

COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 1, T 24-S. , R 34-E

Mortarboard Federal Com 13H

HOBBS OCD

DEC 20 2018

RECEIVED

Wellbore #2- ST01

Design: Wellbore #2- ST01

Survey Report - Geographic

06 August, 2018

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Mortarboard Federal Com 13H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=23' @ 3493.00ft (Noram 23)
Site:	Sec. 1, T 24-S., R 34-E	MD Reference:	KB=23' @ 3493.00ft (Noram 23)
Well:	Mortarboard Federal Com 13H	North Reference:	Grid
Wellbore:	Wellbore #2- ST01	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #2- ST01	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. 1, T 24-S., R 34-E			
Site Position:		Northing:	456,986.10 usft	Latitude:	32.25311
From:	Map	Easting:	780,685.90 usft	Longitude:	-103.42540
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.48 °

Well	Mortarboard Federal Com 13H, ACTIVE					
Well Position	+N/-S	0.00 ft	Northing:	456,986.10 usf	Latitude:	32.25311
	+E/-W	0.00 ft	Easting:	780,685.90 usf	Longitude:	-103.42540
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	3,464.00 ft

Wellbore	Wellbore #2- ST01				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	7/11/2018	6.75	60.00	48,037

Design	Wellbore #2- ST01				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	11,483.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	179.36	

Survey Program	Date 8/6/2018				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
100.00	11,040.00	Keeper Gyros (Wellbore #1)	Keeper	Standard Wireline Keeper ver 1.0.2	
11,153.00	11,483.00	MWD Surveys (Wellbore #1)	MWD	MWD - Standard	
11,510.00	18,995.00	MWD Surveys (Wellbore #2- ST01)	MWD	MWD - Standard	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	456,986.10	780,685.90	32.25311	-103.42540	
100.00	0.37	161.74	100.00	-0.31	0.10	456,985.79	780,686.00	32.25311	-103.42540	
125.00	0.36	180.06	125.00	-0.46	0.13	456,985.64	780,686.02	32.25311	-103.42540	
150.00	0.28	173.50	150.00	-0.60	0.13	456,985.50	780,686.03	32.25311	-103.42540	
175.00	0.32	171.34	175.00	-0.73	0.15	456,985.37	780,686.05	32.25311	-103.42540	
200.00	0.42	164.69	200.00	-0.89	0.19	456,985.21	780,686.08	32.25311	-103.42539	
225.00	0.44	158.56	225.00	-1.07	0.24	456,985.03	780,686.14	32.25311	-103.42539	
250.00	0.42	159.18	250.00	-1.24	0.31	456,984.86	780,686.21	32.25311	-103.42539	
275.00	0.38	168.71	275.00	-1.41	0.36	456,984.69	780,686.26	32.25311	-103.42539	
300.00	0.40	143.20	299.99	-1.56	0.43	456,984.54	780,686.33	32.25311	-103.42539	

Survey Report - Geographic

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Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=23' @ 3493.00ft (Noram 23)
Site:	Sec. 1, T 24-S., R 34-E	MD Reference:	KB=23' @ 3493.00ft (Noram 23)
Well:	Mortarboard Federal Com 13H	North Reference:	Grid
Wellbore:	Wellbore #2- ST01	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #2- ST01	Database:	EDM 5000.1

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
325.00	0.36	160.22	324.99	-1.70	0.51	456,984.40	780,686.41	32.25311	-103.42539
350.00	0.41	165.60	349.99	-1.86	0.56	456,984.24	780,686.45	32.25310	-103.42539
375.00	0.44	155.50	374.99	-2.04	0.62	456,984.06	780,686.52	32.25310	-103.42539
400.00	0.43	161.27	399.99	-2.21	0.69	456,983.89	780,686.59	32.25310	-103.42539
425.00	0.40	162.50	424.99	-2.39	0.75	456,983.71	780,686.64	32.25310	-103.42539
450.00	0.37	156.51	449.99	-2.54	0.80	456,983.56	780,686.70	32.25310	-103.42539
475.00	0.32	145.09	474.99	-2.67	0.88	456,983.43	780,686.77	32.25310	-103.42539
500.00	0.20	143.21	499.99	-2.77	0.94	456,983.33	780,686.84	32.25310	-103.42539
525.00	0.32	165.09	524.99	-2.87	0.99	456,983.23	780,686.88	32.25310	-103.42539
550.00	0.32	138.84	549.99	-2.99	1.05	456,983.11	780,686.95	32.25310	-103.42539
575.00	0.21	160.61	574.99	-3.08	1.11	456,983.02	780,687.01	32.25310	-103.42539
600.00	0.23	174.35	599.99	-3.18	1.13	456,982.92	780,687.03	32.25310	-103.42539
625.00	0.20	157.84	624.99	-3.27	1.15	456,982.83	780,687.05	32.25310	-103.42539
650.00	0.20	169.78	649.99	-3.35	1.18	456,982.75	780,687.07	32.25310	-103.42539
675.00	0.19	172.34	674.99	-3.44	1.19	456,982.66	780,687.09	32.25310	-103.42539
700.00	0.16	175.10	699.99	-3.51	1.20	456,982.59	780,687.10	32.25310	-103.42539
725.00	0.09	168.37	724.99	-3.57	1.21	456,982.53	780,687.10	32.25310	-103.42539
750.00	0.07	177.16	749.99	-3.60	1.21	456,982.50	780,687.11	32.25310	-103.42539
775.00	0.15	229.87	774.99	-3.64	1.19	456,982.46	780,687.08	32.25310	-103.42539
800.00	0.13	183.02	799.99	-3.69	1.16	456,982.41	780,687.06	32.25310	-103.42539
825.00	0.13	197.60	824.99	-3.74	1.15	456,982.36	780,687.05	32.25310	-103.42539
850.00	0.05	171.70	849.99	-3.78	1.14	456,982.32	780,687.04	32.25310	-103.42539
875.00	0.10	214.58	874.99	-3.81	1.13	456,982.29	780,687.03	32.25310	-103.42539
900.00	0.11	191.82	899.99	-3.85	1.11	456,982.25	780,687.01	32.25310	-103.42539
925.00	0.04	279.08	924.99	-3.87	1.10	456,982.23	780,687.00	32.25310	-103.42539
950.00	0.06	307.47	949.99	-3.86	1.08	456,982.24	780,686.98	32.25310	-103.42539
975.00	0.14	301.29	974.99	-3.84	1.05	456,982.26	780,686.94	32.25310	-103.42539
1,000.00	0.21	298.02	999.99	-3.80	0.98	456,982.30	780,686.88	32.25310	-103.42539
1,025.00	0.13	302.92	1,024.99	-3.76	0.91	456,982.34	780,686.81	32.25310	-103.42539
1,050.00	0.16	331.88	1,049.99	-3.72	0.87	456,982.38	780,686.77	32.25310	-103.42539
1,075.00	0.29	322.54	1,074.99	-3.64	0.82	456,982.46	780,686.72	32.25310	-103.42539
1,100.00	0.28	320.62	1,099.99	-3.54	0.74	456,982.56	780,686.64	32.25310	-103.42539
1,125.00	0.22	347.91	1,124.99	-3.44	0.69	456,982.66	780,686.59	32.25310	-103.42539
1,150.00	0.32	359.88	1,149.99	-3.33	0.68	456,982.77	780,686.58	32.25310	-103.42539
1,175.00	0.24	343.98	1,174.99	-3.21	0.67	456,982.89	780,686.57	32.25310	-103.42539
1,200.00	0.26	330.06	1,199.99	-3.11	0.63	456,982.99	780,686.52	32.25310	-103.42539
1,225.00	0.27	351.69	1,224.99	-3.00	0.59	456,983.10	780,686.49	32.25310	-103.42539
1,250.00	0.33	337.68	1,249.99	-2.88	0.55	456,983.22	780,686.45	32.25310	-103.42539
1,275.00	0.28	334.80	1,274.99	-2.75	0.50	456,983.35	780,686.40	32.25310	-103.42539
1,300.00	0.30	328.75	1,299.99	-2.64	0.44	456,983.46	780,686.34	32.25310	-103.42539
1,325.00	0.33	340.58	1,324.98	-2.52	0.38	456,983.58	780,686.28	32.25310	-103.42539
1,350.00	0.30	342.24	1,349.98	-2.39	0.34	456,983.71	780,686.24	32.25310	-103.42539
1,375.00	0.34	333.02	1,374.98	-2.26	0.28	456,983.84	780,686.18	32.25310	-103.42539
1,400.00	0.29	329.53	1,399.98	-2.14	0.22	456,983.96	780,686.12	32.25310	-103.42539
1,425.00	0.35	322.14	1,424.98	-2.02	0.14	456,984.08	780,686.04	32.25310	-103.42540
1,450.00	0.41	321.88	1,449.98	-1.89	0.04	456,984.21	780,685.94	32.25310	-103.42540
1,475.00	0.41	306.39	1,474.98	-1.77	-0.09	456,984.33	780,685.81	32.25310	-103.42540
1,500.00	0.44	319.71	1,499.98	-1.64	-0.22	456,984.46	780,685.67	32.25311	-103.42540
1,525.00	0.35	320.06	1,524.98	-1.51	-0.33	456,984.59	780,685.56	32.25311	-103.42540
1,550.00	0.43	316.41	1,549.98	-1.39	-0.45	456,984.71	780,685.45	32.25311	-103.42540
1,575.00	0.51	310.62	1,574.98	-1.25	-0.60	456,984.85	780,685.30	32.25311	-103.42540
1,600.00	0.35	317.58	1,599.98	-1.12	-0.73	456,984.98	780,685.16	32.25311	-103.42540
1,625.00	0.32	320.83	1,624.98	-1.01	-0.83	456,985.09	780,685.07	32.25311	-103.42540
1,650.00	0.38	318.22	1,649.98	-0.89	-0.93	456,985.21	780,684.97	32.25311	-103.42540
1,675.00	0.29	314.58	1,674.98	-0.78	-1.03	456,985.32	780,684.87	32.25311	-103.42540

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Section:	Sec. 1, T 24-S., R 34-E	MD Reference:	KB=23' @ 3493.00ft (Noram 23)
Well:	Mortarboard Federal Com 13H	North Reference:	Grid
Wellbore:	Wellbore #2- ST01	Survey Calculation Method:	Minimum Curvature
Wellbore Ign:	Wellbore #2- ST01	Database:	EDM 5000.1

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,700.00	0.50	331.16	1,699.98	-0.64	-1.13	456,985.46	780,684.77	32.25311	-103.42540
1,725.00	0.37	331.42	1,724.98	-0.48	-1.22	456,985.62	780,684.68	32.25311	-103.42540
1,750.00	0.38	337.27	1,749.98	-0.33	-1.29	456,985.77	780,684.61	32.25311	-103.42540
1,775.00	0.42	326.37	1,774.98	-0.18	-1.37	456,985.92	780,684.53	32.25311	-103.42540
1,800.00	0.59	327.61	1,799.97	0.01	-1.49	456,986.11	780,684.41	32.25311	-103.42540
1,825.00	0.50	325.85	1,824.97	0.21	-1.62	456,986.31	780,684.28	32.25311	-103.42540
1,850.00	0.54	329.55	1,849.97	0.40	-1.74	456,986.50	780,684.16	32.25311	-103.42540
1,875.00	0.56	335.44	1,874.97	0.61	-1.85	456,986.71	780,684.05	32.25311	-103.42540
1,900.00	0.48	332.09	1,899.97	0.81	-1.95	456,986.91	780,683.95	32.25311	-103.42540
1,925.00	0.54	350.66	1,924.97	1.02	-2.02	456,987.12	780,683.88	32.25311	-103.42540
1,950.00	0.60	337.42	1,949.97	1.26	-2.09	456,987.36	780,683.81	32.25311	-103.42540
1,975.00	0.56	325.50	1,974.97	1.48	-2.21	456,987.58	780,683.69	32.25311	-103.42540
2,000.00	0.61	332.27	1,999.96	1.70	-2.34	456,987.80	780,683.56	32.25311	-103.42540
2,025.00	0.55	336.36	2,024.96	1.93	-2.45	456,988.03	780,683.45	32.25312	-103.42540
2,050.00	0.56	339.81	2,049.96	2.15	-2.54	456,988.25	780,683.36	32.25312	-103.42540
2,075.00	0.64	343.06	2,074.96	2.40	-2.62	456,988.50	780,683.27	32.25312	-103.42540
2,100.00	0.64	333.59	2,099.96	2.66	-2.73	456,988.76	780,683.17	32.25312	-103.42540
2,125.00	0.53	337.13	2,124.96	2.89	-2.83	456,988.99	780,683.06	32.25312	-103.42540
2,150.00	0.54	346.86	2,149.96	3.11	-2.90	456,989.21	780,682.99	32.25312	-103.42540
2,175.00	0.65	330.85	2,174.96	3.35	-3.00	456,989.45	780,682.90	32.25312	-103.42541
2,200.00	0.66	355.20	2,199.95	3.62	-3.08	456,989.72	780,682.82	32.25312	-103.42541
2,225.00	0.65	346.27	2,224.95	3.90	-3.13	456,990.00	780,682.77	32.25312	-103.42541
2,250.00	0.73	353.42	2,249.95	4.20	-3.18	456,990.30	780,682.72	32.25312	-103.42541
2,275.00	0.75	342.66	2,274.95	4.51	-3.25	456,990.61	780,682.65	32.25312	-103.42541
2,300.00	0.67	347.66	2,299.95	4.81	-3.33	456,990.91	780,682.57	32.25312	-103.42541
2,325.00	0.77	351.23	2,324.94	5.12	-3.38	456,991.22	780,682.51	32.25312	-103.42541
2,350.00	0.80	353.68	2,349.94	5.46	-3.43	456,991.56	780,682.47	32.25312	-103.42541
2,375.00	0.84	348.33	2,374.94	5.81	-3.48	456,991.91	780,682.41	32.25313	-103.42541
2,400.00	0.86	351.06	2,399.94	6.17	-3.55	456,992.27	780,682.35	32.25313	-103.42541
2,425.00	0.84	359.42	2,424.93	6.54	-3.58	456,992.64	780,682.32	32.25313	-103.42541
2,450.00	1.01	356.99	2,449.93	6.95	-3.60	456,993.05	780,682.30	32.25313	-103.42541
2,475.00	1.06	0.87	2,474.93	7.40	-3.60	456,993.50	780,682.29	32.25313	-103.42541
2,500.00	1.22	11.68	2,499.92	7.89	-3.55	456,993.99	780,682.35	32.25313	-103.42541
2,525.00	1.15	2.05	2,524.92	8.40	-3.48	456,994.50	780,682.41	32.25313	-103.42541
2,550.00	1.23	10.85	2,549.91	8.92	-3.42	456,995.02	780,682.47	32.25313	-103.42541
2,575.00	1.41	19.96	2,574.90	9.47	-3.27	456,995.57	780,682.63	32.25314	-103.42541
2,600.00	1.33	3.54	2,599.90	10.05	-3.14	456,996.15	780,682.75	32.25314	-103.42541
2,625.00	1.25	2.28	2,624.89	10.61	-3.12	456,996.71	780,682.78	32.25314	-103.42541
2,650.00	1.30	6.45	2,649.89	11.16	-3.07	456,997.26	780,682.82	32.25314	-103.42541
2,675.00	1.35	5.64	2,674.88	11.74	-3.01	456,997.84	780,682.88	32.25314	-103.42540
2,700.00	1.47	11.13	2,699.87	12.35	-2.92	456,998.45	780,682.98	32.25314	-103.42540
2,725.00	1.45	4.73	2,724.86	12.98	-2.83	456,999.08	780,683.06	32.25315	-103.42540
2,750.00	1.47	6.11	2,749.85	13.61	-2.77	456,999.71	780,683.12	32.25315	-103.42540
2,775.00	1.48	7.68	2,774.85	14.25	-2.70	457,000.35	780,683.20	32.25315	-103.42540
2,800.00	1.50	5.16	2,799.84	14.89	-2.62	457,000.99	780,683.27	32.25315	-103.42540
2,825.00	1.52	2.18	2,824.83	15.55	-2.58	457,001.65	780,683.32	32.25315	-103.42540
2,850.00	1.53	2.92	2,849.82	16.22	-2.55	457,002.32	780,683.35	32.25315	-103.42540
2,875.00	1.66	6.11	2,874.81	16.91	-2.50	457,003.01	780,683.40	32.25316	-103.42540
2,900.00	1.65	6.83	2,899.80	17.63	-2.42	457,003.73	780,683.48	32.25316	-103.42540
2,925.00	1.59	5.69	2,924.79	18.33	-2.34	457,004.43	780,683.56	32.25316	-103.42540
2,950.00	1.66	3.56	2,949.78	19.04	-2.28	457,005.14	780,683.62	32.25316	-103.42540
2,975.00	1.68	5.10	2,974.77	19.76	-2.23	457,005.86	780,683.67	32.25316	-103.42540
3,000.00	1.67	5.24	2,999.76	20.49	-2.16	457,006.59	780,683.74	32.25317	-103.42540
3,025.00	1.72	9.43	3,024.75	21.22	-2.07	457,007.32	780,683.83	32.25317	-103.42540
3,050.00	1.76	9.31	3,049.74	21.97	-1.94	457,008.07	780,683.96	32.25317	-103.42540

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Mortarboard Federal Com 13H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=23' @ 3493.00ft (Noram 23)
Section:	Sec. 1, T 24-S., R 34-E	MD Reference:	KB=23' @ 3493.00ft (Noram 23)
Well:	Mortarboard Federal Com 13H	North Reference:	Grid
Wellbore:	Wellbore #2- ST01	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #2- ST01	Database:	EDM 5000.1

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
3,075.00	1.50	7.94	3,074.73	22.67	-1.83	457,008.77	780,684.06	32.25317	-103.42540
3,100.00	1.13	357.79	3,099.72	23.24	-1.80	457,009.35	780,684.10	32.25317	-103.42540
3,125.00	1.01	2.02	3,124.72	23.71	-1.80	457,009.81	780,684.10	32.25318	-103.42540
3,150.00	1.02	4.96	3,149.71	24.15	-1.77	457,010.25	780,684.12	32.25318	-103.42540
3,175.00	1.03	7.01	3,174.71	24.60	-1.73	457,010.70	780,684.17	32.25318	-103.42540
3,200.00	1.12	3.50	3,199.70	25.07	-1.68	457,011.17	780,684.21	32.25318	-103.42540
3,225.00	1.12	1.35	3,224.70	25.55	-1.66	457,011.65	780,684.23	32.25318	-103.42540
3,250.00	1.13	9.74	3,249.69	26.04	-1.62	457,012.14	780,684.28	32.25318	-103.42540
3,275.00	1.20	7.17	3,274.69	26.54	-1.54	457,012.64	780,684.36	32.25318	-103.42540
3,300.00	1.19	8.29	3,299.68	27.06	-1.47	457,013.16	780,684.43	32.25318	-103.42540
3,325.00	1.19	2.94	3,324.68	27.58	-1.42	457,013.68	780,684.48	32.25319	-103.42540
3,350.00	1.20	6.14	3,349.67	28.10	-1.38	457,014.20	780,684.52	32.25319	-103.42540
3,375.00	1.29	9.13	3,374.67	28.63	-1.31	457,014.73	780,684.59	32.25319	-103.42540
3,400.00	1.32	9.24	3,399.66	29.20	-1.22	457,015.30	780,684.68	32.25319	-103.42540
3,425.00	1.25	11.08	3,424.65	29.75	-1.12	457,015.85	780,684.78	32.25319	-103.42540
3,450.00	1.05	36.27	3,449.65	30.20	-0.93	457,016.30	780,684.97	32.25319	-103.42540
3,475.00	1.34	6.57	3,474.64	30.67	-0.76	457,016.77	780,685.14	32.25319	-103.42540
3,500.00	1.33	13.16	3,499.64	31.25	-0.66	457,017.35	780,685.24	32.25320	-103.42540
3,525.00	1.45	10.59	3,524.63	31.84	-0.54	457,017.94	780,685.36	32.25320	-103.42540
3,550.00	1.24	15.57	3,549.62	32.41	-0.41	457,018.51	780,685.49	32.25320	-103.42540
3,575.00	1.48	11.15	3,574.62	32.99	-0.27	457,019.09	780,685.63	32.25320	-103.42540
3,600.00	1.34	12.88	3,599.61	33.59	-0.14	457,019.69	780,685.75	32.25320	-103.42540
3,625.00	1.40	12.60	3,624.60	34.17	-0.01	457,020.27	780,685.89	32.25320	-103.42539
3,650.00	1.33	16.04	3,649.59	34.75	0.13	457,020.85	780,686.03	32.25321	-103.42539
3,675.00	1.25	17.97	3,674.59	35.29	0.30	457,021.39	780,686.20	32.25321	-103.42539
3,700.00	1.45	8.28	3,699.58	35.86	0.43	457,021.96	780,686.33	32.25321	-103.42539
3,725.00	1.21	14.20	3,724.57	36.43	0.54	457,022.53	780,686.44	32.25321	-103.42539
3,750.00	1.17	17.21	3,749.57	36.93	0.68	457,023.03	780,686.58	32.25321	-103.42539
3,775.00	1.25	8.71	3,774.56	37.44	0.80	457,023.54	780,686.69	32.25321	-103.42539
3,800.00	1.26	10.29	3,799.56	37.98	0.89	457,024.08	780,686.78	32.25321	-103.42539
3,825.00	1.31	10.15	3,824.55	38.54	0.99	457,024.64	780,686.88	32.25322	-103.42539
3,850.00	1.30	8.25	3,849.54	39.10	1.08	457,025.20	780,686.97	32.25322	-103.42539
3,875.00	1.36	4.11	3,874.54	39.67	1.14	457,025.77	780,687.04	32.25322	-103.42539
3,900.00	1.38	1.66	3,899.53	40.27	1.17	457,026.37	780,687.07	32.25322	-103.42539
3,925.00	1.24	12.20	3,924.52	40.84	1.23	457,026.94	780,687.13	32.25322	-103.42539
3,950.00	1.25	23.60	3,949.52	41.35	1.40	457,027.45	780,687.30	32.25322	-103.42539
3,975.00	1.20	21.68	3,974.51	41.84	1.61	457,027.94	780,687.50	32.25322	-103.42539
4,000.00	1.19	24.16	3,999.51	42.32	1.81	457,028.42	780,687.71	32.25323	-103.42539
4,025.00	1.30	28.63	4,024.50	42.81	2.05	457,028.91	780,687.95	32.25323	-103.42539
4,050.00	1.34	36.48	4,049.49	43.29	2.36	457,029.39	780,688.26	32.25323	-103.42539
4,075.00	1.47	50.92	4,074.49	43.73	2.78	457,029.83	780,688.68	32.25323	-103.42539
4,100.00	1.71	56.51	4,099.48	44.14	3.34	457,030.24	780,689.24	32.25323	-103.42538
4,125.00	1.64	67.41	4,124.47	44.48	3.99	457,030.58	780,689.88	32.25323	-103.42538
4,150.00	1.74	65.03	4,149.46	44.78	4.66	457,030.88	780,690.56	32.25323	-103.42538
4,175.00	1.87	64.24	4,174.44	45.12	5.37	457,031.22	780,691.27	32.25323	-103.42538
4,200.00	2.10	70.76	4,199.43	45.45	6.17	457,031.55	780,692.07	32.25323	-103.42537
4,225.00	2.17	73.58	4,224.41	45.73	7.06	457,031.83	780,692.96	32.25324	-103.42537
4,250.00	2.24	72.54	4,249.39	46.01	7.98	457,032.11	780,693.88	32.25324	-103.42537
4,275.00	2.12	75.08	4,274.37	46.28	8.89	457,032.38	780,694.79	32.25324	-103.42537
4,300.00	2.20	75.61	4,299.36	46.51	9.80	457,032.61	780,695.70	32.25324	-103.42536
4,325.00	2.17	80.04	4,324.34	46.72	10.73	457,032.82	780,696.63	32.25324	-103.42536
4,350.00	2.06	78.86	4,349.32	46.88	11.64	457,032.98	780,697.54	32.25324	-103.42536
4,375.00	2.00	82.78	4,374.31	47.03	12.51	457,033.13	780,698.41	32.25324	-103.42535
4,400.00	1.83	86.32	4,399.29	47.11	13.35	457,033.21	780,699.24	32.25324	-103.42535
4,425.00	1.80	89.00	4,424.28	47.14	14.14	457,033.24	780,700.03	32.25324	-103.42535

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Mortarboard Federal Corn 13H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=23' @ 3493.00ft (Noram 23)
Site:	Sec. 1, T 24-S., R 34-E	MD Reference:	KB=23' @ 3493.00ft (Noram 23)
Well:	Mortarboard Federal Corn 13H	North Reference:	Grid
Wellbore:	Wellbore #2- ST01	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #2- ST01	Database:	EDM 5000.1

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,450.00	1.82	92.92	4,449.27	47.13	14.93	457,033.23	780,700.82	32.25324	-103.42535	
4,475.00	1.88	92.38	4,474.25	47.09	15.73	457,033.19	780,701.63	32.25324	-103.42534	
4,500.00	2.03	92.82	4,499.24	47.05	16.58	457,033.15	780,702.48	32.25324	-103.42534	
4,525.00	2.15	94.37	4,524.22	46.99	17.49	457,033.09	780,703.39	32.25324	-103.42534	
4,550.00	2.23	92.42	4,549.20	46.94	18.45	457,033.04	780,704.34	32.25324	-103.42533	
4,575.00	2.03	89.49	4,574.19	46.92	19.38	457,033.02	780,705.27	32.25324	-103.42533	
4,600.00	2.14	89.69	4,599.17	46.93	20.29	457,033.03	780,706.18	32.25324	-103.42533	
4,625.00	2.12	84.15	4,624.15	46.98	21.21	457,033.08	780,707.11	32.25324	-103.42533	
4,650.00	2.17	86.40	4,649.14	47.05	22.14	457,033.15	780,708.04	32.25324	-103.42532	
4,675.00	2.18	86.23	4,674.12	47.11	23.09	457,033.21	780,708.99	32.25324	-103.42532	
4,700.00	2.32	86.75	4,699.10	47.17	24.07	457,033.27	780,709.97	32.25324	-103.42532	
4,725.00	2.33	87.68	4,724.08	47.22	25.08	457,033.32	780,710.98	32.25324	-103.42531	
4,750.00	2.25	87.47	4,749.06	47.26	26.08	457,033.36	780,711.98	32.25324	-103.42531	
4,775.00	2.18	92.13	4,774.04	47.27	27.05	457,033.37	780,712.94	32.25324	-103.42531	
4,800.00	2.13	101.23	4,799.02	47.16	27.98	457,033.26	780,713.88	32.25324	-103.42530	
4,825.00	2.07	102.45	4,824.00	46.97	28.87	457,033.07	780,714.77	32.25324	-103.42530	
4,850.00	1.94	104.63	4,848.99	46.77	29.72	457,032.87	780,715.62	32.25324	-103.42530	
4,875.00	2.13	108.42	4,873.97	46.51	30.58	457,032.61	780,716.47	32.25324	-103.42530	
4,900.00	2.21	109.03	4,898.96	46.21	31.47	457,032.31	780,717.37	32.25324	-103.42529	
4,925.00	2.22	111.32	4,923.94	45.88	32.38	457,031.98	780,718.28	32.25324	-103.42529	
4,950.00	2.05	118.27	4,948.92	45.49	33.22	457,031.59	780,719.12	32.25323	-103.42529	
4,975.00	1.74	135.19	4,973.91	45.01	33.88	457,031.11	780,719.78	32.25323	-103.42528	
5,000.00	1.36	156.07	4,998.90	44.47	34.27	457,030.57	780,720.17	32.25323	-103.42528	
5,025.00	1.35	160.25	5,023.89	43.92	34.49	457,030.02	780,720.39	32.25323	-103.42528	
5,050.00	1.38	164.71	5,048.88	43.35	34.67	457,029.45	780,720.57	32.25323	-103.42528	
5,075.00	1.37	165.15	5,073.88	42.77	34.83	457,028.87	780,720.72	32.25323	-103.42528	
5,100.00	1.30	166.65	5,098.87	42.21	34.97	457,028.31	780,720.87	32.25323	-103.42528	
5,125.00	1.38	161.95	5,123.86	41.65	35.13	457,027.75	780,721.03	32.25322	-103.42528	
5,150.00	1.31	171.12	5,148.86	41.08	35.27	457,027.18	780,721.16	32.25322	-103.42528	
5,175.00	1.33	167.37	5,173.85	40.51	35.37	457,026.61	780,721.27	32.25322	-103.42528	
5,200.00	1.19	169.36	5,198.84	39.97	35.48	457,026.07	780,721.38	32.25322	-103.42528	
5,225.00	1.26	171.60	5,223.84	39.45	35.57	457,025.55	780,721.47	32.25322	-103.42528	
5,250.00	1.26	172.72	5,248.83	38.90	35.65	457,025.00	780,721.54	32.25322	-103.42528	
5,275.00	1.32	166.57	5,273.82	38.35	35.75	457,024.45	780,721.65	32.25321	-103.42528	
5,300.00	1.25	167.71	5,298.82	37.80	35.87	457,023.90	780,721.77	32.25321	-103.42528	
5,325.00	1.24	171.06	5,323.81	37.27	35.97	457,023.37	780,721.87	32.25321	-103.42528	
5,350.00	1.23	166.16	5,348.81	36.74	36.08	457,022.84	780,721.98	32.25321	-103.42528	
5,375.00	1.14	163.76	5,373.80	36.24	36.21	457,022.34	780,722.11	32.25321	-103.42528	
5,400.00	1.22	153.37	5,398.80	35.77	36.40	457,021.87	780,722.30	32.25321	-103.42528	
5,425.00	1.05	164.22	5,423.79	35.31	36.58	457,021.41	780,722.48	32.25321	-103.42528	
5,450.00	1.16	157.21	5,448.79	34.85	36.74	457,020.95	780,722.64	32.25320	-103.42528	
5,475.00	1.04	160.84	5,473.78	34.41	36.92	457,020.51	780,722.81	32.25320	-103.42528	
5,500.00	1.02	160.17	5,498.78	33.98	37.07	457,020.08	780,722.96	32.25320	-103.42527	
5,525.00	1.02	159.30	5,523.77	33.56	37.22	457,019.66	780,723.12	32.25320	-103.42527	
5,550.00	1.03	160.50	5,548.77	33.14	37.37	457,019.24	780,723.27	32.25320	-103.42527	
5,575.00	0.91	163.19	5,573.77	32.74	37.51	457,018.84	780,723.40	32.25320	-103.42527	
5,600.00	0.96	157.22	5,598.76	32.36	37.65	457,018.46	780,723.54	32.25320	-103.42527	
5,625.00	0.93	160.04	5,623.76	31.98	37.80	457,018.08	780,723.69	32.25320	-103.42527	
5,650.00	0.89	158.68	5,648.76	31.60	37.94	457,017.70	780,723.83	32.25320	-103.42527	
5,675.00	0.88	162.16	5,673.75	31.24	38.07	457,017.34	780,723.96	32.25319	-103.42527	
5,700.00	0.85	162.89	5,698.75	30.88	38.18	457,016.98	780,724.08	32.25319	-103.42527	
5,725.00	0.82	161.75	5,723.75	30.53	38.29	457,016.63	780,724.19	32.25319	-103.42527	
5,750.00	0.79	164.66	5,748.75	30.20	38.39	457,016.30	780,724.29	32.25319	-103.42527	
5,775.00	0.79	171.75	5,773.74	29.86	38.46	457,015.96	780,724.36	32.25319	-103.42527	
5,800.00	0.76	162.02	5,798.74	29.53	38.54	457,015.63	780,724.43	32.25319	-103.42527	

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Mortarboard Federal Com 13H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=23' @ 3493.00ft (Noram 23)
Site:	Sec. 1, T 24-S., R 34-E	MD Reference:	KB=23' @ 3493.00ft (Noram 23)
Well:	Mortarboard Federal Com 13H	North Reference:	Grid
Wellbore:	Wellbore #2- ST01	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #2- ST01	Database:	EDM 5000:1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,825.00	0.70	169.48	5,823.74	29.22	38.62	457,015.32	780,724.51	32.25319	-103.42527
5,850.00	0.47	180.50	5,848.74	28.97	38.64	457,015.07	780,724.54	32.25319	-103.42527
5,875.00	0.35	221.16	5,873.74	28.81	38.59	457,014.91	780,724.49	32.25319	-103.42527
5,900.00	0.62	178.57	5,898.74	28.62	38.55	457,014.72	780,724.44	32.25319	-103.42527
5,925.00	0.80	161.64	5,923.73	28.32	38.60	457,014.42	780,724.50	32.25319	-103.42527
5,950.00	0.74	167.20	5,948.73	28.00	38.69	457,014.10	780,724.59	32.25319	-103.42527
5,975.00	0.60	167.87	5,973.73	27.71	38.76	457,013.81	780,724.66	32.25319	-103.42527
6,000.00	0.66	167.15	5,998.73	27.44	38.82	457,013.54	780,724.71	32.25318	-103.42527
6,025.00	0.62	180.02	6,023.73	27.17	38.85	457,013.27	780,724.75	32.25318	-103.42527
6,050.00	0.58	177.78	6,048.73	26.90	38.85	457,013.00	780,724.75	32.25318	-103.42527
6,075.00	0.57	183.60	6,073.72	26.65	38.85	457,012.75	780,724.75	32.25318	-103.42527
6,100.00	0.55	189.26	6,098.72	26.41	38.82	457,012.51	780,724.72	32.25318	-103.42527
6,125.00	0.62	182.47	6,123.72	26.16	38.80	457,012.26	780,724.70	32.25318	-103.42527
6,150.00	0.56	174.62	6,148.72	25.90	38.80	457,012.00	780,724.70	32.25318	-103.42527
6,175.00	0.48	197.93	6,173.72	25.68	38.78	457,011.78	780,724.68	32.25318	-103.42527
6,200.00	0.52	192.19	6,198.72	25.47	38.73	457,011.57	780,724.62	32.25318	-103.42527
6,225.00	0.57	185.81	6,223.72	25.23	38.69	457,011.33	780,724.59	32.25318	-103.42527
6,250.00	0.48	189.81	6,248.72	25.01	38.66	457,011.11	780,724.56	32.25318	-103.42527
6,275.00	0.54	198.46	6,273.72	24.79	38.61	457,010.89	780,724.50	32.25318	-103.42527
6,300.00	0.54	194.03	6,298.71	24.57	38.54	457,010.67	780,724.44	32.25318	-103.42527
6,325.00	0.50	196.87	6,323.71	24.35	38.48	457,010.45	780,724.38	32.25318	-103.42527
6,350.00	0.49	198.07	6,348.71	24.14	38.41	457,010.24	780,724.31	32.25318	-103.42527
6,375.00	0.51	197.96	6,373.71	23.93	38.35	457,010.03	780,724.24	32.25317	-103.42527
6,400.00	0.53	196.16	6,398.71	23.72	38.28	457,009.82	780,724.18	32.25317	-103.42527
6,425.00	0.51	207.57	6,423.71	23.51	38.20	457,009.61	780,724.09	32.25317	-103.42527
6,450.00	0.54	204.70	6,448.71	23.30	38.10	457,009.40	780,723.99	32.25317	-103.42527
6,475.00	0.55	203.82	6,473.71	23.09	38.00	457,009.19	780,723.90	32.25317	-103.42527
6,500.00	0.48	210.68	6,498.71	22.89	37.90	457,008.99	780,723.79	32.25317	-103.42527
6,525.00	0.55	224.50	6,523.71	22.71	37.76	457,008.81	780,723.66	32.25317	-103.42527
6,550.00	0.45	225.30	6,548.70	22.56	37.61	457,008.66	780,723.50	32.25317	-103.42527
6,575.00	0.52	215.81	6,573.70	22.39	37.47	457,008.49	780,723.37	32.25317	-103.42527
6,600.00	0.50	215.92	6,598.70	22.21	37.34	457,008.31	780,723.24	32.25317	-103.42527
6,625.00	0.51	215.55	6,623.70	22.03	37.21	457,008.14	780,723.11	32.25317	-103.42527
6,650.00	0.50	224.36	6,648.70	21.87	37.07	457,007.97	780,722.97	32.25317	-103.42528
6,675.00	0.50	218.72	6,673.70	21.70	36.92	457,007.80	780,722.82	32.25317	-103.42528
6,700.00	0.50	213.15	6,698.70	21.53	36.80	457,007.63	780,722.69	32.25317	-103.42528
6,725.00	0.48	218.47	6,723.70	21.35	36.67	457,007.45	780,722.57	32.25317	-103.42528
6,750.00	0.47	224.06	6,748.70	21.20	36.54	457,007.30	780,722.43	32.25317	-103.42528
6,775.00	0.55	216.41	6,773.70	21.03	36.39	457,007.13	780,722.29	32.25317	-103.42528
6,800.00	0.51	227.39	6,798.69	20.86	36.24	457,006.96	780,722.14	32.25317	-103.42528
6,825.00	0.44	227.00	6,823.69	20.72	36.09	457,006.82	780,721.98	32.25317	-103.42528
6,850.00	0.44	229.06	6,848.69	20.59	35.94	457,006.69	780,721.84	32.25317	-103.42528
6,875.00	0.44	217.43	6,873.69	20.45	35.81	457,006.55	780,721.71	32.25317	-103.42528
6,900.00	0.47	217.70	6,898.69	20.29	35.69	457,006.39	780,721.59	32.25316	-103.42528
6,925.00	0.45	225.46	6,923.69	20.14	35.56	457,006.24	780,721.46	32.25316	-103.42528
6,950.00	0.44	218.88	6,948.69	20.00	35.43	457,006.10	780,721.33	32.25316	-103.42528
6,975.00	0.50	229.50	6,973.69	19.85	35.29	457,005.95	780,721.18	32.25316	-103.42528
7,000.00	0.44	226.07	6,998.69	19.71	35.13	457,005.81	780,721.03	32.25316	-103.42528
7,025.00	0.42	213.43	7,023.69	19.57	35.02	457,005.67	780,720.91	32.25316	-103.42528
7,050.00	0.42	230.45	7,048.69	19.44	34.89	457,005.54	780,720.79	32.25316	-103.42528
7,075.00	0.47	222.13	7,073.69	19.30	34.75	457,005.40	780,720.65	32.25316	-103.42528
7,100.00	0.50	223.81	7,098.69	19.15	34.61	457,005.25	780,720.51	32.25316	-103.42528
7,125.00	0.45	226.67	7,123.68	19.00	34.46	457,005.10	780,720.36	32.25316	-103.42528
7,150.00	0.38	228.54	7,148.68	18.88	34.33	457,004.98	780,720.23	32.25316	-103.42528
7,175.00	0.34	260.32	7,173.68	18.81	34.19	457,004.91	780,720.09	32.25316	-103.42528

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Mortarboard Federal Com 13H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=23' @ 3493.00ft (Noram 23)
Site:	Sec. 1, T 24-S. , R 34-E	MD Reference:	KB=23' @ 3493.00ft (Noram 23)
Well:	Mortarboard Federal Com 13H	North Reference:	Grid
Wellbore:	Wellbore #2- ST01	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #2- ST01	Database:	EDM 5000.1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
7,200.00	0.32	223.69	7,198.68	18.75	34.07	457,004.85	780,719.97	32.25316	-103.42528
7,225.00	0.30	217.02	7,223.68	18.65	33.99	457,004.75	780,719.88	32.25316	-103.42529
7,250.00	0.09	319.25	7,248.68	18.61	33.93	457,004.71	780,719.83	32.25316	-103.42529
7,275.00	0.43	210.82	7,273.68	18.54	33.87	457,004.64	780,719.77	32.25316	-103.42529
7,300.00	0.34	218.10	7,298.68	18.40	33.78	457,004.50	780,719.68	32.25316	-103.42529
7,325.00	0.28	217.68	7,323.68	18.30	33.70	457,004.40	780,719.59	32.25316	-103.42529
7,350.00	0.45	217.14	7,348.68	18.17	33.60	457,004.27	780,719.50	32.25316	-103.42529
7,375.00	0.35	213.91	7,373.68	18.03	33.50	457,004.13	780,719.39	32.25316	-103.42529
7,400.00	0.34	213.98	7,398.68	17.90	33.41	457,004.00	780,719.31	32.25316	-103.42529
7,425.00	0.29	225.32	7,423.68	17.80	33.33	457,003.90	780,719.22	32.25316	-103.42529
7,450.00	0.33	209.98	7,448.68	17.69	33.25	457,003.79	780,719.14	32.25316	-103.42529
7,475.00	0.38	209.71	7,473.68	17.56	33.17	457,003.66	780,719.07	32.25316	-103.42529
7,500.00	0.31	224.18	7,498.68	17.44	33.08	457,003.54	780,718.98	32.25316	-103.42529
7,525.00	0.33	215.63	7,523.68	17.33	32.99	457,003.43	780,718.89	32.25316	-103.42529
7,550.00	0.32	216.46	7,548.68	17.21	32.91	457,003.31	780,718.81	32.25316	-103.42529
7,575.00	0.37	204.42	7,573.68	17.08	32.83	457,003.18	780,718.73	32.25316	-103.42529
7,600.00	0.35	214.62	7,598.68	16.95	32.76	457,003.05	780,718.65	32.25316	-103.42529
7,625.00	0.23	212.53	7,623.68	16.84	32.69	457,002.94	780,718.58	32.25316	-103.42529
7,650.00	0.27	220.66	7,648.68	16.76	32.62	457,002.86	780,718.52	32.25316	-103.42529
7,675.00	0.34	200.65	7,673.68	16.64	32.56	457,002.74	780,718.45	32.25315	-103.42529
7,700.00	0.28	211.09	7,698.68	16.52	32.50	457,002.62	780,718.40	32.25315	-103.42529
7,725.00	0.25	185.70	7,723.67	16.41	32.46	457,002.51	780,718.36	32.25315	-103.42529
7,750.00	0.21	142.93	7,748.67	16.32	32.48	457,002.42	780,718.38	32.25315	-103.42529
7,775.00	0.13	138.59	7,773.67	16.26	32.53	457,002.36	780,718.43	32.25315	-103.42529
7,800.00	0.29	168.74	7,798.67	16.18	32.56	457,002.28	780,718.46	32.25315	-103.42529
7,825.00	0.25	167.62	7,823.67	16.07	32.59	457,002.17	780,718.48	32.25315	-103.42529
7,850.00	0.22	168.42	7,848.67	15.97	32.61	457,002.07	780,718.50	32.25315	-103.42529
7,875.00	0.15	171.34	7,873.67	15.89	32.62	457,001.99	780,718.52	32.25315	-103.42529
7,900.00	0.14	212.24	7,898.67	15.83	32.61	457,001.93	780,718.51	32.25315	-103.42529
7,925.00	0.11	190.06	7,923.67	15.78	32.59	457,001.88	780,718.49	32.25315	-103.42529
7,950.00	0.08	235.80	7,948.67	15.75	32.57	457,001.85	780,718.47	32.25315	-103.42529
7,975.00	0.15	258.39	7,973.67	15.73	32.52	457,001.83	780,718.42	32.25315	-103.42529
8,000.00	0.27	254.02	7,998.67	15.71	32.44	457,001.81	780,718.33	32.25315	-103.42529
8,025.00	0.28	269.68	8,023.67	15.69	32.32	457,001.79	780,718.21	32.25315	-103.42529
8,050.00	0.34	320.79	8,048.67	15.75	32.21	457,001.85	780,718.11	32.25315	-103.42529
8,075.00	0.39	307.21	8,073.67	15.86	32.09	457,001.96	780,717.99	32.25315	-103.42529
8,100.00	0.44	287.23	8,098.67	15.94	31.94	457,002.04	780,717.83	32.25315	-103.42529
8,125.00	0.46	282.23	8,123.67	15.99	31.75	457,002.09	780,717.64	32.25315	-103.42529
8,150.00	0.51	283.35	8,148.67	16.03	31.54	457,002.13	780,717.44	32.25315	-103.42529
8,175.00	0.58	282.17	8,173.67	16.08	31.31	457,002.18	780,717.20	32.25315	-103.42529
8,200.00	0.62	283.42	8,198.67	16.14	31.05	457,002.24	780,716.95	32.25315	-103.42529
8,225.00	0.64	278.94	8,223.67	16.20	30.78	457,002.30	780,716.68	32.25315	-103.42530
8,250.00	0.59	282.52	8,248.66	16.25	30.52	457,002.35	780,716.42	32.25315	-103.42530
8,275.00	0.61	283.08	8,273.66	16.30	30.26	457,002.40	780,716.16	32.25315	-103.42530
8,300.00	0.78	286.00	8,298.66	16.38	29.97	457,002.48	780,715.87	32.25315	-103.42530
8,325.00	0.73	284.37	8,323.66	16.47	29.65	457,002.57	780,715.55	32.25315	-103.42530
8,350.00	0.79	271.34	8,348.66	16.51	29.33	457,002.61	780,715.22	32.25315	-103.42530
8,375.00	0.76	315.69	8,373.65	16.63	29.04	457,002.73	780,714.94	32.25315	-103.42530
8,400.00	0.72	274.23	8,398.65	16.76	28.77	457,002.86	780,714.66	32.25316	-103.42530
8,425.00	0.77	274.73	8,423.65	16.79	28.44	457,002.89	780,714.34	32.25316	-103.42530
8,450.00	0.79	276.01	8,448.65	16.82	28.10	457,002.92	780,714.00	32.25316	-103.42530
8,475.00	0.74	276.35	8,473.65	16.86	27.77	457,002.96	780,713.67	32.25316	-103.42531
8,500.00	0.77	275.76	8,498.64	16.89	27.44	457,002.99	780,713.34	32.25316	-103.42531
8,525.00	0.71	275.40	8,523.64	16.92	27.12	457,003.02	780,713.02	32.25316	-103.42531
8,550.00	0.75	272.71	8,548.64	16.94	26.80	457,003.05	780,712.70	32.25316	-103.42531

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Mortarboard Federal Com 13H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=23' @ 3493.00ft (Noram 23)
Site:	Sec. 1, T 24-S, R 34-E	MD Reference:	KB=23' @ 3493.00ft (Noram 23)
Well:	Mortarboard Federal Com 13H	North Reference:	Grid
Wellbore:	Wellbore #2- ST01	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #2- ST01	Database:	EDM 5000.1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,575.00	0.74	267.12	8,573.64	16.94	26.48	457,003.04	780,712.38	32.25316	-103.42531
8,600.00	0.71	263.37	8,598.64	16.92	26.16	457,003.02	780,712.06	32.25316	-103.42531
8,625.00	0.70	266.08	8,623.63	16.89	25.86	457,002.99	780,711.76	32.25316	-103.42531
8,650.00	0.76	253.71	8,648.63	16.83	25.55	457,002.93	780,711.44	32.25316	-103.42531
8,675.00	0.65	257.07	8,673.63	16.76	25.25	457,002.86	780,711.15	32.25316	-103.42531
8,700.00	0.55	265.30	8,698.63	16.71	24.99	457,002.81	780,710.89	32.25316	-103.42531
8,725.00	0.57	254.15	8,723.63	16.67	24.75	457,002.77	780,710.65	32.25316	-103.42532
8,750.00	0.53	252.07	8,748.63	16.60	24.52	457,002.70	780,710.42	32.25315	-103.42532
8,775.00	0.59	252.33	8,773.63	16.53	24.29	457,002.63	780,710.19	32.25315	-103.42532
8,800.00	0.45	255.02	8,798.62	16.46	24.07	457,002.56	780,709.97	32.25315	-103.42532
8,825.00	0.49	241.67	8,823.62	16.38	23.88	457,002.49	780,709.78	32.25315	-103.42532
8,850.00	0.53	238.33	8,848.62	16.27	23.69	457,002.37	780,709.59	32.25315	-103.42532
8,875.00	0.46	240.46	8,873.62	16.16	23.51	457,002.26	780,709.40	32.25315	-103.42532
8,900.00	0.42	256.42	8,898.62	16.09	23.33	457,002.19	780,709.23	32.25315	-103.42532
8,925.00	0.46	244.85	8,923.62	16.03	23.15	457,002.13	780,709.05	32.25315	-103.42532
8,950.00	0.47	236.41	8,948.62	15.93	22.97	457,002.03	780,708.87	32.25315	-103.42532
8,975.00	0.40	242.36	8,973.62	15.83	22.81	457,001.93	780,708.71	32.25315	-103.42532
9,000.00	0.54	246.38	8,998.62	15.74	22.63	457,001.84	780,708.52	32.25315	-103.42532
9,025.00	0.49	239.42	9,023.62	15.64	22.43	457,001.74	780,708.32	32.25315	-103.42532
9,050.00	0.60	235.60	9,048.62	15.51	22.23	457,001.61	780,708.12	32.25315	-103.42532
9,075.00	0.72	229.10	9,073.61	15.34	22.00	457,001.44	780,707.90	32.25315	-103.42532
9,100.00	0.80	231.92	9,098.61	15.13	21.74	457,001.23	780,707.64	32.25315	-103.42532
9,125.00	0.77	231.89	9,123.61	14.92	21.47	457,001.02	780,707.37	32.25315	-103.42533
9,150.00	0.73	232.57	9,148.61	14.71	21.21	457,000.82	780,707.11	32.25315	-103.42533
9,175.00	0.19	272.38	9,173.61	14.62	21.05	457,000.72	780,706.94	32.25315	-103.42533
9,200.00	0.64	209.40	9,198.61	14.50	20.94	457,000.60	780,706.83	32.25315	-103.42533
9,225.00	0.75	211.18	9,223.60	14.24	20.78	457,000.34	780,706.68	32.25315	-103.42533
9,250.00	0.78	201.74	9,248.60	13.94	20.64	457,000.04	780,706.53	32.25315	-103.42533
9,275.00	0.75	215.35	9,273.60	13.65	20.48	456,999.75	780,706.37	32.25315	-103.42533
9,300.00	0.75	205.28	9,298.60	13.37	20.31	456,999.47	780,706.21	32.25315	-103.42533
9,325.00	0.74	212.09	9,323.60	13.08	20.16	456,999.18	780,706.05	32.25315	-103.42533
9,350.00	0.77	203.70	9,348.59	12.79	20.00	456,998.89	780,705.90	32.25314	-103.42533
9,375.00	0.80	208.86	9,373.59	12.49	19.85	456,998.59	780,705.75	32.25314	-103.42533
9,400.00	0.78	217.41	9,398.59	12.20	19.66	456,998.30	780,705.56	32.25314	-103.42533
9,425.00	0.82	220.03	9,423.59	11.93	19.45	456,998.03	780,705.34	32.25314	-103.42533
9,450.00	0.86	230.08	9,448.58	11.67	19.19	456,997.77	780,705.08	32.25314	-103.42533
9,475.00	0.77	247.55	9,473.58	11.48	18.89	456,997.58	780,704.79	32.25314	-103.42533
9,500.00	1.05	243.08	9,498.58	11.32	18.53	456,997.42	780,704.43	32.25314	-103.42534
9,525.00	1.17	250.65	9,523.57	11.13	18.08	456,997.23	780,703.98	32.25314	-103.42534
9,550.00	1.30	252.29	9,548.57	10.96	17.57	456,997.06	780,703.47	32.25314	-103.42534
9,575.00	1.34	252.91	9,573.56	10.78	17.02	456,996.88	780,702.92	32.25314	-103.42534
9,600.00	1.44	250.51	9,598.55	10.59	16.45	456,996.69	780,702.34	32.25314	-103.42534
9,625.00	1.62	250.99	9,623.54	10.37	15.82	456,996.47	780,701.71	32.25314	-103.42534
9,650.00	1.82	252.92	9,648.53	10.14	15.10	456,996.24	780,701.00	32.25314	-103.42535
9,675.00	2.10	252.50	9,673.52	9.89	14.29	456,995.99	780,700.18	32.25314	-103.42535
9,700.00	2.26	252.61	9,698.50	9.60	13.38	456,995.70	780,699.28	32.25314	-103.42535
9,725.00	2.31	255.46	9,723.48	9.33	12.42	456,995.43	780,698.32	32.25314	-103.42536
9,750.00	2.43	251.79	9,748.46	9.04	11.43	456,995.14	780,697.33	32.25313	-103.42536
9,775.00	2.43	252.80	9,773.44	8.71	10.42	456,994.81	780,696.32	32.25313	-103.42536
9,800.00	1.86	250.34	9,798.42	8.42	9.53	456,994.52	780,695.43	32.25313	-103.42536
9,825.00	1.14	235.62	9,823.41	8.14	8.95	456,994.24	780,694.84	32.25313	-103.42537
9,850.00	1.15	237.45	9,848.41	7.87	8.53	456,993.97	780,694.43	32.25313	-103.42537
9,875.00	1.16	235.06	9,873.40	7.59	8.11	456,993.69	780,694.01	32.25313	-103.42537
9,900.00	1.16	234.63	9,898.39	7.30	7.70	456,993.40	780,693.59	32.25313	-103.42537
9,925.00	1.20	233.22	9,923.39	6.99	7.28	456,993.09	780,693.18	32.25313	-103.42537

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Mortarboard Federal Com 13H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=23' @ 3493.00ft (Noram 23)
Site:	Sec. 1, T 24-S., R 34-E	MD Reference:	KB=23' @ 3493.00ft (Noram 23)
Well:	Mortarboard Federal Com 13H	North Reference:	Grid
Wellbore:	Wellbore #2- ST01	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #2- ST01	Database:	EDM 5000.1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,950.00	1.07	236.16	9,948.38	6.71	6.88	456,992.81	780,692.77	32.25313	-103.42537
9,975.00	1.26	235.73	9,973.38	6.42	6.46	456,992.52	780,692.35	32.25313	-103.42537
10,000.00	1.17	236.57	9,998.37	6.13	6.02	456,992.23	780,691.91	32.25313	-103.42538
10,025.00	1.26	234.31	10,023.37	5.83	5.58	456,991.93	780,691.48	32.25313	-103.42538
10,050.00	1.28	237.71	10,048.36	5.52	5.12	456,991.62	780,691.02	32.25312	-103.42538
10,075.00	1.37	237.38	10,073.36	5.21	4.63	456,991.31	780,690.53	32.25312	-103.42538
10,100.00	1.28	235.97	10,098.35	4.89	4.15	456,990.99	780,690.05	32.25312	-103.42538
10,125.00	1.32	244.51	10,123.34	4.61	3.66	456,990.71	780,689.55	32.25312	-103.42538
10,150.00	1.33	249.73	10,148.34	4.38	3.13	456,990.48	780,689.02	32.25312	-103.42539
10,175.00	1.38	262.92	10,173.33	4.25	2.55	456,990.35	780,688.45	32.25312	-103.42539
10,200.00	1.25	268.81	10,198.32	4.20	1.98	456,990.30	780,687.88	32.25312	-103.42539
10,225.00	1.29	278.75	10,223.32	4.24	1.43	456,990.34	780,687.33	32.25312	-103.42539
10,250.00	1.36	267.30	10,248.31	4.27	0.86	456,990.37	780,686.76	32.25312	-103.42539
10,275.00	1.51	278.44	10,273.30	4.30	0.24	456,990.40	780,686.13	32.25312	-103.42539
10,300.00	1.53	287.31	10,298.29	4.45	-0.41	456,990.55	780,685.49	32.25312	-103.42540
10,325.00	1.74	296.70	10,323.28	4.72	-1.07	456,990.82	780,684.83	32.25312	-103.42540
10,350.00	1.88	295.95	10,348.27	5.07	-1.77	456,991.17	780,684.12	32.25312	-103.42540
10,375.00	1.96	299.65	10,373.26	5.46	-2.51	456,991.56	780,683.38	32.25312	-103.42540
10,400.00	1.95	298.79	10,398.24	5.88	-3.26	456,991.98	780,682.64	32.25313	-103.42541
10,425.00	2.36	303.98	10,423.22	6.37	-4.06	456,992.47	780,681.84	32.25313	-103.42541
10,450.00	2.70	319.84	10,448.20	7.11	-4.87	456,993.21	780,681.03	32.25313	-103.42541
10,475.00	3.10	330.81	10,473.17	8.15	-5.57	456,994.25	780,680.32	32.25313	-103.42541
10,500.00	3.44	337.57	10,498.13	9.43	-6.19	456,995.53	780,679.71	32.25314	-103.42542
10,525.00	3.67	337.68	10,523.08	10.87	-6.78	456,996.97	780,679.12	32.25314	-103.42542
10,550.00	3.70	338.28	10,548.03	12.36	-7.38	456,998.46	780,678.51	32.25314	-103.42542
10,575.00	3.67	337.84	10,572.98	13.85	-7.98	456,999.95	780,677.91	32.25315	-103.42542
10,600.00	3.47	341.00	10,597.93	15.30	-8.53	457,001.40	780,677.37	32.25315	-103.42542
10,625.00	2.85	349.37	10,622.89	16.63	-8.89	457,002.73	780,677.01	32.25316	-103.42542
10,650.00	2.33	359.62	10,647.86	17.75	-9.01	457,003.85	780,676.89	32.25316	-103.42542
10,675.00	1.88	16.14	10,672.85	18.65	-8.90	457,004.75	780,677.00	32.25316	-103.42542
10,700.00	2.06	8.41	10,697.83	19.49	-8.72	457,005.59	780,677.18	32.25316	-103.42542
10,725.00	1.39	20.08	10,722.82	20.22	-8.55	457,006.32	780,677.35	32.25317	-103.42542
10,750.00	0.42	315.26	10,747.82	20.57	-8.51	457,006.67	780,677.39	32.25317	-103.42542
10,775.00	0.67	259.16	10,772.82	20.61	-8.72	457,006.71	780,677.18	32.25317	-103.42542
10,800.00	0.80	259.88	10,797.81	20.55	-9.03	457,006.65	780,676.86	32.25317	-103.42542
10,825.00	0.94	244.54	10,822.81	20.43	-9.39	457,006.53	780,676.51	32.25317	-103.42543
10,850.00	1.06	251.64	10,847.81	20.27	-9.80	457,006.37	780,676.10	32.25317	-103.42543
10,875.00	1.14	234.52	10,872.80	20.05	-10.22	457,006.15	780,675.68	32.25317	-103.42543
10,900.00	1.14	248.49	10,897.80	19.81	-10.65	457,005.91	780,675.25	32.25316	-103.42543
10,925.00	1.24	238.00	10,922.79	19.58	-11.11	457,005.68	780,674.79	32.25316	-103.42543
10,950.00	1.39	241.09	10,947.79	19.29	-11.61	457,005.39	780,674.29	32.25316	-103.42543
10,975.00	1.46	243.74	10,972.78	19.00	-12.16	457,005.10	780,673.74	32.25316	-103.42543
11,000.00	1.60	236.40	10,997.77	18.67	-12.73	457,004.77	780,673.16	32.25316	-103.42544
11,025.00	1.78	241.01	11,022.76	18.29	-13.36	457,004.39	780,672.53	32.25316	-103.42544
11,040.00	1.72	244.28	11,037.75	18.08	-13.77	457,004.18	780,672.13	32.25316	-103.42544
11,153.00	2.56	220.06	11,150.67	15.41	-16.92	457,001.51	780,668.97	32.25315	-103.42545
11,200.00	7.93	188.86	11,197.47	11.40	-18.10	456,997.50	780,667.80	32.25314	-103.42545
11,247.00	13.48	189.85	11,243.63	2.79	-19.54	456,988.89	780,666.36	32.25312	-103.42546
11,294.00	18.28	186.79	11,288.83	-9.93	-21.35	456,976.17	780,664.55	32.25308	-103.42546
11,342.00	22.96	183.57	11,333.74	-26.76	-22.82	456,959.34	780,663.08	32.25304	-103.42547
11,389.00	28.50	180.80	11,376.06	-47.14	-23.55	456,938.96	780,662.35	32.25298	-103.42547
11,436.00	34.29	179.72	11,416.17	-71.61	-23.64	456,914.49	780,662.26	32.25291	-103.42547
11,483.00	40.41	181.10	11,453.51	-100.11	-23.87	456,885.99	780,662.03	32.25284	-103.42548
11,510.00	35.75	187.70	11,474.77	-116.69	-25.09	456,869.41	780,660.80	32.25279	-103.42548
11,541.00	36.68	197.05	11,499.80	-134.53	-29.03	456,851.57	780,656.87	32.25274	-103.42549

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Mortarboard Federal Com 13H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=23' @ 3493.00ft (Noram 23)
Site:	Sec. 1, T 24-S. , R 34-E	MD Reference:	KB=23' @ 3493.00ft (Noram 23)
Well:	Mortarboard Federal Com 13H	North Reference:	Grid
Wellbore:	Wellbore #2- ST01	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #2- ST01	Database:	EDM 5000.1

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
11,575.00	43.47	200.67	11,525.80	-155.21	-36.14	456,830.89	780,649.76	32.25268	-103.42552	
11,607.00	50.02	200.63	11,547.72	-177.01	-44.35	456,809.09	780,641.54	32.25262	-103.42554	
11,636.00	53.83	201.00	11,565.60	-198.34	-52.47	456,787.76	780,633.43	32.25257	-103.42557	
11,667.00	57.80	200.37	11,583.01	-222.33	-61.52	456,763.77	780,624.38	32.25250	-103.42560	
11,699.00	61.57	197.24	11,599.17	-248.47	-70.41	456,737.63	780,615.49	32.25243	-103.42563	
11,730.00	65.28	194.74	11,613.03	-275.12	-78.03	456,710.98	780,607.86	32.25236	-103.42566	
11,761.00	68.75	191.67	11,625.14	-302.90	-84.54	456,683.20	780,601.36	32.25228	-103.42568	
11,793.00	71.97	190.67	11,635.89	-332.46	-90.38	456,653.64	780,595.52	32.25220	-103.42570	
11,824.00	74.17	190.61	11,644.92	-361.61	-95.85	456,624.49	780,590.05	32.25212	-103.42572	
11,856.00	77.44	190.23	11,652.77	-392.12	-101.46	456,593.99	780,584.44	32.25203	-103.42573	
11,890.00	81.13	188.57	11,659.09	-425.07	-106.91	456,561.03	780,578.98	32.25194	-103.42575	
11,922.00	83.59	186.89	11,663.34	-456.49	-111.18	456,529.61	780,574.72	32.25186	-103.42577	
11,954.00	85.50	186.21	11,666.38	-488.14	-114.81	456,497.96	780,571.09	32.25177	-103.42578	
11,985.00	87.91	185.18	11,668.17	-518.93	-117.88	456,467.17	780,568.02	32.25169	-103.42579	
12,048.00	88.84	185.01	11,669.95	-581.66	-123.47	456,404.45	780,562.42	32.25151	-103.42581	
12,142.00	89.62	185.61	11,671.22	-675.24	-132.17	456,310.86	780,553.73	32.25126	-103.42584	
12,237.00	90.71	186.05	11,670.94	-769.75	-141.82	456,216.35	780,544.08	32.25100	-103.42588	
12,331.00	91.27	185.68	11,669.32	-863.24	-151.43	456,122.86	780,534.47	32.25074	-103.42591	
12,425.00	89.59	183.93	11,668.61	-956.90	-159.30	456,029.20	780,526.60	32.25048	-103.42594	
12,519.00	87.72	180.17	11,670.82	-1,050.80	-162.66	455,935.31	780,523.24	32.25023	-103.42595	
12,613.00	86.29	175.17	11,675.73	-1,144.56	-158.85	455,841.55	780,527.05	32.24997	-103.42594	
12,709.00	86.62	175.25	11,681.67	-1,240.04	-150.85	455,746.06	780,535.05	32.24970	-103.42592	
12,804.00	87.72	175.11	11,686.36	-1,334.59	-142.87	455,651.52	780,543.02	32.24944	-103.42589	
12,899.00	87.91	175.18	11,689.98	-1,429.18	-134.84	455,556.93	780,551.06	32.24918	-103.42587	
12,994.00	90.77	174.28	11,691.08	-1,523.76	-126.12	455,462.35	780,559.78	32.24892	-103.42585	
13,088.00	92.76	174.31	11,688.18	-1,617.24	-116.78	455,368.86	780,569.12	32.24867	-103.42582	
13,183.00	93.35	174.94	11,683.12	-1,711.69	-107.89	455,274.41	780,578.01	32.24841	-103.42579	
13,277.00	92.90	175.00	11,677.99	-1,805.19	-99.66	455,180.92	780,586.24	32.24815	-103.42577	
13,371.00	90.63	175.25	11,675.10	-1,898.80	-91.68	455,087.31	780,594.22	32.24789	-103.42574	
13,465.00	89.29	175.23	11,675.17	-1,992.47	-83.88	454,993.63	780,602.02	32.24764	-103.42572	
13,559.00	89.76	175.33	11,675.94	-2,086.15	-76.14	454,899.96	780,609.76	32.24738	-103.42570	
13,653.00	89.43	175.12	11,676.61	-2,179.82	-68.32	454,806.28	780,617.58	32.24712	-103.42568	
13,748.00	89.09	174.23	11,677.84	-2,274.40	-59.50	454,711.70	780,626.40	32.24686	-103.42565	
13,842.00	87.86	174.11	11,680.34	-2,367.88	-49.96	454,618.22	780,635.94	32.24660	-103.42562	
13,936.00	88.36	173.80	11,683.44	-2,461.31	-40.06	454,524.80	780,645.83	32.24635	-103.42559	
14,030.00	87.89	175.30	11,686.51	-2,554.83	-31.14	454,431.28	780,654.76	32.24609	-103.42557	
14,125.00	87.88	176.89	11,690.02	-2,649.54	-24.68	454,336.57	780,661.22	32.24583	-103.42555	
14,219.00	87.91	178.35	11,693.47	-2,743.39	-20.77	454,242.71	780,665.12	32.24557	-103.42554	
14,313.00	88.28	178.82	11,696.60	-2,837.31	-18.46	454,148.79	780,667.44	32.24531	-103.42553	
14,407.00	89.20	178.86	11,698.66	-2,931.27	-16.55	454,054.84	780,669.34	32.24505	-103.42553	
14,501.00	88.33	179.24	11,700.69	-3,025.23	-14.99	453,960.87	780,670.90	32.24479	-103.42553	
14,596.00	87.94	179.27	11,703.78	-3,120.17	-13.76	453,865.93	780,672.14	32.24453	-103.42553	
14,690.00	88.70	180.16	11,706.54	-3,214.13	-13.29	453,771.98	780,672.60	32.24428	-103.42553	
14,784.00	87.74	179.94	11,709.46	-3,308.08	-13.37	453,678.02	780,672.52	32.24402	-103.42553	
14,879.00	88.28	180.34	11,712.76	-3,403.03	-13.61	453,583.08	780,672.29	32.24376	-103.42553	
14,979.00	89.87	181.45	11,714.37	-3,503.00	-15.17	453,483.11	780,670.73	32.24348	-103.42554	
15,074.00	91.13	178.90	11,713.54	-3,597.98	-15.46	453,388.12	780,670.44	32.24322	-103.42554	
15,168.00	93.27	178.21	11,709.93	-3,691.88	-13.09	453,294.23	780,672.81	32.24296	-103.42554	
15,262.00	89.71	177.04	11,707.49	-3,785.75	-9.20	453,200.36	780,676.70	32.24270	-103.42553	
15,357.00	88.00	176.51	11,709.39	-3,880.58	-3.85	453,105.53	780,682.04	32.24244	-103.42551	
15,452.00	83.39	176.09	11,716.52	-3,975.08	2.26	453,011.02	780,688.15	32.24218	-103.42550	
15,546.00	85.14	174.75	11,725.91	-4,068.31	9.73	452,917.80	780,695.62	32.24193	-103.42548	
15,640.00	86.03	173.97	11,733.15	-4,161.57	18.94	452,824.53	780,704.83	32.24167	-103.42545	
15,734.00	87.69	174.92	11,738.30	-4,254.99	28.02	452,731.12	780,713.92	32.24141	-103.42542	
15,828.00	85.94	175.95	11,743.52	-4,348.54	35.49	452,637.57	780,721.39	32.24116	-103.42540	

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Mortarboard Federal Com 13H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=23' @ 3493.00ft (Noram 23)
Site:	Sec. 1, T 24-S, R 34-E	MD Reference:	KB=23' @ 3493.00ft (Noram 23)
Well:	Mortarboard Federal Com 13H	North Reference:	Grid
Wellbore:	Wellbore #2- ST01	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #2- ST01	Database:	EDM 5000.1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,923.00	88.67	179.57	11,747.99	-4,443.34	39.20	452,542.77	780,725.09	32.24090	-103.42539
16,017.00	88.05	181.07	11,750.68	-4,537.30	38.67	452,448.81	780,724.57	32.24064	-103.42539
16,111.00	87.94	182.67	11,753.97	-4,631.18	35.61	452,354.92	780,721.50	32.24038	-103.42541
16,205.00	89.34	181.83	11,756.20	-4,725.08	31.92	452,261.03	780,717.82	32.24012	-103.42542
16,290.00	87.10	181.12	11,758.84	-4,810.01	29.73	452,176.10	780,715.63	32.23989	-103.42543
16,384.00	87.13	179.55	11,763.57	-4,903.88	29.18	452,082.23	780,715.08	32.23963	-103.42544
16,479.00	86.48	179.71	11,768.86	-4,998.73	29.79	451,987.38	780,715.69	32.23937	-103.42544
16,572.00	85.89	180.31	11,775.05	-5,091.53	29.78	451,894.58	780,715.68	32.23911	-103.42544
16,667.00	83.11	179.42	11,784.16	-5,186.08	30.00	451,800.03	780,715.90	32.23885	-103.42544
16,761.00	86.76	178.89	11,792.45	-5,279.69	31.38	451,706.43	780,717.28	32.23860	-103.42544
16,856.00	87.52	179.19	11,797.19	-5,374.55	32.97	451,611.56	780,718.87	32.23834	-103.42544
16,950.00	85.19	177.03	11,803.17	-5,468.30	36.06	451,517.81	780,721.96	32.23808	-103.42543
17,045.00	86.15	176.15	11,810.34	-5,562.86	41.70	451,423.25	780,727.59	32.23782	-103.42541
17,140.00	87.94	176.66	11,815.24	-5,657.54	47.65	451,328.57	780,733.54	32.23756	-103.42540
17,235.00	88.55	177.55	11,818.15	-5,752.37	52.44	451,233.74	780,738.34	32.23730	-103.42538
17,329.00	90.60	177.94	11,818.85	-5,846.29	56.14	451,139.82	780,742.04	32.23704	-103.42537
17,424.00	84.91	176.45	11,822.57	-5,941.07	60.78	451,045.05	780,746.68	32.23678	-103.42536
17,519.00	90.77	177.21	11,826.14	-6,035.81	66.03	450,950.30	780,751.92	32.23652	-103.42535
17,615.00	87.21	176.46	11,827.84	-6,131.63	71.32	450,854.48	780,757.22	32.23625	-103.42533
17,709.00	86.88	174.25	11,832.68	-6,225.19	78.93	450,760.92	780,764.82	32.23600	-103.42531
17,803.00	88.75	176.54	11,836.27	-6,318.81	86.47	450,667.30	780,772.36	32.23574	-103.42529
17,898.00	89.73	180.11	11,837.53	-6,413.75	89.24	450,572.37	780,775.14	32.23548	-103.42528
17,992.00	88.59	177.77	11,838.91	-6,507.71	90.98	450,478.40	780,776.88	32.23522	-103.42528
18,087.00	86.88	175.28	11,842.66	-6,602.45	96.73	450,383.66	780,782.63	32.23496	-103.42526
18,181.00	86.48	173.91	11,848.10	-6,695.88	105.57	450,290.24	780,791.47	32.23470	-103.42524
18,270.00	86.99	174.94	11,853.17	-6,784.31	114.20	450,201.80	780,800.10	32.23446	-103.42521
18,364.00	90.66	177.39	11,855.10	-6,878.06	120.49	450,108.06	780,806.38	32.23420	-103.42519
18,459.00	92.34	179.36	11,852.61	-6,972.98	123.18	450,013.14	780,809.08	32.23394	-103.42519
18,553.00	93.55	180.32	11,847.79	-7,066.85	123.44	449,919.26	780,809.34	32.23368	-103.42519
18,647.00	93.83	181.74	11,841.74	-7,160.64	121.76	449,825.48	780,807.65	32.23342	-103.42520
18,741.00	95.31	182.04	11,834.25	-7,254.29	118.67	449,731.83	780,804.56	32.23317	-103.42521
18,836.00	96.81	182.71	11,824.22	-7,348.67	114.75	449,637.45	780,800.65	32.23291	-103.42523
18,947.00	98.82	183.47	11,809.12	-7,458.47	108.83	449,527.64	780,794.72	32.23261	-103.42525
18,995.00	98.82	183.47	11,801.76	-7,505.82	105.95	449,480.30	780,791.85	32.23248	-103.42526

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
11,483.00	11,453.51	-100.11	-23.87	Tie in to Wellbore #1
11,510.00	11,474.77	-116.69	-25.09	First MWD Survey Wellbore #2 @ 11510'MD
11,516.15	11,479.76	-120.25	-25.64	FTP @ 11516'MD (330'FNL)
18,871.53	11,819.81	-7,383.88	113.01	LTP @ 18871'MD (330'FSL)
18,947.00	11,809.12	-7,458.47	108.83	Last MWD Survey @ 18947'MD
18,995.00	11,801.76	-7,505.82	105.95	PTB @ TD @ 18995'MD

Checked By: _____ Approved By: _____ Date: _____