

R309-211. Monitoring and Water Quality: Distribution System - Total Coliform Requirements.

R309-211-1. Purpose.

The purpose of this rule is to outline the total coliform monitoring and treatment technique requirements for public water systems. This rule applies to all public drinking water systems as specified herein.

R309-211-2. Authority.

This rule is promulgated by the Drinking Water Board as authorized by Title 19, Environmental Quality Code, Chapter 4, Safe Drinking Water Act, Subsection 104 of the Utah Code and in accordance with 63G-3 of the same, known as the Administrative Rulemaking Act.

R309-211-3. Definitions.

Definitions for certain terms used in this rule are given in R309-110 but may be further clarified herein.

R309-211-4. General monitoring requirements for all public water systems.

(1) Sample siting plans.

(a) Systems must develop a written sample siting plan that identifies sampling sites and a sample collection schedule that are representative of water throughout the distribution system. These plans are subject to Director review and revision. Systems must collect total coliform samples according to the written sample siting plan. Monitoring required by R309-211-5 may take place at a customer's premise, dedicated sampling station, or other designated compliance sampling location. Routine and repeat sample sites and any sampling points necessary to meet the requirements of R309-215-16 must be reflected in the sampling plan.

(b) Systems must collect samples at regular time intervals throughout the month, except that systems that use only ground water and serve 4,900 or fewer people may collect all required samples on a single day if they are taken from different sites.

(c) Systems must take at least the minimum number of required samples even if the system has had an E. coli MCL violation or has exceeded the coliform treatment technique triggers in R309-211-8(1).

(d) A system may conduct more compliance monitoring than is required by this rule to investigate potential problems in the distribution system and use monitoring as a tool to assist in uncovering problems. A system may take more than the minimum number of required routine samples and must include the results

in calculating whether the coliform treatment technique trigger in R309-211-8(1)(a)(i) and (ii) has been exceeded only if the samples are taken in accordance with the existing sample siting plan and are representative of water throughout the distribution system.

(e) Systems must identify repeat monitoring locations in the sample siting plan. Unless the provisions of paragraphs (1)(e)(i) or (1)(e)(ii) of this section are met, the system must collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. If a total coliform-positive sample is at the end of the distribution system, or one service connection away from the end of the distribution system, the system must still take all required repeat samples. However, the Director may allow an alternative sampling location in lieu of the requirement to collect at least one repeat sample upstream or downstream of the original sampling site. Except as provided for in paragraph (1)(e)(ii) of this section, systems required to conduct triggered source water monitoring under R309-215-16(2) must take ground water source sample(s) in addition to repeat samples required under this this rule.

(i) Systems may propose repeat monitoring locations to the Director that the system believes to be representative of a pathway for contamination of the distribution system. A system may elect to specify either alternative fixed locations or criteria for selecting repeat sampling sites on a situational basis in a standard operating procedure (SOP) in its sample siting plan. The system must design its SOP to focus the repeat samples at locations that best verify and determine the extent of potential contamination of the distribution system area based on specific situations. The Director may modify the SOP or require alternative monitoring locations as needed.

(ii) Ground water systems serving 1,000 or fewer people may propose repeat sampling locations to the Director that differentiate potential source water and distribution system contamination (e.g., by sampling at entry points to the distribution system). A ground water system with a single well required to conduct triggered source water monitoring may, with written Director approval, take one of its repeat samples at the monitoring location required for triggered source water monitoring under R309-215-16(2)(a) if the system demonstrates to the Director's satisfaction that the sample siting plan remains representative of water quality in the distribution system. If approved by the Director, the system may use that sample result

to meet the monitoring requirements in both R309-215-16(2)(a) and this section.

(A) If a repeat sample taken at the monitoring location required for triggered source water monitoring is E. coli-positive, the system has violated the E. coli MCL and must also comply with R309-215-16(2)(a)(iii). If a system takes more than one repeat sample at the monitoring location required for triggered source water monitoring, the system may reduce the number of additional source water samples required under R309-215-16(2)(a)(iii) by the number of repeat samples taken at that location that were not E. coli-positive.

(B) If a system takes more than one repeat sample at the monitoring location required for triggered source water monitoring under R309-215-16(2)(a), and more than one repeat sample is E. coli-positive, the system has violated the E. coli MCL and must also comply with R309-215-16(3)(a)(i).

(C) If all repeat samples taken at the monitoring location required for triggered source water monitoring are E. coli-negative and a repeat sample taken at a monitoring location other than the one required for triggered source water monitoring is E. coli-positive, the system has violated the E. coli MCL, but is not required to comply with R309-215-16(2)(a)(iii).

(f) The Director may review, revise, and approve, as appropriate, repeat sampling proposed by systems under paragraphs (1)(e)(i) and (ii) of this section. The system must demonstrate that the sample siting plan remains representative of the water quality in the distribution system. The Director may determine that monitoring at the entry point to the distribution system (especially for undisinfected ground water systems) is effective to differentiate between potential source water and distribution system problems.

(2) Special purpose samples. Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, must not be used to determine whether the coliform treatment technique trigger has been exceeded. Repeat samples taken pursuant to R309-211-7 are not considered special purpose samples, and must be used to determine whether the coliform treatment technique trigger has been exceeded.

(3) Invalidation of total coliform samples. A total coliform-positive sample invalidated under this paragraph (3) of this section does not count toward meeting the minimum monitoring requirements of this subpart.

(a) The Director may invalidate a total coliform-positive sample only if the conditions of paragraph (3)(a)(i), (ii), or (iii) of this section are met.

(i) The laboratory establishes that improper sample analysis caused the total coliform-positive result.

(ii) The Director, on the basis of the results of repeat samples collected as required under R309-211-7(1), determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem. The Director cannot invalidate a sample on the basis of repeat sample results unless all repeat sample(s) collected at the same tap as the original total coliform-positive sample are also total coliform-positive, and all repeat samples collected at a location other than the original tap are total coliform-negative (e.g., a Director cannot invalidate a total coliform-positive sample on the basis of repeat samples if all the repeat samples are total coliform-negative, or if the system has only one service connection).

(iii) The Director has substantial grounds to believe that a total coliform-positive result is due to a circumstance or condition that does not reflect water quality in the distribution system. In this case, the system must still collect all repeat samples required under R309-211-7(1), and use them to determine whether a coliform treatment technique trigger in R309-211-8 has been exceeded. To invalidate a total coliform-positive sample under this paragraph, the decision and supporting rationale must be documented in writing, and approved and signed by the supervisor of the Director who recommended the decision. The Director must make this document available to EPA and the public. The written documentation must state the specific cause of the total coliform-positive sample, and what action the system has taken, or will take, to correct this problem. The Director may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

(b) A laboratory must invalidate a total coliform sample (unless total coliforms are detected) if the sample produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (e.g., the Multiple-Tube Fermentation Technique), produces a turbid culture in the absence of an acid reaction in the Presence-Absence (P-A) Coliform Test, or exhibits confluent growth or produces colonies too numerous to count with an analytical method using a membrane filter (e.g., Membrane Filter Technique). If a laboratory invalidates a sample because of such interference, the system must collect another sample from the same location as the original sample within 24 hours of being notified of the interference problem, and have it analyzed for the presence of total coliforms. The system must continue to re-sample within 24 hours and have the samples analyzed until it obtains a valid

result. The Director may waive the 24-hour time limit on a case-by-case basis. Alternatively, the Director may implement criteria for waiving the 24-hour sampling time limit to use in lieu of case-by-case extensions.

(4) A public water system that uses inadequately treated surface water or inadequately treated ground water under the direct influence of surface water shall collect and analyze for total coliforms at least one sample each day the turbidity level of the source water exceeds 1 NTU. This sample shall be collected near the first service connection from the source. The system shall collect the sample within 24 hours of the time when the turbidity level was first exceeded. The sample shall be analyzed within 30 hours of collection. Sample results from this coliform monitoring shall be included in determining total coliform compliance for that month. The Director may extend the 24 hour limitation if the system has a logistical problem that is beyond the system's control. In the case of an extension the Director shall specify how much time the system has to collect the sample.

R309-211-5. Routine monitoring requirements for water systems serving 1,000 or fewer people.

(1) General.

(a) The provisions of this section apply to water systems serving 1,000 or fewer people.

(b) Following any total coliform-positive sample taken under the provisions of this section, systems must comply with the repeat monitoring requirements and E. coli analytical requirements in R309-211-7.

(c) Once all monitoring required by this section and R309-211-7 for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in R309-211-8 have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by R309-211-8.

(2) Monitoring frequency for total coliforms. The monitoring frequency for total coliforms is one sample/month.

(3) Seasonal systems.

(a) All seasonal systems must demonstrate completion of a Director-approved start-up procedure, which may include a requirement for startup sampling prior to serving water to the public.

(b) A seasonal system must monitor every month that it is in operation.

(c) The Director may exempt any seasonal system from some or all of the requirements for seasonal systems if the entire distribution system remains pressurized during the entire period that the system is not operating.

(4) Additional routine monitoring the month following a total coliform-positive sample. Systems must collect at least three routine samples during the next month, except that the Director may waive this requirement if the conditions of paragraph 5(4)(a), (b), or (c) of this section are met. Systems may either collect samples at regular time intervals throughout the month or may collect all required routine samples on a single day if samples are taken from different sites. Systems must use the results of additional routine samples in coliform treatment technique trigger calculations under R309-211-8(1).

(a) The Director may waive the requirement to collect three routine samples the next month in which the system provides water to the public if the Director, or an agent approved by the Director, performs a site visit before the end of the next month in which the system provides water to the public. Although a sanitary survey need not be performed, the site visit must be sufficiently detailed to allow the Director to determine whether additional monitoring and/or any corrective action is needed. The Director cannot approve an employee of the system to perform this site visit, even if the employee is an agent approved by the Director to perform sanitary surveys.

(b) The Director may waive the requirement to collect three routine samples the next month in which the system provides water to the public if the Director has determined why the sample was total coliform-positive and has established that the system has corrected the problem or will correct the problem before the end of the next month in which the system serves water to the public. In this case, the Director must document this decision to waive the following month's additional monitoring requirement in writing, have it approved and signed by the supervisor of the Director who recommends such a decision, and make this document available to the EPA and public. The written documentation must describe the specific cause of the total coliform-positive sample and what action the system has taken and/or will take to correct this problem.

(c) The Director may not waive the requirement to collect three additional routine samples the next month in which the system provides water to the public solely on the grounds that all repeat samples are total coliform-negative. If the Director determines that the system has corrected the contamination problem before the system takes the set of repeat samples required in R309-211-7, and all repeat samples were total coliform-negative, the Director may waive the requirement for additional routine monitoring the next month.

R309-211-6. Routine monitoring requirements for public water systems serving more than 1,000 people.

(1) General.

(a) The provisions of this section apply to public water systems serving more than 1,000 persons.

(b) Following any total coliform-positive sample taken under the provisions of this section, systems must comply with the repeat monitoring requirements and E. coli analytical requirements in R309-211-7.

(c) Once all monitoring required by this section and R309-211-7 for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in R309-211-8 have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by R309-211-8.

(d) Seasonal systems.

(i) Beginning April 1, 2016, all seasonal systems must demonstrate completion of a Director-approved start-up procedure, which may include a requirement for start-up sampling prior to serving water to the public.

(ii) The Director may exempt any seasonal system from some or all of the requirements for seasonal systems if the entire distribution system remains pressurized during the entire period that the system is not operating.

(2) Monitoring frequency for total coliforms. The monitoring frequency for total coliforms is based on the population served by the system, as follows:

TABLE 211-1
TOTAL COLIFORM MONITORING FREQUENCY FOR
PUBLIC WATER SYSTEMS

<u>Population served</u>	<u>Minimum number of samples per month</u>
25 to 1,000	1
1,001 to 2,500	2
2,501 to 3,300	3
3,301 to 4,100	4
4,101 to 4,900	5
4,901 to 5,800	6
5,801 to 6,700	7
6,701 to 7,600	8
7,601 to 8,500	9
8,501 to 12,900	10
12,901 to 17,200	15
17,201 to 21,500	20
21,501 to 25,000	25
25,001 to 33,000	30
33,001 to 41,000	40

41,001 to 50,000	50
50,001 to 59,000	60
59,001 to 70,000	70
70,001 to 83,000	80
83,001 to 96,000	90
96,001 to 130,000	100
130,001 to 220,000	120
220,001 to 320,000	150
320,001 to 450,000	180
450,001 to 600,000	210
600,001 to 780,000	240
780,001 to 970,000	270
970,001 to 1,230,000	300
1,230,001 to 1,520,000	330
1,520,001 to 1,850,000	360
1,850,001 to 2,270,000	390
2,270,001 to 3,020,000	420
3,020,001 to 3,960,000	450
3,960,001 or more	480

R309-211-7. Repeat monitoring and E. coli requirements.

(1) Repeat monitoring.

(a) If a sample taken under R309-211-5 though R309-211-6 is total coliform-positive, the system must collect a set of repeat samples within 24 hours of being notified of the positive result. The system must collect no fewer than three repeat samples for each total coliform-positive sample found. The Director may extend the 24-hour limit on a case-by-case basis if the system has a logistical problem in collecting the repeat samples within 24 hours that is beyond its control. Alternatively, the Director may implement criteria for the system to use in lieu of case-by-case extensions. In the case of an extension, the Director must specify how much time the system has to collect the repeat samples. The Director cannot waive the requirement for a system to collect repeat samples in paragraphs (1)(a) through (1)(c) of this section.

(b) The system must collect all repeat samples on the same day, except that the Director may allow a system with a single service connection to collect the required set of repeat samples over a three-day period or to collect a larger volume repeat sample(s) in one or more sample containers of any size, as long as the total volume collected is at least 300 ml.

(c) The system must collect an additional set of repeat samples in the manner specified in paragraphs (1)(a) through (1)(c) of this section if one or more repeat samples in the current set of repeat samples is total coliform-positive. The system must collect the additional set of repeat samples within

24 hours of being notified of the positive result, unless the Director extends the limit as provided in paragraph (1)(a) of this section. The system must continue to collect additional sets of repeat samples until either total coliforms are not detected in one complete set of repeat samples or the system determines that a coliform treatment technique trigger specified in R309-211-8(1) has been exceeded as a result of a repeat sample being total coliform-positive and notifies the Director. If a trigger identified in R309-211-8 is exceeded as a result of a routine sample being total coliform-positive, systems are required to conduct only one round of repeat monitoring for each total coliform-positive routine sample.

(d) After a system collects a routine sample and before it learns the results of the analysis of that sample, if it collects another routine sample(s) from within five adjacent service connections of the initial sample, and the initial sample, after analysis, is found to contain total coliforms, then the system may count the subsequent sample(s) as a repeat sample instead of as a routine sample.

(e) Results of all routine and repeat samples taken under R309-211-5 through R309-211-7 not invalidated by the Director must be used to determine whether a coliform treatment technique trigger specified in R309-211-8 has been exceeded.

(2) Escherichia coli (E. coli) testing.

(a) If any routine or repeat sample is total coliform-positive, the system must analyze that total coliform-positive culture medium to determine if E. coli are present. If E. coli are present, the system must notify the Director by the end of the day when the system is notified of the test result, unless the system is notified of the result after the Director office is closed and the Director does not have either an after-hours phone line or an alternative notification procedure, in which case the system must notify the Director before the end of the next business day.

(b) The Director has the discretion to allow a system, on a case-by-case basis, to forgo E. coli testing on a total coliform-positive sample if that system assumes that the total coliform-positive sample is E. coli-positive. Accordingly, the system must notify the Director as specified in paragraph (2)(a) of this section and the provisions of R309-200-5(6)(b) apply.

R309-211-8. Coliform treatment technique triggers and assessment requirements for protection against potential fecal contamination.

(1) Treatment technique triggers. Systems must conduct assessments in accordance with paragraph (2) of this section

after exceeding treatment technique triggers in paragraphs (1)(a) and (1)(b) of this section.

(a) Level 1 treatment technique triggers.

(i) For systems taking 40 or more samples per month, the system exceeds 5.0% total coliform-positive samples for the month.

(ii) For systems taking fewer than 40 samples per month, the system has two or more total coliform-positive samples in the same month.

(iii) The system fails to take every required repeat sample after any single total coliform-positive sample.

(b) Level 2 treatment technique triggers.

(i) An E. coli MCL violation, as specified in R309-211-9(1).

(ii) A second Level 1 trigger as defined in paragraph (1)(a) of this section, within a rolling 12-month period, unless the Director has determined a likely reason that the samples that caused the first Level 1 treatment technique trigger were total coliform-positive and has established that the system has corrected the problem.

(2) Requirements for assessments.

(a) Systems must ensure that Level 1 and 2 assessments are conducted in order to identify the possible presence of sanitary defects and defects in distribution system coliform monitoring practices. Level 2 assessments must be conducted by parties approved by the Director.

(b) When conducting assessments, systems must ensure that the assessor evaluates minimum elements that include review and identification of inadequacies in sample sites; sampling protocol; sample processing; atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., small ground water systems); and existing water quality monitoring data. The system must conduct the assessment consistent with any Director directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system.

(c) Level 1 Assessments. A system must conduct a Level 1 assessment consistent with Director requirements if the system exceeds one of the treatment technique triggers in paragraph (1)(a) of this section.

(i) The system must complete a Level 1 assessment as soon as practical after any trigger in paragraph (1)(a) of this

section. In the completed assessment form, the system must describe sanitary defects detected, corrective actions completed, and a proposed timetable for any corrective actions not already completed. The assessment form may also note that no sanitary defects were identified. The system must submit the completed Level 1 assessment form to the Director within 30 days after the system learns that it has exceeded a trigger.

(ii) If the Director reviews the completed Level 1 assessment and determines that the assessment is not sufficient (including any proposed timetable for any corrective actions not already completed), the Director must consult with the system. If the Director requires revisions after consultation, the system must submit a revised assessment form to the Director on an agreed-upon schedule not to exceed 30 days from the date of the consultation.

(iii) Upon completion and submission of the assessment form by the system, the Director must determine if the system has identified a likely cause for the Level 1 trigger and, if so, establish that the system has corrected the problem, or has included a schedule acceptable to the Director for correcting the problem.

(d) Level 2 Assessments. A system must ensure that a Level 2 assessment consistent with Director requirements is conducted if the system exceeds one of the treatment technique triggers in paragraph (1)(b) of this section. The system must comply with any expedited actions or additional actions required by the Director in the case of an E. coli MCL violation.

(i) The system must ensure that a Level 2 assessment is completed by the Director or by a party approved by the Director as soon as practical after any trigger in paragraph (1)(b) of this section. The system must submit a completed Level 2 assessment form to the Director within 30 days after the system learns that it has exceeded a trigger. The assessment form must describe sanitary defects detected, corrective actions completed, and a proposed timetable for any corrective actions not already completed. The assessment form may also note that no sanitary defects were identified.

(ii) The system may conduct Level 2 assessments if the system has staff or management with the certification or qualifications specified by the Director unless otherwise directed by the Director.

(iii) If the Director reviews the completed Level 2 assessment and determines that the assessment is not sufficient (including any proposed timetable for any corrective actions not already completed), the Director must consult with the system. If the Director requires revisions after consultation, the

system must submit a revised assessment form to the Director on an agreed-upon schedule not to exceed 30 days.

(iv) Upon completion and submission of the assessment form by the system, the Director must determine if the system has identified a likely cause for the Level 2 trigger and determine whether the system has corrected the problem, or has included a schedule acceptable to the Director for correcting the problem.

(3) Corrective Action. Systems must correct sanitary defects found through either Level 1 or 2 assessments conducted under paragraph (2) of this section. For corrections not completed by the time of submission of the assessment form, the system must complete the corrective action(s) in compliance with a timetable approved by the Director in consultation with the system. The system must notify the Director when each scheduled corrective action is completed.

(4) Consultation. At any time during the assessment or corrective action phase, either the water system or the Director may request a consultation with the other party to determine the appropriate actions to be taken. The system may consult with the Director on all relevant information that may impact on its ability to comply with a requirement of this subpart, including the method of accomplishment, an appropriate timeframe, and other relevant information.

R309-211-9. Violations.

(1) E. coli MCL Violation. A system is in violation of the MCL for E. coli when any of the conditions identified in paragraphs (1)(a) through (1)(d) of this section occur.

(a) The system has an E. coli-positive repeat sample following a total coliform-positive routine sample.

(b) The system has a total coliform-positive repeat sample following an E. coli-positive routine sample.

(c) The system fails to take all required repeat samples following an E. coli-positive routine sample.

(d) The system fails to test for E. coli when any repeat sample tests positive for total coliform.

(2) Treatment technique violation.

(a) A treatment technique violation occurs when a system exceeds a treatment technique trigger specified in R309-211-8(1) and then fails to conduct the required assessment or corrective actions within the timeframe specified in R309-211-8(2) and (3).

(b) A treatment technique violation occurs when a seasonal system fails to complete a Director-approved start-up procedure prior to serving water to the public.

(3) Monitoring violations.

(a) Failure to take every required routine or additional routine sample in a compliance period is a monitoring violation.

(b) Failure to analyze for E. coli following a total coliform-positive routine sample is a monitoring violation.

(4) Reporting violations.

(a) Failure to submit a monitoring report or completed assessment form after a system properly conducts monitoring or assessment in a timely manner is a reporting violation.

(b) Failure to notify the Director following an E. coli-positive sample as required by R309-211-7(2)(a) in a timely manner is a reporting violation.

(c) Failure to submit certification of completion of Director-approved start-up procedure by a seasonal system is a reporting violation.

R309-211-10. Invalidation of a total coliform sample.

The invalidation of a total coliform sample result can be made only by the Administrator in accordance with §§ 141.21(c)(1)(i), (ii), or (iii) or by the certified laboratory in accordance with R309-211-4(3), with the Administrator acting as the Director.

R309-211-11. Reporting and recordkeeping.

(1) Reporting.

(a) E. coli.

(i) A system must notify the Director by the end of the day when the system learns of an E. coli MCL violation, unless the system learns of the violation after the Director's office is closed and the Director does not have either an after-hours phone line or an alternative notification procedure, in which case the system must notify the Director before the end of the next business day, and notify the public in accordance with R309-220.

(ii) A system must notify the Director by the end of the day when the system is notified of an E. coli-positive routine sample, unless the system is notified of the result after the Director's office is closed and the Director does not have either an after-hours phone line or an alternative notification procedure, in which case the system must notify the Director before the end of the next business day.

(b) A system that has violated the treatment technique for coliforms in R309-211-8 must report the violation to the Director no later than the end of the next business day after it learns of the violation, and notify the public in accordance with R309-220.

(c) A system required to conduct an assessment under the provisions of R309-211-8 of this part must submit the assessment report within 30 days. The system must notify the Director in accordance with R309-211-8(3) when each scheduled corrective

action is completed for corrections not completed by the time of submission of the assessment form.

(d) A system that has failed to comply with a coliform monitoring requirement must report the monitoring violation to the Director within 10 days after the system discovers the violation, and notify the public in accordance with R309-220.

(e) A seasonal system must certify, prior to serving water to the public, that it has complied with the Director-approved start-up procedure.

(2) Recordkeeping.

(a) The system must maintain any assessment form, regardless of who conducts the assessment, and documentation of corrective actions completed as a result of those assessments, or other available summary documentation of the sanitary defects and corrective actions taken under R309-211-8 for Director review. This record must be maintained by the system for a period not less than five years after completion of the assessment or corrective action.

(b) The system must maintain a record of any repeat sample taken that meets Director's criteria for an extension of the 24-hour period for collecting repeat samples as provided for under R309-211-7(1)(a).