



Ohio Environmental Council

Technical Comments of the Ohio Environmental Council regarding ORSANCO's Revisions to its Pollution Control Standards

Introduction

The Ohio Environmental Council (the “OEC”) is a statewide non-partisan, non-profit environmental and conservation advocacy organization. We are committed to ensuring clean water, air, and energy for all of Ohio’s residents. For well over half a century, The Ohio River Valley Water Sanitation Commission (“ORSANCO” or “the Commission”) has provided robust protections, especially as it developed its Pollution Control Standards following the passage of the Clean Water Act in the 1970s.

ORSANCO’s present efforts to repeal the substantive portions of the Pollution Control Standards flies in the face of the Commission’s historical efforts to ensure consistent and reliable pollution control throughout the Ohio River and its tributaries. As illustrated by ORSANCO’s minority report and the comments of numerous organizations, the Pollution Control Standards provide numerous numeric criteria not included in the water quality standards of some of the states along the River.

In its request for comment, ORSANCO states that it “is particularly interested in receiving technical and scientific information or data that supports comments on the proposed revisions.” Accordingly, the OEC submits the following comments to satisfy ORSANCO’s request.

The Intent of the Proposed Changes to ORSANCO’s Pollution Control Standards

ORSANCO justifies rescinding the substantive portions of its Pollution Control Standards based on the following conclusions, as stated in the “Marked Version” of the revised Pollution Control Standards:

“Because all states are mandated by the federal Clean Water Act to adopt and submit for USEPA approval a program that addresses designated uses, free from mandates,

wastewater discharge requirements, water quality standards, mixing zones, and more, the Commission has concluded that the requirements of the Compact are being satisfied by member state programs implementing the federal Clean Water Act. The Commission has also concluded that all of its member states are implementing programs approved under the federal Clean Water Act for the safe and satisfactory uses of the Ohio River as public and industrial water supplies after reasonable treatment, suitable for recreational usage, capable of maintaining fish and other aquatic life, and that therefore the requirement of the Compact are being satisfied by member states through these programs.

Given the fact that all member states are implementing approved programs under the federal Clean Water Act, the Commission will discontinue the triennial review process of updating the PCS rules. By proceeding under this approach the Commission is confident that public will have the full and complete protection of the federal Clean Water Act and the oversight of USEPA and the states without the redundancy of the current PCS program.

The standards set forth in this document are intended to be the mandatory requirements to be applied to the Ohio River as established in the Compact.”

ORSANCO’s argument boils down to a simple claim: because state’s implement programs that satisfy the Clean Water Act, states satisfy the requirements of the aforementioned Compact. However, ORSANCO ignores the spirit of the Clean Water Act and the Ohio River Valley Water Sanitation Compact. By rescinding the substantive numeric water quality criteria contained within the Pollution Control Standards, ORSANCO sets in motion a chain of events that will inevitably harm the water quality of the Ohio River.

Conflicts with the Clean Water Act and ORSANCO’s Compact

When Congress originally passed the Clean Water Act, it established policy goals to eliminate the discharge of pollutants into navigable waters and to prohibit the discharge of toxic pollutants in toxic amounts. Clean Water Act, Sec. 101 (a). While the United States has not achieved that laudable goal, waterways all across the country have much better water quality now than in the early 1970s. .

Similarly, the Ohio River Valley Water Sanitation Compact established particular water pollution obligations for the signatory states to the compact, including all of the following:

- Faithful cooperation in the control of future pollution in and abatement of existing pollution from the rivers. See Ohio River Valley Water Sanitation Compact, Article I.

- Enactment of necessary legislation to enable each State to place and maintain in the waters a satisfactory sanitary condition, available for sale and satisfactory use as public and industrial water supplies after reasonable treatment, suitable for recreational usage, capable of maintaining fish and other aquatic life, and free from unsightly or malodorous nuisances due to floating solids or sludge deposits. See Ohio River Valley Water Sanitation Compact, Article I.
- Pollution by sewage or industrial wastes originating within a signatory State shall not injuriously affect the various uses of the interstate waters. See Ohio River Valley Water Sanitation Compact, Article VI.

Article VI of the Compact further establishes the methods through which ORSANCO achieves the goal of avoiding interstate water pollution. Specifically, the Compact allows ORSANCO to promulgate rules to protect the public health or to preserve the waters for other legitimate purposes, and those rules are developed and determined as necessary by the Commission. The Commission may promulgate rules governing the following affirmative obligations:

- The removal of not less than forty-five per cent of the total suspended solids, and in specific instances a higher degree of treatment to achieve the goals in Article I of the Compact
- The modification or treatment of industrial wastes discharged or permitted to flow into the Ohio River, to such a degree necessary to achieve the goals stated in Article I of the Compact
- An insurance that any pollution into tributary waters situated wholly within one State are treated or modified so that the waters of the State are of equal water quality to the waters of the Ohio River

Both the Clean Water Act and the Compact enshrine the policy goal to eliminate water pollution from the waterways of the United States. However, the Clean Water Act was promulgated by Congress in the 1970s, while the states within the watershed of the Ohio River signed the Compact in 1948. The states tailored the compact specifically for the needs of the Ohio River, and for forty years after the passage of the Clean Water Act, the states of the Compact used ORSANCO to pass more stringent rules tailored specifically for that purpose: The Pollution Control Standards.

However, the Commission argues in its revised Pollution Control Standards that the requirements placed by the Clean Water Act upon the individual signatory states to the Compact satisfy the requirements of the Compact itself. The Commission has trapped itself into erroneous logic. If the goal of the Clean Water Act is to eliminate all pollution into the waters of the United States, eliminating Pollution Control Standards that are more stringent than the rules promulgated under the Clean Water Act cannot achieve such a goal.

Similarly, the Compact authorizes the Commission to promulgate rules to achieve the Article I and Article VI objectives of the Compact, and for forty years the Commission has believed that the additional protections provided by the Pollution Control Standards are necessary to satisfy the Compact beyond the federally required standards from the Clean Water Act. ORSANCO has a duty to promulgate rules that enforce the provisions of the article; if it makes changes to already promulgated rules, it must provide evidence that those changes further the goals of the Compact. ORSANCO has not provided evidence that shows that a lessening of the Pollution Control Standards will improve water quality, or keep the water quality of the Ohio River at its current level.

In fact, all the evidence points in the opposite direction. By removing the Pollution Control Standards, ORSANCO will weaken the strength of water quality standards used by state environmental agencies in the development of NPDES Permits. In turn, this will impact the water quality of the Ohio River and adjoining tributaries. With the varied standards between the signatory states as evidenced in the Minority Report, ORSANCO risks increased instances of transboundary water pollution between states with water quality standards.

Significant Differences between Ohio EPA Regulations and ORSANCO PCS

To emphasize the shift in applicable water quality criteria that communities along the Ohio River will face if ORSANCO amends these Pollution Control Standards, the OEC has catalogued the differences between the Standards and the Ohio EPA's water quality criteria for the protection of human health. In **Appendix I**, we have provided a complete chart that notes these differences. In addition to the actual data showing the specific discrepancies, we have provided narrative discussing a nonexhaustive subset of particular substances that pose both a significant danger to public health and have significantly different water quality criteria under the Ohio EPA when compared to ORSANCO's Pollution Control Standards.

Finally the OEC attaches as **Appendix II** a 2011 proposed water quality standard for the Ohio River. These 2011 proposed water quality standards were never adopted by

the agency, but the agency readily admits the following in its fact sheet explaining the 2011 proposed rulemaking:

Existing rule 32 includes tables of water quality criteria that are combinations of Ohio and ORSANCO (Ohio River Valley Water Sanitation Commission) water quality criteria. The existing rule is being rescinded and replaced with new rule 32 that identifies applicable use designations and incorporates the criteria from the ORSANCO "Pollution Control Standards for discharges to the Ohio River" that are more stringent than the criteria for those use designations. *Draft Rules – Surface Water Quality Water Quality Standards (OAC Chapter 3745-1)*, Ohio Environmental Protection Agency, (December 2010), http://www.epa.state.oh.us/portals/35/rules/fs_ipr_wqs_dec10.pdf.

OAC 3745-1-32(A) and Table 32-1

Ohio EPA implements water quality standards for the Ohio River at OAC 3745-1-32. Generally speaking, these water quality standards implement the numeric criteria promulgated in OAC 3745-1-33 and 3745-1-34 for the Ohio River. However, OAC 3745-1-32 does include certain criteria not mentioned in other sections, including Table 32-1, which implements water quality criteria similar to parameters found in ORSANCO's current Pollution Control Standards. Specifically, Table 32-1 implements water quality criteria covering bacteria (fecal coliform), cyanide, dissolved oxygen, radionuclides, and temperature.

In its more generalized water quality criteria for the entire state for the protection of human health, the Ohio EPA lacks water quality criteria covering radionuclides and fecal coliform. If the grounding for Table 32-1 comes from ORSANCO's Pollution Control Standards, the OEC hopes the Ohio EPA does not choose to rescind that water quality criteria if ORSANCO rescinds the substantive portions of the Pollution Control Standards.

Ammonia

Ammonia is an inorganic gas produced naturally and is used in a variety of processes, such as fertilizers and cleaners; it can affect the dermal, ocular, and respiratory systems. See "Ammonia", Agency for Toxic Substances & Disease Registry, <https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=2>. Ohio EPA lacks water quality criteria for Ammonia but ORSANCO proposes a limitation of 0.1 mg/L. As noted in the technical comments produced by the Environmental Law & Policy Center, a number of NPDES permits along the Ohio River have implemented ammonia limitations based on the ORSANCO Pollution Control Standards, even when their state has not promulgated water quality criteria for ammonia.

Benzidine

Benzidine, a confirmed human carcinogen, affects the liver, immune system, and nervous system. See “Benzidine”, Agency for Toxic Substances & Disease Registry, <https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=105>. Ohio’s water quality standard for the Ohio River limits Benzidine to 0.0012 micrograms per liter, while ORSANCO’s current standards limit Benzidine to 0.000086 micrograms per liter.

Bromoform

Bromoform is a non flammable liquid with a sweet odor that can sometimes form naturally in plants or in the ocean. See “Bromoform & Dibromochloromethane”, Agency for Toxic Substances & Disease Registry, <https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=128>. The substance is still used as a laboratory reagent in the U.S., though was used as a flame retardant or solvent in the past. It affects the liver, nervous system, and kidneys. For the Ohio River, the Ohio EPA has limited Bromoform to 43 micrograms per liter, but ORSANCO’s standards limit the substance to 4.3 micrograms per liter.

Chloroform

Chloroform, a colorless liquid formerly used as an anesthetic, is still used to create other substances and can form naturally when chlorine mixes with water. See “Chloroform”, Agency for Toxic Substances & Disease Registry, <https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=16>. Chloroform can affect the cardiovascular system, liver, nervous system, and urinary system, and can also disrupt reproductive systems and the development of children. In the Ohio River water quality standard, the Ohio EPA limits chloroform to 57 micrograms per liter, while ORSANCO limits it to 5.7 micrograms per liter.

Cyanide

The dangers of cyanide need know introduction; while infamous as a “poison,” its used throughout industry in the production of organic chemicals, electroplating, metallurgy, photography, and more. See “Cyanide”, Agency for Toxic Substances & Disease Registry, <https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=19>. Cyanide affects the skin, the nervous system, and the reproductive systems. The Ohio EPA listed “free” Cyanide in its Ohio River water quality standard at 200 micrograms per liter at intakes, and 700 micrograms per liter everywhere else. Additionally, Table 32-1 at OAC 3745-1-32 provides further limitations for “free” Cyanide, at 44 micrograms per liter inside mixing zones and 22 micrograms per liter for an outside mixing zone maximum.

While ORSANCO does not provide a “free” cyanide pollution control standard for the protection of human health (it does list a standard for the protection of aquatic life), ORSANCO does limit total cyanide at 140 micrograms per liter. The Ohio EPA does not provide water quality criteria for total cyanide.

DDD, DDE, and DDT

DDT is a pesticide banned in 1972; DDE and DDD are related chemicals that occur when commercially preparing DDT. See “DDT, DDE, DDD”, Agency for Toxic Substances & Disease Registry, <https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=20>. A probable human carcinogen, these related chemicals have developmental effects, and impact the endocrine, hepatic, neurological, and reproductive systems. The Ohio EPA limits DDD in the Ohio River’s water quality standard to 0.0083 micrograms per liter, and DDE and DDT to 0.0059 micrograms per liter. Conversely, ORSANCO limits DDD to 0.00031 micrograms per liter, and DDE and DDT to 0.00022 micrograms per liter.

E Coli and Fecal Coliform

The Ohio EPA regulates E. coli and fecal coliform hand-in-hand in its Ohio River water quality standard. In Table 32-1, Ohio EPA notes that “for the months of May to October, measurements of Escherichia coli bacteria may be substituted for fecal coliform.” When substituting, the content of E. coli cannot exceed 130 per 100 mL. Ohio EPA requires that “the maximum allowable level of fecal coliform bacteria shall not exceed two hundred ml as a monthly geometric mean based on not less than five samples per month.” However, between November and April. Fecal coliform bacteria may not exceed 2100 ml.

On the other hand, ORSANCO limits E. Coli to 130 CFU/100 mL and fecal coliform to 2000 CFU/ 100 mL. In the Ohio EPA’s Ohio River water quality standard, the agency has essentially adopted ORSANCO’s limitation, with slight variation in the maximum allowable fecal coliform limit. However, the Ohio EPA does not have a fecal coliform or E. coli standard under its own water quality criteria; if Ohio EPA has based these values on the work of ORSANCO, then rescinding the Pollution Control Standards may incentivize the Ohio EPA to rescind its own standards for these dangerous bacteria.

Isophorone

Isophorone is an industrial solvent that occurs naturally in cranberries; it affects the hepatic system. See “Isophorone”, Agency for Toxic Substances & Disease Registry, <https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=148>. In the Ohio River

water quality standard, the Ohio EPA limits Isophorone to 360 micrograms per liter, while ORSANCO limits it to 35 micrograms per liter.

Methylmercury

Methylmercury is a compound formed when microorganisms methylate inorganic mercury, and presents a danger to humans separate from inorganic mercury due to “its variable toxicity dependent on its form, inflow path, exposure amount, and individual susceptibility.” “Methylmercury Exposure and Health Effects”, J Prev Med Public Health. 2012 Nov; 45(6): 353–363. Published online 2012 Nov 29. doi: 10.3961/jpmph.2012.45.6.353. The Ohio EPA does not provide any numeric criteria for methylmercury in its water quality standard for the Ohio River, though it does provide standards for mercury at 40 micrograms per liter at outtakes and 100 micrograms per liter everywhere else.

However, ORSANCO provides a specific limitation for methylmercury for the Ohio River, at 0.3 mg/kg for the protection of human health.

Combined radium 226 and 228; Total gross strontium 90

For the Ohio River, the Ohio EPA has implemented limitations for “radionuclides,” which includes radium-226 (but does not include radium 228), and gross strontium-90. The limitations provided by the Ohio EPA match the values promulgated by ORSANCO in its standards. However, the Ohio EPA has not promulgated radionuclide water quality criteria elsewhere, so if ORSANCO rescinds its PCS which include these numeric values, Ohio EPA may decide to rescind its own values, too.

Silver

Similarly, the Ohio EPA has included in its Ohio River water quality standard a limitation for Silver at 50 micrograms per liter, matching ORSANCO’s limitation in its Pollution Control Standards. Likewise, the Ohio EPA has not promulgated water quality criteria for Silver anywhere outside the Ohio River water quality standard, so if ORSANCO rescinds its standards, Ohio EPA may choose to rescind its limitation upon Silver for the Ohio River.

Tetrachloroethylene

Tetrachloroethylene is a substance used in dry cleaning and metal-degreasing and other industrial processes; it is a probable carcinogen, and affects developmental, neurological, and respiratory systems. See “Tetrachloroethylene”, Agency for Toxic Substances & Disease Registry, <https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=48>. The Ohio EPA has established in the Ohio River water quality standard a

limitation of 5 micrograms per liter for this substance at intakes, and 8 micrograms per liter everywhere else. ORSANCO proposes a more stringent limitation at 0.69 micrograms per liter.

Thallium

Thallium, while not produced in the United States, is still imported for use in manufacturing of electronic devices; it can affect the gastrointestinal, hepatic, neurological, and renal systems. See “Thallium”, Agency for Toxic Substances & Disease Registry, <https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=49>. The Ohio EPA’s water quality standard for the Ohio River limits Thallium to 1.7 micrograms per liter, while ORSANCO limits Thallium to 0.24 micrograms per liter.

TCDD (Dioxin)

TCDD is the most widely studied of a family of substances known as CDDs, and it one of the most toxic; these substances are “formed during chlorination by waste and drinking water treatment plants.” “Chlorinated Dibenzo-p-dioxins (CDDs)”, Agency for Toxic Substances & Disease Registry, <https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=63>. Dioxin can affect the dermal, developmental, immunological, and reproductive systems and is a known carcinogen. The Ohio EPA limits Dioxin in the Ohio River to 0.13 picograms per liter; ORSANCO limits Dioxin to 0.005 picograms per liter.

Conclusion

Our comments provide insight into the inconsistent logic proposed by ORSANCO in considering an enormous substantive modification to its Pollution Control Standards. ORSANCO claims that it need not develop the Pollution Control Standards further because all states develop programs approved by the United States Environmental Protection Agency. However, ORSANCO misinterprets its fundamental purpose as a regional regulatory body. It is not designed as a body that ensures that individual state agencies satisfy federal law; for the Ohio River Valley Water Sanitation Compact creates obligations that go beyond the law put forth by the Clean Water Act. The states should cooperate together to create standards that adequately protect the Ohio River.

Perhaps the individual programs of the states along the Ohio River provide some protection, but the OEC’s analysis (and the analysis of numerous other public interest organizations) proves an irrefutable truth. Rescinding the numeric criteria within the Standards ***will eliminate water quality criteria more stringent than what currently exists within the water quality standards of the individual states.***

Removing protections already scientifically developed for the protection of human health goes against the purpose of both the Compact and the Clean Water Act. ORSANCO has provided no scientific justification for removing these numeric criteria. Therefore, the Commissioners must vote against the proposal to modify the Pollution Control Standards; any other choice is a clear dereliction of their duty to collectively protect the waters of the Ohio River.

Respectfully submitted,

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Appendix I

NOTE: The numerical values for the Ohio Water Quality Criteria are drawn from OAC 3745-1-33 and 3745-1-34. In limited instances, the actual Water Quality Standard for the Ohio River found at OAC 3745-1-32 contains slightly different criteria than the water quality criteria found in OAC 3745-1-33 and 3745-1-34. Those differences are noted above in discussion of individual criteria where applicable.

In this chart, we compared the ORSANCO Pollution Control Standards to the Ohio Water Quality Criteria rather than the promulgated water quality standard for the Ohio River. If ORSANCO rescinds its pollution control standards, the criteria in the Ohio River water quality standard will only have the Ohio water quality criteria as a basis, and Ohio EPA could potentially remove those criteria based on ORSANCO's Pollution Control Standards.

Ohio Water Quality Criteria		<u>ORSANCO Pollution Control Standards</u>
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Human Health (Fish, ug/L)	Human Health (Public Water Supply, ug/L)	Chemical	Human Health (Carcinogenic, ug/L)	Human Health (non-carcinogenic, ug/L)
2700	1200	Acenaphthene		670
780	320	Acrolein		190
6.6	0.59	Arcylonitrile	0.051	
0.0014	0.0013	Aldrin	0.000049	
		Ammonia		1 mg/L
110,000	9600	Anthracene		8300
4,300	6	Antimony		5.6
	10	Arsenic		0.010 mg/L
	7 Mf/l	Asbestos		7,000,000 fibers/L
	2000	Barium		1 mg/L
710	5	Benzene	2.2	
0.0054	0.0012	Benzidine	0.000086	
0.49	0.044	Benzo(a)anthracene	0.0038	
0,49	0.044	Benzo(a)pyrene	0.0038	
0.49	0.044	Benzo(b)fluoranthene	0.0038	
0.49	0.044	benzo(k)fluroanthene	0.0038	
3600	43	Bromoform	4.3	
5200	3000	Butylbenzyl phthalate		1500
	5	Cadmium	-	-
44	2.5	Carbon tetrachloride	0.23	
0.022	0.021	Chlordane	0.0008	
	250 (mg/l)	Chlorides	-	-
21000	100	Chlorobenzene		130
340	4.1	Chlorodibromomethane	0.4	
14	0.31	Bis(2-Chloroethyl)ether	0.03	
4700	57	Chloroform	5.7	
170000	1400	bis(2-Chloroisopropyl)ether		1400
	100	Chromium III	-	-
	100	Chromium VI	-	-
0.49	0.044	Chrysene		0.0038
1300		Copper		1300

		Cyanide		140
220000	200	Cyanide (free)	-	-
0.0084	0.0083	4,4'-DDD	0.00031	
0.0059	0.0059	4,4'-DDE	0.00022	
0.0059	0.0059	4,4'-DDT	0.00022	
0.49	0.044	Dibenzo(a,h)anthracene	0.0038	
0.0014	0.0014	Dieldrin	0.000052	
120000	23000	Diethyl phtalate		17000
2,900,000	310000	Dimethyl phtalate		270000
12000	2700	Di n Butyl Phthalate		2000
Not in water quality criteria but in Ohio EPA water quality standard for Ohio River		E Coli		130 CFU/100 mL (GM), 240 CFU/100mL
240	110	alpha-Endosulfan	62	
240	110	beta-Endosulfan	62	
240	110	Endosulfan sulfate		62
0.81	0.76	Endrin		0.059
0.81	0.76	Endrin aldehyde		0.29
29,000	700	Ethylbenzene		530
Not in water quality criteria but in Ohio EPA water quality standard for Ohio River		fecal Coliform		2000 CFU/100mL
59	6	bis(2-Ethylhexyl)phthalate	1.2	
370	300	Fluroanthene		130
14,000	1300	Fluorene		1100
	4000	Fluoride		1.0 mg/L
0.0021	0.0021	Heptachlor	0.000079	
0.0011	0.001	Heptachlor epoxide	0.000039	
0.0077	0.0075	Hexachlorobenzene	0.00028	
500	4.4	Hexachlorobutadiene	0.44	
0.13	0.039	alpha-Hexachlorocyclohexane	0.0026	
0.46	0.14	beta-Hexachlorocyclohexane	0.0091	
0.63	0.19	gamma-Hexachlorocyclohexane (Lindane)		0.98
17,000	50	Hexachlorocyclopentadiene		40

89	19	Hexachloroethane	1.4	
0.49	0.044	Ideno (1,2,3-c,d)pyrene	0.0038	
26000	360	Isophorone	35	
0.012	0.012	Mercury		0.000012 mg/L
4000	48	Methyl bromide		47
16000	5	Methylene chloride	4.6	
		methylmercury		0.3 mg/kg
4600	610	Nickel		610
	10000	Nitrate-N + Nitrite-N		10 mg/L
	1000	Nitrite-N		1 mg/L
1900	17	Nitrobenzene		17
81	0.008	N-Nitrosodimethylamine	0.00069	
14	0.05	N-Nitrosodi-n-propylamine	0.005	
160	50	N-Nitrosodiphenylamine	3.3	
82	1	Pentachlorophenol	0.27	
4600000	21000	Phenol	21000	
0.0017	0.0017	Polychlorinated biphenyls	0.000064	
11000	960	Pyrene		830
While not implemented in Ohio water quality criteria, Ohio EPA has promulgated these values into its Ohio Water Quality Standard.		combined radium 226 and radium 228	4pCi/L	
		gross total alpha	15 pCi/L	
		total gross beta	50 pCi/L	
		total gross strontium 90	8 pCi/L	
11000	50	Selenium	170	
Not in water quality criteria but in Ohio EPA water quality standard		Silver	0.05 mg/L	
		Temperature		110 Deg F
89	5	Tetrachloroethylene	0.69	
	1.7	Thallium		0.24
200000	1000	Toluene		1300
0.0075	0.0073	Toxaphene	0.00028	
810	5	Trichloroethylene	2.5	
65	21	2,4,6-Trichlorophenol	1.4	
5300	2	Vinyl chloride	0.025	

69000	9100	Zinc		7400
110	1.7	1,1,2,2-Tetrachloroethane	0.17	
420	5	1,1,2-Trichloroethane	0.59	
32	0.57	1,1-Dichloroethylene		330
940	70	1,2,4-Trichlorobenzene		35
17000	600	1,2-Dichlorobenzene		420
990	3.8	1,2-Dichloroethane	0.38	
390	5	1,2-Dichloropropane	0.5	
5.4	0.4	1,2-Diphenylhydrazine	0.036	
140000	100	1,2-Trans-Dichloroethylene		140
2600	400	1,3-Dichlorobenzene		320
1700	10	1,3-Dichloropropene	0.34	
2600	75	1,4-Dichlorobenzene		63
0.14	0.13	2,3,7,8-TCDD (Dioxin)	0.000000005	
790	93	2,4-Dichlorophenol		77
2300	540	2,4-Dimethylphenol		380
--	70	2,4-Dinitrophenol		69
91	1.1	2,4-Dinitrotoluene	0.11	
4300	1700	2-Chloronaphthalene		1000
400	120	2-Chlorophenol		81
14000	13	2-Methyl-4,6-Dinitrophenol		13
0.77	0.4	3,3-Dichlorobenzidine	0.021	

Appendix II

Below, we have provided the text of a proposed Ohio river water quality standard that was never finalized into the Ohio Administrative Code. Ohio EPA proposed this version of the Ohio River water quality standard specifically to implement the water quality criteria developed by ORSANCO that was more stringent than the previous water quality criteria of the Ohio EPA.

For instance, note that the Dioxin numeric criteria proposed in the text below is 0.005 picograms per liter, matching the ORSANCO limit but not the current Ohio water quality standard.

Source: 2011 OH REG TEXT 280049 (NS), 2011 OH REG TEXT 280049 (NS) (Westlaw)

OH ADC 3745-1-32

OH ADC 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.]

The Ohio river is designated warmwater habitat, public water supply, agricultural water supply, industrial water supply and bathing waters, and will meet the criteria set forth in, or derived in accordance with, rules 3745-1-01 to 3745-1-07 of the Administrative Code and rules 3745-1-35 to 3745-1-43 of the Administrative Code. However, criteria set forth in this rule supercede the criteria for those designations where applicable.

(A) Water quality criteria for the protection of aquatic life.

Table 32-1. Ohio river water quality criteria for the protection of aquatic life.

Chemical Form¹ Units² IMZM³ OMZM³ OMZA³

Ammonia T mg/l -- Table 42-2c Table 42-2a,c

Cadmium TR ug/l Table 32-2 Table 32-2 Table 32-2

Cyanide free ug/l 44 22 5.2

Dissolved oxygen⁴ T mg/l -- 4.0b 5.0

Lead TR ug/l Table 32-2 Table 32-2 Table 32-2

Selenium TR ug/l -- 20 5.0

Temperature -- -- -- Table 32-3 Table 32-3

¹ T = total; TR = total recoverable.

² mg/l = milligrams per liter (parts per million); ug/l = micrograms per liter (parts per billion).

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

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

a In addition, the four-day average within the thirty-day period shall not exceed 2.5 times the OMZA.

b During the April fifteen to June fifteen spawning season, a minimum concentration of 5.0 mg/l shall be maintained at all times.

c Table 42-2 can be found in rule 3745-1-42 of the Administrative Code.

Table 32-2. Water quality criteria for the protection of aquatic life for water hardness dependent criteria.

A. The equations in this table can be used to calculate numeric criteria at any water hardness up to 400 mg/l CaCO₃. The criteria at a water hardness of 400 mg/l CaCO₃ are used for water hardnesses above 400 mg/l CaCO₃. "e" = the base e exponential function. "ln H" = the natural logarithm of the water hardness. Criteria at example values of water hardness are in table 32-2B of this rule.

Table 32-2A.

Chemical Total Recoverable Criteria (ug/l²) Dissolved Criteria (ug/l²) Conservation Factor (CF)

Cadmium

--IMZM1 $e^{(0.8368[\ln H] - 2.867)} / CF e^{(0.8368[\ln H] - 2.867)} 1.136672 - [(\ln H) \times 0.041838]$

--OMZM1 $e^{(0.8368[\ln H] - 3.560)} / CF e^{(0.8368[\ln H] - 3.560)} 1.136672 - [(\ln H) \times 0.041838]$

--OMZA1 $e^{(0.7409[\ln H] - 4.719)} e^{(0.7409[\ln H] - 4.719)} \times CF 1.101672 - [(\ln H) \times 0.041838]$

Lead

--IMZM1 $e^{(1.273[\ln H] - 0.7669)} e^{(1.273[\ln H] - 0.7669)} \times CF 1.46203 - [(\ln H) \times 0.145712]$

--OMZM1 $e^{(1.273[\ln H] - 1.460)}$ $e^{(1.273[\ln H] - 1.460)}$ x CF 1.46203 - $[(\ln H) \times 0.145712]$

--OMZA1 $e^{(1.273[\ln H] - 4.705)}$ $e^{(1.273[\ln H] - 4.705)}$ x CF 1.46203 - $[(\ln H) \times 0.145712]$

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

2 ug/l = micrograms per liter (parts per billion).

B. Water quality criteria for the protection of aquatic life for water hardness dependent criteria.

Table 32-2B.

Chemical Form1 Units2 Criteria

100 200 300 400

Cadmium

--IMZM3 D4 ug/l 2.7 4.8 6.7 8.6

--OMZM3 D4 ug/l 1.3 2.4 3.4 4.3

--OMZA3 D4 ug/l 0.25 0.40 0.53 0.64

Cadmium

--IMZM3 TR5 ug/l 2.8 5.2 7.5 9.7

--OMZM3 TR5 ug/l 1.4 2.6 3.7 4.8

--OMZA3 TR5 ug/l 0.27 0.45 0.61 0.76

Lead

--IMZM3 D4 ug/l 130 270 420 560

--OMZM3 D4 ug/l 65 140 210 280

--OMZA3 D4 ug/l 2.5 5.3 8.1 11

Lead

--IMZM3 TR5 ug/l 160 390 660 950

--OMZM3 TR5 ug/l 82 200 330 480

--OMZA3 TR5 ug/l 3.2 7.7 13 19

1 D = dissolved; TR = total recoverable.

2 ug/l = micrograms per liter (parts per billion).

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

4 These criteria are implemented by multiplying them by a translator approved by the director pursuant to rule 3745-2-04 of the Administrative Code.

5 These criteria apply in the absence of a translator approved by the director pursuant to rule 3745-2-04 of the Administrative Code.

Table 32-3. Ohio river temperature criteria.

Month/date Period average Instantaneous maximum

°F °C °F °C

January 1-31 45 7.2 50 10.0

February 1-29 45 7.2 50 10.0

March 1-15 51 10.6 56 13.3

March 16-31 54 12.2 59 15.0

April 1-15 58 14.4 64 17.8

April 16-30 64 17.8 69 20.6

May 1-15 68 20.0 73 22.8

May 16-31 75 23.9 80 26.7

June 1-15 80 26.7 85 29.4

June 16-30 83 28.3 87 30.6

July 1-31 84 28.9 89 31.7

August 1-31 84 28.9 89 31.7

September 1-15 84 28.9 87 30.6

September 16-30 82 27.8 86 30.0

October 1-15 77 25.0 82 27.8

October 16-31 72 22.2 77 25.0

November 1-30 67 19.4 72 22.2

December 1-31 52 11.1 57 13.9

(B) Water quality criteria for the protection of human health. These criteria apply everywhere in the Ohio river outside mixing zones, unless specified otherwise.

(1) Bacteria. For the protection of the public water supply use, at no time shall fecal coliform bacteria content exceed two thousand per one hundred milliliters as a monthly geometric mean based on not less than five samples per month year round.

(2) Total ammonia-nitrogen. Total ammonia-nitrogen shall not exceed one milligram per liter at any surface water intake for a public water system.

(3) Radionuclides. Gross total alpha 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. Concentration of total gross beta particle activity shall not exceed fifty pCi/l. 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.

(4) Total dissolved solids. Total dissolved solids shall not exceed five hundred milligrams per liter at river flows equal to or greater than the minimum seven day, ten year flow at drinking water intakes.

(5) In addition to the criteria in table 32-4 of this rule, the water quality criteria identified in table 40-2 of rule 3745-1-40 of the Administrative Code apply everywhere in the Ohio river outside mixing zones, except that the ambient water quality criteria based on maximum contaminant levels (MCLs) identified in table 40-1 of rule 3745-1-40 of the Administrative Code apply outside mixing zones only within five hundred yards of surface water intakes for public water systems.

Table 32-4. Ohio river water quality criteria for the protection of human health.

Chemical Form1 Units2 OMZA3

Acenaphthene T ug/l 670

Acrolein T ug/l 190

Acrylonitrile5 T ug/l 0.51

Aldrin5 T ug/l 0.00049

Anthracene T ug/l 8,300

Antimony TR ug/l 5.6

Arsenic T ug/l 10

Asbestos T MF/l 7.0

Barium T ug/l 1,000

Benzene5 T ug/l 12

Benzidine5 T ug/l 0.00086

Benzo(a)anthracene5 T ug/l 0.038

Benzo(a)pyrene5 T ug/l 0.038

Benzo(b)fluoranthene5 T ug/l 0.038

Benzo(k)fluoranthene5 T ug/l 0.038

Beryllium TR ug/l 16

Bromoform5 T ug/l 43

Butylbenzyl phthalate T ug/l 1,500

Carbon tetrachloride5 T ug/l 2.3

Chlordane5 T ug/l 0.008

Chlorides T ug/l 250,000

Chlorobenzene T ug/l 130
Chlorodibromomethane⁵ T ug/l 4.0
bis(2-Chloroethyl)ether⁵ T ug/l 0.30
2-Chloronaphthalene T ug/l 1,000
2-Chlorophenol T ug/l 81
Chrysene⁵ T ug/l 0.038
Copper TR ug/l 1,300
Cyanide Free ug/l 140
2,4-D (Dichlorophenoxyacetic acid) T ug/l 100
4,4'-DDD⁵ T ug/l 0.0031
4,4'-DDE⁵ T ug/l 0.0022
4,4-DDT⁵ T ug/l 0.0022
Dibenzo(a,h)anthracene⁵ T ug/l 0.038
Di-n-butyl phthalate T ug/l 2,000
1,2-Dichlorobenzene T ug/l 420
1,3-Dichlorobenzene T ug/l 320
1,4-Dichlorobenzene T ug/l 63
3,3'-Dichlorobenzidine⁵ T ug/l 0.21
Dichlorobromomethane⁵ T ug/l 5.5
trans-1,2-Dichloroethylene T ug/l 140
2,4-Dichlorophenol T ug/l 77
1,2-Dichloropropane⁵ T ug/l 5.0
1,3-Dichloropropene T ug/l 3.4

Dieldrin⁵ T ug/l 0.00052

Diethyl phthalate T ug/l 17,000

2,4-Dimethylphenol T ug/l 380

Dimethyl phthalate T ug/l 270,000

Dinitrophenols⁴ T ug/l 69

2,4-Dinitrotoluene T ug/l 1.1

1,2-Diphenylhydrazine T ug/l 0.36

alpha-Endosulfan⁶ T ug/l 62

beta-Endosulfan⁶ T ug/l 62

Endosulfan sulfate⁶ T ug/l 62

Endrin⁷ T ug/l 0.059

Endrin aldehyde⁷ T ug/l 0.29

Ethylbenzene T ug/l 530

bis(2-Ethylhexyl)phthalate⁵ T ug/l 12

Fluoranthene T ug/l 130

Fluorene T ug/l 1,100

Fluoride T ug/l 1,000

Heptachlor⁵ T ug/l 0.00079

Heptachlor epoxide⁵ T ug/l 0.00039

Hexachlorobenzene⁵ T ug/l 0.0028

alpha-Hexachlorocyclohexane⁵ T ug/l 0.026

beta-Hexachlorocyclohexane⁵ T ug/l 0.091

Hexachlorocyclopentadiene T ug/l 40

Hexachloroethane⁵ T ug/l 14

Indeno(1,2,3-c,d)pyrene⁵ T ug/l 0.038

Isophorone⁵ T ug/l 350

Methoxychlor T ug/l 100

Methyl bromide T ug/l 47

Methylene chloride⁵ T ug/l 46

Nitrate-N + Nitrite-N T ug/l 10,000

Nitrite-N T ug/l 1,000

N-Nitrosodiphenylamine⁵ T ug/l 33

Pentachlorophenol⁵ T ug/l 2.7

Phenol T ug/l 21,000

Phenolics T ug/l 5.0

Polychlorinated biphenyls⁵ T ug/l 0.00064

Pyrene T ug/l 830

Selenium TR ug/l 170

Sulfates T ug/l 250,000

2,3,7,8-Tetrachlorodibenzo-p-dioxin⁵ T ug/l 0.00000005

Tetrachloroethylene⁵ T ug/l 6.9

Thallium TR ug/l 0.24

Toluene T ug/l 1,300

Toxaphene⁵ T ug/l 0.0028

1,2,4-Trichlorobenzene T ug/l 35

1,1,2-Trichloroethane⁵ T ug/l 5.9

Trichloroethylene⁵ T ug/l 25

2,4,6-Trichlorophenol⁵ T ug/l 14

Vinyl chloride⁵ T ug/l 0.25

Zinc T ug/l 7,400

1 T = total; TR = total recoverable.

2 ug/l = micrograms per liter; Mf/l = million fibers per liter.

3 OMZA = outside mixing zone average.

4 The criteria for this chemical apply to the sum of all dinitrophenols.

5 Criteria for this chemical are based on a carcinogenic endpoint.

6 The criteria for this chemical apply to the sum of alpha-endosulfan, beta-endosulfan and endosulfan sulfate.

7 The criteria for this chemical apply to the sum of endrin and endrin aldehyde.

Replaces: 3745-1-32

Effective:

R.C. 119.032 review dates:

Certification

Date

Promulgated Under: 119.03

Statutory Authority: 6111.041

Rule Amplifies: 6111.041

Prior Effective Dates: 4/4/1985, 8/19/1985, 5/1/1990, 10/31/1997, 12/30/2002

