



Survey Calculation Program

Chesapeake Operating Inc.  
Craig Bessinger 6H  
Upshur Co, WV

M.W.D. OPERATOR: T. Parrilla/D. Scruggs/M. Layfield

DIRECTIONAL DRILLERS: A. Palmer/K. Edwards/R. Calcote

Magnetic Declination: -9.00

Job #: 4331

97-3673

Minimum Curvature Calculation

Vertical Section 165.0

No.	Survey Depth	INC	AZM	TVD	N-S	E-W	Vertical Section	DLS/100
Tie	1700	1.03	133.49	1699.77	-17.95	15.51	21.35	0.16
1	1782	0.88	147.60	1781.76	-18.99	16.38	22.58	0.34
2	1910	2.02	274.80	1909.73	-19.63	14.66	22.76	2.07
3	2037	4.40	292.60	2036.53	-17.57	7.93	19.02	2.01
4	2164	7.70	288.40	2162.80	-13.01	-4.64	11.37	2.62
5	2292	9.70	283.30	2289.33	-7.82	-23.28	1.53	1.67
6	2419	10.00	282.50	2414.45	-2.98	-44.45	-8.63	0.26
7	2545	11.20	282.60	2538.30	2.06	-67.08	-19.35	0.95
8	2672	12.20	279.30	2662.66	6.92	-92.36	-30.59	0.95
9	2799	13.10	277.90	2786.58	11.07	-119.86	-41.71	0.75
10	2927	14.60	279.10	2910.85	15.61	-150.16	-53.94	1.19
11	3054	14.70	276.10	3033.73	19.86	-181.98	-66.28	0.60
12	3181	16.20	279.70	3156.14	24.56	-215.47	-79.49	1.40
13	3308	16.50	280.10	3278.00	30.70	-250.69	-94.54	0.25
14	3435	16.40	276.80	3399.81	35.99	-286.25	-108.85	0.74
15	3563	16.70	277.70	3522.50	40.59	-322.42	-122.66	0.31
16	3690	16.00	276.00	3644.37	44.87	-357.91	-135.97	0.67
17	3817	15.20	277.40	3766.69	48.84	-391.83	-148.59	0.70
18	3942	16.40	277.10	3886.96	53.13	-425.59	-161.47	0.96
19	4070	15.50	278.90	4010.04	58.01	-460.42	-175.20	0.80
20	4197	16.10	281.80	4132.24	64.24	-494.42	-190.02	0.78
21	4324	17.50	281.50	4253.81	71.65	-530.37	-206.48	1.10
22	4451	15.80	273.80	4375.50	76.60	-566.34	-220.57	2.19
23	4578	14.50	268.50	4498.09	77.33	-599.49	-229.86	1.49
24	4704	13.60	276.10	4620.33	78.49	-629.99	-238.87	1.63
25	4832	16.20	279.90	4744.02	83.16	-662.55	-251.81	2.17
26	4957	19.50	282.80	4862.99	90.78	-700.08	-268.89	2.73
27	5083	17.60	273.90	4982.46	96.74	-739.61	-284.87	2.70
28	5209	16.30	264.50	5103.01	96.34	-776.22	-293.96	2.40
29	5337	14.90	262.40	5226.29	92.44	-810.42	-299.04	1.18
30	5464	14.80	270.40	5349.06	90.40	-842.83	-305.46	1.62
31	5592	15.20	283.80	5472.74	94.51	-875.48	-317.89	2.72
32	5717	19.50	287.90	5592.03	104.84	-911.26	-337.12	3.57
33	5845	20.30	287.00	5712.38	117.90	-952.83	-360.49	0.67
34	5972	18.50	281.20	5832.18	128.26	-993.67	-381.07	2.07
35	6098	16.90	275.10	5952.22	133.77	-1031.53	-396.19	1.94
36	6225	17.40	279.60	6073.58	138.58	-1068.64	-410.44	1.12
37	6353	18.60	272.40	6195.33	142.62	-1107.91	-424.51	1.97



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Vertical Section 165.0

No.	Survey Depth	INC	AZM	TVD	N-S	E-W	Vertical Section	DLS/100
38	6480	17.80	271.60	6315.97	144.01	-1147.55	-436.11	0.66
39	6607	16.80	275.40	6437.23	146.28	-1185.23	-448.06	1.19
40	6734	16.30	282.90	6558.98	151.99	-1220.88	-462.80	1.73
41	6840	18.10	281.90	6660.24	158.71	-1251.49	-477.21	1.72
42	6872	18.20	285.80	6690.65	161.09	-1261.16	-482.02	3.81
43	6903	16.40	297.40	6720.25	164.43	-1269.71	-487.45	12.52
44	6935	14.10	300.80	6751.12	168.50	-1277.07	-493.29	7.71
45	6967	13.20	282.80	6782.23	171.31	-1283.99	-497.79	13.51
46	6999	14.30	265.40	6813.33	171.80	-1291.49	-500.21	13.32
47	7030	16.50	250.20	6843.23	170.00	-1299.45	-500.53	14.77
48	7060	18.90	237.40	6871.81	165.94	-1307.56	-498.70	15.20
49	7092	20.90	226.20	6901.91	159.19	-1316.05	-494.39	13.43
50	7123	22.80	215.00	6930.70	150.44	-1323.49	-487.86	14.75
51	7155	24.60	205.40	6960.01	139.34	-1329.91	-478.80	13.29
52	7187	27.00	196.10	6988.83	126.34	-1334.78	-467.50	14.68
53	7219	30.20	190.40	7016.93	111.43	-1338.25	-454.00	13.13
54	7251	32.50	184.40	7044.26	94.94	-1340.36	-438.62	12.11
55	7282	35.20	179.40	7070.01	77.70	-1340.91	-422.10	12.51
56	7314	37.90	176.00	7095.71	58.66	-1340.12	-403.51	10.54
57	7346	40.80	174.60	7120.46	38.45	-1338.46	-383.55	9.48
58	7378	45.60	173.70	7143.78	16.66	-1336.22	-361.93	15.12
59	7410	50.20	173.30	7165.22	-6.92	-1333.53	-338.46	14.40
60	7441	54.20	171.70	7184.22	-31.20	-1330.32	-314.18	13.53
61	7472	57.70	170.20	7201.58	-56.56	-1326.27	-288.63	11.98
62	7504	61.70	169.50	7217.72	-83.75	-1321.40	-261.11	12.64
63	7535	64.80	169.90	7231.67	-110.98	-1316.45	-233.52	10.07
64	7567	67.50	170.50	7244.61	-139.82	-1311.48	-204.38	8.61
65	7599	70.20	170.60	7256.15	-169.26	-1306.58	-174.68	8.44
66	7631	72.30	169.90	7266.44	-199.12	-1301.44	-144.51	6.88
67	7663	73.60	169.70	7275.82	-229.23	-1296.03	-114.02	4.11
68	7694	76.30	167.70	7283.87	-258.58	-1290.16	-84.15	10.71
69	7726	80.00	166.60	7290.44	-289.11	-1283.19	-52.86	12.04
70	7758	82.70	165.30	7295.25	-319.79	-1275.51	-21.23	9.34
71	7789	85.30	164.70	7298.49	-349.57	-1267.53	9.60	8.61
72	7820	87.70	164.70	7300.39	-379.41	-1259.37	40.54	7.74
73	7851	88.60	165.00	7301.39	-409.32	-1251.27	71.52	3.06
74	7914	89.30	165.10	7302.54	-470.18	-1235.02	134.51	1.12
75	7978	89.80	164.90	7303.04	-531.99	-1218.46	198.51	0.84



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76	8041	90.70	165.50	7302.77	-592.90	-1202.36	261.50	1.72
77	8105	90.70	165.50	7301.99	-654.86	-1186.34	325.50	0.00
78	8169	90.10	164.80	7301.54	-716.72	-1169.94	389.49	1.44
79	8231	91.70	165.80	7300.57	-776.68	-1154.21	451.48	3.04
80	8294	91.60	165.50	7298.75	-837.69	-1138.60	514.45	0.50
81	8358	90.80	164.40	7297.41	-899.48	-1121.99	578.44	2.12
82	8420	90.10	162.80	7296.93	-958.95	-1104.48	640.41	2.82
83	8546	90.70	163.40	7296.05	-1079.51	-1067.86	766.34	0.67
84	8672	90.60	163.10	7294.62	-1200.15	-1031.54	892.27	0.25
85	8799	91.40	164.40	7292.40	-1322.06	-996.01	1019.22	1.20
86	8927	91.00	164.20	7289.72	-1445.25	-961.38	1147.18	0.35
87	9053	91.00	166.20	7287.52	-1567.05	-929.20	1273.16	1.59
88	9180	90.70	167.00	7285.64	-1690.58	-899.78	1400.09	0.67
89	9306	92.50	170.60	7282.12	-1814.10	-875.31	1525.74	3.19
90	9433	90.70	167.40	7278.57	-1938.70	-851.09	1652.36	2.89
91	9560	92.00	168.30	7275.58	-2062.81	-824.37	1779.16	1.24
92	9684	90.50	165.80	7272.87	-2183.62	-796.59	1903.04	2.35
93	9810	91.40	164.30	7270.78	-2305.33	-764.09	2029.02	1.39
94	9937	90.10	162.30	7269.12	-2426.96	-727.60	2155.94	1.88
95	10064	91.60	164.20	7267.24	-2548.55	-691.01	2282.86	1.91
96	10189	89.80	162.60	7265.71	-2668.32	-655.30	2407.79	1.93
97	10315	91.90	165.60	7263.84	-2789.46	-620.79	2533.74	2.91
98	10440	91.80	166.20	7259.80	-2910.63	-590.36	2658.66	0.49
99	10566	90.50	165.10	7257.28	-3032.67	-559.14	2784.62	1.35
100	10691	90.10	165.10	7256.62	-3153.47	-527.00	2909.62	0.32
101	10815	90.90	167.50	7255.54	-3273.93	-497.63	3033.57	2.04
102	10939	92.10	167.10	7252.29	-3394.85	-470.38	3157.43	1.02
103	11064	91.40	165.10	7248.48	-3516.12	-440.37	3282.34	1.69
104	11188	89.90	163.70	7247.07	-3635.54	-407.02	3406.32	1.65
105	11312	90.20	165.00	7246.96	-3754.94	-373.57	3530.31	1.08
106	11437	90.40	164.00	7246.31	-3875.39	-340.17	3655.30	0.82
107	11560	90.60	164.20	7245.23	-3993.68	-306.48	3778.28	0.23
108	11684	90.30	163.70	7244.26	-4112.85	-272.19	3902.25	0.47
109	11807	91.10	164.70	7242.76	-4231.19	-238.71	4025.23	1.04
110	11930	91.90	164.90	7239.54	-4349.84	-206.47	4148.19	0.67
111	12053	91.90	165.60	7235.46	-4468.72	-175.17	4271.12	0.57
112	12178	91.90	165.20	7231.31	-4589.62	-143.68	4396.05	0.32
113	12301	90.10	164.80	7229.17	-4708.41	-111.85	4519.02	1.50
114	12425	89.80	166.30	7229.28	-4828.48	-80.91	4643.01	1.23



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Vertical Section 165.0

No.	Survey Depth	INC	AZM	TVD	N-S	E-W	Vertical Section	DLS/ 100
115	12549	91.00	168.10	7228.41	-4949.39	-53.44	4766.91	1.74
116	12672	90.70	165.40	7226.58	-5069.09	-25.25	4889.83	2.21
117	12796	89.10	163.90	7226.80	-5188.66	7.57	5013.82	1.77
118	12920	89.50	163.80	7228.32	-5307.76	42.06	5137.78	0.33
119	13044	89.80	164.20	7229.07	-5426.95	76.24	5261.76	0.40
120	13167	89.60	164.50	7229.72	-5545.39	109.42	5384.75	0.29
121	13238	89.90	164.70	7230.03	-5613.84	128.27	5455.75	0.51
PTB	13282	89.90	164.70	7230.10	-5656.28	139.88	5499.75	0.00