

June 2018

The Pennsylvania Department of Environmental Protection (DEP) Bureau of Safe Drinking Water is pleased to provide you with this edition of the Drinking Water News. It contains information, explanations and reminders on:

- Disinfection Requirements Rule (DRR) Sample Siting Plans
- Level 2 Assessments - Questions About Well Integrity
- Avoid Dangerous Chemical Cocktails – Verify Your Chemical Deliveries
- Data Integrity – The Importance of Date Reporting
- Sampling Criteria for Lifting a Boil Water Advisory
- Water Loss Management Training in the Delaware River Basin
- EPA Method 334.0 Video Tutorials
- We're So Glad You Asked!

Your feedback and suggestions are always welcome. They can be submitted to jonardone@pa.gov.



Disinfection Requirements Rule (DRR) Sample Siting Plan Basics

Jamie Estep- Compliance Assistance Specialist, Southwest Region

The Disinfection Requirements Rule (DRR) was published in the Pennsylvania Bulletin on April 28, 2018. Rule requirements relating to the monitoring of disinfectant residuals in the distribution system go into effect on April 29, 2019. The rule is intended to provide a multiple-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. The DRR does not change the daily requirement to measure the disinfectant residual at the entry point.

The DRR requires community water systems, nontransient noncommunity water systems that have installed chemical disinfection, and transient noncommunity water systems that provide continuous filtration for surface water and GUDI sources or provide 4-log treatment of viruses for groundwater to maintain a minimum residual disinfectant concentration of **0.2 mg/L** throughout the distribution system (or at a level approved by DEP for systems using an alternative oxidizing disinfection treatment).

In order to demonstrate compliance with the DRR, systems will be required to sample the residual disinfectant concentration in the distribution system at least once per week. Systems will continue to measure the residual disinfectant concentration at the same time and from the same location that total coliform samples are collected but, if coliform samples are not collected weekly, additional disinfectant sampling will be necessary.

All systems affected by the DRR will be required to submit a sample siting plan to DEP by October 29, 2018. The DRR Sample Siting Plan must contain the following elements:

- A list of distribution system representative sample site locations with site-specific location ID
- An indication of whether each sample site location is used as a coliform, disinfection byproducts, or lead and copper sampling location
- An indication of whether each sample site location is within a mixing zone
- Whether online monitoring and recording will be substituted for grab sample measurements and, if so, at what frequency
- A sample collection schedule

Representative locations include dead ends, first service connections, finished water storage facilities, interconnections with other public water supplies, areas of high water age, areas with previous coliform detections and mixing zones. The DRR Sample Siting Plan may be combined with the Revised Total Coliform Rule (RTCR) Sample Siting Plan if all the required content elements are included.

DEP is developing a YouTube video and webinar on the DRR Sample Siting Plan requirements. The webinar is planned for late summer and early fall. Once developed, sample siting plan templates will be available on the DEP website at:

<http://www.dep.pa.gov/Business/Water/BureauSafeDrinkingWater/DrinkingWaterMgmt/Regulations/Pages/Proposed-Disinfection-Requirements-Rule--.aspx>.

In preparation of developing a DRR Sample Siting Plan, community water systems should begin reviewing their coliform, disinfection byproducts and lead and copper sampling plans to determine if these locations can be used to monitor residual disinfectant concentration or if additional representative sample locations will need to be identified.



Level 2 Assessments: Questions About Well Integrity (and Why They Are Important)

John Cairnes, Compliance Assistance Specialist, Southeast Region

Conducting a Level 2 Assessment can be a challenge for an operator tackling it for the first time. The questions in the assessment form are designed to guide the investigation in any relevant direction in which a sanitary defect may be found. But sometimes, the rationale behind the questions is not immediately understood. In evaluating Level 2 Assessments submitted by certified water operators, DEP staff have reported that some questions are frequently skipped, or operators provide issue descriptions that indicate they may not have an intuitive grasp of why the questions are being asked.

One common source of confusion are the questions regarding wellhead integrity. Specifically, Questions 9 through 13 of Part IV, Section A. An operator may wonder why, if the purpose of the assessment is to find sanitary defects, are there questions about measuring raw water turbidity and testing the water for iron and manganese? In practice, these questions, and their answers are designed to identify possible failures of wellhead integrity and surface water intrusion.

The phrase “surface water intrusion” invokes situations where water from a surface water source, such as a lake or river, is mixing with groundwater in an aquifer, resulting in a Groundwater Under Direct Influence of Surface Water (GUDI) source. Surface water intrusion may also refer to rainwater or localized flooding entering a damaged or degraded well casing, creating a pathway to contamination and carrying micro-organisms and organic matter into a well.

Scoping a well – inserting a camera into a well casing and observing what it records – is a useful method to evaluate well integrity but is expensive and may be unnecessary. Questions 9 through 13 help an operator to determine if well scoping is needed and if it is likely to be a productive effort.

Question 9 asks, “Were raw water turbidity measurements collected as part of this investigation?” Ideally, the answer should be “Yes”. In some cases, an obvious sanitary defect unrelated to source water quality may be found during an assessment, and an assessor may deem raw water sampling unnecessary. But turbidity sampling should be done as a precautionary measure just the same.

9. Were raw water turbidity measurements collected as part of this investigation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. If the raw water turbidity measurements were greater than 5 NTU, was the source water tested for iron and manganese?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Was iron or manganese measured above the secondary MCLs of 0.30 mg/L for iron or 0.05 mg/L for manganese?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Was the well scoped to determine its integrity as part of this investigation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13. If the well was scoped were issues with the well identified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Excerpt from Level 2 Assessment Form

Question 10 asks, “If the raw water turbidity measurements were greater than 5 NTU, was the source water tested for iron and manganese?” If the raw water turbidity is less than 5 NTU, it is unlikely surface water intrusion has occurred. Turbidity above 5 NTU is a common indicator of surface water intrusion. High turbidity may also indicate the presence of contaminants unrelated to surface water intrusion. Confirming or eliminating iron and manganese as the likely source of the high turbidity is a valuable step in determining if the well needs to be scoped. Question 11, “Was iron or manganese measured above the secondary MCLs of 0.30 mg/L for iron or 0.05 mg/L for manganese?” provides the benchmark for determining if iron or manganese concentrations are high enough to cause high turbidity. If the concentrations of iron and manganese are below the secondary MCLs, the assessor should acknowledge that the high turbidity may be caused by surface water intrusion and proceed to scope the well.

Question 12 asks, “Was the well scoped to determine its integrity as part of this investigation?” Note that answering “No” to this question is a “gray box” answer that must be addressed in Part V with a full issue description and corrective action. As with question 9, an assessor may have identified a sanitary defect unrelated to well integrity and may decide well scoping is unnecessary. The rationale for not scoping the well should be included in the Issue Description box in Part V, and the identified sanitary defects should have appropriate corrective actions and completion schedules.

Question 13 asks, “If the well was scoped, were issues with the well identified?” A cracked or corroded well casing is a sanitary defect and should be identified and addressed as such. Corrective actions may include, but are not limited to, repairing or replacing the well casing, drilling a new well or upgrading treatment to remove contaminants that can enter the well.

It is important to remember that all questions posed on the assessment forms are designed to help assessors identify specific circumstances and conditions by which a sanitary defect may occur. Sometimes, it requires a “big-picture” view, drawing conclusions from the cumulative viewpoints of multiple answer, to determine the best cause of action.



Avoid Dangerous Chemical Cocktails - Verify Your Chemical Deliveries

Joseph Mattucci, Planning and Conservation Section Chief, Southcentral Region

A large number of chemicals are used every day in the drinking water industry and not all of those chemicals are compatible. Earlier this spring, a Pennsylvania elementary school occupied by 150 children was evacuated because an employee mixed two common but incompatible chemicals, resulting in an adverse reaction.

One of the tasks assigned to an uncertified maintenance employee was to check and refill the sodium hypochlorite (NaOCl) day tank when the certified waterworks operator was unavailable. On the day of the event, a container of hydrochloric acid (HCl) was received from the chemical supplier instead of the expected sodium hypochlorite. The employee did not verify he had received the correct chemical before using it. Furthermore, he did not notice that the chemical had been delivered in a container of a different color.

When the employee began to add hydrochloric acid to the day tank which still contained some sodium hypochlorite, the chemical reaction rapidly produced a cloud of chlorine gas that overwhelmed the employee and required him to leave the treatment room and seek medical attention. As the reaction continued it increased the amount of chlorine gas in the treatment room and surrounding area. Staff and students at the school soon noticed the choking chlorine odor and were evacuated.

Trained responders drained the day tank and ventilated the chlorine gas, resolving the immediate hazards. The maintenance employee recovered with no long-term issues and there were no other reported injuries. The certified operator had to drain and flush the treatment facilities, replace some of the chemical feed equipment, purge the distribution system and demonstrate that the water system was delivering water of acceptable quality before the water system could return to service and students and staff were able to return to routine school life.



Day Tanks and Feed Pumps

A lesson to be learned from this event is that even mundane tasks such as accepting chemical deliveries and refilling day tanks can involve significant risks if staff are not attentive. Before use, do you verify that the chemicals you received match what you had ordered? This is true for carboys and drums as well as bulk deliveries. Did you receive the correct container, percent strength, or chemical blend? It is also important to make sure all staff who handle chemicals understand the risks of those substances, their intended uses, incompatibilities, and emergency response procedures.

DEP's Chemical Compatibility Table, document number 3940-FM-BSDW0559, can be used as a quick guide for chemical storage and is available online at this location:

<http://www.depgreenport.state.pa.us/elibrary/GetDocument?docId=9441&DocName=CHEMICAL%20COMPATIBILITY%20TABLE.PDF%20>

Data Integrity – The Importance of Data Reporting

Cathy Port, Water Program Specialist, Central Office

The Pennsylvania Safe Drinking Water Act relies on a self-monitoring program to determine compliance with regulations. Water suppliers in the state, from the smallest transient noncommunity water system to the largest community water system spend a lot of time and money collecting, analyzing and reporting results of drinking water samples. All drinking water sample results are important because they assure the public that treatment is effective and their drinking water meets regulatory standards.

Data integrity involves more than the collection and analysis of data (location, timing, collection method, analytical QA/QC) that we are most familiar with. Data reporting integrity is equally important. Drinking water data reported through our Drinking Water Electronic Reporting (DWELR) system is a permanent public record and needs to have a high degree of integrity. Everyone has a part in ensuring reported data integrity, but it starts with the chain-of-custody and ends with a review of the reported data to make sure it is correct.

Chain-of-Custody

The chain-of-custody form is a legal document that contains important information about where, when and why the sample was collected, as well as how the sample was preserved, results of field tests, and what analyses should be conducted. All individuals who handle the sample are documented on the chain-of-custody form to show who had access to the sample. The sample collector needs to take the time to complete the chain-of-custody document correctly

The chain-of-custody is also the document that the laboratory uses to tell them how to report the sample results (as well as verify that the sample was collected using appropriate protocols for sample preservation and holding times). **As the sample collector, you need to make sure the location ID, sample type, sample date, and sample time are recorded clearly on the chain-of-custody to ensure that the sample is reported correctly.**

* **Be as descriptive as possible with your location ID** (e.g., 101 (Entry Point Tap in Well House 1) or 701 (kitchen tap at Lot 50)) and

* **Be as descriptive as possible with your sample type** (e.g., D or E (Routine) or A (Startup) or S (Special Monitoring)).

If you do not know the location ID and/or the sample type, you can consult your Sample Siting Plan, look it up in DEP's Drinking Water Reporting System (DWRS) at www.drinkingwater.state.pa.us , or check with your DEP sanitarian. **If you find out you have made a mistake, you should submit a revised chain-of-custody to the lab, so that the lab can submit a correction request.**

Review of Data

It's always a good idea to review your data once it is submitted through DWELR. You can make corrections within the application until the 10th of the month. After midnight on the 10th of the month, valid data moves over into the sample file. After the data moves, any corrections must be made by submitting a request to the Bureau of Safe Drinking Water through fax (717-772-5630) or mail at PA DEP SDWA Monitoring Data, 10th Floor RCSOB, PO Box 8467, Harrisburg, PA 17105-8467..

To review data entered in the application, go to "View and Edit Records," and get a Printer-Friendly version (.pdf). Review this document for typos (check dates, location IDs, contaminant IDs and method codes). Sometimes it helps to ask another person to review the data.

VIEW and EDIT RECORDS

Click [here](#) for a Printer Friendly Version

[View a Monitoring Calendar](#)

You can also go to "Error Report" and view any errors or warnings associated with your data.

ERROR REPORT

Click [here](#) for a Printer Friendly Version

If you have **View Access** in DWELR (i.e. where you enter the application with your PWSID, as shown below), you can enter the application using your PWSID instead of your Lab ID, and see sample results that the lab has submitted on your behalf.

**The account you used to log in has multiple associated DWELR Mirror IDs.
Before proceeding you must first choose the Lab DWELR ID to enter
information or choose the PWS DWELR ID for which you wish
to view information.**

Please choose a DWELR ID from the following list of possible IDs:

P7220012 - STEWARTSTOWN WATER CO

L05560 - Name not found

We recommend that you check these records, especially location IDs, dates, and results. If you see any errors when reviewing your data, you can let the lab know, and they can make corrections within the application before the 10th of the month. As a public water supplier, you are ultimately responsible for timely and correct data reporting.

A few days after the 10th of the month, your data is publicly available on the Drinking Water Reporting System website at www.drinkingwater.state.pa.us. This application allows you to download data into a spreadsheet where you can evaluate your data by generating graphs and reviewing trends. If you see a mistake here, it can still be corrected via mail or fax request.

If you have any questions about how to get “View Access” in DWELR, interpret errors, correct errors, or navigate the applications, give us a call at 717-772-4018, and we can guide you over the phone.

It is worth taking the time to complete the chain-of-custody form correctly and review results in the available applications because a little extra time up front will save time in the long run by reducing errors that may result in violations, reducing monitoring/reporting violations, and improving data integrity. Reducing errors and violations with careful attention to data reporting will increase your customers’ confidence in the quality of their drinking water.



Sampling Criteria for Lifting a Boil Water Advisory

John Cairnes, Compliance Assistance Specialist, Southeast Region

Every public water supplier must face the possibility that someday they may need to issue a Boil Water Advisory (BWA) following an incident that confirms microbial contamination or creates an elevated risk of microbial contamination. Common incidents that require a BWA include: exceeding the Maximum Contaminant Level (MCL) for E. coli; water main breaks that result in both the loss of positive pressure and a definable risk of contamination; treatment technique violations; or failure of a key treatment process. Whatever the cause, lifting a BWA once it is in place is not as simple as just declaring the problem solved. It requires a multi-level response that is designed to ensure customers are receiving water that is free of contamination.



Pot of boiling water

The first response to any incident that may require a BWA is to notify DEP within one hour of discovery of the incident. A system's emergency response plan should contain procedures that enable water suppliers to identify and report such incidents as quickly as possible. Besides meeting regulatory requirements, this notification also provides the advantage of having DEP guidance at the earliest stages of response.

Water suppliers should determine, as quickly as possible, the extent of the risk and how many customers will be affected. A small main break may only affect a few nearby residents, while a failure of continuous chlorine disinfection, may impact the entire distribution system. An accurate assessment of the affected customers will determine both the extent to which the BWA shall be distributed and the number of samples that need to be taken in order to lift the BWA.

Corrective actions for contamination incidents will vary by the type of incident. All the corrective actions must be completed before the BWA is lifted. Displacement or flushing of undisinfected or contaminated water must be completed and all repaired or replaced water mains must be disinfected according to AWWA Standard C651 before the mains are put back into use. If there is a chance that the highly-chlorinated water used for disinfecting the mains will have an environmental impact, the chlorine must be neutralized before it is flushed out.

The final step before lifting the BWA is to ascertain the effectiveness of the disinfection and flushing through coliform sampling. Both the timing and number of the samples are crucial. Exercise care when selecting sample sites. They must be within the affected area, at indoor taps that are in-line with revised total coliform sample site locations, and collected with methodology appropriate for coliform monitoring. The minimum number of samples required for each round of sampling is determined by the number of customers affected by the incident.

The table below defines the minimum sampling requirements.

Minimum # of Check Samples Required Each Day to Lift a BWA	
Population Affected	Minimum # of Samples
1 – 500	1
501 – 1,000	2
1,001 – 2,000	3
2,001 – 3,000	4
3,001 – 4,000	5
4,001 – 5,000	6
5,001 – 7,500	7
7,501 – 10,000	8
10,001 – 25,000	9
25,001 – 50,000	10
>50,000	11

If the size of the population affected cannot be determined accurately, it may be estimated using the formula: **Population affected = # of service connection x 2.7**. Also, the number of check samples may be adjusted accordingly if the contamination is not representative of the water quality in the distribution system.

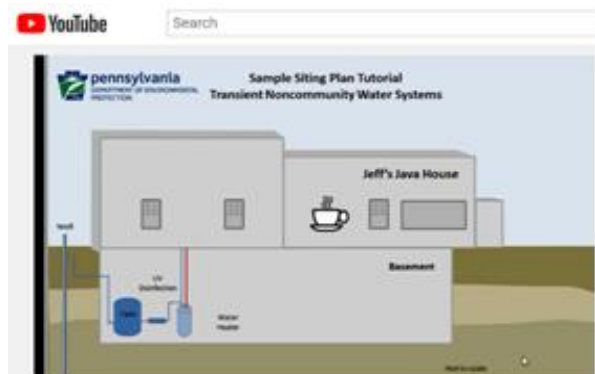
Samples must be collected on consecutive days, with a minimum of 12 hours between any two sample sets, and a system must achieve two consecutive days of representative negative sample results before a BWA can be lifted. If the sample sets are not taken on consecutive days, as frequently happens when a system is under a BWA over a weekend, they cannot be used as a rationale for lifting the BWA. **Remember that lifting a BWA requires DEP permission.**

Always remember that a BWA should only be a response to microbial contamination. It should not be used in response to chemical contamination, such as a primary MCL exceedance or a treatment chemical overfeed, as boiling water will only concentrate the contamination. DEP sanitarians can assist water suppliers in determining what type of water advisory is appropriate for a situation. **DEP's Policy for Issuing and Removing Water Supply Warnings** can provide more information at: <http://www.depgreenport.state.pa.us/elibrary/GetDocument?docId=7771&DocName=383-2129-005.pdf>

EPA Method 334.0: Video Tutorials

Jill Anderson, Water Program Specialist, Central Office

In the December 2017 edition of *Drinking Water News*, there was an article about EPA Method 334.0, which is a quality control protocol for online and handheld/benchtop chlorine analyzers used to collect regulatory data. In Pennsylvania, all community water systems, all nontransient noncommunity water systems, and any transient noncommunity water system using a surface water source or 4-log treatment of



viruses for a groundwater source are expected to comply with Method 334.0.

DEP created a series of video tutorials to breakdown and explain the various requirements of Method 334.0, including basic QA/QC, working with primary standards, how to perform dilutions of primary standards, how to use secondary standards, and documentation. The Method 334.0 videos are available to view at <https://www.youtube.com/user/PennsylvaniaDEP>. Once on the DEP YouTube channel, click “Playlists” and then “Drinking Water Tutorials”.

As a reminder, DEP has developed six recordkeeping forms to document compliance with various components of the method. These forms are available on DEP’s [eLibrary](#) under Safe Drinking Water Forms. Each of the forms is covered in detail in the videos, including when to use each form and how to complete them.

In addition, classroom training for operators on the requirements of Method 334.0 will be available in the upcoming months. This training will be provided by DEP, in coordination with the Pennsylvania section of the American Water Works Association (PA-AWWA). Please visit the PA-AWWA website at www.paawwa.org to look for training in your area.



Water Loss Management Training for Water Systems in the Delaware River Basin

Sponsored by Delaware River Basin Commission and PA Department of Environmental Protection’s Outreach Assistance Provider Program

Session 1: Water Loss Auditing - September 27, 2018

Session 2: Metering and Billing - October 23, 2018

Session 3: Leakage Management - November 28, 2018

Location (for all 3 sessions): Bucks County Community College – Newtown Campus
Gateway Center, Gallagher Room
275 Swamp Road
Newtown, PA 18940

Fee: No charge for training sessions

Lunch on your own: bring bag lunch or purchase at BCCC Cafeteria

PLEASE REGISTER EARLY! SPOTS WILL BE FILLED FIRST-COME, FIRST-SERVED

To register: <https://www.eventbrite.com/e/drbcpadep-2018-water-loss-training-registration-45733646568>

For more information about the Water Loss Management Training Series, contact Dr. SeungAh Byun, P.E. at 609-883-9500 x237 or via email: SeungAh.Byun@drbc.nj.gov.

For more information about DRBC’s Water Audit Program visit

<http://www.nj.gov/drbc/programs/supply/water-audit-program.html>.

Please note: These are stand-alone workshops, so you may attend one, two, or all three sessions. However, if you have not conducted a water audit at your utility, we highly recommended attending the Water Loss Auditing session first.



We're so glad you asked!

DEP receives a lot of good questions from water system operators and officials, so in each edition of our newsletter, we share some of the most common questions we receive in hopes of helping more water systems and certified laboratories.

Q: The letter I got about the Disinfection Requirements Rule only mentions weekly disinfectant residual monitoring & reporting in the distribution system. Do I still need to measure the chlorine residual every day at the entry point?

A: YES. The new DRR requirements are separate from, **and in addition to** the daily testing that is done at the entry point. You need to continue to measure the disinfectant residual every day at each entry point and report the results each month.

Q: I received a letter about the new Disinfection Requirements Rule. Where can I find more information on these requirements?

A: The Bureau of Safe Drinking Water's webpage has information on the [Disinfection Requirements Rule](#). You should check this web page periodically because more information and links to new forms will continue to be added as they are developed and we receive feedback from operators.

CORRECTION TO NOTE: The link to the Operators Exam page listed in the last Drinking Water News was incorrect. The link to the Operators Exam page is:

<http://www.dep.pa.gov/Business/Water/BureauSafeDrinkingWater/OperatorCertification/Certification/Pages/default.aspx>

Pennsylvania Department of Environmental Protection, 400 Market Street, Harrisburg, PA 17101

