



# WEST VIRGINIA RIVERS

## HUMAN HEALTH CRITERIA PROPOSAL

Submitted to WVDEP October 1, 2019

West Virginia Rivers Coalition (WV Rivers) believes that clean water is a human right and the foundation of life, and that all people should be able to enjoy West Virginia's rivers and streams for all of their uses. Strong, science-based water quality standards ensure that residents have access to clean water and that their health is protected.

The West Virginia Department of Environmental Protection (WVDEP) must implement stringent standards to minimize the amount of pollution entering state waters and to protect and maintain water quality necessary to meet designated uses such as recreation, public water supply, and aquatic life. Strict standards are essential in preserving residents' health and quality of life in a state that is so fortunate to have plentiful aquatic resources.

During the 2019 session, the Legislature required WVDEP to propose updates to the numeric human health criteria on or before April 1, 2020, for consideration in the 2021 legislative session. As a first step, WVDEP was required to allow for the submission of proposed human health criteria until October 1, 2019. For the health of all West Virginians and visitors to this state, WV Rivers makes the following recommendations on updating West Virginia's human health criteria:

1. Recalculate Environmental Protection Agency's (EPA's) 2015 recommended human health criteria using EPA's regional Inland South fish consumption rate (FCR) of 22.8 grams/day.<sup>1</sup>
2. Adopt all recalculated human health criteria that are more stringent than current West Virginia criteria, including the adoption of new criteria for pollutants that do not have current criteria.
3. Update criteria for pollutants without 2015 updates, but where West Virginia criteria are less stringent than EPA-recommended criteria.
4. Do not relax any existing human health criteria.

The justifications of these recommendations are outlined below.

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<sup>1</sup> U.S. Environmental Protection Agency. 2014 Estimated Fish Consumption Rates for the U.S. Population and Selected Subpopulations (NHANES 2003-2010). EPA-820-R-14-002. April 2014.

## 1. Recalculate EPA's 2015 recommended human health criteria using EPA's regional Inland South FCR of 22.8 grams/day.

The rivers in West Virginia have provided residents plentiful fish for sustenance throughout history. Many West Virginians have a strong connection to our rivers through fishing. In fact, fishing is often seen as an intergenerational family heritage. However, we cannot and do not eat as much fish as generations before us, because of the pollution we have allowed industries to discharge in our rivers. As a state, we should aspire to see our residents eat more fish, not less.

### The Fish Consumption Rate of 9.9 grams/day is flawed.

WVDEP's proposal debated in the 2019 legislative session adopted a FCR of 9.9 grams/day, based on a 2008 West Virginia survey conducted by Responsive Management. WV Rivers is opposed to the use of this FCR for the reasons explained below.

This survey only looked at fish consumption habits of residents from the prior 12 months in 2007-2008. FCR estimates over a short period of time can be quite variable.

This survey also may not be representative of the entire state population. Survey data must be distributed properly across the state for it to be representative of West Virginia's population. Question 318 of the survey asked respondents if they lived in a large city or urban area, suburban area, small city or town, rural area on a farm, or rural area not on a farm. While the responses were split between urban and rural, no information is provided on where, geographically, the respondents were distributed. Without this information, we cannot know whether the statewide fish consumption rate accurately represents the entire state population.

The 2008 West Virginia survey does not account for statewide fish consumption advisories. In 2008, a statewide fish consumption advisory recommended limiting consumption to one meal per month for Black Bass greater than 12 inches, Walleye and Saugeye, White Bass and Hybrid Striped Bass. In comparison, the 2019 statewide fish consumption advisory recommends limiting consumption to one meal per month for White Bass only. Black Bass, Hybrid Striped Bass, Walleye, Sauger and Saugeye can be consumed safely at two meals per month. Basing West Virginia's human health criteria on a 2008 study does not account for the change in the statewide fish consumption advisories that allow for increased consumption of fish. West Virginians would be expected to consume less fish in 2008, as compared with 2019, because of the relaxation of the statewide fish consumption advisories. Moreover, the 2008 study did not ask whether respondents would eat more fish if it were safe to do so. In 2019 it is safer to eat more fish. Basing the state's fish consumption rate on data from 2008 disregards and undermines progress made on relaxing the statewide fish consumption advisories.

### The Fish Consumption Rate of 22.8 grams/day is more appropriate.

When local data is used instead of national data, it must be obtained using comprehensive information and sound science. For this reason, we recommend using EPA's regional Inland South FCR of 22.8 grams/day, which was released in 2014.

EPA's regional Inland South FCR was calculated in the National Health and Nutrition Examination Survey (NHANES) using continuous survey information from an eight-year period: 2003-2010. This is a much longer time frame than the 2008 West Virginia study. As the time frame covered by the data gets longer, the estimated FCR becomes less variable. The NHANES FCR provides a better estimate of long-term fish consumption habits.

NHANES provides more comprehensive data from which WVDEP should base the state's fish consumption rate. NHANES breaks down the national data into regional data. West Virginia is included in the Inland South region, which also includes non-coastal counties in Delaware, Maryland, the District of Columbia, Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Florida, Louisiana, and Texas and all of Kentucky, Tennessee, Arkansas, and Oklahoma. With a sample size of 6,825 individuals, this dataset is more comprehensive than the 2008 West Virginia survey, which included a sample size of only 1,687 individuals. Given the geographic distribution of the data and the larger sample size, the Inland South FCR is more reflective of fish consumption across the region, including in West Virginia. Also, it provides better protection for fish consumed downstream and in neighboring states.

## 2. Adopt all recalculated human health criteria that are more stringent than current West Virginia criteria, including the adoption of new criteria for pollutants that do not have current criteria.

We recommend the adoption of all EPA-recommended human health criteria that strengthen the state standards to be more protective of human health—but after recalculating them using the regional Inland South FCR of 22.8 g/day.

### Adopt the more stringent criteria.

Many recalculated human health criteria would make the criteria more stringent and reduce the amount of these toxic pollutants allowed in our water. Table 1 presents five examples.

Table 1. Human health criteria for selected pollutants currently being discharged in West Virginia (ug/L)

Pollutant	Current criterion	EPA-recommended criterion	Recommended criterion using Inland South FCR <sup>2</sup>
<b>Aldrin</b>	0.000071	0.00000077	0.00000070
<b>Benzo(a) Pyrene</b>	0.0038	0.00012	0.00012
<b>Heptachlor</b>	0.00021	0.0000059	0.0000053
<b>Phenol</b>	21,000	4,000	3,900
<b>Toluene</b>	6,800	57	57

Note: For the purposes of this report we are focusing on Category A (surface water with a designated use as a drinking water source). For Benzo(a) Pyrene and Toluene, the recommended criterion using Inland South FCR is lower than the EPA-recommended criterion, but they appear the same after rounding.

Union Carbide is permitted to discharge Aldrin, Benzo(a) Pyrene, and Heptachlor, among other pollutants. Aldrin and Heptachlor are included in the “dirty dozen.” The “dirty dozen” includes chemicals that were banned in an international treaty, formally known as persistent organic pollutants (POPs). These POPs were banned because they are extremely toxic to both humans and wildlife, persist in the environment for long periods of time, and accumulate in fatty tissues at higher concentrations as they move up the food chain. Benzo(a) Pyrene is a poly aromatic hydrocarbon found in coal tar. It is listed as a group 1 carcinogen, known to cause cancer.

<sup>2</sup> To calculate the recommended criterion using Inland South FCR, the Inland South FCR was broken into trophic levels as in the original source; these FCRs sum to 22.3, not 22.8 grams/day. Level 2: 7.6, Level 3: 8.6, Level 4: 6.1 grams/day.

The Chemours Company/Dupont is permitted to discharge Toluene. Toluene is an aromatic hydrocarbon present in petroleum and coal tar. EPA has recommended a drinking water guideline value of 1000 µg/L for Toluene. WVDEP’s current standard in surface waters exceeds the amount allowed in drinking water, putting the burden on water utilities and the public’s health at risk.

**Adopt criteria for pollutants even if West Virginia currently does not have a criterion.**

In its previous proposal, WVDEP proposed to update just over half of EPA’s criteria. This left West Virginians vulnerable to chemical exposure where West Virginia does not have a criterion to limit the discharge of that chemical in state waters — should a facility start using that chemical. Table 2 identifies five such pollutants.

Table 2. A subset of EPA’s criteria for which WVDEP has no water quality standards (µg/L)

Pollutant	EPA-recommended criterion
<b>Acrolein</b>	3
<b>Alpha, beta-Endosulfan</b>	20
<b>Benzidine</b>	0.00014
<b>Nitrobenzene</b>	10
<b>Pentachlorobenzene</b>	0.1

Note: For the purposes of this report we are focusing on Category A (surface water with a designated use as a drinking water source)

**Acrolein**

Acrolein is primarily used to make other chemicals and may also be found in some livestock feed. Acrolein is itself a pesticide and is added to irrigation canals and the water supplies of some industrial plants to control underwater plant, algae, and slime growth. Acrolein is very irritating to the eyes, nose, throat, lungs, stomach, and skin.

**Alpha-endosulfan and beta-Endosulfan**

EPA has initiated action to end the use of Endosulfan in the United States, although it is used in China and India. It is a neurotoxin and is highly toxic to mammals.

**Benzidine**

Benzidine is an organic compound called an aromatic amine that was once used in the production of dyes. Benzidine has been significantly withdrawn from use in most industries because it is so carcinogenic and has been linked to bladder and pancreatic cancer.

## Nitrobenzene

Nitrobenzene is an industrial chemical used to manufacture a chemical called aniline. Nitrobenzene is also used to produce lubricating oils such as those used in motors and machinery. A small amount of nitrobenzene is used in the manufacture of dyes, drugs, pesticides, and synthetic rubber. Nitrobenzene can cause a wide variety of harmful health effects to exposed persons. Direct contact of small amounts of nitrobenzene with the skin or eyes may cause mild irritation. Repeated exposures to a high concentration of nitrobenzene can result in a blood condition called methemoglobinemia. This condition affects the ability of the blood to carry oxygen.

## Pentachlorobenzene

Pentachlorobenzene is a pesticide that is one of the “dirty dozen.” If WVDEP has standards for other chemicals included in the dirty dozen, there is no justification why other chemicals in that group are omitted from state water quality standards.

WVDEP must adopt all criteria, even if the state currently does not have a standard, to protect residents from current or future use of those chemicals. Incorporating all chemicals harmful to public health in the state’s water quality standards is the right thing to do.

## Adopt the updated criteria as soon as possible.

Delaying updates to human health criteria puts health at risk. EPA has used the most up-to-date science to calculate the criteria. Exposure assessments will always be a moving target. We must use what is available now and, if necessary, tweak the criteria later as more information becomes available.

### 3. Update criteria for pollutants without 2015 updates, but where West Virginia criteria are less stringent than EPA-recommended criteria.

Now is the opportune time to harmonize West Virginia’s human health criteria with EPA’s National Recommended Water Quality Criteria—even for those pollutants that EPA did not include in its 2015 update. Table 3 identifies four such pollutants.

Table 3. A subset of EPA’s criteria that were not incorporated into WVDEP’s original proposal (ug/L)

Pollutant	Current criterion	EPA-recommended criterion
<b>Arsenic</b>	10	0.018
<b>Antimony</b>	14	5.6
<b>Dioxin</b>	0.000000013	0.000000005
<b>Thallium</b>	1.7	0.24

Note: For the purposes of this report we are focusing on Category A (surface water with a designated use as a drinking water source)

We strongly urge WVDEP to update all human health criteria standards that strengthen the protections for surface waters in the state without further delay.

## 4. Do not relax any existing human health criteria.

We oppose the adoption of any new criteria that weaken current standards. Because of the changes to the calculation method for the human health criteria, there are many pollutants where the criteria actually increased in EPA's 2015 proposal, meaning more of those pollutants would be allowed in our water. Table 4 identifies eight such pollutants.

Table 4. A subset of EPA's recommended criteria that would weaken West Virginia's current criteria (ug/L)

Pollutant	Current criterion	EPA-recommended criterion
<b>Carbon Tetrachloride</b>	0.25	0.4
<b>DDT</b>	0.000024	0.00003
<b>Dichlorobromomethane</b>	0.55	0.95
<b>Endrin</b>	0.0023	0.03
<b>Methylene Chloride</b>	4.6	20
<b>Tetrachloroethylene</b>	0.8	10
<b>1,1-dichloroethylene</b>	0.03	300
<b>1,2-dichloroethane</b>	0.035	9.9

Note: For the purposes of this report we are focusing on Category A (surface water with a designated use as a drinking water source)

### Carbon Tetrachloride

Any increases in the amount of Carbon Tetrachloride allowed in the state's surface water would be harmful to public health. The U.S. Department of Health and Human Services (DHHS) has determined that carbon tetrachloride may reasonably be anticipated to be a carcinogen. The International Agency for Research on Cancer (IARC) has classified carbon tetrachloride in Group 2B: possibly carcinogenic to humans. EPA has also determined that carbon tetrachloride is a probable human carcinogen. To ensure that drinking water supplies are safe, EPA has set a Maximum Contaminant Level for carbon tetrachloride of 5 parts per billion (ppb), based on analytical detection limits in drinking water. Because carbon tetrachloride is possibly carcinogenic to humans, a Maximum Contaminant Level Goal of zero has been proposed. WVDEP should not relax the standard for the amount of this toxin allowed in surface water.

### DDT and Endrin

These chemicals are included in the "dirty dozen" which include chemicals that were banned in an international treaty, formally known as POPs. Again, these POPs were banned because they are extremely toxic to both humans and wildlife, persist in the environment for long periods of time, and accumulate in fatty tissues at higher concentrations as they move up the food chain.



Some of the known health effects include cancer and reproductive disorders. WVDEP should not allow more of these chemicals on our water. The DDT increase is particularly troublesome.

### Dichlorobromomethane

Dichlorobromomethane is a trihalomethane, which is formed as a by-product when chlorine is added to water-supply systems. DHHS has determined that dichlorobromomethane is reasonably anticipated to be a human carcinogen and is known to cause birth defects. Allowing more harmful chemicals in our water is detrimental to public health in a state with already-high cancer rates compared to the rest of the country.

### Methylene Chloride

Methylene Chloride is a chemical permitted to be discharged in the Union Carbide and Chemours NPDES permits. EPA considers methylene chloride to be a probable human carcinogen. While discharges at the Union Carbide facility currently meet water quality standards, increasing the amount of this chemical allowed in the water could result in increased exposure of the public. If the facility is meeting current water quality standards, there is no justification for increasing the amount of Methylene Chloride allowed in surface water. Doing so would increase risk to public health.

### Tetrachloroethylene

Tetrachloroethylene is widely used in dry-cleaning and metal de-greasing operations. Tetrachloroethylene exposure may harm the nervous system, liver, kidneys, and reproductive system, and it may be harmful to unborn children. If you are exposed to tetrachloroethylene, you may also be at a higher risk of getting certain types of cancer.

### 1,1-dichloroethylene

1,1-Dichloroethylene, also known as 1,1-dichloroethene, is used to make certain plastics, such as flexible films like food wrap, and in packaging materials. It is also used to make flame-retardant coatings for fiber and carpet backings, and in piping, coating for steel pipes, and adhesive applications. EPA has determined that 1,1-dichloroethene is a possible human carcinogen. This chemical is currently being discharged by Covestro.

### 1,2-dichloroethane

The most common use of 1,2-dichloroethane is to make a variety of plastic and vinyl products including polyvinyl chloride pipes, packaging materials, furniture and automobile upholstery, wall coverings, housewares, and automobile parts. DHHS has determined that 1,2-dichloroethane may reasonably be expected to cause cancer. IARC has determined that 1,2-dichloroethane can possibly cause cancer in humans. EPA has determined that 1,2-dichloroethane is a probable human carcinogen. This chemical is currently being discharged by Union Carbide.

Weakening any human health criteria is a move in the wrong direction. West Virginia has the tenth-highest rate of cancer diagnoses in the United States, according to the Center for Disease Control. Some of the pollutants for which EPA's recommended criteria would be less protective are known carcinogens and are very toxic to humans. We should not be relaxing any standards to allow residents to be exposed to more pollutants.

According to Dr. Michael McCawley, a West Virginia public health expert: "it is a well-accepted fact that there is no level of a carcinogen that does not represent a risk of cancer to the exposed individual. Having any exposure limit other than zero is therefore a risk. An increase in already attainable standards especially for carcinogens, should be considered unacceptable by everyone."<sup>3</sup>

Dr. Joseph Golden, a physician from Beckley, concurs stating, "Such chemicals – Dichlorobenzene, Fluoranthene and alpha-Hexachlorocyclohexane – are examples of those accumulated in fat tissue. As a physician, I believe that these organic chemical compounds would persist longer in people who have a greater amount of fat tissue, and hence create a prolonged deleterious effect on such people. It makes no sense medically that we should let this argument by the Manufacturers Association lead to allowing higher levels of these chemicals to persist in the environment that leads to higher absorption into humans."<sup>4</sup>

As described above, these chemicals are known carcinogens or harmful to public health; therefore, there is no justification for increasing human exposure. We encourage WVDEP to keep the current standards for chemicals where EPA's calculations recommend an increase. Increasing the standard would be a step backwards and detrimental to public health.

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<sup>3</sup> McCawley, Michael A. "Comments for WVDEP Water Quality Standards Public Listening Session." 17 Jan 2019.

<sup>4</sup> Golden, Joseph I. "Manufacturers' argument does not hold water." *The Register-Herald*. 6 Sept 2019.

## Conclusion

WV Rivers urges WVDEP to be proactive in protecting the health of West Virginians and ensuring that surface waters within the state are safe for drinking, fishing, and swimming now and for future use. Basing water quality standards on more current FCRs would be appropriately protective of public health. Adopting FCRs based on 10-year-old data, when fish consumption advisories were more restrictive, takes us several steps backwards. We should be aspiring to do away with fish consumption advisories altogether. Likewise, relaxing standards for any pollutant that is harmful to public health only increases risks in a population that is already experiencing one of the highest rates of cancer in the nation.

For the health of all West Virginians and visitors to this state, WV Rivers makes the following recommendations within this proposal to WVDEP on updating its Human Health Criteria:

1. Recalculate Environmental Protection Agency's (EPA's) 2015 recommended human health criteria using EPA's regional Inland South fish consumption rate (FCR) of 22.8 grams/day.
2. Adopt all recalculated human health criteria that are more stringent than current West Virginia criteria, including the adoption of new criteria for pollutants that do not have current criteria.
3. Update criteria for pollutants without 2015 updates, but where West Virginia criteria are less stringent than EPA-recommended criteria.
4. Do not relax any existing human health criteria.

Additionally, we urge the WVDEP to be proactive in applying the best available science to establish human health criteria for per- and polyfluoroalkyl chemicals (PFOA and PFOS, broadly known as PFAS chemicals) as PFAS chemicals have been linked to negative health effects. A medical study of more than 70,000 people exposed to PFOA, or C8, released by DuPont's Washington Works plant near Parkersburg linked exposure to the chemical with multiple health problems from cancer to reduced immune function.<sup>5</sup> In May 2016, EPA released its own health assessments of health effects of PFAS chemicals.<sup>6,7</sup>

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<sup>5</sup> C8 Science Panel. C8 Probable Link Reports. 29 October 2012.

<sup>6</sup> U.S. Environmental Protection Agency. Health Effects Support Document for Perfluorooctane Sulfonate (PFOS). EPA-822-R-16-002. May 2016.

<sup>7</sup> U.S. Environmental Protection Agency. Health Effects Support Document for Perfluorooctanoic Acid (PFOA). EPA-822-R-16-003. May 2016.

This proposal was developed by WV Rivers' Water Policy Workgroup consisting of the following members:

West Virginia Rivers Coalition  
Friends of Blackwater  
League of Women Voters of West Virginia  
New River Conservancy  
Ohio Valley Environmental Coalition  
People Concerned about Chemical Safety  
Upper Potomac Riverkeeper  
West Virginia Chapter of the Sierra Club  
West Virginia Citizens Action Group  
West Virginia Environmental Council  
West Virginia Highlands Conservancy

Thank you for your consideration of this proposal.

Sincerely,

A handwritten signature in blue ink, appearing to read "Angie Rosser", with a stylized flourish at the end.

Angie Rosser, Executive Director  
West Virginia Rivers Coalition