

COG

SURVEY REPORT

VAST STATE #21H

ENSIGN 156

6/13/2017



The **Ultimate Partner** In Wellbore Placement

SURVEY REPORT

VAST STATE #21H

KEEPER GYRO SURVEY

CUSTOMER
PROJECT
FIELD

COG
Lea County, New Mexico
N/A

SDI JOB NO.
SDI DISTRICT
SDI KIT/UNIT

OP.002054
Midland

SITE INFORMATION

Site Name
Lat/Long
Northing
Easting

Lea County, New Mexico
32.0501089° N, 103.58743° W
382,753.3 ft
731,103 ft

Section
Township
Range

MAP INFORMATION

North Reference
Grid Correction
System
Datum
Map Zone

Grid North
-0.40 deg
US State Plane 1927
North American Datum 1927 (Clarke 1866)
New Mexico East: 3001

**WELL INFORMATION**

Lat/Long
Northing
Easting
UWI

32.0501089° N, 103.58743° W
382,753.3 ft
731,103 ft
30-025-43550

DEPTH AND ELEVATION REFERENCE

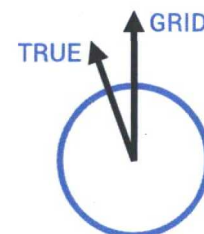
Ground Level
Reference Datum
Reference Height
Reference Elevation

3260 ft above Mean Sea Level
RKB
24 ft above G.L.
3284 ft

VERTICAL SECTION REFERENCE

+N/-S
+E/-W
Proposal Direction
Calculation Method

0 ft
0 ft
112.78°
Minimum Curvature

**LOCAL GRAVITY REFERENCE INFORMATION**

Local Gravity
True to Grid

998.500 mG [computed]
subtract 0.4°

WELL NOTES

Keeper Gyro survey in Casing

OPERATORS

Jeffrey Loyd

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	0.45	345.95	100.00	-0.24	0.38	-0.10	0.45	0.39	345.95
125.00	0.37	334.62	125.00	-0.36	0.55	-0.15	0.46	0.57	344.36
150.00	0.32	351.01	150.00	-0.45	0.69	-0.20	0.45	0.72	343.91
175.00	0.38	353.33	175.00	-0.53	0.84	-0.22	0.26	0.87	345.36
200.00	0.27	318.48	200.00	-0.62	0.97	-0.27	0.89	1.00	344.52
225.00	0.18	289.57	225.00	-0.71	1.03	-0.34	0.56	1.08	341.45
250.00	0.13	299.29	250.00	-0.78	1.05	-0.41	0.21	1.13	338.87
275.00	0.23	261.51	275.00	-0.85	1.06	-0.48	0.58	1.16	335.57
300.00	0.27	249.68	300.00	-0.94	1.03	-0.59	0.27	1.19	330.41
325.00	0.18	221.64	325.00	-1.00	0.98	-0.67	0.57	1.19	325.83
350.00	0.20	250.19	350.00	-1.04	0.94	-0.73	0.38	1.19	322.01
375.00	0.31	243.70	375.00	-1.12	0.89	-0.83	0.46	1.22	316.99
400.00	0.33	224.27	400.00	-1.19	0.81	-0.95	0.44	1.25	310.70
425.00	0.29	223.23	425.00	-1.24	0.72	-1.04	0.15	1.26	304.52
450.00	0.41	238.98	449.99	-1.31	0.62	-1.16	0.61	1.32	298.21
475.00	0.37	229.49	474.99	-1.40	0.52	-1.30	0.31	1.40	291.97
500.00	0.39	240.96	499.99	-1.49	0.43	-1.43	0.32	1.50	286.66
525.00	0.52	237.13	524.99	-1.61	0.33	-1.61	0.53	1.64	281.47
550.00	0.43	232.59	549.99	-1.72	0.21	-1.78	0.41	1.79	276.66
575.00	0.47	244.28	574.99	-1.83	0.11	-1.94	0.41	1.95	273.12
600.00	0.50	234.11	599.99	-1.96	0.00	-2.12	0.36	2.12	269.94
625.00	0.44	234.41	624.99	-2.06	-0.12	-2.29	0.23	2.29	266.97
650.00	0.52	235.33	649.99	-2.17	-0.24	-2.46	0.34	2.47	264.39
675.00	0.47	232.59	674.99	-2.29	-0.37	-2.63	0.24	2.66	262.05
700.00	0.52	237.84	699.99	-2.40	-0.49	-2.81	0.30	2.85	260.10
725.00	0.47	221.56	724.99	-2.50	-0.63	-2.98	0.61	3.04	258.09
750.00	0.47	238.94	749.98	-2.59	-0.76	-3.13	0.56	3.22	256.42
775.00	0.52	233.61	774.98	-2.71	-0.88	-3.31	0.27	3.42	255.18
800.00	0.46	236.42	799.98	-2.82	-1.00	-3.48	0.23	3.62	254.01
825.00	0.57	233.88	824.98	-2.94	-1.13	-3.67	0.43	3.84	252.92
850.00	0.46	240.58	849.98	-3.07	-1.25	-3.85	0.50	4.05	252.05

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	0.57	237.93	874.98	-3.20	-1.36	-4.05	0.47	4.27	251.37
900.00	0.52	234.99	899.98	-3.34	-1.50	-4.25	0.24	4.50	250.59
925.00	0.64	230.51	924.98	-3.46	-1.65	-4.45	0.52	4.74	249.64
950.00	0.57	228.48	949.98	-3.58	-1.82	-4.65	0.30	4.99	248.60
975.00	0.67	233.60	974.97	-3.71	-1.99	-4.86	0.46	5.25	247.72
1000.00	0.59	230.11	999.97	-3.84	-2.16	-5.08	0.36	5.52	246.94
1025.00	0.67	233.29	1024.97	-3.98	-2.33	-5.29	0.36	5.78	246.23
1050.00	0.59	229.86	1049.97	-4.11	-2.50	-5.51	0.35	6.05	245.57
1075.00	0.68	233.52	1074.97	-4.25	-2.67	-5.73	0.36	6.32	244.97
1100.00	0.62	229.22	1099.97	-4.38	-2.85	-5.95	0.29	6.60	244.40
1125.00	0.74	232.91	1124.97	-4.52	-3.04	-6.18	0.51	6.89	243.83
1150.00	0.61	228.19	1149.96	-4.66	-3.22	-6.41	0.60	7.17	243.30
1175.00	0.70	232.02	1174.96	-4.79	-3.41	-6.63	0.41	7.45	242.81
1200.00	0.60	227.40	1199.96	-4.92	-3.59	-6.84	0.44	7.73	242.34
1225.00	0.72	228.17	1224.96	-5.04	-3.78	-7.06	0.46	8.01	241.82
1250.00	0.59	230.55	1249.96	-5.17	-3.97	-7.27	0.54	8.28	241.40
1275.00	0.71	228.05	1274.96	-5.30	-4.15	-7.49	0.52	8.56	240.99
1300.00	0.61	228.92	1299.95	-5.42	-4.34	-7.70	0.42	8.84	240.59
1325.00	0.69	222.03	1324.95	-5.53	-4.54	-7.90	0.46	9.12	240.12
1350.00	0.57	234.76	1349.95	-5.65	-4.73	-8.11	0.74	9.38	239.76
1375.00	0.62	227.90	1374.95	-5.77	-4.89	-8.31	0.35	9.64	239.53
1400.00	0.62	235.99	1399.95	-5.90	-5.06	-8.52	0.35	9.91	239.32
1425.00	0.60	223.88	1424.95	-6.02	-5.23	-8.73	0.53	10.17	239.08
1450.00	0.63	242.83	1449.94	-6.16	-5.38	-8.94	0.82	10.44	238.94
1475.00	0.57	241.07	1474.94	-6.32	-5.51	-9.17	0.25	10.70	239.02
1500.00	0.64	243.21	1499.94	-6.49	-5.63	-9.41	0.28	10.96	239.10
1525.00	0.51	237.05	1524.94	-6.65	-5.75	-9.63	0.56	11.21	239.13
1550.00	0.63	244.95	1549.94	-6.80	-5.87	-9.84	0.55	11.46	239.17
1575.00	0.56	262.08	1574.94	-7.00	-5.95	-10.09	0.76	11.71	239.47
1600.00	0.57	247.71	1599.94	-7.19	-6.01	-10.32	0.57	11.95	239.79
1625.00	0.57	261.59	1624.94	-7.38	-6.08	-10.56	0.55	12.19	240.08
1650.00	0.53	257.71	1649.93	-7.59	-6.12	-10.80	0.22	12.41	240.45

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	0.63	268.19	1674.93	-7.81	-6.15	-11.05	0.60	12.64	240.90
1700.00	0.49	262.41	1699.93	-8.02	-6.17	-11.29	0.60	12.87	241.36
1725.00	0.61	265.06	1724.93	-8.24	-6.19	-11.53	0.49	13.09	241.76
1750.00	0.53	267.86	1749.93	-8.46	-6.21	-11.78	0.37	13.32	242.21
1775.00	0.59	261.22	1774.93	-8.67	-6.23	-12.02	0.36	13.54	242.60
1800.00	0.37	251.56	1799.93	-8.84	-6.28	-12.23	0.95	13.75	242.82
1825.00	0.44	183.33	1824.93	-8.87	-6.40	-12.31	1.83	13.87	242.53
1850.00	0.62	157.87	1849.93	-8.74	-6.62	-12.26	1.16	13.94	241.64
1875.00	0.77	153.37	1874.92	-8.52	-6.90	-12.14	0.65	13.96	240.40
1900.00	0.74	150.49	1899.92	-8.27	-7.19	-11.98	0.21	13.97	239.05
1925.00	0.93	151.79	1924.92	-7.98	-7.51	-11.81	0.76	13.99	237.56
1950.00	0.83	153.77	1949.92	-7.69	-7.84	-11.63	0.42	14.03	236.01
1975.00	0.93	149.52	1974.91	-7.39	-8.18	-11.45	0.47	14.07	234.46
2000.00	0.82	150.78	1999.91	-7.09	-8.51	-11.26	0.44	14.12	232.92
2025.00	0.89	147.12	2024.91	-6.79	-8.83	-11.07	0.36	14.16	231.42
2050.00	0.84	157.44	2049.91	-6.50	-9.16	-10.89	0.66	14.23	229.94
2075.00	0.80	153.92	2074.90	-6.24	-9.49	-10.75	0.24	14.33	228.56
2100.00	0.87	156.30	2099.90	-5.97	-9.82	-10.59	0.28	14.44	227.18
2125.00	0.76	153.59	2124.90	-5.70	-10.14	-10.44	0.45	14.56	225.85
2150.00	0.80	154.22	2149.90	-5.45	-10.44	-10.29	0.16	14.66	224.58
2175.00	0.59	151.83	2174.89	-5.22	-10.72	-10.16	0.84	14.76	223.46
2200.00	0.64	144.87	2199.89	-5.00	-10.94	-10.02	0.35	14.84	222.46
2225.00	0.50	136.65	2224.89	-4.78	-11.14	-9.86	0.63	14.88	221.52
2250.00	0.58	123.08	2249.89	-4.55	-11.29	-9.68	0.59	14.87	220.62
2275.00	0.40	126.52	2274.89	-4.35	-11.41	-9.50	0.71	14.85	219.80
2300.00	0.45	114.98	2299.89	-4.16	-11.50	-9.34	0.40	14.82	219.09
2325.00	0.47	131.67	2324.89	-3.97	-11.61	-9.18	0.54	14.80	218.32
2350.00	0.37	110.72	2349.89	-3.79	-11.71	-9.02	0.72	14.78	217.63
2375.00	0.43	134.49	2374.89	-3.62	-11.80	-8.88	0.70	14.77	216.96
2400.00	0.36	136.96	2399.89	-3.46	-11.93	-8.76	0.28	14.80	216.30
2425.00	0.37	143.11	2424.88	-3.32	-12.05	-8.66	0.16	14.84	215.70
2450.00	0.26	151.68	2449.88	-3.20	-12.16	-8.58	0.50	14.89	215.20

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	"/100ft	ft	deg
2475.00	0.18	109.26	2474.88	-3.12	-12.23	-8.52	0.70	14.90	214.87
2500.00	0.60	345.55	2499.88	-3.16	-12.11	-8.51	2.87	14.81	215.11
2525.00	1.04	351.59	2524.88	-3.36	-11.76	-8.58	1.76	14.56	216.11
2550.00	1.00	348.75	2549.88	-3.60	-11.32	-8.66	0.25	14.25	217.40
2575.00	1.17	350.08	2574.87	-3.86	-10.86	-8.74	0.69	13.94	218.84
2600.00	1.11	347.38	2599.87	-4.13	-10.37	-8.84	0.32	13.63	220.44
2625.00	1.17	347.87	2624.86	-4.42	-9.89	-8.95	0.24	13.33	222.14
2650.00	1.06	349.93	2649.86	-4.69	-9.41	-9.04	0.46	13.05	223.85
2675.00	1.14	346.36	2674.85	-4.97	-8.94	-9.14	0.43	12.78	225.63
2700.00	1.13	350.34	2699.85	-5.25	-8.45	-9.24	0.32	12.52	227.54
2725.00	1.06	343.28	2724.84	-5.53	-7.99	-9.35	0.61	12.30	229.48
2750.00	0.95	348.32	2749.84	-5.79	-7.56	-9.46	0.55	12.11	231.34
2775.00	0.91	340.55	2774.84	-6.04	-7.17	-9.56	0.53	11.95	233.14
2800.00	0.93	346.62	2799.83	-6.30	-6.79	-9.68	0.39	11.82	234.96
2825.00	0.84	345.12	2824.83	-6.53	-6.41	-9.77	0.35	11.69	236.73
2850.00	0.84	341.73	2849.83	-6.76	-6.06	-9.88	0.20	11.59	238.47
2875.00	0.73	344.89	2874.83	-6.98	-5.73	-9.98	0.49	11.51	240.11
2900.00	0.75	331.99	2899.82	-7.20	-5.44	-10.09	0.67	11.46	241.69
2925.00	0.70	337.92	2924.82	-7.44	-5.15	-10.23	0.36	11.45	243.26
2950.00	0.62	320.95	2949.82	-7.66	-4.91	-10.37	0.84	11.47	244.68
2975.00	0.63	330.51	2974.82	-7.89	-4.68	-10.52	0.42	11.52	246.01
3000.00	0.56	322.50	2999.82	-8.10	-4.47	-10.66	0.43	11.56	247.28
3025.00	0.61	327.34	3024.82	-8.32	-4.26	-10.81	0.30	11.62	248.51
3050.00	0.50	329.01	3049.81	-8.52	-4.05	-10.94	0.44	11.66	249.69
3075.00	0.55	322.80	3074.81	-8.71	-3.86	-11.07	0.29	11.72	250.78
3100.00	0.59	332.40	3099.81	-8.91	-3.65	-11.20	0.42	11.78	251.96
3125.00	0.55	324.28	3124.81	-9.12	-3.44	-11.33	0.37	11.84	253.13
3150.00	0.60	331.64	3149.81	-9.32	-3.23	-11.46	0.35	11.91	254.28
3175.00	0.50	322.08	3174.81	-9.52	-3.03	-11.59	0.53	11.98	255.37
3200.00	0.57	325.17	3199.81	-9.71	-2.84	-11.73	0.29	12.07	256.40
3225.00	0.45	326.27	3224.81	-9.90	-2.66	-11.85	0.49	12.15	257.37
3250.00	0.49	301.59	3249.81	-10.09	-2.52	-12.00	0.82	12.26	258.15



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	0.44	307.12	3274.80	-10.29	-2.40	-12.17	0.29	12.40	258.82
3300.00	0.44	296.84	3299.80	-10.47	-2.30	-12.33	0.31	12.54	259.41
3325.00	0.51	305.44	3324.80	-10.68	-2.20	-12.50	0.41	12.69	260.04
3350.00	0.34	307.45	3349.80	-10.86	-2.09	-12.65	0.68	12.82	260.64
3375.00	0.32	318.81	3374.80	-10.99	-1.99	-12.76	0.27	12.91	261.14
3400.00	0.30	31.56	3399.80	-11.05	-1.88	-12.77	1.48	12.91	261.63
3425.00	0.30	46.93	3424.80	-11.01	-1.78	-12.69	0.32	12.81	262.02
3450.00	0.54	63.59	3449.80	-10.91	-1.68	-12.54	1.04	12.65	262.36
3475.00	0.73	75.80	3474.80	-10.70	-1.59	-12.28	0.96	12.38	262.62
3500.00	0.94	74.37	3499.80	-10.41	-1.50	-11.92	0.84	12.02	262.85
3525.00	1.43	76.36	3524.79	-10.00	-1.37	-11.42	1.96	11.50	263.18
3550.00	1.47	76.02	3549.78	-9.49	-1.22	-10.81	0.15	10.87	263.58
3575.00	1.75	77.34	3574.77	-8.93	-1.05	-10.12	1.15	10.18	264.06
3600.00	1.94	79.86	3599.76	-8.26	-0.90	-9.33	0.81	9.38	264.52
3625.00	2.09	77.82	3624.74	-7.53	-0.73	-8.47	0.67	8.50	265.11
3650.00	2.18	78.80	3649.73	-6.76	-0.54	-7.56	0.39	7.58	265.94
3675.00	2.11	77.80	3674.71	-5.99	-0.35	-6.64	0.30	6.65	267.01
3700.00	2.12	77.27	3699.69	-5.24	-0.15	-5.74	0.09	5.74	268.53
3725.00	1.77	81.55	3724.68	-4.53	0.01	-4.91	1.52	4.91	270.14
3750.00	1.41	81.96	3749.67	-3.93	0.11	-4.22	1.46	4.22	271.51
3775.00	1.21	87.85	3774.66	-3.43	0.16	-3.65	0.95	3.66	272.58
3800.00	1.09	82.90	3799.66	-2.98	0.20	-3.15	0.63	3.16	273.70
3825.00	1.11	89.20	3824.65	-2.56	0.24	-2.67	0.49	2.68	275.05
3850.00	0.99	91.41	3849.65	-2.13	0.23	-2.22	0.48	2.23	276.04
3875.00	0.91	89.86	3874.64	-1.75	0.23	-1.80	0.37	1.82	277.26
3900.00	0.64	134.93	3899.64	-1.44	0.13	-1.50	2.57	1.51	275.00
3925.00	0.74	190.87	3924.64	-1.28	-0.12	-1.44	2.60	1.44	265.04
3950.00	0.94	194.05	3949.64	-1.21	-0.48	-1.52	0.82	1.59	252.40
3975.00	1.03	198.69	3974.64	-1.16	-0.89	-1.64	0.48	1.87	241.43
4000.00	0.91	198.62	3999.63	-1.13	-1.29	-1.77	0.48	2.19	233.92
4025.00	0.98	194.68	4024.63	-1.09	-1.69	-1.89	0.40	2.53	228.26
4050.00	0.92	198.41	4049.62	-1.04	-2.09	-2.01	0.35	2.90	223.93

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	"/100ft	ft	deg
4075.00	0.80	190.31	4074.62	-0.99	-2.45	-2.10	0.69	3.23	220.68
4100.00	0.80	179.80	4099.62	-0.89	-2.79	-2.13	0.59	3.51	217.38
4125.00	0.75	163.78	4124.62	-0.71	-3.12	-2.09	0.89	3.76	213.74
4150.00	0.94	152.55	4149.61	-0.45	-3.46	-1.95	0.99	3.97	209.35
4175.00	1.05	143.99	4174.61	-0.10	-3.83	-1.72	0.75	4.20	204.17
4200.00	1.34	132.94	4199.61	0.37	-4.21	-1.37	1.47	4.43	198.02
4225.00	1.63	133.10	4224.60	0.98	-4.66	-0.90	1.18	4.74	190.91
4250.00	1.68	131.57	4249.59	1.66	-5.14	-0.36	0.25	5.15	184.04
4275.00	1.86	128.95	4274.57	2.39	-5.64	0.23	0.82	5.64	177.70
4300.00	1.99	130.10	4299.56	3.20	-6.17	0.87	0.52	6.24	171.94
4325.00	1.92	127.17	4324.55	4.02	-6.71	1.54	0.49	6.88	167.07
4350.00	1.80	125.42	4349.53	4.80	-7.19	2.19	0.52	7.51	163.03
4375.00	1.24	126.53	4374.52	5.45	-7.58	2.73	2.26	8.05	160.18
4400.00	1.01	122.06	4399.52	5.93	-7.85	3.13	0.99	8.46	158.25
4425.00	0.91	115.32	4424.52	6.34	-8.05	3.50	0.59	8.78	156.52
4450.00	0.60	111.70	4449.51	6.67	-8.19	3.80	1.24	9.03	155.10
4475.00	0.28	60.99	4474.51	6.84	-8.21	3.97	1.91	9.12	154.16
4500.00	0.44	351.51	4499.51	6.83	-8.08	4.01	1.73	9.02	153.59
4525.00	0.47	334.55	4524.51	6.70	-7.89	3.95	0.55	8.83	153.39
4550.00	0.54	334.92	4549.51	6.54	-7.69	3.86	0.28	8.61	153.35
4575.00	0.45	340.37	4574.51	6.38	-7.49	3.78	0.39	8.39	153.25
4600.00	0.43	335.07	4599.51	6.25	-7.32	3.71	0.20	8.20	153.14
4625.00	0.52	335.81	4624.51	6.10	-7.13	3.62	0.40	7.99	153.08
4650.00	0.55	334.46	4649.51	5.92	-6.92	3.52	0.12	7.76	153.02
4675.00	0.64	325.16	4674.51	5.71	-6.69	3.39	0.54	7.50	153.15
4700.00	0.72	327.47	4699.50	5.47	-6.44	3.22	0.32	7.21	153.42
4725.00	0.64	329.68	4724.50	5.23	-6.19	3.07	0.32	6.91	153.64
4750.00	0.75	318.02	4749.50	4.97	-5.95	2.89	0.72	6.61	154.10
4775.00	0.90	316.20	4774.50	4.64	-5.68	2.64	0.60	6.27	155.07
4800.00	0.85	320.48	4799.49	4.29	-5.40	2.39	0.34	5.90	156.14
4825.00	0.84	314.63	4824.49	3.96	-5.13	2.14	0.35	5.56	157.34
4850.00	0.92	314.24	4849.49	3.60	-4.86	1.87	0.35	5.21	158.99

MD ft	INC deg	AZIM deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS "/100ft	CLOSURE DIST ft	CLOSURE DIR deg
4875.00	0.87	322.62	4874.49	3.25	-4.57	1.61	0.56	4.84	160.63
4900.00	0.80	319.79	4899.48	2.93	-4.28	1.38	0.33	4.50	162.17
4925.00	0.69	322.03	4924.48	2.64	-4.03	1.17	0.46	4.20	163.79
4950.00	0.38	9.87	4949.48	2.49	-3.83	1.09	2.07	3.98	164.06
4975.00	0.44	42.26	4974.48	2.50	-3.68	1.17	0.94	3.86	162.32
5000.00	0.45	67.63	4999.48	2.60	-3.57	1.33	0.78	3.81	159.59
5025.00	0.31	75.09	5024.48	2.73	-3.51	1.48	0.61	3.81	157.11
5050.00	0.46	71.99	5049.48	2.86	-3.46	1.64	0.62	3.83	154.62
5075.00	0.59	74.95	5074.48	3.03	-3.40	1.86	0.53	3.88	151.27
5100.00	0.55	71.46	5099.48	3.23	-3.33	2.10	0.21	3.94	147.72
5125.00	0.57	90.06	5124.47	3.43	-3.29	2.34	0.72	4.04	144.58
5150.00	0.69	123.65	5149.47	3.69	-3.37	2.59	1.52	4.25	142.50
5175.00	0.75	137.25	5174.47	3.99	-3.58	2.82	0.73	4.56	141.71
5200.00	0.69	134.43	5199.47	4.28	-3.80	3.04	0.31	4.87	141.33
5225.00	0.78	129.25	5224.47	4.58	-4.01	3.28	0.46	5.18	140.74
5250.00	0.83	131.86	5249.46	4.91	-4.24	3.55	0.26	5.53	140.10
5275.00	0.77	139.33	5274.46	5.24	-4.49	3.79	0.48	5.88	139.83
5300.00	0.77	124.51	5299.46	5.55	-4.72	4.04	0.80	6.21	139.40
5325.00	0.78	125.64	5324.46	5.88	-4.91	4.32	0.07	6.54	138.67
5350.00	0.80	133.56	5349.45	6.21	-5.13	4.58	0.44	6.88	138.22
5375.00	0.69	140.85	5374.45	6.51	-5.37	4.80	0.58	7.20	138.16
5400.00	0.47	149.40	5399.45	6.72	-5.57	4.95	0.94	7.45	138.37
5425.00	0.51	261.88	5424.45	6.71	-5.68	4.89	3.27	7.49	139.23
5450.00	0.72	270.43	5449.45	6.47	-5.69	4.63	0.92	7.33	140.89
5475.00	0.79	269.91	5474.45	6.16	-5.69	4.30	0.29	7.13	142.95
5500.00	0.76	276.73	5499.44	5.84	-5.67	3.96	0.39	6.91	145.09
5525.00	0.72	272.34	5524.44	5.54	-5.64	3.63	0.27	6.71	147.22
5550.00	0.79	272.74	5549.44	5.23	-5.63	3.30	0.26	6.53	149.59
5575.00	0.76	275.06	5574.44	4.91	-5.61	2.97	0.18	6.34	152.11
5600.00	0.75	266.53	5599.44	4.60	-5.60	2.64	0.45	6.19	154.79
5625.00	0.79	259.43	5624.43	4.31	-5.64	2.30	0.41	6.10	157.80
5650.00	0.84	262.19	5649.43	4.01	-5.70	1.95	0.26	6.03	161.10

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	"/100ft	ft	deg
5675.00	0.81	270.03	5674.43	3.69	-5.72	1.59	0.47	5.94	164.45
5700.00	0.75	268.36	5699.43	3.37	-5.73	1.25	0.26	5.87	167.65
5725.00	0.77	264.54	5724.42	3.08	-5.75	0.92	0.22	5.82	170.87
5750.00	0.79	264.60	5749.42	2.78	-5.78	0.59	0.06	5.81	174.22
5775.00	0.76	269.31	5774.42	2.48	-5.80	0.25	0.28	5.81	177.54
5800.00	0.77	264.70	5799.42	2.18	-5.82	-0.08	0.25	5.82	180.81
5825.00	0.80	265.01	5824.42	1.87	-5.85	-0.42	0.12	5.86	184.14
5850.00	0.75	258.58	5849.41	1.58	-5.90	-0.76	0.40	5.94	187.32
5875.00	0.65	253.41	5874.41	1.34	-5.97	-1.05	0.47	6.06	190.01
5900.00	0.67	246.36	5899.41	1.13	-6.07	-1.32	0.34	6.21	192.30
5925.00	0.80	254.24	5924.41	0.89	-6.17	-1.63	0.66	6.39	194.75
5950.00	0.77	255.24	5949.40	0.62	-6.27	-1.96	0.13	6.56	197.35
5975.00	0.69	245.61	5974.40	0.38	-6.37	-2.26	0.60	6.76	199.51
6000.00	0.66	246.39	5999.40	0.18	-6.49	-2.53	0.10	6.96	201.27
6025.00	0.76	246.76	6024.40	-0.03	-6.61	-2.81	0.38	7.19	203.03
6050.00	0.64	256.62	6049.40	-0.26	-6.71	-3.10	0.67	7.39	204.79
6075.00	0.56	248.99	6074.40	-0.46	-6.79	-3.35	0.45	7.57	206.27
6100.00	0.68	249.15	6099.39	-0.66	-6.88	-3.60	0.48	7.77	207.63
6125.00	0.70	250.98	6124.39	-0.88	-6.99	-3.89	0.11	8.00	209.09
6150.00	0.64	257.00	6149.39	-1.11	-7.07	-4.17	0.38	8.20	210.52
6175.00	0.64	251.36	6174.39	-1.32	-7.14	-4.43	0.25	8.41	211.83
6200.00	0.71	248.99	6199.39	-1.54	-7.24	-4.71	0.30	8.64	213.03
6225.00	0.63	256.31	6224.39	-1.76	-7.33	-4.99	0.46	8.87	214.22
6250.00	0.59	255.59	6249.38	-1.97	-7.40	-5.24	0.16	9.07	215.34
6275.00	0.60	250.05	6274.38	-2.17	-7.47	-5.49	0.23	9.27	216.31
6300.00	0.66	253.66	6299.38	-2.38	-7.56	-5.75	0.29	9.50	217.28
6325.00	0.71	258.01	6324.38	-2.62	-7.63	-6.04	0.30	9.73	218.38
6350.00	0.56	258.94	6349.38	-2.85	-7.69	-6.31	0.62	9.95	219.40
6375.00	0.66	249.85	6374.38	-3.05	-7.76	-6.57	0.56	10.17	220.25
6400.00	0.73	251.40	6399.38	-3.28	-7.86	-6.86	0.29	10.43	221.10
6425.00	0.70	257.23	6424.37	-3.52	-7.94	-7.15	0.32	10.69	222.01
6450.00	0.59	253.39	6449.37	-3.74	-8.01	-7.43	0.46	10.92	222.82

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	0.66	252.45	6474.37	-3.95	-8.09	-7.69	0.29	11.16	223.52
6500.00	0.63	252.09	6499.37	-4.17	-8.18	-7.95	0.13	11.41	224.20
6525.00	0.60	261.68	6524.37	-4.38	-8.24	-8.22	0.43	11.64	224.91
6550.00	0.58	259.83	6549.37	-4.60	-8.28	-8.47	0.11	11.85	225.65
6575.00	0.71	250.42	6574.36	-4.83	-8.36	-8.74	0.65	12.09	226.29
6600.00	0.62	258.55	6599.36	-5.05	-8.44	-9.02	0.53	12.35	226.92
6625.00	0.57	267.21	6624.36	-5.27	-8.47	-9.28	0.40	12.56	227.61
6650.00	0.52	257.17	6649.36	-5.48	-8.50	-9.51	0.43	12.75	228.21
6675.00	0.54	250.98	6674.36	-5.66	-8.56	-9.73	0.24	12.96	228.66
6700.00	0.61	255.76	6699.36	-5.85	-8.63	-9.97	0.35	13.19	229.11
6725.00	0.56	263.85	6724.36	-6.07	-8.68	-10.22	0.38	13.41	229.67
6750.00	0.46	252.85	6749.36	-6.25	-8.72	-10.44	0.57	13.61	230.13
6775.00	0.40	242.71	6774.35	-6.38	-8.79	-10.61	0.39	13.78	230.37
6800.00	0.46	255.16	6799.35	-6.52	-8.86	-10.79	0.44	13.96	230.61
6825.00	0.42	257.79	6824.35	-6.67	-8.90	-10.97	0.17	14.13	230.95
6850.00	0.38	248.71	6849.35	-6.81	-8.95	-11.14	0.30	14.29	231.22
6875.00	0.40	235.13	6874.35	-6.91	-9.03	-11.29	0.37	14.46	231.34
6900.00	0.42	246.65	6899.35	-7.02	-9.12	-11.44	0.34	14.63	231.46
6925.00	0.33	255.00	6924.35	-7.14	-9.17	-11.60	0.43	14.78	231.66
6950.00	0.31	250.73	6949.35	-7.25	-9.21	-11.73	0.12	14.91	231.85
6975.00	0.35	249.87	6974.35	-7.35	-9.26	-11.86	0.17	15.05	232.03
7000.00	0.39	265.05	6999.35	-7.48	-9.29	-12.02	0.42	15.19	232.29
7025.00	0.32	274.47	7024.35	-7.63	-9.30	-12.18	0.35	15.32	232.64
7050.00	0.25	267.50	7049.35	-7.74	-9.29	-12.30	0.32	15.42	232.93
7075.00	0.34	250.70	7074.35	-7.85	-9.32	-12.43	0.49	15.53	233.13
7100.00	0.36	267.17	7099.35	-7.98	-9.35	-12.58	0.41	15.67	233.38
7125.00	0.25	271.67	7124.35	-8.10	-9.35	-12.71	0.46	15.78	233.66
7150.00	0.22	256.37	7149.35	-8.19	-9.36	-12.81	0.28	15.87	233.85
7175.00	0.26	249.03	7174.35	-8.27	-9.39	-12.91	0.21	15.97	233.97
7200.00	0.29	265.77	7199.35	-8.37	-9.42	-13.03	0.34	16.07	234.14
7225.00	0.11	298.09	7224.35	-8.44	-9.41	-13.11	0.82	16.14	234.33
7250.00	0.05	241.00	7249.35	-8.47	-9.40	-13.14	0.36	16.16	234.41

MD ft	INC deg	AZIM deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS "/100ft	CLOSURE DIST ft	CLOSURE DIR deg
7275.00	0.16	241.75	7274.35	-8.50	-9.43	-13.18	0.44	16.21	234.43
7300.00	0.19	253.50	7299.35	-8.56	-9.45	-13.25	0.18	16.28	234.49
7325.00	0.11	272.74	7324.35	-8.61	-9.47	-13.32	0.37	16.34	234.59
7350.00	0.07	219.28	7349.35	-8.64	-9.48	-13.35	0.35	16.37	234.63
7375.00	0.16	212.26	7374.35	-8.65	-9.52	-13.38	0.34	16.42	234.57
7400.00	0.17	207.75	7399.35	-8.66	-9.58	-13.41	0.06	16.48	234.47
7425.00	0.13	178.67	7424.35	-8.65	-9.64	-13.43	0.32	16.53	234.33
7450.00	0.22	150.76	7449.35	-8.60	-9.71	-13.40	0.49	16.55	234.07
7475.00	0.31	151.06	7474.35	-8.51	-9.81	-13.35	0.33	16.57	233.68
7500.00	0.30	155.86	7499.35	-8.41	-9.93	-13.29	0.11	16.59	233.23
7525.00	0.21	133.25	7524.35	-8.32	-10.02	-13.23	0.52	16.60	232.85
7550.00	0.23	107.29	7549.35	-8.22	-10.07	-13.15	0.40	16.56	232.56
7575.00	0.26	116.63	7574.35	-8.12	-10.11	-13.05	0.20	16.51	232.24
7600.00	0.27	122.51	7599.34	-8.01	-10.16	-12.95	0.11	16.46	231.87
7625.00	0.23	141.98	7624.34	-7.90	-10.24	-12.87	0.37	16.44	231.51
7650.00	0.20	123.30	7649.34	-7.82	-10.30	-12.80	0.30	16.43	231.18
7675.00	0.27	120.65	7674.34	-7.71	-10.35	-12.71	0.27	16.40	230.84
7700.00	0.38	129.53	7699.34	-7.58	-10.44	-12.60	0.46	16.36	230.37
7725.00	0.44	141.18	7724.34	-7.41	-10.56	-12.48	0.43	16.35	229.75
7750.00	0.43	142.01	7749.34	-7.25	-10.71	-12.36	0.06	16.36	229.08
7775.00	0.46	144.58	7774.34	-7.08	-10.87	-12.24	0.15	16.37	228.40
7800.00	0.49	135.73	7799.34	-6.90	-11.03	-12.11	0.31	16.38	227.68
7825.00	0.59	131.45	7824.34	-6.68	-11.19	-11.94	0.43	16.36	226.86
7850.00	0.67	135.38	7849.34	-6.42	-11.38	-11.74	0.35	16.35	225.90
7875.00	0.64	140.82	7874.34	-6.16	-11.59	-11.55	0.27	16.36	224.91
7900.00	0.62	139.08	7899.34	-5.92	-11.80	-11.37	0.10	16.39	223.95
7925.00	0.61	136.07	7924.33	-5.67	-12.00	-11.19	0.14	16.41	223.01
7950.00	0.70	134.14	7949.33	-5.41	-12.20	-10.99	0.35	16.42	222.01
7975.00	0.72	145.77	7974.33	-5.13	-12.44	-10.79	0.58	16.47	220.94
8000.00	0.78	154.51	7999.33	-4.88	-12.72	-10.63	0.51	16.58	219.88
8025.00	0.69	159.70	8024.33	-4.64	-13.02	-10.50	0.43	16.73	218.90
8050.00	0.65	156.34	8049.32	-4.44	-13.29	-10.39	0.23	16.87	218.03

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	"/100ft	ft	deg
8075.00	0.72	152.78	8074.32	-4.21	-13.56	-10.26	0.33	17.01	217.12
8100.00	0.72	151.03	8099.32	-3.97	-13.84	-10.12	0.09	17.14	216.17
8125.00	0.73	147.19	8124.32	-3.71	-14.11	-9.95	0.20	17.27	215.20
8150.00	0.77	151.83	8149.32	-3.45	-14.39	-9.79	0.30	17.41	214.21
8175.00	0.69	156.09	8174.31	-3.21	-14.68	-9.65	0.41	17.57	213.31
8200.00	0.73	150.72	8199.31	-2.98	-14.96	-9.51	0.32	17.72	212.44
8225.00	0.60	152.99	8224.31	-2.75	-15.21	-9.37	0.55	17.87	211.63
8250.00	0.71	147.23	8249.31	-2.52	-15.46	-9.23	0.50	18.00	210.84
8275.00	0.68	148.90	8274.31	-2.28	-15.71	-9.07	0.13	18.14	209.99
8300.00	0.69	148.17	8299.31	-2.03	-15.97	-8.91	0.07	18.29	209.16
8325.00	0.71	154.92	8324.30	-1.80	-16.24	-8.77	0.34	18.45	208.36
8350.00	0.67	151.35	8349.30	-1.57	-16.51	-8.63	0.24	18.63	207.60
8375.00	0.62	149.88	8374.30	-1.35	-16.75	-8.49	0.18	18.78	206.89
8400.00	0.59	148.97	8399.30	-1.13	-16.98	-8.36	0.16	18.92	206.21
8425.00	0.54	139.15	8424.30	-0.93	-17.18	-8.22	0.43	19.04	205.56
8450.00	0.52	134.09	8449.30	-0.71	-17.34	-8.06	0.20	19.12	204.92
8475.00	0.62	128.49	8474.30	-0.48	-17.51	-7.87	0.46	19.19	204.21
8500.00	0.85	125.70	8499.29	-0.17	-17.70	-7.61	0.93	19.27	203.28
8525.00	1.31	127.95	8524.29	0.29	-17.98	-7.24	1.86	19.39	201.92
8550.00	1.48	128.88	8549.28	0.88	-18.36	-6.76	0.68	19.57	200.21
8575.00	1.52	129.42	8574.27	1.50	-18.78	-6.25	0.17	19.79	198.42
8600.00	1.58	118.03	8599.26	2.17	-19.15	-5.69	1.26	19.98	196.55
8625.00	1.72	92.91	8624.25	2.86	-19.33	-5.01	2.93	19.97	194.53
8650.00	1.95	77.90	8649.24	3.57	-19.26	-4.22	2.12	19.72	192.36
8675.00	2.07	65.14	8674.23	4.22	-18.98	-3.39	1.84	19.28	190.14
8700.00	2.30	53.13	8699.21	4.78	-18.49	-2.58	2.05	18.67	187.95
8725.00	2.61	45.72	8724.18	5.25	-17.79	-1.78	1.77	17.88	185.70
8750.00	2.74	44.36	8749.16	5.69	-16.97	-0.95	0.58	17.00	183.21
8775.00	2.71	43.16	8774.13	6.12	-16.11	-0.13	0.25	16.11	180.45
8800.00	2.46	40.87	8799.10	6.49	-15.27	0.63	1.12	15.29	177.65
8825.00	2.07	36.76	8824.08	6.77	-14.51	1.25	1.67	14.56	175.08
8850.00	1.96	35.07	8849.07	6.97	-13.80	1.76	0.52	13.91	172.71

MD ft	INC deg	AZIM deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS "/100ft	CLOSURE DIST ft	CLOSURE DIR deg
8875.00	1.81	36.72	8874.05	7.15	-13.13	2.25	0.62	13.32	170.29
8900.00	1.49	37.92	8899.04	7.33	-12.56	2.68	1.29	12.84	167.94
8925.00	1.26	40.75	8924.04	7.50	-12.09	3.06	0.97	12.47	165.79
8950.00	1.17	41.54	8949.03	7.67	-11.69	3.41	0.36	12.18	163.74
8975.00	1.18	42.48	8974.03	7.84	-11.31	3.75	0.08	11.92	161.64
9000.00	1.19	44.23	8999.02	8.02	-10.94	4.11	0.15	11.68	159.41
9025.00	1.14	44.14	9024.02	8.21	-10.57	4.46	0.20	11.47	157.12
9050.00	1.18	40.81	9049.01	8.38	-10.20	4.80	0.31	11.27	154.79
9075.00	1.15	47.26	9074.01	8.56	-9.83	5.15	0.53	11.10	152.35
9100.00	1.11	47.33	9099.00	8.76	-9.50	5.52	0.16	10.99	149.86
9125.00	1.19	52.48	9124.00	8.99	-9.18	5.90	0.53	10.91	147.27
9150.00	1.21	59.90	9148.99	9.28	-8.89	6.34	0.63	10.91	144.51
9175.00	1.31	74.00	9173.98	9.66	-8.68	6.84	1.30	11.05	141.75
9200.00	1.34	80.36	9198.98	10.13	-8.55	7.40	0.60	11.31	139.11
9225.00	1.36	84.70	9223.97	10.64	-8.47	7.98	0.42	11.64	136.69
9250.00	1.34	90.38	9248.96	11.18	-8.45	8.57	0.54	12.04	134.57
9275.00	1.36	92.76	9273.96	11.73	-8.46	9.16	0.24	12.47	132.72
9300.00	1.42	89.47	9298.95	12.29	-8.47	9.77	0.39	12.93	130.93
9325.00	1.40	91.96	9323.94	12.86	-8.48	10.39	0.26	13.41	129.23
9350.00	1.44	107.69	9348.93	13.46	-8.59	10.99	1.57	13.95	127.99
9375.00	1.79	128.98	9373.92	14.15	-8.93	11.60	2.75	14.64	127.59
9400.00	1.99	136.33	9398.91	14.92	-9.49	12.20	1.25	15.45	127.87
9425.00	2.17	139.78	9423.89	15.74	-10.16	12.80	0.88	16.35	128.44
9450.00	2.41	141.03	9448.87	16.62	-10.93	13.44	1.01	17.32	129.12
9475.00	2.75	145.24	9473.85	17.59	-11.83	14.11	1.54	18.42	129.98
9500.00	3.09	142.78	9498.82	18.68	-12.86	14.86	1.46	19.66	130.88
9525.00	3.02	137.48	9523.78	19.87	-13.89	15.72	1.17	20.97	131.46
9550.00	3.42	127.03	9548.74	21.19	-14.82	16.76	2.83	22.37	131.49
9575.00	3.88	120.19	9573.69	22.75	-15.69	18.08	2.54	23.94	130.96
9600.00	3.70	114.15	9598.64	24.39	-16.45	19.55	1.75	25.55	130.08
9625.00	3.76	111.39	9623.58	26.02	-17.08	21.05	0.76	27.10	129.06
9650.00	3.81	114.83	9648.53	27.67	-17.73	22.56	0.94	28.69	128.15

MD ft	INC deg	AZIM deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS %/100ft	CLOSURE DIST ft	CLOSURE DIR deg
9675.00	4.03	117.72	9673.47	29.37	-18.48	24.10	1.18	30.37	127.49
9700.00	3.93	120.92	9698.41	31.09	-19.33	25.61	0.98	32.09	127.05
9725.00	3.65	121.19	9723.36	32.73	-20.18	27.02	1.12	33.73	126.76
9750.00	3.50	120.42	9748.31	34.27	-20.98	28.36	0.63	35.28	126.49
9775.00	3.45	120.28	9773.26	35.77	-21.75	29.67	0.21	36.78	126.24
9800.00	3.43	119.06	9798.22	37.26	-22.49	30.97	0.30	38.27	125.99
9825.00	3.48	116.44	9823.17	38.76	-23.19	32.30	0.66	39.77	125.67
9850.00	4.23	114.83	9848.11	40.44	-23.91	33.82	3.03	41.42	125.27
9875.00	5.40	119.05	9873.03	42.53	-24.87	35.68	4.89	43.50	124.88
9900.00	6.02	120.56	9897.90	45.00	-26.11	37.84	2.57	45.97	124.61
9925.00	6.22	121.77	9922.76	47.64	-27.49	40.12	0.96	48.64	124.42
9950.00	6.30	122.94	9947.61	50.32	-28.95	42.42	0.60	51.36	124.31
9975.00	6.37	123.86	9972.46	53.04	-30.47	44.73	0.49	54.12	124.26
10000.00	6.35	124.81	9997.30	55.75	-32.03	47.02	0.43	56.89	124.27
10025.00	6.33	126.09	10022.15	58.44	-33.63	49.26	0.57	59.65	124.32
10050.00	6.23	125.44	10047.00	61.11	-35.23	51.48	0.49	62.38	124.38
10075.00	6.04	125.89	10071.86	63.71	-36.79	53.65	0.79	65.05	124.44
10100.00	6.09	125.38	10096.72	66.28	-38.32	55.80	0.30	67.69	124.48
10125.00	6.29	122.72	10121.57	68.92	-39.83	58.03	1.42	70.38	124.47
10150.00	6.48	120.78	10146.42	71.67	-41.29	60.39	1.15	73.16	124.36
10175.00	6.34	118.70	10171.26	74.44	-42.68	62.82	1.10	75.94	124.19
10200.00	6.17	117.01	10196.11	77.15	-43.95	65.22	0.99	78.65	123.97
10225.00	6.18	114.82	10220.97	79.84	-45.13	67.64	0.95	81.31	123.71
10250.00	6.22	112.55	10245.82	82.54	-46.21	70.11	0.99	83.97	123.39
10275.00	6.19	111.61	10270.67	85.24	-47.23	72.62	0.43	86.62	123.04
10300.00	6.12	110.97	10295.53	87.92	-48.20	75.11	0.38	89.25	122.69
10325.00	6.11	109.81	10320.39	90.58	-49.13	77.61	0.49	91.85	122.33
10350.00	6.14	109.18	10345.25	93.24	-50.02	80.12	0.31	94.45	121.97
10375.00	6.22	108.94	10370.10	95.93	-50.90	82.67	0.33	97.08	121.62
10400.00	6.20	108.05	10394.95	98.62	-51.75	85.23	0.39	99.72	121.27
10425.00	6.28	106.24	10419.81	101.33	-52.56	87.83	0.85	102.35	120.89
10450.00	6.41	105.36	10444.65	104.07	-53.31	90.49	0.65	105.02	120.50

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	"/100ft	ft	deg
10475.00	6.41	105.37	10469.50	106.84	-54.05	93.18	0.01	107.72	120.11
10500.00	6.40	104.67	10494.34	109.60	-54.77	95.87	0.32	110.42	119.74
10525.00	6.29	103.58	10519.19	112.33	-55.44	98.55	0.63	113.08	119.36
10550.00	6.13	102.98	10544.04	115.00	-56.07	101.19	0.69	115.68	118.99
10575.00	6.11	101.79	10568.90	117.62	-56.64	103.79	0.52	118.24	118.62
10600.00	6.13	102.14	10593.75	120.24	-57.19	106.40	0.17	120.79	118.26
10625.00	6.04	101.53	10618.61	122.84	-57.73	108.99	0.43	123.34	117.91
10650.00	5.84	101.39	10643.48	125.38	-58.25	111.52	0.80	125.82	117.58
10675.00	5.62	100.84	10668.35	127.82	-58.73	113.97	0.91	128.22	117.26
10700.00	5.52	100.24	10693.24	130.20	-59.17	116.36	0.47	130.54	116.95
10725.00	5.41	99.42	10718.12	132.52	-59.58	118.71	0.53	132.82	116.65
10750.00	5.23	98.91	10743.02	134.77	-59.95	121.00	0.74	135.03	116.36
10775.00	5.11	98.79	10767.91	136.96	-60.30	123.22	0.48	137.19	116.07
10800.00	5.24	100.04	10792.81	139.15	-60.67	125.45	0.66	139.35	115.81
10825.00	5.36	100.31	10817.70	141.40	-61.07	127.72	0.49	141.57	115.56
10850.00	5.54	102.97	10842.59	143.73	-61.55	130.04	1.25	143.88	115.33
10875.00	5.58	106.23	10867.47	146.13	-62.16	132.39	1.28	146.26	115.15
10900.00	6.03	110.02	10892.35	148.65	-62.95	134.79	2.34	148.77	115.03
10925.00	6.66	112.71	10917.19	151.41	-63.96	137.36	2.81	151.52	114.97
10950.00	6.97	114.36	10942.02	154.38	-65.15	140.08	1.44	154.49	114.94
10975.00	7.05	114.36	10966.83	157.43	-66.41	142.86	0.35	157.54	114.93
11000.00	6.88	113.87	10991.64	160.46	-67.64	145.63	0.73	160.57	114.92
11025.00	6.78	113.10	11016.47	163.43	-68.83	148.35	0.55	163.54	114.89
11050.00	6.63	112.11	11041.30	166.35	-69.95	151.05	0.75	166.46	114.85
11075.00	6.51	111.52	11066.13	169.21	-71.01	153.70	0.55	169.31	114.80
11100.00	6.07	111.19	11090.98	171.95	-72.01	156.25	1.76	172.05	114.74
11125.00	5.61	110.36	11115.85	174.49	-72.91	158.63	1.87	174.59	114.69
11150.00	5.29	109.45	11140.74	176.86	-73.72	160.86	1.34	176.95	114.62
11175.00	5.15	107.79	11165.64	179.13	-74.45	163.02	0.81	179.21	114.55
11200.00	4.91	105.28	11190.54	181.31	-75.07	165.12	1.30	181.38	114.45
11225.00	4.78	102.48	11215.45	183.39	-75.58	167.17	1.09	183.46	114.33
11250.00	4.86	103.09	11240.36	185.46	-76.05	169.22	0.38	185.52	114.20

MD ft	INC deg	AZIM deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	CLOSURE DIST ft	CLOSURE DIR deg
11275.00	5.27	103.26	11265.26	187.64	-76.55	171.36	1.63	187.68	114.07
11300.00	5.50	105.36	11290.15	189.96	-77.13	173.64	1.21	190.00	113.95
11325.00	5.53	103.33	11315.04	192.33	-77.73	175.96	0.79	192.36	113.83
11350.00	5.12	101.72	11339.93	194.61	-78.23	178.23	1.74	194.64	113.70
11375.00	5.03	100.22	11364.83	196.78	-78.65	180.40	0.65	196.80	113.56
11400.00	4.85	96.57	11389.74	198.86	-78.97	182.52	1.45	198.87	113.39
11425.00	4.65	95.33	11414.65	200.84	-79.18	184.58	0.88	200.85	113.22
11450.00	4.45	94.93	11439.57	202.73	-79.36	186.56	0.84	202.73	113.04
11475.00	4.15	96.61	11464.50	204.52	-79.55	188.42	1.27	204.52	112.89
11499.82	3.95	103.14	11489.26	206.23	-79.84	190.15	2.04	206.23	112.78



COG Operating, LLC

**Lea County, NM
Sec 17, T26S, R33E
Vast State #21H**

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

28 June, 2017



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Vast State #21H
Project:	Lea County, NM	TVD Reference:	RKB @ 3284.7usft (Ensign #156)
Site:	Sec 17, T26S, R33E	MD Reference:	RKB @ 3284.7usft (Ensign #156)
Well:	Vast State #21H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Project	Lea County, NM		
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 17, T26S, R33E				
Site Position:		Northing:	378,083.90 usft	Latitude:	32° 2' 14.178 N
From:	Map	Easting:	731,217.50 usft	Longitude:	103° 35' 13.794 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.40 °

Well	Vast State #21H				
Well Position	+N/-S	0.0 usft	Northing:	377,880.20 usft	Latitude: 32° 2' 12.200 N
	+E/-W	0.0 usft	Easting:	730,666.60 usft	Longitude: 103° 35' 20.210 W
Position Uncertainty	0.0 usft		Wellhead Elevation:	0.0 usft	Ground Level: 3,259.7 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	6/9/2017	6.95	59.89	47,828

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	5.12	

Survey Program	Date	6/28/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	11,499.8	Gyros (Wellbore #1)	GYRO-NS	Gyrocompass Gyro	
11,737.0	17,080.0	MWD Surveys (QES) (Wellbore #1)	MWD+IFR1+MS	OWSG MWD + IFR1 + Multi-Station Correction	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.0	0.00	0.00	0.0	0.0	0.0	377,880.20	730,666.60	32° 2' 12.200 N	103° 35' 20.210 W	
100.0	0.45	345.95	100.0	0.4	-0.1	377,880.58	730,666.50	32° 2' 12.204 N	103° 35' 20.211 W	
125.0	0.37	334.62	125.0	0.5	-0.2	377,880.75	730,666.44	32° 2' 12.205 N	103° 35' 20.212 W	
150.0	0.32	351.01	150.0	0.7	-0.2	377,880.89	730,666.40	32° 2' 12.207 N	103° 35' 20.212 W	
175.0	0.38	353.33	175.0	0.8	-0.2	377,881.04	730,666.38	32° 2' 12.208 N	103° 35' 20.212 W	
200.0	0.27	318.48	200.0	1.0	-0.3	377,881.17	730,666.33	32° 2' 12.209 N	103° 35' 20.213 W	
225.0	0.18	289.57	225.0	1.0	-0.3	377,881.22	730,666.25	32° 2' 12.210 N	103° 35' 20.214 W	
250.0	0.13	299.29	250.0	1.1	-0.4	377,881.25	730,666.19	32° 2' 12.210 N	103° 35' 20.214 W	
275.0	0.23	261.51	275.0	1.1	-0.5	377,881.26	730,666.12	32° 2' 12.210 N	103° 35' 20.215 W	
300.0	0.27	249.68	300.0	1.0	-0.6	377,881.23	730,666.01	32° 2' 12.210 N	103° 35' 20.216 W	
325.0	0.18	221.64	325.0	1.0	-0.7	377,881.18	730,665.93	32° 2' 12.209 N	103° 35' 20.217 W	

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Vast State #21H
Project:	Lea County, NM	TVD Reference:	RKB @ 3284.7usft (Ensign #156)
Site:	Sec 17, T26S, R33E	MD Reference:	RKB @ 3284.7usft (Ensign #156)
Well:	Vast State #21H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
350.0	0.20	250.19	350.0	0.9	-0.7	377,881.14	730,665.86	32° 2' 12.209 N	103° 35' 20.218 W
375.0	0.31	243.70	375.0	0.9	-0.8	377,881.09	730,665.76	32° 2' 12.209 N	103° 35' 20.219 W
400.0	0.33	224.27	400.0	0.8	-0.9	377,881.01	730,665.65	32° 2' 12.208 N	103° 35' 20.221 W
425.0	0.29	223.23	425.0	0.7	-1.0	377,880.91	730,665.56	32° 2' 12.207 N	103° 35' 20.222 W
450.0	0.41	238.98	450.0	0.6	-1.2	377,880.82	730,665.44	32° 2' 12.206 N	103° 35' 20.223 W
475.0	0.37	229.49	475.0	0.5	-1.3	377,880.72	730,665.30	32° 2' 12.205 N	103° 35' 20.225 W
500.0	0.39	240.96	500.0	0.4	-1.4	377,880.63	730,665.16	32° 2' 12.204 N	103° 35' 20.226 W
525.0	0.52	237.13	525.0	0.3	-1.6	377,880.52	730,664.99	32° 2' 12.203 N	103° 35' 20.228 W
550.0	0.43	232.59	550.0	0.2	-1.8	377,880.41	730,664.82	32° 2' 12.202 N	103° 35' 20.230 W
575.0	0.47	244.28	575.0	0.1	-1.9	377,880.30	730,664.66	32° 2' 12.201 N	103° 35' 20.232 W
600.0	0.50	234.11	600.0	0.0	-2.1	377,880.20	730,664.48	32° 2' 12.200 N	103° 35' 20.234 W
625.0	0.44	234.41	625.0	-0.1	-2.3	377,880.08	730,664.31	32° 2' 12.199 N	103° 35' 20.236 W
650.0	0.52	235.33	650.0	-0.2	-2.5	377,879.96	730,664.14	32° 2' 12.198 N	103° 35' 20.238 W
675.0	0.47	232.59	675.0	-0.4	-2.6	377,879.83	730,663.96	32° 2' 12.196 N	103° 35' 20.240 W
700.0	0.52	237.84	700.0	-0.5	-2.8	377,879.71	730,663.79	32° 2' 12.195 N	103° 35' 20.242 W
725.0	0.47	221.56	725.0	-0.6	-3.0	377,879.57	730,663.62	32° 2' 12.194 N	103° 35' 20.244 W
750.0	0.47	238.94	750.0	-0.8	-3.1	377,879.44	730,663.47	32° 2' 12.192 N	103° 35' 20.246 W
775.0	0.52	233.61	775.0	-0.9	-3.3	377,879.32	730,663.29	32° 2' 12.191 N	103° 35' 20.248 W
800.0	0.46	236.42	800.0	-1.0	-3.5	377,879.20	730,663.11	32° 2' 12.190 N	103° 35' 20.250 W
825.0	0.57	233.88	825.0	-1.1	-3.7	377,879.07	730,662.93	32° 2' 12.189 N	103° 35' 20.252 W
850.0	0.46	240.58	850.0	-1.3	-3.9	377,878.95	730,662.74	32° 2' 12.188 N	103° 35' 20.255 W
875.0	0.57	237.93	875.0	-1.4	-4.0	377,878.83	730,662.55	32° 2' 12.186 N	103° 35' 20.257 W
900.0	0.52	234.99	900.0	-1.5	-4.2	377,878.70	730,662.35	32° 2' 12.185 N	103° 35' 20.259 W
925.0	0.64	230.51	925.0	-1.7	-4.4	377,878.55	730,662.15	32° 2' 12.184 N	103° 35' 20.262 W
950.0	0.57	228.48	950.0	-1.8	-4.6	377,878.37	730,661.95	32° 2' 12.182 N	103° 35' 20.264 W
975.0	0.67	233.60	975.0	-2.0	-4.9	377,878.20	730,661.74	32° 2' 12.180 N	103° 35' 20.266 W
1,000.0	0.59	230.11	1,000.0	-2.2	-5.1	377,878.04	730,661.52	32° 2' 12.179 N	103° 35' 20.269 W
1,025.0	0.67	233.29	1,025.0	-2.3	-5.3	377,877.87	730,661.30	32° 2' 12.177 N	103° 35' 20.271 W
1,050.0	0.59	229.86	1,050.0	-2.5	-5.5	377,877.70	730,661.09	32° 2' 12.175 N	103° 35' 20.274 W
1,075.0	0.68	233.52	1,075.0	-2.7	-5.7	377,877.52	730,660.87	32° 2' 12.174 N	103° 35' 20.276 W
1,100.0	0.62	229.22	1,100.0	-2.9	-5.9	377,877.35	730,660.65	32° 2' 12.172 N	103° 35' 20.279 W
1,125.0	0.74	232.91	1,125.0	-3.0	-6.2	377,877.16	730,660.42	32° 2' 12.170 N	103° 35' 20.282 W
1,150.0	0.61	228.19	1,150.0	-3.2	-6.4	377,876.98	730,660.19	32° 2' 12.168 N	103° 35' 20.284 W
1,175.0	0.70	232.02	1,175.0	-3.4	-6.6	377,876.79	730,659.97	32° 2' 12.166 N	103° 35' 20.287 W
1,200.0	0.60	227.40	1,200.0	-3.6	-6.8	377,876.61	730,659.75	32° 2' 12.165 N	103° 35' 20.290 W
1,225.0	0.72	228.17	1,225.0	-3.8	-7.1	377,876.42	730,659.54	32° 2' 12.163 N	103° 35' 20.292 W
1,250.0	0.59	230.55	1,250.0	-4.0	-7.3	377,876.23	730,659.32	32° 2' 12.161 N	103° 35' 20.295 W
1,275.0	0.71	228.05	1,275.0	-4.2	-7.5	377,876.05	730,659.11	32° 2' 12.159 N	103° 35' 20.297 W
1,300.0	0.61	228.92	1,300.0	-4.3	-7.7	377,875.85	730,658.89	32° 2' 12.157 N	103° 35' 20.300 W
1,325.0	0.69	222.03	1,325.0	-4.5	-7.9	377,875.65	730,658.69	32° 2' 12.155 N	103° 35' 20.302 W
1,350.0	0.57	234.76	1,350.0	-4.7	-8.1	377,875.47	730,658.49	32° 2' 12.154 N	103° 35' 20.304 W
1,375.0	0.62	227.90	1,374.9	-4.9	-8.3	377,875.31	730,658.29	32° 2' 12.152 N	103° 35' 20.307 W
1,400.0	0.62	235.99	1,399.9	-5.1	-8.5	377,875.14	730,658.08	32° 2' 12.150 N	103° 35' 20.309 W
1,425.0	0.60	223.88	1,424.9	-5.2	-8.7	377,874.97	730,657.87	32° 2' 12.149 N	103° 35' 20.312 W
1,450.0	0.63	242.83	1,449.9	-5.4	-8.9	377,874.82	730,657.66	32° 2' 12.147 N	103° 35' 20.314 W
1,475.0	0.57	241.07	1,474.9	-5.5	-9.2	377,874.69	730,657.43	32° 2' 12.146 N	103° 35' 20.317 W
1,500.0	0.64	243.21	1,499.9	-5.6	-9.4	377,874.57	730,657.19	32° 2' 12.145 N	103° 35' 20.319 W
1,525.0	0.51	237.05	1,524.9	-5.8	-9.6	377,874.45	730,656.98	32° 2' 12.143 N	103° 35' 20.322 W
1,550.0	0.63	244.95	1,549.9	-5.9	-9.8	377,874.33	730,656.76	32° 2' 12.142 N	103° 35' 20.325 W
1,575.0	0.56	262.08	1,574.9	-5.9	-10.1	377,874.25	730,656.51	32° 2' 12.142 N	103° 35' 20.327 W
1,600.0	0.57	247.71	1,599.9	-6.0	-10.3	377,874.19	730,656.28	32° 2' 12.141 N	103° 35' 20.330 W
1,625.0	0.57	261.59	1,624.9	-6.1	-10.6	377,874.12	730,656.04	32° 2' 12.140 N	103° 35' 20.333 W
1,650.0	0.53	257.71	1,649.9	-6.1	-10.8	377,874.08	730,655.80	32° 2' 12.140 N	103° 35' 20.336 W
1,675.0	0.63	268.19	1,674.9	-6.1	-11.0	377,874.05	730,655.55	32° 2' 12.140 N	103° 35' 20.339 W
1,700.0	0.49	262.41	1,699.9	-6.2	-11.3	377,874.03	730,655.31	32° 2' 12.139 N	103° 35' 20.341 W

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Vast State #21H
Project:	Lea County, NM	TVD Reference:	RKB @ 3284.7usft (Ensign #156)
Site:	Sec 17, T26S, R33E	MD Reference:	RKB @ 3284.7usft (Ensign #156)
Well:	Vast State #21H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,725.0	0.61	265.06	1,724.9	-6.2	-11.5	377,874.01	730,655.07	32° 2' 12.139 N	103° 35' 20.344 W
1,750.0	0.53	267.86	1,749.9	-6.2	-11.8	377,873.99	730,654.82	32° 2' 12.139 N	103° 35' 20.347 W
1,775.0	0.59	261.22	1,774.9	-6.2	-12.0	377,873.97	730,654.58	32° 2' 12.139 N	103° 35' 20.350 W
1,800.0	0.37	251.56	1,799.9	-6.3	-12.2	377,873.92	730,654.38	32° 2' 12.138 N	103° 35' 20.352 W
1,825.0	0.44	183.33	1,824.9	-6.4	-12.3	377,873.80	730,654.29	32° 2' 12.137 N	103° 35' 20.353 W
1,850.0	0.62	157.87	1,849.9	-6.6	-12.3	377,873.58	730,654.34	32° 2' 12.135 N	103° 35' 20.353 W
1,875.0	0.77	153.37	1,874.9	-6.9	-12.1	377,873.30	730,654.47	32° 2' 12.132 N	103° 35' 20.351 W
1,900.0	0.74	150.49	1,899.9	-7.2	-12.0	377,873.01	730,654.62	32° 2' 12.129 N	103° 35' 20.349 W
1,925.0	0.93	151.79	1,924.9	-7.5	-11.8	377,872.69	730,654.80	32° 2' 12.126 N	103° 35' 20.347 W
1,950.0	0.83	153.77	1,949.9	-7.8	-11.6	377,872.35	730,654.97	32° 2' 12.123 N	103° 35' 20.345 W
1,975.0	0.93	149.52	1,974.9	-8.2	-11.4	377,872.02	730,655.16	32° 2' 12.120 N	103° 35' 20.343 W
2,000.0	0.82	150.78	1,999.9	-8.5	-11.3	377,871.68	730,655.35	32° 2' 12.116 N	103° 35' 20.341 W
2,025.0	0.89	147.12	2,024.9	-8.8	-11.1	377,871.37	730,655.54	32° 2' 12.113 N	103° 35' 20.339 W
2,050.0	0.84	157.44	2,049.9	-9.2	-10.9	377,871.03	730,655.71	32° 2' 12.110 N	103° 35' 20.337 W
2,075.0	0.80	153.92	2,074.9	-9.5	-10.7	377,870.71	730,655.86	32° 2' 12.107 N	103° 35' 20.335 W
2,100.0	0.87	156.30	2,099.9	-9.8	-10.6	377,870.38	730,656.01	32° 2' 12.103 N	103° 35' 20.333 W
2,125.0	0.76	153.59	2,124.9	-10.1	-10.4	377,870.05	730,656.16	32° 2' 12.100 N	103° 35' 20.332 W
2,150.0	0.80	154.22	2,149.9	-10.4	-10.3	377,869.75	730,656.31	32° 2' 12.097 N	103° 35' 20.330 W
2,175.0	0.59	151.83	2,174.9	-10.7	-10.1	377,869.48	730,656.45	32° 2' 12.094 N	103° 35' 20.328 W
2,200.0	0.64	144.87	2,199.9	-10.9	-10.0	377,869.25	730,656.59	32° 2' 12.092 N	103° 35' 20.327 W
2,225.0	0.50	136.65	2,224.9	-11.1	-9.8	377,869.06	730,656.75	32° 2' 12.090 N	103° 35' 20.325 W
2,250.0	0.58	123.08	2,249.9	-11.3	-9.7	377,868.91	730,656.93	32° 2' 12.089 N	103° 35' 20.323 W
2,275.0	0.40	126.52	2,274.9	-11.4	-9.5	377,868.79	730,657.10	32° 2' 12.087 N	103° 35' 20.321 W
2,300.0	0.45	114.98	2,299.9	-11.5	-9.3	377,868.69	730,657.26	32° 2' 12.087 N	103° 35' 20.319 W
2,325.0	0.47	131.67	2,324.9	-11.6	-9.2	377,868.58	730,657.43	32° 2' 12.085 N	103° 35' 20.317 W
2,350.0	0.37	110.72	2,349.9	-11.7	-9.0	377,868.49	730,657.58	32° 2' 12.084 N	103° 35' 20.315 W
2,375.0	0.43	134.49	2,374.9	-11.8	-8.9	377,868.39	730,657.72	32° 2' 12.084 N	103° 35' 20.314 W
2,400.0	0.36	136.96	2,399.9	-11.9	-8.8	377,868.27	730,657.84	32° 2' 12.082 N	103° 35' 20.312 W
2,425.0	0.37	143.11	2,424.9	-12.0	-8.7	377,868.15	730,657.95	32° 2' 12.081 N	103° 35' 20.311 W
2,450.0	0.26	151.68	2,449.9	-12.2	-8.6	377,868.03	730,658.02	32° 2' 12.080 N	103° 35' 20.310 W
2,475.0	0.18	109.26	2,474.9	-12.2	-8.5	377,867.97	730,658.08	32° 2' 12.079 N	103° 35' 20.310 W
2,500.0	0.60	345.55	2,499.9	-12.1	-8.5	377,868.09	730,658.09	32° 2' 12.080 N	103° 35' 20.310 W
2,525.0	1.04	351.59	2,524.9	-11.8	-8.6	377,868.44	730,658.02	32° 2' 12.084 N	103° 35' 20.310 W
2,550.0	1.00	348.75	2,549.9	-11.3	-8.6	377,868.87	730,657.95	32° 2' 12.088 N	103° 35' 20.311 W
2,575.0	1.17	350.08	2,574.9	-10.9	-8.7	377,869.34	730,657.86	32° 2' 12.093 N	103° 35' 20.312 W
2,600.0	1.11	347.38	2,599.9	-10.4	-8.8	377,869.83	730,657.76	32° 2' 12.098 N	103° 35' 20.313 W
2,625.0	1.17	347.87	2,624.9	-9.9	-8.9	377,870.31	730,657.66	32° 2' 12.103 N	103° 35' 20.314 W
2,650.0	1.06	349.93	2,649.9	-9.4	-9.0	377,870.79	730,657.56	32° 2' 12.107 N	103° 35' 20.315 W
2,675.0	1.14	346.36	2,674.9	-8.9	-9.1	377,871.26	730,657.46	32° 2' 12.112 N	103° 35' 20.317 W
2,700.0	1.13	350.34	2,699.8	-8.5	-9.2	377,871.74	730,657.36	32° 2' 12.117 N	103° 35' 20.318 W
2,725.0	1.06	343.28	2,724.8	-8.0	-9.3	377,872.21	730,657.26	32° 2' 12.121 N	103° 35' 20.319 W
2,750.0	0.95	348.32	2,749.8	-7.6	-9.4	377,872.63	730,657.15	32° 2' 12.126 N	103° 35' 20.320 W
2,775.0	0.91	340.55	2,774.8	-7.2	-9.6	377,873.02	730,657.04	32° 2' 12.129 N	103° 35' 20.321 W
2,800.0	0.93	346.62	2,799.8	-6.8	-9.7	377,873.41	730,656.93	32° 2' 12.133 N	103° 35' 20.323 W
2,825.0	0.84	345.12	2,824.8	-6.4	-9.8	377,873.78	730,656.83	32° 2' 12.137 N	103° 35' 20.324 W
2,850.0	0.84	341.73	2,849.8	-6.1	-9.9	377,874.13	730,656.73	32° 2' 12.140 N	103° 35' 20.325 W
2,875.0	0.73	344.89	2,874.8	-5.7	-10.0	377,874.46	730,656.63	32° 2' 12.144 N	103° 35' 20.326 W
2,900.0	0.75	331.99	2,899.8	-5.4	-10.1	377,874.76	730,656.51	32° 2' 12.147 N	103° 35' 20.327 W
2,925.0	0.70	337.92	2,924.8	-5.2	-10.2	377,875.05	730,656.38	32° 2' 12.149 N	103° 35' 20.329 W
2,950.0	0.62	320.95	2,949.8	-4.9	-10.4	377,875.29	730,656.23	32° 2' 12.152 N	103° 35' 20.331 W
2,975.0	0.63	330.51	2,974.8	-4.7	-10.5	377,875.52	730,656.08	32° 2' 12.154 N	103° 35' 20.332 W
3,000.0	0.56	322.50	2,999.8	-4.5	-10.7	377,875.73	730,655.94	32° 2' 12.156 N	103° 35' 20.334 W
3,025.0	0.61	327.34	3,024.8	-4.3	-10.8	377,875.94	730,655.79	32° 2' 12.158 N	103° 35' 20.336 W
3,050.0	0.50	329.01	3,049.8	-4.1	-10.9	377,876.15	730,655.67	32° 2' 12.160 N	103° 35' 20.337 W
3,075.0	0.55	322.80	3,074.8	-3.9	-11.1	377,876.34	730,655.54	32° 2' 12.162 N	103° 35' 20.339 W

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Vast State #21H
Project:	Lea County, NM	TVD Reference:	RKB @ 3284.7usft (Ensign #156)
Site:	Sec 17, T26S, R33E	MD Reference:	RKB @ 3284.7usft (Ensign #156)
Well:	Vast State #21H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
3,100.0	0.59	332.40	3,099.8	-3.7	-11.2	377,876.55	730,655.40	32° 2' 12.164 N	103° 35' 20.340 W	
3,125.0	0.55	324.28	3,124.8	-3.4	-11.3	377,876.76	730,655.27	32° 2' 12.166 N	103° 35' 20.342 W	
3,150.0	0.60	331.64	3,149.8	-3.2	-11.5	377,876.97	730,655.14	32° 2' 12.169 N	103° 35' 20.343 W	
3,175.0	0.50	322.08	3,174.8	-3.0	-11.6	377,877.17	730,655.01	32° 2' 12.171 N	103° 35' 20.345 W	
3,200.0	0.57	325.17	3,199.8	-2.8	-11.7	377,877.36	730,654.88	32° 2' 12.172 N	103° 35' 20.346 W	
3,225.0	0.45	326.27	3,224.8	-2.7	-11.8	377,877.54	730,654.75	32° 2' 12.174 N	103° 35' 20.348 W	
3,250.0	0.49	301.59	3,249.8	-2.5	-12.0	377,877.68	730,654.60	32° 2' 12.176 N	103° 35' 20.349 W	
3,275.0	0.44	307.12	3,274.8	-2.4	-12.2	377,877.80	730,654.44	32° 2' 12.177 N	103° 35' 20.351 W	
3,300.0	0.44	296.84	3,299.8	-2.3	-12.3	377,877.90	730,654.27	32° 2' 12.178 N	103° 35' 20.353 W	
3,325.0	0.51	305.44	3,324.8	-2.2	-12.5	377,878.00	730,654.10	32° 2' 12.179 N	103° 35' 20.355 W	
3,350.0	0.34	307.45	3,349.8	-2.1	-12.6	377,878.11	730,653.95	32° 2' 12.180 N	103° 35' 20.357 W	
3,375.0	0.32	318.81	3,374.8	-2.0	-12.8	377,878.21	730,653.84	32° 2' 12.181 N	103° 35' 20.358 W	
3,400.0	0.30	31.56	3,399.8	-1.9	-12.8	377,878.32	730,653.83	32° 2' 12.182 N	103° 35' 20.358 W	
3,425.0	0.30	46.93	3,424.8	-1.8	-12.7	377,878.42	730,653.91	32° 2' 12.183 N	103° 35' 20.357 W	
3,450.0	0.54	63.59	3,449.8	-1.7	-12.5	377,878.52	730,654.07	32° 2' 12.184 N	103° 35' 20.355 W	
3,475.0	0.73	75.80	3,474.8	-1.6	-12.3	377,878.61	730,654.33	32° 2' 12.185 N	103° 35' 20.352 W	
3,500.0	0.94	74.37	3,499.8	-1.5	-11.9	377,878.70	730,654.68	32° 2' 12.186 N	103° 35' 20.348 W	
3,525.0	1.43	76.36	3,524.8	-1.4	-11.4	377,878.83	730,655.18	32° 2' 12.187 N	103° 35' 20.343 W	
3,550.0	1.47	76.02	3,549.8	-1.2	-10.8	377,878.98	730,655.79	32° 2' 12.188 N	103° 35' 20.335 W	
3,575.0	1.75	77.34	3,574.8	-1.1	-10.1	377,879.14	730,656.48	32° 2' 12.190 N	103° 35' 20.327 W	
3,600.0	1.94	79.86	3,599.8	-0.9	-9.3	377,879.30	730,657.27	32° 2' 12.192 N	103° 35' 20.318 W	
3,625.0	2.09	77.82	3,624.7	-0.7	-8.5	377,879.47	730,658.13	32° 2' 12.193 N	103° 35' 20.308 W	
3,650.0	2.18	78.80	3,649.7	-0.5	-7.6	377,879.66	730,659.04	32° 2' 12.195 N	103° 35' 20.298 W	
3,675.0	2.11	77.80	3,674.7	-0.3	-6.6	377,879.85	730,659.96	32° 2' 12.197 N	103° 35' 20.287 W	
3,700.0	2.12	77.27	3,699.7	-0.1	-5.7	377,880.05	730,660.86	32° 2' 12.199 N	103° 35' 20.276 W	
3,725.0	1.77	81.55	3,724.7	0.0	-4.9	377,880.21	730,661.69	32° 2' 12.200 N	103° 35' 20.267 W	
3,750.0	1.41	81.96	3,749.7	0.1	-4.2	377,880.31	730,662.38	32° 2' 12.201 N	103° 35' 20.259 W	
3,775.0	1.21	87.85	3,774.7	0.2	-3.7	377,880.36	730,662.95	32° 2' 12.202 N	103° 35' 20.252 W	
3,800.0	1.09	82.90	3,799.7	0.2	-3.2	377,880.40	730,663.45	32° 2' 12.202 N	103° 35' 20.246 W	
3,825.0	1.11	89.20	3,824.7	0.2	-2.7	377,880.43	730,663.92	32° 2' 12.202 N	103° 35' 20.241 W	
3,850.0	0.99	91.41	3,849.6	0.2	-2.2	377,880.43	730,664.38	32° 2' 12.202 N	103° 35' 20.235 W	
3,875.0	0.91	89.86	3,874.6	0.2	-1.8	377,880.43	730,664.80	32° 2' 12.202 N	103° 35' 20.231 W	
3,900.0	0.64	134.93	3,899.6	0.1	-1.5	377,880.33	730,665.09	32° 2' 12.201 N	103° 35' 20.227 W	
3,925.0	0.74	190.87	3,924.6	-0.1	-1.4	377,880.07	730,665.16	32° 2' 12.199 N	103° 35' 20.226 W	
3,950.0	0.94	194.05	3,949.6	-0.5	-1.5	377,879.71	730,665.08	32° 2' 12.195 N	103° 35' 20.227 W	
3,975.0	1.03	198.69	3,974.6	-0.9	-1.6	377,879.30	730,664.96	32° 2' 12.191 N	103° 35' 20.229 W	
4,000.0	0.91	198.62	3,999.6	-1.3	-1.8	377,878.90	730,664.82	32° 2' 12.187 N	103° 35' 20.230 W	
4,025.0	0.98	194.68	4,024.6	-1.7	-1.9	377,878.51	730,664.71	32° 2' 12.183 N	103° 35' 20.232 W	
4,050.0	0.92	198.41	4,049.6	-2.1	-2.0	377,878.11	730,664.59	32° 2' 12.179 N	103° 35' 20.233 W	
4,075.0	0.80	190.31	4,074.6	-2.5	-2.1	377,877.75	730,664.49	32° 2' 12.176 N	103° 35' 20.234 W	
4,100.0	0.80	179.80	4,099.6	-2.8	-2.1	377,877.40	730,664.46	32° 2' 12.172 N	103° 35' 20.235 W	
4,125.0	0.75	163.78	4,124.6	-3.1	-2.1	377,877.07	730,664.51	32° 2' 12.169 N	103° 35' 20.234 W	
4,150.0	0.94	152.55	4,149.6	-3.5	-1.9	377,876.73	730,664.65	32° 2' 12.166 N	103° 35' 20.233 W	
4,175.0	1.05	143.99	4,174.6	-3.8	-1.7	377,876.36	730,664.88	32° 2' 12.162 N	103° 35' 20.230 W	
4,200.0	1.34	132.94	4,199.6	-4.2	-1.4	377,875.98	730,665.23	32° 2' 12.158 N	103° 35' 20.226 W	
4,225.0	1.63	133.10	4,224.6	-4.7	-0.9	377,875.54	730,665.70	32° 2' 12.154 N	103° 35' 20.221 W	
4,250.0	1.68	131.57	4,249.6	-5.1	-0.4	377,875.05	730,666.24	32° 2' 12.149 N	103° 35' 20.214 W	
4,275.0	1.86	128.95	4,274.6	-5.6	0.2	377,874.55	730,666.83	32° 2' 12.144 N	103° 35' 20.208 W	
4,300.0	1.99	130.10	4,299.6	-6.2	0.9	377,874.02	730,667.47	32° 2' 12.139 N	103° 35' 20.200 W	
4,325.0	1.92	127.17	4,324.5	-6.7	1.5	377,873.49	730,668.14	32° 2' 12.133 N	103° 35' 20.192 W	
4,350.0	1.80	125.42	4,349.5	-7.2	2.2	377,873.00	730,668.79	32° 2' 12.128 N	103° 35' 20.185 W	
4,375.0	1.24	126.53	4,374.5	-7.6	2.7	377,872.62	730,669.33	32° 2' 12.125 N	103° 35' 20.179 W	
4,400.0	1.01	122.06	4,399.5	-7.9	3.1	377,872.34	730,669.73	32° 2' 12.122 N	103° 35' 20.174 W	
4,425.0	0.91	115.32	4,424.5	-8.1	3.5	377,872.14	730,670.10	32° 2' 12.120 N	103° 35' 20.170 W	
4,450.0	0.60	111.70	4,449.5	-8.2	3.8	377,872.00	730,670.40	32° 2' 12.118 N	103° 35' 20.166 W	

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Vast State #21H
Project:	Lea County, NM	TVD Reference:	RKB @ 3284.7usft (Ensign #156)
Site:	Sec 17, T26S, R33E	MD Reference:	RKB @ 3284.7usft (Ensign #156)
Well:	Vast State #21H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,475.0	0.28	60.99	4,474.5	-8.2	4.0	377,871.98	730,670.58	32° 2' 12.118 N	103° 35' 20.164 W
4,500.0	0.44	351.51	4,499.5	-8.1	4.0	377,872.11	730,670.62	32° 2' 12.119 N	103° 35' 20.164 W
4,525.0	0.47	334.55	4,524.5	-7.9	4.0	377,872.30	730,670.56	32° 2' 12.121 N	103° 35' 20.164 W
4,550.0	0.54	334.92	4,549.5	-7.7	3.9	377,872.50	730,670.46	32° 2' 12.123 N	103° 35' 20.165 W
4,575.0	0.45	340.37	4,574.5	-7.5	3.8	377,872.69	730,670.38	32° 2' 12.125 N	103° 35' 20.166 W
4,600.0	0.43	335.07	4,599.5	-7.3	3.7	377,872.87	730,670.31	32° 2' 12.127 N	103° 35' 20.167 W
4,625.0	0.52	335.81	4,624.5	-7.1	3.6	377,873.06	730,670.22	32° 2' 12.129 N	103° 35' 20.168 W
4,650.0	0.55	334.46	4,649.5	-6.9	3.5	377,873.27	730,670.12	32° 2' 12.131 N	103° 35' 20.169 W
4,675.0	0.64	325.16	4,674.5	-6.7	3.4	377,873.50	730,669.99	32° 2' 12.133 N	103° 35' 20.171 W
4,700.0	0.72	327.47	4,699.5	-6.5	3.2	377,873.74	730,669.83	32° 2' 12.136 N	103° 35' 20.173 W
4,725.0	0.64	329.68	4,724.5	-6.2	3.1	377,874.00	730,669.67	32° 2' 12.138 N	103° 35' 20.175 W
4,750.0	0.75	318.02	4,749.5	-6.0	2.9	377,874.24	730,669.49	32° 2' 12.141 N	103° 35' 20.177 W
4,775.0	0.90	316.20	4,774.5	-5.7	2.7	377,874.50	730,669.25	32° 2' 12.143 N	103° 35' 20.179 W
4,800.0	0.85	320.48	4,799.5	-5.4	2.4	377,874.79	730,668.99	32° 2' 12.146 N	103° 35' 20.182 W
4,825.0	0.84	314.63	4,824.5	-5.1	2.1	377,875.06	730,668.75	32° 2' 12.149 N	103° 35' 20.185 W
4,850.0	0.92	314.24	4,849.5	-4.9	1.9	377,875.33	730,668.47	32° 2' 12.151 N	103° 35' 20.188 W
4,875.0	0.87	322.62	4,874.5	-4.6	1.6	377,875.62	730,668.21	32° 2' 12.154 N	103° 35' 20.191 W
4,900.0	0.80	319.79	4,899.5	-4.3	1.4	377,875.90	730,667.98	32° 2' 12.157 N	103° 35' 20.194 W
4,925.0	0.69	322.03	4,924.5	-4.0	1.2	377,876.15	730,667.78	32° 2' 12.160 N	103° 35' 20.196 W
4,950.0	0.38	9.87	4,949.5	-3.8	1.1	377,876.35	730,667.70	32° 2' 12.162 N	103° 35' 20.197 W
4,975.0	0.44	42.26	4,974.5	-3.7	1.2	377,876.51	730,667.78	32° 2' 12.163 N	103° 35' 20.196 W
5,000.0	0.45	67.63	4,999.5	-3.6	1.3	377,876.61	730,667.93	32° 2' 12.164 N	103° 35' 20.195 W
5,025.0	0.31	75.09	5,024.5	-3.5	1.5	377,876.67	730,668.09	32° 2' 12.165 N	103° 35' 20.193 W
5,050.0	0.46	71.99	5,049.5	-3.5	1.7	377,876.72	730,668.25	32° 2' 12.165 N	103° 35' 20.191 W
5,075.0	0.59	74.95	5,074.5	-3.4	1.9	377,876.78	730,668.47	32° 2' 12.166 N	103° 35' 20.188 W
5,100.0	0.55	71.46	5,099.5	-3.3	2.1	377,876.85	730,668.71	32° 2' 12.166 N	103° 35' 20.185 W
5,125.0	0.57	90.06	5,124.5	-3.3	2.4	377,876.89	730,668.95	32° 2' 12.167 N	103° 35' 20.183 W
5,150.0	0.69	123.65	5,149.5	-3.4	2.6	377,876.81	730,669.20	32° 2' 12.166 N	103° 35' 20.180 W
5,175.0	0.75	137.25	5,174.5	-3.6	2.8	377,876.60	730,669.43	32° 2' 12.164 N	103° 35' 20.177 W
5,200.0	0.69	134.43	5,199.5	-3.8	3.1	377,876.38	730,669.65	32° 2' 12.162 N	103° 35' 20.175 W
5,225.0	0.78	129.25	5,224.5	-4.0	3.3	377,876.17	730,669.89	32° 2' 12.160 N	103° 35' 20.172 W
5,250.0	0.83	131.86	5,249.5	-4.3	3.6	377,875.94	730,670.16	32° 2' 12.157 N	103° 35' 20.169 W
5,275.0	0.77	139.33	5,274.5	-4.5	3.8	377,875.69	730,670.40	32° 2' 12.155 N	103° 35' 20.166 W
5,300.0	0.77	124.51	5,299.5	-4.7	4.1	377,875.47	730,670.65	32° 2' 12.153 N	103° 35' 20.163 W
5,325.0	0.78	125.64	5,324.5	-4.9	4.3	377,875.27	730,670.93	32° 2' 12.151 N	103° 35' 20.160 W
5,350.0	0.80	133.56	5,349.5	-5.1	4.6	377,875.05	730,671.19	32° 2' 12.149 N	103° 35' 20.157 W
5,375.0	0.69	140.85	5,374.5	-5.4	4.8	377,874.82	730,671.41	32° 2' 12.146 N	103° 35' 20.154 W
5,400.0	0.47	149.40	5,399.5	-5.6	5.0	377,874.61	730,671.56	32° 2' 12.144 N	103° 35' 20.153 W
5,425.0	0.51	261.88	5,424.5	-5.7	4.9	377,874.51	730,671.50	32° 2' 12.143 N	103° 35' 20.153 W
5,450.0	0.72	270.43	5,449.4	-5.7	4.6	377,874.49	730,671.24	32° 2' 12.143 N	103° 35' 20.156 W
5,475.0	0.79	269.91	5,474.4	-5.7	4.3	377,874.49	730,670.91	32° 2' 12.143 N	103° 35' 20.160 W
5,500.0	0.76	276.73	5,499.4	-5.7	4.0	377,874.51	730,670.57	32° 2' 12.143 N	103° 35' 20.164 W
5,525.0	0.72	272.34	5,524.4	-5.7	3.7	377,874.54	730,670.25	32° 2' 12.143 N	103° 35' 20.168 W
5,550.0	0.79	272.74	5,549.4	-5.6	3.3	377,874.55	730,669.92	32° 2' 12.144 N	103° 35' 20.172 W
5,575.0	0.76	275.06	5,574.4	-5.6	3.0	377,874.58	730,669.58	32° 2' 12.144 N	103° 35' 20.176 W
5,600.0	0.75	266.53	5,599.4	-5.6	2.7	377,874.58	730,669.25	32° 2' 12.144 N	103° 35' 20.179 W
5,625.0	0.79	259.43	5,624.4	-5.7	2.3	377,874.54	730,668.92	32° 2' 12.144 N	103° 35' 20.183 W
5,650.0	0.84	262.19	5,649.4	-5.7	2.0	377,874.48	730,668.57	32° 2' 12.143 N	103° 35' 20.187 W
5,675.0	0.81	270.03	5,674.4	-5.7	1.6	377,874.46	730,668.21	32° 2' 12.143 N	103° 35' 20.191 W
5,700.0	0.75	268.36	5,699.4	-5.7	1.3	377,874.45	730,667.87	32° 2' 12.143 N	103° 35' 20.195 W
5,725.0	0.77	264.54	5,724.4	-5.8	0.9	377,874.43	730,667.54	32° 2' 12.143 N	103° 35' 20.199 W
5,750.0	0.79	264.60	5,749.4	-5.8	0.6	377,874.40	730,667.20	32° 2' 12.142 N	103° 35' 20.203 W
5,775.0	0.76	269.31	5,774.4	-5.8	0.3	377,874.38	730,666.86	32° 2' 12.142 N	103° 35' 20.207 W
5,800.0	0.77	264.70	5,799.4	-5.8	-0.1	377,874.36	730,666.53	32° 2' 12.142 N	103° 35' 20.211 W
5,825.0	0.80	265.01	5,824.4	-5.9	-0.4	377,874.33	730,666.19	32° 2' 12.142 N	103° 35' 20.215 W

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Vast State #21H
Project:	Lea County, NM	TVD Reference:	RKB @ 3284.7usft (Ensign #156)
Site:	Sec 17, T26S, R33E	MD Reference:	RKB @ 3284.7usft (Ensign #156)
Well:	Vast State #21H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,850.0	0.75	258.58	5,849.4	-5.9	-0.7	377,874.29	730,665.85	32° 2' 12.141 N	103° 35' 20.219 W
5,875.0	0.65	253.41	5,874.4	-6.0	-1.0	377,874.21	730,665.56	32° 2' 12.141 N	103° 35' 20.222 W
5,900.0	0.67	246.36	5,899.4	-6.1	-1.3	377,874.11	730,665.29	32° 2' 12.140 N	103° 35' 20.225 W
5,925.0	0.80	254.24	5,924.4	-6.2	-1.6	377,874.01	730,664.99	32° 2' 12.139 N	103° 35' 20.229 W
5,950.0	0.77	255.24	5,949.4	-6.3	-1.9	377,873.92	730,664.66	32° 2' 12.138 N	103° 35' 20.233 W
5,975.0	0.69	245.61	5,974.4	-6.4	-2.2	377,873.81	730,664.36	32° 2' 12.137 N	103° 35' 20.236 W
6,000.0	0.66	246.39	5,999.4	-6.5	-2.5	377,873.69	730,664.09	32° 2' 12.136 N	103° 35' 20.239 W
6,025.0	0.76	246.76	6,024.4	-6.6	-2.8	377,873.57	730,663.80	32° 2' 12.134 N	103° 35' 20.243 W
6,050.0	0.64	256.62	6,049.4	-6.7	-3.1	377,873.47	730,663.52	32° 2' 12.133 N	103° 35' 20.246 W
6,075.0	0.56	248.99	6,074.4	-6.8	-3.3	377,873.40	730,663.27	32° 2' 12.133 N	103° 35' 20.249 W
6,100.0	0.68	249.15	6,099.4	-6.9	-3.6	377,873.30	730,663.01	32° 2' 12.132 N	103° 35' 20.252 W
6,125.0	0.70	250.98	6,124.4	-7.0	-3.9	377,873.20	730,662.73	32° 2' 12.131 N	103° 35' 20.255 W
6,150.0	0.64	257.00	6,149.4	-7.1	-4.1	377,873.12	730,662.45	32° 2' 12.130 N	103° 35' 20.259 W
6,175.0	0.64	251.36	6,174.4	-7.2	-4.4	377,873.04	730,662.18	32° 2' 12.129 N	103° 35' 20.262 W
6,200.0	0.71	248.99	6,199.4	-7.3	-4.7	377,872.94	730,661.90	32° 2' 12.128 N	103° 35' 20.265 W
6,225.0	0.63	256.31	6,224.4	-7.3	-5.0	377,872.85	730,661.63	32° 2' 12.127 N	103° 35' 20.268 W
6,250.0	0.59	255.59	6,249.4	-7.4	-5.2	377,872.79	730,661.37	32° 2' 12.127 N	103° 35' 20.271 W
6,275.0	0.60	250.05	6,274.4	-7.5	-5.5	377,872.71	730,661.12	32° 2' 12.126 N	103° 35' 20.274 W
6,300.0	0.66	253.66	6,299.4	-7.6	-5.7	377,872.63	730,660.86	32° 2' 12.125 N	103° 35' 20.277 W
6,325.0	0.71	258.01	6,324.4	-7.6	-6.0	377,872.55	730,660.57	32° 2' 12.124 N	103° 35' 20.280 W
6,350.0	0.56	258.94	6,349.4	-7.7	-6.3	377,872.50	730,660.30	32° 2' 12.124 N	103° 35' 20.284 W
6,375.0	0.66	249.85	6,374.4	-7.8	-6.6	377,872.42	730,660.04	32° 2' 12.123 N	103° 35' 20.287 W
6,400.0	0.73	251.40	6,399.4	-7.9	-6.8	377,872.32	730,659.76	32° 2' 12.122 N	103° 35' 20.290 W
6,425.0	0.70	257.23	6,424.4	-8.0	-7.1	377,872.24	730,659.46	32° 2' 12.121 N	103° 35' 20.293 W
6,450.0	0.59	253.39	6,449.4	-8.0	-7.4	377,872.17	730,659.18	32° 2' 12.121 N	103° 35' 20.297 W
6,475.0	0.66	252.45	6,474.4	-8.1	-7.7	377,872.09	730,658.92	32° 2' 12.120 N	103° 35' 20.300 W
6,500.0	0.63	252.09	6,499.4	-8.2	-7.9	377,872.00	730,658.66	32° 2' 12.119 N	103° 35' 20.303 W
6,525.0	0.60	261.68	6,524.4	-8.3	-8.2	377,871.94	730,658.40	32° 2' 12.119 N	103° 35' 20.306 W
6,550.0	0.58	259.83	6,549.4	-8.3	-8.5	377,871.90	730,658.14	32° 2' 12.118 N	103° 35' 20.309 W
6,575.0	0.71	250.42	6,574.4	-8.4	-8.7	377,871.83	730,657.87	32° 2' 12.117 N	103° 35' 20.312 W
6,600.0	0.62	258.55	6,599.4	-8.5	-9.0	377,871.75	730,657.59	32° 2' 12.117 N	103° 35' 20.315 W
6,625.0	0.57	267.21	6,624.4	-8.5	-9.3	377,871.71	730,657.34	32° 2' 12.116 N	103° 35' 20.318 W
6,650.0	0.52	257.17	6,649.4	-8.5	-9.5	377,871.68	730,657.10	32° 2' 12.116 N	103° 35' 20.321 W
6,675.0	0.54	250.98	6,674.4	-8.6	-9.7	377,871.62	730,656.88	32° 2' 12.116 N	103° 35' 20.323 W
6,700.0	0.61	255.76	6,699.4	-8.6	-10.0	377,871.55	730,656.64	32° 2' 12.115 N	103° 35' 20.326 W
6,725.0	0.56	263.85	6,724.4	-8.7	-10.2	377,871.50	730,656.39	32° 2' 12.114 N	103° 35' 20.329 W
6,750.0	0.46	252.85	6,749.4	-8.7	-10.4	377,871.46	730,656.17	32° 2' 12.114 N	103° 35' 20.332 W
6,775.0	0.40	242.71	6,774.4	-8.8	-10.6	377,871.39	730,656.00	32° 2' 12.113 N	103° 35' 20.334 W
6,800.0	0.46	255.16	6,799.4	-8.9	-10.8	377,871.32	730,655.82	32° 2' 12.113 N	103° 35' 20.336 W
6,825.0	0.42	257.79	6,824.4	-8.9	-11.0	377,871.28	730,655.64	32° 2' 12.112 N	103° 35' 20.338 W
6,850.0	0.38	248.71	6,849.4	-9.0	-11.1	377,871.23	730,655.47	32° 2' 12.112 N	103° 35' 20.340 W
6,875.0	0.40	235.13	6,874.4	-9.0	-11.3	377,871.15	730,655.32	32° 2' 12.111 N	103° 35' 20.341 W
6,900.0	0.42	246.65	6,899.4	-9.1	-11.4	377,871.06	730,655.16	32° 2' 12.110 N	103° 35' 20.343 W
6,925.0	0.33	255.00	6,924.4	-9.2	-11.6	377,871.01	730,655.01	32° 2' 12.110 N	103° 35' 20.345 W
6,950.0	0.31	250.73	6,949.4	-9.2	-11.7	377,870.97	730,654.88	32° 2' 12.109 N	103° 35' 20.347 W
6,975.0	0.35	249.87	6,974.4	-9.3	-11.9	377,870.92	730,654.74	32° 2' 12.109 N	103° 35' 20.348 W
7,000.0	0.39	265.05	6,999.3	-9.3	-12.0	377,870.89	730,654.59	32° 2' 12.108 N	103° 35' 20.350 W
7,025.0	0.32	274.47	7,024.3	-9.3	-12.2	377,870.88	730,654.43	32° 2' 12.108 N	103° 35' 20.352 W
7,050.0	0.25	267.50	7,049.3	-9.3	-12.3	377,870.89	730,654.31	32° 2' 12.108 N	103° 35' 20.353 W
7,075.0	0.34	250.70	7,074.3	-9.3	-12.4	377,870.86	730,654.18	32° 2' 12.108 N	103° 35' 20.355 W
7,100.0	0.36	267.17	7,099.3	-9.4	-12.6	377,870.83	730,654.03	32° 2' 12.108 N	103° 35' 20.356 W
7,125.0	0.25	271.67	7,124.3	-9.4	-12.7	377,870.83	730,653.90	32° 2' 12.108 N	103° 35' 20.358 W
7,150.0	0.22	256.37	7,149.3	-9.4	-12.8	377,870.82	730,653.80	32° 2' 12.108 N	103° 35' 20.359 W
7,175.0	0.26	249.03	7,174.3	-9.4	-12.9	377,870.79	730,653.70	32° 2' 12.107 N	103° 35' 20.360 W
7,200.0	0.29	265.77	7,199.3	-9.4	-13.0	377,870.76	730,653.58	32° 2' 12.107 N	103° 35' 20.362 W

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Vast State #21H
Project:	Lea County, NM	TVD Reference:	RKB @ 3284.7usft (Ensign #156)
Site:	Sec 17, T26S, R33E	MD Reference:	RKB @ 3284.7usft (Ensign #156)
Well:	Vast State #21H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
7,225.0	0.11	298.09	7,224.3	-9.4	-13.1	377,870.77	730,653.50	32° 2' 12.107 N	103° 35' 20.363 W
7,250.0	0.05	241.00	7,249.3	-9.4	-13.1	377,870.78	730,653.47	32° 2' 12.107 N	103° 35' 20.363 W
7,275.0	0.16	241.75	7,274.3	-9.4	-13.2	377,870.75	730,653.43	32° 2' 12.107 N	103° 35' 20.363 W
7,300.0	0.19	253.50	7,299.3	-9.5	-13.2	377,870.73	730,653.36	32° 2' 12.107 N	103° 35' 20.364 W
7,325.0	0.11	272.74	7,324.3	-9.5	-13.3	377,870.72	730,653.29	32° 2' 12.107 N	103° 35' 20.365 W
7,350.0	0.07	219.28	7,349.3	-9.5	-13.3	377,870.70	730,653.26	32° 2' 12.107 N	103° 35' 20.365 W
7,375.0	0.16	212.26	7,374.3	-9.5	-13.4	377,870.66	730,653.23	32° 2' 12.106 N	103° 35' 20.366 W
7,400.0	0.17	207.75	7,399.3	-9.6	-13.4	377,870.60	730,653.20	32° 2' 12.106 N	103° 35' 20.366 W
7,425.0	0.13	178.67	7,424.3	-9.7	-13.4	377,870.54	730,653.18	32° 2' 12.105 N	103° 35' 20.366 W
7,450.0	0.22	150.76	7,449.3	-9.7	-13.4	377,870.47	730,653.20	32° 2' 12.104 N	103° 35' 20.366 W
7,475.0	0.31	151.06	7,474.3	-9.8	-13.3	377,870.37	730,653.26	32° 2' 12.103 N	103° 35' 20.365 W
7,500.0	0.30	155.86	7,499.3	-9.9	-13.3	377,870.25	730,653.32	32° 2' 12.102 N	103° 35' 20.365 W
7,525.0	0.21	133.25	7,524.3	-10.0	-13.2	377,870.16	730,653.38	32° 2' 12.101 N	103° 35' 20.364 W
7,550.0	0.23	107.29	7,549.3	-10.1	-13.1	377,870.11	730,653.46	32° 2' 12.101 N	103° 35' 20.363 W
7,575.0	0.26	116.63	7,574.3	-10.1	-13.0	377,870.07	730,653.56	32° 2' 12.100 N	103° 35' 20.362 W
7,600.0	0.27	122.51	7,599.3	-10.2	-12.9	377,870.01	730,653.66	32° 2' 12.100 N	103° 35' 20.361 W
7,625.0	0.23	141.98	7,624.3	-10.3	-12.9	377,869.94	730,653.74	32° 2' 12.099 N	103° 35' 20.360 W
7,650.0	0.20	123.30	7,649.3	-10.3	-12.8	377,869.88	730,653.81	32° 2' 12.098 N	103° 35' 20.359 W
7,675.0	0.27	120.65	7,674.3	-10.4	-12.7	377,869.83	730,653.90	32° 2' 12.098 N	103° 35' 20.358 W
7,700.0	0.38	129.53	7,699.3	-10.5	-12.6	377,869.74	730,654.01	32° 2' 12.097 N	103° 35' 20.357 W
7,725.0	0.44	141.18	7,724.3	-10.6	-12.5	377,869.62	730,654.13	32° 2' 12.096 N	103° 35' 20.355 W
7,750.0	0.43	142.01	7,749.3	-10.7	-12.3	377,869.47	730,654.25	32° 2' 12.094 N	103° 35' 20.354 W
7,775.0	0.46	144.58	7,774.3	-10.9	-12.2	377,869.31	730,654.37	32° 2' 12.093 N	103° 35' 20.353 W
7,800.0	0.49	135.73	7,799.3	-11.0	-12.1	377,869.15	730,654.50	32° 2' 12.091 N	103° 35' 20.351 W
7,825.0	0.59	131.45	7,824.3	-11.2	-11.9	377,868.99	730,654.67	32° 2' 12.090 N	103° 35' 20.349 W
7,850.0	0.67	135.38	7,849.3	-11.4	-11.7	377,868.80	730,654.87	32° 2' 12.088 N	103° 35' 20.347 W
7,875.0	0.64	140.82	7,874.3	-11.6	-11.5	377,868.59	730,655.06	32° 2' 12.086 N	103° 35' 20.345 W
7,900.0	0.62	139.08	7,899.3	-11.8	-11.4	377,868.38	730,655.24	32° 2' 12.084 N	103° 35' 20.343 W
7,925.0	0.61	136.07	7,924.3	-12.0	-11.2	377,868.18	730,655.42	32° 2' 12.082 N	103° 35' 20.341 W
7,950.0	0.70	134.14	7,949.3	-12.2	-11.0	377,867.98	730,655.62	32° 2' 12.080 N	103° 35' 20.338 W
7,975.0	0.72	145.77	7,974.3	-12.5	-10.8	377,867.74	730,655.82	32° 2' 12.077 N	103° 35' 20.336 W
8,000.0	0.78	154.51	7,999.3	-12.7	-10.6	377,867.46	730,655.98	32° 2' 12.074 N	103° 35' 20.334 W
8,025.0	0.69	159.70	8,024.3	-13.0	-10.5	377,867.16	730,656.11	32° 2' 12.071 N	103° 35' 20.333 W
8,050.0	0.65	156.34	8,049.3	-13.3	-10.4	377,866.89	730,656.22	32° 2' 12.069 N	103° 35' 20.331 W
8,075.0	0.72	152.78	8,074.3	-13.6	-10.3	377,866.62	730,656.34	32° 2' 12.066 N	103° 35' 20.330 W
8,100.0	0.72	151.03	8,099.3	-13.9	-10.1	377,866.35	730,656.49	32° 2' 12.063 N	103° 35' 20.328 W
8,125.0	0.73	147.19	8,124.3	-14.1	-9.9	377,866.08	730,656.65	32° 2' 12.061 N	103° 35' 20.326 W
8,150.0	0.77	151.83	8,149.3	-14.4	-9.8	377,865.79	730,656.82	32° 2' 12.058 N	103° 35' 20.324 W
8,175.0	0.69	156.09	8,174.3	-14.7	-9.6	377,865.51	730,656.96	32° 2' 12.055 N	103° 35' 20.323 W
8,200.0	0.73	150.72	8,199.3	-15.0	-9.5	377,865.23	730,657.10	32° 2' 12.052 N	103° 35' 20.321 W
8,225.0	0.60	152.99	8,224.3	-15.2	-9.4	377,864.98	730,657.24	32° 2' 12.050 N	103° 35' 20.320 W
8,250.0	0.71	147.23	8,249.3	-15.5	-9.2	377,864.73	730,657.38	32° 2' 12.047 N	103° 35' 20.318 W
8,275.0	0.68	148.90	8,274.3	-15.7	-9.1	377,864.47	730,657.54	32° 2' 12.045 N	103° 35' 20.316 W
8,300.0	0.69	148.17	8,299.3	-16.0	-8.9	377,864.22	730,657.70	32° 2' 12.042 N	103° 35' 20.314 W
8,325.0	0.71	154.92	8,324.3	-16.3	-8.8	377,863.95	730,657.84	32° 2' 12.040 N	103° 35' 20.313 W
8,350.0	0.67	151.35	8,349.3	-16.5	-8.6	377,863.68	730,657.98	32° 2' 12.037 N	103° 35' 20.311 W
8,375.0	0.62	149.88	8,374.3	-16.8	-8.5	377,863.43	730,658.12	32° 2' 12.034 N	103° 35' 20.310 W
8,400.0	0.59	148.97	8,399.3	-17.0	-8.3	377,863.21	730,658.25	32° 2' 12.032 N	103° 35' 20.308 W
8,425.0	0.54	139.15	8,424.3	-17.2	-8.2	377,863.01	730,658.39	32° 2' 12.030 N	103° 35' 20.306 W
8,450.0	0.52	134.09	8,449.3	-17.4	-8.0	377,862.84	730,658.55	32° 2' 12.029 N	103° 35' 20.305 W
8,475.0	0.62	128.49	8,474.3	-17.5	-7.9	377,862.68	730,658.74	32° 2' 12.027 N	103° 35' 20.302 W
8,500.0	0.85	125.70	8,499.3	-17.7	-7.6	377,862.48	730,659.00	32° 2' 12.025 N	103° 35' 20.299 W
8,525.0	1.31	127.95	8,524.3	-18.0	-7.2	377,862.20	730,659.37	32° 2' 12.022 N	103° 35' 20.295 W
8,550.0	1.48	128.88	8,549.3	-18.4	-6.7	377,861.82	730,659.85	32° 2' 12.018 N	103° 35' 20.290 W
8,575.0	1.52	129.42	8,574.3	-18.8	-6.2	377,861.41	730,660.36	32° 2' 12.014 N	103° 35' 20.284 W

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Vast State #21H
Project:	Lea County, NM	TVD Reference:	RKB @ 3284.7usft (Ensign #156)
Site:	Sec 17, T26S, R33E	MD Reference:	RKB @ 3284.7usft (Ensign #156)
Well:	Vast State #21H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,600.0	1.58	118.03	8,599.3	-19.2	-5.7	377,861.04	730,660.92	32° 2' 12.010 N	103° 35' 20.277 W
8,625.0	1.72	92.91	8,624.3	-19.3	-5.0	377,860.86	730,661.59	32° 2' 12.009 N	103° 35' 20.269 W
8,650.0	1.95	77.90	8,649.2	-19.3	-4.2	377,860.93	730,662.39	32° 2' 12.009 N	103° 35' 20.260 W
8,675.0	2.07	65.14	8,674.2	-19.0	-3.4	377,861.20	730,663.21	32° 2' 12.012 N	103° 35' 20.251 W
8,700.0	2.30	53.13	8,699.2	-18.5	-2.6	377,861.70	730,664.02	32° 2' 12.017 N	103° 35' 20.241 W
8,725.0	2.61	45.72	8,724.2	-17.8	-1.8	377,862.39	730,664.83	32° 2' 12.024 N	103° 35' 20.232 W
8,750.0	2.74	44.36	8,749.2	-17.0	-0.9	377,863.22	730,665.66	32° 2' 12.032 N	103° 35' 20.222 W
8,775.0	2.71	43.16	8,774.1	-16.1	-0.1	377,864.08	730,666.48	32° 2' 12.040 N	103° 35' 20.212 W
8,800.0	2.46	40.87	8,799.1	-15.3	0.6	377,864.91	730,667.23	32° 2' 12.048 N	103° 35' 20.204 W
8,825.0	2.07	36.76	8,824.1	-14.5	1.3	377,865.68	730,667.85	32° 2' 12.056 N	103° 35' 20.196 W
8,850.0	1.96	35.07	8,849.1	-13.8	1.8	377,866.39	730,668.37	32° 2' 12.063 N	103° 35' 20.190 W
8,875.0	1.81	36.72	8,874.1	-13.1	2.3	377,867.06	730,668.85	32° 2' 12.070 N	103° 35' 20.185 W
8,900.0	1.49	37.92	8,899.0	-12.6	2.7	377,867.63	730,669.29	32° 2' 12.075 N	103° 35' 20.180 W
8,925.0	1.26	40.75	8,924.0	-12.1	3.1	377,868.10	730,669.67	32° 2' 12.080 N	103° 35' 20.175 W
8,950.0	1.17	41.54	8,949.0	-11.7	3.4	377,868.50	730,670.02	32° 2' 12.084 N	103° 35' 20.171 W
8,975.0	1.18	42.48	8,974.0	-11.3	3.8	377,868.88	730,670.36	32° 2' 12.087 N	103° 35' 20.167 W
9,000.0	1.19	44.23	8,999.0	-10.9	4.1	377,869.25	730,670.71	32° 2' 12.091 N	103° 35' 20.163 W
9,025.0	1.14	44.14	9,024.0	-10.6	4.5	377,869.62	730,671.07	32° 2' 12.095 N	103° 35' 20.159 W
9,050.0	1.18	40.81	9,049.0	-10.2	4.8	377,869.99	730,671.41	32° 2' 12.098 N	103° 35' 20.155 W
9,075.0	1.15	47.26	9,074.0	-9.8	5.2	377,870.36	730,671.76	32° 2' 12.102 N	103° 35' 20.151 W
9,100.0	1.11	47.33	9,099.0	-9.5	5.5	377,870.69	730,672.12	32° 2' 12.105 N	103° 35' 20.146 W
9,125.0	1.19	52.48	9,124.0	-9.2	5.9	377,871.01	730,672.51	32° 2' 12.108 N	103° 35' 20.142 W
9,150.0	1.21	59.90	9,149.0	-8.9	6.3	377,871.30	730,672.94	32° 2' 12.111 N	103° 35' 20.137 W
9,175.0	1.31	74.00	9,174.0	-8.7	6.8	377,871.51	730,673.45	32° 2' 12.113 N	103° 35' 20.131 W
9,200.0	1.34	80.36	9,199.0	-8.6	7.4	377,871.64	730,674.01	32° 2' 12.115 N	103° 35' 20.124 W
9,225.0	1.36	84.70	9,224.0	-8.5	8.0	377,871.72	730,674.59	32° 2' 12.115 N	103° 35' 20.118 W
9,250.0	1.34	90.38	9,249.0	-8.5	8.6	377,871.74	730,675.18	32° 2' 12.115 N	103° 35' 20.111 W
9,275.0	1.36	92.76	9,274.0	-8.5	9.2	377,871.73	730,675.77	32° 2' 12.115 N	103° 35' 20.104 W
9,300.0	1.42	89.47	9,298.9	-8.5	9.8	377,871.72	730,676.37	32° 2' 12.115 N	103° 35' 20.097 W
9,325.0	1.40	91.96	9,323.9	-8.5	10.4	377,871.71	730,676.99	32° 2' 12.115 N	103° 35' 20.090 W
9,350.0	1.44	107.69	9,348.9	-8.6	11.0	377,871.60	730,677.59	32° 2' 12.114 N	103° 35' 20.083 W
9,375.0	1.79	128.98	9,373.9	-8.9	11.6	377,871.26	730,678.20	32° 2' 12.110 N	103° 35' 20.076 W
9,400.0	1.99	136.33	9,398.9	-9.5	12.2	377,870.70	730,678.80	32° 2' 12.105 N	103° 35' 20.069 W
9,425.0	2.17	139.78	9,423.9	-10.2	12.8	377,870.03	730,679.41	32° 2' 12.098 N	103° 35' 20.062 W
9,450.0	2.41	141.03	9,448.9	-10.9	13.4	377,869.26	730,680.04	32° 2' 12.091 N	103° 35' 20.054 W
9,475.0	2.75	145.24	9,473.8	-11.8	14.1	377,868.35	730,680.71	32° 2' 12.082 N	103° 35' 20.047 W
9,500.0	3.09	142.78	9,498.8	-12.9	14.9	377,867.33	730,681.46	32° 2' 12.071 N	103° 35' 20.038 W
9,525.0	3.02	137.48	9,523.8	-13.9	15.7	377,866.30	730,682.32	32° 2' 12.061 N	103° 35' 20.028 W
9,550.0	3.42	127.03	9,548.7	-14.8	16.8	377,865.37	730,683.36	32° 2' 12.052 N	103° 35' 20.016 W
9,575.0	3.88	120.19	9,573.7	-15.7	18.1	377,864.49	730,684.68	32° 2' 12.043 N	103° 35' 20.001 W
9,600.0	3.70	114.15	9,598.6	-16.5	19.6	377,863.74	730,686.15	32° 2' 12.036 N	103° 35' 19.984 W
9,625.0	3.76	111.39	9,623.6	-17.1	21.1	377,863.11	730,687.65	32° 2' 12.029 N	103° 35' 19.967 W
9,650.0	3.81	114.83	9,648.5	-17.7	22.6	377,862.46	730,689.17	32° 2' 12.023 N	103° 35' 19.949 W
9,675.0	4.03	117.72	9,673.5	-18.5	24.1	377,861.70	730,690.70	32° 2' 12.015 N	103° 35' 19.931 W
9,700.0	3.93	120.92	9,698.4	-19.3	25.6	377,860.86	730,692.21	32° 2' 12.007 N	103° 35' 19.914 W
9,725.0	3.65	121.19	9,723.4	-20.2	27.0	377,860.00	730,693.63	32° 2' 11.998 N	103° 35' 19.897 W
9,750.0	3.50	120.42	9,748.3	-21.0	28.4	377,859.20	730,694.97	32° 2' 11.990 N	103° 35' 19.882 W
9,775.0	3.45	120.28	9,773.3	-21.8	29.7	377,858.44	730,696.27	32° 2' 11.982 N	103° 35' 19.867 W
9,800.0	3.43	119.06	9,798.2	-22.5	31.0	377,857.70	730,697.58	32° 2' 11.975 N	103° 35' 19.852 W
9,825.0	3.48	116.44	9,823.2	-23.2	32.3	377,857.00	730,698.91	32° 2' 11.968 N	103° 35' 19.836 W
9,850.0	4.23	114.83	9,848.1	-23.9	33.8	377,856.27	730,700.43	32° 2' 11.961 N	103° 35' 19.819 W
9,875.0	5.40	119.05	9,873.0	-24.9	35.7	377,855.31	730,702.29	32° 2' 11.951 N	103° 35' 19.797 W
9,900.0	6.02	120.56	9,897.9	-26.1	37.9	377,854.07	730,704.45	32° 2' 11.939 N	103° 35' 19.772 W
9,925.0	6.22	121.77	9,922.8	-27.5	40.1	377,852.69	730,706.73	32° 2' 11.925 N	103° 35' 19.746 W
9,950.0	6.30	122.94	9,947.6	-29.0	42.4	377,851.24	730,709.03	32° 2' 11.910 N	103° 35' 19.719 W

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Vast State #21H
Project:	Lea County, NM	TVD Reference:	RKB @ 3284.7usft (Ensign #156)
Site:	Sec 17, T26S, R33E	MD Reference:	RKB @ 3284.7usft (Ensign #156)
Well:	Vast State #21H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,975.0	6.37	123.86	9,972.5	-30.5	44.7	377,849.72	730,711.33	32° 2' 11.895 N	103° 35' 19.693 W
10,000.0	6.35	124.81	9,997.3	-32.0	47.0	377,848.16	730,713.62	32° 2' 11.879 N	103° 35' 19.666 W
10,025.0	6.33	126.09	10,022.2	-33.6	49.3	377,846.55	730,715.87	32° 2' 11.863 N	103° 35' 19.640 W
10,050.0	6.23	125.44	10,047.0	-35.2	51.5	377,844.96	730,718.09	32° 2' 11.847 N	103° 35' 19.614 W
10,075.0	6.04	125.89	10,071.9	-36.8	53.7	377,843.40	730,720.26	32° 2' 11.832 N	103° 35' 19.589 W
10,100.0	6.09	125.38	10,096.7	-38.3	55.8	377,841.86	730,722.41	32° 2' 11.817 N	103° 35' 19.565 W
10,125.0	6.29	122.72	10,121.6	-39.8	58.0	377,840.35	730,724.64	32° 2' 11.801 N	103° 35' 19.539 W
10,150.0	6.48	120.78	10,146.4	-41.3	60.4	377,838.89	730,727.00	32° 2' 11.787 N	103° 35' 19.511 W
10,175.0	6.34	118.70	10,171.3	-42.7	62.8	377,837.50	730,729.43	32° 2' 11.773 N	103° 35' 19.483 W
10,200.0	6.17	117.01	10,196.1	-44.0	65.2	377,836.23	730,731.83	32° 2' 11.760 N	103° 35' 19.455 W
10,225.0	6.18	114.82	10,221.0	-45.1	67.7	377,835.06	730,734.25	32° 2' 11.748 N	103° 35' 19.427 W
10,250.0	6.22	112.55	10,245.8	-46.2	70.1	377,833.97	730,736.72	32° 2' 11.737 N	103° 35' 19.399 W
10,275.0	6.19	111.61	10,270.7	-47.2	72.6	377,832.96	730,739.23	32° 2' 11.727 N	103° 35' 19.370 W
10,300.0	6.12	110.97	10,295.5	-48.2	75.1	377,831.98	730,741.73	32° 2' 11.717 N	103° 35' 19.341 W
10,325.0	6.11	109.81	10,320.4	-49.1	77.6	377,831.06	730,744.22	32° 2' 11.708 N	103° 35' 19.312 W
10,350.0	6.14	109.18	10,345.2	-50.0	80.1	377,830.17	730,746.74	32° 2' 11.699 N	103° 35' 19.283 W
10,375.0	6.22	108.94	10,370.1	-50.9	82.7	377,829.29	730,749.28	32° 2' 11.690 N	103° 35' 19.253 W
10,400.0	6.20	108.05	10,395.0	-51.8	85.2	377,828.43	730,751.84	32° 2' 11.682 N	103° 35' 19.224 W
10,425.0	6.28	106.24	10,419.8	-52.6	87.8	377,827.63	730,754.44	32° 2' 11.674 N	103° 35' 19.194 W
10,450.0	6.41	105.36	10,444.7	-53.3	90.5	377,826.88	730,757.10	32° 2' 11.666 N	103° 35' 19.163 W
10,475.0	6.41	105.37	10,469.5	-54.1	93.2	377,826.14	730,759.79	32° 2' 11.658 N	103° 35' 19.131 W
10,500.0	6.40	104.67	10,494.3	-54.8	95.9	377,825.41	730,762.48	32° 2' 11.651 N	103° 35' 19.100 W
10,525.0	6.29	103.58	10,519.2	-55.5	98.6	377,824.74	730,765.16	32° 2' 11.644 N	103° 35' 19.069 W
10,550.0	6.13	102.98	10,544.0	-56.1	101.2	377,824.12	730,767.80	32° 2' 11.638 N	103° 35' 19.039 W
10,575.0	6.11	101.79	10,568.9	-56.7	103.8	377,823.55	730,770.40	32° 2' 11.632 N	103° 35' 19.008 W
10,600.0	6.13	102.14	10,593.8	-57.2	106.4	377,822.99	730,773.01	32° 2' 11.626 N	103° 35' 18.978 W
10,625.0	6.04	101.53	10,618.6	-57.7	109.0	377,822.45	730,775.60	32° 2' 11.621 N	103° 35' 18.948 W
10,650.0	5.84	101.39	10,643.5	-58.3	111.5	377,821.94	730,778.14	32° 2' 11.616 N	103° 35' 18.919 W
10,675.0	5.62	100.84	10,668.4	-58.7	114.0	377,821.45	730,780.58	32° 2' 11.611 N	103° 35' 18.890 W
10,700.0	5.52	100.24	10,693.2	-59.2	116.4	377,821.01	730,782.97	32° 2' 11.606 N	103° 35' 18.863 W
10,725.0	5.41	99.42	10,718.1	-59.6	118.7	377,820.60	730,785.32	32° 2' 11.602 N	103° 35' 18.835 W
10,750.0	5.23	98.91	10,743.0	-60.0	121.0	377,820.23	730,787.60	32° 2' 11.598 N	103° 35' 18.809 W
10,775.0	5.11	98.79	10,767.9	-60.3	123.2	377,819.89	730,789.83	32° 2' 11.594 N	103° 35' 18.783 W
10,800.0	5.24	100.04	10,792.8	-60.7	125.5	377,819.52	730,792.05	32° 2' 11.591 N	103° 35' 18.757 W
10,825.0	5.36	100.31	10,817.7	-61.1	127.7	377,819.11	730,794.33	32° 2' 11.587 N	103° 35' 18.731 W
10,850.0	5.54	102.97	10,842.6	-61.6	130.1	377,818.63	730,796.65	32° 2' 11.582 N	103° 35' 18.704 W
10,875.0	5.58	106.23	10,867.5	-62.2	132.4	377,818.02	730,799.00	32° 2' 11.575 N	103° 35' 18.677 W
10,900.0	6.03	110.02	10,892.3	-63.0	134.8	377,817.23	730,801.40	32° 2' 11.567 N	103° 35' 18.649 W
10,925.0	6.66	112.71	10,917.2	-64.0	137.4	377,816.22	730,803.97	32° 2' 11.557 N	103° 35' 18.619 W
10,950.0	6.97	114.36	10,942.0	-65.2	140.1	377,815.04	730,806.69	32° 2' 11.545 N	103° 35' 18.588 W
10,975.0	7.05	114.36	10,966.8	-66.4	142.9	377,813.78	730,809.47	32° 2' 11.533 N	103° 35' 18.555 W
11,000.0	6.88	113.87	10,991.6	-67.7	145.6	377,812.54	730,812.23	32° 2' 11.520 N	103° 35' 18.523 W
11,025.0	6.78	113.10	11,016.5	-68.8	148.4	377,811.35	730,814.96	32° 2' 11.508 N	103° 35' 18.492 W
11,050.0	6.63	112.11	11,041.3	-70.0	151.1	377,810.23	730,817.65	32° 2' 11.497 N	103° 35' 18.461 W
11,075.0	6.51	111.52	11,066.1	-71.0	153.7	377,809.17	730,820.31	32° 2' 11.486 N	103° 35' 18.430 W
11,100.0	6.07	111.19	11,091.0	-72.0	156.3	377,808.17	730,822.86	32° 2' 11.476 N	103° 35' 18.400 W
11,125.0	5.61	110.36	11,115.9	-72.9	158.6	377,807.27	730,825.24	32° 2' 11.467 N	103° 35' 18.373 W
11,150.0	5.29	109.45	11,140.7	-73.7	160.9	377,806.46	730,827.47	32° 2' 11.459 N	103° 35' 18.347 W
11,175.0	5.15	107.79	11,165.6	-74.5	163.0	377,805.73	730,829.63	32° 2' 11.452 N	103° 35' 18.322 W
11,200.0	4.91	105.28	11,190.5	-75.1	165.1	377,805.11	730,831.73	32° 2' 11.445 N	103° 35' 18.298 W
11,225.0	4.78	102.48	11,215.4	-75.6	167.2	377,804.60	730,833.78	32° 2' 11.440 N	103° 35' 18.274 W
11,250.0	4.86	103.09	11,240.4	-76.1	169.2	377,804.14	730,835.82	32° 2' 11.435 N	103° 35' 18.250 W
11,275.0	5.27	103.26	11,265.3	-76.6	171.4	377,803.63	730,837.97	32° 2' 11.430 N	103° 35' 18.225 W
11,300.0	5.50	105.36	11,290.2	-77.1	173.6	377,803.05	730,840.25	32° 2' 11.424 N	103° 35' 18.199 W
11,325.0	5.53	103.33	11,315.0	-77.7	176.0	377,802.46	730,842.57	32° 2' 11.418 N	103° 35' 18.172 W

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Vast State #21H
Project:	Lea County, NM	TVD Reference:	RKB @ 3284.7usft (Ensign #156)
Site:	Sec 17, T26S, R33E	MD Reference:	RKB @ 3284.7usft (Ensign #156)
Well:	Vast State #21H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
11,350.0	5.12	101.72	11,339.9	-78.2	178.2	377,801.95	730,844.84	32° 2' 11.413 N	103° 35' 18.145 W
11,375.0	5.03	100.22	11,364.8	-78.7	180.4	377,801.53	730,847.01	32° 2' 11.409 N	103° 35' 18.120 W
11,400.0	4.85	96.57	11,389.7	-79.0	182.5	377,801.22	730,849.14	32° 2' 11.406 N	103° 35' 18.096 W
11,425.0	4.65	95.33	11,414.7	-79.2	184.6	377,801.00	730,851.20	32° 2' 11.403 N	103° 35' 18.072 W
11,450.0	4.45	94.93	11,439.6	-79.4	186.6	377,800.82	730,853.17	32° 2' 11.402 N	103° 35' 18.049 W
11,475.0	4.15	96.61	11,464.5	-79.6	188.4	377,800.64	730,855.04	32° 2' 11.400 N	103° 35' 18.027 W
11,499.8	3.95	103.14	11,489.3	-79.9	190.2	377,800.34	730,856.76	32° 2' 11.396 N	103° 35' 18.007 W
11,500.0	3.95	103.14	11,489.4	-79.9	190.2	377,800.34	730,856.77	32° 2' 11.396 N	103° 35' 18.007 W
Gyro Tie In @ 11500.0 MD / 11489.4 TVD									
11,737.0	4.75	91.50	11,725.8	-82.0	207.9	377,798.22	730,874.53	32° 2' 11.374 N	103° 35' 17.801 W
11,769.0	4.75	90.80	11,757.7	-82.0	210.6	377,798.17	730,877.18	32° 2' 11.374 N	103° 35' 17.770 W
11,800.0	6.16	77.97	11,788.5	-81.7	213.5	377,798.50	730,880.09	32° 2' 11.377 N	103° 35' 17.736 W
11,831.0	9.41	66.36	11,819.2	-80.3	217.4	377,799.86	730,884.04	32° 2' 11.390 N	103° 35' 17.690 W
11,863.0	9.76	77.97	11,850.8	-78.7	222.5	377,801.48	730,889.09	32° 2' 11.406 N	103° 35' 17.631 W
11,894.0	9.60	92.70	11,881.3	-78.3	227.6	377,801.90	730,894.24	32° 2' 11.409 N	103° 35' 17.572 W
11,925.0	11.80	93.80	11,911.8	-78.6	233.4	377,801.57	730,899.99	32° 2' 11.406 N	103° 35' 17.505 W
11,956.0	14.90	71.10	11,942.0	-77.5	240.3	377,802.65	730,906.93	32° 2' 11.416 N	103° 35' 17.424 W
11,988.0	22.10	53.70	11,972.3	-72.6	249.1	377,807.56	730,915.69	32° 2' 11.464 N	103° 35' 17.322 W
12,019.0	29.00	42.90	12,000.3	-63.7	258.9	377,816.53	730,925.52	32° 2' 11.552 N	103° 35' 17.207 W
12,051.0	33.60	37.70	12,027.6	-51.0	269.6	377,829.23	730,936.23	32° 2' 11.677 N	103° 35' 17.082 W
12,082.0	37.10	34.20	12,052.9	-36.4	280.1	377,843.76	730,946.73	32° 2' 11.820 N	103° 35' 16.958 W
12,113.0	41.10	30.30	12,077.0	-19.9	290.5	377,860.30	730,957.13	32° 2' 11.983 N	103° 35' 16.836 W
12,145.0	46.30	27.30	12,100.1	-0.5	301.2	377,879.67	730,967.75	32° 2' 12.174 N	103° 35' 16.711 W
12,172.0	51.50	24.30	12,117.9	17.8	310.0	377,897.99	730,976.59	32° 2' 12.355 N	103° 35' 16.607 W
12,203.0	56.50	21.30	12,136.1	40.9	319.7	377,921.10	730,986.28	32° 2' 12.583 N	103° 35' 16.493 W
12,234.0	60.80	20.50	12,152.2	65.6	329.1	377,945.83	730,995.72	32° 2' 12.827 N	103° 35' 16.381 W
12,265.0	63.90	19.20	12,166.6	91.5	338.4	377,971.66	731,005.04	32° 2' 13.082 N	103° 35' 16.271 W
12,297.0	67.70	17.80	12,179.7	119.1	347.7	377,999.33	731,014.29	32° 2' 13.355 N	103° 35' 16.161 W
12,300.7	67.95	17.74	12,181.1	122.4	348.7	378,002.60	731,015.34	32° 2' 13.387 N	103° 35' 16.149 W
FTP Crossing @ 12300.7 MD / 12181.1 TVD									
12,328.0	69.80	17.30	12,190.9	146.7	356.4	378,026.88	731,023.00	32° 2' 13.627 N	103° 35' 16.058 W
12,360.0	70.70	17.10	12,201.7	175.5	365.3	378,055.65	731,031.91	32° 2' 13.911 N	103° 35' 15.952 W
12,392.0	71.60	16.80	12,212.1	204.4	374.1	378,084.62	731,040.74	32° 2' 14.197 N	103° 35' 15.847 W
12,423.0	72.00	16.60	12,221.8	232.6	382.6	378,112.82	731,049.20	32° 2' 14.476 N	103° 35' 15.747 W
12,454.0	73.10	16.40	12,231.1	261.0	391.0	378,141.18	731,057.60	32° 2' 14.756 N	103° 35' 15.647 W
12,485.0	74.40	15.90	12,239.7	289.6	399.3	378,169.77	731,065.88	32° 2' 15.038 N	103° 35' 15.548 W
12,517.0	77.50	15.00	12,247.5	319.5	407.5	378,199.68	731,074.14	32° 2' 15.333 N	103° 35' 15.450 W
12,548.0	78.60	14.10	12,253.9	348.8	415.2	378,229.04	731,081.76	32° 2' 15.623 N	103° 35' 15.359 W
12,579.0	79.40	13.60	12,259.8	378.4	422.4	378,258.58	731,089.05	32° 2' 15.915 N	103° 35' 15.272 W
12,611.0	80.10	12.40	12,265.5	409.1	429.5	378,289.27	731,096.13	32° 2' 16.218 N	103° 35' 15.187 W
12,642.0	81.30	11.80	12,270.5	439.0	435.9	378,319.18	731,102.54	32° 2' 16.514 N	103° 35' 15.110 W
12,673.0	82.40	10.60	12,274.9	469.1	441.9	378,349.28	731,108.50	32° 2' 16.812 N	103° 35' 15.039 W
12,705.0	83.60	9.90	12,278.8	500.3	447.6	378,380.53	731,114.15	32° 2' 17.120 N	103° 35' 14.970 W
12,737.0	85.40	9.50	12,281.9	531.7	452.9	378,411.93	731,119.52	32° 2' 17.431 N	103° 35' 14.906 W
12,768.0	87.20	8.70	12,283.9	562.3	457.8	378,442.47	731,124.41	32° 2' 17.733 N	103° 35' 14.846 W
12,800.0	88.60	8.00	12,285.1	593.9	462.5	378,474.11	731,129.05	32° 2' 18.045 N	103° 35' 14.790 W
12,831.0	89.90	6.40	12,285.5	624.7	466.3	378,504.86	731,132.94	32° 2' 18.349 N	103° 35' 14.742 W
12,862.0	91.10	5.30	12,285.2	655.5	469.5	378,535.70	731,136.10	32° 2' 18.654 N	103° 35' 14.703 W
12,956.0	91.30	0.80	12,283.2	749.3	474.5	378,629.52	731,141.10	32° 2' 19.583 N	103° 35' 14.637 W
13,050.0	94.20	1.10	12,278.7	843.2	476.1	378,723.39	731,142.65	32° 2' 20.511 N	103° 35' 14.612 W
13,145.0	93.70	359.00	12,272.2	938.0	476.1	378,818.16	731,142.74	32° 2' 21.449 N	103° 35' 14.603 W
13,239.0	92.20	358.10	12,267.3	1,031.8	473.8	378,912.00	731,140.36	32° 2' 22.378 N	103° 35' 14.623 W
13,334.0	91.10	357.10	12,264.6	1,126.7	469.8	379,006.88	731,136.38	32° 2' 23.317 N	103° 35' 14.662 W
13,428.0	90.90	356.50	12,263.0	1,220.5	464.5	379,100.71	731,131.14	32° 2' 24.246 N	103° 35' 14.715 W
13,521.0	92.60	358.30	12,260.1	1,313.4	460.3	379,193.57	731,126.92	32° 2' 25.165 N	103° 35' 14.757 W

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Vast State #21H
Project:	Lea County, NM	TVD Reference:	RKB @ 3284.7usft (Ensign #156)
Site:	Sec 17, T26S, R33E	MD Reference:	RKB @ 3284.7usft (Ensign #156)
Well:	Vast State #21H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
13,615.0	93.70	358.10	12,255.0	1,407.2	457.4	379,287.38	731,123.97	32° 2' 26.094 N	103° 35' 14.784 W
13,709.0	93.60	358.60	12,249.0	1,500.9	454.7	379,381.15	731,121.27	32° 2' 27.022 N	103° 35' 14.808 W
13,803.0	90.90	358.50	12,245.3	1,594.8	452.3	379,475.04	731,118.89	32° 2' 27.951 N	103° 35' 14.828 W
13,897.0	89.50	357.80	12,245.0	1,688.8	449.3	379,568.98	731,115.86	32° 2' 28.881 N	103° 35' 14.855 W
13,991.0	90.00	357.20	12,245.4	1,782.7	445.2	379,662.89	731,111.76	32° 2' 29.811 N	103° 35' 14.895 W
14,086.0	92.10	0.20	12,243.6	1,877.6	443.0	379,757.84	731,109.60	32° 2' 30.750 N	103° 35' 14.913 W
14,181.0	92.30	359.50	12,240.0	1,972.6	442.8	379,852.77	731,109.36	32° 2' 31.690 N	103° 35' 14.908 W
14,275.0	90.00	358.60	12,238.1	2,066.5	441.2	379,946.73	731,107.80	32° 2' 32.620 N	103° 35' 14.919 W
14,369.0	91.80	358.50	12,236.6	2,160.5	438.8	380,040.68	731,105.42	32° 2' 33.550 N	103° 35' 14.939 W
14,463.0	93.40	358.30	12,232.4	2,254.3	436.2	380,134.54	731,102.80	32° 2' 34.479 N	103° 35' 14.962 W
14,557.0	92.60	359.50	12,227.4	2,348.2	434.4	380,228.40	731,101.00	32° 2' 35.407 N	103° 35' 14.975 W
14,651.0	88.80	358.50	12,226.3	2,442.2	432.8	380,322.36	731,099.35	32° 2' 36.337 N	103° 35' 14.987 W
14,745.0	90.40	359.00	12,226.9	2,536.1	430.7	380,416.33	731,097.30	32° 2' 37.267 N	103° 35' 15.003 W
14,839.0	92.40	359.20	12,224.7	2,630.1	429.2	380,510.28	731,095.83	32° 2' 38.197 N	103° 35' 15.012 W
14,933.0	93.10	0.40	12,220.1	2,724.0	428.9	380,604.17	731,095.50	32° 2' 39.126 N	103° 35' 15.009 W
15,027.0	90.50	359.40	12,217.2	2,817.9	428.7	380,698.12	731,095.34	32° 2' 40.056 N	103° 35' 15.003 W
15,121.0	90.80	0.80	12,216.1	2,911.9	428.9	380,792.11	731,095.50	32° 2' 40.986 N	103° 35' 14.994 W
15,215.0	92.50	1.10	12,213.4	3,005.9	430.5	380,886.05	731,097.06	32° 2' 41.916 N	103° 35' 14.968 W
15,309.0	91.40	0.60	12,210.2	3,099.8	431.9	380,979.99	731,098.45	32° 2' 42.845 N	103° 35' 14.944 W
15,403.0	90.80	0.40	12,208.4	3,193.8	432.7	381,073.96	731,099.27	32° 2' 43.775 N	103° 35' 14.927 W
15,497.0	91.90	1.10	12,206.2	3,287.7	433.9	381,167.93	731,100.50	32° 2' 44.705 N	103° 35' 14.905 W
15,590.0	89.30	0.40	12,205.2	3,380.7	435.1	381,260.91	731,101.72	32° 2' 45.625 N	103° 35' 14.884 W
15,684.0	91.20	0.20	12,204.8	3,474.7	435.6	381,354.90	731,102.21	32° 2' 46.555 N	103° 35' 14.871 W
15,778.0	93.20	359.90	12,201.2	3,568.6	435.7	381,448.83	731,102.29	32° 2' 47.485 N	103° 35' 14.862 W
15,872.0	91.60	0.10	12,197.3	3,662.5	435.7	381,542.74	731,102.29	32° 2' 48.414 N	103° 35' 14.855 W
15,966.0	88.30	0.20	12,197.4	3,756.5	435.9	381,636.73	731,102.54	32° 2' 49.344 N	103° 35' 14.844 W
16,060.0	89.10	0.20	12,199.5	3,850.5	436.3	381,730.70	731,102.87	32° 2' 50.274 N	103° 35' 14.833 W
16,154.0	89.00	359.20	12,201.0	3,944.5	435.8	381,824.69	731,102.37	32° 2' 51.204 N	103° 35' 14.831 W
16,248.0	89.10	358.30	12,202.6	4,038.5	433.7	381,918.65	731,100.32	32° 2' 52.134 N	103° 35' 14.847 W
16,342.0	89.60	358.00	12,203.7	4,132.4	430.7	382,012.59	731,097.29	32° 2' 53.064 N	103° 35' 14.875 W
16,436.0	93.80	358.50	12,200.9	4,226.3	427.8	382,106.49	731,094.42	32° 2' 53.993 N	103° 35' 14.901 W
16,530.0	93.40	357.20	12,195.0	4,320.0	424.3	382,200.23	731,090.90	32° 2' 54.921 N	103° 35' 14.934 W
16,623.0	93.50	357.80	12,189.4	4,412.8	420.3	382,292.98	731,086.85	32° 2' 55.839 N	103° 35' 14.974 W
16,718.0	94.40	358.00	12,182.8	4,507.5	416.8	382,387.69	731,083.38	32° 2' 56.777 N	103° 35' 15.006 W
16,812.0	94.50	356.90	12,175.5	4,601.1	412.6	382,481.31	731,079.21	32° 2' 57.703 N	103° 35' 15.047 W
16,906.0	94.60	356.00	12,168.1	4,694.6	406.8	382,574.83	731,073.41	32° 2' 58.629 N	103° 35' 15.107 W
16,954.6	94.91	355.53	12,164.1	4,742.9	403.2	382,623.13	731,069.83	32° 2' 59.107 N	103° 35' 15.145 W
LTP Crossing @ 16954.6' MD / 12164.1' TVD									
16,999.0	95.20	355.10	12,160.1	4,787.0	399.6	382,667.21	731,066.22	32° 2' 59.544 N	103° 35' 15.183 W
17,080.0	95.20	355.10	12,152.8	4,867.4	392.7	382,747.58	731,059.33	32° 3' 0.340 N	103° 35' 15.257 W
TD @ 17080.0' MD / 12152.8' TVD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
11,500.0	11,489.4	-79.9	190.2	Gyro Tie In @ 11500.0' MD / 11489.4' TVD
12,300.7	12,181.1	122.4	348.7	FTP Crossing @ 12300.7' MD / 12181.1' TVD
16,954.6	12,164.1	4,742.9	403.2	LTP Crossing @ 16954.6' MD / 12164.1' TVD
17,080.0	12,152.8	4,867.4	392.7	TD @ 17080.0' MD / 12152.8' TVD