**Section 611.611 Inorganic Analysis**

Analytical methods are from documents incorporated by reference in Section 611.102. The substantive rules mostly reference these by a short name Section 611.102(a) defines. Section 611.101 defines other abbreviations.

a) A certified laboratory must conduct analyses for contaminants in this Section using the indicated methods or an alternative method the Agency approved under Section 611.480. USEPA Technical Notes, incorporated by reference in Section 611.102, includes criteria for analyzing arsenic, barium, beryllium, cadmium, calcium, chloride, chromium, copper, lead, nickel, selenium, sodium, sulfate, and thallium with digestion or directly without digestion, and other analytical procedures.

BOARD NOTE: Because a laboratory determines MDLs it reports under USEPA 200.7 (94) and USEPA 200.9 (94) using a 2× preconcentration step during sample digestion, MDLs the laboratory determines analyzing samples by direct analysis (i.e., no sample digestion) are higher. For direct analysis of cadmium and arsenic using USEPA 200.7 (94) and arsenic using SM 3120 B (89), SM 3120 B (93), or SM 3120 B (99), it may be necessary to engage in sample preconcentration using pneumatic nebulization to achieve lower detection limits. Direct analysis of antimony, lead, and thallium using USEPA 200.9 (94); antimony and lead using SM 3113 B (89), SM 3113 B (99), or SM 3113 B (10); and lead using ASTM D3559-96 D, ASTM D3559-03 D, ASTM D3559-08 D, or ASTM D3559-15 D may require preconcentration, unless the laboratory makes multiple in-furnace depositions.

1) Alkalinity

A) Titrimetric. ASTM D1067-92 B, ASTM D1067-02 B, ASTM D1067-06 B, ASTM D1067-11 B, ASTM D1067-16 B, SM 2320 B (91), or SM 2320 B (97).

B) Electrometric Titration. USGS I-1030-85.

2) Antimony

A) Inductively Coupled Plasma-Mass Spectrometry. USEPA 200.8 (94).

B) Atomic Absorption, Hydride Technique. ASTM D3697-92, ASTM D3697-02, ASTM D3697-07, ASTM D3697-12, or ASTM D3697-17.

C) Atomic Absorption, Platform Furnace Technique. USEPA 200.9 (94).

D) Atomic Absorption, Furnace Technique. SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), or SM 3113 B (10).

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry (AVICP-AES). USEPA 200.5 (03).

3) Arsenic

BOARD NOTE: If the laboratory uses ultrasonic nebulization in determining arsenic using USEPA 200.8 (94), the arsenic must be in the pentavalent state to provide uniform signal response. For direct analysis of arsenic with USEPA 200.8 (94) using ultrasonic nebulization, samples and standards must contain one mg/L of sodium hypochlorite.

A) Inductively Coupled Plasma-Mass Spectrometry. USEPA 200.8 (94).

B) Atomic Absorption, Platform Furnace Technique. USEPA 200.9 (94).

C) Atomic Absorption, Furnace Technique. ASTM D2972-97 C, ASTM D2972-03 C, ASTM D2972-08 C, ASTM D2972-15 C, SM 3113 B (89), SM 3113 B (93), 3113 B (99), 3113 B (04), or 3113 B (10).

D) Atomic Absorption, Hydride Technique. ASTM D2972-97 B, ASTM D2972-03 B, ASTM D2972-08 B, ASTM D2972-15 B, SM 3114 B (89), SM 3114 B (93), SM 3114 B (97), SM 3114 B (04), or SM 3114 B (09).

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry (AVICP-AES). USEPA 200.5 (94).

4) Asbestos. Transmission Electron Microscopy. USEPA 100.1 (83) or USEPA 100.2 (94).

5) Barium

A) Inductively Coupled Plasma. USEPA 200.7 (94), SM 3120 B (83), SM 3120 B (93), or SM 3120 B (99).

B) Inductively Coupled Plasma-Mass Spectrometry. USEPA 200.8 (94).

C) Atomic Absorption, Direct Aspiration Technique. SM 3111 D (89), SM 3111 D (93), or SM 3111 D (99).

D) Atomic Absorption, Furnace Technique. SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), and SM 3113 B (10).

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry (AVICP-AES). USEPA 200.5 (03).

6) Beryllium

A) Inductively Coupled Plasma. USEPA 200.7 (94), SM 3120 B (83), SM 3120 B (93), or SM 3120 B (99).

B) Inductively Coupled Plasma-Mass Spectrometry. USEPA 200.8 (94).

C) Atomic Absorption, Platform Furnace Technique. USEPA 200.9 (94).

D) Atomic Absorption, Furnace Technique. ASTM D3645-97 B, ASTM D3645-03 B, ASTM D3645-08 B, ASTM D3645-15 B, SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), or SM 3113 B (10).

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry (AVICP-AES). USEPA 200.5 (03).

7) Cadmium

A) Inductively Coupled Plasma Arc Furnace. USEPA 200.7 (94).

B) Inductively Coupled Plasma-Mass Spectrometry. USEPA 200.8 (94).

C) Atomic Absorption, Platform Furnace Technique. USEPA 200.9 (94).

D) Atomic Absorption, Furnace Technique. SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), and SM 3113 B (10).

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry (AVICP-AES). USEPA 200.5 (03).

8) Calcium

A) EDTA Titrimetric. ASTM D511-93 A, ASTM D511-03 A, ASTM D511-09 A, ASTM D511-14 A, SM 3500-Ca B (97), or 3500-Ca D (91).

B) Atomic Absorption, Direct Aspiration. ASTM D511-93 B, ASTM D511-03 B, ASTM D511-09 B, ASTM D511-14 B, SM 3111 B (89), SM 3111 B (93), or SM 3111 B (99).

C) Inductively Coupled Plasma. USEPA 200.7 (94), SM 3120 B (83), SM 3120 B (93), or SM 3120 B (99).

D) Ion Chromatography. ASTM D6919-03, ASTM D6919-09, or ASTM D6919-17.

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry (AVICP-AES). USEPA 200.5 (03).

9) Chloride. Ion Chromatography. ASTM D4327-17.

10) Chromium

A) Inductively Coupled Plasma. USEPA 200.7 (94), SM 3120 B (83), SM 3120 B (93), or SM 3120 B (99).

B) Inductively Coupled Plasma-Mass Spectrometry. USEPA 200.8 (94).

C) Atomic Absorption, Platform Furnace Technique. USEPA 200.9 (94).

D) Atomic Absorption, Furnace Technique. SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), and SM 3113 B (10).

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry (AVICP-AES). USEPA 200.5 (03).

11) Copper

A) Atomic Absorption, Furnace Technique. ASTM D1688-95 C, ASTM D1688-02 C, ASTM D1688-07 C, ASTM D1688-12 C, ASTM D1688-17 C, SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), and SM 3113 B (10).

B) Atomic Absorption, Direct Aspiration. ASTM D1688-95 A, ASTM D1688-02 A, ASTM D1688-07 A, ASTM D1688-12 A, ASTM D1688-17 A, SM 3111 B (89), SM 3111 B (93), or SM 3111 B (99).

C) Inductively Coupled Plasma. USEPA 200.7 (94), SM 3120 B (83), SM 3120 B (93), or SM 3120 B (99).

D) Inductively Coupled Plasma-Mass Spectrometry. USEPA 200.8 (94).

E) Atomic Absorption, Platform Furnace Technique. USEPA 200.9 (94).

F) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry (AVICP-AES). USEPA 200.5 (03).

G) Colorimetric. Hach 8026 (15) or Hach 10272 (15).

12) Conductivity; Conductance. ASTM D1125-95 (1999) A, ASTM D1125-14 A, SM 2510 B (91), or SM 2510 B (97).

13) Cyanide

A) Manual Distillation with MgCl2. (ASTM D2036-98 A, ASTM D2036-06 A, SM 4500-CN– C (90), SM 4500-CN– C (97), SM 4500-CN– C (99), or SM 4500-CN– C (16)), followed by spectrophotometric, amenable (ASTM D2036-98 B, ASTM D2036-06 B, SM 4500-CN– G (90), SM 4500-CN– G (97), SM 4500-CN– G (99), or SM 4500-CN– G (16)).

B) Manual Distillation with MgCl2. Distillation (ASTM D2036-98 A or ASTM D2036-06 A or SM 4500-CN– C (90), SM 4500-CN– C (97), SM 4500-CN– C (99), or SM 4500-CN– C (16)), followed by Spectrophotometric, Manual (ASTM D2036-98 A, ASTM D2036-06 A, SM 4500-CN– E (90), 4500-CN– E (97), 4500-CN– E (99), 4500-CN– E (16), or USGS I-3300-85).

C) Spectrophotometric, Semiautomated. USEPA 335.4 (93).

D) Selective Electrode. SM 4500-CN– F (90), SM 4500-CN– F (97), SM 4500-CN– F (99), or SM 4500-CN– F (16).

E) UV/Distillation/Spectrophotometric. Kelada 01 (01).

F) Microdistillation/Flow Injection/Spectrophotometric. QuikChem 10-204-00-1-X (00).

G) Ligand Exchange and Amperometry. ASTM D6888-04 or OIA-1677 DW (04).

H) Gas Chromatography-Mass Spectrometry Headspace. ME355.01 (09).

14) Fluoride

A) Ion Chromatography. USEPA 300.0 (93), USEPA 300.1 (97), ASTM D4327-97, ASTM D4327-03, ASTM D4327-11, ASTM D4327-17, SM 4110 B (90), SM 4110 B (91), SM 4110 B (97), or SM 4110 B (00).

B) Manual Distillation, Colorimetric SPADNS. SM 4500-F– B (88), SM 4500-F– B (94), SM 4500-F– B (97), SM 4500-F–, D (88), SM 4500-F– B (94), or SM 4500-F– B (97).

C) Manual Electrode. ASTM D1179-93 B, ASTM D1179-99 B, ASTM D1179-04 B, ASTM D1179-10 B, ASTM D1179-16 B, SM 4500-F– C (88), SM 4500-F– C (94), or SM 4500-F– C (97).

D) Automated Electrode. Technicon # 380-75WE (76).

E) Automated Alizarin. SM 4500-F– E (88), SM 4500-F– E (94), SM 4500-F– E (97), or Technicon #129-71W.

F) Arsenite-Free Colorimetric SPADNS. Hach 10225 (11) (SPADNS 2).

G) Capillary Ion Electrophoresis. ASTM D6508-00.

BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for fluoride to add capillary ion electrophoresis in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of "Waters Method D6508, Rev. 2". The Board cited the ASTM Method D6508-00 (2005). On May 2, 2012 (at 77 Fed. Reg. 26072, 26096-97; in corrections to UCMR 3), USEPA changed the entries for nitrate, nitrite, and orthophosphate to ASTM D6508-00.

15) Lead

A) Atomic Absorption, Furnace Technique. ASTM D3559-96 D, ASTM D3559-03 D, ASTM D3559-08 D, ASTM D3559-15 D, SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), or SM 3113 B (10).

B) Inductively Coupled Plasma-Mass Spectrometry. USEPA 200.8 (94).

C) Atomic Absorption, Platform Furnace Technique. USEPA 200.9 (94).

D) Differential Pulse Anodic Stripping Voltammetry. Palintest 1001 (99).

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry (AVICP-AES). USEPA 200.5 (03).

F) Differential Pulse Anode Stripping Voltametry. Palintest 1001 (20).

16) Magnesium

A) Atomic Absorption. ASTM D511-93 B, ASTM D511-03 B, ASTM D511-09 B, ASTM D511-14 B, SM 3111 B (89), SM 3111 B (93), or SM 3111 B (99).

B) Inductively Coupled Plasma. USEPA 200.7 (94), SM 3120 B (89), SM 3120 B (93), or SM 3120 B (99).

C) Complexation Titrimetric. ASTM D511-93 A, ASTM D511-03 A, ASTM D511-09 A, ASTM D511-14 A, SM 3500-Mg B (97), SM 3500-Mg E (90), or SM 3500-Mg E (91).

D) Ion Chromatography. ASTM D6919-03, ASTM D6919-09, or ASTM D6919-17.

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry (AVICP-AES). USEPA 200.5 (03).

17) Mercury

A) Manual Cold Vapor Technique. ASTM D3223-97, ASTM D3223-02, ASTM D3223-12, ASTM D3223-17, SM 3112 B (88), SM 3112 B (93), SM 3112 B (99), SM 3112 B (09), or USEPA 245.1 (91).

B) Automated Cold Vapor Technique. USEPA 245.2 (74).

C) Inductively Coupled Plasma-Mass Spectrometry. USEPA 200.8 (94).

18) Nickel

A) Inductively Coupled Plasma. SM 3120 B (89), SM 3120 B (93), SM 3120 B (99), or USEPA 200.7 (94).

B) Inductively Coupled Plasma-Mass Spectrometry. USEPA 200.8 (94).

C) Atomic Absorption, Platform Furnace Technique. USEPA 200.9 (94).

D) Atomic Absorption, Direct Aspiration Technique. SM 3111 B (89), 3111 B (93), or 3111 B (99).

E) Atomic Absorption, Furnace Technique. SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), or SM 3113 B (10).

F) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry (AVICP-AES). USEPA 200.5 (03).

19) Nitrate

A) Ion Chromatography. ASTM D4327-97, ASTM D4327-03, ASTM D4327-11, ASTM D4327-17, SM 4110 B (90), SM 4110 B (97), SM 4110 B (00), USEPA 300.0 (93), USEPA 300.1 (97), or Waters B-1011 (87).

B) Automated Cadmium Reduction. ASTM D3867-90 A; SM 4500-NO3– F (88), 4500-NO3– F (93), 4500-NO3– F (97), 4500-NO3– F (00), 4500-NO3– F (16), or USEPA 353.2 (93).

C) Ion Selective Electrode. ATI Orion Technical Bulletin 601 (94), SM 4500-NO3– D (88), SM 4500-NO3– D (93), SM 4500-NO3– D (97), SM 4500-NO3– D (00), or SM 4500-NO3– D (16).

D) Manual Cadmium Reduction. ASTM D3867-90 B, SM 4500-NO3– E (88), SM 4500-NO3– E (93), SM 4500-NO3– E (97), SM 4500-NO3– E (00), or SM 4500-NO3– E (16).

E) Capillary Ion Electrophoresis. ASTM D6508-00 or ASTM D6508-15.

F) Reduction-Colorimetric. Systea Easy (1-Reagent) (09) or NECi Nitrate-Reductase (06).

G) Direct Colorimetric. Hach 10206 (TNTplus 835/836).

20) Nitrite

A) Ion Chromatography. ASTM D4327-97, ASTM D4327-03, ASTM D4327-11, ASTM D4327-17, SM 4110 B (90), SM 4110 B (97), SM 4110 B (00), USEPA 300.0 (93), USEPA 300.1 (97), or Waters B-1011 (87).

B) Automated Cadmium Reduction. ASTM D3867-90 A, SM 4500-NO3– F (93), 4500-NO3– F (97), 4500-NO3– F (00), 4500-NO3– F (16), or USEPA 353.2 (93).

C) Manual Cadmium Reduction. ASTM D3867-90 B, SM 4500-NO3– E (93), 4500-NO3– E (97), 4500-NO3– E (00), or 4500-NO3– E (16).

D) Spectrophotometric. SM 4500-NO2– B (88), 4500-NO2– B (93), or 4500-NO2– B (00).

E) Capillary Ion Electrophoresis. ASTM D6508-00 or ASTM D6508-15.

F) Reduction-Colorimetric. Systea Easy (1-Reagent) (09) or NECi Nitrate-Reductase (06).

21) Orthophosphate (unfiltered, without digestion or hydrolysis)

A) Automated Colorimetric, Ascorbic Acid. SM 4500-P F (88), SM 4500-P F (93), SM 4500-P F (97), SM 4500-P F (99), SM 4500-P F (05), Thermo-Fisher Discrete Analyzer (16), or USEPA 365.1 (93).

B) Single-Reagent Colorimetric, Ascorbic Acid. ASTM D515-88 A, SM 4500-P E (88), 4500-P E (93), 4500-P E (97), or 4500-P E (99), or 4500-P E (05).

C) Colorimetric, Phosphomolybdate. USGS I-1601-85.

D) Phosphorus, Orthophosphate, Colorimetry, Phosphomolybdate, Automated-Segmented Flow. USGS I-2601-90.

E) Colorimetric, Phosphomolybdate, Automated Discrete. USGS I-2598-85.

F) Ion Chromatography. ASTM D4327-97, ASTM D4327-03, ASTM D4327-11, ASTM D4327-17, SM 4110 B (90), SM 4110 B (91), SM 4110 B (97), SM 4110 B (00), USEPA 300.0 (93), or USEPA 300.1 (97).

G) Capillary Ion Electrophoresis. ASTM D6508-00 or ASTM D6508-15.

22) pH, Electrometric. ASTM D1293-95, ASTM D1293-99, ASTM D1293-12, ASTM D1293-18, SM 4500-H+ B (90), SM 4500-H+ B (96), SM 4500-H+ B (00), USEPA 150.1 (71), USEPA 150.2 (82), or USEPA 150.3 (13).

23) Selenium

A) Atomic Absorption, Hydride. ASTM D3859-98 A, ASTM D3859-03 A, ASTM D3859-08 A, ASTM D3859-15 A, SM 3114 B (89), SM 3114 (93), SM 3114 (97), or SM 3114 (09).

B) Inductively Coupled Plasma-Mass Spectrometry. USEPA 200.8 (94).

C) Atomic Absorption, Platform Furnace Technique. USEPA 200.9 (94).

D) Atomic Absorption, Furnace Technique. ASTM D3859-98 B, ASTM D3859-03 B, ASTM D3859-08 B, ASTM D3859-15 B, SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), or SM 3113 B (10).

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry (AVICP-AES). USEPA 200.5 (03).

24) Silica

A) Colorimetric, Molybdate Blue. USGS I-1700-85.

B) Colorimetric, Molybdate Blue, Automated-Segmented Flow. USGS I-2700-85.

C) Colorimetric. ASTM D859-94, ASTM D859-00, ASTM D859-05, ASTM D859-10, or ASTM D859-16.

D) Molybdosilicate. SM 4500-Si D (88), SM 4500-Si D (93), or SM 4500-SiO2 C (97).

E) Heteropoly Blue. SM 4500-Si E (88), SM 4500-Si E (93), or SM 4500-SiO2 D (97).

F) Automated Method for Molybdate-Reactive Silica. SM 4500-Si F (88), SM 4500-Si F (93), or SM 4500-SiO2 E (97).

G) Inductively Coupled Plasma. SM 3120 B (89), SM 3120 B (93), SM 3120 B (99), or USEPA 200.7 (94).

H) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry (AVICP-AES). USEPA 200.5 (03).

25) Sodium

A) Inductively Coupled Plasma. USEPA 200.7 (94).

B) Atomic Absorption, Direct Aspiration. SM 3111 B (89), SM 3111 B (93), or SM 3111 B (99).

C) Ion Chromatography. ASTM D6919-03, ASTM D6919-09, or ASTM D6919-17.

D) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry (AVICP-AES). USEPA 200.5 (03).

26) Sulfate. Ion Chromatography. ASTM D4327-17.

27) Temperature; Thermometric. SM 2550 (88), SM 2550 (93), SM 2550 (00), or SM 2550 (10).

28) Thallium

A) Inductively Coupled Plasma-Mass Spectrometry. USEPA 200.8 (94).

B) Atomic Absorption, Platform Furnace Technique. USEPA 200.9 (94).

b) The supplier must use specific sample preservation, container, and maximum holding time procedures when collecting samples for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium, and thallium under Sections 611.600 through 611.604:

BOARD NOTE: For cyanide determinations, the supplier must adjust samples to pH 12 with sodium hydroxide to pH 12 when collecting them. When a sample needs chilling, the supplier must ship and store the sample at 4° C or less. The supplier may acidify nitrate or metals samples using a concentrated acid or a dilute (50% by volume) solution of the concentrated acid. USEPA encourages acidifying samples for metals analysis and that the laboratory acidify, rather than at the time of sampling, provided the supplier follows the shipping time and other instructions in Section 8.3 of USEPA 200.7 (94), USEPA 200.8 (94), or USEPA 200.9 (94).

1) Antimony

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. Samples must be analyzed as soon after collection as possible, but in any event within six months.

2) Arsenic

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. Samples must be analyzed as soon after collection as possible, but in any event within six months.

3) Asbestos

A) Preservative: Cool to 4° C.

B) Plastic or glass (hard or soft).

C) Holding Time. Samples must be analyzed as soon after collection as possible, but in any event within 48 hours.

4) Barium

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. Samples must be analyzed as soon after collection as possible, but in any event within six months.

5) Beryllium

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. Samples must be analyzed as soon after collection as possible, but in any event within six months.

6) Cadmium

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. Samples must be analyzed as soon after collection as possible, but in any event within six months.

7) Chromium

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. Samples must be analyzed as soon after collection as possible, but in any event within six months.

8) Cyanide

A) Preservative: Cool to 4° C. Add sodium hydroxide to pH greater than 12. See the analytical methods for information on sample preservation.

B) Plastic or glass (hard or soft).

C) Holding Time. Samples must be analyzed as soon after collection as possible, but in any event within 14 days.

9) Fluoride

A) Preservative: None.

B) Plastic or glass (hard or soft).

C) Holding Time. Samples must be analyzed as soon after collection as possible, but in any event within one month.

10) Mercury

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. Samples must be analyzed as soon after collection as possible, but in any event within 28 days.

11) Nickel

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. Samples must be analyzed as soon after collection as possible, but in any event within six months.

12) Nitrate, Chlorinated

A) Preservative: Cool to 4° C.

B) Plastic or glass (hard or soft).

C) Holding Time. Samples must be analyzed as soon after collection as possible, but in any event within 14 days.

13) Nitrate, Non-Chlorinated

A) Preservative: Concentrated sulfuric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. Samples must be analyzed as soon after collection as possible, but in any event within 14 days.

14) Nitrite

A) Preservative: Cool to 4° C.

B) Plastic or glass (hard or soft).

C) Holding Time. Samples must be analyzed as soon after collection as possible, but in any event within 48 hours.

15) Selenium

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. Samples must be analyzed as soon after collection as possible, but in any event within six months.

16) Thallium

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. Samples must be analyzed as soon after collection as possible, but in any event within six months.

c) A certified laboratory in one of the categories in Section 611.490(a) must conduct analyses under this Subpart N. The Agency must certify laboratories to conduct analyses for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium, and thallium if the laboratory fulfills certain conditions:

1) The laboratory analyzes performance evaluation (PE) samples the Agency provides under 35 Ill. Adm. Code 186 including those substances at levels not exceeding reasonably expected levels in drinking water; and

2) The laboratory achieves quantitative results on the analyses within specified acceptance limits:

A) Antimony: ± 30% at greater than or equal to 0.006 mg/L.

B) Arsenic: ± 30% at greater than or equal to 0.003 mg/L.

C) Asbestos: 2 standard deviations based on study statistics.

D) Barium: ± 15% at greater than or equal to 0.15 mg/L.

E) Beryllium: ± 15% at greater than or equal to 0.001 mg/L.

F) Cadmium: ± 20% at greater than or equal to 0.002 mg/L.

G) Chromium: ± 15% at greater than or equal to 0.01 mg/L.

H) Cyanide: ± 25% at greater than or equal to 0.1 mg/L.

I) Fluoride: ± 10% at 1 to 10 mg/L.

J) Mercury: ± 30% at greater than or equal to 0.0005 mg/L.

K) Nickel: ± 15% at greater than or equal to 0.01 mg/L.

L) Nitrate: ± 10% at greater than or equal to 0.4 mg/L.

M) Nitrite: ± 15% at greater than or equal to 0.4 mg/L.

N) Selenium: ± 20% at greater than or equal to 0.01 mg/L.

O) Thallium: ± 30% at greater than or equal to 0.002 mg/L.

BOARD NOTE: This Section derives from 40 CFR 141.23(k) 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 2320 B-97 appears in the 21st, 22nd, and 23rd editions as Method 2320 B. This appears in this Section as SM 2320 B (97).

Standard Methods Online, Method 2510 B-97 appears in the 20th, 21st, 22nd, and 23rd editions as Method 2510 B. This appears in this Section as SM 2510 B (97).

Standard Methods Online, Method 2550-00 appears in the 21st edition as Method 2550. This appears in this Section as SM 2550 (00).

Standard Methods Online, Method 2550-10 appears in the 22nd edition as Method 2550. This appears in this Section as SM 2550 (10).

Standard Methods Online, Methods 3111 B-99 and 3111 D-99 appear in the 21st, 22nd, and 23rd editions as Methods 3111 B and 3111 D. These appear in this Section as SM 3111 B (99) and SM 3111 D (99).

Standard Methods Online, Method 3112 B-09 appears in the 22nd and 23rd editions as Method 3112 B. This appears in this Section as SM 3112 B (09).

Standard Methods Online, Method 3113 B-99 appears in the 21st edition as Method 3113 B. This appears in this Section as SM 3113 B (99).

Standard Methods Online, Method 3113 B-10 appears in the 22nd and 23rd editions as Method 3113 B. This appears in this Section as SM 3113 B (10).

Standard Methods Online, Method 3114 B-97 appears in the 21st edition as Method 3114 B. This appears in this Section as SM 3114 B (97).

Standard Methods Online, Method 3114 B-09 appears in the 22nd and 23rd editions as Method 3114 B. This appears in this Section as SM 3114 B (09).

Standard Methods Online, Method 3120 B-99 appears in the 21st edition as Method 3120 B. This appears in this Section as SM 3120 B (99).

Standard Methods Online, Methods 3500-Ca B-97 and 3500-Ca D-97 appear in the 20th, 21st, 22nd, and 23rd editions as Methods 3500-Ca B and 3500-Ca D. These appear in this Section as SM 3500-Ca B (97) and SM 3500-Ca D (97).

Standard Methods Online, Method 3500-Mg B-97 appears in the 20th, 21st, 22nd, and 23rd editions as Method 3500-Mg B. This appears in this Section as SM 3500-Mg B (97).

Standard Methods Online, Method 4110 B-00 appears in the 21st, 22nd, and 23rd editions as Method 4110 B. This appears in this Section as SM 4110 B (00).

Standard Methods Online, Methods 4500-CN– C-90, 4500-CN– E-90, 4500-CN– F-90, and 4500-CN– G-90 appear in the 18th and 19th editions as Methods 4500-CN– C, 4500-CN– E, 4500-CN– F, and 4500-CN– G. These appear in this Section as SM 4500-CN– C (90), SM 4500-CN– E (90), SM 4500-CN– F (90), and SM 4500-CN– G (90).

Standard Methods Online, Methods 4500-CN– C-99, 4500-CN– E-99, 4500-CN– F-99, and 4500-CN– G-99 appear in the 21st and 22nd editions as Methods 4500-CN– C, 4500-CN– E, 4500-CN– F, and 4500-CN– G. These appear in this Section as SM 4500-CN– C (99), SM 4500-CN– E (99), SM 4500-CN– F (99), and SM 4500-CN– G (99).

Standard Methods Online, Methods 4500-F– B-97, 4500-F– C-97, 4500-F– D-97, and 4500-F– E-97 appear in the 20th, 21st, 22nd, and 23rd editions as Methods 4500-F– B, 4500-F– C, 4500-F– D, and 4500-F– E. These appear in this Section as SM 4500-F– B (97), SM 4500-F– C (97), SM 4500-F– D (97), and SM 4500-F– E (97).

Standard Methods Online, Methods 4500-NO3– D-00, 4500-NO3– E-00, and 4500-NO3– F-00 appear in the 21st, 22nd, and 23rd editions as Methods 4500-NO3– D, 4500-NO3– E, and 4500-NO3– F. These appear in this Section as SM 4500-NO3– D (00), SM 4500-NO3– E (00), and SM 4500-NO3– F (00).

Standard Methods Online, Methods 4500-NO2– B-00 appears in the 21st, 22nd, and 23rd editions as Method 4500-NO2– B. This appears in this Section as SM 4500-NO2– B (00).

Standard Methods Online, Method 4500-H+ B-90 appears in the 18th and 19th editions as Method 4500-H+ B. This appears in this Section as SM 4500-H+ B (90).

Standard Methods Online, Method 4500-H+ B-00 appears in the 21st, 22nd, and 23rd editions as Method 4500-H+ B. This appears in this Section as SM 4500-H+ B (00).

Standard Methods Online, Methods 4500-P E-99 and 4500-P F-99 appear in the 21st and 22nd editions as Methods 4500-P E and 4500-P F. These appear in this Section as SM 4500-P E (97) and SM 4500-P F (97).

Standard Methods Online, Methods 4500-SiO2 C-97, 4500-SiO2 D-97, and 4500-SiO2 E-97 appear in the 20th, 21st, 22nd, and 23rd editions as Methods 4500-SiO2 C, 4500-SiO2 D, and 4500-SiO2 E. These appear in this Section as SM 4500-SiO2 C (97), SM 4500-SiO2 D (97), and SM 4500-SiO2 E (97).

Standard Methods Online, Method 6251 B-07 appears in the 22nd and 23rd editions as Method 6251 B. This appears in this Section as SM 6251 B (07).

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