THE IMPORTANCE OF SAFE DRINKING WATER FOR PROTECTING WOMEN'S AND CHILDREN'S HEALTH

SAFE WATER
FOR WEST VIRGINIA

WEST VIRGINIA RIVERS COALITION

wvfree.org
Advocates for Reproductive Health, Rights and Justice

INTRODUCTION

While polluted drinking water can harm any person, pregnant women and babies are particularly sensitive to certain pollutants. Category A, one portion of the state's water quality standards, protects surface waters from harmful levels of more than 80 pollutants, including metals, organic compounds, and other toxic pollutants (See Appendix A).

Category A is the backbone for Clean Water Act protections for the state's rivers, streams, and reservoirs that serve as drinking water sources. This document explains the importance of Category A for protecting women's reproductive health.

WEST VIRGINIA'S WATER QUALITY STANDARDS PROVIDE TARGETS FOR KEEPING RIVERS, STREAMS, AND RESERVOIRS CLEAN AND USEABLE

West Virginia's water quality standards protect the state's rivers, streams, and reservoirs now and in the future (47 CSR 2). Specific protections are provided for different uses, and surface waters are typically protected for more than one use.

Category A is shorthand for waters used as public water supplies, defined as waters that, after conventional treatment, are used for human consumption. Other common uses include Category C (water contact recreation), Category B1 (warm water fishery streams), and Category B2 (trout waters).

For each use, West Virginia's water quality standards provide numeric criteria for a variety of parameters that can be measured in the water or in fish. For many pollutants, Category A criteria are the most stringent among the uses, and in some cases, Category A provides the only criteria.

Because Category A limits the amount of toxic and cancer-causing chemicals allowed in our water, it provides extremely important protections for pregnant women and babies, two particularly vulnerable populations.

Category A criteria are enforceable targets for keeping streams clean and for restoring impaired streams. Clean Water Act discharge permits must be written to prevent violations of Category A criteria. If violations occur, a surface water is considered to be impaired. Impaired waters are placed on the state's 303(d) list, and total maximum daily loads (TMDLs) are then written to determine which pollutant sources must be addressed so that the stream can once again meet its Category A criteria.

CATEGORY A PROTECTS DRINKING WATER SOURCES FROM TOXIC POLLUTION

The West Virginia Department of Environmental Protection (WVDEP) has had a longstanding policy of protecting every surface water for Category A, in order to ensure clean drinking water for all people and businesses now and in the future.

While some states only provide drinking water protections in a defined area around known water intakes, WVDEP's Category A policy recognizes that clean drinking water across West Virginia is a precious resource, both for protecting the health of the current population and as a foundation for future economic development. Even with Category A protections in place, the table below shows that thousands of stream miles need to be cleaned up in order to serve as safe drinking water supplies.

Category A pollutant	Impaired waters in West Virginia	Specific impaired rivers and streams
Iron	7,583 stream miles 54 reservoir acres	• Numerous
Polychlorinated biphenyls (PCBs)	478 stream miles 630 reservoir acres	• Ohio River • Kanawha River • Bluestone River • Shenandoah Rivers • Flat Fork of the Kanawha River • R.D. Bailey Lake
Dioxin	352 stream miles	• Ohio River • Kanawha River • Pocatalico River • Armour Creek of the Kanawha River
Methylmercury	9,826 reservoir acres	• Numerous

Source: West Virginia Department of Environmental Protection (Undated). Note: This is not a complete list of all Category A pollutants with 303(d) listings. Also, some Category A pollutants, such as iron, have criteria for other uses. Waters listed as impaired for such waters may violate the Category A criterion, other criteria, or multiple criteria.

CATEGORY A POLLUTANTS IMPACT WOMEN'S REPRODUCTIVE HEALTH

Many Category A pollutants have well-documented impacts on women's reproductive health and on the health of babies. While not a comprehensive list, the following summary lists some of the potential hazards of exposure to chemicals that Category A limits.

IRON

- High doses injected into pregnant rats may result in embryo malformations, such as being born with one or no eyes and a condition in which fluid accumulates in the brain, sometimes causing brain damage (HSDB e).
- Iron compounds can disturb the development of embryos and fetuses, could cause birth defects, or may abort pregnancy outright (HSDB e).

MANGANESE

- Manganese, an essential metal for normal growth and development, is neurotoxic with excessive exposure (Aschner et al. 2015).
- Maternal blood manganese levels during pregnancy are associated with birth weight, suggesting that manganese may affect fetal growth (Zota et al. 2009).

DIOXIN

- Low birth weights and both growth and neurological defects have been associated with dioxin exposure (HSDB a).
- Dioxins may cause malformations of human embryos. Malformations may include central nervous system, cardiac, and skeletal defects (HSDB a).

METHYLMERCURY

- Pregnant women and young children are most vulnerable to methylmercury exposure. Common symptoms of perinatal exposure include increased visual deficits, motor impairment, and an overall cognitive decline. The developing cerebellum is particularly vulnerable to methylmercury neurotoxicity (Patel 2013).
- Consumption of methylmercury contaminated food causes nervous system damage in pregnant women and very serious effects in the fetus (Choi 1991).
- Prenatal exposure to organic mercury is associated with severe effects, including seizures, spasticity, profound mental retardation, and cerebral palsy (HSDB i).

LEAD

- Unborn children are considered particularly susceptible to lead poisoning (HSDB f).
- Lead is transferred across the placenta and affects neurodevelopmental milestones in children with prenatal exposure. It can also affect reproduction in males and females (HSDB f).
- Prenatal exposure to lead is thought to be a risk factor for attention-deficit hyperactivity disorder (ADHD) (HSDB f).
- Increased risk of abortion, premature birth, birth defects, and delayed mental and physical growth are associated with exposure to lead during pregnancy (HSDB f).
- Maternal lead exposure is associated with poor birth outcomes in populations with moderate-to-high blood levels (HSDB f).

POLYCHLORINATED BIPHENYLS (PCBs)

- PCBs are potentially toxic to the developing brain, and prenatal exposure to high background levels of most PCBs seems to impair early motor skills development (Berghuis et al. 2013).
- A potential symptom of occupational PCB overexposure is decreased birth weight in offspring of exposed mothers (HSDB g).
- Although relatively small quantities of PCBs reach the fetus, significant PCB overexposure can cause embryo malformations (HSDB g).
- Prenatal exposure to PCBs is thought to be risk factors for ADHD (HSDB f).

2,4-DICHLOROPHENOL

- Animal test subjects exhibited decreases in maternal body weight gain, decreased fetal weight, and fetal and material death at various chemical concentrations (Multivolume work 1999).

ETHYLBENZENE

- Ethylbenzene has been found to disturb fetal development and can poison a developing fetus or embryo in experimental animals. It has also been detected in umbilical cord blood (HSDB d).
- Ethylbenzene induced maternal and fetal toxicity in rats and developmental toxicity in rat pups at certain concentrations (ChemView c).

BENZENE

- Benzene has been found in umbilical cord blood. Benzene exposure has been linked to menstrual changes, spontaneous abortion, and stillbirth (HSDB c).
- Benzene caused reproductive toxicity in rats at certain concentrations. Effects included decreased maternal and placental weight and increases in number of non-pregnant females, total resorptions and postimplantation fetal loss (ChemView b).
- Benzene caused a significant increase in mouse maternal mortality and embryonic resorption and a significant decrease in fetal weight following certain exposures (ChemView a).

PYRENE

- Embryo malformations have been noted (HSDB h).

ARSENIC

- Inorganic arsenic crosses the placenta and may result in spontaneous abortion or stillbirth with either acute or chronic poisoning (HSDB b).

Category A limits concentrations of a wide range of pollutants, several of which, as outlined above, are hazardous to women's reproductive health. In many cases, Category A provides the most protective criteria compared to all other uses. Currently, all West Virginia surface waters must meet these Category A criteria, in order to ensure that West Virginia's surface waters can be used for human consumption after conventional treatment.

Removing Category A protections would allow more harmful toxins into our rivers and streams. It is imperative to preserve Category A designation for all waters of the state to protect women's health, the health of future generations, and the health of those living downstream.

APPENDIX A:
CATEGORY A POLLUTANTS AND CRITERIA IN WEST VIRGINIA

Pollutant	Concentration	Unit
1,1-dichloroethylene	0.03	µg/L
1,1,1-trichloroethane	12	mg/L
1,1,2,2-tetrachloroethane	0.17	µg/L
1,2-dichlorobenzene	2.7	mg/L
1,2-dichloroethane	0.035	µg/L
1,3-dichlorobenzene	0.4	mg/L
1,4-dichlorobenzene	0.4	mg/L
2-Chloronaphthalene	1,000	µg/L
2-Chlorophenol	120	µg/L
2-methy 1-4,6-Dinitrophenol	13.4	µg/L
2,4-Dichlorophenol	93	µg/L
2,4-Dimethylphenol	540	µg/L
2,4-Dinitrophenol	70	µg/L
2,4-dinitrotoluene	0.11	µg/L
2,4,6-Trichlorophenol	2.1	µg/L
Acenaphthene	670	µg/L
Acrylonitrile	0.059	µg/L
Aldrin	0.071	ng/L
alpa-BHC	0.0039	µg/L
Anthracene	8,300	µg/L
Antimony	14	µg/L
Arsenic	10	µg/L
Barium	1.0	mg/L
Benzene	0.66	µg/L
Benzo(a) Anthracene	0.0038	µg/L
Benzo(a) Pyrene	0.0038	µg/L
Benzo(b) Fluoranthene	0.0038	µg/L
Benzo(k) Fluoranthene	0.0038	µg/L
Beryllium	4.0	µg/L
beta-BHC	0.014	µg/L
Bromoform	4.3	µg/L
Carbon tetrachloride	0.25	µg/L
Chlordane	0.46	ng/L
Chloride	250	mg/L
Chlorobenzene	0.68	mg/L
Chloroform	5.7	µg/L
Chromium	50	µg/L
Chrysene	0.0038	µg/L
Copper	1,000	µg/L
Cyanide	5.0	µg/L
DDT	0.024	ng/L
Dibenzo(a,h)Anthracene	0.0038	µg/L
Dichlorobromomethane	0.55	µg/L
Dieldrin	0.071	ng/L
Dioxin	0.013	pg/L

mg/L=parts per million, µg/L=parts per billion, ng/L= parts per billion

Pollutant	Concentration	Unit
Dissolved oxygen	5	mg/L
Endrin	2.3	ng/L
Ethylbenzene	3.1	mg/L
Fluoranthene	300	µg/L
Fluorene	1,100	µg/L
Fluoride	1.4	mg/L
gamma-BHC	0.019	µg/L
Heptachlor	0.21	ng/L
Hexachlorobenzene	0.72	ng/L
Indeno(1,2,3-cd)Pyrene	0.0038	µg/L
Iron	1.5	mg/L
Lead	50	µg/L
Manganese	1.0	mg/L
Mercury	0.14	µg/L
Mercury-body burden	0.5	µg/g
Methoxychlor	0.03	µg/L
Methyl Bromide	47	µg/L
Methylene Chloride	4.6	µg/L
Nickel	510	µg/L
Nitrate	10	mg/L
PCBs	0.044	ng/L
Pentachlorophenol	0.28	µg/L
Phenol	21,000	µg/L
Pyrene	830	µg/L
Selenium	50	µg/L
Tetrachloroethylene	0.8	µg/L
Thallium	1.7	µg/L
Toluene	6.8	mg/L
Toxaphene	0.73	ng/L
Trichloroethylene	2.7	µg/L

Source: 47 CSR 2, Appendix E. Note: The water quality standards rule includes more complex Category A criteria for cadmium, fecal coliform, pH, radioactivity, silver, threshold odor, and turbidity; these criteria are not shown. Cyanide as free cyanide HCN+CN-). Chromium as dissolved hexavalent. Dissolved Oxygen as minimum value. Mercury-body burden as total organism body burden of any aquatic species as methylmercury. Mercury as total in any unfiltered water sample. Nitrate as Nitrate-N. Dioxin as 2,3,7,8-TCDD. Vinyl chloride as chloroethene. Alpa-BHC as alpha- Hexachlorocyclohexane. Beta-BHC as beta- Hexachlorocyclohexane. Gamma-BHC as gamma- Hexachlorocyclohexane.

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