



pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

Safe Drinking Water Disinfection Requirements Rule

25 Pa. Code Chapter 109
46 Pa.B. 857 (February 20, 2016)
Environmental Quality Board Regulation #7-520
(Independent Regulatory Review Commission #3136)

Comment and Response Document

List of Commentators

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Introduction

The Environmental Quality Board (Board) adopted the proposed disinfection requirements rule at its November 17, 2015 meeting. On February 11, 2016, the Department of Environmental Protection (DEP) submitted a copy of the proposed rulemaking to the Independent Regulatory Review Commission (IRRC) and to the Chairpersons of the Senate and House Environmental Resources and Energy Committees for review and comment in accordance with Section 5(a) of the Regulatory Review Act (71 P.S. § 745.5(a)). The proposed rulemaking was published in the *Pennsylvania Bulletin* on February 20, 2016 (46 Pa.B. 857) with provision for a 60-day public comment period that closed on April 19, 2016. Three public hearings were held during the public comment period to accept verbal comments on the proposed regulation. Comments were received from 21 commentators including IRRC. All comments can be viewed in their entirety on the Department of Environmental Protection's (Department) eComment page for this rulemaking:

<http://www.ahs.dep.pa.gov/eComment/ViewComments.aspx?enc=8YWleHIdijzUAFiG53EkjT71%2fkEF%2ftLQ%2fP436oCNhfE%3d>

Comments and Responses

- 1. Comment:** We have determined that [the proposed regulation #7-520] will have minimal effect on our membership since very few municipal systems are not already in compliance. The regulations are to strengthen public water systems requirements for microbial protection and disinfection prerequisites in those systems that do not have the necessary equipment to meet the established federal and state standards. Since it is a health issue it is hard to argue that the changes are not necessary. The only concern is the potential cost to those potential municipal or municipal authority systems that need to not only upgrade their monitoring equipment which should be at a minimal cost, but also need to install booster chlorination stations at a substantial cost. (1)

Response: The Department appreciates the commentators' support of this rulemaking and acknowledges the concern. Please see the response to comment # 5 regarding cost estimates.

- 2. Comment:** There is no clear or present public health threat being addressed by the proposed rule. Pennsylvania does not have a problem with *E. coli* outbreaks that can be attributed to water systems. (2, 3, 4, 5, 7, 10, 11, 12, 13, 15, 19)

Response: Drinking water in the distribution system is not sterile, regardless of the degree to which the water is treated. The water contains microbes that survive the treatment process or enter the distribution system through the pipe network. Many of these microbes can attach to the pipe wall and become part of a biofilm. Biofilms likely exist in all distribution systems, and are recognized as a normal part of the distribution system. Contamination and material in the biofilm may subsequently be released into the flowing water under various circumstances. As a result, biofilms can act as a slow-release mechanism for persistent contamination of the water. The organisms and their products may decrease disinfectant levels (by increasing disinfectant demand), pose a direct public health risk, or create taste and odor problems (EPA, 2002).

The amendments included in this rulemaking are intended to strengthen the distribution system disinfectant residual requirements by increasing the minimum residual in the distribution system to 0.2 mg/L free or total chlorine. The Department's previous disinfectant residual requirements for distribution systems had not been substantially updated since 1992 and required the maintenance of a

detectable residual that was defined as 0.02 mg/L. The Department's previous treatment technique was not protective of public health because a residual of 0.02 mg/L is below the minimum reporting level of 0.1 mg/L and represents a false positive reading.

Maintenance of a disinfectant residual in the distribution system is:

- Required under the Federal Surface Water Treatment Rule for all systems using surface water and groundwater under the direct influence of surface water (GUDI) sources, and under Chapter 109 for all community water systems and those noncommunity water systems that have installed disinfection.
- Designated by the U.S. Environmental Protection Agency (EPA) as the best available technology for compliance with both the Total Coliform Rule (TCR) and the Revised TCR.
- Considered an important element in a multiple barrier strategy aimed at maintaining the integrity of the distribution system and protecting public health.
- Intended to maintain the integrity of the distribution system by: inactivating microorganisms in the distribution system, indicating distribution system upset and controlling biofilm growth.

The preamble to the proposed rule included numerous studies, reports and data which provide the scientific and technical basis for a minimum disinfectant residual of 0.2 mg/L in the distribution system. Additional studies, reports and data were reviewed for this final-form rulemaking.

EPA published a Six-Year Review 3 (SYR 3) Technical Support Document for Microbial Contaminant Regulations in December 2016 (EPA, 2016). The 1996 Safe Drinking Water Act amendments require EPA to periodically review existing national primary drinking water regulations and determine which, if any, need to be revised. The purpose of the review, called the SYR, is to identify those regulations for which current health effects assessments, changes in technology, analytical methods, occurrence and exposure, implementation or other factors will improve or strengthen public health protection.

As part of the SYR 3, EPA requested compliance monitoring data from states/tribes from 2006 through 2011 regarding the presence/absence of total coliforms, *E. coli* and fecal coliforms; and data for disinfectant residual levels in the distribution system. Microbial contaminant data from 34 states/tribes met the quality assurance/quality control criteria and are included in the SYR 3 microbial dataset.

Using the SYR 3 data, EPA conducted an occurrence analysis of microbial indicators paired with disinfectant residual data that are measured at the same time and location. The five bins of free and total chlorine residual concentrations are:

- Bin 1: Concentrations equal to 0 (“not detected or below detection limit”)
- Bin 2: Concentrations >0 and ≤ 0.2 mg/L
- Bin 3: Concentrations >0.2 mg/L and ≤ 0.5 mg/L
- Bin 4: Concentrations >0.5 mg/L and ≤ 1.0 mg/L
- Bin 5: Concentrations >1.0 mg/L

This represents the first national dataset available to evaluate microbial data as a function of disinfectant residual. In summary, based on an assessment of 5.434 million samples, EPA determined:

- There was a lower rate of occurrence of both total coliform and fecal coliform/*E. coli* positives as the free or total chlorine residual increased to higher levels.
- This relationship between chlorine residuals and occurrence of total coliform and fecal coliform/*E. coli* positives was similar to results reported by the Colorado Department of Public Health and Environment (Ingels, 2015). In addition, this relationship is consistent with the findings of LeChevallier et al. (1996) which stated that disinfectant residuals of 0.2 mg/L or more of free chlorine, or 0.5 mg/L or more of total chlorine, are associated with reduced levels of coliform bacteria. Both studies were discussed in the preamble to the proposed rule.
- A detectable concentration of disinfectant residual in the distribution system may not be adequately protective of public health due to microbial pathogens. This is based on concerns about analytical methods and the potential for false positives (Wahman and Pressman, 2015). According to EPA, maintaining a disinfectant residual above a set numerical value in the distribution system may improve public health protection from a variety of pathogens.

EPA's concerns about the analytical methods and the potential for false positives is consistent with information provided by HACH®, the leading manufacturer of field test equipment. HACH® provided information to the Small Water Systems Technical Assistance Center Advisory Board (TAC) during development of the proposed rulemaking that supported a minimum reporting level for disinfectant residual of 0.1 mg/L. Details related to this data were included in the preamble to the proposed rule.

In order to ensure that the Department's disinfectant residual requirements are adequately protective of public health and are achievable using currently available analytical methods, the Department has retained the level of 0.2 mg/L as a numeric standard. This level represents a standard that is above the minimum reporting level of 0.1 mg/L. Due to EPA's rules of rounding for compliance determinations, disinfectant residual levels ≥ 0.15 mg/L will round up to 0.2 mg/L and will be in compliance with the numeric standard.

3. **Comment:** DEP's existing minimum disinfection residual requirement for distribution systems defined as 0.02 mg/L does not represent a true detectable residual. Scientific studies presented during the stakeholder process have demonstrated that 0.1 mg/L chlorine residual does in fact represent a true detectable residual. The minimum residual should be set at 0.1 mg/L. A minimum value of 0.1 mg/L is a responsible level given the Department's concerns regarding a detectable level. The proposed 0.2 mg/L does not provide any additional health benefits. (2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 19)

Response: Although many commentators recommend setting the disinfectant residual level at 0.1 mg/L, no scientific studies or reports were provided that indicate this level of disinfectant residual is protective of public health. As per the response to comment #2, studies and data in support of a level of 0.2 mg/L are well-established.

It has been shown that the level of 0.1 mg/L represents the minimum reporting level based on currently available N, N-diethyl-p-phenylenediamine (DPD) analytical methods. Any drinking water standard for disinfectant residuals would need to be set above the minimum reporting level so that compliance with the standard can be measured and achieved.

In addition, a standard of 0.1 mg/L may not adequately address potential interferences from organic chloramines and manganese that could mask the actual level of disinfectant residual in the distribution system and produce a false positive reading. Although routine monitoring for

manganese is not required, water suppliers have submitted nearly 3,100 results from all over the state with detections for manganese.

Therefore, the regulations set a minimum disinfectant residual level of 0.2 mg/L in the distribution system to account for the minimum reporting level of 0.1 mg/L, to compensate for known interferences in the DPD analytical method, and increase protection of public.

- 4. Comment:** The compliance calculation for systems serving greater than 33,000 people should be 95% in two consecutive months and the compliance calculation for systems serving 33,000 or fewer people should be 75% in two consecutive months. However, we are concerned that the increased residual monitoring (from once/month to once/week) will increase small system operating costs. (2, 4, 10, 12, 13, 15, 19)

The compliance calculation for systems serving greater than 33,000 people should be 95% in two consecutive months. However, small systems should be given an option to select compliance monitoring based on a 75th percentile (weekly monitoring) or by choosing compliance based on a single monthly sample result. The cost for small systems such as those that utilize circuit riders or commercial environmental accredited laboratories to perform such weekly monitoring should be considered. (3)

Response: Pennsylvania ranks third in the nation for the number of regulated public water systems (nearly 9,000) and has automated compliance determinations for over 90% of the monitoring/reporting and health-based violations that are reported to EPA to maximize use of staff resources. For consistency, one method of determining compliance must be selected. Additionally, any system using surface water (SW) or GUDI sources must comply with the 95% compliance determination specified in the federal regulations. Therefore, the Department requested that TAC recommend which option should apply to small groundwater systems. TAC recommended that the compliance calculation in the proposed rulemaking should be retained (that no more than one sample is below the minimum disinfectant residual level in two consecutive months).

With regard to operating costs, it is unlikely costs to small systems would increase because Section 109.304 specifies that certain parameters (including turbidity and disinfectant residuals) may be analyzed by an appropriately certified operator or a person using a standard operator procedure as specified in the Water and Wastewater Systems' Operator Certification Act. Small water systems that are required to install and maintain disinfection (under either the Surface Water Treatment Rule (SWTR) or the Groundwater Rule (GWR)) are currently required to measure the disinfectant residual at the entry point at least once per day, so a procedure is in place for conducting daily disinfectant residual measurements. The weekly distribution system measurements may be conducted by the same person.

- 5. Comment:** The stated compliance benefits in the proposed rule are unfounded and the associated compliance costs are dramatically underestimated. Actual costs to achieve compliance are much higher than the Department's predictions. Recurring annual operating costs were not accounted for in the Department's projections. (2, 3, 4, 5, 7, 10, 11, 12, 13, 15, 16, 17, 19)

Response: Please see the response provided to Comment #2. Public health protection is achieved through a multi-barrier approach designed to guard against microbial contamination by ensuring the adequacy of treatment designed to inactivate microbial pathogens and the integrity of drinking water distribution systems.

Systems may need to increase the frequency of or improve the effectiveness of existing operation and maintenance best management practices (BMPs), such as flushing, storage tank maintenance, cross connection control, leak detection, and effective pipe replacement and repair practices, in order to lower chlorine demand and meet disinfectant residual requirements at all points in the distribution system. These BMPs will also reduce water age and likely lower disinfection byproduct levels in the distribution system.

The Board requested comment on the costs to achieve compliance with the new provisions and the Department’s cost estimates were updated in the final-form rulemaking in response to public comments.

Some systems with very large and extensive distribution systems may need to install automatic flushing devices, tank mixers or booster chlorination stations to achieve a 0.2 mg/L at all points in the distribution system. The Department’s revised capital expense estimates and annual operational expenses are as follows:

Type of Facility	Capital Expenses	Annual Expenses
Automatic flushing device	\$2,500	\$750
Tank mixer	\$75,000	\$0
Booster chlorination station	\$250,000	\$10,000

It is estimated that 25% of community water systems serving over 25,000 people, or ~20 systems, may need to install automatic flushing devices, tank mixers or booster chlorination stations. Of these 20 systems:

- 12 water systems may need to install up to ten automatic flushing devices for capital costs of up to \$25,000 and annual expenses of up to \$7,500 per system. The total cost for 12 systems is estimated to be up to \$300,000 in capital costs and up to \$90,000 in annual expenses.
- Four water systems may need to install up to two tank mixers for capital costs of up to \$150,000 per system. The total cost for four systems is estimated to be up to \$600,000 in capital costs.
- Four systems may need to install up to four booster chlorination stations for capital costs of up to \$1,000,000 and annual expenses of up to \$40,000 per system. The total cost for four systems is estimated to be up to \$4,000,000 in capital costs and up to \$160,000 in annual expenses.

Costs for small systems are not expected to increase because most small systems are already maintaining adequate disinfectant residuals (0.40 mg/L) as required by the GWR.

Total estimated costs to the regulated community are as much as \$4,900,000 in capital costs and up to \$250,000 in annual operational expenses. Capital costs are one-time costs expected to be split over the first three years. Annual operational expenses are not expected to begin until year two.

Estimate of Fiscal Savings and Costs						
	Current FY	FY +1	FY +2	FY +3	FY +4	FY +5
Savings:	\$	\$	\$	\$	\$	\$
Regulated community	0	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000
Local & state costs	0	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000
Total savings	0	2,600,000	2,600,000	2,600,000	2,600,000	2,600,000
Costs:		\$	\$	\$	\$	\$
Regulated community	0	1,630,000	1,880,000	1,880,000	250,000	250,000
Local & state costs	0	0	0	0	0	0
Total costs	0	1,630,000	1,880,000	1,880,000	250,000	250,000

However, these costs are offset by the avoidance of waterborne disease outbreaks. If even one waterborne disease outbreak is avoided each year, the cost savings to the regulated community (residents and businesses) is estimated at \$1.5 million, with an additional \$1.1 million in savings to local, state and nongovernmental agencies, healthcare facilities and schools.

- 6. Comment:** Disinfection byproducts (DBPs) are likely to increase at some utilities as a result of increasing the distribution disinfection residual to 0.2 mg/L. Additionally, compliance with the Lead and Copper Rule will likely be negatively impacted. (2, 3, 5, 7, 8, 10, 11, 12, 13, 14, 15, 19)

Response: Based on currently available data, many water systems are already meeting a disinfectant residual of ≥ 0.15 mg/L. There are 1,949 community water systems (CWSs) that are required to provide and maintain disinfection treatment. Of these systems, 1,298 (67%) are required to conduct only one measurement each month. An additional 232 systems are required to collect only two measurements each month. In total, 1,530 systems (79%) are only required to collect one or two disinfectant residual measurements each month, which means the average result reported each month for the large majority of systems is essentially the same as the actual sample results.

The Department reviewed the summary data (distribution system disinfectant residual average result values) from Jan 2012-May 2017 for the 1,949 CWSs.

- During this period, 165,328 average result values were reported; of these records, 154,623 average result values (93.5%) were at or above 0.15 mg/L.
- For the systems that are required to conduct only one or two measurements each month, 136,743 average result values were reported; of these records, 126,406 average result values (92.4%) were at or above 0.15 mg/L.
- For the systems that only conduct one measurement each month, 116,900 average result values were reported; of these records, 107,366 (91.8%) were at or above 0.15 mg/L.

The below table shows the number of CWSs and the number of average result summary records submitted for each population group.

CWS Disinfectant Average Result by Population Category

Population Group	No. Samples Required	No. PWSs	Total POPL ¹	Total No. Records	No. Results < 0.15	No. Results >= 0.15
< 25 ²	1	9	172	300	14	286
25-1,000	1	1290	311,515	116,600	9,520	107,080
1,001-2,500	2	231	381,322	19,843	803	19,040
2,501-3,300	3	86	255,069	6,292	168	6,124
3,301-4,100	4	28	103,784	2,534	65	2,469
4,101-4,900	5	37	164,629	2,518	11	2,507
4,901-5,800	10	27	145,425	1,752	0	1,752
5,801-6,700	15	22	137,596	1,672	1	1,671
6,701-7,600	20	22	156,720	1,246	0	1,246
7,601-8,500	25	22	178,117	1,194	22	1,172
8,501-12,900	30	46	469,925	3,311	34	3,277
12,901-33,000	35	69	1,436,581	4,333	66	4,267
> 33,000	≥ 40	60	7,628,402	3,733	1	3,732
Total	-----	1,949	11,369,257	165,328	10,705	154,623

¹Total POPL is the total population served for the population category, based on the CWS population in PADWIS. The Revised Total Coliform Rule required water systems to submit a revised sampling plan which included updated population numbers in accordance with existing EPA guidance. The CWS population served includes nontransient and transient consumers.

²These CWSs triggered applicability under the SDWA because each system provides water to 15 or more service connections.

There are an additional 621 noncommunity water systems with disinfection treatment that are currently required to maintain a disinfectant residual in the distribution system. Of these 621 water systems, 598 (96%) are only required to collect one or two residual measurements each month; 554 (89%) are only required to conduct one measurement each month.

Therefore, it is appropriate to use the average result data, and the data indicate that most water systems are already in compliance with these minimum disinfection residual requirements. Since the majority of systems are already meeting these minimum requirements, the Department would not expect a large increase in DBP non-compliance rates

7. **Comment:** Taste and odor complaints will likely increase if the minimum distribution disinfection residual is set at 0.2 mg/L. (2, 8, 10, 11, 12, 13, 19)

Response: The majority of water systems are already maintaining a 0.2 mg/L disinfectant residual level without taste and odor complaints based on the disinfectant residual values reported to the Department since 2012 (noted in the response to comment #6).

8. **Comment:** The option for Heterotrophic Plate Count (HPC) should be retained as an alternative compliance criteria for surface water systems when the distribution disinfectant residual is below the minimum required level. Removing the use of HPC as an indicator of distribution health is effectively removing a tool from the operator's tool box. (2, 3, 5, 6, 7, 8, 12, 13, 15, 19)

Response: The alternative compliance option for HPC allowed under the federal regulation applies only to systems using surface water sources (including purchased water) and is allowed instead of maintaining a “detectable” disinfectant residual. This regulation is setting a minimum disinfectant residual level of 0.2 mg/L for all water systems that are required to install disinfection to ensure public health protection regardless of the source of water. The Board requested comment on any references or studies that support the use of HPC as an alternative compliance criteria for a level of 0.2 mg/L. One reference was provided, but it was for a draft unpublished document. The Department could find no published studies or reports that support its use in lieu of a numeric standard of 0.2 mg/L.

Bottled Water, and Vended Water Systems, Retail Water Facilities and Bulk Water Hauling (BVRB) systems that use surface water or GUDI sources or that purchase water from a system that uses surface water or GUDI sources must meet the federal distribution system disinfection residual requirements. The HPC alternative compliance option is being retained for BVRB systems because these systems are purchasing finished water that has already been treated with an appropriate level of disinfection. These systems often remove chlorine from the water to improve taste, and then re-treat the water with an alternative secondary disinfectant such as ultraviolet light that does not provide a detectable residual.

Water systems may still choose to monitor for HPC as part of their overall operation and maintenance practices.

9. **Comment:** Requiring water utilities to issue Tier 2 public notification (PN) for failing to meet 0.2 mg/L will unnecessarily erode public confidence in water quality. (2, 4, 8, 10, 12, 13, 15, 19)

Response: There is a risk to public health if adequate disinfection is not maintained. Please see the response provided to comments # 2 and 15.

The federal rule requires Tier 2 PN for failure to meet the disinfectant residual treatment technique in the distribution system. Pennsylvania must be at least as stringent as the federal rule, 40 CFR 141.203(a). Further, these regulatory amendments will not substantially increase the number of Tier 2 PNs. As per the response to comment #6, the majority of systems are already meeting a disinfectant residual of ≥ 0.15 mg/L. In addition, a violation does not occur unless the water system fails to meet the minimum level in more than five percent of samples for two consecutive months. The Department anticipates that most water systems will be able to make operational changes (i.e., increase flushing, etc.) after the first monthly failure and improve water quality ahead of the next monthly monitoring period. It should be the exception, not the norm, that water systems fail to meet the minimum level for two consecutive months.

10. **Comment:** The minimum entry point residual should remain at 0.2 mg/L instead of changing it to 0.20 mg/L. DEP’s statement that “strip chart recorders can record to two decimal places” is inaccurate. While [adding a second digit] was done with the groundwater rule requirement (minimum 0.40), the second digit is still uncertain given the current field testing kits. The field testing kits are used to calibrate on-line instrumentation. Scientific study and analysis in a scientific manner should be done to address the ability to regulate to the most significant figure. (3, 15)

Response: Continuous entry point disinfectant residual monitoring and recording is required by existing Federal requirements in 40 CFR 141.74(c)(2) and is necessary to protect consumers against waterborne pathogens such as bacteria, protozoans, and viruses. Strip chart and circle chart

recorders can record measurements to two decimal places depending on the resolution that is used. In cases when the requisite scale and resolution is not possible, an upgrade to electronic recording devices would cost approximately \$1,560 (based on 6/16/2017 prices). This cost estimate includes the cost of purchasing a HACH© SC200 Universal Controller (\$1360) which is capable of continuously recording and storing electronic disinfection data on an SD card. Installation can be accomplished using existing in-house water system maintenance or operations staff at an estimated cost of \$200. The Department's cost estimate does not include the cost to connect the instrumentation to a supervisory control and data acquisition (SCADA) system as SCADA systems are not required for compliance with this regulation.

It is important to note that a general reference to "strip charts" is not equal to circle charts. Strip charts are a very different type of recording device than circle charts even though they both use paper. Strip charts are used much less frequently than circle charts in Pennsylvania filter plants for compliance monitoring. There are less than 11 filter plants in Pennsylvania (out of 353 filter plants) that are using a strip chart technology that cannot be adjusted to read to two decimal places. At least two of these plants are currently in the process of replacing/upgrading their recording equipment.

The remaining systems using paper recording devices that are not currently recording to two decimal places would simply need to switch the paper chart used (i.e. from a 7-day chart to a 24-hour chart) and adjust the recording device to new resolution. Although some plants are not staffed continuously, there should not be additional operational costs to replace the paper charts daily, because daily on-site visits to verify filter plant performance should be part of a water system's routine operation & maintenance.

Additionally, the current field test instruments (e.g. colorimeters) are calibrated by the manufacturer and provide the residual measurement reading to two decimal places. This data is what water systems are using for compliance determinations and to calibrate their on-line instruments.

- 11. Comment:** The use of the average data to draw the conclusion that the majority of public water systems already meet the proposed 0.2 mg/L is inappropriate. One cannot utilize monthly average chlorine residuals from a water system to project 'ease of compliance' nor accurately project expenditures. A reliance on average monthly chlorine residual results fails to recognize the wide variation that is possible, especially in medium to large distribution systems. By using the monthly average distribution system disinfectant residual data, DEP has dramatically overestimated the potential for utilities to comply with the proposed required minimum distribution system disinfectant residual. (2, 3, 4, 5)

Response: Please see the response provided to comment #6.

- 12. Comment:** The provisions of the proposed rulemaking should be deferred (for 24-36 months). The regulation should be revised to allow water systems the ability to submit an implementation plan giving systems adequate time to make necessary operational changes. (3, 4, 5, 8, 14, 17)

Response: In response to public comments, the implementation dates have been revised. The current regulatory requirements will remain in effect for 12 months after the final regulation is published in the *Pennsylvania Bulletin*. Water systems will have six months after the final regulation is published to develop and submit a monitoring plan, and water systems using chloramines will have one year to develop a nitrification control plan. Compliance monitoring under the proposed regulation has been deferred for one year after the final regulation is published in the

Pennsylvania Bulletin for water systems to adjust operational practices as needed. Systems that need capital improvements or need to complete more complex operational changes can request a system-specific compliance schedule.

- 13. Comment:** Disinfection residuals taken in response to customer complaints or water main breaks and repairs should not be used in determining compliance. (8)

Response: These measurements will not be used for compliance determinations. Distribution disinfectant residual compliance monitoring locations will be specified in a monitoring plan.

- 14. Comment:** The regulation should allow flexibility in system-specific nitrification control plans, including the parameters to be monitored. (3)

Nitrification is not an immediate public health issue. The regulation should not require a nitrification control plan. (5)

Response: Nitrification occurs when ammonium is converted to nitrate, which then may be further converted to nitrite. Nitrate and nitrite are acute contaminants for which EPA has set maximum contaminant levels (MCLs). Therefore, nitrification is a public health issue. Systems that chloramine have the potential for elevated nitrate and nitrite levels to occur within the distribution system. This regulation allows flexibility for systems to develop a nitrification control plan based on their needs. The regulation specifies the minimum elements of the plan and allows each water system to identify the parameters that will be monitored.

- 15. Comment:** Increasing the required minimum distribution system disinfectant residual will not reduce the likelihood of *E. coli* and *Legionella*. (5,7)

Response: Please see the response provided to comment #2.

- 16. Comment:** *Legionella* is not an issue that public water suppliers can control since it is a premise plumbing issue. The U.S. Center for Disease Control defines premise plumbing as “the drinking water system that is inside housing, schools, and other buildings.” Water utilities are not responsible for premise plumbing problems in homes, businesses, schools, hospitals, hotels, and all other commercial and industrial facilities. Further regulations on increasing chlorine levels in the distribution system will not fix the known problems within the building footprint of these customers. (2, 3, 5, 10)

Response: Water distribution systems consist of an interconnected series of pipes, storage facilities, and components that convey drinking water and are also designed to meet fire protection needs for cities, homes, schools, hospitals, businesses, industries and other facilities. Public water systems depend on distribution systems to provide an uninterrupted supply of pressurized safe drinking water to all consumers. Distribution systems convey water from treatment facilities (or from the source in the absence of treatment) to the consumer.

As noted in the response to comment #2, drinking water in the distribution system is not sterile, regardless of the degree to which the water is treated. The water contains microbes that survive the treatment process or enter the distribution system through the pipe network and become part of a biofilm. Biofilms can act as a slow-release mechanism for persistent contamination of the water. It

is likely that drinking water is an important, if not the primary, source of Legionella that seed hot water plumbing systems and cause outbreaks (EPA, 2002).

Premise plumbing is connected to the public drinking water distribution system via the service line. Virtually every change in water quality associated with the public water system can also occur in premise plumbing, although there are additional concerns such as those related to water temperature and stagnation that can be exacerbated in premise plumbing. The characteristics of the water provided from the treatment plant, and its interactions within the distribution system, and the unique characteristics of premise plumbing all affect the public health risk of the drinking water at the tap and complicate the formulation of coherent strategies to minimize risk. (EPA, 2010)

Maintaining a disinfection residual throughout the distribution system is a key element for controlling pathogen re-growth in both the distribution system and premise plumbing.

- 17. Comment:** Monitoring & reporting for CTs should be deferred or eliminated. Many small systems do not have online instrumentation to monitor flow, pH, temperature or other pertinent parameters. (3, 15)

Response: Existing state and federal regulations mandate CT/log inactivation requirements (CT is the product of residual disinfectant concentration (C) and disinfectant contact time (T)). Filter plants are required 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 CT value reported to the Department is a calculated value using existing data to demonstrate that the water system is maintaining the level of pathogen inactivation required under the existing regulation.

It is not necessary to install on-line instruments to monitor the elements needed to calculate CT values. Water systems that currently use hand-held or bench top instruments to measure pH, temperature, and disinfectant residuals as well as existing flow meters and clearwell levels will continue to use these instruments to obtain the information necessary to calculate a daily CT value. The parameters needed to calculate a CT value are all process control parameters that filter plant operators currently measure and use to provide and maintain an adequate level of treatment. The CT value reported to the Department is a calculated value using existing data to demonstrate that the water system is maintaining the level of pathogen inactivation required under the existing regulation.

- 18. Comment:** The proposed language in the preamble and Annex A should be revised to clarify requirements for Tier 1 Public Notice for Minimum Entry Point Disinfectant Residuals and Treatment Technique Requirements for pathogenic bacteria, viruses and protozoan cysts. (5)

Response: The language has been edited to clarify that a Tier 1 PN is required if the entry point residual is below the minimum value for more than four hours and the water system has either not met the required log inactivation value or the log inactivation value has not been calculated during that period.

- 19. Comment:** The proposed language in Annex A should be revised to accurately reflect how water systems determine peak hourly flow to ensure compliance with treatment technique requirements. (5)

Response: The language has been edited to clarify that the log inactivation (CT) value is calculated during the time of expected peak hourly flow. CT values should be calculated in real-time under several worst-case conditions (highest flow, coldest temperature, highest pH level, lowest disinfectant residual level), to ensure adequate disinfection is maintained. Because the CT calculation involves several parameters that fluctuate based on changing raw water chemistry, it is not practical to define what constitutes worst-case conditions for all water systems. To ensure consistency in implementation, the regulation requires, at minimum, a daily calculation during the hour of expected highest flow.

20. Comment: The Preamble presents the benefits of the proposed regulation as avoidance of the costs associated with avoiding waterborne disease outbreaks, like the cryptosporidiosis outbreak in Milwaukee, Wisconsin in 1993 and the salmonellosis outbreak in Alamosa, Colorado in 2008. The events (and their associated costs) like the *Cryptosporidiosis* outbreak in Milwaukee, Wisconsin in 1993 and the *Salmonellosis* outbreak in Alamosa, Colorado in 2008 cannot be avoided by simply raising the required minimum distribution system disinfectant residual. The avoidance of event and costs associated with these outbreaks should be removed from the Preamble entirely. (5)

Response: This language was included in the original Preamble as presented to the EQB on April 21, 2015. After the EQB separated that proposed rulemaking, the various documents needed to be subsequently revised. This language was supporting information for provisions that were included in the General Update proposed regulation (presented to the EQB on May 17, 2017). The inclusion of this information in the Disinfection Requirements proposed rulemaking was an error and is not included in the Order of the final-form rulemaking.

21. Comment: The proposed Disinfection Requirements Rule regulation package submitted to the Independent Regulatory Review Commission (IRRC) states that Pennsylvania is at a competitive disadvantage compared to other states with more stringent disinfection residual requirements. DEP's statement to IRRC is incorrect because most states do not define detectable or have numeric residual requirements. Although other states may have more stringent required minimum distribution system disinfectant residual requirements, the majority of states do not define detectable (40 states) or have numeric residual requirements (26 states). There are 19 states that regulate distribution system disinfectant residual at or above 0.2 mg/L; however, 31 states regulate distribution system disinfectant residual below 0.2 mg/L or require a "detectable" disinfectant residual and detectable might not be defined. Therefore, Pennsylvania is not an outlier, in the minority, or at a competitive disadvantage compared to other states. (5)

Response: The information submitted to IRRC does not state that Pennsylvania is at a competitive disadvantage. It states that Pennsylvania will not be at a competitive disadvantage when these provisions are implemented because at least 23 other states have requirements more stringent than Pennsylvania's current standard of 0.02 mg/L and at least 19 of these states have promulgated a disinfectant residual at least as stringent as the proposed level of 0.2 mg/L. 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 incidence of illness, and reduce health care costs. As noted in the response to comment #3, this regulation does not specify a method detection limit or minimum reporting limit. Instead, the regulation sets a minimum disinfectant residual level of 0.2 mg/L in the distribution system.

22. Comment: DEP's intentions to regulate standards for water systems utilizing free chlorination and not for systems utilizing chloramines gives the appearance of being biased. (16)

Response: The minimum disinfectant residual requirement of 0.2 mg/L applies to water systems using free chlorine and chloramines. The residual measurement (free vs. total chlorine) would depend on which type of disinfectant was used to maintain disinfection within the distribution system.

23. Comment: The current regulatory requirements for vended water systems (i.e. water dispensing units (WDUs)) are sufficiently comprehensive and effective at ensuring public safety. A WDU should not be required to measure chlorine residuals or HPC at the entry point. As a point of comparison, a drinking dispenser that has a carbon filter that removes the chlorine before dispensing cold water would not be subject to that type of requirement, because a WDU operates essentially as a consecutive and supplemental filtration option to the municipal water supply that includes an additional disinfection step. It is unclear why HPC should play a role given it measures heterotrophs which are a range of bacteria that are naturally present in the environment and have no direct correlation with human health. The drinking water standard for HPC is geared towards public water systems treating non-potable surface water or groundwater under the influence of surface water, which is materially different from water from WDU's which receive already treated municipal water. The quality of the WDU source water will also benefit from the recent increased chlorine residual requirements for the municipal water supply and is yet another reason the addition of HPC testing is unnecessary. (18)

Response: 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. 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.

Vended, retail and bulk hauling water systems are public water systems under the federal SDWA and must comply with federal drinking water regulations. The Department acknowledges that WDUs use carbon filters to remove the residual chlorine before further treating the water with a secondary disinfectant such as ozone or UV. However, federal regulations at 40 CFR 141.72(b)(3) mandate that water systems using surface water (including GUDI) sources or that purchase water from a system that uses surface water or GUDI sources must either maintain a detectable disinfectant residual or demonstrate that HPC levels are less than 500/mL.

Therefore, the revisions related to BVRB systems using surface water or GUDI source are required by EPA to ensure Pennsylvania's regulations are no less stringent than federal standards in order for Pennsylvania to maintain primacy.

24. Comment: The Preamble is inaccurate, inadequate, and misleading. The terms “true detectable residual, Method Limit, Method Detection Limit and Practical Quantitation Limit” used in the Preamble are confusing and not clearly defined. The HACH© Primer does not provide sufficient justification for the proposed disinfection level of 0.2 mg/L. (4, 5, 9)

Response: See response to comment #2 and #3.

25. Comment: EPA offers the following comments regarding the proposed rule:

1. BVRB systems monitoring requirements apply to some federally regulated public water systems, and as such these provisions must be no less stringent than the federal rule. These requirements established in 1992, set monitoring requirements via the following two mechanisms:

Specific requirements defined in § 109.1003 that are different from § 109.301:

- A. The current regulation in § 109.1003 (a)(1) and § 109.1003(c) establishes monitoring requirements for bottled, retail and bulk systems, which are different from the regulations in § 109.301.
- B. The current regulation at § 109.1003(a)(2) requires vended systems to satisfy with the exception of vended systems qualifying for permit by rule.

Cross Reference to § 109.301:

- C. The current regulation § 109.1003(d) requires Bulk systems serving >25 of the same people year-round to satisfy the community water system monitoring requirements of § 109.301.
- D. The proposed Disinfection Requirements Rule states that bulk, vended or retail water systems serving at least 25 of the same people for more than six months of the year comply with the non-transient non-community water system monitoring requirements in § 109.301.

EPA would suggest revision of BVRB systems regulations for clarity and to be no less stringent than the federal rule that applies to these systems.

The following comments identify situations where BVRB systems specific monitoring in § 109.1003 are inconsistent with federal regulations. In order to receive primacy for the Stage 2 Disinfectant and Disinfection By-Products Rule, changes must occur.

2. The proposed BVRB systems monitoring requirement of § 109.1003(a)(1) does not include the compliance calculation and should clarify that Total Trihalomethanes (TTHM) or Haloacetic Acids 5 (HAA5) maximum contaminant level compliance is determined based the locational running annual average (LRAA) of quarterly samples.
3. The current analytical requirements applicable to BVRB systems as listed in § 109.1003(b)(2) are not consistent with § 109.304(c) and should be. The current safe drinking water regulation at [§ 109.1003(b)(2)] for BVRB water systems has a shorter list of excepted analysis that may be performed by someone other than an accredited laboratory (e.g., daily chlorite monitoring by BVRB is not excepted from the requirement to be performed by an accredited lab).
4. The current BVRB systems monitoring requirement of § 109.1003(a)(1)(x) requires only chlorite monitoring on a daily basis and does not allow for monthly, reduced or additional monitoring. The federal chlorite monitoring requirements of 40 CFR § 141.132(b)(2)(i)(B) and 40 CFR § 141.132(b)(2)(ii & iii) should also be required for an entry point of BVRB water systems similar to the requirements in § 109.301(12)(iii)(A)(II & III) and § 109.301(12)(iii)(B).
5. The proposed BVRB monitoring requirement of § 109.1003(a)(1)(xi) requires additional chlorine dioxide monitoring at one location on a daily basis on the day following exceedance of the maximum residual disinfectant level (MRDL) and does not meet the intent of the federal requirement. The federal chlorine dioxide monitoring requirement of 40 CFR § 141.132(c)(2)(ii) requires analysis of three additional chlorine dioxide samples, for systems with no booster chlorination, that are collected at one location at intervals of at least six hours on the day following exceedance of the MRDL.
6. The current BVRB systems monitoring requirement of § 109.1003(a)(1)(ix) lists the start date of Stage 2 monitoring as October 1, 2013 for BVRB systems and is inconsistent with federal Stage 2 monitoring start dates listed in 40 CFR § 141.620(c).

7. The current BVRB systems monitoring requirement of § 109.1003 (a)(1)(ix) lists the routine stage 2 monitoring schedule as one dual sample set per year which is inconsistent with the federal regulation and § 109.301(12)(ii)(B). The federal regulation would require routine quarterly sampling for water systems (e.g., retail system) serving more than 500 people that use or obtain water from surface water or ground water under the influence of surface water sources.

Finally, there is a different value stated for BVRB systems' entry point residual of 0.2 mg/L. This is different from § 109.202(c)(1)(ii)(B), which states the new residual at the entry point is 0.20 mg/L. While we understand that this could be the case, we wanted to ensure that a typo had not occurred.
(20)

Response: To ensure that any BVRB system that meets the definition of a community or nontransient noncommunity water system is complying with both state and federal regulations, the language in Subchapter J has been revised as follows.

To address EPA's comment #1:

- Subsection 109.1003(d) has been amended to clarify the discrepancy in the cross-reference with 109.301 so that bulk water haulers must comply with the provisions of both Subchapters J and C (if a bulk water hauler meets the criteria for a community or nontransient noncommunity water system).
- Subsection 109.1003(e) has been amended to clarify the discrepancy in the cross-reference with 109.301 so that vended and retail water systems must comply with the provisions of both Subchapters J and C (if the criteria for a nontransient noncommunity water system is met). Vended and retail water systems do not meet the definition of a community water system because they cannot serve as the primary potable water supply for year-round residents.

To address comment #2 and #7, subparagraph 109.1003(a)(1)(ix) has been amended to include the compliance determinations for total trihalomethanes and haloacetic acids. Language was also added to clause 109.1003(a)(1)(ix)(A) to ensure that water systems meeting the definition of a community or nontransient noncommunity water system are complying with the monitoring requirements of 109.301(12)(ii).

To address comment #3, paragraph 109.1003(b)(2) has been amended to be consistent with the language in 109.304 so that daily chlorite measurements may be conducted by someone other than an accredited laboratory.

In response to comment #4, the language in subparagraph 109.1003(a)(1)(x) is already consistent with and more stringent than federal requirements. BVRB systems do not have a distribution system in which to conduct monthly monitoring or monitoring after an entry point exceedance. Therefore, reduced monitoring is not allowed. The existing language does require 3 additional samples within 24 hours (as is specified in the federal rule) from the same lot, batch, machine, carrier vehicle or point of delivery which are the only sampling locations available to BVRB systems.

To address comment #5, subparagraph 109.1003(a)(1)(xi) has been amended to ensure the monitoring and compliance determinations for chlorine dioxide are at least as stringent as the federal regulations. BVRB systems do not have a distribution system in which to conduct monitoring after

an entry point exceedance; therefore, MRDL compliance is based on the results from entry point samples, which is more stringent than the federal regulations.

In response to comment #6, the start dates for compliance monitoring specified in the federal Stage 2 DBPR do not apply to BVRB systems in Pennsylvania because when Subchapter J was revised in 2009 to include the provisions of the Stage 2 Disinfectants/ Disinfection Byproducts Rule (Stage 2 rule), no BVRB systems existed in Pennsylvania that qualified as a community or nontransient noncommunity water system. Therefore, none of the BVRB systems were subject to the federal regulations. Because none of the BVRB systems were subject to the federal regulations at the time of the Stage 2 rule implementation date, the compliance start date for BVRB systems was determined to be equivalent to a schedule 4 water system. This initial compliance date has since passed for all water systems in existence at the time of the Stage 2 rule implementation date, and any new BVRB system will be required to comply with provisions at least as stringent as the federal regulations.

Additionally, to date, none of the BVRB systems in Pennsylvania qualify as a community or nontransient noncommunity water system, so BVRB systems are currently complying with Stage 2 rule requirements that are more stringent than the federal regulations.

Regarding EPA's final comment, the entry point residual level of 0.2 mg/L was a typographical error. It should have been 0.20 mg/L to be consistent with the provisions of § 109.301. The text has been corrected.

26. Comment: Effective date of rulemaking. — Implementation procedures. Commentators request that EQB defer the effective date of the rulemaking to at least six months to 24 months after final promulgation. They state that additional time is needed for capital improvements, proper budgeting, planning, and training. Some commentators suggest adding a provision that would allow water systems to make requests for extended compliance schedules under certain circumstances. We acknowledge that EQB is specifically seeking input on when certain provisions of the rulemaking should become effective. We ask the EQB to continue to work with the regulated community to develop a schedule for implementing this rule that adequately protects the health, safety and welfare of the public, while at the same time, minimizing the fiscal impact it will have on water systems. (21)

Response: The effective dates for distribution disinfectant residual requirements have been deferred for one year in response to public comments. Please also see response provided to comment #12.

27. Comment: Section 109.202. State MCLs, MRDLs and treatment technique requirements. — Fiscal impact; Reasonableness; Need. EQB is proposing to amend Section 109.202(c)(1)(ii) to clarify the existing minimum residual disinfectant level at the entry point by adding a zero to the minimum level (0.20 mg/L). EQB explains that 0.20 mg/L is needed to ensure an adequate disinfectant residual in the water entering the distribution system and that the level of sensitivity is consistent with other Department of Environmental Protection (DEP) values. The Small Water Systems Technical Advisory Center (TAC) to DEP recommended the minimum entry point residual remain at 0.2 mg/L because water systems using strip chart recorders may not be able to record data to two decimal places and would need to upgrade to supervisory control and data acquisition (SCADA) systems. Commentators are in agreement with the TAC and question whether DEP's estimate to upgrade to electronic recording devices of \$1,500 per system includes costs for installation and connection to SCADA systems. In the final-form Preamble and RAF, EQB should provide specific estimates of all the costs associated with compliance and an explanation of how the estimates were

derived. In addition, the Board should provide further explanation concerning the benefits of the regulation as compared to the costs. (21)

Response: Please see the response provided to comment #10. Some commentators mistakenly believed that all paper chart recorders will need to be replaced and that these recorders must be connected to a SCADA (or similar) system. SCADA systems are not mandated in the proposed rule. The majority of water systems using paper strip chart recorders will be able to switch the resolution of the paper charts used and adjust their existing equipment to record 2 decimal places. The cost estimates have been further explained in the Order and Regulatory Analysis Form for the very few systems that will need to replace equipment.

28. Comment: Section 109.301. General monitoring requirements. — Reasonableness; Fiscal impact. This section sets forth performance monitoring requirements for public water suppliers. Section 109.301(1)(i)(D)(II) requires a public water supplier to monitor the disinfectant residual at representative locations in the distribution system at least once per week. Commentators believe the additional residual monitoring from once a month to once a week will increase operating costs for small water systems. They recommend monitoring at the same frequency and schedule as the Revised Total Coliform Rule (RTCR). In the Preamble to the final-form regulation, EQB should explain the reasonableness of requiring weekly monitoring, and how the potential benefits outweigh any costs associated with it. (21)

Response: Please see response provided to comment #4. Small water systems will not need to increase operating costs because on-site personnel using a Standard Operating Procedure may conduct disinfectant residual measurements. The same on-site person conducting the daily entry point disinfectant residual measurements (required under existing regulations) will also be able to conduct the weekly measurements in the distribution system. Language explaining this is included in the Order for the rulemaking under Compliance Costs. Any costs to the regulated community are offset by the avoidance of waterborne disease outbreaks. If even one waterborne disease outbreak is avoided each year, the cost savings to the regulated community (residents and businesses) is estimated at \$1.5 million, with an additional \$1.1 million in savings to local, state and nongovernmental agencies, healthcare facilities and schools.

29. Comment: Section 109.710. Disinfectant residual in the distribution system. — Reasonableness; Protection of the public health, safety and welfare; Fiscal impact; and Implementation procedures. Minimum disinfectant residual. EQB is proposing to increase the minimum residual in the distribution system to 0.2 mg/L free or total chlorine from the current level 0.02 mg/L. EQB explains that the distribution systems remain a source of contamination that has yet to be fully addressed and that the existing 0.02 mg/L is inadequate to protect against microbial growth within the distribution system.

Despite the data provided in the Preamble by the EQB, commentators remain unclear as to which public health concern the EQB is addressing by raising the residual limit in the distribution system. Commentators also expressed concern that the new residual standard would likely increase the formation of disinfection byproducts (DBPs) which have known health risks. In the Preamble to the final-form regulation, EQB should explain what specific public health issue is being addressed by the proposed disinfectant residual that is not currently being handled by the RTCR or isn't a premise plumbing concern. EQB should also explain what measures exist to safeguard against increases in DBPs.

Costs

The fiscal analysis provided in the RAF indicates that the total estimated cost to the regulated community is \$823,500. The regulated community believes DEP has overestimated the number of water suppliers that would be in compliance with the proposed residual and has underestimated capital and operational costs. For example, Philadelphia Water estimated \$25 million dollars in capital costs and \$2.5 million dollars in annual operating and maintenance costs. The Borough of Carlisle estimates capital costs ranging from \$115,000 to \$190,000 to potentially comply with a 0.2 mg/L free chlorine requirement. As EQB develops the final-form regulation, we ask that they reach out to the regulated community to gain a better understanding of the potential costs associated with the new requirements and to include those revised costs in the RAF submitted with regulatory package.

Tier 2 Public Notification

Subparagraph (c)(3) requires water utilities to issue a Tier 2 public notification for all results not meeting the proposed 0.2 mg/L minimum limitation. Several municipal water authorities have stated that because no known health risks have been identified in the proposed rulemaking, requiring water utilities to issue Tier 2 public notices for failing to meet 0.2 mg/L will erode public confidence in water quality. Commentators disagree that the proposed minimum disinfectant residual is practical and achievable. They believe additional notifications could lead to overuse of public notifications. In the Preamble to the final-form rulemaking, we ask EQB to explain why public notification is needed when the minimum disinfectant residual is not maintained in the distribution system and why the benefits of such a notice outweigh any potential costs associated with such notice.

Heterotrophic plate count (HPC)

EQB is proposing to delete Subsection (b) which requires a public water system that uses surface water or groundwater under direct influence of surface water (GUDI) sources or obtains finished water from another permitted public water system using the surface water or GUDI to collect Heterotrophic Plate Count (HPC) measurements. TAC recommends retaining HPC monitoring as an alternative compliance criteria. Supporters view it as a tool that can alert operators to a problem before sample locations actually present with a positive Total Coliform or E.coli sample. They argue removing this provision may weaken public health protections. Others remarked that HPC is allowed under the federal regulations and retaining it will reduce the number of instances where public notice is required. We note that the EQB has asked for comments with references to studies, reports or data comparing whether HPC less than 500 provides the same level of public health protection as a disinfectant residual of 0.2mg/L. In the Preamble to the final-form rulemaking, we ask the EQB to explain its rationale for removing this provision. We will consider EQB's response to comments and any changes made to this subsection in our review of the final-form regulation to determine whether it is in the public interest. (21)

Response: With regard to the 0.2 level, please see the response provided to comments #3 and #5.

With regard to the cost of the regulation, please see the response provided to comment #5.

With regard to the Tier 2 PN, please see the response provided to comment #9.

With regard to HPC, please see the response provided to comment #8.

- 30. Comment:** Section 109.1003. Monitoring requirements. — Reasonableness; Clarity; Possible conflict with other statutes or existing regulations. Section 109.1003(a)(1)(xiv) requires that bottled, bulk and retail water systems that use or purchase water from a system that uses surface water or GUDI sources must also meet the minimum distribution system disinfection residual requirements. EQB states these revisions are in response to the United State Environmental Protection Agency's

(EPA) comments to obtain primacy for Long Term 2 Enhanced Surface Water Treatment Rule. Water dispensing unit (WDU) operators commented that adding the HPC test alongside the Total Coliform test is duplicative and adds unnecessary costs. They further point out the drinking water standard for HPC is geared toward public water systems treating non-potable surface water or GUDI and that it should not apply to WDUs which receive already treated municipal water. We ask EQB to explain in the RAF and Preamble of the final-form regulation the reasonableness of requiring water dispensing units to meet the same disinfection residual requirements as public water systems.

The EPA submitted comments that identify several instances where the Bottled Water and Vended Water Systems, Retail Water Facilities and Bulk Water Hauling Systems (BVRB) monitoring provisions are inconsistent with federal regulations and must be changed to obtain primacy. The EPA also seeks clarification on the BVRB entry point residual. We will review the EQB 's response to the EPA's comments and any changes made to this section in our review of the final-form rulemaking to determine whether it is in the public interest. (21)

Response: Please see the response provided to comments # 23 and 25. The disinfection requirements for BVRB systems are necessary to maintain primacy. The language relating to the Stage 2 DBPR in Subchapter J has been revised. The entry point disinfectant residual level has been corrected.

References:

Colorado Department of Public Health and Environment (April 2014). "Draft-Minimum Distribution System Disinfection Residuals: Chlorine Residual Values Reported from Within Drinking Water Distribution Systems".

DEP, Pennsylvania Drinking Water Information System online database.

EPA (June 2002). "Health Risks from Microbial Growth and Biofilms in Drinking Water Distribution Systems." Distribution System White Paper:
http://www.epa.gov/safewater/disinfection/tcr/regulation_revisions.html

EPA (April 2010). "Final—Priorities of the Distribution System Research and Information Collection Partnership."

EPA (December 2016). "Six-Year Review 3 Technical Support Document for Microbial Contaminant Regulations." EPA 810-R-16-010.

LeChevallier, M. W., et al. (1996). "Full-Scale Studies of Factors Related to Coliform Regrowth in Drinking Water." Applied and Environmental Microbiology, 62(7), p. 2201.

Wahman, D. G. and Pressman, J. G. (2015). "Distribution System Residuals—Is 'Detectable' Still Acceptable for Chloramines." Journal—American Water Works Association, 107(8), p. 53.