

ILLINOIS POLLUTION CONTROL BOARD  
November 29, 1990

IN THE MATTER OF: )  
 )  
SAFE DRINKING WATER ACT ) R90-21  
CORRECTIONS ) (Rulemaking)  
 )

FINAL ORDER. ADOPTED RULES.

OPINION AND ORDER OF THE BOARD (by J. Anderson):

On August 9, 1990, the Board entered a final Opinion and Order in R88-26, which involved adoption of regulations in 35 Ill. Adm. Code 611 which are identical in substance to USEPA regulations implementing the Safe Drinking Water Act (SDWA). On September 13, 1990, the Board proposed to make needed corrections to the regulations adopted in R88-26. Following public comment, the Board is now adopting the proposed amendments.

Section 17.5 of the Act provides for quick adoption of regulations which are "identical in substance" to federal regulations; Section 17.5 provides that Title VII of the Act and Section 5 of the Illinois Administrative Procedure Act (APA) shall not apply. Because this rulemaking is not subject to Section 5 of the APA, it is not subject to first notice or to second notice review by the Joint Committee on Administrative Rules (JCAR).

The SDWA program was drawn from 40 CFR 141, 142 and 143 (1989).

PUBLIC COMMENT

The Board is aware of two areas in the R88-26 Order which require correction. First, on August 6, 1990, the Environmental Protection Agency (Agency) filed a supplemental post-adoption comment, which included the text of the materials it asked to be incorporated by reference in its July 20, 1990, comment. (PC 14 in R88-26) The August 6 comment did not arrive in time to be reviewed in advance of the August 9 meeting. It is now necessary to revise the titles of the incorporations by reference to conform with the actual titles in the documents.

Second, on September 2, 1990, the Board received a request from Access Analytical Systems, Inc. (Access) for inclusion of the "MMO-MUG" or "Colilert" methods for bacterial analysis. As was discussed on page 47 of the August 9, 1990, Opinion in R88-26, these were omitted since 40 CFR 141.21(f) references only journal articles which do not actually set forth the methods. Access has provided supplemental materials which actually describe the methods.

The Board will make the August 6, 1990, Agency comment in R88-26 PC 2 in this Docket, and the September 2, 1990, Access comment PC 1. Also, on September 12, 1990, the Board received a letter from the Agency requesting inclusion of the MMO-MUG test. (PC 3)

The proposed rules appeared on October 5, 1990, at 14 Ill. Reg. 16215. The Board received the following public comment following the September 13, 1990, Proposed Opinion and Order and publication:

- PC 4 Agency, October 8, 1990
- PC 5 Agency, October 23, 1990
- PC 6 Administrative Code Division, November 13, 1990
- PC 7 JCAR, November 19, 1990

Neither the Code Division nor JCAR had any suggestions for change. The Agency comments are discussed below.

#### PROCEDURAL HISTORY OF R88-26 and R90-4

The SDWA rules were recently adopted in Docket R88-26. The Board entered a Proposed Opinion and Order on October 5, 1989. The proposal appeared on December 1, 1989, at 13 Ill. Reg. 18690. Following the public comment period, the Board adopted a "Final" Opinion and Order on May 24, 1990. The Board then allowed a post-adoption comment period. On August 9, 1990, the Board withdrew the May 24 Opinion and Order, and substituted a new Opinion and Order. The final rules appeared in the Illinois Register On October 5, 1990, at 14 Ill. Reg. 16517.

In R88-26 the Board adopted regulations to correspond with USEPA rules adopted through June 30, 1989. The Board reserved Docket R90-4 to update the rules through December 31, 1989. However, on June 21, 1990, the Board dismissed R90-4, after determining that the USEPA amendments affected only language which was not to be adopted in R88-26.

On September 27, 1990, in R90-13, the Board proposed to update the SDWA rules to include USEPA amendments during the period January 1 through June 30, 1990. That proposal appeared on October 19, 1990, at 14 Ill. Reg 17154.

#### APA AND INCORPORATIONS BY REFERENCE

The rulemaking concerns mainly mainly "incorporations by reference". In Part 611 these are mainly references to analytical methods published by a variety of sources. The Illinois Administrative Procedure Act (APA), and derived regulations, restrict the use of such references in rules. (Ill. Rev. Stat. 1989, ch. 127, par. 1006.02) An Illinois agency may incorporate such standards or guidelines into a rule without publishing the standard or guideline in full if:

1. The standard is from a federal agency or a nationally recognized organization.
2. The rule contains the address of the agency or organization for purposes of ordering the standard.
3. The agency or organization which adopted the standard makes copies

readily available to the public.

4. The rule includes the date of the standard.
5. The rule states that it does not include later editions or amendments.
6. The agency maintains a copy of the standard in its files for public inspection and copying.

Incorporations by reference have been a major issue in several identical in substance rulemakings, including the underground storage tank program adopted in R88-27 (April 27, 1989; 13 Ill. Reg. 9519, effective June 12, 1989).

Section 7.2(a)(4) authorizes the Board to incorporate USEPA rules by reference where it is possible to do so without causing confusion to the public. Section 7.2(a)(4) concerns "normal" incorporations by reference, in which the Board references a USEPA rule rather than adopting the verbatim text. "Normal" incorporations are usually placed at the appropriate point in the verbatim text. Section 611.102 concerns "abnormal" incorporations by reference. These mainly consist of technical documents which are referenced in the body of the verbatim text. "Abnormal" incorporations also include USEPA rules which are referenced in the verbatim text, but which are not a part of the program the Board is supposed to adopt. For example, in the drinking water rules, USEPA may cite to analytical standards for wastewater.

The APA requirements on incorporation by reference are "enforced" by way of JCAR review of the documents during the first and second notice periods pursuant to Section 5 of the APA. Because Section 17.5 of the Act provides that Section 5 of the APA does not apply to identical in substance rulemaking, the Board is not required to obtain JCAR prior approval of these documents. However, Section 17.5 does not include a specific exemption from the APA limitations on incorporation by reference.

There is a potential conflict between the requirements of the APA and the identical in substance mandate if a USEPA rule cites to a document which the APA prohibits. In such a situation the Board balances the requirements of the APA and the Act. The Board considers: whether the reference is really necessary to the identical in substance program; whether the APA violation amounts to a due process question; and, whether there are alternative ways, such as setting forth the substance of the standard in the rule.

#### MMO-MUG TEST

For clarity and back-referencing purposes, we are below first summarizing the history of the difficulties with including the MMO-MUG test.

40 CFR 141.21(f)(3)(iv) allows the use of the "MMO-MUG test" ("minimal medium ortho-nitrophenyl-beta-d-galactopyranoside - 4-methyl-umbelliferyl-beta-d-glucuronide test") or "Autoanalysis Colilert System" as a method for total coliform analysis. The corresponding Board rule is 35 Ill. Adm. Code 611.526. USEPA cites to a series of journal articles for these methods. **The**

initial problem was that the APA authorizes incorporation by reference of "standards or guidelines", but not journal articles. This was discussed in the October 5, 1989, R88-26 Proposed Opinion on page 13.

The Board received no response to this issue raised in the Proposed Opinion. (See PC 5 in R88-26, items 25 through 27) The Board therefore undertook to find the journal articles and attempt to obtain permission from the publisher. This led to several discoveries: First, the the journal is in fact published by the American Society for Microbiology (ASM), rather than AWWA as implied in the USEPA rule. Second, although the journal articles discuss the "MMO-MUG" test, they do not tell a person how to perform the test. Therefore, in the May 24, 1990, Opinion and Order, the Board dropped this method from the rules. The discussion occurred on page 30, in which the Board asked for clarification, as follows:

54 Fed. Reg. 29998, July 17, 1989, appears to be the only USEPA action during the first update period for these rules. (July 1 through December 31, 1989.) This adds to this reference additional journal articles, which suffer the same flaws. The Board requests clarification of the agencies' position during the final comment period. (R88-26 Opinion of May 24, 1990, p. 30)

The Board received no response to this issue during the post-adoption comment period. (See PC 14 in R88-26, p. 18 - 21, 47) On August 9, 1990, the Board therefore adopted the rules without reference to the MMO-MUG test. (R88-26 Opinion of August 9, 1990, p. 47)

On June 21, 1990, the Board dismissed R90-4 (SDWA Update for July 1 through December 31, 1989) after determining that the journal articles would not appear in the Board rules in the first place. The Board received no comment on R90-4.

Following the final adoption of R88-26, the Board was contacted by Access. The MMO-MUG test is a proprietary method in which Access sells tubes containing the a culture medium and the "Colilert reagent". Coliform bacteria metabolize the ortho-nitrophenyl-beta-d-galactopyranoside, freeing o-nitrophenol, which is detected through color change.

As noted above, the journal articles cited by USEPA discuss the MMO-MUG test, but do not describe it. Rather, they start with the assumption that the reader is already familiar with the test itself. Access has provided the Board with a number of documents describing the test. One of these is an article describing the test, entitled "Rapid specific environmental coliform monitoring", by S. Stratman, American Laboratory, July, 1988. However, this is still a journal article. The better reference appears to be the instruction sheet which Access provides with the culture medium and reagent.

Although the instruction sheet has the format of a "standard or guideline", it comes from a private company. However, USEPA has incorporated this method by reference. The Board will therefore accept Access as a "nationally recognized organization" within the meaning of the APA for

purposes of this identical in substance rulemaking.

There are two types of colilert test: a presence absence (P/A) test and a most probable number (MPN) test. The latter actually exists in at least three variations. All appear to be encompassed within the USEPA references.

A possible conflict exists between 40 CFR 141 and the colilert methods. While the former requires sample collection in accordance with the 16th Edition of Standard Methods, the latter requires the 17th Edition.

As discussed above, USEPA added additional references to the MMO-MUG test in the July 17, 1989, Federal Register. However, these amendments appear to amend USEPA language which had been repealed on June 29, 1990. The July 17 action amended 40 CFR 141.14(b)(3) and 141.21(a). However, on June 29, 1989, at 54 Fed. Reg. 27562, 40 CFR 141.14 was repealed, and 141.21(a) was modified in a manner such that it is impossible to make the July 17 changes. Since the repealed language does not appear in the Board rules, there is no place to insert these additional references. The Board therefore proposed no changes in response to the July 17, 1989, USEPA amendments, but solicited comment.

The Agency responded in PC 5. It is clear that the Agency supports inclusion of the ONP-MUG test, and agrees that both the P/A and MPN variations have been approved by USEPA. However, the Agency comment does not give guidance as to the appropriate mechanism. The Agency asked the Board to incorporate the journal articles cited in the June 29 and July 17, 1989, Federal Registers, but did not provide any rationale for so doing. As is discussed above, the APA does not authorize incorporation by reference of journal articles. Moreover, the cited articles do not describe the test methods in question. And, the July 17, 1989, Federal Register amended rules which USEPA had repealed on June 29, so that there is no place to hang the amendments.

The Agency also indicated that USEPA had approved only the 16th Edition sample collection procedures for the colilert methods. (PC 5) However, the Agency gave no citation for this USEPA action. The Board will not insert language authorizing the use of 16th Edition methods, but will let the ONP-MUG test speak for itself.

#### OTHER INCORPORATION BY REFERENCE QUESTIONS

In PC 14 in R88-26, the Agency indicated that certain out-of-date analytical methods had to be referenced in Part 611. On August 6, 1990, the Agency provided the Board with a collection of many of the methods it wanted referenced, but this was not received in time to aid in preparing the Order in R88-26. The Board attempted to follow the Agency's recommended Methods, but many of the references were inaccurate or incomplete, since the Board did not yet have the documents in front of it at the time the Order was drafted.

The Board has below corrected and completed the references to correspond with the documents received from the Agency. The following items referenced in R88-26 were still missing from the materials provided in PC 14 in R88-26:

ASTM Method D992-71

611.606(g)(1)(B)

ASTM Method D1688-84D	611.606(m)(1)
Standard Methods, 13th Edition:	
Methods 302, 303, 304, 305 and 306	611.720(a)(2)
Standard Methods, 14th Edition:	
Methods 404A and B(4)	611.606(a)(2)(B)
Methods 419C and D	611.606(g)(2)(B)
Method 605	611.606(g)(2)(C)
Standard Methods, 16th Edition:	
Method 43A and C	611.606(j)(2)(A)
Methods 408C, D, E and F	611.531(e)(1)
Method 412D	611.606(o)(2)
Methods 413 B and E	611.606(j)(2)
Method 908D	611.531(a) and (b)
Method 909C	611.531(a)

The Agency provided copies of these materials with PC 5. The Agency pointed out that Methods "43A and C" should be "413A and C". (PC 5) This typo was copied from 40 CFR 141.23(f)(10). This illustrates the importance of assembling the actual documents, rather than relying on the USEPA citations.

#### SECTION-BY-SECTION DISCUSSION

##### Section 611.102

This is the incorporations by reference Section. It includes the complete "library-type" reference to the documents which are used in subsequent Sections.

As is discussed in general above, the Board has added a definition of "MMO-MUG test", the term which will be used in the rules. The test is available from Access, whose address and phone number are now the first entry in subsection (b).

Most of the ASTM and Standard Methods references have been amended to conform with the numbers and titles in the documents submitted by the Agency. The Board has deleted ASTM Methods D1067, D1126 and D1293. These were used in the corrosivity monitoring in Proposed Sections 611.621 et seq. in the R88-26 Proposal. Corrosivity monitoring was dropped, as was discussed on page 92 of the August 9, 1990 Opinion in R88-26. In that this was the only

use made of these references, the Board has deleted them.

The Board has deleted the reference to Standard Methods, 16th Edition, Method 912K. As was discussed on page 62 of the August 9, 1990, Opinion in R88-26, this reference was used in the draft Guidance Manual for the determination of "groundwater under the direct influence of surface water", which is reflected in Section 611.212. However, in that the reference was dropped from the final version of the Guidance Manual, the Board dropped it from Section 611.212. In that this was the only use of Method 912K, the Board has deleted it from the incorporation by reference Section.

Section 611.526

To this Section is added the reference to the MMO-MUG test discussed above.

Section 611.606

In subsection (a), the reference to "ASTM 2972" has been modified to "ASTM 2972A or B", to conform with the Agency documentation.

On November 9, 1990, in connection with its post-adoption review of R88-26, JCAR noted a minor typographical error in Section 611.606(m)(2)(B), which the Board has corrected in this Docket.

Section 611.610

In subsection (d), Standard Methods, 14th Edition, "Method 325B" has been modified to "Method 320 and 320A" to conform with the Agency documentation.

Section 611.720

In subsection (b)(1), "NTIS" has been specified as the source of "Procedures for Radiochemical Analysis...", to conform with Section 611.102.

ORDER

The Board hereby amends 35 Ill. Adm. Code 611 to read as follows.

TITLE 35: ENVIRONMENTAL PROTECTION  
SUBTITLE F: PUBLIC WATER SUPPLIES  
CHAPTER I: POLLUTION CONTROL BOARD

PART 611  
PRIMARY DRINKING WATER STANDARDS

SUBPART A: GENERAL

Section  
611.100 Purpose, Scope and Applicability  
611.101 Definitions  
611.102 Incorporations by Reference  
611.103 Severability

611.108 Delegation to Local Government  
611.109 Enforcement  
611.110 Special Exception Permits  
611.111 Section 1415 Variances  
611.112 Section 1416 Variances  
611.113 Alternative Treatment Techniques  
611.114 Siting requirements  
611.115 Source Water Quality  
611.120 Effective dates  
611.121 Maximum Contaminant Levels  
611.125 Fluoridation Requirement  
611.126 Prohibition on Use of Lead

SUBPART B: FILTRATION AND DISINFECTION

Section  
611.201 Requiring a Demonstration  
611.202 Procedures for Agency Determinations  
611.211 Filtration Required  
611.212 Groundwater under Direct Influence of Surface Water  
611.213 No Method of HPC Analysis  
611.220 General Requirements  
611.230 Filtration Effective Dates  
611.231 Source Water Quality Conditions  
611.232 Site-specific Conditions  
611.233 Treatment Technique Violations  
611.240 Disinfection  
611.241 Unfiltered PWSs  
611.242 Filtered PWSs  
611.250 Filtration  
611.261 Unfiltered PWSs: Reporting and Recordkeeping  
611.262 Filtered PWSs: Reporting and Recordkeeping  
611.271 Protection during Repair Work  
611.272 Disinfection following Repair

SUBPART C: USE OF NON-CENTRALIZED TREATMENT DEVICES

Section  
611.280 Point-of-Entry Devices  
611.290 Use of other Non-centralized Treatment Devices

SUBPART F: MAXIMUM CONTAMINANT LEVELS (MCL's)

Section  
611.300 Inorganic Chemicals  
611.310 Organic Chemicals  
611.311 VOCs  
611.320 Turbidity  
611.325 Microbiological Contaminants  
611.330 Radium and Gross Alpha Particle Activity  
611.331 Beta Particle and Photon Radioactivity

SUBPART K: GENERAL MONITORING AND ANALYTICAL REQUIREMENTS

Section  
611.480 Alternative Analytical Techniques  
611.490 Certified Laboratories



611.491 Laboratory Testing Equipment  
611.500 Consecutive PWSs

SUBPART L: MICROBIOLOGICAL MONITORING AND ANALYTICAL REQUIREMENTS

Section  
611.521 Routine Coliform Monitoring  
611.522 Repeat Coliform Monitoring  
611.523 Invalidation of Total Coliform Samples  
611.524 Sanitary Surveys  
611.525 Fecal Coliform and E. Coli Testing  
611.526 Analytical Methodology  
611.527 Response to Violation  
611.531 Analytical Requirements  
611.532 Unfiltered PWSs  
611.533 Filtered PWSs

SUBPART M: TURBIDITY MONITORING AND ANALYTICAL REQUIREMENTS

Section  
611.560 Turbidity

SUBPART N: INORGANIC MONITORING AND ANALYTICAL REQUIREMENTS

Section  
611.601 Requirements  
611.602 Violation of State MCL  
611.603 Frequency of State Monitoring  
611.606 Analytical Methods  
611.607 Fluoride Monitoring  
611.610 Special Monitoring for Sodium

SUBPART O: ORGANIC MONITORING AND ANALYTICAL REQUIREMENTS

Section  
611.641 Sampling and Analytical Requirements  
611.645 Analytical Methods  
611.648 Sampling for VOCs  
611.650 Monitoring for 36 Contaminants  
611.657 Analytical Methods for 36 Contaminants

SUBPART P: THM MONITORING AND ANALYTICAL REQUIREMENTS

Section  
611.680 Sampling, Analytical and other Requirements  
611.683 Reduced Monitoring Frequency  
611.684 Averaging  
611.685 Analytical Methods  
611.686 Modification to System

SUBPART Q: RADIOLOGICAL MONITORING AND ANALYTICAL REQUIREMENTS

Section  
611.720 Analytical Methods  
611.731 Gross Alpha  
611.732 Manmade Radioactivity

SUBPART T: REPORTING, PUBLIC NOTIFICATION AND RECORDKEEPING

Section

611.830	Applicability
611.831	Monthly Operating Report
611.832	Notice by Agency
611.833	Cross Connection Reporting
611.840	Reporting
611.851	Reporting MCL and other Violations
611.852	Reporting other Violations
611.853	Notice to New Billing Units
611.854	General Content of Public Notice
611.855	Mandatory Health Effects Language
611.856	Fluoride Notice
611.858	Fluoride Secondary Standard
611.860	Record Maintenance
611.870	List of 36 Contaminants

Appendix A	Mandatory Health Effects Information
Appendix B	Percent Inactivation of G. Lamblia Cysts
Appendix C	Common Names of Organic Chemicals
Table A	Total Coliform Monitoring Frequency
Table B	Fecal or Total Coliform Density Measurements
Table C	Frequency of RDC Measurement

AUTHORITY: Implementing Sections 17 and 17.5 and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1989, ch. 111 1/2, pars. 1017, 1017.5 and 1027.

SOURCE: Adopted in R88-26 at 14 Ill. Reg. , effective  
; amended in R90-21 at 14 Ill. Reg. , effective

#### SUBPART A: GENERAL

##### Section 611.102 Incorporations by Reference

- a) Abbreviations. The following abbreviated names are used for materials incorporated by reference:

"AEPA-1 Polymer" is available from Advanced Polymer Systems.

"ASTM" means American Society for Testing and Materials

"Indigo method" is as described in "Standard Methods", 17th Edition, Method 4500-03 B.

"Inductively Coupled Plasma Method" means "Inductively Coupled Plasma-Atomic Emission Spectrometric Method for Trace Element Analysis in Water and Wastes -- Method 200.7, with appendix" See 40 CFR 136, Appendix C.

"Inorganic Methods" means "Methods for Chemical Analysis of Water and Wastes", available from NTIS

"Microbiological Methods" means "Microbiological Methods for Monitoring the Environment, Water and Wastes", available from

NTIS.

"MMO-MUG Test" means "minimal medium ortho-nitrophenyl-beta-d-galactopyranoside - 4-methyl-umbelliferyl-beta-d-glucuronide test", available from Access Analytical Systems, Inc.

"NCRP" means "National Council on Radiation Protection".

"NTIS" means "National Technical Information Service".

"Organic Methods" means "Methods for the Determination of Organic Compounds in Drinking Water", available from USEPA.

"Pesticide Methods" means "Methods for Organochlorine Pesticides and Chloro-phenoxy Acid Herbicides in Drinking Water and Raw Source Water", available from USEPA.

"Radiochemical Methods" means "Interim Radiochemical Methodology for Drinking Water", available from NTIS.

"SPE Test Method" means "Solid Phase Extraction Test Method", available from J.T. Baker Chemical Company.

"Standard Methods", means "Standard Methods for the Examination of Water and Wastewater", available from the American Waterworks Association.

"Technicon Methods" means "Fluoride in Water and Wastewater", available from Technicon.

"USGS Method" means "United States Geological Survey Method"

b) The Board incorporates the following publications by reference:

Access Analytical Systems, Inc., 21 Business Park Drive,  
Branford, CT 06405 800/321-0207

MMO-MUG tests: Colilert P/A or Colilert MPN.

ASTM. American Society for Testing and Materials, 1976 Race Street, Philadelphia, PA 19103

ASTM Method D858-88, "Standard Test Methods for Manganese in Water", approved August 19, 1988.

ASTM Method D992-71, "Standard Method of Test for Nitrate Ion in Water", effective October 22, 1971.

~~-ASTM Method D1067-88, "Standard Test Methods for Acidity or Alkalinity of Water", approved August 19, 1988.~~

~~ASTM Method D1126-86, "Standard Test Method for Hardness in Water, approved August 29, 1988.~~

ASTM Method D1179-72A or B "Standard Test Methods for Fluoride in Water", approved July 28, 1972, reapproved 1978.

-ASTM Method D1293-84, "Standard Test Methods for pH of Water", approved October 26, 1984.-

ASTM Method D1428-64, "Standard Test Methods for Sodium and Potassium in Water and Water-Formed Deposits by Flame Photometry", approved August 31, 1964, reapproved 1977.

ASTM Method D1687-77D, "Standard Test Methods for Chromium in Water", approved February 18, 1977.

ASTM Method D1688-84D or E, "Standard Test Methods for Copper in Water", approved November 30, 1984.

ASTM Method D1889-88a, "Standard Test Method for Turbidity of Water", approved June 24, 1988.

ASTM Method D2459-72, "Standard Test Method for Gamma Spectrometry in Water," 1975, reapproved 1981, discontinued 1988.

ASTM Method D2907-83, "Standard Test Methods for Microquantities of Uranium in Water by Fluorometry", approved May 27, 1983.

ASTM Method D2972-78A or B, "Standard Test Methods for Arsenic in Water", approved August 18, 1978.

ASTM Method D3086-79, "Standard Test Methods for Organochlorine Pesticides In Water", approved November 30, 1979.

ASTM Method D3223-79, "Standard Test Method for Total Mercury in Water", approved November 30, 1979.

ASTM Method D3478-85, "Standard Test Method for Chlorinated Phenoxy Acid Herbicides in Water", approved November 29, 1985.

ASTM Method D3557-78A or B, "Standard Test Methods for Cadmium in Water", approved July 28, 1978.

ASTM Method D3559-78A or B, "Standard Test Methods for Lead in Water", approved July 28, 1978.

ASTM Method D3859-79, "Standard Test Methods for Selenium in Water", approved November 30, 1979.

ASTM Method D3867-79A or B, "Standard Test Methods for

Nitrite-Nitrate in Water", approved November 30, 1979.

American Waterworks Association et al., 6666 West Quincy Ave.,  
Denver, CO 80235 (303) 794-7711

Standard Methods for the Examination of Water and  
Wastewater, 13th Edition, 1971.

Method-s 302, 303, 304, 305 and 306- 302, Gross Alpha  
and Gross Beta Radioactivity in Water (Total,  
Suspended and Dissolved).

Method 303, Total Radioactive Strontium and Strontium  
90 in Water.

Method 304, Radium in Water by Precipitation.

Method 305, Radium 226 by Radon in Water (Soluble,  
Suspended and Total).

Method 306, Tritium in Water.

Standard Methods for the Examination of Water and  
Wastewater, 14th Edition, 1976.

Method-s- 301A II, -III, IV, VI and VII-Determination  
of Cadmium, etc. by Direct Aspiration into an Air-  
Acetylene Flame.

Method 301A III, Determination of Low Concentrations  
of Cadmium, etc. by Chelation with Ammonium  
Pyrrolidine Dithiocarbamate, and Extraction into  
Methyl Isobutyl Ketone.

Method 301A IV, Determination of Aluminum, etc. by  
Direct Aspiration into a Nitrous Oxide Acetylene  
Flame.

Method 301A VI, Determination of Mercury by Cold Vapor  
(Flameless) Atomic Absorption.

Method 301A VII, Determination of Arsenic and Selenium  
by Conversion to their Hydrides and Aspiration of the  
Gas into the Argon-Hydrogen Flame.

Method -~~325B~~-320 and 320A, Sodium, Flame Photometric  
Method.

Method 404A -and -, Arsenic/ Silver  
Diethyldithiocarbamate Method.

Method 404B(4) Arsenic/ Mercuric Bromide Stain Method

Method 413D, Cyanide, Colorimetric Method.

Method 419C- and D -, Nitrogen (Nitrate), Cadmium Reduction Method (Tentative).

Method 419D, Nitrogen (Nitrate), Brucine Method (Tentative).

Method 509A- and B-, Organochlorine Pesticides (Tentative).

Method 509B, Chlorinated Phenoxy Acid Herbicides (Tentative).

Method 605, Nitrogen (Nitrate), Cadmium Reduction Method (Tentative).

Standard Methods for the Examination of Water and Wastewater, 16th Edition, 1985.

-Method 43A and G-

Method 212, Temperature.

Method 214A, Turbidity, Nephelometric Method -- Nephelometric Turbidity Units.

Method-s- 303A- and B-, Determination of Antimony, etc. by Direct Aspiration into an Air-Acetylene Flame.

Method 303B, Determination of Low Concentrations of Cadmium, etc. by Chelation with Ammonium Pyrrolidine Dithiocarbamate (APDC) and Extraction into Methyl Isobutyl Ketone (MIBK).

Method 304, Determination of Micro Quantities of Aluminum, etc. by Electrothermal Atomic Absorption Spectrometry.

Method 408C-, D, E and F-, Chlorine (Residual), Amperometric Titration Method.

Method 408D, Chlorine (Residual), DPD Ferrous Titrimetric Method.

Method 408E, Chlorine (Residual), DPD Colorimetric Method.

Method 408F, Chlorine (Residual), Leuco Crystal Violet Method.

Method 410B- and G-, Chlorine Dioxide, Amperometric Method.

Method 410C, Chlorine Dioxide, DPD Method (Tentative).

Method 412D, Cyanide, Colorimetric Method.

Method 413-B and E-A, Fluoride, Preliminary Distillation Step.

Method 413B, Fluoride, Electrode Method.

Method 413C, Fluoride, SPADNS Method.

Method 413E, Fluoride, Complexone Method.

Method 423, pH Value.

Method 907A, Pour Plate Method.

Method 908-, 908A, B, C, D and E-, Multiple Tube Fermentation Technique for Members of the Coliform Group.

Method 908A, Standard Coliform Multiple-Tube (MPN) Tests.

Method 908B, Application of Tests to Routine Examinations.

Method 908C, Fecal Coliform MPN Procedure.

Method 908D, Estimation of Bacterial Density.

Method 908E, Presence-Absence (P-A) Coliform Test (Tentative).

Method 909-, 909A, B and C-, Membrane Filter Technique for Members of the Coliform Group.

Method 909A, Standard Total Coliform Membrane Filter Procedure.

Method 909B, Delayed Incubation Total Coliform Procedure.

Method 909C, Fecal Coliform Membrane Filter Procedure.

~~Method 912K-~~

Standard Methods for the Examination of Water and Wastewater, 17th Edition, 1989.

Advanced Polymer Systems, 3696 Haven Avenue, Redwood City, CA 94063 415/ 366-2626:

AEPA-1 Polymer. See 40 CFR 141.22(a). Also, as referenced in ASTM D1889.

ERDA Health and Safety Laboratory, New York, NY

HASL Procedure Manual, HASL 300, 1973. See 40 CFR 141.25(b)(2).

J.T. Baker Chemical Company, 22 Red School Lane, Phillipsburg, NJ 08865:

Solid Phase Extract (SPE) Test Method Number SPE-550. See 40 CFR 141.24(e), footnote 6.

NCRP. National Council on Radiation Protection, 7910 Woodmont Ave., Bethesda, MD (301) 657-2652.

"Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure", NCRP Report Number 22, June 5, 1959.

NTIS. National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 (703) 487-4600.

"Methods of for Chemical Analysis of Water and Wastes", J. Kopp and D. McGee, Third Edition, March, 1979. EPA-600/4-79-020, Doc. No. PB84-128677

"Microbiological Methods for Monitoring the Environment: Water and Wastes", R. Bodner and J. Winter, 1978. EPA-600/8-78-017, Doc. No. PB290-329/LP

"Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions", H.L. Krieger and S. Gold, EPA-R4-73-014, May, 1973, Doc. No. PB222-154/7BA

Technicon Industrial Systems, Tarrytown, NY 10591

"Fluoride in Water and Wastewater", Industrial Method #129-71W, December, 1972 See 40 CFR 141.23(f)(10), footnotes 6 and 7.

"Fluoride in Water and Wastewater", #380-75WE, February, 1976. See 40 CFR 141.23(f)(10), footnotes 6 and 7.

United States Environmental Protection Agency, (202) 382-4359

"The Analysis of Trihalomethanes in Drinking Waters by the Purge and Trap Method", Method 501.1. See 40 CFR 141, Subpart C, Appendix C.



"The Analysis of Trihalomethanes in Drinking Water by Liquid/Liquid Extraction," Method 501.2 See 40 CFR 141, Subpart C, Appendix C.

"Inductively Coupled Plasma-Atomic Emission Spectrometric Method for Trace Element Analysis in Water and Wastes -- Method 200.7, with Appendix to Method 200.7" entitled, "Inductively Coupled Plasma-Atomic Emission Analysis of Drinking Water", March 1987. See 40 CFR 136, Appendix C.

"Interim Radiochemical Methodology for Drinking Water", EPA-600/4-75-008 (Revised) March, 1976.

"Methods for the Determination of Organic Compounds in Drinking Water", EPA/600/4-88/039, December, 1988.

"Methods for Organochlorine Pesticides and Chloro-phenoxy Acid Herbicides in Drinking Water and Raw Source Water"

"Methods of for Chemical Analysis of Water and Wastes". See NTIS

Microbiological Methods for Monitoring the Environment, Water and Wastes". See NTIS

"Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions". See NTIS

United States Environmental Protection Agency, Science and Technology Branch, Criteria and Standards Division, Office of Drinking Water, Washington D.C. 20460

"Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems using Surface Water Sources", October, 1989

USGS. United States Geological Survey.

Techniques of Water-Resources Investigation of the United States Geological Survey:

Book 5, Chapter A-1, "Methods for Determination of Inorganic substances in Water and Fluvial Sediments", 1979

Book 5, Chapter A-3, "Methods for Analysis of Organic Substances in Water," 1971

- c) The Board incorporates the following federal regulations by reference:

40 CFR 136, Appendix B and C (1989)

40 CFR 141.22(a) (1989)

40 CFR 141.23(f)(10), footnotes 6 and 7 (1989)

40 CFR 141.24(e), footnote 6 (1989)

40 CFR 141.25(b)(2) (1989)

40 CFR 141, Subpart C, Appendix C (1989).

d) This Part incorporates no future amendments or editions.

(Source: Amended at 14 Ill. Reg. , effective )

SUBPART L: MICROBIOLOGICAL MONITORING AND ANALYTICAL REQUIREMENTS

Section 611.526 Analytical Methodology

- a) The standard sample volume required for total coliform analysis, regardless of analytical method used, is 100 ml.
- b) Suppliers need only determine the presence or absence of total coliforms, a determination of total coliform density is not required.
- c) Suppliers shall conduct total coliform analyses in accordance with one of the following analytical methods, incorporated by reference in Section 611.102:
  - 1) Multiple-Tube Fermentation (MTF) Technique, as set forth in:
    - A) Standard Methods, 16th Edition, Method 908, 908A and 908B, except that 10 fermentation tubes must be used; or
    - B) Microbiological Methods, Part III, Section B 4.1-4.6.4, pp. 114-118, (Most Probable Number Method), except that 10 fermentation tubes must be used; or
  - 2) Membrane Filter (MF) Technique, as set forth in:
    - A) Standard Methods, 16th Edition, Method 909, 909A and 909B; or
    - B) Microbiological Methods, Part III, Section B.2.1-2.6, pp. 108-112; or
  - 3) P-A Coliform Test, as set forth in: Standard Methods, 16th Edition, Method 908E-~~r~~-; or
  - 4) MMO-MUG test.
- d) In lieu of the 10-tube MTF Technique specified in subsection (c)(1), a supplier may use the MTF Technique using either five tubes (20-ml sample portions or a single culture bottle containing the culture

medium for the MTF Technique, i.e., lauryl tryptose broth (formulated as described in Standard Methods, 16th Edition, Method 908A, incorporated by reference in Section 611.102) as long as a 100-ml water sample is used in the analysis.

- e) Suppliers shall conduct fecal coliform analysis in accordance with the following procedure:
- 1) When the MTF Technique or P-A Coliform Test is used to test for total coliforms, shake the lactose-positive presumptive tube or P-A bottle vigorously and transfer the growth with a sterile 3-mm loop or sterile applicator stick into brilliant green lactose bile broth and EC medium, defined below, to determine the presence of total and fecal coliforms, respectively.
  - 2) For Microbiological Methods, referenced above, which use a membrane filter, remove the membrane containing the total coliform colonies from the substrate with a sterile forceps and carefully curl and insert the membrane into a tube of EC medium. (The laboratory may first remove a small portion of selected colonies for verification). Gently shake the inoculated EC tubes to insure adequate mixing and incubate in a waterbath at 44.5 +/- 0.2 degrees C for 24 +/- 2 hours. Gas production of any amount in the inner fermentation tube of the EC medium indicates a positive fecal coliform test.
  - 3) The preparation of EC medium is described in Standard Methods, 16th Edition, Method 908C.
  - 4) Suppliers need only determine the presence or absence of fecal coliforms, a determination of fecal coliform density is not required.

BOARD NOTE: Derived from 40 CFR 141.21(f) (1989), as amended at 54 Fed. Reg. 27562, June 29, 1989.

(Source: Amended at 14 Ill. Reg. , effective )

#### SUBPART N: INORGANIC MONITORING AND ANALYTICAL REQUIREMENTS

##### Section 611.606 Analytical Methods

Analyses conducted to determine compliance with Section 611.300 must be made in accordance with the following methods, incorporated by reference in Section 611.102. For approved analytical procedures for metals, the technique applicable to total metals must be used.

- a) Arsenic:
- 1) ASTM Method D2972A or B; or
  - 2) Standard Methods, 14th Edition:

- A) Method 301A VII; or
  - B) Method 404A and 404B(4); or
  - 3) USGS Methods, Method I-1062-78, pp. 61-63, Atomic Absorption - Gaseous Hydride; or
  - 4) Inorganic Methods:
    - A) Method 206.2, Atomic Absorption Furnace Technique; or
    - B) Method 206.3; or
    - C) Method 206.4; or
  - 5) Inductively Coupled Plasma Method 200.7.
- b) Barium:
- 1) Standard Methods, 14th Edition, Method 301A IV; or
  - 2) Inorganic Methods:
    - A) Method 208.1; or
    - B) Method 208.2, Atomic Absorption Furnace Technique; or
  - 3) Inductively Coupled Plasma Method 200.7.
- c) Cadmium:
- 1) ASTM Method D3557 A or B; or
  - 2) Standard Methods, 14th Edition, Methods 301A II or III; or
  - 3) Inorganic Methods:
    - A) Method 213.1; or
    - B) Method 213.2, Atomic Absorption Furnace Technique; or
  - 4) Inductively Coupled Plasma Method 200.7.
- d) Chromium:
- 1) ASTM Method D 1687; or
  - 2) Standard Methods, 14th Edition, Methods 301A II or III; or
  - 3) Inorganic Methods:
    - A) Method 218.1; or

- B) Method 218.2, Atomic Absorption Furnace Technique; or
  - 4) Inductively Coupled Plasma Method 200.7.
- e) Lead:
- 1) ASTM Method D 3559 A or B; or
  - 2) Standard Methods, 14th Edition, Methods 301A II or III; or
  - 3) Inorganic Methods:
    - A) Method 239.1; or
    - B) Method 239.2, Atomic Absorption Furnace Technique.
  - 4) Inductively Coupled Plasma Method 200.7.
- f) Mercury:
- 1) ASTM Method D 3223; or
  - 2) Standard Methods, 14th Edition, Method 301A VI, Cold Vapor Technique; or
  - 3) Inorganic Methods:
    - A) Method 245.1; or
    - B) Method 245.2, Automated Cold Vapor Technique.
- g) Nitrate:
- 1) ASTM:
    - A) Method D 3867 A or B; or
    - B) Method D 992; or
  - 2) Standard Methods, 14th Edition:
    - A) Method 419C, Spectrometric, Cadmium Reduction;
    - B) Method 419D, Colorimetric Brucine; or
    - C) Method 605, Automated Cadmium Reduction.
  - 3) Inorganic Methods:
    - A) Method 352.1; or
    - B) Method 353.1, Automated Hydrazine Reduction; or

- C) Method 353.2; or
- D) Method 353.3; or
- h) Selenium:
  - 1) Inorganic Methods
    - A) Method 270.2, Atomic Absorption Furnace Technique; or
    - B) Method 270.3; or
  - 3 2) USGS Methods, Method I-1667-78, pp. 237-239; or
  - 4 3) ASTM Method D 3859; or
  - 5 4) Standard methods, 14th Edition, Method 301A VII, Hydride Generation - Atomic Absorption Spectrophotometry.
- i) Silver:
  - 1) Standard Methods, 14th Edition, Methods 301A II; or
  - 2) Inorganic Methods:
    - A) Method 272.1; or
    - B) Method 272.2, Atomic Absorption Furnace Technique; or
  - 3) Inductively Coupled Plasma Method 200.7.
- j) Fluoride:
  - 1) ASTM D 1179 A or B; or
  - 2) Standard Methods, 16th Edition:
    - A) Methods 413A and 413C;
    - B) 413B; or
    - C) 413E; or
  - 3) Inorganic Methods:
    - A) Method 340.1;
    - B) Method 340.2;
    - C) Method 340.3; or
  - 4) Technicon Methods, Methods 129-71W or 380-75WE

BOARD NOTE: Derived from 40 CFR 141.23(f) (1989).

k) Manganese:

- 1) ASTM D 858;
- 2) Standard Methods, 16th Edition, Method 303A.
- 3) Inorganic Methods: Methods 243.1 or 243.2; or
- 4) Inductively Coupled Plasma Method 200.7.

BOARD NOTE: These methods are used for additional State requirements.

l) Iron:

- 1) Inorganic Methods: 236.1 or 236.2; or
- 2) Inductively Coupled Plasma Method 200.7.
- 3) Standard Methods, 16th Edition, Method 303A

BOARD NOTE: These methods are used for additional State requirements.

m) Copper:

- 1) ASTM D 1688 D or E;
- 2) Standard Methods, 16th Edition:
  - A) Methods 303A or B;
  - B) Method 304-~~3~~ 0F-1.

BOARD NOTE: These methods are used for additional State requirements.

- 3) Inorganic Methods: 220.1 or 220.2; or
- 4) Inductively Coupled Plasma Method 200.7.

n) Zinc:

- 1) Inorganic Methods 289.1 or 289.2; or
- 2) Standard Methods, 16th Edition, Method 303A

BOARD NOTE: These methods are used for additional State requirements.

o) Cyanide:

- 1) Inorganic Method 335.2; or
- 2) Standard Methods, 16th Edition, Method 412D

BOARD NOTE: These methods are used for additional State requirements.

(Source: Amended at 14 Ill. Reg. , effective )

Section 611.610 Special Monitoring for Sodium

- a) CWS suppliers shall collect and analyze one sample per plant at the entry point of the distribution system for the determination of sodium concentration levels; samples must be collected and analyzed annually for CWSs utilizing surface water sources in whole or in part, and at least every three years for CWSs utilizing solely groundwater sources. The minimum number of samples required to be taken by the supplier is based on the number of treatment plants used by the supplier, except that multiple wells drawing raw water from a single aquifer may, with the Agency approval, be considered one treatment plant for determining the minimum number of samples. The Agency shall require the supplier to collect and analyze water samples for sodium more frequently in locations where the sodium content is variable.
- b) The CWS supplier shall report to the Agency the results of the analyses for sodium within the first 10 days of the month following the month in which the sample results were received or within the first 10 days following the end of the required monitoring period as specified by special exception permit, whichever of these is first. If more than annual sampling is required the supplier shall report the average sodium concentration within 10 days of the month following the month in which the analytical results of the last sample used for the annual average was received.
- c) The CWS supplier shall notify the Agency and appropriate local public health officials of the sodium levels by written notice by direct mail within three months. A copy of each notice required to be provided by this subsection must be sent to the Agency within 10 days of its issuance.
- d) Analyses for sodium must be performed by the following methods, incorporated by reference in Section 611.102:
  - 1) Standard Methods, 14th Edition, Method ~~325B~~-320 and 320A, flame photometric method;
  - 2) Inorganic Methods:
    - A) Method 273.1, Atomic Absorption - Direct Aspiration; or
    - B) Method 273.2, Atomic Absorption - Graphite Furnace; or



3) ASTM Method D1428.

BOARD NOTE: Derived from 40 CFR 141.41 (1989).

(Source: Amended at 14 Ill. Reg. , effective )

SUBPART Q: RADIOLOGICAL MONITORING AND ANALYTICAL REQUIREMENTS

Section 611.720 Analytical Methods

- a) The methods specified below, incorporated by reference in Section 611.102, are to be used to determine compliance with Sections 611.330 and 611.331, except in cases where alternative methods have been approved in accordance with Section 611.480.
  - 1) Radiochemical Methods;
  - 2) Standard Methods, 13th Edition:
    - A) Gross Alpha and Beta: Method 302;
    - B) Total Radium: Method 304;
    - C) Radium-226: Method 305;
    - D) Strontium-89,90: Method 303;
    - E) Tritium: Method 306.
  - 3) ASTM Methods:
    - A) Cesium-134: ASTM D-2459;
    - B) Uranium: ASTM D-2907.
- b) When the identification and measurement of radionuclides other than those listed in subsection (a) is required, the following methods, incorporated by reference in Section 611.102, are to be used, except in cases where alternative methods have been approved in accordance with Section 611.480:
  - 1) "Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions", available from -USEPA-NTIS.
  - 2) HASL Procedure Manual, HASL 300.
- c) For the purpose of monitoring radioactivity concentrations in drinking water, the required sensitivity of the radioanalysis is defined in terms of a detection limit. The detection limit must be that concentration which can be counted with a precision of plus or minus 100 percent at the 95 percent confidence level (1.96 sigma where sigma is the standard deviation of the net counting rate of the

sample).

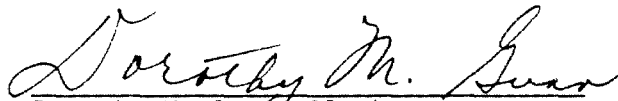
- 1) To determine compliance with Section 611.330(a) the detection limit must not exceed 1 pCi/L. To determine compliance with Section 611.330(b) the detection limit must not exceed 3 pCi/L.
  - 2) To determine compliance with Section 611.331 the detection limits must not exceed the concentrations listed in that Section.
- d) To judge compliance with the MCLs listed in Sections 611.330 and 611.331, averages of data must be used and must be rounded to the same number of significant figures as the MCL for the substance in question.

BOARD NOTE: Derived from 40 CFR 141.25 (1989).

(Source: Amended at 14 Ill. Reg. , effective )

IT IS SO ORDERED

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 29<sup>th</sup> day of November, 1990, by a vote of 7-0.

  
Dorothy M. Gunn, Clerk  
Illinois Pollution Control Board