

COG

SURVEY REPORT

AZORES FEDERAL #9H

SCANDRILL FREEDOM

10/9/2017

This survey is correct to the best of my knowledge and is supported by actual field data.

Kolton Cotton

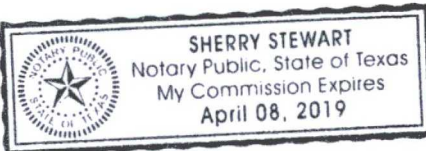
Notarized this date 9 of February, 2018.

Sherry Stewart

Notary Signature

County of Midland

State of Texas



The **Ultimate Partner** In Wellbore Placement

CUSTOMER
PROJECT
FIELD

COG
Azores Federal #9H
Azores Federal #9H

SDI JOB NO.
SDI DISTRICT
SDI KIT/UNIT

OP:004913
Midland

SITE INFORMATION

Site Name Azores Federal #9H
Lat/Long 32.181593° N, 103.703259° W
Northing 430,354.8 ft
Easting 694,935.6 ft

Section
Township
Range

MAP INFORMATION

North Reference Grid North
Grid Correction -0.34 deg
System US State Plane 1927
Datum North American Datum 1927 (Clarke 1866)
Map Zone New Mexico East: 3001



WELL INFORMATION

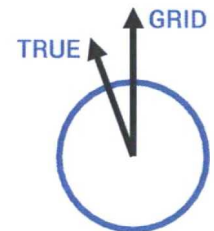
Lat/Long 32.181593° N, 103.703259° W
Northing 430,354.8 ft
Easting 694,935.6 ft
UWI 30-025-4375800

DEPTH AND ELEVATION REFERENCE

Ground Level 3500.5 ft above Mean Sea
Level
Reference Datum RKB
Reference Height 26 ft above G.L.
Reference Elevation 3526.5 ft

VERTICAL SECTION REFERENCE

+N/-S 0 ft
+E/-W 0 ft
Proposal Direction 358.10°
Calculation Method Minimum Curvature



LOCAL GRAVITY REFERENCE INFORMATION

Local Gravity 998.488 mG [computed]
True to Grid subtract 0.34°

WELL NOTES

Keeper Gyro Wireline Survey in 4 1/2 IF

OPERATORS

Nathan Yerby

SDI Operator Name (Printed)

SIGNATURE

DATE

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid	0.00	0.00
100.00	0.47	190.98	100.00	-0.40	-0.40	-0.08	0.47	0.41	190.98
125.00	0.54	197.07	125.00	-0.61	-0.61	-0.13	0.37	0.63	192.13
150.00	0.58	188.72	150.00	-0.84	-0.85	-0.19	0.36	0.87	192.30
175.00	0.59	190.99	175.00	-1.09	-1.10	-0.23	0.10	1.13	191.75
200.00	0.60	196.49	199.99	-1.34	-1.35	-0.29	0.24	1.39	192.13
225.00	0.60	211.73	224.99	-1.58	-1.59	-0.40	0.64	1.64	194.00
250.00	0.77	217.07	249.99	-1.82	-1.84	-0.57	0.74	1.92	197.15
275.00	0.68	209.61	274.99	-2.07	-2.10	-0.74	0.52	2.23	199.45
300.00	0.68	219.30	299.99	-2.31	-2.34	-0.91	0.46	2.51	201.20
325.00	0.46	219.28	324.99	-2.50	-2.54	-1.07	0.89	2.75	202.80
350.00	0.48	225.38	349.99	-2.64	-2.69	-1.20	0.23	2.94	204.13
375.00	0.31	236.10	374.98	-2.75	-2.80	-1.33	0.76	3.10	205.50
400.00	0.41	214.76	399.98	-2.86	-2.91	-1.44	0.66	3.25	206.36
425.00	0.47	224.34	424.98	-3.00	-3.06	-1.56	0.38	3.43	207.11
450.00	0.49	241.92	449.98	-3.12	-3.18	-1.73	0.59	3.62	208.55
475.00	0.37	224.80	474.98	-3.22	-3.29	-1.88	0.68	3.79	209.78
500.00	0.26	236.86	499.98	-3.31	-3.37	-1.98	0.52	3.92	210.46
525.00	0.39	242.73	524.98	-3.37	-3.45	-2.11	0.55	4.04	211.47
550.00	0.33	239.53	549.98	-3.44	-3.52	-2.25	0.27	4.18	212.55
575.00	0.40	261.66	574.98	-3.49	-3.57	-2.40	0.63	4.30	213.86
600.00	0.32	279.08	599.98	-3.49	-3.57	-2.55	0.54	4.39	215.55
625.00	0.25	269.13	624.98	-3.47	-3.56	-2.68	0.36	4.46	216.93
650.00	0.32	271.73	649.98	-3.47	-3.56	-2.80	0.28	4.53	218.20
675.00	0.22	290.99	674.98	-3.44	-3.54	-2.92	0.53	4.59	219.49
700.00	0.31	289.56	699.98	-3.40	-3.50	-3.03	0.33	4.63	220.85
725.00	0.24	285.68	724.98	-3.36	-3.46	-3.14	0.28	4.68	222.19
750.00	0.29	280.08	749.98	-3.33	-3.44	-3.25	0.23	4.73	223.41
775.00	0.20	309.88	774.98	-3.29	-3.40	-3.35	0.61	4.77	224.59
800.00	0.26	320.26	799.98	-3.21	-3.33	-3.42	0.27	4.77	225.79
825.00	0.38	308.28	824.98	-3.11	-3.23	-3.52	0.56	4.78	227.45
850.00	0.35	303.33	849.98	-3.02	-3.14	-3.65	0.18	4.81	229.30

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
875.00	0.33	317.20	874.98	-2.92	-3.04	-3.76	0.34	4.84	231.02
900.00	0.39	320.19	899.98	-2.80	-2.93	-3.87	0.24	4.85	232.86
925.00	0.37	318.90	924.97	-2.67	-2.80	-3.97	0.08	4.86	234.80
950.00	0.32	306.43	949.97	-2.56	-2.70	-4.08	0.35	4.89	236.52
975.00	0.38	314.45	974.97	-2.46	-2.60	-4.20	0.31	4.94	238.24
1000.00	0.37	319.56	999.97	-2.33	-2.48	-4.31	0.14	4.97	240.10
1025.00	0.39	308.80	1024.97	-2.22	-2.36	-4.43	0.29	5.02	241.92
1050.00	0.33	306.26	1049.97	-2.12	-2.27	-4.55	0.25	5.09	243.53
1075.00	0.39	305.40	1074.97	-2.02	-2.18	-4.68	0.26	5.16	245.08
1100.00	0.28	312.84	1099.97	-1.92	-2.08	-4.80	0.50	5.23	246.51
1125.00	0.35	291.22	1124.97	-1.85	-2.02	-4.91	0.54	5.31	247.68
1150.00	0.41	289.33	1149.97	-1.79	-1.96	-5.07	0.26	5.43	248.86
1175.00	0.45	297.38	1174.97	-1.71	-1.88	-5.24	0.29	5.57	250.22
1200.00	0.39	301.53	1199.97	-1.61	-1.79	-5.40	0.26	5.69	251.62
1225.00	0.39	307.64	1224.97	-1.51	-1.70	-5.54	0.17	5.79	252.96
1250.00	0.40	315.89	1249.97	-1.39	-1.58	-5.67	0.23	5.88	254.39
1275.00	0.37	315.39	1274.97	-1.27	-1.46	-5.78	0.10	5.97	255.80
1300.00	0.51	333.66	1299.97	-1.11	-1.31	-5.89	0.79	6.03	257.49
1325.00	0.47	331.18	1324.97	-0.92	-1.12	-5.99	0.18	6.09	259.44
1350.00	0.50	352.02	1349.96	-0.72	-0.92	-6.05	0.71	6.12	261.38
1375.00	0.69	352.74	1374.96	-0.46	-0.66	-6.09	0.75	6.12	263.82
1400.00	0.81	359.27	1399.96	-0.13	-0.33	-6.11	0.58	6.12	266.87
1425.00	0.94	4.40	1424.96	0.25	0.05	-6.10	0.61	6.10	270.44
1450.00	1.15	5.51	1449.95	0.70	0.50	-6.06	0.83	6.08	274.72
1475.00	1.20	5.15	1474.95	1.21	1.01	-6.01	0.23	6.09	279.54
1500.00	1.43	0.09	1499.94	1.78	1.58	-5.98	1.02	6.19	284.83
1525.00	1.46	5.89	1524.93	2.41	2.21	-5.95	0.59	6.35	290.40
1550.00	1.62	3.87	1549.93	3.07	2.88	-5.89	0.66	6.56	296.04
1575.00	1.67	6.47	1574.92	3.79	3.59	-5.83	0.37	6.85	301.66
1600.00	1.68	1.27	1599.90	4.51	4.32	-5.78	0.61	7.22	306.80
1625.00	1.80	5.69	1624.89	5.27	5.08	-5.73	0.71	7.66	311.55
1650.00	1.92	6.36	1649.88	6.07	5.89	-5.65	0.49	8.16	316.20

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	"/100ft	ft	deg
1675.00	1.96	4.79	1674.87	6.91	6.73	-5.57	0.27	8.73	320.42
1700.00	1.97	3.48	1699.85	7.77	7.59	-5.50	0.18	9.37	324.04
1725.00	1.99	4.79	1724.84	8.62	8.45	-5.44	0.20	10.05	327.21
1750.00	2.06	3.53	1749.82	9.50	9.33	-5.38	0.32	10.77	330.04
1775.00	2.08	6.84	1774.80	10.40	10.23	-5.30	0.48	11.52	332.62
1800.00	2.06	5.84	1799.79	11.29	11.12	-5.20	0.15	12.28	334.96
1825.00	2.08	8.54	1824.77	12.18	12.02	-5.08	0.40	13.05	337.08
1850.00	2.06	15.80	1849.76	13.06	12.90	-4.89	1.05	13.80	339.23
1875.00	2.12	4.95	1874.74	13.94	13.79	-4.73	1.60	14.58	341.07
1900.00	2.11	7.52	1899.72	14.86	14.71	-4.63	0.38	15.42	342.52
1925.00	1.86	5.31	1924.71	15.71	15.57	-4.53	1.04	16.22	343.77
1950.00	1.39	355.83	1949.70	16.42	16.28	-4.52	2.17	16.89	344.49
1975.00	1.20	349.97	1974.69	16.98	16.84	-4.59	0.91	17.45	344.77
2000.00	1.18	341.71	1999.68	17.49	17.34	-4.71	0.70	17.97	344.80
2025.00	1.19	333.23	2024.68	17.97	17.82	-4.91	0.70	18.48	344.60
2050.00	1.07	343.43	2049.67	18.43	18.27	-5.09	0.94	18.97	344.43
2075.00	0.97	337.59	2074.67	18.85	18.69	-5.24	0.56	19.41	344.34
2100.00	0.88	329.72	2099.67	19.22	19.05	-5.42	0.62	19.81	344.13
2125.00	0.67	322.36	2124.66	19.51	19.33	-5.60	0.93	20.13	343.84
2150.00	0.65	325.77	2149.66	19.75	19.57	-5.77	0.18	20.40	343.57
2175.00	0.63	322.92	2174.66	19.98	19.79	-5.93	0.13	20.66	343.31
2200.00	0.57	299.96	2199.66	20.16	19.96	-6.13	0.99	20.88	342.94
2225.00	0.68	313.78	2224.66	20.33	20.13	-6.34	0.75	21.11	342.52
2250.00	0.63	304.98	2249.66	20.52	20.31	-6.56	0.46	21.35	342.10
2275.00	0.65	311.12	2274.66	20.70	20.48	-6.78	0.29	21.58	341.69
2300.00	0.55	322.79	2299.65	20.89	20.67	-6.96	0.63	21.81	341.39
2325.00	0.54	307.94	2324.65	21.06	20.84	-7.12	0.56	22.02	341.13
2350.00	0.66	309.82	2349.65	21.24	21.00	-7.33	0.50	22.25	340.77
2375.00	0.66	323.38	2374.65	21.45	21.21	-7.52	0.63	22.51	340.47
2400.00	0.85	317.06	2399.65	21.71	21.46	-7.74	0.82	22.82	340.18
2425.00	0.84	317.42	2424.65	21.99	21.73	-7.99	0.06	23.16	339.82
2450.00	0.78	317.92	2449.64	22.26	21.99	-8.22	0.24	23.48	339.50

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
2475.00	0.85	319.15	2474.64	22.53	22.26	-8.46	0.32	23.81	339.19
2500.00	0.83	324.77	2499.64	22.82	22.55	-8.68	0.34	24.16	338.94
2525.00	0.92	326.00	2524.63	23.15	22.86	-8.90	0.36	24.53	338.73
2550.00	0.96	310.46	2549.63	23.46	23.16	-9.17	1.03	24.91	338.40
2575.00	0.98	316.12	2574.63	23.76	23.45	-9.48	0.39	25.30	337.99
2600.00	1.01	318.28	2599.62	24.08	23.77	-9.77	0.21	25.70	337.65
2625.00	0.94	311.68	2624.62	24.40	24.07	-10.08	0.53	26.10	337.29
2650.00	0.92	315.00	2649.62	24.68	24.35	-10.37	0.23	26.47	336.93
2675.00	0.96	318.76	2674.61	24.99	24.65	-10.65	0.29	26.85	336.64
2700.00	0.83	321.40	2699.61	25.30	24.95	-10.90	0.53	27.23	336.40
2725.00	0.87	320.42	2724.61	25.59	25.24	-11.14	0.18	27.59	336.19
2750.00	0.88	327.72	2749.61	25.91	25.55	-11.36	0.45	27.96	336.03
2775.00	0.80	327.17	2774.60	26.23	25.86	-11.56	0.33	28.32	335.92
2800.00	0.82	330.28	2799.60	26.54	26.16	-11.74	0.19	28.68	335.83
2825.00	0.75	329.20	2824.60	26.84	26.46	-11.91	0.28	29.02	335.76
2850.00	0.73	331.01	2849.60	27.13	26.74	-12.08	0.14	29.34	335.70
2875.00	0.76	344.68	2874.59	27.43	27.04	-12.20	0.72	29.66	335.72
2900.00	0.74	332.91	2899.59	27.74	27.34	-12.31	0.62	29.99	335.76
2925.00	0.85	330.93	2924.59	28.05	27.65	-12.48	0.45	30.33	335.71
2950.00	0.83	336.35	2949.59	28.38	27.97	-12.64	0.33	30.70	335.69
2975.00	0.94	337.72	2974.58	28.74	28.33	-12.79	0.46	31.08	335.70
3000.00	0.93	332.74	2999.58	29.11	28.70	-12.96	0.33	31.49	335.70
3025.00	0.99	341.19	3024.58	29.50	29.09	-13.12	0.61	31.91	335.72
3050.00	0.85	339.66	3049.57	29.89	29.46	-13.26	0.57	32.31	335.77
3075.00	0.90	344.47	3074.57	30.25	29.83	-13.37	0.37	32.69	335.85
3100.00	0.96	344.47	3099.57	30.65	30.22	-13.48	0.20	33.09	335.95
3125.00	0.83	341.74	3124.56	31.03	30.59	-13.60	0.54	33.48	336.04
3150.00	0.85	339.82	3149.56	31.37	30.94	-13.72	0.13	33.84	336.09
3175.00	0.53	319.40	3174.56	31.64	31.20	-13.85	1.59	34.13	336.05
3200.00	0.38	280.62	3199.56	31.75	31.30	-14.01	1.33	34.29	335.88
3225.00	0.28	236.98	3224.56	31.73	31.28	-14.14	1.06	34.33	335.67
3250.00	0.31	239.49	3249.56	31.67	31.21	-14.25	0.13	34.31	335.46

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
3275.00	0.35	239.51	3274.56	31.60	31.14	-14.38	0.15	34.30	335.22
3300.00	0.38	279.43	3299.56	31.58	31.12	-14.52	0.99	34.34	334.98
3325.00	0.41	260.85	3324.56	31.59	31.12	-14.69	0.52	34.41	334.73
3350.00	0.55	263.02	3349.56	31.57	31.09	-14.90	0.57	34.47	334.40
3375.00	0.31	258.35	3374.55	31.54	31.06	-15.08	0.96	34.53	334.10
3400.00	0.35	282.36	3399.55	31.55	31.06	-15.22	0.58	34.59	333.89
3425.00	0.53	251.82	3424.55	31.54	31.04	-15.41	1.17	34.66	333.60
3450.00	0.53	282.57	3449.55	31.53	31.03	-15.63	1.12	34.75	333.26
3475.00	0.59	287.79	3474.55	31.60	31.10	-15.87	0.31	34.91	332.97
3500.00	0.57	288.14	3499.55	31.69	31.17	-16.10	0.06	35.09	332.68
3525.00	0.50	303.15	3524.55	31.80	31.27	-16.31	0.63	35.27	332.45
3550.00	0.63	307.32	3549.55	31.95	31.42	-16.52	0.56	35.49	332.27
3575.00	0.69	306.97	3574.55	32.13	31.59	-16.75	0.24	35.75	332.07
3600.00	0.72	315.89	3599.54	32.34	31.79	-16.98	0.45	36.04	331.90
3625.00	0.88	312.97	3624.54	32.59	32.04	-17.22	0.67	36.37	331.73
3650.00	0.81	315.46	3649.54	32.86	32.29	-17.49	0.29	36.72	331.56
3675.00	1.02	337.61	3674.54	33.19	32.62	-17.70	1.61	37.12	331.52
3700.00	0.94	332.49	3699.53	33.59	33.01	-17.88	0.45	37.54	331.56
3725.00	0.86	333.15	3724.53	33.94	33.36	-18.06	0.35	37.94	331.57
3750.00	0.92	349.41	3749.53	34.31	33.73	-18.18	1.03	38.31	331.67
3775.00	0.81	2.60	3774.52	34.68	34.10	-18.21	0.90	38.66	331.90
3800.00	0.56	42.44	3799.52	34.95	34.37	-18.12	2.10	38.85	332.20
3825.00	0.61	106.44	3824.52	34.99	34.42	-17.91	2.48	38.80	332.51
3850.00	0.94	120.01	3849.52	34.84	34.28	-17.60	1.52	38.53	332.82
3875.00	1.27	122.51	3874.51	34.58	34.03	-17.19	1.31	38.12	333.20
3900.00	1.44	124.63	3899.51	34.23	33.70	-16.70	0.72	37.61	333.64
3925.00	1.63	132.09	3924.50	33.80	33.28	-16.18	1.09	37.00	334.08
3950.00	1.92	127.53	3949.49	33.29	32.79	-15.58	1.29	36.30	334.58
3975.00	1.74	124.91	3974.47	32.79	32.32	-14.94	0.80	35.60	335.19
4000.00	2.01	121.81	3999.46	32.32	31.87	-14.25	1.18	34.91	335.90
4025.00	2.17	115.99	4024.44	31.86	31.43	-13.46	1.04	34.19	336.82
4050.00	2.22	114.20	4049.42	31.42	31.02	-12.59	0.35	33.48	337.91

MD ft	INC deg	AZIM deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	CLOSURE DIST ft	CLOSURE DIR deg
4075.00	2.16	117.78	4074.41	30.98	30.61	-11.73	0.61	32.78	339.03
4100.00	1.94	113.73	4099.39	30.56	30.22	-10.93	1.03	32.13	340.12
4125.00	2.00	108.90	4124.38	30.22	29.90	-10.13	0.70	31.57	341.29
4150.00	1.75	110.59	4149.36	29.92	29.63	-9.35	1.00	31.07	342.48
4175.00	1.26	111.45	4174.35	29.67	29.39	-8.74	1.97	30.67	343.44
4200.00	0.72	124.69	4199.35	29.46	29.20	-8.36	2.35	30.38	344.03
4225.00	0.50	175.17	4224.35	29.26	29.01	-8.22	2.22	30.15	344.18
4250.00	0.48	200.35	4249.35	29.05	28.80	-8.25	0.87	29.95	344.02
4275.00	0.80	210.85	4274.35	28.81	28.55	-8.37	1.35	29.75	343.66
4300.00	0.92	212.77	4299.34	28.50	28.23	-8.57	0.49	29.50	343.11
4325.00	1.07	209.24	4324.34	28.13	27.86	-8.79	0.64	29.21	342.48
4350.00	1.16	214.09	4349.33	27.73	27.44	-9.05	0.51	28.90	341.75
4375.00	1.22	210.54	4374.33	27.30	27.00	-9.33	0.40	28.57	340.95
4400.00	1.36	205.74	4399.32	26.81	26.51	-9.59	0.70	28.19	340.11
4425.00	1.24	177.46	4424.32	26.28	25.97	-9.71	2.58	27.72	339.50
4450.00	1.43	213.19	4449.31	25.75	25.44	-9.87	3.35	27.28	338.80
4475.00	1.52	217.67	4474.30	25.24	24.92	-10.24	0.59	26.94	337.66
4500.00	1.53	214.54	4499.29	24.72	24.38	-10.63	0.34	26.60	336.44
4525.00	1.52	215.60	4524.28	24.19	23.83	-11.01	0.12	26.26	335.20
4550.00	1.55	211.34	4549.28	23.64	23.28	-11.38	0.47	25.91	333.94
4575.00	1.50	211.78	4574.27	23.08	22.71	-11.73	0.21	25.56	332.68
4600.00	1.68	210.02	4599.26	22.50	22.11	-12.08	0.73	25.20	331.34
4625.00	1.73	206.36	4624.25	21.86	21.46	-12.43	0.48	24.80	329.91
4650.00	1.80	209.59	4649.23	21.19	20.78	-12.80	0.49	24.40	328.38
4675.00	1.72	207.15	4674.22	20.53	20.11	-13.16	0.43	24.03	326.79
4700.00	1.67	206.38	4699.21	19.88	19.45	-13.49	0.24	23.67	325.24
4725.00	1.66	205.99	4724.20	19.24	18.79	-13.81	0.05	23.32	323.68
4750.00	1.68	209.10	4749.19	18.61	18.15	-14.15	0.36	23.01	322.05
4775.00	1.83	205.57	4774.18	17.94	17.47	-14.50	0.76	22.70	320.30
4800.00	1.83	209.51	4799.17	17.24	16.76	-14.87	0.50	22.41	318.42
4825.00	1.71	206.32	4824.15	16.57	16.08	-15.23	0.62	22.15	316.55
4850.00	1.78	207.88	4849.14	15.91	15.40	-15.58	0.34	21.91	314.67

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
4875.00	1.77	206.63	4874.13	15.23	14.71	-15.94	0.16	21.69	312.71
4900.00	1.77	206.38	4899.12	14.55	14.02	-16.28	0.03	21.48	310.73
4925.00	1.79	208.21	4924.11	13.87	13.33	-16.64	0.24	21.32	308.70
4950.00	1.77	208.53	4949.09	13.20	12.64	-17.01	0.08	21.19	306.63
4975.00	1.77	203.92	4974.08	12.52	11.95	-17.35	0.57	21.07	304.56
5000.00	1.89	204.26	4999.07	11.80	11.22	-17.67	0.45	20.94	302.41
5025.00	1.65	202.55	5024.06	11.11	10.51	-17.98	0.98	20.83	300.32
5050.00	0.85	182.23	5049.05	10.59	10.00	-18.13	3.60	20.70	298.88
5075.00	0.72	163.07	5074.05	10.26	9.66	-18.09	1.17	20.51	298.11
5100.00	0.57	153.62	5099.05	9.99	9.40	-17.99	0.72	20.30	297.60
5125.00	0.58	145.19	5124.05	9.77	9.19	-17.86	0.34	20.08	297.22
5150.00	0.65	148.75	5149.04	9.54	8.96	-17.71	0.30	19.85	296.84
5175.00	0.64	139.34	5174.04	9.31	8.73	-17.55	0.42	19.60	296.46
5200.00	0.58	144.70	5199.04	9.10	8.52	-17.38	0.34	19.36	296.12
5225.00	0.55	146.70	5224.04	8.89	8.32	-17.24	0.15	19.15	295.76
5250.00	0.62	151.50	5249.04	8.67	8.10	-17.11	0.34	18.94	295.33
5275.00	0.68	142.63	5274.04	8.42	7.87	-16.96	0.47	18.70	294.88
5300.00	0.70	140.02	5299.04	8.18	7.63	-16.77	0.16	18.43	294.47
5325.00	0.60	137.44	5324.03	7.96	7.42	-16.59	0.41	18.17	294.10
5350.00	0.59	138.11	5349.03	7.77	7.23	-16.41	0.05	17.93	293.76
5375.00	0.63	142.76	5374.03	7.56	7.02	-16.24	0.24	17.69	293.38
5400.00	0.59	147.40	5399.03	7.33	6.80	-16.09	0.25	17.47	292.92
5425.00	0.60	148.48	5424.03	7.11	6.58	-15.95	0.08	17.26	292.43
5450.00	0.52	145.09	5449.03	6.90	6.38	-15.82	0.36	17.06	291.96
5475.00	0.44	152.79	5474.03	6.72	6.20	-15.71	0.41	16.89	291.54
5500.00	0.44	161.34	5499.03	6.54	6.02	-15.63	0.26	16.75	291.07
5525.00	0.40	166.07	5524.03	6.36	5.85	-15.58	0.19	16.64	290.57
5550.00	0.40	163.79	5549.02	6.19	5.68	-15.54	0.06	16.54	290.07
5575.00	0.39	161.78	5574.02	6.02	5.51	-15.49	0.08	16.44	289.59
5600.00	0.35	156.28	5599.02	5.87	5.36	-15.43	0.21	16.33	289.16
5625.00	0.39	162.34	5624.02	5.72	5.21	-15.37	0.22	16.23	288.72
5650.00	0.42	169.11	5649.02	5.54	5.04	-15.33	0.23	16.14	288.20

MD ft	INC deg	AZIM deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	CLOSURE DIST ft	CLOSURE DIR deg
5675.00	0.43	155.79	5674.02	5.37	4.86	-15.27	0.40	16.03	287.66
5700.00	0.45	171.53	5699.02	5.18	4.68	-15.22	0.49	15.92	287.09
5725.00	0.50	172.30	5724.02	4.98	4.48	-15.19	0.20	15.84	286.42
5750.00	0.55	175.26	5749.02	4.75	4.25	-15.17	0.22	15.75	285.65
5775.00	0.47	169.79	5774.02	4.53	4.03	-15.14	0.36	15.67	284.90
5800.00	0.50	169.05	5799.02	4.32	3.82	-15.10	0.11	15.58	284.20
5825.00	0.50	173.53	5824.02	4.10	3.61	-15.07	0.16	15.49	283.46
5850.00	0.53	178.85	5849.02	3.88	3.38	-15.05	0.23	15.43	282.66
5875.00	0.49	177.29	5874.01	3.66	3.16	-15.04	0.19	15.37	281.86
5900.00	0.53	177.53	5899.01	3.43	2.94	-15.03	0.18	15.32	281.05
5925.00	0.57	171.42	5924.01	3.19	2.70	-15.01	0.27	15.25	280.19
5950.00	0.56	176.71	5949.01	2.95	2.45	-14.99	0.21	15.18	279.30
5975.00	0.48	168.89	5974.01	2.72	2.23	-14.96	0.44	15.12	278.48
6000.00	0.50	171.59	5999.01	2.51	2.02	-14.92	0.13	15.06	277.70
6025.00	0.45	169.79	6024.01	2.31	1.81	-14.89	0.20	15.00	276.94
6050.00	0.56	175.81	6049.01	2.09	1.60	-14.86	0.46	14.95	276.13
6075.00	0.52	173.65	6074.01	1.85	1.36	-14.84	0.16	14.90	275.24
6100.00	0.51	175.86	6099.01	1.63	1.14	-14.82	0.10	14.86	274.39
6125.00	0.50	184.23	6124.00	1.41	0.92	-14.82	0.29	14.85	273.55
6150.00	0.49	192.45	6149.00	1.20	0.71	-14.85	0.28	14.87	272.73
6175.00	0.45	196.40	6174.00	1.01	0.51	-14.90	0.20	14.91	271.97
6200.00	0.53	213.90	6199.00	0.82	0.32	-14.99	0.68	15.00	271.23
6225.00	0.38	219.55	6224.00	0.66	0.16	-15.11	0.62	15.11	270.62
6250.00	0.44	216.92	6249.00	0.53	0.02	-15.22	0.25	15.22	270.08
6275.00	0.53	220.17	6274.00	0.37	-0.14	-15.35	0.37	15.35	269.46
6300.00	0.54	226.07	6299.00	0.20	-0.31	-15.51	0.22	15.52	268.84
6325.00	0.54	221.37	6324.00	0.04	-0.48	-15.68	0.18	15.68	268.23
6350.00	0.57	226.07	6349.00	-0.13	-0.66	-15.84	0.21	15.86	267.62
6375.00	0.62	229.53	6373.99	-0.30	-0.83	-16.03	0.26	16.06	267.03
6400.00	0.58	231.39	6398.99	-0.46	-1.00	-16.24	0.20	16.27	266.49
6425.00	0.65	234.39	6423.99	-0.61	-1.16	-16.45	0.32	16.49	265.97
6450.00	0.59	232.15	6448.99	-0.77	-1.32	-16.66	0.26	16.72	265.48

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	"/100ft	ft	deg
6475.00	0.59	246.57	6473.99	-0.89	-1.45	-16.88	0.59	16.95	265.10
6500.00	0.68	241.35	6498.99	-1.00	-1.57	-17.13	0.42	17.20	264.76
6525.00	0.73	239.39	6523.99	-1.14	-1.72	-17.40	0.22	17.48	264.35
6550.00	0.74	248.13	6548.98	-1.28	-1.86	-17.68	0.45	17.78	263.99
6575.00	0.67	242.83	6573.98	-1.39	-1.99	-17.96	0.38	18.07	263.68
6600.00	0.72	243.96	6598.98	-1.52	-2.12	-18.23	0.22	18.36	263.35
6625.00	0.75	253.43	6623.98	-1.62	-2.24	-18.53	0.50	18.67	263.11
6650.00	0.76	252.16	6648.98	-1.71	-2.34	-18.85	0.09	18.99	262.93
6675.00	0.74	249.05	6673.97	-1.81	-2.45	-19.15	0.19	19.31	262.72
6700.00	0.79	248.00	6698.97	-1.92	-2.57	-19.46	0.22	19.63	262.48
6725.00	0.79	251.76	6723.97	-2.03	-2.69	-19.79	0.21	19.97	262.27
6750.00	0.70	242.99	6748.97	-2.14	-2.81	-20.08	0.57	20.28	262.04
6775.00	0.71	246.71	6773.96	-2.26	-2.94	-20.36	0.19	20.57	261.79
6800.00	0.69	247.57	6798.96	-2.37	-3.06	-20.64	0.07	20.87	261.58
6825.00	0.18	204.82	6823.96	-2.46	-3.15	-20.80	2.29	21.04	261.38
6850.00	0.08	160.86	6848.96	-2.51	-3.20	-20.81	0.55	21.05	261.25
6875.00	0.21	110.28	6873.96	-2.55	-3.24	-20.76	0.68	21.01	261.14
6900.00	0.31	92.91	6898.96	-2.57	-3.26	-20.65	0.51	20.91	261.04
6925.00	0.33	93.61	6923.96	-2.58	-3.26	-20.51	0.07	20.77	260.96
6950.00	0.40	88.99	6948.96	-2.59	-3.27	-20.36	0.31	20.62	260.88
6975.00	0.31	90.92	6973.96	-2.59	-3.27	-20.20	0.36	20.46	260.82
7000.00	0.34	88.31	6998.96	-2.60	-3.26	-20.06	0.15	20.32	260.76
7025.00	0.36	100.90	7023.96	-2.62	-3.28	-19.91	0.32	20.17	260.65
7050.00	0.37	112.36	7048.96	-2.67	-3.32	-19.75	0.30	20.03	260.45
7075.00	0.50	107.10	7073.96	-2.74	-3.39	-19.57	0.52	19.86	260.18
7100.00	0.42	117.62	7098.96	-2.82	-3.46	-19.39	0.46	19.70	259.88
7125.00	0.60	116.68	7123.96	-2.92	-3.56	-19.19	0.71	19.52	259.49
7150.00	0.58	117.46	7148.96	-3.05	-3.68	-18.96	0.06	19.32	259.02
7175.00	0.59	115.97	7173.95	-3.17	-3.79	-18.73	0.07	19.11	258.55
7200.00	0.63	121.61	7198.95	-3.31	-3.92	-18.50	0.29	18.91	258.02
7225.00	0.67	117.27	7223.95	-3.46	-4.06	-18.25	0.26	18.70	257.45
7250.00	0.71	129.10	7248.95	-3.63	-4.23	-18.00	0.59	18.49	256.78

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	"/100ft	ft	deg
7275.00	0.60	132.26	7273.95	-3.82	-4.41	-17.78	0.46	18.32	256.06
7300.00	0.68	142.71	7298.95	-4.04	-4.62	-17.59	0.57	18.19	255.28
7325.00	0.70	150.82	7323.94	-4.29	-4.87	-17.43	0.40	18.10	254.38
7350.00	0.85	166.05	7348.94	-4.61	-5.19	-17.31	1.02	18.07	253.32
7375.00	0.90	169.89	7373.94	-4.99	-5.56	-17.23	0.31	18.11	252.12
7400.00	0.92	171.91	7398.94	-5.38	-5.95	-17.17	0.14	18.17	250.88
7425.00	0.97	171.10	7423.93	-5.79	-6.36	-17.11	0.22	18.25	249.61
7450.00	0.98	172.16	7448.93	-6.21	-6.78	-17.05	0.08	18.34	248.31
7475.00	0.97	171.25	7473.93	-6.63	-7.20	-16.98	0.07	18.45	247.03
7500.00	1.08	169.48	7498.92	-7.08	-7.64	-16.91	0.46	18.56	245.68
7525.00	1.06	173.24	7523.92	-7.54	-8.10	-16.84	0.30	18.69	244.30
7550.00	1.02	165.88	7548.91	-7.99	-8.55	-16.76	0.56	18.81	242.97
7575.00	1.07	169.04	7573.91	-8.44	-9.00	-16.66	0.30	18.93	241.63
7600.00	1.03	171.16	7598.90	-8.89	-9.45	-16.58	0.21	19.08	240.32
7625.00	1.11	172.86	7623.90	-9.36	-9.91	-16.51	0.34	19.26	239.03
7650.00	1.11	173.04	7648.90	-9.84	-10.39	-16.45	0.03	19.46	237.73
7675.00	1.11	172.79	7673.89	-10.32	-10.87	-16.40	0.02	19.67	236.46
7700.00	1.15	173.07	7698.89	-10.81	-11.36	-16.33	0.19	19.90	235.19
7725.00	1.10	168.92	7723.88	-11.30	-11.84	-16.26	0.38	20.11	233.93
7750.00	0.71	154.75	7748.88	-11.68	-12.22	-16.15	1.78	20.25	232.88
7775.00	0.42	129.19	7773.88	-11.88	-12.42	-16.01	1.52	20.26	232.20
7800.00	0.47	92.53	7798.88	-11.95	-12.48	-15.84	1.13	20.16	231.76
7825.00	0.40	95.63	7823.88	-11.97	-12.49	-15.65	0.30	20.02	231.39
7850.00	0.43	105.74	7848.87	-12.01	-12.53	-15.47	0.32	19.91	231.00
7875.00	0.42	82.02	7873.87	-12.03	-12.54	-15.29	0.70	19.77	230.64
7900.00	0.44	79.57	7898.87	-12.00	-12.51	-15.10	0.09	19.61	230.36
7925.00	0.45	75.82	7923.87	-11.97	-12.47	-14.91	0.13	19.44	230.10
7950.00	0.42	90.87	7948.87	-11.95	-12.45	-14.73	0.47	19.28	229.80
7975.00	0.44	82.80	7973.87	-11.95	-12.44	-14.54	0.25	19.13	229.46
8000.00	0.34	95.54	7998.87	-11.95	-12.43	-14.37	0.53	19.00	229.14
8025.00	0.35	105.23	8023.87	-11.98	-12.46	-14.22	0.24	18.91	228.79
8050.00	0.37	104.12	8048.87	-12.02	-12.50	-14.07	0.10	18.82	228.39

MD ft	INC deg	AZIM deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	CLOSURE DIST ft	CLOSURE DIR deg
8075.00	0.30	88.97	8073.87	-12.05	-12.52	-13.93	0.46	18.72	228.05
8100.00	0.38	91.66	8098.87	-12.05	-12.52	-13.78	0.30	18.61	227.74
8125.00	0.27	91.13	8123.87	-12.06	-12.52	-13.64	0.41	18.51	227.44
8150.00	0.37	98.73	8148.87	-12.08	-12.53	-13.50	0.44	18.42	227.12
8175.00	0.31	100.78	8173.87	-12.11	-12.56	-13.35	0.27	18.33	226.75
8200.00	0.27	101.71	8198.87	-12.14	-12.58	-13.22	0.14	18.26	226.42
8225.00	0.32	119.82	8223.87	-12.19	-12.63	-13.11	0.42	18.20	226.06
8250.00	0.54	77.28	8248.87	-12.20	-12.64	-12.93	1.49	18.08	225.65
8275.00	0.36	127.63	8273.87	-12.23	-12.66	-12.75	1.66	17.97	225.21
8300.00	0.30	107.33	8298.86	-12.30	-12.73	-12.63	0.51	17.93	224.77
8325.00	0.32	103.05	8323.86	-12.34	-12.76	-12.50	0.10	17.86	224.39
8350.00	0.32	123.89	8348.86	-12.40	-12.82	-12.37	0.46	17.82	223.98
8375.00	0.37	112.86	8373.86	-12.48	-12.89	-12.24	0.33	17.77	223.52
8400.00	0.40	136.62	8398.86	-12.58	-12.98	-12.10	0.65	17.75	222.99
8417.00	0.45	149.59	8415.86	-12.68	-13.09	-12.03	0.65	17.78	222.59



COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 29, T 24 S. , R 32E

Azores Federal 9H

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

19 October, 2017





Integrity Directional Services, LLC
Survey Report - Geographic



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Azores Federal 9H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Site:	Sec. 29, T 24 S. , R 32E	MD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Well:	Azores Federal 9H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

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. 29, T 24 S. , R 32E			
Site Position:		Northing:	430,368.5000 usft	Latitude:	32.181611
From:	Map	Easting:	696,155.5000 usft	Longitude:	-103.699316
Position Uncertainty:	5.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.34 °

Well	Azores Federal 9H, ACTIVE					
Well Position	+N/-S	0.00 ft	Northing:	430,354.8000 usf	Latitude:	32.181593
	+E/-W	0.00 ft	Easting:	694,935.6000 usf	Longitude:	-103.703259
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	3,500.50 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/24/2017	6.88	59.90	48,059

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	358.10	

Survey Program	Date	10/19/2017			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
100.00	8,417.00	Keeper Gyros (Wellbore #1)	Keeper	Standard Wireline Keeper ver 1.0.2	
8,454.00	13,874.00	MWD Surveys (Wellbore #1)	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	430,354.8000	694,935.6000	32.181593	-103.703259	
100.00	0.47	190.98	100.00	-0.40	-0.08	430,354.3973	694,935.5218	32.181592	-103.703259	
125.00	0.54	197.07	125.00	-0.62	-0.13	430,354.1841	694,935.4677	32.181591	-103.703259	
150.00	0.58	188.72	150.00	-0.85	-0.19	430,353.9464	694,935.4140	32.181591	-103.703260	
175.00	0.59	190.99	175.00	-1.11	-0.23	430,353.6949	694,935.3702	32.181590	-103.703260	
200.00	0.60	196.49	199.99	-1.36	-0.29	430,353.4431	694,935.3085	32.181589	-103.703260	
225.00	0.60	211.73	224.99	-1.59	-0.40	430,353.2062	694,935.2026	32.181589	-103.703260	
250.00	0.77	217.07	249.99	-1.84	-0.57	430,352.9609	694,935.0325	32.181588	-103.703261	
275.00	0.68	209.61	274.99	-2.10	-0.74	430,352.6978	694,934.8579	32.181587	-103.703261	
300.00	0.68	219.30	299.99	-2.35	-0.91	430,352.4541	694,934.6906	32.181587	-103.703262	
325.00	0.46	219.28	324.99	-2.54	-1.07	430,352.2616	694,934.5331	32.181586	-103.703262	



Integrity Directional Services, LLC
Survey Report - Geographic



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Azores Federal 9H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Site:	Sec. 29, T 24 S. , R 32E	MD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Well:	Azores Federal 9H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
350.00	0.48	225.38	349.99	-2.69	-1.20	430,352.1104	694,934.3951	32.181586	-103.703263
375.00	0.31	236.10	374.98	-2.80	-1.34	430,351.9991	694,934.2644	32.181585	-103.703263
400.00	0.41	214.76	399.98	-2.91	-1.44	430,351.8879	694,934.1573	32.181585	-103.703264
425.00	0.47	224.34	424.98	-3.06	-1.57	430,351.7411	694,934.0346	32.181585	-103.703264
450.00	0.49	241.92	449.98	-3.18	-1.73	430,351.6174	694,933.8686	32.181584	-103.703265
475.00	0.37	224.80	474.98	-3.29	-1.88	430,351.5098	694,933.7174	32.181584	-103.703265
500.00	0.26	236.86	499.98	-3.38	-1.99	430,351.4215	694,933.6130	32.181584	-103.703265
525.00	0.39	242.73	524.98	-3.45	-2.11	430,351.3515	694,933.4899	32.181584	-103.703266
550.00	0.33	239.53	549.98	-3.52	-2.25	430,351.2760	694,933.3522	32.181583	-103.703266
575.00	0.40	261.66	574.98	-3.57	-2.40	430,351.2269	694,933.2038	32.181583	-103.703267
600.00	0.32	279.08	599.98	-3.57	-2.55	430,351.2252	694,933.0486	32.181583	-103.703267
625.00	0.25	269.13	624.98	-3.56	-2.67	430,351.2354	694,932.9251	32.181583	-103.703268
650.00	0.32	271.73	649.98	-3.56	-2.80	430,351.2367	694,932.8008	32.181583	-103.703268
675.00	0.22	290.99	674.98	-3.54	-2.91	430,351.2560	694,932.6862	32.181583	-103.703268
700.00	0.31	289.56	699.98	-3.50	-3.02	430,351.2958	694,932.5776	32.181584	-103.703269
725.00	0.24	285.68	724.98	-3.47	-3.14	430,351.3326	694,932.4635	32.181584	-103.703269
750.00	0.29	280.08	749.98	-3.44	-3.25	430,351.3579	694,932.3508	32.181584	-103.703269
775.00	0.20	309.88	774.98	-3.40	-3.34	430,351.3969	694,932.2550	32.181584	-103.703270
800.00	0.26	320.26	799.98	-3.33	-3.41	430,351.4685	694,932.1853	32.181584	-103.703270
825.00	0.38	308.28	824.98	-3.24	-3.52	430,351.5635	694,932.0839	32.181584	-103.703270
850.00	0.35	303.33	849.98	-3.14	-3.64	430,351.6568	694,931.9551	32.181585	-103.703271
875.00	0.33	317.20	874.98	-3.05	-3.76	430,351.7516	694,931.8424	32.181585	-103.703271
900.00	0.39	320.19	899.98	-2.93	-3.86	430,351.8697	694,931.7390	32.181585	-103.703271
925.00	0.37	318.90	924.97	-2.80	-3.97	430,351.9959	694,931.6314	32.181585	-103.703272
950.00	0.32	306.43	949.97	-2.70	-4.08	430,352.0982	694,931.5222	32.181586	-103.703272
975.00	0.38	314.45	974.97	-2.60	-4.19	430,352.1977	694,931.4068	32.181586	-103.703272
1,000.00	0.37	319.56	999.97	-2.48	-4.30	430,352.3172	694,931.2953	32.181586	-103.703273
1,025.00	0.39	308.80	1,024.97	-2.37	-4.42	430,352.4320	694,931.1766	32.181587	-103.703273
1,050.00	0.33	306.26	1,049.97	-2.27	-4.55	430,352.5279	694,931.0523	32.181587	-103.703274
1,075.00	0.39	305.40	1,074.97	-2.18	-4.68	430,352.6197	694,930.9249	32.181587	-103.703274
1,100.00	0.28	312.84	1,099.97	-2.09	-4.79	430,352.7106	694,930.8107	32.181587	-103.703274
1,125.00	0.35	291.22	1,124.97	-2.02	-4.91	430,352.7797	694,930.6947	32.181588	-103.703275
1,150.00	0.41	289.33	1,149.97	-1.96	-5.06	430,352.8370	694,930.5392	32.181588	-103.703275
1,175.00	0.45	297.38	1,174.97	-1.89	-5.23	430,352.9117	694,930.3676	32.181588	-103.703276
1,200.00	0.39	301.53	1,199.97	-1.80	-5.39	430,353.0014	694,930.2079	32.181588	-103.703276
1,225.00	0.39	307.64	1,224.97	-1.70	-5.53	430,353.0978	694,930.0680	32.181588	-103.703277
1,250.00	0.40	315.89	1,249.97	-1.59	-5.66	430,353.2125	694,929.9399	32.181589	-103.703277
1,275.00	0.37	315.39	1,274.97	-1.47	-5.78	430,353.3326	694,929.8224	32.181589	-103.703278
1,300.00	0.51	333.66	1,299.97	-1.31	-5.88	430,353.4898	694,929.7164	32.181590	-103.703278
1,325.00	0.47	331.18	1,324.97	-1.12	-5.98	430,353.6793	694,929.6176	32.181590	-103.703278
1,350.00	0.50	352.02	1,349.96	-0.92	-6.05	430,353.8772	694,929.5530	32.181591	-103.703278
1,375.00	0.69	352.74	1,374.96	-0.67	-6.08	430,354.1345	694,929.5188	32.181591	-103.703279
1,400.00	0.81	359.27	1,399.96	-0.34	-6.10	430,354.4605	694,929.4976	32.181592	-103.703279
1,425.00	0.94	4.40	1,424.96	0.04	-6.09	430,354.8417	694,929.5111	32.181593	-103.703279
1,450.00	1.15	5.51	1,449.95	0.50	-6.05	430,355.2959	694,929.5509	32.181595	-103.703278
1,475.00	1.20	5.15	1,474.95	1.01	-6.00	430,355.8063	694,929.5985	32.181596	-103.703278
1,500.00	1.43	0.09	1,499.94	1.58	-5.98	430,356.3790	694,929.6225	32.181598	-103.703278
1,525.00	1.46	5.89	1,524.93	2.21	-5.94	430,357.0077	694,929.6556	32.181599	-103.703278
1,550.00	1.62	3.87	1,549.93	2.88	-5.89	430,357.6771	694,929.7122	32.181601	-103.703278
1,575.00	1.67	6.47	1,574.92	3.59	-5.82	430,358.3916	694,929.7771	32.181603	-103.703278
1,600.00	1.68	1.27	1,599.90	4.32	-5.77	430,359.1200	694,929.8262	32.181605	-103.703277
1,625.00	1.80	5.69	1,624.89	5.08	-5.73	430,359.8771	694,929.8733	32.181607	-103.703277
1,650.00	1.92	6.36	1,649.88	5.88	-5.64	430,360.6840	694,929.9586	32.181609	-103.703277
1,675.00	1.96	4.79	1,674.87	6.73	-5.56	430,361.5262	694,930.0407	32.181612	-103.703277
1,700.00	1.97	3.48	1,699.85	7.58	-5.50	430,362.3812	694,930.1025	32.181614	-103.703277



Integrity Directional Services, LLC
Survey Report - Geographic



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Azores Federal 9H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Site:	Sec. 29, T 24 S. , R 32E	MD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Well:	Azores Federal 9H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,725.00	1.99	4.79	1,724.84	8.44	-5.44	430,363.2426	694,930.1648	32.181616	-103.703276
1,750.00	2.06	3.53	1,749.82	9.32	-5.37	430,364.1236	694,930.2287	32.181619	-103.703276
1,775.00	2.08	6.84	1,774.80	10.22	-5.29	430,365.0226	694,930.3104	32.181621	-103.703276
1,800.00	2.06	5.84	1,799.79	11.12	-5.19	430,365.9200	694,930.4102	32.181624	-103.703275
1,825.00	2.08	8.54	1,824.77	12.02	-5.08	430,366.8157	694,930.5233	32.181626	-103.703275
1,850.00	2.06	15.80	1,849.76	12.90	-4.89	430,367.6967	694,930.7130	32.181629	-103.703274
1,875.00	2.12	4.95	1,874.74	13.79	-4.72	430,368.5897	694,930.8752	32.181631	-103.703274
1,900.00	2.11	7.52	1,899.72	14.71	-4.62	430,369.5067	694,930.9753	32.181634	-103.703274
1,925.00	1.86	5.31	1,924.71	15.57	-4.53	430,370.3669	694,931.0731	32.181636	-103.703273
1,950.00	1.39	355.83	1,949.70	16.27	-4.51	430,371.0733	694,931.0886	32.181638	-103.703273
1,975.00	1.20	349.97	1,974.69	16.83	-4.58	430,371.6335	694,931.0210	32.181639	-103.703273
2,000.00	1.18	341.71	1,999.68	17.34	-4.71	430,372.1357	694,930.8946	32.181641	-103.703274
2,025.00	1.19	333.23	2,024.68	17.81	-4.90	430,372.6119	694,930.6969	32.181642	-103.703274
2,050.00	1.07	343.43	2,049.67	18.27	-5.09	430,373.0674	694,930.5134	32.181643	-103.703275
2,075.00	0.97	337.59	2,074.67	18.69	-5.23	430,373.4867	694,930.3662	32.181645	-103.703275
2,100.00	0.88	329.72	2,099.67	19.05	-5.41	430,373.8482	694,930.1887	32.181646	-103.703276
2,125.00	0.67	322.36	2,124.67	19.33	-5.60	430,374.1297	694,930.0026	32.181646	-103.703277
2,150.00	0.65	325.77	2,149.66	19.56	-5.77	430,374.3627	694,929.8336	32.181647	-103.703277
2,175.00	0.63	322.92	2,174.66	19.79	-5.93	430,374.5896	694,929.6709	32.181648	-103.703278
2,200.00	0.57	299.96	2,199.66	19.96	-6.12	430,374.7613	694,929.4803	32.181648	-103.703278
2,225.00	0.68	313.78	2,224.66	20.13	-6.33	430,374.9261	694,929.2655	32.181649	-103.703279
2,250.00	0.63	304.98	2,249.66	20.31	-6.55	430,375.1075	694,929.0458	32.181649	-103.703280
2,275.00	0.65	311.12	2,274.66	20.48	-6.77	430,375.2796	694,928.8263	32.181649	-103.703280
2,300.00	0.55	322.79	2,299.65	20.67	-6.95	430,375.4684	694,928.6470	32.181650	-103.703281
2,325.00	0.54	307.94	2,324.65	20.84	-7.12	430,375.6364	694,928.4815	32.181650	-103.703282
2,350.00	0.66	309.82	2,349.65	21.00	-7.32	430,375.8010	694,928.2780	32.181651	-103.703282
2,375.00	0.66	323.38	2,374.65	21.21	-7.52	430,376.0088	694,928.0815	32.181652	-103.703283
2,400.00	0.85	317.06	2,399.65	21.46	-7.73	430,376.2601	694,927.8693	32.181652	-103.703283
2,425.00	0.84	317.42	2,424.65	21.73	-7.98	430,376.5308	694,927.6190	32.181653	-103.703284
2,450.00	0.78	317.92	2,449.64	21.99	-8.22	430,376.7920	694,927.3809	32.181654	-103.703285
2,475.00	0.85	319.15	2,474.64	22.26	-8.45	430,377.0586	694,927.1456	32.181654	-103.703286
2,500.00	0.83	324.77	2,499.64	22.55	-8.68	430,377.3467	694,926.9199	32.181655	-103.703287
2,525.00	0.92	326.00	2,524.63	22.86	-8.90	430,377.6610	694,926.7032	32.181656	-103.703287
2,550.00	0.96	310.46	2,549.63	23.16	-9.17	430,377.9633	694,926.4316	32.181657	-103.703288
2,575.00	0.98	316.12	2,574.63	23.45	-9.48	430,378.2533	694,926.1241	32.181658	-103.703289
2,600.00	1.01	318.28	2,599.62	23.77	-9.77	430,378.5719	694,925.8293	32.181659	-103.703290
2,625.00	0.94	311.68	2,624.62	24.07	-10.07	430,378.8727	694,925.5295	32.181659	-103.703291
2,650.00	0.92	315.00	2,649.62	24.35	-10.37	430,379.1510	694,925.2344	32.181660	-103.703292
2,675.00	0.96	318.76	2,674.61	24.65	-10.65	430,379.4504	694,924.9544	32.181661	-103.703293
2,700.00	0.83	321.40	2,699.61	24.95	-10.90	430,379.7494	694,924.7034	32.181662	-103.703294
2,725.00	0.87	320.42	2,724.61	25.24	-11.13	430,380.0372	694,924.4695	32.181663	-103.703294
2,750.00	0.88	327.72	2,749.61	25.55	-11.35	430,380.3458	694,924.2460	32.181663	-103.703295
2,775.00	0.80	327.17	2,774.60	25.85	-11.55	430,380.6547	694,924.0489	32.181664	-103.703296
2,800.00	0.82	330.28	2,799.60	26.16	-11.73	430,380.9568	694,923.8656	32.181665	-103.703296
2,825.00	0.75	329.20	2,824.60	26.45	-11.91	430,381.2527	694,923.6931	32.181666	-103.703297
2,850.00	0.73	331.01	2,849.60	26.73	-12.07	430,381.5325	694,923.5321	32.181667	-103.703297
2,875.00	0.76	344.68	2,874.59	27.03	-12.19	430,381.8317	694,923.4112	32.181668	-103.703298
2,900.00	0.74	332.91	2,899.59	27.34	-12.31	430,382.1353	694,923.2938	32.181668	-103.703298
2,925.00	0.85	330.93	2,924.59	27.64	-12.47	430,382.4411	694,923.1302	32.181669	-103.703299
2,950.00	0.83	336.35	2,949.59	27.97	-12.63	430,382.7691	694,922.9675	32.181670	-103.703299
2,975.00	0.94	337.72	2,974.58	28.32	-12.78	430,383.1247	694,922.8171	32.181671	-103.703300
3,000.00	0.93	332.74	2,999.58	28.69	-12.95	430,383.4948	694,922.6464	32.181672	-103.703300
3,025.00	0.99	341.19	3,024.58	29.08	-13.12	430,383.8796	694,922.4839	32.181673	-103.703301
3,050.00	0.85	339.66	3,049.57	29.46	-13.25	430,384.2579	694,922.3498	32.181674	-103.703301
3,075.00	0.90	344.47	3,074.57	29.82	-13.37	430,384.6210	694,922.2327	32.181675	-103.703302

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Azores Federal 9H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Site:	Sec. 29, T 24 S. , R 32E	MD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Well:	Azores Federal 9H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
3,100.00	0.96	344.47	3,099.57	30.21	-13.48	430,385.0119	694,922.1241	32.181676	-103.703302
3,125.00	0.83	341.74	3,124.56	30.59	-13.59	430,385.3857	694,922.0113	32.181677	-103.703302
3,150.00	0.85	339.82	3,149.56	30.93	-13.71	430,385.7317	694,921.8906	32.181678	-103.703303
3,175.00	0.53	319.40	3,174.56	31.19	-13.85	430,385.9935	694,921.7514	32.181679	-103.703303
3,200.00	0.38	280.62	3,199.56	31.30	-14.01	430,386.0966	694,921.5946	32.181679	-103.703304
3,225.00	0.28	236.98	3,224.56	31.28	-14.14	430,386.0786	694,921.4619	32.181679	-103.703304
3,250.00	0.31	239.49	3,249.56	31.21	-14.25	430,386.0109	694,921.3524	32.181679	-103.703304
3,275.00	0.35	239.51	3,274.56	31.14	-14.37	430,385.9379	694,921.2284	32.181679	-103.703305
3,300.00	0.38	279.43	3,299.56	31.11	-14.52	430,385.9127	694,921.0808	32.181679	-103.703305
3,325.00	0.41	260.85	3,324.56	31.11	-14.69	430,385.9121	694,920.9107	32.181679	-103.703306
3,350.00	0.55	263.02	3,349.56	31.08	-14.90	430,385.8833	694,920.7033	32.181679	-103.703306
3,375.00	0.31	258.35	3,374.55	31.06	-15.08	430,385.8550	694,920.5180	32.181679	-103.703307
3,400.00	0.35	282.36	3,399.55	31.06	-15.22	430,385.8577	694,920.3771	32.181679	-103.703308
3,425.00	0.53	251.82	3,424.55	31.04	-15.41	430,385.8380	694,920.1927	32.181679	-103.703308
3,450.00	0.53	282.57	3,449.55	31.03	-15.63	430,385.8271	694,919.9700	32.181679	-103.703309
3,475.00	0.59	287.79	3,474.55	31.09	-15.87	430,385.8916	694,919.7346	32.181679	-103.703310
3,500.00	0.57	288.14	3,499.55	31.17	-16.11	430,385.9696	694,919.4938	32.181679	-103.703310
3,525.00	0.50	303.15	3,524.55	31.27	-16.32	430,386.0680	694,919.2843	32.181679	-103.703311
3,550.00	0.63	307.32	3,549.55	31.41	-16.52	430,386.2109	694,919.0837	32.181680	-103.703312
3,575.00	0.69	306.97	3,574.55	31.58	-16.75	430,386.3848	694,918.8541	32.181680	-103.703312
3,600.00	0.72	315.89	3,599.54	31.79	-16.98	430,386.5881	694,918.6245	32.181681	-103.703313
3,625.00	0.88	312.97	3,624.54	32.03	-17.23	430,386.8317	694,918.3747	32.181681	-103.703314
3,650.00	0.81	315.46	3,649.54	32.29	-17.49	430,387.0885	694,918.1103	32.181682	-103.703315
3,675.00	1.02	337.61	3,674.54	32.62	-17.70	430,387.4202	694,917.9016	32.181683	-103.703315
3,700.00	0.94	332.49	3,699.53	33.01	-17.88	430,387.8079	694,917.7221	32.181684	-103.703316
3,725.00	0.86	333.15	3,724.53	33.36	-18.06	430,388.1571	694,917.5427	32.181685	-103.703317
3,750.00	0.92	349.41	3,749.53	33.72	-18.18	430,388.5218	694,917.4211	32.181686	-103.703317
3,775.00	0.81	2.60	3,774.52	34.10	-18.21	430,388.8956	694,917.3922	32.181687	-103.703317
3,800.00	0.56	42.44	3,799.52	34.36	-18.12	430,389.1623	694,917.4826	32.181688	-103.703317
3,825.00	0.61	106.44	3,824.52	34.41	-17.91	430,389.2148	694,917.6927	32.181688	-103.703316
3,850.00	0.94	120.01	3,849.52	34.27	-17.60	430,389.0746	694,917.9979	32.181688	-103.703315
3,875.00	1.27	122.51	3,874.51	34.02	-17.19	430,388.8231	694,918.4092	32.181687	-103.703314
3,900.00	1.44	124.63	3,899.51	33.70	-16.70	430,388.4957	694,918.9013	32.181686	-103.703312
3,925.00	1.63	132.09	3,924.50	33.28	-16.18	430,388.0789	694,919.4236	32.181685	-103.703311
3,950.00	1.92	127.53	3,949.49	32.79	-15.58	430,387.5854	694,920.0196	32.181683	-103.703309
3,975.00	1.74	124.91	3,974.47	32.31	-14.94	430,387.1131	694,920.6630	32.181682	-103.703307
4,000.00	2.01	121.81	3,999.46	31.86	-14.25	430,386.6648	694,921.3468	32.181681	-103.703304
4,025.00	2.17	115.99	4,024.44	31.43	-13.46	430,386.2263	694,922.1448	32.181680	-103.703302
4,050.00	2.22	114.20	4,049.42	31.02	-12.59	430,385.8204	694,923.0119	32.181679	-103.703299
4,075.00	2.16	117.78	4,074.41	30.60	-11.73	430,385.4023	694,923.8704	32.181677	-103.703296
4,100.00	1.94	113.73	4,099.39	30.21	-10.93	430,385.0124	694,924.6746	32.181676	-103.703294
4,125.00	2.00	108.90	4,124.38	29.90	-10.13	430,384.7008	694,925.4747	32.181675	-103.703291
4,150.00	1.75	110.59	4,149.36	29.63	-9.36	430,384.4253	694,926.2448	32.181675	-103.703289
4,175.00	1.26	111.45	4,174.35	29.39	-8.74	430,384.1905	694,926.8579	32.181674	-103.703287
4,200.00	0.72	124.69	4,199.35	29.20	-8.36	430,384.0006	694,927.2429	32.181673	-103.703285
4,225.00	0.50	175.17	4,224.35	29.00	-8.22	430,383.8025	694,927.3813	32.181673	-103.703285
4,250.00	0.48	200.35	4,249.35	28.80	-8.25	430,383.5956	694,927.3540	32.181672	-103.703285
4,275.00	0.80	210.85	4,274.35	28.55	-8.37	430,383.3476	694,927.2281	32.181672	-103.703285
4,300.00	0.92	212.77	4,299.34	28.23	-8.57	430,383.0290	694,927.0300	32.181671	-103.703286
4,325.00	1.07	209.24	4,324.34	27.86	-8.79	430,382.6566	694,926.8073	32.181670	-103.703287
4,350.00	1.16	214.09	4,349.33	27.44	-9.05	430,382.2433	694,926.5515	32.181669	-103.703288
4,375.00	1.22	210.54	4,374.33	27.00	-9.33	430,381.8045	694,926.2744	32.181667	-103.703289
4,400.00	1.36	205.74	4,399.32	26.51	-9.59	430,381.3081	694,926.0103	32.181666	-103.703289
4,425.00	1.24	177.46	4,424.32	25.97	-9.71	430,380.7706	694,925.8935	32.181665	-103.703290
4,450.00	1.43	213.19	4,449.31	25.44	-9.87	430,380.2393	694,925.7347	32.181663	-103.703290

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Azores Federal 9H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Site:	Sec. 29, T 24 S. , R 32E	MD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Well:	Azores Federal 9H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,475.00	1.52	217.67	4,474.30	24.92	-10.24	430,379.7158	694,925.3613	32.181662	-103.703292
4,500.00	1.53	214.54	4,499.29	24.38	-10.63	430,379.1784	694,924.9694	32.181660	-103.703293
4,525.00	1.52	215.60	4,524.28	23.83	-11.01	430,378.6339	694,924.5872	32.181659	-103.703294
4,550.00	1.55	211.34	4,549.28	23.28	-11.38	430,378.0755	694,924.2183	32.181657	-103.703295
4,575.00	1.50	211.78	4,574.27	22.71	-11.73	430,377.5085	694,923.8701	32.181656	-103.703296
4,600.00	1.68	210.02	4,599.26	22.11	-12.09	430,376.9131	694,923.5145	32.181654	-103.703298
4,625.00	1.73	206.36	4,624.25	21.46	-12.44	430,376.2576	694,923.1636	32.181652	-103.703299
4,650.00	1.80	209.59	4,649.23	20.78	-12.80	430,375.5781	694,922.8021	32.181650	-103.703300
4,675.00	1.72	207.15	4,674.22	20.10	-13.16	430,374.9028	694,922.4370	32.181649	-103.703301
4,700.00	1.67	206.38	4,699.21	19.44	-13.50	430,374.2426	694,922.1040	32.181647	-103.703302
4,725.00	1.66	205.99	4,724.20	18.79	-13.82	430,373.5908	694,921.7834	32.181645	-103.703303
4,750.00	1.68	209.10	4,749.19	18.15	-14.15	430,372.9451	694,921.4465	32.181643	-103.703304
4,775.00	1.83	205.57	4,774.18	17.46	-14.50	430,372.2648	694,921.0960	32.181641	-103.703305
4,800.00	1.83	209.51	4,799.17	16.76	-14.87	430,371.5573	694,920.7271	32.181639	-103.703307
4,825.00	1.71	206.32	4,824.15	16.08	-15.23	430,370.8756	694,920.3651	32.181638	-103.703308
4,850.00	1.78	207.88	4,849.14	15.40	-15.58	430,370.1980	694,920.0181	32.181636	-103.703309
4,875.00	1.77	206.63	4,874.13	14.71	-15.94	430,369.5097	694,919.6635	32.181634	-103.703310
4,900.00	1.77	206.38	4,899.12	14.02	-16.28	430,368.8187	694,919.3189	32.181632	-103.703311
4,925.00	1.79	208.21	4,924.11	13.33	-16.64	430,368.1287	694,918.9628	32.181630	-103.703312
4,950.00	1.77	208.53	4,949.09	12.65	-17.01	430,367.4454	694,918.5938	32.181628	-103.703314
4,975.00	1.77	203.92	4,974.08	11.95	-17.35	430,366.7533	694,918.2529	32.181626	-103.703315
5,000.00	1.89	204.26	4,999.07	11.22	-17.67	430,366.0245	694,917.9269	32.181624	-103.703316
5,025.00	1.65	202.55	5,024.06	10.52	-17.98	430,365.3163	694,917.6195	32.181622	-103.703317
5,050.00	0.85	182.23	5,049.05	10.00	-18.13	430,364.7985	694,917.4743	32.181621	-103.703317
5,075.00	0.72	163.07	5,074.05	9.66	-18.09	430,364.4630	694,917.5128	32.181620	-103.703317
5,100.00	0.57	153.62	5,099.05	9.40	-17.99	430,364.2013	694,917.6138	32.181619	-103.703317
5,125.00	0.58	145.19	5,124.05	9.19	-17.86	430,363.9860	694,917.7413	32.181619	-103.703316
5,150.00	0.65	148.75	5,149.05	8.96	-17.71	430,363.7609	694,917.8871	32.181618	-103.703316
5,175.00	0.64	139.34	5,174.04	8.73	-17.55	430,363.5337	694,918.0516	32.181617	-103.703315
5,200.00	0.58	144.70	5,199.04	8.52	-17.38	430,363.3246	694,918.2157	32.181617	-103.703315
5,225.00	0.55	146.70	5,224.04	8.32	-17.25	430,363.1210	694,918.3547	32.181616	-103.703314
5,250.00	0.62	151.50	5,249.04	8.10	-17.11	430,362.9018	694,918.4851	32.181616	-103.703314
5,275.00	0.68	142.63	5,274.04	7.87	-16.96	430,362.6651	694,918.6397	32.181615	-103.703314
5,300.00	0.70	140.02	5,299.04	7.63	-16.77	430,362.4302	694,918.8279	32.181614	-103.703313
5,325.00	0.60	137.44	5,324.03	7.42	-16.59	430,362.2167	694,919.0145	32.181614	-103.703312
5,350.00	0.59	138.11	5,349.03	7.22	-16.41	430,362.0245	694,919.1890	32.181613	-103.703312
5,375.00	0.63	142.76	5,374.03	7.02	-16.24	430,361.8193	694,919.3581	32.181613	-103.703311
5,400.00	0.59	147.40	5,399.03	6.80	-16.09	430,361.6014	694,919.5106	32.181612	-103.703311
5,425.00	0.60	148.48	5,424.03	6.58	-15.95	430,361.3814	694,919.6484	32.181611	-103.703310
5,450.00	0.52	145.09	5,449.03	6.38	-15.82	430,361.1768	694,919.7818	32.181611	-103.703310
5,475.00	0.44	152.79	5,474.03	6.20	-15.71	430,360.9984	694,919.8906	32.181610	-103.703310
5,500.00	0.44	161.34	5,499.03	6.02	-15.63	430,360.8221	694,919.9652	32.181610	-103.703309
5,525.00	0.40	166.07	5,524.03	5.85	-15.58	430,360.6464	694,920.0169	32.181609	-103.703309
5,550.00	0.40	163.79	5,549.02	5.68	-15.54	430,360.4779	694,920.0623	32.181609	-103.703309
5,575.00	0.39	161.78	5,574.02	5.51	-15.49	430,360.3133	694,920.1132	32.181608	-103.703309
5,600.00	0.35	156.28	5,599.02	5.36	-15.43	430,360.1626	694,920.1706	32.181608	-103.703309
5,625.00	0.39	162.34	5,624.02	5.21	-15.37	430,360.0116	694,920.2271	32.181608	-103.703308
5,650.00	0.42	169.11	5,649.02	5.04	-15.33	430,359.8405	694,920.2702	32.181607	-103.703308
5,675.00	0.43	155.79	5,674.02	4.87	-15.27	430,359.6650	694,920.3260	32.181607	-103.703308
5,700.00	0.45	171.53	5,699.02	4.68	-15.22	430,359.4823	694,920.3789	32.181606	-103.703308
5,725.00	0.50	172.30	5,724.02	4.48	-15.19	430,359.2771	694,920.4080	32.181606	-103.703308
5,750.00	0.55	175.26	5,749.02	4.25	-15.17	430,359.0495	694,920.4325	32.181605	-103.703308
5,775.00	0.47	169.79	5,774.02	4.03	-15.14	430,358.8290	694,920.4606	32.181604	-103.703308
5,800.00	0.50	169.05	5,799.02	3.82	-15.10	430,358.6210	694,920.4995	32.181604	-103.703308
5,825.00	0.50	173.53	5,824.02	3.61	-15.07	430,358.4055	694,920.5325	32.181603	-103.703308



Integrity Directional Services, LLC
Survey Report - Geographic



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Azores Federal 9H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Site:	Sec. 29, T 24 S. , R 32E	MD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Well:	Azores Federal 9H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,850.00	0.53	178.85	5,849.02	3.38	-15.05	430,358.1815	694,920.5471	32.181603	-103.703307
5,875.00	0.49	177.29	5,874.01	3.16	-15.05	430,357.9591	694,920.5545	32.181602	-103.703307
5,900.00	0.53	177.53	5,899.01	2.94	-15.04	430,357.7368	694,920.5646	32.181601	-103.703307
5,925.00	0.57	171.42	5,924.01	2.70	-15.01	430,357.4983	694,920.5881	32.181601	-103.703307
5,950.00	0.56	176.71	5,949.01	2.45	-14.99	430,357.2534	694,920.6137	32.181600	-103.703307
5,975.00	0.48	168.89	5,974.01	2.23	-14.96	430,357.0287	694,920.6408	32.181599	-103.703307
6,000.00	0.50	171.59	5,999.01	2.02	-14.92	430,356.8180	694,920.6770	32.181599	-103.703307
6,025.00	0.45	169.79	6,024.01	1.81	-14.89	430,356.6135	694,920.7103	32.181598	-103.703307
6,050.00	0.56	175.81	6,049.01	1.60	-14.86	430,356.3950	694,920.7367	32.181598	-103.703307
6,075.00	0.52	173.65	6,074.01	1.36	-14.84	430,356.1604	694,920.7581	32.181597	-103.703307
6,100.00	0.51	175.86	6,099.01	1.14	-14.82	430,355.9367	694,920.7787	32.181596	-103.703307
6,125.00	0.50	184.23	6,124.00	0.92	-14.82	430,355.7169	694,920.7787	32.181596	-103.703307
6,150.00	0.49	192.45	6,149.00	0.70	-14.85	430,355.5038	694,920.7476	32.181595	-103.703307
6,175.00	0.45	196.40	6,174.00	0.51	-14.90	430,355.3052	694,920.6968	32.181595	-103.703307
6,200.00	0.53	213.90	6,199.00	0.32	-15.00	430,355.1151	694,920.6046	32.181594	-103.703307
6,225.00	0.38	219.55	6,224.00	0.16	-15.11	430,354.9552	694,920.4874	32.181594	-103.703308
6,250.00	0.44	216.92	6,249.00	0.01	-15.22	430,354.8145	694,920.3769	32.181593	-103.703308
6,275.00	0.53	220.17	6,274.00	-0.15	-15.36	430,354.6494	694,920.2447	32.181593	-103.703309
6,300.00	0.54	226.07	6,299.00	-0.32	-15.51	430,354.4793	694,920.0852	32.181592	-103.703309
6,325.00	0.54	221.37	6,324.00	-0.49	-15.68	430,354.3092	694,919.9225	32.181592	-103.703310
6,350.00	0.57	226.07	6,349.00	-0.67	-15.84	430,354.1345	694,919.7551	32.181592	-103.703310
6,375.00	0.62	229.53	6,373.99	-0.84	-16.04	430,353.9604	694,919.5626	32.181591	-103.703311
6,400.00	0.58	231.39	6,398.99	-1.01	-16.24	430,353.7937	694,919.3609	32.181591	-103.703311
6,425.00	0.65	234.39	6,423.99	-1.17	-16.45	430,353.6321	694,919.1467	32.181590	-103.703312
6,450.00	0.59	232.15	6,448.99	-1.33	-16.67	430,353.4706	694,918.9298	32.181590	-103.703313
6,475.00	0.59	246.57	6,473.99	-1.46	-16.89	430,353.3404	694,918.7100	32.181589	-103.703314
6,500.00	0.68	241.35	6,498.99	-1.58	-17.14	430,353.2181	694,918.4618	32.181589	-103.703314
6,525.00	0.73	239.39	6,523.99	-1.73	-17.41	430,353.0659	694,918.1945	32.181589	-103.703315
6,550.00	0.74	248.13	6,548.98	-1.88	-17.69	430,352.9247	694,917.9076	32.181588	-103.703316
6,575.00	0.67	242.83	6,573.98	-2.00	-17.97	430,352.7978	694,917.6278	32.181588	-103.703317
6,600.00	0.72	243.96	6,598.98	-2.14	-18.24	430,352.6621	694,917.3566	32.181588	-103.703318
6,625.00	0.75	253.43	6,623.98	-2.25	-18.54	430,352.5465	694,917.0586	32.181587	-103.703319
6,650.00	0.76	252.16	6,648.98	-2.35	-18.86	430,352.4490	694,916.7440	32.181587	-103.703320
6,675.00	0.74	249.05	6,673.97	-2.46	-19.16	430,352.3405	694,916.4354	32.181587	-103.703321
6,700.00	0.79	248.00	6,698.97	-2.58	-19.48	430,352.2182	694,916.1248	32.181586	-103.703322
6,725.00	0.79	251.76	6,723.97	-2.70	-19.80	430,352.0997	694,915.8013	32.181586	-103.703323
6,750.00	0.70	242.99	6,748.97	-2.82	-20.10	430,351.9764	694,915.5016	32.181586	-103.703324
6,775.00	0.71	246.71	6,773.96	-2.95	-20.38	430,351.8458	694,915.2233	32.181585	-103.703325
6,800.00	0.69	247.57	6,798.96	-3.07	-20.66	430,351.7271	694,914.9419	32.181585	-103.703326
6,825.00	0.18	204.82	6,823.96	-3.17	-20.81	430,351.6341	694,914.7862	32.181585	-103.703326
6,850.00	0.08	160.86	6,848.96	-3.22	-20.82	430,351.5819	694,914.7755	32.181585	-103.703326
6,875.00	0.21	110.28	6,873.96	-3.25	-20.78	430,351.5496	694,914.8242	32.181584	-103.703326
6,900.00	0.31	92.91	6,898.96	-3.27	-20.67	430,351.5303	694,914.9347	32.181584	-103.703326
6,925.00	0.33	93.61	6,923.96	-3.28	-20.53	430,351.5223	694,915.0741	32.181584	-103.703325
6,950.00	0.40	88.99	6,948.96	-3.28	-20.37	430,351.5193	694,915.2332	32.181584	-103.703325
6,975.00	0.31	90.92	6,973.96	-3.28	-20.21	430,351.5197	694,915.3881	32.181584	-103.703324
7,000.00	0.34	88.31	6,998.96	-3.28	-20.07	430,351.5208	694,915.5298	32.181584	-103.703324
7,025.00	0.36	100.90	7,023.96	-3.29	-19.92	430,351.5082	694,915.6811	32.181584	-103.703323
7,050.00	0.37	112.36	7,048.96	-3.34	-19.77	430,351.4626	694,915.8329	32.181584	-103.703323
7,075.00	0.50	107.10	7,073.96	-3.40	-19.59	430,351.3998	694,916.0118	32.181584	-103.703322
7,100.00	0.42	117.62	7,098.96	-3.47	-19.40	430,351.3253	694,916.1972	32.181584	-103.703322
7,125.00	0.60	116.68	7,123.96	-3.58	-19.20	430,351.2240	694,916.3954	32.181584	-103.703321
7,150.00	0.58	117.46	7,148.96	-3.69	-18.98	430,351.1069	694,916.6246	32.181583	-103.703320
7,175.00	0.59	115.97	7,173.95	-3.81	-18.75	430,350.9922	694,916.8526	32.181583	-103.703320
7,200.00	0.63	121.61	7,198.95	-3.94	-18.51	430,350.8638	694,917.0854	32.181583	-103.703319



Integrity Directional Services, LLC
Survey Report - Geographic



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Azores Federal 9H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Site:	Sec. 29, T 24 S. , R 32E	MD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Well:	Azores Federal 9H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
7,225.00	0.67	117.27	7,223.95	-4.08	-18.27	430,350.7248	694,917.3323	32.181582	-103.703318	
7,250.00	0.71	129.10	7,248.95	-4.24	-18.02	430,350.5601	694,917.5825	32.181582	-103.703317	
7,275.00	0.60	132.26	7,273.95	-4.43	-17.80	430,350.3744	694,917.7996	32.181581	-103.703317	
7,300.00	0.68	142.71	7,298.95	-4.63	-17.61	430,350.1684	694,917.9863	32.181581	-103.703316	
7,325.00	0.70	150.82	7,323.94	-4.88	-17.45	430,349.9170	694,918.1506	32.181580	-103.703315	
7,350.00	0.85	166.05	7,348.94	-5.20	-17.33	430,349.6037	694,918.2698	32.181579	-103.703315	
7,375.00	0.90	169.89	7,373.94	-5.57	-17.25	430,349.2305	694,918.3490	32.181578	-103.703315	
7,400.00	0.92	171.91	7,398.94	-5.96	-17.19	430,348.8385	694,918.4117	32.181577	-103.703315	
7,425.00	0.97	171.10	7,423.93	-6.37	-17.13	430,348.4307	694,918.4727	32.181576	-103.703314	
7,450.00	0.98	172.16	7,448.93	-6.79	-17.07	430,348.0098	694,918.5346	32.181575	-103.703314	
7,475.00	0.97	171.25	7,473.93	-7.21	-17.00	430,347.5889	694,918.5959	32.181574	-103.703314	
7,500.00	1.08	169.48	7,498.92	-7.65	-16.93	430,347.1481	694,918.6711	32.181572	-103.703314	
7,525.00	1.06	173.24	7,523.92	-8.11	-16.86	430,346.6868	694,918.7414	32.181571	-103.703314	
7,550.00	1.02	165.88	7,548.91	-8.56	-16.78	430,346.2414	694,918.8229	32.181570	-103.703313	
7,575.00	1.07	169.04	7,573.91	-9.00	-16.68	430,345.7964	694,918.9215	32.181569	-103.703313	
7,600.00	1.03	171.16	7,598.90	-9.45	-16.60	430,345.3452	694,919.0004	32.181567	-103.703313	
7,625.00	1.11	172.86	7,623.90	-9.92	-16.53	430,344.8829	694,919.0651	32.181566	-103.703313	
7,650.00	1.11	173.04	7,648.90	-10.40	-16.48	430,344.4023	694,919.1245	32.181565	-103.703312	
7,675.00	1.11	172.79	7,673.89	-10.88	-16.42	430,343.9217	694,919.1842	32.181563	-103.703312	
7,700.00	1.15	173.07	7,698.89	-11.37	-16.36	430,343.4324	694,919.2449	32.181562	-103.703312	
7,725.00	1.10	168.92	7,723.88	-11.85	-16.28	430,342.9479	694,919.3213	32.181561	-103.703312	
7,750.00	0.71	154.75	7,748.88	-12.23	-16.17	430,342.5723	694,919.4335	32.181560	-103.703311	
7,775.00	0.42	129.19	7,773.88	-12.43	-16.03	430,342.3743	694,919.5706	32.181559	-103.703311	
7,800.00	0.47	92.53	7,798.88	-12.49	-15.86	430,342.3119	694,919.7440	32.181559	-103.703310	
7,825.00	0.40	95.63	7,823.88	-12.50	-15.67	430,342.2988	694,919.9333	32.181559	-103.703310	
7,850.00	0.43	105.74	7,848.87	-12.54	-15.49	430,342.2648	694,920.1104	32.181559	-103.703309	
7,875.00	0.42	82.02	7,873.87	-12.55	-15.31	430,342.2520	694,920.2915	32.181559	-103.703309	
7,900.00	0.44	79.57	7,898.87	-12.52	-15.12	430,342.2821	694,920.4766	32.181559	-103.703308	
7,925.00	0.45	75.82	7,923.87	-12.48	-14.93	430,342.3236	694,920.6662	32.181559	-103.703307	
7,950.00	0.42	90.87	7,948.87	-12.45	-14.75	430,342.3462	694,920.8530	32.181559	-103.703307	
7,975.00	0.44	82.80	7,973.87	-12.44	-14.56	430,342.3569	694,921.0399	32.181559	-103.703306	
8,000.00	0.34	95.54	7,998.87	-12.44	-14.39	430,342.3617	694,921.2089	32.181559	-103.703306	
8,025.00	0.35	105.23	8,023.87	-12.47	-14.24	430,342.3345	694,921.3564	32.181559	-103.703305	
8,050.00	0.37	104.12	8,048.87	-12.51	-14.09	430,342.2948	694,921.5084	32.181559	-103.703305	
8,075.00	0.30	88.97	8,073.87	-12.52	-13.95	430,342.2763	694,921.6521	32.181559	-103.703304	
8,100.00	0.38	91.66	8,098.87	-12.52	-13.80	430,342.2750	694,921.8004	32.181559	-103.703304	
8,125.00	0.27	91.13	8,123.87	-12.53	-13.66	430,342.2715	694,921.9422	32.181559	-103.703303	
8,150.00	0.37	98.73	8,148.87	-12.54	-13.52	430,342.2581	694,922.0809	32.181559	-103.703303	
8,175.00	0.31	100.78	8,173.87	-12.57	-13.37	430,342.2332	694,922.2271	32.181559	-103.703302	
8,200.00	0.27	101.71	8,198.87	-12.59	-13.25	430,342.2085	694,922.3512	32.181559	-103.703302	
8,225.00	0.32	119.82	8,223.87	-12.64	-13.13	430,342.1619	694,922.4695	32.181559	-103.703302	
8,250.00	0.54	77.28	8,248.87	-12.65	-12.96	430,342.1531	694,922.6449	32.181559	-103.703301	
8,275.00	0.36	127.63	8,273.87	-12.67	-12.78	430,342.1311	694,922.8221	32.181558	-103.703300	
8,300.00	0.30	107.33	8,298.86	-12.74	-12.65	430,342.0636	694,922.9467	32.181558	-103.703300	
8,325.00	0.32	103.05	8,323.86	-12.77	-12.52	430,342.0284	694,923.0772	32.181558	-103.703300	
8,350.00	0.32	123.89	8,348.86	-12.83	-12.40	430,341.9737	694,923.2032	32.181558	-103.703299	
8,375.00	0.37	112.86	8,373.86	-12.90	-12.26	430,341.9034	694,923.3355	32.181558	-103.703299	
8,400.00	0.40	136.62	8,398.86	-12.99	-12.13	430,341.8086	694,923.4698	32.181		



Integrity Directional Services, LLC
Survey Report - Geographic



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Azores Federal 9H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Site:	Sec. 29, T 24 S. , R 32E	MD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Well:	Azores Federal 9H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,723.00	2.31	338.80	8,721.84	-13.06	-13.35	430,341.7405	694,922.2482	32.181557	-103.703302
8,754.00	4.26	345.83	8,752.79	-11.36	-13.86	430,343.4395	694,921.7403	32.181562	-103.703304
8,785.00	6.43	348.90	8,783.65	-8.54	-14.48	430,346.2595	694,921.1242	32.181570	-103.703306
8,816.00	9.07	350.91	8,814.37	-4.42	-15.20	430,350.3764	694,920.4039	32.181581	-103.703308
8,847.00	11.47	351.74	8,844.87	1.04	-16.03	430,355.8402	694,919.5749	32.181596	-103.703311
8,878.00	14.13	352.03	8,875.10	7.84	-16.99	430,362.6390	694,918.6073	32.181615	-103.703314
8,909.00	17.50	351.78	8,904.92	16.20	-18.18	430,371.0018	694,917.4159	32.181638	-103.703317
8,940.00	22.25	351.53	8,934.06	26.63	-19.72	430,381.4259	694,915.8842	32.181667	-103.703322
8,971.00	26.29	351.23	8,962.32	39.22	-21.63	430,394.0210	694,913.9722	32.181701	-103.703328
9,002.00	30.79	352.41	8,989.54	53.88	-23.72	430,408.6784	694,911.8764	32.181742	-103.703335
9,033.00	35.07	353.19	9,015.56	70.59	-25.83	430,425.3941	694,909.7714	32.181788	-103.703341
9,064.00	38.84	352.88	9,040.33	89.09	-28.09	430,443.8897	694,907.5096	32.181838	-103.703348
9,095.00	42.74	352.18	9,063.79	109.17	-30.73	430,463.9650	694,904.8725	32.181894	-103.703356
9,124.52	46.49	351.96	9,084.80	129.70	-33.59	430,484.4962	694,902.0113	32.181950	-103.703365
South 330' Crossing Point @ 9124.52'MD									
9,126.00	46.68	351.95	9,085.82	130.76	-33.74	430,485.5607	694,901.8608	32.181953	-103.703365
9,157.00	51.80	351.34	9,106.05	153.98	-37.15	430,508.7838	694,898.4453	32.182017	-103.703376
9,189.00	57.23	351.17	9,124.62	179.73	-41.12	430,534.5276	694,894.4839	32.182088	-103.703388
9,220.00	62.84	351.69	9,140.10	206.27	-45.11	430,561.0737	694,890.4869	32.182161	-103.703401
9,252.00	69.01	352.77	9,153.15	235.21	-49.05	430,590.0081	694,886.5455	32.182240	-103.703413
9,283.00	74.49	353.41	9,162.85	264.42	-52.59	430,619.2238	694,883.0074	32.182321	-103.703424
9,312.00	80.22	353.94	9,169.20	292.54	-55.71	430,647.3365	694,879.8928	32.182398	-103.703433
9,406.00	88.61	353.05	9,178.34	385.40	-66.30	430,740.2032	694,869.2986	32.182654	-103.703466
9,500.00	89.79	352.82	9,179.65	478.68	-77.86	430,833.4785	694,857.7383	32.182910	-103.703501
9,594.00	90.94	353.62	9,179.05	572.02	-88.96	430,926.8167	694,846.6414	32.183167	-103.703536
9,687.00	92.09	354.15	9,176.59	664.45	-98.86	431,019.2532	694,836.7382	32.183421	-103.703566
9,781.00	92.20	354.43	9,173.07	757.92	-108.21	431,112.7209	694,827.3924	32.183678	-103.703594
9,874.00	90.57	355.75	9,170.82	850.55	-116.16	431,205.3473	694,819.4356	32.183933	-103.703618
9,968.00	90.49	357.81	9,169.96	944.39	-121.44	431,299.1896	694,814.1562	32.184191	-103.703634
10,061.00	90.80	357.42	9,168.91	1,037.30	-125.31	431,392.1027	694,810.2864	32.184446	-103.703644
10,155.00	92.03	359.98	9,166.59	1,131.24	-127.45	431,486.0400	694,808.1541	32.184705	-103.703649
10,248.00	93.43	0.08	9,162.16	1,224.13	-127.40	431,578.9319	694,808.2027	32.184960	-103.703647
10,342.00	91.92	359.99	9,157.77	1,318.03	-127.34	431,672.8266	694,808.2600	32.185218	-103.703646
10,435.00	92.12	0.45	9,154.49	1,410.97	-126.98	431,765.7676	694,808.6168	32.185474	-103.703643
10,528.00	90.29	359.64	9,152.54	1,503.95	-126.91	431,858.7421	694,808.6896	32.185729	-103.703641
10,622.00	87.77	357.96	9,154.13	1,597.90	-128.88	431,952.6969	694,806.7221	32.185988	-103.703645
10,716.00	89.45	357.07	9,156.41	1,691.78	-132.95	432,046.5764	694,802.6476	32.186246	-103.703657
10,810.00	90.15	357.83	9,156.74	1,785.68	-137.13	432,140.4813	694,798.4655	32.186504	-103.703668
10,903.00	89.06	358.87	9,157.38	1,878.64	-139.81	432,233.4376	694,795.7877	32.186759	-103.703675
10,996.00	89.12	359.85	9,158.85	1,971.62	-140.85	432,326.4188	694,794.7491	32.187015	-103.703677
11,090.00	92.14	0.96	9,157.82	2,065.60	-140.19	432,420.3982	694,795.4131	32.187273	-103.703673
11,183.00	92.87	0.81	9,153.76	2,158.50	-138.75	432,513.2974	694,796.8482	32.187529	-103.703667
11,277.00	90.74	0.53	9,150.80	2,252.44	-137.65	432,607.2387	694,797.9467	32.187787	-103.703661
11,371.00	88.87	359.97	9,151.12	2,346.44	-137.24	432,701.2325	694,798.3568	32.188045	-103.703658
11,464.00	85.16	358.78	9,155.96	2,439.29	-138.25	432,794.0827	694,797.3456	32.188301	-103.703660
11,557.00	87.88	357.58	9,161.60	2,532.06	-141.20	432,886.8538	694,794.3963	32.188556	-103.703667
11,651.00	90.07	357.61	9,163.28	2,625.96	-145.15	432,980.7500	694,790.4527	32.188814	-103.703678
11,745.00	90.35	357.51	9,162.94	2,719.87	-149.15	433,074.6639	694,786.4508	32.189072	-103.703689
11,839.00	91.19	357.89	9,161.68	2,813.78	-152.92	433,168.5785	694,782.6788	32.189330	-103.703700
11,933.00	91.11	358.49	9,159.79	2,907.72	-155.89	433,262.5120	694,779.7104	32.189588	-103.703708
12,027.00	91.05	357.80	9,158.02	3,001.65	-158.93	433,356.4453	694,776.6682	32.189847	-103.703716
12,121.00	91.36	357.54	9,156.04	3,095.55	-162.75	433,450.3465	694,772.8475	32.190105	-103.703726
12,215.00	91.92	357.71	9,153.35	3,189.43	-166.65	433,544.2265	694,768.9538	32.190363	-103.703737
12,309.00	92.56	357.78	9,149.68	3,283.29	-170.34	433,638.0813	694,765.2580	32.190621	-103.703747
12,403.00	91.36	359.12	9,146.46	3,377.19	-172.88	433,731.9879	694,762.7173	32.190879	-103.703754

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Azores Federal 9H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Site:	Sec. 29, T 24 S. , R 32E	MD Reference:	KB=26' @ 3526.50ft (Scandril Freedom)
Well:	Azores Federal 9H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
12,497.00	92.45	359.49	9,143.34	3,471.13	-174.02	433,825.9273	694,761.5777	32.191137	-103.703756
12,590.00	90.77	0.35	9,140.72	3,564.09	-174.15	433,918.8861	694,761.4482	32.191393	-103.703754
12,683.00	91.84	0.38	9,138.61	3,657.07	-173.56	434,011.8585	694,762.0405	32.191649	-103.703751
12,777.00	90.63	0.18	9,136.58	3,751.04	-173.10	434,105.8336	694,762.4997	32.191907	-103.703747
12,870.00	90.63	359.95	9,135.56	3,844.04	-173.00	434,198.8277	694,762.6052	32.192163	-103.703745
12,963.00	89.01	359.22	9,135.85	3,937.03	-173.67	434,291.8208	694,761.9316	32.192418	-103.703746
13,056.00	89.29	358.39	9,137.23	4,030.00	-175.61	434,384.7893	694,759.9923	32.192674	-103.703750
13,150.00	90.43	358.41	9,137.46	4,123.96	-178.23	434,478.7506	694,757.3677	32.192932	-103.703757
13,243.00	92.62	358.61	9,134.98	4,216.89	-180.65	434,571.6804	694,754.9504	32.193188	-103.703763
13,336.00	90.18	358.54	9,132.71	4,309.83	-182.96	434,664.6166	694,752.6385	32.193443	-103.703769
13,429.00	91.19	358.35	9,131.60	4,402.78	-185.49	434,757.5743	694,750.1151	32.193699	-103.703775
13,523.00	91.69	357.69	9,129.24	4,496.70	-188.73	434,851.4875	694,746.8684	32.193957	-103.703784
13,617.00	90.41	358.19	9,127.52	4,590.62	-192.11	434,945.4086	694,743.4902	32.194215	-103.703793
13,711.00	89.90	359.42	9,127.26	4,684.59	-194.07	435,039.3855	694,741.5299	32.194473	-103.703798
13,763.99	90.33	359.60	9,127.15	4,737.58	-194.53	435,092.3732	694,741.0752	32.194619	-103.703798
North 330' Crossing Point @ 13763.99'MD									
13,804.00	90.66	359.73	9,126.81	4,777.59	-194.76	435,132.3808	694,740.8401	32.194729	-103.703798
Final MWD Survey @ 13804'MD									
13,874.00	90.66	359.73	9,126.00	4,847.59	-195.09	435,202.3753	694,740.5102	32.194921	-103.703798
Projection to TD @ 13874'MD									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
8,454.00	8,452.86	-13.24	-11.98	First MWD Survey @ 8454'MD	
9,124.52	9,084.80	129.70	-33.59	South 330' Crossing Point @ 9124.52'MD	
13,763.99	9,127.15	4,737.58	-194.53	North 330' Crossing Point @ 13763.99'MD	
13,804.00	9,126.81	4,777.59	-194.76	Final MWD Survey @ 13804'MD	
13,874.00	9,126.00	4,847.59	-195.09	Projection to TD @ 13874'MD	

Checked By: _____	Approved By: _____	Date: _____
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