STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH

Revised Total Coliform Rule Level 2 Assessment Form Instructions

General Requirements

A Level 2 assessment is a more in-depth examination of the distribution system, water sources, treatment facilities, storage facilities and relevant operational practices at a public water system (PWS). A Level 2 assessment helps to identify possible sanitary defects that may have the triggered assessment. The *Revised Total Coliform Rule Level 2 Assessment Form* identifies the minimum elements that must be reviewed and identifies typical events that could impact water quality or indicate that water quality may have been impaired. Level 2 Assessments must be performed by a Level 2 Assessor that in not an employee of the water system. The Department may also elect to conduct a Level 2 Assessment and must notify the PWS not later than 5 days after the PWS learns that it has exceeded a Level 2 treatment technique trigger.

In accordance with the EPA Revised Total Coliform Rule (RTCR) (40 CFR 141), a PWS must conduct a Level 2 Assessment after exceeding any of the following treatment technique triggers:

- An E. coli MCL Violation
- System has exceeded 2 Level 1 treatment technique triggers in a rolling 12-month period

The PWS may also arrange to voluntarily conduct a Level 2 Assessment in order to qualify for a reduced monitoring requirement or to return to routine monitoring following a monitoring increase. Refer to 40 CFR 141 for more information regarding additional eligibility requirements for monitoring reductions.

Reporting Requirements

The completed *Revised Total Coliform Rule Level 2 Assessment Form* must be submitted to the Department no later than 30 days after the date that the PWS learns that a treatment technique trigger has been exceeded (Assessment Trigger Date). All potential Sanitary Defects that were identified during the Level 2 Assessment must be corrected at the time the form is submitted. The form must include a description of the potential Sanitary Defect identified and the actions taken to correct the Sanitary Defect. If the Sanitary Defect cannot be corrected by the time the form is submitted, the PWS must provide a proposed corrective action with a date for completion.

The completed form must be returned to the Drinking Water Section at:

Mail: State of Connecticut
Department of Public Health
Drinking Water Section
410 Capitol Avenue, MS# 51WAT
P.O. Box 340308
Hartford, CT 06134-0308

Email: dwdcompliance@ct.gov

Fax: 860-509-7359

Form Instructions

Public Water System Information

PWS ID:	Public Water System (PWS) Identification Number (CTXXXXXXX)
PWS Name:	Name of the PWS
Town:	Primary town served by the PWS
Date Assessment Form Completed:	Date that the Assessment Form was completed
Assessment Trigger Date:	Date that the PWS learned that a Level 2 treatment technique trigger was exceeded
Assessment Trigger:	Indicate which Level 2 treatment technique trigger was exceeded or if it was performed voluntarily.

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1	**General Questions**	
1.1	Are there any unresolved significant deficiencies from the last CT DPH Sanitary Survey?	Review most recent CT DPH Sanitary Survey Report or response letter and determine if all significant deficiencies have been corrected. Any unresolved significant deficiencies may be contributing to the contamination and must be corrected.
1.2	Are there any unresolved sanitary defects identified in prior Level 1 or 2 Assessments?	Review any Level 1 and Level 2 Assessments performed in the past 12 months and determine if all sanitary defects have been corrected. Any unresolved sanitary defects may be contributing to the contamination and must be corrected.
1.3	Have there been any community illnesses suspected of being waterborne? (e.g., Do community public health officials indicate that an outbreak has occurred?)	Contact LHD, CT DPH Drinking Water Section and review system records and complaints to determine if there have been reported illnesses, which may be the result of bacteriologically contaminated water.
1.4	Have there been any visible or physical indicators of unsanitary conditions?	Inspect system components: wells, tanks, etc. and the area around them to determine the sanitary conditions and if it may be a concern. Physical indicators of unsanitary conditions may include but are not limited to: trash dumping, animal/bird droppings, overflowing septic systems, mice or rodent activity/nesting near the well, air compressor intake for hydro-pneumatic tanks or unpressurized storage tanks.
1.5	Have there been any signs of vandalism or forced entry to water system components or facilities?	Determine if there were signs that water system components were tampered with. Immediately notify police and CT DPH if there was any vandalism or forced entry.
1.6	Have there been any other water quality issues within distribution or plumbing systems (color, turbidity, taste, and odor)?	Review water quality physical tests and system complaints. Water quality issues include changes in water color, odor, taste, cloudiness. Some, but not all, changes in water quality can be attributed to the bacteriological contamination of drinking water systems.
1.7	Have there been any fire-fighting events, flushing activities, water main breaks or service line breaks?	Review records to determine if there have been any fire-fighting events, system flushing activities or water main breaks or service-line breaks which may have contributed to the bacteriological contamination.
2	**Operational Changes**	
2.1	Has there been any other source of supply used or placed into operation that is not normally used?	Determine if any water sources not routinely used have been placed into operation such as lag, standby alternate or emergency well, interconnection, bulk water delivery, etc.
2.2	Have there been any general repairs, operational changes or maintenance activities on the water system?	Review records and/or ask person(s) who deal with the system to determine if any repairs, operational changes, addition of other system components or maintenance activities have occurred. This includes: treatment – chemical or filter, well pump, tank – atmospheric or pressure, water mains, building plumbing/fixtures, etc.
2.3	Was there a failure to follow adequate disinfection practices following any repairs or maintenance activities on the system?	Verify that the system was properly disinfected upon completion of any repair or maintenance activity. Examples of activities that require disinfection include work on or replacement of: well, pumps, tanks, pipes, filters, etc.

2.4	If this is a seasonal system, were there any problems during the most recent start-up procedure?	Verify that system followed the written start up procedure, collected a round of clean samples and submitted the verification form prior to opening up for the season.
3	**Sampling Sites**	**See Sampling Site Plan Guidance**
3.1	Does the area surrounding each sampling tap appear to be unsanitary?	Determine if the taps used for the compliance monitoring are clean and in sanitary condition. Slop sink taps, taps in dirty condition, etc. may result in bacteriological contaminated samples.
3.2	Are there sampling taps that are not routinely used or not identified in the system's Sampling Site Plan?	Determine that the sampling taps are from locations where water is used on a routine basis and from locations identified in your DPH approved Sampling Site Plan. A tap that is not used on a routine basis may result in bacteriological contaminated samples, and a system is required to collect samples from approved sites.
4	**Sampling Protocol**	**In answering the following questions consult with the laboratory that conducted the analysis and/or sample collector(s).**
4.1	Was the sample taken in an improper sample container?	Verify that the sample containers were sterile and of the appropriate size or type for bacteriological sampling.
4.2	Were there any sampling or handling errors (i.e. human error)?	Review chain-of-custody records and lab compliance reports to verify that samples containers were properly collected, handled and stored prior to, during or after sampling. This may include the removal of aerator, flushing or other procedure as a specific laboratory may conduct or require.
4.3	Were any of the sampling locations equipped with an auto sensing, swivel-or single-spout type faucet?	Determine if these type faucets were used. These types of faucets should not be used as sampling locations since hot water flows through the faucet or may leak and blend with the cold water, and hot water may contain bacteria.
4.4	Were there any sample holding time or storage temperature exceedances?	Review chain-of-custody records and lab compliance reports to verify that samples did not exceed allowed sample holding times and that the samples were stored properly at all times prior to analysis.
4.5	Did the laboratory report any testing errors?	Review chain-of-custody records and lab compliance reports to verify that samples were analyzed in accordance with applicable methods.
4.6	Was there a failure to follow appropriate collection procedures when samples were collected?	Verify that proper sample collection procedures were followed prior to sample collection. This may include the removal of aerator, flushing or other procedure that a specific laboratory analysis method requires.
4.7	Have there been any special samples taken from a water treatment plant, well, tank or distribution system as part of the investigation that have confirmed the bacteriological contamination?	Review the results of any special samples taken (those not used for compliance) during the investigation and determine if any indicated the presence of bacteria. Detections may help identify where areas where the bacteriological contamination may be coming from. A summary of these special sample test results should be provided as supporting documentation where applicable.
5	**Distribution**	
5.1	Have there been any incidents of low or inadequate pressure (<25 psi)?	Determine if there been any inadequate or low pressure events. Adequate pressure is the first barrier in protection of water system from contamination.

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5.2	Have there been any distribution plumbing installations, water service line breaks or main breaks?	Review records to determine if there were any breaks or repairs to the system. A break or installation may cause bacteria to be introduced into a system directly or indirectly. Increased flows or other disturbances to the pipes may release bacteria in sediment or scale within the pipe. Effective disinfection followed by sampling and testing for bacteria is warranted following these events.
5.3	Were there any events that may have caused flows in excess of normal?	Review records to determine if there was any event where flows within the system were in excess of normal. Such event may include flushing, fire event, unauthorized use, operation of a blow off, etc. Increased flows in pipes may disturb bacteria-containing sediment or scale buildup and cause the bacteria to be released into the water.
5.4	Have all cross connection violations been corrected?	Review sanitary survey reports, cross connection inspection reports and recent work orders to determine if any cross connection violations have been identified and not corrected.
5.5	Are there any dead end or low flow sections within the distribution system or plumbing system?	Chronic repeated coliform bacteriological issues have been associated with inadequate disinfection of stagnant water lines.
5.6	Are there any automatically operating air vacuum, air release or combination air release/air vacuum valves having a discharge port connected to drain, not screened or that may have been submerged in water?	Review records and/or inspect system to determine if there is any air vacuum, air release or combination air release/air vacuum valves. If present determine that they are not connected to a drain, submerged in water or may become submerged in water. Any valves routinely operated on a pump discharge or elsewhere should be appropriated screened.
5.7	Were there low disinfection residuals?	Review distribution sample results to determine if chlorine was below normal operating levels or if a detectable free chlorine level (i.e. > 0.05 mg/L) is maintained in the distribution or plumbing system. This would apply only to water systems which provide continuous chlorination treatment.
6 Source of Supply		**This section should be repeated for each source of supply. Include the name, facility ID number and type (surface water, ground water or spring) of the source. Select Consecutive System if the system's only source of supply is a consecutive connection with another PWS.**
6.1	Have there been any recent activities (i.e. septic or sewer releases, construction, waste discharges) in the vicinity of the source?	Inspect the property around the source looking for evidence of failed septic or sewage system components by looking for wet soil areas, septic odors etc. and if it may be flowing toward the source. For surface water sources, review the system's annual Watershed Inspection Report to determine if any potential bacteriological sources of pollution were identified and not corrected.
6.2	Are there any holes or unprotected openings in the well casing?	Inspect the well casing to determine if there are any visible cracks or openings in the casing. For steel casing check for severe corrosion especially at the point where the casing enters the soil or a concrete floor.

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6.3	Does the well casing terminate less than 6 inches below established grade or well pit floor?	Inspect the well casing to determine if it extends at least 6 inches above established grade or well pit floor The casing extension should be as high as feasible for the specific location and at least 12 inches above grade or the floor. Cutting the grade around the well may be feasible as long as surface wash is directed away from the well or standing water will not collect around the well. If the well is located in a structure which may flood under certain conditions, the structure containing the well should be eliminated with the well casing being extended above grade where possible. Please refer to the DPH's guidance document "Well Casing Extension" which can be found on the DPH's website.
6.4	Does the well casing terminate less than ten feet below the surface or do the casing sections not appear to be joined watertight?	Inspect the well interior to determine that the casing and appurtenances are installed watertight to the casing. If no obvious defects can be seen, further investigation (i.e. subject to down well video camera inspection of internal or physical well components may be warranted). Please refer to the DPH's guidance document: "Well Casing Extension" which can be found on the DPH's website too. Approval from the DPH is necessary for the construction of a new well, and applications for seeking approval can be found on the DPH's website.
6.5	Is the cover of the dug well watertight and sealed watertight to the casing?	Inspect the cover on the dug well to determine if it is free of defects (i.e. cracks, openings, deterioration, etc.) and is sealed watertight to the casing. Improperly constructed or maintained dug wells can pose an elevated risk of bacteria and microbial pathogens entering the water. Approval from the DPH is necessary for the construction of a new well, and applications for seeking approval can be found on the DPH's website.
6.6	Is the well located in a depressed area where water may collect or is subject to flooding, and has any flooding or ponding occurred?	Inspect the immediate area and grading around the well to determine if water runoff is being directed towards the vicinity of the well or may collect around the well. Also determine if there are signs that water has flooded or collected in the area. Surface water with bacteria may flow along a casing or through the soil and contaminate the water.
6.7	Is the sanitary seal or well cap improperly installed to the casing and electric conduit, or are they in an unsatisfactory condition?	Inspect the well cap or sanitary seal (i.e. split seal) to determine if it is properly installed and in satisfactory condition (bolts are tightened, no openings, not cracked or missing pieces, does not move on casing, etc.). Additionally, determine if the electrical conduit is tightly connected into the cap or seal and the other end is buried into the ground, sealed or connected into an electrical box. The smallest opening into a well casing may cause a bacteriological contamination by allowing runoff, insects, mice, etc. to get into a well.
6.8	Does the well lack a vent?	Inspect the well cap or seal to determine if it has a vent. Lack of an appropriate vent can result in a negative pressure within the casing and potentially draw surface water with bacteria into a well. The DPH requires all wells to have a shielded and screened vent. If there is no vent one must be installed which may require the installation of a new cap or sanitary seal.
6.9	Is the well vent not shielded or properly screened?	Inspect the vent to determine that it is properly shielded (inverted "J", mushroom type, or other) to prevent rain water from entering, connected tightly into a cap or sanitary seal, and provided with a fine mesh screen to keep insects, mice, etc. out.

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6.10	Is the well pit currently flooded or is there any indication that water collects in the pit?	Examine the well pit and determine if there is standing water or is there is staining or other evidence of past flooding. Additionally determine if the pit is equipped with a gravity drain clear of obstructions or functioning sump pump.
6.11	Is the well pit drain line directly connected to a septic, sewer or storm drain system?	Inspect the drain line to verify that its discharge end is not connected to a septic, sewer or storm drainage system, is not subject to flooding and is properly screened to keep out mice, snakes, etc.
6.12	Is the source in compliance with separation distance requirements associated with a potential bacterial source?	Inspect area and records to determine if there are any bacteriological sources within the required protective radius as identified in the table. [septic or sewer system components, animal excrement, improperly maintained dumpsters, etc.)

Separating Distance Requirements

Withdrawal Rate	<10	10-50	>50 gpm
source of pollution including septic/ sewer	75 feet	150 feet	200 feet
septic/ sewer tight pipe	25 feet	75 feet	100 feet

6.10	Does the spring box have any breaches, holes or unprotected openings?	Inspect the spring to determine if there are any visible cracks or openings in the spring box.
6.10	Are all spring box hatches appropriately sealed and overflow vents appropriately shielded and screened?	Inspect the spring box to determine if it has a hatch, overflow or vent. If provided with these components, assess the items under storage facilities which correspond to these components.
6.10	Does the source have a history of bacteriological contamination?	Review the history of water quality results to determine if there is a history of repeated bacteriological issues at the source. If no obvious sources of contamination are identified further investigation (down well video camera) of internal or physical well components may be warranted.
7 Treatment Facility		**This section should be repeated for each treatment facility/plant. Include the name and facility ID number of the facility. Check the *PWS does not have any treatment facilities* box if the PWS does not use any treatment facilities.**
7.1	Has there been any by-pass in the disinfection treatment process?	If the disinfection system is equipped with a by-pass determine that the by-pass valve was closed. A system providing disinfection treatment for compliance of a maximum contaminant level (MCL) must not have a bypass.
7.2	Is the filter backwash discharge line directly connected to a drainage pipe or sewer/septic line?	Inspect or follow the backwash discharge line to its discharge end to verify that it is not physically connected to the sewer or septic system or drain pipe.
7.3	Have there been any interruptions in disinfection treatment (UV, chlorine, etc.)?	Determine if there was an interruption on chlorine feed due to power outage, feed pump or other malfunction (loss of prime, no chemical, leak, etc.). For UV treatment assess whether the unit was operating and has been appropriately maintained (on or off, alarm mode, dirty quartz sleeve, lamp operational, etc.).
7.4	Has there been any recent installation or repair to the treatment process?	Review maintenance records to determine if there was any recent installations or changes to the treatment process. For systems with filters, this may include if any vessels have been re-bedded or replaced which includes cartridge filters. For chemical feed systems, this may include changes in chemical used or replacement of feed system components.

7.5	Have there been any low or inadequate disinfection residual levels?	Review the daily or continuous monitoring records for water leaving a treatment plant to determine if residuals levels were below typical levels. For a ground water treatment plant approved to provide 4 log inactivation of viruses review operation records to determine if the level dropped below the approved minimum chlorine disinfection residual (free chlorine) or below the minimum CT of 6.0 mg min/L. For a surface water treatment plant review operational records to determine if the CT achieved and maintained at the system's water treatment plant supplying water to the area of the contamination was above the required CT as identified in EPA compliance tables. This would apply only to public water systems which provide continuous chlorination treatment. CT = contact time (min) x chlorine residual (mg/L)
7.6	Is there any evidence of filter or media contamination?	Review maintenance logs to see when the media was last replaced. For systems with a cartridge filter, review DPH's guidance document on cartridge filters (Follow the link for DPH guidance: **Sediment Filter Replacement**) to assess if protocol was followed. It is recommended to collect pre and post filter total coliform samples to determine if the contamination may be in the filter or its media
7.7	For ultraviolet (UV) disinfection systems, is the well(s) discharge flow rate (pre-UV) above the rated manufacturer's capacity of the UV unit?	Review source (well) meter readings if available and UV unit manufacturer's specifications to determine if the flow into the UV unit is greater than its rated capacity. For a system without a source meter(s) a determination of what the actual flow rate of the well(s) needs to be determined. A UV unit operated at a flow above its rated capacity may result in inadequate inactivation of bacteria.
7.8	For surface water treatment plants was the required inactivation CT being achieved during the time of the recent coliform positive test results?	Review operational records to determine if the CT achieved and maintained at the system's water treatment plant supplying water to the area of the contamination was above the required CT as identified in EPA compliance tables.
7.9	Is the water treated with a phosphate inhibitor without the system being chlorinated?	Determine if the system is adding a phosphate chemical without the addition of chlorine or other disinfectant, which maintains a residual. If the system is adding phosphate without disinfectant chemical, the phosphate may feed a bacterial growth in a system.
8 Storage Facilities		**This section should be repeated for each storage facility. Include the name, type and facility ID number of the facility. Check the *PWS does not have any storage facilities* box if the PWS does not use any storage facilities.** **See Storage_Tank_Design_and_Construction_Guidelines**
8.1	Are there any holes or unprotected openings in the atmospheric tank(s)?	Inspect the tank to determine if there are any visible cracks or unprotected openings especially on concrete tanks. Check to see if vents, overflows, hatches, level tubes, level probes/floats, etc. to determine if they are sealed watertight to the tank.
8.2	Is the hatch on the atmospheric tank not sealed properly?	Inspect the hatch to ensure that it is properly sealed and is provided with; a raised curb frame, tightly fitting overlapping cover, or fitted with a gasket. A watertight seal with the appropriate gasket or other means is necessary to prevent surface wash, insects, vermin and other foreign matter from entering.
8.3	Is vent on the atmospheric tank not suitably protected and/or screened?	Inspect vents to ensure they are properly shielded and screened (fine mesh) and connected watertight into the tank.

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8.4	Is the overflow on the atmospheric tank not suitably protected and/or screened?	Inspect the outlet of the overflow to ensure that it is has shielded (prevents rain or runoff from entering) screen (fine mesh) and /or provided with a duckbill or flap valve that closes tightly. Inspect the overflow for rust, holes or other breaches. Additionally assess if the connection into the tank is watertight.
8.5	Is the overflow not equipped with an air gap?	Inspect the outlet end of the overflow to verify if it has an air gap and is not directly connected to a sewer, drain, or structure that may fill with water and is not subject to flooding.
8.6	Was the last atmospheric tank inspection performed more than 10 years ago or does its interior need cleaning or repainting?	Review records to assess when the interior of the tank was last inspected, cleaned or repainted. The DPH requires all atmospheric tanks and clearwells to be inspected every 10 years. (**Follow the link for DPH guidance: Atmospheric Storage Tank Inspection Guidelines**) Sediment buildup, corrosion or biofilm in a tank may harbor bacteria.
8.7	Does the air compressor for the hydro-pneumatic storage tank lack an air filter or is the air filter in poor condition?	Inspect the air compressor to verify the presence of an air filter and the condition of the filter. Unsanitary conditions in the vicinity of the air compressor intake (evidence of rodent nesting activities, etc.) may introduce contaminants into the storage tank.
8.8	Is there any evidence of tank failure?	Inspect for evidence of failure. Examples include damaged bladder on pressure tank resulting in it being water logged, unexplained water loss or wet areas near buried tanks, severe corrosion/deterioration, etc.
8.9	Has there been any work or maintenance conducted on the tank (i.e. cleaning, inspection, repairs, painting, etc.) after which it was not disinfected?	Review records to verify proper disinfection procedures were followed upon completion of any work or maintenance activities during which the tank was potentially subject to a bacteriological contamination. It is recommended to collect pre and post storage tank total coliform samples to determine if the contamination may be in the tank.
8.10	Does the in-ground storage tank not meet minimum separation distance requirements to drains, septic or sewer components?	Review site plans to verify appropriate separation distances from sources of pollution to the underground storage tank(s) (is not within: 50 feet of sewer or septic system component or source of pollution; or 25 feet of tight sewer pipe, watercourse or storm drain).

RTCR Level 2 Assessor Information

Level 2 Assessments must be performed by a Level 2 Assessor that in not an employee of the water system. Complete the contact information for the RTCR Level 2 Assessor, including the assessor's name, RTCR Level 2 Credential Number, phone number and email address. In addition, confirm that the RTCR Level 2 Assessor is not an employee of the public water system by checking the box provided. The individual identified may be contacted by the Department for more information and/or consultation.

Contact Information for the Public Water System

Complete all of the contact information for the person who is the responsible party of the public water system that worked with the RTCR Level 2 Assessor to determine the appropriate corrective action(s) for any sanitary defects found. The individual identified may be contacted by the Department for more information and/or consultation.

Certification

The Level 2 Assessment Form must be signed by the person or a legal representative of the entity that owns or controls the Public Water System. Forms will not be accepted without certification by the responsible party.