



**COLORADO**  
Department of Public  
Health & Environment

**WATER QUALITY CONTROL DIVISION**  
**SAFE DRINKING WATER PROGRAM POLICY**

<b>POLICY TITLE:</b> <b>Sanitary Defect Applicability Policy</b>	
SDWP policy number:	DW-010
Adoption date:	
Effective date:	April 1, 2016
Scheduled review date:	
Version:	1
Approved by:  Ron Falco, P.E. Safe Drinking Water Program Manager	

### 1.0 Purpose and Background

The Water Quality Control Commission's March 10, 2015 addition of the Revised Total Coliform Rule and the Storage Tank Rule to the Colorado Primary Drinking Water Regulations, 5 CCR 1002-11 (Regulation 11) was intended to ensure that suppliers of water operate and maintain their distribution system so that it is free of sanitary defects. In order to achieve this, section 11.16 (Revised Total Coliform Rule) requires that suppliers identify and correct sanitary defects. In addition, section 11.28 (Storage Tank Rule) of Regulation 11 requires suppliers of water to operate and maintain finished water storage tanks so that they are free of sanitary defects by developing, maintaining and implementing a written tank inspection plan. The plan must include an inventory of the tanks and specific information regarding conducting periodic and comprehensive inspections of these tanks.

The purpose of this policy is to present the department's interpretation of what constitutes a sanitary defect in the distribution system (e.g., piping,

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storage tanks, uncontrolled cross-connections, etc.). Specifically, this policy provides examples of the possible sanitary defects that can be identified in response to investigating a total coliform positive sample during routine and/or repeat monitoring or during periodic or comprehensive inspections of finished water storage tanks. This policy is not intended to be an all-inclusive list of sanitary defects.

### Applicability

This policy applies to all suppliers of water that are subject to sections 11.16 and 11.28 of Regulation 11.

## 2.0 Definitions

Definitions from Regulation 11 that are applicable to this policy include:

- 2.1 *Public Water System* or *PWS* as defined in Regulation 11, section 11.3(60) means a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves an average of at least 25 individuals daily at least 60 days per year.
- 2.2 *Disinfection* as defined in Regulation 11, section 11.3(25) means a process that that inactivates pathogenic microorganisms in water by chemical oxidants, ultraviolet light, or equivalent agents.
- 2.3 *Finished Water* as defined in Regulation 11, section 11.3(32) means water that is supplied to the distribution system of a public water system and intended for distribution and human consumption without further treatment, including disinfection contact time, except treatment as necessary to maintain water quality in the distribution system (e.g., booster disinfection, addition of corrosion control chemicals).
- 2.4 *Finished Water Storage Tank* as defined in Regulation 11, section 11.28(1)(c) means a tank or vessel owned by the supplier that is located downstream of the entry point and is not pressurized at the air water interface. Pressurized storage tanks are not included in the definition of finished water storage tanks.
- 2.5 *Entry Point* as defined in Regulation 11, section 11.3(30) means a location before or at the first customer which is representative of finished water. The entry point may represent finished water from multiple treatment plants and/or multiple sources.
- 2.6 *Level 1 Assessment* as defined by Regulation 11, section 11.3(40) means, beginning April 1, 2016, an evaluation conducted by the supplier to identify sanitary defects, inadequate or inappropriate distribution

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system coliform sampling practices, and the possible cause(s) that triggered the assessment. Level 1 assessments must meet the requirements specified in section 11.16(10) of Regulation 11.

- 2.7 *Level 2 Assessment* as defined by Regulation 11, section 11.3(40) means, beginning April 1, 2016, an evaluation conducted by the department or department-approved party to identify sanitary defects, inadequate or inappropriate distribution system coliform sampling practices, and the possible cause(s) that triggered the assessment. Level 1 assessments must meet the requirements specified in section 11.16(10) of Regulation 11. A level 2 assessment is a more detailed examination of the systems than a level 1 assessment. A level 2 assessment involves a comprehensive investigation and review of available information, additional internal and external resources, and other relevant practices.
- 2.8 *Comprehensive Inspection* as defined in Regulation 11, section 11.28(1)(b) means an internal and external storage tank inspection to identify sanitary defects that covers all aspects of the condition of the storage tank including but not limited to sanitary, structural, and coating systems conditions, as well as security and safety concerns.
- 2.9 *Periodic Inspection* as defined in Regulation 11, section 11.28(1)(d) means a visual external storage tank inspection that is typically performed by the supplier to identify evident sanitary defects (e.g., lack of screens on vents).
- 2.10 *Sanitary Defect* as defined in Regulation 11, section 11.3(67) means, beginning April 1, 2016, a defect:
  - (i) That could provide a pathway of entry for microbial contamination into the distribution system; or
  - (ii) That is indicative of a failure or imminent failure in a barrier that is already in place.

### 3.0 Policy Statements

- 3.1 Sanitary defects in the distribution system can lead to contamination of the finished water. If suppliers of water identify any sanitary defects during level 1 or level 2 assessments or periodic or comprehensive tank inspections, then the supplier must develop corrective action schedules to correct such defects and document them.
- 3.2 Sanitary defects include, but are not limited to, the following issues:

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- (i) Source water and source water transmission/storage. Examples include:
  - a. Conditions at sources that could allow contamination to enter the water such as:
    - i. Cracks or holes in sanitary seals or well casings
    - ii. Standing water around the well casing or flooded wellhead
    - iii. Flooded well vaults
    - iv. Unprotected raw water transmission lines (e.g., open channel flow, flooded/unsanitary pipes, unprotected air release valves, leaking raw water pipes)
    - v. Unprotected raw water storage tanks (applicable to groundwater storage tanks only)
    - vi. Leaking sewer lines or septic tanks that have the potential to directly contaminate drinking water sources.
- (ii) Treatment. Examples include:
  - a. Failure of disinfection treatment
  - b. Failure of required filtration (for surface water systems)
  - c. Inability to reliably and continuously operate/control filtration (at surface water systems) and/or disinfection (both groundwater and surface water systems)
  - d. Power loss resulting in treatment failure - untreated water being served to the public.
  - e. Water treatment plant cross connections
- (iii) Storage tanks. Examples include:
  - a. Overflow, vents, hatches, and other penetrations not configured, screened, or sealed properly. For example:
    - i. A tank penetration that is not adequately sealed or protected with proper screening or a valve
    - ii. An access opening that does not have a sanitary seal including a metal on metal hatch
    - iii. A sanitary seal gasket that is damaged and does not provide a water/insect tight seal
    - iv. The interior of an access hatch shows signs of structural deficiencies, irregularities or other failure
    - v. An air vent that is not down turned and/or does not include a twenty-four mesh non-corrodible screen
    - vi. A vent screen that is damaged or is not in place

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- vii. A ground level overflow that is not screened or has a flap valve or the screen/flapper is not intact
- b. Evidence of visible contamination inside the tank or the stored water is turbid, discolored, or other failure
- c. Sediment/sludge accumulation in the bottom of the tank that exceeds a depth of one inch
- d. The interior coating has excessive blistering, peeling, scaling, corrosion or any other irregularity or failure
- e. The interior sidewalls show signs of structural deficiencies, irregularities, biofilm or other failure
- f. The interior roof shows signs of structural deficiencies, irregularities or other failure
- g. The tank floor shows signs of structural deficiencies, excessive corrosion, irregularities or other failure
- h. Tank penetrations (joints/gaskets) as viewed from the interior are not properly sealed
- i. There is visible daylight around a hatch, vent, joint or other penetration as viewed from the interior

(iv) Distribution systems. Examples include:

- a. Inability to maintain or restore a disinfectant residual upon discovery of low residuals in the distribution system
- b. Failure to protect the distribution system integrity and keep in sanitary condition
- c. Failure to disinfect properly during/after pipe repair/replacement activities
- d. Inadequate inspection and maintenance of the distribution system
- e. Systemic loss of distribution system pressure (e.g. regular, uncontrolled main breaks)
- f. Improper protection of newly constructed, replaced, or renovated water lines like construction of water lines that will be directly impacted by the sanitary sewer
- g. Supplier permitted cross-connections (i.e., no backflow prevention assembly or method)
- h. Unknown and/or unidentified pipes connected to the distribution system

3.3 The department's policy, guidance, level 1 assessment form and storage tank inspection checklists are not all inclusive and are not intended to address all sanitary defects that might be present at a public water system.

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- 3.4 Sanitary defects can be varied and complex and cannot always be readily identified.
- 3.5 Sanitary defects in the distribution system can lead to contamination of the finished water. The department expects suppliers of water to immediately notify the department by calling the 24-hour Incident Reporting Line at 1-877-518-5608 in cases where contamination is discovered within the distribution system that could adversely affect public health. Examples of such situations include:
- (i) Animal carcasses discovered within a storage tank
  - (ii) Confirmed microbial contamination within a storage tank or water transmission line (e.g., presence of *E. coli*)
  - (iii) Presence of chemical contamination (e.g., oil slicks, foaming agents, or other volatile chemicals)