

Revised Total Coliform Rule (RTCR) Level 1 Assessments - Getting it Right the First Time

**John Cairnes, Compliance Assistance Specialist,
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The Revised Total Coliform Rule (RTCR) has introduced public water systems (PWS) to some new concepts in self-monitoring. Among these is the use of Assessments – tools to assist water suppliers in identifying pathways to microbial contamination and sanitary defects that could lead to waterborne illness among the system's customers. The Level 1 Assessment is designed to be completed “in house” by qualified water suppliers without the assistance of outside experts.

When a public water system triggers a Level 1 Assessment, the water supplier should download a Level 1 Assessment and Corrective Action Form and Instructions from the Department of Environmental Protection's (DEP's) [RTCR](#) webpage. Completed Assessments are evaluated by DEP personnel and determined to be either sufficient or insufficient. If the Assessment is insufficient, it must be revised and re-submitted. Some Level 1 Assessments submitted to DEP from transient noncommunity systems following the implementation of RTCR have been deemed insufficient, as water suppliers adapt to the increased level of awareness and due diligence required by RTCR. Assessors can reduce the amount of work for both themselves and DEP staff by producing an accurate, complete assessment as an initial effort. Following are some tips on how to complete a good assessment.

The first step to a sufficient assessment is to have a good total coliform sample siting plan. Your plan contains information describing sample sites and identifying sample collectors – necessary information for Part II of the assessment. Be sure to share your sample siting plan with the contracted laboratory that collects the samples, so they can avoid the pitfalls of reporting errors.

You need to understand what triggers a Level 1 Assessment. The first trigger is a confirmed coliform presence, through either routine samples, or a combination of routine and check samples. For systems collecting fewer than 40 samples a month, this means more than one sample in a monthly monitoring period. For systems collecting more than 40 samples per month, the assessment is triggered when more than 5% of samples for each month test positive. In both cases, the “trigger date” is the date of analysis of the confirming sample.

The second trigger of a Level 1 Assessment under the Revised Total Coliform Rule is a failure to collect check samples following a routine positive sample result. Check sample sites should be chosen with care and identified with the same Location ID as the

Continued on page 2

In this issue:

RTCR Level 1 Assessments	1	Helpful Hints for RTCR Level 1 Assessments	6
YouTube Tutorials Available	2	Monitoring Waivers 2017-2019	7
RTCR Assessment Triggers	3	Optimizing Sample Collections for Optimized Corrosion Control	7
Sanitary Defects and Corrective Actions under the RTCR	4	New Fact Sheet on RTCR Assessments	8
Important Lab Reporting Update	5	RTCR Webinar Recording Available	9
Certified Operators and Process Control Decisions	6	We're So Glad You Asked	9

... Continued from page 1

associated routine sample site. Without that correlation, the Pennsylvania Drinking Water Information System (PADWIS) will interpret the reported results as a failure to collect check samples, triggering an assessment. In this case, the trigger date is the day after the analysis date of the routine sample.

Read the Assessment Instructions carefully. Remember that the Level 1 Assessment is not a “test” that you might fail. It is intended to be an honest and diligent review of your drinking water facilities to help you better provide potable water to your customers. Don’t think about what should be the “right” answer to the assessment questions; just answer them to the best of your knowledge.

Don’t be afraid of those gray checkboxes. They merely identify a possible issue that requires a response. Not all issues are sanitary defects and not all corrective actions will require an expensive or complicated resolution.

And always remember that DEP is prepared to assist water suppliers in complying with state drinking water regulations. While completing the Level 1 Assessment, you may encounter terminology with which you are unfamiliar. If you are uncertain if your well cap has a sanitary seal, or you are unsure if an issue you’ve identified is a sanitary defect, your DEP sanitarian can help you make that determination.

Finally, be aware that you are on a timetable. You have 30 days from the trigger date to complete your assessment and submit it to DEP. Missing that deadline will incur violations that will require additional corrective actions besides the Assessment.

The 12-page Level 1 Assessment form may look complicated to someone who is using it for the first time, but the majority of Level 1 Assessments conducted in Pennsylvania can be completed using only the first six pages. Most of the questions can be answered either from memory, or through a quick observation. It is not intended to be either a corrective action or a penalty against a water supplier, but rather as a means of helping you to better protect the health of your customers.

Safe Drinking Water Program Tutorials on YouTube

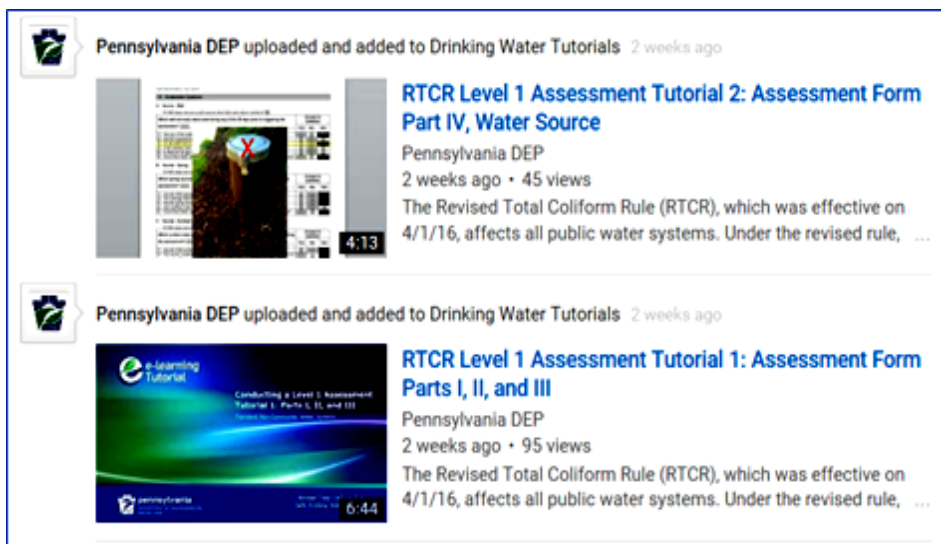
Have you ever turned to YouTube to learn how to fix something in your home or maybe your car?

Now you can go to DEP’s YouTube channel for Safe Drinking Water program tutorials. Currently, there is a two-part video series on using the Drinking Water Electronic Lab Reporting (DWELR) system and a tutorial on completing a sample siting plan under the Revised Total Coliform Rule (RTCR). By the time you are reading this, the playlist will include a six-part tutorial on conducting an RTCR Level 1 Assessment at a transient noncommunity water system.

Here is how to access the tutorials:

- Go to the DEP YouTube site at <https://www.youtube.com/user/PennsylvaniaDEP>
- Once at the site, click on “Playlists” in the menu at the top
- On the Playlists page, click on “Drinking Water Tutorials”

The tutorials can be viewed from any device with Internet access. The Safe Drinking Water program will continue to update the site with relevant tutorials, so check back often.



The screenshot shows two video results from the Pennsylvania DEP YouTube channel. The first video is titled "RTCR Level 1 Assessment Tutorial 2: Assessment Form Part IV, Water Source" and has 45 views. The second video is titled "RTCR Level 1 Assessment Tutorial 1: Assessment Form Parts I, II, and III" and has 95 views. Both videos are part of a series on the Revised Total Coliform Rule (RTCR).

Video 1: Pennsylvania DEP uploaded and added to Drinking Water Tutorials 2 weeks ago. Title: RTCR Level 1 Assessment Tutorial 2: Assessment Form Part IV, Water Source. Duration: 4:13. Views: 45.

Video 2: Pennsylvania DEP uploaded and added to Drinking Water Tutorials 2 weeks ago. Title: RTCR Level 1 Assessment Tutorial 1: Assessment Form Parts I, II, and III. Duration: 6:44. Views: 95.

RTCR Assessment Triggers

Jeff Allgyer, Operations Section Chief, Central Office

The table below shows when assessments are triggered under RTCR:

A Level 1 Assessment must be conducted when:

A PWS fails to collect at least three check samples for each routine sample that tested positive for total coliform (TC+);

or

A PWS that collects less than 40 samples per month has two or more TC+ samples (including both routine and check sample results) in one month;

or

A PWS that collects more than 40 samples per month has greater than 5% of sample results be TC+ (including both routine and check sample results).

> A Level 1 Assessment is conducted by the public water system.

A Level 2 Assessment must be conducted when:

A PWS incurs an *E. coli* MCL violation under any of the following situations:

Sample Result Type: ROUTINE	Sample Result Type: CHECK
TC+ & EC+	TC+
TC+ & EC+	Any missing check sample
TC+ & EC-	EC+
TC+ & EC-	TC+ (but not analyzed for <i>E. coli</i>)

or

A PWS triggers two Level 1 Assessments in a rolling 12-month period.

> A Level 2 Assessment must be conducted by a certified operator with the appropriate class and subclass certifications for the water system being assessed.

It's easy to prevent an assessment being triggered due to an insufficient number of check samples collected. Simply ensure that **three check samples are collected on time** for each routine sample that tests positive for total coliform.

Remember, the RTCR regulations require that three check samples be collected within 24 hours of being notified that a routine sample tested positive.

DEP may extend the collection time limit to 72 hours if there is a logistical problem outside of the water system's control such as being notified of the results on a weekend. However, you are always required to contact DEP within one hour of learning that a sample requires the collection of check samples. When notifying DEP, you can then discuss whether the 72-hour extension applies.

Compliance Tip: *If you rely on a laboratory to collect your samples, the next time they notify you of a routine sample testing positive for total coliform, schedule with the laboratory right then to have three check samples collected within 24 hours. When you've completed that call with your laboratory, why not just dial DEP and complete your one-hour notification?*

Sanitary Defects and Corrective Actions under the Revised Total Coliform Rule (RTCR)

Jill Anderson, Compliance Assistance Specialist, Southcentral Region

The Pennsylvania Revised Total Coliform Rule (RTCR) was published in the PA Bulletin on September 24, 2016 (found [at this link](#)). This rule changes how public water suppliers (PWSs) respond to detections of bacteria in the distribution system, by requiring PWSs to “find and fix” sanitary defects. A PWS that may be vulnerable to contamination, based on results of total coliform monitoring, needs to conduct either a Level 1 or Level 2 assessment to identify sanitary defects in their water system. Once sanitary defects are identified, they must then be corrected, thereby preventing future contamination in the distribution system.

Identifying sanitary defects is the first step in the “find and fix” approach. A sanitary defect is defined in 109.1 as: “A defect that could provide a pathway of entry for microbial contamination into the distribution system or that is indicative of a failure or imminent failure of a barrier that is already in place.” During an assessment, the assessor looks for any issues in the PWS, and then determines whether those issues meet the definition of a sanitary defect. Note that there are two parts to this definition. Some examples of each part are listed below.

Pathway of entry for microbial contamination into the distribution system:

- Unprotected cross connections
- Main breaks
- Cracks or holes in well seals or casings
- Missing sanitary seal well cap
- Holes in storage tanks that may allow entry of vermin
- Storage tank vents, overflows, hatches not screened or sealed properly



Photo property of Nevada Division of Environmental Protection

Indication of a failure or imminent failure of a barrier that is already in place:

- Cross connection control devices not working properly or not tested
- Inadequate disinfection during and/or after pipe repair or replacement
- Failure to maintain adequate pressure in the distribution system
- Failure to maintain disinfectant residual at the entry point
- Failure to maintain adequate disinfection residual throughout the distribution system
- Interruption or failure of disinfection treatment

These are just a few examples of sanitary defects. Every PWS is unique; if an assessment is required at your PWS, the assessor needs to thoroughly consider any issues and determine whether they satisfy either part of this definition.

Compliance Tip: *When conducting an assessment, the assessor must identify sanitary defects and describe them in detail in Part V of the Level 1 or Level 2 Assessment and Corrective Action Form.*

Once sanitary defects are identified, **the PWS is required to correct all sanitary defects** according to 109.705(b)(8); this is the other half of the “find and fix” approach. The type of corrective actions required will vary depending on the sanitary defects identified. Corrective actions should be detailed and specific enough to correct the sanitary defect and reduce the likelihood of future microbial contamination. In addition, all corrective actions should be completed in accordance with state regulations and guidance and industry best practices. PWSs are advised to consult with the Department prior to completing any corrective actions.

Finally, **the assessor must also provide a schedule for completing all corrective actions:**

- If a corrective action has already been completed by the time the assessment form is submitted, the date of completion should be provided as the schedule.
- If more time is required to fix the sanitary defect, the assessor should provide a date by which the corrective action will be completed.

An appropriate completion schedule timeframe depends on the complexity of the corrective action and case-specific details; consultation with DEP staff is recommended.

Continued on page 5

Certified Operators and Process Control Decisions

Sheryl Martin, Compliance Assistance Specialist, Southcentral Region

All community and nontransient noncommunity water systems must have an appropriately-certified available operator.

According to the DEP Chapter 302 Operator Certification Regulations, an available operator must be either on-site or available for consultation, to make **all** process control decisions. The regulations define a *process control decision* as a “decision that maintains or changes the water *quality* or *quantity* of a water system in a manner that may affect the public health or environment”. Some examples of process control decisions include: turning the water off, shutting or opening valves, turning chemical feed pumps on/off, or making changes to chemical feed pumps. It’s important to understand that this requirement extends to the distribution system. Valving off a portion of the distribution system to repair a break affects water quantity and possibly quality, and is therefore, a process control decision.

A system owner, contractor, or maintenance employee cannot make water system adjustments which meet the definition of a process control decision unless they have contacted and consulted with their certified operator. The consultation may be done through the use of standard operating procedures if they have been approved in advance by the operator in responsible charge and meet the requirements outlined in the Chapter 302 regulations. Communication between all parties during consultation is very important so that any critical information about treatment equipment, processes and potential consumer notification can be relayed as required. If the certified operator in responsible charge is not notified of changes that affect the quality or quantity of water before they happen, he/she may be unaware of potential problems for the water system. If in doubt, contact your certified operator first!

For more information on system operation and process control decisions, please see chapter 7 of DEP’s Drinking Water and Wastewater Systems Operator Certification Program Handbook available online at: <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-94656/391-2300-001.pdf>.

Helpful Hints for RTCR Level 1 Assessments

Pete Mengak, Compliance Assistance Specialist, Northeast Region

Between April 1, 2016 and September 30, 2016, over 250 RTCR Level 1 Assessments were completed and submitted to DEP. DEP staff reviewing the assessments noted some common errors that can be easily fixed. Here are a few things to keep in mind when completing an RTCR Level 1 Assessment:

- Submit your assessment form on time. The forms are due to DEP within 30 days of triggering an assessment.
- Have the responsible official for the water system sign the assessment form.
- Complete **all** fields on the assessment form. If a set of questions does not apply to your water system, then be sure to check the box indicating the questions don’t apply. Often times, basic information such as the name of the public water system or the public water system’s identification number (PWSID #) have been left blank. If you are unsure of how to answer a particular question, refer to the assessment form’s instructions or to the Level 1 Assessment tutorial located on DEP’s YouTube channel.
- Provide an issue description for each gray box checked on the assessment form. When a sampling issue or sanitary defect is identified, you are also required to provide an appropriate corrective action and corrective action completion schedule.
- If you correct a problem before submitting the form to DEP, provide the date that the corrective action was completed.

If you have any questions when conducting your RTCR Level 1 Assessment or completing the assessment paperwork, please don’t hesitate to contact your local DEP office.

Monitoring Waivers 2017—2019

Jamie Estep, Compliance Assistance Specialist, Southcentral Region

We are fast approaching the third and final period of the current nine-year monitoring cycle. Systems that were granted waivers during the 2014-2016 monitoring period for SOCs, VOCs, Dioxin or PCBs will need to renew their monitoring waivers or begin routine sampling.

Waiver requests and renewals must be made in writing and sent to the appropriate DEP office for review (See Application Instructions at the link below for a list of DEP District Offices by county). Until a waiver request is approved, public water systems are responsible for conducting all monitoring.

Please remember that each entry point is evaluated individually, therefore each entry point requires a separate application or renewal. Contaminants that are removed with a specific treatment are not eligible for a waiver at the entry point where the treatment is installed. Systems are required to apply for monitoring waivers using DEP forms.



Information and application forms for monitoring waivers can be found on the DEP website at: <http://www.dep.pa.gov/Business/Water/BureauSafeDrinkingWater/DrinkingWaterMgmt/Pages/Monitoring-Waivers.aspx> and <http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-8755>.

Waivers for IOCs and asbestos are good for the entire nine-year cycle and are not required to be renewed every three-year period.

Optimizing Sample Collection for Optimized Corrosion Control

John Cairnes, Compliance Assistance Specialist, Southeast Region

The Lead and Copper Rule was implemented to safeguard public health from contaminants caused by the corrosion of man-made materials that are used to convey drinking water to its users, rather than from environmental conditions or intrusion into natural water sources. Distribution materials, and their vulnerability to corrosion, will vary, sometimes from one city block to the next. For these reasons, the collection of lead and copper samples, and the selection of good sample sites, should be done with great care.

Community and non-transient noncommunity water systems are required to have a lead and copper sample site plan, identifying at least the minimum number of samples determined by the system's population. Site selection should focus on areas of distribution constructed of materials deemed to be at the highest risk of lead or copper corrosion.

A complete list of lead and copper monitoring requirements may be found in Chapter 109, Subchapter K of Title 25 of the Pennsylvania Code. The purpose of this article is to provide some real-world practical considerations and tips on good sample site selection, and sample collection, for lead and copper monitoring. Optimizing your sample site plan is as important as optimizing corrosion control.

For Sample Site Selection:

- Keep a list of sample dates as well as sample sites. Systems on annual or triennial monitoring are required to collect samples between June 1st and September 30th. Samples collected outside that date range will lead to monitoring violations.
- Site selection considerations do not end at the curb stop. A lead service or supply line connecting the curb stop to residential plumbing is sufficient to define that residence as a Tier 1 sampling site.

Continued on page 8.....

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- Do not use vacant or abandoned properties for sample sites. Lack of maintenance and usage can make their sample taps unreliable and produce inaccurate results.
- Give all sample sites a unique location ID number. If you replace a site with a new one, give the new site its own ID number instead of re-using the old one.
- Review your sample site plan annually, or prior to each sampling period. Ensure the quality of your site selection by verifying that all sample sites are active and accessible. Make changes if they are not.
- Special monitoring, following sample results with a 90th percentile value in excess of the lead or copper action level, will include more sample sites than used in routine monitoring. You can prepare for this eventuality by including alternative sites in your sample site plan.

For Sample Collection:

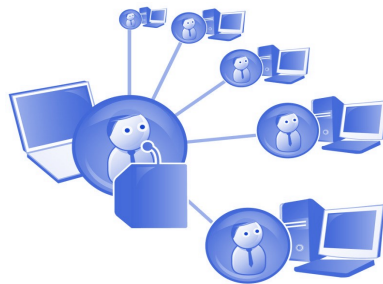
- Samples should be collected in 1-liter bottles from taps that are regularly used. Oxidation (corrosion) of metal can occur in seldom-used plumbing, leading to ion-heavy water that is not representative of the distribution system.
- No more than one sample may be collected from a tap per day. If a public water system has fewer taps than the minimum number of samples required, samples may be collected from a tap on consecutive days.
- Home-use filters and softeners should be disconnected prior to sample. Aerators may remain in place.
- Sample taps should be given a standing time (a period during which the tap is unused) of at least six hours, but less than twenty-four hours.
- Use only cold water, indoor taps. A water heater may release metal ions into the water passing through it, creating a product that is not representative of the distribution system. Outdoor taps are subject to on-site oxidation in excess of what is occurring in the distribution mains.
- Take “first flush” samples – the first water to pass through the tap following the standing time.
- Record the sample date, time and location during sample collection, and pack the samples in ice for transport to your accredited lab. Samples may be collected by homeowners, provided they follow the correct sampling procedures and complete a signed sample collection certification form.

As a public water supplier, it is essential that you do not let routine sample collection become “routine”. A careful consideration of the factors that affect the reliability of your drinking water samples will help obtain the most accurate results, and keep you aware of how water quality can change over time.

Did You Miss the RTCR Webinar?

On October 19, 2016, DEP hosted a successful webinar to highlight some of the key requirements of the Revised Total Coliform Rule (RTCR). If you were unable to view the webinar when it was presented, you can watch a recording of the webinar, as well as review the slides from the presentation, on DEP’s RTCR page.

To visit the DEP RTCR page, please follow this link: <http://www.dep.pa.gov/Business/Water/BureauSafeDrinkingWater/DrinkingWaterMgmt/Regulations/Pages/Revised-Total-Coliform-Rule.aspx#.VkH6tvMo6UI>



RTCR Assessments Fact Sheet



DEP has a new fact sheet that explains assessments required under the new Revised Total Coliform Rule (RTCR). It explains the difference between a Level 1 Assessment and a Level 2 Assessment and lists when each assessment is triggered. It also specifies who can conduct the assessments.

The new fact sheet can be found in DEP's eLibrary at <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-115481/3930-FS-DEP4697.pdf>

We're So Glad You Asked



DEP receives a lot of good questions from water system operators and officials, so we're sharing some of the most common questions in hopes of helping more water systems and certified laboratories.

Q: One of my recent coliform sample results came back positive. I think I may have sampled wrong because I was distracted while I was taking the samples. When I saw the positive result, I contacted my local DEP Sanitarian but they won't invalidate that sample result. Why not?

A: There are only a few instances in which a coliform sample can be invalidated. They are: 1.) the laboratory confirms it used an incorrect analysis method; 2.) results of repeat samples suggest the problem is associated with a domestic or other non-distribution system plumbing problem; or 3.) something happened that doesn't reflect the true water quality in the distribution system—such as a broken sample bottle. It is the responsibility of the water system to ensure that samples are taken correctly. Positive results cannot be assumed to be the result of sampling errors. Additionally, every sample taken for compliance purposes must be reported to DEP regardless of the results.

Q: During a recent inspection, I was issued a violation for not operating a piece of equipment that is in my permit, but that I haven't used in a while. The quality of my finished water is actually better without it. Why did I receive a violation?

A: Operating outside of what's specified in your permit is a violation. Your failure to use the piece of equipment as specified in your permit may have unintended consequences with another treatment process. If you believe your system is better off without a certain process or piece of equipment, ask your Sanitarian to put you in touch with the regional Safe Drinking Water Program's Technical Services Section to discuss how you can change your current requirement to use it.

Q: Why did my DEP Sanitarian recommend that I NOT buy a drum of Sodium Hypochlorite?

Many smaller facilities think about purchasing sodium hypochlorite in large quantities in order to save money. The problem is that sodium hypochlorite has a limited storage life that is further reduced by increasing concentrations and increasing temperatures. The deterioration of sodium hypochlorite solutions may be rapid and is accelerated by light, heat and ventilation. A 10% solution of sodium hypochlorite could lose 20% of its strength in the first 60 to 80 days after production. It is recommended that facilities purchase only a two- to three-month supply at a time.

Q: I hear the term "Log Inactivation" a lot anymore. What, exactly, does it mean?

A: The term Log Inactivation is often used in reference to the Groundwater Rule (GWR) which deals with the inactivation of viruses in drinking water. The GWR requires 4-Log inactivation. 1-Log means that a 90% inactivation of the viruses is accomplished; 2-Log is a 99% inactivation ; 3-Log is a 99.9% inactivation ; and 4-Log is 99.99% inactivation .

Q: I don't have any labs near me and I would like to ship my bacteriological samples to an accredited lab. Do I need to ship them on ice?

If your laboratory is using a presence/absence method to analyze your revised total coliform rule bacteriological samples, then it is not a requirement to keep the samples cold. This means that samples do not need be shipped on ice, which should keep the cost of shipping a routine bacteriological sample to approximately \$20. However, it is essential that the samples are shipped quickly and overnight in order to meet the hold time requirements for bacteriological sampling. Prior to shipping, you should call your lab to confirm that they are using a presence/absence method to analyze your samples and what the hold time for the method is.