

COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 35, T 24 S. , R 32 E

Eider Federal 203H

Wellbore #1

Design: Wellbore #1

Standard Survey Report

16 August, 2018

HOBBS OCD
FEB 28 2019
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Survey Report

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 203H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3551.80ft (Scandrift Freedom)
Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3551.80ft (Scandrift Freedom)
Well:	Eider Federal 203H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

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	Sec. 35, T 24 S., R 32 E				
Site Position:		Northing:	425,243.29 usft	Latitude:	32.16727
From:	Map	Easting:	711,320.50 usft	Longitude:	-103.65041
Position Uncertainty:	5.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.36 °

Well	Eider Federal 203H, ACTIVE					
Well Position	+N/-S	0.00 ft	Northing:	425,283.70 usf	Latitude:	32.16736
	+E/-W	0.00 ft	Easting:	712,390.40 usf	Longitude:	-103.64695
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	3,525.80 ft

Wellbore:	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	HDGM	7/26/2018	6.77	59.85	47,934

Design:	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	359.26	

Survey Program	Date 8/16/2018				
From	To	Survey (Wellbore)	Tool Name	Description	
(ft)	(ft)				
100.00	8,770.00	Keeper Gyros (Wellbore #1)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4	
8,881.00	16,764.00	IDS MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

Survey										
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate	
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(°/100usft)	(°/100usft)	(°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.92	334.59	100.00	0.73	-0.34	0.73	0.92	0.92	0.00	
125.00	0.98	339.30	124.99	1.11	-0.51	1.11	0.39	0.24	18.84	
150.00	1.02	338.11	149.99	1.51	-0.66	1.52	0.18	0.16	-4.76	
175.00	1.08	341.93	174.98	1.94	-0.82	1.95	0.37	0.24	15.28	
200.00	1.05	344.56	199.98	2.39	-0.95	2.40	0.23	-0.12	10.52	
225.00	1.07	344.37	224.98	2.83	-1.08	2.85	0.08	0.08	-0.76	
250.00	1.04	348.75	249.97	3.28	-1.19	3.30	0.34	-0.12	17.52	
275.00	1.01	350.65	274.97	3.72	-1.27	3.74	0.18	-0.12	7.60	
300.00	0.97	351.95	299.96	4.15	-1.33	4.16	0.18	-0.16	5.20	

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Well:	Eider Federal 203H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
325.00	0.97	348.29	324.96	4.56	-1.40	4.58	0.25	0.00	-14.64
350.00	0.89	346.52	349.96	4.96	-1.49	4.98	0.34	-0.32	-7.08
375.00	0.79	348.92	374.95	5.32	-1.57	5.34	0.42	-0.40	9.60
400.00	0.66	350.46	399.95	5.63	-1.63	5.65	0.53	-0.52	6.16
425.00	0.57	348.68	424.95	5.89	-1.68	5.91	0.37	-0.36	-7.12
450.00	0.55	338.91	449.95	6.13	-1.74	6.15	0.39	-0.08	-39.08
475.00	0.55	337.12	474.95	6.35	-1.83	6.37	0.07	0.00	-7.16
500.00	0.41	331.19	499.95	6.54	-1.92	6.56	0.59	-0.56	-23.72
525.00	0.38	318.77	524.95	6.68	-2.02	6.71	0.36	-0.12	-49.68
550.00	0.35	310.91	549.95	6.79	-2.13	6.82	0.23	-0.12	-31.44
575.00	0.40	313.27	574.95	6.90	-2.25	6.93	0.21	0.20	9.44
600.00	0.41	305.55	599.95	7.01	-2.39	7.04	0.22	0.04	-30.88
625.00	0.39	296.02	624.94	7.10	-2.54	7.14	0.28	-0.08	-38.12
650.00	0.43	295.38	649.94	7.18	-2.70	7.21	0.16	0.16	-2.56
675.00	0.45	294.06	674.94	7.26	-2.88	7.30	0.09	0.08	-5.28
700.00	0.47	296.93	699.94	7.35	-3.06	7.39	0.12	0.08	11.48
725.00	0.45	292.36	724.94	7.43	-3.24	7.47	0.17	-0.08	-18.28
750.00	0.38	294.46	749.94	7.50	-3.40	7.55	0.29	-0.28	8.40
775.00	0.34	296.45	774.94	7.57	-3.55	7.62	0.17	-0.16	7.96
800.00	0.30	286.04	799.94	7.62	-3.68	7.67	0.28	-0.16	-41.64
825.00	0.30	278.26	824.94	7.65	-3.80	7.70	0.16	0.00	-31.12
850.00	0.24	262.84	849.94	7.65	-3.92	7.70	0.37	-0.24	-61.68
875.00	0.18	252.74	874.94	7.63	-4.01	7.68	0.28	-0.24	-40.40
900.00	0.26	238.70	899.94	7.59	-4.10	7.64	0.38	0.32	-56.16
925.00	0.19	240.95	924.94	7.54	-4.18	7.60	0.28	-0.28	9.00
950.00	0.26	235.65	949.94	7.49	-4.26	7.54	0.29	0.28	-21.20
975.00	0.24	235.51	974.94	7.43	-4.35	7.48	0.08	-0.08	-0.56
1,000.00	0.23	231.71	999.94	7.37	-4.44	7.42	0.07	-0.04	-15.20
1,025.00	0.22	236.99	1,024.94	7.31	-4.52	7.37	0.09	-0.04	21.12
1,050.00	0.29	241.27	1,049.94	7.25	-4.61	7.31	0.29	0.28	17.12
1,075.00	0.28	251.37	1,074.94	7.20	-4.72	7.26	0.20	-0.04	40.40
1,100.00	0.21	253.51	1,099.94	7.17	-4.83	7.23	0.28	-0.28	8.56
1,125.00	0.29	255.77	1,124.94	7.14	-4.93	7.21	0.32	0.32	9.04
1,150.00	0.22	266.78	1,149.94	7.13	-5.04	7.19	0.34	-0.28	44.04
1,175.00	0.17	248.00	1,174.94	7.11	-5.12	7.17	0.32	-0.20	-75.12
1,200.00	0.20	252.36	1,199.94	7.08	-5.20	7.15	0.13	0.12	17.44
1,225.00	0.19	253.30	1,224.94	7.06	-5.28	7.12	0.04	-0.04	3.76
1,250.00	0.16	252.18	1,249.94	7.03	-5.35	7.10	0.12	-0.12	-4.48
1,275.00	0.25	224.80	1,274.94	6.98	-5.43	7.05	0.52	0.36	-109.52
1,300.00	0.27	223.89	1,299.94	6.90	-5.50	6.97	0.08	0.08	-3.64
1,325.00	0.35	229.84	1,324.94	6.81	-5.60	6.88	0.34	0.32	23.80
1,350.00	0.32	229.66	1,349.94	6.72	-5.72	6.79	0.12	-0.12	-0.72
1,375.00	0.31	225.58	1,374.93	6.62	-5.82	6.70	0.10	-0.04	-16.32

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,400.00	0.37	227.55	1,399.93	6.52	-5.92	6.60	0.24	0.24	7.88
1,425.00	0.34	236.99	1,424.93	6.43	-6.05	6.51	0.26	-0.12	37.76
1,450.00	0.32	247.03	1,449.93	6.36	-6.17	6.44	0.24	-0.08	40.16
1,475.00	0.36	239.78	1,474.93	6.29	-6.31	6.37	0.23	0.16	-29.00
1,500.00	0.33	242.05	1,499.93	6.22	-6.44	6.30	0.13	-0.12	9.08
1,525.00	0.25	240.62	1,524.93	6.16	-6.55	6.24	0.32	-0.32	-5.72
1,550.00	0.30	232.55	1,549.93	6.09	-6.65	6.18	0.25	0.20	-32.28
1,575.00	0.26	214.60	1,574.93	6.01	-6.73	6.09	0.38	-0.16	-71.80
1,600.00	0.33	219.17	1,599.93	5.90	-6.81	5.99	0.30	0.28	18.28
1,625.00	0.39	209.99	1,624.93	5.77	-6.90	5.86	0.33	0.24	-36.72
1,650.00	0.45	209.92	1,649.93	5.62	-6.99	5.71	0.24	0.24	-0.28
1,675.00	0.51	208.99	1,674.93	5.43	-7.09	5.52	0.24	0.24	-3.72
1,700.00	0.45	203.35	1,699.93	5.25	-7.18	5.34	0.31	-0.24	-22.56
1,725.00	0.48	205.37	1,724.93	5.06	-7.27	5.15	0.14	0.12	8.08
1,750.00	0.51	207.38	1,749.93	4.87	-7.36	4.96	0.14	0.12	8.04
1,775.00	0.48	212.93	1,774.93	4.68	-7.47	4.78	0.23	-0.12	22.20
1,800.00	0.45	212.88	1,799.92	4.51	-7.58	4.61	0.12	-0.12	-0.20
1,825.00	0.51	205.70	1,824.92	4.33	-7.68	4.43	0.34	0.24	-28.72
1,850.00	0.60	200.75	1,849.92	4.11	-7.78	4.21	0.41	0.36	-19.80
1,875.00	0.63	198.36	1,874.92	3.85	-7.87	3.95	0.16	0.12	-9.56
1,900.00	0.74	202.82	1,899.92	3.57	-7.97	3.68	0.49	0.44	17.84
1,925.00	0.72	200.97	1,924.92	3.28	-8.09	3.38	0.12	-0.08	-7.40
1,950.00	0.65	187.23	1,949.92	2.99	-8.17	3.10	0.71	-0.28	-54.96
1,975.00	0.81	208.30	1,974.91	2.69	-8.27	2.80	1.24	0.64	84.28
2,000.00	0.78	207.23	1,999.91	2.39	-8.43	2.50	0.13	-0.12	-4.28
2,025.00	0.80	206.09	2,024.91	2.08	-8.59	2.19	0.10	0.08	-4.56
2,050.00	0.82	202.84	2,049.91	1.76	-8.73	1.87	0.20	0.08	-13.00
2,075.00	0.80	204.75	2,074.90	1.43	-8.87	1.55	0.13	-0.08	7.64
2,100.00	1.02	203.04	2,099.90	1.07	-9.03	1.19	0.89	0.88	-6.84
2,125.00	1.10	204.02	2,124.90	0.65	-9.22	0.77	0.33	0.32	3.92
2,150.00	1.01	202.23	2,149.89	0.22	-9.40	0.35	0.38	-0.36	-7.16
2,175.00	1.12	203.98	2,174.89	-0.20	-9.58	-0.08	0.46	0.44	7.00
2,200.00	1.21	201.84	2,199.88	-0.67	-9.78	-0.55	0.40	0.36	-8.56
2,225.00	1.25	206.61	2,224.88	-1.16	-10.00	-1.03	0.44	0.16	19.08
2,250.00	1.21	204.83	2,249.87	-1.64	-10.23	-1.51	0.22	-0.16	-7.12
2,275.00	1.21	208.46	2,274.87	-2.12	-10.47	-1.98	0.31	0.00	14.52
2,300.00	1.21	210.25	2,299.86	-2.58	-10.73	-2.44	0.15	0.00	7.16
2,325.00	1.22	205.15	2,324.85	-3.04	-10.97	-2.90	0.43	0.04	-20.40
2,350.00	1.27	201.77	2,349.85	-3.54	-11.19	-3.40	0.36	0.20	-13.52
2,375.00	1.34	203.30	2,374.84	-4.07	-11.41	-3.92	0.31	0.28	6.12
2,400.00	1.36	202.17	2,399.84	-4.61	-11.64	-4.46	0.13	0.08	-4.52
2,425.00	1.38	202.60	2,424.83	-5.16	-11.86	-5.01	0.09	0.08	1.72
2,450.00	1.42	200.27	2,449.82	-5.73	-12.09	-5.58	0.28	0.16	-9.32

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
2,475.00	1.43	202.52	2,474.81	-6.31	-12.31	-6.15	0.23	0.04	9.00	
2,500.00	1.35	193.41	2,499.81	-6.89	-12.50	-6.72	0.94	-0.32	-36.44	
2,525.00	1.39	184.36	2,524.80	-7.48	-12.59	-7.31	0.88	0.16	-36.20	
2,550.00	1.44	178.27	2,549.79	-8.09	-12.61	-7.93	0.63	0.20	-24.36	
2,575.00	1.51	177.90	2,574.78	-8.73	-12.59	-8.57	0.28	0.28	-1.48	
2,600.00	1.45	176.04	2,599.77	-9.38	-12.55	-9.22	0.31	-0.24	-7.44	
2,625.00	1.53	176.80	2,624.77	-10.03	-12.51	-9.87	0.33	0.32	3.04	
2,650.00	1.56	176.27	2,649.76	-10.70	-12.47	-10.54	0.13	0.12	-2.12	
2,675.00	1.77	174.47	2,674.75	-11.42	-12.41	-11.26	0.87	0.84	-7.20	
2,700.00	1.84	174.56	2,699.73	-12.21	-12.34	-12.05	0.28	0.28	0.36	
2,725.00	1.80	173.61	2,724.72	-13.00	-12.25	-12.84	0.20	-0.16	-3.80	
2,750.00	1.82	175.99	2,749.71	-13.78	-12.18	-13.63	0.31	0.08	9.52	
2,775.00	1.77	177.36	2,774.70	-14.57	-12.14	-14.41	0.26	-0.20	5.48	
2,800.00	1.92	175.03	2,799.68	-15.37	-12.08	-15.21	0.67	0.60	-9.32	
2,825.00	2.02	173.21	2,824.67	-16.22	-11.99	-16.07	0.47	0.40	-7.28	
2,850.00	1.91	174.45	2,849.65	-17.08	-11.90	-16.92	0.47	-0.44	4.96	
2,875.00	1.99	173.63	2,874.64	-17.92	-11.81	-17.77	0.34	0.32	-3.28	
2,900.00	2.14	174.61	2,899.62	-18.82	-11.72	-18.67	0.62	0.60	3.92	
2,925.00	2.19	174.18	2,924.61	-19.76	-11.63	-19.61	0.21	0.20	-1.72	
2,950.00	2.29	173.86	2,949.59	-20.73	-11.53	-20.58	0.40	0.40	-1.28	
2,975.00	2.27	172.86	2,974.57	-21.72	-11.41	-21.57	0.18	-0.08	-4.00	
3,000.00	2.29	172.27	2,999.55	-22.70	-11.28	-22.56	0.12	0.08	-2.36	
3,025.00	2.32	172.92	3,024.53	-23.70	-11.15	-23.55	0.16	0.12	2.60	
3,050.00	2.32	170.92	3,049.51	-24.70	-11.01	-24.56	0.32	0.00	-8.00	
3,075.00	1.99	169.09	3,074.49	-25.63	-10.85	-25.49	1.35	-1.32	-7.32	
3,100.00	1.68	170.63	3,099.48	-26.42	-10.71	-26.28	1.26	-1.24	6.16	
3,125.00	1.55	168.43	3,124.47	-27.11	-10.58	-26.97	0.58	-0.52	-8.80	
3,150.00	1.56	167.00	3,149.46	-27.77	-10.44	-27.64	0.16	0.04	-5.72	
3,175.00	1.55	166.80	3,174.45	-28.43	-10.28	-28.30	0.05	-0.04	-0.80	
3,200.00	1.59	165.21	3,199.44	-29.10	-10.12	-28.96	0.24	0.16	-6.36	
3,225.00	1.52	167.66	3,224.43	-29.76	-9.96	-29.63	0.39	-0.28	9.80	
3,250.00	1.56	167.16	3,249.42	-30.41	-9.81	-30.28	0.17	0.16	-2.00	
3,275.00	1.70	165.58	3,274.41	-31.10	-9.64	-30.98	0.59	0.56	-6.32	
3,300.00	1.74	164.17	3,299.40	-31.83	-9.45	-31.70	0.23	0.16	-5.64	
3,325.00	1.72	166.35	3,324.39	-32.56	-9.25	-32.44	0.28	-0.08	8.72	
3,350.00	1.63	167.16	3,349.38	-33.27	-9.09	-33.15	0.37	-0.36	3.24	
3,375.00	1.64	166.19	3,374.37	-33.96	-8.92	-33.84	0.12	0.04	-3.88	
3,400.00	1.61	166.50	3,399.36	-34.65	-8.76	-34.54	0.13	-0.12	1.24	
3,425.00	1.69	167.65	3,424.35	-35.35	-8.59	-35.24	0.35	0.32	4.60	
3,450.00	1.72	168.39	3,449.33	-36.08	-8.44	-35.97	0.15	0.12	2.96	
3,475.00	1.68	167.49	3,474.32	-36.81	-8.29	-36.70	0.19	-0.16	-3.60	
3,500.00	1.66	168.37	3,499.31	-37.52	-8.13	-37.41	0.13	-0.08	3.52	
3,525.00	1.53	166.91	3,524.30	-38.20	-7.98	-38.09	0.54	-0.52	-5.84	
3,550.00	1.19	163.13	3,549.30	-38.77	-7.83	-38.67	1.41	-1.36	-15.12	

Survey Report

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 203H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3551.80ft (Scandril Freedom)
Site:	Sec. 35, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3551.80ft (Scandril Freedom)
Well:	Eider Federal 203H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,575.00	0.55	154.13	3,574.29	-39.13	-7.71	-39.03	2.61	-2.56	-36.00
3,600.00	0.46	141.64	3,599.29	-39.31	-7.59	-39.21	0.57	-0.36	-49.96
3,625.00	0.39	129.85	3,624.29	-39.45	-7.46	-39.35	0.45	-0.28	-47.16
3,650.00	0.48	119.00	3,649.29	-39.55	-7.31	-39.46	0.49	0.36	-43.40
3,675.00	0.48	106.43	3,674.29	-39.63	-7.11	-39.54	0.42	0.00	-50.28
3,700.00	0.52	101.03	3,699.29	-39.69	-6.90	-39.59	0.25	0.16	-21.60
3,725.00	0.54	97.46	3,724.29	-39.72	-6.67	-39.63	0.15	0.08	-14.28
3,750.00	0.62	108.03	3,749.29	-39.78	-6.43	-39.69	0.53	0.32	42.28
3,775.00	0.56	109.02	3,774.29	-39.86	-6.19	-39.78	0.24	-0.24	3.96
3,800.00	0.44	110.92	3,799.28	-39.94	-5.98	-39.85	0.48	-0.48	7.60
3,825.00	0.24	155.65	3,824.28	-40.02	-5.87	-39.94	1.27	-0.80	178.92
3,850.00	0.32	228.77	3,849.28	-40.11	-5.90	-40.03	1.36	0.32	292.48
3,875.00	0.48	242.52	3,874.28	-40.21	-6.04	-40.12	0.74	0.64	55.00
3,900.00	0.73	249.63	3,899.28	-40.31	-6.29	-40.22	1.04	1.00	28.44
3,925.00	0.66	249.16	3,924.28	-40.42	-6.57	-40.33	0.28	-0.28	-1.88
3,950.00	0.64	248.63	3,949.28	-40.52	-6.84	-40.43	0.08	-0.08	-2.12
3,975.00	0.68	249.34	3,974.28	-40.62	-7.10	-40.53	0.16	0.16	2.84
4,000.00	0.60	251.51	3,999.27	-40.71	-7.37	-40.62	0.33	-0.32	8.68
4,025.00	0.69	247.82	4,024.27	-40.81	-7.63	-40.71	0.40	0.36	-14.76
4,050.00	0.65	241.99	4,049.27	-40.94	-7.90	-40.83	0.32	-0.16	-23.32
4,075.00	0.63	234.63	4,074.27	-41.08	-8.13	-40.97	0.34	-0.08	-29.44
4,100.00	0.53	230.01	4,099.27	-41.24	-8.33	-41.13	0.44	-0.40	-18.48
4,125.00	0.56	212.40	4,124.27	-41.41	-8.49	-41.30	0.68	0.12	-70.44
4,150.00	0.66	190.54	4,149.27	-41.66	-8.58	-41.54	1.01	0.40	-87.44
4,175.00	0.72	182.98	4,174.26	-41.96	-8.61	-41.84	0.44	0.24	-30.24
4,200.00	0.82	173.26	4,199.26	-42.29	-8.60	-42.18	0.66	0.40	-38.88
4,225.00	0.82	170.31	4,224.26	-42.65	-8.55	-42.53	0.17	0.00	-11.80
4,250.00	0.92	168.36	4,249.26	-43.02	-8.48	-42.91	0.42	0.40	-7.80
4,275.00	1.06	162.61	4,274.25	-43.44	-8.37	-43.32	0.69	0.56	-23.00
4,300.00	1.13	160.90	4,299.25	-43.89	-8.22	-43.78	0.31	0.28	-6.84
4,325.00	1.14	160.40	4,324.24	-44.36	-8.06	-44.25	0.06	0.04	-2.00
4,350.00	1.33	154.62	4,349.24	-44.85	-7.85	-44.75	0.91	0.76	-23.12
4,375.00	1.57	143.06	4,374.23	-45.39	-7.52	-45.29	1.51	0.96	-46.24
4,400.00	1.64	150.34	4,399.22	-45.97	-7.13	-45.88	0.86	0.28	29.12
4,425.00	1.82	151.33	4,424.21	-46.63	-6.77	-46.54	0.73	0.72	3.96
4,450.00	2.15	144.39	4,449.19	-47.36	-6.30	-47.28	1.63	1.32	-27.76
4,475.00	2.50	146.81	4,474.17	-48.20	-5.73	-48.12	1.45	1.40	9.68
4,500.00	2.58	146.37	4,499.15	-49.12	-5.12	-49.05	0.33	0.32	-1.76
4,525.00	2.70	147.23	4,524.12	-50.09	-4.49	-50.03	0.51	0.48	3.44
4,550.00	2.76	147.44	4,549.09	-51.09	-3.85	-51.04	0.24	0.24	0.84
4,575.00	2.66	149.49	4,574.07	-52.10	-3.23	-52.05	0.56	-0.40	8.20
4,600.00	2.06	152.49	4,599.04	-53.00	-2.73	-52.96	2.45	-2.40	12.00
4,625.00	1.86	152.70	4,624.03	-53.76	-2.34	-53.72	0.80	-0.80	0.84

Survey Report

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 203H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3551.80ft (Scandril Freedom)
Site:	Sec. 35, T-24 S., R 32 E	MD Reference:	KB=26' @ 3551.80ft (Scandril Freedom)
Well:	Eider Federal 203H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,650.00	1.77	151.55	4,649.02	-54.46	-1.97	-54.43	0.39	-0.36	-4.60
4,675.00	1.84	151.69	4,674.00	-55.15	-1.59	-55.12	0.28	0.28	0.56
4,700.00	1.84	151.06	4,698.99	-55.85	-1.21	-55.83	0.08	0.00	-2.52
4,725.00	1.74	153.31	4,723.98	-56.54	-0.84	-56.53	0.49	-0.40	9.00
4,750.00	1.33	159.37	4,748.97	-57.15	-0.57	-57.14	1.76	-1.64	24.24
4,775.00	0.75	172.33	4,773.97	-57.59	-0.44	-57.58	2.49	-2.32	51.84
4,800.00	0.44	204.08	4,798.96	-57.84	-0.46	-57.83	1.77	-1.24	127.00
4,825.00	0.48	218.22	4,823.96	-58.01	-0.57	-57.99	0.48	0.16	56.56
4,850.00	0.38	218.17	4,848.96	-58.15	-0.68	-58.14	0.40	-0.40	-0.20
4,875.00	0.41	210.76	4,873.96	-58.30	-0.78	-58.28	0.24	0.12	-29.64
4,900.00	0.44	215.47	4,898.96	-58.45	-0.88	-58.44	0.18	0.12	18.84
4,925.00	0.44	222.10	4,923.96	-58.60	-1.00	-58.58	0.20	0.00	26.52
4,950.00	0.38	222.61	4,948.96	-58.73	-1.12	-58.71	0.24	-0.24	2.04
4,975.00	0.40	228.62	4,973.96	-58.85	-1.24	-58.83	0.18	0.08	24.04
5,000.00	0.38	224.86	4,998.96	-58.97	-1.37	-58.95	0.13	-0.08	-15.04
5,025.00	0.39	230.36	5,023.96	-59.08	-1.49	-59.06	0.15	0.04	22.00
5,050.00	0.40	223.66	5,048.96	-59.20	-1.62	-59.17	0.19	0.04	-26.80
5,075.00	0.37	220.25	5,073.96	-59.32	-1.73	-59.30	0.15	-0.12	-13.64
5,100.00	0.40	218.89	5,098.96	-59.45	-1.84	-59.42	0.13	0.12	-5.44
5,125.00	0.40	216.75	5,123.96	-59.59	-1.94	-59.56	0.06	0.00	-8.56
5,150.00	0.42	219.45	5,148.96	-59.73	-2.05	-59.70	0.11	0.08	10.80
5,175.00	0.40	218.61	5,173.96	-59.87	-2.17	-59.84	0.08	-0.08	-3.36
5,200.00	0.43	215.88	5,198.95	-60.01	-2.28	-59.98	0.14	0.12	-10.92
5,225.00	0.45	216.43	5,223.95	-60.17	-2.39	-60.13	0.08	0.08	2.20
5,250.00	0.43	222.66	5,248.95	-60.32	-2.51	-60.28	0.21	-0.08	24.92
5,275.00	0.46	227.93	5,273.95	-60.45	-2.65	-60.41	0.20	0.12	21.08
5,300.00	0.45	229.78	5,298.95	-60.58	-2.80	-60.54	0.07	-0.04	7.40
5,325.00	0.40	229.32	5,323.95	-60.70	-2.94	-60.66	0.20	-0.20	-1.84
5,350.00	0.38	224.88	5,348.95	-60.82	-3.06	-60.78	0.14	-0.08	-17.76
5,375.00	0.40	231.14	5,373.95	-60.93	-3.19	-60.89	0.19	0.08	25.04
5,400.00	0.40	236.11	5,398.95	-61.04	-3.33	-60.99	0.14	0.00	19.88
5,425.00	0.42	232.33	5,423.95	-61.14	-3.48	-61.09	0.13	0.08	-15.12
5,450.00	0.44	240.11	5,448.95	-61.25	-3.63	-61.19	0.25	0.08	31.12
5,475.00	0.38	239.63	5,473.95	-61.34	-3.79	-61.28	0.24	-0.24	-1.92
5,500.00	0.48	232.18	5,498.95	-61.44	-3.94	-61.39	0.46	0.40	-29.80
5,525.00	0.43	232.00	5,523.95	-61.56	-4.10	-61.51	0.20	-0.20	-0.72
5,550.00	0.37	243.04	5,548.95	-61.66	-4.24	-61.60	0.39	-0.24	44.16
5,575.00	0.35	240.62	5,573.94	-61.73	-4.38	-61.67	0.10	-0.08	-9.68
5,600.00	0.32	241.26	5,598.94	-61.80	-4.51	-61.74	0.12	-0.12	2.56
5,625.00	0.39	236.19	5,623.94	-61.88	-4.64	-61.82	0.31	0.28	-20.28
5,650.00	0.40	234.35	5,648.94	-61.98	-4.78	-61.92	0.06	0.04	-7.36
5,675.00	0.35	229.93	5,673.94	-62.08	-4.91	-62.01	0.23	-0.20	-17.68
5,700.00	0.44	228.95	5,698.94	-62.19	-5.04	-62.12	0.36	0.36	-3.92

Survey Report

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 203H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3551.80ft (Scandril Freedom)
Site:	Sec. 35, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3551.80ft (Scandril Freedom)
Well:	Eider Federal 203H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,725.00	0.35	232.14	5,723.94	-62.30	-5.18	-62.23	0.37	-0.36	12.76
5,750.00	0.41	229.21	5,748.94	-62.41	-5.30	-62.34	0.25	0.24	-11.72
5,775.00	0.31	231.96	5,773.94	-62.51	-5.42	-62.43	0.41	-0.40	11.00
5,800.00	0.33	231.99	5,798.94	-62.60	-5.53	-62.52	0.08	0.08	0.12
5,825.00	0.44	231.85	5,823.94	-62.70	-5.67	-62.62	0.44	0.44	-0.56
5,850.00	0.44	242.93	5,848.94	-62.80	-5.83	-62.72	0.34	0.00	44.32
5,875.00	0.42	237.32	5,873.94	-62.90	-5.99	-62.81	0.19	-0.08	-22.44
5,900.00	0.38	233.40	5,898.94	-62.99	-6.13	-62.91	0.19	-0.16	-15.68
5,925.00	0.47	241.38	5,923.94	-63.09	-6.29	-63.01	0.43	0.36	31.92
5,950.00	0.40	240.82	5,948.94	-63.18	-6.46	-63.10	0.28	-0.28	-2.24
5,975.00	0.38	241.82	5,973.94	-63.27	-6.61	-63.18	0.08	-0.08	4.00
6,000.00	0.37	249.05	5,998.93	-63.33	-6.75	-63.24	0.19	-0.04	28.92
6,025.00	0.35	254.60	6,023.93	-63.38	-6.90	-63.29	0.16	-0.08	22.20
6,050.00	0.40	254.87	6,048.93	-63.43	-7.06	-63.33	0.20	0.20	1.08
6,075.00	0.42	241.94	6,073.93	-63.49	-7.23	-63.39	0.38	0.08	-51.72
6,100.00	0.33	248.80	6,098.93	-63.56	-7.37	-63.46	0.40	-0.36	27.44
6,125.00	0.35	239.75	6,123.93	-63.63	-7.51	-63.52	0.23	0.08	-36.20
6,150.00	0.34	242.81	6,148.93	-63.70	-7.64	-63.59	0.08	-0.04	12.24
6,175.00	0.35	245.82	6,173.93	-63.76	-7.78	-63.66	0.08	0.04	12.04
6,200.00	0.32	247.66	6,198.93	-63.82	-7.91	-63.71	0.13	-0.12	7.36
6,225.00	0.33	240.94	6,223.93	-63.88	-8.04	-63.77	0.16	0.04	-26.88
6,250.00	0.36	234.73	6,248.93	-63.96	-8.16	-63.85	0.19	0.12	-24.84
6,275.00	0.37	237.33	6,273.93	-64.05	-8.30	-63.94	0.08	0.04	10.40
6,300.00	0.32	236.67	6,298.93	-64.13	-8.42	-64.02	0.20	-0.20	-2.64
6,325.00	0.35	240.38	6,323.93	-64.21	-8.55	-64.09	0.15	0.12	14.84
6,350.00	0.33	249.07	6,348.93	-64.27	-8.68	-64.16	0.22	-0.08	34.76
6,375.00	0.32	245.28	6,373.93	-64.33	-8.81	-64.21	0.09	-0.04	-15.16
6,400.00	0.32	241.15	6,398.93	-64.39	-8.94	-64.27	0.09	0.00	-16.52
6,425.00	0.37	241.61	6,423.93	-64.46	-9.07	-64.34	0.20	0.20	1.84
6,450.00	0.47	225.31	6,448.93	-64.57	-9.21	-64.45	0.62	0.40	-65.20
6,475.00	0.63	228.80	6,473.93	-64.74	-9.39	-64.61	0.65	0.64	13.96
6,500.00	0.58	230.72	6,498.92	-64.91	-9.59	-64.78	0.22	-0.20	7.68
6,525.00	0.65	228.20	6,523.92	-65.08	-9.79	-64.95	0.30	0.28	-10.08
6,550.00	0.64	233.57	6,548.92	-65.26	-10.01	-65.12	0.24	-0.04	21.48
6,575.00	0.73	228.67	6,573.92	-65.45	-10.24	-65.31	0.43	0.36	-19.60
6,600.00	0.75	226.84	6,598.92	-65.66	-10.48	-65.52	0.12	0.08	-7.32
6,625.00	0.67	224.53	6,623.92	-65.88	-10.70	-65.74	0.34	-0.32	-9.24
6,650.00	0.87	228.61	6,648.91	-66.11	-10.95	-65.96	0.83	0.80	16.32
6,675.00	0.79	230.18	6,673.91	-66.35	-11.22	-66.20	0.33	-0.32	6.28
6,700.00	0.87	234.06	6,698.91	-66.57	-11.51	-66.41	0.39	0.32	15.52
6,725.00	0.78	231.49	6,723.90	-66.79	-11.80	-66.63	0.39	-0.36	-10.28
6,750.00	0.84	227.71	6,748.90	-67.01	-12.07	-66.85	0.32	0.24	-15.12
6,775.00	0.83	227.32	6,773.90	-67.26	-12.33	-67.10	0.05	-0.04	-1.56
6,800.00	0.87	226.68	6,798.90	-67.51	-12.61	-67.35	0.16	0.16	-2.56

Survey Report

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 203H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3551.80ft (Scandril Freedom)
Site:	Sec. 35, T 24 S., R 32 E.	MD Reference:	KB=26' @ 3551.80ft (Scandril Freedom)
Well:	Eider Federal 203H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,825.00	0.93	223.08	6,823.89	-67.79	-12.88	-67.62	0.33	0.24	-14.40
6,850.00	0.96	223.14	6,848.89	-68.09	-13.16	-67.92	0.12	0.12	0.24
6,875.00	0.95	225.36	6,873.89	-68.39	-13.45	-68.21	0.15	-0.04	8.88
6,900.00	0.95	222.26	6,898.88	-68.69	-13.74	-68.51	0.21	0.00	-12.40
6,925.00	0.93	223.81	6,923.88	-68.99	-14.02	-68.80	0.13	-0.08	6.20
6,950.00	0.91	224.08	6,948.88	-69.28	-14.30	-69.09	0.08	-0.08	1.08
6,975.00	0.94	224.75	6,973.87	-69.57	-14.58	-69.37	0.13	0.12	2.68
7,000.00	0.96	225.69	6,998.87	-69.86	-14.88	-69.66	0.10	0.08	3.76
7,025.00	1.02	224.57	7,023.87	-70.16	-15.18	-69.96	0.25	0.24	-4.48
7,050.00	1.02	234.50	7,048.86	-70.45	-15.52	-70.25	0.71	0.00	39.72
7,075.00	1.07	235.71	7,073.86	-70.71	-15.89	-70.50	0.22	0.20	4.84
7,100.00	1.05	233.91	7,098.85	-70.98	-16.27	-70.76	0.16	-0.08	-7.20
7,125.00	1.02	234.94	7,123.85	-71.24	-16.64	-71.02	0.14	-0.12	4.12
7,150.00	1.23	241.32	7,148.85	-71.50	-17.06	-71.27	0.98	0.84	25.52
7,175.00	1.10	243.52	7,173.84	-71.73	-17.51	-71.50	0.55	-0.52	8.80
7,200.00	1.06	247.60	7,198.84	-71.93	-17.93	-71.69	0.35	-0.16	16.32
7,225.00	1.08	250.00	7,223.83	-72.10	-18.37	-71.85	0.20	0.08	9.60
7,250.00	1.10	245.99	7,248.83	-72.28	-18.81	-72.03	0.32	0.08	-16.04
7,275.00	1.19	246.41	7,273.82	-72.48	-19.27	-72.22	0.36	0.36	1.68
7,300.00	1.14	249.32	7,298.82	-72.67	-19.74	-72.41	0.31	-0.20	11.64
7,325.00	1.08	242.14	7,323.81	-72.87	-20.18	-72.60	0.61	-0.24	-28.72
7,350.00	1.05	244.35	7,348.81	-73.08	-20.59	-72.80	0.20	-0.12	8.84
7,375.00	1.07	246.69	7,373.80	-73.27	-21.02	-72.99	0.19	0.08	9.36
7,400.00	1.01	246.73	7,398.80	-73.45	-21.43	-73.16	0.24	-0.24	0.16
7,425.00	1.16	244.56	7,423.79	-73.64	-21.86	-73.35	0.62	0.60	-8.68
7,450.00	1.03	252.05	7,448.79	-73.82	-22.31	-73.53	0.77	-0.52	29.96
7,475.00	1.04	247.84	7,473.79	-73.98	-22.73	-73.68	0.31	0.04	-16.84
7,500.00	1.13	246.78	7,498.78	-74.16	-23.17	-73.85	0.37	0.36	-4.24
7,525.00	1.11	244.72	7,523.78	-74.36	-23.61	-74.05	0.18	-0.08	-8.24
7,550.00	1.14	241.26	7,548.77	-74.58	-24.05	-74.27	0.30	0.12	-13.84
7,575.00	1.14	241.45	7,573.77	-74.82	-24.48	-74.50	0.02	0.00	0.76
7,600.00	1.15	242.10	7,598.76	-75.06	-24.92	-74.73	0.07	0.04	2.60
7,625.00	1.22	240.25	7,623.76	-75.31	-25.38	-74.97	0.32	0.28	-7.40
7,650.00	1.30	240.10	7,648.75	-75.58	-25.85	-75.24	0.32	0.32	-0.60
7,675.00	1.39	243.89	7,673.74	-75.85	-26.37	-75.51	0.51	0.36	15.16
7,700.00	1.35	245.98	7,698.74	-76.11	-26.91	-75.75	0.26	-0.16	8.36
7,725.00	1.42	247.24	7,723.73	-76.35	-27.47	-75.99	0.31	0.28	5.04
7,750.00	1.52	248.88	7,748.72	-76.59	-28.06	-76.22	0.43	0.40	6.56
7,775.00	1.50	250.09	7,773.71	-76.82	-28.68	-76.44	0.15	-0.08	4.84
7,800.00	1.54	250.29	7,798.70	-77.04	-29.30	-76.66	0.16	0.16	0.80
7,825.00	1.54	251.58	7,823.69	-77.26	-29.94	-76.87	0.14	0.00	5.16
7,850.00	1.66	250.77	7,848.68	-77.49	-30.60	-77.09	0.49	0.48	-3.24
7,875.00	1.66	250.43	7,873.67	-77.73	-31.28	-77.32	0.04	0.00	-1.36

Survey Report

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 203H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3551.80ft (Scandril Freedom)
Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3551.80ft (Scandril Freedom)
Well:	Eider Federal 203H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
7,900.00	1.60	248.97	7,898.66	-77.97	-31.95	-77.56	0.29	-0.24	-5.84	
7,925.00	1.52	245.19	7,923.66	-78.24	-32.58	-77.81	0.52	-0.32	-15.12	
7,950.00	1.60	245.70	7,948.65	-78.52	-33.20	-78.09	0.32	0.32	2.04	
7,975.00	1.54	242.78	7,973.64	-78.82	-33.81	-78.38	0.40	-0.24	-11.68	
8,000.00	1.55	242.07	7,998.63	-79.13	-34.41	-78.68	0.09	0.04	-2.84	
8,025.00	1.51	242.52	8,023.62	-79.44	-35.00	-78.98	0.17	-0.16	1.80	
8,050.00	1.46	240.26	8,048.61	-79.75	-35.57	-79.29	0.31	-0.20	-9.04	
8,075.00	1.42	237.45	8,073.60	-80.08	-36.11	-79.60	0.32	-0.16	-11.24	
8,100.00	1.36	235.61	8,098.59	-80.41	-36.61	-79.93	0.30	-0.24	-7.36	
8,125.00	1.40	236.59	8,123.59	-80.75	-37.11	-80.26	0.19	0.16	3.92	
8,150.00	1.38	235.37	8,148.58	-81.09	-37.62	-80.59	0.14	-0.08	-4.88	
8,175.00	1.40	237.22	8,173.57	-81.42	-38.12	-80.92	0.20	0.08	7.40	
8,200.00	1.42	238.58	8,198.57	-81.75	-38.64	-81.24	0.16	0.08	5.44	
8,225.00	1.32	233.34	8,223.56	-82.08	-39.14	-81.57	0.64	-0.40	-20.96	
8,250.00	1.45	234.63	8,248.55	-82.44	-39.63	-81.92	0.53	0.52	5.16	
8,275.00	1.53	225.63	8,273.54	-82.85	-40.12	-82.33	0.99	0.32	-36.00	
8,300.00	1.71	216.84	8,298.53	-83.39	-40.58	-82.85	1.23	0.72	-35.16	
8,325.00	1.75	214.68	8,323.52	-84.00	-41.03	-83.46	0.31	0.16	-8.64	
8,350.00	1.86	211.38	8,348.51	-84.66	-41.45	-84.12	0.61	0.44	-13.20	
8,375.00	1.83	209.34	8,373.50	-85.35	-41.86	-84.80	0.29	-0.12	-8.16	
8,400.00	1.83	210.03	8,398.48	-86.05	-42.26	-85.49	0.09	0.00	2.76	
8,425.00	1.89	208.87	8,423.47	-86.75	-42.65	-86.19	0.28	0.24	-4.64	
8,450.00	1.91	207.53	8,448.46	-87.48	-43.05	-86.92	0.19	0.08	-5.36	
8,475.00	1.88	207.26	8,473.44	-88.22	-43.43	-87.65	0.13	-0.12	-1.08	
8,500.00	1.93	203.90	8,498.43	-88.97	-43.79	-88.39	0.49	0.20	-13.44	
8,525.00	1.93	204.14	8,523.41	-89.74	-44.13	-89.16	0.03	0.00	0.96	
8,550.00	1.92	205.88	8,548.40	-90.50	-44.48	-89.91	0.24	-0.04	6.96	
8,575.00	1.86	203.96	8,573.39	-91.24	-44.83	-90.66	0.35	-0.24	-7.68	
8,600.00	1.91	204.19	8,598.37	-92.00	-45.17	-91.40	0.20	0.20	0.92	
8,625.00	1.87	203.01	8,623.36	-92.75	-45.50	-92.16	0.22	-0.16	-4.72	
8,650.00	1.98	202.82	8,648.35	-93.52	-45.82	-92.92	0.44	0.44	-0.76	
8,675.00	1.93	202.37	8,673.33	-94.31	-46.15	-93.71	0.21	-0.20	-1.80	
8,700.00	1.96	202.09	8,698.32	-95.10	-46.47	-94.49	0.13	0.12	-1.12	
8,725.00	2.03	201.64	8,723.30	-95.90	-46.80	-95.29	0.29	0.28	-1.80	
8,750.00	1.65	198.36	8,748.29	-96.66	-47.07	-96.04	1.58	-1.52	-13.12	
8,770.00	2.23	202.89	8,768.28	-97.29	-47.31	-96.67	3.00	2.90	22.65	
Tie in to Gyro Surveys @ 8770'MD										
8,906.00	1.31	338.03	8,904.24	-98.29	-48.93	-97.65	2.42	-0.68	99.37	
First MWD Survey @ 8906'MD										
8,953.00	7.38	343.14	8,951.09	-94.90	-50.00	-94.24	12.93	12.91	10.87	
8,999.00	12.56	345.73	8,996.38	-87.22	-52.09	-86.54	11.30	11.26	5.63	
9,046.00	14.87	352.08	9,042.04	-76.29	-54.19	-75.58	5.86	4.91	13.51	
9,092.00	15.84	2.19	9,086.40	-64.17	-54.76	-63.45	6.18	2.11	21.98	
9,139.00	20.78	3.75	9,131.01	-49.43	-53.97	-48.73	10.56	10.51	3.32	

Survey Report

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 203H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3551.80ft (Scandril Freedom)
Site:	Sec. 35, T 24 S, R 32 E	MD Reference:	KB=26' @ 3551.80ft (Scandril Freedom)
Well:	Eider Federal 203H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,185.00	26.18	0.52	9,173.19	-31.12	-53.34	-30.43	12.06	11.74	-7.02
9,232.00	31.85	356.62	9,214.28	-8.36	-53.98	-7.66	12.71	12.06	-8.30
9,279.00	37.64	355.21	9,252.88	18.35	-55.91	19.07	12.44	12.32	-3.00
9,310.00	41.88	355.66	9,276.70	38.11	-57.48	38.85	13.71	13.68	1.45
9,341.00	47.63	354.70	9,298.71	59.85	-59.33	60.61	18.68	18.55	-3.10
9,372.00	53.85	354.17	9,318.32	83.72	-61.66	84.51	20.11	20.06	-1.71
9,378.98	55.33	354.21	9,322.36	89.38	-62.23	90.18	21.16	21.16	0.63
FTP @ 9378' MD (330' FSL)									
9,404.00	60.62	354.36	9,335.63	110.48	-64.34	111.30	21.16	21.16	0.58
9,435.00	65.09	353.70	9,349.77	137.91	-67.22	138.77	14.54	14.42	-2.13
9,466.00	67.78	354.14	9,362.16	166.16	-70.22	167.06	8.77	8.68	1.42
9,498.00	69.37	353.84	9,373.85	195.79	-73.34	196.72	5.04	4.97	-0.94
9,529.00	73.51	355.38	9,383.71	225.04	-76.10	226.00	14.16	13.35	4.97
9,548.00	76.67	357.12	9,388.60	243.36	-77.30	244.33	18.84	16.63	9.16
9,573.00	81.58	358.94	9,393.32	267.88	-78.14	268.87	20.90	19.64	7.28
9,626.00	89.85	1.42	9,397.27	320.69	-77.97	321.67	16.29	15.60	4.68
9,689.00	91.72	1.77	9,396.41	383.65	-76.21	384.60	3.02	2.97	0.56
9,783.00	93.69	2.21	9,391.98	477.49	-72.95	478.39	2.15	2.10	0.47
9,877.00	91.67	1.40	9,387.58	571.33	-69.99	572.19	2.31	-2.15	-0.86
9,970.00	93.41	1.81	9,383.46	664.20	-67.39	665.01	1.92	1.87	0.44
10,063.00	91.86	0.24	9,379.18	757.08	-65.73	757.87	2.37	-1.67	-1.69
10,157.00	89.59	358.24	9,377.99	851.05	-66.98	851.85	3.22	-2.41	-2.13
10,250.00	90.24	358.65	9,378.13	944.02	-69.50	944.84	0.83	0.70	0.44
10,343.00	88.95	359.09	9,378.79	1,037.00	-71.34	1,037.83	1.47	-1.39	0.47
10,436.00	90.24	359.81	9,379.45	1,129.99	-72.23	1,130.83	1.59	1.39	0.77
10,530.00	88.72	359.89	9,380.30	1,223.98	-72.48	1,224.81	1.62	-1.62	0.09
10,624.00	88.98	0.00	9,382.19	1,317.96	-72.57	1,318.79	0.30	0.28	0.12
10,718.00	90.13	359.73	9,382.92	1,411.96	-72.79	1,412.78	1.26	1.22	-0.29
10,812.00	91.64	359.95	9,381.46	1,505.94	-73.05	1,506.76	1.62	1.61	0.23
10,906.00	90.74	358.64	9,379.51	1,599.91	-74.21	1,600.74	1.69	-0.96	-1.39
11,000.00	92.20	358.35	9,377.10	1,693.85	-76.67	1,694.69	1.58	1.55	-0.31
11,095.00	92.06	357.30	9,373.57	1,788.71	-80.28	1,789.60	1.11	-0.15	-1.11
11,189.00	89.93	356.57	9,371.94	1,882.56	-85.30	1,883.50	2.40	-2.27	-0.78
11,283.00	88.64	358.31	9,373.11	1,976.45	-89.50	1,977.44	2.30	-1.37	1.85
11,377.00	90.18	358.83	9,374.08	2,070.41	-91.85	2,071.42	1.73	1.64	0.55
11,471.00	88.67	359.32	9,375.02	2,164.39	-93.36	2,165.42	1.69	-1.61	0.52
11,564.00	89.90	359.49	9,376.18	2,257.38	-94.33	2,258.41	1.34	1.32	0.18
11,658.00	88.64	359.87	9,377.38	2,351.37	-94.85	2,352.39	1.40	-1.34	0.40
11,752.00	89.96	0.42	9,378.53	2,445.36	-94.62	2,446.37	1.52	1.40	0.59
11,845.00	91.89	0.04	9,377.03	2,538.34	-94.24	2,539.34	2.12	2.08	-0.41
11,938.00	89.29	359.74	9,376.07	2,631.33	-94.42	2,632.33	2.81	-2.80	-0.32
12,033.00	91.05	0.10	9,375.79	2,726.32	-94.55	2,727.31	1.89	1.85	0.38
12,127.00	91.86	1.86	9,373.40	2,820.27	-92.95	2,821.24	2.06	0.86	1.87

Survey Report

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Elder Federal 203H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3551.80ft (Scandril Freedom)
Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3551.80ft (Scandril Freedom)
Well:	Elder Federal 203H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,221.00	87.55	0.94	9,373.88	2,914.22	-90.65	2,915.15	4.69	-4.59	-0.98
12,315.00	87.10	1.29	9,378.27	3,008.10	-88.82	3,009.00	0.61	-0.48	0.37
12,409.00	89.96	1.94	9,380.68	3,102.02	-86.18	3,102.88	3.12	3.04	0.69
12,502.00	89.93	2.02	9,380.77	3,194.97	-82.96	3,195.77	0.09	-0.03	0.09
12,595.00	90.01	1.81	9,380.82	3,287.91	-79.85	3,288.67	0.24	0.09	-0.23
12,690.00	89.99	1.72	9,380.82	3,382.87	-76.93	3,383.58	0.10	-0.02	-0.09
12,784.00	89.93	358.07	9,380.89	3,476.85	-77.10	3,477.56	3.88	-0.06	-3.88
12,878.00	90.63	357.97	9,380.43	3,570.79	-80.35	3,571.53	0.75	0.74	-0.11
12,971.00	90.24	357.42	9,379.72	3,663.72	-84.09	3,664.50	0.72	-0.42	-0.59
13,065.00	91.33	357.71	9,378.43	3,757.62	-88.08	3,758.44	1.20	1.16	0.31
13,159.00	91.83	357.04	9,375.84	3,851.49	-92.39	3,852.36	0.89	0.53	-0.71
13,252.00	91.61	358.10	9,373.05	3,944.36	-96.33	3,945.27	1.16	-0.24	1.14
13,346.00	91.58	358.30	9,370.43	4,038.28	-99.28	4,039.22	0.22	-0.03	0.21
13,439.00	91.67	358.35	9,367.80	4,131.20	-102.00	4,132.17	0.11	0.10	0.05
13,533.00	90.91	359.99	9,365.68	4,225.16	-103.36	4,226.14	1.92	-0.81	1.74
13,627.00	90.74	0.43	9,364.33	4,319.15	-103.01	4,320.12	0.50	-0.18	0.47
13,721.00	90.91	0.18	9,362.97	4,413.14	-102.51	4,414.10	0.32	0.18	-0.27
13,814.00	90.74	359.86	9,361.63	4,506.13	-102.48	4,507.08	0.39	-0.18	-0.34
13,908.00	89.99	359.73	9,361.03	4,600.13	-102.82	4,601.07	0.81	-0.80	-0.14
14,001.00	89.09	359.27	9,361.78	4,693.12	-103.63	4,694.07	1.09	-0.97	-0.49
14,095.00	89.03	0.51	9,363.32	4,787.10	-103.81	4,788.05	1.32	-0.06	1.32
14,179.00	90.60	0.36	9,363.59	4,871.10	-103.17	4,872.02	1.88	1.87	-0.18
14,273.00	90.18	358.41	9,362.95	4,965.09	-104.18	4,966.02	2.12	-0.45	-2.07
14,366.00	89.76	359.78	9,363.00	5,058.07	-105.65	5,059.01	1.54	-0.45	1.47
14,461.00	90.18	1.89	9,363.05	5,153.06	-104.26	5,153.97	2.26	0.44	2.22
14,555.00	90.32	1.73	9,362.64	5,247.01	-101.29	5,247.88	0.23	0.15	-0.17
14,648.00	89.23	0.37	9,363.01	5,339.99	-99.59	5,340.83	1.87	-1.17	-1.46
14,742.00	88.67	359.89	9,364.73	5,433.97	-99.38	5,434.80	0.78	-0.60	-0.51
14,835.00	89.06	1.37	9,366.57	5,526.95	-98.35	5,527.75	1.65	0.42	1.59
14,928.00	88.89	1.40	9,368.24	5,619.90	-96.11	5,620.68	0.19	-0.18	0.03
15,022.00	90.43	2.55	9,368.79	5,713.84	-92.87	5,714.56	2.04	1.64	1.22
15,115.00	90.55	2.36	9,368.00	5,806.75	-88.88	5,807.42	0.24	0.13	-0.20
15,209.00	91.53	2.68	9,366.29	5,900.64	-84.75	5,901.25	1.10	1.04	0.34
15,302.00	91.11	2.67	9,364.15	5,993.52	-80.41	5,994.06	0.45	-0.45	-0.01
15,395.00	91.95	3.32	9,361.67	6,086.36	-75.55	6,086.83	1.14	0.90	0.70
15,489.00	92.82	2.06	9,357.76	6,180.17	-71.15	6,180.57	1.63	0.93	-1.34
15,582.00	92.06	0.43	9,353.80	6,273.06	-69.13	6,273.43	1.93	-0.82	-1.75
15,676.00	90.55	359.98	9,351.66	6,367.03	-68.79	6,367.39	1.68	-1.61	-0.48
15,769.00	89.15	356.97	9,351.90	6,459.99	-71.27	6,460.37	3.57	-1.51	-3.24
15,862.00	88.75	356.72	9,353.60	6,552.83	-76.38	6,553.27	0.51	-0.43	-0.27
15,956.00	89.54	357.26	9,355.01	6,646.69	-81.32	6,647.18	1.02	0.84	0.57
16,049.00	90.43	357.80	9,355.03	6,739.60	-85.33	6,740.14	1.12	0.96	0.58
16,143.00	90.55	358.21	9,354.23	6,833.54	-88.60	6,834.11	0.45	0.13	0.44

Survey Report

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Eider Federal 203H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3551.80ft (Scandrill Freedom)
Site:	Sec. 35, T 24 S., R 32 E	MD Reference:	KB=26' @ 3551.80ft (Scandrill Freedom)
Well:	Eider Federal 203H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,236.00	90.27	358.69	9,353.56	6,926.50	-91.12	6,927.10	0.60	-0.30	0.52
16,330.00	90.77	359.92	9,352.71	7,020.49	-92.26	7,021.10	1.41	0.53	1.31
16,424.00	90.80	0.59	9,351.42	7,114.48	-91.84	7,115.07	0.71	0.03	0.71
16,518.00	90.21	359.48	9,350.59	7,208.47	-91.78	7,209.06	1.34	-0.63	-1.18
16,612.00	89.23	357.34	9,351.05	7,302.43	-94.39	7,303.04	2.50	-1.04	-2.28
16,658.49	89.31	358.08	9,351.64	7,348.88	-96.25	7,349.51	1.60	0.18	1.59
LTP @ 16658'MD (330'FNL)									
16,706.00	89.40	358.83	9,352.17	7,396.37	-97.53	7,397.01	1.60	0.18	1.59
Last MWD Survey @ 16706'MD									
16,764.00	89.40	358.83	9,352.78	7,454.35	-98.71	7,455.01	0.00	0.00	0.00
PTB @ TD @ 16764'MD									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
8,770.00	8,768.28	-97.29	-47.31	Tie in to Gyro Surveys @ 8770'MD
8,906.00	8,904.24	-98.29	-48.93	First MWD Survey @ 8906'MD
9,378.98	9,322.36	89.38	-62.23	FTP @ 9378'MD (330'FSL)
16,658.49	9,351.64	7,348.88	-96.25	LTP @ 16658'MD (330'FNL)
16,706.00	9,352.17	7,396.37	-97.53	Last MWD Survey @ 16706'MD
16,764.00	9,352.78	7,454.35	-98.71	PTB @ TD @ 16764'MD

Checked By: _____	Approved By: _____	Date: _____
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