

**BEFORE THE WATER QUALITY CONTROL COMMISSION
FOR THE STATE OF NEW MEXICO**



In the Matter of:

**PROPOSED
AMENDMENTS TO GROUND
AND SURFACE WATER
PROTECTION REGULATIONS,
20.6.2 NMAC**

No. WQCC 17-03(R)

**New Mexico Mining Association,
Petitioner.**

**NOTICE OF INTENT TO PRESENT TESTIMONY ON NEW MEXICO MINING
ASSOCIATION'S STATEMENT ON 20.6.2 NMAC PROPOSED AMENDMENTS**

The New Mexico Mining Association (NMMA) hereby submits this Notice of Intent to Present Testimony on 20.6.2 NMAC Proposed Amendments in accordance with the Scheduling Order for this matter. Pursuant to the Proposed Amendments to 20.6.2 NMAC, NMMA hereby states:

1. Person for whom the witness(es) will testify:

The witness will testify for NMMA and its members.

2. Identify each technical witness the person intends to present and state the qualifications of that witness including a description of their educational and work background:

NMMA presents the following witness to present direct testimony. The witness's educational and work background is presented in the Direct Testimony:

Michael Neumann

3. Attach the full written direct testimony of each technical witness, which shall include an express basis for all expert opinion offered:

The direct testimony is attached.

4. **Include the text of any recommended modifications to the proposed regulatory change:**

NMMA's recommended modifications and amendments are included in the attached Direct Testimony.

5. **Identify and attach all exhibits to be offered by the person at the hearing:**

EXHIBIT #	DESCRIPTION
NMMA A	Direct Testimony of Michael Neumann
NMMA B	Resume of Michael Neumann
NMMA C	Federal Register Notice January 30, 1991 (selected pages)
NMMA D	Federal Register Notice April 2, 1986

WHEREFORE, NMMA respectfully requests that the Water Quality Control Commission accept the following NOI on the Proposed Amendments on behalf of NMMA. Further, NMMA reserves the right to supplement this pleading and its attachments in accordance with the applicable rules and Scheduling Order.

Respectfully Submitted,

GALLAGHER & KENNEDY, P.A.



Dalva L. Moellenberg, Esq.

Rikki-Lee Chavez, Esq.

1239 Paseo de Peralta

Santa Fe, NM 87501

(505) 982-9523

(505) 983-8160

DLM@gknet.com

Rikki-Lee.Chavez@gknet.com

CERTIFICATE OF SERVICE

I certify that a copy of the foregoing Notice of Intent was served on September 11, 2017, via electronic mail to the following:

Ms. Pam Castañeda,
Administrator
Water Quality Control
Commission
Room N-2168, Runnels
Building
1190 St. Francis Dr.
Santa Fe, New Mexico 87505
Pam.castaneda@state.nm.us

Pete Domenici
Lorraine Hollingsworth
Domenici Law Firm, P.C.
320 Gold Ave. SW, Suite 1000
Albuquerque, NM 87102
pdomenici@domenicilaw.com
lhollingsworth@domenicilaw.com

William C. Olson
14 Cosmic Way
Lamy, NM 87540
billjeanie.olson@gmail.com

New Mexico Environment
Department
Office of General Counsel
John Verheul
Lara Katz
P.O. Box 5469
Santa Fe, New Mexico 87502
John.verhaul@state.nm.us
Lara.katz@state.nm.us

Louis W. Rose
Kari Olsen
P.O. Box 2307
Santa Fe, NM 87504
lrose@montand.com
kolson@montand.com

John Grubescic
Office of the Attorney General
Post Office Drawer 1508
Santa Fe, NM 87504-1508
jgrubescic@nmag.gov

New Mexico Environmental
Law Center
Jaimie Park
Douglas Meiklejohn
Johnathan Block
Eric Jantz
1405 Luisa Street, Suite 5
Santa Fe, New Mexico 87505
jpark@nmelc.org
dmeiklejohn@nmelc.org

Michael L. Casillo
AFLOA/JACE
1500 West Perimeter Rd. Ste.
1500
Joint Base Andrews, MD 20762
michael.l.casillo2.civ@mail.mil

Michael Bowen
Executive Director
1470 St. Francis Drive
Santa Fe, NM 87505
nmma@comcast.net


Rachel Conn
Projects Director
Amigos Bravos
P.O. Box 238
Taos, NM 87571
rconn@amigosbravos.org

William Brancard
Cheryl Bada
Energy, Minerals & Natural
Resources Department
1220 South St. Francis Drive
Santa Fe, NM 87505
bill.brancard@state.nm.us
cheryl.bada@state.nm.us

Russell Church, President
NMML EQA Subsection
NM Municipal League
P.O. Box 846
Santa Fe, NM 87504
rchurch@redriver.org

Stuart R. Butzier
Christina C. Sheehan
American Magnesium, LLC
Rio Grande Resources
Corporation
New Mexico Copper
Corporation
P.O. Box 2168
Albuquerque, NM 87103-2168
Stuart.butzier@modrall.com
Christina.sheehan@modrall.com

Timothy A. Dolan
Office of Laboratory Counsel
Los Alamos National Laboratory
P.O. Box 1663, MS A187
Los Alamos, NM 87545
tdolan@lanl.gov



Dalva L. Moellenberg, Esq.

NMMA EXHIBIT A

**STATE OF NEW MEXICO
BEFORE THE WATER QUALITY CONTROL COMMISSION**

**IN THE MATTER OF PROPOSED)
AMENDMENTS TO GROUND)
AND SURFACE WATER)
PROTECTION REGULATIONS,)
20.6.2 NMAC)**

No. WQCC 17-03(R)

NMMA EXHIBIT A

**DIRECT TESTIMONY OF MICHAEL NEUMANN
ON BEHALF OF THE NEW MEXICO MINING ASSOCIATION**

My name is Michael Neumann and I currently serve as President of the Board of Directors of the New Mexico Mining Association ("NMMA") and present this testimony in that capacity. I am employed by Energy Fuels Resources as Manager of its New Mexico Operations. Previously I have been employed by Neutron Energy Inc. as Vice President, Environment (2007-2013) and as manager of the Environmental Group at Montgomery Watson/Terramatrix (1994-2000). As part of these positions I am experienced in a wide variety of environmental regulatory matters, including supervising work under the Commission's regulations, 20.6.2, such as discharge permit applications. I hold a Bachelor of Science degree in Range Management from the University of Wyoming. A copy of my current resume is attached hereto as NMMA Exhibit B. I present this testimony based on my general regulatory work and experience, and not as a technical expert in any particular field. NMMA's proposed amendments are offered to the Commission based largely upon policy considerations.

On behalf of the New Mexico Mining Association ("NMMA") I present this written direct testimony in support of the amendments to 20.6.2 NMAC offered by NMMA. NMMA identified its proposed additions and alternative language for amendments to 20.6.2. NMAC in its Statement

of Position and Proposed Amendments filed on July 27, 2017. NMMA offered the following amendments that are supported in my Direct Testimony: (1) a different definition of “discharge permit amendment” from the definition as proposed by the Environment Department; (2) different language regarding the five-year review of variances granted by the Commission; (3) amendments to the existing ground water quality standards for chromium and fluoride; and (4) modified language to the footnote to the updated ground water quality standards addressing when the Secretary may require a person who has completed abatement under an existing standard to take additional abatement action to meet a new, more stringent ground water quality standard. I am aware that NMMA has indicated its opposition to some of the rule amendments as proposed by the Environment Department, including some of the proposed amendments to the ground water quality standards. NMMA will address the amendments that it opposes in its written Rebuttal Testimony.

Definition of Discharge Permit Amendment

The first change offered by NMMA is to replace the definition of “discharge permit amendment” as proposed by the Environment Department in proposed section 20.6.2.7.D(4) NMAC with a definition that reads as follows:

“Discharge permit amendment” means a minor modification of a discharge permit that does not result in a significant change in the location of a discharge, an increase in daily discharge volume of greater than 10% of the original daily discharge volume approved in an existing discharge permit for an individual discharge location, a significant increase in the concentration of water contaminants discharged, or introduction of a new water contaminant discharged.

NMMA is in agreement with the need and purpose for a definition of “discharge permit amendment” as stated in NMED’s Proposed Statement of Reasons filed with its Petition. In particular, the existing rules contain a definition of “discharge permit modification,” which reads as follows: “discharge permit modification” means a change to the requirements of a discharge

permit that results from a change in the location of the discharge, a significant increase in the quantity of the discharge, a significant change in the quality of the discharge, or as required by the secretary.” 20.6.2.7.P NMAC. NMMA understands that a purpose of this definition is to identify permit changes that are subject to the criteria for decisionmaking under 20.6.2.3109 NMAC and that require public notice and opportunity for public participation under 20.6.2.3108 NMAC, which are defined and treated as “discharge permit modifications.” These are distinguished from other permit changes that do not require public notice and an opportunity for participation.

From time to time, a permit holder may request minor changes to a discharge permit that do not qualify as “discharge permit modifications.” For example, a permit holder and the Department might agree to a change in the specific location, frequency, or constituents requiring ground water quality monitoring. Unless that change is associated with a change that would meet the definition of “discharge permit modification,” such a change could be made administratively, unless the secretary deems the change to be of sufficient importance to require public notice under 20.6.2.3108 NMAC. An example of the type of change in circumstance that might warrant a change to a permit that would not constitute a “discharge permit modification” as currently defined is a monitoring well going dry, which needs to be replaced by a new monitoring well.

The Department proposes a new definition of “discharge permit amendment” to define changes to a permit that are not “discharge permit modifications.” NMMA agrees with the need and purposes for a definition of “discharge permit amendments.” NMMA contends that the definition as proposed by the Department is too limited as it relates to changes in the volume of a discharge in the context of mining operations. Of particular concern is the language of the proposed definition which appears to disqualify any change in discharge permit volume of more than 50,000 gallons per day from being treated as a “discharge permit amendment.” Mining

operations often have authorized discharges of fluids that are measured in thousands of gallons permit minute. A discharge of 50,000 gallons per day would be less than 35 gallons per minute. Such a change in authorized discharge rate would be trivial for an operation that is authorized to discharge thousands of gallons per minute. In my experience and opinion, the ten-percent limit is more appropriate for this scale of operation, and is more consistent with the existing definition of “discharge permit modification” which, with regard to volume, includes only those changes constituting a “significant increase in the quantity of a discharge.”

The Commission previously has adopted a definition of “discharge permit amendment” as part of the Copper Rule, 20.6.7.7.B(19). NMMA proposes that the Commission adopt that same definition, which is quoted above, rather than the definition proposed by the Department. In addition to the reasons stated above, adoption of the definition in the Copper Rule would result in greater consistency within the rules. It is important to note that whether the Department’s or NMMA’s proposed definition of “discharge permit amendment” is adopted, under the revised definition of “discharge permit modification” as proposed by the Department, the Secretary still would have the discretion to treat a permit change that would qualify as a “discharge permit amendment” as a “discharge permit modification” due to the retention of the phrase “or as required by the secretary.” This obviates the need for some of the finer details contained in the Department’s proposed definition of “discharge permit amendment.”

Five-Year Review of Variances

The Department’s Petition proposes changes to the variance provision, 20.6.2.1210 NMAC, which would remove the five-year maximum limit on the term of a variance, subject to a new five-year review process. NMMA proposes alternative language for subsection E of this section to read as follows:

E. For a variance ~~variances~~ granted for a period in excess of five years, the petition shall provide to the department for review a variance compliance report accompanying an application to renew the associated discharge permit, or if there is no associated permit, at five year intervals, to demonstrate that the conditions of the variance are being met, including notification of any changed circumstances or newly discovered facts. The report shall identify any changes of circumstances or newly discovered facts which are material to the variance and which are substantially different than the circumstances or facts presented in the original application for the variance. At such time as the department determines the report is administratively complete, the department shall post the report on its website, and mail or e-mail notice of its availability to those persons on a general and facility-specific list maintained by the department who have requested notice of discharge permit applications, and any person who participated in the variance process. If such conditions are not being met, or if there is evidence indicating changed circumstances or newly-discovered facts or conditions that were unknown at the time the variance was initially granted and which are material to the variance or the conditions under which the variance was approved, any person who would have standing to appeal a permit decision or including the department, may request a hearing before the commission to revoke, modify or otherwise reconsider the variance within 90 days of the notice of availability of the report.

NMMA's alternative language is primarily presented for clarity and to coordinate with permit renewal requirements. The first change made in NMMA's language is to change the introductory language to refer to a single variance, rather than plural. This is an editorial change and probably also should be made in subsection D. The second change is to modify the timing of a compliance report to coincide with an application for discharge permit renewal, which is required every five years, unless the variance is not associated with a discharge permit. That would be more convenient for both the permit holder and the Department. Furthermore, those changes of circumstances or newly discovered facts that must be presented in a compliance report and that may be the basis for requesting a hearing on the variance should be limited to differences that are material to the granting of the variance or its conditions. As proposed by the Department, and if read literally, a compliance report would have to identify changes of circumstance or newly discovered facts which may have nothing to do with the variance, and in turn those changes could be the basis for a hearing request. A reasonable test for materiality would be whether the

commission's decision on the variance likely would have been substantially influenced by the change in facts or circumstances. Under the NMMA's proposed language, the commission could consider materiality of the change in circumstances or new facts when it considers whether to grant a request for a hearing. Also, NMMA's language would extend the right to request a hearing to only those persons who have appeal rights under the Water Quality Act.

Amendments to the Ground Water Quality Standards for Chromium and Fluoride

NMMA proposes that the numerical ground water quality standards in 20.6.2.3103.A for chromium and fluoride be amended as follows:

- a. Chromium: A standard of 0.1 mg/l
- b. Fluoride: A standard of 4.0 mg/l

NMMA proposes these changes for the same reasons as stated in the Department's Petition, that is, for consistency with current Maximum Contaminant Levels ("MCLs") adopted for public drinking water systems under the Safe Drinking Water Act. Under the Safe Drinking Water Act, the U.S. Environmental Protection Agency ("EPA") adopts two criterion for certain water contaminants: Maximum Contaminant Level Goals ("MCLGs"), which are set at a level fully protective of public health, and MCLs, which also consider the feasibility of treatment by public water systems. For chromium, EPA has adopted an MCLG and an MCL at the same level, 0.1 mg/l. Attached as NMMA Exhibit C is a copy of the relevant parts of the Federal Register notice explaining EPA's adoption of the MCLG and MCL for chromium. EPA also has adopted an MCLG and an MCL for fluoride at the same level: 4.0 mg/l. Attached as NMMA Exhibit D is a copy of the Federal Register notice adopting the MCLG and MCL for fluoride. These standards are found in the current version of 40 C.F.R. Part 141, which has been adopted in its entirety by

the Environmental Improvement Board (“EIB”) as the New Mexico drinking water standards.
20.7.10.100.A NMAC.

The standards in 20.6.2.3103.A are the numerical standards to protect human health. The Department has proposed various changes to the ground water standards to conform to current MCLs. In NMMA’s experience, the Commission normally has aligned the standards in 20.6.2.3103.A with MCLs. In fairness, for consistent policy, if in fact it is the Commission’s policy to have ground water quality standards consistent with MCLs, and for the reasons set forth in EPA’s determinations and the current primary drinking water standards for protection of human health for these constituents as adopted by both the EPA and the EIB, the Commission should amend the current MCL’s for chromium and fluoride to be consistent with the current MCL.

Amendment to the Note in Subsection 20.6.2.3103.A

The current regulations include a note at the end of section 20.6.2.3103 NMAC which addresses the effective date of new standards previously adopted by the Commission. The Department has proposed to modify this note to address the new standards it proposes and to add some additional language to address the circumstances where a person subject to a requirement to abate water pollution has completed the abatement to meet a standard in effect at that time, but the Commission has subsequently adopted a more stringent standard. Under these circumstances, the Department proposes language to state that the abatement need not be reopened to address the new standard unless the Department notifies the responsible person that “the site is a source of these contaminants in ground water at a place of withdrawal of water for present or reasonably foreseeable future use.”

The phrase “place of withdrawal of water for present or reasonably foreseeable future use” has been the subject of litigation and disagreement. It is fair to say, based upon the history of this

issue, that it is unclear what locations in ground water are not "places of withdrawal." NMMA believes that when a person has fully completed abatement in compliance with standards in existence at the time, it fair to expect that the abatement process will not be reopened unless there are extraordinary circumstances, and there should be clear criteria to define those circumstances. As an alternative to the "place of withdrawal" as a criteria, and due to the uncertainty of that criteria, NMMA proposes to replace that criteria with "hazard to public health," as that phrase is defined in current rule as 20.6.7.AA NMAC and in the proposed amended rule at 20.6.7.H NMAC. Use of the phrase "hazard to public health" will provide a clearer criterion for the reopening of a completed abatement action while still ensuring that if the continued presence of a water contaminant at a level above the new standard exists following the completion of abatement, that additional action can be required to avoid a hazard to public health. Consequently, NMMA proposes that the second sentence of the Note at the end of this subsection amended to read:

With regard to sites for which the secretary has, as of the effective date of these rule amendments, approved an abatement completion report pursuant to 20.6.2.4112 NMAC or has otherwise approved the completion of abatement of water pollution, the amended numeric standards for arsenic, cadmium, lead, combined radium-226 & radium-228, benzene, PCBs, carbon tetrachloride, EDC, PCE, TECE, methylene chloride, EDB, 1,1,2-trichloroethane, and benzo-a-pyrene shall not apply unless the secretary notifies the responsible person that site is a source of these contaminants in ground water ~~at a place of withdrawal for present or reasonably foreseeable future use at concentrations in excess of the standards of this section~~ and is a hazard to public health.

Conclusion

This concludes my direct written testimony on behalf of the NMMA.


Michael Neumann

NMMA EXHIBIT B

Michel R. Neumann
9489 W. Auburn Ave.
Lakewood, CO 80227
970-620-0749
meekermike@gmail.com

EDUCATION

University of Wyoming: B.S. Range Management, 1978.

PROFESSIONAL WORK HISTORY

Energy Fuels Resources Manager, New Mexico Operations	Aug. 2013 to present
Uranium Resources Inc./Neutron Energy Inc. Vice President, Environmental Affairs Director, Environmental Services	9/08-05/13 3/07-9/08
Rio Blanco County Land Use Director	11/04-12/06
City of Steamboat Springs Open Space Supervisor	2000-8/04
Montgomery Watson Harza (formerly TerraMatrix Inc.) Environmental Group Manager/Sr. Project Manager Steamboat Springs, Colorado	1994-2000
Neumann Environmental Services Inc. Principal Westminster and Oak Creek, Colorado	1991-1994
Union Pacific Resources/Rocky Mountain Energy Company Senior Environmental Coordinator Denver, Colorado and Casper, Wyoming	1978-1991
Mine Reclamation Consultants Range Technician Laramie, Wyoming	1975-1978

EXPERIENCE SUMMARY

Over 35 years experience in the environmental and regulatory aspects of natural resource development with particular expertise in mine permitting. Proven skills in staff and project management, reclamation planning and supervision, design and supervision of studies covering all resource fields, permitting, regulatory evaluations, agency negotiations, feasibility studies, technical writing and editing, compliance audits, due diligence evaluations and litigation support. Sound understanding of the NEPA process and all major environmental laws affecting mine development, operations and closure as well as extensive experience working with local, state and federal regulatory agencies and stakeholders including Native Americans to obtain project approvals.

Energy Fuels Resources (August 2013 to present)

Executive Director of the Roca Honda Resources Joint Venture, directing all aspects of project development for planned underground uranium mine in NW New Mexico. Prepared budgets, work plans, permitting documents, partnership meeting materials; managed public relations and negotiated land owner agreements. Supervised staff and consultants in technical evaluations, assisted preparation of NI 43-101 documents and reports.

Uranium Resources Inc. & Neutron Energy Inc. (July 2006-May 2013)

Responsible for permitting uranium exploration and development projects primarily in New Mexico. Constant high level interaction with State and Federal regulatory agencies (USFS and NRC), company CEO and Board of Directors, investors, legal advisors, and all project stakeholders including Spanish land grant descendants and multiple Native American tribes. Developed project schedules, budgets, staffing rosters, obtained precedent-setting exploration permits; managed numerous consultants performing over \$2M in baseline studies and tribal consultation for planned new uranium mill and mines.

Montgomery Watson/TerraMatrix (9/93-4/99; Steamboat Springs, CO)

As the Environmental Group leader for Montgomery Watson's Mining Division, managed a staff of 10-15 professional engineers, surface and groundwater hydrologists, geologists, and environmental scientists in the completion of diverse natural resource investigations. Responsibilities included hiring, employee performance reviews, budget and work schedule preparation, marketing, and budget control for Group. Concurrently served as Senior Project Manager for over a dozen major projects involving preparation of environmental analyses documents (EIS or foreign equivalent), mine reclamation plans, and permit applications for both domestic and international mining projects. Multi-year projects included: management of environmental remediation programs, regulatory negotiations, permitting, innovative revegetation work, and bond release efforts for a surface coal mine in Colorado; completion of extensive site characterization studies, preparation of major permit application documents, and securing of aquifer protection permits for large copper and copper-moly mines in Arizona; completion of an on-site environmental audit, design of baseline studies, screening and selection of in-country environmental scientists, and meetings with regulatory officials in Kazakhstan regarding planned in-situ leach uranium mine. Major clients included Kennecott, Newmont Gold, Cameco, Peabody Coal, Cyprus Minerals, W.R. Grace Co., 3M Corporation, and Couer d'Alene Mines.

Projects of shorter duration included: Development of reclamation and revegetation plans for a large granite quarry in Wisconsin; preparation of EIS- type documents for the Batu Hijau mine (gold-copper) in Indonesia, and a proposed gold-silver mine in Chile; installation of deep monitor wells at El Abra mine (copper) in Peru; coordinated preparation of EIS's for Yanacocha mine (gold) in Peru; supervised a data adequacy review and baseline studies for expansion of the Usibelli coal mine in Alaska; developed interim reclamation and revegetation plans for Energy Fuels coal mines in Colorado; completed regulatory evaluations and data adequacy reviews for EIS concerning closure of the Midnight uranium mine in Washington. Prepared numerous technical and cost proposals for a wide variety of projects.

Neumann Environmental Services (1/91-9/93; Denver, CO and Oak Creek, CO)

Provided permitting, reclamation design, and environmental evaluation services for mining companies. Performed environmental and regulatory compliance audit (RCRA, EPCRA) and waste water disposal evaluation for Crow Butte ISL uranium mine; compiled and analyzed decommissioning and groundwater restoration costs for all ISL uranium mines in USA; developed stormwater management plans for large marble quarry; conducted stream gaging and surface water sampling for coal mines; performed several Phase 1 Environmental Site Assessments of commercial, agricultural and residential properties.

Union Pacific Resources/Rocky Mountain Energy (11/78-12/91; Denver, CO and Casper, WY)

Held positions progressing from Reclamation Specialist to Sr. Environmental Coordinator. Provided permitting and regulatory support for coal, uranium, hard rock and industrial minerals projects ranging from exploration through mine closure and bond release phases in 12 states. Specific accomplishments while at UP included:

- Planned and directed baseline studies for air quality, archeology/cultural resources,

hydrology, meteorology, radiology, risk assessments, socioeconomics, soils, vegetation and wildlife resources.

- Obtained permits for proposed underground uranium mine in Arizona strip and served as primary company spokesman for successful community relations program.
- Performed and/or supervised extensive field work including installation of monitoring stations, air and water quality monitoring equipment, drill hole plugging and drill site reclamation work.
- Managed permitting, regulatory compliance and closure approvals for two in-situ leach uranium mines.
- Performed property evaluations, liability analyses and due diligence investigations of potential earn-in and acquisition properties.
- Prepared and presented project development plans at city, county and regional government association public meetings/hearings for uranium and industrial minerals projects.
- Chairman of Wyoming Mining Association In-Situ Leach committee.
- Conducted environmental and regulatory compliance audits of corporate oil and gas, coal, industrial minerals and uranium operations.

Mine Reclamation Consultants 1975-1978 (mostly summers). Laramie, WY.

Designed and conducted extensive field studies for the collection of ecological data for vegetation, soils and wildlife resources. Also evaluated data and interpreted for Environmental Impact Statements, biological assessments and permit applications

Teton Exploration Co. 1973-1974 (summers). Casper WY, Grants NM, Marfa TX

Performed drill site reclamation and drill hole abandonment work for exploration drilling programs. All field work performed independently in remote, sparsely inhabited locations on Navajo Reservation and Red Desert, Wyoming. Also worked as Geologist Assistant logging core, supervising drillers and as shop hand fabricating/assembling equipment for drilling programs.

NMMA EXHIBIT C

NMMA EXHIBIT C
No. WQCC 17-03 (R)

federal register

**Wednesday
April 2, 1986**

Part II

Environmental Protection Agency

**40 CFR Parts 141, 142 and 143
National Primary and Secondary Drinking
Water Regulations; Fluoride; Final Rule**

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 141, 142, and 143

(WH-FRL-2976-2)

National Primary and Secondary Drinking Water Regulations; Fluoride

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This notice finalizes several actions regulating fluoride in public drinking water systems under the Safe Drinking Water Act (SDWA) (42 U.S.C. 300f *et seq.*).

EPA is promulgating a National Revised Primary Drinking Water Regulation (NRPDWR or Revised Regulation) setting an MCL of 4.0 mg/l for fluoride. EPA is also promulgating an amendment to the existing National Interim Primary Drinking Water Regulation (NIPDWR or Interim Regulation) for fluoride which revises the Interim Maximum Contaminant Level (MCL) to 4.0 mg/l. This amendment to the Interim Regulation and the new Revised Regulation are based on a Recommended Maximum Contaminant Level (RMCL) of 4 mg/l promulgated in the Federal Register of November 14, 1985 (50 FR 47142) to protect against crippling skeletal fluorosis. While the RMCL is a non-enforceable health goal, Interim and Revised Regulations are enforceable standards for the protection of public health.

The Agency is also promulgating procedures by which systems may obtain variances from the Interim and Revised Regulations.

Under the variance procedure, a system must install or agree to install, one of the identified best technologies generally available (BTGA) unless none of them are technically available and effective. In any event, the system must install other technologies if their use is technically feasible, economically reasonable, and will achieve reductions commensurate with the costs incurred. EPA has also concluded that exemptions are available under the Act for the Revised Regulation.

A National Secondary Drinking Water Regulation (NSDWR or secondary regulation) is promulgated establishing a Secondary Maximum Contaminant Level (SMCL) of 2.0 mg/l to protect against objectionable dental fluorosis. EPA is also establishing monitoring, reporting, and public notification regulations to support the Interim and Revised Regulations. Secondary regulations are federal guidelines for the

protection of public welfare. EPA also is establishing a public notification requirement for systems which exceed the SMCL.

EFFECTIVE DATE:

1. The revised MCL (§ 141.81(b)(1)) and the requirement that compliance monitoring data be produced by laboratories that have met certain requirements (§ 141.23(g)(4)) will take effect October 2, 1987.

2. All other regulations promulgated today will take effect May 2, 1986.

ADDRESSES: Supporting documents cited in Section XI will be available for inspection in Room 2904 (rear) in the Public Information Reference Unit, USEPA, 401 M Street SW., Washington DC 20460 and at the Drinking Water Supply Branch Offices in EPA's Regional Offices. For the addresses of the EPA Regional Offices, see the *Supplementary Information* section, Appendix A.

Copies of the documents on the technology and cost, methods and monitoring, and economic impact analysis are available for a fee from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll free number is 800/338-4700; local: 703/487-4850.

The public comments, supporting documents and a copy of the index to the public docket for this rulemaking are available for review during normal business hours at the EPA, Room 2904 (rear), 401 M Street SW., Washington, DC 20460. A complete copy of the public docket is available for inspection by contacting Ms. Kittibel Miller, 202/382-7380.

FOR FURTHER INFORMATION: Contact: Joseph A. Cotruvo, Ph.D., Director, Criteria and Standards Division, Office of Drinking Water (WH-550), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460, (202) 382-7575.

SUPPLEMENTARY INFORMATION:**I. Statutory Authority and Regulatory Background**

- A. Statutory Authority
- B. Regulatory Background
- C. Public Comments on the Proposal

II. Summary and Explanation of Today's Actions

- A. Establishment of the MCL
 - 1. Analytical Methods
 - 2. Best Technology Generally Available
 - 3. Determination of the MCL
- B. Amendment of the Interim MCL
- C. The SMCL
- D. Variances and Exemptions
- E. Public Notification
- F. Reporting Requirements
- G. Compliance Monitoring Requirements
- H. Non-Community Water Systems

III. Effective Dates**IV. Economic Impact Analysis****V. References and Public Docket****VI. Appendix A—Addresses of EPA Regional Offices****VII. Appendix B—Variances****VIII. List of Subjects****Abbreviations Used in This Notice**

BTGA: Best Technology Generally Available

MCL: Maximum Contaminant Level

NIPDWR: National Interim Primary

Drinking Water Regulations

NPDWR: National Primary Drinking Water Regulation (includes both Interim and Revised National Primary Drinking Water Regulations)

NSDWR: National Secondary Drinking Water Regulation

POE: Point-of Entry Technologies

POU: Point-of-Use Technologies

PQL: Practical Quantitation Level

RMCL: Recommended Maximum Contaminant Level

RO: Reverse Osmosis

SDWA: The Safe Drinking Water Act, also referred to as the Act

SMCL: Secondary Maximum Contaminant Level

POTW: Publicly Owned Treatment Work

NPDES: National Pollutant Discharge Elimination System

I. Statutory Authority and Regulatory Background**A. Statutory Authority**

Sections 1401 and 1412 of the Safe Drinking Water Act ("SDWA" or "the Act") require EPA to establish National Primary Drinking Water Regulations (NPDWR) for contaminants which may have any adverse human health effect. The NPDWR establish a Maximum Contaminant Level (MCL) for drinking water supplied by public water systems. If it is not economically or technically feasible to ascertain the level of a contaminant in drinking water, a treatment technique is to be established in lieu of an MCL.

Today's action promulgates a Revised Regulation for fluoride and will supersede the Interim Regulation 18 months from today's date. Revised Regulations are developed in two steps. First EPA establishes a Recommended Maximum Contaminant Level (RMCL) based upon health effects, then an MCL is established as close to the RMCL as feasible with the use of the best technology, treatment techniques and other means which are generally available (taking costs into consideration). Section 1412(b)(3).

Under section 1412, Interim Regulations were to be promulgated in 1975. Section 1412(a)(1) states that the Interim Regulations may be amended

from time to time. Today's action also amends the Interim Regulation, effective 30 days from today's date.

Sections 1415 and 1416 authorize EPA or primary States to issue variances and exemptions. Variances are allowed if it is determined that a system cannot comply despite use of the best technology generally available (BTGA). Exemptions are allowed for systems which cannot comply with an MCL for compelling reasons (including economic reasons).

National Secondary Drinking Water Regulations (NSDWR) (Section 1412(c)) are also authorized by the SDWA. The NSDWR establish Secondary Maximum Contaminant Levels which are guidelines for the protection of the public welfare; they are not federally enforceable.

States may assume primary enforcement responsibility (primacy) for public water systems under the SDWA, section 1413. To assume or retain primacy, States must adopt MCLs that are no less stringent than EPA's but need not adopt the SMCLs or RMCLs.

Under section 1401(1)(D), NPDWRs are to contain "criteria and procedures to assure a supply of drinking water which dependably complies with such maximum contaminant levels; including quality control and testing procedures to insure compliance with such levels." In addition, section 1445 states, "every person who is a supplier of water . . . shall establish and maintain such records, make such reports, conduct such monitoring and provide such information as the Administrator may reasonably require by regulation to assist him in establishing regulations, . . . in evaluating the health risks of unregulated contaminants or in advising the public of such risks." Section 1450 authorizes the EPA to promulgate such rules as are necessary to implement the Safe Drinking Water Act.

Public notification requirements (Section 1414(c)) provide that any violation of a maximum contaminant level, failure to comply with an applicable testing provision, or failure to comply with any monitoring required pursuant to Section 1445 of the Act must be reported to the persons served by the water system.

B. Regulatory Background

Detailed discussions of the background on the regulation of fluoride in drinking water together with information on occurrence and adverse effects of human exposure are presented in the proposed RMCL (50 FR 20164, May 14, 1985), and in the final RMCL and proposed MCL (50 FR 47142 & 47156,

November 14, 1985). This background is summarized below.

The Interim Regulation for fluoride was promulgated in 1975 as a NIPDWR under section 1412 of the Safe Drinking Water Act (40 FR 59566, December 24, 1975). The MCL varied from 1.4 mg/l to 2.4 mg/l, depending upon local annual average temperatures in the location of the public water system. The MCL was based upon the protection from objectionable dental fluorosis.

In 1981, the State of South Carolina petitioned the Agency requesting that fluoride be deleted from the Primary Drinking Water Regulations and that an SMCL be established in the Secondary Drinking Water Regulations. South Carolina sued EPA seeking faster action in EPA's rulemaking on fluoride (*South Carolina Department of Health and Environmental Control v. U.S. Environmental Protection Agency, et al.*, No. 3:84-0678-15 [D.S.C. filed April 4, 1984]). On January 18, 1985, EPA and South Carolina signed a consent decree. The decree set forth a schedule for rulemaking decisions for fluoride under the revised regulation but did not commit the Agency to regulate fluoride or to regulate at any particular level. The first step in implementing that decree was accomplished by proposing the RMCL, published on May 14, 1985 (50 FR 20164). The second step was met with the promulgation of the fluoride RMCL and proposal of an MCL, an SMCL, and the related monitoring, reporting, and notification actions, published on November 14, 1985. Today's rule is the third and final step in the satisfaction of the consent decree.

In the November 14, 1985 notice, the proposed MCL was based upon the Agency finding that the best technology generally available (BTGA) for the removal of fluoride from public water supplies is capable of achieving the RMCL (i.e., 4 mg/l). The proposed SMCL was based upon the finding that 2 mg/l would prevent the majority of cases of water-related cosmetically objectionable dental fluorosis while still allowing for the beneficial effects of fluoride (prevention of dental caries). In addition, the Agency proposed that the Interim MCL for fluoride be amended to the same level as the proposed Revised MCL, 4.0 mg/l.

C. Public Comments on the Proposal

EPA requested comments on all aspects of the proposal. The Agency's responses to many of the issues raised in the comments are presented in the following section. A detailed recitation of the comments received and the Agency's responses are presented in the document "Responses to Comments

Received on the Proposed Fluoride MCL and SMCL of November 14, 1985" (EPA 1986d), available in the public docket.

EPA received over 90 written comments on the proposed rule. Of the comments, 59 were from individuals, 4 were from companies, 12 from public or professional organizations, and 16 from Federal Agencies, States, and local governments.

A public hearing was held in Washington, DC on December 18, 1985, and an additional 6 comments were provided at that time.

Many of the comments received addressed the RMCL and the Agency's findings on adverse health effects and did not address any of the proposed actions. Because these comments in fact pertain to the RMCL, they are not relevant to this rulemaking. However, the Agency examined all comments received for new information on the health effects of fluoride. This review did not identify any significant new health-related information.

II. Summary and Explanation of Today's Actions

This notice explains the following actions taken today by the Agency:

- The Revised MCL is set at 4.0 mg/l.
- The Interim MCL is set at 4.0 mg/l.
- BTGA under Section 1412 is identified.
- Variances and exemptions are allowed as specified.
- BTGA and other appropriate technologies under Section 1415 are specified, including certain procedures for issuance of a variance.
- The SMCL is set at 2.0 mg/l.
- Public notice is required of levels above 2.0 mg/l SMCL. A required notice is prescribed.
- Compliance monitoring requirements are set.
- Analytical methods for use in compliance monitoring are revised.
- A laboratory performance requirement of $\pm 10\%$ of the reference value is established.
- Non-community Water Systems are not covered by today's rules.
- Decentralized treatment technologies (point-of-entry, point-of-use, and bottled water) are not addressed in the final rules.

A. Establishment of the MCL

MCLs are enforceable standards under the SDWA. They are to be set as close to the RMCL as is feasible with the use of best technology generally available (taking cost into consideration). An MCL is to be established in lieu of a treatment technique if it is economically and

technologically feasible to ascertain the concentration of the contaminant in public water systems. Other factors relative to technical feasibility, such as levels of reliable analytical detection, also are considered.

1. *Analytical Methods.* The Agency has examined the analytical methods available for the measurement of fluoride in drinking water and summarized the evaluation in the document entitled, "Monitoring For Fluoride In Drinking Water, an Update," (EPA 1986a). Based upon this examination, the Agency has determined that analytical methodologies currently exist which can reliably measure fluoride in drinking water to levels well below the MCL. In addition, measurements at a frequency to assure detection of any violation are considered to be economically feasible for any public water system. Costs are estimated to be approximately \$10 per sample analysis.

In 1975, EPA approved five analytical methodologies for the detection of fluoride under the interim standard: (1) ion selective electrode, (2) automated ion selective electrode, (3) colorimetric SPADNS, (4) complexone, and (5) zirconium eriochrome cyanine R. The last of these methods is being deleted today due to problems with obtaining standards and the absence of data from performance evaluation studies. The remaining 4 methods are specified in this rule as approved for use in compliance monitoring. The Agency has determined that the 4 methods have method detection limits at or below 0.1 mg/l and that the practical quantitation level (PQL) for fluoride is 0.5 mg/l. The PQL is the lowest level that can be reliably achieved, within specified limits of precision and accuracy, during routine laboratory operating conditions. The determinations of the method detection limits and the PQL are based on performance evaluation studies of the 4 approved analytical methods. Further information on the PQL and precision and accuracy limits is contained in the Monitoring Document (EPA 1986a).

Existing rules require that analyses for compliance monitoring purposes be conducted only by certified laboratories. In addition, effective 18 months from today, monitoring data may only be used to determine compliance if they are produced by a laboratory that has successfully analyzed performance evaluation samples containing fluoride at concentrations from 1.0 mg/l to 10.0 mg/l to within $\pm 10\%$ of the true value. EPA has added to the regulations a definition of a performance evaluation

sample; this definition is consistent with the way the term was used in the proposal and also with the common understanding. This action is part of EPA's ongoing efforts to improve the laboratory certification program. A more complete explanation of the program is contained in the notice proposing similar laboratory performance criteria for volatile organic chemicals (50 FR 46880, Section III. B.3., November 13, 1985).

EPA proposed that the changes to the monitoring requirements and the laboratory performance requirement be effective within 30 days of promulgation. Although the monitoring requirements are promulgated effective 30 days from today, EPA has decided to make the laboratory performance requirements effective 18 months hence to avoid implementation problems. Not all laboratories conducting drinking water analyses for fluoride have been analyzing performance evaluation samples. To impose a 30 day effective date would not allow sufficient time for laboratories interested in analyzing for fluoride to learn of the requirement, obtain performance evaluation samples, report to EPA, and determine whether they have passed or failed the performance requirement. Because performance samples are only distributed by the Agency semiannually, the Agency must postpone the effective date of the laboratory performance requirement. In addition, the EPA Environmental Monitoring and Support Laboratory in Cincinnati (EMSL) has been distributing approximately 1,100 fluoride performance samples to commercial and state laboratories, and anticipates that between 3,000 and 5,000 laboratories may want to analyze for fluoride and need to meet the performance requirement (there are approximately 5,000 laboratories that are now conducting drinking water analyses). It is, therefore, necessary to allow this significant number of "new" laboratories sufficient time to obtain performance evaluation samples in an orderly fashion. Eighteen months should allow for an orderly implementation of the new requirement.

EPA believes that laboratories should be required to analyze performance samples at least annually. Less frequent performance checks would provide insufficient oversight of laboratory performance.

The performance requirement is promulgated as part of the National Primary Drinking Water Regulations which include criteria and procedures to assure a supply of drinking water which dependably complies with the MCL, and specifies quality control and testing

procedures (SDWA sec. 1401(1)(D)). Because states must adopt NPDWRs that are no less stringent than EPA's regulations, state regulations must be no less stringent than the monitoring and performance requirement regulations promulgated today. Laboratories that wish to comply with the performance requirement should contact the state drinking water office that handles laboratory certification or the EPA Regional Office where the state does not have primary enforcement responsibility.

EPA requested comment on the analytical methods and performance requirement in the proposal. No comments were received on the analytical methodologies. Comments received on the laboratory performance requirements supported the proposal.

2. *Best Technology Generally Available.* The Agency determined BTGA for fluoride by first identifying available technologies which have the ability to reduce fluoride concentrations in drinking water, and second, evaluating the costs and commercial availability of technologies. The criteria used in the determination of whether such technologies are economically available is whether they are reasonably affordable by regional and large metropolitan public water systems (H.R. Rep. No. 93-1185, p. 18 (1974)). BTGAs were also judged to be the best technology based upon the following factors: wide applicability, high removal efficiency, high cost efficiency, high degree of compatibility with other water treatment processes, and the ability to achieve compliance for all the water in a public water system.

A number of treatment processes were examined for their potential to reduce fluoride. These technologies are discussed in the document "Technologies and Costs For The Removal of Fluoride From Potable Water Supplies, With Addendum," (U.S. EPA 1986b). A draft of this document was available at the time of the proposal. This document is available from the National Technical Information Service at the address listed at the front of this notice. This document includes the evaluation of the following central treatment technologies: activated alumina adsorption, reverse osmosis (RO), modified lime softening, adsorption using bone char and tricalcium phosphate, anion-exchange resins, and electrodialysis. Nontreatment options for the reduction or removal of fluoride, regionalization and alternate sources, were also evaluated. Additionally, point-of-use (POU), point-of-entry (POE) and bottled

water were examined. These were discussed as possible decentralized compliance methods.

The Agency proposed that of the technologies considered, activated alumina adsorption and RO meet the above criteria for BTGA under Section 1412, which is the basis for setting the MCL. Activated alumina was considered to be generally available technology in 1975 in promulgating the interim MCL regulation.

The costs of reducing fluoride concentrations have been estimated for both activated alumina and RO (EPA 1988b). EPA estimates that the average system which will be out of compliance with the MCL will have a fluoride concentration of 5.4 mg/l. In the MCL proposal, the costs for such systems to reduce their levels of fluoride (not including the cost of waste disposal) to 4 mg/l by activated alumina were estimated to range from \$0.51/1,000 gallons for systems serving from 25 to 100 customers to \$0.22/1,000 gallons for systems serving 10,000 to 100,000 customers. The cost of reducing fluoride using RO ranged from \$1.50/1,000 gallons in systems serving 25 to 100 customers to \$0.74/1,000 gallons in systems serving 10,000 to 100,000 customers. The RO process may be especially desirable in situations where high dissolved solids and other contaminants may have to be removed in addition to fluoride because RO removes a high percentage of almost all inorganic ions, including fluorides, and some organic matter, turbidity, bacteria, and viruses. Although the cost of RO is somewhat greater than activated alumina, its additional benefits may make it the technology of choice for some systems.

The costs of meeting the MCL for systems with higher levels of fluoride, 8 to 12 mg/l, have not been exhaustively calculated because (1) the MCL is to be based on performance of BTGA with relatively clean intake waters and because (2) only 18 systems are reported to have levels greater than 8 mg/l. The Agency estimates that costs for systems with these higher concentrations could be as much as 2 times the above costs. This estimate is based on the fact that systems at 5.4 mg/l are expected to treat only a portion of their flow and then blend it with the untreated portion to meet the MCL. Systems with higher levels of fluoride would use the same treatment methodology but treat a greater portion of their flow. The difference in cost would result from more frequent recharging of the

activated alumina or the need for a somewhat higher capacity RO unit.

The Agency received a number of comments on its proposal of which technologies could be considered BTGA. Several comments agreed with the EPA analysis that activated alumina and RO were effective for removing fluoride. No comments were received stating that these technologies were not effective. Critical comments were received on two issues relating to BTGA: the affordability of BTGA technologies for small systems, and the acceptance of point-of-entry and point-of-use devices and bottled water as BTGA.

Two States and an engineering firm questioned whether activated alumina or RO was actually affordable by small systems. They contended that the methodologies were too expensive to be considered generally available. As explained below, EPA continues to believe that RO and activated alumina are BTGA and can be reasonably afforded by large metropolitan and regional water systems as well as by small systems.

Commenters also stated that the Agency had not considered waste disposal in connection with the best technologies generally available. They argued that the costs of disposing of waste streams generated in the removal of fluoride would be expensive and cost more than the removal technology itself. One commenter hypothesized that disposal could cost millions of dollars. The comments did not provide any specific technical or economic information supporting these cost estimates.

EPA agrees that BTGA should include consideration of disposal for wastes generated by the BTGA water treatment technology. The Agency believes that consideration of waste disposal in selecting BTGA is good regulatory policy and is allowed under the Safe Drinking Water Act. Specifically, EPA believes that the SDWA requirement that the Agency determine *best* technology generally available means that the Agency is authorized by the SDWA to consider the economic costs and environmental impacts that flow from the wastes generated by the BTGA.

In general, EPA identifies the water storage, treatment and disposal (STD) technologies reasonably available for large metropolitan and regional drinking water plants or at off-site facilities. The Agency then considers the environmental impacts of the available STD technologies to determine if they are significantly adverse. Finally, the

Agency determines the economic costs of the STD technologies and includes those costs with the costs of water treatment technologies in determining whether the BTGA is generally available to large metropolitan and regional systems.

Waste disposal practices were described in the proposal (see 50 FR 47162, November 14, 1985) and in supporting documents. However, consistent with this policy and in response to these comments, waste disposal issues have been reexamined.

Activated alumina plants generate wastewaters when the alumina is periodically backwashed and regenerated with sodium hydroxide. These wastewaters can be 3% to 4% of the plant flow and consist of a concentrated fluoride solution (generally about 20 to 30 ppm) with an elevated pH. RO technologies do not involve regeneration. RO processes continually separate fluoride from drinking water and concentrate it in a smaller continuous flow of reject water. RO process-wastewater can be 15% to 20% of the plant flow. While the volume of RO reject water is greater than the volume of waste from activated alumina systems, the RO reject water is more dilute (approximately 10 ppm fluoride). Also, a continuous flow of reject water may be easier to handle in some circumstances than the sudden quantity of wastes generated during the regeneration of activated alumina.

Alternatives for disposal of fluoride wastewaters for activated alumina include disposal to a stream or other body of water, to a publicly owned treatment plant via sewer or to an evaporation pond, or by chemical treatment and recycling.

Where evaporation rates exceed rainfall, activated alumina wastes may be discharged into lined evaporation ponds. This method of disposal has been utilized by at least four public water systems: Desert Center, California; Vail, Arizona; Gila Bend, Arizona; and Palo Verde, Arizona.

In regions where disposal of wastes by evaporation is not possible and where the discharge of fluoride wastewater is permitted, wastes may be contained in a surge tank from which slow discharge to a publicly owned treatment work (POTW) or directly to receiving waters may be permissible. This is termed "controlled discharge."

Zero discharge for activated alumina systems can be accomplished by chemical precipitation of fluoride with

lime and subsequent dewatering of solids and adjustment of pH. The neutral wastewater supernatant is then fed back to the head of the treatment plant. This technology has been demonstrated on a pilot scale for activated alumina plants, but is not yet believed to be generally available.

Reverse osmosis reject water has been disposed by discharge into ponds, streams, underground tile systems and public sewers (Sorg, *et al.*, 1980 & Eisenberg, *et al.*, 1984). Small RO systems, in mobile home and trailer parks, have reported a number of discharge practices including the discharge of reject water into a field, creek, bay, storm sewer or a holding pond (Sorg, 1980). Fluoride wastewaters from RO systems may also be discharged continuously to a publicly owned treatment plant.

Discharge of fluoride wastewaters to an evaporation pond is not likely to have an adverse environmental impact. The wastewater is not of such high pH that it could be considered a hazardous waste under the Resource Conservation and Recovery Act (42 U.S.C. 6901 *et seq.*), and it is not a listed hazardous waste. There appear to be no other federal regulatory schemes that would prohibit STD in lagoons or evaporation ponds. There may be state restrictions, however.

Discharge to a POTW or a receiving water is permissible under federal law as long as the requirements of the Clean Water Act (33 U.S.C. 1251 *et seq.* are met. (State law may impose further restrictions.) Discharge to a POTW would be allowed under 40 CFR 403.5 unless the fluoride discharges would pass through the POTW and cause it to violate a permit limitation. POTWs also have authority to limit pollutants sent to them by indirect discharges. Direct discharge to a receiving water would require a National Pollutant Discharge Elimination System (NPDES) permit issued by EPA under the Clean Water Act (or by a state approved to administer the NPDES program).

Table 1 presents a summary of the estimated additional costs for disposal for the reduction of fluoride by BTGA for several representative system sizes. The costs of disposal for both activated alumina and RO can be minimal where the wastes can be directly discharged into local sewers. However, costs for evaporation ponds and surge tanks may be significant for smaller systems. Disposal does not significantly increase the total costs for large systems.

TABLE 1.—TOTAL COSTS OF TREATMENT IN DOLLARS PER 1,000 GALLONS

	System size (people served)		
	Small (25-99)	Medium (2,500-5,000)	Large (10,000-100,000)
Act. Alum. Removal Alone	\$0.51	\$0.32	\$0.22
Removal Plus Discharge to POTW	.53	.33	.23
Removal Plus Controlled Discharge to POTW ¹	.87	.38	.25
Removal Plus Evaporation Pond	1.44	.45	.28
RO Removal Alone	1.52	1.07	.74
Removal Plus Discharge to POTW ¹	1.84	1.25	.86

¹ Direct discharge of activated alumina recharge water into a surge tank and controlled long term release into POTW.

Based upon the available information, the Agency finds that activated alumina and RO, when considered with the above described waste disposal techniques, still meet the requirements to be considered BTGA. As discussed in the proposed rule, BTGA under section 1412 of the Act is determined on the basis of what is reasonably affordable by large regional water supplies (50 FR 47158). The Agency believes that large systems would not find the costs of disposal of fluoride to be unreasonable, both because of economics of scale and because sewers would generally be available for disposal. In addition, the Agency has determined that the cost of using these technologies including the costs of waste disposal will be acceptable for most public water systems. The Agency notes that, for any system size, the combined cost of activated alumina and the most expensive disposal technology for activated alumina is less than the cost of RO without disposal. RO alone is found to be BTGA; hence, costs of disposal do not alter the findings of BTGA for activated alumina technology. The cost of RO plus waste disposal (which add approximately 10% to costs) is still reasonably affordable by large systems, and, thus, is found to be BTGA. A more detailed discussion of the cost issue can be found in Addendum F to the Technology and Cost Document (EPA, 1986b) and in the Response to Comments Document (1986d).

A number of comments were received on the decentralized treatment alternatives—POE, POU and bottled water. Many of the comments addressed whether POE and POU devices and bottled water should be listed as BTGA. Some of the commenters questioned the Agency's decision not to accept POE, POU or bottled water technologies as BTGA. They maintained that these technologies were more cost effective for small systems than central treatment. Some commenters also requested that the Agency accept POU

devices which remove fluoride by distillation as BTGA. Two other comments stated that POE and POU should not be considered to be BTGA because of the difficulty in controlling installation, maintenance, operation, and repair. They also stated that treatment efficiency cannot be assured on a day-to-day basis.

In the fluoride MCL proposal, the Agency proposed that before POE and POU devices could be used to meet the fluoride MCL, the state or EPA was to review the system's proposed plan and impose certain conditions and restrictions (these restrictions were specified in the MCL proposal on volatile organic chemicals published in the November 13, 1985 Federal Register). One organization provided detailed comments on these proposed criteria and the National Drinking Water Advisory Council also reviewed them. One commenter stated that that POE and POU devices be allowed on the condition that they do not significantly increase the health risk over centrally treated water.

The Agency proposed that bottled water not be used as a permanent means of compliance and that it only be used in emergency situations or to prevent unreasonable risk as a condition of a variance or exemption. An association of bottled water producers strongly objected to such a restriction on the use of bottled water.

EPA has reviewed the comments submitted regarding the acceptability of decentralized treatment technologies (i.e., POU, POE, bottled water) for compliance purposes and for BTGA findings. Because of the many complex issues raised by the proposal and commenters and the short time available in this rulemaking due to the consent order, the Agency is not able to promulgate regulations addressing decentralized treatment alternatives. EPA will continue to study decentralized treatment and may promulgate final regulations on this matter at a later date, possibly with the final MCL rules for volatile organic chemicals.

Although the Agency identified BTGA in the proposed rulemaking, systems are not limited to those technologies to meet the MCL. Public water systems could use any appropriate central treatment technology to meet the MCL. However, the Agency is not at this time promulgating rules which would govern the use of decentralized technologies (POU, POE or bottled water) for the purpose of complying with the MCL. Use of the POU devices, POE devices, bottled water or any other technology could be required to avoid unreasonable

risk (under conditions specified by States or EPA) in connection with a variance or an exemption or in an emergency situation.

3. *Determination of the MCL.* The Agency has determined that the MCL should be set at the same level as the RMCL. This finding is based upon (1) the determination that analytical methodologies currently exist which are sufficient to measure fluoride levels below the RMCL with acceptable reliability (PQL is 0.5 mg/l), and at reasonable costs (approximately \$10 per sample), and (2) the determination that BTGA is able to reduce fluoride levels reported to occur in public water supplies to 4.0 mg/l and below. BTGA can achieve at least 85% reduction in fluoride levels, and the Agency has determined that application of BTGA can more than achieve the RMCL for drinking water supplies; BTGA is sufficient to meet the RMCL for the highest levels of fluoride reported (approximately 10-12 mg/l). Therefore, the Agency is setting the MCL equal to the RMCL.

The Agency received a large number of comments on the proposed MCL of 4.0 mg/l, arguing that EPA should set a higher or lower MCL based on toxicity evidence. Some argued that the risks were high and that a lower MCL should be established; others thought that fluoride should be regulated at a higher level. The statute requires EPA to set the MCL as close to the RMCL as feasible with use of BTGA. No comments were received which disputed the Agency's finding that BTGA is sufficient to achieve the RMCL and that the MCL, therefore, should be set at the same level as the RMCL. The National Drinking Water Advisory Council also reviewed the proposed MCL at its meeting on November 20-21, 1985 and supported the Agency's findings (EPAe).

B. Amendment of the Interim MCL

According to the SDWA, the existing interim regulation for fluoride remains in effect until superseded by the revised regulation (which takes effect 18 months after the revised regulation is promulgated; see SDWA section 1412(b)(5)). Therefore, until the revised regulation supersedes the interim regulation, the interim MCL of 1.4 to 2.4 mg/l would remain effective unless amended. In order to avoid an 18 month period in which the interim MCL is inconsistent with the revised MCL, EPA is amending the interim MCL to be identical to the revised MCL.

An environmental group commented that this amendment removes the normal 18 month delay between promulgation and effective dates during

which the new standard can be adjudicated. The commenter stated that under the old standard no consumer of drinking water will be harmed; and the new, less protective, standard will become effective immediately, without sufficient time for adjudication.

The statute does not require that amendments to the Interim Regulations have an effective date 18 months after the date of promulgation. Section 1412(a) only requires that the Interim Regulations have an 18 month effective date when first promulgated. The Agency, accordingly, delayed the effective date 18 months for the Interim Regulation when it was promulgated in 1975. However, there is no requirement that amendments to an existing Interim Regulation be delayed 18 months. When an amendment raised an MCL, there is no lead time for systems to procure new technology to comply with a new requirement. It would be unreasonable to place public water supplies in a position where they could be forced to make expensive improvements which would no longer be required after the revised regulation took effect. The Agency notes that the 4.0 mg/l level is adequately protective of public health.

The SDWA requires that the Agency determine the Interim MCL based on analytical and treatment technologies which were available at the time of enactment of the SDWA (in 1974; SDWA § 1412(a)(2)). Because the amended standard raises the permitted level of fluoride, the Agency believes that if methods were capable of meeting the original interim standard, they also would be capable of meeting the higher amended standard. Moreover, a review of the technologies shows that at least activated alumina treatment was available in 1974.

Because relaxing the standard is protective of public health and will not produce any adverse economic effect on public water systems, a short period of time, 30 days, between promulgation and effective date for compliance is appropriate. For further discussion, see the proposed rule (50 FR 47142) and the comment and response document.

States are not required to raise their Interim MCL to 4.0 mg/l. States are explicitly allowed by the Act to maintain more stringent requirements (SDWA § 1413).

C. The SMCL

EPA has determined that the formation of cosmetically objectionable dental fluorosis as a result of exposure to elevated drinking water fluoride levels, in a significant portion of the population, is an adverse effect on public welfare that should be addressed

under section 1412(c) of the SDWA. EPA is, therefore, promulgating an SMCL at 2.0 mg/l for protection of public welfare. A detailed discussion of objectionable dental fluorosis appeared in the preamble to the proposed RMCL and to the final RMCL, (50 FR 20164, and 50 FR 47142). Objectionable dental fluorosis is a discoloration and/or pitting of teeth that is caused by excess fluoride exposures during the formative period prior to eruption of the teeth.

The level of the SMCL was set based upon a balancing of the beneficial and undesirable effects of fluoride. Epidemiological studies of dental fluorosis have found that approximately 2.0 mg/l of fluoride in drinking water provides significant protection from dental caries and results in minimal occurrence of moderate to severe dental fluorosis. This level is consistent with recommendations by the Surgeon General, an *ad hoc* committee headed by the Chief Dental Officer of the U.S. Public Health Service, and the previous MCL which was based on this balance.

In setting this secondary standard, EPA is not recommending that systems which fluoridate raise the levels of fluoride added to drinking water above the current recommendations of the Centers for Disease Control (HHS, 1985) (0.7-1.2 mg/l). Rather, the Agency is establishing the SMCL as guidance to the public served by systems which have naturally high levels of fluoride.

The Agency is requiring community water systems which exceed the SMCL to notify their consumers. While the SMCL is not a federally enforceable standard, states are free to make the SMCL mandatory for public water supplies. The adverse effects on public welfare that can result from water-related objectionable dental fluorosis should be avoided, and the public should be informed of those effects and be able to choose to take appropriate action. As documented in the proposed MCL and SMCL, it is technologically feasible for systems to reduce their fluoride levels to 2.0 mg/l.

A large number of comments were received on the promulgation of the SMCL. The American Medical Association and the American Water Works Association supported setting the SMCL at 2.0 mg/l. One commenter expressed concern that two standards for the same contaminant would be confusing to the public. EPA believes that two standards should not be confusing as they are tied to different effects. The legislative history is clear that contaminants may have public health significance at one level and aesthetic significance at a lower level,

and that EPA may set both primary and secondary regulations for the same contaminant (see H.R. Rep. No. 93-1185 at 16 (1974)).

A State commented that the SMCL was not justified because there was no significant occurrence of dental fluorosis at levels of exposure below 4 mg/l. The Agency disagrees. As explained in the May 14, 1985 Federal Register notice proposing the RMCL for fluoride (50 FR 20164), there is evidence that objectionable dental fluorosis occurs in a significant percentage of the population at fluoride concentrations in tapwater below 4 mg/l.

Two health associations commented that some systems which met the old MCL would be in violation of the SMCL. They stated that it would be an undue hardship for those systems to be out of compliance given an effective date of 30 days after promulgation. The Agency does not feel this would be overly burdensome since community water systems which exceed the SMCL are only required to notify the public and the state annually and are not required to perform additional analyses. Systems will be required to notify new customers when their service commences. The text of the notice is presented in figure 1.

D. Variances and Exemptions

1. Variances

The conditions for granting a variance from an MCL are specified in section 1415(a)(1)(A) of the Safe Drinking Water Act. According to the Act, a state may grant variances from MCLs to systems which cannot comply with the MCL because of characteristics of the raw water sources which are reasonably available to large systems and despite application of BTGA (the purpose of applying BTGA is to achieve compliance with the MCL).

In the proposed rule, the Agency stated its belief that, because application of BTGA is expected to allow compliance with the MCL, variances would not be available. Activated alumina and RO are both reasonably affordable for large systems and can achieve over 85 percent reduction in fluoride levels. Thus, systems could meet the MCL and would not qualify for a variance. Therefore, the Agency proposed the findings of BTGA and also proposed its interpretation that no variances were available for the fluoride MCL.

Two commenters argued that variances should be available under the regulations for systems that could qualify for a variance because they could not comply with the MCL despite application of BTGA. No such systems

have been identified by commenters or the Agency.

However, after carefully considering the comments requesting that variances be available, the Agency has decided to promulgate a rule that allows variances (New § 142.61). The Agency is still unable to identify systems that cannot comply despite application of activated alumina or reverse osmosis. Nevertheless, it is possible that there may be some systems that the Agency and the commenters are unaware of that cannot comply even after installation and/or use of these technologies. In addition, EPA believes that there may be some systems which cannot meet the MCL for which BTGA is not technically available and effective. In this case, the systems should not be required to install BTGA but should be required to investigate and install treatment methods that are technically feasible and economically reasonable, and that the fluoride reductions obtained would be commensurate with the costs incurred with the installation and use of the treatment method.

The fluoride variance regulations at 40 CFR 142.61 apply to EPA where it has authority to administer the Act. States that have been delegated primary enforcement authority (primacy) for Public Water System Programs under the SDWA and that choose to issue variances must do so under conditions and in a manner which are no less stringent than those described in this section. States may adopt different procedures provided that they are no less stringent in effect than those described in 40 CFR 142.61. States are not required to adopt new authority or regulations by today's rule unless existing variance authorities are less stringent and the state wishes to issue variances.

Appendix B explains the statutory authority governing variances, the basis for § 142.61, the effective date of the variance regulation, and EPA's authority to review state-issued variances.

2. Exemptions

Under SDWA section 1416, exemptions from any MCL may be granted to public water systems if the primacy agency makes certain findings. To grant an exemption, the State or EPA must find that (1) due to compelling factors (including economic factors), the system is unable to comply, and that (2) the system was in operation on the effective date of the MCL, or for newer systems, that no reasonable alternative source is available, and that (3) the exemption will not result in an unreasonable risk to health (SDWA sections 1416(a) (1)-(3)). Under section

1416(b), exemptions from the Interim Regulations were to require compliance by January 1, 1984 (or January 1, 1986 for systems that were regionalizing). Thus, exemptions to the Interim Regulations are no longer available. Exemptions to a revised regulations are to require compliance no later than seven years after the revised regulation takes effect (nine years for systems that are regionalizing). SDWA section 1416(b)(2)(A).

In the preamble to the proposal, the Agency explained that the statute appeared to allow exemptions for all Revised Regulations without regard to whether the contaminant at issue also was regulated under the Interim Regulations. Therefore, the Agency stated that exemptions would be available for the Revised MCL for fluoride.

Two comments were received on the Agency's proposal to allow exemptions. One supported exemptions for the Revised Regulations for fluoride. The second comment challenged the need for an additional 7 years of exemptions when the MCL was being raised. This commenter argued that the proposal would allow a system with a 7 year exemption under the Interim Regulation and a new 7 year exemption under the Revised Regulation a total of 14 years to comply with a fluoride MCL, and that this was contrary to the intent of Congress, as most recently expressed in proposed amendments to the Act. These amendments would allow a one year exemption, with a possible three year extension, except for small systems which may be granted additional extensions. The commenters also argued that since treatment technologies are "reasonably affordable for public water systems regardless of size" (quoting EPA), there is no justification for allowing such a lengthy compliance period.

EPA must promulgate a rule that complies with the SDWA as it is presently written. EPA has determined that the statute, on its face, allows up to seven years to comply with the Revised Regulations. As explained in the preamble to the proposed rule, section 1416(b)(2)(A) allows seven years for compliance with the Revised Regulations and does not provide different exemption periods for those contaminants that were regulated under the Interim Regulations and those that were not. Therefore, the statute clearly provides that systems may apply for exemptions under both the Interim Regulations and Revised Regulations. Because exemptions to the Interim Regulations were to require compliance

by January 1, 1984 (or January 1, 1986), no exemptions to the Interim Regulations may be granted. The Revised Regulations are effective on the date 18 months from the date of today's notice, and exemptions to those regulations are also available beginning 18 months from today. Therefore, there is an 18 month hiatus in which exemptions are not available.

EPA believes that this is the proper interpretation of the statute. There is no legislative history which supports a contrary interpretation. EPA cannot adopt the exemption scheme contained in the proposed legislation (as suggested by the commenter) as that proposed scheme is inconsistent with the present statute.

Although exemptions are available, EPA agrees with the commenter that there are probably few situations where an exemption would be justified. In the few cases where an exemption may be justified, there is unlikely to be justification for a lengthy compliance period. Exemptions are to be granted only where the system cannot comply due to compelling factors (which may include economic factors). After such lengthy opportunity to comply with the lower Interim MCL, EPA believes that there should be few situations where compelling circumstances could still exist, and therefore believes that few, if any, exemptions could be justified. As EPA has stated, the costs of compliance are believed to be reasonable, even for many small systems.

The interim fluoride MCL was promulgated in December, 1975 and was effective 18 months later. Thus, systems have been aware of this requirement for over 10 years; exemptions have been available for a substantial portion of those 10 years to allow systems time to comply. There has been ample time to comply with the previous Interim MCL of 1.4-2.4 mg/l; systems should have been taking steps to reduce their fluoride levels during this period. The Revised MCL and the amended Interim MCL are now higher, making compliance easier for many systems.

States that have been authorized to administer the Safe Drinking Water Act Public Water System program are not required to allow exemptions. If they do, states must issue exemptions "under conditions and in a manner which is not less stringent than the conditions under, and the manner in, which . . . exemptions may be granted." . . . by EPA under the SDWA (SDWA section 1413(a)(4), 42 U.S.C. 300g-2(a)(4)). The Agency believes that although exemptions are legally available, few, if any, exemptions could now be justified under the "compelling factors"

requirement. Thus, states are similarly constrained in granting exemptions under their state programs to remain no less stringent than the federal program.

Under section 1416, EPA is empowered to review state issued exemptions and, if the Administrator finds that a State has, in a substantial number of instances, abused its discretion in granting exemptions or failed to prescribe schedules in accordance with the statute, he may revoke or modify those exemptions. SDWA section 1416(d), 42 U.S.C. 300g-5(d). EPA will strictly scrutinize exemptions from the fluoride MCL granted by states and, if appropriate, will revoke or modify improper exemptions.

E. Public Notification

1. MCL and Primary Regulation

Current regulations at 40 CFR 141.32 require that any violation of an MCL, failure to comply with an applicable testing provision, or failure to comply with any monitoring required pursuant to section 1445(a) of the Act be reported to the persons served by the water system. Today's action does not change these requirements for the fluoride MCL, except that it extends these regulatory requirements to the violations of the Revised MCL. Because the notice requirements for violation of an Interim or Revised MCL are imposed by statute, this change to the regulation merely reflects the statutory requirement.

2. SMCL and Secondary Regulation.

The Agency believes that public notification is an essential part of EPA's regulation of fluoride to protect public welfare. From EPA's experience in regulating fluoride, many persons in high fluoride areas are concerned about objectionable dental fluorosis and if alerted, would take steps to avoid it. EPA believes that public notification is justified because the public welfare effects are especially significant, as described in the fluoride RMCL. Therefore, public notice when a system exceeds the SMCL was proposed and is promulgated today.

This public notification requirement is authorized by SDWA section 1445(a), 42 U.S.C. 300j-4(a) and SDWA section 1450(a)(1), 42 U.S.C. 300j-9(a)(1). Section 1445 authorizes the Administrator to require public water systems to "establish and maintain such records, make such reports, conduct such monitoring, and provide such information as the Administrator may reasonably require by regulation to assist him in establishing regulations under this title, . . . in evaluating the

health risks . . . or in advising the public of such risks." Section 1450(a)(1) authorizes the Administrator "to prescribe such regulations as are necessary or appropriate to carry out his functions" under the SDWA. These two authorities, together with the requirement that EPA must set NSDWRs, permit the Agency to require public notification where there are serious adverse public welfare effects posed by a contaminant regulated under the Secondary Regulations. EPA regards fluoride differently from the other secondary contaminants. No other contaminant has been placed in the Secondary Regulations for its effects on the human body. Accordingly, EPA finds that public notification is reasonable and necessary.

As noted above, SMCLs are not enforceable nor must they be adopted by states to retain primacy. Because this notification requirement is not related to the primary drinking water regulations, it also does not need to be adopted by the States to retain primary enforcement responsibility. However, the notification requirement is federally enforceable requirement under the Safe Drinking Water Act with which community water systems must comply.

No separate monitoring is required by EPA to support the secondary regulation; monitoring conducted for the primary regulation shall be used to determine compliance with the SMCL. A system shall be determined to be in compliance on the basis of the most recent single sample taken in accordance with the requirements of § 141.23.

EPA proposed requiring quarterly notification of customers when drinking water concentrations exceed the SMCL. The notification consists of mailing the notice prepared by EPA to all billing units and the publication of the notice in the printed media. EPA also proposed requiring the quarterly mailing of notices to customers, States, local dentists, doctors, public officials, and newspapers. EPA has modified the proposed requirements in response to public comments as noted below.

The Agency received a number of comments on the proposed notification requirements. Several states commented that they were against mandatory notification for exceeding the SMCL and that there was no legal basis for such a requirement. They believed that states should be left with the discretion to require notification. The Agency believes that public notification is an essential part of the fluoride regulations and that the SDWA provides sufficient basis for the notification requirements.

The American Medical Association (AMA), the American Water Works Association (AWWA), and a state supported the notification requirement, but commented that quarterly notification would be excessive. The Agency agrees that there is little justification for notification as frequently as once every three months and the final rules require only annual notification for the SMCL. In order to prevent new customers from receiving water without notification for a period up to one year, the final rules require notification of new billing units at the time that service commences. EPA has determined that between 6 to 12 months of exposure to fluoride in drinking water above the SMCL may cause moderate to severe dental fluorosis in some children. In the Agency's experience, notices of this type are likely to be effective in alerting the public, but if not reissued periodically, they are forgotten. Therefore, the Agency believes that annual notification is necessary to maintain the appropriate level of awareness.

A medical association, a state, and a gas utility company commented that the proposed notification requirements were unclear and would pose an unreasonable burden on small systems. Small systems (e.g., trailer parks) near large towns would be required to send copies of the notice to large numbers of doctors and dentists.

The Agency acknowledges that some flexibility in the notification requirements for the SMCL will be necessary for small systems. Therefore, the Agency is specifying only minimum requirements for notification. Systems must notify the states after the initial sample is taken. Systems must notify billing units annually, and new customers must be notified when they begin service. States and localities may require more extensive or frequent notification, including prominent posting in public places and notification of dentists, doctors and local health officials.

One commenter argued that non-community systems should not be required to give public notice of SMCL exceedance. EPA is deferring the decision on whether to require non-community systems to notify the public. As explained below, coverage of non-community water systems under the Primary Regulations is still being considered and raises issues similar to those raised by regulation of these systems under the SMCL. Therefore, the Agency is today requiring only community public water systems to notify the public if the SMCL is

exceeded; EPA will decide at a later date whether to require non-community systems to notify.

The costs of notification will not be significant to individual water systems or to the country as a whole. The Agency estimates that approximately 1300 community water systems will be required to notify under this rule. The majority of these systems are currently required to notify customers every quarter since they are out of compliance with the existing National Interim Primary Drinking Water Regulation (NIPDWR). Some communities currently in compliance with the NIPDWR with concentrations between 2.0 and 2.4 mg/l would now be required to notify. Some costs could be incurred by a few systems which bill by postcard since the required notification would require the mailing of an envelope. This additional cost of notification for such systems has been considered and has been found to be minimal and reasonable.

The Agency received a number of comments on the wording of the proposed notice. Opinion over the notice language was divided. One medical association approved of the notice language, while two others were critical of what they considered to be overstatements on the potential risks of fluoride. The Centers for Disease Control and a gas-utility company requested specific revisions in the wording. The Agency has considered the comments and has made changes that it believes to be appropriate. Figure 1 presents the revised notice. For detailed responses to the comments, see the Comment and Response Document (EPAd).

Figure 1.—Public Notice

Dear User, the U.S. Environmental Protection Agency requires that we send you this notice on the level of fluoride in your drinking water. The drinking water in your community has a fluoride concentration of 1 milligram per liter (mg/l).

Federal regulations require that fluoride, which occurs naturally in your water supply, not exceed a concentration of 4.0 mg/l in drinking water. This is an enforceable standard called a Maximum Contaminant Level (MCL), and it has been established to protect the public health. Exposure to drinking water levels above 4.0 mg/l for many years may result in some cases of crippling skeletal fluorosis, which is a serious bone disorder.

Federal law also requires that we notify you when monitoring indicates that the fluoride in your drinking water exceeds 2.0 mg/l. This is intended to alert families about dental problems that might affect children under nine years of age. The fluoride

concentration of your water exceeds this federal guideline.

Fluoride in children's drinking water at levels of approximately 1 mg/l reduces the number of dental cavities. However, some children exposed to levels of fluoride greater than about 2.0 mg/l may develop dental fluorosis. Dental fluorosis, in its moderate and severe forms, is a brown staining and/or pitting of the permanent teeth.

Because dental fluorosis occurs only when developing teeth (before they erupt from the gums) are exposed to elevated fluoride levels, households without children are not expected to be affected by this level of fluoride. Families with children under the age of nine are encouraged to seek other sources of drinking water for their children to avoid the possibility of staining and pitting.

Your water supplier can lower the concentration of fluoride in your water so that you will still receive the benefits of cavity prevention while the possibility of stained and pitted teeth is minimized. Removal of fluoride may increase your water costs. Treatment systems are also commercially available for home use. Information of such systems is available at the address given below. Low fluoride bottled drinking water that would meet all standards is also commercially available.

For further information, contact * at your water system.

F. Reporting Requirements

The Interim Regulations, 40 CFR 141.31, currently require public water systems to report monitoring data to States within specified time periods. This action does not change those requirements for fluoride.

G. Compliance Monitoring Requirements

Compliance monitoring is being required for the purpose of determining if public water systems are distributing drinking water that meets the MCL. The Agency has determined that fluoride is a Tier II contaminant in the three tiered approach presented in the Phase II Advance Notice of Proposed Rulemaking, published on October 5, 1983 (48 FR 45502). Tier II contaminants are those which are of sufficient concern to warrant national regulation (MCLs) but which occur in a predictable fashion, justifying flexible national minimum monitoring requirements to be applied by State authorities.

EPA has determined that the presence of excess fluoride contamination of drinking water is normally the result of natural factors and that the occurrence of fluoride is highly predictable based upon geological and historical monitoring records. Under the Interim Regulations for fluoride, monitoring has

* PWS shall insert the compliance result which triggered notification under this Part.

* PWS shall insert the name, address, and telephone number of a contact person at the PWS.

been required for all public water systems since 1976. Therefore, considerable historical information is available on drinking water fluoride concentrations. EPA believes that systems which can demonstrate to the State that they do not exceed the MCL should not be required to monitor, except on an infrequent basis to confirm that fluoride levels have not changed significantly.

EPA is retaining the monitoring frequency requirements for fluoride now in force under 40 CFR 141.23, with modifications to allow greater state flexibility. The existing regulation requires community water systems using surface waters to monitor yearly, and those using ground water systems to monitor every three years (40 CFR 141.23(a)(1)-(3)). The Agency finds that these requirements continue to be well suited for fluoride monitoring of public water supplies; they allow detection of any increases in contaminant levels before there is a significantly increased risk of harm. However, in order to provide greater flexibility to the states, EPA is granting the authority to the states to reduce sampling to a minimum of once every 10 years if the state determines that the system is not likely to exceed the MCL. States, as part of their determinations, must consider factors such as levels reported during previous monitoring; the degree of variation reported in the monitoring levels; factors which may affect fluoride levels, such as changes in pumping rates for ground water supplies, operating procedures, source of water, changes in stream flows; and other relevant factors. Where historic levels have been close to but below the MCL or where there is particular concern about the quality of the analytical results, states may want to wait to reduce monitoring until they have analytical results produced by laboratories that have met the laboratory performance requirements.

States also have the authority to require monitoring more frequently than the minimum (i.e., yearly for surface sources, every three years for ground water sources). States would consider the same factors listed above in making this decision. More frequent monitoring would be especially appropriate initially for new systems, systems which begin use of new wells or water intakes, or systems for which insufficient monitoring data exist for determining that the system is not likely to exceed the MCL.

The Agency received a number of comments on the proposed monitoring requirements. In general, the comments supported the increased state flexibility.

A municipal water utility commented that there should not be any monitoring requirements for systems which historically have been shown to be problem free. The Agency believes that monitoring at least once every 10 years is reasonable because some monitoring is necessary to deal with unforeseen events and changes of conditions. Moreover, the costs of monitoring once every 10 years are minimal. An environmental group and a medical association objected to the proposed monitoring on the basis that it would decrease the protection to the public. The commenters did not provide any basis for asserting that levels could change significantly so that public health risks would significantly increase. Only in unusual circumstances should the levels change significantly. Where there is some possibility of changing circumstances, states may wish to require monitoring more frequently. The Agency believes that systems with fluoride levels that have been historically below the MCL of 4.0 mg/l should not be required to conduct frequent monitoring.

EPA requested comments on whether monitoring should be required of systems which practice fluoridation. The Centers for Disease Control (CDC) stated that they were against mandatory monitoring of fluoridating systems for the following reasons:

- A monitoring system currently exists (i.e., CDC recommends daily monitoring).
- CDC has a study of this monitoring program in progress.
- Historical records indicate that overfeeds are rare.
- Costs for additional monitoring will be burdensome.

The American Public Health Association and the Georgia Department of Natural Resources also were against such monitoring. The Agency agrees with these comments and is not setting additional monitoring for systems which practice fluoridation. However, EPA strongly encourages systems which practice fluoridation to follow the monitoring recommendation of the Centers for Disease Control (HHS 1985). EPA strongly encourages states which have not done so to require at least daily monitoring for systems which practice fluoridation.

Under the proposal, systems would be required to sample at points in the distribution system which are representative of household taps. At a minimum, separate samples from the distribution system were proposed to be required which are representative of

water contributed by each individual source (well or surface water intake).

The Agency received a number of comments on this proposal. The majority of the comments objected to the proposal for a number of reasons. One commenter objected that because some systems might have as many as 20-30 wells, enforcement of the proposed monitoring of representative taps would be an unreasonable burden on the states. Another commenter said that if measurements were taken at the tap, it could be impossible to know what well was serving what tap because of variable pumping patterns.

The Agency disagrees with the comment that the proposed monitoring would be a burden to systems with large numbers of sources. The costs of monitoring for fluoride are relatively low and should be affordable even for multiple well systems since samples are only to be taken yearly (in the most frequent situation required by rule). In general, systems with large numbers of sources serve a large number of people. Because fiscal resources available to systems increase with system size, the Agency does not feel that the proposed monitoring will pose a burden on such systems. While some large systems may have a large number of sources, smaller systems generally will have only one or two. Because fluoride levels exceeding the MCL will occur chiefly among smaller systems, the Agency believes that neither the monitoring itself nor the enforcement of the rule will present an unreasonable burden on either water supplies or states, respectively.

The Agency does not agree with the comment that monitoring for different portions of a system served by multiple sources may be problematic. Therefore, consistent with the proposal, the Agency is promulgating a requirement that where the system draws water from more than one source and does not combine the sources before distribution, the system must sample at each entry point to the distribution. See § 141.23(g)(1)(ii).

EPA is also aware that some systems use multiple sources and combine those sources prior to distribution. As noted by the commenter, it could be impossible to know which source is serving which tap due to system configuration or variable pumping patterns. The Agency believes that multiple sources used by the same system can have different fluoride levels. To address this situation, the Agency is promulgating a requirement that systems must sample at an entry point to the distribution system representative of the maximum fluoride

levels occurring under normal operating conditions. Sampling at the entry point to the distribution systems is appropriate for each source or where the sources are combined at or before the entry point. Because sources with differing fluoride levels may be used at different times, a monitoring scheme must account for the possibility that fluoride levels may vary.

EPA considered but rejected an averaging scheme. Averaging schemes may mask the fact that water with fluoride levels exceeding the MCL was being delivered for much of the year. Instead, the Agency believes that samples should be taken to reflect the highest levels of fluoride delivered to consumers during normal operations. By restricting the sampling period to normal operations, the Agency is excluding monitoring during abnormal conditions when the fluoride levels may be abnormally low or high (e.g., during accidents or breakdowns to treatment equipment). This scheme should provide a reasonable estimate of the maximum fluoride concentrations delivered by the system.

Compliance with both the SMCL and the MCL will be determined for each sampling point in a system. If any of the points of a sampling system are found to be out of compliance with the SMCL or the MCL, that portion of the water system shall be considered to be out of compliance. If a portion of a water system is out of compliance, then the entire system is deemed to be out of compliance.

This method of determining compliance is new and provides a higher degree of understanding regarding exposure than the previous method. The Agency intends to adopt a similar scheme for the other Revised Regulations.

The Agency proposed that the new monitoring rule would take effect 30 days from the date of today's notice and is promulgating the regulation with an effective date of 30 days. As explained above, EPA is establishing an 18 month effective date for the laboratory performance requirement.

H. Non-community Water Systems.

Under the Interim Regulations, "community water systems," as defined in 40 CFR 141.2(e)(1), were required to comply with the interim MCL. In the proposed National Primary Drinking Water Regulations for volatile organic chemicals (50 FR 46880, November 13, 1985), EPA considered redefining community water systems to include certain non-community water systems that had not been previously covered. The purpose was to include non-

residential populations of more than 25 people who, because of regular long-term exposure, might incur similar long-term risks of adverse health effects as residential populations. It included systems serving more than 25 persons in such places as workplaces, offices, and schools. That notice should be consulted for further detail.

Under the proposed rule for fluoride, the Agency would have granted states the flexibility to require such systems to meet the fluoride rules promulgated, herein, on a case-by-case basis. The proposal to include a non-community system was to be made after a review of the number of persons served, their expected drinking water consumption, the levels of fluoride, the number of months the system is used by the same persons, and other factors relevant to the risks that might be incurred. The basic criterion would have been whether users of these systems would be exposed to risks of crippling skeletal fluorosis and/or moderate to severe dental fluorosis similar to those posed by community water systems with residential populations and with similar fluoride levels.

The Agency received several critical comments on this proposal. Several comments stated that the extension of the MCL to schools would conflict with the school fluoridation program by the Centers for Disease Control (CDC). CDC currently recommends that schools in areas with low levels of fluoride add fluoride to their drinking waters supplies at levels up to 5.4 mg/l. CDC has calculated that a level of 5.4 mg/l would provide a daily consumption of fluoride equivalent to public water systems that fluoridate to the optimum level for caries prevention. Studies have not demonstrated increased levels of objectionable dental fluorosis in children covered by the program.

The Agency recognizes that the redefinition of community water system to include certain non-community water systems raises a number of complex technical and administrative issues (for fluoride and other contaminants to be addressed in the Revised Regulations) for public water systems, states and the Agency. Therefore, the Agency has decided not to take any action on this issue in this rule. Non-community systems are not required to comply with the fluoride MCL by this rule. The Agency believes that it is more appropriate to consider the need for regulating fluoride in non-community water systems as part of the larger decision whether to extend any or all Revised Regulations to such systems.

Deferring action on redefinition will also allow the Agency to further study

the issue and comments submitted on this rule and those on the proposed rule for volatile organic chemicals. The volatile organic chemicals proposal is scheduled for promulgation in the Fall of 1986 and may address non-community water systems.

It should be noted that states can adopt requirements affecting public water systems which are more stringent than those of the federal program. As such, states have been free to require non-community water systems to meet any MCL and may do so at any time. This could be accomplished in the same manner as described in the proposed rule: redefining the community water system to include certain (or all) non-community water systems. Thus, states could now adopt the approach EPA proposed.

III. Effective Dates

Two regulations have an effective date of 18 months from today's date: the Revised MCL (§ 141.61(b)) and the laboratory performance requirement (§ 141.23(g)(4)). This date is (insert date 18 months from date of publication that is a weekday). By statute, exemptions from the Revised MCL may be granted beginning on the same day. All the other regulations promulgated in this final rulemaking are effective 30 days from today's date. This date is (insert date 30 days from date of publication).

IV. Economic Impact Analysis

The economic impact analysis supporting this final rule is contained in "Economic Assessment of Reducing Fluoride in Drinking Water," as amended (EPA, 1986c). The report presents estimates of the benefits and costs of regulatory alternatives. Also included are analyses required by the Regulatory Flexibility Act and the Paperwork Reduction Act. The purpose of the assessment was to determine overall economic impacts of the regulations. The addendum to the assessment responds to comments made during the public comment period. There has been no significant change in the initial assessment. Approximately 1300 public water systems have fluoride above 2 mg/l, and about 300 systems have concentrations above 4 mg/l. If all systems with fluoride levels greater than 4 mg/l reduce their fluoride concentrations to 4 mg/l, the total cost would be approximately \$43 million or about \$2.9 million per year. Systems with recent data indicating compliance, generated pursuant to the Interim Regulation, are not required to monitor until ten years from the date of their last sample, at the discretion of the State. If

it is assumed that most states will reduce the frequency of monitoring for systems with less than about 2 mg/l of fluoride and that those systems which exceed 2 mg/l on their last interim sample were required to phase-in sampling under the one and three year schemes for surface and ground waters, respectively, then the annual costs for monitoring under this minimum federal requirement would be approximately \$170,000. The cost of notification would be minimal because most of the systems that would be required to notify under this proposal are already required to do so under the existing Interim Regulation.

Under Executive Order 12291, EPA must judge whether a regulation is "major" and, therefore, subject to the requirements of a Regulatory Impact Analysis. This action does not constitute a "major" regulatory action because it will not have a major financial or adverse impact on the country. This regulation was submitted to the Office of Management and Budget for review as required by Executive Order 12291. Executive Order 12291 does not distinguish between the legislative authority of various statutes but requires the same kinds of information on all actions. Therefore, some of the information was collected to meet the specific requirements of E.O. 12291 and was not used in determining the MCL.

The Regulatory Flexibility Act requires EPA to explicitly consider the effect of regulations on small entities. If there is a significant effect on a substantial number of small systems, means should be sought to minimize the effects. With respect to the requirements of the Regulatory Flexibility Act, 5 U.S.C. 602 *et seq.*, today's action will not have a significant effect on a substantial number of small entities. The Small Business Administration would define a small water utility as one which serves fewer than 50,000 people. There are about 58,500 systems which are considered small systems under this definition. Of these, fewer than 300 are likely to have contamination levels greater than the MCL. This rule would regulate less than 1 percent of the "small" systems and this does not constitute a substantial number of small systems.

The Paperwork Reduction Act seeks to minimize the reporting burden on the regulated community as well as minimize the cost of federal information collection and dissemination. Monitoring pursuant to today's action will indicate if a water system is in compliance with the new standards. The monitoring requirement is a reduction to the existing requirements and

constitutes a reduction in the reporting burden.

OMB has not approved the Information Requirements for collection of information under the Fluoride regulation, and they are not effective until we receive OMB clearance.

V. References and Public Docket

The following references are included in the Public Docket together with other correspondence and information. The Public Docket is available for viewing in Washington, DC at the address listed at the beginning of this notice. All public comments received on the proposal are included in the Docket.

- Eisenberg, 1984—Eisenberg, T.N., Middlebrook, E.J., A Survey of Problems With Reverse Osmosis Water Treatment, *J.A.W.W.A.*, August, 1984.
- EPAa—U.S. Environmental Protection Agency, Criteria and Standards Division, Monitoring for Fluoride in Drinking Water, Revised, March, 1986.
- EPAb—U.S. Environmental Protection Agency, Criteria and Standards Division, Technologies and Costs for the Removal of fluoride from Drinking Water, Updated February 1986.
- EPAc—U.S. Environmental Protection Agency, Office of Program Development and Evaluation, Economic Impact Assessment of the Proposed Fluoride Regulation, November, 1986, with Addendum, March 1986.
- EPAd—U.S. Environmental Protection Agency, Criteria and Standards Division, Responses to Comments Received on the Proposed Fluoride MCL and SMCL, November 14, 1985, March, 1986.
- EPAe—U.S. Environmental Protection Agency, Transcript of the Meeting of the National Drinking Water Advisory Council on November 20–21, 1985.
- HH5—U.S. Department of Health and Human Services, Centers for Disease Control, Center for Prevention Services, Dental Disease Prevention Activity, *Water Fluoridation A Manual for Engineers and Technicians*, October, 1985.
- Sorg, 1980—Sorg, T.J., Forbes, R.W., Chambers, D.S., Removal of Radium—226 from Sarasota County, Fla., *Drinking Water by Reverse Osmosis, J.A.W.W.A.*, April 1980.

VI. Appendix A—Addresses of EPA Regional Office

- I. JFK Federal Bldg., Boston, MA 02203, Phone: (617) 223-8488, Jerome Healy
- II. 28 Federal Plaza, Room 824, New York, NY 10278, Phone: (212) 264-1800, Walter Andrews
- III. 8th & Walnut Streets, Philadelphia, PA 19106, Phone: (215) 597-8673, Bernie Sarnowski
- IV. 345 Courtland Street, Atlanta, GA 30365, Phone: (404) 881-3781, Robert Jourdan
- V. 230 S. Dearborn Street, Chicago IL 60604, Phone: (312) 886-6176, Joseph Harrison
- VI. 1201 Elm Street, Dallas, TX 75270, Phone: (214) 767-2620, James Graham

VII. 725 Minnesota Ave., Kansas City, KS 66101, Phone: (913) 234-2615, Gerald R. Foree

VIII. 1860 Lincoln Street, Denver, CO 80295, Phone: (303) 293-1413, Marc Alston

IX. 215 Fremont Street, San Francisco, CA 94105, Phone: (415) 874-8078, Leslie Ragle

X. 1200 Sixth Avenue, Seattle, WA 98101, Phone: (206) 442-1225, Jerry Opatz

VII. Appendix B—Variances

a. Requirements of the Safe Drinking Water Act for Variances

Under section 1415(a)(1)(A) of the SDWA, EPA or a primacy state may grant variances from National Primary Drinking Water Regulations which, because of high levels of a contaminant, cannot meet an MCL despite application of best technology, treatment techniques, or other means which the Administrator finds are generally available (BTGA) (taking costs into consideration). In other words, a system must not be able to comply with the MCL even after installing BTGA because of the characteristics of the raw water sources. Variances or exemptions are only appropriate for systems that do not comply with the MCL. Before a variance can be granted, the state must find that the variance will not result in unreasonable risk to health.

If EPA or a primacy state grants a variance, it shall prescribe within one year a schedule for (1) compliance with the MCL and (2) implementation of such additional control measures during the period that the variance is in force. Before a prescribed schedule may take effect, EPA or the state must provide notice and opportunity for a public hearing on the schedule. A schedule is to require compliance as expeditiously as practicable. Subsections 1416(a)(1)(B)–(E) provide additional administrative requirements for issuing variances. Section 1414 of the Act requires systems receiving variances to give public notice of such variance to the persons served by it (SDWA § 1414(c)(2), 42 USC § 300g–(c)(2)).

b. Identification of Best Technologies Generally Available for Purposes of Fluoride Variances

In § 142.61(a), EPA identifies BTGA for purposes of variances to the fluoride regulation as activated alumina and reverse osmosis treatment technologies. Section 1415 of the Act authorizes EPA to identify BTGA. These technologies are the same as those identified under § 1412 as BTGA for purposes of determining the MCL for fluoride. The basis for identifying these technologies as BTGA is described at length in this rule and the preamble of the proposal.

EPA solicited comment on its finding that activated alumina and reverse osmosis were BTGA for purposes of section 1415 variances. No comments were received on identification of these technologies as BTGA. The Agency also stated that the technologies were reasonably affordable for all systems regardless of size. The Agency invited comment on whether BTGA for purposes of section 1415 should differ depending on size of the system, economic, or technical factors. The Agency received no comments suggesting that other centralized technologies should be identified as BTGA under section 1415 that BTGA should vary depending on system size, or that no BTGA was available for small systems.

Although the Agency received comments that some small systems could not afford to install reverse osmosis or activated alumina, these comments did not provide any economic data or technical support for their position. Even if some small systems do not find these technologies affordable, they are still affordable for large systems, and this finding was not challenged.

The Agency explained in the proposal that its determination of BTGA for section 1415 relied on the findings of BTGA for section 1412. No commenter challenged this reliance.

c. Inability to Meet MCLs Despite Application of Best Technology Generally Available; Determination of Availability and Effectiveness

In § 142.61(b), EPA stipulates how it or a primacy state that issues variances shall make the determination as to whether a system shall be required to install and/or use a best generally available treatment method. Generally, a system must install and/or use BTGA to receive a variance. Under limited circumstances, a system may receive a variance without installing and/or using BTGA if the identified BTGA technologies are not available and effective for it.

Before issuing a variance, the variance-issuing authority must find that a variance is warranted, i.e., that because of the characteristics of the raw water source, the system will not be able to meet the MCL despite application of best generally available treatment methods (Section 1415(a)(1)(A) 40 CFR 142.40(a) and analogous primacy state regulations). This interpretation was explained in the proposed rule and the Agency received no comment on it. This has always been the Agency's interpretation of this position (see 45 FR 50833-35 (July 31,

1980) and 50 FR 47163-64 (November 14, 1985); also 50 FR 46918 (November 13, 1985)). While the system may have already installed the treatment method, the finding could be made prior to such installation.

The treatment methods should be in place to demonstrate that non-compliance is attributable to poor source water quality or if the installation is not yet complete, the system may demonstrate non-compliance based on studies indicating that the treatment methods will not allow compliance after they are operational. In some cases, additional time may be needed to complete installation of the required treatment methods. However, EPA expects any such compliance schedule would require the expeditious installation of such treatment methods. The important fact is that the "available and effective" methods be installed in order to reduce the levels of fluoride, either before the variance is issued or within a short and specified period of time. It is for this reason that § 142.61(b) requires the system to "install and/or use" one of the identified methods.

A system which cannot comply with the MCL due to high contaminant levels in the water system must install and/or use one of the technologies identified as BTGA, unless it is determined that both are not "available and effective." Under the criteria in § 142.60(b), a treatment method would not be considered to be "available and effective" for an individual system if the treatment method would not be "technically appropriate and technically feasible" for that system, or would only result in a marginal reduction of fluoride for that system. By "technically appropriate and technically feasible" the Agency means that the proposed treatment method would be technically compatible with treatment methods then in use by the system and represent sound water utility engineering judgment applied to that system. By use of the term "marginal reduction," the Agency means that a system should not be required to install and use a treatment method where the reduction in fluoride would be small relative to the existing levels of fluoride or small relative to the reduction available by use of the other listed best generally available treatment method. The Agency does not intend that systems be required to use treatment methods that will give only small or insignificant reductions in fluoride under a variance. It is the burden of the system to show that the treatment methods are not available and effective. EPA intends to publish additional guidance on the issuance of

variances, including the role of costs in determining technical appropriateness and feasibility.

Inasmuch as the costs of installation and use of both of the listed treatment methods have been considered by the Agency and are anticipated to be affordable, it is not anticipated that such costs should be a deterrent to requiring a system to install and use any of such treatment methods. The determinations respecting the availability and effectiveness of either of the listed treatment methods necessarily would be made on a case-by-case basis, considering the operating characteristics and capabilities of the system applying for a variance. If EPA or a primacy state determines that one of the above listed BTGA is "available and effective" (as defined in § 142.60(b)) for a system and the system has not completed installation of the treatment method at the time it applies for a variance, EPA or the primacy state may grant the variance accompanied by a compliance schedule for the expeditious installation of such treatment method.

EPA wishes to emphasize that the Administrator is specifically charged with the responsibility of "taking costs into consideration" in establishing primary drinking water regulations and in making determinations as to which treatment methods are BTGA for meeting SDWA regulations. If a system is unable to afford to install and/or use BTGA due to compelling factors, it must apply to the primacy agency for an exemption which specifically allows for the consideration of economic factors and authorizes the granting of time for the system to raise additional capital to install the necessary treatment. As noted below, EPA believes that there are few systems that will be able to demonstrate compelling economic factors which justify an exemption from the 4.0 mg/l MCL for fluoride. The grounds for not installing a BTGA method are limited to system-specific technical problems of availability and effectiveness.

EPA believes that the criteria in § 142.61(b) authorizing the primacy agency to relieve a system of an obligation to install and/or use a treatment method that is not available and effective for that system are both reasonable and necessary. Systems should not be expected to install treatment methods that would interfere with other unit operations that control health-related contaminants, treatment methods that would be operationally unstable due to existing treatment configurations or treatment methods that would only reduce fluoride by a

negligible or trivial amount. There is a need for flexibility in the variance process and EPA believes it process includes the right amount of flexibility while ensuring the installation of appropriate treatment methods.

In the proposed rule, EPA solicited comment on how to treat the situation in which a system had no technology generally available (for economic reasons), and whether variances should be allowed that did not require installation of a BTGA (see 50 FR 47164, November 14, 1985).

No comment was received on these issues. The Agency's final rule does allow the issuance of variances where BTGA is not available and effective for technical reasons. As explained above, the Agency believes that the identified BTGA is reasonably affordable for large systems and for many small systems.

d. Required Examination and Installation of Alternate Treatment Methods

As explained above, systems that are candidates to receive variances must either (1) not be able to comply with the MCL even though they have installed or with install BTGA or (2) be in the small class of systems for which BTGA is not available and effective. In either case, the system will still be out of compliance with the MCL. Section 142.61 (c) and (d) are intended to address this situation and to implement SDWA § 1415(a)(1)(A) (i) and (ii).

The Act requires EPA or the state to prescribe within one year of the date the variance is issued, a schedule for (1) compliance (including increments of progress) and (2) implementation by the system of such control measures as may be necessary (SDWA § 1415(a)(1)(A) (i) and (ii)). These provisions are aimed at bringing the system into compliance with the MCL as soon as practicable. To adopt a reasonable schedule to ensure compliance, the Agency believes it is appropriate to require systems to expeditiously investigate and install those treatment technologies that are technically feasible, economically reasonable, and will achieve fluoride reductions commensurate with the costs of installation and operation. As an example of economic reasonability, the Agency believes that the costs of BTGA as estimated in this rulemaking are economically reasonable.

Therefore, in addition to the two best generally available treatment methods, EPA in § 142.61(c) has identified for investigation and possible installation seven additional treatment methods. These seven methods are not identified as "generally available" pursuant to Section 1415(a)(1)(A). These treatment

methods, however, may be available for some systems.

Section 142.61(d) specifies criteria that EPA and primacy states shall apply in determining what requirements to include in a compliance schedule accompanying a variance. Such schedules of compliance may include a requirement that the system examine other treatment methods identified below to determine their availability, feasibility, cost, and effectiveness. Such an examination may include engineering studies, and for potentially applicable technologies, pilot projects, to determine accurately what reduction in fluoride levels could be achieved by the treatments.

Section 142.61(c) provides that a schedule shall be issued that may require examination of the listed technologies. The Act and the regulations require a compliance schedule as a condition of receiving a variance. Requiring examination of the listed technologies is not mandatory because some systems will already have chosen a specific technology which will allow compliance. In these cases, further study may not be necessary.

In prescribing compliance schedules, EPA and primacy states shall consider the potential efficacy of the treatment methods and avoid the requirement for studies of methods that do not have the probability of significantly reducing the levels of fluoride. The additional treatment methods that EPA believes should be considered as part of a compliance schedule are listed in § 142.61(c) and are:

- (1) Modification of lime softening
- (2) Alum coagulation
- (3) Electrodialysis
- (4) Anion exchange resins
- (5) Well field management
- (6) Alternate source
- (7) Regionalization.

These technologies and alternative means of compliance are described briefly in the preamble to the proposal and in some detail in the cost and technologies documents which accompanied the proposed and final fluoride rules. Little comment on these alternative means of compliance was received.

This list is not intended to be inclusive of all potentially available or effective treatment methods and development of new technologies is encouraged. Systems always have the option of proposing studies of other methods. Based on studies by the system and other available information, EPA or a primacy state shall decide whether any of the identified above treatment methods would achieve a

reduction in fluoride levels justifying use of the method.

This regulation, by itself, does not require installation or use of any of these seven treatment methods for the granting or continuation of a variance. Section 142.61(d) provides, however, that EPA or a primacy state may decide for a particular system that such treatment methods (or other treatment methods) are technically feasible and economically reasonable, and that the fluoride reductions obtained would be commensurate with the costs incurred with the installation and use of the treatment method. In such a case, EPA or the primacy state shall require, as part of a compliance schedule, installation or use of such methods by the system. The Act requires that a compliance schedule must include a schedule for implementation of control measures. This provision is not intended to allow a reopening of the health basis of the standard on a case-by-case basis but rather to allow reasonable judgments on the cost and effectiveness of major changes in sources or treatment.

By allowing consideration of reductions commensurate with costs, EPA is reasonably accounting for the costs and efficiency in requiring control measures beyond BTGA. The Agency notes that case-by-case economic considerations are not appropriate in determining whether a system must use a best "generally available" treatment method. However, the seven treatment methods identified in § 142.61(c) were not determined to be BTGA. Therefore, case-by-case cost considerations are not precluded by the SDWA. The Agency listed the treatment methods in § 142.61(c) for use by EPA and primacy states in determining what should be required of a system that has applied each available and effective treatment method listed in § 142.61(a) (or for which no BTGA is available and effective) and still is not in compliance with the MCL. Section 1415(a)(1)(A) requires the primacy agency to prescribe a compliance schedule for such a system, with increments of progress designed to bring the system into ultimate compliance. At this stage, the Agency believes it is appropriate to consider the reasonableness of the cost of using additional (not "generally available") treatment methods and in requiring a reduction in fluoride commensurate with the costs of installing and/or using such treatment methods. This is consistent with the SDWA and represents sound regulatory judgment. Costs would be considered reasonable if they were similar to those that were considered

reasonable in the determination of BTGA.

The only significant difference between the variance rule for trihalomethanes (THM) and the variance rule for fluoride is the THM variance rule precluded EPA and the states from requiring systems to install methods not listed in the regulation in § 142.60 (a) and (c). (See 40 CFR 142.60(d) and preamble at 48 FR 8408-413 and 47 FR 9796-798.) This prohibition was promulgated because of a concern that states might mandate installation of other treatment methods which the Agency believed should not be required as part of a variance. EPA does not have this concern for other fluoride technologies that are not listed.

Under section 1415 (a)(1)(A)(ii), EPA or the primacy state is to prescribe a schedule for implementation of control measures to reduce contaminants which, under the regulation, includes examination and installation of appropriate technologies. The term "control measures" also includes any other interim steps that may be necessary to prevent unreasonable risks until a treatment technology is installed. Thus, EPA or the primacy state may require the system to implement interim control measures, such as provision of bottled water or use of point-of-use or point-of-entry devices, to reduce exposure to fluoride as a condition and requirement of granting the variance.

e. Effective Date of Variance Regulation

Variances to the Interim Regulation have been available by statute since the Interim Regulation became effective in 1977. Variances do not have a statutory expiration date and therefore continue to be available for the Interim Regulation. Variances from the Revised Regulation are available by statute when the Revised Regulations become effective October 2, 1987.

The variance regulation applies to both the Interim Regulation and the Revised Regulation. The Agency sees no benefit from delaying the variance regulation; if variances are to be issued, they should comply with the requirements of § 142.61. This effective date is consistent with the effective date

discussed in the proposal (see 50 FR 47164 (November 14, 1985)).

f. EPA Review of State Variances

Under SDWA § 1415(a)(1)(F), EPA is authorized to review variances issued by states. Where the state has abused its discretion in granting variances in a substantial number of cases, the Administrator is authorized to revoke the variances and propose revised schedules or other requirements (SDWA § 1415(a)(1)(G)). Because most, if not all, systems can comply using BTGA, a variance will rarely be appropriate. EPA will review state issued variances.

Existing variances may not comply with the new variance regulations. In this case, states will need to amend their variances so that they are not less stringent than those that would be issued under § 142.61. Such variances should be amended expeditiously.

VIII. List of Subjects

40 CFR Part 141

Chemicals, Intergovernmental relations, Radiation protection, Reporting and recordkeeping requirements, Water supply.

40 CFR Part 142

Administrative practice and procedure, Chemicals, Radiation protection, Recordkeeping requirements, Intergovernmental relations, Water supply.

40 CFR Part 143

Chemicals, Water supply, Reporting and recordkeeping requirements.

Dated: March 15, 1986.

Lee M. Thomas,
Administrator.

For the reasons set out in the preamble, Title 40, Code of Federal Regulations, is amended as set forth below.

PART 141—NATIONAL PRIMARY DRINKING WATER REGULATIONS

1. The authority citation for Part 141 continues to read as follows:

Authority: 42 U.S.C. 300g-1, 300g-3, 300j-4, and 300j-9.

2. Section 141.2 is amended by adding a new paragraph (v) to read as follows:

§ 141.2 Definitions.

(v) "Performance evaluation sample" means a reference sample provided to a laboratory for the purpose of demonstrating that the laboratory can successfully analyze the sample within limits of performance specified by the Agency. The true value of the concentration of the reference material is unknown to the laboratory at the time of the analysis.

3. Section 141.6 is amended by adding a new paragraph (f) to read as follows:

§ 141.6 Effective dates.

(f) The regulations set forth in § 141.11(c) and § 141.23(g) are effective May 2, 1986. Section 141.23(g)(4) is effective October 2, 1987.

4. Section 141.11 is amended by revising paragraph (c) as follows:

§ 141.11 Maximum contaminant levels for inorganic chemicals.

(c) The Maximum Contaminant Level for fluoride is 4.0 mg/l. See 40 CFR 143.3, which establishes a Secondary Maximum Contaminant Level at 2.0 mg/l.

5. Section 141.23 is amended by revising paragraphs (b) and (f)(10), republishing footnotes 1 through 4 and adding footnotes 5 through 7 to (f) and by adding a new paragraph (g) to read as follows:

§ 141.23 Inorganic chemical sampling and analytical requirements.

(b) If the result of an analysis made under paragraph (a) of (g) of this section indicates that the level of any contaminant listed in § 141.11 or § 141.62 exceeds the maximum contaminant level, the supplier of the water shall report to the State within 7 days and initiate three additional analyses at the same sampling point within one month.

(f) * * *
(10) Fluoride:

Methodology	Reference (method number)			
	EPA *	ASTM *	SM *	Other
Colorimetric SPADNS; with distillation	340.1	D1179-72A	43 A and C	
Potentiometric ion selective electrode	340.2	D1179-72B	413 B	
Automated Alizarin fluoride blue; with distillation (complexone)	340.3		413 E	129-71W *
Automated ion selective electrode				380-75WE *

* "Methods of Chemical Analysis of Water and Wastes," EPA Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268 (EPA-600/4-79-020), March 1979. Available from ORD Publications, CERL, EPA, Cincinnati, Ohio 45268. For approved analytical procedures for metals, the technique applicable to total metals must be used.

* "Standard Methods for the Examination of Water and Wastewater," 14th Edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, 1976.

- * Techniques of Water-Resources Investigation of the United States Geological Survey, Chapter A-1, "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments," Book 5, 1978. Stock #024-001-03177-8. Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.
- * Annual Book of ASTM Standards, part 31 Water, American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.
- * "Standard Methods for the Examination of Water and Wastewater," 16th Edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, 1985.
- * "Fluoride in Water and Wastewater, Industrial Method # 129-71W," Technicon Industrial Systems, Tarrytown, New York, 10591. December 1972.
- * "Fluoride in Water and Wastewater," Technicon Industrial Systems, Tarrytown New York, 10591, February 1976.

(g) **Fluoride.** In addition to complying with paragraphs (a) through (f) of this section, systems monitoring for fluoride must comply with the requirements of this paragraph.

(1)(i) Where the system draws water from one source, the system shall take one sample at the entry point to the distribution system.

(ii) Where the system draws water from more than one source, the system must sample each source at the entry points to the distribution system.

(iii) If the system draws water from more than one source and sources are combined before distribution, the system must sample at an entry point to the distribution system during periods representative of the maximum fluoride levels occurring under normal operating conditions.

(2) The state may alter the frequencies for fluoride monitoring as set out in paragraph (a) of this section to increase or decrease such frequency considering the following factors:

(i) Reported concentrations from previously required monitoring.

(ii) The degree of variation in reported concentrations and.

(iii) Other factors which may affect fluoride concentrations such as changes in pumping rates in ground water supplies or significant changes in the system's configuration, operating procedures, source of water, and changes in stream flows.

(3) Monitoring may be decreased from the frequencies specified in paragraph (a) of this section upon application in writing by water systems if the state determines that the system is unlikely to exceed the MCL, considering the factors listed in paragraph (g)(2) of this section. Such determination shall be made in writing and set forth the basis for the determination. A copy of the determination shall be provided to the Administrator. In no case shall monitoring be reduced to less than one sample every 10 years. For systems monitoring once every 10 years, the state shall review the monitoring results every ten years to determine whether more frequent monitoring is necessary.

(4) Analyses for fluoride under this section shall only be used for determining compliance if conducted by laboratories that have analyzed Performance Evaluation samples to within $\pm 10\%$ of the reference value at fluoride concentrations from 1.0 mg/l to 10.0 mg/l, within the last 12 months.

(5) Compliance with the MCL shall be determined based on each sampling point. If any sampling point is determined to be out of compliance, the system is deemed to be out of compliance.

6. § 141.32 is amended by revising the first sentence of paragraph (a) as follows:

§ 141.32 Public notification.

(a) If a community water system fails to comply with an applicable maximum contaminant level established in Subparts B or G, fails to comply with an applicable testing procedure established in Subpart C of this part, is granted a variance or an exemption from an applicable maximum contaminant level, fails to comply with the requirements of any schedule prescribed pursuant to a variance or exemption, or fails to perform any monitoring pursuant to section 1445(a) of the Act, the supplier of water shall notify persons served by the water system of the failure or grant by inclusion of a notice in the first set of water bills of the system issued after the failure or grant and in any event by written notice within three months.

7. Part 141 is amended by adding a new Subpart G to read as follows:

Subpart G—National Revised Primary Drinking Water Regulations: Maximum Contaminant Levels

Sec.

141.60 Effective dates.

141.61 [Reserved]

141.62 Maximum Contaminant Levels for Inorganic Contaminants.

Subpart G—National Revised Primary Drinking Water Regulations: Maximum Contaminant Levels

§ 141.60 Effective dates.

(a) [Reserved]

(b) Effective dates for § 141.62

(1) [Reserved]

(2) The effective date for § 141.62(b)(1) is October 2, 1987.

§ 141.61 [Reserved]

§ 141.62 Maximum Contaminant Levels for Inorganic Contaminants.

(a) [Reserved]

(b) The following Maximum Contaminant Levels for inorganic contaminants apply to community water systems.

Contaminant	Maximum contaminant level in mg/l
(1) Fluoride	4.0
(2) [Reserved]	

PART 142—NATIONAL PRIMARY DRINKING WATER REGULATIONS IMPLEMENTATION

8. The authority citation for Part 142 continues to read as follows:

Authority: 42 U.S.C. 300g-2, 300g-3, 300g-4, 300g-5, 300j-4, and 300j-9.

9. § 142.61 is added to read as follows:

§ 142.61 Variances from the maximum contaminant level for fluoride.

(a) The Administrator, pursuant to Section 1415(a)(1)(A) of the Act, hereby identifies the following as the best technology, treatment techniques or other means generally available for achieving compliance with the Maximum Contaminant Level for fluoride.

(1) Activated alumina absorption, centrally applied

(2) Reverse osmosis, centrally applied

(b) The Administrator in a state that does not have primary enforcement responsibility or a state with primary enforcement responsibility (primacy state) that issues variances shall require a community water system to install and/or use any treatment method identified in § 142.61(a) as a condition for granting a variance unless the Administrator or the primacy state determines that such treatment method identified in § 142.61(a) as a condition for granting a variance is not available and effective for fluoride control for the system. A treatment method shall not be considered to be "available and effective" for an individual system if the treatment method would not be technically appropriate and technically feasible for that system. If, upon application by a system for a variance, the Administrator or primacy state that issues variances determines that none of the treatment methods identified in § 142.61(a) are available and effective for the system, that system shall be entitled to a variance under the provisions of Section 1415(a)(1)(A) of the Act. The Administrator's or primacy state's determination as to the availability and effectiveness of such treatment methods shall be based upon

studies by the system and other relevant information. If a system submits information to demonstrate that a treatment method is not available and effective for fluoride control for that system, the Administrator or primacy state shall make a finding whether this information supports a decision that such treatment method is not available and effective for that system before requiring installation and/or use of such treatment method.

(c) Pursuant to § 142.43(c)-(g) or corresponding state regulations, the Administrator or primacy state that issues variances shall issue a schedule of compliance that may require the system being granted the variance to examine the following treatment methods (1) to determine the probability that any of these methods will significantly reduce the level of fluoride for that system, and (2) if such probability exists, to determine whether any of these methods are technically feasible and economically reasonable, and that the fluoride reductions obtained will be commensurate with the costs incurred with the installation and use of such treatment methods for that system:

- (1) Modification of lime softening
- (2) Alum coagulation
- (3) Electrodialysis
- (4) Anion exchange resins
- (5) Well field management
- (6) Alternate source
- (7) Regionalization

(d) If the Administrator or primary state that issues variances determines that a treatment method identified in § 142.61(c) or other treatment method is technically feasible, economically reasonable, and will achieve fluoride reductions commensurate with the costs incurred with the installation and/or use of such treatment method for the system, the Administrator or primacy state shall require the system to install and/or use that treatment method in connection with a compliance schedule issued under the provisions of Section 1415(a)(1)(A) of the Act. The Administrator's or primacy state's determination shall be based upon

studies by the system and other relevant information.

PART 143—NATIONAL SECONDARY DRINKING WATER REGULATIONS

10. The authority citation for Part 143 is revised to read as follows:

Authority: 42 U.S.C. 300g-1(c), 300j-4, and 300j-9.

11. Part 143, § 143.3 is amended by adding the following entry to the table between the entries corrosivity and foaming agent:

§ 143.3 Secondary maximum contaminant levels.

Contaminant	Level
Fluoride	2.0 mg/l

12. Part 143 is amended by adding a new § 143.5 to read as follows:

§ 143.5 Compliance With secondary maximum contaminant level and public notification for fluoride.

(a) Community water systems, as defined in 40 CFR § 141.2(e)(1), that exceed the secondary maximum contaminant level for fluoride as determined by the last single sample taken in accordance with the requirements of § 141.223 or any equivalent state law shall send the notice described in (b) to (1) all billing units generally, (2) all new billing units at the time service begins, and (3) the state public health officer.

(b) The notice to be used by systems which exceed the secondary MCL shall contain the following language and no additional language except as necessary to replace the asterisks:

Public Notice

Dear User,

The U.S. Environmental Protection Agency requires that we send you this notice on the level of fluoride in your drinking water. The drinking water in your community has a fluoride concentration of * milligrams per liter (mg/l).

Federal regulations require that fluoride, which occurs naturally in your water supply, not exceed a concentration of 4.0 mg/l in drinking water. This is an enforceable standard called a Maximum Contaminant Level (MCL), and it has been established to protect the public health. Exposure to drinking water levels above 4.0 mg/l for many years may result in some cases of crippling skeletal fluorosis, which is a serious bone disorder.

Federal law also requires that we notify you when monitoring indicates that the fluoride in your drinking water exceeds 2.0 mg/l. This is intended to alert families about dental problems that might affect children under nine years of age. The fluoride concentration of your water exceeds this federal guideline.

Fluoride in children's drinking water at levels of approximately 1 mg/l reduces the number of dental cavities. However, some children exposed to levels of fluoride greater than about 2.0 mg/l may develop dental fluorosis. Dental fluorosis, in its moderate and severe forms, is a brown staining and/or pitting of the permanent teeth.

Because dental fluorosis occurs only when developing teeth (before they erupt from the gums) are exposed to elevated fluoride levels, households without children are not expected to be affected by this level of fluoride. Families with children under the age of nine are encouraged to seek other sources of drinking water for their children to avoid the possibility of staining and pitting.

Your water supplier can lower the concentration of fluoride in your water so that you will still receive the benefits of cavity prevention while the possibility of stained and pitted teeth is minimized. Removal of fluoride may increase your water costs. Treatment systems are also commercially available for home use. Information on such systems is available at the address given below. Low fluoride bottled drinking water that would meet all standards is also commercially available.

For further information, contact * at your water system.

* PWS shall insert the compliance result which triggered notification under this Part.

* PWS shall insert the name, address, and telephone number of a contact person at the PWS.

(c) The effective date of this section is May 2, 1986.

[FR Doc. 86-6843 Filed 4-1-86; 8:45 am]

BILLING CODE 5560-50-M

NMMA EXHIBIT D

federal register

570Z91050

Wednesday
January 30, 1991

Part II

Environmental Protection Agency

40 CFR Parts 141, 142, and 143
National Primary Drinking Water
Regulations; Final Rule

ENVIRONMENTAL PROTECTION AGENCY**40 CFR Parts 141, 142, and 143**

(WH-FRL-3380-1)

National Primary Drinking Water Regulations—Synthetic Organic Chemicals and Inorganic Chemicals; Monitoring for Unregulated Contaminants; National Primary Drinking Water Regulations Implementation; National Secondary Drinking Water Regulations**AGENCY:** U.S. Environmental Protection Agency (EPA).**ACTION:** Final rule.

SUMMARY: By this document, EPA is promulgating maximum contaminant level goals (MCLGs) and National Primary Drinking Water Regulations (NPDWRs) for 28 synthetic organic chemicals (SOCs) and 7 inorganic chemicals (IOCs). (The MCLGs and MCLs for aldicarb, aldicarb sulfoxide, aldicarb sulfone, pentachlorophenol and barium are repropounded elsewhere in today's Federal Register due to changes in the health basis for the MCLGs and/or revised MCLs.) The NPDWRs consist of maximum contaminant levels (MCLs) or treatment techniques for the SOCs and IOCs. The NPDWRs also include monitoring, reporting, and public notification requirements for these compounds. This document includes the best available technology (BAT) upon which the MCLs are based and the BAT for the purpose of issuing variances. The Agency is promulgating secondary MCLs (SMCLs) for two contaminants and one-time monitoring requirements for approximately 30 SOCs and IOCs that are not regulated by NPDWRs.

EFFECTIVE DATE: All sections (141.11, 141.23, 141.24, 141.32, 141.40, 141.50, 141.60, 141.61, 141.62, 141.110, 141.111, 142.14, 142.15, 142.16, 142.57, 142.62, 142.64, 143.3, and 143.4) of this regulation are effective July 30, 1992. The information collection requirements of §§ 141.23, 141.24 and 141.40 are effective July 30, 1992 if the Information Collection Request is cleared by the Office of Management and Budget (OMB). If not, the requirements will be effective when OMB clears the request at which time a document will be published in the Federal Register establishing the effective date. In accordance with 40 CFR 23.7, this regulation shall be considered final Agency action for the purposes of judicial review at 1 p.m., Eastern time on February 13, 1991.

ADDRESSES: A copy of the public comments received, EPA responses, and all other supporting documents (including references included in this notice) are available for review at the U.S. Environmental Protection Agency (EPA), Drinking Water Docket, 401 M Street, SW., Washington, DC 20460. For access to the docket materials, call 202-382-3027 between 9 a.m. and 3:30 p.m. Any document referenced by an MRID number is available by contacting Susan Laurence, Freedom of Information Office, Office of Pesticide Programs, at 703-557-4454.

Copies of health criteria, analytical methods, and regulatory impact analysis documents are available for a fee from the National Technical Information Service (NTIS), U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll-free number is 800-336-4700, local: 703-487-4650.

FOR FURTHER INFORMATION CONTACT: Al Havinga, Criteria and Standards Division, Office of Drinking Water (WH-550), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460, 202-382-5553, or one of the EPA Regional Office contacts listed below. General information may also be obtained from the EPA Drinking Water Hotline. The toll-free number is 800-426-4791, local: 202-382-5533.

EPA Regional Offices

- I. JFK Federal Bldg., room 2203, Boston, MA 02203. Phone: (617) 565-3602, Jerry Healey
- II. 28 Federal Plaza, room 824, New York, NY 10278. Phone: (212) 264-1800, Walter Andrews
- III. 841 Chestnut Street, Philadelphia, PA 19107. Phone: (215) 597-8227, Jon Capacasa
- IV. 345 Courland Street, Atlanta, GA 30385. Phone: (404) 347-2913, Allen Antley
- V. 230 S. Dearborn Street, Chicago, IL 60604. Phone: (312) 353-2152, El Waters
- VI. 1445 Ross Avenue, Dallas, TX 75202. Phone: (214) 253-7155, Tom Love
- VII. 726 Minnesota Ave., Kansas City, KS 66201. Phone: (913) 551-7032, Ralph Longemeier
- VIII. One Denver Place, 999 18th Street, suite 300, Denver, CO 80202-2413. Phone: (303) 293-1408, Patrick Crotty
- IX. 215 Fremont Street, San Francisco, CA 94105. Phone: (415) 974-0912, Steve Pardieck
- X. 1200 Sixth Avenue, Seattle, WA 98101. Phone: (206) 442-4092, Jan Hastings

Abbreviations Used in This Document

AA: Direct Aspiration Atomic Absorption Spectroscopy
ADI: Adjusted Daily Intake
BAT: Best Available Technology
BTCA: Best Technology Generally Available
CAA: Clean Air Act
CAG: Cancer Assessment Group
CAVE: Cancer Risk Assessment Verification Endeavor

CUR: Carbon Usage Rate
CWS: Community Water System
DWEL: Drinking Water Equivalent Level
EBCT: Empty Bed Contact Time
ED: Electrodialysis
EDR: Electrodialysis Reversal
EMSL: EPA Environmental Monitoring and Support Laboratory (Cincinnati)
FmHA: Farmer's Home Administration
GAC: Granular Activated Carbon
GFAA: Graphite Furnace Atomic Absorption Spectroscopy
ICP-AES: Inductively Coupled Plasma-Atomic Emission Spectroscopy
IE: Ion Exchange
IMDL: Inter-Laboratory Method Detection Limit
IOC: Inorganic Chemical
LOAEL: Lowest-Observed-Adverse-Effect Level
LOQ: Limit of Quantitation
MBS: Multinational Business Services, Inc.
MCL: Maximum Contaminant Level (expressed as mg/l)¹
MCLG: Maximum Contaminant Level Goal
MDL: Method Detection Limit
MCD: Million Gallons per Day
NAS: National Academy of Science
NPDWR: National Interim Primary Drinking Water Regulation
NIST: National Institute of Standards and Technology
NOAEL: No-Observed-Adverse-Effect Level
NORS: National Organic Reconnaissance Survey
NPDWR: National Primary Drinking Water Regulation
NSF: National Sanitation Foundation
NTWS: Non-Transient Non-Community Water System
OPP: EPA's Office of Pesticide Programs
PAP: Polymer Addition Processes
PE: Performance Evaluation
POE: Point-of-Entry Technologies
POU: Point-of-Use Technologies
PQL: Practical Quantitation Level
PTA: Packed Tower Aeration
PWS: Public Water System
RDI: Reference Dose (formerly termed Acceptable Daily Intake (ADI))
RIA: Regulatory Impact Analysis
RMCL: Recommended Maximum Contaminant Level
RO: Reverse Osmosis
RSC: Relative Source Contribution
SDWA: Safe Drinking Water Act, or the "Act," as amended in 1986
SMCL: Secondary Maximum Contaminant Level
SOC: Synthetic Organic Chemical
TEM: Transmission Electron Microscopy
THMs: Trihalomethanes
TON: Total Odor Number
TWS: Transient Non-Community Water System
UF: Uncertainty Factor
UIC: Underground Injection Control
VOC: Volatile Organic Chemical
WHP: Wellhead Protection

List of Tables

Table 1—MCLGs and MCLs for Inorganic Contaminants

¹ 1,000 micrograms (µg) = 1 milligram (mg).

Table 2—MCLGs and MCLs for Volatile Organic Contaminants	4. Inorganic MCLGs	1. Introduction
Table 3—MCLGs and MCLs for Pesticides/PCBs	a. Asbestos	2. Effective Date
Table 4—MCLGs and Treatment Technique Requirements for Other Organic Contaminants	b. Cadmium	3. Standard Monitoring Framework
Table 5—Secondary Maximum Contaminant Levels (SMCLs)	c. Chromium	a. Three-, Six-, Nine-Year Cycles
Table 6—Best Available Technologies to Remove Inorganic Contaminants	d. Mercury	b. Base Monitoring Requirements
Table 7—Best Available Technologies to Remove Synthetic Organic Contaminants	e. Nitrate/Nitrite	c. Eight VOCs Regulated July 8, 1987
Table 8—Compliance Monitoring Requirements	(1) Nitrates and Cancer	d. Increased Monitoring
Table 9—Analytical Methods for Inorganic Chemicals	(2) Other Effects	e. Decreased Monitoring
Table 10—Analytical Methods for Volatile Organic Chemicals	(3) Other Issues	f. Vulnerability Assessments
Table 11—Analytical Methods for Pesticides/PCBs	f. Selenium	g. Relation to the Wellhead Protection Program
Table 12—Laboratory Certification Criteria	5. Volatile Organic Contaminants (VOCs)	h. Initial and Repeat Base Monitoring
Table 13—State Implementation Requirements	MCLGs	4. Monitoring Frequencies
Table 14—EPA's Three Category Approach for Establishing MCLGs	a. cis-1,2-Dichloroethylene and trans-1,2-Dichloroethylene	a. Inorganics
Table 15—Relative Source Contribution	b. 1,2-Dichloropropane	(1) Initial and Repeat Base Requirements
Table 16—Inorganic Contaminant Acceptance Limits and Practical Quantification Levels	c. Ethylbenzene	(2) Increased Monitoring
Table 17—Inorganic Contaminant Sample Preservation, Container, and Holding Time Requirements	d. Monochlorobenzene	(3) Decreased Monitoring
Table 18—Pesticide/PCB Practical Quantification Levels and Acceptance Limits	e. ortho-Dichlorobenzene	b. Asbestos
Table 19—Electrodialysis Performance Compared to Proposed BATs	f. Styrene	(1) Initial and Repeat Base Requirements
Table 20—Additional Costs for Vapor Phase Carbon Emission Controls for Packed Tower Aeration Facility	g. Tetrachloroethylene	(2) Increased Monitoring
Table 21—GAC and Packed Column Costs to Remove SOCs	h. Toluene	(3) Decreased Monitoring
Table 22—MCL Analysis for Category I SOCs	i. Xylenes	c. Nitrate
Table 23—MCL Analysis for Category II and III SOCs	j. Pesticides/PCBs MCLGs	(1) Initial and Repeat Base Requirements
Table 24—Method Detection Limits—Pesticides/PCBs	a. Alachlor	(A) Community and Non-Transient Water Systems
Table 25—Unregulated Inorganic and Organic Contaminants	b. Atrazine	(B) Transient Non-Community Water Systems
Table 26—Section 1415 BAT for Inorganic Contaminants	c. Carbofuran	(2) Increased Monitoring (CWS, NTWS, TWS)
Table 27—Section 1415 BAT for Organic Contaminants	d. Chlordane	(3) Decreased Monitoring (Surface CWS and NTWS)
Table 28—Summary Impact Estimates for Final IOC and SOC Regulations	e. 1,2-Dibromo-3-chloropropane (DBCP)	d. Nitrite
Table 29—Comparison of Total Annualized Costs for Proposed and Final Rules	f. 2,4-D	(1) Initial and Repeat Base Requirements
Table 30—Upper Bound Household Costs (\$/F31/year)	g. Heptachlor/Heptachlor Epoxide	e. Volatile Organic Contaminants (VOCs)

SUPPLEMENTARY INFORMATION:

Abbreviations Used in This Document

List of Tables

Table of Contents

I. Summary of Today's Action

II. Background

A. Statutory Authority

B. Regulatory History

C. Public Comments on the Proposal

III. Expiration of Today's Action

A. Establishment of MCLGs

1. How MCLGs Are Developed

2. Response to Comments on EPA's Zero MCLG Policy

3. Relative Source Contribution

1. Methodology for Determination of MCLs	2. Inorganic Analytical Methods	a. Asbestos
b. Nitrate/Nitrite	c. Other Inorganic Analyses	d. Method Detection Limits and Practical Quantification Level
(1) Inorganics	(2) Nitrite	e. Inorganic Chemical Sample Preservation, Container, and Holding Time
3. SOC Analytical Methods	a. VOC Methods	b. Method Availability
c. Cleanup Procedures	d. Pesticide Methods	e. Method 525
f. PCB Analytical Methods	g. VOC Performance Studies	b. Pesticide/PCB PQL and Performance Acceptance Limits
4. Selection of Best Available Technology	a. Inorganics	b. Synthetic Organic Contaminants
(1) Why PTA is BAT for Air Stripping	(2) PTA and Air Emissions	(3) BAT Field Evaluations
(4) Carbon Disposal Costs	(5) Powdered Activated Carbon as BAT	(6) Empty Bed Contact Time
(7) Carbon Usage Rates	5. Determination of MCLs (Feasibility and Cost)	a. Inorganic Contaminant MCLs
b. Synthetic Organic Contaminant MCLs	(1) Category I Contaminants	(2) Category II and III Contaminants
C. Treatment Technique Requirements	D. Compliance Monitoring Requirements	

1. Monitoring Requirements	2. Changes in MCLs	3. Changes in Occurrence Data	4. Changes in Unit Treatment Cost Estimates
----------------------------	--------------------	-------------------------------	---

C. Cost to Systems
D. Cost to State Programs
E. Other Requirements

A. Regulatory Flexibility Analysis
B. Paperwork Reduction Act
VI. Public Docket and References

I. Summary of Today's Action
The effective date of this rule is July 30, 1992.

TABLE 1.—MCLGs AND MCLs FOR INORGANIC CONTAMINANTS

	MCLGs	MCLs
(1) Asbestos	7 million fibers/liter (longer than 10 μ m)	7 million fibers/liter (longer than 10 μ m).
(2) Cadmium	0.005 mg/l	0.005 mg/l.
(3) Chromium	0.1 mg/l	0.1 mg/l.
(4) Mercury	0.002 mg/l	0.002 mg/l
(5) Nitrate	10 mg/l (as N)	10 mg/l (as N).
(6) Nitrite	1 mg/l (as N)	1 mg/l (as N).
(7) Total Nitrate and Nitrite	13 mg/l (as N)	10 mg/l (as N).
(8) Selenium	0.05 mg/l	0.05 mg/l.

TABLE 2.—MCLGs AND MCLs FOR VOLATILE ORGANIC CONTAMINANTS

	MCLGs (mg/l)	MCLs (mg/l)
(1) o-Dichlorobenzene	0.6	0.6
(2) cis-1,2-Dichloroethylene	0.07	0.07
(3) trans-1,2-Dichloroethylene	0.1	0.1
(4) 1,2-Dichloropropane	0	0.005
(5) Ethylbenzene	0.7	0.7
(6) Monochlorobenzene	0.1	0.1
(7) Styrene	0.1	0.1
(8) Tetrachloroethylene	0	0.005
(9) Toluene	1	1
(10) Xylenes (total)	10	10

TABLE 3.—MCLGs AND MCLs FOR PESTICIDES/PCBs

	MCLGs	MCLs (mg/l)
(1) Alachlor	Zero	0.002
(2) Atrazine	0.003 mg/l	0.003
(3) Carbofuran	0.04 mg/l	0.04
(4) Chlordane	Zero	0.002
(5) 1,2-Dibromo-3-chloropropane (DBCP)	Zero	0.0002
(6) 2,4-D	0.07 mg/l	0.07/l
(7) Ethylene dibromide (EDB)	Zero	0.00005
(8) Heptachlor	Zero	0.0004
(9) Heptachlor epoxide	Zero	0.0002
(10) Lindane	0.0002 mg/l	0.0002
(11) Methoxychlor	0.04 mg/l	0.04
(12) Polychlorinated biphenyls (PCBs) (as decachlorobiphenyl)	Zero	0.0005
(13) Toxaphene	Zero	0.003
(14) 2,4,5-TP (Silvex)	0.05 mg/l	0.05

TABLE 4.—MCLGs AND TREATMENT TECHNIQUE REQUIREMENTS FOR OTHER ORGANIC CONTAMINANTS

	MCLGs	MCLs
(1) Acrylamide	Zero	Treatment technique.
(2) Epichlorohydrin	Zero	Treatment technique.

TABLE 5.—SECONDARY MAXIMUM CONTAMINANT LEVELS (SMCLs)

(1) Aluminum	0.05 to 0.2 mg/l
(2) Silver	0.1 mg/l.

TABLE 6.—BEST AVAILABLE TECHNOLOGIES TO REMOVE INORGANIC CONTAMINANTS

Inorganic contaminant	Best available technologies									
	Activated sludge	Coagulation/filtration	Corrosion control	Direct filtration	Diatomite filtration	Granular activated carbon	Ion exchange	Line softening	Reverse osmosis	Electrodialysis
Asbestos		X		X	X					
Barium		X					X	X	X	X
Cadmium		X					X	X	X	
Chromium		X					X		X	
Chromium VI		X					X		X	
Mercury		X				X	X	X	X	X
Nitrate							X		X	
Nitrite							X		X	
Selenium	X	X						X		X
Selenate										
Selenite							X	X	X	
Sulfate	X									

BAT only if effluent mercury concentrations do not exceed 10 μ g/l. Coagulation/filtration for mercury removal includes PAC addition or post-filtration GAC.
 (2) where high organic mercury is present in source water.
 (3) Not BAT for small systems for variances unless treatment is currently in place.

TABLE 7.—BEST AVAILABLE TECHNOLOGIES TO REMOVE SYNTHETIC ORGANIC CONTAMINANTS

Chemical	GAC ¹	PTA ²	PAP ³
VOCs:			
o-Dichlorobenzene	X	X	
cis-1,2-Dichloroethylene	X	X	
trans-1,2-Dichloroethylene	X	X	
1,2-Dichloropropane	X	X	
Ethylbenzene	X	X	
Monochlorobenzene	X	X	
Styrene	X	X	
Tetrachloroethylene	X	X	
Toluene	X	X	
Xylenes (Total)	X	X	
Pesticides/PCBs:			
Aldicarb	X		
Aldicarb sulfone	X		
Aldicarb sulfide	X		
Atrazine	X		
Carbofuran	X		
Chlordane	X		
2,4-D	X		
Dibromochloropropane (DBCP)	X	X	
Ethylene Dibromide (EDB)	X	X	
Heptachlor	X		
Heptachlor epoxide	X		
Lindane	X		
Methoxychlor	X		
PCBs	X		
Pentachlorophenol	X		
2,4,5-TP (Silvex)	X		
Toxaphene	X		
Other Organic Contaminants:			
Acrylamide			X
Epichlorohydrin			X

¹ GAC = Granular activated carbon.² PTA = Packed tower aeration.³ PAP = Polymer addition practices.

TABLE 8.—COMPLIANCE MONITORING REQUIREMENTS

Contaminant	Base requirement		Trigger that increases monitoring	Waivers
	Ground water	Surface water		
	1 sample/3 yr	Annual sample		
5 Inorganics	1 sample/9 years after 3 samples < MCL		> MCL	Yes: Based on analytical results of 3 rounds.
Asbestos	1 sample every 9 years		> MCL	Yes: Based on vulnerability assessment.
	Annual	Quarterly		
Nitrate	After 1 year < 50% MCL, SWS, may reduce to an annual sample.		> 50% MCL	No.
Nitrite	1 Sample—If < 50% of MCL, state discretion.		> 50% MCL	No.
10 VOCs	Quarterly/Yr; annual after one year of no detect; every 3 years after 3 rounds.		> 0.0005 mg/l	Yes: Based on vulnerability assessment.
18 Pesticides, PCBs	4 quarterly samples every 3 yrs; after 1 round of no detect; systems > 3,300 reduce to 2 samples/yr every 3 yrs; systems < 3,300 reduce to 1 sample every 3 yrs.		Detection, (see Table 23)	Yes: Based on vulnerability assessment.
Unregulated — 6 IOCs, — 24 SOCs	One sample, 4 consecutive quarters		N.A.	Yes: Based on vulnerability assessment.

Table 9.—Analytical Methods for Inorganic Chemicals

Contaminant and Methodology

Aluminum:

Atomic absorption; furnace technique¹Atomic absorption; direct aspiration²

Asbestos:

Transmission electron microscopy

Barium:

Atomic absorption; furnace technique¹Atomic absorption; direct aspiration²

Inductively coupled plasma /3/

Cadmium:

Atomic absorption; furnace technique

Inductively coupled plasma²

Chromium:

Atomic absorption; furnace technique¹Inductively coupled plasma²

Mercury:

¹ Graphite Furnace Atomic Absorption Spectroscopy (GFAAS).² Direct Aspiration Atomic Absorption Spectroscopy (DAAS).³ Inductively Coupled Plasma—Atomic Emission Spectroscopy (ICP-AES).

Manual cold vapor technique
Automated cold vapor technique
Nitrate:
Manual cadmium reduction
Automated hydrazine reduction
Automated cadmium reduction
Ion selective electrode
Ion chromatography

Nitrite:
Spectrophotometric
Automated cadmium reduction
Manual cadmium reduction
Ion chromatography
Selenium:
Atomic absorption, gaseous hydride
Atomic absorption, furnace
Silver:
Atomic absorption, direct aspiration
Inductively coupled plasma

TABLE 10.—ANALYTICAL METHODS FOR VOLATILE ORGANIC CHEMICALS

EPA methods	Contaminants
502.1	o-Dichlorobenzene
502.2	o,p-1,2-Dichlorobenzene
503.1	trans-1,2-Dichloroethylene
524.1	1,2-Dichloropropane
524.2	Ethylbenzene, Monochlorobenzene, Styrene, Tetrachloroethylene, Toluene, Xylenes.

TABLE 11.—ANALYTICAL METHODS FOR PESTICIDES/PCBS

EPA methods	Contaminants
504	Dibromochloropropane
505	Ethylene dibromide, Alachlor, Atrazine, Chlordane, Heptachlor, Heptachlor epoxide, Lindane, Methoxychlor, Toxaphene, PCBs ¹
507	Alachlor, Atrazine
508	Chlordane, Heptachlor, Heptachlor epoxide, Lindane, Methoxychlor, PCBs ¹
508A	PCBs (as decachlorobiphenyl)
515.1	2,4-D, 2,4,5-TP (Silvex), Pentachlorophenol
525	Alachlor, Atrazine, Chlordane, Heptachlor, Heptachlor epoxide, Lindane, Methoxychlor, Pentachlorophenol, Aldicarb, Aldicarb sulfone, Aldicarb sulfonate, Carbofuran.

Method 505 and 508 are used as screens only. If detected in 505 or 508, systems must confirm using Method 508A.

TABLE 12.—LABORATORY CERTIFICATION CRITERIA

IOCs	2 standard deviations based on study statistics
Asbestos	
Barium	±15% at >0.5 mg/l
Cadmium	±20% at >0.02 mg/l
Chromium	±15% at >0.01 mg/l
Fluoride	±10% at 1 to 10 mg/l
Mercury	±30% at >0.0005 mg/l
Nitrate	±10% at >0.4 mg/l
Nitrite	±15% at >0.4 mg/l
Selenium	±20% at >0.01 mg/l
VOCs:	±20% at >0.010 mg/l ±40% at <0.010 mg/l
Pesticides and PCBs:	
Alachlor	±45% at 0.002 mg/l
Atrazine	±45% at 0.001 mg/l
Carbofuran	±45% at 0.007 mg/l
Chlordane	±45% at 0.002 mg/l
Heptachlor	±45% at 0.0004 mg/l
Heptachlor epoxide	±45% at 0.0002 mg/l
Lindane	±45% at 0.0002 mg/l
Methoxychlor	±45% at 0.01 mg/l
PCBs (as Decachlorobiphenyl)	0-200% at 0.0005 mg/l
Aldicarb	±55% at 0.003 mg/l
Aldicarb sulfone	±55% at 0.003 mg/l
Aldicarb sulfonate	±55% at 0.003 mg/l
Toxaphene	±45% at 0.003 mg/l
Pentachlorophenol	±50% at 0.001 mg/l
2,4-D	±50% at 0.005 mg/l
2,4,5-TP	±50% at 0.005 mg/l
EDS	±40% at 0.00005 mg/l
DSCP	±40% at 0.0002 mg/l

TABLE 13.—STATE IMPLEMENTATION REQUIREMENTS

Requirement	Priority	Record-keeping	Reporting
Vulnerability assessment procedures	X		
Waiver procedures	X		
Monitoring schedule	X		
Vulnerability assessment determinations		X	
Waivers granted		X	
Treatment technique certifications		X	
Unregulated contaminant results		X	X

¹ Required if States grant waivers.

II. Background

A. Statutory Authority

The Safe Drinking Water Act (SDWA or "the Act"), as amended in 1986 (Pub. L. No. 99-338, 100 Stat. 642), requires EPA to publish "maximum contaminant level goals" (MCLGs) for contaminants which, in the judgment of the Administrator, "may have an adverse effect on the health of persons and

which [are] known or anticipated to occur in public water systems" (section 1412(b)(3)(A)). MCLGs are to be set at a level at which "no known or anticipated adverse effects on the health of persons occur and which allows an adequate margin of safety" (section 1412(b)(4)).

At the same time EPA publishes an MCLG, which is a non-enforceable health goal, it must also promulgate a National Primary Drinking Water Regulation (NPDWR) which includes either (1) a maximum contaminant level (MCL), or (2) a required treatment technique (section 1401(1), 1412(a)(3), and 1412(b)(7)(A)). A treatment technique may be set only if it is not "economically or technologically feasible" to ascertain the level of a contaminant (sections 1401(1) and 1412(b)(7)(A)). An MCL must be set as close to the MCLG as feasible (section 1412(b)(4)). Under the Act, "feasible" means "feasible with the use of the best technology, treatment techniques, and other means which the Administrator finds, after examination for efficacy under field conditions and not solely under laboratory conditions, are available (taking cost into consideration)" (section 1412(b)(5)). In setting MCLs, EPA considers the cost of treatment technology to large public water systems (i.e., >1,000,000 people) with relatively clean source water supplies (132 Cong. Rec. S6287 (daily ed., May 21, 1986)). Each NPDWR that establishes an MCL must list the best available technology, treatment techniques, and other means that are feasible for meeting the MCL (BAT) (section 1412(b)(6)). NPDWRs include monitoring, analytical and quality assurance requirements, specifically, "criteria and procedures to assure a supply of drinking water which dependably complies with such maximum contaminant levels . . ." (Section 1401(1)(D)). Section 1445 also authorizes EPA to promulgate monitoring requirements.

Section 1414(c) requires each owner or operator of a public water system to give notice to persons served by it of (1) any failure to comply with a maximum contaminant level, treatment technique, or testing procedure required by a NPDWR; (2) any failure to comply with any monitoring required pursuant to section 1445 of the Act; (3) the existence of a variance or exemption; and (4) any failure to comply with the requirements of any schedule prescribed pursuant to a variance or exemption.

Under the 1986 Amendments to the SDWA, EPA was to complete the promulgation of NPDWRs for 88 contaminants, in three phases, by June

19, 1989. After 1989, an additional 25 contaminants must be regulated every three years (section 1412(b)).

B. Regulatory History

In the 1986 Amendments to the SDWA, Congress required that MCLGs and MCLs be proposed and promulgated simultaneously (section 1412(a)(3)). This change streamlined development of drinking water standards by combining two steps in the regulation development process. Section 1412(a)(2) renamed recommended maximum contaminant levels (RMCLs) as maximum contaminant level goals (MCLGs).

To ensure compliance with the provision that MCLGs and MCLs be proposed and promulgated simultaneously and to ensure adequate opportunity for public comment on these proposed standards, EPA proposed as RMCLs, in November 1989, most of the MCLGs contained in today's rule.

On May 22, 1989, EPA proposed MCLGs and MCLs for 38 contaminants and a treatment technique requirement for two contaminants. Most of the MCLGs and MCLs are promulgated at the same levels as proposed in May 1989. However, the MCLGs and/or MCLs for five contaminants are lower than previously proposed. Where EPA is promulgating MCLGs, MCLs, analytical methods, best available technology, monitoring requirements, and State implementation requirements that differ from the proposal, the changes result from public comments and/or additional data that the preamble indicated were under development or analysis. The technical and/or policy basis for these changes are explained in this notice.

On February 14, 1989, in response to a citizen suit from the Bull Run Coalition, EPA entered into a consent order which requires promulgation of regulations for 40 contaminants by December 31, 1990. EPA on June 19, 1989 partially fulfilled this requirement by promulgating regulations on coliforms and other microbiological contaminants. The promulgation of regulations on the 34 contaminants in today's rule partially fulfills the terms of the consent decree. Because of changed RfDs for aldicarb, aldicarb sulfoxide, aldicarb sulfone, and barium and the reclassification of pentachlorophenol as a B2 carcinogen and placement in Category I, EPA, elsewhere in today's Federal Register, is reproposing the MCLGs and MCLs for these contaminants. EPA intends to promulgate final standards for these chemicals by July, 1991.

C. Public Comments on the Proposal

EPA requested comments on all aspects of the May 22, 1989 proposal. A

summary of the major comments and the Agency's response to the issues raised are presented in the following section. The Agency's detailed response to the comments received are presented in the document "Response to Comments Received on the Proposed Requirements for 35 Contaminants of May 22, 1989," which is in the docket for this rule.

EPA received approximately 170 comments on the proposed MCLGs in the May, 1989 proposal. These comments represented the views of 65 industrial/commercial groups, 47 State governments, 35 local governments and public water systems, 9 public interest groups, 6 federal agencies, as well as comments from individual citizens and academic interests.

EPA held a public hearing on the proposed rule July 12, 1989 in Washington, DC. Fourteen organizations made oral presentations at the public hearing. A transcript of the hearing is available in the docket.

III. Explanation of Today's Action

A. Establishment of MCLGs

Most of the MCLGs promulgated today are at the same level as proposed in May 1989. However, MCLGs (toluene and methoxychlor) are lower than proposed. One contaminant, styrene, originally proposed at levels of zero and 0.1 mg/l is promulgated today at a level of 0.1 mg/l. EPA is reproposing lower MCLGs based upon revised RfDs elsewhere in today's Federal Register for five contaminants. The basis for that change is explained in that notice. Where EPA in this notice is promulgating MCLGs that differ from previously proposed MCLGs, the changes result from public comments and/or data or that the preamble indicated were under development or analysis. An explanation of these changes is included in this notice. In this notice, EPA is responding to the major issues raised in public comments. For EPA's complete response to all issues raised in comments, EPA refers the reader to the Comment/Response Document found in the Phase II docket.

For a number of the contaminants, EPA had previously responded to issues raised in response to the November 1988 notice in the May 1989 proposal. For the most part, these responses are not repeated in this notice unless additional information was provided to the Agency. Where comments were previously responded to, EPA refers the reader to the May 1989 proposal. For four contaminants, no major issues were raised and no new information was obtained by the Agency that would cause it to change the MCLGs from the

level proposed in May 1989. For these contaminants (EDB, toxaphene, 2,4,5-TP, and epichlorohydrin), final MCLGs are promulgated without additional comment.

For contaminants classified in Category II, EPA currently considers two options for setting the MCLG as described in 50 FR 40949, November 13, 1985. The lead option is to set the MCLG based on noncarcinogenic endpoints (the RfD adjusted for an adult drinking an average of 2 L water/day over a lifetime) if adequate data exist. To account for possible carcinogenicity, an additional uncertainty factor of up to 10 is applied. If adequate noncarcinogenic data are not available (i.e., asbestos), the second option consists of setting the MCLG in the theoretical excess cancer risk range of 10^{-6} to 10^{-7} . EPA is currently evaluating the appropriateness of the two options for establishing MCLGs (see 55 FR 30376, p. 30404). However, the MCLGs promulgated today use the RfD option with an application of an additional uncertainty factor up to 10, except as noted for asbestos.

1. How MCLGs Are Developed

MCLGs are set at concentration levels at which no known or anticipated adverse health effects would occur, allowing for an adequate margin of safety. Establishment of a specific MCLG depends on the evidence of carcinogenicity from drinking water exposure or the Agency's reference dose (RfD), which is calculated for each specific contaminant.

The cancer classification for a specific chemical and the reference dose are adopted by two different Agency groups. Decisions on cancer classifications are made by the Cancer Risk Assessment Verification Endeavor (CRAVE) group, which is composed of representatives of various EPA program offices. Decisions on EPA reference doses (using non-cancer endpoints only) are made through the Agency Reference Dose work group, also composed of representatives of various EPA program offices. Decisions by CRAVE and the RfD groups represent policy decisions for the Agency and are used by the respective regulatory programs as the basis for regulatory decisions. Decisions of these two groups are published in the Agency's Integrated Risk Information System (IRIS). This system can be accessed by the public by contacting Mike McLaughlin of DEALCOM, Inc. at 202-488-6559.

The RfD is an estimate, with an uncertainty spanning perhaps an order of magnitude, of a daily exposure to the

human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious health effects during a lifetime. The RfD is derived from a no- or lowest-observed-adverse-effect level (called a NOAEL or LOAEL, respectively) that has been identified from a subchronic or chronic scientific study of humans or animals. The NOAEL or LOAEL is then divided by the uncertainty factor to derive the RfD.

The use of an uncertainty factor is important in the derivation of the RfD. EPA has established certain guidelines (shown below) to determine which uncertainty factor should be used:

10—Valid experimental results for appropriate duration. Human exposure.

100—Human data not available. Extrapolation from valid long-term animal studies.

1,000—Human data not available. Extrapolation from animal studies of less than chronic exposure.

1-10—Additional safety factor for use of a LOAEL instead of a NOAEL.

Other—Other uncertainty factors are used according to scientific judgment when justified.

In general, an uncertainty factor is calculated to consider intra- and interspecies variations, limited or incomplete data, use of subchronic studies, significance of the adverse effect, and the pharmacokinetic factors.

From the RfD, a drinking water equivalent level (DWEL) is calculated by multiplying the RfD by an assumed adult body weight (generally 70 kg) and then dividing by an average daily water consumption of 2 L per day. The DWEL assumes the total daily exposure to a substance is from drinking water exposure. The MCLG is determined by multiplying the DWEL by the percentage of the total daily exposure contributed by drinking water, called the relative source contribution. Generally, EPA assumes that the relative source contribution from drinking water is 20 percent of the total exposure, unless other exposure data for the chemical are available. The calculation below expresses the derivation of the MCLG:

$$RfD = \frac{\text{NOAEL or LOAEL}}{\text{uncertainty factor}} = \frac{\text{mg/kg/body weight/day}}{\text{day}} \quad (1)$$

$$DWEL = \frac{RfD \times \text{body weight}}{\text{daily water consumption in L/day}} = \text{mg/L} \quad (2)$$

$$MCLG = DWEL \times \text{drinking water contribution (3)}$$

For chemicals suspected as carcinogens, the assessment for nonthreshold toxicants consists of the weight of evidence of carcinogenicity in humans, using bioassays in animals and human epidemiological studies as well as information that provides indirect evidence (i.e., mutagenicity and other short-term test results). The objectives of the assessment are (1) to determine the level or strength of evidence that the substance is a human or animal carcinogen and (2) to provide an upperbound estimate of the possible risk of human exposure to the substance in drinking water. A summary of EPA's carcinogen classification scheme is:

Group A—Human carcinogen based on sufficient evidence from epidemiological studies.

Group B1—Probable human carcinogen based on at least limited evidence of carcinogenicity to humans.

Group B2—Probable human carcinogen based on a combination of sufficient evidence in animals and inadequate data in humans.

Group C—Possible human carcinogen based on limited evidence of carcinogenicity in animals in the absence of human data.

Group D—Not classifiable based on lack of data or inadequate evidence of carcinogenicity from animal data.

Group E—No evidence of carcinogenicity for humans (no evidence for carcinogenicity in at least two adequate animal tests in different

species or in both epidemiological and animal studies).

Establishing the MCLG for a chemical is generally accomplished in one of three ways depending upon its categorization (Table 14). The starting point in EPA's analysis is the Agency's cancer classification (i.e., A, B, C, D, or E). Each chemical is analyzed for evidence of carcinogenicity via ingestion. In most cases, the Agency places Group A, B1, and B2 contaminants into Category I, Group C into Category II, and Group D and E into Category III. However, where there is additional information on cancer risks from drinking water ingestion (taking into consideration weight of evidence, pharmacokinetics and exposure) additional scrutiny is conducted which may result in placing the contaminant into a different category. Asbestos and cadmium are examples where the categorization was adjusted based on the evidence of carcinogenicity via ingestion. In the case of chromium, where there is uncertainty in the ingestion data base, the Agency used the RfD approach (described below) to derive an MCLG even though the chemical has not been categorized. This issue is discussed below. Where there is no additional information on cancer risks from drinking water ingestion to consider, the Agency's cancer classification is used to categorize the chemical. In the cases of styrene and tetrachloroethylene, where the Agency's cancer classification is unresolved, EPA used its categorization approach to derive an MCLG.

EPA's policy is to set MCLGs for Category I chemicals at zero. The MCLG for Category II contaminants is calculated by using the RfD/DWEL with an added margin of safety to account for cancer effects or is based on a cancer risk range of 10^{-5} to 10^{-6} when non-cancer data are inadequate for deriving an RfD. Category III contaminants are calculated using the RfD/DWEL approach.

TABLE 14.—EPA'S THREE-CATEGORY APPROACH FOR ESTABLISHING MCLGS

Category	Evidence of carcinogenicity via ingestion	MCLG setting approach
I	Strong evidence considering weight of evidence, pharmacokinetics, and exposure.	Zero.
II	Limited evidence considering weight of evidence, pharmacokinetics, and exposure.	RfD approach with added safety margin or 10^{-5} to 10^{-6} cancer risk range
III	Inadequate or no animal evidence	RfD approach.

The MCLG for Category I contaminants is set at zero because it is assumed, in the absence of other data, that there is no known threshold. Category I contaminants are those contaminants which EPA has determined that there is strong evidence of carcinogenicity from drinking water ingestion. If there is no additional information to consider on potential cancer risks from drinking water ingestion, chemicals classified as A or B carcinogens are placed in Category I.

Category II contaminants include those contaminants which EPA has determined that there is limited evidence of carcinogenicity via drinking water ingestion considering weight of evidence, pharmacokinetics, and exposure. If there is no additional information to consider on potential cancer risks from drinking water ingestion, chemicals classified by the Agency as Group C carcinogens are placed in Category II. For Category II contaminants two approaches are used to set the MCLGs—either (1) setting the goal based upon noncarcinogenic endpoints (the RfD) then applying an additional uncertainty (safety) factor of up to 10 or (2) setting the goal based upon a nominal lifetime cancer risk calculation in the range of 10^{-6} to 10^{-8} using a conservative calculation model. The first approach is generally used; however, the second is used when valid noncarcinogenicity data are not available and adequate experimental data are available to quantify the cancer risk. EPA is currently evaluating its approach to establishing MCLGs for Category II contaminants.

Category III contaminants include those contaminants for which there is inadequate evidence of carcinogenicity via ingestion. If there is no additional information to consider, contaminants classified as Group D or E carcinogens are placed in Category III. For these contaminants, the MCLG is established using the RfD approach.

2. Response to Comments on EPA's Zero MCLG Policy

The purpose of MCLGs under the SDWA is to set goals for both carcinogens and noncarcinogens, at a level at which "no known or anticipated adverse effects on the health of persons occur and which allow an adequate margin of safety." SDWA section 1412(b)(4). In its rulemaking on volatile synthetic organic chemicals (VOCs), the Agency articulated its policy of setting MCLGs at zero for known and probable human carcinogens. See 47 FR 9360 (March 4, 1982), 49 FR 24330, at 24343 (June 12, 1984) and 50 FR 46880, at 46885 (Nov. 13, 1985). Multinational Business

Services, Inc. (MBS) asked the Agency to reconsider this policy which MBS considered a departure from the consistent application of risk assessment principles by federal agencies in regulating carcinogens. Instead, MBS recommended that EPA establish MCLGs for such contaminants at calculated negligible risk levels. In the May, 1989 proposal of today's rule, the Agency indicated that it intended to continue the zero MCLG policy. At the same time, the Agency agreed to address the MBS request and any other comments on the policy.

In the VOCs rulemaking, the Agency considered three major options (and several variations) for setting MCLGs (then called "recommended maximum contaminant levels") for the carcinogenic VOCs. These were: zero MCLGs, MCLGs set at the analytical detection limit, and MCLGs set at non-zero levels based on calculated negligible contribution to lifetime risks. (50 FR 46880, at 46884.) The Agency recognized that humans can tolerate and detoxify a certain threshold level of noncarcinogens, and therefore found it appropriate to set MCLGs for the noncarcinogenic VOCs above zero. However, in the Agency's view a threshold for the action of potential carcinogens could not be demonstrated by current science; it was conservatively assumed that no threshold exists, absent evidence to the contrary. *Id.* Any exposure to carcinogens might represent some finite level of risk, the magnitude of which would depend on dosage and potency of the particular carcinogen. Under these circumstances, in the Agency's judgment an MCLG above zero did not meet the statutory requirement that the goal be set where no known or anticipated adverse effects occur or allow an adequate margin of safety.

The Agency believed that MCLGs of zero for the carcinogens would also best reflect the Agency's general philosophy that, as a goal, carcinogens should not be present in drinking water. Moreover, the legislative history of the SDWA specifically authorized this regulatory option. "The (MCLG) must be set to prevent the occurrence of any known or anticipated adverse effect. It must include an adequate margin of safety, unless there is no safe threshold for a contaminant. In such a case the (MCLG) should be set at the zero level." (H.R. Rep. No. 1185, 93d Cong., 2d Sess. 20 (1974), reprinted in "A Legislative History of the Safe Drinking Water Act," 1982 at 562.) EPA's decision to promulgate zero MCLGs for the carcinogenic VOCs was upheld in the

"VOCs decision." *Natural Resources Defense Council v. Thomas*, 824 F.2d 1211 (D.C. Cir., 1987). (EPA's determination was "well within the bounds of its authority" under the SDWA. *Id.* at 1213).

Comments on the zero MCLG issue in the May 1989 proposal were received from eighteen commenters in addition to MBS. Virtually all of the issues in these comments have been raised and addressed earlier. See 49 FR 24330 (June 12, 1984) and 50 FR 46880 (Nov. 13, 1985).

MBS and other commenters disagree with the Agency's interpretation of the statutory standard to set MCLGs at a level to prevent the occurrence of any known or anticipated adverse health effects with an adequate margin of safety. These commenters argue that Congress intended MCLGs to give "reasonable," not "absolute," assurance against adverse health effects. MBS and others maintain that health effects are not "anticipated" absent evidence indicating they should be expected. We note that the House Report cited earlier indicates that "the Administrator must decide whether any adverse effects can be reasonably anticipated, even though not proved to exist." H.R. Rep. No. 1185, *id.* Some commenters are critical of the Agency's "reliance" on the House Report language addressing the situation where there is no known safe threshold. These commenters argue that EPA's interpretation is "inconsistent" with other legislative history. MBS, for example, cites the House Report discussion of a study to be conducted by the National Academy of Sciences (NAS) to support its position that Congress did not intend MCLGs to be set at zero. The Committee directed NAS to develop recommendations of maximum contaminant levels "solely on considerations of public health" and not to be "influenced by political, budgetary, or other considerations." *Id.*, at 551. In recommending an adequate margin of safety, NAS was to consider, among other factors, the margins of safety used by other regulatory systems. *Id.* However, as the Committee made clear, determining an adequate margin of safety was but the final step in the process of setting an MCLG. The Administrator must first decide if any adverse health effects can reasonably be anticipated, even though not proved to exist. It was necessary to determine an adequate margin of safety only if there is a safe threshold for the contaminant. If there is no safe threshold, the MCLG "should be set at the zero level." *Id.* at 552. We find nothing in the discussion of the NAS study to contradict the Committee's

EPA retains a B2 classification for acrylamide and places it in Category I with an MCLG of zero.

B. Establishment of MCLS

1. Methodology for Determination of MCLs

The SDWA directs EPA to set the MCL "as close to" the MCLG "as is feasible." The term "feasible" means "feasible with the use of the best technology, treatment techniques, and other means, which the Administrator finds, after examination for efficacy under field conditions and not solely under laboratory conditions, are available (taking costs into consideration)." (SDWA section 1412(b)(5)). Each Nation's Primary Drinking Water Regulation that establishes an MCL lists the technology, treatment techniques, and other means which the Administrator finds to be feasible for meeting the MCL (SDWA section 1412(b)(6)).

The present statutory standard for "best available technology" (BAT) under 1412(b)(5) represents a change from the provision prior to 1986, which required EPA to judge feasibility on the basis of "best technologies generally available" (BTGA). The 1986 Amendments to the SDWA changed BTGA to BAT and added the requirement that BAT must be tested for efficacy under field conditions, not just under laboratory conditions. The legislative history explains that Congress removed the term "generally" to assure that MCLs "reflect the full extent of current technology capability" (S. Rep. No. 56, 99th Cong., 1st Sess. at 8 (1985)). Read together with the legislative history, EPA has concluded that the statutory term "best available technology" is a broader standard than "best technology generally available," and that this standard allows EPA to select a technology that is not necessarily in widespread use, as long as it has been field tested beyond the laboratory. In addition, EPA believes this change in the statutory requirement means that the technology selected need not necessarily have been field tested for each specific contaminant. Rather, EPA may project operating conditions for a specific contaminant using a field tested technology from laboratory or pilot systems data.

Based on the statutory directive for setting the MCLs, EPA derives the MCLs based on an evaluation of (1) the availability and performance of various technologies for removing the contaminant, and (2) the costs of applying those technologies. Other technology factors that are considered

in determining the MCL include the ability of laboratories to measure accurately and consistently the level of the contaminant with available analytical methods. For Category I contaminants, the Agency also evaluates the health risks that are associated with various levels of the contaminants, with the goal of ensuring that the maximum risk at the MCL falls within the 10^{-4} to 10^{-6} risk range that the Agency considers protective of public health, therefore achieving the overall purpose of the SDWA.

EPA's initial step in deriving the MCL is to make an engineering assessment of technologies that are capable of removing a contaminant from drinking water. This assessment determines which of those technologies are "best." EPA reviews the available data to determine technologies that have the highest removal efficiencies, are compatible with other water treatment processes, and are not limited to a particular geographic region.

Based on the removal capabilities of the various technologies, EPA calculates the level of each contaminant that is achievable by their application to large systems with relatively clean raw water sources. [See H.R. Rep. 1185, 83rd Cong., 2nd Sess. at 13, (1974); 132 Cong. Rec. S6287, May 21, 1986, statement of Sen. Durenberger.]

When considering costs to control the contaminants in this rule, EPA analyzed whether the technology is reasonably affordable by regional and large metropolitan public water systems [see H.R. Rep. No. 93-1185 at 18 (1974) and 132 Cong. Rec. S6287 (May 21, 1986) (statement of Sen. Durenberger)]. EPA also evaluated the total national compliance costs for each contaminant considering the number of systems that will have to install treatment in order to comply with the MCL. The resulting national costs vary depending upon the concentration level chosen as the MCL. The more stringent the MCL, the greater the number of systems that may have to install BAT in order to achieve compliance. In today's rule, EPA has determined that costs for large systems and total national compliance costs at the MCL are reasonably affordable and, therefore, feasible. Therefore, alternative MCLs were not considered.

The feasibility of setting the MCL at a precise level is also influenced by laboratory ability to measure the contaminant reliably. EPA derives practical quantitation levels (PQLs) which reflect the level that can be measured by good laboratories under normal operating conditions within specified limits of precision and

accuracy. Because compliance with the MCL is determined by analysis with approved analytical techniques, the ability to analyze consistently and accurately for a contaminant at the MCL is important to enforce a regulatory standard. Thus, the feasibility of meeting a particular level is affected by the ability of analytical methods to determine with sufficient precision and accuracy whether such a level is actually being achieved. This factor is critically important in determining the MCL for contaminants for which EPA sets the MCLG at zero, a number which by definition can be neither measured nor attained. Limits of analytical detection require that the MCL be set at some level greater than the MCLG for these contaminants. In these cases, EPA examined the reduction capability of BAT and the accuracy of analytical techniques as reflected in the PQL to establish the appropriate MCL level.

EPA also evaluates the health risks that are associated with various contaminant levels in order to ensure that the MCL adequately protects the public health. For drinking water contaminants, EPA sets a maximum reference risk range 10^{-4} to 10^{-6} excess individual risk from for carcinogens at lifetime exposure. This policy is consistent with other EPA regulatory programs that generally target this range using conservative models that are not likely to underestimate the risk. Since the underlying goal of the Safe Drinking Water Act is to protect the public from adverse effects due to drinking water contaminants, EPA seeks to ensure that the health risks associated with MCLs for carcinogenic contaminants are not significant.

Below is a detailed discussion of the Agency's response to the comments on the proposed rule and how today's MCLs were determined. EPA is reproposing for public comment the MCLGs and MCLs for aldicarb, aldicarb sulfide, aldicarb sulfone, barium, and pentachlorophenol due to a change in the health basis for the standard. However, regardless of the final standards which are established, EPA believes the BAT and analytical methods promulgated today will not be affected by the new standards. Consequently, those requirements are promulgated today.

2. Inorganic Analytical Methods

In the May 1989 notice, the Agency proposed a list of analytical methods to be used for measuring eight inorganic chemicals (IOCs) that it considered economically and technologically feasible for monitoring compliance.

are estimated to be about \$4 million/year for IOCs and about \$20 million/year for SOCs. Based on the RFA results, EPA has determined that the 6,473 systems required to install treatment will be significantly affected by this rule.

While a "substantial" number of the small water supplies serving fewer than 50,000 persons will be affected by the monitoring requirements, their production costs will not increase by five percent. Therefore, the impact on this substantial number of systems is not considered "significant" according to RFA guidelines. There are 6,473 small systems estimated to require treatment and thus, incur "significant" increases in costs. However, 6,473 systems is only 3.2% of 199,390 systems and, according to EPA guidelines for conducting RFAs, less than 20% of a regulated population is not considered a substantial number.

Despite the results of this RFA, the Agency considers several thousand systems to be substantial and has attempted to provide greater flexibility to small systems while still providing adequate protection of the public health. The most significant change to the proposed rule which reduces the burden on small systems involves standardized monitoring requirements and the opportunity for waivers. In addition, EPA has reduced some monitoring requirements for systems serving <3,300 people.

As well as these changes in the rule, the 1985 Amendments to the SDWA provide small systems with exemptions. Thus, the Agency has tried to relieve small systems as much as possible from the costs of compliance with the regulatory requirements while still providing adequate protection to the health of their consumers.

B. Paperwork Reduction Act

The information collection requirements in this rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*). An Information Collection Request (ICR) document has been prepared by EPA and a copy may be obtained from: Sandy Farmer, Information Policy Branch, EPA, 401 M Street, SW. (PM-223), Washington, DC or by calling 202-382-2740.

Public reporting burden for today's final rule is estimated to average 0.7 hours per response. The entire regulated population of 200,183 systems will incur some monitoring costs for nitrates. Of the total population, 76,703 systems are expected to incur monitoring costs for contaminants other than nitrates. The "one-time" estimate is about 1.2

million hours per year. In addition, systems monitoring for unregulated contaminants are expected to incur a one-time reporting burden of 0.5 hours/response resulting in a total of 31,481 hours. The monitoring costs associated with these information collection requirements are somewhat lower than those estimated for the proposed rule. Specifically, IOC monitoring costs have increased from \$4 million/year to \$4.5 million/year, SOC monitoring costs have decreased from \$27 million/year to \$21 million/year, and the one-time monitoring costs for unregulated contaminants have decreased from \$42 million to \$39 million. The change in cost is due to the numerous changes made to the monitoring, recordkeeping, and reporting requirements that had been proposed. The information collection requirements are not effective until OMB approves them and a technical amendment to that effect is published in the Federal Register.

VI. Public Docket and References

All supporting materials pertinent to the promulgation of this rule are included in the Public Docket located at EPA headquarters, Washington, DC. The Public Docket is available for viewing by appointment by calling the telephone number at the beginning of this notice. All public comments received on the 1985 proposal are included in the Docket.

All references cited in this notice are included in the Public Docket together with other correspondence and information.

List of Subjects in 40 CFR Parts 141, 142 and 143

Administrative practice and procedure, Chemicals, Reporting and Recordkeeping requirements, Water supply.

Dated: December 31, 1990.

F. Henry Habicht
Acting Administrator.

For the reasons set forth in the preamble, chapter I of Title 40 of the Code of Federal Regulations is proposed to be amended as follows:

PART 141—NATIONAL PRIMARY DRINKING WATER REGULATIONS

1. The authority citation for part 141 continues to read as follows:

Authority: 42 U.S.C. 300f, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-4 and 300j-6.

2. Section 141.2 is amended by adding, in alphabetical order, definitions for "Compliance cycle," "Compliance period," "Initial compliance period," and

"repeat compliance period" to read as follows:

§ 141.2 Definitions.

Compliance cycle means the nine-year calendar year cycle during which public water systems must monitor. Each compliance cycle consists of three three-year compliance periods. The first calendar year cycle begins January 1, 1993 and ends December 31, 2001; the second begins January 1, 2002 and ends December 31, 2010; the third begins January 1, 2011 and ends December 31, 2019.

Compliance period means a three-year calendar year period within a compliance cycle. Each compliance cycle has three three-year compliance periods. Within the first compliance cycle, the first compliance period runs from January 1, 1993 to December 31, 1995; the second from January 1, 1996 to December 31, 1998; the third from January 1, 1999 to December 31, 2001.

Initial compliance period means the first full three-year compliance period which begins at least 18 months after promulgation.

Repeat compliance period means any subsequent compliance period after the initial compliance period.

3. In § 141.11, paragraph (b) is amended by removing the entry for "silver" from the table, and by revising the introductory text of paragraph (b) to read as follows:

§ 141.11 Maximum contaminant levels for inorganic chemicals.

(b) The following maximum contaminant levels for cadmium, chromium, mercury, nitrate, and selenium shall remain effective until July 30, 1992.

3. Section 141.12 is revised to read as follows:

§ 141.12 Maximum contaminant levels for organic chemicals.

The following are the maximum contaminant levels for organic chemicals. The maximum contaminant levels for organic chemicals in paragraph (a) of this section apply to all community water systems. Compliance with the maximum contaminant level in paragraph (a) of this section is calculated pursuant to § 141.24. The maximum contaminant level for total trihalomethanes in paragraph (c) of this section applies only to community water systems which serve a population of

§ 141.51 Maximum contaminant level goals for inorganic contaminants.

(b) . . .

Contaminant	MCLG (mg/l)
(2) Asbestos	7 Million fibers/liter (longer than 10 μ m).
(3) [Reserved]	
(4) Cadmium	0.005
(5) Chromium	0.1
(6) Mercury	0.002
(7) Nitrate	10 (as Nitrogen).
(8) Nitrite	1 (as Nitrogen).
(9) Total Nitrate + Nitrite	10 (as Nitrogen).
(10) Selenium	0.05

10. Section 141.60 is revised to read as follows:

§ 141.60 Effective dates.

(a) The effective dates for § 141.61 are as follows:

(1) The effective date for paragraphs (a)(1) through (a)(8) of § 141.61 is January 9, 1989.

(2) The effective date for paragraphs (a)(9) through (a)(18) and (c)(1) through (c)(18) of § 141.61 is July 30, 1992.

(b) The effective dates for § 141.62 are as follows:

(1) The effective date of paragraph (b)(1) of § 141.62 is October 2, 1987.

(2) The effective date for paragraphs (b)(2) and (b)(4) through (b)(10) of § 141.62 is July 30, 1992.

11. Section 141.61 is revised to read as follows:

§ 141.61 Maximum contaminant levels for organic contaminants.

(a) The following maximum contaminant levels for organic contaminants apply to community and non-transient, non-community water systems.

CAS No.	Contaminant	MCL (mg/l)
(1) 75-01-4	Vinyl chloride	0.002
(2) 71-43-2	Benzene	0.005
(3) 98-23-8	Carbon tetrachloride	0.005
(4) 107-06-2	1,2-Dichloroethane	0.005
(5) 79-01-6	Trichloroethylene	0.005
(6) 106-46-7	para-Dichlorobenzene	0.075
(7) 75-35-4	1,1-Dichloroethylene	0.007
(8) 71-55-6	1,1,1-Trichloroethane	0.2
(9) 156-59-2	cis-1,2-Dichloroethylene	0.07
(10) 78-67-5	1,2-Dichloropropane	0.005
(11) 100-41-4	Ethylbenzene	0.7
(12) 106-90-7	Monochlorobenzene	0.1
(13) 95-50-1	o-Dichlorobenzene	0.6
(14) 100-42-5	Styrene	0.1
(15) 127-18-4	Tetrachloroethylene	0.005
(16) 106-88-3	Toluene	1
(17) 156-80-5	trans-1,2-Dichloroethylene	0.1
(18) 1330-20-7	Xylenes (total)	10

(b) The Administrator, pursuant to section 1412 of the Act, hereby identifies as indicated in the Table below either granular activated carbon (GAC),

packed tower aeration (PTA), or both as the best technology, treatment technique, or other means available for achieving compliance with the

maximum contaminant level for organic contaminants identified in paragraphs (a) and (c) of this section:

BAT FOR ORGANIC CONTAMINANTS LISTED IN SECTION 141.61 (a) AND (c)

CAS No.	Chemical	GAC	PTA
15972-80-8	Alachlor	X	
116-06-3	Aldicarb	X	
1646-86-4	Aldicarb sulfate	X	
1646-87-3	Aldicarb sulfonate	X	
1912-24-6	Atrazine	X	
71-43-2	Benzene	X	X
1563-86-2	Carbofuran	X	
56-23-6	Carbon tetrachloride	X	X
67-74-9	Chlordane	X	
94-75-7	2,4-D	X	
96-12-8	Dibromochloropropane (DBCP)	X	X
95-50-1	o-Dichlorobenzene	X	X
107-06-2	1,2-Dichloroethane	X	X
156-59-2	cis-1,2-Dichloroethylene	X	X
156-80-5	trans-1,2-Dichloroethylene	X	X
75-35-4	1,1-Dichloroethylene	X	X
78-67-5	1,2-Dichloropropane	X	X
106-83-4	Ethylene dibromide (EDB)	X	X
100-41-4	Ethylbenzene	X	X
76-44-6	Heptachlor	X	
1024-57-3	Heptachlor epoxide	X	
56-88-9	Lindane	X	
72-43-6	Methoxychlor	X	
106-90-7	Monochlorobenzene	X	X
106-46-7	para-Dichlorobenzene	X	X
1336-36-3	Polychlorinated biphenyls (PCB)	X	
87-86-5	Pentachlorophenol	X	

BAT FOR ORGANIC CONTAMINANTS LISTED IN SECTION 141.61 (a) AND (c)—Continued

CAS No.	Chemical	GAC	PTA
100-42-6	Styrene	X	X
93-72-1	2,4,5-TP (Silvex)	X	
127-18-4	Tetrachloroethylene	X	X
71-55-6	1,1,1-Trichloroethane	X	X
78-01-8	Trichloroethylene	X	X
108-88-3	Toluene	X	
8001-35-2	Toxaphene	X	X
75-01-4	Vinyl chloride		X
1330-20-7	Xylene	X	X

(c) The following maximum contaminant levels for organic

contaminants apply to community water systems and non-transient, non-community water systems.

CAS No.	Contaminant	MCL (mg/l)
(1) 15072-00-8	Alachlor	0.002
(2)	[Reserved]	
(3)	[Reserved]	
(4)	[Reserved]	
(5) 1912-24-9	Atrazine	0.003
(6) 1563-06-2	Carbofuran	0.04
(7) 87-74-9	Chlordane	0.002
(8) 86-12-8	Dibromochloropropane	0.0002
(9) 94-73-7	2,4-D	0.07
(10) 105-83-4	Ethylene dibromide	0.00006
(11) 78-44-8	Heptachlor	0.0004
(12) 1024-67-3	Heptachlor epoxide	0.0002
(13) 88-80-9	Lindane	0.0002
(14) 72-43-5	Methoxychlor	0.04
(15) 1336-36-3	Polychlorinated biphenyls	0.0006
(16)	[Reserved]	
(17) 8001-35-2	Toxaphene	0.003
(18) 93-72-1	2,4,5-TP	0.05

12. Section 141.62 is revised to read as follows:

§ 141.62 Maximum contaminant levels for inorganic contaminants.

(a) [Reserved]

(b) The maximum contaminant levels for inorganic contaminants specified in paragraphs (b)(2) through (b)(10) of this section apply to community water systems and non-transient, non-community water systems. The Maximum Contaminant Level specified in paragraph (b)(1) of this section only applies to community water systems. The Maximum Contaminant Levels specified in paragraphs (b)(7), (b)(8), and (b)(9) of this section apply to community, non-transient non-community, and transient non-community water systems.

Contaminant	MCL (mg/l)
(1) Fluoride	4
(2) Asbestos	7 Million Fibers/liter (longer than 10 µm)
(3) [Reserved]	
(4) Cadmium	0.005
(5) Chromium	0.1
(6) Mercury	0.002
(7) Nitrate	10 (as Nitrogen)
(8) Nitrite	1 (as Nitrogen)

Contaminant	MCL (mg/l)
(9) Total Nitrate and Nitrite	10 (as Nitrogen)
(10) Selenium	0.05

(c) The Administrator, pursuant to section 1412 of the Act, hereby identifies the following as the best technology, treatment technique, or other means available for achieving compliance with the maximum contaminant level for inorganic contaminants identified in paragraph (b) of this section, except fluoride:

BAT FOR INORGANIC CONTAMINANTS LISTED IN § 141.62(b)

Chemical name	BAT(s)
Asbestos	2,3,8
Barium	5,6,7,9
Cadmium	2,5,6,7
Chromium	2,5,6,7
Mercury	2,4,6,7,9
Nitrate	5,7,9
Nitrite	5,7
Selenium	1,2,6,7,9

¹ BAT only if influent Hg concentrations <10 µg/L

² BAT for Chromium III only.

³ BAT for Selenium IV only.

Key to BATs in Table:

1 = Activated Alumina

- 2 = Coagulation/Filtration
- 3 = Direct and Diatomite Filtration
- 4 = Granular Activated Carbon
- 5 = Ion Exchange
- 6 = Lime Softening
- 7 = Reverse Osmosis
- 8 = Corrosion Control
- 9 = Electrodialysis

13. A new subpart K is added to part 141 to read as follows:

Subpart K—Treatment Techniques

Sec.

141.110 General requirements.

141.111 Treatment techniques for acrylamide and epichlorohydrin.

Subpart K—Treatment Techniques

§ 141.110 General requirements.

The requirements of subpart K of this part constitute national primary drinking water regulations. These regulations establish treatment techniques in lieu of maximum contaminant levels for specified contaminants.

§ 141.111 Treatment techniques for acrylamide and epichlorohydrin.

Each public water system must certify annually in writing to the State (using third party or manufacturer's certification) that when acrylamide and epichlorohydrin are used in drinking

water systems, the combination (or product) of dose and monomer level does not exceed the levels specified as follows:

Acrylamide = 0.05% dosed at 1 ppm (or equivalent)

Epichlorohydrin = 0.01% dosed at 20 ppm (or equivalent)

Certifications can rely on manufacturers or third parties, as approved by the State.

PART 142—NATIONAL PRIMARY DRINKING WATER REGULATIONS IMPLEMENTATION

1. The authority citation for part 142 continues to read as follows:

Authority: 42 U.S.C. 300g, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-4 and 300j-9.

2. Section 142.14 is amended by revising paragraph (a)(6), paragraph (c), the introductory text to paragraph (d), and paragraph (f); and by adding paragraphs (d)(4) through (d)(7) to read as follows:

§ 142.14 Records kept by States.

(a)
(6) Records of analysis for other than microbiological contaminants (including total coliform, fecal coliform, and heterotrophic plate count), residual disinfectant concentration, other parameters necessary to determine disinfection effectiveness (including temperature and pH measurements), and turbidity shall be retained for not less than 12 years and shall include at least the following information:

(c) Each State which has primary enforcement responsibility shall maintain current inventory information for every public water system in the State and shall retain inventory records of public water systems for not less than 12 years.

(d) Each State which has primary enforcement responsibility shall retain, for not less than 12 years, files which shall include for each such public water system in the State:

(4) A record of the most recent vulnerability determination, including the monitoring results and other data supporting the determination, the State's findings based on the supporting data and any additional bases for such determination; except that it shall be kept in perpetuity or until a more current vulnerability determination has been issued.

(5) A record of all current monitoring requirements and the most recent monitoring frequency decision

pertaining to each contaminant, including the monitoring results and other data supporting the decision, the State's findings based on the supporting data and any additional bases for such decision; except that the record shall be kept in perpetuity or until a more recent monitoring frequency decision has been issued.

(6) A record of the most recent asbestos repeat monitoring determination, including the monitoring results and other data supporting the determination, the State's findings based on the supporting data and any additional bases for the determination, and the repeat monitoring frequency; except that these records shall be maintained in perpetuity or until a more current repeat monitoring determination has been issued.

(7) Records of annual certifications received from systems pursuant to part 141, subpart K demonstrating the system's compliance with the treatment techniques for acrylamide and/or epichlorohydrin in § 14.111.

(f) Records required to be kept under this section shall be available to the Regional Administrator upon request. The records required to be kept under this section shall be maintained and made available for public inspection by the State, or, the State at its option may require suppliers of water to make available for public inspection those records maintained in accordance with § 141.33.

3. In § 142.15 is amended by adding new paragraph (c)(3) to read as follows:

§ 142.15 Reports by States.

(c)
(3) The results of monitoring for unregulated contaminants shall be reported quarterly.

4. § 142.16 is amended by reserving paragraph (d) and by adding a new paragraph (e) to read as follows:

§ 142.16 Special primary requirements.

(d) [Reserved]

(e) An application for approval of a State program revision which adopts the requirements specified in §§ 141.23, 141.24, 141.32, 141.40, 141.61, 141.62, and 141.11 must contain the following (in addition to the general primary requirements enumerated elsewhere in this part, including the requirement that state regulations be at least as stringent as the federal requirements):

(1) If a State chooses to issue waivers from the monitoring requirements in §§ 141.23, 141.24, and 141.40, the State

shall describe the procedures and criteria which it will use to review waiver applications and issue waiver determinations.

(i) The procedures for each contaminant or class of contaminants shall include a description of:

(A) The waiver application requirements;

(B) The State review process for "use" waivers and for "susceptibility" waivers; and

(C) The State decision criteria, including the factors that will be considered in deciding to grant or deny waivers. The decision criteria must include the factors specified in §§ 141.24(f)(6), 141.24(h)(6), and 141.40(a)(4).

(ii) The State must specify the monitoring data and other documentation required to demonstrate that the contaminant is eligible for a "use" and/or "susceptibility" waiver.

(2) A plan for the initial monitoring period within which the State will assure that all systems complete the required monitoring by the regulatory deadlines:

(i) The plan must describe how systems will be scheduled during the initial monitoring period and demonstrate that the analytical workload on certified laboratories for each of the three years has been taken into account to assure that the State's plan will result in a high degree of monitoring compliance and will be updated as necessary.

(ii) The State must demonstrate that the initial plan is enforceable under State law.

5. Section 142.18 is added to subpart B to read as follows:

§ 142.18 EPA review of State monitoring determinations.

(a) A Regional Administrator may annul a State monitoring determination for the types of determinations identified in §§ 141.23(b), 141.23(c), 141.24(f), 141.24(h), and 141.40(n) in accordance with the procedures in paragraph (b) of this section.

(b) When information available to a Regional Administrator, such as the results of an annual review, indicate a State determination fails to apply the standards of the approved State program, he may propose to annul the State monitoring determination by sending the State and the affected PWS a draft Rescission Order. The draft order shall:

(1) Identify the PWS, the State determination, and the provisions at issue;