**Section 611.802 Groundwater Source Microbial Monitoring and Analytical Methods**

a) Triggered Source Water Monitoring

1) General Requirements. A GWS supplier must conduct triggered source water monitoring if the following conditions exist.

A) The supplier does not provide at least 4-log treatment of viruses (using inactivation, removal, or an Agency-approved combination of 4-log virus inactivation and removal) before or at the first customer for each groundwater source.

B) This subsection (a)(1)(B) corresponds with 40 CFR 141.802(a)(1)(ii), which has no operative effect after a past implementation date. This statement maintains structural consistency with the federal regulations.

C) The system is notified that a sample collected under Sections 611.1054 through 611.1057 is total coliform-positive and the sample is not invalidated under Section 611.1053(c).

2) Sampling Requirements. A GWS supplier must collect, within 24 hours after notification of the total coliform-positive sample, at least one groundwater source sample from each groundwater source in use at the time the total coliform-positive sample was collected under Sections 611.1054 through 611.1057, except as provided in subsection (a)(2)(B).

A) The Agency may issue a SEP extending the 24-hour time limit on a case-by-case basis if it determines that the supplier cannot collect the groundwater source water sample within 24 hours due to circumstances beyond the supplier's control. In the case of an extension, the Agency must specify how much time the supplier has to collect the sample.

B) If approved by the Agency, a supplier with more than one groundwater source may meet the requirements of this subsection (a)(2) by sampling a representative groundwater source or sources. If directed by the Agency in a SEP, the supplier must submit for Agency approval a triggered source water monitoring plan that identifies one or more groundwater sources that are representative of each monitoring site in the system's sample siting plan under Section 611.1053 and that the system intends to use for representative sampling under this subsection (a).

C) This subsection (a)(2)(C) corresponds with 40 CFR 141.802(a)(1)(ii), a now-obsolete implementing provision. This statement maintains structural consistency with the federal regulations.

D) A GWS supplier serving 1,000 or fewer people may use a repeat sample collected from a groundwater source to meet both the requirements of Subpart AA and to satisfy the monitoring requirements of subsection (a)(2) for that groundwater source only if the Agency issues a SEP approving the use of E. coli as a fecal indicator for source water monitoring under this subsection (a) and approves the use of a single sample for meeting both the triggered source water monitoring requirements in this subsection (a) and the repeat monitoring requirements in Section 611.1058. If the repeat sample collected from the groundwater source is E. coli-positive, the system must comply with subsection (a)(3).

3) Additional Requirements. If the Agency does not require corrective action under Section 611.803(a)(2) for a fecal indicator-positive source water sample collected under subsection (a)(2) that is not invalidated under subsection (d), the supplier must collect five additional source water samples from the same source within 24 hours after being notified of the fecal indicator-positive sample.

4) Consecutive and Wholesale Systems

A) In addition to the other requirements of this subsection (a), a consecutive GWS supplier that has a total coliform-positive sample collected under Sections 611.1054 through 611.1057, must notify the wholesale systems within 24 hours after being notified of the total coliform-positive sample.

B) In addition to the other requirements of this subsection (a), a wholesale GWS supplier must comply with the following requirements:

i) A wholesale GWS supplier that receives notice from a consecutive system it serves that a sample collected under Sections 611.1054 through 611.1057 is total coliform-positive must, within 24 hours after being notified, collect a sample from its groundwater sources under subsection (a)(2) and analyze it for a fecal indicator under subsection (c).

ii) If the sample collected under subsection (a)(4)(B)(i) is fecal indicator-positive, the wholesale GWS supplier must notify all consecutive systems served by that groundwater source of the fecal indicator source water positive within 24 hours after being notified of the groundwater source sample monitoring result and must meet the requirements of subsection (a)(3).

5) Exceptions to the Triggered Source Water Monitoring Requirements. A GWS supplier is not required to comply with the source water monitoring requirements of subsection (a) if either of the following conditions exists:

A) The Agency issues a SEP determining and documenting that a distribution system deficiency caused the total coliform-positive sample collected under Sections 611.1054 through 611.1057; or

B) The total coliform-positive sample collected under Sections 611.1054 through 611.1057 is collected at a location that meets Agency criteria for distribution system conditions that will cause total coliform-positive samples.

b) Assessment Source Water Monitoring. If the Agency directs in a SEP, a GWS supplier must conduct assessment source water monitoring that meets Agency-determined requirements for such monitoring. A GWS supplier conducting assessment source water monitoring may use a triggered source water sample collected under subsection (a)(2) to meet the requirements of subsection (b). Agency-determined assessment source water monitoring requirements may include the following:

1) Collection of a total of 12 groundwater source samples that represent each month the system provides groundwater to the public;

2) Collection of samples from each well, unless the system obtains written Agency approval to conduct monitoring at one or more wells within the GWS that are representative of multiple wells used by that system and that draw water from the same hydrogeologic setting;

3) Collection of a standard sample volume of at least 100 mL for fecal indicator analysis, regardless of the fecal indicator or analytical method used;

4) Analysis of all groundwater source samples using one of the analytical methods listed in subsection (c)(2) for the presence of E. coli, enterococci, or coliphage;

5) Collection of groundwater source samples at a location prior to any treatment of the groundwater source unless the Agency approves a sampling location after treatment; and

6) Collection of groundwater source samples at the well itself, unless the system's configuration does not allow for sampling at the well itself and the Agency approves in a SEP an alternate sampling location that is representative of the water quality of that well.

c) Analytical Methods

1) A GWS supplier subject to the source water monitoring requirements of subsection (a) must collect a standard sample volume of at least 100 mL for fecal indicator analysis, regardless of the fecal indicator or analytical method used.

2) A GWS supplier must analyze all groundwater source samples collected under subsection (a) using one of the analytical methods listed in subsections (c)(2)(A) through (c)(2)(C), each incorporated by reference in Section 611.102, or alternative methods approved by the Agency under Section 611.480, subject to the limitations of subsection (c)(2)(D), for the presence of E. coli, enterococci, or coliphage:

A) E. coli. Enzyme Substrate Technique

i) Colilert®. SM 9223 B (97), SM 9223 B (04), or SM 9223 B (16).

ii) Colisure®. SM 9223 B (97), SM 9223 B (04), or SM 9223 B (16).

iii) Membrane Filter Method with MI Agar. USEPA 1604 (02).

iv) E\*Colite (98).

v) EC-MUG. SM 9221 F (94), SM 9221 F (06), or SM 9221 F (14).

vi) NA-MUG. SM 9222 G (97) (20th ed. only) or SM 9222 I (15).

vii) Colilert®-18. SM 9223 B (97), SM 9223 B (04), or SM 9223 B (16).

viii) Readycult® (07).

ix) Modified Colitag™ (09) or Modified Colitag™ (20).

x) Chromocult® (00).

xi) Tecta (14) or Tecta (17).

xii) RAPID'E. coli (20).

BOARD NOTE: EC-MUG (SM 9221 F (94) (20th ed. only)) or NA-MUG (SM 9222 G (97) (20th ed. only)), both incorporated by reference in Section 611.102, can be used for E. coli testing step, as described in 40 CFR 141.21(f)(6)(i) or (f)(6)(ii), incorporated by reference in Section 611.102, after use of SM 9221 B (93), SM 9221 B (94), SM 9221 B (99), SM 9221 B (06), SM 9221 D (93), SM 9221 D (94), SM 9221 D (99), SM 9221 D (06), SM 9222 B (91), SM 9222 B (94), SM 9222 B (97), SM 9222 C (91), SM 9222 C (94), or SM 9222 C (97).

B) E. coli. Fermentation Technique

i) Hach 10029 (99) (m-ColiBlue24®).

ii) SM 9222 J (15).

C) Enterococci

i) Multiple-Tube Technique. SM 9230 B (93) (20th ed. only), SM 9230 B (04), SM 9230 C (93) (20th ed. only), SM 9230 C (13), or USEPA 1600 (02).

BOARD NOTE: The holding time and temperature for groundwater samples are specified in subsection (c)(2)(D), rather than as specified in Section 8 of USEPA 1600 (02).

ii) Fluorogenic Substrate Enterococcus Test (using Enterolert). Enterolert (96) or SM 9230 D (13).

BOARD NOTE: Medium is available through IDEXX Laboratories, Inc., at the address set forth in Section 611.102(b). Preparation and use of the medium must be as set forth in the article that embodies the method as incorporated by reference in Section 611.102(b).

D) Coliphage

i) Two-Step Enrichment Presence-Absence Procedure. USEPA 1601 (01) or Charm Fast Phage (12).

ii) Single Agar Layer Procedure. USEPA 1602 (01).

E) Limitation on Methods Use. The time from sample collection to initiation of analysis may not exceed 30 hours. The GWS supplier is encouraged but is not required to hold samples below 10° C during transit.

d) Invalidation of a Fecal Indicator-Positive Groundwater Source Sample

1) A GWS supplier may obtain Agency invalidation of a fecal indicator-positive groundwater source sample collected under subsection (a) only under either of the following conditions:

A) The supplier provides the Agency with written notice from the laboratory that improper sample analysis occurred; or

B) The Agency issues a SEP determining and documenting that substantial evidence that a fecal indicator-positive groundwater source sample is not related to source water quality.

2) If the Agency invalidates a fecal indicator-positive groundwater source sample, the GWS supplier must collect another source water sample under subsection (a) within 24 hours after being notified by the Agency of its invalidation decision, and the supplier must have it analyzed for the same fecal indicator using the analytical methods in subsection (c). The Agency may extend the 24-hour time limit on a case-by-case basis if the supplier cannot collect the source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the Agency must specify how much time the system has to collect the sample.

e) Sampling Location

1) Any groundwater source sample required under subsection (a) must be collected at a location prior to any treatment of the groundwater source unless the Agency approves a sampling location after treatment.

2) If the supplier's system configuration does not allow for sampling at the well itself, it may collect a sample at an Agency-approved location to meet the requirements of subsection (a) if the sample is representative of the water quality of that well.

f) New Sources. If the Agency directs in a SEP, a GWS supplier placing a new groundwater source into service must conduct assessment source water monitoring under subsection (b). If the SEP directs, the supplier must begin monitoring before the groundwater source is used to provide water to the public.

g) Public Notification. A GWS supplier with a groundwater source sample collected under subsection (a) or (b) that is fecal indicator-positive and that is not invalidated under subsection (d), including a consecutive system supplier served by the groundwater source, must conduct public notification under Section 611.902.

h) Monitoring Violations. A failure to meet the requirements of subsections (a) through (f) is a monitoring violation that requires the GWS supplier to provide public notification under Section 611.904.

BOARD NOTE: This Section derives from 40 CFR 141.402 and appendix A to subpart C of 40 CFR 141. The Board did not separately list approved alternative methods from Standard Methods Online that are the same version as a method appearing in a printed edition of Standard Methods. Using the Standard Methods Online copy is acceptable.

Standard Methods Online, Method 9221 F-06 appears in the 22nd edition as Method 9221 F. This appears in this Section as SM 9221 F (06).

Standard Methods Online, Method 9222 G-97 appears in the 20th and 21st editions as Method 9222 G. This appears in this Section as SM 9222 G (97).

Standard Methods Online, Method 9223 B-97 appears in the 20th and 21st editions as Method 9223 B. This appears in this Section as SM 9223 B (97).

Standard Methods Online, Method 9223 B-04 appears in the 22nd edition as Method 9223 B. This appears in this Section as SM 9223 B (04).

(Source: Amended at 47 Ill. Reg. 16486, effective November 2, 2023)