TABLE 3
RECOMMENDED AND ADOPTED TOXICITY VALUES FOR TOXIC POLLUTANTS *

Chemical	EPA Recommended Toxicity Value	ADEM Adopted Toxicity Value
1,1,1-Trichloroethane 71556	RfD = 2	
1,1,2,2-Tetrachloroethane 79345	CSF = 0.2	CSF = 0.2
1,1,2-Trichloroethane 79005	CSF = 0.057	CSF = 0.057
1,1-Dichloroethylene 75354	RfD = 0.05	RfD = 0.05
1,2,4-Trichlorobenzene 120821	CSF = 0.029	RfD = 0.01
1,2-Dichlorobenzene 95501	RfD = 0.03	RfD = 0.09
1,2-Dichloroethane 107062	CSF = 0.0033	CSF = 0.091
1,2-Dichloropropane 78875	CSF = 0.036	CSF = 0.067
1,2-Diphenylhydrazine 122667	CSF = 0.8	CSF = 0.8
1,3-Dichlorobenzene 541731	RfD = 0.002	RfD = 0.0134
1,3-Dichloropropene 542756	CSF = 0.122	CSF = 0.1
1,4-Dichlorobenzene 106467	RfD = 0.07	RfD = 0.0134
2,3,7,8-TCDD (Dioxin) 1746016	CSF = 1.56E+05	CSF = 1.75E+04
2,4,6-Trichlorophenol 88062	CSF = 0.011	CSF = 0.011

ED_013582_00000149-00001

Chemical	EPA Recommended Toxicity Value	ADEM Adopted Toxicity Value
2,4-Dichlorophenol 120832	RfD = 0.003	RfD = 0.003
2,4-Dimethylphenol 105679	RfD = 0.02	RfD = 0.02
2,4-Dinitrophenol 51285	RfD = 0.002	RfD = 0.002
2,4-Dinitrotoluene 121142	CSF = 0.667	CSF = 0.311
2-Chloronaphthalene 91587	RfD = 0.08	RfD = 0.08
2-Chlorophenol 95578	RfD = 0.005	RfD = 0.005
2-Methyl-4,6-Dinitrophenol 534521	RfD = 0.0003	RfD = 0.00039
3,3'-Dichlorobenzidine 91941	CSF = 0.45	CSF = 0.45
3-Methyl-4-Chlorophenol 59507	RfD = 0.1	
Acenaphthene 83329	RfD = 0.06	RfD = 0.06
Acrolein 107028	RfD = 0.0005	RfD = 0.0005
Acrylonitrile 107131	CSF = 0.54	CSF = 0.54
Aldrin 309002	CSF = 17	CSF = 0.0061
alpha-Hexachlorocyclohexane (HCH) 319846	CSF = 6.3	CSF = 6.3
alpha-Endosulfan 959988	RfD = 0.006	RfD = 0.006

Table 3 - Alabama (page 2 of 8)

Chemical	EPA Recommended Toxicity Value	ADEM Adopted Toxicity Value
Anthracene 120127	RfD = 0.3	RfD = 0.3
Antimony 7440360	RfD = 0.0004	RfD = 0.0004
Arsenic 7440382	CSF = 1.75	CSF = 1.75
Asbestos 1332214		
Benzene 71432	CSF = 0.015 – 0.055	CSF = 0.029
Benzidine 92875	CSF = 230	CSF = 230
Benzo(a)anthracene 56553	CSF = 0.73	CSF = 7.3
Benzo(a)pyrene 50328	CSF = 7.3	CSF = 7.3
Benzo(b)fluoranthene 205992	CSF = 0.73	CSF = 7.3
Benzo(k)fluoranthene 207089	CSF = 0.073	CSF = 7.3
beta-Hexachlorocyclohexane (HCH) 319857	CSF = 1.8	CSF = 1.8
beta-Endosulfan 33213659	RfD = 0.006	RfD = 0.006
Bis(2-Chloro-1-methylethyl) Ether 108601	RfD = 0.04	RfD = 0.04
Bis(2-Chloroethyl) Ether 111444	CSF = 1.1	CSF = 1.1
Bis(2-Ethylhexyl) Phthalate 117817	CSF = 0.014	CSF = 0.014

Chemical	EPA Recommended Toxicity Value	ADEM Adopted Toxicity Value
Bromoform 75252	CSF = 0.0045	CSF = 0.0079
Butylbenzyl Phthalate 85687	CSF = 0.0019	RfD = 0.2
Carbon Tetrachloride 56235	CSF = 0.07	CSF = 0.13
Chlordane 57749	CSF = 0.35	CSF = 1.3
Chlorobenzene 108907	RfD = 0.02	RfD = 0.02
Chlorodibromomethane 124481	CSF = 0.040	CSF = 0.084
Chloroform 67663	RfD = 0.01	CSF = 0.0061
Chrysene 218019	CSF = 0.0073	CSF = 0.73
Copper 7440508		
Cyanide 57125	RfD = 0.0006	RfD = 0.02
Dibenzo(a,h)anthracene 53703	CSF = 7.3	CSF = 7.3
Dichlorobromomethane 75274	CSF = 0.034	CSF = 0.062
Dieldrin 60571	CSF = 16	CSF = 16
Diethyl Phthalate 84662	RfD = 0.8	RfD = 0.8
Dimethyl Phthalate 131113	RfD = 10	RfD = 10

Chemical	EPA Recommended Toxicity Value	ADEM Adopted Toxicity Value
Di-n-Butyl Phthalate 84742	RfD = 0.1	RfD = 0.1
Endosulfan Sulfate 1031078	RfD = 0.006	RfD = 0.006
Endrin 72208	RfD = 0.0003	RfD = 0.0003
Endrin Aldehyde 7421934	RfD = 0.0003	RfD = 0.0003
Ethylbenzene 100414	RfD = 0.022	RfD = 0.1
Fluoranthene 206440	RfD = 0.04	RfD = 0.04
Fluorene 86737	RfD = 0.04	RfD = 0.04
gamma-Hexachlorocyclohexane (HCH) [Lindane] 58899	RfD = 0.0047	RfD = 0.0003
Heptachlor 76448	CSF = 4.1	CSF = 4.5
Heptachlor Epoxide 1024573	CSF = 5.5	CSF = 0.91
Hexachlorobenzene 118741	CSF = 1.02	CSF = 1.6
Hexachlorobutadiene 87683	CSF = 0.04	CSF = 0.078
Hexachlorocyclopentadiene 77474	RfD = 0.006	RfD = 0.006
Hexachloroethane 67721	CSF = 0.04	CSF = 0.014
Indeno(1,2,3-cd)pyrene 193395	CSF = 0.73	CSF = 7.3

Chemical	EPA Recommended Toxicity Value	ADEM Adopted Toxicity Value
Isophorone 78591	CSF = 0.00095	CSF = 0.00095
Methylmercury 22967926	RfD = 0.0001	
Methyl Bromide 74839	RfD = 0.02	RfD = 0.0014
Methylene Chloride 75092	CSF = 0.002	CSF = 0.0075
Nickel 744000	RfD = 0.02	RfD = 0.02
Nitrobenzene 98953	RfD = 0.002	RfD = 0.005
N-Nitrosodimethylamine 62759	CSF = 51	CSF = 51
N-Nitrosodi-n-Propylamine 621647	CSF = 7.0	CSF = 7.0
N-Nitrosodiphenylamine 86306	CSF = 0.0049	CSF = 0.0049
Pentachlorophenol 87865	CSF = 0.4	CSF = 0.12
Phenol 108952	RfD = 0.6	RfD = 0.3
p,p'-Dichlorodiphenyldichloroethane (DDD) 72548	CSF = 0.24	CSF = 0.34
p,p-Dichlorodiphenyldichloroethylene (DDE) 72559	CSF = 0.167	CSF = 0.34
p,p'-Dichlorodiphenyltrichloroethane (DDT) 50293	CSF = 0.34	CSF = 0.34

Table 3 - Alabama (page 6 of 8)

Chemical	EPA Recommended Toxicity Value	ADEM Adopted Toxicity Value
Polychlorinated Biphenyls (PCBs) 1336363	CSF = 2.0	CSF = 7.7
Pyrene 129000	RfD = 0.03	RfD = 0.03
Selenium 7782492	RfD = 0.005	RfD = 0.005
Tetrachloroethylene 127184	CSF = 0.0021	CSF = 0.0398
Thallium 7440280	RfD = 0.000068	RfD = 0.000068
Toluene 108883	RfD = 0.0097	RfD = 0.2
Toxaphene 8001352	CSF = 1.1	CSF = 1.1
trans-1,2-Dichloroethylene 156605	RfD = 0.02	RfD = 0.02
Trichloroethylene 79016	CSF = 0.05	CSF = 0.0126
Vinyl Chloride 75014	CSF = 1.5	CSF = 1.4
Zinc 7440666	RfD = 0.3	RfD = 0.3

*** Summary:**

Table 3 identifies the toxicity values used to calculate EPA's national recommended water quality criteria for 97 toxic pollutants to protect human health and the toxicity values used to calculate ADEM's adopted water quality criteria for 94 of those toxic pollutants. The former are based on individual water quality criteria documents for toxic pollutants hyperlinked in *National Recommended Water Quality Criteria - Human Health Criteria Table*, https://www.epa.gov/wqc/national-recommended-water-quality-criteria-human-health-

criteria-table (accessed Dec. 31, 2021). The latter are based on ADEM Admin. Code r. 335-6-10-.07, Appendix A.

ADEM has adopted toxicity values which are less stringent than EPA's recommended toxicity values for 29 toxic pollutants and adopted no criteria for another 3 toxic pollutants. ADEM's less stringent and omitted toxicity values are highlighted in yellow.

Comments:

The toxicity values represent the potential of a toxic pollutant to cause cancer (Cancer Slope Factor or CSF) or the daily dose of a toxic pollutant over a lifetime of exposure that can be safely ingested without causing systemic (non-cancer) health effects (Reference Dose or RfD).

In *Human Health Ambient Water Quality Criteria: 2015 Update* (EPA 820-F-15-001 June 2015), EPA described how it determined its recommended toxicity values for 94 toxic pollutants:

> **Updated Health Toxicity Values**
>
> EPA considered all available toxicity values for both noncarcinogenic and carcinogenic toxicological effects to develop the updated human health criteria. EPA's Integrated Risk Information System (IRIS) was the primary source for reference dose and cancer slope factors for this update. For some pollutants, however, more recent toxicity assessments were provided by EPA's Office of Water, EPA's Office of Pesticide Programs, and international or state agencies. EPA followed a systematic process to search for and select the toxicity values used to derive the final updated human health criteria for noncarcinogenic and carcinogenic effects.

"The EPA recommends that states and authorized tribes use the most up-to-date, scientifically sound toxicity data when deriving human health criteria. *Water Quality Standards Handbook* (EPA 823-B-17-001, 2017), Chap. 3 at § 3.3.1.

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