

Regulatory Analysis Form

(Completed by Promulgating Agency)

**INDEPENDENT REGULATORY
REVIEW COMMISSION**

(All Comments submitted on this regulation will appear on IRRC's website)

(1) Agency:

Department of Environmental Protection

(2) Agency Number:

Identification Number: 7-494

IRRC Number:

(3) PA Code Cite:

25 Pa. Code, Chapter 109

(4) Short Title:

Revised Total Coliform Rule (RTCR)

(5) Agency Contacts (List Telephone Number and Email Address):

Primary Contact: Laura Edinger, 783-8727, ledinger@pa.gov

Secondary Contact: Patrick McDonnell, 783-8727, pmcdonnell@pa.gov

(6) Type of Rulemaking (check applicable box):

- Proposed Regulation
 Final Regulation
 Final Omitted Regulation

- Emergency Certification Regulation;
 Certification by the Governor
 Certification by the Attorney General

(7) Briefly explain the regulation in clear and nontechnical language. (100 words or less)

The purpose of the RTCR is to protect public health by ensuring the integrity of drinking water distribution systems and monitoring for the presence of microbial contamination. EPA anticipates greater public health protection under the RTCR, as it requires public water systems (PWS) that are vulnerable to microbial contamination to perform assessments to identify sanitary defects and subsequently take action to correct them.

Proposed amendments that go beyond the scope of the RTCR are designed to enhance public health protection by strengthening regulations pertaining to source water protection, disinfection, and filtration. Collectively, the proposed amendments will promote healthy and sustainable communities.

(8) State the statutory authority for the regulation. Include specific statutory citation.

Section 4(s) of the Pennsylvania Safe Drinking Water Act, 35 P.S. § 721.4(a), and section 1920-A of the Administrative Code of 1929, 71 P.S. § 510-20(b).

(9) Is the regulation mandated by any federal or state law or court order, or federal regulation? Are there any relevant state or federal court decisions? If yes, cite the specific law, case or regulation as well as, any deadlines for action.

Yes for all of the RTCR, Long Term 2 (LT2) Enhanced Surface Water Treatment Rule and Stage 2 Disinfectants/Disinfection Byproducts Rule (Stage 2 DBPR) components.

Section 1413 of the Federal Safe Drinking Water Act, 42 U.S.C. § 300g-2a, requires that, in order for the state to retain primary enforcement authority (primacy), the state must adopt drinking water regulations that are “no less stringent than” the national primary drinking water regulations not later than 2 years after the date on which the regulations are promulgated by the United States Environmental Protection Agency (EPA), or must ask EPA for an extension of up to 2 years. The federal drinking water primacy regulations at 40 CFR § 142.12(a) also require the state to adopt all new and revised national primary drinking water regulations contained in 40 CFR Part 141 in order to retain primary enforcement responsibility. Furthermore, Section 4(a) of the Pennsylvania Safe Drinking Water Act, 35 P.S. § 721.4(a), requires the Environmental Quality Board to adopt maximum contaminant levels and treatment technique requirements no less stringent than those promulgated under the Federal act for all contaminants regulated under the national primary and secondary drinking water regulations. Also Section 5(a) of the state act, 35 P.S. § 721.5(a), requires the PA Department of Environmental Protection (DEP) to adopt and implement a public water supply program which includes those program elements necessary to assume state primary enforcement responsibility under the Federal act.

EPA promulgated the Federal RTCR on February 13, 2013. Therefore, Pennsylvania must adopt regulations implementing the Federal RTCR rules by February 13, 2015. Without an EPA-granted extension, failure to adopt regulations prior to February 13, 2015 may result in Pennsylvania losing primacy. As of March, 2015, DEP is in discussion with the EPA regarding the extension. EPA is expected to grant an extension to the Commonwealth

EPA promulgated the Federal Stage 2 DBPR on January 4, 2006, and the Federal LT2 on January 5, 2006. Pennsylvania adopted state regulations implementing the Federal rules on December 26, 2009. Minor clarifications are included in this proposed rulemaking, as required by EPA, in order to obtain primacy for these rules.

Other updates to Ch. 109 are not mandated by federal law.

(10) State why the regulation is needed. Explain the compelling public interest that justifies the regulation. Describe who will benefit from the regulation. Quantify the benefits as completely as possible and approximate the number of people who will benefit.

RTCR

According to the preamble to the federal rule, the RTCR aims for greater public health protection than the 1989 TCR in a cost-effective manner by: (1) Maintaining the objectives of the 1989 TCR (i.e., to evaluate the effectiveness of treatment, to determine the integrity of the distribution system, and to signal the possible presence of fecal contamination); (2) reducing the potential pathways of contamination into the distribution system; (3) using the optimal indicator for the intended objectives (i.e., using total coliforms as an indicator of system operation and condition rather than an immediate public health concern and using *E. coli* as a fecal indicator); and (4) requiring systems that may be vulnerable to contamination, as indicated by the nature of their operation, to have in place procedures that will minimize the incidence of contamination (e.g., requiring start-up procedures for seasonal systems). EPA, therefore, anticipates greater public health protection under the RTCR compared to the 1989 TCR because of the RTCR’s more preventive approach to identifying and fixing problems that affect or may affect public health. (78 FR 10272 – 10273, February 13, 2013)

One or more of these revisions affect all 8,868 PWS that serve a total population of over 12 million Pennsylvanians. A decrease in fecal contamination should reduce the potential risk to human health for PWS customers. Thus, any reduction in *E. coli* occurrence is considered a benefit of the RTCR. Fecal

contamination may contain waterborne pathogens including bacteria, viruses, and parasitic protozoa; a reduction in fecal contamination should reduce the health risk from each of these contaminants.

Source Water Protection and Permitting

The Source Water Assessment and Protection Program amendments in the proposed regulation will support the protection of public drinking water sources, which will result in maintaining the highest source water quality available. Revisions include adding definitions relating to source water protection and requiring assessments for new sources as part of the permitting process. These revisions will not only protect public health but also help to maintain, reduce or avoid drinking water treatment costs.

The need to understand and update potential threats to public drinking water sources and how to minimize those threats are underscored by the January 2014 chemical spill in West Virginia that impacted the drinking water for 300,000 people. Currently, of the 10.6 million people served by community water systems in Pennsylvania, 7.7 million people are covered by substantially implemented local source water protection programs. Thus, nearly 3 million additional people can benefit from local source water protection efforts.

The proposed changes relating to source water protection in Section 109.503 will facilitate the permitting process for a new PWS source, thereby resulting in less delay for adding a new source needed to meet public health protection requirements and avoidance of costly permitting mistakes.

Surface Water and Groundwater Under the Direct Influence (GUDI) Filter Plants

The proposed amendments to surface water treatment regulations will benefit more than 8 million Pennsylvanians that are supplied water by PWS utilizing filtration technologies.

Filter Plant Performance Requirements

Existing regulations, 25 PA. Code § 109.301(i), require turbidity monitoring of the combined filter effluent (CFE) once every 4 hours. This period between grab samples allows water to be produced without being monitored for compliance with the maximum allowable turbidity limit. The proposed amendments for CFE turbidity monitoring will require continuous monitoring and recording of the results every 15 minutes.

Individual filter effluent (IFE) monitoring ensures that filter deficiencies are identified and corrected before a CFE turbidity exceedance occurs. Existing regulations require continuous IFE turbidity monitoring at conventional and direct filtration plants. The proposed amendments for IFE monitoring will be broadened to include all filtration types.

Health effects associated with microbial contaminants tend to be due to short-term, single dose exposure rather than long-term exposure. Therefore, if a short duration single turbidity exceedance of the existing maximum allowable turbidity limit occurs and goes unnoticed consumers are at risk of exposure to microbial pathogens. By requiring continuous monitoring and recording of the results at least every 15 minutes at both CFE and IFE locations for all filter plants, water suppliers will be able to identify problems before an exceedance occurs and determine compliance with the maximum allowable turbidity limit at all times.

The proposed amendments lower IFE trigger levels to be consistent with CFE turbidity requirements. Exceeding an IFE trigger is not a violation; instead, it prompts the water supplier to investigate the cause of the problem and correct any deficiencies.

An additional revision will require all filtration plants to implement a filter bed evaluation program that assesses the overall health of each filter to identify and correct problems before a turbidity exceedance occurs.

All of these filter plant performance provisions are part of a multi-barrier approach to ensure treatment is adequate to provide safe and potable water to all users.

Automatic Alarms and Shutdown Capabilities

Filter plants require an immediate response from the water plant operator on duty when source water quality changes, filters need backwashing, or other unforeseen circumstances occur. Water plant operators are often called to perform other duties, which leaves the operation of the water plant unattended and which limits the operator's ability to respond immediately to treatment needs.

Automated alarms and shutdown capabilities play an important role in modern water treatment and public health protection. Most water suppliers have already taken advantage of the readily available technology in order to cut personnel costs and provide safe water to their customers. The proposed amendments will ensure that operators are immediately alerted to major treatment problems. The proposed amendments will also ensure that unmanned filter plants are automatically shut down when producing water that is not safe to drink, which prevents contaminated water from being provided to customers for extended periods of time. These alarms and shutdown capabilities will allow water operators at both attended and unattended filtration plants to promptly respond to the water quality problems and treatment needs of the plant. The automated plant shut down is intended to prevent unsafe water from reaching customers, which will protect public health, reduce PWS costs related to corrective actions and issuing public notice, reduce costs to the community and maintain consumer confidence.

Filter-To-Waste

DEP's Filter Plant Performance Evaluation program has evaluated approximately 1,268 filters since 1999. Results of these evaluations show that filters are most likely to shed turbidity, particles, and microbial organisms at the beginning of a filter run when the filter is first placed into service following filter backwash and/or maintenance. The proposed amendments will require all filter plants that have the ability to filter-to-waste to do so following filter backwash and/or maintenance and before placing the filter into service. Filtering to waste will reduce the likelihood of pathogens passing through filters and into the finished drinking water. The proposed amendments will not require water suppliers without filter-to-waste capabilities or with undersized filter-to-waste capabilities to make a capital improvement.

Calculations to Demonstrate 1.0 log Giardia and 3.0 log Virus Inactivation

Existing regulations require filter plants to maintain 90% (1-log) inactivation of Giardia cysts and 99.9% (3-log) inactivation of viruses by way of disinfection. When these levels are not achieved, customers may be exposed to pathogenic Giardia cysts and viruses. The only way to determine compliance with this requirement is to perform log inactivation calculations, which is not required by current regulation.

The proposed amendments will require water suppliers to calculate their log inactivation every four hours and report to DEP the lowest level achieved each day. This provision will provide a mechanism for the PWS and DEP to determine compliance with the log inactivation requirements.

Disinfectant Residual in the Distribution System

DEP is proposing to increase the minimum disinfectant residual requirements in the distribution system to 0.30 mg/L free or 0.50 mg/L total. DEP's existing disinfectant residual requirements for the distribution system have not been substantially updated since 1992 and require the maintenance of a

detectable residual (0.02 mg/L). Based on numerous studies and reports that have been published since 2002, these existing requirements may not adequately protect against microbial contamination in the distribution system. Despite advances in water treatment, waterborne disease outbreaks continue to occur and a greater proportion of these outbreaks have been linked to distribution system deficiencies. This data emphasizes the importance of protecting, maintaining and improving the distribution system infrastructure and water quality. Maintenance of a disinfectant residual throughout the distribution system serves as one of the final barriers to protect public health. An adequate residual can help to maintain the integrity of the distribution system by inactivating microorganisms, serving as an indicator of distribution system contamination, and controlling biofilm growth.

PA's existing disinfectant residual requirements, while consistent with the federal rule, have not kept pace with other states or industry standards. At least 19 states have promulgated more stringent requirements, including Delaware, Ohio and West Virginia. In addition, The Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (10 States Standards) specifies that the minimum free chlorine residual in water distribution systems should be 0.2 mg/L, and the minimum chloramine residual, where chloramination is practiced, should be 1.0 mg/L at distant points in the distribution system. Finally, the Water Research Foundation recommends a free chlorine residual of 0.20 mg/L and a total chlorine residual of 0.50 mg/L for an optimized distribution system.

This provision will affect and improve public health protection for all 1,982 community water systems (CWS) and 151 noncommunity water systems (NCWS) that have installed 4-log treatment for viruses. These 2,133 public water systems serve a total population of 10.6 million people.

Other Minor Revisions

Other minor revisions to Ch. 109 have been included to provide clarity and to maintain primacy.

Combined, the proposed rulemaking package will promote healthy and sustainable communities. Safe drinking water is vital to maintaining healthy and sustainable communities. Proactively avoiding incidents such as waterborne disease outbreaks can prevent loss of life, reduce the incidents of illness, and reduce health care costs. Proper investment in public water system infrastructure and operations helps ensure a continuous supply of safe drinking water; which enables communities to effectively serve existing residential, business and commercial customers; attracts new customers; and ensures their long-term sustainability for years to come.

(11) Are there any provisions that are more stringent than federal standards? If yes, identify the specific provisions and the compelling Pennsylvania interest that demands stronger regulations.

There are several provisions in this proposal that are more stringent than federal requirements. DEP developed these provisions to better protect public health and to be consistent with existing Pennsylvania drinking water regulations.

- Sections 109.202(c)(6), 109.202(c)(7), 109.701(a)(3)(iv), and 109.710(c) require one hour notification for violations or situations where the federal rule does not. These provisions have been added to clarify that these situations are covered by the existing one hour reporting requirements of § 109.701(a)(3). Pennsylvania's one hour reporting requirements remain more stringent than federal standards and ensure that DEP and the public are alerted to potential problems as soon as possible so that appropriate investigative and corrective actions can be taken.

- Section 109.202(c)(6)(iii) allows DEP to direct a PWS to conduct an assessment even if an assessment has not been triggered under § 109.202(c)(6)(i) or § 109.202(c)(6)(ii). DEP believes that other circumstances may warrant an assessment if circumstances exist that could adversely impact drinking water quality. If DEP becomes aware of a situation that may indicate a PWS' distribution system has become compromised, for example DEP learns of a waterborne outbreak, DEP can direct the PWS to conduct a self-assessment. Additional examples of when an assessment may be warranted include the situations specified in § 109.701(a)(3)(iii).
- Section 109.705(b)(7) requires PWS to consult with DEP within 14 days of receiving written notification that a Level 1 or Level 2 assessment is determined to be insufficient. The federal rule requires consultation but does not set a time limit. This provision will prevent violations by ensuring that systems consult with DEP and take steps to make corrections to an improperly completed assessment in advance of the 30 day due date for the revised assessment.
- Sections 109.202(c)(4) & (5), 109.301(13), 109.710(a), and 109.710 (b) are provisions which strengthen minimum disinfectant residual levels and disinfectant monitoring and reporting requirements to protect public health from microbial contamination in the distribution system. Additional justification for these provisions may be found in Question 10.
- Sections 109.202(c)(1)(i)(A)(II), 109.202(c)(1)(i)(D), 109.301(1)(i) and (ii), 109.301(2)(ii), 109.602(f) through 109.602 (h), 109.701(e)(i) through 109.701(e)(iv), 109.703(b)(1), 109.703(b)(5), and 109.703(b)(6) are provisions which strengthen turbidity requirements and filtration monitoring and reporting requirements. Health effects associated with microbial contaminants tend to be due to short-term, single dose exposure rather than long-term exposure. These amendments are part of a multi-barrier approach to ensure treatment is adequate to provide safe and potable water to all users.
- Sections 109.301(1)(iv), 109.301(2)(ii)-(iii) and 109.1305(a)(1)(iii) require systems to notify DEP within 24 hours of the failure of continuous monitoring equipment and to repair/replace continuous monitoring equipment, regardless of system size, within 5 working days of equipment failure. These provisions will ensure timely repair and restoration of continuous monitoring equipment necessary to maintain adequate treatment of drinking water for public health protection.
- Sections 109.301(1)(v) and 109.701(a)(2)(D)-(E) require systems providing filtration and disinfection of surface water or GUDI sources to calculate log inactivation every 4 hours and report at least the lowest level achieved for each day. The regulations already require PWS to maintain 1 log inactivation of Giardia cysts and 3 log inactivation of viruses; these revisions are necessary for PWS to demonstrate compliance with this requirement.

(12) How does this regulation compare with those of the other states? How will this affect Pennsylvania's ability to compete with other states?

RTCR

The federal RTCR will need to be complied with or adopted in all of the other 49 states.

Source Water Protection and Permitting

Two other states in EPA Region III, West Virginia and Virginia, also require source water assessments for new sources. In Virginia, the goal is to have a source water assessment completed by Virginia drinking water program staff before the operations permit is issued. Under West Virginia's new statute on source water protection, an assessment is included as part of a local source water protection plan and must be completed by the water supplier prior to operation for a surface water source.

Regarding the development of local source water protection programs, Delaware and more recently, West Virginia, have requirements for source water protection by statute. Under this regulation, the development of a local source water protection program will remain voluntary in Pennsylvania.

The source water aspects of the regulation should not affect Pennsylvania's ability to compete with other states.

Pennsylvania has had a permitting program in place for many years and the permitting aspects of the proposed regulation should not affect Pennsylvania's ability to compete with other states.

Surface Water and Groundwater Under the Direct Influence of Surface Water (GUDI) Filter Plants

Turbidity Monitoring, Recording, and Reporting

Thirty states responded to a survey that was shared with all states that have a safe drinking water program represented by Association of State Drinking Water Administrators (ASDWA). Twenty states require continuous turbidity monitoring and recording of CFE and fourteen states require continuous IFE monitoring and recording for all filtration types.

Automatic Alarms and Shutdown Capabilities

Thirty states responded to a survey that was shared with all states that have a safe drinking water program represented by ASDWA. Twelve states responded that they require filter plants to be attended at all times while in operation. Of the twelve states that require attended operation, seven have regulations that establish standards for plant automation, alarms and shutdowns. Pennsylvania's proposed amendments are less stringent than twelve other states since attended operation is not being required. In addition, the proposed amendments related to plant automation, alarms, and shutdown capabilities are less stringent than those standards suggested by the Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (also known as the 10 States Standards).

Annual Filter Inspection Program

All states require some of their filter plants to implement an annual filter inspection program. This proposed amendment is not expected to negatively affect Pennsylvania's ability to compete with other states because most PWS have in house filter inspection capabilities via their existing maintenance staff or certified water operator.

Filter-To-Waste

All states require some of their filter plants to filter-to-waste. This proposed amendment is not expected to negatively affect Pennsylvania because implementation is not expected to require any capital improvements.

Calculations to Demonstrate 1.0 log Giardia and 3.0 log Virus Inactivation

At least fifteen other states require log inactivation to be calculated, recorded and reported on plant Monthly Operating Reports (MORs).

Disinfectant Residual in the Distribution System

DEP's existing disinfectant residual requirements, while consistent with the federal rule, have not kept pace with other states. At least 19 states have promulgated more stringent requirements, including Delaware, Ohio and West Virginia. Other state's disinfectant residual requirements range from 0.2

mg/L to 0.5 mg/L (free), and 0.2 mg/L to 1.5 mg/L (total). This proposed amendment will make Pennsylvania more consistent with others states regarding public health protection. This proposal is not expected to negatively affect Pennsylvania because implementation is not expected to require any capital improvements.

The amendments will not put Pennsylvania at a competitive disadvantage with any other state. Rather the amendments will enhance Pennsylvania's ability to compete with other states by improving public health protection and promoting healthy and sustainable communities.

(13) Will the regulation affect any other regulations of the promulgating agency or other state agencies? If yes, explain and provide specific citations.

The amendments will be incorporated into the existing language of 25 Pa Code Chapter 109. Other than this incorporation, the amendments should not affect any existing or proposed regulations of DEP or any other state agency.

(14) Describe the communications with and solicitation of input from the public, any advisory council/group, small businesses and groups representing small businesses in the development and drafting of the regulation. List the specific persons and/or groups who were involved. ("Small business" is defined in Section 3 of the Regulatory Review Act, Act 76 of 2012.)

The draft proposed rulemaking was submitted to the Small Water Systems Technical Assistance Center (TAC) Advisory Board for review and discussion on June 18, 2014. Comments and recommendations were received from TAC on July 3, 2014. Discussion with TAC was continued on September 23, 2014 and TAC's revised comments were received on October 20, 2014.

(15) Identify the types and number of persons, businesses, small businesses (as defined in Section 3 of the Regulatory Review Act, Act 76 of 2012) and organizations which will be affected by the regulation. How are they affected?

One or more of these revisions will affect all PWS as well as the people to which they provide water. Currently, there are 8,868 PWS that serve a total population of over 12 million Pennsylvanians. Of the 8,868 PWS, approximately 2,408 are owned by a municipality, an authority, the Commonwealth of Pennsylvania, the federal government, or another not-for-profit entity. The other 6,460 PWS are either privately or investor owned.

A review of the USA Small Business Size Regulations under 13 CFR Chapter 1, Part 121 provides a standard for determining what constitutes a small business for the NAICS category relating to PWS. A PWS falls within NAICS category 221310, Water Supply and Irrigation Systems, which comprises establishments primarily engaged in operating water treatment plants and/or operating water supply systems. The small size standard for this NAICS category is annual receipts of not more than \$7.0 million.

For the 6,460 privately or investor owned PWS, DEP has no way to estimate annual receipts. Therefore, DEP used the federal definition of a small water system in 40 CFR 141.2, which states that a small water system is "a water system that serves 3,300 persons or fewer". Under this regulatory package, a PWS owned by a private individual or investor serving less than or equal to 3,300 persons was considered to be a small business.

In Pennsylvania, there are approximately 6,177 PWS meeting this criteria and can be considered as a small business.

The persons served by a PWS will benefit from this regulation, because a decrease in fecal contamination should reduce the potential risk to human health.

Some PWS will be affected by the need to change operation or make capital improvements to comply with some of the proposed provisions. Additionally, PWS which identify sanitary defects will need to correct those problems.

(16) List the persons, groups or entities, including small businesses, that will be required to comply with the regulation. Approximate the number that will be required to comply.

RTCR

8,868 PWS will be required to comply with one or more of these revisions. Of the 8,868 PWS, approximately 6,177 may be considered to be small businesses. For the purposes of this regulatory package, a PWS owned by a private individual or investor serving less than or equal to 3,300 persons was identified as a small business.

Source Water Protection and Permitting

Regarding the proposed changes to the permitting requirements for new sources, approximately 30 community water systems (CWS) per year will be required to comply.

Surface Water and Groundwater Under the Direct Influence (GUDI) Filter Plants

The 353 filter plants in Pennsylvania which are operated by 319 water systems will be required to comply with one or more of these revisions. The approximate number of filter plants by ownership type is shown below:

- 181 Authorities
- 85 Investors
- 57 Municipalities
- 15 State Agencies
- 6 Water Associations
- 4 Other
- 3 Private Individuals
- 2 Federal Agencies

Of the 353 filter plants, 22 are considered to be small businesses. For the purposes of this regulatory package, a PWS owned by a private individual or investor serving less than or equal to 3,300 persons was identified as a small business.

Disinfectant Residual in the Distribution System

All CWSs and noncommunity water systems that trigger 4-log inactivation under the Ground Water Rule must comply with existing disinfectant residual requirements. This same group of water systems (approximately 2,100 water systems) will need to comply with the increased disinfectant residual requirements.

Of this number, approximately 1,060 are considered a small business.

(17) Identify the financial, economic and social impact of the regulation on individuals, small businesses, businesses and labor communities and other public and private organizations. Evaluate the benefits expected as a result of the regulation.

The expected benefits of this regulation are (1) the avoidance of a full range of health effects from the consumption of contaminated drinking water such as: acute and chronic illness, endemic and epidemic disease, waterborne disease outbreaks, and death; and (2) healthy and sustainable communities.

This regulation will provide a positive economic impact to individuals, small businesses and businesses that provide services to the drinking water industry.

RTCR

The financial impact of these revisions to the regulated community will be: increased monitoring for noncommunity water systems, hiring a certified operator to conduct a Level 2 assessment for transient noncommunity water systems (TNC), and correcting sanitary defects which have been identified during an assessment for all systems.

Source Water Protection and Permitting

PWS will incur a cost when completing the source water assessment portion of the permitting process for new sources.

Source water protection represents the first barrier to drinking water contamination. A vulnerable drinking water source also puts a water utility and the community it serves at risk and at a disadvantage in planning and building future capacity for economic growth. Contamination of a community water system source is costly for the water supplier and the public. For example, it is estimated that the total cost of an *E. coli* contamination incident in Walkerton, Ontario was \$64.5 million (*The Economic Costs of the Walkerton Water Crisis* by John Livernois, 2002). In addition to increased monitoring and treatment costs for the water system, there may be costs associated with containment and/or remediation, legal proceedings, adverse public health and environmental effects, reduced consumer confidence, diminished property values and replacement of the contaminated source.

A Texas A&M study shows that water suppliers in source water areas with chemical contaminants paid \$25 more per gallon to treat drinking water than suppliers in areas with no chemical contaminant detections. The study also showed that for every four percent increase in source water turbidity (an indicator of water quality degradation from sediment, algae and microbial pathogens), treatment costs increase by one percent (Trust for Public Land, 2002). A study by the PA Legislative Budget and Finance Committee (2013) stated, “(r)educing pollution inputs from pipes and land-based sources can reduce locality costs to treat drinking water sources to safe standards. An EPA study of drinking water source protection efforts concluded that every \$1 spent on source-water protection saved an average of \$27 in water treatment costs. Similarly, a study by the Brookings Institute suggested that a 1 percent decrease in sediment loading will lead to a 0.05 percent reduction in water treatment costs.”

Findings from the source water assessments can support and enhance emergency response, improve land use planning and municipal decisions, complement sustainable infrastructure initiatives and help prioritize and coordinate actions by federal and state agencies to better protect public health and safety.

Surface Water and Groundwater Under the Direct Influence (GUDI) Filter Plants

The financial impact to PWS with filter plants includes the cost associated with installation of continuous monitoring equipment, installation of alarm and shutdown capabilities, implementation of a filter bed inspection program and the cost associated with filtering to waste.

The proposed amendments are intended to reduce the public health risks and associated costs related to waterborne pathogens and waterborne disease outbreaks. Costs related to waterborne disease outbreaks are extremely high. For example, the total medical costs and productivity losses associated with the 1993 waterborne outbreak of cryptosporidiosis in Milwaukee, Wisconsin was \$96.2 million: \$31.7 million in medical costs and \$64.6 million in productivity losses. The average total cost per person with mild, moderate, and severe illness was \$116, \$475, and \$7,808, respectively according to the following study:

Cost of illness in the 1993 Waterborne *Cryptosporidium* outbreak, Milwaukee, Wisconsin. Corso PS, Kramer MH, Blair KA, Addiss DG, Davis JP, Haddix AC. Emerg Infect Dis [serial online] 2003 April. Available from: URL: <http://wwwnc.cdc.gov/eid/article/9/4/02-0417>

In 2008, a large *Salmonella* outbreak caused by contamination of the municipal drinking water supply occurred in Alamosa, Colorado. The outbreak's estimated total cost to residents and businesses of Alamosa using a Monte Carlo simulation model (10,000 iterations) was approximately \$1.5 million dollars (range: \$196,677–\$6,002,879), and rose to \$2.6 million dollars (range: \$1,123,471–\$7,792,973) with the inclusion of outbreak response costs to local, state and nongovernmental agencies and City of Alamosa healthcare facilities and schools. This investigation documents the significant economic and health impacts associated with waterborne disease outbreaks and highlights the potential for loss of trust in public water systems following such outbreaks. This information can be found in the following study:

Economic and Health Impacts Associated with a *Salmonella* Typhimurium Drinking Water Outbreak—Alamosa, CO, 2008. Available from URL: <http://www.ncbi.nlm.nih.gov/pubmed/23526942>

Disinfectant Residual in the Distribution System

It is expected that the large majority of water systems will be able to comply with this requirement with little to no capital costs. According to Department records for the last three years (2012 – 2014):

- Based on almost 80,000 monthly average distribution system disinfectant residual values reported by 2,594 different water systems:
 - 92.4% of the average values already meet or exceed the increased minimum residual of 0.30 mg/L (free)
 - Only 7.6% of the average values are below the minimum residual.
- For the 34 systems that chloramine, based on more than 1,000 monthly average values reported:
 - 99.25% of the average values already meet or exceed the increased minimum residual of 0.50 mg/L (total)
 - Only 0.75% of the average values are below the minimum residual.

In order to lower chlorine demand and improve water quality, systems may need to improve the effectiveness of existing operation and maintenance best management practices, such as flushing, storage tank maintenance, cross connection control, leak detection, and effective pipe replacement and repair . Improving these practices will help ensure PWS meet disinfectant residual requirements at all points in the distribution system.

Other Minor Revisions

The permit exemption for small CWS and nontransient noncommunity water systems (NTNC) will be removed so that all CWS and NTNC will be required to obtain a permit for installing optimal corrosion control treatment. The benefits associated with CWS and NTNC obtaining a permit will be increased public health protection because appropriate corrosion control technology will be installed.

(18) Explain how the benefits of the regulation outweigh any cost and adverse effects.

RTCR

Implementation of the proposed amendments is not anticipated to produce adverse effects. The benefits as discussed by EPA are largely unquantifiable but include the potential for decreased incidence of endemic illness from fecal contamination and other waterborne pathogens, increased knowledge regarding system operation, accelerated maintenance and repair, avoided costs of outbreaks, and reductions in averting behavior. (78 FR 10302 – 10303, February 13, 2013). These benefits outweigh the costs because of the increased protection of public health.

Source Water Protection and Permitting

The proposed regulation will support the protection of public drinking water sources resulting in maintaining the highest source water quality available. Protected source water reduces or avoids drinking water treatment costs.

Surface Water and Groundwater Under the Direct Influence (GUDI) Filter Plants

The filtration amendments are designed to identify and correct problems at the plant before a turbidity exceedance occurs or escalates. The proposed alarm and shutdown capability amendments will ensure that operators are immediately alerted to major treatment problems. A plant producing water that is not safe to drink will automatically shut down when an operator is not immediately available. These amendments will prevent violations, which will protect public health, avoid PWS costs related to correcting violations, and reduce costs to the community.

Disinfectant Residual in the Distribution System

The proposed amendment is intended to increase public health protection. Maintenance of a disinfectant residual throughout the distribution system serves as one of the final barriers to protect public health. Lack of an adequate disinfectant residual may increase the likelihood that disease-causing organisms are present. Lack of a residual may also signal the existence of a potential pathway of contamination, which supports the main purpose of the RTCR to find and fix sanitary defects.

It is expected that the large majority of water systems will be able to comply with this requirement with little to no capital costs. In order to lower chlorine demand and improve water quality, systems may need to improve the effectiveness of existing operation and maintenance best management practices, such as flushing, storage tank maintenance, cross connection control, leak detection, and effective pipe replacement and repair. Improving these practices will help ensure PWS meet disinfectant residual requirements at all points in the distribution system.

(19) Provide a specific estimate of the costs and/or savings to the **regulated community** associated with compliance, including any legal, accounting or consulting procedures which may be required. Explain how the dollar estimates were derived.

RTCR

Costs were derived from the alternative option of EPA's economic analysis of the Federal RTCR. The alternative option looks at the costs associated with monthly monitoring for all PWS and shows that costs are relatively insignificant. National costs were adjusted to represent the ratio of Pennsylvania PWS compared to the number of PWS nationwide.

CWS: \$126.77 per system/year

NTNC: \$128.90 per system/year

TNC: \$229.31 per system/year

Mandating monthly monitoring for all PWS will eliminate the requirement to collect 3 additional samples in the month following a total coliform positive sample. Based on a five year average of approximately 580 positive samples per year, regulated noncommunity water systems (NCWS) are expected to save approximately \$40,000 per year in these extra sampling costs.

Source Water Protection and Permitting

DEP's records indicate that approximately 50 new CWS sources are permitted each year. DEP estimates that an extra 8 hours of work completed by a professional geologist will be needed to comply with the new source permitting amendments.

This extra time paid to a professional geologist will amount to approximately \$1,176.00 per source permitted. This estimate is based on current hourly rates charged by consulting firms conducting this work.

Surface Water and Groundwater Under the Direct Influence (GUDI) Filter Plants

Turbidity Monitoring, Recording, and Reporting

Costs have been derived from vendors of HACH brand turbidimeters; the most commonly used turbidimeter in Pennsylvania. If the water supplier prefers a different brand of equipment, the cost may change. There could be some per instrument cost savings when multiple instruments are purchased. The following table, provided for illustrative purposes, shows costs related to installing and maintaining one HACH continuous monitoring and recording device:

Items	Initial Cost	Estimated Annual Calibration and Maintenance Cost
HACH 1720E and SC200	\$2,705.00	
Shipping	\$ 76.25	
Installation	\$ 200.00	
Calibration Kit	\$ 286.00	
20 NTU StablCal x (4) Calibrations		\$ 492.00
Lamp Assembly Replacement		\$ 62.00
Total	\$3,267.25	\$ 554.00

Individual Filter Effluent (IFE) Monitoring

There are 353 filter plants in Pennsylvania of which 263 are currently required to continuously monitor and record their IFE and already have instrumentation installed. The proposed amendments will require the

remaining 90 filter plants to comply with the IFE monitoring requirements of which 69 already have the needed instrumentation. Therefore, 21 filter plants will need to install one or more monitoring and recording device. The majority of these 21 filter plants only have two filters. The estimated cost, for a water supplier having two filters, to install IFE monitoring and recording equipment is expected to be \$6,534.50. The annual maintenance cost for the monitoring and recording equipment on two filters is estimated to be \$616.00 (1 bottle of StablCal and 2 replacement lamps). The cumulative cost for the installation of the IFE monitoring and recording equipment at all 21 filter plants is estimated to be \$137,224.50. The cumulative cost for maintaining the monitoring and recording equipment at all 21 filter plants is estimated to be \$12,936.00 per year.

Combined Filter Effluent (CFE) Monitoring

The majority of filter plants in Pennsylvania already continuously monitor and record their CFE. The exact number of filtration plants without this capability is not known, but based on a review of 90 filtration plants, it is estimated to be 15% of the 353 filter plants in the state. The estimated cost to install CFE monitoring and recording equipment is \$3,267.25 per plant. The annual maintenance cost for the monitoring and recording equipment is estimated to be \$554.00 for one turbidimeter. The cumulative cost for an estimated 52 filter plants to install continuous monitoring and recording equipment is estimated to be \$169,897.00. The cumulative cost for maintaining the monitoring and recording equipment at all 52 filter plants is estimated to be \$28,808.00 per year.

Annual Filter Inspection Program

No significant additional costs are expected to be associated with implementation of a filter inspection program as this will be included in the duties of existing PWS staff.

Filter-To-Waste

No expected costs are associated with the proposed filtering to waste amendments.

Automatic Alarms and Shutdown Capabilities

Raco Verbatim is a commonly used controller at small filter plants. It has the capability of receiving data from continuous monitoring turbidimeters, chlorine residual analyzers, and water level indicators. The control also has the capability to call or page the operator on duty, trigger an alarm, and/or shutdown plant processes based on the data received from instrumentation. The controller can call the operator on duty through use of a landline or cellular option.

Example Cost for a small filter plant to add alarms, phone dialers, and automated shutdown are shown in the following table:

Items	Initial Cost	Estimated Annual Calibration and Maintenance Cost
Raco Verbatim (8 channel)	\$2,350.00	
Installation	\$1,000.00	
Surge Protector	\$ 80.00	
Shutdown Options	\$1,000.00	
Cellular option for remote locations	\$1,000.00	
Landline or cellular service		\$600.00
Total	\$5,430.00	\$600.00

DEP estimates that 10% of the 353 filter plants in Pennsylvania will need to install a controller. The cumulative installation cost for an estimated 35 filter plants to comply with automated alarms and

shutdown capability is estimated to be \$190,050. The cumulative maintenance cost for 35 filter plants to comply with automated alarms and shutdown capability is estimated to be \$21,000 per year.

Disinfectant Residual in the Distribution System

It is expected that the large majority of water systems will be able to comply with this requirement with little to no capital costs. In order to lower chlorine demand and improve water quality, systems may need to improve the effectiveness of existing operation and maintenance best management practices, such as flushing, storage tank maintenance, cross connection control, leak detection, and effective pipe replacement and repair. Improving these practices will help ensure PWS meet disinfectant residual requirements at all points in the distribution system.

(20) Provide a specific estimate of the costs and/or savings to the **local governments** associated with compliance, including any legal, accounting or consulting procedures which may be required. Explain how the dollar estimates were derived.

The only costs to local government will be costs incurred by systems that are owned and/or operated by local government. The cost estimates are based on the figures in question 19.

RTCR

The proposed amendments will affect all PWS, which includes local government agencies and municipal authorities operating such systems. The only costs to local government will be costs incurred by systems that are owned and/or operated by local government. Of the 8,868 PWS in Pennsylvania affected by this proposal, approximately 1,000 are operated by local governments. The total annual cost to these cities/boroughs or other municipal authorities are calculated and estimated to be \$156,393.

Source Water Protection and Permitting

Of the 50 new sources permitted each year, approximately 19 are expected to occur at locally owned systems. The approximate cost paid to a professional geologist will amount to approximately \$22,344 per year.

Surface Water and Groundwater Under the Direct Influence (GUDI) Filter Plants

Approximately two-thirds of all filter plants are owned and/or operated by local government. Total cost to local government for the revisions associated with filter plants are as follows:

- There are nine plants that need to add equipment to comply with the IFE requirements. The initial expected cumulative cost for the nine plants is \$58,811, with a cumulative annual maintenance cost of \$5,544, or \$616 per plant.
- There are approximately 35 plants that need to add equipment to comply with the CFE requirements. The initial expected cumulative cost for the 35 plants is \$114,354, with a cumulative annual maintenance cost of \$19,390, or \$554 per plant.
- There are approximately 24 plants that need to add equipment to comply with the alarm and shutdown requirements. The initial expected cumulative cost for the 24 plants is \$130,320, with a cumulative annual maintenance cost of \$14,400, or \$600 per plant.

Disinfectant Residual in the Distribution System

It is expected that the large majority of water systems will be able to comply with this requirement with little to no capital costs. In order to lower chlorine demand and improve water quality, systems may need to improve the effectiveness of existing operation and maintenance best management practices, such as flushing, storage tank maintenance, cross connection control, leak detection, and effective pipe

replacement and repair . Improving these practices will help ensure PWS meet disinfectant residual requirements at all points in the distribution system.

(21) Provide a specific estimate of the costs and/or savings to the **state government** associated with the implementation of the regulation, including any legal, accounting, or consulting procedures which may be required. Explain how the dollar estimates were derived.

The costs to state government will be those incurred by systems that are owned and/or operated by state government and costs associated with implementing and administering the rule. The cost estimates are based on the figures in question 19.

RTCR

Implementation of the proposed amendments will result in Pennsylvania state government incurring costs associated with implementing and administering the rule, reviewing sample siting plans, reviewing sampling results, reviewing seasonal system start-up procedures and annual certification, reviewing completed assessment forms, tracking corrective actions, and tracking public notifications. EPA estimates nationwide costs for state government to equate to approximately \$200,000. The expected annual cost to Pennsylvania state government equates to \$11,000.

208 systems are owned and/or operated by the Commonwealth of Pennsylvania. The total cost to the Commonwealth for these systems is estimated to be \$44,139.

Source Water Protection and Permitting

State costs associated with administering these revisions are not expected to substantially increase or decrease.

Of the 50 new sources permitted each year, no more than 1 is expected to occur at any state owned system. The approximate cost paid to a professional geologist will amount to approximately \$1,176 per year.

Surface Water and Groundwater Under the Direct Influence (GUDI) Filter Plants

State costs associated with administering these revisions are not expected to substantially increase or decrease. The proposed amendments are intended to identify Tier 1 violations that previously would have gone unnoticed. As a result, staff time related to compliance and enforcement could increase. However, the proposed amendments are also intended to identify and correct water system deficiencies before they worsen to the point of a Tier 1 violation, which would result in a reduction of staff time spent on compliance and enforcement. Overall, the proposed amendments are expected to result in more efficient use of staff time.

15 filter plants are owned and/or operated by the Commonwealth of Pennsylvania. The total cost to the Commonwealth for these systems is estimated as follows:

- There are no IFE costs, because no state-owned filter plants will need to add IFE instrumentation.
- There are approximately 3 plants that need to add equipment to comply with the CFE requirements. The initial expected cost is \$9,802, with an annual maintenance cost of \$1,662.
- There are approximately 2 plants that need to add equipment to comply with the alarm and shutdown requirements. The initial expected cost is \$10,860, with an annual maintenance cost of \$1,200.

Disinfectant Residual in the Distribution System

State costs associated with administering these revisions are not expected to substantially increase or decrease. This is an existing treatment technique requirement. The minimum residual is simply being raised to improve public health protection.

(22) For each of the groups and entities identified in items (19)-(21) above, submit a statement of legal, accounting or consulting procedures and additional reporting, recordkeeping or other paperwork, including copies of forms or reports, which will be required for implementation of the regulation and an explanation of measures which have been taken to minimize these requirements.

RTCR

When sample results indicate the presence of total coliform and/or *E. coli* in a sufficient number of samples as designated by the rule, PWS are required to complete a Level 1 and/or Level 2 Assessment form. Level 2 assessments must be completed by certified operators. Therefore, PWS which do not employ a certified operator will need to contract with one. PWS which operate seasonally are required to submit a Seasonal System Start-up Plan and then annually submit a form to DEP certifying that the start-up plan was implemented prior to opening for the season.

Source Water Protection and Permitting

CWS will only be required to update their source water assessment report if the annual water system evaluation identifies changes to actual or probable sources of contamination. To minimize the reporting burden, these reports are not required to be submitted to DEP.

Surface Water and Groundwater Under the Direct Influence (GUDI) Filter Plants

- PWS that exceed the lower IFE triggers will have additional reporting requirements using existing forms.
- PWS will be required to report log inactivation values on a monthly basis using existing forms.
- PWS that experience a failure of alarm or shutdown equipment will be required to report the failure to DEP within 24 hours.

Disinfectant Residual in the Distribution System

This is an existing treatment technique requirement. No additional reporting, recordkeeping or other paperwork is expected.

Other

NCWS will be required to develop and maintain a distribution map.

(23) In the table below, provide an estimate of the fiscal savings and costs associated with implementation and compliance for the regulated community, local government, and state government for the current year and five subsequent years.

	Current FY Year	FY +1 Year	FY +2 Year	FY +3 Year	FY +4 Year	FY +5 Year
SAVINGS:	\$	\$	\$	\$	\$	\$
Regulated Community	0	0	0	0	0	0
Local Government	0	0	0	0	0	0
State Government	0	0	0	0	0	0
Total Savings	0	0	0	0	0	0

COSTS:						
Regulated Community	2,276,582	1,842,154	1,818,634	1,818,634	1,818,634	1,818,634
Local Government	505,486	218,631	218,631	218,631	218,631	218,631
State Government	11,000 (72,511)	11,000 (3,970)	11,000 (3,970)	11,000 (3,970)	11,000 (3,970)	11,000 (3,970)
Total Costs	2,273,864	1,839,966	1,839,966	1,839,966	1,839,966	1,839,966
REVENUE LOSSES:						
Regulated Community	0	0	0	0	0	0
Local Government	0	0	0	0	0	0
State Government	0	0	0	0	0	0
Total Revenue Losses	0	0	0	0	0	0

***Notes:**

- These provisions will not affect all systems every year, but for the purposes of the table above, the one-time costs are included in the current year and all affected systems are assumed to implement all provisions each year.
- Costs for the regulated community is the cost for all PWS which includes the cost to local and state government PWS.
- Local Government in this analysis is the regulated community, not the regulating agencies. Thus, the costs under local government are a portion of the costs identified for the regulated community.
- The top number in the State Government row is the State's oversight costs. The number in parentheses represents the portion of the costs identified for the regulated community for state-owned water systems.
- The Total Costs is equal to the cost to the regulated community plus the portion of the State Government oversight costs.

(23a) Provide the past three year expenditure history for programs affected by the regulation.

Program	FY -3 2011-12	FY -2 2012-13	FY -1 2013-14	Current FY 2014-15
Environmental Protection Operations	\$6,551,854	\$7,184,356	\$7,357,140	\$5,224,967
Environmental Program Management	\$359,473	\$570,817	\$710,938	\$251,959
General Government Operations	\$0	\$0	\$385	\$0
Safe Drinking Water Act	\$0	\$58,480	\$15,439	\$24,650

(24) For any regulation that may have an adverse impact on small businesses (as defined in Section 3 of the Regulatory Review Act, Act 76 of 2012), provide an economic impact statement that includes the following:

- (a) An identification and estimate of the number of small businesses subject to the regulation.
- (b) The projected reporting, recordkeeping and other administrative costs required for compliance with the proposed regulation, including the type of professional skills necessary for preparation of the report or record.
- (c) A statement of probable effect on impacted small businesses.
- (d) A description of any less intrusive or less costly alternative methods of achieving the purpose of the proposed regulation.

RTCR

- (a) Of the 8,868 PWS approximately 6,177 may be considered to be small businesses (as defined in Question 15).
- (b) When sample results indicate the presence of total coliform and/or *E. coli* in a sufficient number of samples as designated by the rule, PWS are required to complete a Level 1 and/or Level 2 Assessment form. Level 2 assessments must be completed by certified operators. Therefore, PWS which do not employ a certified operator will need to contract with one. PWS which operate seasonally are required to submit a Seasonal System Start-up Plan and then annually submit a form to DEP certifying that the start-up plan was implemented prior to opening for the season. The costs to complete these activities are part of the total implementation cost detailed in (c).
- (c) Depending on the PWS type, businesses are expected to incur from \$126.77 for CWS up to \$229.31 for TNC per system per year. Some of the associated expenses will only be realized if sampling indicates the potential for *E. coli* contamination, which then needs to be further evaluated through a Level 1 or Level 2 Assessment.
- (d) For the RTCR provisions, no alternative regulatory schemes were considered. These amendments reflect federal rules that must be complied with or adopted by the individual state in order to assume primary enforcement responsibility.

Source Water Protection and Permitting

- (a) Of the 30 CWS expected to permit at least one new source each year, 13 may be considered as being owned by a small business (as defined in Question 15).
- (b) Administrative costs associated with these revisions are not expected to substantially increase.
- (c) It is estimated to cost an additional \$1,176.00 per source to be permitted.
- (d) For the source water protection and permitting provisions, no alternative regulatory schemes were considered.

Surface Water and Groundwater Under the Direct Influence (GUDI) Filter Plants

- (a) Of the 353 filter plants, 22 plants are considered as being owned by a small business (as defined in Question 15).
- (b) Administrative costs associated with these revisions are not expected to substantially increase. Existing certified operators currently employed by these small systems can comply with the requirements.
- (c) Most small systems with filter plants in Pennsylvania already have the instrumentation being required in these provisions. It is estimated that between one and three plants will need to install equipment to monitor for IFE and/or CFE or to meet the alarm requirements. If a system must install equipment for each of these requirements the cost would equal \$15,232 and have an annual maintenance cost of \$2,262.

(d) For the surface water and GUDI provisions, no alternative regulatory schemes were considered.

Disinfectant Residual in the Distribution System

- (a) Approximately 1,060 small systems must comply with the proposed increase in the minimum disinfectant residual requirements.
- (b) Administrative costs are not expected to increase because this is an existing treatment technique requirement.
- (c) Capital costs are not expected to increase. In order to lower chlorine demand and improve water quality, systems may need to improve the effectiveness of existing operation and maintenance best management practices, such as flushing, storage tank maintenance, cross connection control, leak detection, and effective pipe replacement and repair . Improving these practices will help ensure PWS meet disinfectant residual requirements at all points in the distribution system.
- (d) This amendment constitutes a revision to an existing regulation and treatment technique. The increase in minimum residual is necessary to improve public health protection. No alternative regulatory scheme was considered.

(25) List any special provisions which have been developed to meet the particular needs of affected groups or persons including, but not limited to, minorities, the elderly, small businesses, and farmers.

The amendments should have no effects on one particular group relative to another since it will apply to most of Pennsylvania’s population served by public water systems. However, the Safe Drinking Water Program is prepared to develop special provisions or provide special services to accommodate any such group as the need arises.

(26) Include a description of any alternative regulatory provisions which have been considered and rejected and a statement that the least burdensome acceptable alternative has been selected.

RTCR

No alternative regulatory schemes were considered. These amendments reflect federal rules that must be complied with or adopted by the individual states.

Source Water Protection and Permitting

No alternative regulatory schemes were considered.

Surface Water and Groundwater Under the Direct Influence (GUDI) Filter Plants

Consideration was given to requiring plants be manned during all hours of operation and to mandate shutdown capabilities for all filter plants. Based on feedback from the Small Water Systems Technical Advisory Center (TAC), this requirement was determined to be too burdensome.

Disinfectant Residual in the Distribution System

No alternative regulatory schemes were considered.

(27) In conducting a regulatory flexibility analysis, explain whether regulatory methods were considered that will minimize any adverse impact on small businesses (as defined in Section 3 of the Regulatory Review Act, Act 76 of 2012), including:

- a) The establishment of less stringent compliance or reporting requirements for small businesses;

For these provisions, no less stringent compliance or reporting requirements for small businesses were considered.

- b) The establishment of less stringent schedules or deadlines for compliance or reporting requirements for small businesses;

For these provisions, no less stringent schedules or deadlines for small businesses were considered.

- c) The consolidation or simplification of compliance or reporting requirements for small businesses;

For these provisions, neither consolidation nor simplification of compliance or reporting requirements for small businesses was considered.

- d) The establishment of performing standards for small businesses to replace design or operational standards required in the regulation;

For these provisions, no performing standards for small businesses to replace design or operational standards required in the regulation for small businesses were considered.

- e) The exemption of small businesses from all or any part of the requirements contained in the regulation.

For these provisions, no exemptions for small businesses from all or any part of the requirements contained in the regulation were considered.

For language relating to the RTCR, alternative provisions were not considered for small businesses, because those requirements reflect federal regulations that must be adopted to maintain primacy. For other revisions, alternative provisions were not considered for small water systems. The customers of water systems classified as small businesses must be afforded the same level of public health protection as customers of large water systems.

(28) If data is the basis for this regulation, please provide a description of the data, explain in detail how the data was obtained, and how it meets the acceptability standard for empirical, replicable and testable data that is supported by documentation, statistics, reports, studies or research. Please submit data or supporting materials with the regulatory package. If the material exceeds 50 pages, please provide it in a searchable electronic format or provide a list of citations and internet links that, where possible, can be accessed in a searchable format in lieu of the actual material. If other data was considered but not used, please explain why that data was determined not to be acceptable.

RTCR

These amendments reflect federal rules that must be complied with or adopted by the individual states.

Source Water Protection and Permitting

Data is not the basis for the regulation; rather, the revisions clarify existing policy, guidance and federal requirements for the Source Water Assessment and Protection Program.

Surface Water and Groundwater Under the Direct Influence (GUDI) Filter Plants

The following items are included or attached:

Documentation related to Continuous Turbidity Monitoring and Recording

- The link to HACH's product website from which cost information was gathered: <http://www.hach.com/1720e-turbidimeter-with-sc200-controller-2-channel/product?id=7640457955>
- A PowerPoint slide showing a filter profile which demonstrates that turbidity particles and pathogenic cysts that are stored during a filter run can be discharged during a very short period of time as a result of a hydraulic surge. This slide demonstrates the need for continuous turbidity monitoring as this type of filter break through would normally not be identified during 4 hour grab sampling.
- EPA Turbidity Provisions; Chapter 7 *Importance of Turbidity* cites and summarizes data, research, and case studies which demonstrate: outbreaks have occurred when turbidity values did not exceed 0.17 NTU or during short increases in turbidity; microbial organisms can be shielded from disinfection by larger organism or particles; that most pathogens are removed when filter performance is less than 0.10 NTU.
- The link to an abstract called *Do free-living amoebae in treated drinking water systems present an emerging health risk?*. This study describes how human pathogens can be harbored inside of an amoeba host and protected against disinfection allowing the live pathogens to later replicate and emerge in the distribution system. This scenario shows the importance of particle and microbial organism removal during the filtration process to reduce the risk to public health in the distribution system: <http://www.ncbi.nlm.nih.gov/pubmed/21194220>

Documentation related to Filter Plant Automation, Alarms and Shutdowns

- The results from a survey of other states related to turbidity monitoring and plant automation.
- Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers *Policy Statement on Automated/Unattended Operation of Surface Water Treatment Plants*.
- West Virginia Department of Health's requirements on filter plant automation, alarms and shutdowns.
- The link to Raco Verbatim's product website from which cost information was gathered for alarms, phone dialers, and shutdown controllers: <http://www.racoman.com/verbatim.html>
- The link to Grainger's product website from which cost information was gathered for clearwell high-low level controllers: [http://www.grainger.com/product/WATERLINE-CONTROLS-Water-Level-Control-High-and-4GHL1?s_pp=false&picUrl=//static.grainger.com/rp/s/is/image/Grainger/4GHL1_AS01?\\$smthumb\\$](http://www.grainger.com/product/WATERLINE-CONTROLS-Water-Level-Control-High-and-4GHL1?s_pp=false&picUrl=//static.grainger.com/rp/s/is/image/Grainger/4GHL1_AS01?$smthumb$)

Disinfectant Residual in the Distribution System

Documentation related to the prevalence of waterborne disease outbreaks associated with distribution system deficiencies:

- Centers for Disease Control and Prevention (CDC). Legionellosis-United States, 2000-2009, MMWR, Vol. 60, No. 32, 2011.
- CDC. Surveillance for Waterborne Disease Outbreaks Associated with Drinking Water-United States, 2009-2010, MMWR, Vol. 62, No. 35, 2013.
- Craun, et al. Causes of Outbreaks Associated with Drinking Water in the United States from 1971 to 2006, *Clinical Microbiology Reviews*, 23(3), 507-528.

Documentation related to the effectiveness of disinfectant residuals in inactivating pathogens:

- Kuchta, et al. 1983. Susceptibility of *Legionella pneumophila* to Chlorine in Tap Water. *Applied and Environmental Microbiology*, Vol. 46, No. 5.

- Loret et al. 2005. Comparison of Disinfectants for Biofilm, Protozoa and *Legionella* Control. *Journal of Water and Health*, 03.4.

(29) Include a schedule for review of the regulation including:

- | | |
|---|--|
| A. The date by which the agency must receive public comments: | <u>August 13, 2015</u> |
| B. The date or dates on which public meetings or hearings will be held: | <u>2 Hearings</u>
<u>Dates to be determined</u> |
| C. The expected date of promulgation of the proposed regulation as a final-form regulation: | <u>July 17, 2016</u> |
| D. The expected effective date of the final-form regulation: | <u>July 17, 2016</u> |
| E. The date by which compliance with the final-form regulation will be required: | <u>July 17, 2016</u> |
| F. The date by which required permits, licenses or other approvals must be obtained: | <u>July 17, 2016 through</u>
<u>July 17, 2019</u> |

(30) Describe the plan developed for evaluating the continuing effectiveness of the regulations after its implementation.

The amendments will be reviewed in accordance with the Sunset Review Schedule published by DEP.