



Surface Water Treatment Rule Contact Time Tables

Click on the following links for *Giardia lamblia* inactivation requirements put forth by the EPA.

[0.5 Log Contact Time Tables](#): Conventional treatment processes should use these tables for compliance in Maine.

[1.0 Log Contact Time Tables](#): Water systems in Maine which use direct filtration (Microfloc, IDI, pressure filters) and use free chlorine as a primary disinfectant should use these tables.

[1.5 Log Contact Time Tables](#): Alternative Filtration Technologies should use these tables for compliance in Maine.

[3.0 Log Contact Time Tables](#): Water systems which have an "avoidance to filtration" and use free chlorine as a primary disinfectant should use these tables.

[Contact Time Tables for Ozone](#)

0.5 Log Contact Time Tables

CT Values for 0.5 Log Inactivation of Giardia cysts by							
Free Chlorine at 0.5 C (32.9 F) or Lower							
Chlorine Concentration*	pH = 6	pH = 6.5	pH = 7	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	23	27	33	40	46	55	65
0.6	24	28	33	40	48	57	68
0.8	24	29	34	41	49	59	70
1	25	29	35	42	51	61	73
1.2	25	30	36	43	52	63	75
1.4	26	31	37	44	54	65	77
1.6	26	32	38	46	55	66	80
1.8	27	32	39	47	56	68	82
2	28	33	39	48	58	70	83
2.2	28	34	40	50	59	71	85
2.4	29	34	41	50	60	73	87
2.6	29	35	42	51	61	74	89
2.8	30	36	43	52	63	75	91
3	30	36	44	53	64	77	92

CT Values for 0.5 Log Inactivation of Giardia cysts by							
Free Chlorine at 5 C (41 F) or Lower							
Chlorine Concentration*	pH = 6	pH = 6.5	pH = 7	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	16	20	23	28	33	39	47
0.6	17	20	24	29	34	41	49
0.8	17	20	24	29	35	42	50
1	18	21	25	30	36	43	52
1.2	18	21	25	31	37	45	53
1.4	18	22	26	31	38	46	55
1.6	19	22	26	32	39	47	56
1.8	19	23	27	33	40	48	58
2	19	23	28	33	41	49	59
2.2	20	23	28	34	41	50	60
2.4	20	24	29	35	42	51	61
2.6	20	24	29	36	43	52	63
2.8	21	25	30	36	44	53	64
3	21	25	30	37	45	54	65

CT Values for 0.5 Log Inactivation of Giardia cysts by							
Free Chlorine at 10 C (50 F) or Lower							
Chlorine Concentration*	pH = 6	pH = 6.5	pH = 7	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	12	15	17	21	25	30	35
0.6	13	15	18	21	26	31	36
0.8	13	15	18	22	26	32	38
1	13	16	19	22	27	33	39
1.2	13	16	19	23	28	33	40
1.4	14	16	19	23	28	34	41
1.6	14	17	20	24	29	35	42
1.8	14	17	20	25	30	36	43
2	15	17	21	25	30	37	44
2.2	15	18	21	26	31	38	45
2.4	15	18	22	26	32	38	46
2.6	15	18	22	27	32	39	47
2.8	16	19	22	27	33	40	48
3	16	19	23	28	34	41	49

CT Values for 0.5 Log Inactivation of Giardia cysts by							
Free Chlorine at 15 C (59 F) or Lower							
Chlorine Concentration*	pH = 6	pH = 6.5	pH = 7	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	8	10	12	14	17	20	23
0.6	8	10	12	14	17	20	24
0.8	9	10	12	15	18	21	25
1	9	11	13	15	18	22	26
1.2	9	11	13	15	19	22	27
1.4	9	11	13	16	19	23	28
1.6	9	11	13	16	19	24	28
1.8	10	11	14	16	20	24	29
2	10	12	14	17	20	25	30
2.2	10	12	14	17	21	25	30
2.4	10	12	14	18	21	26	31
2.6	10	12	15	18	22	26	31
2.8	10	12	15	18	22	27	32
3	11	13	15	19	22	27	33

CT Values for 0.5 Log Inactivation of Giardia cysts by							
Free Chlorine at 20 C (68 F) or Lower							
Chlorine Concentration*	pH = 6	pH = 6.5	pH = 7	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	6	7	9	10	12	15	18
0.6	6	8	9	11	13	15	18
0.8	7	8	9	11	13	16	19
1	7	8	9	11	14	16	20
1.2	7	8	10	12	14	17	20
1.4	7	8	10	12	14	17	21
1.6	7	8	10	12	15	18	21
1.8	7	9	10	12	15	18	22
2	7	9	10	13	15	18	22
2.2	7	9	11	13	16	19	23
2.4	8	9	11	13	16	19	23
2.6	8	9	11	13	16	20	24
2.8	8	9	11	14	17	20	24
3	8	10	11	14	17	20	24

CT Values for 0.5 Log Inactivation of Giardia cysts by							
Free Chlorine at 25 C (77 F) or Lower							
Chlorine Concentration*	pH = 6	pH = 6.5	pH = 7	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	4	5	6	7	8	10	12
0.6	4	5	6	7	9	10	12
0.8	4	5	6	7	9	11	13
1	4	5	6	8	9	11	13
1.2	5	5	6	8	9	11	13
1.4	5	6	7	8	10	12	14
1.6	5	6	7	8	10	12	14
1.8	5	6	7	8	10	12	14
2	5	6	7	8	10	12	15
2.2	5	6	7	9	10	13	15
2.4	5	6	7	9	11	13	15
2.6	5	6	7	9	11	13	16
2.8	5	6	8	9	11	13	16
3	5	6	8	9	11	14	16

1.0 Log Contact Time Tables

CT Values for 1.0 Log Inactivation of Giardia cysts by							
Free Chlorine at 0.5 C (32.9 F) or Lower							
Chlorine Concentration*	pH = 6	pH = 6.5	pH = 7	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	46	54	65	79	92	110	130
0.6	47	56	67	80	95	114	136
0.8	48	57	68	82	98	118	141
1	49	59	70	84	101	122	146
1.2	51	60	72	86	104	125	150
1.4	52	61	74	89	107	129	155
1.6	52	63	75	91	110	132	159
1.8	54	64	77	93	113	136	169
2	55	66	79	95	115	139	167
2.2	56	67	81	99	118	142	170
2.4	57	68	82	99	120	145	174
2.6	58	70	84	101	123	148	178
2.8	59	71	86	103	125	151	181
3	60	72	87	105	127	153	184

CT Values for 1.0 Log Inactivation of Giardia cysts by							
Free Chlorine at 5 C (41 F) or Lower							
Chlorine Concentration*	pH = 6	pH = 6.5	pH = 7	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	32	39	46	55	66	79	93
0.6	33	40	48	57	68	81	97
0.8	34	41	49	58	70	84	100
1	35	42	50	60	72	87	104
1.2	36	42	51	61	74	89	107
1.4	36	43	52	62	76	91	110
1.6	37	44	53	64	77	94	112
1.8	38	45	54	65	79	96	115
2	39	46	55	67	81	98	118
2.2	39	47	56	68	83	100	120
2.4	40	48	57	70	84	102	123
2.6	41	49	58	71	86	104	125
2.8	41	49	59	72	88	106	127
3	42	50	61	74	89	108	130

CT Values for 1.0 Log Inactivation of Giardia cysts by							
Free Chlorine at 10 C (50 F) or Lower							
Chlorine Concentration*	pH = 6	pH = 6.5	pH = 7	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	24	29	35	42	50	59	70
0.6	25	30	36	43	51	61	73
0.8	26	31	37	44	53	63	75
1	26	31	37	45	54	65	78
1.2	27	32	38	46	55	67	80
1.4	27	33	39	47	57	69	82
1.6	28	33	40	48	58	70	84
1.8	29	34	41	49	60	72	86
2	29	35	41	50	61	74	88
2.2	30	35	42	51	62	75	90
2.4	30	36	43	52	63	77	92
2.6	31	37	44	53	65	78	94
2.8	31	37	45	54	66	80	96
3	32	38	46	55	67	81	97

CT Values for 1.0 Log Inactivation of Giardia cysts by							
Free Chlorine at 15 C (59 F) or Lower							
Chlorine Concentration*	pH = 6	pH = 6.5	pH = 7	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	16	20	23	28	33	39	47
0.6	17	20	24	29	34	41	49
0.8	17	20	24	29	35	42	50
1	18	21	25	30	36	43	52
1.2	18	21	25	31	37	45	53
1.4	18	22	26	31	38	46	55
1.6	19	22	26	32	39	47	56
1.8	19	23	27	33	40	48	58
2	19	23	28	33	41	49	59
2.2	20	23	28	34	41	50	60
2.4	20	24	29	35	42	51	61
2.6	20	24	29	36	43	52	63
2.8	21	25	30	36	44	53	64
3	21	25	30	37	45	54	65

CT Values for 1.0 Log Inactivation of Giardia cysts by							
Free Chlorine at 20 C (68 F) or Lower							
Chlorine Concentration*	pH = 6	pH = 6.5	pH = 7	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	12	15	17	21	25	30	35
0.6	13	15	18	21	26	31	36
0.8	13	15	18	22	26	32	38
1	13	16	19	22	27	33	39
1.2	13	16	19	23	28	33	40
1.4	14	16	19	23	28	34	41
1.6	14	17	20	24	29	35	42
1.8	14	17	20	25	30	36	43
2	15	17	21	25	30	37	44
2.2	15	18	21	26	31	38	45
2.4	15	18	22	26	32	38	46
2.6	15	18	22	27	32	39	47
2.8	16	19	22	27	33	40	48
3	16	19	23	28	34	41	49

CT Values for 1.0 Log Inactivation of Giardia cysts by							
Free Chlorine at 25 C (77 F) or Lower							
Chlorine Concentration*	pH = 6	pH = 6.5	pH = 7	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	8	10	12	14	17	20	23
0.6	8	10	12	14	17	20	24
0.8	9	10	12	15	18	21	25
1	9	10	12	15	18	22	26
1.2	9	11	13	15	18	22	27
1.4	9	11	13	16	19	23	27
1.6	9	11	13	16	19	23	28
1.8	10	11	14	16	20	24	29
2	10	12	14	17	20	25	29
2.2	10	12	14	17	21	25	30
2.4	10	12	14	17	21	26	31
2.6	10	12	15	18	22	26	31
2.8	10	12	15	18	22	27	32
3	11	13	15	18	22	27	32

1.5 Log Contact Time Tables

CT Values for 1.5 Log Inactivation of Giardia cysts by							
Free Chlorine at 0.5 C (32.9 F) or Lower							
Chlorine Concentration*	pH = 6.0	pH = 6.5	pH = 7.0	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	69	82	98	119	139	165	195
0.6	71	84	100	120	143	171	204
0.8	73	86	103	123	148	177	211
1	74	88	105	127	152	183	219
1.2	76	90	108	130	157	188	226
1.4	78	92	111	133	161	194	232
1.6	79	95	113	137	165	199	239
1.8	81	97	116	140	169	204	245
2	83	99	118	143	173	209	250
2.2	85	101	121	149	177	213	256
2.4	86	103	124	149	181	218	261
2.6	88	105	126	152	184	222	267
2.8	89	107	129	155	188	226	272
3	91	109	131	158	191	230	276

CT Values for 1.5 Log Inactivation of Giardia cysts by							
Free Chlorine at 5 C (41 F) or Lower							
Chlorine Concentration*	pH = 6.0	pH = 6.5	pH = 7.0	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	49	59	70	83	99	118	140
0.6	50	60	72	86	102	122	146
0.8	52	61	73	88	105	126	151
1	53	63	75	90	108	130	156
1.2	54	64	76	92	111	134	160
1.4	55	65	78	94	114	137	165
1.6	56	66	79	96	116	141	169
1.8	57	68	81	98	119	144	173
2	58	69	83	100	122	147	177
2.2	59	70	85	102	124	150	181
2.4	60	72	86	105	127	153	184
2.6	61	73	88	107	129	156	188
2.8	62	74	89	109	132	159	191
3	63	76	91	111	134	162	195

CT Values for 1.5 Log Inactivation of Giardia cysts by							
Free Chlorine at 10 C (50 F) or Lower							
Chlorine Concentration*	pH = 6.0	pH = 6.5	pH = 7.0	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	37	44	52	63	75	89	105
0.6	38	45	54	64	77	92	109
0.8	39	46	55	66	79	95	113
1	40	47	56	67	81	98	117
1.2	40	48	57	69	83	100	120
1.4	41	49	58	70	85	103	124
1.6	42	50	60	72	87	106	127
1.8	43	51	61	74	90	108	130
2	44	52	62	75	91	111	133
2.2	45	53	64	77	93	113	136
2.4	45	54	65	79	95	115	138
2.6	46	55	66	80	97	117	141
2.8	47	56	67	82	99	120	144
3	48	57	69	83	101	122	146

CT Values for 1.5 Log Inactivation of Giardia cysts by							
Free Chlorine at 15 C (59 F) or Lower							
Chlorine Concentration*	pH = 6.0	pH = 6.5	pH = 7.0	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	25	30	35	42	50	59	70
0.6	25	30	36	43	51	61	73
0.8	26	31	37	44	53	63	76
1	27	32	38	45	54	65	78
1.2	27	32	38	46	56	67	80
1.4	28	33	39	47	57	69	83
1.6	28	33	40	48	58	71	85
1.8	29	34	41	49	60	72	87
2	29	35	42	50	61	74	89
2.2	30	35	43	51	62	75	91
2.4	30	36	43	53	64	77	92
2.6	31	37	44	54	65	78	94
2.8	31	37	45	55	66	80	96
3	32	38	46	56	67	81	98

CT Values for 1.5 Log Inactivation of Giardia cysts by							
Free Chlorine at 20 C (68 F) or Lower							
Chlorine Concentration*	pH = 6.0	pH = 6.5	pH = 7.0	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	18	22	26	31	37	45	53
0.6	19	23	27	32	39	46	55
0.8	20	23	28	33	40	48	57
1	20	24	28	34	41	49	59
1.2	20	24	29	35	42	50	60
1.4	21	25	29	35	43	52	62
1.6	21	25	30	36	44	53	63
1.8	22	26	31	37	45	54	65
2	22	26	31	38	46	55	66
2.2	22	27	32	39	47	57	68
2.4	23	27	33	39	48	58	69
2.6	23	28	33	40	49	59	71
2.8	24	28	34	41	50	60	72
3	24	29	34	42	51	61	73

CT Values for 1.5 Log Inactivation of Giardia cysts by							
Free Chlorine at 25 C (77 F) or Lower							
Chlorine Concentration*	pH = 6.0	pH = 6.5	pH = 7.0	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	12	15	18	21	25	30	35
0.6	13	15	18	22	26	31	37
0.8	13	16	19	22	27	32	38
1	13	16	19	23	27	33	39
1.2	14	16	19	23	28	34	40
1.4	14	17	20	24	29	35	41
1.6	14	17	20	24	29	35	42
1.8	15	17	21	25	30	36	43
2	15	18	21	25	31	37	44
2.2	15	18	21	26	31	38	45
2.4	15	18	22	26	32	39	46
2.6	16	19	22	27	33	39	47
2.8	16	19	23	27	33	40	48
3	16	19	23	28	34	41	49

3.0 Log Contact Time Tables

CT Values for 3 Log Inactivation of Giardia cysts by							
Free Chlorine at 0.5 C (32.9 F) or Lower							
Chlorine Concentration*	pH = 6.0	pH = 6.5	pH = 7.0	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	137	163	195	237	277	329	390
0.6	141	168	200	239	286	342	407
0.8	145	172	205	246	295	354	422
1	148	176	210	253	304	365	437
1.2	152	180	215	259	313	376	451
1.4	155	184	221	266	321	387	464
1.6	157	189	226	273	329	397	477
1.8	162	193	231	279	338	407	498
2	165	197	236	286	346	417	500
2.2	169	201	242	297	353	426	511
2.4	172	205	247	298	361	435	522
2.6	175	209	252	304	368	444	533
2.8	178	213	257	310	375	452	543
3	181	217	261	316	382	460	552

CT Values for 3 Log Inactivation of Giardia cysts by							
Free Chlorine at 5 C (41 F) or Lower							
Chlorine Concentration*	pH = 6.0	pH = 6.5	pH = 7.0	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	97	117	139	166	198	236	279
0.6	100	120	143	171	204	244	291
0.8	103	122	146	175	210	252	301
1	105	125	149	179	216	260	312
1.2	107	127	152	183	221	267	320
1.4	109	130	155	187	227	274	329
1.6	111	132	158	192	232	281	337
1.8	114	135	162	196	238	287	345
2	116	138	165	200	243	294	353
2.2	118	140	169	204	248	300	361
2.4	120	143	172	209	253	306	368
2.6	122	146	175	213	258	312	375
2.8	124	148	178	217	263	318	382
3	126	151	182	221	268	324	389

CT Values for 3 Log Inactivation of Giardia cysts by							
Free Chlorine at 10 C (50 F) or Lower							
Chlorine Concentration*	pH = 6.0	pH = 6.5	pH = 7.0	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	73	88	104	125	149	177	209
0.6	75	90	107	128	153	183	218
0.8	78	92	110	131	158	189	226
1	79	94	112	134	162	195	234
1.2	80	95	114	137	166	200	240
1.4	82	98	116	140	170	206	247
1.6	83	99	119	144	174	211	253
1.8	86	101	122	147	179	215	259
2	87	104	124	150	182	221	265
2.2	89	105	127	153	186	225	271
2.4	90	107	129	157	190	230	276
2.6	92	110	131	160	194	234	281
2.8	93	111	134	163	197	239	287
3	95	113	137	166	201	243	292

CT Values for 3 Log Inactivation of Giardia cysts by							
Free Chlorine at 15 C (59 F) or Lower							
Chlorine Concentration*	pH = 6.0	pH = 6.5	pH = 7.0	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	49	59	70	83	99	118	140
0.6	50	60	72	86	102	122	146
0.8	52	61	73	88	105	126	151
1	53	63	75	90	108	130	156
1.2	54	64	76	92	111	134	160
1.4	55	65	78	94	114	137	165
1.6	56	66	79	96	116	141	169
1.8	57	68	81	98	119	144	173
2	58	69	83	100	122	147	177
2.2	59	70	85	102	124	150	181
2.4	60	72	86	105	127	153	184
2.6	61	73	88	107	129	156	188
2.8	62	74	89	109	132	159	191
3	63	76	91	111	134	162	195

CT Values for 3 Log Inactivation of Giardia cysts by							
Free Chlorine at 20 C (68 F) or Lower							
Chlorine Concentration*	pH = 6	pH = 6.5	pH = 7	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	36	44	52	62	74	89	105
0.6	38	45	54	64	77	92	109
0.8	39	46	55	66	79	95	113
1	39	47	56	67	81	98	117
1.2	40	48	57	69	83	100	120
1.4	41	49	58	70	85	103	123
1.6	42	50	59	72	87	105	126
1.8	43	51	61	74	89	108	129
2	44	52	62	75	91	110	132
2.2	44	53	63	77	93	113	135
2.4	45	54	65	78	95	115	138
2.6	46	55	66	80	97	117	141
2.8	47	56	67	81	99	119	143
3	47	57	68	83	100	122	146

CT Values for 3 Log Inactivation of Giardia cysts by							
Free Chlorine at 25 C (77 F) or Lower							
Chlorine Concentration*	pH = 6.0	pH = 6.5	pH = 7.0	pH = 7.5	pH = 8.0	pH = 8.5	pH = 9.0
0.4	24	29	35	42	50	59	70
0.6	25	30	36	43	51	61	73
0.8	26	31	37	44	53	63	75
1	26	31	37	45	54	65	78
1.2	27	32	38	46	55	67	80
1.4	27	33	39	47	57	69	82
1.6	28	33	40	48	58	70	84
1.8	29	34	41	49	60	72	86
2	29	35	41	50	61	74	88
2.2	30	35	42	51	62	75	90
2.4	30	36	43	52	63	77	92
2.6	31	37	44	53	65	78	94
2.8	31	37	45	54	66	80	96
3	32	38	46	55	67	81	97

Contact Time Tables for Ozone

	Temperature (C)												
Inactivation	<=1	2	3	4	5	6	7	8	9	10	11	12	13
0.5 log	0.48	0.44	0.40	0.36	0.32	0.30	0.28	0.27	0.25	0.23	0.22	0.20	0.19
1 log	0.97	0.89	0.80	0.72	0.63	0.60	0.57	0.54	0.51	0.48	0.45	0.42	0.38
1.5 log	1.50	1.36	1.23	1.09	0.95	0.90	0.86	0.81	0.77	0.72	0.67	0.62	0.58
2 log	1.90	1.75	1.60	1.45	1.30	1.23	1.16	1.09	1.02	0.95	0.89	0.82	0.76
2.5 log	2.40	2.20	2.00	1.80	1.60	1.52	1.44	1.36	1.28	1.20	1.12	1.04	0.95
3 log	2.90	2.65	2.40	2.15	1.90	1.81	1.71	1.62	1.52	1.43	1.33	1.24	1.14

	Temperature (C)											
Inactivation	14	15	16	17	18	19	20	21	22	23	24	25
0.5 log	0.17	0.16	0.15	0.14	0.14	0.13	0.12	0.11	0.10	0.10	0.09	0.08
1 log	0.35	0.32	0.30	0.29	0.27	0.26	0.24	0.22	0.21	0.19	0.18	0.16
1.5 log	0.53	0.48	0.46	0.43	0.41	0.38	0.36	0.34	0.31	0.29	0.26	0.24
2 log	0.69	0.63	0.60	0.57	0.54	0.51	0.48	0.45	0.42	0.38	0.35	0.32
2.5 log	0.87	0.79	0.75	0.71	0.68	0.64	0.60	0.56	0.52	0.48	0.44	0.40
3 log	1.05	0.95	0.90	0.86	0.81	0.77	0.72	0.67	0.62	0.58	0.53	0.48