Notice of Proposed Rulemaking
Department of Environmental Protection
Environmental Quality Board
25 Pa. Code, Chapter 109
Safe Drinking Water
(Stage 2 Disinfectants and Disinfection Byproducts Rule)

Preamble

The Environmental Quality Board (Board) proposes to amend 25 Pa. Code, Chapter 109 (relating to Safe Drinking Water). The proposed amendments will supplement the Stage 1 Disinfectants and Disinfection Byproduct Rule by requiring water systems to meet disinfection byproduct maximum contaminant levels (MCLs) at each monitoring site in the distribution system. The amendments will first focus on identifying the higher risk monitoring locations through the Initial Distribution System Evaluation (IDSE) and then addresses reducing exposure and lowering DBP peaks in distribution systems by using a new method to determine MCL compliance (Locational Running Annual Average (LRAA)).

The proposed amendments will reduce the potential risks of cancer and reproductive and developmental health effects associated with disinfectant byproducts (DBPs) by reducing peak and average levels of DBPs in drinking water supplies.

The amendments will apply to community water systems (CWSs) and nontransient noncommunity water systems (NTNCWSs) that add a primary or residual disinfectant other than ultraviolet light (UV) or deliver water that has been treated with a primary or residual disinfectant other than UV.

The proposal was adopted by the Board at its meeting of _____.

A. Effective Date

These amendments will go into effect upon publication in the *Pennsylvania Bulletin* as final rulemaking.

B. Contact Persons

For further information, contact Ronald Furlan, Chief, Division of Planning and Permits, P.O. Box 8774, Rachel Carson State Office Building, Harrisburg, PA 17105-8774, (717) 787-8184 or Marylou Barton, Assistant Counsel, Bureau of Regulatory Counsel, P.O. Box 8464, Rachel Carson State Office Building, Harrisburg, PA 17105-8464, (717) 787-7060. Persons with a disability may use the AT&T Relay Service by calling 1-800-654-5984 (TDD users) or 1-800-654-5988 (voice users). This proposal is available electronically through the DEP Web site (http://www.dep.state.pa.us).

C. Statutory Authority

The proposed rulemaking is being made under the authority of Section 4 of the Pennsylvania Safe Drinking Water Act (35 P.S. § 721.4), which grants the Board the authority to adopt rules and regulations governing the provision of drinking water to the public, and Sections 1917-A and 1920-A of the Administrative Code of 1929 (71 P.S. §§ 510-7 and 510-20).

D. Background and Purpose

The public health benefits of disinfection are significant and well-recognized. However, these very disinfection practices pose health risks of their own. Although disinfectants such as chlorine, hypochlorites, and chlorine dioxide are effective in controlling many harmful microorganisms, they react with organic and inorganic matter in the water to form disinfection byproducts (DBPs), which pose health risks at certain levels.

The first DBPs discovered in public drinking water were halogenated methanes in 1974. As a result, the United States Environmental Protection Agency (EPA) promulgated a maximum contaminant level (MCL) for the composite sum of four individual DBP species: chloroform, bromodichloromethane, dibromochloromethane, and bromoform. This composite sum was termed "Total Trihalomethanes" (TTHMs) and had an MCL of 0.1 mg/L that was applied only to community water systems serving at least 10,000 people.

Since the discovery of TTHMs in drinking water in 1974, other DBPs have been identified and studied for their health effects. Many of these studies have shown DBPs to be carcinogenic and/or to cause reproductive or developmental effects in laboratory animals. Studies have also shown that high levels of the disinfectants themselves may cause health problems over long periods of time, including damage to both the blood and the kidneys. While many of these studies have been conducted at high doses, the weight of the evidence indicates that DBPs present a potential public health problem that must be addressed.

In 1992, the EPA initiated a rulemaking process to address public health concerns associated with disinfectants, DBPs, and microbial pathogens. As part of this rulemaking process, EPA established a Regulatory Negotiation (Reg/Neg) Committee, which included representatives of state and local health and regulatory agencies, public water systems, elected officials, consumer groups and environmental groups.

EPA's most significant concern in developing regulations for disinfectants and DBPs was the need to ensure that adequate treatment be maintained for controlling risks from microbial pathogens. One of the major goals addressed in the rulemaking process was to develop an approach that would reduce the level of exposure from disinfectants and DBPs without undermining the control of microbial pathogens. The intention was to ensure that drinking water is microbiologically safe at the limits set for disinfectants and DBPs and that these chemicals do not pose an unacceptable health risk at these limits. Thus, the Reg/Neg Committee also considered a range of microbial issues and agreed that EPA should also propose a companion microbial rule, the *Interim Enhanced Surface Water Treatment Rule* (IESWTR).

Following months of intensive discussions and technical analysis, the Reg/Neg Committee recommended the development of three sets of rules: a two-stage rule to address disinfectants and DBPs (D/DBPs), the *Interim Enhanced Surface Water Rule (*IESWTR), and an *Information Collection Rule* (ICR). The approach used in developing these proposals considered the constraints of simultaneously treating water to control microbial contaminants, disinfectants, and DBPs. The Reg/Neg Committee agreed that the schedule for the IESWTR should be linked to the schedule of the first stage of the D/DBPs rule to assure simultaneous compliance and a balanced risk-risk based implementation. The Reg/Neg Committee also agreed that additional information on health risk, occurrence, treatment technologies, and analytical methods needed to be developed in order to better understand the risk-risk tradeoff, and how to accomplish an overall reduction in health risks to both pathogens and D/DBPs. Finally the Reg/Neg Committee agreed that to develop a reasonable set of rules and to understand more fully the limitations of the current Surface Water Treatment Rule, additional field data were critical. Thus, a key component of the regulation negotiation agreement was the promulgation of the ICR.

The *Federal Disinfectants and Disinfection Byproducts Rule* (D/DBPR) (40 CFR Parts 9, 141, and 142), which was promulgated on December 16, 1998, was developed based on the outcome of this rulemaking process, as well as a wide range of technical comments from stakeholders and members of the public. Pennsylvania adopted the Stage 1 DBPR on July 21, 2001.

The Stage 1 DBPR regulated treatment practices at public water systems in order to eliminate or minimize disinfectant levels and disinfection byproducts that may cause harmful health effects. The Stage 1 DBPR applied to all community and nontransient noncommunity water systems that use a chemical disinfectant or oxidant, as well as to all transient noncommunity water systems that use chlorine dioxide. The Stage 1 DBPR established maximum residual disinfectant levels (MRDLs) for free chlorine, combined chlorine, and chlorine dioxide. MCLs were also established for TTHM, five haloacetic acids (HAA5), bromate (calculated as running annual average (RAA)) and chlorite based on daily and monthly sampling. The MCL for TTHMs was lowered from 0.1 mg/L to 0.08 mg/L and applied to all community and nontransient noncommunity water systems, regardless of the population that is served. The Stage 1 DBPR also regulated pre-filtration treatment techniques for public water systems that use conventional filtration in order to reduce source water Total Organic Carbon (TOC), which serves as a precursor to disinfection byproducts.

The EPA promulgated the federal Stage 2 DBPR on January 4, 2006. Congress required EPA to promulgate the Stage 2 DBPR as part of the 1996 Safe Drinking Water Act (SDWA) Amendments. The Stage 2 DBPR augments the Stage 1 DBPR. The goal of the Stage 2 DBPR is to target the highest risk systems for changes beyond those required for Stage 1 DBPR. The new requirements will provide for more consistent, equitable protection from DBPs across the entire distribution system and the reduction of DBP peaks. New risk-targeting provisions require systems to first identify their risk level; then, only those systems with the greatest risk will need to make operational or treatment changes. The Stage 2 DBPR will first focus on identifying the higher risk monitoring locations through the IDSE and then addresses reducing exposure and lowering DBP peaks in distribution systems by using a new method to determine MCL compliance (LRAA). The rule will also define operational evaluation levels.

As in Stage 1 DBPR, the Stage 2 DBPR will focus on monitoring for and reducing concentrations of two classes of DBPs: total trihalomethanes (TTHM) and haloacetic acids (HAA5). These two groups of DBPs act as indicators for the various byproducts that are present in water disinfected with chlorine or chloromine. This means that concentrations of TTHM and HAA5 are monitored for compliance, but their presence in drinking water is representative of many other chlorination DBPs that may also occur in the water; thus, a reduction in TTHM and HAA5 generally indicates an overall reduction of DBPs.

The Board proposes to incorporate the provisions of the federal Stage 2 DBPR into the Pennsylvania Safe Drinking Water Regulations (25 Pa. Code Chapter 109).

The draft proposed amendments were submitted for review to the Small Water Systems Technical Assistance Center Advisory Board (TAC) for review and discussion on November 15, 2007. The TAC Board noted that the revisions are required for the Department to receive primacy and are not more stringent than the federal rule. The TAC Board approved the proposed revisions in a letter dated December 12, 2007. The TAC comment letter is attached with this document.

E. Summary of Regulatory Requirements

The proposed amendments reflect, and are no more stringent than the new federal Stage 2 DBPR requirements.

1. § 109.1 Definitions.

This section was amended in order to add the following EPA definitions: combined distribution systems, dual sample set, locational running annual average, running annual average and wholesale systems. The definition of finished water was also amended. These amendments reflect the new definitions of the federal Stage 2 DBPR found in 40 CFR § 141.2.

2. § 109.301(12) Monitoring *requirements for disinfection byproducts and disinfection byproduct precursors.*

This paragraph was revised to incorporate EPA's new monitoring requirements for the Stage 2 DBPR. This amendment reflects the federal requirements found in 40 CFR § 141.132(a), (b), & (d) and 40 CFR § 141.620 to 623.

3. § 109.301(12)(i) TTHM and HAA5 Stage 1 DBP Rule.

A new sub clause was added to incorporate EPA's minor changes to Stage 1 DBPR which did not specify a time frame or sampling frequency for taking TOC source water samples. The Stage 2 DBPR requires systems to take TOC samples every 30 days at a location prior to treatment. These samples must be averaged quarterly for the most recent 4 quarters. Once a system has qualified for reduced monitoring it may reduce source water TOC monitoring to one sample every 90 days. This amendment reflects the federal requirement found in 40 CFR § 141.132(b)(1)(iii).

4. § 109.301(12)(ii) TTHM and HAA5 Stage 2 DBP Rule.

This new subparagraph was added to incorporate the monitoring requirements of the Stage 2 DBPR. The subparagraph establishes monitoring and other requirements for achieving compliance with the maximum contaminant levels based on locational running annual averages (LRAA) for TTHM and HAA5 and for achieving compliance with the maximum residual disinfectant residuals for chlorine and chloramines for certain consecutive systems. The amendment reflects the federal requirements in 40 CFR § 141.620 to 623.

5. § 109.301(12)(ii)(A) Applicability and schedule

A new clause was added to incorporate EPA's schedule for Stage 2 DBPR. The amendment reflects the federal requirements in 40 CFR § 141.620.

6. § 109.301(12)(ii)(B) Routine monitoring

A new clause was added to incorporate EPA's routine monitoring requirements for Stage 2 DBPR. The amendment reflects the federal requirements in 40 CFR § 141.621.

7. § 109.301(12)(ii)(C) Reduced monitoring

A new clause was added to incorporate EPA's reduced monitoring requirements for Stage 2 DBPR. The amendment reflects the federal requirements in 40 CFR § 141.623.

8. § 109.301(12)(ii)(D) Increased monitoring

A new clause was added to incorporate EPA's conditions requiring increased monitoring. The amendment reflects the federal requirements in 40 CFR § 141.625.

9. § 109.301(12)(ii)(E) General monitoring and compliance requirements

A new clause was added to incorporate EPA's general monitoring and compliance requirements. The amendment reflects the federal requirements in 40 CFR § 141.620(d)(1&2), 141.620(c)(7) and 141.620(e).

10. § 109.301(12)(iv) Bromate

A new sub clause was added to incorporate EPA's minor changes to Stage 1 DBPR. Under the Stage 1 DBPR, systems that use ozone are required to monitor water in the distribution system for bromate whose MCL is 0.010 mg/L running annual average. Under the Stage 2 DBPR, the criterion for reduced bromate monitoring is a bromate running annual average less than or equal to 0.0025 mg/L. The amendment reflects the federal requirements in 40 CFR § 141.132(b)(3)(ii)(A) and (B).

11. § 109.701(g) Monitoring plans for disinfectants, disinfection byproducts and disinfection byproduct precursors.

This paragraph was revised to incorporate EPA's new monitoring plans for disinfectants, disinfection byproducts and disinfection byproduct precursors requirements under Stage 2 DBPR. This amendment reflects the federal requirements found in 40 CFR § 141.620 to 621.

12. § 109.701(g)(1)(iii)

This new sub clause was added to incorporate EPA's new monitoring plan requirements. This amendment reflects federal requirements found in 40 CFR § 141.33(f).

13. § 109.701 (g)(2)(i) IDSE Requirements.

This sub clause was added to incorporate by reference EPA's IDSE requirements. The amendment reflects federal requirements found in 40 CFR § 141.620 to 621.

14. § 109.701(g)(2)(ii) Subchapter G monitoring plan

This sub clause was added to incorporate EPA's monitoring plan requirements under the Stage 2 DBPR. The amendment reflects federal requirements found in 40 CFR § 141.622.

15. § 109.701(g)(2)(iii) Operational evaluation level.

This sub clause was added to incorporate EPA's new operational evaluation level requirements. The amendment reflects federal requirements found in 40 CFR § 141.626

TTHM and HAA5 MCL compliance is based on an LRAA, therefore a system may have individual DBP results significantly higher than the MCL from time to time while remaining in compliance. This situation is a result of the fact that high concentrations are averaged with lower concentrations at a given location. While this situation does not constitute an MCL violation, it might indicate a trend that could lead to an MCL violation in future quarters.

The operational evaluation level is an LRAA threshold, meant to help systems identify if they are in danger of exceeding the MCL in the following monitoring quarter. The process is useful in that it alerts the system to the potential of an MCL violation if DBP levels remain at their current level and encourages them to consider what operational changes may be necessary to reduce DBP levels.

The operational evaluation level at any location is the sum of the two previous quarters' TTHM or HAA5 results plus the current quarter's TTHM or HAA5 result, divided by four to determine an average. If the operational evaluation level for TTHM exceeds 0.080 mg/L or the operational evaluation level for HAA5 exceeds 0.060 mg/L at any monitoring location, an exceedance of the operational evaluation level has occurred.

If this happens, the system must conduct an operational evaluation and submit a written report of the evaluation to the Department no later than 90 days after the system is notified of the analytical result that caused the exceedance.

16. § 109.1003(a)(1)(viii) *Monitoring requirements.*

This subparagraph was revised to incorporate EPA's TTHM and HAA5 bromate monitoring requirements for bottled water systems. This amendment reflects the federal requirements found in 40 CFR § 141.132(b)(1)(iii).

17 § 109.1003(a)(1)(x)(B) *Monitoring requirements.*

This sub clause was revised to incorporate EPA's bromate reduced monitoring requirements for bottled water systems. This amendment reflects the federal requirements found in 40 CFR § 141.132(b)(3)(ii).

F. Benefits, Costs and Compliance

Benefits

The public health benefits of disinfection practices are significant and well-recognized. Disinfection, however, poses its own health risks. The proposed amendments will improve public health by increasing level of protection from exposure to DBP's through providing more consistent, equitable protection from DBPs across the entire distribution systems and the reduction of DBP peaks.

The proposed amendments will affect all community water systems (almost 2,042) and nontransient noncommunity water systems (almost 600) serving about 10.5 million Pennsylvanians. These 10.5 million people will benefit from a reduction in health risks associated with disinfection practices, such as bladder cancer and kidney damage.

The EPA has estimated that the nation may realize a total annual benefit of up to $3.5 billion as a result of avoiding up to 581 cases of bladder cancer per year. In Pennsylvania, this translates into a total annual benefit of up to $144 million in avoiding up to 24 cases of bladder cancer per year.

Compliance Costs

The EPA has estimated that a total annual cost of almost $589 million will be borne by the regulated community, nationwide, as a result of this rule. It is estimated that Pennsylvania water systems will bear over $26 million of this total annual cost.

The $26 million estimate will include non-treatment costs of rule implementation, IDSE, Stage 2 DBPR monitoring plans, additional routine monitoring, reporting, recordkeeping and operational evaluations. Systems required to install treatment to comply with MCLs will accrue the additional costs of treatment installation as well as O&M.

Compliance Assistance Plan

The Safe Drinking Water Program utilizes the Commonwealth's PENNVEST Program in order to offer financial assistance to eligible public water systems. This assistance is in the form

of a low-interest loan, with some augmenting grant funds for hardship cases. Eligibility is based upon factors such as public health impact, compliance necessity, and project/operational affordability.

The Safe Drinking Water Program has established a network of regional and central office training staff that is responsive to identifiable training needs. The target audience in need of training may be either program staff or the regulated community.

In addition to this network of training staff, the Bureau of Water Standards and Facility Regulation have staff dedicated to providing both training and outreach support services to public water system operators. The DEP Internet site also contains the *Drinking Water & Wastewater Treatment System Operator Information Center* Internet site, which provides a bulletin board of timely, useful information for treatment plant operators.

Paperwork Requirements

The proposed amendments will involve monitoring activities, which include conducting the IDSE, Stage 2 DBPR monitoring plans, additional routine monitoring and operational evaluations. Water systems which treat with conventional filtration will also need to monitor and report total organic carbon, both in the source water and in the treated water.

It is anticipated that this additional monitoring and reporting will be easily facilitated by the addition of one or two new data reporting forms and that little additional paperwork will be necessary.

G. Sunset Review

These regulations will be reviewed in accordance with the sunset review schedule published by the Department to determine whether the regulations effectively fulfill the goals for which they were intended.

H. Regulatory Review

Under section 5(a) of the Regulatory Review Act (71 P.S. § 745.5(a)), on _____ the Department submitted a copy of these proposed amendments to the Independent Regulatory Review Commission (IRRC) and the Chairpersons of the House and Senate Environmental Resources and Energy Committees. In addition to submitting the proposed amendments, the Department has provided IRRC and the Committees with a copy of a detailed regulatory analysis form prepared by the Department. A copy of this material is available to the public upon request.

Under section 5(g) of the Regulatory Review Act, IRRC may convey any comments, recommendations or objections to the proposed regulations within 30 days of the close of the public comment period. The comments, recommendations or objections shall specify the regulatory review criteria that have not been met. The Regulatory Review Act specifies detailed

procedures for review of these issues by the Department, the General Assembly and the Governor prior to final publication of the regulations.

I. Public Comments

Written Comments - Interested persons are invited to submit comments, suggestions, or objection regarding the proposed regulation to the Environmental Quality Board, P.O. Box 8477, Harrisburg, PA 17105-8477 (express mail: Rachel Carson State Office Building, 16th Floor, 400 Market Street, Harrisburg, PA 17105-2301). Comments submitted by facsimile will not be accepted. Comments, suggestions, or objections must be received by the Board by _____ (within 30 days of publication in the *Pennsylvania Bulletin*). Interested persons may also submit a summary of their comments to the Board. The summary may not exceed one page in length and must also be received by _____ (within 30 days of publication in the *Pennsylvania Bulletin*). The one-page summary will be provided to each member of the Board in the agenda packet distributed prior to the meeting at which the final regulations will be considered.

Electronic Comments - Comments may be submitted electronically to the Board at RegComments@state.pa.us and must also be received by the Board by _____. A subject heading of the proposal and a return name and address must be included in each transmission. If an acknowledgement of electronic comments is not received by the sender within two working days, the comments should be retransmitted to ensure receipt.

BY:

JOSEPH R. POWERS
Acting Chairman
Environmental Quality Board