

3745-1-32

Ohio river standards.

[Comment: For dates of non-regulatory government publications, publications of recognized organizations and associations, federal rules and federal statutory provisions referenced in this rule, see rule 3745-1-03 of the Administrative Code.]

(A) The Ohio river is designated warmwater habitat, public water supply, agricultural water supply, industrial water supply and bathing waters, and will meet the most stringent criteria set forth in, or derived in accordance with, this rule, rules 3745-1-01 to 3745-1-07 and 3745-1-33 to 3745-1-40 of the Administrative Code.

Table 32-1. Water quality criteria for the Ohio river.

Chemical	Form ¹	Units ²	IMZM ³	OMZM ³	OMZA ³
<u>Bacteria (E. coli)^a</u>	<u>T</u>	<u>cfu/100 mL</u>	<u>126</u>	<u>126</u>	<u>126</u>
<u>Bacteria (E. coli)^b</u>	<u>T</u>	<u>cfu/100 mL</u>	<u>410</u>	<u>410</u>	<u>410</u>
Bacteria (fecal coliform) ^c	T	<u>cfu/100 mL</u>	<u>--2,000</u>	<u>2,000</u>	<u>2,000</u>
Cyanide	free	µg/l	44	22	5.2
Dissolved oxygen ⁴	T	mg/l	--	4.0 ^{bd}	5.0
Radionuclides	T		--	ee	ee
Temperature	--	°F	--	Table 32-3	Table 32-3

¹T = total.

²mg/l = milligrams per liter (parts per million); µg/l = micrograms per liter (parts per billion); °F = degrees Fahrenheit; cfu/100 mL = colony forming units per one hundred milliliters.

³IMZM = inside mixing zone maximum; OMZM = outside mixing zone maximum; OMZA = outside mixing zone average.

⁴For dissolved oxygen, OMZM means outside mixing zone minimum at any time and OMZA means outside mixing zone minimum daily average.

^a~~For the months of May to October, the maximum allowable level of fecal coliform bacteria shall not exceed two hundred per one hundred ml as a monthly geometric mean based on not less than five samples per month; nor exceed four hundred per one hundred ml in more than ten per cent of all samples taken during the month. For the months of May to October, measurements of Escherichia coli bacteria may be substituted for fecal coliform. Content shall not exceed one hundred thirty per one hundred ml as a monthly geometric mean, based on not less than five samples per month, nor exceed two hundred forty per one hundred ml in any sample. For the months of November to April, the maximum allowable level of fecal coliform bacteria shall not exceed two thousand per one hundred ml as a geometric mean based on not less than five samples per month. Criterion applies for contact recreation during the months of May through October and is expressed as a ninety-day geometric mean.~~

^bCriterion applies for contact recreation during the months of May through October and is not to be exceeded in more than ten per cent of samples taken during any ninety-day period.

^cCriterion applies at all times and is expressed as a monthly geometric mean based on not less than five samples per month. For the months of May through October, measurements of E. coli bacteria may be substituted for fecal coliform.

^{bd}A minimum of 5.0 mg/l at any time shall be maintained during the April fifteen to June fifteen spawning season.

^{ee}Gross total alpha particle activity (including radium-226, but excluding radon and uranium) shall not exceed fifteen picocuries per liter (pci/l) and combined radium-226 and radium-228 shall not exceed four pci/l. The concentration of total gross beta particle activity shall not exceed fifty pci/l. The concentration of total strontium-90 shall not exceed eight pci/l.

Table 32-2. Ohio river water quality criteria for the protection of human health.

Chemical	Form ¹	Units ²	OMZA ³	
			Intakes	Elsewhere
Acenaphthene	T	µg/l	1,200 <u>70</u>	1,200 <u>70</u>
Acrolein	T	µg/l	3203 <u>.0</u>	3203 <u>.0</u>
Acrylonitrile ⁵	T	µg/l	0.590 <u>.51</u>	0.590 <u>.51</u>

Alachlor	T	µg/l	2.0 ^a	--
Aldicarb ⁶	F	µg/l	7.0a	--
Aldicarb sulfone ⁶	F	µg/l	7.0a	--
Aldicarb sulfoxide ⁶	F	µg/l	7.0a	--
Aldrin ⁵	T	µg/l	0.001 37.7*10 ⁻⁶	0.001 37.7*10 ⁻⁶
Anthracene	T	µg/l	9,600 300	9,600 300
Antimony	TR	µg/l	6.0a 5.6	1 45.6
Arsenic	TR	µg/l	10 ^a	50
Asbestos	T	Mf/l	7.0 ^a	--
Atrazine	T	µg/l	3.0 ^a	--
Barium	TR	µg/l	2,000a 1,000	-- 1,000
Benzene ⁵	T	µg/l	5.0 ^a	12
Benzidine ⁵	T	µg/l	0.001 20.00086	0.001 20.00086
Benzo(a)anthracene ⁵	T	µg/l	0.044 0.012	0.044 0.012
Benzo(a)pyrene ⁵	T	µg/l	0.044 0.0012	0.044 0.0012
Benzo(b)fluoranthene ⁵	T	µg/l	0.044 0.012	0.044 0.012
Benzo(k)fluoranthene ⁵	T	µg/l	0.044 0.038	0.044 0.038
Beryllium	TR	µg/l	4.0 ^a	16
Bromate	T	µg/l	10 ^a	--
Bromoform (<u>Tribromomethane</u>) ⁵	T	µg/l	43	43
Butylbenzyl phthalate ⁵	T	µg/l	3,000 1.0	3,000 1.0
Cadmium	TR	µg/l	5.0 ^a	--

Carbofuran	T	µg/l	40 ^a	--
Carbon tetrachloride ⁵	T	µg/l	2.5 <u>2.3</u>	2.5 <u>2.3</u>
Chloramine	T	µg/l	4,000 ^a	--
Chlordane ⁵	T	µg/l	0.02 <u>0.0031</u>	0.02 <u>0.0031</u>
Chlorides	T	mg/l	250 ^a	250
Chlorine	T	µg/l	4,000 ^a	--
Chlorine dioxide	T	µg/l	800 ^a	--
Chlorite	T	µg/l	1,000 ^a	--
Chloroacetic acid ⁷⁶	T	µg/l	60 ^a	--
Chlorobenzene	T	µg/l	100 ^a	68 <u>100</u>
Chlorodibromomethane ⁵	T	µg/l	4.1 <u>4.0</u>	4.1 <u>4.0</u>
<u>Bis(2-Chloro-1-methylethyl) ether</u>	<u>T</u>	<u>µg/l</u>	<u>200</u>	<u>200</u>
Bis(2-Chloroethyl) ether ⁵	T	µg/l	0.3 <u>0.30</u>	0.3 <u>0.30</u>
Chloroform ⁵	T	µg/l	57	57
bis(2-Chloroisopropyl) ether	T	µg/l	1,400	1,400
bis(2-Chloromethyl) ether ⁵	T	µg/l	0.0013 <u>0.0015</u>	0.0013 <u>0.0015</u>
2-Chloronaphthalene	T	µg/l	1,700 <u>800</u>	1,700 <u>800</u>
2-Chlorophenol	T	µg/l	120 <u>30</u>	120 <u>30</u>
Chromium	TR	µg/l	100 ^a	--
Chrysene ⁵	T	µg/l	0.044 <u>0.038</u>	0.044 <u>0.038</u>
Copper	TR	µg/l	--	--
Cyanide	free	µg/l	200 <u>4.0</u>	700 <u>4.0</u>

2,4-D (2,4-Dichlorophenoxy-acetic acid)	T	µg/l	70 ^a	100 <u>1,300</u>
Dalapon	T	µg/l	200 ^a	--
4,4'-DDD ⁵	T	µg/l	0.00830 <u>0.0012</u>	0.00830 <u>0.0012</u>
4,4'-DDE ⁵	T	µg/l	0.00590 <u>0.00018</u>	0.00590 <u>0.00018</u>
4,4'-DDT ⁵	T	µg/l	0.00590 <u>0.0003</u>	0.00590 <u>0.0003</u>
Dibenzo (a,h) anthracene ⁵	T	µg/l	0.0440 <u>0.0012</u>	0.0440 <u>0.0012</u>
Dibromochloropropane	T	µg/l	0.2 ^a	--
Di-n-butyl phthalate	T	µg/l	2,700 <u>20</u>	2,700 <u>20</u>
Dichloroacetic acid ⁷⁶	T	µg/l	60 ^a	--
1,2-Dichlorobenzene	T	µg/l	600a <u>420</u>	2,700 <u>420</u>
1,3-Dichlorobenzene	T	µg/l	400 <u>7.0</u>	400 <u>7.0</u>
1,4-Dichlorobenzene	T	µg/l	75a <u>63</u>	400 <u>63</u>
3,3'-Dichlorobenzidine ⁵	T	µg/l	0.400 <u>0.21</u>	0.400 <u>0.21</u>
Dichlorobromomethane ⁵	T	µg/l	5.65 <u>5.5</u>	5.65 <u>5.5</u>
1,2-Dichloroethane ⁵	T	µg/l	3.8	3.8
1,1-Dichloroethylene ⁵	T	µg/l	0.577 <u>0^a</u>	0.57 <u>300</u>
cis-1,2-Dichloroethylene	T	µg/l	70 ^a	--
trans-1,2-Dichloroethylene	T	µg/l	100 ^a	700 <u>100</u>
2,4-Dichlorophenol	T	µg/l	93 <u>10</u>	93 <u>10</u>
1,2-Dichloropropane ⁵	T	µg/l	5.0 ^a	5.25 <u>0</u>
1,3-Dichloropropene ⁵	T	µg/l	102 <u>7</u>	102 <u>7</u>

Dieldrin ⁵	T	µg/l	0.0014 <u>1.2*10⁻⁵</u>	0.0014 <u>1.2*10⁻⁵</u>
Di (2-ethylhexyl) adipate	T	µg/l	400 ^a	--
Diethyl phthalate	T	µg/l	23,000 <u>600</u>	23,000 <u>600</u>
2,4-Dimethylphenol	T	µg/l	540 <u>100</u>	540 <u>100</u>
Dimethyl phthalate	T	µg/l	310,000 <u>2,000</u>	310,000 <u>2,000</u>
4,6-Dinitro-o-cresol (4,6- Dinitro-2-methylphenol)	T	µg/l	132.0	132.0
Dinitrophenols ⁴	T	µg/l	70 <u>10</u>	70 <u>10</u>
2,4-Dinitrotoluene ⁵	T	µg/l	1.10 <u>.49</u>	1.10 <u>.49</u>
<u>2,4-Dinitrophenol</u>	<u>T</u>	<u>µg/l</u>	<u>10</u>	<u>10</u>
Dinoseb	T	µg/l	7.0 ^a	--
1,2-Diphenylhydrazine ⁵	T	µg/l	0.400 <u>.30</u>	0.400 <u>.30</u>
Diquat	T	µg/l	20 ^a	--
Dissolved solids	T	mg/l	750/500 ^{a,b}	--
alpha-Endosulfan ^{8Z}	T	µg/l	110 <u>20</u>	110 <u>20</u>
beta-Endosulfan ^{8Z}	T	µg/l	110 <u>20</u>	110 <u>20</u>
Endosulfan sulfate ^{8Z}	T	µg/l	110 <u>20</u>	110 <u>20</u>
Endothall	T	µg/l	100 ^a	--
Endrin ⁹⁸	T	µg/l	0.760 <u>.03</u>	0.760 <u>.03</u>
Endrin aldehyde ⁹⁸	T	µg/l	0.760 <u>.29</u>	0.760 <u>.29</u>
Ethylbenzene	T	µg/l	700a <u>68</u>	3,100 <u>68</u>
Ethylene dibromide (EDB)	T	µg/l	0.050 ^a	--

bis (2-Ethylhexyl) phthalate ⁵	T	µg/l	6.0 <u>3.2</u>	<u>183.2</u>
Fluoranthene	T	µg/l	300 <u>20</u>	<u>30020</u>
Fluorene	T	µg/l	1,300 <u>50</u>	<u>1,30050</u>
Fluoride	T	µg/l	1,000	1,000
Glyphosate	T	µg/l	700 ^a	--
Heptachlor ⁵	T	µg/l	0.00215.9 <u>*10⁻⁵</u>	<u>0.00215.9*10⁻⁵</u>
Heptachlor epoxide ⁵	T	µg/l	0.00100.00032	<u>0.00100.00032</u>
Hexachlorobenzene ⁵	T	µg/l	0.00750.00079	<u>0.00750.00079</u>
Hexachlorobutadiene ⁵	T	µg/l	4.4 <u>0.1</u>	<u>4.40.1</u>
alpha-Hexachlorocyclohexane ⁵	T	µg/l	0.0390.0036	<u>0.0390.0036</u>
beta-Hexachlorocyclohexane ⁵	T	µg/l	0.14 <u>0.08</u>	<u>0.140.08</u>
gamma-Hexachlorocyclohexane (Lindane) ⁵	T	µg/l	0.19 <u>0.20^a</u>	<u>0.190.98</u>
Hexachlorocyclohexane - technical grade ⁵	T	µg/l	0.12 <u>0.066</u>	<u>0.120.066</u>
Hexachlorocyclopentadiene	T	µg/l	50 <u>4.0</u>	<u>2404.0</u>
Hexachloroethane ⁵	T	µg/l	19 <u>1.0</u>	<u>191.0</u>
Indeno (1,2,3-c,d) pyrene ⁵	T	µg/l	0.044 <u>0.012</u>	<u>0.0440.012</u>
Iron	S	µg/l	300 ^a	--
Isophorone ⁵	T	µg/l	360 <u>340</u>	<u>360340</u>
Mercury	TR	µg/l	0.012	0.012
Methoxychlor	T	µg/l	40 <u>0.02</u>	<u>1000.02</u>
Methyl bromide	T	µg/l	48 <u>47</u>	<u>4847</u>

<u>3-Methyl-4-chlorophenol</u>	<u>T</u>	<u>µg/l</u>	<u>500</u>	<u>500</u>
Methylene chloride ⁵	T	µg/l	5.0 ^a	4746
Nickel	TR	µg/l	610	610
Nitrate-N + Nitrite-N	T	µg/l	10,000 ^a	10,000
Nitrite-N	T	µg/l	1,000 ^a	1,000
Nitrobenzene	T	µg/l	4710	4710
Nitrosoamines ⁵	T	µg/l	0.0080	0.0080
N-Nitrosodibutylamine ⁵	T	µg/l	0.0640.063	0.0640.063
N-Nitrosodiethylamine ⁵	T	µg/l	0.0080	0.0080
N-Nitrosodimethylamine ⁵	T	µg/l	0.0069	0.0069
N-Nitrosodi-n-propylamine ⁵	T	µg/l	0.050	0.050
N-Nitrosodiphenylamine ⁵	T	µg/l	5033	5033
N-Nitrosodipyrrolidine ⁵	T	µg/l	0.16	0.16
Oxamyl (Vydate)	T	µg/l	200 ^a	--
Pentachlorobenzene	T	µg/l	3.50.1	3.50.1
Pentachlorophenol ⁵	T	<u>µg/ lmg/l</u>	1.0a0.3	820.3
Phenol	T	µg/l	21,0004.000	21,0004.000
Phenolics	T	µg/l	5.0	5.0--
Picloram	T	µg/l	500 ^a	--
Polychlorinated biphenyls ⁵	T	µg/l	0.00170.00064	0.00170.00064
Pyrene	T	µg/l	96020	96020
Selenium	TR	µg/l	50 ^a	170

Silver	T	µg/l	50	50
Silvex (2, 4, 5-TP, 2- [2, 4, 5-Trichlorophenoxy] propionic acid	T	µg/l	40 <u>50</u> ^a	40 <u>100</u>
Simazine	T	µg/l	4.0 ^a	--
Styrene	T	µg/l	100 ^a	--
Sulfates	T	mg/l	250 ^a	250 --
1, 2, 4, 5-Tetrachlorobenzene	T	µg/l	2.30 <u>0.03</u>	2.30 <u>0.03</u>
2, 3, 7, 8-Tetrachlorodibenzo-p-dioxin ⁵	T	pg/l µg/l	0.135.0 <u>*10⁻⁸</u>	0.135.0 <u>*10⁻⁸</u>
1, 1, 2, 2-Tetrachloroethane ⁵	T	µg/l	1.7	1.7
Tetrachloroethylene ⁵	T	µg/l	5.0 ^a	8.0 <u>6.9</u>
Thallium	TR	µg/l	1.7	1.7
Toluene	T	µg/l	1,000 <u>a57</u>	6,800 <u>57</u>
Toxaphene ⁵	T	µg/l	0.00730 <u>.0028</u>	0.00730 <u>.0028</u>
Trichloroacetic acid ⁷⁶	T	µg/l	60 ^a	--
1, 2, 4-Trichlorobenzene ⁵	T	µg/l	70 <u>a0.71</u>	260 <u>0.71</u>
1, 1, 1-Trichloroethane	T	µg/l	200 ^a	-- <u>10,000</u>
1, 1, 2-Trichloroethane ⁵	T	µg/l	5.0 ^a	6.0 <u>5.5</u>
Trichloroethylene ⁵	T	µg/l	5.0 ^a	27 <u>6.0</u>
2, 4, 5-Trichlorophenol	T	µg/l	2,600 <u>300</u>	2,600 <u>300</u>
2, 4, 6-Trichlorophenol ⁵	T	µg/l	21 <u>14</u>	21 <u>14</u>
Vinyl chloride ⁵	T	µg/l	2.0 <u>a0.22</u>	20 <u>0.22</u>
Xylenes	T	µg/l	10,000 ^a	--

Zinc	T	µg/l	9,100 <u>7,400</u>	9,100 <u>7,400</u>
¹ S = soluble; T = total; TR = total recoverable.				
² mg/l = milligrams per liter (parts per million); µg/l = micrograms per liter (parts per billion); ng/l = nanograms per liter (parts per trillion); pg/l = picograms per liter (parts per quadrillion); Mf/l = million fibers per liter.				
³ OMZA = outside mixing zone average. Criteria in the "Intakes" column apply within five hundred yards of drinking water intakes. Criteria in the "Elsewhere" column apply at all other locations.				
⁴ The criteria for this chemical apply to the sum of all dinitrophenols.				
⁵ Criteria for this chemical are based on a carcinogenic endpoint.				
⁶The criterion for this chemical applies to the sum of aldicarb, aldicarb sulfone and aldicarb sulfoxide.				
⁷ ⁶ The criterion for this chemical applies to the sum of chloroacetic acid, dichloroacetic acid and trichloroacetic acid.				
⁸⁷ The criteria for this chemical apply to the sum of alpha-endosulfan, beta-endosulfan and endosulfan sulfate.				
⁹⁸ The criteria for this chemical apply to the sum of endrin and endrin aldehyde.				
^a This criterion is the maximum contaminant level (MCL) developed under the "Safe Drinking Water Act".				
^b Equivalent 25°C specific conductance values are 1200 micromhos/cm as a maximum and 800 micromhos/cm as a thirty-day average.				

Table 32-3. Ohio river temperature criteria.

	<u>PA state line to Greenup Lock and Dam (RM 341.1)</u>	<u>PA state line to Greenup Lock and Dam (RM 341.1)</u>	<u>Greenup Lock and Dam (RM 341.1) to IN state line</u>	<u>Greenup Lock and Dam (RM 341.1) to IN state line</u>
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Month/date	Period Average (°F)	<u>Instantaneous Maximum (°F)</u>	<u>Period Average (°F)</u>	Instantaneous Maximum (°F)
January 1 - 31	45 <u>45.7</u>	<u>47.0</u>	<u>46.8</u>	50 <u>47.2</u>
February 1 - 29	45 <u>43.9</u>	<u>46.3</u>	<u>47.9</u>	50 <u>52.8</u>
March 1 - 15 <u>31</u>	51 <u>51.2</u>	<u>56.4</u>	<u>57.4</u>	56 <u>62.4</u>
March 16 - 31	54			59
April 1 - 15 <u>30</u>	58 <u>61.2</u>	<u>66.3</u>	<u>66.9</u>	64 <u>71.1</u>
April 16 - 30	64			69
May 1 - 15 <u>31</u>	68 <u>71.2</u>	<u>76.5</u>	<u>76.4</u>	73 <u>81.4</u>
May 16 - 31	75			80
June 1 - 15 <u>14</u>	80 <u>78.8</u>	<u>81.0</u>	<u>83.5</u>	85 <u>85.7</u>
June 16 <u>15</u> - 30	83 <u>87.0</u>	<u>87.0</u>	<u>87.0</u>	87 <u>87.0</u>
July 1 - 31	84 <u>89.0</u>	<u>89.0</u>	<u>89.0</u>	89 <u>89.0</u>
August 1 - 31	84 <u>89.0</u>	<u>89.0</u>	<u>89.0</u>	89 <u>89.0</u>
September 1 - 15	84 <u>87.0</u>	<u>87.0</u>	<u>87.0</u>	87 <u>87.0</u>
September 16 - 30	82 <u>81.0</u>	<u>83.1</u>	<u>84.7</u>	86 <u>87.0</u>
October 1 - 15 <u>31</u>	77 <u>74.1</u>	<u>78.3</u>	<u>76.7</u>	82 <u>81.6</u>
October 16 - 31	72			77
November 1 - 30	67 <u>65.0</u>	<u>69.0</u>	<u>66.2</u>	72 <u>70.8</u>
December 1 - 31	52 <u>55.8</u>	<u>60.0</u>	<u>55.6</u>	57 <u>60.4</u>

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Five Year Review (FYR) Dates: 10/30/2019

Certification

Date

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