

## Assessments and Corrective Actions



November 2015

---

---

---

---

---

---

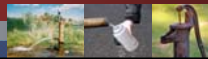
---

---

## Purpose of Assessments

- All systems required to conduct assessment when monitoring results show that the system may be vulnerable to contamination
- An assessment is an evaluation to identify sanitary defects & TT triggers
- More proactive approach to public health protection compared to TCR
  - Conditions that defined a non-acute MCL violation under TCR are now used to trigger an assessment

40 CFR 141.859(a)-(b)



2

---

---

---

---

---

---

---

---

## Level 1 Assessment Triggers

Must consider all compliance samples (the total number of routine and repeat samples) to determine Level 1 assessment trigger

- >5% TC+ in monthly sampling
- 2 or more TC+ results for systems taking < 40 samples/month
- Failure to take every repeat sample after any TC+

40 CFR 141.859(a)(1)



3

---

---

---

---

---

---

---

---

## Level 2 Assessment Triggers

- Considering all compliance samples (routine and repeat) a system:
  - Has a second Level 1 trigger within a rolling 12-month period
    - Unless the state has determined a likely reason that the samples that caused the first Level 1 TT trigger were total coliform-positive and has established that the system has corrected the problem (NOT COVERED IN STATE IMPLEMENTATION GUIDANCE)
  - An *E. coli* violation
  - On approved annual monitoring exceeds a Level 1 trigger in two consecutive years



40 CFR 141.859(a)(2)

---

---

---

---

---

---

---

---

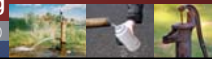
## Elements of Assessments

At a minimum, assessment must include review & identification of the following elements:

- Atypical events that may affect distributed water quality
- Distribution or storage maintenance & operation changes that may affect water quality
- Source & treatment considerations affecting water quality
- Existing water quality monitoring data
- Inadequacies in sample sites, sampling protocol, & sample processing

40 CFR 141.859(b)(2)

5



---

---

---

---

---

---

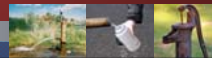
---

---

## Level of Effort – Level 1 vs. Level 2

- Level 1:
  - Primarily completed using existing data
  - May include limited inspections or interviews
  - Intended to be a self-assessment by PWS
- Level 2:
  - More comprehensive review of existing data
  - May include field investigations, additional sampling, and inspections
  - May involve consultation with additional parties
  - Assessment must be conducted by the state or party approved by the state

6



---

---

---

---

---

---

---

---



7

---

---

---

---

---

---

---

---

**Sanitary Defect**

*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 in a barrier that is already in place*

Not linked directly to significant deficiencies under the GWR, but may overlap

40 CFR 141.2

8

---

---

---

---

---

---

---

---



9

---

---

---

---

---

---

---

---

## Sanitary Defects



10

---

---

---

---

---

---

---

---



11

---

---

---

---

---

---

---

---

## Corrective Actions Associated with Level 1 and Level 2 Assessments

12

---

---

---

---

---

---

---

---

## Common Causes of Contamination & Corrective Actions

Common Cause	Common Corrective Action(s)
Failure to disinfect (or improper disinfection) after maintenance work in the distribution system	<ul style="list-style-type: none"> <li>Disinfection</li> </ul>
Main breaks	<ul style="list-style-type: none"> <li>Disinfection</li> <li>Replacement/repair of distribution system components</li> </ul>
Holes in storage tank, inadequate screening, etc.	<ul style="list-style-type: none"> <li>Maintenance of storage facility</li> <li>Addition of security measures</li> <li>Development &amp; implementation of an operations plan</li> </ul>
Cracks in well seal, casing, etc.	<ul style="list-style-type: none"> <li>Replacement/repair of well components</li> </ul>

13




---

---

---

---

---

---

---

---

---

---

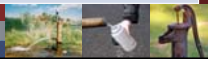
---

---

## Common Causes of Contamination & Corrective Actions (cont.)

Common Cause	Common Corrective Action(s)
Loss of system pressure	<ul style="list-style-type: none"> <li>Maintenance of adequate pressure</li> <li>Valve maintenance</li> <li>Addition or upgrade of on-line monitoring &amp; control</li> </ul>
Biofilm accumulation in the distribution system	<ul style="list-style-type: none"> <li>Flushing</li> <li>Maintenance of adequate pressure</li> </ul>
Cross connections	<ul style="list-style-type: none"> <li>Maintenance of adequate pressure</li> <li>Installation of backflow prevention assembly/device</li> <li>Implementation/upgrade of cross connection control program</li> </ul>

14




---

---

---

---

---

---

---

---

---

---

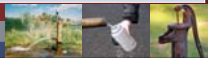
---

---

## Common Causes of Contamination & Corrective Actions (cont.)

Common Cause	Common Corrective Action(s)
Inadequate disinfectant residual	<ul style="list-style-type: none"> <li>Disinfection</li> <li>Flushing</li> <li>Maintaining appropriate hydraulic residence time</li> <li>Addition or upgrade of on-line monitoring &amp; control</li> </ul>
Contaminated sampling taps	<ul style="list-style-type: none"> <li>Replacement/repair of distribution system components</li> <li>Sampler training</li> </ul>
Sampling protocol errors	<ul style="list-style-type: none"> <li>Sampler training</li> <li>Development &amp; implementation of an operations plan</li> </ul>

15




---

---

---

---

---

---

---

---

---

---

---

---

## Assessment Form Components

- Must include:
  - Sanitary defect(s) identified
    - Assessment form may note that no sanitary defects were identified, if applicable
  - Corrective actions taken
  - Proposed timetable for corrective actions not yet completed
- Level 2 assessment elements contain the same elements as the Level 1, but each element is investigated in greater detail

40 CFR 141.859(b)

16



---

---

---

---

---

---

---

---

## Submission & Review



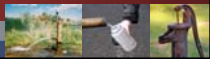
→ Submit completed Level 1 or 2 assessment form to state

Within 30 days of learning that trigger has been exceeded

- State will review assessment to determine if:
  - System identified likely cause of Level 1 or Level 2 trigger
  - System corrected the problem or has an acceptable schedule for correction

40 CFR 141.859(b)(3)(iii) and (4)(iv)

17



---

---

---

---

---

---

---

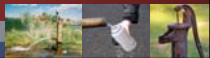
---

## Timing of Corrective Action

- System must complete corrective action:
  - By the time assessment form is submitted, which is within 30 days of the trigger
- OR
- Within state-approved timeframe
- System must notify the state when each scheduled corrective action is completed
- Either system or state can at any time request a consultation with the other party to discuss the corrective action

40 CFR 141.859(c)-(d)

18



---

---

---

---

---

---

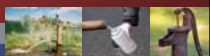
---

---

## Who Conducts Level 1 Assessments?

- Intended to be self-assessments
- Systems may receive assistance from states
  - PWS may conduct assessment while consulting with state via phone
  - State may fill out assessment form during phone consultation with PWS
  - Either the PWS or state can at any time consult with the other party to discuss the assessment or corrective action(s)
  - States may set up alternative methods for form submission

19



---

---

---

---

---

---

---

---

---

---

## Who Conducts Level 2 Assessments?

- Must be conducted by state-approved party
  - The state
  - A third party approved by the state, including PWS staff, if qualified
- Must follow state directives related to:
  - Size & type of system
  - Size, type, & characteristics of distribution system

A sanitary survey can be conducted in lieu of a Level 2 Assessment

20

40 CFR 141.859(b)(2); 141.859(b)(4)(i)-(ii)



---

---

---

---

---

---

---

---

---

---

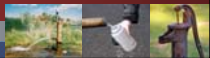
## Who Conducts Level 2 Assessments?

### Considerations:

- An understanding of objectives & structure of RTCR
- An understanding of the nature of the coliform group and E. coli
- A familiarity with bacteriological sampling practices
- A working knowledge in how to interpret distribution system water quality and operational data
- An understanding of disinfection practices
- Familiarity with the water system treatment plant and distribution system

21

40 CFR 141.859(b)(2); 141.859(b)(4)(i)-(ii)



---

---

---

---

---

---

---

---

---

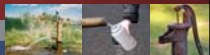
---



## Special Considerations for State Drinking Water Agencies

- Things to Consider about state approved third party for Level 2 assessments
  - Conflict of interest,
  - Legal ramifications,
  - Cultural norms
- Using state approved third party to track and follow-up on corrective actions
- Create state regulations to specify qualifications and experience of Level 2 Assessors

22



---

---

---

---

---

---

---

---

## Special Considerations for State Drinking Water Agencies

What if a PWS conducts the required assessment, and does not identify any sanitary defects?

Things to Consider:

- Best practices procedures such as flushing and disinfection as part of consultation and corrective actions procedures
- Special purpose samples

23



---

---

---

---

---

---

---

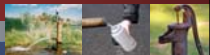
---

## Frequently Asked Question

What if a system conducts a required assessment, sets a timeline for corrective action years into the future, which is accepted by the primacy agency, but triggers additional assessments before the corrective action can be completed?

**ANSWER:** The system would incur a Level 1 or Level 2 assessment for each triggered event and must correct any additional sanitary defects. If the system discovers that the contamination continues to be caused by the original triggering event, the system can perform interim measures that ensure the delivery of safe water.

24



---

---

---

---

---

---

---

---