



Division of Surface Water

Response to Comments on Draft Rule

Rule: OAC 3745-1-34 Water quality criteria for the Ohio river drainage basin.

Agency Contact for this Package

Dan Dudley
Division of Surface Water
(614) 644-2876
dan.dudley@epa.ohio.gov

On March 5, 2014, Ohio EPA made available for review and comment one water quality standards program rule. This document identifies the comments and questions received during the associated comment period, which ended on March 19, 2014.

Ohio EPA reviewed and considered all comments received during the public comment period. By law, Ohio EPA has authority to consider specific issues related to protection of the environment and public health.

Comment 1: On March 5, 2014 Ohio EPA issued Availability for Interested Party Comment for Ohio Administrative Code 3745-1-34 (Water Quality Standards for the Ohio River Basin). American Electric Power (AEP) appreciates and supports this action, which seeks to remove the thallium nondrinking human health criterion of 6.3 ug/L due to the lack of a scientifically defensible lifetime exposure benchmark (i.e., the reference dose). The most recent assessment of potential human health effects caused by exposure to thallium (US EPA, 2009) indicated that “the available toxicity database for thallium contains studies that are generally of poor quality.” (p. 78 of US EPA, 2009. Toxicological review of thallium and compounds. EPA/635/R-08/00IF). In addition to US EPA’s assessment, the Agency for Toxic Substance Disease Registry (ATSDR) has not issued a minimum risk level (an effects-based human health benchmark similar to the reference dose) for thallium due to insufficient toxicity data. We believe that Ohio EPA should not implement water quality criteria that are not scientifically defensible. This could result in the expenditure of costly water treatment technologies that offer speculative or insignificant human health protection. (Robin J. Reash, American Electric Power)

Response 1: Comments are in support of the draft rule revision, no response necessary.

Comment 2: On March 5, 2014, Ohio EPA issued Availability for Interested Party Comments for Ohio Adm.Code 3745-1-34 (Water Quality Standards for the Ohio River Basin). The following comments regarding this action are submitted on behalf of the Ohio Utility Group and its member companies ("OUG" or "the Utilities"), which is an association of individual electric utilities in the State of Ohio. The electric utilities own and operate power plants and other facilities that generate, transmit, and distribute electricity for residential, commercial, industrial, and institutional customers. These power plants and other facilities are subject to the Clean Water Act. OUG's purpose, in part, is to participate collectively on behalf of its members in administrative proceedings under various environmental laws and in litigation arising from those proceedings that affect the Utilities. Thus, this notice affects the members of OUG.

OUG appreciates and supports this action, which seeks to remove the thallium nondrinking human health criterion (6.3 µg/l) due to the lack of scientifically defensible lifetime exposure benchmark (i.e., the reference dose). The most recent assessment of potential human health effects caused by exposure to thallium (U.S. EPA, 2009) indicated that "the available toxicity database for thallium contains studies that are generally of poor quality" (p. 78).

In addition to U.S. EPA's IRIS database, other health effects data on individual chemicals are published by the Agency for Toxic Substances Disease Registry ("ATSDR"). This Agency calculates Minimum Risk Levels ("MRLs"), which is an estimate of daily human exposure to a substance that is likely without an appreciable risk of adverse effects over a specified duration of exposure. MRLs are similar to, but not identical to, U.S. EPA referenced dose ("RfD") values. MRLs are developed for non-carcinogen chemicals. There is no evidence that thallium causes carcinogenic effects.

ATSDR has not calculated a MRL for thallium due to insufficient toxicity data. The Agency summarizes the information that is not available regarding mammalian effects studies:

Most of the information concerning the health effects of thallium in humans is found in case reports of accidental or intentional acute ingestion of thallium. No information was found on effects after intermediate and chronic exposures. Reports of chronic inhalation exposure in the workplace exist; however, these are limited to sites outside of the United States. No information was found on effects of thallium after acute and intermediate inhalation exposure or on effects after acute, intermediate, or chronic dermal exposures. In animals . . . no studies were located regarding chronic oral exposures and on effects following acute, intermediate, and chronic inhalation or dermal exposure.
(ATSDR, 1992; p. 31).

The Utilities would also like to note that very little information exists concerning the calculation of a bioaccumulation factor ("BAF") for thallium. This value is used in calculating a non-carcinogenic human health criterion. To derive an accurate BAF value, Ohio EPA should collect fish tissue and water samples in water bodies located in the state. Thus, the

speculative basis of the thallium BAF is another reason for judging the human health criterion (6.3 µg/l) as technically invalid.

The Utilities believe that human health criteria should not be implemented in regulatory settings when the underlying basis of a pollutant's potential health effects is speculative or not robust scientifically. As such, the Utilities support rescinding the non-drinking human health criterion for thallium.

The Utilities appreciate this opportunity to provide these comments. (Ohio Utility Group)

Response 2: Comments are in support of the draft rule revision, no response necessary.

Comment 3: Buckeye Power, Inc. ("Buckeye") hereby submits comments on Ohio EPA's draft revision to Ohio Admin. Code 3745-I-34, Water Quality Criteria for the Ohio River Drainage Basin. As explained more fully below, and in the comments submitted by AEP and the Ohio Utility Group, Buckeye supports the draft rule, which will amend Ohio Admin. Code 3745-I-34 by removing the thallium nondrinking human health criterion from the Water Quality Criteria.

A. Background on Buckeye

Buckeye is an Ohio nonprofit corporation operating on a cooperative basis. Buckeye commenced commercial operation in 1968 and provides wholesale electric service to its 25 members, which include all of the electric distribution cooperatives engaged in the sale of electricity within the state of Ohio. The retail service area of Buckeye's members covers a substantial part of the land area of the state of Ohio and extends into portions of 77 of Ohio's 88 counties. Buckeye's members currently serve approximately 390,000 customers, around 90% of whom are classified as residential (farm and non-farm), while the remaining 10% are classified as commercial, industrial, or other.

Buckeye owns or has the right to the electric generation output of facilities across the state of Ohio. Of relevance to the draft rule at issue are Buckeye's electric generating units at the Cardinal Station, a coal-fired electric generating facility located near Brilliant, Ohio. Effluent from the Cardinal Station is discharged into the Ohio River Drainage Basin pursuant to the facility's National Pollution Discharge Elimination System permit.

Buckeye is fully committed to environmental stewardship. Indeed, in recent years, Buckeye has spent nearly \$1 billion installing state of the art pollution control equipment on its electric generating units at the Cardinal Station. In 2003, selective catalytic reduction equipment was placed in commercial operation on Buckeye's units at a total capital cost of approximately \$185 million. In 2008 and 2012, Buckeye installed jet bubbling reactor flue gas desulfurization equipment on its units at a capital cost of over \$750 million.

B. Buckeye Supports Ohio EPA's Draft Rule Because the Thallium Nondrinking

Human Health Criterion Lacks a Scientifically Defensible Underlying Reference Dose.

Buckeye supports Ohio EPA's draft rule, which would remove the existing 6.3 ug/l thallium nondrinking criterion from Ohio Admin. Code 3745-1-34, because a valid underlying reference dose is unavailable for thallium. In its most recent toxicological review of thallium, USEPA determined that the available toxicity database for thallium contains studies that are "generally of poor quality." EPA found that a study selected as a candidate principal study contained "critical limitations," noting, among other flaws, difficulties in the selection of endpoints for toxicological analysis. Based on these findings, USEPA concluded that available data are "not adequate" to derive a reference dose for thallium salts.

A human health criterion must be developed based on health effects that have been thoroughly researched and adequately demonstrated. The current criterion has no such bases. Consequently, Buckeye supports rescinding the nondrinking human health criterion for thallium.

Response 3: Comments are in support of the draft rule revision, no response necessary.

Comment 4: Ohio EPA ("OEPA") proposed eliminating the thallium nondrink human health criterion of 6.3 ug/l from Ohio's water quality criteria rule for the Ohio River drainage basin. As OEPA notes, "these criteria are protective of the human consumption of sport caught fish and the incidental water intake and exposure that may occur during recreation in surface waters."

The Ohio Environmental Council ("OEC") and Sierra Club assert that OEPA's proposal to eliminate the human nondrink health criterion for thallium is improper and highly peculiar. The proposal unnecessarily risks the health of the public as the price of doing a favor for a single regulated entity – American Electric Power, Cardinal Operating Company. The Common Sense Initiative (CSI) Business Impact Analysis submitted by OEPA states the following:

"Due to unresolved issues in completing a larger review of OAC Chapter 3745-1, the Agency has decided to move forward with one revision to one rule to address a permit schedule of compliance deadline for American Electric Power, Cardinal Operating Company."

The 2009 USEPA toxicological review of thallium declined to determine a level of daily oral thallium exposure that is not likely to have long-term negative health impacts; i.e., the 2009 USEPA review declined to determine a "safety" limit for human thallium injection. OEPA cites this fact as justification for eliminating the thallium nondrink health standards from Ohio's water quality rules.

The fact that a "safe" limit for human thallium injection may not have been determined must not be mistaken for a determination that thallium is safe for oral exposure. To the contrary, thallium is a highly toxic heavy metal that is extremely harmful to human health. Per the 2009 USEPA review (page 9):

In adults, the average lethal oral dose has been estimated to range from 10 to 15 mg/kg. [...] [A]cute toxicity of thallium is characterized by alopecia (hair loss), severe pain in the extremities, lethargy, ataxia, abdominal pain or vomiting, back pain, abnormal reflexes, neuropathy, muscle weakness, coma, convulsion, other neurological symptoms (i.e., mental abnormalities, tremors, abnormal movements, abnormal vision, and headache), and death[.]

For the aforementioned reasons, OEC and Sierra Club request that OEPA retain the thallium nondrink human health criterion of 6.3 ug/l as is currently exists in OAC 3745-1-34, Ohio's water quality criteria rule for the Ohio River drainage basin. (Ohio Environmental Council and Sierra Club)

Response 4: The Division recognizes and appreciates OEC and Sierra Club's concern regarding the human health risks associated with ingestion of thallium. It is important to note that the current nondrink value of 6.3 ug/l was calculated using a reference dose previously published by U.S. EPA. A reference dose is an estimate of a safe level of a chemical which can be ingested daily without appreciable risk of harm, and is generally the basis for Ohio's human health water quality standards. In the 2009 report cited by OEC and Sierra Club, U.S. EPA goes on to discuss that the supporting studies which had originally been used to estimate the toxicity of thallium to humans was later determined to be of poor quality, stating:

"The available toxicity database for thallium contains studies that are generally of poor quality. The MRI (1988) study that was selected as a candidate principal study suffers from certain critical limitations (e.g., high background incidence of alopecia, lack of histopathological examination of skin tissue in low- and mid-dose groups, and inadequate examination of objective measures of neurotoxicity), and there are particular difficulties in the selection of appropriate endpoints. Therefore, even though an RfD [reference dose] would generally be derived with a combined uncertainty factor of 3000, an RfD for soluble thallium salts is not derived in this specific case."

This means that the estimates of thallium toxicity originally used by Ohio EPA are no longer considered to be reliable, have been withdrawn by U.S. EPA, and therefore the Ohio nondrink human health water quality criterion currently in place is no longer scientifically defensible. As such, it was determined that we cannot hold dischargers accountable to a standard which we cannot defend. We also note that Ohio EPA initiated the removal of this water quality standard in 2010 as part of a larger rules package that reviewed all human health criteria, but that larger rulemaking was not successful for unrelated reasons. Ohio EPA could undertake a more comprehensive review of human health water quality criteria if U.S. EPA's Office of Science and Technology updates their human health criteria documents currently scheduled for publication in 2014. Finally, we note that the thallium water quality standards for the protection of aquatic life remain in place and continue to limit the potential human exposure to thallium.

End of Response to Comments