97	-330.7	-3,799.4	978.2	921.2	57.05	17.148	
12,000.0	8,235.4	13,145.2	9,212.1	106.3	111.0	179.97	-332.5	-3,899.4	977.9	919.5	58.48	16.724	
12,100.0	8,233.8	13,245.2	9,210.2	109.0	113.7	179.98	-334.3	-3,999.3	977.6	917.7	59.91	16.319	
12,200.0	8,232.2	13,345.2	9,208.3	111.7	116.4	179.98	-336.2	-4,099.3	977.3	916.0	61.34	15.933	
12,300.0	8,230.6	13,445.2	9,206.4	114.4	119.1	179.99	-338.0	-4,199.3	977.0	914.2	62.77	15.564	
12,400.0	8,229.1	13,545.2	9,204.5	117.1	121.8	179.99	-339.8	-4,299.2	976.7	912.5	64.21	15.212	
12,500.0	8,227.5	13,645.2	9,202.6	119.9	124.5	179.99	-341.6	-4,399.2	976.4	910.8	65.64	14.874	
12,600.0	8,225.9	13,745.2	9,200.7	122.6	127.3	180.00	-343.4	-4,499.2	976.1	909.0	67.08	14.551	
12,639.8	8,225.2	13,782.1	9,200.0	123.7	128.3	-180.00	-344.1	-4,536.0	976.0	908.3	67.63	14.430	
12,655.4	8,225.0	13,782.1	9,200.0	124.1	128.3	180.00	-344.1	-4,536.0	976.1	908.4	67.75	14.408	

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #4H
Project:	Lea County, NM	**TVD Reference:**	KB @ 3678.0usft (McVay 6)
Reference Site:	Haas 6 Federal Com	**MD Reference:**	KB @ 3678.0usft (McVay 6)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design USA Continental A - A-1 - OH - OH — **Offset Site Error:** 0.0 usft

Survey Program: 107-MWD — **Offset Well Error:** 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-92.57	-53.9	-1,199.8	1,201.4				
100.0	100.0	70.3	70.3	0.1	0.1	-92.56	-53.7	-1,199.8	1,201.0	1,200.9	0.16	7,513.920	
200.0	200.0	170.3	170.3	0.3	0.2	-92.53	-52.9	-1,199.8	1,201.0	1,200.4	0.55	2,189.056	
300.0	300.0	270.3	270.3	0.5	0.4	-92.50	-52.4	-1,199.8	1,201.0	1,200.0	0.98	1,226.376	
400.0	400.0	370.5	370.5	0.8	0.6	-92.46	-51.6	-1,199.8	1,200.9	1,199.5	1.42	848.008	
500.0	500.0	470.5	470.4	1.0	0.9	-92.42	-50.7	-1,199.8	1,200.9	1,199.0	1.86	645.948	
600.0	600.0	570.5	570.4	1.2	1.1	-92.38	-49.9	-1,199.8	1,200.8	1,198.5	2.31	520.919	
700.0	700.0	670.4	670.4	1.4	1.3	-92.34	-49.0	-1,199.8	1,200.8	1,198.1	2.74	437.867	
800.0	800.0	770.3	770.3	1.7	1.5	-92.31	-48.3	-1,199.8	1,200.8	1,197.6	3.17	378.447	
900.0	900.0	870.2	870.2	1.9	1.7	-92.28	-47.8	-1,199.8	1,200.8	1,197.2	3.60	333.226	
1,000.0	1,000.0	970.4	970.3	2.1	1.9	-92.25	-47.2	-1,199.8	1,200.7	1,196.7	4.04	297.526	
1,100.0	1,100.0	1,070.5	1,070.5	2.3	2.1	-92.21	-46.3	-1,199.8	1,200.7	1,196.2	4.47	268.701	
1,200.0	1,200.0	1,170.6	1,170.5	2.6	2.3	-92.15	-45.1	-1,199.8	1,200.7	1,195.8	4.90	244.966	
1,300.0	1,300.0	1,270.4	1,270.4	2.8	2.5	-92.11	-44.1	-1,199.8	1,200.6	1,195.3	5.33	225.085	
1,400.0	1,400.0	1,370.2	1,370.2	3.0	2.8	-92.08	-43.5	-1,199.8	1,200.6	1,194.8	5.77	208.188	
1,500.0	1,500.0	1,470.3	1,470.2	3.2	3.0	-92.05	-43.0	-1,199.8	1,200.6	1,194.4	6.20	193.627	
1,600.0	1,600.0	1,570.3	1,570.3	3.5	3.2	-92.03	-42.4	-1,199.8	1,200.6	1,193.9	6.63	180.968	
1,700.0	1,700.0	1,670.4	1,670.3	3.7	3.4	-91.99	-41.8	-1,199.8	1,200.5	1,193.5	7.07	169.862	
1,800.0	1,800.0	1,770.4	1,770.3	3.9	3.6	-91.96	-41.0	-1,199.8	1,200.5	1,193.0	7.50	160.040	
1,900.0	1,900.0	1,870.4	1,870.3	4.1	3.8	-91.91	-40.1	-1,199.8	1,200.5	1,192.5	7.94	151.193	
2,000.0	2,000.0	1,970.4	1,970.3	4.4	4.0	-91.87	-39.2	-1,199.8	1,200.5	1,192.1	8.38	143.230	
2,100.0	2,100.0	2,070.4	2,070.3	4.6	4.2	-91.83	-38.4	-1,199.8	1,200.4	1,191.6	8.82	136.064	
2,200.0	2,200.0	2,170.4	2,170.3	4.8	4.5	-91.79	-37.5	-1,199.8	1,200.4	1,191.1	9.26	129.646	
2,300.0	2,300.0	2,270.3	2,270.2	5.0	4.7	-91.76	-36.8	-1,199.8	1,200.4	1,190.7	9.69	123.855	
2,400.0	2,400.0	2,370.2	2,370.2	5.3	4.9	-91.73	-36.3	-1,199.8	1,200.4	1,190.2	10.12	118.558	
2,500.0	2,500.0	2,470.4	2,470.3	5.5	5.1	-91.70	-35.6	-1,199.8	1,200.3	1,189.8	10.56	113.687	
2,600.0	2,600.0	2,570.6	2,570.5	5.7	5.3	-91.64	-34.3	-1,199.8	1,200.3	1,189.3	10.99	109.198	
2,700.0	2,700.0	2,670.6	2,670.5	5.9	5.5	-91.56	-32.7	-1,199.8	1,200.3	1,188.8	11.43	105.051	
2,800.0	2,800.0	2,770.5	2,770.4	6.2	5.7	-91.49	-31.2	-1,199.8	1,200.2	1,188.4	11.86	101.209	
2,900.0	2,900.0	2,870.5	2,870.3	6.4	5.9	-91.43	-30.0	-1,199.8	1,200.2	1,187.9	12.29	97.680	
3,000.0	3,000.0	2,970.4	2,970.3	6.6	6.1	-91.38	-29.0	-1,199.8	1,200.2	1,187.4	12.71	94.390	
3,100.0	3,100.0	3,070.4	3,070.2	6.8	6.3	-91.34	-28.1	-1,199.8	1,200.1	1,187.0	13.15	91.295	
3,200.0	3,200.0	3,170.4	3,170.2	7.1	6.5	-91.30	-27.2	-1,199.8	1,200.1	1,186.5	13.58	88.376	
3,300.0	3,300.0	3,270.4	3,270.2	7.3	6.7	-91.26	-26.3	-1,199.8	1,200.1	1,186.1	14.01	85.637	
3,400.0	3,400.0	3,370.5	3,370.3	7.5	7.0	-91.20	-25.2	-1,199.8	1,200.1	1,185.6	14.45	83.039	
3,500.0	3,500.0	3,470.3	3,470.2	7.7	7.2	-91.17	-24.5	-1,199.8	1,200.1	1,185.2	14.89	80.619	
3,600.0	3,600.0	3,570.3	3,570.2	8.0	7.4	-91.13	-23.7	-1,199.8	1,200.0	1,184.7	15.32	78.334	
3,700.0	3,700.0	3,670.3	3,670.2	8.2	7.6	-91.10	-23.0	-1,199.8	1,200.0	1,184.3	15.75	76.175	
3,800.0	3,800.0	3,770.3	3,770.1	8.4	7.8	-91.07	-22.4	-1,199.8	1,200.0	1,183.8	16.19	74.132	
3,900.0	3,900.0	3,870.3	3,870.1	8.6	8.0	-91.05	-21.9	-1,199.8	1,200.0	1,183.4	16.62	72.196	
4,000.0	4,000.0	3,970.3	3,970.1	8.9	8.2	-91.02	-21.3	-1,199.8	1,200.0	1,182.9	17.06	70.358	
4,100.0	4,100.0	4,070.3	4,070.2	9.1	8.4	-90.98	-20.6	-1,199.8	1,200.0	1,182.5	17.49	68.611	
4,200.0	4,200.0	4,170.3	4,170.2	9.3	8.6	-90.94	-19.7	-1,199.8	1,200.0	1,182.0	17.93	66.935	
4,300.0	4,300.0	4,270.3	4,270.2	9.5	8.8	-90.90	-18.8	-1,199.8	1,200.0	1,181.6	18.37	65.335	
4,400.0	4,400.0	4,370.3	4,370.2	9.8	9.1	-90.86	-18.0	-1,199.8	1,199.9	1,181.1	18.81	63.809	
4,500.0	4,500.0	4,470.3	4,470.1	10.0	9.3	-90.82	-17.1	-1,199.8	1,199.9	1,180.7	19.24	62.353	
4,600.0	4,600.0	4,570.3	4,570.1	10.2	9.5	-90.77	-16.2	-1,199.8	1,199.9	1,180.2	19.68	60.959	
4,700.0	4,700.0	4,670.3	4,670.2	10.4	9.7	-90.73	-15.3	-1,199.8	1,199.9	1,179.8	20.12	59.623	
4,800.0	4,800.0	4,770.4	4,770.2	10.7	9.9	-90.67	-14.1	-1,199.8	1,199.9	1,179.3	20.57	58.344	
4,900.0	4,900.0	4,870.4	4,870.2	10.9	10.1	-90.61	-12.8	-1,199.8	1,199.9	1,178.9	21.01	57.118	
5,000.0	5,000.0	4,970.4	4,970.2	11.1	10.4	-90.55	-11.5	-1,199.8	1,199.9	1,178.4	21.45	55.941	
5,100.0	5,100.0	5,070.4	5,070.2	11.3	10.6	-90.48	-10.1	-1,199.8	1,199.9	1,178.0	21.89	54.810	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #4H
Project:	Lea County, NM	**TVD Reference:**	KB @ 3678.0usft (McVay 6)
Reference Site:	Haas 6 Federal Com	**MD Reference:**	KB @ 3678.0usft (McVay 6)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design USA Continental A - A-1 - OH - OH — Offset Site Error: 0.0 usft

Survey Program: 107-MWD — Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,200.0	5,200.0	5,170.4	5,170.1	11.6	10.8	-90.40	-8.5	-1,199.8	1,199.8	1,177.5	22.33	53.724	
5,300.0	5,300.0	5,270.4	5,270.1	11.8	11.0	-90.32	-6.7	-1,199.8	1,199.8	1,177.1	22.78	52.678	
5,400.0	5,400.0	5,370.4	5,370.1	12.0	11.2	-90.23	-4.8	-1,199.8	1,199.8	1,176.6	23.22	51.672	
5,500.0	5,500.0	5,470.3	5,470.1	12.2	11.5	-90.13	-2.7	-1,199.8	1,199.8	1,176.2	23.66	50.704	
5,600.0	5,600.0	5,570.3	5,570.0	12.5	11.7	-90.03	-0.6	-1,199.8	1,199.8	1,175.7	24.11	49.771	
5,624.2	5,624.2	5,594.5	5,594.2	12.5	11.7	-90.00	0.0	-1,199.8	1,199.8	1,175.6	24.21	49.550	
5,700.0	5,700.0	5,670.3	5,670.0	12.7	11.9	-89.91	1.8	-1,199.8	1,199.8	1,175.3	24.55	48.871	
5,800.0	5,800.0	5,770.2	5,769.9	12.9	12.1	-89.80	4.3	-1,199.8	1,199.8	1,174.8	24.99	48.003	
5,900.0	5,900.0	5,870.2	5,869.8	13.1	12.3	-89.67	6.9	-1,199.8	1,199.8	1,174.4	25.44	47.164	
6,000.0	6,000.0	5,970.2	5,969.8	13.4	12.6	-89.55	9.5	-1,199.8	1,199.8	1,174.0	25.88	46.355	
6,100.0	6,100.0	6,070.1	6,069.7	13.6	12.8	-89.42	12.1	-1,199.8	1,199.9	1,173.5	26.33	45.573	
6,200.0	6,200.0	6,170.1	6,169.6	13.8	13.0	-89.29	14.8	-1,199.8	1,199.9	1,173.1	26.77	44.816	
6,300.0	6,300.0	6,270.0	6,269.5	14.0	13.2	-89.16	17.7	-1,199.8	1,199.9	1,172.7	27.22	44.084	
6,400.0	6,400.0	6,369.9	6,369.3	14.3	13.5	-89.01	20.7	-1,199.8	1,200.0	1,172.3	27.66	43.376	
6,500.0	6,500.0	6,469.8	6,469.2	14.5	13.7	-88.85	24.1	-1,199.8	1,200.1	1,171.9	28.11	42.691	
6,600.0	6,600.0	6,569.7	6,569.0	14.7	13.9	-88.68	27.6	-1,199.8	1,200.1	1,171.6	28.56	42.027	
6,700.0	6,700.0	6,669.7	6,668.9	14.9	14.1	-88.52	31.0	-1,199.8	1,200.2	1,171.2	29.00	41.383	
6,800.0	6,800.0	6,769.6	6,768.8	15.2	14.3	-88.35	34.5	-1,199.8	1,200.3	1,170.9	29.45	40.759	
6,900.0	6,900.0	6,869.6	6,868.7	15.4	14.6	-88.18	38.0	-1,199.8	1,200.4	1,170.5	29.90	40.154	
7,000.0	7,000.0	6,969.5	6,968.6	15.6	14.8	-88.02	41.5	-1,199.8	1,200.5	1,170.2	30.34	39.567	
7,100.0	7,100.0	7,069.4	7,068.4	15.8	15.0	-87.85	45.0	-1,199.8	1,200.7	1,169.9	30.79	38.997	
7,200.0	7,200.0	7,169.4	7,168.3	16.1	15.2	-87.69	48.5	-1,199.8	1,200.8	1,169.6	31.24	38.443	
7,300.0	7,300.0	7,269.3	7,268.2	16.3	15.5	-87.52	52.0	-1,199.8	1,200.9	1,169.3	31.68	37.905	
7,400.0	7,400.0	7,369.3	7,368.1	16.5	15.7	-87.35	55.5	-1,199.8	1,201.1	1,169.0	32.13	37.382	
7,500.0	7,500.0	7,469.4	7,468.2	16.7	15.9	-87.19	58.9	-1,199.8	1,201.3	1,168.7	32.57	36.881	
7,600.0	7,600.0	7,569.4	7,568.2	16.9	16.1	-87.05	61.7	-1,199.8	1,201.4	1,168.4	33.00	36.403	
7,700.0	7,700.0	7,668.9	7,667.5	17.2	16.3	-86.89	65.1	-1,199.8	1,201.6	1,168.1	33.43	35.939	
7,800.0	7,800.0	7,768.2	7,766.8	17.4	16.6	-86.69	69.3	-1,199.8	1,201.8	1,168.0	33.86	35.489	
7,812.6	7,812.6	7,780.7	7,779.3	17.4	16.6	-86.67	69.9	-1,199.8	1,201.8	1,167.9	33.92	35.433	
7,825.0	7,825.0	7,793.0	7,791.6	17.5	16.6	17.17	70.5	-1,199.8	1,201.7	1,167.7	34.05	35.294	
7,850.0	7,850.0	7,817.8	7,816.3	17.5	16.7	17.29	71.7	-1,199.8	1,200.6	1,166.5	34.07	35.236	
7,875.0	7,874.8	7,842.5	7,840.9	17.5	16.7	17.47	73.0	-1,199.8	1,198.1	1,164.1	34.02	35.220	
7,900.0	7,899.5	7,867.1	7,865.5	17.6	16.8	17.72	74.3	-1,199.8	1,194.5	1,160.6	33.89	35.244	
7,925.0	7,924.0	7,891.4	7,889.8	17.6	16.8	18.05	75.6	-1,199.8	1,189.6	1,155.9	33.69	35.310	
7,950.0	7,948.1	7,915.5	7,913.8	17.7	16.9	18.44	76.8	-1,199.8	1,183.6	1,150.1	33.42	35.417	
7,975.0	7,971.9	7,939.1	7,937.5	17.8	16.9	18.91	78.1	-1,199.8	1,176.3	1,143.2	33.08	35.563	
8,000.0	7,995.2	7,962.3	7,960.6	17.8	17.0	19.47	79.3	-1,199.8	1,167.9	1,135.2	32.67	35.746	
8,025.0	8,018.1	7,985.0	7,983.3	17.9	17.0	20.12	80.5	-1,199.8	1,158.3	1,126.1	32.21	35.962	
8,050.0	8,040.3	8,007.0	8,005.3	17.9	17.1	20.87	81.6	-1,199.8	1,147.6	1,116.0	31.70	36.206	
8,075.0	8,062.0	8,028.4	8,026.6	18.0	17.1	21.73	82.8	-1,199.8	1,135.9	1,104.8	31.15	36.468	
8,100.0	8,083.0	8,049.0	8,047.2	18.1	17.2	22.72	83.9	-1,199.8	1,123.1	1,092.6	30.57	36.736	
8,125.0	8,103.2	8,068.9	8,067.1	18.1	17.2	23.85	85.0	-1,199.8	1,109.4	1,079.4	29.99	36.993	
8,150.0	8,122.6	8,088.0	8,086.1	18.2	17.3	25.14	86.1	-1,199.8	1,094.7	1,065.3	29.42	37.214	
8,175.0	8,141.2	8,106.2	8,104.3	18.3	17.3	26.62	87.1	-1,199.8	1,079.1	1,050.2	28.88	37.364	
8,200.0	8,158.9	8,123.5	8,121.5	18.4	17.4	28.29	88.1	-1,199.8	1,062.6	1,034.2	28.41	37.402	
8,225.0	8,175.6	8,139.8	8,137.8	18.5	17.4	30.20	89.1	-1,199.8	1,045.4	1,017.3	28.04	37.276	
8,250.0	8,191.3	8,155.1	8,153.1	18.6	17.4	32.38	90.1	-1,199.8	1,027.4	999.5	27.82	36.928	
8,275.0	8,206.0	8,169.5	8,167.5	18.8	17.5	34.86	90.9	-1,199.8	1,008.7	980.9	27.79	36.301	
8,300.0	8,219.7	8,182.8	8,180.7	18.9	17.5	37.67	91.7	-1,199.8	989.4	961.4	27.98	35.356	
8,325.0	8,232.2	8,194.9	8,192.9	19.1	17.5	40.86	92.5	-1,199.8	969.5	941.1	28.44	34.085	
8,350.0	8,243.5	8,205.9	8,203.8	19.3	17.6	44.45	93.2	-1,199.8	949.1	919.9	29.19	32.516	
8,375.0	8,253.7	8,215.8	8,213.6	19.5	17.6	48.48	93.8	-1,199.8	928.3	898.1	30.22	30.724	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #4H
Project:	Lea County, NM	**TVD Reference:**	KB @ 3678.0usft (McVay 6)
Reference Site:	Haas 6 Federal Com	**MD Reference:**	KB @ 3678.0usft (McVay 6)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design USA Continental A - A-1 - OH - OH — **Offset Site Error:** 0.0 usft

Survey Program: 107-MWD — **Offset Well Error:** 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,400.0	8,262.6	8,224.4	8,222.2	19.7	17.6	52.94	94.3	-1,199.8	907.2	875.7	31.48	28.814	
8,425.0	8,270.4	8,231.7	8,229.6	20.0	17.6	57.82	94.7	-1,199.8	885.7	852.8	32.92	26.903	
8,450.0	8,276.8	8,237.8	8,235.7	20.3	17.6	63.07	95.1	-1,199.8	864.0	829.6	34.43	25.096	
8,475.0	8,282.1	8,242.7	8,240.5	20.5	17.6	68.59	95.4	-1,199.8	842.2	806.3	35.88	23.470	
8,500.0	8,286.0	8,246.2	8,244.1	20.8	17.6	74.25	95.6	-1,199.8	820.3	783.1	37.17	22.068	
8,525.0	8,288.6	8,248.5	8,246.3	21.2	17.7	79.91	95.8	-1,199.8	798.3	760.1	38.20	20.900	
8,550.0	8,289.9	8,249.4	8,247.3	21.5	17.7	85.40	95.8	-1,199.8	776.5	737.6	38.92	19.949	
8,570.3	8,290.0	8,249.2	8,247.1	21.8	17.7	89.64	95.8	-1,199.8	758.9	719.6	39.29	19.315	
8,600.0	8,289.5	8,248.3	8,246.2	22.2	17.6	89.50	95.7	-1,199.8	733.3	693.6	39.71	18.465	
8,700.0	8,287.9	8,245.3	8,243.1	23.8	17.6	89.04	95.6	-1,199.8	649.7	608.5	41.27	15.745	
8,800.0	8,286.3	8,242.2	8,240.1	25.5	17.6	88.58	95.4	-1,199.8	571.5	528.5	43.00	13.289	
8,900.0	8,284.7	8,239.2	8,237.0	27.4	17.6	88.12	95.2	-1,199.8	501.0	456.1	44.89	11.162	
9,000.0	8,283.1	8,236.1	8,233.9	29.4	17.6	87.65	95.0	-1,199.8	442.1	395.2	46.89	9.429	
9,100.0	8,281.5	8,233.0	8,230.9	31.5	17.6	87.19	94.8	-1,199.8	399.8	350.8	48.98	8.162	
9,120.3	8,281.2	8,232.4	8,230.3	32.0	17.6	87.10	94.8	-1,199.8	393.8	344.4	49.42	7.968	
9,200.0	8,279.9	8,230.1	8,228.0	33.7	17.6	86.76	94.6	-1,199.8	377.5	326.4	51.13	7.384	
9,266.4	8,278.8	8,228.4	8,226.3	35.3	17.6	86.53	94.5	-1,199.8	373.2	320.7	52.55	7.102	CC, ES
9,300.0	8,278.3	8,227.6	8,225.5	36.0	17.6	86.43	94.5	-1,199.8	374.3	321.1	53.24	7.030	SF
9,400.0	8,276.7	8,225.5	8,223.4	38.4	17.6	86.22	94.4	-1,199.8	390.5	335.2	55.30	7.061	
9,440.2	8,276.0	8,224.8	8,222.7	39.3	17.6	86.17	94.3	-1,199.8	402.0	345.9	56.11	7.164	
9,500.0	8,275.1	8,223.8	8,221.6	40.7	17.6	86.02	94.2	-1,199.8	424.8	367.3	57.54	7.383	
9,600.0	8,273.5	8,222.1	8,220.0	43.2	17.6	85.77	94.1	-1,199.8	477.6	417.6	59.97	7.963	
9,700.0	8,271.9	8,220.4	8,218.3	45.6	17.6	85.51	94.0	-1,199.8	543.8	481.3	62.43	8.709	
9,800.0	8,270.3	8,218.7	8,216.6	48.1	17.6	85.26	93.9	-1,199.8	619.1	554.2	64.92	9.536	
9,900.0	8,268.7	8,217.0	8,214.9	50.7	17.6	85.01	93.8	-1,199.8	700.6	633.2	67.43	10.390	
10,000.0	8,267.2	8,215.3	8,213.2	53.2	17.6	84.75	93.7	-1,199.8	786.4	716.4	69.96	11.241	
10,100.0	8,265.6	8,213.6	8,211.5	55.8	17.6	84.50	93.6	-1,199.8	875.2	802.7	72.50	12.071	
10,200.0	8,264.0	8,211.9	8,209.8	58.3	17.6	84.24	93.5	-1,199.8	966.2	891.1	75.06	12.873	
10,300.0	8,262.4	8,210.2	8,208.1	60.9	17.6	83.99	93.4	-1,199.8	1,058.8	981.2	77.62	13.641	
10,400.0	8,260.8	8,208.6	8,206.5	63.5	17.6	83.74	93.3	-1,199.8	1,152.7	1,072.5	80.20	14.373	
10,500.0	8,259.2	8,206.9	8,204.8	66.2	17.6	83.48	93.2	-1,199.8	1,247.5	1,164.7	82.78	15.071	
10,600.0	8,257.6	8,205.2	8,203.1	68.8	17.5	83.23	93.1	-1,199.8	1,343.0	1,257.7	85.36	15.733	
10,700.0	8,256.0	8,203.5	8,201.4	71.4	17.5	82.97	93.0	-1,199.8	1,439.2	1,351.2	87.95	16.363	
10,800.0	8,254.5	8,201.8	8,199.7	74.1	17.5	82.72	92.9	-1,199.8	1,535.8	1,445.3	90.54	16.962	
10,900.0	8,252.9	8,200.1	8,198.0	76.7	17.5	82.47	92.8	-1,199.8	1,632.9	1,539.7	93.14	17.531	
11,000.0	8,251.3	8,198.4	8,196.3	79.4	17.5	82.22	92.7	-1,199.8	1,730.3	1,634.5	95.74	18.073	
11,100.0	8,249.7	8,196.7	8,194.6	82.1	17.5	81.96	92.6	-1,199.8	1,827.9	1,729.6	98.33	18.589	
11,200.0	8,248.1	8,195.0	8,193.0	84.8	17.5	81.71	92.5	-1,199.8	1,925.8	1,824.9	100.93	19.080	
11,300.0	8,246.5	8,193.3	8,191.3	87.4	17.5	81.46	92.4	-1,199.8	2,023.9	1,920.4	103.53	19.549	
11,400.0	8,244.9	8,191.6	8,189.6	90.1	17.5	81.21	92.3	-1,199.8	2,122.2	2,016.1	106.13	19.997	
11,500.0	8,243.3	8,189.9	8,187.9	92.8	17.5	80.95	92.2	-1,199.8	2,220.7	2,111.9	108.72	20.425	
11,600.0	8,241.8	8,188.3	8,186.2	95.5	17.5	80.70	92.1	-1,199.8	2,319.2	2,207.9	111.31	20.835	
11,700.0	8,240.2	8,186.6	8,184.5	98.2	17.5	80.45	92.0	-1,199.8	2,417.9	2,304.0	113.90	21.228	
11,800.0	8,238.6	8,184.9	8,182.8	100.9	17.5	80.20	91.9	-1,199.8	2,516.7	2,400.2	116.49	21.604	
11,900.0	8,237.0	8,183.2	8,181.1	103.6	17.5	79.95	91.8	-1,199.8	2,615.6	2,496.5	119.08	21.965	
12,000.0	8,235.4	8,181.5	8,179.5	106.3	17.5	79.70	91.7	-1,199.8	2,714.5	2,592.9	121.66	22.313	
12,100.0	8,233.8	8,179.8	8,177.8	109.0	17.5	79.45	91.6	-1,199.8	2,813.6	2,689.3	124.24	22.647	
12,200.0	8,232.2	8,178.1	8,176.1	111.7	17.5	79.20	91.5	-1,199.8	2,912.7	2,785.8	126.81	22.969	
12,300.0	8,230.6	8,176.4	8,174.4	114.4	17.5	78.95	91.4	-1,199.8	3,011.8	2,882.4	129.38	23.279	
12,400.0	8,229.1	8,174.7	8,172.7	117.1	17.5	78.70	91.3	-1,199.8	3,111.0	2,979.1	131.94	23.579	
12,500.0	8,227.5	8,173.0	8,171.0	119.9	17.5	78.45	91.1	-1,199.8	3,210.3	3,075.8	134.50	23.868	
12,600.0	8,225.9	8,171.3	8,169.3	122.6	17.5	78.20	91.0	-1,199.8	3,309.6	3,172.5	137.06	24.148	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #4H
Project:	Lea County, NM	**TVD Reference:**	KB @ 3678.0usft (McVay 6)
Reference Site:	Haas 6 Federal Com	**MD Reference:**	KB @ 3678.0usft (McVay 6)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design USA Continental A - A-1 - OH - OH — **Offset Site Error:** 0.0 usft

Survey Program: 107-MWD — **Offset Well Error:** 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
12,655.4	8,225.0	8,170.4	8,168.4	124.1	17.5	78.06	91.0	-1,199.8	3,364.6	3,226.1	138.47	24.298	

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #4H
Project:	Lea County, NM	**TVD Reference:**	KB @ 3678.0usft (McVay 6)
Reference Site:	Haas 6 Federal Com	**MD Reference:**	KB @ 3678.0usft (McVay 6)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design USA Continental B - B-1 - OH - OH — **Offset Site Error:** 0.0 usft

Survey Program: 10000-MWD — **Offset Well Error:** 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-91.17	-58.7	-2,885.6	2,886.2				
100.0	100.0	95.0	95.0	0.1	0.1	-91.17	-58.7	-2,885.6	2,886.2	2,886.0	0.20	N/A	
200.0	200.0	195.0	195.0	0.3	0.2	-91.17	-58.7	-2,885.6	2,886.2	2,885.7	0.54	5,388.006	
300.0	300.0	295.0	295.0	0.5	0.3	-91.17	-58.7	-2,885.6	2,886.2	2,885.3	0.87	3,307.521	
400.0	400.0	395.0	395.0	0.8	0.4	-91.17	-58.7	-2,885.6	2,886.2	2,885.0	1.21	2,386.151	
500.0	500.0	495.0	495.0	1.0	0.6	-91.17	-58.7	-2,885.6	2,886.2	2,884.7	1.55	1,866.268	
600.0	600.0	595.0	595.0	1.2	0.7	-91.17	-58.7	-2,885.6	2,886.2	2,884.3	1.88	1,532.397	
700.0	700.0	695.0	695.0	1.4	0.8	-91.17	-58.7	-2,885.6	2,886.2	2,884.0	2.22	1,299.855	
800.0	800.0	795.0	795.0	1.7	0.9	-91.17	-58.7	-2,885.6	2,886.2	2,883.6	2.56	1,128.592	
900.0	900.0	895.0	895.0	1.9	1.0	-91.17	-58.7	-2,885.6	2,886.2	2,883.3	2.89	997.204	
1,000.0	1,000.0	995.0	995.0	2.1	1.1	-91.17	-58.7	-2,885.6	2,886.2	2,883.0	3.23	893.218	
1,100.0	1,100.0	1,095.0	1,095.0	2.3	1.2	-91.17	-58.7	-2,885.6	2,886.2	2,882.6	3.57	808.871	
1,200.0	1,200.0	1,195.0	1,195.0	2.6	1.3	-91.17	-58.7	-2,885.6	2,886.2	2,882.3	3.91	739.079	
1,300.0	1,300.0	1,295.0	1,295.0	2.8	1.5	-91.17	-58.7	-2,885.6	2,886.2	2,882.0	4.24	680.374	
1,400.0	1,400.0	1,395.0	1,395.0	3.0	1.6	-91.17	-58.7	-2,885.6	2,886.2	2,881.6	4.58	630.309	
1,500.0	1,500.0	1,495.0	1,495.0	3.2	1.7	-91.17	-58.7	-2,885.6	2,886.2	2,881.3	4.92	587.107	
1,600.0	1,600.0	1,595.0	1,595.0	3.5	1.8	-91.17	-58.7	-2,885.6	2,886.2	2,881.0	5.25	549.447	
1,700.0	1,700.0	1,695.0	1,695.0	3.7	1.9	-91.17	-58.7	-2,885.6	2,886.2	2,880.6	5.59	516.328	
1,800.0	1,800.0	1,795.0	1,795.0	3.9	2.0	-91.17	-58.7	-2,885.6	2,886.2	2,880.3	5.93	486.974	
1,900.0	1,900.0	1,895.0	1,895.0	4.1	2.1	-91.17	-58.7	-2,885.6	2,886.2	2,879.9	6.26	460.778	
2,000.0	2,000.0	1,995.0	1,995.0	4.4	2.2	-91.17	-58.7	-2,885.6	2,886.2	2,879.6	6.60	437.257	
2,100.0	2,100.0	2,095.0	2,095.0	4.6	2.4	-91.17	-58.7	-2,885.6	2,886.2	2,879.3	6.94	416.020	
2,200.0	2,200.0	2,195.0	2,195.0	4.8	2.5	-91.17	-58.7	-2,885.6	2,886.2	2,878.9	7.27	396.751	
2,300.0	2,300.0	2,295.0	2,295.0	5.0	2.6	-91.17	-58.7	-2,885.6	2,886.2	2,878.6	7.61	379.188	
2,400.0	2,400.0	2,395.0	2,395.0	5.3	2.7	-91.17	-58.7	-2,885.6	2,886.2	2,878.3	7.95	363.113	
2,500.0	2,500.0	2,495.0	2,495.0	5.5	2.8	-91.17	-58.7	-2,885.6	2,886.2	2,877.9	8.29	348.347	
2,600.0	2,600.0	2,595.0	2,595.0	5.7	2.9	-91.17	-58.7	-2,885.6	2,886.2	2,877.6	8.62	334.734	
2,700.0	2,700.0	2,695.0	2,695.0	5.9	3.0	-91.17	-58.7	-2,885.6	2,886.2	2,877.2	8.96	322.145	
2,800.0	2,800.0	2,795.0	2,795.0	6.2	3.1	-91.17	-58.7	-2,885.6	2,886.2	2,876.9	9.30	310.469	
2,900.0	2,900.0	2,895.0	2,895.0	6.4	3.2	-91.17	-58.7	-2,885.6	2,886.2	2,876.6	9.63	299.609	
3,000.0	3,000.0	2,995.0	2,995.0	6.6	3.4	-91.17	-58.7	-2,885.6	2,886.2	2,876.2	9.97	289.484	
3,100.0	3,100.0	3,095.0	3,095.0	6.8	3.5	-91.17	-58.7	-2,885.6	2,886.2	2,875.9	10.31	280.020	
3,200.0	3,200.0	3,195.0	3,195.0	7.1	3.6	-91.17	-58.7	-2,885.6	2,886.2	2,875.6	10.64	271.156	
3,300.0	3,300.0	3,295.0	3,295.0	7.3	3.7	-91.17	-58.7	-2,885.6	2,886.2	2,875.2	10.98	262.836	
3,400.0	3,400.0	3,395.0	3,395.0	7.5	3.8	-91.17	-58.7	-2,885.6	2,886.2	2,874.9	11.32	255.011	
3,500.0	3,500.0	3,495.0	3,495.0	7.7	3.9	-91.17	-58.7	-2,885.6	2,886.2	2,874.6	11.65	247.639	
3,600.0	3,600.0	3,595.0	3,595.0	8.0	4.0	-91.17	-58.7	-2,885.6	2,886.2	2,874.2	11.99	240.680	
3,700.0	3,700.0	3,695.0	3,695.0	8.2	4.1	-91.17	-58.7	-2,885.6	2,886.2	2,873.9	12.33	234.103	
3,800.0	3,800.0	3,795.0	3,795.0	8.4	4.3	-91.17	-58.7	-2,885.6	2,886.2	2,873.5	12.67	227.875	
3,900.0	3,900.0	3,895.0	3,895.0	8.6	4.4	-91.17	-58.7	-2,885.6	2,886.2	2,873.2	13.00	221.970	
4,000.0	4,000.0	3,995.0	3,995.0	8.9	4.5	-91.17	-58.7	-2,885.6	2,886.2	2,872.9	13.34	216.363	
4,100.0	4,100.0	4,095.0	4,095.0	9.1	4.6	-91.17	-58.7	-2,885.6	2,886.2	2,872.5	13.68	211.033	
4,200.0	4,200.0	4,195.0	4,195.0	9.3	4.7	-91.17	-58.7	-2,885.6	2,886.2	2,872.2	14.01	205.958	
4,300.0	4,300.0	4,295.0	4,295.0	9.5	4.8	-91.17	-58.7	-2,885.6	2,886.2	2,871.9	14.35	201.123	
4,400.0	4,400.0	4,395.0	4,395.0	9.8	4.9	-91.17	-58.7	-2,885.6	2,886.2	2,871.5	14.69	196.509	
4,500.0	4,500.0	4,495.0	4,495.0	10.0	5.0	-91.17	-58.7	-2,885.6	2,886.2	2,871.2	15.02	192.102	
4,600.0	4,600.0	4,595.0	4,595.0	10.2	5.2	-91.17	-58.7	-2,885.6	2,886.2	2,870.8	15.36	187.888	
4,700.0	4,700.0	4,695.0	4,695.0	10.4	5.3	-91.17	-58.7	-2,885.6	2,886.2	2,870.5	15.70	183.855	
4,800.0	4,800.0	4,795.0	4,795.0	10.7	5.4	-91.17	-58.7	-2,885.6	2,886.2	2,870.2	16.04	179.992	
4,900.0	4,900.0	4,895.0	4,895.0	10.9	5.5	-91.17	-58.7	-2,885.6	2,886.2	2,869.8	16.37	176.287	
5,000.0	5,000.0	4,995.0	4,995.0	11.1	5.6	-91.17	-58.7	-2,885.6	2,886.2	2,869.5	16.71	172.732	
5,100.0	5,100.0	5,095.0	5,095.0	11.3	5.7	-91.17	-58.7	-2,885.6	2,886.2	2,869.2	17.05	169.318	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #4H
Project:	Lea County, NM	**TVD Reference:**	KB @ 3678.0usft (McVay 6)
Reference Site:	Haas 6 Federal Com	**MD Reference:**	KB @ 3678.0usft (McVay 6)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design USA Continental B - B-1 - OH - OH — **Offset Site Error:** 0.0 usft

Survey Program: 10000-MWD — **Offset Well Error:** 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,200.0	5,200.0	5,195.0	5,195.0	11.6	5.8	-91.17	-58.7	-2,885.6	2,886.2	2,868.8	17.38	166.036	
5,300.0	5,300.0	5,295.0	5,295.0	11.8	5.9	-91.17	-58.7	-2,885.6	2,886.2	2,868.5	17.72	162.879	
5,400.0	5,400.0	5,395.0	5,395.0	12.0	6.1	-91.17	-58.7	-2,885.6	2,886.2	2,868.2	18.06	159.840	
5,500.0	5,500.0	5,495.0	5,495.0	12.2	6.2	-91.17	-58.7	-2,885.6	2,886.2	2,867.8	18.39	156.912	
5,600.0	5,600.0	5,595.0	5,595.0	12.5	6.3	-91.17	-58.7	-2,885.6	2,886.2	2,867.5	18.73	154.089	
5,700.0	5,700.0	5,695.0	5,695.0	12.7	6.4	-91.17	-58.7	-2,885.6	2,886.2	2,867.1	19.07	151.366	
5,800.0	5,800.0	5,795.0	5,795.0	12.9	6.5	-91.17	-58.7	-2,885.6	2,886.2	2,866.8	19.40	148.738	
5,900.0	5,900.0	5,895.0	5,895.0	13.1	6.6	-91.17	-58.7	-2,885.6	2,886.2	2,866.5	19.74	146.199	
6,000.0	6,000.0	5,995.0	5,995.0	13.4	6.7	-91.17	-58.7	-2,885.6	2,886.2	2,866.1	20.08	143.746	
6,100.0	6,100.0	6,095.0	6,095.0	13.6	6.8	-91.17	-58.7	-2,885.6	2,886.2	2,865.8	20.42	141.373	
6,200.0	6,200.0	6,195.0	6,195.0	13.8	6.9	-91.17	-58.7	-2,885.6	2,886.2	2,865.5	20.75	139.078	
6,300.0	6,300.0	6,295.0	6,295.0	14.0	7.1	-91.17	-58.7	-2,885.6	2,886.2	2,865.1	21.09	136.856	
6,400.0	6,400.0	6,395.0	6,395.0	14.3	7.2	-91.17	-58.7	-2,885.6	2,886.2	2,864.8	21.43	134.703	
6,500.0	6,500.0	6,495.0	6,495.0	14.5	7.3	-91.17	-58.7	-2,885.6	2,886.2	2,864.4	21.76	132.618	
6,600.0	6,600.0	6,595.0	6,595.0	14.7	7.4	-91.17	-58.7	-2,885.6	2,886.2	2,864.1	22.10	130.596	
6,700.0	6,700.0	6,695.0	6,695.0	14.9	7.5	-91.17	-58.7	-2,885.6	2,886.2	2,863.8	22.44	128.635	
6,800.0	6,800.0	6,795.0	6,795.0	15.2	7.6	-91.17	-58.7	-2,885.6	2,886.2	2,863.4	22.77	126.732	
6,900.0	6,900.0	6,895.0	6,895.0	15.4	7.7	-91.17	-58.7	-2,885.6	2,886.2	2,863.1	23.11	124.884	
7,000.0	7,000.0	6,995.0	6,995.0	15.6	7.8	-91.17	-58.7	-2,885.6	2,886.2	2,862.8	23.45	123.089	
7,100.0	7,100.0	7,095.0	7,095.0	15.8	8.0	-91.17	-58.7	-2,885.6	2,886.2	2,862.4	23.78	121.346	
7,200.0	7,200.0	7,195.0	7,195.0	16.1	8.1	-91.17	-58.7	-2,885.6	2,886.2	2,862.1	24.12	119.651	
7,300.0	7,300.0	7,295.0	7,295.0	16.3	8.2	-91.17	-58.7	-2,885.6	2,886.2	2,861.7	24.46	118.002	
7,400.0	7,400.0	7,395.0	7,395.0	16.5	8.3	-91.17	-58.7	-2,885.6	2,886.2	2,861.4	24.80	116.399	
7,500.0	7,500.0	7,495.0	7,495.0	16.7	8.4	-91.17	-58.7	-2,885.6	2,886.2	2,861.1	25.13	114.838	
7,600.0	7,600.0	7,595.0	7,595.0	16.9	8.5	-91.17	-58.7	-2,885.6	2,886.2	2,860.7	25.47	113.319	
7,700.0	7,700.0	7,695.0	7,695.0	17.2	8.6	-91.17	-58.7	-2,885.6	2,886.2	2,860.4	25.81	111.840	
7,800.0	7,800.0	7,795.0	7,795.0	17.4	8.7	-91.17	-58.7	-2,885.6	2,886.2	2,860.1	26.14	110.398	
7,812.6	7,812.6	7,807.6	7,807.6	17.4	8.8	-91.17	-58.7	-2,885.6	2,886.2	2,860.0	26.19	110.219	
7,825.0	7,825.0	7,820.0	7,820.0	17.5	8.8	12.64	-58.7	-2,885.6	2,886.1	2,859.8	26.22	110.072	
7,850.0	7,850.0	7,845.0	7,845.0	17.5	8.8	12.68	-58.7	-2,885.6	2,884.8	2,858.5	26.25	109.914	
7,875.0	7,874.8	7,869.8	7,869.8	17.5	8.8	12.76	-58.7	-2,885.6	2,882.2	2,856.0	26.22	109.915	
7,900.0	7,899.5	7,894.5	7,894.5	17.6	8.9	12.88	-58.7	-2,885.6	2,878.4	2,852.3	26.15	110.073	
7,925.0	7,924.0	7,919.0	7,919.0	17.6	8.9	13.04	-58.7	-2,885.6	2,873.4	2,847.3	26.03	110.388	
7,950.0	7,948.1	7,943.1	7,943.1	17.7	8.9	13.25	-58.7	-2,885.6	2,867.1	2,841.2	25.86	110.860	
7,975.0	7,971.9	7,966.9	7,966.9	17.8	8.9	13.50	-58.7	-2,885.6	2,859.5	2,833.9	25.65	111.490	
8,000.0	7,995.2	7,990.2	7,990.2	17.8	9.0	13.81	-58.7	-2,885.6	2,850.8	2,825.4	25.39	112.275	
8,025.0	8,018.1	8,013.1	8,013.1	17.9	9.0	14.17	-58.7	-2,885.6	2,840.9	2,815.8	25.09	113.215	
8,050.0	8,040.3	8,035.3	8,035.3	17.9	9.0	14.59	-58.7	-2,885.6	2,829.8	2,805.1	24.76	114.306	
8,075.0	8,062.0	8,057.0	8,057.0	18.0	9.0	15.09	-58.7	-2,885.6	2,817.6	2,793.3	24.39	115.542	
8,100.0	8,083.0	8,078.0	8,078.0	18.1	9.1	15.66	-58.7	-2,885.6	2,804.4	2,780.4	23.99	116.911	
8,125.0	8,103.2	8,098.2	8,098.2	18.1	9.1	16.32	-58.7	-2,885.6	2,790.1	2,766.5	23.57	118.397	
8,150.0	8,122.6	8,117.6	8,117.6	18.2	9.1	17.08	-58.7	-2,885.6	2,774.8	2,751.6	23.13	119.972	
8,175.0	8,141.2	8,136.2	8,136.2	18.3	9.1	17.95	-58.7	-2,885.6	2,758.5	2,735.8	22.69	121.593	
8,200.0	8,158.9	8,153.9	8,153.9	18.4	9.1	18.97	-58.7	-2,885.6	2,741.3	2,719.0	22.25	123.198	
8,225.0	8,175.6	8,170.6	8,170.6	18.5	9.2	20.15	-58.7	-2,885.6	2,723.2	2,701.4	21.84	124.696	
8,250.0	8,191.3	8,186.3	8,186.3	18.6	9.2	21.52	-58.7	-2,885.6	2,704.3	2,682.8	21.47	125.960	
8,275.0	8,206.0	8,201.0	8,201.0	18.8	9.2	23.12	-58.7	-2,885.6	2,684.7	2,663.5	21.17	126.817	
8,300.0	8,219.7	8,214.7	8,214.7	18.9	9.2	25.01	-58.7	-2,885.6	2,664.3	2,643.3	20.97	127.046	
8,325.0	8,232.2	8,227.2	8,227.2	19.1	9.2	27.26	-58.7	-2,885.6	2,643.3	2,622.3	20.91	126.383	
8,350.0	8,243.5	8,238.5	8,238.5	19.3	9.2	29.94	-58.7	-2,885.6	2,621.6	2,600.6	21.05	124.554	
8,375.0	8,253.7	8,248.7	8,248.7	19.5	9.3	33.18	-58.7	-2,885.6	2,599.5	2,578.1	21.42	121.331	
8,400.0	8,262.6	8,257.6	8,257.6	19.7	9.3	37.11	-58.7	-2,885.6	2,576.9	2,554.8	22.10	116.616	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #4H
Project:	Lea County, NM	**TVD Reference:**	KB @ 3678.0usft (McVay 6)
Reference Site:	Haas 6 Federal Com	**MD Reference:**	KB @ 3678.0usft (McVay 6)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design USA Continental B - B-1 - OH - OH — **Offset Site Error:** 0.0 usft

Survey Program: 10000-MWD — **Offset Well Error:** 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,425.0	8,270.4	8,265.4	8,265.4	20.0	9.3	41.91	-58.7	-2,885.6	2,553.8	2,530.7	23.11	110.523	
8,450.0	8,276.8	8,271.8	8,271.8	20.3	9.3	47.79	-58.7	-2,885.6	2,530.4	2,506.0	24.47	103.430	
8,475.0	8,282.1	8,277.1	8,277.1	20.5	9.3	54.97	-58.7	-2,885.6	2,506.8	2,480.6	26.12	95.967	
8,500.0	8,286.0	8,281.0	8,281.0	20.8	9.3	63.56	-58.7	-2,885.6	2,482.9	2,455.0	27.92	88.941	
8,525.0	8,288.6	8,283.6	8,283.6	21.2	9.3	73.50	-58.7	-2,885.6	2,458.8	2,429.3	29.56	83.185	
8,550.0	8,289.9	8,284.9	8,284.9	21.5	9.3	84.39	-58.7	-2,885.6	2,434.7	2,404.0	30.68	79.360	
8,570.3	8,290.0	8,285.0	8,285.0	21.8	9.3	93.39	-58.7	-2,885.6	2,415.2	2,384.1	31.01	77.872	
8,600.0	8,289.5	8,284.5	8,284.5	22.2	9.3	93.35	-58.7	-2,885.6	2,386.5	2,355.0	31.44	75.912	
8,700.0	8,287.9	8,282.9	8,282.9	23.8	9.3	93.20	-58.7	-2,885.6	2,290.2	2,257.2	33.00	69.398	
8,800.0	8,286.3	8,281.3	8,281.3	25.5	9.3	93.06	-58.7	-2,885.6	2,194.3	2,159.5	34.75	63.146	
8,900.0	8,284.7	8,279.7	8,279.7	27.4	9.3	92.91	-58.7	-2,885.6	2,098.7	2,062.1	36.65	57.268	
9,000.0	8,283.1	8,278.1	8,278.1	29.4	9.3	92.77	-58.7	-2,885.6	2,003.6	1,964.9	38.67	51.818	
9,100.0	8,281.5	8,276.5	8,276.5	31.5	9.3	92.62	-58.7	-2,885.6	1,908.9	1,868.2	40.78	46.809	
9,120.3	8,281.2	8,276.2	8,276.2	32.0	9.3	92.59	-58.7	-2,885.6	1,889.8	1,848.6	41.22	45.847	
9,200.0	8,279.9	8,274.9	8,274.9	33.7	9.3	92.99	-58.7	-2,885.6	1,814.1	1,771.2	42.94	42.246	
9,300.0	8,278.3	8,273.3	8,273.3	36.0	9.3	93.69	-58.7	-2,885.6	1,717.8	1,672.8	45.06	38.121	
9,400.0	8,276.7	8,271.7	8,271.7	38.4	9.3	94.82	-58.7	-2,885.6	1,620.2	1,573.1	47.09	34.406	
9,440.2	8,276.0	8,271.0	8,271.0	39.3	9.3	95.51	-58.7	-2,885.6	1,580.6	1,532.7	47.86	33.024	
9,500.0	8,275.1	8,270.1	8,270.1	40.7	9.3	95.30	-58.7	-2,885.6	1,521.6	1,472.3	49.32	30.854	
9,600.0	8,273.5	8,268.5	8,268.5	43.2	9.3	94.95	-58.7	-2,885.6	1,423.2	1,371.4	51.78	27.483	
9,700.0	8,271.9	8,266.9	8,266.9	45.6	9.3	94.60	-58.7	-2,885.6	1,324.9	1,270.6	54.28	24.407	
9,800.0	8,270.3	8,265.3	8,265.3	48.1	9.3	94.25	-58.7	-2,885.6	1,227.0	1,170.2	56.82	21.596	
9,900.0	8,268.7	8,263.7	8,263.7	50.7	9.3	93.89	-58.7	-2,885.6	1,129.4	1,070.0	59.37	19.022	
10,000.0	8,267.2	8,262.2	8,262.2	53.2	9.3	93.54	-58.7	-2,885.6	1,032.3	970.3	61.95	16.663	
10,100.0	8,265.6	8,260.6	8,260.6	55.8	9.3	93.19	-58.7	-2,885.6	935.8	871.2	64.55	14.498	
10,200.0	8,264.0	8,259.0	8,259.0	58.3	9.3	92.83	-58.7	-2,885.6	840.1	772.9	67.16	12.509	
10,300.0	8,262.4	8,257.4	8,257.4	60.9	9.3	92.48	-58.7	-2,885.6	745.5	675.7	69.78	10.683	
10,400.0	8,260.8	8,255.8	8,255.8	63.5	9.3	92.13	-58.7	-2,885.6	652.5	580.1	72.42	9.010	
10,500.0	8,259.2	8,254.2	8,254.2	66.2	9.3	91.77	-58.7	-2,885.6	561.9	486.9	75.06	7.486	
10,600.0	8,257.6	8,252.6	8,252.6	68.8	9.3	91.42	-58.7	-2,885.6	475.2	397.5	77.71	6.114	
10,700.0	8,256.0	8,251.0	8,251.0	71.4	9.3	91.06	-58.7	-2,885.6	394.7	314.4	80.37	4.911	
10,800.0	8,254.5	8,249.5	8,249.5	74.1	9.3	90.71	-58.7	-2,885.6	325.3	242.3	83.04	3.917	
10,900.0	8,252.9	8,247.9	8,247.9	76.7	9.3	90.35	-58.7	-2,885.6	275.4	189.7	85.71	3.213	
11,000.0	8,251.3	8,246.3	8,246.3	79.4	9.3	90.00	-58.7	-2,885.6	256.6	168.2	88.38	2.903	
11,000.0	8,251.3	8,246.3	8,246.3	79.4	9.3	90.00	-58.7	-2,885.6	256.6	168.2	88.38	2.903	CC, ES, SF
11,100.0	8,249.7	8,244.7	8,244.7	82.1	9.2	89.65	-58.7	-2,885.6	275.3	184.3	91.05	3.024	
11,200.0	8,248.1	8,243.1	8,243.1	84.8	9.2	89.29	-58.7	-2,885.6	325.3	231.5	93.73	3.470	
11,300.0	8,246.5	8,241.5	8,241.5	87.4	9.2	88.94	-58.7	-2,885.6	394.7	298.3	96.41	4.094	
11,400.0	8,244.9	8,239.9	8,239.9	90.1	9.2	88.58	-58.7	-2,885.6	475.2	376.1	99.09	4.795	
11,500.0	8,243.3	8,238.3	8,238.3	92.8	9.2	88.23	-58.7	-2,885.6	561.9	460.1	101.76	5.522	
11,600.0	8,241.8	8,236.8	8,236.8	95.5	9.2	87.87	-58.7	-2,885.6	652.5	548.0	104.44	6.247	
11,700.0	8,240.2	8,235.2	8,235.2	98.2	9.2	87.52	-58.7	-2,885.6	745.4	638.3	107.11	6.959	
11,800.0	8,238.6	8,233.6	8,233.6	100.9	9.2	87.17	-58.7	-2,885.6	840.0	730.2	109.79	7.651	
11,900.0	8,237.0	8,232.0	8,232.0	103.6	9.2	86.81	-58.7	-2,885.6	935.7	823.3	112.46	8.321	
12,000.0	8,235.4	8,230.4	8,230.4	106.3	9.2	86.46	-58.7	-2,885.6	1,032.2	917.1	115.13	8.966	
12,100.0	8,233.8	8,228.8	8,228.8	109.0	9.2	86.11	-58.7	-2,885.6	1,129.4	1,011.6	117.79	9.588	
12,200.0	8,232.2	8,227.2	8,227.2	111.7	9.2	85.75	-58.7	-2,885.6	1,227.0	1,106.5	120.45	10.186	
12,300.0	8,230.6	8,225.6	8,225.6	114.4	9.2	85.40	-58.7	-2,885.6	1,324.9	1,201.8	123.11	10.762	
12,400.0	8,229.1	8,224.1	8,224.1	117.1	9.2	85.05	-58.7	-2,885.6	1,423.1	1,297.4	125.76	11.316	
12,500.0	8,227.5	8,222.5	8,222.5	119.9	9.2	84.70	-58.7	-2,885.6	1,521.6	1,393.2	128.40	11.850	
12,600.0	8,225.9	8,220.9	8,220.9	122.6	9.2	84.35	-58.7	-2,885.6	1,620.2	1,489.2	131.04	12.364	
12,655.4	8,225.0	8,220.0	8,220.0	124.1	9.2	84.15	-58.7	-2,885.6	1,674.9	1,542.4	132.50	12.641	

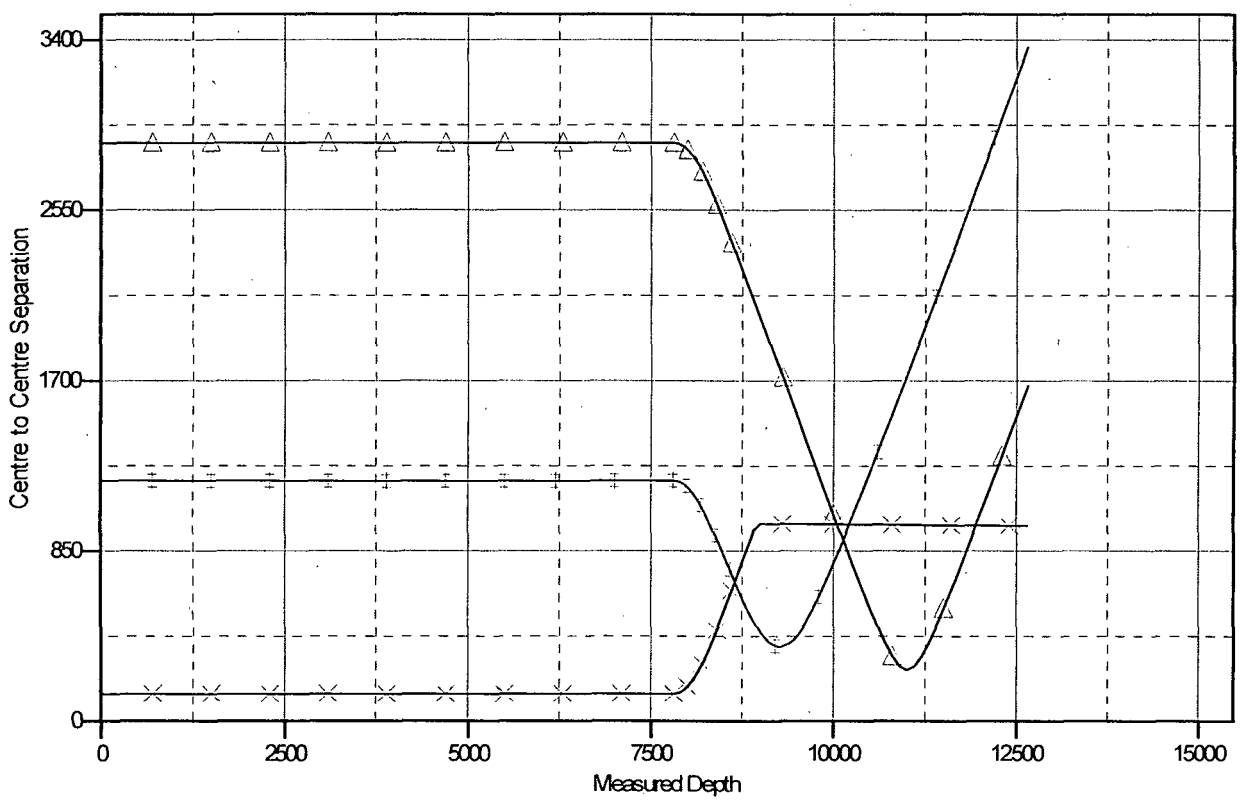
CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #4H
Project:	Lea County, NM	**TVD Reference:**	KB @ 3678.0usft (McVay 6)
Reference Site:	Haas 6 Federal Com	**MD Reference:**	KB @ 3678.0usft (McVay 6)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to KB @ 3678.0usft (McVay 6)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: **#4H**
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 3001
Grid Convergence at Surface is: 0.29°

Ladder Plot



LEGEND

#2H,OH,Plan#1 V0 A-1,OH,OH V0 B-1,OH,OH V0

LLD ACREAGE REPORT

Admin State: NM

Geo State: NM

MTR: 23 0190S 0320E

Section: 006

Sur Type	Sur No	Lld Suff	NE NNSS EWWE	NW NNSS EWWE	SW NNSS EWWE	SE NNSS EWWE	Sur Note	Dup Flg	Sub Surf	Acreage
A			XXXX	X--X	X--X	XXXX				480.000
L	1		----	-X--	----	----				41.410
L	2		----	--X-	----	----				41.260
L	3		----	----	-X--	----				41.120
L	4		----	----	--X-	----				40.970

Section 006 Total: 644.760

MTR Total Exluding Survey Notes C/D/R and Sub Surf = Y 644.760

Grand Total Excluding Survey Notes C/D/R and Sub Surf = Y: 644.760

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub-basin Code	County	Q 64	Q 16	Q 4	Sec	Twn	Rng	X	Y	Depth Well	Depth Water	Water Column
CP 00073		LE		2	4	34	19S	32E	617502	3609301	575		
CP 00075		LE		2	4	34	19S	32E	617502	3609301	575		
CP 00563		LE	1	1	2	19	19S	32E	612118	3613376*	300		
CP 00639		LE		3	1	20	19S	32E	613029	3612880*	350	345	5
CP 00640		LE		2	2	19	19S	32E	612621	3613280*	260	102	158
CP 00812		LE		4	4	01	19S	32E	620623	3616973*	200		

Average Depth to Water: **223 feet**

Minimum Depth: **102 feet**

Maximum Depth: **345 feet**

Record Count: 6

PLSS Search:

Township: 19S **Range:** 32E

***UTM location was derived from PLSS - see Help**

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

No records found.

PLSS Search:

Section(s): 6 **Township:** 19S **Range:** 32E

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #4H
Project:	Lea County, NM	**TVD Reference:**	KB @ 3678.0usft (McVay 6)
Reference Site:	Haas 6 Federal Com	**MD Reference:**	KB @ 3678.0usft (McVay 6)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to KB @ 3678.0usft (McVay 6)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: #4H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 3001
Grid Convergence at Surface is: 0.29°