

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*Lease Serial No.
NM120907

SUBMIT IN TRIPLICATE - Other instructions

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other2. Name of Operator
COG PRODUCTION LLCContact: MAYTE X REYES
E-Mail: mreyes1@concho.com8. Well Name and No.
EIDER 23 FEDERAL 702H9. API Well No.
30-025-46381-00-X13a. Address
2208 W MAIN STREET
ARTESIA, NM 882103b. Phone No. (include area code)
Ph: 575-748-694510. Field and Pool or Exploratory Area
WILDCAT

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 23 T24S R32E NWNE 435FNL 1965FEL
32.209187 N Lat, 103.643181 W Lon11. County or Parish, State
LEA COUNTY, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original A
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	PD

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

COG Operating respectfully requests approval for the following changes to the originally approved APD.

BHL CHANGE
FROM: 2590' FNL & 1650' FEL Section 26. T24S. R32E
TO: 2590' FNL & 660' FEL Section 26. T24S. T32E.

C102 Attached.
Directional plan attached.
AC attached.

All previous Conditions of Approval still apply. DR

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #485287 verified by the BLM Well Information System

For COG PRODUCTION LLC, sent to the Hobbs

Committed to AFMSS for processing by PRISCILLA PEREZ on 09/26/2019 (19PP3290SE)

Name (Printed/Typed) MAYTE X REYES

Title SENIOR REGULATORY ANALYST

Signature (Electronic Submission)

Date 09/26/2019

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By DYLAN ROSSMANGO

Title PETROLEUM ENGINEER

Date 10/03/2019

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office Hobbs

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED **



PHOENIX
TECHNOLOGY SERVICES

COG Operating LLC

Lea County, NM (NAD27 NME)

Eider 23 Federal

702H

OH

Plan 1 09-25-19

Anticollision Report

25 September, 2019





Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Eider 23 Federal
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 1.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 09-25-19

Local Co-ordinate Reference: Well 702H
TVD Reference: RKB @ 3597.30usft (Permitting)
MD Reference: RKB @ 3597.30usft (Permitting)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Reference	Plan 1 09-25-19				
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria				
Interpolation Method:	MD Interval 100.00usft		Error Model:	ISWWSA	
Depth Range:	Unlimited		Scan Method:	Closest Approach 3D	
Results Limited by:	Maximum center-center distance of 50,000.00 usft		Error Surface:	Pedal Curve	
Warning Levels Evaluated at:	2.00 Sigma		Casing Method:	Not applied	

Survey Tool Program	Date 9/25/2019				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	20,148.11	Plan 1 09-25-19 (OH)	MWD+HRGM	OWSG MWD + HRGM	

Summary									
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning			
Offset Well - Wellbore - Design									
Eider 23 Federal									
602H - OH - Plan 1 09-25-19	2,500.00	2,500.00	30.00	11.45	1.617	CC, ES, SF			

Offset Design Eider 23 Federal - 602H - OH - Plan 1 09-25-19														Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HRGM														Offset Well Error: 1.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)		Offset Wellbore Centre		Distance		Minimum Separation		Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)			+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation (usft)	Factor	
0.00	0.00	0.00	0.00	1.00	1.00	-90.95		-0.50	-30.00	30.00				
100.00	100.00	100.00	100.00	1.03	1.03	-90.95		-0.50	-30.00	30.00	27.97	2.04	14.724	
200.00	200.00	200.00	200.00	1.34	1.34	-90.95		-0.50	-30.00	30.00	27.53	2.47	12.143	
300.00	300.00	300.00	300.00	1.73	1.73	-90.95		-0.50	-30.00	30.00	26.92	3.08	9.734	
400.00	400.00	400.00	400.00	2.11	2.11	-90.95		-0.50	-30.00	30.00	26.27	3.73	8.040	
500.00	500.00	500.00	500.00	2.48	2.48	-90.95		-0.50	-30.00	30.00	25.60	4.40	6.816	
600.00	600.00	600.00	600.00	2.85	2.85	-90.95		-0.50	-30.00	30.00	24.92	5.08	5.901	
700.00	700.00	700.00	700.00	3.22	3.22	-90.95		-0.50	-30.00	30.00	24.23	5.78	5.184	
800.00	800.00	800.00	800.00	3.58	3.58	-90.95		-0.50	-30.00	30.00	23.53	6.47	4.635	
900.00	900.00	900.00	900.00	3.95	3.95	-90.95		-0.50	-30.00	30.00	22.83	7.17	4.182	
1,000.00	1,000.00	1,000.00	1,000.00	4.31	4.31	-90.95		-0.50	-30.00	30.00	22.13	7.88	3.809	
1,100.00	1,100.00	1,100.00	1,100.00	4.67	4.67	-90.95		-0.50	-30.00	30.00	21.42	8.58	3.496	
1,200.00	1,200.00	1,200.00	1,200.00	5.03	5.03	-90.95		-0.50	-30.00	30.00	20.71	9.29	3.229	
1,300.00	1,300.00	1,300.00	1,300.00	5.40	5.40	-90.95		-0.50	-30.00	30.00	20.00	10.00	3.000	
1,400.00	1,400.00	1,400.00	1,400.00	5.76	5.76	-90.95		-0.50	-30.00	30.00	19.29	10.71	2.802	
1,500.00	1,500.00	1,500.00	1,500.00	6.12	6.12	-90.95		-0.50	-30.00	30.00	18.58	11.42	2.627	
1,600.00	1,600.00	1,600.00	1,600.00	6.48	6.48	-90.95		-0.50	-30.00	30.00	17.87	12.13	2.473	
1,700.00	1,700.00	1,700.00	1,700.00	6.84	6.84	-90.95		-0.50	-30.00	30.00	17.16	12.84	2.338	
1,800.00	1,800.00	1,800.00	1,800.00	7.20	7.20	-90.95		-0.50	-30.00	30.00	16.45	13.56	2.213	
1,900.00	1,900.00	1,900.00	1,900.00	7.56	7.56	-90.95		-0.50	-30.00	30.00	15.73	14.27	2.103	
2,000.00	2,000.00	2,000.00	2,000.00	7.92	7.92	-90.95		-0.50	-30.00	30.00	15.02	14.98	2.002	
2,100.00	2,100.00	2,100.00	2,100.00	8.28	8.28	-90.95		-0.50	-30.00	30.00	14.31	15.70	1.911	
2,200.00	2,200.00	2,200.00	2,200.00	8.64	8.64	-90.95		-0.50	-30.00	30.00	13.59	16.41	1.828	
2,300.00	2,300.00	2,300.00	2,300.00	9.00	9.00	-90.95		-0.50	-30.00	30.00	12.88	17.13	1.752	
2,400.00	2,400.00	2,400.00	2,400.00	9.36	9.36	-90.95		-0.50	-30.00	30.00	12.16	17.84	1.682	
2,500.00	2,500.00	2,500.00	2,500.00	9.72	9.72	-90.95		-0.50	-30.00	30.00	11.45	18.56	1.617	CC, ES, SF

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Eider 23 Federal
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 1.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 09-25-19

Local Co-ordinate Reference: Well 702H
TVD Reference: RKB @ 3597.30usft (Permitting)
MD Reference: RKB @ 3597.30usft (Permitting)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Eider 23 Federal - 602H - OH - Plan 1 09-25-19													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HRGM													Offset Well Error: 1.00 usft
Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance				Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
2,600.00	2,599.98	2,600.01	2,599.99	10.12	10.15	-161.81	1.24	-29.94	31.62	12.33	19.29	1.639	
2,700.00	2,699.84	2,699.77	2,699.81	10.62	10.70	-155.98	6.46	-29.78	36.72	16.68	20.06	1.831	
2,800.00	2,799.45	2,799.05	2,798.50	11.13	11.25	-149.49	15.09	-29.50	45.73	24.98	20.76	2.203	
2,900.00	2,898.70	2,898.16	2,897.08	11.65	11.66	-145.36	25.44	-29.17	58.46	36.83	21.52	2.716	
3,000.07	2,897.54	2,896.99	2,895.36	12.16	12.00	-144.29	35.75	-28.84	74.15	51.77	22.38	3.314	
3,100.00	3,095.95	3,095.44	3,093.28	12.54	12.33	-144.36	46.03	-28.51	91.23	68.09	23.14	3.942	
3,200.00	3,194.43	3,193.97	3,191.27	12.85	12.87	-144.41	56.32	-28.18	108.32	84.48	23.84	4.543	
3,300.00	3,292.91	3,292.50	3,289.26	13.17	13.01	-144.45	66.61	-27.86	125.41	100.88	24.55	5.109	
3,400.00	3,391.39	3,391.03	3,387.25	13.49	13.35	-144.47	76.90	-27.53	142.50	117.25	25.25	5.643	
3,500.00	3,489.87	3,489.56	3,485.24	13.81	13.70	-144.49	87.19	-27.20	159.59	133.83	25.96	6.147	
3,600.00	3,588.35	3,588.09	3,583.23	14.13	14.04	-144.51	97.47	-26.87	176.68	150.01	26.68	6.623	
3,700.00	3,686.83	3,686.61	3,681.22	14.46	14.39	-144.52	107.76	-26.54	193.77	166.38	27.39	7.074	
3,800.00	3,785.31	3,785.14	3,779.20	14.79	14.73	-144.54	118.05	-26.21	210.87	182.75	28.11	7.501	
3,900.00	3,883.79	3,883.67	3,877.19	15.12	15.08	-144.54	128.34	-25.88	227.96	199.12	28.83	7.906	
4,000.00	3,982.27	3,982.20	3,975.18	15.46	15.43	-144.55	138.62	-25.55	245.05	215.49	29.55	8.291	
4,100.00	4,080.75	4,080.73	4,073.17	15.80	15.78	-144.56	148.91	-25.22	262.14	231.86	30.28	8.657	
4,200.00	4,179.23	4,179.26	4,171.16	16.13	16.13	-144.57	159.20	-24.90	279.23	248.22	31.01	9.006	
4,300.00	4,277.71	4,277.79	4,269.15	16.46	16.48	-144.57	169.49	-24.57	296.32	264.59	31.73	9.337	
4,400.00	4,376.19	4,376.32	4,367.14	16.82	16.83	-144.58	179.78	-24.24	313.41	280.95	32.47	9.654	
4,500.00	4,474.67	4,474.84	4,465.13	17.16	17.18	-144.58	190.06	-23.91	330.50	297.31	33.20	9.956	
4,600.00	4,573.15	4,573.37	4,563.12	17.51	17.53	-144.59	200.35	-23.58	347.60	313.67	33.93	10.244	
4,700.00	4,671.63	4,671.90	4,661.11	17.86	17.89	-144.59	210.64	-23.25	364.69	330.02	34.68	10.520	
4,800.00	4,770.11	4,770.43	4,759.10	18.21	18.24	-144.59	220.93	-22.92	381.78	346.38	35.40	10.785	
4,900.00	4,868.59	4,868.96	4,857.09	18.57	18.60	-144.60	231.21	-22.59	398.87	362.73	36.14	11.037	
5,000.00	4,967.07	4,967.49	4,955.08	18.93	18.95	-144.60	241.50	-22.27	415.96	379.08	36.88	11.280	
5,100.00	5,065.55	5,066.02	5,053.07	19.29	19.31	-144.60	251.79	-21.94	433.05	395.44	37.62	11.513	
5,200.00	5,164.03	5,164.54	5,151.06	19.67	19.68	-144.60	262.08	-21.61	450.14	411.79	38.36	11.736	
5,300.00	5,262.51	5,263.07	5,249.05	20.05	20.02	-144.61	272.37	-21.28	467.23	428.14	39.10	11.951	
5,400.00	5,360.99	5,361.60	5,347.04	20.44	20.38	-144.61	282.65	-20.95	484.32	444.49	39.84	12.157	
5,500.00	5,459.47	5,460.13	5,445.03	20.83	20.74	-144.61	292.94	-20.62	501.42	460.83	40.58	12.355	
5,600.00	5,557.95	5,558.66	5,543.02	21.23	21.10	-144.61	303.23	-20.29	518.51	477.18	41.33	12.547	
5,700.00	5,656.43	5,657.19	5,641.01	21.64	21.46	-144.61	313.52	-19.96	535.60	493.53	42.07	12.731	
5,800.00	5,754.91	5,755.72	5,739.00	22.05	21.81	-144.62	323.80	-19.63	552.69	509.87	42.82	12.908	
5,900.00	5,853.40	5,854.24	5,836.98	22.46	22.17	-144.62	334.09	-19.31	569.78	526.22	43.56	13.079	
6,000.00	5,951.88	5,952.77	5,934.97	22.87	22.54	-144.62	344.38	-18.98	586.87	542.56	44.31	13.245	
6,100.00	6,050.36	6,051.30	6,032.96	23.28	22.90	-144.62	354.67	-18.65	603.96	558.91	45.06	13.404	
6,200.00	6,148.84	6,149.83	6,130.95	23.70	23.26	-144.62	364.96	-18.32	621.05	575.25	45.81	13.559	
6,300.00	6,247.32	6,252.18	6,232.81	24.11	23.83	-144.68	374.97	-18.00	637.97	591.39	46.58	13.697	
6,400.00	6,345.80	6,357.26	6,337.67	24.53	24.06	-145.04	384.74	-17.78	653.99	608.63	47.36	13.809	
6,500.00	6,444.28	6,462.27	6,442.62	24.94	24.50	-145.70	384.67	-17.69	669.08	620.95	48.13	13.902	
6,600.00	6,542.76	6,562.40	6,542.76	25.36	24.88	-146.52	384.80	-17.68	683.60	634.73	48.86	13.991	
6,700.00	6,641.24	6,660.88	6,641.24	25.78	25.20	-147.30	384.80	-17.68	698.21	648.83	49.58	14.081	
6,800.00	6,739.72	6,759.36	6,739.72	26.20	25.54	-148.06	384.80	-17.68	712.95	662.65	50.31	14.172	
6,900.00	6,838.20	6,857.84	6,838.20	26.62	25.88	-148.78	384.80	-17.68	727.81	676.78	51.03	14.262	
7,000.00	6,936.68	6,956.32	6,936.68	27.04	26.23	-149.47	384.80	-17.68	742.78	691.02	51.75	14.353	
7,100.00	7,035.16	7,054.80	7,035.16	27.46	26.57	-150.13	384.80	-17.68	757.84	705.37	52.47	14.442	
7,200.00	7,133.64	7,153.28	7,133.64	27.88	26.82	-150.77	384.80	-17.68	773.01	719.81	53.19	14.532	
7,300.00	7,232.12	7,251.76	7,232.12	28.30	27.26	-151.39	384.80	-17.68	788.26	734.35	53.92	14.620	
7,400.00	7,330.60	7,350.24	7,330.60	28.72	27.81	-151.98	384.80	-17.68	803.60	748.97	54.64	14.708	
7,500.00	7,429.08	7,448.72	7,429.08	29.14	27.95	-152.55	384.80	-17.68	819.03	763.67	55.36	14.796	
7,600.00	7,527.56	7,547.20	7,527.56	29.56	28.30	-153.09	384.80	-17.68	834.52	778.45	56.08	14.882	
7,700.00	7,626.04	7,645.68	7,626.04	29.98	28.64	-153.62	384.80	-17.68	850.10	793.30	56.80	14.968	

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Eider 23 Federal
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 1.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 09-25-19

Local Co-ordinate Reference: Well 702H
TVD Reference: RKB @ 3597.30usft (Permitting)
MD Reference: RKB @ 3597.30usft (Permitting)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Eider 23 Federal - 602H - OH - Plan 1 09-25-19													Offset Site Error: 0.00 usft
Survey Program: 0-MWD-HRGM													Offset Well Error: 1.00 usft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,800.00	7,724.52	7,744.16	7,724.52	30.41	28.99	-154.13	384.80	-17.68	885.73	808.22	57.52	15.052	
7,900.00	7,823.00	7,842.65	7,823.00	30.83	29.33	-154.62	384.80	-17.68	881.44	823.20	58.23	15.136	
8,000.00	7,921.48	7,941.13	7,921.48	31.25	29.68	-155.10	384.80	-17.68	897.20	838.25	58.95	15.219	
8,100.00	8,019.96	8,039.61	8,019.96	31.67	30.02	-155.55	384.80	-17.68	913.03	853.35	59.67	15.301	
8,200.00	8,118.44	8,138.09	8,118.44	32.10	30.37	-156.00	384.80	-17.68	928.91	868.51	60.39	15.381	
8,300.00	8,216.92	8,236.57	8,216.92	32.52	30.72	-156.42	384.80	-17.68	944.84	883.72	61.11	15.461	
8,400.00	8,315.40	8,335.05	8,315.40	32.94	31.08	-156.84	384.80	-17.68	960.82	898.99	61.83	15.540	
8,500.00	8,413.88	8,433.53	8,413.88	33.37	31.41	-157.24	384.80	-17.68	976.84	914.30	62.55	15.617	
8,600.00	8,512.36	8,532.01	8,512.36	33.79	31.76	-157.62	384.80	-17.68	992.82	929.65	63.27	15.694	
8,700.00	8,610.84	8,630.49	8,610.84	34.22	32.10	-158.00	384.80	-17.68	1,009.03	945.05	63.99	15.769	
8,800.00	8,709.33	8,728.97	8,709.33	34.64	32.45	-158.36	384.80	-17.68	1,025.19	960.48	64.71	15.844	
8,900.00	8,807.81	8,827.45	8,807.81	35.06	32.80	-158.71	384.80	-17.68	1,041.39	975.96	65.42	15.917	
9,000.00	8,906.29	8,925.93	8,906.29	35.49	33.14	-159.05	384.80	-17.68	1,057.62	991.47	66.14	15.990	
9,100.00	9,004.77	9,024.41	9,004.77	35.91	33.49	-159.38	384.80	-17.68	1,073.89	1,007.02	66.86	16.061	
9,200.00	9,103.25	9,122.89	9,103.25	36.34	33.84	-159.70	384.80	-17.68	1,090.19	1,022.61	67.58	16.131	
9,300.00	9,201.73	9,221.37	9,201.73	36.76	34.19	-160.02	384.80	-17.68	1,106.52	1,038.22	68.30	16.200	
9,400.00	9,300.21	9,319.85	9,300.21	37.19	34.53	-160.32	384.80	-17.68	1,122.89	1,053.87	69.02	16.269	
9,500.00	9,398.69	9,418.33	9,398.69	37.61	34.88	-160.61	384.80	-17.68	1,139.29	1,069.54	69.74	16.336	
9,600.00	9,497.17	9,516.81	9,497.17	38.04	35.23	-160.90	384.80	-17.68	1,155.71	1,085.25	70.46	16.402	
9,700.00	9,595.65	9,615.29	9,595.65	38.46	35.58	-161.18	384.80	-17.68	1,172.16	1,100.98	71.18	16.467	
9,800.00	9,694.13	9,713.77	9,694.13	38.89	35.93	-161.44	384.80	-17.68	1,188.64	1,116.74	71.90	16.532	
9,900.00	9,792.61	9,812.25	9,792.61	39.31	36.28	-161.71	384.80	-17.68	1,205.14	1,132.52	72.62	16.595	
10,000.00	9,891.09	9,910.73	9,891.09	39.74	36.62	-161.96	384.80	-17.68	1,221.67	1,148.32	73.34	16.658	
10,100.00	9,989.57	10,009.21	9,989.57	40.17	36.97	-162.21	384.80	-17.68	1,238.21	1,164.15	74.06	16.719	
10,200.00	10,088.05	10,107.69	10,088.05	40.59	37.32	-162.45	384.80	-17.68	1,254.79	1,180.00	74.78	16.780	
10,300.00	10,186.53	10,206.17	10,186.53	41.02	37.67	-162.69	384.80	-17.68	1,271.38	1,195.88	75.50	16.839	
10,400.00	10,285.11	10,304.75	10,285.11	41.44	38.02	-162.96	384.80	-17.68	1,287.43	1,211.21	76.22	16.891	
10,500.00	10,384.17	10,403.82	10,384.17	41.84	38.37	-163.22	384.80	-17.68	1,300.48	1,223.50	76.97	16.895	
10,600.00	10,483.65	10,503.29	10,483.65	42.22	38.72	-163.40	384.80	-17.68	1,310.22	1,232.46	77.75	16.851	
10,700.00	10,583.42	10,603.06	10,583.42	42.58	39.07	-163.52	384.80	-17.68	1,316.62	1,238.10	78.52	16.787	
10,800.00	10,683.36	10,703.01	10,683.36	42.92	39.43	-163.58	384.80	-17.68	1,319.69	1,240.40	79.29	16.645	
10,900.00	10,783.36	10,803.01	10,783.36	43.24	39.78	-90.63	384.80	-17.68	1,319.98	1,240.01	79.97	16.505	
11,000.00	10,883.36	10,903.01	10,883.36	43.55	40.14	-90.63	384.80	-17.68	1,319.98	1,239.33	80.66	16.366	
11,100.00	10,983.36	11,003.01	10,983.36	43.86	40.49	-90.63	384.80	-17.68	1,319.98	1,238.64	81.34	16.228	
11,200.00	11,083.36	11,103.01	11,083.36	44.18	40.85	-90.63	384.80	-17.68	1,319.98	1,237.96	82.03	16.092	
11,300.00	11,183.36	11,203.01	11,183.36	44.50	41.20	-90.63	384.80	-17.68	1,319.98	1,237.27	82.71	15.959	
11,400.00	11,283.36	11,303.01	11,283.36	44.81	41.56	-90.63	384.80	-17.68	1,319.98	1,236.58	83.40	15.827	
11,500.00	11,383.36	11,403.01	11,383.36	45.13	41.91	-90.63	384.80	-17.68	1,319.98	1,235.90	84.09	15.698	
11,600.00	11,483.36	11,503.01	11,483.36	45.45	42.27	-90.63	384.80	-17.68	1,319.98	1,235.21	84.77	15.571	
11,700.00	11,583.36	11,603.01	11,583.36	45.77	42.62	-90.63	384.80	-17.68	1,319.98	1,234.52	85.46	15.445	
11,800.00	11,683.36	11,703.01	11,683.36	46.09	42.98	-90.63	384.80	-17.68	1,319.98	1,233.83	86.15	15.322	
11,803.45	11,686.81	11,706.45	11,686.81	46.10	42.99	-90.63	384.80	-17.68	1,319.98	1,233.81	86.17	15.318	
11,800.00	11,783.36	11,801.96	11,783.36	46.40	43.32	-90.75	382.13	-17.67	1,320.00	1,233.20	86.80	15.207	
12,000.00	11,883.36	11,897.03	11,875.67	46.73	43.71	88.76	385.18	-17.60	1,320.28	1,232.89	87.39	15.108	
12,100.00	11,982.85	11,987.18	11,960.54	47.11	44.05	87.70	335.06	-17.47	1,321.09	1,233.21	87.88	15.034	
12,200.00	12,079.31	12,074.35	12,037.13	47.50	44.35	86.70	293.63	-17.30	1,322.25	1,233.97	88.28	14.978	
12,300.00	12,169.80	12,159.08	12,104.74	47.84	44.59	85.81	242.68	-17.08	1,323.64	1,235.04	88.80	14.940	
12,400.00	12,251.58	12,241.86	12,162.83	48.10	44.79	85.02	183.82	-16.83	1,325.10	1,236.25	88.85	14.914	
12,500.00	12,322.16	12,323.10	12,211.03	48.28	44.93	84.36	118.50	-16.56	1,326.49	1,237.44	89.05	14.896	
12,600.00	12,379.40	12,400.00	12,247.71	48.40	45.03	83.86	50.98	-16.27	1,327.69	1,238.49	89.20	14.885	
12,700.00	12,421.56	12,482.48	12,276.63	48.45	45.11	83.48	-26.18	-15.95	1,328.57	1,239.20	89.37	14.866	
12,800.00	12,447.35	12,561.28	12,293.64	48.47	45.16	83.29	-103.05	-15.62	1,329.07	1,239.54	89.53	14.844	

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Eider 23 Federal
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 1.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 09-25-19

Local Co-ordinate Reference: Well 702H
TVD Reference: RKB @ 3597.30usft (Permitting)
MD Reference: RKB @ 3597.30usft (Permitting)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Eider 23 Federal - 602H - OH - Plan 1 09-25-19											Offset Site Error: 0.00 usft		
Survey Program: 0-MWD+HRGM											Offset Well Error: 1.00 usft		
Reference		Offset		Semi Major Axis			Distance				Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)		Minimum Separation (usft)	Separation Factor
12,900.00	12,456.00	12,639.85	12,299.96	48.50	45.20	83.26	-181.32	-15.29	1,329.14	1,239.43	89.72	14.815	
12,941.81	12,455.96	12,679.63	12,299.96	48.51	45.22	83.26	-221.09	-15.12	1,329.14	1,239.31	89.83	14.797	
13,000.00	12,455.81	12,737.81	12,299.90	48.55	45.26	83.26	-279.28	-14.88	1,329.13	1,239.12	90.00	14.768	
13,100.00	12,455.61	12,837.81	12,299.79	48.65	45.35	83.27	-379.28	-14.45	1,329.12	1,238.74	90.37	14.707	
13,200.00	12,455.42	12,937.81	12,299.68	48.80	45.47	83.27	-479.28	-14.03	1,329.11	1,238.27	90.84	14.632	
13,300.00	12,455.23	13,037.81	12,299.57	48.99	45.65	83.27	-579.28	-13.61	1,329.10	1,237.71	91.39	14.544	
13,400.00	12,455.03	13,137.81	12,299.46	49.24	45.80	83.28	-679.28	-13.18	1,329.09	1,237.06	92.02	14.443	
13,500.00	12,454.84	13,237.81	12,299.35	49.54	46.20	83.28	-779.28	-12.76	1,329.08	1,236.34	92.74	14.331	
13,600.00	12,454.65	13,337.81	12,299.24	49.89	46.56	83.28	-879.27	-12.34	1,329.07	1,235.52	93.54	14.208	
13,700.00	12,454.46	13,437.81	12,299.13	50.29	46.88	83.29	-979.27	-11.91	1,329.06	1,234.83	94.42	14.075	
13,800.00	12,454.26	13,537.81	12,299.02	50.73	47.45	83.29	-1,079.27	-11.49	1,329.05	1,233.87	95.38	13.934	
13,900.00	12,454.07	13,637.81	12,288.91	51.21	47.96	83.30	-1,179.27	-11.07	1,329.04	1,232.82	96.42	13.784	
14,000.00	12,453.88	13,737.81	12,288.80	51.74	48.51	83.30	-1,279.27	-10.65	1,329.03	1,231.51	97.52	13.628	
14,100.00	12,453.68	13,837.81	12,288.69	52.30	49.11	83.30	-1,379.27	-10.22	1,329.02	1,230.32	98.70	13.465	
14,200.00	12,453.49	13,937.81	12,288.58	52.90	49.74	83.31	-1,479.27	-9.80	1,329.01	1,229.07	99.94	13.288	
14,300.00	12,453.30	14,037.81	12,288.47	53.52	50.40	83.31	-1,579.27	-9.38	1,329.00	1,227.75	101.25	13.125	
14,400.00	12,453.10	14,137.81	12,288.35	54.19	51.10	83.31	-1,679.27	-8.95	1,328.99	1,226.38	102.63	12.950	
14,500.00	12,452.91	14,237.81	12,288.24	54.88	51.83	83.32	-1,779.27	-8.53	1,328.98	1,224.92	104.06	12.771	
14,600.00	12,452.72	14,337.81	12,288.13	55.60	52.59	83.32	-1,879.26	-8.11	1,328.97	1,223.42	105.55	12.591	
14,700.00	12,452.52	14,437.81	12,288.02	56.35	53.37	83.32	-1,979.26	-7.68	1,328.96	1,221.88	107.10	12.409	
14,800.00	12,452.33	14,537.81	12,287.91	57.13	54.19	83.33	-2,079.26	-7.26	1,328.95	1,220.25	108.70	12.226	
14,900.00	12,452.14	14,637.81	12,287.80	57.93	55.03	83.33	-2,179.26	-6.84	1,328.94	1,218.59	110.35	12.043	
15,000.00	12,451.94	14,737.81	12,287.69	58.75	55.89	83.33	-2,279.26	-6.41	1,328.93	1,216.88	112.05	11.860	
15,100.00	12,451.75	14,837.81	12,287.58	59.60	56.78	83.34	-2,379.26	-5.99	1,328.92	1,215.12	113.80	11.678	
15,200.00	12,451.56	14,937.81	12,287.47	60.48	57.69	83.34	-2,479.26	-5.57	1,328.91	1,213.32	115.59	11.497	
15,300.00	12,451.36	15,037.81	12,287.36	61.37	58.63	83.35	-2,579.26	-5.15	1,328.90	1,211.48	117.42	11.317	
15,400.00	12,451.17	15,137.81	12,287.25	62.28	59.58	83.35	-2,679.26	-4.72	1,328.89	1,209.60	119.29	11.140	
15,500.00	12,450.98	15,237.81	12,287.14	63.21	60.55	83.35	-2,779.26	-4.30	1,328.88	1,207.68	121.21	10.964	
15,600.00	12,450.79	15,337.81	12,287.03	64.17	61.54	83.36	-2,879.25	-3.88	1,328.87	1,205.72	123.15	10.790	
15,700.00	12,450.59	15,437.81	12,286.92	65.13	62.55	83.36	-2,979.25	-3.45	1,328.86	1,203.73	125.14	10.619	
15,800.00	12,450.40	15,537.81	12,286.81	66.12	63.57	83.36	-3,079.25	-3.03	1,328.86	1,201.70	127.18	10.451	
15,900.00	12,450.21	15,637.81	12,286.70	67.12	64.61	83.37	-3,179.25	-2.61	1,328.85	1,199.64	129.20	10.285	
16,000.00	12,450.01	15,737.81	12,286.59	68.14	65.67	83.37	-3,279.25	-2.18	1,328.84	1,197.55	131.28	10.122	
16,100.00	12,449.82	15,837.81	12,286.48	69.17	66.73	83.37	-3,379.25	-1.76	1,328.83	1,195.44	133.39	9.962	
16,200.00	12,449.63	15,937.81	12,286.37	70.22	67.82	83.38	-3,479.25	-1.34	1,328.82	1,193.29	135.53	9.805	
16,300.00	12,449.43	16,037.81	12,286.26	71.28	68.91	83.38	-3,579.25	-0.92	1,328.81	1,191.12	137.69	9.651	
16,400.00	12,449.24	16,137.81	12,286.15	72.35	70.02	83.38	-3,679.25	-0.49	1,328.80	1,188.92	139.88	9.500	
16,500.00	12,449.05	16,237.81	12,286.04	73.44	71.14	83.39	-3,779.25	-0.07	1,328.79	1,186.70	142.09	9.352	
16,600.00	12,448.85	16,337.81	12,285.93	74.53	72.27	83.39	-3,879.24	0.35	1,328.78	1,184.46	144.32	9.207	
16,700.00	12,448.66	16,437.81	12,285.82	75.64	73.41	83.39	-3,979.24	0.78	1,328.77	1,182.19	146.57	9.065	
16,800.00	12,448.47	16,537.81	12,285.71	76.76	74.56	83.40	-4,079.24	1.20	1,328.76	1,179.91	148.85	8.927	
16,900.00	12,448.27	16,637.81	12,285.60	77.89	75.73	83.40	-4,179.24	1.62	1,328.75	1,177.60	151.15	8.791	
17,000.00	12,448.08	16,737.81	12,285.48	79.03	76.90	83.41	-4,279.24	2.05	1,328.74	1,175.28	153.46	8.658	
17,100.00	12,447.89	16,837.81	12,285.37	80.18	78.08	83.41	-4,379.24	2.47	1,328.73	1,172.94	155.79	8.529	
17,200.00	12,447.69	16,937.81	12,285.26	81.34	79.26	83.41	-4,479.24	2.89	1,328.72	1,170.58	158.14	8.402	
17,300.00	12,447.50	17,037.81	12,285.15	82.50	80.46	83.42	-4,579.24	3.31	1,328.71	1,168.20	160.51	8.278	
17,400.00	12,447.31	17,137.81	12,285.04	83.68	81.66	83.42	-4,679.24	3.74	1,328.70	1,165.81	162.89	8.157	
17,500.00	12,447.12	17,237.81	12,284.93	84.86	82.88	83.42	-4,779.24	4.16	1,328.69	1,163.40	165.29	8.038	
17,600.00	12,446.92	17,337.81	12,284.82	86.05	84.09	83.43	-4,879.24	4.58	1,328.68	1,160.98	167.70	7.923	
17,700.00	12,446.73	17,437.81	12,284.71	87.25	85.32	83.43	-4,979.23	5.01	1,328.67	1,158.54	170.13	7.810	
17,800.00	12,446.54	17,537.81	12,284.60	88.46	86.55	83.43	-5,079.23	5.43	1,328.66	1,156.09	172.57	7.699	
17,900.00	12,446.34	17,637.81	12,284.49	89.67	87.79	83.44	-5,179.23	5.85	1,328.65	1,153.63	175.02	7.591	

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Eider 23 Federal
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 1.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 09-25-19

Local Co-ordinate Reference: Well 702H
TVD Reference: RKB @ 3597.30usft (Permitting)
MD Reference: RKB @ 3597.30usft (Permitting)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Eider 23 Federal - 602H - OH - Plan 1 09-25-19											Offset Site Error: 0.00 usft		
Survey Program: 0-MWD+HRGM											Offset Well Error: 1.00 usft		
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Tooface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
18,000.00	12,446.15	17,737.81	12,294.38	90.89	89.03	83.44	-5,279.23	6.28	1,328.65	1,151.16	177.49	7.486	
18,100.00	12,445.96	17,837.81	12,294.27	92.11	90.28	83.44	-5,379.23	6.70	1,328.64	1,148.67	179.96	7.383	
18,200.00	12,445.76	17,937.81	12,294.16	93.34	91.54	83.45	-5,479.23	7.12	1,328.63	1,146.18	182.45	7.282	
18,300.00	12,445.57	18,037.81	12,294.05	94.58	92.80	83.45	-5,579.23	7.55	1,328.62	1,143.67	184.95	7.184	
18,400.00	12,445.38	18,137.81	12,293.94	95.82	94.06	83.46	-5,679.23	7.97	1,328.61	1,141.15	187.46	7.088	
18,500.00	12,445.18	18,237.81	12,293.83	97.07	95.33	83.46	-5,779.23	8.39	1,328.60	1,138.62	189.98	6.994	
18,600.00	12,444.99	18,337.81	12,293.72	98.32	96.61	83.46	-5,879.23	8.81	1,328.59	1,136.08	192.50	6.902	
18,700.00	12,444.80	18,437.81	12,293.61	99.58	97.89	83.47	-5,979.22	9.24	1,328.58	1,133.54	195.04	6.812	
18,800.00	12,444.60	18,537.81	12,293.50	100.84	99.17	83.47	-6,079.22	9.66	1,328.57	1,130.98	197.59	6.724	
18,900.00	12,444.41	18,637.81	12,293.39	102.11	100.46	83.47	-6,179.22	10.08	1,328.56	1,128.42	200.14	6.638	
19,000.00	12,444.22	18,737.81	12,293.28	103.38	101.75	83.48	-6,279.22	10.51	1,328.55	1,125.85	202.70	6.554	
19,100.00	12,444.02	18,837.81	12,293.17	104.65	103.05	83.48	-6,379.22	10.93	1,328.54	1,123.27	205.28	6.472	
19,200.00	12,443.83	18,937.81	12,293.06	105.93	104.35	83.48	-6,479.22	11.35	1,328.53	1,120.68	207.85	6.392	
19,300.00	12,443.64	19,037.81	12,292.95	107.22	105.65	83.49	-6,579.22	11.78	1,328.52	1,118.08	210.44	6.313	
19,400.00	12,443.45	19,137.81	12,292.84	108.50	106.96	83.49	-6,679.22	12.20	1,328.51	1,115.48	213.03	6.236	
19,500.00	12,443.25	19,237.81	12,292.73	109.79	108.26	83.49	-6,779.22	12.62	1,328.50	1,112.87	215.63	6.161	
19,600.00	12,443.06	19,337.81	12,292.61	111.09	109.58	83.50	-6,879.22	13.04	1,328.49	1,110.26	218.24	6.087	
19,700.00	12,442.87	19,437.81	12,292.50	112.39	110.89	83.50	-6,979.21	13.47	1,328.48	1,107.63	220.85	6.015	
19,800.00	12,442.67	19,537.81	12,292.39	113.69	112.21	83.50	-7,079.21	13.89	1,328.48	1,105.01	223.47	5.945	
19,900.00	12,442.48	19,637.81	12,292.28	114.99	113.53	83.51	-7,179.21	14.31	1,328.47	1,102.37	226.09	5.876	
20,000.00	12,442.29	19,737.81	12,292.17	116.30	114.86	83.51	-7,279.21	14.74	1,328.46	1,099.73	228.72	5.808	
20,100.00	12,442.09	19,837.81	12,292.06	117.61	116.18	83.52	-7,379.21	15.16	1,328.45	1,097.09	231.36	5.742	
20,148.11	12,442.00	19,885.92	12,292.01	118.24	116.82	83.52	-7,427.32	15.36	1,328.44	1,095.82	232.63	5.711	

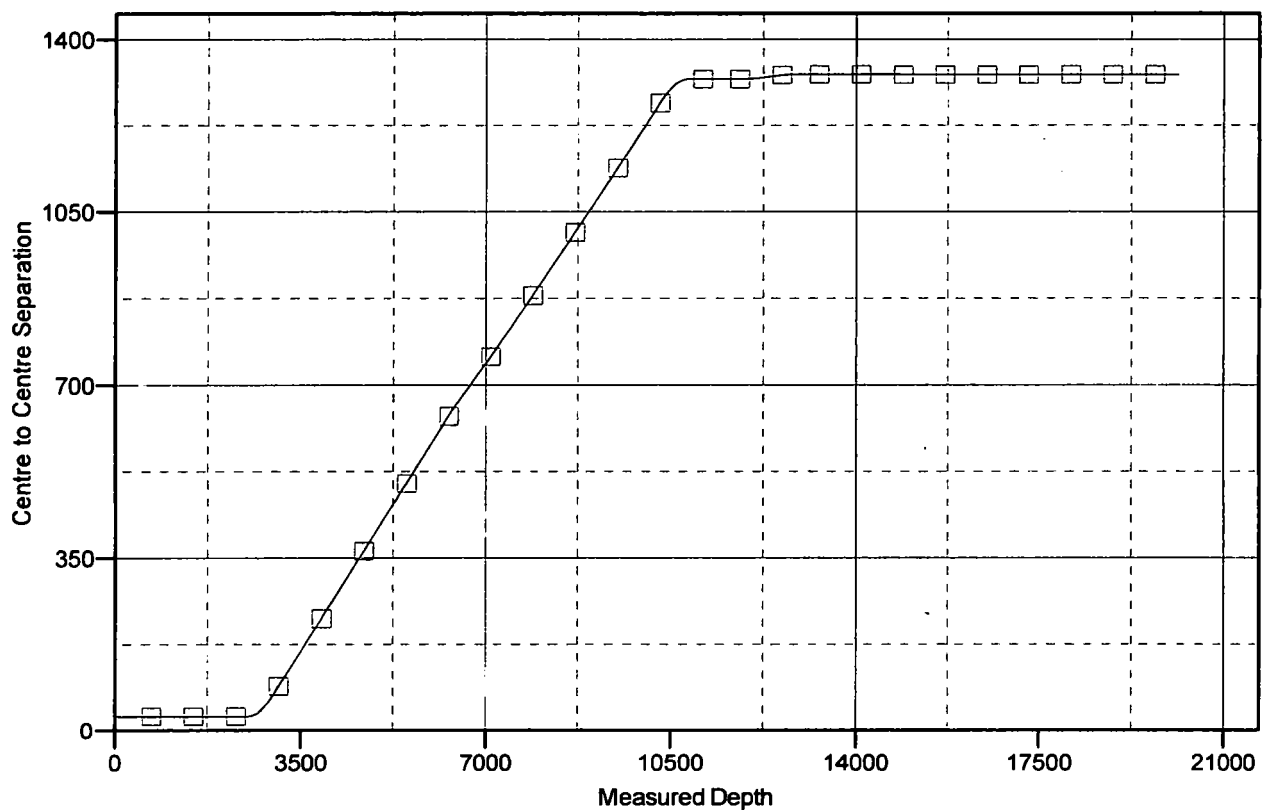
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Eider 23 Federal
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 1.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 09-25-19

Local Co-ordinate Reference: Well 702H
TVD Reference: RKB @ 3597.30usft (Permitting)
MD Reference: RKB @ 3597.30usft (Permitting)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Reference Depths are relative to RKB @ 3597.30usft (Permitting)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.000000 W

Coordinates are relative to: 702H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.37°

Ladder Plot



LEGEND

—□— 602H, OH, Plan 109-25-19 V0

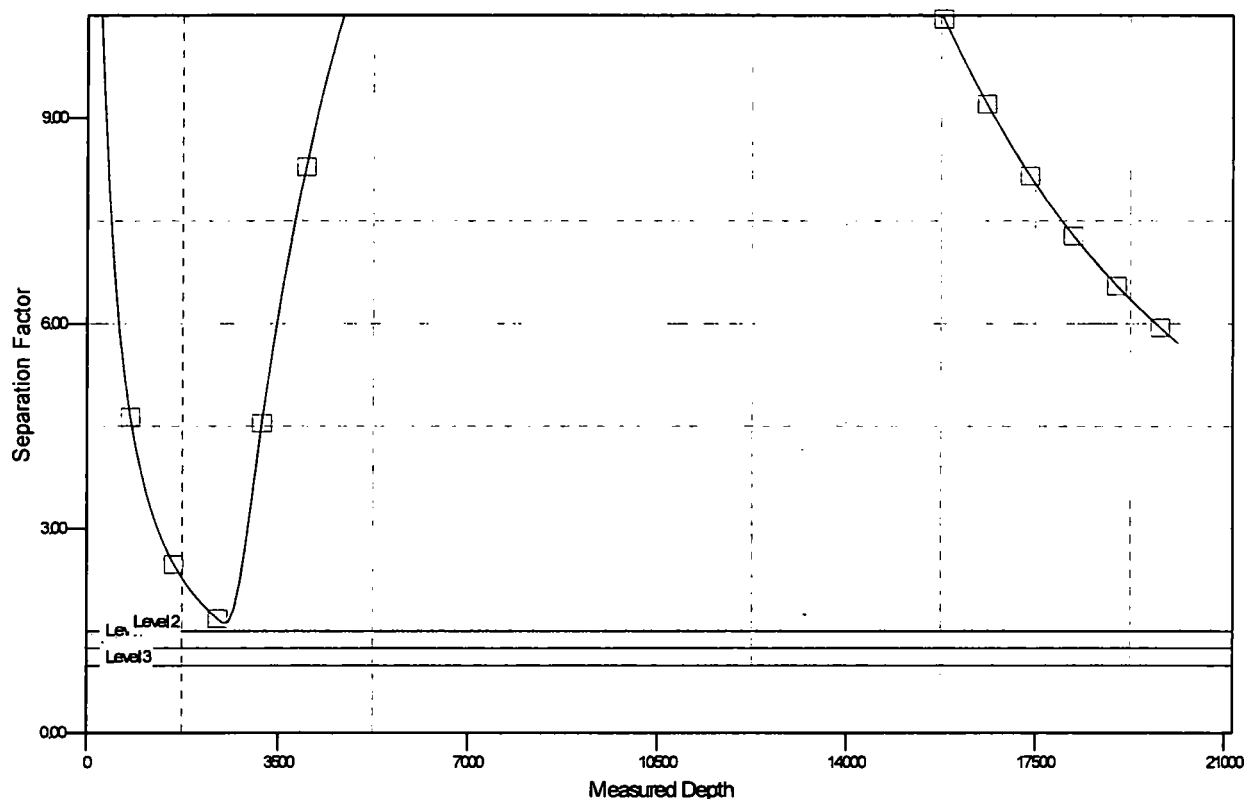
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Eider 23 Federal
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 1.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 09-25-19

Local Co-ordinate Reference: Well 702H
TVD Reference: RKB @ 3597.30usft (Permitting)
MD Reference: RKB @ 3597.30usft (Permitting)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Reference Depths are relative to RKB @ 3597.30usft (Permitting)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.000000 W

Coordinates are relative to: 702H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.37°

Separation Factor Plot



LEGEND

602H, OH, Plan 109-25-19 V0



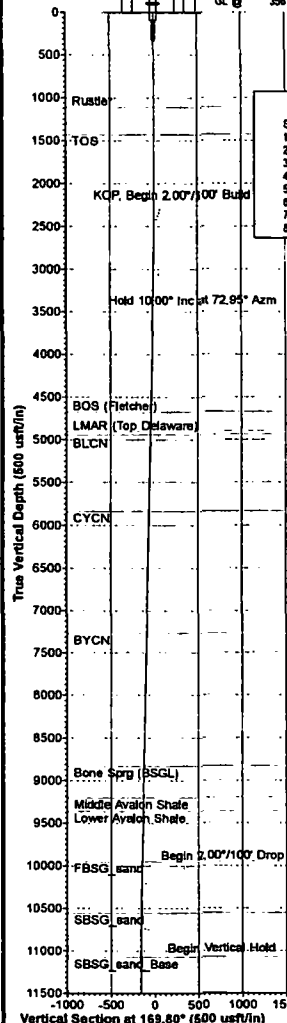
Project: Lea County, NM (NAD27 NME)
Site: Elder 23 Federal
Well: 702H
Wellbore: OH
Design: Plan 1 09-25-19
Rig: Permitting



PHOENIX
TECHNOLOGY SERVICES



Azimuths to Grid North
True North: -0.37°
Magnetic North: 6.20°
Magnetic Field
Strength: 47824.0nT
Dip Angle: 59.84°
Date: 11/24/2019
Model: MVHD



WELL DETAILS						
-NAS	-EAW	North	Ground Elevation	Latitude	Longitude	
0.00	0.00	440452.50	3567.30	32° 12' 32.623668 N	103° 38' 33.737758 W	

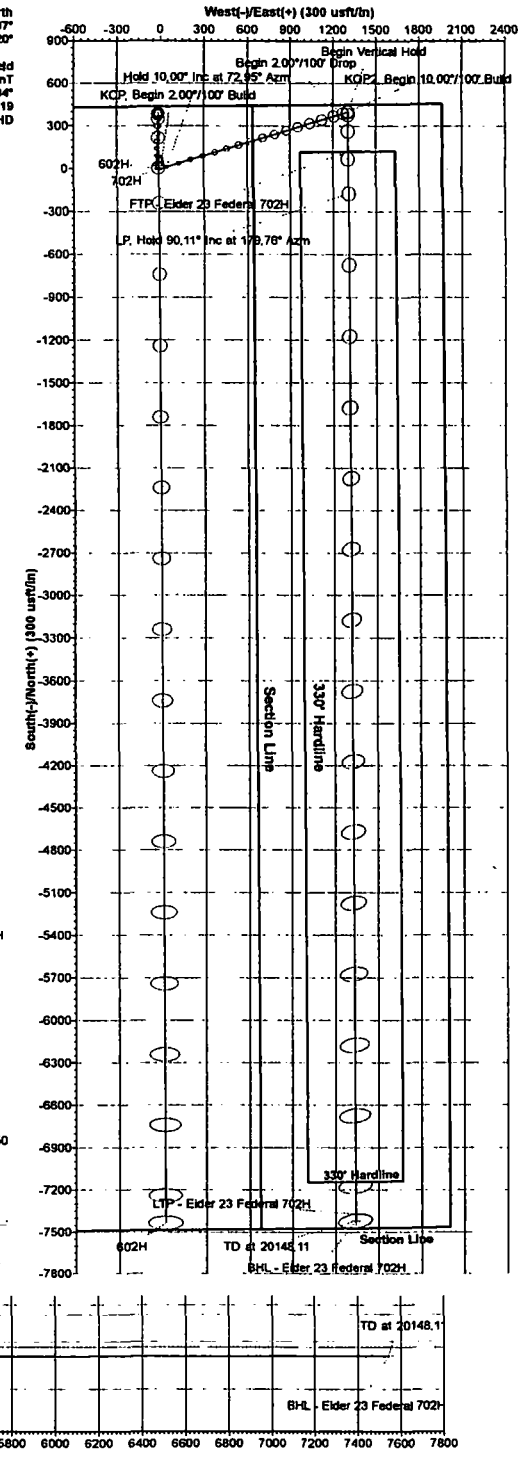
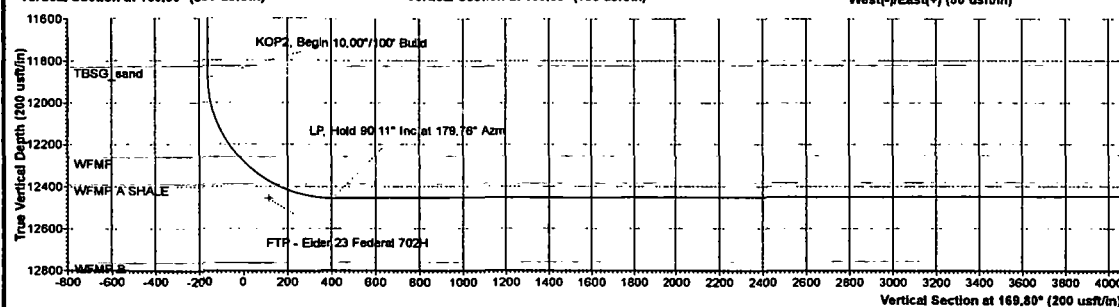
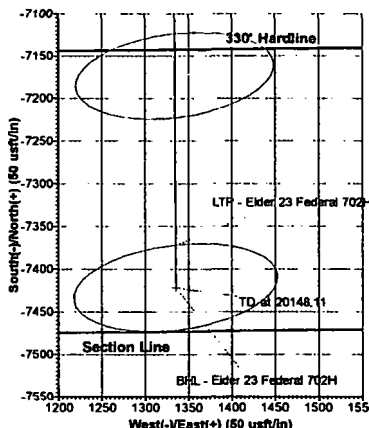
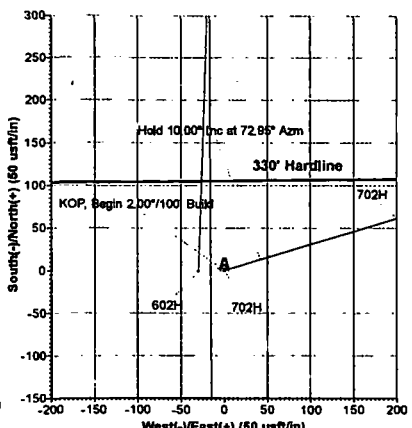
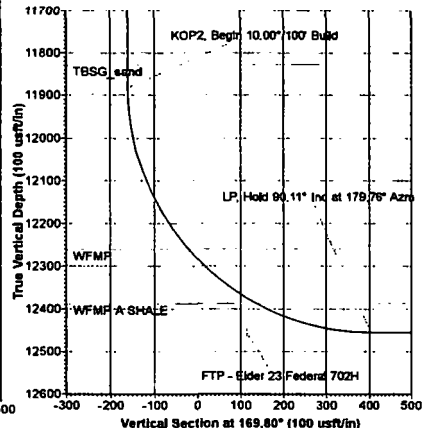
SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	-NAS	-EAW	Deg	TFace	VSSD	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP: Begin 2.00'/100' Build
2	2500.00	0.00	0.00	2500.00	0.00	0.00	0.00	0.00	0.00	0.00	Hold 10.00' Inc at 72.95° Azm
3	3000.07	10.00	72.95	2907.54	12.77	41.82	2.00	72.95	-5.19		Begin 2.00'/100' Drop
4	10341.57	10.00	72.95	10227.48	388.84	1260.59	0.00	0.00	-157.31		Begin Vertical Hold
5	10841.64	0.00	0.00	10725.00	399.40	1302.22	2.00	180.00	-162.51		KOP2: Begin 10.00'/100' Build
6	11899.88	0.00	0.00	11883.04	399.40	1302.22	0.00	0.00	-162.51		LP: Hold 90.11° Inc at 179.78° Azm
7	12900.78	80.11	179.78	12458.00	-174.66	1304.84	10.00	179.78	402.91		TD at 20148.11
8	20148.11	80.11	179.78	12442.00	-7421.90	1335.30	0.00	0.00	7541.98	BHL - Elder 23 Federal 702H	

DESIGN TARGET DETAILS											
Name	TVD	-NAS	-EAW	North	East	End	Latitude	Longitude			
LTP - Elder 23 Federal 702H	0.00	-7371.90	1335.10	433000.60	714941.30	32° 11' 19.58458 N	103° 38' 18.70319 W				
BHL - Elder 23 Federal 702H	12442.00	-7421.90	1335.30	433040.60	714941.50	32° 11' 19.09360 N	103° 38' 18.754751 W				
FTP - Elder 23 Federal 702H	12458.00	119.40	1303.40	440581.90	714909.80	32° 12' 33.722088 N	103° 38' 18.558848 W				

LEGEND
— 602H, OH, Plan 1 09-25-19 VO
— Plan 1 09-25-19

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001
Local Origin: Well 702H, Grid North
Latitude: 32° 12' 32.623668 N
Longitude: 103° 38' 33.737758 W
Grid East: 713808.20
Grid North: 440482.50
Scale Factor: 1.000
Geomagnetic Model: MVHD
Sample Date: 24-Nov-19
Magnetic Declination: 6.57°
Dip Angle from Horizontal: 59.84°
Magnetic Field Strength: 47824.0223383nT
To convert a Magnetic Direction to a Grid Direction, Add 6.21°
To convert a Magnetic Direction to a True Direction, Add 6.57° East
To convert a True Direction to a Grid Direction, Subtract 0.37°

FORMATION TOP DETAILS				
TVDPath	MDPath	Formation	DipAngle	DipDir
1111.30	1111.30	Rusler	-0.11	169.80
1430.30	1430.30	TOS	-0.11	169.80
4876.38	4704.82	BOS (Fletcher)	-0.11	169.80
4906.39	4938.38	LMAR (Top Delaware)	-0.11	169.80
4943.39	4975.95	BLCH	-0.11	169.80
5638.42	5684.90	CYCN	-0.11	169.80
7271.48	7339.97	BYCN	-0.11	169.80
8832.55	8925.12	Bone Sprg (BSGL)	-0.11	169.80
9202.56	9300.85	Middle Avaton Shale	-0.11	169.80
9363.57	9464.34	Lower Avaton Shale	-0.11	169.80
9954.59	10064.48	FBSSG sand	-0.11	169.80
10558.61	10673.15	SBSG sand	-0.11	169.80
11080.61	11187.25	SBSG sand Base	-0.11	169.80
11829.61	11948.25	TBSG sand	-0.11	169.80
12281.34	12412.88	WFMP	-0.11	169.80
12388.04	12617.78	WFMP A SHALE	-0.11	169.80





PHOENIX
TECHNOLOGY SERVICES

COG Operating LLC

Lea County, NM (NAD27 NME)

Eider 23 Federal

702H

OH

Plan: Plan 1 09-25-19

Standard Planning Report

25 September, 2019





Planning Report



Database: USA Compass
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Eider 23 Federal
Well: 702H
Wellbore: OH
Design: Plan 1 09-25-19

Local Co-ordinate Reference: Well 702H
TVD Reference: RKB @ 3597.30usft (Permitting)
MD Reference: RKB @ 3597.30usft (Permitting)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	Lea County, NM (NAD27 NME)		
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	Eider 23 Federal				
Site Position:		Northing:	440,462.00 usft	Latitude:	32° 12' 32.620628 N
From:	Map	Easting:	713,576.20 usft	Longitude:	103° 38' 34.086957 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.37 °

Well	702H					
Well Position	+N/-S	0.50 usft	Northing:	440,462.50 usft	Latitude:	32° 12' 32.623668 N
	+E/-W	30.00 usft	Easting:	713,606.20 usft	Longitude:	103° 38' 33.737758 W
Position Uncertainty	1.00 usft	Wellhead Elevation:		Ground Level:	3,567.30 usft	

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	11/24/2019	6.57	59.84	47,824.02223383

Design	Plan 1 09-25-19			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	169.80

Plan Survey Tool Program	Date 9/25/2019			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	20,148.11 Plan 1 09-25-19 (OH)	MWD+HRGM	
			OWSG MWD + HRGM	

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,000.07	10.00	72.95	2,997.54	12.77	41.62	2.00	2.00	0.00	72.95	
10,341.57	10.00	72.95	10,227.46	386.64	1,260.59	0.00	0.00	0.00	0.00	
10,841.64	0.00	0.00	10,725.00	399.40	1,302.22	2.00	-2.00	0.00	180.00	
11,999.68	0.00	0.00	11,883.04	399.40	1,302.22	0.00	0.00	0.00	0.00	
12,900.79	90.11	179.76	12,456.00	-174.66	1,304.64	10.00	10.00	19.95	179.76	
20,148.11	90.11	179.76	12,442.00	-7,421.90	1,335.30	0.00	0.00	0.00	0.00	BHL - Eider 23 Feder



Planning Report



Database: USA Compass
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Eider 23 Federal
Well: 702H
Wellbore: OH
Design: Plan 1 09-25-19

Local Co-ordinate Reference: Well 702H
TVD Reference: RKB @ 3597.30usft (Permitting)
MD Reference: RKB @ 3597.30usft (Permitting)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Bulld 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
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Begin 2.00°/100' Bulld									
2,600.00	2.00	72.95	2,599.98	0.51	1.67	-0.21	2.00	2.00	0.00
2,700.00	4.00	72.95	2,699.84	2.05	6.67	-0.83	2.00	2.00	0.00
2,800.00	6.00	72.95	2,799.45	4.60	15.00	-1.87	2.00	2.00	0.00
2,900.00	8.00	72.95	2,898.70	8.18	26.65	-3.33	2.00	2.00	0.00
3,000.00	10.00	72.95	2,997.47	12.76	41.61	-5.19	2.00	2.00	0.00
3,000.07	10.00	72.95	2,997.54	12.77	41.62	-5.19	2.00	2.00	0.00
Hold 10.00° Inc at 72.95° Azm									
3,100.00	10.00	72.95	3,095.95	17.85	58.21	-7.26	0.00	0.00	0.00
3,200.00	10.00	72.95	3,194.43	22.95	74.82	-9.34	0.00	0.00	0.00
3,300.00	10.00	72.95	3,292.91	28.04	91.42	-11.41	0.00	0.00	0.00
3,400.00	10.00	72.95	3,391.39	33.13	108.02	-13.48	0.00	0.00	0.00
3,500.00	10.00	72.95	3,489.87	38.22	124.63	-15.55	0.00	0.00	0.00
3,600.00	10.00	72.95	3,588.35	43.32	141.23	-17.62	0.00	0.00	0.00
3,700.00	10.00	72.95	3,686.83	48.41	157.84	-19.70	0.00	0.00	0.00
3,800.00	10.00	72.95	3,785.31	53.50	174.44	-21.77	0.00	0.00	0.00
3,900.00	10.00	72.95	3,883.79	58.60	191.04	-23.84	0.00	0.00	0.00
4,000.00	10.00	72.95	3,982.27	63.69	207.65	-25.91	0.00	0.00	0.00
4,100.00	10.00	72.95	4,080.75	68.78	224.25	-27.99	0.00	0.00	0.00
4,200.00	10.00	72.95	4,179.23	73.87	240.86	-30.06	0.00	0.00	0.00
4,300.00	10.00	72.95	4,277.71	78.97	257.46	-32.13	0.00	0.00	0.00
4,400.00	10.00	72.95	4,376.19	84.06	274.06	-34.20	0.00	0.00	0.00
4,500.00	10.00	72.95	4,474.67	89.15	290.67	-36.27	0.00	0.00	0.00
4,600.00	10.00	72.95	4,573.15	94.24	307.27	-38.35	0.00	0.00	0.00
4,700.00	10.00	72.95	4,671.63	99.34	323.88	-40.42	0.00	0.00	0.00
4,800.00	10.00	72.95	4,770.11	104.43	340.48	-42.49	0.00	0.00	0.00
4,900.00	10.00	72.95	4,868.59	109.52	357.08	-44.56	0.00	0.00	0.00
5,000.00	10.00	72.95	4,967.07	114.61	373.69	-46.63	0.00	0.00	0.00
5,100.00	10.00	72.95	5,065.55	119.71	390.29	-48.71	0.00	0.00	0.00
5,200.00	10.00	72.95	5,164.03	124.80	406.89	-50.78	0.00	0.00	0.00
5,300.00	10.00	72.95	5,262.51	129.89	423.50	-52.85	0.00	0.00	0.00
5,400.00	10.00	72.95	5,360.99	134.98	440.10	-54.92	0.00	0.00	0.00
5,500.00	10.00	72.95	5,459.47	140.08	456.71	-56.99	0.00	0.00	0.00
5,600.00	10.00	72.95	5,557.95	145.17	473.31	-59.07	0.00	0.00	0.00
5,700.00	10.00	72.95	5,656.43	150.26	489.91	-61.14	0.00	0.00	0.00
5,800.00	10.00	72.95	5,754.91	155.35	506.52	-63.21	0.00	0.00	0.00
5,900.00	10.00	72.95	5,853.40	160.45	523.12	-65.28	0.00	0.00	0.00
6,000.00	10.00	72.95	5,951.88	165.54	539.73	-67.35	0.00	0.00	0.00
6,100.00	10.00	72.95	6,050.36	170.63	556.33	-69.43	0.00	0.00	0.00
6,200.00	10.00	72.95	6,148.84	175.72	572.93	-71.50	0.00	0.00	0.00
6,300.00	10.00	72.95	6,247.32	180.82	589.54	-73.57	0.00	0.00	0.00
6,400.00	10.00	72.95	6,345.80	185.91	606.14	-75.64	0.00	0.00	0.00
6,500.00	10.00	72.95	6,444.28	191.00	622.75	-77.71	0.00	0.00	0.00
6,600.00	10.00	72.95	6,542.76	196.10	639.35	-79.79	0.00	0.00	0.00
6,700.00	10.00	72.95	6,641.24	201.19	655.95	-81.86	0.00	0.00	0.00
6,800.00	10.00	72.95	6,739.72	206.28	672.56	-83.93	0.00	0.00	0.00
6,900.00	10.00	72.95	6,838.20	211.37	689.16	-86.00	0.00	0.00	0.00
7,000.00	10.00	72.95	6,936.68	216.47	705.76	-88.07	0.00	0.00	0.00
7,100.00	10.00	72.95	7,035.16	221.56	722.37	-90.15	0.00	0.00	0.00
7,200.00	10.00	72.95	7,133.64	226.65	738.97	-92.22	0.00	0.00	0.00
7,300.00	10.00	72.95	7,232.12	231.74	755.58	-94.29	0.00	0.00	0.00



Planning Report



Database: USA Compass
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Eider 23 Federal
Well: 702H
Wellbore: OH
Design: Plan 1 09-25-19

Local Co-ordinate Reference: Well 702H
TVD Reference: RKB @ 3597.30usft (Permitting)
MD Reference: RKB @ 3597.30usft (Permitting)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,400.00	10.00	72.95	7,330.60	236.84	772.18	-96.36	0.00	0.00	0.00
7,500.00	10.00	72.95	7,429.08	241.93	788.78	-98.44	0.00	0.00	0.00
7,600.00	10.00	72.95	7,527.56	247.02	805.39	-100.51	0.00	0.00	0.00
7,700.00	10.00	72.95	7,626.04	252.11	821.99	-102.58	0.00	0.00	0.00
7,800.00	10.00	72.95	7,724.52	257.21	838.60	-104.65	0.00	0.00	0.00
7,900.00	10.00	72.95	7,823.00	262.30	855.20	-106.72	0.00	0.00	0.00
8,000.00	10.00	72.95	7,921.48	267.39	871.80	-108.80	0.00	0.00	0.00
8,100.00	10.00	72.95	8,019.96	272.48	888.41	-110.87	0.00	0.00	0.00
8,200.00	10.00	72.95	8,118.44	277.58	905.01	-112.94	0.00	0.00	0.00
8,300.00	10.00	72.95	8,216.92	282.67	921.62	-115.01	0.00	0.00	0.00
8,400.00	10.00	72.95	8,315.40	287.76	938.22	-117.08	0.00	0.00	0.00
8,500.00	10.00	72.95	8,413.88	292.85	954.82	-119.16	0.00	0.00	0.00
8,600.00	10.00	72.95	8,512.36	297.95	971.43	-121.23	0.00	0.00	0.00
8,700.00	10.00	72.95	8,610.84	303.04	988.03	-123.30	0.00	0.00	0.00
8,800.00	10.00	72.95	8,709.33	308.13	1,004.63	-125.37	0.00	0.00	0.00
8,900.00	10.00	72.95	8,807.81	313.22	1,021.24	-127.44	0.00	0.00	0.00
9,000.00	10.00	72.95	8,906.29	318.32	1,037.84	-129.52	0.00	0.00	0.00
9,100.00	10.00	72.95	9,004.77	323.41	1,054.45	-131.59	0.00	0.00	0.00
9,200.00	10.00	72.95	9,103.25	328.50	1,071.05	-133.66	0.00	0.00	0.00
9,300.00	10.00	72.95	9,201.73	333.59	1,087.65	-135.73	0.00	0.00	0.00
9,400.00	10.00	72.95	9,300.21	338.69	1,104.26	-137.80	0.00	0.00	0.00
9,500.00	10.00	72.95	9,398.69	343.78	1,120.86	-139.88	0.00	0.00	0.00
9,600.00	10.00	72.95	9,497.17	348.87	1,137.47	-141.95	0.00	0.00	0.00
9,700.00	10.00	72.95	9,595.65	353.97	1,154.07	-144.02	0.00	0.00	0.00
9,800.00	10.00	72.95	9,694.13	359.06	1,170.67	-146.09	0.00	0.00	0.00
9,900.00	10.00	72.95	9,792.61	364.15	1,187.28	-148.16	0.00	0.00	0.00
10,000.00	10.00	72.95	9,891.09	369.24	1,203.88	-150.24	0.00	0.00	0.00
10,100.00	10.00	72.95	9,989.57	374.34	1,220.48	-152.31	0.00	0.00	0.00
10,200.00	10.00	72.95	10,088.05	379.43	1,237.09	-154.38	0.00	0.00	0.00
10,300.00	10.00	72.95	10,186.53	384.52	1,253.69	-156.45	0.00	0.00	0.00
10,341.57	10.00	72.95	10,227.46	386.64	1,260.59	-157.31	0.00	0.00	0.00
Begin 2.00°/100' Drop									
10,400.00	8.83	72.95	10,285.11	389.44	1,269.73	-158.45	2.00	-2.00	0.00
10,500.00	6.83	72.95	10,384.17	393.44	1,282.76	-160.08	2.00	-2.00	0.00
10,600.00	4.83	72.95	10,483.65	396.42	1,292.48	-161.29	2.00	-2.00	0.00
10,700.00	2.83	72.95	10,583.42	398.38	1,298.87	-162.09	2.00	-2.00	0.00
10,800.00	0.83	72.95	10,683.36	399.31	1,301.93	-162.47	2.00	-2.00	0.00
10,841.64	0.00	0.00	10,725.00	399.40	1,302.22	-162.51	2.00	-2.00	0.00
Begin Vertical Hold									
11,999.68	0.00	0.00	11,883.04	399.40	1,302.22	-162.51	0.00	0.00	0.00
KOP2, Begin 10.00°/100' Build									
12,000.00	0.03	179.76	11,883.36	399.40	1,302.22	-162.51	10.00	10.00	0.00
12,100.00	10.03	179.76	11,982.85	390.64	1,302.25	-153.88	10.00	10.00	0.00
12,200.00	20.03	179.76	12,079.31	364.74	1,302.36	-128.37	10.00	10.00	0.00
12,300.00	30.03	179.76	12,169.80	322.48	1,302.54	-86.74	10.00	10.00	0.00
12,400.00	40.03	179.76	12,251.58	265.15	1,302.78	-30.28	10.00	10.00	0.00
12,500.00	50.03	179.76	12,322.16	194.49	1,303.08	39.32	10.00	10.00	0.00
12,600.00	60.03	179.76	12,379.40	112.65	1,303.43	119.93	10.00	10.00	0.00
12,700.00	70.03	179.76	12,421.56	22.11	1,303.81	209.11	10.00	10.00	0.00
12,800.00	80.03	179.76	12,447.35	-74.37	1,304.22	304.14	10.00	10.00	0.00
12,900.00	90.03	179.76	12,456.00	-173.87	1,304.64	402.14	10.00	10.00	0.00
12,900.79	90.11	179.76	12,456.00	-174.66	1,304.64	402.91	10.00	10.00	0.00
LP, Hold 90.11° Inc at 179.76° Azm									



Planning Report



Database: USA Compass
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Eider 23 Federal
Well: 702H
Wellbore: OH
Design: Plan 1 09-25-19

Local Co-ordinate Reference: Well 702H
TVD Reference: RKB @ 3597.30usft (Permitting)
MD Reference: RKB @ 3597.30usft (Permitting)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,000.00	90.11	179.76	12,455.81	-273.87	1,305.06	500.63	0.00	0.00	0.00
13,100.00	90.11	179.76	12,455.61	-373.87	1,305.49	599.12	0.00	0.00	0.00
13,200.00	90.11	179.76	12,455.42	-473.87	1,305.91	697.62	0.00	0.00	0.00
13,300.00	90.11	179.76	12,455.23	-573.87	1,306.33	796.11	0.00	0.00	0.00
13,400.00	90.11	179.76	12,455.03	-673.86	1,306.76	894.60	0.00	0.00	0.00
13,500.00	90.11	179.76	12,454.84	-773.86	1,307.18	993.10	0.00	0.00	0.00
13,600.00	90.11	179.76	12,454.65	-873.86	1,307.60	1,091.59	0.00	0.00	0.00
13,700.00	90.11	179.76	12,454.46	-973.86	1,308.02	1,190.09	0.00	0.00	0.00
13,800.00	90.11	179.76	12,454.26	-1,073.86	1,308.45	1,288.58	0.00	0.00	0.00
13,900.00	90.11	179.76	12,454.07	-1,173.86	1,308.87	1,387.07	0.00	0.00	0.00
14,000.00	90.11	179.76	12,453.88	-1,273.86	1,309.29	1,485.57	0.00	0.00	0.00
14,100.00	90.11	179.76	12,453.68	-1,373.86	1,309.72	1,584.06	0.00	0.00	0.00
14,200.00	90.11	179.76	12,453.49	-1,473.86	1,310.14	1,682.55	0.00	0.00	0.00
14,300.00	90.11	179.76	12,453.30	-1,573.85	1,310.56	1,781.05	0.00	0.00	0.00
14,400.00	90.11	179.76	12,453.10	-1,673.85	1,310.99	1,879.54	0.00	0.00	0.00
14,500.00	90.11	179.76	12,452.91	-1,773.85	1,311.41	1,978.03	0.00	0.00	0.00
14,600.00	90.11	179.76	12,452.72	-1,873.85	1,311.83	2,076.53	0.00	0.00	0.00
14,700.00	90.11	179.76	12,452.52	-1,973.85	1,312.25	2,175.02	0.00	0.00	0.00
14,800.00	90.11	179.76	12,452.33	-2,073.85	1,312.68	2,273.52	0.00	0.00	0.00
14,900.00	90.11	179.76	12,452.14	-2,173.85	1,313.10	2,372.01	0.00	0.00	0.00
15,000.00	90.11	179.76	12,451.94	-2,273.85	1,313.52	2,470.50	0.00	0.00	0.00
15,100.00	90.11	179.76	12,451.75	-2,373.85	1,313.95	2,569.00	0.00	0.00	0.00
15,200.00	90.11	179.76	12,451.56	-2,473.85	1,314.37	2,667.49	0.00	0.00	0.00
15,300.00	90.11	179.76	12,451.36	-2,573.84	1,314.79	2,765.98	0.00	0.00	0.00
15,400.00	90.11	179.76	12,451.17	-2,673.84	1,315.22	2,864.48	0.00	0.00	0.00
15,500.00	90.11	179.76	12,450.98	-2,773.84	1,315.64	2,962.97	0.00	0.00	0.00
15,600.00	90.11	179.76	12,450.79	-2,873.84	1,316.06	3,061.46	0.00	0.00	0.00
15,700.00	90.11	179.76	12,450.59	-2,973.84	1,316.48	3,159.96	0.00	0.00	0.00
15,800.00	90.11	179.76	12,450.40	-3,073.84	1,316.91	3,258.45	0.00	0.00	0.00
15,900.00	90.11	179.76	12,450.21	-3,173.84	1,317.33	3,356.95	0.00	0.00	0.00
16,000.00	90.11	179.76	12,450.01	-3,273.84	1,317.75	3,455.44	0.00	0.00	0.00
16,100.00	90.11	179.76	12,449.82	-3,373.84	1,318.18	3,553.93	0.00	0.00	0.00
16,200.00	90.11	179.76	12,449.63	-3,473.83	1,318.60	3,652.43	0.00	0.00	0.00
16,300.00	90.11	179.76	12,449.43	-3,573.83	1,319.02	3,750.92	0.00	0.00	0.00
16,400.00	90.11	179.76	12,449.24	-3,673.83	1,319.45	3,849.41	0.00	0.00	0.00
16,500.00	90.11	179.76	12,449.05	-3,773.83	1,319.87	3,947.91	0.00	0.00	0.00
16,600.00	90.11	179.76	12,448.85	-3,873.83	1,320.29	4,046.40	0.00	0.00	0.00
16,700.00	90.11	179.76	12,448.66	-3,973.83	1,320.71	4,144.89	0.00	0.00	0.00
16,800.00	90.11	179.76	12,448.47	-4,073.83	1,321.14	4,243.39	0.00	0.00	0.00
16,900.00	90.11	179.76	12,448.27	-4,173.83	1,321.56	4,341.88	0.00	0.00	0.00
17,000.00	90.11	179.76	12,448.08	-4,273.83	1,321.98	4,440.38	0.00	0.00	0.00
17,100.00	90.11	179.76	12,447.89	-4,373.82	1,322.41	4,538.87	0.00	0.00	0.00
17,200.00	90.11	179.76	12,447.69	-4,473.82	1,322.83	4,637.36	0.00	0.00	0.00
17,300.00	90.11	179.76	12,447.50	-4,573.82	1,323.25	4,735.86	0.00	0.00	0.00
17,400.00	90.11	179.76	12,447.31	-4,673.82	1,323.68	4,834.35	0.00	0.00	0.00
17,500.00	90.11	179.76	12,447.12	-4,773.82	1,324.10	4,932.84	0.00	0.00	0.00
17,600.00	90.11	179.76	12,446.92	-4,873.82	1,324.52	5,031.34	0.00	0.00	0.00
17,700.00	90.11	179.76	12,446.73	-4,973.82	1,324.94	5,129.83	0.00	0.00	0.00
17,800.00	90.11	179.76	12,446.54	-5,073.82	1,325.37	5,228.32	0.00	0.00	0.00
17,900.00	90.11	179.76	12,446.34	-5,173.82	1,325.79	5,326.82	0.00	0.00	0.00
18,000.00	90.11	179.76	12,446.15	-5,273.81	1,326.21	5,425.31	0.00	0.00	0.00
18,100.00	90.11	179.76	12,445.96	-5,373.81	1,326.64	5,523.81	0.00	0.00	0.00
18,200.00	90.11	179.76	12,445.76	-5,473.81	1,327.06	5,622.30	0.00	0.00	0.00
18,300.00	90.11	179.76	12,445.57	-5,573.81	1,327.48	5,720.79	0.00	0.00	0.00



Planning Report



Database: USA Compass
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Eider 23 Federal
Well: 702H
Wellbore: OH
Design: Plan 1 09-25-19

Local Co-ordinate Reference: Well 702H
TVD Reference: RKB @ 3597.30usft (Permitting)
MD Reference: RKB @ 3597.30usft (Permitting)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
18,400.00	90.11	179.76	12,445.38	-5,673.81	1,327.91	5,819.29	0.00	0.00	0.00
18,500.00	90.11	179.76	12,445.18	-5,773.81	1,328.33	5,917.78	0.00	0.00	0.00
18,600.00	90.11	179.76	12,444.99	-5,873.81	1,328.75	6,016.27	0.00	0.00	0.00
18,700.00	90.11	179.76	12,444.80	-5,973.81	1,329.17	6,114.77	0.00	0.00	0.00
18,800.00	90.11	179.76	12,444.60	-6,073.81	1,329.60	6,213.26	0.00	0.00	0.00
18,900.00	90.11	179.76	12,444.41	-6,173.81	1,330.02	6,311.76	0.00	0.00	0.00
19,000.00	90.11	179.76	12,444.22	-6,273.80	1,330.44	6,410.25	0.00	0.00	0.00
19,100.00	90.11	179.76	12,444.02	-6,373.80	1,330.87	6,508.74	0.00	0.00	0.00
19,200.00	90.11	179.76	12,443.83	-6,473.80	1,331.29	6,607.24	0.00	0.00	0.00
19,300.00	90.11	179.76	12,443.64	-6,573.80	1,331.71	6,705.73	0.00	0.00	0.00
19,400.00	90.11	179.76	12,443.45	-6,673.80	1,332.14	6,804.22	0.00	0.00	0.00
19,500.00	90.11	179.76	12,443.25	-6,773.80	1,332.56	6,902.72	0.00	0.00	0.00
19,600.00	90.11	179.76	12,443.06	-6,873.80	1,332.98	7,001.21	0.00	0.00	0.00
19,700.00	90.11	179.76	12,442.87	-6,973.80	1,333.40	7,099.70	0.00	0.00	0.00
19,800.00	90.11	179.76	12,442.67	-7,073.80	1,333.83	7,198.20	0.00	0.00	0.00
19,900.00	90.11	179.76	12,442.48	-7,173.79	1,334.25	7,296.69	0.00	0.00	0.00
20,000.00	90.11	179.76	12,442.29	-7,273.79	1,334.67	7,395.19	0.00	0.00	0.00
20,100.00	90.11	179.76	12,442.09	-7,373.79	1,335.10	7,493.68	0.00	0.00	0.00
20,148.11	90.11	179.76	12,442.00	-7,421.90	1,335.30	7,541.06	0.00	0.00	0.00

TD at 20148.11

Design Targets

Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape									
LTP - Eider 23 Federal 7	0.00	0.00	0.00	-7,371.90	1,335.10	433,090.60	714,941.30	32° 11' 19.588459 N	103° 38' 18.753319 W
- plan misses target center by 7491.82usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Point									
BHL - Eider 23 Federal 7	0.00	0.00	12,442.00	-7,421.90	1,335.30	433,040.60	714,941.50	32° 11' 19.093660 N	103° 38' 18.754751 W
- plan hits target center									
- Point									
FTP - Eider 23 Federal 7	0.00	0.00	12,456.00	119.40	1,303.40	440,581.90	714,909.60	32° 12' 33.722088 N	103° 38' 18.558848 W
- plan misses target center by 70.60usft at 12626.25usft MD (12391.98 TVD, 89.62 N, 1303.53 E)									
- Point									



Planning Report



Database: USA Compass
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Eider 23 Federal
Well: 702H
Wellbore: OH
Design: Plan 1 09-25-19

Local Co-ordinate Reference: Well 702H
TVD Reference: RKB @ 3597.30usft (Permitting)
MD Reference: RKB @ 3597.30usft (Permitting)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,111.30	1,111.30	Rustler		-0.11	169.80
1,430.30	1,430.30	TOS		-0.11	169.80
4,704.82	4,676.38	BOS (Fletcher)		-0.11	169.80
4,938.38	4,906.39	LMAR (Top Delaware)		-0.11	169.80
4,975.95	4,943.39	BLCN		-0.11	169.80
5,884.80	5,838.42	CYCN		-0.11	169.80
7,339.97	7,271.48	BYCN		-0.11	169.80
8,925.12	8,832.55	Bone Sprg (BSGL)		-0.11	169.80
9,300.85	9,202.56	Middle Avalon Shale		-0.11	169.80
9,464.34	9,363.57	Lower Avalon Shale		-0.11	169.80
10,064.48	9,954.59	FBSG_sand		-0.11	169.80
10,673.15	10,556.61	SBSG_sand		-0.11	169.80
11,197.25	11,080.61	SBSG_sand_Base		-0.11	169.80
11,946.25	11,829.61	TBSG_sand		-0.11	169.80
12,412.88	12,261.34	WFMP		-0.11	169.80
12,617.78	12,388.04	WFMP A SHALE		-0.11	169.80

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N-S (usft)	+E-W (usft)	
2,500.00	2,500.00	0.00	0.00	KOP, Begin 2.00°/100' Build
3,000.07	2,997.54	12.77	41.62	Hold 10.00° Inc at 72.95° Azm
10,341.57	10,227.46	386.64	1,260.59	Begin 2.00°/100' Drop
10,841.64	10,725.00	399.40	1,302.22	Begin Vertical Hold
11,999.68	11,883.04	399.40	1,302.22	KOP2, Begin 10.00°/100' Build
12,900.79	12,456.00	-174.66	1,304.64	LP, Hold 90.11° Inc at 179.76° Azm
20,148.11	12,442.00	-7,421.90	1,335.30	TD at 20148.11

DISTRICT IV
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505
Phone: (505) 476-3400 Fax: (505) 476-3462

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

API Number 30-025-46381		Pool Code 98309	Pool Name WC-025 G-08 S243213C; WOLFCAMP
Property Code 326116	Property Name EIDER 23 FEDERAL		Well Number 702H
OGRID No. 217955	Operator Name COG PRODUCTION, LLC		Elevation 3567.3'

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	23	24-S	32-E		435	NORTH	1965	EAST	LEA

UL or lot No. H	Section 26	Township 24-S	Range 32-E	Lot Idn	Feet from the 2590	North/South line NORTH	Feet from the 660	East/West line EAST	County LEA
Dedicated Acres 240		Joint or Infill	Consolidation Code		Order No.				

Y=440963.3 N
X=755425.8 E

Y=440977.9 N
X=756749.9 E

NAD 83 NME
SURFACE LOCATION
Y=440521.1 N
X=754790.7 E
LAT.=32.209186° N
LONG.=103.643184° W

NMNM120907

SECTION 23
SECTION 26

NAD 83 NME
PROPOSED BOTTOM
HOLE LOCATION
Y=433099.1 N
X=756126.3 E
LAT.=32.188761° N
LONG.=103.639021° W

Y=433041.2 N
X=755465.0 E

Y=433054.5 N
X=756786.6 E

435'

S.L.

1965'

330' FNL & 660' FEL
Y=440840.6 N
X=756094.0 E
LAT.=32.209491° N
LONG.=103.638968° W
GRID AZ. TO FIP
84°45'51"

GRID AZ. = 179°45'17"
HORZ. DIST. = 7541.6'

2590'

B.H.

660'

2540' FNL & 660' FEL
Y=433149.1 N
X=756126.1 E
LAT.=32.188899° N
LONG.=103.639020° W

I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or possesses mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Mate Ken 9-23-19

Mayte Reyes

Printed Name
mreyes1@concho.com

E-mail Address _____

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

APRIL 4, 2019

Date of Survey

Signature & Seal of Professional Surveyor



Chad Harcrow 9/16/19
Certificate No. CHAD HARCROW 1777
W.O. # 19-1707 DRAWN BY: DS