



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
59				Qe = Plant effluent flow												
60				Qb = Critical low flow of stream at discharge point expressed as the 7Q10 or harmonic mean flow for human health criteria												
61				Upstream Flow (Qb)= (% of 7Q10) X 7Q10 for Chronic and Acute												
62																
63	The following formulae convert metals reported in total form to dissolved form if criteria are in dissolved form															
64																
65	Kp = Kpo * (TSS**a)			Kp = Linear partition coefficient; Kpo and a can be found in table below												
66	C/Ct = 1/ (1 + Kp*TSS* 10^-6)			TSS = Total suspended solids concentration found in receiving stream (or in effluent for intermittent stream)												
67	Total Metal Criteria (Ct) = Cr / (C/Ct)			C/Ct = Fraction of metal dissolved; and Cr = Dissolved criteria value												
68																
69		<b>*Stream Linear Partition Coefficient (Insert "Dissolved" Conc in Column B to convert to "Total")</b>								<b>Lake Linear Partition Coefficient</b>						
70	Total Metals	Dissolved Value in Stream		Kpo	alpha (a)	Kp	C/Ct	Total Value		Kpo	alpha (a)	Kp	C/Ct	Total Value		
71																
73	Cadmium			4000000	-1.13	381564.802	0.246760137	0.00		3520000.00	-0.92	519636.77	0.1939076	0		
74	Chromium(3)			3360000	-0.93	485809.037	0.204646612	0.00		2170000.00	-0.27	1237728.63	0.0917277	0		
75	Copper			1040000	-0.74	223227.013	0.358961238	0.00		2850000.00	-0.9	438595.20	0.2217904	0		
76	Lead			2800000	-0.8	530500.798	0.190693894	0.00		2040000.00	-0.53	677629.77	0.1557381	0		
77	Mercury			2900000	-1.14	270941.426	0.315703262	0.00		1970000.00	-1.17	172922.28	0.4195725	0		
78	Nickel			490000	-0.57	149773.434	0.454920253	0.00		2210000.00	-0.76	455034.04	0.2155046	0		
79	Zinc			1250000	-0.7	291572.81	0.300067592	0.00		3340000.00	-0.68	812166.88	0.1333807	0		
80	Silver			2400000	-1.03	281856.825	0.307233386	0.00		2400000.00	-1.03	281856.82	0.3072334	0		
81		<i>*Note: Use this section to convert lab concentrations shown as "dissolved" to "total"</i>														
82																
83	<b>The following formulas are used to calculate water quality criteria based on Regulation No. 2 (Act 472 of Ark 1949)</b>										Dissolved	Total				
84	Cadmium			Acute			WER X CF1 X e(1.128[ln(hardness)]-3.828)			2.95		CF1 = 1.136672 - [0.041838*ln(hardness)]				
85				Chronic			WER X CF2 X e(0.7852[ln(hardness)]-3.490)			0.88		CF2 = 1.101672 - [0.041838*ln(hardness)]				
86																
87	Chromium Tri			Acute			WER X 0.316 X e(0.819[ln(hardness)]+3.688)			461.76						
88				Chronic			WER X 0.86 X e(0.819[ln(hardness)]+1.561)			149.79						
89																
90	Chromium Hex			Acute			WER X 0.982 X 16			15.71						
91				Chronic			WER X 11 X 0.962			10.58						
92																
93	Copper			Acute			WER X 0.96 X e(0.9422[ln(hardness)]-1.464)			13.95						
94				Chronic			WER X 0.96 X e(0.8545[ln(hardness)]-1.465)			9.48						
95																
96	Lead			Acute			WER X e(1.273[ln(hardness)]-1.460)*CF3			51.30		CF3 = 1.46203 - [0.145712*ln(hardness)]				
97				Chronic			WER X e(1.273[ln(hardness)]-4.705)*CF3			2.00						
98																
99	Mercury			Acute			WER X 0.85 X 2.4			2.04						
100				Chronic			WER X 0.012			0.01						
101																
102	Nickel			Acute			WER X 0.998 X e(0.8460[ln(hardness)]+3.3612)			1184.29						
103				Chronic			WER X 0.997 X e(0.8460[ln(hardness)]+1.1645)			131.53						
104																
105	Zinc			Acute			WER X 0.978 X e(0.8473[ln(hardness)]+0.8604)			95.73						
106				Chronic			WER X 0.986 X e(0.8473[ln(hardness)]+0.7614)			87.42						
107																
108	Silver			Acute			WER X 0.85 X e(1.72[ln(hardness)]-6.52)			2.40						
109																
110	Cyanide			Acute			WER X 22.36			22.36						
111				Chronic			WER X 5.2			5.20						
118																
119	Selenium			Acute			WER X 20			20.00						
120				Chronic			WER X 5			5.00						

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
121																
122	The following formulas are applicable to the Jet Stream Model for lakes for calculating the Dilution Factor (DF):															
123			DF = ((2.8 * D * 3.1416^0.5) / X)				where DF is % of effluent at distance X, D is the diameter of the outfall pipe									
124			and X is aquatic life criteria--25 feet for ZID; 100 feet for mixing zone; human health criteria 200 feet for mixing zone.													
125			DF =	#VALUE!	Acute	#VALUE!	Chronic	#VALUE!	Bioacc.							
126																
127	The following formulas are used to calculate the instream waste concentration (IWC) for each pollutant:															
128																
129			IWC = [(Frac X Critical Flow X Cb) + (2.13 X Ce X Qd)] / [Frac X Critical Flow + Qd] where the critical flow is the 7Q10 except for lakes with the Jet Stream Model.													
130			Use EPA Statistical Factor of 2.13 for less than 20 Ce data points with the Geometric Mean of the Ce's; use 1 for more than 20 data points with the maximum Ce.													
131			IWC = (DF X Ce) + Cb for lakes with Jet Stream Model.													
132	POLLUTANTS		Number of Data points	MQL	EPA Statistical	Background Conc. Cb	Effluent Conc. Ce	Domestic Supply IWC	Acute Aquatic IWC	Chronic Aquatic IWC	Bioacc. IWC	[Reserved]	Arkansas Acute Aquatic	Arkansas Chronic Aquatic	Arkansas Bioacc.	EPA Bioacc.
133				ug/l	Factor	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l		ug/l	ug/l	ug/l	ug/l
137	<b>METALS AND CYANIDE</b>															
138	1. Antimony Total		1	60	2.13			0.00	0.00	0.00	0.00	9999999	9999999.00	9999999.00	9999999	6,400
139	2. Arsenic Total		1	0.5	2.13			0.00	0.00	0.00	0.00	9999999	9999999.00	9999999.00	9999999	1.4
140	3. Beryllium Total		1	0.5	2.13			0.00	0.00	0.00	0.00	9999999	9999999.00	9999999.00	4	4
141	4. Cadmium Total		1	1	2.13			0.00	0.00	0.00	0.00	9999999	11.94	3.58	9999999	5
142	6. Chromium (Tri)		1	10	2.13			0.00	0.00	0.00	0.00	9999999	2256.37	731.94	9999999	100
143	7. Chromium (hex)		1	10	2.13		9999999	250.77	4178.73	1003.04	83.59	9999999	15.71	10.58	9999999	100
144	8. Copper Total		1	0.5	2.13			0.00	0.00	0.00	0.00	9999999	38.87	26.41	9999999	13,000
145	9. Lead Total		1	0.5	2.13		9999999	250.77	4178.73	1003.04	83.59	9999999	269.04	10.48	9999999	50
146	10. Mercury Total		1	0.005	2.13			0.00	0.00	0.00	0.00	9999999	6.46	0.012	9999999	2
147	12. Nickel Total		1	0.5	2.13		9999999	250.77	4178.73	1003.04	83.59	9999999	2603.30	289.12	9999999	46,000
148	13. Selenium Total		1	5	2.13			0.00	0.00	0.00	0.00	9999999	20.00	5.00	9999999	42,000
149	14. Silver Total		1	0.5	2.13			0.00	0.00	0.00	0.00	9999999	7.82	9999999.00	9999999	
150	15. Thallium Total		1	0.5	2.13			0.00	0.00	0.00	0.00	9999999	9999999.00	9999999.00	9999999	4.7
151	16. Zinc Total		1	20	2.13		9999999	250.77	4178.73	1003.04	83.59	9999999	319.04	291.33	9999999	260,000
152	129. Phenols, Total		1	5	2.13			0.00	0.00	0.00	0.00	9999999	9999999.00	9999999.00	9999999	
153	17. Cyanide Total		1	10	2.13			0.00	0.00	0.00	0.00	9999999	22.36	5.2	9999999	4,000
156	<b>DIOXIN</b>															
157	18. 2-3-7-8-TCDD		3	0.00001	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	1.00E-06	
159	<b>VOLATILE COMPOUNDS</b>															
160	19. Acrolein		3	50	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
161	20. Acrylonitrile		3	20	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
162	21. Benzene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
163	22. Bromoform		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
164	23. Carbon Tetrach		3	2	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
165	24. Chlorobenzene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
166	25. Chlorodibromomethane		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
167	26. Chloroethane		3	50	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
168	27. 2-Chloroethylvinyl ether		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
169	28. Chloroform		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
170	29. Dichlorobromomethane		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
171	30. 1-1-Dichloroethane		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
172	31. 1-2-Dichloroethane		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
173	32. 1-1-Dichloroethylene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
174	33. 1,2 Dichloropropane		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
175	34. 1,3 Dichloropropylene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
176	35. Ethylbenzene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
177	37. Methyl Chloride		3	50	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
178	36. Methyl bromide		3	50	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
179	38. Methylene chloride		3	20	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
180	39. 1-1-2-2-Tetrachloroethane		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
181	40. Tetrachloroethylene		1	10	2.13		9999999	250.77	4178.73	1003.04	83.59	9999999	5280	840	88.5	
182	41. Toluene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
183	42. 1,2-trans-dichloroethylene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
184	44. 1-1-2-Trichloroethane		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
185	43. 1-1-1-Trichloroethane		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
186	45. Trichloroethylene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
187	46. Vinyl Chloride		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
188																
189	<b>ACID COMPOUNDS</b>															
190	47. 2-Chlorophenol		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
191	48. 2-4-Dichlorophenol		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
192	49. 2-4 Dimethylphenol		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
193	50. 4,6-Dinitro-o-Cresol		3	50	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
194	51. 2,4-Dinitrophenol		3	50	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
195	52.-53. Nitrophenols		3	20	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
196	54. 4 Chloro-3-methylphenol		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
197	55. Pentachlorophenol		3	5	2.13			0.00	0.00	0.00	0.00	9999999	8.72	6.69	9999999	
198	56. Phenol		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
199	57. 2-4-6-Trichlorophenol		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
200																
201						Ambient Background Conc. Cb	Effluent Conc. Ce	Domestic Supply IWC	Acute Aquatic IWC	Chronic Aquatic IWC	Human Health IWC	[Reserved]	Acute Aquatic Criteria ug/l	Chronic Aquatic Criteria ug/l	Human Health Criteria ug/l	
202	<b>BASE/NEUTRAL COMPOUNDS</b>				2.13											
203	58. Acenaphthene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
204	59. Acenaphthylene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
205	60. Anthracene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
206	61. Benzidine		3	50	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
207	62. Benzo(a) anthracene		3	5	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
208	63. Benzo(a) pyrene		3	5	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
209	64. 3,4-benzoflouranthene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
210	65. Benzo(g,h,i)perylene		3	20	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
211	66. Benzo(k) fluoranthene		3	5	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
212	67. Bis(2-chloroethoxy)methane		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
213	68. Bis(2-chloroethyl) Ether		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
214	69. Bis(2-Chloroisopropyl) ether		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
215	70. Bis(2-ethylhexyl)phthalate		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
216	71. 4-Bromophenyl phenyl ether		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
217	72. Butylbenzyl phthalate		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
218	73. 2-chloronaphthalene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
219	74. 4-chlorophenyl phenyl ether		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
220	75. Chrysene		3	5	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
221	76. Dibenzo(a,h)anthracene		3	5	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
222	77-79. Dichlorobenzene(1,2,4)		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
223	80. 3,3' Dichlorobenzidine		3	5	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
224	81. Diethyl Phthalate		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
225	82. Dimethyl phthalate		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
226	83. Di-n-Butyl phthalate		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
227	84. 2-4-Dinitrotoluene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
228	85. 2-6-Dinitrotoluene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
229	86. Di-n-octyl phthalate		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
230	87. 1,2-diphenylhydrazine		3	20	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
231	88. Fluoranthene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
232	89. Fluorene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
233	90. Hexachlorobenzene		3	5	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
234	91. Hexachlorobutadiene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
235	92. Hexachlorocyclopentadiene		3	10	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	
236	93. Hexachloroethane		3	20	2.13			0.00	0.00	0.00	0.00	9999999	9999999	9999999	9999999	

