

Clearinghouse Rule 97-017 State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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STATE OF WISCONSIN

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DEPARTMENT OF NATURAL RESOURCES

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETINGS:

I, George E. Meyer, Secretary of the Department of Natural Resources and custodian of the official records of said Department, do hereby certify that the annexed copy of Natural Resources Board Order No. DG-6-97 was duly approved and adopted by this Department on May 28, 1997. I further certify that said copy has been compared by me with the original on file in this Department and that the same is a true copy thereof, and of the whole of such original.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the official seal of the Department at the Natural Resources Building in the City of Madison, this <u>7</u> <u>th</u> day of August, 1997.

George H. Meyer, Secre

11-1-97



Quality Natural Resources Management Through Excellent Customer Service



(SEAL)

ORDER OF THE STATE OF WISCONSIN NATURAL RESOURCES BOARD AMENDING, REPEALING AND RECREATING, AND CREATING RULES

The Wisconsin Natural Resources Board proposes an order to amend NR 809.12 (1) (a) and (b), NR809.12 (3)(a), NR809.12 (3)(b), NR809.12(9) (b), NR 809.20 (2)(b), NR 809.21(9)(b), NR 809.24(2)(a), NR 809.25(2), NR 809.25(12) (c), NR 809.25(16) & (17), DG-6-97 NR 809.26, NR 809.541(7), NR 809.541(12), NR809.542(3), NR 809.547(2)(c), NR 809.548, NR 809.549(1)(a), NR 809.55(7), Subchapter IV, NR 809.725 Tables A, B, C, D, E, F and G, NR 809.81(5)(ee), NR 809.81(5)(hq) of Wisconsin Administrative Code, pertaining to safe drinking water standards.

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Analysis Prepared by the Department of Natural Resources

Statutory authority: 280.11, Stats. [formerly s. 162.01, Stats.] and 281.17 (8), Stats. [formerly s. 144.025(2)(t), Stats.]

Statutes interpreted: 280.11, Stats. [formerly s. 162.01, Stats.] and 281.17 (8), Stats. [formerly s. 144.025(2)(t), Stats.]

USEPA published amendments to 40 CFR 141, 142 and 143. Our primacy agreement with EPA requires us to adopt rules no less stringent than federal regulations. The proposed changes to Chapter NR 809 update it to reflect changes in 40 CFR, and are necessary to assure that our administrative rules are consistent with federal regulations.

These Safe Drinking Water Act amendments do not develop new rules, but clarify language and interpretation of existing rules.

Section 1. NR 809.12 (1) (a) and (b) is amended to read:

NR 809.12(1)(a) Groundwater sources shall be sampled at every entry point to the distribution system which is representative of each well after treatment <u>beginning in the initial</u> compliance period. Each sample shall be taken at the same entry point unless conditions make another sampling location more representative of each source after treatment.

(b) Surface water sources or combined surface water and groundwater sources shall be sampled at every point of entry to the distribution system after any application of treatment, or in the distribution system at a point which is representative of each source after treatment <u>beginning</u> in the initial compliance period. Each sample shall be taken at the same entry point unless conditions make another sampling location more representative of each source after treatment.

Section 2. NR 809.12(3)(a) is amended to read:

NR 809.12(3)(a) Groundwater sources shall be sampled at each entry point once every 3 years beginning in the initial during each compliance period. Suppliers of water having surface water sources or combined surface water and groundwater sources shall take one sample annually at each entry point beginning January 1, 1993.

Note: For the contaminants in s. NR 809.11(2)(b), the initial compliance period is January 1993 - December 1995 for systems with 150 or more service connections and January 1996 - December 1998 for systems having fewer than 150 service connections.

Section 3. NR 809.12(3)(b) is amended to read:

NR 809.12 (3)(b) The system owner or operator may apply to the department for a waiver from the monitoring frequencies specified in par. (a). <u>The department may grant a waiver for</u> monitoring of cyanide, provided that the system is not vulnerable to contamination because there is no industrial source of cyanide.

Section 4. NR 809.12(9)(b) is amended to read:

NR 809.12(9)(b) For systems which are conducting monitoring more frequently than annual annually, compliance with the MCLs for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium and or thallium is determined by a running annual average at each entry point. If the average at any sampling point is greater than the MCL, then the system is out of compliance. If any one or more samples would cause the annual average to exceed a an MCL, then the system is out of compliance immediately. Any sample below the reported method detection limit shall be calculated at zero for the purpose of determining the annual average.

Section 5. NR 809.20 (2)(b) is amended to read:

NR 809.20 (2)(b) Packed tower aeration for dibromochloropropane, di(2-ethylhexyl)adipate, ethylene dibromide, and hexachlorocyclopentadiene and toxaphene and,

Section 6. NR 809.21(9)(b) is amended to read:

NR 809.21(9)(b) If the concentration in the composite sample detects one or more contaminants listed in s. NR 809.20, then a follow-up sample shall be taken and analyzed for

each contaminant detected within 14 days from each entry point included in the composite.

Section 7. NR 809.24(2)(a) is amended to read:

NR 809.24(2)(a) Central treatment using packed tower aeration, except for toluene, and

Section 8. NR 809.25(2) is amended to read:

NR 809.25(2) Each community and non-transient non-community water system owner or operator shall take 4 consecutive quarterly samples for each VOC contaminant specified in s. NR 809.24 during each compliance period, beginning in the compliance period starting January 1, 1993 with the initial compliance period.

Section 9. NR 809.25(12)(c) is amended to read:

NR 809.25(12)(c) If the concentration in the composite sample is greater than 0.0003 mg/L for vinyl chloride or 0.0005 mg/L for any other contaminant listed under s. NR 809.24, then a follow-up sample shall be taken and analyzed for each contaminant detected within 14 days from each entry point included in the composite.

Section 10. NR 809.25(16) and (17) is amended to read:

NR 809.25(16) Analyses under this section shall only be conducted by laboratories that have received approval certification by EPA or certified under ch. NR 149.

(17) Each approved <u>certified</u> laboratory shall determine the method detection limit (MDL) at which it is capable of detecting VOCs as defined under 40 Code of Federal Regulations, Part 136, Appendix B. The maximum acceptable MDL is 0.0005 mg/L for all VOCs except vinyl chloride, which is 0.0003 mg/L. These are the detection concentrations for purposes of this section.

Section 11. NR 809.26 (title) is amended to read:

NR 809.26 (title) Special monitoring, reporting, and public notification for selected organic contaminants and sulfate.

Section 12. NR 809.541(7) is amended to read:

NR 809.541(7) PUBLIC EDUCTION REQUIREMENTS. Any system exceeding the lead action level shall implement the public eduction requirements contained in s. NR 809.545. Any system exceeding the copper action level shall annually provide public education on the health effects of copper using language in s. NR 809.81(5)(eu), and information on reducing exposure to copper in drinking water similar to s. NR 809.546.

Section 13. NR 809.541(12) is amended to read:

NR 809.541(12) PREMISE OWNER NOTIFICATION OF LEAD AND COPPER RESULTS. System owners or operators shall provide owners or occupants of all premises used in the lead and copper monitoring program the analytical results of all samples collected at that site. If sample results at a sample location exceed action levels $15 \mu g/L$ for lead and $1300 \mu g/L$ for copper, system owners or operators must inform premise owners or occupants of health effects and measures necessary to lower lead or copper levels.

Section 14. NR 809.542(3) is amended to read:

NR 809.542(3) CRITERIA FOR CLASSIFYING CORROSION CONTROL TREATMENT STUDIES FOR SMALL AND MEDIUM-SIZE SYSTEMS. Any small or medium-size water system owner or operator that is required to complete the corrosion control steps due to the exceedance of the lead or copper action level may cease completing the treatment steps whenever the system meets both action levels during each of 2 consecutive monitoring periods conducted pursuant to s. NR 809.547 and the results are submitted to the department. If any such water system thereafter exceeds the lead or copper action level during any monitoring period, the system owner or operator shall recommence completion of the applicable treatment steps, beginning with the first treatment step which was not previously completed in its entirety. The department may require a system owner or operator to repeat treatment steps previously completed by the system owner or operator where the department determines that this is necessary to implement properly the treatment requirements. The department shall notify the system owner or operator in writing of such a determination and explain the basis for its decision. A small or medium-size water system shall implement corrosion control treatment steps in accordance with sub. (5), including a system deemed to have optimized corrosion control under sub. (2)(a), whenever it exceeds the lead or copper action level.

Section 15. NR 809.547(2)(c) is amended to read:

NR 809.547(2)(c) If the sample is not acidified immediately after collection, then the sample shall stand in the original container for at least $\frac{28}{16}$ hours after acidification.

Section 16. NR 809.548 (intro) is amended to read:

NR 809.548 (intro) Owners or operators of all large systems, and <u>of all</u> small and medium-size systems that exceed the lead or copper action level, shall monitor water quality parameters in addition to lead and copper in accordance with this section. The requirements of this section are summarized in the table at the end of this section.

Section 17. NR 809.549(1)(a) is amended to read:

NR 809.549(1)(a) The owner or operator of a water system that fails to meet the lead or copper action level on the basis of tap samples collected in accordance with s. NR 809.547 shall collect lead and copper source water samples in accordance with the requirements regarding sample location, number of samples and collection methods specified in s. NR 809.12 (1) (a) to (d)(c). The timing of sampling for lead and copper shall be in accordance with subs. (2) and (3), and not dates specified in s. NR 809.12 (1) (a) and (b).

Section 18. NR 809.55(7) is amended to read:

NR 809.55(7) REPORTING OF ADDITIONAL MONITORING DATA. Any system owner or operator who collects sampling data in addition to that required by this subchapter shall report the results to the department by within the first 10 days following the end of the applicable monitoring period under ss. NR 809.547, 809.548 and 809.549 during which the samples are collected.

Section 19. Subchapter IV (title) is amended to read:

Subchapter IV(title) — Miscellaneous Chemical Monitoring Requirements, Raw Surface Water Standards, Approved Certified Laboratories and Approved Methods for Safe Drinking Water Analysis.

Section 20. NR 809.725 Table A is amended to read:

| Approved | Methodology for Prin | mary Inorganic Contam | inants | | | | |
|---|---|------------------------------|--|---|--|--|--|
| Reference (Method Number) | | | | | | | |
| Parameter and Methodology | EPA ⁺ | ASTM ⁴ 3 | SM ⁺ | Other | | | |
| Antimony | | | p. * | | | | |
| Atomic absorption; furnace technique ⁴ Atomic absorption; platform furnace ⁶ Inductively Coupled Plasma; Mass Spectrometry (ICP/MS) ⁶ | 204.2 200.9_2 200.8 ² | | 3113B States and States States and States States and States | n Araba 1995 - Alexandro Alexandro Alexandro Alexandro Alexandro Alexandro | | | |
| Atomic absorption; gaseous hydride ⁹ | - | D3697-87 D3697-92 | - | | | | |
| Asbestos Transmission Electron Microscopy Transmission Electron Microscopy | (12) <u>100.1</u> ° 100.2 ¹⁰ | - · · | - - | - - | | | |

TABLE A

| | Reference (Method Number) | | | | | | | |
|--|----------------------------------|--|--|--|--|--|--|--|
| Parameter and Methodology | EPAt | ASTM ⁴ 2 | SM ⁹ ⁴ | Other* | | | | |
| | | | | | | | | |
| Arsenic | | | | | | | | |
| Atomic absorption: platform furnace | 200.9 2 | - - | - | | | | | |
| Atomic absorption; furnace technique | 206.2 | <u>D2972-93C</u> | <u>3113B</u> | | | | | |
| Atomic absorption; gaseous hydride | 206.3 | D2972-88B D2972-93B | 3114 <u>B</u> | 1-1062-857- | | | | |
| Spectrophotometric; silver dicthyldithocarbamate | 206.4 | D2972-88A | 3300-A8-C | t to grad the second | | | | |
| Inductively Coupled Plasma (ICP) * | 200.7 A ***** | - | <u>3120B</u> | | | | | |
| <u>ICP/MS</u> | 200.8 - | e e e e e e e e e e e e e e e e e e e | • • • • • • • • • • • • • • • • • • • | - | | | | |
| _ . | | | | | | | | |
| Barium | | | | | | | | |
| Atomic absorption; direct aspiration | 200.1 | - | 3113 B 3111D | - | | | | |
| Atomic absorption; furnace technique | 208:2 | • | 3111 D <u>3113B</u> | - | | | | |
| ICP • | 200.7 A 3.18 4 | • | <u>3120B</u> | - | | | | |
| <u>ICP/MS</u> | 200.8 - | - | - | - | | | | |
| | | | | | | | | |
| Berymum | | D2645 040 D2645 020 | 2100 21120 | 1. C. | | | | |
| Atomic absorption; turnace technique | 210.2 | D3045-84D D3045-93B | 3120 <u>3113B</u> | - | | | | |
| Atomic absorption; platform furnace | 200.94 | | - | - | | | | |
| ICP | 200.7* | • | 3120 B <u>3120B</u> | | | | | |
| ICP/MS * | 200.8 4 | | | e e de la companya d | | | | |
| | | | | | | | | |
| Cadmium | | the badfine of the second second | | | | | | |
| Atomic absorption; furnace technique * | 213.2 | - | 3113B | - | | | | |
| Atomic absorption: platform furnace | <u>200.9²</u> | • | n n <u>e</u> l la | • | | | | |
| ICP * | 200.7 A ³⁷⁰ 2 | e de la seconda de la secon | - | <u> </u> | | | | |
| <u>ICP/MS</u> | 200.8^{2} | • | - | | | | | |
| | | | | | | | | |
| Copper | | | | | | | | |
| Atomic absorption; furnace technique | 220:2 | D1688-90C | 3113 <u>B</u> | - | | | | |
| Atomic absorption; direct aspiration * | 220.1 | D1688-90A | 3111B | - | | | | |
| ICP 4 | 200.7 ⁵ 2 | • • • • • • • • • • • • • • • • • • • | 3120 B <u>3120B</u> | All struet and the state | | | | |
| ICP/MS ⁴ | 200.8 ² | - | - | ··· • | | | | |
| Atomic absorption; platform furnace * | 200.9 <u>2</u> | · • | - | - | | | | |
| | | | en de la presentación de la companya | | | | | |
| Chromium | | | 1 | | | | | |
| Atomic absorption; furnace technique | 218.2 | ora, for - North Sign (the spine) | 3113 B <u>3113B</u> | urativ sa <mark>≓</mark> ra | | | | |
| Atomic absorption: platform furnace | 200.9 ² | - | • | • • • • • | | | | |
| ICP * | 200.7 + 310 2 | and the second second second | 3120 B 3120B | - | | | | |
| ICP/MS | 200.8 ² | antan ang Bangaran ang Kangaran ang Kangaran. Ang Kangaran ang Bangaran ang Kangaran ang Kangaran ang Kangaran ang Kangaran ang Kangaran ang Kangaran ang Kan | - | - | | | | |
| the second s | la la la Sa ndara Ara | | and the second | and the second second | | | | |
| Cyanide | | | | and a second | | | | |
| Manual Distillation; followed by spectrophotometric | 335.2 | D2036-89A | 4500-CN D 4500-CN-C | 1-3300-85 | | | | |
| Distillation, automated spectrophotometric | 335.3 | • | 4500-EN-E | - | | | | |
| Distillation, selective electrode | - | D2036-89A | 4500-CN F | - | | | | |
| Distillation, amenable, spectrophotometric; | 335.1 | D2036-89B | 4500-CN-G | - | | | | |
| Spectrophotometric, Amenable | | D2036-91B | 4500-CN-G | 25.5 · | | | | |
| Spectrophotometric Manual | - | D2036-91A | 4500-CN-E | | | | | |
| Semi-automated | 335.46 | - | - | - | | | | |
| Selective Electrode | - | - | 4500CN-F | | | | | |
| | and the state | and the second | | | | | | |
| Fluoride | | | The second s | | | | | |
| Ion Chromatography | 300.0 ⁶ | <u>D4327-91</u> | <u>4110B</u> | a agrada 🖣 a stri | | | | |
| Manual distillation Colorimetric SPADNS; with | 340.1 | D1179-72A | 4500-F-D, Bº 4500F-B. | <u>D</u> - | | | | |
| distillation | | | | 문제 유명한 제 가지 않는 것이 있는 것이 없다. | | | | |
| Manual Potentiometric ion selective electrode | 340.2 | D1179-72B D1179-93B | 4500-F-C | - | | | | |
| Automated Alizarin fluoride blue; with distillation | 340.3 | · _ | 4500-F-E, -B * | 129-71W ⁺¹¹ | | | | |
| Automated ion selective electrode | - | - | - | 380-75WE ⁺⁵ 11 | | | | |
| | | | | | | | | |
| Lead | | and the second | 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - | and the second | | | | |
| Atomic absorption; furnace technique * | 239.2 | D3559-85D D3559-90D | 3113 B <u>3113B</u> | | | | | |
| ICP/MS [®] | 200.8_2 | - | - | . - | | | | |
| Atomic absorption; platform furnace * | 200.9_2 | 1 | - | - | | | | |
| | | | | | | | | |
| Mercury | ∂_{α} | 방송에는 물질했는데 물관이 | n an Na State and Anna an Anna Anna an Anna an | | | | | |
| Manual cold vapor technique ⁹ | 245.1 ² | D3223-86 D3223-91 | 3112 B 3112B | • | | | | |
| Automated cold vapor technique? | 245.2 ¹ | - | • | · _ | | | | |
| ICP/MS | 200.8 ² | and the state of the | a da anti-series de la compañía de l | 동네가 있으며 - 제품에서 | | | | |
| | | | 1 | | | | | |
| Nickel | | | | | | | | |
| Atomic absorption; direct aspiration | 249.1 | - | 3111 B <u>3111B</u> | alge de la s <u>a</u> ant | | | | |
| Atomic absorption; furnace technique | 249:2 | _ | 3113 B 3113B | nghasi sat <u>a</u> ri | | | | |
| Atomic absorption; platform furnace | 200.9 ² | - | and a second | a Aren Argen | | | | |
| ICP ⁴ | 200.7 ² | - | 3120 B <u>31</u> 20B | | | | | |
| ICP/MS ⁴ | 200.8 ² | - | | alle a chor <u>a</u> | | | | |
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| | Reference (Method Number) | | | | | | |
|---|--|---|--|--|--|--|--|
| Parameter and Methodology | EPA [†] | ASTM ^e 2 | SM ⁺ ⁴ | Other" | | | |
| Nitrate | | | | | | | |
| Manual cadmium reduction | 353.3 | D3867-90B | 4500-NO ₃₋ E | ∠ 1 | | | |
| Automated hydrazine reduction | 353.1 | | End of the second se | - | | | |
| Automated cadmium reduction | 353.2 | D3867-90A | 4500-NO <u>3 - F</u> | | | | |
| Ion selective electrode | • • • • • • • • • • | | <u>4500-NO3 - D</u> | WeWWG/58807 6017 | | | |
| Ion Chromatography | 300.0 A ⁺⁺⁶ | <u>D4327-91</u> | <u>4110B</u> | B-1011 7 <u>B-10118</u> | | | |
| Nitrite | an de la companya de | and the second secon | an an an an tair tair an tair | | | | |
| Spectrophotometric | 354.1 | - | 4500-NO,-B | = | | | |
| Automated cadmium reduction | 353.26 | D3867-90A | 4500-NO3- F | - | | | |
| Manual cadmium reduction | 353.3 | D3867-90B | 4500-NO ₃ - E | | | | |
| Ion chromatography | 300.0 A ^{#6} | D4327-91 | <u>4110B</u> | B-1011 ⁸ | | | |
| Selenium Atomic absorption; gaseous hydride ⁵⁷⁰ <u>ICP/MS</u> <u>Atomic absorption: platform furnace</u> Atomic absorption; furnace technique ⁶ | 270.3 200.8 ² 200.9 ² 270.2 | D3859-84A <u>D3859-93A</u> - - D3859-88-D <u>D3859-93B</u> | 3114 D <u>3114B</u> - 3113 D <u>3113B</u> | | | | |
| Spectrophotometric | 375.1 | - | - | • | | | |
| Spectrophotometric | 375.2* | | | - | | | |
| Turbidimetric | 375.4 | • | i 📲 i ki shekara shekara ta | 87 - , | | | |
| Ion chromatography | 300.0A ¹¹ 2 | - | - | · · • | | | |
| n | Or a start of the | and a standard and stand | an an Araba ang ang ang ang ang ang ang ang ang an | en e | | | |
| Atomic absorption; platform furnace * | 200.9 ² | • | - | - | | | |
| Atomic absorption; furnace technique | 279.2 | | 3113 B | - | | | |
| ICP/MS | 200.8 ² | - | - | - | | | |
| Turbidity Nephelometric | 180.1 <u>\$</u> | | 2130 B <u>2130B</u> | | | | |
| Great Lakes Instruments | - | • | • | Method 2 | | | |

¹ <u>Method 245.2 is available from US EPA. EMSL. Cincinnati, OH 45268. The identical methods were formerly in Methods for Chemical Analysis of Water and Wastes", EPA Environmental Monitoring and Support Laboratory, Cincinnati, Ohio, 45268 (EPA-600/4-79-020), March 1983, Available from ORD Publications, CERI, EPA, 26 W. Martin Luther King Drive, Cincinnati, Ohio, 45268 at National Technical Information Services, PB84-128677, 5285 Port Royal Road, Springfield, VA 22161. For approved analytical procedures for metals, the technique applicable to total metals shall be used.</u>

^{3.2} The method is found in "Methods for the Determination of Metals in Environmental Samples- <u>Supplement I</u>", ORD Publications, EPA/600/4-91/010, June 1991. <u>EPA/600/R-94-111 May</u> 1994 Available from National Technical Information Service, Order #PB91-231498 <u>#PB94-184942</u>, 5285 Port Royal Road, Springfield, VA 22161.

²² The procedures shall be done in accordance with the "Annual Book of ASTM Standards", Vol. 1994. Vols 11.01. and 11.02 Available from the American Society for Testing and Materials. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies may be obtained from the American Society for Testing Material. 1916 Race Street, Philadelphia, Pennsylvania, 19103. Copies may be inspected at EPA's Drinking Water Docket. 401 M Street. SW. Washington. DC 20460: or at the Office of the Federal Register. 800 North Capitol Street. NW., Suite 700. Washington. DC.

⁴² The procedures shall be done in accordance with the "Standard Methods for the Examination of Water and Wastewater", 17th 18th Edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, 1989[192]. This incorroration by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, N.W., Washington, D.C., 20005. <u>Copies may be inspected at EPA's Drinking Water Docket</u>, 401 M Street, SW. Washington, DC 20450; or at the Office of the Federal Register. 800 North Capitol Street, NW., Suite 700, Washington DC.

* "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments", Techniques of Water Resources Investigation of the United States Geological Survey, Chapter A-1, Third Edition, 1989. Available from Open-File Services Section, Western Distribution Branch, U.S. Geological Survey, MS 306 Box 24525, Denver Federal Center, Denver, CO 80225.

² GLI Method 2. "Turbidity", November 2. 1992. Great Lakes Instruments, Inc., 8855 North 55th Street, Milwaukee, Wisconsin, 53223

⁴ Samples that contain less than 1 NTU (nephelometric turbidity unit) and are properly preserved (cone. HNO₃ to pH <2) may be analyzed directly (without digestion) for total metals, otherwise, digestion is required. Turbidity must be measured on preserved samples just prior to the initiation of metal analysis. When digestion is required the total recoverable technique as defined in the method must be used.

⁴ "Methods for the Determinatin of Inorganic Substances in Invironmental Samples", EPA-600/R-93-100, August 1993. Available at NTIS, PB94-121811

7-10 Orion Guide to Water and Wastewater Analysis." From WeWWG/5880, p. 5, 1985. Orion Research, Inc. Cambridge, MA.

² The procedure shall be done in accordance with the Technical Bulletin 601 "Standard Method of Test for Nitrate in Drinking Water", July 1994. PN 221890-001, Analytical Technology, Inc. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies may be obtained from ATI Orion. 529 Main Street. Boston, MA 02129. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW, Washington, DC 20460: or at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, DC.

- ⁸ "Waters Test Method for the Determination of Nitrite/Nitrate in Water Using Single Column Ion Chromatography", Method B-1011, Millipore Corporation, Waters Chromatography Division, 34 Maple Street, Milford, MA 01757.
- ⁹ For the gascous hydride determinations of antimony, arsenie, and selenium and for the determination of mercury by the cold vapor techniques, the proper digestion technique as defined in the method must be followed to ensure the element is in the proper state for analyses.
- #2 Method 100.1. "Analytical Method For Determination of Asbestos Fibers in Water", EPA-600/4-83-043, EPA, September 1983. U.S. EPA, Environmental Reaearch Laboratory, Athens, GA 30613. <u>Available at NTIS, PB83-260471.</u>
- Mad 2 mL of 30% H.Q. and an appropriate concentration of matrix modifier Ni(NO3)2+6H2O (nickel nitrate) to samples.
- Method 100.2. "Determination Of Asbestos Structures Over 10-um In Length In Drinking Water". EPA-600/R-94-134, June 1994. Availabel at NTIS. PB94-201902.
- **- "Method 300.0 Determination of Inorganic Anions in Water by Ion Chromatography." Inorganic Chemistry Branch, Environmental Monitoring Systems Laboratory: August 1991.

The procedures shall be done in accordance with the Industrial Method No. 129-71W. "Fluoride in Water and Wastewater". December 1972. and Method No. 380-75WE. "Fluoride in Water and Wastewater". February 1976. Technicon Industrial Systems. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies may be obtained from the Technicon Industrial Systems. Tarrytown. NY 10591. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW. Washington. DC 20460: or at the Office of the Federal Register. 800 North Capitol Street, NW., Suite 700. Washington. DC.

* "Standard Methods for the Examination of Water and Wastewater", 16th Edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, 1985. American Public Health Association, 1015 Fifteenth Street, N.W., Washington, D.C. 20005. (16th Edition is available on inter-library loan.)

14- "Fluoride in Water and Wastewater Industrial Method #129-71W". December 1972. Available from Technicon Industrial Systems, Benedict Avenue, Tarrytown, New York, 10591.

"--- "Fluoride in Water and Wastewater", February 1976. Available from Technicon Industrial Systems, Benedict Avenue, Tarrytown, New York, 10591.

Section 21. NR 809.725 Table B is amended to read:

TABLE B

SDWA Approved Methodology for Organic Contaminants

| | Reference (Method Number) |
|--|--|
| Contaminant | EPA ¹² |
| Regulated Parameters: | |
| the state of the set of the set of the set | 化丁基基 医黄疸 化化合金 医动物 计分子问题 化分子子 机械工具 化乙烯二乙烯 |
| Synthetic Organic Compounds (SOCs) | |
| Alachlor | 505 ⁴ , 507, 525.1 , <u>525.2, 508.1</u> |
| Aldicarb | - 531.1 characteristic and the second |
| | - 531.1 |
| | - 531.1 |
| Atrazine | 505 ⁶ , 507, 525.1 , <u>525.2, 508.1</u> in a second state of the seco |
| Benzo[a]pyrene | 550, 550.1, 525.1, <u>525.2</u> does not be a set of the first of the product of the first of the set of the |
| Carbofuran | 7 531:1, <u>6610⁵ (1997)</u> (1997) - 1997 - 2017 (1997) - 199 |
| Chlordane | 505, 508, 525.1 , <u>525.2, 508.1</u> |
| Dalapon | - 515.1, <u>552.1</u> |
| Dibromochloropropane | |
| Di(2-ethylhexyl)adipate | 506, 525.1 , <u>525.2</u> |
| Di(2-ethylhexyl)phthalate | s 506, 525.1, <u>525.2</u> the selectory of the selectory o |
| Dinoseb | 515.1, <u>515.2, 555</u> |
| Diquat | er <mark>549, <u>549, 1</u>. en </mark> |
| 2,4-D | 515.1, <u>515.2, 555</u> |
| Endothall | 1 548 <u>548.1</u> |
| Endrin | 505, 508, 525.1 , <u>525.2, 508.1</u> |
| Ethylene Dibromide (EDB) | 504 , <u>504.1.551</u> |
| Glyphosate | 547, <u>6651</u> |
| Heptachlor | 505, 508, 525,1 , <u>525,2</u> , <u>508,1</u> |
| Heptachlor Epoxide | 505, 508, 525.1 , <u>525.2</u> , <u>508,1</u> |
| Hexachlorobenzene | 505, 508, 525.1 , <u>525.2</u> , <u>508.1</u> |
| Hexachlorocyclopentadiene | 505, 525.1 , <u>525.2, 508 508.1</u> |
| Lindane | 505, 508, 525.1 , <u>525.2</u> , <u>505.1</u> |
| Methoxychlor | 505, 508, 523.1 , <u>525.2</u> , <u>508.1</u> |
| Oxamyl (Vydate) | - <u>331-1, <u>0010</u>⁻</u> |
| Picloram | 515.1, <u>515.2, 555</u> |

and the second second

Polychlorinated Biphenyls (PCBs) 505, 508; 508A² Pentachlorophenol 515.1, 525.1, <u>515.2, 525.2, 555</u> Total Trihalomethanes (TTHM) 502.1, 502.2, 524.1, 524.2, <u>551</u> 505^e, 507, 525.1, <u>525.2, 508.1</u> Simazine Toxaphene 505, 508, 525.1, 525.2 2,3,7,8-TCDD (Dioxin) 1613³ 515.1, 515.2, 555 2,4,5-TP (Silvex) 502.1, 502.2, 503.1, 524.1, 524.2 Volatile Organic Chemical (VOCs) Volatile Organic Chemical (VOCs) 502.2, 524.2 Benzene Carbon Tetrachloride 502.2. 524.2. 551, 502.2. 524.2 Chlorobenzene 504.1.551 Dibromochloropropane (DBCP) 1.2-Dichlorobenzene 502.2, 524.2 1.4-Dichlorobenzene 502.2. 524.2 1.2-Dichloroethane 502.2, 524.2 cis-Dichloroethylene 502.2. 524.2 trans-Dichlorethylene 502.2. 524.2 502.2. 524.2 Dichloromethane 502.2. 524.2 1.2-Dichloropropane Ethylbenzene <u>502.2. 524.2</u> 502.2. 524.2 Styrene 502.2. 524.2. 551 Tetrachloroethylene 1,1,1-Trichloroethane 502.2, 524.2, 551 502.2. 524.2. 551 Trichloroethylene 502.2. 524.2 Toluene 502.2. 524.2 1.2.4-Trichlorobenzene 1.1-Dichloroethylene 502.2. 524.2 1.1.2-Trichlorothane 502.2.524.2 502.2. 524.2 Vinvl Chloride Xylenes (total) 502.2. 524.2 **Unregulated Parameters** Aldicarb 531.1, 6610⁵ 531.1.6610⁵ Aldicarb sulfone Aldicarb Sulfoxide <u>531.1. 6610⁵</u> 505, 508, 525.1, 525.2, 508.1 Aldrin Butachlor 507, 525.1 525.2 Carbaryl 531.1, <u>6610</u> Dicamba 515.1, 555, 515.2 505, 508, 525.1, <u>525,2, 508.1</u> Dieldrin 3-Hydroxycarbofuran 531.1. 6610⁵ 531.1, 6610⁵ Methomyl 507, 525.1, <u>525.2, 508.1</u> Metolachlor 507, 508, 525.1, 525.2, 508.1 Metribuzin Propachlor 508 507, 525.1, 525.2, 508.1

¹ Procedures for Methods 502.2, 505, 507, 508, 508A, 515.1 and 531.1 are in "Methods for the Determination of Organic Compounds in Drinking Water", ORD Publications, CERI, EPA/600/4-88/039 EPA-600/4-88/039, December 1988, Revised, July 1991. Methods 506, 547, 550, 550.1 are in "Methods for the Determination of Organic Compounds in Drinking Water, Supplement I", ORD Publications, CERI, EPA-600/4-90/020, July 1990. Methods 515.2, 524.2, 548.1, 549.1, 552.1 and 555 are in "Methods for the Determination of Organic Compounds in Drinking Water, Supplement II", EPA-600/4-90/020, July 1990. Methods 515.2, 524.2, 548.1, 549.1, 552.1 and 555 are in "Methods for the Determination of Organic Compounds in Drinking Water, Supplement II", EPA-600/R-92-129, August 1992. These documents are available from the National Technical Information Service (NTIS), U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161 as publications NTIS PB1-231480, PB91-146027, and PB92-207703. The toll-free number is 1-800-336-4700.

² Method 505 or 508 can be used as a screen for PCBs. Method 508A shall be used to quantitate PCBs as decachlorobiphenyl if detected in Method 505 or 508. PCBs are qualitatively identified as Aroclors and measured for compliance purposes as decachlorobiphenyl

³ Method 1613, "Tetra-through Octa-Chlorinated Dioxins and Furons by Isotope Dilution. <u>HRGC/HRMS</u>", <u>EPA-821/B-94/005, October 1994.</u> Method 1613 can be used to measure 2,3,7,8-TCDD (dioxin). This method is available from VSEPA-OST, Sample Control Center, P.O. Box 1407, Alexandria, VA 22313. <u>National</u> Technical Information Service. NTIS PB95-104774.

⁴<u>Method 6651 shall be followed in accordance with the "Standard Methods for the Examination of Water and Wastewater".</u> 18th Edition. 1992. American Public Health Association. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies may be obtained from the American Public Health Association. 1015 Fifteenth Street. N.W., Washington, D.C., 20005. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW, Washington, DC 20460; or at the Office of the Federal Register. 800 North Capitol Street. N.W., Suite 700. Washington DC.

⁵<u>Method 6610 shall be followed in accordance with the "Suppliment to the 18th edition of Standard Methods for the Examination of Water and Wastewater", 1994.</u> American Public Health Association This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, N.W., Washington, D.C., 20005. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW, Washington, DC 20460; or at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700. ² A nitrogen-phosphorus detector should be substituted for the electron capture detector in Method 505 (or other approved method should be used) to determine alachlor, atrazine and simizine, if lower detection limits are required.

² EPA Methods 504.1,508.1, and 525.2 are available from US EPA EMSL, Cincinnati, OH 45268. The phone number is (513) 569-7586.

Section 22. NR 809.725 Table C is amended to read:

| | | (a) A set of the se | | | |
|--|---|---|--|--|--|
| | Methodology | EPA [†] | Standard Methods (18th 16th Edition ¹) | | |
| Total Coliform Bacteria ⁸ | Multiple tube fermentation ^{3 <u>4.5</u> (preferred for turbid or high noncoliform populations)} | Part III, Section B, 4.1 thru 4.6.4(c) (pp. 114-118) | 908, 908A, and 908B (pp. 870-878) <u>9221A.B.C</u> | | |
| | Membrane filter ^t (preferred because large volumes of samples analyzed in much shorter time) | Part III, Section B, 2.1 thru 2.6 (pp. 108-112) | 909, 909A, and 909B (pp. 886-896) 9222A.B.C | | |
| | Minimal Media ONPG-MUG (MMO-MUG) Test ^{\$2} | ing National Annual Annual Annual Annual | <u>9223</u> | | |
| | Chromogenic/Fluorogenic ¹⁰ | | see footnote 10 | | |
| | Presence - Absence (P-A) Coliform Test ²⁶ | | 908E (pp. 882-886) <u>9221D</u> | | |
| Total Fecal Coliform, Concentration | Standard Total <u>Fecal</u> Coliform Multiple Tube (MPN) ² Tests | | 908A, 908B, and 908D <u>9221E</u> | | |
| | Standard Total Fecal Coliform Membrane Filter (MF) Procedure | | 909A or 909B <u>9222D</u> | | |
| | Minimal Modium ONPG MUG Test? | | a Barana a sa | | |
| Fccal Coliform, follow up for positive total coliform test | EC Medium | | 908C (pp. 879, par. 1a) | | |
| Escherichia coli | EC Medium + MUG ⁷ | | 908C (pp. 879) | | |
| | Nutrient Agar + MUG ⁷ | | 908B (pp. 874) | | |
| Fecal Coliform Concentration | Minimal Medium + MUG (MMO-MUG) ³⁷ Fecal Coliform MPN Procedures Fecal Coliform MF Procedures | | 908C or 908D, (pp. 878-882) 908C or 908D, (pp. 878-882) 909C (pp. 896-898) | | |
| Waterotrophic Plate Count? | Pour Plate Method | and the second | 907A (pp. 864-866) 9215B | | |

, inc

-30

| | TABLE C |
|------|---|
| sdwa | Approved Methodology for Microbiological Measurements |

*-Whierobiological Methods for Monitoring the Environment, Water and Wastes", EPA-600/8-78-017, December 1978. Available from the U.S. EPA, Environmental Monitoring and Support Laboratory, 26 W. Martin Luther King Drive, Cincinnati, Ohio, 54268.

⁴¹ Except where noted. all methods refer to the "Standard Methods for the Examination of Water and Wastewater", 16th 18 Edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, 1985.

³ The standard sample size for MPN procedure shall be 10 times the standard portion of 10 ml.

* A standard sample size of 100 ml shall be used for the membrane filter.

¹ Analyses shall be conducted in accordance with the analytical recommendations set forth in "National Field Evaluation of a Defined Substrate Method for the Simultaneous Detection of Total Coliforms and Escherichia coli from Drinking Water. Comparison with Presence - Absence Techniques", (Edberg et al.), Applied and Environmental Microbiology, 55, pp. 1003-1008, April 1989. Available from the American Water Works Association Research Foundation, 6666 West Quincy Ave., Denver, CO 80235.

⁴ Analyses shall be conducted in accordance with the analytical recommendations set forth in "National Field Evaluation of a Defined Substrate Method for the Simultaneous Enumeration of Total Coliforms and Escherichia coli from Drinking Water: Comparison with the Standard Multiple Tube Formentation Method", (Edberg et al.), pp. 1595-1601, June 1988 (as amended under Erratum, Volume 54, p. 3197, December, 1988). Available from the American Water Works Association Research Foundation, 6666 West Quincy Ave., Deaver, CO 80235.

7-Analyses shall be conducted in accordance with the analytical procedure described in Federal Register, Vol 56, No. 5, Tuesday, January 8, 1991, Rules and Regulations, pp. 642-643, 40 CFR Part 141.21(f)(5&6) and Federal Register, Vol 57, No. 112, Wednesday, June 10, 1992, Rules and Regulations, p. 24747, 40 CFR Part 141.21(f)(3, 6, & 7). ² The time from sample collection to initiation of analysis may not exceed 8 hours. Sample must be iced

² Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between this medium and lauryl tryptose broth using the water normally tested, and this comparison demonstrates that the false-positive rate for total coliforms, using lactose broth, is less than 10 percent.

⁴ If inverted tubes are used to detect gas production, the media should cover these tubes at least one-half to two-thirds after the sample is added.

² No requirement exists to run the completed phase on 10 percent of all total colliform-positive confirmed tubes

² Six-times formulation strength may be used if the medium is filter-sterilized rather than autoclaved

² The ONPG-MUG Test is also known as the Autoanalysis Colilert System.

⁸ The time from sample collection to initation of analysis should not exceed 30 hours. If the laboratory analyzes the sample between 30 and 48 hours after collection, results are indicated as possibly invalid

² A-1 broth may be held up to three months in a tightly closed screwcap tube at 4°C.

¹⁰ This is also known as the Colisure Test. The Colisure Test must be incubated for 28 hours befor examining the results. If an examination if the results at 28 nours is not convenient, the results may be examined at any time between 28 and 48 hours. A description of the Colisure Test may be obtained from the Millipore Corp., Technical Services Department, 80 Ashby Road, Bedford, MA 01730

Section 23. NR 809.725 Table D is amended to read:

| | | SDWA Ap | proved Meth | nodology | for Radio | logical Measurer | nents | and the second second | | · . |
|----------------------------|--|--|--|------------------------------|--------------|---|---|--|--------------------------------|---|
| | an a | an a | | | Re | ference (method | or page numbe | r) – 1997 – (* 1997 | - | |
| Parameter | Method | EPA ¹ | EPA ² | EPA ³ | <u>EPA</u> ⁴ | Standard Methods² SM^{5.} | ASTM ^{9 §} (1975) | <u>USGS</u> ' | DOE ⁸ | Others |
| Naturally Occurring: | | - | | | | | | | | |
| Gross alpha Gross | Total suspended | 900 | <u>p1</u> | <u>00-01</u> | <u>p1</u> | 302 <u>. 7110 B</u> | | <u>R-1120-76</u> | | e en la companya de l La companya de la comp |
| alpha ¹¹ & beta | and dissolved | | | | | | | n an the state of the | e.et. | al mir Marut |
| | Evaporation | | | | | | and the second se | | | |
| Gross alpha ¹¹ | co-precipitatation | | | <u>00-02</u> | | <u>7110 C</u> | | | | |
| Total radium | Precipitation | 903 | | | | 304 | | | | r Haffinger (finger S |
| Radium 226 | Soluble, suspended | 903.1 <u>903.0</u> | <u>P 16</u> p13 | <u>Ra-04</u> <u>Ra-03</u> | <u>p 19</u> | <u>7500-Ra C</u> <u>304,</u> 305, | <u>D 3454-91</u> <u>D 2460-90</u> | <u>R-1141-76</u> <u>R-1140-76</u> | <u>Ra-05</u> | <u>N.Y.</u> 9 |
| | Radon emanation. Radiochemical | | en en ser ser en se | | | <u>7500-Ra B</u> | | | t i estrue a prefiliere est | allettaa alle alle ander 1 |
| Radium 228 | Radiochemical | <u>904.0</u> | <u>P 24</u> | <u>Ra-05</u> | <u>p 19</u> | <u>304.7500-</u> <u>Ra D</u> | in franke Sales sterres fr | <u>R-1142-76</u> | na servit | N.Y. ⁹ N.J. ¹⁰ |

| | TABLE D |
|-----|--|
|)WA | Approved Methodology for Radiological Measuremer |

| | ······································ | | | · · · · · · | Ref | erence (method of | or page number |) , | | |
|--|--|---|--|-------------------------|--|---|--|---|---|--|
| Parameter | Method | EPA ¹ | EPA ² | EPA ³ | <u>EPA</u> ⁴ | Standard Methods ² SM ⁵ | ASTM ^{3 <u>§</u> (1975)} | USGS ⁷ | DOE ⁸ | Others |
| Uranium ¹² | Radiochemical. Fluorometric | <u>908.0</u> 908.1 | en e sta Transformer | e Socialis El consta | anter a la composición de la composición El terreter de la composición de la comp | <u>7500-U B</u> <u>7500-U C</u> (17th Ed) | <u>D2907-91</u> | <u>R-1180-76</u> <u>R-1181-76</u> R-1182-76 | <u>U-04</u> U-2 | |
| | Alpha spectrometry | | x | <u>00-07</u> | <u>p 33</u> | <u>7500-U C</u> (18th or 19th Ed | <u>D 3972-90</u> | | · · · · · · | |
| | <u>Laser</u> Phosphorimetry | | a se po | . ""- | | | <u>D 5174-91</u> | | | |
| <u>Man-Made</u> : | | | | | | an dhuinn an sha An Anna Anna | and the second | a da serie a series. | | |
| <u>Radioactive</u> Strontium - 89, 90 | Total Radiochemnical | 905 <u>905.0</u> | <u>p 29</u> | <u>Sr-04</u> | <u>p 65</u> | 303 <u>. 7500-</u> <u>Sr B</u> | | <u>R-1160-76</u> | <u>Sr-01</u> <u>Sr-02</u> | |
| Tritium | Liquid Scintillation | 906 906.0 | <u>p 34</u> | <u>H-02</u> | <u>p 87</u> | 306 <u>. 7500-</u> <u>3H B</u> | <u>D 4107-91</u> | <u>R-1171-76</u> | n Linear References (Constant Linear | |
| De lie estine Casium - | Descinitation & hate | 901 | | | | | D3459 | | | |
| Hadioactive Cestum - | counting [#] | 11.11 | | | | | - 11. 42 | | | |
| | Radiochemical. | <u>901.0</u> | <u>p 4</u> | | · | <u>7500-Cs B</u> | <u>D 2459-72</u> | | | |
| e na Vor Gar e | Gamma ray | <u>901.1</u> | n in de la competition Anna anna anna anna anna anna anna ann | | <u>p 92</u> | <u>7120 (19th</u> | <u>D 3649-91</u> | <u>R-1110-76</u> | 4.5.2.3 | |
| | spectrophotometry | | | | | <u>1×1.1</u> | | | | an a |
| Uranium | Fluorometry | 908.1 | | ••• | Man , A | · · · · · · · · · | D2907 | | · | (5)(0) |
| Others | and and a second se | | \mathcal{D}^{*} | | | | 5 6 (10 01 | | 4500 | · · · · · |
| Radioactive Iodine | Radiochemical. Gamma ray spectrophotometry | <u>902.0</u> <u>901.1</u> | <u>P 6</u> p9 | | <u>p 92</u> | <u>7500-1 B</u> <u>7500-1 C</u> <u>7500-1 D</u> | <u>D 3649-91</u> <u>D 4785-88</u> | | <u>4.5.2.5</u> | |
| 10.7 | | • | | | 1. N. N. N | <u>7120 (19th</u> Ed) | | en jagen er | | A. A. S. S. |
| Gamma Emitters | <u>Gamma Ray</u> | <u>901.1</u> | Sec. 1 | | <u>p 92</u> | <u>7120 (19th</u> Ed.) | <u>D 3649-91</u> D 4785-88 | | | <u>4.5.2.3</u> |
| $\frac{2\pi}{4} \frac{2\pi}{4} \frac$ | <u>Spectrometry</u> | <u>902.0</u> 901.0 | en en en en Recentration | • • | * | <u>7500-Cs B</u> 7500-I B | 100-00 | | <u></u> | |
| | | • · · · · · · · · · · · · · · · · · · · | 1 | | | | e l'agrico de la composición de la comp | | | |

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¹ "Prescribed Procedures for Measurement of Radioactivity in Drinking Water", EPA-600/4-80-032. August, 1980. Available from the EMSL, Office of Research and Development, U.S. EPA, 26 W. Martin Luther King Drive, Cincinnati, Ohio, 45268.

2- "Standard Methods for the Examination of Water and Wastewater", 13th Edition, (1971), APHA, 1015 Fifteenth Street, N.W., Washington, D.C. 20005 (13th Edition no longer available):

4

Interim Radiochemical Methodology for Drinking Water", EPA 600/4-75-008(revised), March 1976. Available at NTIS. ibid PB 253258.

² "Radiochemistry Procedures Manual", EPA 520/5-84-006, December 1987, Available at NTIS, ibid, PB 84-215581

4 "Radiochemical Analytical Procedures fir Analysis of Environmental Samples", March 1979. Available at NTIS, ibid. EMSL LV 053917

2 "Standard Methods for the Examination of Water and Wastewater". 13th Edition. 17th. 18th. 19th Editions. 1971, 1989, 1992. 1995. Available at APHA, 1015 Fifteenth Street, N.W., Washington, D.C. 20005. All methods are in the 17th. 18th and 19th editions except 7500-U C Fluorometric Uranium was discontinued after the 17th Edition. 7120 Gamma Emitters is only in the 19th Edition. and 302, 303, 304, 305 and 306 are only in the 13th Edition.

Annual Book of ASTM Standards, Vol. 11.02, 1994. Available at Amarican Society for Testing and Materials. 100 Barr Harbor Drive. West Conshohocken, PA 19428.

² "<u>Methods for Determination of Radioactive Substances in Water and Fluvial Sediments". Chapter A5 in Book 5 of Techniques of Water Resources Investigations of the United States Geological Survey. 1997. Available at U.S. Geologial Survey (USGS) Information Services, Box 25286 Federal Center. Denver. CO 80225-0425.</u>

* "EML Procedures Manual", 27th Edition, Volume 1, 1990 Available at the Environmental Measurements Laboratory, U.S. Department of Energy (DOB), 376 Hudson Street, New York, NY 10014-3621.

2 "Determination of Ra-226 and Ra-228 (Ra-02)", January 1980. Revised June 1982. Available at Radiological Sciences Institute Center for Laboratories and Research. New York State Department of Health. Empire State Plaza, Albany, NY 12201.

¹⁰ "Determination of Radium 228 in Drinking Water", August 1980. Available at State of New Jersey, Department of Environmental Protection, Division of Environmental Quality, Bureau of Radiation and Inorganic Analytical Services. 9 Ewing Street, Trenton, N.J. 08625

<u>Natural uranium and thorium-230 ar approved as gross alpha calibration standards for gross alpha with co-precipitation and evaporation methods, american-241 is approved with co-precipitation methods.</u>

If uranium (U) is determined by mass, a 0.67 pCi/g of uranium conversion factor must be used. This conservative factor is based on the 1:1 activity ratio of U-234 to U-238 that is characteristic of naturally occurring uranium.

Section 24. NR 809.725 Table E is amended to read:

TABLE E

SDWA Approved Methodology for Physical Parameters, Residual Chlorine, Sodium, Corrosivity, and Secondary Contaminants Standard

| Parameter and Method | EPA ⁺² | M | ethods ²³ | ASTM ⁹⁴ | USGS ⁴⁵ | Other |
|---|---|---|---|---|---|------------------------------------|
| Alkalinity - <u>Titimetric</u> | 310.1 | | 2320 <u>B</u> | D1067-88(D) <u>D1067-</u> <u>92(B</u>) | I-1030-85 | - |
| Aluminum - Total ⁶ , Digestion, followed by: | | | | | الله الله . المحمد المحمولية المحمد ال | |
| Atomic absorption (AA); direct aspiration | 202.1 | | 3111 D 3111D | • • • • • • • • • • • • • • • • • | I-3051-85 | . . |
| Atomic absorption (AA); graphite furnace | 202.2 | | 3113 B 3113B | | - | - |
| Inductively-coupled plasma (ICP) | 200.7 ^{±9} | | 3120 B 3120B | - | - | - |
| Inductively-coupled plasma; mass spectrometry (ICP/MS) | 200.8** | | _ | - | sadarta da t ara ang t | - |
| Atomic absorption (AA); platform furnace | 200.9 ^{±9} | | - | المراجع | and the second second | - |
| Calcium EDTA titrimetric ^{*0} AA; direct aspiration ICP | 215.2 215.1 200.7 ¹⁹ | | 3500-Ca D 3111 B <u>3111B</u> 3120 B <u>3120B</u> | D511-68(A) D511-93(A) D511-68(B) D511-93(B) - | (1) Say of the end of the state of the second se | - - - |
| Chloride | | | | | and a law at a | |
| Potentiometric ¹⁰ | - | | 4500-CI-Ð <u>4500-</u> CI-D | - | tan | - |
| Colorimetric (ferricyanide) manual or | - | | • | D512-89(C) | ~ I-1187-85 | - |
| Automated | 325.1, 325.2 | | 4500-CI-E | - | I-2187-85 | - |
| Titrimetric, Mercuric Nitrate | 325.3 | | 4500-CI ⁻ C | D512-89(A) | I-1184-85 | 973. 51 * |
| Ion Chromatography | 300.0 A % | | <u>4110</u> | <u>D4327-91</u> | - | - |
| | j. | | 1.00 | | | |

| | | | Standard | | |
|-------------|--|---|---|---|---|
| Paramete | r and Method | EPA ⁺² | Methods ^{#3} | ASTM ⁹⁴ | USGS ⁴⁵ Other |
| Chlo | rine dioxide residual | | | | |
| Amp | erometric | • | 4500-ClO ₂ C | e da la Sectoria de Carlos de C | and the second secon |
| DPD | | - | 4500-ClO ₂ D | - | · · |
| | | | | | and the second |
| Colo | r | | in the second | | dine supervision of a provide structure of the structure |
| Colo | rimetric, Pt-Co | 110.2 | 2120 B <u>2120B</u> | - | I-1250-85 - |
| Spec | trophotometric | 110.3 | 2120 C | | and the second |
| | | | | | |
| Con | luctivity | 120.1 | 2510 <u>B</u> | D1125-82(B) D1125- 91(A) | - 1948 - 1948 - 1948 - 1948 - 1948 - 1948 - 1948 - 1948 - 1948 - 1948 - 1948 - 1948 - 1948 - 1948 - 1948 - 1948 |
| | | | | | |
| Corr | osivity | | Alar - Alar | en en en station de la faite | (2) Reserve the average of the second sec |
| Land | elier Index ¹⁹ | 1970 - 1978 - 197 | 2330 | • | A second sec second second sec |
| Age | essive Index | _ | - | | |
| 1,99 | COSTO MARA | | | | C400 |
| | | | | | -77 ⁷ |
| | A state of the second se second second s second second se | | | | and the second first of the second state of the second |
| 17. | where A source (MADAC) | | | <i>,</i> | |
| Colo | rimetric | 425.1 | 5540 C 5540C | n an tha star an tha an tha star and star and star Tha star and | n an |
| | | | | | |
| Free | chlorine residual ¹¹ | a da ante da comencia da co | al states in the second | | and the second |
| Colo | rimetric or ferrous titrimetric DPD | - | 4500-Cl G or F | ' | and the second |
| Amn | erometric | 330.1 | 4500-C1 D | D1253-76(A) | • • |
| Svrin | saldazine | • | 4500-C1 H | tin and the second s | |
| <u>7148</u> | and the second | | | | |
| Tota | Chlorine | | | | |
| 1014 | aromatric titration | | 4500-C1 D | - | - · · · |
| Amo | erometric titration | _ | 4500-C1 E | - | |
| Auto | Formeure ditrimetrie | - | 4500-C1 E | - | |
| | <u>Ferrous unmerne</u> | - | 4500-C1G | _ | · |
| DPD | Colorimetric | - | 4500-CLU | e de la companya de l | |
| lodo | metric Electrode | • | | | 9 V 1 |
| _ | | | | | |
| Iron | - Total- ² , Digestion, followed by: | | 0111 D C | $D_{10}(0, 0, 4, (0, -, -, D))$ | L2201-04/C |
| AA; | direct aspiration | 230.1 | JIII DOIC | D1008-84 (C 01 D) | |
| | | | <u>3111B</u> | | 10) 915. 011 |
| | | | | | 27 |
| AA; | graphite furnace | 236.2 200.9 | 3113-B <u>3111B</u> | 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - | |
| ICP | | 200.7** | 3120 B <u>3120B</u> | · · · · · · · · · · · · · · · · · · · | |
| | | | | | |
| Man | ganese - Totate, Digestion, followed by: | | | ***** | 1 2 454 85 |
| AA; | direct aspiration | 243.1 | 3111 B or C | D858-90(A) | CO-PCPC-1 |
| | | | <u>3111B</u> | | 974. |
| | Contraction of the second s | | | | 27 |
| AA: | graphite furnace | 243.2 200.9 | 3113 B <u>3113B</u> | • | |
| ICP | 5-1 | 200.7 ^{ts} | 3120 B <u>3113B</u> | · – | - · · · · |
| Colo | rimetric (Persulfate) | - | 3500-Mn D | | A start s |
| Indu | tively-counled plasma: mass spectrometry | 200.8 | | 1 m | |
| (TCP/I | MS) | Sec. 1 | | | |
| 1101/1 | TAD7 | | | | |
| Odo | . Threshold Odor | 140.1 | 2150B | · · · · · | - · · · · · · · · · · · · · · · · · · · |
| Cuo | | | | | |
| Owth | onhogenhate Unfiltered no digestion or hydrolysis | | | | |
| Oru | opnospirate, Onincred, no digestion of hydrolysis | 265 11 | 4500.P E | _ | |
| Colo | imetric, automated, ascorbic acid | 265.2 | 4500 P F | - | • |
| Colo | mictate, ascorote acta, two reagent | 365.0 | 4500-P F | D515-88(A) | |
| C010 | imetric, ascoroic acid, single reagent | 505.2 | 4000-1 15 | 2010 00(11) | I-1601-85 |
| Colo | rimetric, phosphomolyddate; | • | - | - | 1-2601-85 I- |
| ลเ | itomated segment flow | 1 | • | - | 2601-90 |
| | · · · · · | | | | I-2598-85 |
| a | itomated discrete | 200.0411 | - | | |
| Ion c | nromatograpny | 300 0 4 1 * | 4110 | 0-1527-00 <u>0-1527-91</u> | |
| - | | | | | the part of the second s |
| Ozor | | | 4600 A D | | |
| Indig | o Method | • * * * * * * * | 4000-03B | • | |
| | | | | a ^{la a} lta de la companya de | 107- |
| | | | | | 176** |
| | | | | | |
| pH | | | | 1.0.1 | 2010 (1949) - 10 (1970) ¹ |
| Elect | rometric | 150.1 | 4500-Н* <u>-В</u> | D1293-84 (B) | |
| | | 150.2 | - | - | • • |
| Silic | 1 | | | | |
| Colo | imetric, molybdate blue | | · • | - 1 | I-1700-85 - |

•

| Latomate'segmented flow: | ameter and Method | EPA ⁺² | Methods ²³ | ASTM ⁹⁴ | USGS ⁴⁵ C |
|--|---|--|--|---|--|
| Colorization 994+ | Automated-segmented flow: | • | - | - | I-2700-85 |
| Molyboliticse - 4000 Si D - Automatic method for molybulas-reactive allia - 4000 Si D - Automatic method for molybulas-reactive allia - 4000 Si D - Automatic method for molybulas-reactive allia - 4000 Si D - Automatic method 9994 - - - Ard, direct application 9994 - - - Ard, direct application 9994 - - - - IVP 200.7° 9994 - - - - - - IVP 200.7° 9994 - | Colorimetric | 370.1 | | D859-88 | na se contra - Cana |
| Heinspitz has 4005 Si E Anomuel michol for molydae-reactive sills 200.7" Johnson Johnson 200.7" Sadium - Total ⁴ , Digestion, followed by: 200.7" Ari, direct applation 200.7" Silver - Total ⁴ , Digestion, followed by: 200.7" Ari, direct applation 200.7" Silver - Total ⁴ , Digestion, followed by: 200.7" Ari, graphin finance 200.7" Silver - Total ⁴ , Digestion, followed by: - Ari, graphin finance 200.7" Silver - Total ⁴ , Digestion, followed by: - Ari, graphin finance 200.7" Silver - Total ⁴ , Digestion followed by: - Ari, graphin finance 200.7" Silver - Total ⁴ , Digestion followed by: - Ari and since the solution followed by: - Ari and since the solution followed by: - Ari andintermide 199.1 | Maluhdasilisate | | 4500-Si D | - | an a |
| Heteropy bits 4000-31 B LCP 200,7" Software Total 4", Digestion, followed by: A.4, direct application A.4, graphic finance 200,7" State CP State State < | Morybuosinicate | - | 4500-51 D | - | |
| Automated method for molybdar-reactive silica 4000-Si F - Softur - Total % Digestion, followed by: 200,7" 34000 Si F - Ard, direct spinster, franzee 2794 34100 Si F - Ard, direct spinster, franzee 2794 34100 Si F - Silver - Total %, Digestion, followed by: 3260-Ne-D 34260-BE - Ard, direct spinster, franzee 2794 341115 - - Ard, graphic franzee 2792, 8 - - - - Ard, graphic franzee 2792, 8 - | Heteropoly blue | an an 📲 an an an | 4500-Si E | an a the second second | الأجابي مما معروفين فالأحا مرافيا الافتار الا |
| CP 200.7* 9499 9 1209 Sodium: Total- ⁴ , Digestion, followed by: 9754 9441 9 2111B Ar. direct application 9754 9441 9 2111B CP 200.7* 9299 0 Statum: Total- ⁴ , Digestion, followed by: 13720-85 A.3: graphine finance 9754 9411 9 000 A.4: direct application 9754 9411 9 000 A.4: direct application 9754 9411 9 000 A.4: graphine finance 9754 9411 9 000 A.2: pation finance 9752 9499 9 1202 CP 200.7* 9499 9 1202 - KCP 200.8* - - Staffat 200.8* - - Stocotonkomstrik 200.8* - - CPANS 200.8* - - Stocotonkomstrik 200.8* - - Construction 920.4 9411 9 00 - Temperature, Thermometric 2500 - - Total Filterable Residue (TDS), gravimetric 1661 2464 2590C - Total Filterable Residue (TDS), gravimetric 1601 2464 2590C - Total Filterable Residue (TDS), gravimetric 10001 1111B - | Automated method for molybdate-reactive silica | | 4500-Si F | - | - |
| Sodium - Total ⁴ , Digestion, followed by: 279-1 944+0 944+0 944+0 A.: direct application 279-2 2500 Nr-B Directo 60 Silver - Total ⁴ , Digestion, followed by: 379-1 944+0 Directo 60 A.: direct application 979-1 944+0 Directo 60 Silver - Total ⁴ , Digestion, followed by: 379-1 944+0 Directo 60 A.: graphic finance 200,7* 9429-0 - - A.: graphic finance 200,0* 1110 - - A.: graphic finance 200,0* - - - A.: graphic finance 200,0* - - - Solitas 200,0* 12020 - - - Solitas 200,0* 1410 - - - Solitas 200,0* 12020 - - - Solitas 200,0* 12000 - - - Solitas 200,0* 25002 - - | ICP | 200.7** | 3120 B <u>3120B</u> | en a ser en | معاد منهم را معر <mark>ب</mark> م الأدر را |
| Sodian - 1062-4, Descino, followed by: Ar, direct application, followed by: Suffate | o 10 m / 146 m / / / 11 | | | a da a a constante en estado | an an ann an an Anna Anna Anna Anna Ann |
| AA, direct appliation 9754 9744 91419 - | Socium - Totar-2, Digestion, followed by: | | | | |
| Arty graphic finance 979-2 979-2 978-2 978-2 ICP 200,7* 979-2 978-2 978-2 978-2 Silver - Total *1, Digestion, followed by: 3950-90-10 13720-85 13720-85 Art, graphic finance 979-2 978-10 13720-85 Art, patching finance 979-2 978-10 1 Art, patching finance 979-2 978-10 1 Art, patching finance 979-2 978-10 1 1 Art, patching finance 979-2 91120 1 1 1 Art, patching finance 979-2 91202 1 <td< td=""><td>AA; direct aspiration</td><td>273.1</td><td>3111 B <u>3111B</u></td><td>-</td><td>-</td></td<> | AA; direct aspiration | 273.1 | 3111 B <u>3111B</u> | - | - |
| Settler Direction Direction <thdirection< th=""> <thdirection< th=""> <thdir< td=""><td>AA: graphite fornace</td><td>273.2</td><td>-</td><td>· -</td><td>-</td></thdir<></thdirection<></thdirection<> | AA: graphite fornace | 273.2 | - | · - | - |
| Term production 200.7* 200.7* 200.7* Silver - Total *, Digestion, followed by: 3720-85 AA; direct aprination 3720-85 Silver - Total *, Digestion, followed by: - AA; prohib formace 200.7* Hift-B orce 11118 CP 200.7* Hift-B Digestion, followed by: - AA; prohib formace 200.7* Hift-B Digestion, followed by: - AA; prohib formace 200.7* Sulfate Spectrombiometric CP 200.0* Sulfate Spectrombiometric CP 200.02 District 4500-800CD Construction 200.02 District 4500-800CD Construction 200.02 District 4500-800CD Construction 200.02 District 4500-80 Construction 200.02 District 4500-80 At: direct appiration 11119 Construction 200.02 District 4500-80 At: direct appiration 11119 Construction 200.02 Circumstrict 1400-40 Construction 200.02 | Time shatamatic | | 2500 N- D | D1428-82 | - |
| Ait, direct appliation 972-h 91119 or C 1.3720-85 Ait, glarcin manace 972-h 91119 or C 1.3720-85 Ait, platform funace 920-h 1.1118 1.1118 KCP 200.7" 9140-9 11208 1.1118 KCP 200.7" 9140-9 11208 1.1118 Suffixe 200.2" 1.008 1.1118 Suffixe 200.2" 1.008 1.1118 Suffixe 200.2" 1.008 1.1118 Suffixe 200.2" 1.008 1.1118 Suffixe 200.2" 1.1118 1.1118 Suffixe 200.0" D4327-91 4110 1.1118 Total Filterable Residee (TDS), gravimetric 1490-1 25502 1.1118 1.1118 Zine - Total ³ 4, Digestion followed by: 2597 B 1.1118 1.1118 1.1118 Ark- graphic funace 299-2 1.1118 1.1118 1.1118 1.1118 Ark- graphic funace 299-2 1.1118 1.1118 1.1118 1.1118 Ark- graphic funace 200.7" 1120-9 1.1118 <t< td=""><td>ICP</td><td>200.7^{±9}</td><td>3120 B</td><td>-</td><td>n an an</td></t<> | ICP | 200.7 ^{±9} | 3120 B | - | n an |
| Silver - Total ² , Digestion, followed by: A4, graphic funace 2003 ⁴ | | | | · · · · · | 2 |
| AA, graphic funace 972.7 977.7 977.7 977.7 977.7 AA, graphic funace 972.2 912.7 912.0 - - AA, graphic funace 200.7 912.0 - - - AC 200.7 912.0 - - - - Sufate 200.7 912.0 - - - - Sufate 200.7 912.0 - - - - Sufate 200.7 912.0 100 - - - Sufate 200.7 912.0 100 - - - Sufate 200.2 125.2 - 4500-50F - - Sufate 200.2 D4327.21 411.0 - - - Total Filterable Residue (TDS), gravimetric 160.1 2460-6 2540C - - - Tau bidity, acphetometric method 160.1 910.1 910.1 - - - Zince - Total ² 4, Digestion followed by: A. 910.1 910.1 - - - AA, graphic funace 909.2 - - - - - - ICP 200.7 </td <td>Silver - Total ⁴², Digestion, followed by:</td> <td>070 1</td> <td>2111 D C</td> <td></td> <td>1 2720.95</td> | Silver - Total ⁴² , Digestion, followed by: | 070 1 | 2111 D C | | 1 2720.95 |
| AA: graphic furnace 972-0 91118 - - AA: graphic furnace 200.9" - - - Suffate 200.8" - - - Suffate 200.9" - - - - Suffate 200.9" - - - - - Suffate 200.9" - </td <td>AA; direct aspiration</td> <td>272.1</td> <td>JIIIDOIC</td> <td>-</td> <td>1-3720-65</td> | AA; direct aspiration | 272.1 | JIIIDOIC | - | 1-3720-65 |
| AA: graphic funace 97263 941978 (1138) - AA: platform funace 200.97" 94204 (1208) - KCP 200.87" - - Suffate 200.97" 94204 (1208) - Suffate 200.97" - - Constitution 200.10 P4327.91 4100 Temperature, Thermometric - 25502 - Total Filterable Residue (TDS), gravimetric 160:1 2540-62 - Zince - Total ⁴ 4, Digestion followed by: - - - AA: graphic funance 200.97" - - - ICP 200.77" 9120-9 100 - CP 200.77" 9120-9 - - ICP 200.77" 9120-9 - - ICP 200.87" - - < | | | <u>3111B</u> | | |
| AA: platform furnace 200.9° 11. LLL 1 ACP 200.9° 11. LLL 1 CP/MS 200.8° 11. LLL 1 Suffate 200.8° 1 1 Suffate 200.8° 1 1 Suffate 200.8° 1 1 Suffate 200.0° Pla327.91 4110 Temperature, Thermometric 2550B - - Total Filterable Residue (TDS), gravimetric 160:1 2540-62 2510C - Turbidity, nephclometric method 160:1 2540-62 2510C - - Zine - Totals ^{1,4} (Digestion followed by: 200.9° 1111B - - - AA; direct aspination 269:4 1111B or C D1691-90 13900-85 - Zine - Totals ^{1,4} (Digestion followed by: 200.8° - - - - AA; graphite furnace 200.9° - - - - - - CP 200.7° - - - - - - - - | A A graphite furnace | 272.2 | 3113 B 3113B | | 이 가슴 바이 바이 - 바이 가슴이 가슴이 가 |
| Ar. 1 patient influe 200.7 1120 B 1 LCP 200.87 1120 B 1 Sulfate 200.87 1120 B 1 Sulfate 200.87 1200 B 1 Sulfate 200.91 21327-21 4100 1 Temperature, Thermometric - 2550 B - - Total Filterable Residue (TDS), gravimetric 160.1 2540-6 2540 C - - Turbidity nephelometric method 190.1 2100 B - - - Zine - Total F & Digestion followed by: 299.1 3111 B or C 21061-90 13990-05 Zille - Total F & Digestion followed by: 200.97 3120 B 3120 B - - ICP 200.97 3120 B 3120 B - - - ICP NMS 200.97 3120 B 3120 B - - - ICP NMS 200.97 3120 B 3120 B - -< | A A | 200.013 | | | _ |
| ICP 200.7" 9429 9 1228 - - Suffate 200.8" - - Suffate 375.2 - 4500.50, -F - Gravitatrik - 25002 - - Ion chromatornahr 300.0" P4327.91 4110 - Temperature, Thermometric - 25502 - - Total Filterable Residue (TDS), gravimetric 169:1 2940-8 2540C - - Turbidity, acphetometric method 169:1 2940-8 2540C - - - Zine - Total ² 5, Digestion followed by: -< | AA; platorin lumace | 200.9 | - | - | - |
| ICP/MS 200.8 rd - - Suffate 3500-250, -E - Suffate 3500-21 4500-850, -E Cravinotizitie 275.21 - Carbonitotic 275.21 - Carbonitotic 275.21 4100 Temperature, Thermometric - 2550B Total Filterable Residue (TDS), gravimetric 166.1 2540-6 2590C Total Filterable Residue (TDS), gravimetric 166.1 2130 B Zine - Total ⁴ 4, Digestion followed by: - - At, direct sagnitube. 299.1 3111 B or C D1691-90 XAt, garaphite famace 299.2 - - At/ graphite famace 290.97 - - CP/NS 200.07 9120-B CP/NS 200.07 | ICP | 200.7 ¹⁵ | 3120 B 3120B | - | - |
| Sufate Social Social S | ICP/MS | 200.8** | | - | |
| Sultate 3502.2 4500-SO, -F 500-SO, -CD Gravinetric 250.01 D4327.91 4100 - Temperature, Thermometric - 25508 - - Total Filterable Residue (TDS), gravimetric 160.1 2540-6 2550C - - Total Filterable Residue (TDS), gravimetric 160.1 2130 B - - Zine - Total ² 4, Digestion followed by: - - - - - Adv, direct aspiration 299.1 3111 B or C D1691-90 139900-85 Zine, Total ² 4, Digestion followed by: - - - - Adv, graphic fumace 299.2 - - - ZiP/NS 200.07" 9120 B - - - CP 200.7" 9120 B - - - - CP/NS 200.8" - - - - - - - - - - - - - - - - | | | | a fame and a | |
| Spectrophotometric 215.22 4500-SQ, -E - Gravitanetric 100.01 P4327-91 4100 - Temperature, Thermometric - 2550B - - Total Filterable Residue (TDS), gravimetric 160.1 2540-C 2540-C - - Turbidity, nephetometric method 160.1 2100-D - - - Zine - Total ^{9,4} , Digestion followed by: - - - - - - Art, pathform funnec 200.1 2111B - - - - Art, graphite funnec 200.27 - - - - - CP 200.77 7120-B 3120B - - - - CP 200.87 - - - - - CP 200.87 - | Sulfate | | (1) A start of the start of | | 1997) An ann an Aonaichtean ann an Aonaic |
| Grunimetric 4500-SD, -C.D - Ion chromatography 200.0 ¹ D4327-91 4110 - Temperature, Thermometric - 2550B - - Total Filterable Residue (TDS), gravimetric 160:1 2540-0 2540-0 - - Total Filterable Residue (TDS), gravimetric 160:1 2500-B - - - Total Filterable Residue (TDS), gravimetric 160:1 2500-B - - - Tuch Total ² 9, Digestion followed by: Ax, direct aspiration 209:1 3111-B or C 3100-9 1- - Ax, graphic finance 209:2 - - - - - - ICP MS 200.0 ⁸⁷ - | Spectrophotometric | <u>375.21</u> | - | <u>4500-SO₄ - F</u> | • |
| Jon chromitormphy 200.0 ¹ D4327-91 4110 - Temperature, Thermometric - 2550B - - Total Filterable Residue (TDS), gravimetric 160:1 2540-0 2540C - - Total Filterable Residue (TDS), gravimetric 160:1 2540-0 2540C - - Turbidity, nephetometric method 190:1 2100-0 - - Zine - Total ⁻⁵ 4, Digestion followed by: - - - - AA; graphite fumace 209:2 - - - - CP 200.077 3120-0 - - - - CP 200.077 3120-0 - <t< td=""><td>Gravimetric</td><td>-</td><td>-</td><td>4500-SO, - C.D</td><td>and the state of t</td></t<> | Gravimetric | - | - | 4500-SO, - C.D | and the state of t |
| Add Language Langer DOL PERSON PERSON Temperature, Thermometric - 2550B - - Total Filterable Residue (TDS), gravimetric 160:1 2530B - - Turbidity, sephelometric method 160:1 2530B - - Turbidity, sephelometric method 160:1 2530B - - Zine - Total ² 4, Digestion followed by: AA; direct aspiration 260:1 1111B - - AA; direct aspiration 260:1 1111B - - - AA; direct aspiration 260:07 - - - - CP 200.77 3120B - - - ICP 200.77 3120B - - - CP 200.77 3120B - - - CP/NSS 200.87 - - - - CP/NSS 200.78 - - - - CP/NSS 200.79 - - - - - CP/NSS 200.78 | Ton chromotography | 300.01 | D4327-01 | 4110 | A S. A. |
| Temperature, Thermometric - 2550g - - Total Filterable Residue (TDS), gravimetric 160:1 2400 € 2540C - - Tarbidity, sephdometric method 160:1 2100 B - - Tarbidity, sephdometric method 160:1 2100 B - - Zine - Total ² 4, Digestion followed by: 269:1 3111 B - - Adv, graphite funnece 269:9 - - - Adv, prinform funnece 200:97 - - - ICP 200:87 - - - TCPMAS 200:87 - - - Totale 4 Analysis of Weer and Waster, CEP Ac60/4 79:600, March 1980; EP A Environmental Monitoring and Outpoot Laboratory, Clininati, Olin, 45366 - Analible from CeBP Debications, EBA, EDA & Markin Lawler, King Dhee, Clinicatian, Oline, 45666. For aggraved analytical procedures for metals, the totalingue applicabib to total innation all able total. | Ion chromatography | 300.0 | 04527-91 | | All the second s |
| Total Filterable Residue (TDS), gravimetric 169:1 2540-6 2540C - - Turbidity, sephetometric method 199:1 2130 B - - Turbidity, sephetometric method 299:1 2111 B or C D1691-90 13900-05 AA; genome function 289:1 2111 B or C D1691-90 13900-05 AA; genome function 289:1 2111 B - - AA; genome function 289:2 - - - AA; photom function 200:97 - - - ICP 200.77 71:0+9 3120B - - ICP/MS 200.87° - - - Colorization - 2509-25 rE - - Turbots for Chemical Analysis of Water and Water", CPA 40004 79-0000, Match 1983, EFA Environmental Monotring and Support Enboratory, Clinicitati, Ohio, 45260 - Analbeb from - "Methods for the Energies of Water and Water", CPA 40004 479-0000, Match 1983, EFA Environmental Monotring and Support Enboratory, Clinicitati, Ohio, 45260 - Analbeb from - "Methods for the Determination of Increanic Subtances in Environmental Samples - Supplicitable to total method shall be used. - "Methods for the Examination o | Temperature, Thermometric | - | 2550 <u>B</u> | - | • |
| Turbidity, sephelometric method 190:1 2100 B - - Zinc - Total ^{3,5} , Digestion followed by: 290:1 3111 B P1691-90 13990-05 Ark, direct aspiration 290:2 - - - - Ark, graphite furnace 290:3 - - - - CP 200.7* 3120 B - - - - ICP 200.7* 3120 B - - - - - ICP 200.7* 3120 B - <t< td=""><td>Total Filterable Residue (TDS), gravimetric</td><td>160.1</td><td>2540-C 2540C</td><td>-</td><td>-</td></t<> | Total Filterable Residue (TDS), gravimetric | 160.1 | 2540-C 2540C | - | - |
| Turbury, nephetometric fileson Toori 2400 B Zine - Total ²⁵ 4, Digestion followed by: 200.1 3111 B or C D1691-90 1-39900-05 Ark; graphice furnace 200.9 ¹⁰ - - - Ark; graphice furnace 200.9 ¹⁰ - - - ICP 200.9 ¹⁰ - - - - ICP 200.9 ¹⁰ - - - - - ICP 200.9 ¹⁰ - | m | 100-1 | 0130 D | _ | . 1911. |
| Zinc - Total ³ 4, Digestion followed by: 289-1 3111 B or C D1691-90 13990-85 AA; direct aspiration 289-1 3111 B - | Turbinty, nephetometric method | 100.1 | 2150 1 | - | |
| Zinc - Total ³ \$, Digestion followed by: 289.1 3111 B or C D1691-90 13900-85 AA, graphite fumace 289.2 - - - - AA, graphite fumace 289.9 - - - - ICP 200.97° - - - - ICP 200.87° - - - - - CPMS 200.87° - <t< td=""><td></td><td></td><td>and the second second</td><td></td><td></td></t<> | | | and the second second | | |
| Zinc - Total ³ 4, Digestion followed by: 289.1 3111 B or C D1691-90 13900-85 AA; giract aspiration 209.2 - - - - AA; graphic furnace 200.9" - - - - AA; platform furnace 200.9" - - - - ICP 200.7" 3120 B 3120B - - - - ICPMS 200.8" - </td <td></td> <td></td> <td></td> <td></td> <td></td> | | | | | |
| Zink - Total - Digestion followed by: 209:1 3111 B or C Di691-90 13900-85 AA; direct aspiration 209:3 - - - - AA; graphite fumace 200:9 ^{rt} - - - - ICP 200:7 ^{rt} 3120B - - - - ICP 200.7 ^{rt} 3120B - | Zine Total Direction followed hu | | | | • |
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| AA; graphite furnace 200-2 - - - AA; graphite furnace 200-9" - - - ICP 200,07" 9120 B 3120 B - - ICP/MS 200,8" - - - ICP/MS 200,8" - - - Colorimetric (Dithizone) - - - - "Methods for Chemical Analysis of Water and Wastes", (EPA 600/4-79 6260), March 1963, EPA Environmental Monitoring and Support Laboratory, Clancinati, Ohio, 45266. Available from - "Methods for Chemical Analysis of Water and Wastes", (EPA 600/4-79 6260), March 1963, EPA Environmental Monitoring and Support Laboratory, Clancinati, Ohio, 45266. Available from - "Methods for the Determination of Inoraanic Substances in Environmental Samples", EPA-600R-93-100. August 1993. Available at NTIS. Order #PB94-121811. 5285 Port Royal Road. Springfield, VA 22161 Unless otherwise noted, methods are in "Methods for the Determination of Metals in Environmental Samples - Suppliment I", ORD Publications, EPA-6004-914610, June 1991 EPA-6007E: 20111_Max 12924 Available from the National Technical Information Gevice, Onder #PB91-231496, 5266 Port Royal Road, Springfield, VA 22161 EPA-6007E: "Standard Methods for the Datamination of Water and Wastewater", American Public Heahth Association, American Water Works Association, Water Pollution C | AA; direct aspiration | 209.1 | JIIIBOIC | 101091-90 | 1-3900-85 |
| AA; graphite furnace 200,9 ^{rb} - - ICP 200,9 ^{rb} - - ICP/MS 200,8 ^{rb} - - Colorimetic (Bithizone) - - - Tice on - - - "Methods for Chemical Analysis of Water and Wasters", (EPA 660/4 79 680), March 1983, EPA Environmental Monitoring and Support Laboratory, Cincinnati, Ohio, 45268. Available from ORD Publications, CERI, EPA, 26 W. Martin Lather King Drive, Cincinnati, Ohio 45268. For approved analytical procedures for metals, the technique applicable to total metals shall be used. "Methods for the Determination of Inorvanic Substances in Environmental Samples", EPA-600/R-93-100. August 1993. Available at NTIS. Order #PE94-121811. 5285 Pon Roval Road. Springfield, VA 22161 Image: Substances in Environmental Samples - Supplicent I'', ORD Publications, EPA/600/4-91/010, June 1991 EPA-500/R-24/111, May 1994. Available from the National Technical Information 6ervice, Order #PE91-2314/96, 5285 Pon Royal Road, Springfield, VA 22161. <u>PE94-121811. 5285 Pon Royal Road.</u> "Integer Relices of the Detarmination of Water and Wastewater", American Public Health Association, American Water Works Association, Water Pollution Control Federation, 179th 18th "Standard Methods for the Examination of Water and Flavial Sociation: Public Health Association, American Water Works Association, Water Pollution Control Federation, 179th 18th "Methods for Analysis of Inorganic Gubstances in Water and Flavial | A | | <u>3111B</u> | | 1 |
| AA-r printic furnace 200-21 - - - AA-r platform furnace 200.019 - - - ICP 200.77° 3120-B - - - ICP/NS 200.819 - - - - Golorimetric (Dithizonc) - 3500-Zn-E - - - "Methods for Chemical Analysis of Water and Wastes", (ICPA-600/4-79-0820), March 1903, TEPA Environmental Monitoring and Support Laboratory, Clincinnati, Otio, 45260, Available from - "Methods for Chemical Analysis of Water and Wastes", (ICPA-600/4-79-0820, March 1903, TEPA Environmental Monitoring and Support Laboratory, Clincinnati, Otio, 45260, Available from - ORD Publications, CERN, TEPA, 20 W. March Latther Hang Drive, Clancinnati, Otio 45200. For approved analytical procedures for metals, the technique applicable to total metals shall be used - "Methods for the Determination of Inoraanic Substances in Environmental Samples", EPA-600R-93-100. August 1932. Available at NTIS. Order #PB94-121811. 5285 Port Royal Road. Springfield, VA 22161 EPA-600R-94-1904 91-001. Jane 1991 EPA-600R-94-91-001. Jane 1992 EPA-600R-94-91-001. Jane 1991 EPA-600R-94-91-001. Jane 1991 | | | | | |
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| | | - | | | |

Samples that contain less than 1 NTU (nephelometric turbidity unit) and are properly preserved (conc. HNO₅ to pH <2) may be analyzed directly (without digestion) for total metals, otherwise, digestion is required. Turbidity must be measured on the preserved samples just prior to the initiation of metal analysis. When digestion is required the total recoverable technique as defined in the method must be used.
 "AWWA Standards for Asbestos - Cement Pipe, 4 in. through 16 in. for Water and Other Liquids", AWWA C400-77, Revision of C400-75. Available from the AWWA, 6666 West Quincy Avenue, Denver Colorado, 80235.
 Zinc, Zincon Method, Method 6009, Hach Handbook of Water Analysis, 1979, pages 2-231 and 2-333. Available from the Hach Chemical Company, P.O. Box 309, Loveland, Colorado 60537.
 "Determination of Inorganic Ions in Water by Ion Chromatography", December 1989, US EPA EMGL, available from the EMGL-Cincinnati, Ohio 45268.
 This is the method to use for convolvity determination:
 Residual disinfectant concentrations for free chlorine and combined chlorine may also be measured by using DPD colorimetric test kits if approved by the department.

Section 25. NR 809.725 Table F is amended to read:

| Parameter | Preservation ¹ | Container ² | Holding Time ³ | |
|--|--|---|---|--|
| Asbestos | Cool, 4°C4 | P or G | | |
| METALS | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | | |
| Abminum | HNO, | P or G | 6 months | |
| Antimony | HNO, | P or G | 6 months | |
| Arsenic | HNO, | . P or G | 6 months | |
| Barium | HNO, | P or G | 6 months | |
| Bervilium | HNO3 | P or G | 6 months | |
| Cadmium | HNO, | P or G | 6 months | |
| Conper | HNO ₃ | P or G | 6 months | |
| Chromium | HNO | P or G | 6 months | |
| Iron | HNO, | P or G | 6 months | |
| Lead | HNO, | P or G | 6 months | |
| Manganese | HNO, | P or G | 6 months | |
| Mercury | HNO. | P or G | 28 days | |
| Nickel | HNO | P or G | 6 months | |
| Selenium | HNO. | P or G | 6 months | |
| Silver | HNO | P or G | 6 months | |
| Thellium | HNO | P or G | 6 months | |
| Zinc | HNO1 | P.or.G | 6 months | |
| GENERAL CHEMISTRY PARAMETERS | | | • · · · · · · · · · · · · · · · · · · · | |
| Chloride | None Required | P or G | 28 days | |
| Color | Cool 4°C | P or G | 48 hours | |
| Cumide | Cool. 4°C.+ NaOH to pH > | 12 NaOH to P or G | 14 days | |
| | <u>pH>12</u> | | | |
| | 0.6 g Ascorbic acid ⁵ | | | |
| Fhuoride | None | P or G | 28 days | |
| Examing Agents | Cool, 4°C | P or G | 48 hours | |
| Nitrate (ac N) | | | 28 days | |
| Chlorinsted | Cool 4°C | P or G | 48 hrs 14 days | |
| Cinformated | Cool + Core - TY2904 to - pit | → 4°C PorG | 14 days | |
| Non-Chormated | Cool 48C OB Core H2SO | Ato pH 2 Por G | 48 hours | |
| Nürite (as N) | Cool, 4 C <u>OR Core. H250</u> | 4to pH <2 PorG | 14 days | |
| <u>Nitrate+Nitrite</u> | Cool. 4-C OR Colk: H250- | <u>410 bh <2</u> | A9 hours | |
| Odor | C00L, 4°C | | Anotwo Termediatek | |
| pH | None Required | PorG | Analyze inimediately | |
| Solids (TDS) ¹¹¹ and the provided investigation of the second statement of th | Cool, 4°C | P or G | 7 days | |
| Sulfate | Cool, 4°C | e de la constant de l | 28 days | |
| Turbidity | Cool, 4°C | P or G | 48 hours | |

TABLE F Preservation Requirements and Holding Times for Inorganic Paran

If HNO_3 cannot be used because of shipping restrictions, sample may be initially preserved by icing and immediately shipping it to the laboratory. Upon receipt in the laboratory, the sample must be acidified with conc HNO₃ to pH <2. At time of analysis, sample container should be thoroughly rinsed with 1:1 HNO₃; washings should be added to sample.

P = plastic, hard or soft, G = glass, hard or soft

In all cases, samples should be analyzed as soon after collection as possible.

These samples should never be frozen.

Ascorbic acid should only be used in the presence of residual chlorine

Section 26. NR 809.725 Table G is amended to read:

| ······································ | | | HOLDING TIME | |
|--|---|---|--|---|
| Parameter/Method | Preservation | Container | Sample | Extract |
| 502.1,502.3,503.1 | Sodium Thiosulfate (3 mg) or Ascorbic Acid (25 mg) 4°C, HCl pH<2 | 40 mL, G ¹ | 14 days La constituí a constante de la constante La constituí a constante de la constante de la constante de la constante | a de la Contra de La Maria de Contra de La Contra de L |
| 504 - ⁶ 10 ³ 8 (State 1771) | Sodium Thiosulfate (3 mg) Cool, 4°C, HCl pH<2 | 40 mL, G ¹ | 28 days | Analyze immediately |
| 505 | Sodium Thiosulfate (3 mg) Cool, 4°C | 40 mL, G ¹ | 14 days (Heptachlor=7 days) | Analyze immediately |
| 506 | Sodium Thiosulfate (60 mg) Cool, 4°C, dark | 1L, Amber G ² | 14 days | 4°C, dark, 14 days |
| 507 | Mercuric Chloride (10 mg/L) Sodium Thiosulfate (80 mg) Cool, 4°C | 1L, Amber G ² | 14 days (see method for exceptions) | 4°C, dark, 14 days |
| 508 (1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997 - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997) - 1997 | Mercuric Chloride (10 mg/L) Sodium Thiosulfate (80 mg) Cool, 4°C | IL, G ² | 7 days (see method for exceptions) | 4°C, dark 14 days |
| 508A | Cool, 4°C | 1L, G ² | 14 days | 30 days |
| 515.1 | Mercuric Chloride (10 mg/L) Sodium Thiosulfate (80 mg) Cool, 4°C | 1L, Amber G ² | 14 days | 4°C, dark, 28 days |
| 524.1, 524.2 | Ascorbic Acid (25 mg) HCl pH<2, Cool 4°C | 40 mL, G ¹ | 14 days | |
| 525.1 | Sodium Sulfite (40-50 mg) or Sodium Arsenite (40-50 mg) Cool, 4°C, HCl pH<2 | 1L, G ² | 7 days | 30 days |
| 5311 | Monochloroacetic acid pH<3 Sodium Thiosulfate (80 mg) Cool, 4°C | 60 mL, G ¹ | Freeze -10°C, 28 days | • |
| 547 | Sodium Thiosulfate (100 mg/L) Cool, 4°C | 60 mL, G ¹ | 14 days (18 mo. frozen) | en jede 1. juli: 1. har de |
| 548 | Cool, 4°C | 60 mL, G ¹ | 7 days | 1 day |
| 549 | Sodium Thiosulfate (100 mg/L) H_2SO_4 pH<2, Cool, 4°C, dark | 1L, High Density Amber PVC or Silanized Amber Glass | 7 days and the second s | 21 days |
| 550, 550 1 | Sodium Thiosulfate (100 mg/L) Cool, 4°C, HCl pH<2 | 1L, Amber G ² | 7 days | 4°C, dark, 40 days |
| 1613 | Sodium Thiosulfate (80 mg) Cool, 4°C, dark | 1L, Amber G ² | - | 40 days |

 TABLE G

 Sample Preservation Requirements and Holding Times for Organic Parameters

¹ Teflon-lined septa.

² Teflon-lined cap.

Section 27. NR 809.81(5)(ee) is amended to read:

NR 809.81(5)(ee) Chlordane. The United States environmental protection agency (EPA) sets drinking water standards and has determined that chlordane is a health concern at certain levels of exposure. This organic chemical is a pesticide used to control termites. Chlordane is not very mobile in soils. It usually gets into drinking water after application near water supply intakes or wells. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for chlordane at 0.002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to

chlordane.

Section 28. NR 809.81(5)(hq) is amended to read:

NR 809.81(5)(hq) Di(2-ethylhexyl)phthalate. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that di(2-ethylhexyl)phthalate is a health concern at certain levels of exposure. Di(2-ethylhexyl)phthalate is a widely used plasticizer, which is primarily used in the production of polyvinyl chloride (PVC) resins. It may get into drinking water after improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice exposed to high levels over their lifetimes. EPA has set the drinking water standard for di(2-ethylhexyl)phthalate at 0.004 0.006 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to di(2-ethylhexyl)phthalate.

The foregoing rule was approved and adopted by the State of Wisconsin Natural Resources Board on <u>May 28, 1997</u>.

The rule shall take effect on the first day of the month following publication in the Wisconsin Administrative Register as provided in s. 227.22(2) (intro.), Stats.

1997 Dated at Madison, Wisconsin <u>Mugust</u> 7

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Tommy G. Thompson, Governor George E. Meyer, Secretary Box 7921 101 South Webster Street Madison, Wisconsin 53707-7921 TELEPHONE 608-266-2621 FAX 608-267-3579 TDD 608-267-6897

August 7, 1997

Mr. Gary L. Poulson Assistant Revisor of Statutes 131 West Wilson Street - Suite 800 Madison, WI

Dear Mr. Pod

Enclosed are two copies, including one certified copy, of State of Wisconsin Natural Resources Board Order No. DG-6-97. These rules were reviewed by the Assembly Committee on Environment and the Senate Committee on Agriculture and Environmental Resources pursuant to s. 227.19, Stats. Summaries of the final regulatory flexibility analysis and comments of the legislative review committees are also enclosed.

You will note that this order takes effect following publication. Kindly publish it in the Administrative Code accordingly.

Sincerely,

George E. Meyer Secretary

Enc.

