COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS
SAIPAN MARIANA ISLANDS

VOLUME 16 NUMBER 07

JULY 15, 1994

COMMONWEALTH REGISTER

COMMONWEALTH REGISTER
VOLUME 16 NUMBER 07
JULY 15, 1994

TABLE OF CONTENTS

Please correct your page no. 11997 it reads 12997 for Volume 16 number 06

No Page Numbers 12104, 12105 & 12106

PROPOSED REGULATIONS:

Procurement Regulations
Commonwealth Development Authority......12107

Safe Drinking Water Regulations
Public Health & Environmental Services/DEQ......12141

Regulations and Fee Requirement for Siting Permit Holders Requesting Extensions
Coastal Resources Management......12220

PROPOSED AMENDMENTS:

Amendment to the Electric Service Regulations
Commonwealth Utilities Corporations......12225

Immigration Regulations §403, 405/Registration & 1201/Fees.
Office of the Attorney General/Immigration Office......12234

ADOPTION:

Saipan Zoning Schedule for the Termination of Illegal Property Uses
Commonwealth Zoning Board......12237

Drinking Water Regulations
Public Health & Environmental Services/DEQ......12242

<u>PUBLIC NOTICE</u>

NOTICE OF PROPOSED PROCUREMENT REGULATIONS
OF THE
COMMONWEALTH DEVELOPMENT AUTHORITY

The Commonwealth Development Authority (CDA) of the Commonwealth of the Northern Mariana Islands hereby notifies the Commonwealth of its intent to adopt these proposed Procurement Regulations. These Procurement Regulations are promulgated pursuant to Section 6(a) (2) the Commonwealth Development Authority Act of 1984, codified at 4CMC Sec. 10101 et seq.

Copies of the proposed Procurement Regulations are available at the office of the Commonwealth Development Authority, Gualo Rai, Saipan MP 96950.

The Executive Director of the Commonwealth Development Authority urges the public to submit written comments and recommendations regarding the above mentioned Procurement Regulations within thirty (30) days after the publication of this notice in the Commonwealth Registrar. Please submit your comments to the following:

Mr. James H. Ripple
Executive Director
Commonwealth Development Authority
P.O Box 2149, Gualo Rai
Saipan, MP 96950

Dated this 8th day of July, 1994.

James H. Ripple
James H. Ripple
Executive Director

7/11/94
Date of Filing with Registrar

Registrar of Corporations

7/11/94
Date Received in the office of
the Governor

Governor's Authorized Staff

NUTISIAN PUPBLIKU

NUTISIA PUT I MAPROPPONI NA REGULASION PROCUREMENT

PARA

COMMONWEALTH DEVELOPMENT AUTHORITY

I Commonwealth Development Authority (CDA) gi halom i Commonwealth of the Northern Mariana Islands, ha nutitisia i pupbliku put i intension-na na esta para u adapta i manmapropoponi siha na Regulasion Procurement. Este na Regulasion Procurement, macho'gue sigun gi Seksiona 6(a) (2) ginen i Commonwealth Development Authority Act of 1984, komu 4CMC Sec.10101 et.seq.

Guaha kopian i manmapropoponi siha na Regulasion Procurement gi Offisinan I Commonwealth Development Authority, gaige gi Gualo Rai, Saipan, MP 96950 para hayi interesao siha na petsona.

I Executive Director para i Commonwealth Development Authority ha' sosoyu i publiku na para u fanna'halom komentu ya u matuge' papa put este na Regulasion Procurement gi halom trenta (30) dias desde i malaknos-na este na nutisia gi Rehistran Commonwealth. Put fabot na hanao guatu i komentun-miyu gi i sigiente na address.

Mr. James Ripple
Executive Director
Commonwealth Development Authority
P.O. Box 2149, Gualo Rai
Saipan, MP 96950

Ma fecha guine na dia 8 de Julio, 1994

James H. Ripple
Executive Director

7/11/94
Fecha ni ha file i Registrar

Registrar of Corporations

7/11/94
Fecha na marisibi gi Ofisinan Gobietno

I Ma aturisa na staff Gobietno

ARONGORONGOL TOWLAP

ARONGORONG REEL FFEERUL ALLEGHUL PROCUREMENT

MELLOL

COMMONWEALTH DEVELOPMENT AUTHORITY

School Commonwealth Development Authority (CDA) mellol Commonwealth of the Northern Mariana Islands sangi arongorong yeel nge rekke arongaar towlap igha rebwele adaptaali Alleghul Procurement. Alleghul Procurement kkaal nge bwang saing aile ewal mille Talil 6 (a) (2) llol Commonwealth Development Act of 1984, igha a bwa mellol 4CMC Sec.10101 et. seq.

Kkopiyaal Aleleghul Procurement kkaal nge nge eyoor llol Bwulasiyool Commonwealth Development Authority, iye elo Gaulo Rai, Saipan, MP 96950, ngaliir aramas kka re mwusdchal lo bweibwobgh.

Executive Direktoodul Commonwealth Development Authority, nge ekke tingoer ngaliir towlap bwe rebwe ischiitiw meta mangemangiir me tipeer reel allegh kkaal, nge rebwe atolongooy llol eliigh (30) ral sangi igha e toowow arongorong yeel mellol Commonwealth Register nge rebwe afanga ngali address yee:

Mr. James H. Ripple
Executive Director
Commonwealth Development Authority
P.O. Box 2149, Gualo Rai
Saipan, MP 96950

E ffeer llol raalil 8 Ulliiyo, 1994

James H Ripple
James H. Ripple
Executive Director

7/11/94
Ralill igha e file reel Registrar

Registrar of Corporations

7/11/94
Rallil ye rebwughi melloBwulasiyool
Gubenno

Aramas ye e bwughi

COMMONWEALTH DEVELOPMENT AUTHORITY

PROCUREMENT REGULATIONS

CHAPTER 1 - GENERAL PROVISIONS

Article 1 - General

Section 111. Short Title, Authority, and Purposes.

(a) Statutory Authority: These regulations are promulgated pursuant to Section 6(a)(2) the Commonwealth Development Authority Act of 1984, codified at 4 CMC Sec. 10101 *et. seq.*

(b) Purposes. The underlying purposes of these regulations are:

(1) to provide for increased public confidence in the procedures followed in procurement for which Commonwealth Development Authority funds or guarantees, in whole or in part, are provided;

(2) to insure the fair and equitable treatment of all persons who deal with the procurement of goods, services, or products obtained or acquired with funds or guarantees, in whole or in part, of the Commonwealth Development Authority;

(3) to provide increased economy in Commonwealth procurement activities and to maximize to the fullest extent practicable the purchasing value of funds or guarantees of the Commonwealth Development Authority;

(4) to provide safeguards for the maintenance of a procurement system of quality and integrity.

(c) Short Title. These Regulations may be cited as the Commonwealth Development Authority Procurement Regulations.

Section 112. Executive Director. The Executive Director of the Commonwealth Development Authority, or his designee shall oversee, enforce, administer and supervise the negotiation, execution, performance and review of any contract funded or guaranteed, in part or whole, by the Authority. The Executive Director's duties, or his or her designee, include, but are not limited to, the following:

(a) oversee these regulations are observed in any procurement contract or agreement which is funded or guaranteed, in whole or in part, by the Authority;

(b) administer these regulations;

(c) conduct bidding, procurement, negotiation or administration of Authority contracts, agreements, and other procurements;

(d) develop advance plans for the centralized purchase of Authority supplies;

(e) exercise general supervision and control over all inventories and supplies;

(f) establish and maintain programs for the testing and acceptance of supplies;

(g) to implement the specific procurement procedures and other matters relevant to the practical implementation of these Regulations.

Section 114. Supplementary General Principles of Law Applicability. Unless displaced by the particular provisions of these regulations, the principles of law and equity including, but not limited to, the Uniform Commercial Code of the Commonwealth and common law of fraud, conflicts of interest, waste, false, pretenses, and public purpose shall supplement these regulations.

Sections 114. Requirement of Good Faith. These regulations require all parties, including Authority employees, contractors and suppliers, involved in the negotiation, bidding, performance or administration of contracts funded by Commonwealth Development Authority to act in good faith.

Section 115. Application of Regulations. These regulations shall govern the disbursement, expenditure, commitment and use of any Authority funds for any procurement contract, in any amount whatsoever, regardless of source.

Section 116. Severability. If any provision of these regulations or any application thereof to any person or circumstances is held invalid by a court of competent jurisdiction, such invalidity shall not affect other provisions or application of these regulations which can be given effect without the invalid provisions of application, and to this end, the provision of these regulations are declared to be severable.

Section 117. Validity of Contract. Contracts solicited, negotiated, executed, or performed in violation of these regulations shall be voidable by the Authority.

Section 118. Remedy Against Employee. Any procurement action of an employee of the Authority in violation of these regulations is an action outside the scope of employment. The Authority shall seek to have any liability asserted against it by a contractor which directly results from these improper acts to be determined judicially to be the individual liability of the employee who committed the wrongful act.

Article 2 - Definitions

Section 119. Definitions. As used in these regulations:

(a) "Attorney General" means the Attorney General of the Northern Mariana Islands.

(b) "Authority" means the Commonwealth Development Authority.

(c) "Authority funds" means any money, funds, guarantees, underwriting, financing, capital, reimbursement, grants, technical assistance and any other financial or monetary assistance or support whatsoever provided or administered by the Authority, regardless of source or terminology. Authority funds specifically includes any funds received pursuant to P.L. 4-49, Sections 3(a)(1); 6(a)(3) -- (a)(34); 9(a) and (b); and 15.

(d) "Construction" means the process of building, alterating, repairing, improving or demolishing of a public structure or building or public improvements commonly known as "capital improvements." It does not include the routine maintenance of existing structures, buildings, or public real property.

(e) "Contract" means all types of agreements, regardless of what they may be called for the procurement of supplies, services or construction.

(f) "Cost-Reimbursement Contract" means a contract under which a contractor is reimbursed for costs which are allowable and allocable in accordance with the contract terms and these regulations, and a fee, if any.

(g) "Dispute" means a disagreement concerning the legal rights and obligations of contracting parties, which, if not settled by mutual agreement, must be referred to a neutral third party for resolution.

(h) "Employee" means an individual receiving a salary from the Authority. This definition extends to the members of the Board of Directors of the Commonwealth Development Authority and their staff, consultants, independent contractors and part-time workers shall be considered employees for the purposes of these regulations.

(i) "Executive Director" means the Executive Director of the Commonwealth Development Authority as provided by Section 8 of the Authority Act of 1985.

(j) "Goods" means all property, including but not limited to equipment, materials, supplies, and other tangible personal property of any kind of nature, printing, insurance, leases of real and personal property, and sale of other disposal of real and personal property.

(k) "Government" means the Commonwealth of the Northern Mariana Islands Government which includes the executive, legislative and judicial branches. Government includes the public corporations established by Commonwealth law.

(l) "Governor" means the Governor of the Northern Mariana Islands.

(m) "Gratuity" Means any gift, consideration, fee, commission, charge, asset, cash, or property of any other payment or enrichment to the extent that consideration of at least equal value is not received in exchange.

(n) "Immediate relative" means any spouse, parent, son, daughter, brother, sister, father-in-law, mother-in-law, sister-in-law, or brother-in-law.

(o) Invitation for Bids" means all documents, whether attached or incorporated by reference, utilized for soliciting bids.

(p) "Official" means the Executive Director of the Commonwealth Development Authority.

(q) "Person" means an individual, sole proprietorship, partnership, joint venture, corporation, other unincorporated association or a private legal entity.

(r) "Procurement" means buying, purchasing, renting, leasing or acquiring construction, goods or services. It also includes all functions that pertain to the obtaining of construction, goods or services, including description of requirements, selection and solicitation of sources, preparation and award of contracts, and all phases of contract administration.

(s) "Procurement Contract" means any promise, agreement, commitment of any actual purchase, lease, rent, or acquisition of any good or service.

(t) "Purchase Description" means the words used in a solicitation to describe the goods, services or construction to be purchased and includes specifications attached to, or made part of, the solicitation.

(u) "Responsible" in reference to a bidder, means a person who has the capability in all respects to perform fully the contract requirements, and the integrity and reliability which will assure good faith performance.

(v) "Responsive" in reference to a bidder, means a person who has submitted a bid which conforms in all material respects to the invitation for bids.

(w) "Services" means the furnishing of time, labor or effort by a person other than an employee, and not involving the delivery of a specific end product other than reports, plans and incidental documents.

Article 3 - Public Access

Section 120. Public Access to Procurement Information. Procurement information shall be public record. "Procurement information" means any contract, agreement, purchase or any other transaction encompassing, in whole or in part, any Authority funds, grants, or other financial assistance.

CHAPTER 2.

Article 1

Section 121. Duties. The duties and responsibilities of the Executive Director include, but are not limited to, the following:

(a) ensure that these regulations are observed in all Authority procurement;

(b) conduct bidding, procurement, negotiation or administration of Authority contracts upon request of the official as provided by the powers granted the Executive Director by the CDA Board of Directors;

Section 122. Contract Oversight.

(a) The Executive Director shall review all contracts for construction, the procurement of goods, leases, the sale of goods and for services by an independent contractor to insure that the contract complies with these regulations, is for a public purpose, and does not constitute a waste or abuse of Authority funds.

(b) A contract shall be approved first by the Executive Director before it is signed by either party to the contract. The Executive Director shall cause such review to occur in a prompt and timely manner.

(c) No contract funded or guaranteed by the Authority is effective until the Authority is assured that the contract is in compliance with the provisions of these regulations.

Section 123. Split Contracts. If the Executive Director determines that a contract has been split into subcontracts for the purpose of avoiding bidding or if a change order or modification is unreasonably being made in a contract to increase the contract price where a contract has been bid and awarded to the lowest possible and responsive bidder, the Executive Director may require the contract or the modification to be competitively bid. For example, an unreasonable modification or change order would be one which would have been reasonably foreseeable at the time of the formation of the contract.

Section 124. Acceptance of Gratuities.

(a) In addition to the restrictions found in Section 155, the Executive Director and the employees of the Authority shall be subject to these additional restrictions to avoid the appearance of impropriety.

(b) The Executive Director and the employees of the Authority shall not accept from any person any gift or thing of value in excess of $25.00 given to them with the intent to influence their business judgement.

CHAPTER 3. SOURCE SELECTION AND CONTRACT FORMATION

Article 1 - Source Selection.

Section 125. Methods of Source Selection. Unless otherwise authorized by law, all contracts funded or guaranteed by the Authority shall be awarded by competitive sealed bidding, except as provided in:

(a) Section 127 (Small Purchases);

(b) Section 128 (Sole Source Procurement);

(c) Section 129 (Competitive Sealed Proposals);

(d) Section 130 (Professional Services);

(e) Section 142 (Architect-Engineer Services).

Section 126. Competitive Sealed Bidding.

(a) Invitation for Bids. An invitation for bids shall be issued and shall include at the minimum:

(1) an invitation for bids number;

(2) date of issuance;

(3) name, address and location of issuing office;

(4) specific location where bids must be submitted;

(5) date, hour and place of bid opening;

(6) a purchase description in sufficient detail to permit full and open competition and allow bidders to properly respond;

(7) quantity to be furnished;

(8) time, place and method of delivery or performance requirements;

(9) essential contractual terms and conditions; and

(10) any bonding requirements.

(b) Public Notice. Adequate public notice of the Invitation for Bids shall be given a reasonable time prior to the date set and shall be published in a newspaper of general circulation in the Commonwealth once in each week over a period of 30 calendar days is adequate notice.

(c) Bidding Time. A bidding time of at least 30 calendar days shall be provided, unless the Executive Director determines a shorter period is reasonable and necessary.

(d) Bid Receipt. All bids shall be submitted to the Authority office. Bids shall be received prior to the time set for opening and shall be maintained sealed in a locked receptable at that office. If a bid is opened by mistake, it shall be resealed and the person who opened the bid shall write his signature and print his title on the envelope and deliver it to the Executive Director. No information contained in the bid shall be disclosed prior to the bid opening. The Executive Director shall cause the opened bid to be placed into the sealed receptable.

(e) Bid Opening. the bid opening shall be conducted by the Executive Director. Bids shall be opened publicly in the presence of one or more witnesses at the time and place designated in the Invitation for Bids. The Executive Director shall be present at the Bid Opening. The bids received prior to the bid closing date shall be publicly opened. The amount of each bid, together with the name of each bidder shall be recorded, the record and each bid shall be opened to public inspection. The Executive Director shall prepare a written summary of the bid opening.

(f) Bid Acceptance and Bid Evaluation. Bids shall be unconditionally accepted without alteration or correction, except as authorized by these regulations. Bids shall be evaluated based on the requirements set forth in the Invitation for Bids, which may include criteria necessary to reasonably permit a determination as to the acceptability of the bid for the particular purpose intended.

(g) Bid Rejection. A bid may be rejected for any of the following reasons:

(1) failure to conform to essential requirements of the Invitation for Bids such as specifications or time of delivery;

(2) imposition of conditions or restrictions in the bid which modify requirements of the invitation or limit the bidder's liability to the Authority. For example, bids shall be rejected in which the bidder:

(A) protects against future changes in conditions, such as increased costs;

(B) fails to state a price and indicates that price shall be the price in effect at the time of delivery;

(C) states a price but qualifies it as subject to the price in effect at time of delivery; or

(D) limits the rights of government.

(3) unreasonable as to price;

(4) a bid from a nonresponsible bidder.

(h) Correction or Withdrawal of Bids; Cancellation of Awards. Correction or withdrawal of inadvertently erroneous bids, before or after award, or cancellation of awards or contracts based on bid mistakes must be approved of by the Executive Director in writing. After the bid opening, no changes in bid price or other provisions of bids prejudicial to the interest of the Authority or fair competition shall be allowed. Whenever a bid mistake is suspected, the Authority shall request confirmation of the bid prior to award. In such an instance, if the bidder alleges an error, the government shall only permit correction of the bid or withdrawal of the bid in accordance with subsection (h)(1) or (2) of this section.

(1) Correction of Bids. Correction of bids shall only be permitted when:

(A) an obvious clerical mistake is clearly evident from examining the bid document. Examples of such mistakes are errors in addition or the obvious misplacement of a decimal point; or

(B) the otherwise low bidder alleges a mistake and the intended bid is evident from the bid document or is otherwise supported by clear and convincing evidence as to the bid intended and the corrected bid remains the low bid. A low bidder may not be permitted to correct a bid mistake resulting from an error in judgement.

(2) Withdrawal of Bids. Withdrawal of a bid shall only be permitted where the otherwise low bidder alleges a mistake and there is clear and convincing evidence as to the existence of a mistake but not as to the bid intended.

(3) Cancellation of Awards Cancellation of awards or contracts shall only be permitted when:

(A) evidence as to the existence of the mistake is not discovered until after the award;

(B) there exists no clear and convincing evidence to support the bid intended; and

(C) performance of the contract at the award price would be unconscionable.

(i) Award.

(1) The contract must be awarded with reasonable promptness by written notice to the lowest responsive bid by a responsible bidder whose bid fully meets the requirements of the invitation for bids and these regulations. Unsuccessful bidders shall also be promptly notified.

(2) Notice of an award shall only be made by the presentation of a contract with all of the required signatures to the bidder. This shall only be made subsequent to the receipt of a written notice from the Executive Director of the Authority satisfactorily assuring compliance with these regulations. No other notice of an award shall be made orally or by letter. No acceptance of an offer shall occur nor shall any contract be formed until a Authority contract is written.

(3) In the event all bids exceed available funds and the bid of the lowest responsive and responsible bidder does not exceed those funds by more than five percent (5%) and time or economic considerations preclude resolicitation of work of a reduced scope, the Executive Director may be authoritzed by the Board of Directors of Commonwealth Development Authority to negotiate an adjustment of the bid price, including changes in bid requirements, with the lowest responsive and responsible bidder in order to bring the bid price within the amount of available funds. The negotiation shall be documented in writing and attached to the bidding documents.

Section 127. Small Purchases.

(a) Any procurement not exceeding the amounts established in this section may be made in accordance with small purchase procedures. However, procurement requirements shall not be artificially divided so as to constitute a small purchase.

(b) No bidding is required for procurement under Five Thousand Dollars ($5,000.00).

(c) Bidding is not required but the Executive Director is encouraged to obtain price quotations from at least three vendors and bases the selection on competitive price and quality for procurement valued under $5,000.00.

(d) Purchase orders may be used only for small purchases in subsections (b) and (c). In no other instance may purchase orders be used instead of contracts.

Section 128. Sole Source Procurement.

(a) A contract may be awarded for a supply, service or construction item without competition when the Executive Director determines in writing copied to the Board of Directors that there is only one source for the required supply, service or construction item.

(b) The written determination shall be prepared by the Executive Director and shall contain the following information:

(1) the unique capabilities required and why they are so required; and

(2) the consideration given to alternative source.

Section 129. Competitive Sealed Proposals.

(a) Conditions for Use. When the Executive Director determines in writing that the use of competitive sealed bidding is either not practical or not advantageous to the Authority and receives the approval of the Authority Board of Directors, a contract may be entered into by competitive sealed proposals.

(b) Request for Proposals. Proposals shall be solicited through a request for proposals.

(c) Public Notice. Adequate public notice of the request for proposals shall be given in the same manner as provided for in competitive sealed bids.

(d) Receipt of Proposals. Proposals shall be opened so as to avoid disclosure of contents to competing offerors during the process of negotiation. A register of proposals shall be prepared and opened for public inspection after contract award.

(e) Evaluation Factors. The request for proposals shall state the relative importance of price and other evaluation factors.

(f) Discussion with responsible offerors and revisions to proposals. As provided in the request for proposals, discussions may be conducted with responsible offerors who submits proposals determined to be reasonably susceptible of being selected for award for the purpose of clarification and to insure full understanding of, and responsiveness to solicitation requirements. Offerors shall be accorded fair and equal treatment with respect to any opportunity for discussion and revision of proposals and such revision may be permitted after submission and prior to award for the purpose of obtaining the best and final offers. In conducting discussions, there shall be no disclosure of any information derived from proposals submitted by competing offerors.

(g) Award. Award shall be made to the responsible offeror whose proposals is determined in writing to be most advantageous to the Authority taking into consideration price and the evaluation factors set forth in the request for proposals. No other factors or criteria shall be used in the evaluation and the contract file shall contain the basis on which the award is made.

Section 130. Competitive Selection Procedures for Professional Services.

(a) Procurement Method. The services of professionals shall be procured as provided in this section except when authorized as a small purchase or sole-source procurement.

(b) Policy. It is the policy of the Authority to publicly announce all requirements for professional services and negotiate contracts on the basis of demonstrated competence and qualifications at a fair and reasonable price. The Executive Director shall maintain files of current statements of qualifications of professional firms. Persons engaged in providing professional services may submit statements of qualifications and expressions of interest to provide such services. Persons may amend these statements at any time by filing a new statement.

(c) Public announcement and form of request for proposals. Adequate notice of the need for such services shall be given by the Executive Director through a request for proposals. The request for proposals shall describe the services required, list the type of information and data required of each offeror, and state the relative importance of particular qualifications.

(d) Discussions. The Executive Director may conduct discussions with any offeror who has submitted a proposal to determine such offerors qualifications for further consideration. Discussions shall not disclose any information derived from proposals submitted by other offerors.

(e) Award. Award shall be made to the offeror determined in writing by the Executive Director based on the evaluation factors set forth in the request for proposals, and negotiation of compensation determined to be fair and reasonable. If compensation cannot be agreed upon with the best qualified offeror then negotiations will formally terminated with the selected offeror. If proposals were submitted by one or more other offerors determined to be qualified, negotiations may be conducted with such other offeror or offerors, in the order of their respective qualification ranking, and the contract may be awarded to the offeror then ranked as best qualified if the amount of compensation is determined to be fair and reasonable.

Article 2 - Cancellation of Invitation for Bids or Requests for Proposals

Section 131. Cancellation. An invitation for bids or request for proposals may be cancelled, and any and all bids or proposals may be rejected, when such action is determined in writing by the Executive Director to be in the best interest of the Authority based on:

(a) inadequate or ambiguous specifications contained in the solicitation;

(b) specifications which have been revised;

(c) goods or services being procured which are no longer required;

(d) inadequate consideration given to all factors of cost to the Authority in the solicitation;

(e) bids or proposals received indicate that the needs of the Authority can be satisfied by a less expensive good or service;

(f) all others with acceptable bids or proposals received are at unreasonable price; or

(g) bids were collusive.

Article 3 - Qualifications and Duties

Section 132. Responsibility of Bidders and Offerors.

(a) Awards shall be made only to responsible contractors. To be determines responsible, a perspective contractor must:

(1) have adequate financial resources to perform the contract, or the ability to obtain them;

(2) be able to comply with the required delivery or performance schedule;

(3) have a satisfactory performance record;

(4) have a satisfactory record of integrity and business ethics;

(5) have the necessary organization, experience and skills, (or the ability to obtain them), required to successfully perform the contract;

(6) have the necessary production, construction and technical equipment facilities, or the ability to obtain them; and

(7) be otherwise qualified and eligible to receive an award under applicable laws and rules.

(b) Obtaining Information. Prior to award, the Executive Director shall obtain information from the bidder or offeror necessary to make a determination of responsibility using the factors in subsection (a) above. The unreasonable failure of a bidder or offeror to promptly supply information in connection with an inquiry with respect to responsibility may be grounds for determination of nonresponsibility with respect to that bidder or offeror.

(c) Right of non-disclosure. Information furnished by a bidder or offeror pursuant to subsection (b) may not be disclosed outside of the office of the Authority, or any involved government department or agency without prior consent by the bidder or offeror.

(d) Nonresponsibility determination. When a bid or proposal on which a contract award would otherwise be made is rejected because the prospective contractor is found to be nonresponsible, a written determination shall be signed by the Executive Director stating the basis for the determination and this shall be placed in the contract file.

Section 133. Prequalification of Contractors. Prospective suppliers of goods or services may be prequalified for particular types of construction, goods and services when determined necessary by the Executive Director. Opportunity for qualification before solicitation shall be afforded to all suppliers. Solicitation mailing lists of potential contractors shall include, but shall not be limited to, prequalified suppliers. In no event will bidders be allowed to qualify after the bid opening.

Article 4 - Types of Contracts

Section 134. Types of Contracts.

(a) Use of a cost-plus-a-percentage-of-cost and percentage of construction cost methods of contracting are prohibited.

(b) Authority contracts shall utilize a firm fixed price unless use of a cost reimbursement contract is justified under subsection (c).

(c) A cost reimbursement contract may be used when the Executive Director determines in writing, which is attached to the contract, that:

(1) uncertainties in the work to be performed make the cost of performance too difficult to estimate with the degree of accuracy required for a firm fixed price contract;

(2) use of a firm fixed contract could seriously effect the contractor's financial stability or result in payment by the Authority for contingencies that never occur; or

(3) use of a cost reimbursement contract is likely to be less costly to the Authority than any other type due to the nature of the work to be performed under the contract.

Article 5 - Inspection and Audit

Section 135. Right to Inspect Place of Business. The Authority, may at reasonable times, inspect the place of business of a contractor or any subcontractor which is related to the performance of any contract awarded or to be awarded by the Authority.

Section 136. Right to Audit Records. As required by Section 404 of Public Law No. 3-91, the contractor and subcontractor or grantee and subgrantee at all levels shall provide the Public Auditor of the Commonwealth with access to and the right to examine and copy any records, data or papers relevant to the Authority contract or grant for a period of three years after the final payment under the contract or grant. A clause to this effect shall appear in all the Authority contracts and obligations.

Article 6. Reports and Records

Section 137. Report of Anticompetitive or Deceptive Practices. When for any reason any person suspects the following practices are occurring among bidders, offerors, contractors or subcontractors, a notice of the relevant facts shall be transmitted to the Attorney General without delay:

(a) unfair methods of competition; or

(b) unfair or deceptive acts; or

(c) unfair business practices.

These acts are more fully defined at 4CMC Section 5101-5206.

Section 138. Retention of Procurement Records.

(a) All procurement records shall be retained by the Executive Director.

(b) The Executive Director shall maintain a record listing all contracts made under sole-source procurement for a minimum of five years. The records shall contain:

(1) each contractors name;

(2) the amount and type of each contract; and

(3) a listing of the supply services or construction procured under each contract.

(c) All procurement records, except those designated herein as not subject to disclosure, shall be available to public inspection.

CHAPTER 4. Procurement of Construction and Architect-Engineer Services

Article 1. Personnel

Section 139. Designation of Official with Expenditure Authority. Unless otherwise specified by law, official authorized to sign any/or an agreement with Commonwealth Development Authority, or his designee, is the official with expenditure authority over projects funded or guaranteed, in whole or in part, by the Commonwealth Development Authority.

Section 140. Construction Management. The progress of and compliance with construction plans and specifications for all projects funded or guaranteed, in whole or in part, by the Authority shall be monitored by the Executive Director or a construction manager or a construction management firm acceptable to the Authority. The Authority may, at its own expense, select or appoint a construction manager or a construction management firm to monitor projects covered by this policy.

Article 2. Procurement Standards

Section 141. Construction Procurement.

(a) Invitation for Bids.

(1) Deposit. The Executive Director shall determine the amount of deposit required for potential bidders to obtain the invitation for bids.

(2) Contents. The invitation for bids shall be prepared in accordance with Section 127(a). In addition, the following items shall be included in the Invitation for Bids:

(A) Notice to Bidders. General information regarding projects;

(B) Instructions to Bidders Information on the preparation of bids, bid security requirements and forms and certifications that must be submitted with the bid;

(C) General Conditions. Standard contract clauses governing the performance of work;

(D) Special Conditions. Special contract clauses depending on the nature and dollar amount of the work to be performed; and

(E) Technical Specifications. Specifications governing the technical aspects of the work to be performed.

(b) Bid Security.

(1) Requirements. Bid security shall be required for all competitive sealed bidding construction contracts where the price is estimated by the Executive Director to exceed $25,000 or when the Executive Director determines it is in the interest of the Authority. Bid security shall be on a bid bond, in cash, by certified check, cashiers check or other form acceptable to the government. A surety company shall hold the certificate of authority from the U.S. Secretary of the Treasury as an acceptable surety or other surety acceptable to the Authority.

(2) Amount. Bid security shall be an amount equal to at least fifteen percent (15%) of the amount of the bid or other amount as specified in the Invitation for Bids depending upon the source of funding.

(3) Rejection of Bid. Failure to furnish bid security, when required by the invitation, shall result in rejection of the bid as nonresponsive.

(c) Contract Performance and Payment Bonds.

(1) When a construction contract is awarded in excess of $100,000, the following bonds or security shall be delivered to the Authority and shall become binding on the parties upon the execution of the contract:

(A) a performance bond satisfactory to the Authority, executed by a surety company authorized to do business in the Commonwealth or otherwise secured in a manner satisfactory to the Authority, in an amount equal to one hundred percent (100%) of the price specified in the contract; and

(B) a payment bond satisfactory to the Authority, executed by a surety company authorized to do business in the Commonwealth or otherwise secured in a manner satisfactory to the Authority, for the protection of all persons supplying labor and material to the contractor or its subcontractors for the performance of the work provided for in the contract. The bond shall be in an amount equal to one hundred percent (100%) of the price specified in the contract.

(d) Suits on Payment bonds; Right to Institute. Every person who has furnished labor or material to the contractor or its subcontractors for the work provided in the contract, in respect of which a payment bond is furnished under this section, and who has not been paid in full therefore before the expiration of a period of 90 days after the day on which the last of the labor was done or performed by such person or material was furnished or supplied by such person for which such claim is made, shall have the right to sue on the payment bond for the amount, or the balance thereof, unpaid at the time of institution of such suit and to prosecute the action for the sum or sums justly due such person; provided, however, that any person having a direct contractual relationship with a subcontractor of the contractor, but no contractual relationship express or implied with the contractor furnishing the payment bond, shall have a right of action upon the payment bond upon giving written notice to the contractor within 90 days from the date on which such person did or performed the last of the labor or furnished or supplied the last of the material upon which such claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the material was furnished or supplied or for whom the labor was done or performed. Such notice shall be personally served or served by mailing the same by registered or certified mail, postage prepaid, in an envelope addressed to the contractor at any place the contractor maintains an office or conducts its business.

(e) Suits on Payment Bonds; Where and When Brought. Every suit instituted upon a payment bond shall be brought in the Commonwealth Superior Court; but no such suit shall be commenced after the expiration of one year after the day on which the last of the labor was performed or material was supplied by the person bringing suit. The obligee named in the bond need not be joined as a party in any such suit.

(f) Fiscal Responsibility. Every contract modification, change order, or contract price adjustment under a construction contract shall be subject to prior written certification by the Executive Director as to the effect of the contract modification, change order or adjustment in contract price on the total project budget or the total contract budget. In the event that the certification discloses a resulting increase in the total project budget and/or the total contract budget, such contract modification, change order or adjustment in contract price shall not be made unless sufficient funds are available therefore, or the scope of the project or contract is adjusted so as to permit the degree of completion that is feasible within the total project budget and/or total contract budget as it existed prior to the contract modification, change order or adjustment in contract price under consideration; provided, however, that with respect to the validity, as to the contractor, of any executed contract modification, change order or adjustment in contract price which the contract is reasonably relied upon, it shall be presumed that there has been compliance with the provisions of this subsection.

Section 142. Architect-Engineer Services.

(a) Procurement Method. Architect-engineer services shall be procured as provided in this section except when authorized as a small purchase.

(b) Policy. It is the policy of the Authority to cause to be publicly announce all requirements for architect-engineer services and negotiate contracts on the basis of demonstrated competence and qualifications at a fair and reasonable price.

(c) Selection. The Executive Director shall maintain files of current statements of qualifications of architect-engineer firms. After public announcement of a requirement for architect-engineer services, current statements shall be reviewed together with those that may be submitted by other firms in response to the announcement. Discussions shall be conducted with at least three of the firms regarding the contract requirement and technical approach and selection made therefrom, in order or preference, of no less than three firms determined to be the most highly qualified to perform the services required.

(d) Negotiation. The Executive Director shall negotiate a contract with either of two highest qualified architect-engineer firm at a price determined to be fair and reasonable to the Authority. If a fair and reasonable price cannot be negotiated, negotiations shall be terminated and negotiations shall be undertaken with the third highest qualified firm. If a fair and reasonable price cannot be negotiated with any of the firms, then the Executive Director shall select additional firms in order of competence and qualifications and continue negotiations until a fair and reasonable price is agreed upon.

Article 3. Commonwealth Contractor Preference

Section 143. Purpose. The purpose of this policy is to establish a preference for Commonwealth Contractors in the award of bids for construction projects financed or guaranteed by the Authority.

Section 144. Definitions As used in this article:

(a) "Commonwealth Contractor" means a contractor who meets the following qualifications:

(1) (A) If a sole proprietorship, the contractor shall be owned by a citizen of the United States, or a legally admitted permanent resident alien;

(B) If a partnership, the contractor shall be owned by citizens of the United States, or lawfully admitted permanent resident aliens, or corporations incorporated in the Commonwealth, United States, or in a U.S. Territory or possessions if not less than 75% of the ultimate ownership interest in such corporations is owned by citizens of the United States, or lawfully admitted permanent resident aliens; and

(C) If a corporation, the contractor shall be incorporated in the Commonwealth, United States, or in a U.S. Territory or possession and not less than seventy-five percent (75%) of the ultimate ownership interest shall be owned by citizens of the United States, or lawfully admitted permanent resident aliens;

(2) The contractor shall have a valid Commonwealth business license and shall have filed all tax returns that it is obligated to have filed to the Commonwealth, United States, and to a U.S. Territory or possession and to any political subdivision thereof for all previous years of the contractor's existence and the contractor shall not be delinquent in the payment of any of its tax obligations or payments. A contractor is not considered to be delinquent in the payment of taxes pursuant to this Section if the contractor is contesting the imposition of a tax either administratively or judicially.

(3) A contractor shall employ citizens of the United States, or lawfully admitted permanent resident aliens in not less than eighty percent (80%) of the contractor's executive and management positions;

(4) A contractor shall employ resident workers in not less than thirty percent (30%) of its employment positions within the Commonwealth. A resident worker is defined in 3 CMC Section 4412(j).

(b) "Ultimate Ownership Interest" means, in the case of corporations owned by the corporations, the ownership interest of the owning corporation.

Section 145. Preference Given To Commonwealth Contractors

(a) Every construction or architect-engineer services contract funded by the Authority funds, or is or awarded otherwise by bid shall be awarded to a Commonwealth Contractor, unless a contractor who is not a Commonwealth Contractor is equally qualified and submits a bid which is 35% lower than that of the lowest responsible bid of a Commonwealth Contractor. The Executive Director shall ensure that the award of the contract to a contractor who is not a Commonwealth Contractor shall not in any way be injurious to the interest of the Commonwealth.

(b) Upon Certification by the Attorney General that this provision is preempted by applicable federal law with respect to a particular project, the Executive Director shall disregard the requirements of subsection (a) of this section.

CHAPTER 5. Protests and Disputes

Article 1 - Bid Protests and Appeals

Section 146. Protests

(a) General.

(1) Any actual or prospective bidder, offeror, or contractor who is aggrieved in connection with the solicitation or award of a contract may protest to the Executive Director. The protest shall be received by the Executive Director in writing within 10 days after such aggrieved person knows or should have known of the facts giving rise thereto. The Executive Director shall consider all protests or objections to the award of a contract, whether submitted before or after award. The written protest shall state fully the factual and legal grounds for the protest;

(2) Other persons, including bidders, involved in or affected by the protest shall be given notice of the protest and its basis in appropriate cases. These persons shall also be advised that they may submit their views and relevant information to the Executive Director within a specified period of time. Normally, the time specified will be one week;

(3) The Executive Director shall decide the protest within 30 calendar days after all interested parties have submitted their views unless they certify that the complexity of the matter requires a longer time, in which event they shall specify the appropriate longer time;

(4) When a protest, before or after award, has been appealed to the Public Auditor, as provided in these procedures, and the Executive Director is requested to submit a report, he should include with his report a copy of:

(A) the protest;

(B) the bid submitted by the protesting bidder and a copy of the bid of the bidder who is being considered for award, or whose bid is being protested;

(C) the solicitation, including the specifications on portions relevant to the protest;

(D) the abstract of offers or relevant portions;

(E) any other documents that are relevant to the protest; and

(F) the Executive Director's signed statements setting forth findings, actions, and recommendations and any additional evidence or information deemed necessary in determining the validity of the protest. The statement shall be fully responsive to the allegation of the protest. If the award was made after receipt of the protest, the Executive Director's reports will include the determination prescribed in subsection (b)(4) of this section.

(5) Since timely action on protests is essential, they should be handled on a priority basis. Upon receipt of notice that an appeal from the Executive Director's decision has been taken to the Public Auditor, the Executive Director shall immediately begin compiling the information necessary for a report as provided in subsection (4) above. To further expedite processing, the Executive Director who furnished the Authority's report should, upon request of the protestor or the Public Auditor, simultaneously furnish a complete copy (except for information priviliged by law or which the Executive Director deems must be confidential in order to benefit from competitive bidding) to the protestor. In such instances, the protestor shall be requested to furnish a copy of any comments on the administrative report directly to the Public Auditor as well as the Executive Director.

(b) <u>Protests Before Award</u>.

(1) The officials shall require that written confirmation of an oral protest be submitted by the time specified in Section 147(a)(1) and may inform the protestor that the award will be withheld until the specified time. If the written protest is not received by the time specified, an award may be made in the normal manner unless the Executive Director finds it necessary in his

discretion to take remedial action.

(2) When a proper protest against the making of an award is received, the award will be withheld pending disposition of the protest. The bidders whose bids might become eligible for award should be informed of the protest. In addition, those bidders should be requested, before expiration of the time for acceptance of their bids, to extend the time for acceptance to avoid the need for readvertisement. In the event of failure to obtain such extensions of bids, consideration should be given to proceeding with an award under subsection (a)(3), below.

(3) When a written protest is received, award shall not be made until the matter is resolved, unless the Executive Director determines that:

(A) the materials and services to be contracted for are urgently required;

(B) delivery or performance will be unduly delayed by failure to make award promptly; or

(C) a prompt award will otherwise be advantageous to the Commonwealth.

(4) If award is made under subsection (a)(3) above, the Executive Director shall document the file to explain the need for an immediate award. The Executive Director also shall give written notice to the protestor and others concerned of the decision to proceed with the award.

(c) Protests After Award. Although persons involved in or affected by the filing of a protest after award may be limited, in addition to the Executive Director, at least the contractor shall be furnished the notice of protest and its basis in accordance with subsection (a)(2) above. When it appears likely that an award may be invalidated and a delay in receiving the supplies or services is not prejudicial to the Authority's interest, the Executive Director should consider seeking a mutual agreement with the contractor to suspend performance on a no-cost basis.

(d) Computation of Time.

(1) Except as otherwise specified, all "days" referred to in this part are deemed to be working days of the Authority. The term "file" or "submit" except as otherwise provided refers to the date of transmission.

(2) In computing any period of time prescribed or allowed by these procedures, the day of the act or event from which the designated period of time begins to run shall not be included.

Section 147. Appeals of the Executive Director's Decision to the Public Auditor.

(a) Jurisdiction; Exhaustion of Remedies. A written appeal to the Public Auditor from a decision by the Executive Director may be taken provided that the party taking the appeal has first submitted a written protest to the Executive Director as provided in Section 147 of these Procedures, and the Executive Director has denied the protest or has failed to act on the protest within the time provided for in Section 147 (a)(3).

(b) Form of Appeal. No particular form of pleading is required for filing an appeal to the Public Auditor. The appeal shall, however:

(1) Include the name and address of the appellant;

(2) Identify the contracting agency and the number of the solicitation or contract;

(3) Contain a concise, logically arranged, and direct statement of the grounds for appeal; and

(4) Specifically request a ruling by the Public Auditor.

(c) Time for Filing Appeal. An appeal from the Executive Director's decision must be received by the office of the Public Auditor not later than ten days after the appellant received the decision of the Executive Director, or, in the event that the Executive Director has not decided the protest within ten days from the date that he should have decided the protest pursuant to Section 147 (a)(3) above. Any appeal received after these time limits shall not be considered by the Public Auditor unless good cause is shown or unless the Public Auditor determines that the appeal presents issues significant to procurement practices that are not outweighed by the detriment to the commonwealth should the appeal be considered.

(d) Notice of Protest, Submission of Report and Time for Filing of Comments on Reports.

(1) The Public Auditor shall notify the Executive Director by telephone and in writing within one day of receipt of an appeal, requesting the Executive Director to give notice of appeal to the contractor if award has been made or, if no award has been made, to all bidders or proposers who appear to have a substantial and reasonable prospect of receiving an award if the appeal is in accordance with Section 146 (a)(2) of these Procedures, copies of the protest and appeal documents to such parties with instructions to communicate further directly with the Public auditor.

(2) Material submitted by an appellant will not be withheld from any Commonwealth or federal agency which may be involved in the appeal except to the extent that the withholding of information is permitted or required by law or regulation. If the appellant considers that the protest contains materials which should be withheld, a statement advising of this fact must be affixed to the front page of the appeal document and the allegedly propriety information must be so identified wherever it appears.

(3) The Public Auditor shall request the Executive Director to submit a complete report on the appeal to the Public Auditor as expeditiously as possible (generally within 25 working days) in accordance with Section 146 (a)(4) of these regulations and to furnish a copy of the report to the appellant and other interested parties.

(4) Comments on the agency report shall be filed with the Public Auditor within 10 days after the Public Auditor's receipt of the report, with a copy to the agency office which furnished the report, and to other interested parties. Any rebuttal an appellant or interested party may care to make shall be filed with Public Auditor within five days after receipt of the comments to which rebuttal is directed, with a copy to the agency office which furnished the report, the appellant, and interested parties, as the case may be. Unsolicited agency rebuttals shall be considered if filed within five days after receipt by the agency of the comments to which rebuttals is directed.

(5) The failure of an appellant or any interested party to comply with the time limits stated in this section may result in resolution of the appeal without consideration of the comments untimely filed.

(e) Withholding of Award. When an appeal has been filed before award, the Executive Director will not make an award prior to resolution of the protest except as provided in Section 148 (b)(4) of these regulations. In the event the Executive Director determines that award is to be made during the pendency of an appeal, the Executive Director will notify the Public Auditor.

(f) Furnishing of Information on Protests. The Public Auditor shall, upon request, make available to any interested party information bearing on the substance of the appeal which has been submitted by interested parties or agencies, except to the extent that withholding of information is permitted or required by law or regulation. Any comments thereon shall be submitted within a maximum of ten days.

(g) Time for Submission of Additional Information. Any additional information requested by the Public Auditor from the appellant or interested parties shall be submitted no later than five days after the receipt of such request. If it is necessary to obtain additional information from the Executive Director, the Public Auditor will request that such information be furnished as expeditiously as possible.

(h) Conference.

(1) A conference on the merits of the appeal with the Public Auditor may be held at the request of the appellant, any other interested party, or the Executive Director. Request for a conference should be made prior to the expiration of the time period allowed for filing comments on the agency report. Except as unusual circumstances, requests for a conference received after such time will not be honored. The Public Auditor will determine whether a conference is necessary for

resolution of the appeal.

(2) Request for reconsideration of a decision of the Public Auditor shall be filed not later than ten days after the basis for reconsideration is known or should have been known, whichever is earlier. The term "filed" as used in this section means receipt in the Office of the Public Auditor.

(3) A request for reconsideration shall be subject to these bid protest procedures consistent with the need for prompt resolution of the matter.

Section 148. Remedies.

(a) Remedies Prior to Award. If prior to award the Executive Director or the Public Auditor determines that a solicitation or proposed award of a contract is in violation of law or regulation, then the solicitation or proposed award shall be:

(1) cancelled; or

(2) revised to comply with law or regulation.

(b) Remedies After an Award. If after an award the Executive Director or the Public Auditor determines that a solicitation or award of a contract is in violation of law or regulation, then:

(1) if the person awarded the contract has not acted fraudulently or in bad faith:

(A) the contract may be ratified and affirmed, provided it is determined that doing so is in the best interests of the Commonwealth; or

(B) the contract may be terminated and the person awarded the contract shall be compensated for the actual expenses reasonably incurred under the contract, plus a reasonable profit, prior to termination;

(2) if the person awarded the contract has acted fraudulently or in bad faith;

(A) the contract may be declared null and void; and

(B) the contract may be ratified and affirmed if such action is in the best interests of the Commonwealth's rights to such damages as may be appropriate.

(c) Finality of Findings of Fact by the Public Auditor. A determination of an issue of fact by the Public Auditor under these Procedures shall be final and conclusive unless it is arbitrary, capricious, fraudulent, or clearly erroneous.

Article 2 - Disputes

Section 149. Disputes.

(a) Any dispute between the Authority and a contractor to the performance, interpretation of or compensation due under a contract, which is the subject of these regulations must be filed in writing with the Executive Director within ten calendar days after knowledge of the facts surrounding the dispute.

(b) When a claim by or against a contractor cannot be satisfied or settled by mutual agreement and a decision on the dispute is necessary, the Executive Director shall review the facts pertinent to the dispute, secure necessary legal assistance and prepare a written description that shall include:

(1) description of the dispute;

(2) reference to pertinent contract terms;

(3) statement of the factual areas of disagreement of agreement; and

(4) statement of the decision as to the factual areas of disagreement and conclusion of the dispute with any supporting rationale.

(c) Appeals. The Executive Director shall review and render a decision on an appeal from an adverse decision timely taken by a contractor. The Executive Director may require a hearing or that information be submitted for the record, in their descretion. The Executive Director may affirm, reverse or modify the decision or demand for further consideration.

(d) Duty of Continue Performance. A contractor that has a dispute pending before the Executive Director must continue to perform according to the terms of the contract and failure to so continue shall be deemed to be a material breach of the contract unless he obtains a written waiver of this provision by the Board of Directors of the Authority.

CHAPTER 6. Ethics in Public Contracting

Section 150. Definitions of Terms.

(a) "Confidential information" means any information which is available to an employee only because of the employee's status as an employee of this Authority and is not a matter of public knowledge or available to the public on request.

(b) "Conspicuously" means written in such special or distinctive form, print or manner that a reasonable person against whom it is to operate ought to have noticed it.

(c) "Direct or indirect participation" means involvement through decision, approval, disapproval, recommendation, preparation of any part of a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing or in any other advisory capacity.

(d) "Financial interest" means:

(1) ownership of any interest involvement in any relationship from which or as a result of which, a person within the past year has received or is presently or in the future entitled to receive compensation; or

(2) holding a position in a business such as an officer, director, trustee, partner, employee or the like or holding any position of management.

(e) "Gratuity" means a payment, loan, subscription, advance, deposit of money, services or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value is received.

(f) "Immediate family" means spouse, dependent children, dependent parents, dependent brothers and dependent sisters.

Article 2 - Standards of Conduct

Section 151. Policy. Public employment is a public trust. In Authority contracting, Authority employees shall discharge their duties impartially so as to:

(a) insure fair competitive access to Authority procurement by reasonable contractors; and

(b) conduct themselves in a manner as to foster public confidence in the integrity of the Authority.

Section 152. General Standards.

(a) Employees. Any attempt to realize personal gain through Authority employment by conduct inconsistent with the proper discharge of the employee's duties is a breach of public trust. In order to fulfill this ethical standard, employees must meet the requirements of these regulations.

(b) Contractors. Any effort to influence any Authority employee to breach the standards of ethical conduct set forth in these regulations is a breach of ethical standards.

Section 153. Employee Disclosure Requirement.

(a) Disclosure of benefit received from contract. Any employee who has, or obtains any benefit from, any contract, funded or guaranteed, in whole or in part, by the Authority, with a business in which the employee has a financial interest shall report such benefit to the Executive Director.

(b) Failure to disclose benefit received. Any employee who knows or should have known of such benefit and fails to report such benefit is in breach of the ethical standards.

Section 154. Employee Conflict of Interest.

(a) Conflict of interest. It is a breach of ethical standards for any employee to participate directly or indirectly in a procurement when the employee knows that:

(1) the employee or any member of the employee's immediate family has a financial interest pertaining to the procurement;

(2) a business or organization in which the employee, or any member of the employee's immediate family, has a financial interest pertaining to the procurement; or

(3) any other person, business or organization with whom the employee or any member of the employee's immediate family is negotiating or has an arrangement concerning prospective employment is involved in the procurement.

(b) Discovery of actual or potential conflict of interest, disqualification and waiver. Upon discovery of an actual or potential conflict of interest, an employee shall promptly file with the Executive Director a written statement of disqualification and shall withdraw from further participation in the transaction involved. The employee may, at the same time, apply to the Public Auditor for an advisory opinion as to what further participation, if any, the employee may have in the transaction.

Section 155. Gratuities.

(a) Gratuities. No person shall offer, give or agree to give any current or former board member, director, officer, or employee any gratuity, except as provided for in Section 156(c) of these regulations.

Section 156. Prohibition Against Contingent Fees.

(a) Contingent fees. It shall be a breach of ethical standards for a person to be retained, or to retain a person to solicit or secure Authority contracts upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, except for retention of bona fide employees or bona fide established commercial selling agencies for the purpose of securing business.

(b) Representation of contractor. Every person, before being awarded a Authority contract, shall represent, in writing that such person has not retained anyone in violation of this section or of the Lobbyist Disclosure Act (1 CMC section 94411 et. seq.). Failure to do so constitutes a breach of ethical standards.

Section 157. Contract Clauses. The prohibitions against gratuities, kickbacks and against contingent fees shall be conspicuously set forth in every contract and solicitation therefor.

Section 158. Restrictions on Employment of Present and Former Employees.

(a) Present employees. It shall be a breach of ethical standards for any employee who is participating directly or indirectly in the procurement process to become or be while such an employee, the employee of any person contracting with the Authority by whom the employee is employed.

(b) Restrictions on former employees in matters connected with their former duties.

(1) Permanent disqualification of former employee personally involved in a particular matter. It shall be a breach of ethical standards for any former employee knowingly to act as a principal or an agent for anyone other than the Authority, in connection with any:

(A) judicial or other proceeding, application, request for a ruling or other determination;

(B) contract;

(C) charge or controversy in which the employee participated personally and substantially through decision, approval, disapproval, recommendation, rendering of advice, investigation or otherwise while an employee, where the Authority is a party or has direct or substantial interest.

(c) Disqualification of business when an employee has a financial interest. It shall be a breach of ethical standards for a business in which an employee has a financial interest knowingly to act as a principal, or as an agent for anyone other than the Authority, in connection with any:

(1) judicial or other proceeding, application, request for a ruling or other determination;

(2) contract;

(3) claim; or

(4) charge or controversy in which the employee either participate personally and substantially through decision, approval, disapproval, recommendation, the rendering of advice, investigation or otherwise, or which is the subject of the employee's official responsibility, where the Authority is a party or has a direct or substantial interest.

Section 159. Use of Confidential Information. It shall be a breach of ethical standards for any employee or former employee to knowingly use confidential information for actual or anticipated personal gain, or the actual or anticipated personal gain of any other person.

Section 160. Collusion by Bidders. Collusion or secret agreements between bidders for the purpose of securing an advantage to the bidders against the authorizing agent in the awarding of contracts is prohibited. The Executive Director may declare the contract void if they find sufficient evidence after a contract has been let that the contract was obtained by a bidder or bidders by reason of collusive or secret agreement among the bidders to the disadvantage of the Authority.

Section 161. Penalties.

(a) Authority employees. An "Authority employee" is any person whether appointed, elected, excepted service or civil service. An employee who violates the provisions of these regulations is subject to adverse action as may be appropriate in his or her particular circumstances. This action includes but is not limited to reprimand, suspension without pay, termination of employment, civil injunction, civil suit for damages or return of Authority money, or criminal prosecution.

(b) Contractors. A contractor who violates a provision of these rules and regulations shall be subject to a written warning of reprimand, the termination of the contract or suspension from being a contractor or subcontractor under an Authority contract in addition to other penalties prescribed by law.

(c) All proceedings under this section shall be in accordance with due process requirements.

Section 162. Authority to Debar or Suspend.

(a) Authority. After reasonable notice to the person involved and reasonable opportunity for the person to be heard under the Administrative Procedures Act, the Executive Director, after consultation with the Attorney General, shall have authority to debar a person for cause from consideration for award of contracts. The debarment shall not be for a period of more than three years. The Executive Director, after consultation with the Attorney General, shall have authority to suspend a person from consideration for award of contracts if there is probable cause for debarment. The suspension shall not be for a period exceeding three months.

(b) Causes for debarment of suspension The causes for debarment or suspension include the following:

(1) conviction for commission of a criminal offense incident to obtaining or attempting to obtain a public or private contract or subcontract, or in the performance of such contract or subcontract;

(2) conviction under Commonwealth or federal statues of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, violation of the Consumer Protection Act (4 CMC section 5101 et. seq.), violation of any unfair practices as prescribed by 4 CMC section 5202, or any other offense indicating a lack of business integrity or business honesty which currently, seriously and directly affects responsibility as an Authority contractor;

(3) conviction under Commonwealth or federal antitrust statues arising out of the submission of bids or proposals such as in Chapter 2 of Division 5 of Title 4 of the Commonwealth Code;

(4) violation of contract provisions, as set forth below, of a character which is regarded by the Authority to be so serious as to justify debarment action:

(A) deliberate failure without good cause to perform in accordance with the specifications within the time limits provided in the contract; or

(B) a recent record of failure to perform or of unsatisfactory performance in accordance with the terms of one or more contracts; provided that failure to perform or unsatisfactory performance caused by acts beyond the control of the contractor shall not be considered a basis for debarment;

(5) any other cause that the Authority determines to be so serious and compelling as to effect responsibility as a governmental entity; and

(6) for violation of any of the ethical standards set forth in Chapter 6 of these regulations.

(c) Decision. The Executive Director shall issue a written decision to debar or suspend. The decision shall state the reasons for the action taken.

(d) Notice of decision. A copy of the decision shall be mailed or otherwise furnished immediately to the debarred or suspended person.

Section 163. Statutory Authority: These regulations are promulgated pursuant to Section 6(a)(2) the Commonwealth Development Authority Act of 1984, codified at 4 CMC Sec. 10101 et. seq.

Section 164. Regulations. The Executive Director may issue such regulations and forms as he deems necessary to administer and enforce these regulations.

Section 165. <u>Effective Date</u>. These regulations shall take effect 90 days after its approval by the Board of Directors of the Commonwealth Development Authority, upon its becoming effective. Excepting loans or guarantees made by the Development Corporation Division of the Commonwealth Development Authority, these regulations shall become a part of any agreement entered into by the Authority in which the Authority's funds and/or guarantees, in any amount or parts whatsoever, are provided.

Commonwealth of the Northern Mariana Islands
Department of Public Health & Environmental Services
Division of Environmental Quality
P.O. Box 1304
Saipan, Mariana Islands 96950

Tels: (670) 234-6114/6984
Fax: (670) 234-1003

PUBLIC NOTICE
PROPOSED SAFE DRINKING WATER REGULATIONS PROMULGATED UNDER THE AUTHORITY OF
2 CMC §§ 3101 to 3134 and 1 CMC §§ 2601 to 2605
by the
DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENTAL SERVICES

The Director of Public Health and Environmental Services, of the Commonwealth of the Northern Mariana Islands (CNMI), in accordance with 2 CMC §§ 3101 to 3134 and 1 CMC §§ 2601 to 2605, proposes amendments to the existing CNMI Drinking Water Regulations. These proposed changes conform with the requirements imposed on Commonwealth in the Federal Safe Drinking Water Act.

The proposed changes pertain to the requirements set forth in the United States Environmental Protection Agency (EPA) National Primary Drinking Water Regulations which include maximum contaminant levels and monitoring requirements for fifty-seven (57) contaminants including inorganic chemicals, volatile organic compounds, and synthetic organic compounds. A proposed minor modification in the definitions for drinking water regulations is also included to maintain consistency with the federal Surface Water Treatment Rule requirements. Due to the size and scope of these federal regulations, it is proposed that the proposed amendments are incorporated by reference into the existing CNMI Drinking Water regulations. Copies of the final regulations are attached to the proposed CNMI drinking water regulations amendments.

Comments, suggestion, and concerns about the proposed Drinking Water regulation amendments are encouraged and welcomed. All comments concerning the proposed Drinking Water regulations must be submitted in writing to the Department of Public Health and Environmental Services, Division of Environmental Quality, located on the third floor of the Morgen Building in San Jose, Saipan (P.O. Box 1304, Saipan, MP 96950), within thirty (30) days of publication in the Commonwealth Register.

Copies of the promulgated EPA Drinking Water rules are also available for viewing at the office of the Department of Public Health and Environmental Services, Division of Environmental Quality, located on the third floor of the Morgen Building in San Jose, Saipan, MP 96950.

Date: 7/1/94

DR. ISAMU J. ABRAHAM, Director
Public Health and Environmental Services

Date: 7/1/94

MIRIAM K. SEMAN, Chief
Division of Environmental Quality

Filed by:
Date: 7/5/94

SOLEDAD B. SASAMOTO
Registrar of Corporations

Received at Governor's Office:

Date: 7/5/94

DONNA J. CRUZ

Commonwealth of the Northern Mariana Islands
Department of Public Health & Environmental Services
Division of Environmental Quality
P.O. Box 1304
Saipan, Mariana Islands 96950
Tels: (670) 234-6114/6984
Fax: (670) 234-1003

NUTISIAN PUPBLIKU
I MAPROPONI NA AMENDASION GI REGULASION HANOM MA'GIMEN NI MAFATINAS SIGUN GI ATURIDAT
2 CMC §§ 3101 ASTA 3134 YAN 1 CMC §§ 2601 ASTA 2605
GINEN
DIPATAMENTON PUBLIC YAN ENVIRONMENTAL SERVICES

I Direktot Dipatamenton Public Health yan Environmental Services gi halom Commonwealth of the Northern Mariana Islands (CNMI), sigun gi 2 CMC §§ 3101 asta 3134 yan 1 CMC §§ 2601 asta 2605, maproponi amendasion para i prisente na regulasion Hanom Ma'gimen para CNMI. Este siha na tinulaika put i para u akonfotma yan ayu i manmarekomenda yan imposta gi Commonwealth sigun gi Federal Safe Drinking Water Act.

I manmaproponi siha na tinulaika put i rekomendasion ni ginen United States Environmental Protection Agency (EPA) National Primary Drinking Water Regulations put i (57) siha na klasen binenu yan chinemman binenu siha ni enklusu kemikat inorganic, volatile organic compounds, yan synthetic organic compounds. Enklusu lookue' i maproponi menot na tinulaika put ribision definision siha gi halom Regulasion Hanom Ma'gimen, put i para u parehu yan i rekomendasion siha ni ginaga'gao gi Federal Surface Water Treatment Rules. Put i mineddong yan embrasan esta siha na regulasion federat, maproponi na amendasion siha u manfanahalom gi prisente na Regulasion Hanom Ma'gimen giya CNMI. Kopian i uttimu na regulasion federat checheton yan i maproponi na amendasion gi regulasion hanom ma'gimen gi CNMI.

Komentu, rekomendasion, yan interes put i maproponi siha na Regulasion Hanom Ma'gimen manma sosoyu i pupbliku para u manafanhalom. Todu komenti siha debi di u fanmatuge' papa ya u masubmiti halom gi Dipatamenton Public Health yan Environmental Services, Division of Environmental Quality, ni gaige gi mina' tres bibenda hulo' gi Morgen Building giya San Jose, Saipan (P.O. Box 1304, Saipan, MP 96950), gi halom trenta (30) dias desde malaknosna este na nutisia gi halom Rehistran Commonwealth.

Para hayi interesao na petsona, siña mañule kopian Regulasion EPA gi para Hanom Ma'gimen gi Ufisinan Division of Environmental Quality, mina' tres bibenda hulo' gi halom Morgen Building, giya San Jose, Saipan, MP 96950.

Fecha: 7/1/94

DR. ISAMU J. ABRAHAM, Direktot
Public Health yan Environmental Services

Fecha: 7/1/94

MIRIAM K. SEMAN, Chief
Division of Environmental Quality

Ma file as;

Fecha: 7/5/94

SOLEDAD B. SASAMOTO
Registrar of Corporations

Marisibi gi Ufisinan Gobietno:

Fecha: 7/5/94

DONNA J. CRUZ

Commonwealth of the Northern Mariana Islands
Department of Public Health & Environmental Services
Division of Environmental Quality
P.O. Box 1304
Saipan, Mariana Islands 96950
Tels: (670) 234-6114/6984
Fax: (670) 234-1003

ARONGORONGOL TOWLAP
FFÉÉRÚL LLIIWEL MELLÓL ÓWTOL ALLÉGHÚL SCHALÚL ÚÚL IYE E FFEER SÁNGI BWÁNGIL MILLE
2 CMC §§ 3101 NGÁLI 3134 ME 1 CMC §§ 2601 NGÁLI 2605
SÁNGI
DIPATAMENTOOL PUBLIC HEALTH ME ENVIRONMENTAL SERVICES

Direktoodul Dipatamentool Public Health me Environmental Services, mellól Commonwealth of the Northern Mariana Islands (CNMI), sángi bwángil me ailééwal mille 2 CMC §§ 3101 ngáli 3134 me 1 CMC §§ 2601 ngáli 2605 nge ebwe ayoora lliiwel mellól Alléghúl Schalúl Úúl mellól CNMI. Lliiwel kkaal nge ebwe ghol fengál me akkúlé kka re ngalleey Commonwealth reel mille Federal Safe Drinking Water Act.

Lliiwel kkaal nge ebwe tabweey milikka llól ówtol Alléghúl United States Environmental Protection Agency (EPA) National Drinking Water Regulations iye ebwal yoorolong igha rebwe amwuri fischiiy milikka limeigh me fisuuw (57) ikka e bineeno nge organic chemicals, volatile organic compounds, me synthetic organic compounds. LLiiwel kkaal nge ebwe atotoolong milikka aweweel ngáre ammataf reel alléghúl schálúl úúl iye ebwe weewe fengál me ówtol Surface Water Treatment Rules. Reel llapal me tool allégh kkaal nge e fil bwe ebwe atotoolong milikkaal llól Alléghúl CNMI Drinking Water Regulations. Kopiyaal Alléghúl federóód kkaal nge iye e appasch ngáli Alléghúl Schalúl Úúl mellól CNMI, nge iye ebwal yoor lliiwel llól ówtol.

Mángemáng me tiip reel lliiwel kaa llól ówtol Alléghúl Schálúl Úúl nge emmwel schagh le e mwuschál ebwe ischiitiw nge aa afanga ngáli Bwulasiyool Dipatamentool Public Health me Environmental Services, Division of Environmental Quality iye elo aiyeluuwal bibenda mellól Morgen Building me San Jose, Saipan (P.O. Box 1304, Saipan, MP 96950), llól eliigh (30) rál sángi igha e toowow arongorong yeel mellól Commonwealth Register.

Kkopiyaal Alléghúl Schalúl Úúl EPA, nge eyoor llól Bwulasiyool Environmental Quality, aiyeluuwal bibenda mellól Morgen Building iye elo San Jose, Saipan, MP 96950.

Rál: 7/1/94

DR. ISAMU J. ABRAHAM, Direktoodul
Public Health me Environmental Services

Rál: 7/1/94

MIRIAM K. SEMAN, Chief-il
Division of Environmental Quality

File-liiyal

Rál: 7/5/94

SOLEDAD B. SASAMOTO
Registrar of Corporations

Re risiibi mellól Bwulasiyool Gubenno

Rál: 7/5/94

DONNA J. CRUZ

Revisions to the Drinking Water Regulations

These proposed amendments to the current CNMI Drinking Water Regulations, published in the Commonwealth Register, Volume 14, Number 12, December 15, 1992, pages 10215 through 10361, are promulgated under the authority of 2 CMC §§3101 to 3134 and 1 CMC §§2601 to 2605 and are intended to bring the Commonwealth into compliance with the federal Safe Drinking Water Act. The revised language is highlighted in bold print, and the amended sections shall read as set forth below.

Part 3, Definitions, section 3.15 shall be amended as follows:

3.15 "CT" or "CTcalc" is amended to incorporate by reference Tables 1.5, 1.6, 2.1, and 3.1 as found in 40 C.F.R. § 141.74 (b)(3).

The introductory portion of Part 5, Drinking Water Quality Standards, shall be amended as follows:

This part of the regulations establishes the drinking water standards and the requirements for self-monitoring by the supplier of the water. **Except as specified otherwise, all public water systems must meet the drinking water quality standards and monitoring requirements of the existing CNMI Drinking Water regulations and the National Primary Drinking Water Regulations, as set forth in July 1, 1993 edition of the 40 C.F.R. §§ 141.1, 141.4, 141.5, 141.11 to 141.16 inclusive, 141.21 to 141.30 inclusive, 141.61, 141.62, 141.63, 141.100, 141.101, 141.110 and 141.111.**

The National Primary Drinking Water Regulations, as set forth in the July 1, 1993 edition of 40 C.F.R. §§ 141.1, 141.4, 141.5, 141.11 to 141.16 inclusive, 141.21 to 141.30 inclusive, 141.40 to 141.42 inclusive, 141.61, 141.62, 141.63, 141.100, 141.101, 141.110 and 141.111, and attached hereto, are adopted by reference. Copies of the federal regulations are also available from the CNMI DEQ office located on the third floor of the Morgen Building in San Jose, Saipan (P.O. Box 1304, Saipan, MP 96950).

In those sections where the National Primary Drinking Water Regulations provide state discretion in establishing monitoring frequencies, checking sampling requirements, and determining compliance with maximum contaminant levels or recordkeeping or notification requirements, such discretion must be exercised by the Director of the Department of Health and Environmental Services.

Part 5, Drinking Water Quality Standards, Subsection 5.5.1(b), shall be amended as follows:

(b) The following are the maximum contaminant levels for inorganic chemicals:

Contaminant	Level Milligrams Per Liter
Abestos	7 Million Fibers/liter (longer than 10 μm.)
Barium	**2.0**
Cadmium	**0.005**
Chromium	**0.1**
Mercury	0.002
Nitrate (as N)	10.0
Nitrite (as N)	**1 (as Nitrogen)**
Total Nitrate and Nitrite	**10 (as Nitrogen)**
Selenium	0.01
Fluoride	**4.0**

Revisions to the Drinking Water Regulations

These proposed amendments to the current CNMI Drinking Water Regulations, published in the Commonwealth Register, Volume 14, Number 12, December 15, 1992, pages 10215 through 10361, are promulgated under the authority of 2 CMC §§3101 to 3134 and 1 CMC §§2601 to 2605 and are intended to bring the Commonwealth into compliance with the federal Safe Drinking Water Act. The revised language is highlighted in bold print, and the amended sections shall read as set forth below.

Part 3, Definitions, section 3.15 shall be amended as follows:

3.15 "CT" or "CTcalc" is amended to incorporate by reference Tables 1.1 through 1.6, 2.1, and 3.1 as found in 40 C.F.R. § 141.74 (b)(3).

The introductory portion of Part 5, Drinking Water Quality Standards, shall be amended as follows:

This part of the regulations establishes the drinking water standards and the requirements for self-monitoring by the supplier of the water. **Except as specified otherwise, all public water systems must meet the drinking water quality standards and monitoring requirements of the existing CNMI Drinking Water regulations and the National Primary Drinking Water Regulations, as set forth in July 1, 1993 edition of the 40 C.F.R. §§ 141.1, 141.4, 141.5, 141.11 to 141.16 inclusive, 141.21 to 141.30 inclusive, 141.61, 141.62, 141.63, 141.100, 141.101, 141.110 and 141.111.**

The National Primary Drinking Water Regulations, as set forth in the July 1, 1993 edition of 40 C.F.R. §§ 141.1, 141.4, 141.5, 141.11 to 141.16 inclusive, 141.21 to 141.30 inclusive, 141.40 to 141.42 inclusive, 141.61, 141.62, 141.63, 141.100, 141.101, 141.110 and 141.111, and attached hereto, are adopted by reference. Copies of the federal regulations are also available from the CNMI DEQ office located on the third floor of the Morgen Building in San Jose, Saipan (P.O. Box 1304, Saipan, MP 96950).

In those sections where the National Primary Drinking Water Regulations provide state discretion in establishing monitoring frequencies, checking sampling requirements, and determining compliance with maximum contaminant levels or recordkeeping or notification requirements, such discretion must be exercised by the Director of the Department of Health and Environmental Services.

Part 5, Drinking Water Quality Standards, Subsection 5.5.1(b), shall be amended as follows:

(b) The following are the maximum contaminant levels for inorganic chemicals:

Contaminant	Level Milligrams Per Liter
Abestos	7 Million Fibers/liter (longer than 10 μm.)
Arsenic	0.05
Barium	**2.0**
Cadmium	**0.005**
Chromium	**0.1**
Mercury	0.002
Nitrate (as N)	10.0
Nitrite (as N)	**1 (as Nitrogen)**
Total Nitrate and Nitrite	**10 (as Nitrogen)**
Selenium	0.01
Fluoride	**4.0**

141.82 Description of corrosion control treatment requirements.
141.83 Source water treatment requirements.
141.84 Lead service line replacement requirements.
141.85 Public education and supplemental monitoring requirements.
141.86 Monitoring requirements for lead and copper in tap water.
141.87 Monitoring requirements for water quality parameters.
141.88 Monitoring requirements for lead and copper in source water.
141.89 Analytical methods.
141.90 Reporting requirements.
141.91 Recordkeeping requirements.

Subpart J—Use of Non-Centralized Treatment Devices

141.100 Criteria and procedures for public water systems using point-of-entry devices.
141.101 Use of other non-centralized treatment devices.

Subpart K—Treatment Techniques

141.110 General requirements.
141.111 Treatment techniques for acrylamide and epichlorohydrin.

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

SOURCE: 40 FR 59570, Dec. 24, 1975, unless otherwise noted.

NOTE: For community water systems serving 75,000 or more persons, monitoring must begin 1 year following promulgation and the effective date of the MCL is 2 years following promulgation. For community water systems serving 10,000 to 75,000 persons, monitoring must begin within 3 years from the date of promulgation and the effective date of the MCL is 4 years from the date of promulgation. Effective immediately, systems that plan to make significant modifications to their treatment processes for the purpose of complying with the TTHM MCL are required to seek and obtain State approval of their treatment modification plans. This note affects §§141.2, 141.6, 141.12, 141.24 and 141.30. For additional information see 44 FR 68641, Nov. 29, 1979.

Subpart A—General

§ 141.1 Applicability.

This part establishes primary drinking water regulations pursuant to section 1412 of the Public Health Service Act, as amended by the Safe Drinking Water Act (Pub. L. 93-523); and related regulations applicable to public water systems.

§ 141.2 Definitions.

As used in this part, the term:

Act means the Public Health Service Act, as amended by the Safe Drinking Water Act, Public Law 93-523.

Action level, is the concentration of lead or copper in water specified in §141.80(c) which determines, in some cases, the treatment requirements contained in subpart I of this part that a water system is required to complete.

Best available technology or *BAT* means the best technology, treatment techniques, or 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). For the purposes of setting MCLs for synthetic organic chemicals, any BAT must be at least as effective as granular activated carbon.

Coagulation means a process using coagulant chemicals and mixing by which colloidal and suspended materials are destabilized and agglomerated into flocs.

Community water system means a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

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.

Confluent growth means a continuous bacterial growth covering the entire filtration area of a membrane filter, or

Service line sample means a one-liter sample of water collected in accordance with § 141.86(b)(3), that has been standing for at least 6 hours in a service line.

Single family structure, for the purpose of subpart I of this part only, means a building constructed as a single-family residence that is currently used as either a residence or a place of business.

Slow sand filtration means a process involving passage of raw water through a bed of sand at low velocity (generally less than 0.4 m/h) resulting in substantial particulate removal by physical and biological mechanisms.

Small water system, for the purpose of subpart I of this part only, means a water system that serves 3,300 persons or fewer.

Standard sample means the aliquot of finished drinking water that is examined for the presence of coliform bacteria.

State means the agency of the State or Tribal government which has jurisdiction over public water systems. During any period when a State or Tribal government does not have primary enforcement responsibility pursuant to section 1413 of the Act, the term "State" means the Regional Administrator, U.S. Environmental Protection Agency.

Supplier of water means any person who owns or operates a public water system.

Surface water means all water which is open to the atmosphere and subject to surface runoff.

System with a single service connection means a system which supplies drinking water to consumers via a single service line.

Too numerous to count means that the total number of bacterial colonies exceeds 200 on a 47-mm diameter membrane filter used for coliform detection.

Total trihalomethanes (TTHM) means the sum of the concentration in milligrams per liter of the trihalomethane compounds (trichloromethane [chloroform], dibromochloromethane, bromodichloromethane and tribromomethane [bromoform]), rounded to two significant figures.

Trihalomethane (THM) means one of the family of organic compounds, named as derivatives of methane, wherein three of the four hydrogen atoms in methane are each substituted by a halogen atom in the molecular structure.

Virus means a virus of fecal origin which is infectious to humans by waterborne transmission.

Waterborne disease outbreak means the significant occurrence of acute infectious illness, epidemiologically associated with the ingestion of water from a public water system which is deficient in treatment, as determined by the appropriate local or State agency.

[40 FR 59570, Dec. 24, 1975, as amended at 41 FR 28403, July 9, 1976; 44 FR 68641, Nov. 29, 1979; 51 FR 11410, Apr. 2, 1986; 52 FR 20674, June 2, 1987; 52 FR 25712, July 8, 1987; 53 FR 37410, Sept. 26, 1988; 54 FR 27526, 27562, June 29, 1989; 56 FR 3578, Jan. 30, 1991; 56 FR 26547, June 7, 1991; 57 FR 31838, July 17, 1992]

§ 141.3 Coverage.

This part shall apply to each public water system, unless the public water system meets all of the following conditions:

(a) Consists only of distribution and storage facilities (and does not have any collection and treatment facilities);

(b) Obtains all of its water from, but is not owned or operated by, a public water system to which such regulations apply:

(c) Does not sell water to any person; and

(d) Is not a carrier which conveys passengers in interstate commerce.

§ 141.4 Variances and exemptions.

(a) Variances or exemptions from certain provisions of these regulations may be granted pursuant to sections 1415 and 1416 of the Act by the entity with primary enforcement responsibility, except that variances or exemptions from the MCL for total coliforms and variances from any of the treatment technique requirements of subpart H of this part may not be granted.

(b) EPA has stayed the effective date of this section relating to the total coliform MCL of § 141.63(a) for systems that demonstrate to the State that the violation of the total coliform MCL is due to a persistent growth of total coliforms in the distribution system rather than fecal or pathogenic contamination, a treatment lapse or deficiency, or a problem in the operation or maintenance of the distribution system.

[54 FR 27562, June 29, 1989, as amended at 56 FR 1557, Jan. 15, 1991]

§ 141.5 Siting requirements.

Before a person may enter into a financial commitment for or initiate construction of a new public water system or increase the capacity of an existing public water system, he shall notify the State and, to the extent practicable, avoid locating part or all of the new or expanded facility at a site which:

(a) Is subject to a significant risk from earthquakes, floods, fires or other disasters which could cause a breakdown of the public water system or a portion thereof; or

(b) Except for intake structures, is within the floodplain of a 100-year flood or is lower than any recorded high tide where appropriate records exist. The U.S. Environmental Protection Agency will not seek to override land use decisions affecting public water systems siting which are made at the State or local government levels.

§ 141.6 Effective dates.

(a) Except as provided in paragraphs (b) through (g) of this section, the regulations set forth in this part shall take effect on June 24, 1977.

(b) The regulations for total trihalomethanes set forth in § 141.12(c) shall take effect 2 years after the date of promulgation of these regulations for community water systems serving 75,000 or more individuals, and 4 years after the date of promulgation for communities serving 10,000 to 74,999 individuals.

(c) The regulations set forth in §§ 141.11 (a), (d) and (e); 141.14(a)(1); 141.14(b)(1)(i); 141.14(b)(2)(i); 141.14(d); 141.21 (a), (c) and (i); 141.22 (a) and (e); 141.23 (a)(3) and (a)(4); 141.23(f); 141.24(a)(3); 141.24 (e) and (f); 141.25(e); 141.27(a); 141.28 (a) and (b); 141.31 (a), (d) and (e); 141.32(b)(3); and 141.32(d) shall take effect immediately upon promulgation.

(d) The regulations set forth in § 141.41 shall take effect 18 months from the date of promulgation. Suppliers must complete the first round of sampling and reporting within 12 months following the effective date.

(e) The regulations set forth in § 141.42 shall take effect 18 months from the date of promulgation. All requirements in § 141.42 must be completed within 12 months following the effective date.

(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.

(g) The regulations contained in § 141.6, paragraph (c) of the table in 141.12, and 141.62(b)(1) are effective July 1, 1991. The regulations contained in §§ 141.11(b), 141.23, 141.24, 142.57(b), 143.4(b)(12) and (b)(13), are effective July 30, 1992. The regulations contained in the revisions to §§ 141.32(e) (16), (25) through (27) and (46); 141.61(c)(16); and 141.62(b)(3) are effective January 1, 1993. The effective date of regulations contained in § 141.61(c) (2), (3), and (4) is postponed.

(h) Regulations for the analytic methods listed at § 141.23(k)(4) for measuring antimony, beryllium, cyanide, nickel, and thallium are effective August 17, 1992. Regulations for the analytic methods listed at § 141(f)(16) for dichloromethane, 1,2,4-trichlorobenzene, and 1,1,2-trichloroethane are effective August 17, 1992. Regulations for the analytic methods listed at § 141.24(h)(12) for measuring dalapon, dinoseb, diquat, endothall, endrin, glyphosate, oxamyl, picloram, simazine, benzo(a)pyrene, di(2-ethylhexyl)adipate, di(2-ethylhexyl)phthalate, hexachlorobenzene, hexachlorocyclopentadiene, and 2,3,7,8-TCDD are effective August 17, 1992. The revision to § 141.12(a) promulgated on July 17, 1992 is effective on August 17, 1992.

[44 FR 68641, Nov. 29, 1979, as amended at 45 FR 57342, Aug. 27, 1980; 47 FR 10998, Mar. 12, 1982; 51 FR 11410, Apr. 2, 1986; 56 FR 30274, July 1, 1991; 57 FR 22178, May 27, 1992; 57 FR 31838, July 17, 1992]

Subpart B—Maximum Contaminant Levels

1.11 Maximum contaminant levels for inorganic chemicals.

(a) The MCL for nitrate is applicable to both community water systems and non-community water systems except as provided by in paragraph (d) of this section. The levels for the other inorganic chemicals apply only to community water systems. Compliance with MCLs for inorganic chemicals is calculated pursuant to §141.23.

(b) The following maximum contaminant levels for cadmium, chromium, mercury, nitrate, and selenium shall remain effective until July 30, 1992. The following maximum contaminant level for lead shall remain effective until December 7, 1992.

Contaminant	Level, milligrams per liter
Arsenic	0.05
Barium	1
Cadmium	0.010
Chromium	0.05
Lead	0.05
Mercury	0.002
Nitrate (as N)	10
Selenium	0.01

(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.

(d) At the discretion of the State, nitrate levels not to exceed 20 mg/l may be allowed in a non-community water system if the supplier of water demonstrates to the satisfaction of the State that:

(1) Such water will not be available to children under 6 months of age; and

(2) There will be continuous posting of the fact that nitrate levels exceed 10 mg/l and the potential health effects of exposure; and

(3) Local and State public health authorities will be notified annually of nitrate levels that exceed 10 mg/l; and

(4) No adverse health effects shall result.

[40 FR 59570, Dec. 24, 1975, as amended at 45 FR 57342, Aug. 27, 1980; 47 FR 10998, Mar. 12, 1982; 51 FR 11410, Apr. 2, 1986; 56 FR 3578, Jan. 30, 1991; 56 FR 26548, June 7, 1991; 56 FR 30274, July 1, 1991; 56 FR 32113, July 15, 1991]

§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 10,000 or more individuals and which add a disinfectant (oxidant) to the water in any part of the drinking water treatment process. Compliance with the maximum contaminant level for total trihalomethanes is calculated pursuant to §141.30.

	Level, milligrams per liter
(a) [Reserved]	
(b) [Reserved]	
(c) Total trihalomethanes (the sum of the concentrations of bromodichloromethane, dibromochloromethane, tribromomethane (bromoform) and trichloromethane (chloroform))	0.10

[56 FR 3578, Jan. 30, 1991, as amended at 57 FR 31838, July 17, 1992]

§141.13 Maximum contaminant levels for turbidity.

The maximum contaminant levels for turbidity are applicable to both community water systems and non-community water systems using surface water sources in whole or in part. The maximum contaminant levels for turbidity in drinking water, measured at a representative entry point(s) to the distribution system, are:

(a) One turbidity unit (TU), as determined by a monthly average pursuant to §141.22, except that five or fewer turbidity units may be allowed if the supplier of water can demonstrate to the State that the higher turbidity does not do any of the following:

(1) Interfere with disinfection;

(2) Prevent maintenance of an effective disinfectant agent throughout the distribution system; or

(3) Interfere with microbiological determinations.

(b) Five turbidity units based on an average for two consecutive days pursuant to § 141.22.

[40 FR 59570, Dec. 24, 1975]

EFFECTIVE DATE NOTE: At 54 FR 27527, June 29, 1988, § 141.13 was amended, by adding introductory text, effective December 31, 1990. This section already contains an introductory text. EPA will publish a document at a later date clarifying the status of the current introductory text. For the convenience of the user, the added material follows.

§ 141.13 Maximum contaminant levels for turbidity.

The requirements in this section apply to unfiltered systems until December 30, 1991, unless the State has determined prior to that date, in writing pursuant to § 1412(b)(7)(C)(iii), that filtration is required. The requirements in this section apply to filtered systems until June 29, 1993. The requirements in this section apply to unfiltered systems that the State has determined, in writing pursuant to § 1412(b)(7)(C)(iii), must install filtration, until June 29, 1993, or until filtration is installed, whichever is later.

* * * * *

§ 141.15 Maximum contaminant levels for radium-226, radium-228, and gross alpha particle radioactivity in community water systems.

The following are the maximum contaminant levels for radium-226, radium-228, and gross alpha particle radioactivity:

(a) Combined radium-226 and radium-228—5 pCi/1.

(b) Gross alpha particle activity (including radium-226 but excluding radon and uranium)—15 pCi/1.

[41 FR 28404, July 9, 1976]

§ 141.16 Maximum contaminant levels for beta particle and photon radioactivity from man-made radionuclides in community water systems.

(a) The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/year.

(b) Except for the radionuclides listed in Table A, the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents shall be calculated on the basis of a 2 liter per day drinking water intake using the 168 hour data listed in "*Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure*," NBS Handbook 69 as amended August 1963, U.S. Department of Commerce. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed 4 millirem/year.

TABLE A—AVERAGE ANNUAL CONCENTRATIONS ASSUMED TO PRODUCE A TOTAL BODY OR ORGAN DOSE OF 4 MREM/YR

Radionuclide	Critical organ	pCi per liter
Tritium	Total body	20,000
Strontium–90	Bone marrow	8

[41 FR 28404, July 9, 1976]

Subpart C—Monitoring and Analytical Requirements

§ 141.21 Coliform sampling.

(a) *Routine monitoring.* (1) Public water systems must collect total coliform samples at sites which are representative of water throughout the distribution system according to a written sample siting plan. These plans are subject to State review and revision.

(2) The monitoring frequency for total coliforms for community water systems is based on the population served by the system, as follows:

TOTAL COLIFORM MONITORING FREQUENCY FOR COMMUNITY WATER SYSTEMS

Population served	Minimum number of samples per month
25 to 1,000[1]	1
1,001 to 2,500	2
2,501 to 3,300	3
3,301 to 4,100	4
4,101 to 4,900	5
4,901 to 5,800	6
5,801 to 6,700	7
6,701 to 7,600	8
7,601 to 8,500	9
8,501 to 12,900	10
12,901 to 17,200	15
17,201 to 21,500	20
21,501 to 25,000	25
25,001 to 33,000	30

TOTAL COLIFORM MONITORING FREQUENCY FOR COMMUNITY WATER SYSTEMS—Continued

Population served	Minimum number of samples per month
33,001 to 41,000	40
41,001 to 50,000	50
50,001 to 59,000	60
59,001 to 70,000	70
70,001 to 83,000	80
83,001 to 96,000	90
96,001 to 130,000	100
130,001 to 220,000	120
220,001 to 320,000	150
320,001 to 450,000	180
450,001 to 600,000	210
600,001 to 780,000	240
780,001 to 970,000	270
970,001 to 1,230,000	300
1,230,001 to 1,520,000	330
1,520,001 to 1,850,000	360
1,850,001 to 2,270,000	390
2,270,001 to 3,020,000	420
3,020,001 to 3,960,000	450
3,960,001 or more	480

[1] Includes public water systems which have at least 15 service connections, but serve fewer than 25 persons.

If a community water system serving 25 to 1,000 persons has no history of total coliform contamination in its current configuration and a sanitary survey conducted in the past five years shows that the system is supplied solely by a protected groundwater source and is free of sanitary defects, the State may reduce the monitoring frequency specified above, except that in no case may the State reduce the monitoring frequency to less than one sample per quarter. The State must approve the reduced monitoring frequency in writing.

(3) The monitoring frequency for total coliforms for non-community water systems is as follows:

(i) A non-community water system using only ground water (except ground water under the direct influence of surface water, as defined in §141.2) and serving 1,000 persons or fewer must monitor each calendar quarter that the system provides water to the public, except that the State may reduce this monitoring frequency, in writing, if a sanitary survey shows that the system is free of sanitary defects. Beginning June 29, 1994, the State cannot reduce the monitoring frequency for a non-community water system using only ground water (except ground water under the direct influence of surface water, as defined in §141.2) and serving 1,000 persons or fewer to less than once/year.

(ii) A non-community water system using only ground water (except ground water under the direct influence of surface water, as defined in §141.2) and serving more than 1,000 persons during any month must monitor at the same frequency as a like-sized community water system, as specified in paragraph (a)(2) of this section, except the State may reduce this monitoring frequency, in writing, for any month the system serves 1,000 persons or fewer. The State cannot reduce the monitoring frequency to less than once/year. For systems using ground water under the direct influence of surface water, paragraph (a)(3)(iv) of this section applies.

(iii) A non-community water system using surface water, in total or in part, must monitor at the same frequency as a like-sized community water system, as specified in paragraph (a)(2) of this section, regardless of the number of persons it serves.

(iv) A non-community water system using ground water under the direct influence of surface water, as defined in §141.2, must monitor at the same frequency as a like-sized community water system, as specified in paragraph (a)(2) of this section. The system must begin monitoring at this frequency beginning six months after the State determines that the ground water is under the direct influence of surface water.

(4) The public water system must collect samples at regular time intervals throughout the month, except that a system which uses only ground water (except ground water under the direct influence of surface water, as defined in §141.2), and serves 4,900 persons or fewer, may collect all required samples on a single day if they are taken from different sites.

(5) A public water system that uses surface water or ground water under the direct influence of surface water, as defined in §141.2, and does not practice filtration in compliance with Subpart H must collect at least one sample near the first service connection each day the turbidity level of the source water, measured as specified in §141.74(b)(2), exceeds 1 NTU. This sample must be

analyzed for the presence of total coliforms. When one or more turbidity measurements in any day exceed 1 NTU, the system must collect this coliform sample within 24 hours of the first exceedance, unless the State determines that the system, for logistical reasons outside the system's control, cannot have the sample analyzed within 30 hours of collection. Sample results from this coliform monitoring must be included in determining compliance with the MCL for total coliforms in § 141.63.

(6) Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, shall not be used to determine compliance with the MCL for total coliforms in § 141.63. Repeat samples taken pursuant to paragraph (b) of this section are not considered special purpose samples, and must be used to determine compliance with the MCL for total coliforms in § 141.63.

(b) *Repeat monitoring.* (1) If a routine sample is total coliform-positive, the public water system must collect a set of repeat samples within 24 hours of being notified of the positive result. A system which collects more than one routine sample/month must collect no fewer than three repeat samples for each total coliform-positive sample found. A system which collects one routine sample/month or fewer must collect no fewer than four repeat samples for each total coliform-positive sample found. The State may extend the 24-hour limit on a case-by-case basis if the system has a logistical problem in collecting the repeat samples within 24 hours that is beyond its control. In the case of an extension, the State must specify how much time the system has to collect the repeat samples.

(2) The system must collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. If a total coliform-positive sample is at the end of the distribution system, or one away from the end of the distribution system, the State may waive the requirement to collect at least one repeat sample upstream or downstream of the original sampling site.

(3) The system must collect all repeat samples on the same day, except that the State may allow a system with a single service connection to collect the required set of repeat samples over a four-day period or to collect a larger volume repeat sample(s) in one or more sample containers of any size, as long as the total volume collected is at least 400 ml (300 ml for systems which collect more than one routine sample/month).

(4) If one or more repeat samples in the set is total coliform-positive, the public water system must collect an additional set of repeat samples in the manner specified in paragraphs (b)(1)–(3) of this section. The additional samples must be collected within 24 hours of being notified of the positive result, unless the State extends the limit as provided in paragraph (b)(1) of this section. The system must repeat this process until either total coliforms are not detected in one complete set of repeat samples or the system determines that the MCL for total coliforms in § 141.63 has been exceeded and notifies the State.

(5) If a system collecting fewer than five routine samples/month has one or more total coliform-positive samples and the State does not invalidate the sample(s) under paragraph (c) of this section, it must collect at least five routine samples during the next month the system provides water to the public, except that the State may waive this requirement if the conditions of paragraph (b)(5) (i) or (ii) of this section are met. The State cannot waive the requirement for a system to collect repeat samples in paragraphs (b)(1)–(4) of this section.

(i) The State may waive the requirement to collect five routine samples the next month the system provides water to the public if the State, or an agent approved by the State, performs a site visit before the end of the next month the system provides water to the public. Although a sanitary survey need not be performed, the site visit must be sufficiently detailed to allow the State to determine whether additional monitoring and/or any corrective action is needed. The State cannot approve an employee of the system to perform this site visit, even if the employee is an agent approved by the State to perform sanitary surveys.

(ii) The State may waive the requirement to collect five routine samples the next month the system provides water to the public if the State has determined why the sample was total coliform-positive and establishes that the system has corrected the problem or will correct the problem before the end of the next month the system serves water to the public. In this case, the State must document this decision to waive the following month's additional monitoring requirement in writing, have it approved and signed by the supervisor of the State official who recommends such a decision, and make this document available to the EPA and public. The written documentation must describe the specific cause of the total coliform-positive sample and what action the system has taken and/or will take to correct this problem. The State cannot waive the requirement to collect five routine samples the next month the system provides water to the public solely on the grounds that all repeat samples are total coliform-negative. Under this paragraph, a system must still take at least one routine sample before the end of the next month it serves water to the public and use it to determine compliance with the MCL for total coliforms in §141.63, unless the State has determined that the system has corrected the contamination problem before the system took the set of repeat samples required in paragraphs (b)(1)–(4) of this section, and all repeat samples were total coliform-negative.

(6) After a system collects a routine sample and before it learns the results of the analysis of that sample, if it collects another routine sample(s) from within five adjacent service connections of the initial sample, and the initial sample, after analysis, is found to contain total coliforms, then the system may count the subsequent sample(s) as a repeat sample instead of as a routine sample.

(7) Results of all routine and repeat samples not invalidated by the State must be included in determining compliance with the MCL for total coliforms in §141.63.

(c) *Invalidation of total coliform samples.* A total coliform-positive sample invalidated under this paragraph (c) does not count towards meeting the minimum monitoring requirements of this section. (1) The State may invalidate a total coliform-positive sample only if the conditions of paragraph (c)(1)(i), (ii), or (iii) of this section are met.

(i) The laboratory establishes that improper sample analysis caused the total coliform-positive result.

(ii) The State, on the basis of the results of repeat samples collected as required by paragraphs (b) (1) through (4) of this section, determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem. The State cannot invalidate a sample on the basis of repeat sample results unless all repeat sample(s) collected at the same tap as the original total coliform-positive sample are also total coliform-positive, and all repeat samples collected within five service connections of the original tap are total coliform-negative (e.g., a State cannot invalidate a total coliform-positive sample on the basis of repeat samples if all the repeat samples are total coliform-negative, or if the public water system has only one service connection).

(iii) The State has substantial grounds to believe that a total coliform-positive result is due to a circumstance or condition which does not reflect water quality in the distribution system. In this case, the system must still collect all repeat samples required under paragraphs (b) (1)–(4) of this section, and use them to determine compliance with the MCL for total coliforms in §141.63. To invalidate a total coliform-positive sample under this paragraph, the decision with the rationale for the decision must be documented in writing, and approved and signed by the supervisor of the State official who recommended the decision. The State must make this document available to EPA and the public. The written documentation must state the specific cause of the total coliform-positive sample, and what action the system has taken, or will take, to correct this problem. The State may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

(2) A laboratory must invalidate a total coliform sample (unless total coliforms are detected) if the sample produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (e.g., the Multiple-Tube Fermentation Technique), produces a turbid culture in the absence of an acid reaction in the Presence-Absence (P-A) Coliform Test, or exhibits confluent growth or produces colonies too numerous to count with an analytical method using a membrane filter (e.g., Membrane Filter Technique). If a laboratory invalidates a sample because of such interference, the system must collect another sample from the same location as the original sample within 24 hours of being notified of the interference problem, and have it analyzed for the presence of total coliforms. The system must continue to re-sample within 24 hours and have the samples analyzed until it obtains a valid result. The State may waive the 24-hour time limit on a case-by-case basis.

(d) *Sanitary surveys.* (1)(i) Public water systems which do not collect five or more routine samples/month must undergo an initial sanitary survey by June 29, 1994, for community public water systems and June 29, 1999, for non-community water systems. Thereafter, systems must undergo another sanitary survey every five years, except that non-community water systems using only protected and disinfected ground water, as defined by the State, must undergo subsequent sanitary surveys at least every ten years after the initial sanitary survey. The State must review the results of each sanitary survey to determine whether the existing monitoring frequency is adequate and what additional measures, if any, the system needs to undertake to improve drinking water quality.

(ii) In conducting a sanitary survey of a system using ground water in a State having an EPA-approved wellhead protection program under section 1428 of the Safe Drinking Water Act, information on sources of contamination within the delineated wellhead protection area that was collected in the course of developing and implementing the program should be considered instead of collecting new information, if the information was collected since the last time the system was subject to a sanitary survey.

(2) Sanitary surveys must be performed by the State or an agent approved by the State. The system is responsible for ensuring the survey takes place.

(e) *Fecal coliforms/Escherichia coli (E. coli) testing.* (1) If any routine or repeat sample is total coliform-positive, the system must analyze that total coliform-positive culture medium to determine if fecal coliforms are present, except that the system may test for *E. coli* in lieu of fecal coliforms. If fecal coliforms or *E. coli* are present, the system must notify the State by the end of the day when the system is notified of the test result, unless the system is notified of the result after the State office is closed, in which case the system must notify the State before the end of the next business day.

(2) The State has the discretion to allow a public water system, on a case-by-case basis, to forgo fecal coliform or *E. coli* testing on a total coliform-positive sample if that system assumes that the total coliform-positive sample is fecal coliform-positive or *E. coli*-positive. Accordingly, the system must notify the State as specified in paragraph (e)(1) of this section and the provisions of § 141.63(b) apply.

(f) *Analytical methodology.* (1) The standard sample volume required for total coliform analysis, regardless of analytical method used, is 100 ml.

(2) Public water systems need only determine the presence or absence of total coliforms; a determination of total coliform density is not required.

(3) Public water systems must conduct total coliform analyses in accordance with one of the following analytical methods:

(i) Multiple-Tube Fermentation (MTF) Technique, as set forth in *Standard Methods for the Examination of Water and Wastewater*, 1985, American Public Health Association *et al.*, 16th edition, Method 908, 908A, and 908B—pp. 870–878, except that 10 fermentation tubes must be used; or *Microbiological Methods for Monitoring the Environment, Water and Wastes*, U.S. EPA, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268 (EPA-600/8-78-017, December 1978, available from ORD Publications, CERI, U.S. EPA, Cincinnati, Ohio 45268), Part III, Section B.4.1–4.6.4, pp. 114–118 (Most Probable Number Method), except that 10 fermentation tubes must be used; or

(ii) Membrane Filter (MF) Technique, as set forth in *Standard Methods for the Examination of Water and Wastewater*, 1985, American Public Health Association *et al.*, 16th edition, Method 909, 909A and 909B—pp. 886–896; or *Microbiological Methods for Monitoring the Environment, Water and Wastes*, U.S. EPA, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268 (EPA-600/8-78-017, December 1978, available from ORD Publications, CERI, U.S. EPA, Cincinnati, Ohio 45268), Part III, Section B.2.1–2.6, pp. 108–112; or

(iii) Presence-Absence (P-A) Coliform Test, as set forth in *Standard Methods for the Examination of Water and Wastewater*, 1985, American Public Health Association *et al.*, 16th edition, Method 908E—pp. 882–886; or

(iv) Minimal Medium ONPG–MUG (MMO–MUG) Test, as set forth in the article "National Field Evaluation of a Defined Substrate Method for the Simultaneous Detection of Total Coliforms and *Escherichia coli* from Drinking Water: Comparison with Presence-Absence Techniques" (Edberg *et al.*), Applied and Environmental Microbiology, Volume 55, pp. 1003–1008, April 1989. (Note: The MMO–MUG Test is sometimes referred to as the Autoanalysis Colilert System.) The MMO–MUG Test with hepes buffer in lieu of phosphate buffer is an acceptable minor revision.

(4) In lieu of the 10-tube MTF Technique specified in paragraph (f)(3)(i) of this section, a public water system may use the MTF Technique using either five tubes (20-ml sample portions) or a single culture bottle containing the culture medium for the MTF Technique, i.e., lauryl tryptose broth (formulated as described in *Standard Methods for the Examination of Water and Wastewater*, 1985, American Public Health Association *et al.*, 16th Edition, Method 908A—p. 872), as long as a 100-ml water sample is used in the analysis.

(5) Public water systems must conduct fecal coliform analysis in accordance with the following procedure. When the MTF Technique or Presence-Absence (PA) Coliform Test is used to test for total coliforms, shake the lactose-positive presumptive tube or P-A vigorously and transfer the growth with a sterile 3-mm loop or sterile applicator stick into brilliant green lactose bile broth and EC medium to determine the presence of total and fecal coliforms, respectively. For EPA-approved analytical methods which use a membrane filter, transfer the total coliform-positive culture by one of the following methods: remove the membrane containing the total coliform colonies from the substrate with a sterile forceps and carefully curl and insert the membrane into a tube of EC medium (the laboratory may first remove a small portion of selected colonies for verification), swab the entire membrane filter surface with a sterile cotton swab and transfer the inoculum to EC medium (do not leave the cotton swab in the EC medium), or inoculate individual total coliform-positive colonies into EC Medium. Gently shake the inoculated tubes of EC medium to insure adequate mixing and incubate in a waterbath at 44.5 ± 0.2 °C for 24 ± 2 hours. Gas production of any amount in the inner fermentation tube of the EC medium indicates a positive fecal coliform test. The preparation of EC medium is described in *Standard Methods for the Examination of Water and Wastewater*, 1985, American Public Health Association, 16th Edition, Method 908C—p. 879, paragraph 1a. Public water systems need only determine the presence or absence of fecal coliforms; a determination of fecal coliform density is not required.

(6) Public water systems must conduct analysis of *Escherichia coli* in ac-

cordance with one of the following analytical methods:

(i) EC medium supplemented with 50 µg/ml of 4-methylumbelliferyl-beta-D-glucuronide (MUG) (final concentration). EC medium is described in *Standard Methods for the Examination of Water and Wastewater*, 1985, American Public Health Association et al., 16th edition, p. 879. MUG may be added to EC medium before autoclaving. EC medium supplemented with 50 µg/ml of MUG is commercially available. At least 10 ml of EC medium supplemented with MUG must be used. The inner inverted fermentation tube may be omitted. The procedure for transferring a total coliform-positive culture to EC medium supplemented with MUG shall be as specified in paragraph (f)(5) of this section for transferring a total coliform-positive culture to EC medium. Observe fluorescence with an ultraviolet light (366 nm) in the dark after incubating tube at 44.5 ± 0.2 °C for 24 ± 2 hours; or

(ii) Nutrient agar supplemented with 100 µg/ml 4-methylumbelliferyl-beta-D-glucuronide (MUG) (final concentration). Nutrient Agar is described in *Standard Methods for the Examination of Waste and Wastewater*, 1985, American Public Health Association et al., 16th edition, p. 874. This test is used to determine if a total coliform-positive sample, as determined by the Membrane Filter Technique or any other method in which a membrane filter is used, contains *E. coli*. Transfer the membrane filter containing a total coliform colony(ies) to nutrient agar supplemented with 100 µg/ml (final concentration) of MUG. After incubating the agar plate at 35 °C for 4 hours, observe the colony(ies) under ultraviolet light (366 nm) in the dark for fluorescence. If fluorescence is visible, *E. coli* are present.

(iii) Minimal Medium ONPG-MUG (MMO-MUG) Test, as set forth in the article "National Field Evaluation of a Defined Substrate Method for the Simultaneous Detection of Total Coliforms and *Escherichia coli* from Drinking Water: Comparison with Presence-Absence Techniques" (Edberg et al.), Applied and Environmental Microbiology, Volume 55, pp. 1003-1008, April 1989. (Note: The Autoanalysis Colilert System is an MMO-MUG test). If the MMO-MUG test is total coliform-positive after a 24-hour incubation, test the medium for fluorescence with a 366-nm ultraviolet light (preferably with a 6-watt lamp) in the dark. If fluorescence is observed, the sample is *E. coli*-positive. If fluorescence is questionable (cannot be definitively read) after 24 hours incubation, incubate the culture for an additional four hours (but not to exceed 28 hours total), and again test the medium for fluorescence. The MMO-MUG Test with hepes buffer in lieu of phosphate buffer is the only approved formulation for the detection of *E. coli*.

(7) As an option to paragraph (f)(6)(iii) of this section, a system with a total coliform-positive, MUG-negative, MMO-MUG test may further analyze the culture for the presence of *E. coli* by transferring a 0.1 ml, 28-hour MMO-MUG culture to EC Medium + MUG with a pipet. The formulation and incubation conditions of EC Medium + MUG, and observation of the results are described in paragraph (f)(6)(i) of this section.

(8) The following materials are incorporated by reference in this section with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of the analytical methods cited in *Standard Methods for the Examination of Water and Wastewater* may be obtained from the American Public Health Association *et al.*; 1015 Fifteenth Street, NW.; Washington, DC 20005. Copies of the methods set forth in *Microbiological Methods for Monitoring the Environment, Water and Wastes* may be obtained from ORD Publications, U.S. EPA, 26 W. Martin Luther King Drive, Cincinnati, Ohio 45268. Copies of the MMO-MUG Test as set forth in the article "National Field Evaluation of a Defined Substrate Method for the Simultaneous Enumeration of Total Coliforms and *Escherichia coli* from Drinking Water: Comparison with the Standard Multiple Tube Fermentation Method" (Edberg *et al.*) may be obtained from the American Water Works Association Research Foundation, 6666 West Quincy Avenue, Denver, CO 80235. Copies may be inspected at EPA's Drinking Water Docket; 401 M Street, SW.; Washington,

DC 20460, or at the Office of the Federal Register; 800 North Capitol Street, NW., suite 700, Washington, DC.

(g) *Response to violation.* (1) A public water system which has exceeded the MCL for total coliforms in §141.63 must report the violation to the State no later than the end of the next business day after it learns of the violation, and notify the public in accordance with §141.32.

(2) A public water system which has failed to comply with a coliform monitoring requirement, including the sanitary survey requirement, must report the monitoring violation to the State within ten days after the system discovers the violation, and notify the public in accordance with §141.32.

[54 FR 27562, June 29, 1989, as amended at 54 FR 30001, July 17, 1989; 55 FR 25064, June 19, 1990; 56 FR 642, Jan. 8, 1991; 57 FR 1852, Jan. 15, 1992; 57 FR 24747, June 10, 1992]

§141.22 Turbidity sampling and analytical requirements.

The requirements in this section apply to unfiltered systems until December 30, 1991, unless the State has determined prior to that date, in writing pursuant to section 1412(b)(7)(iii), that filtration is required. The requirements in this section apply to filtered systems until June 29, 1993. The requirements in this section apply to unfiltered systems that the State has determined, in writing pursuant to section 1412(b)(7)(C)(iii), must install filtration, until June 29, 1993, or until filtration is installed, whichever is later.

(a) Samples shall be taken by suppliers of water for both community and non-community water systems at a representative entry point(s) to the water distribution system at least once per day, for the purposes of making turbidity measurements to determine compliance with §141.13. If the State determines that a reduced sampling frequency in a non-community will not pose a risk to public health, it can reduce the required sampling frequency. The option of reducing the turbidity frequency shall be permitted only in those public water systems that practice disinfection and which maintain an active residual disinfectant in the distribution system, and in those cases where the State has indicated in writing that no unreasonable risk to health existed under the circumstances of this option. The turbidity measurements shall be made by the Nephelometric Method in accordance with the recommendations set forth in "Standard Methods for Examination of Water and Wastewater," American Public Health Association, 14th Edition, pp. 132–134; or "Methods of Chemical Analysis of Water and Wastes," EPA Environmental Monitoring and Support Laboratory, March 1979, Method 180.1—Nephelometric Method. Calibration of the turbidimeter shall be made either by the use of a formazin standard as specified in the cited references or a styrene divinylbenzene polymer standard (Amco-AEPA-1 Polymer) commercially available from Amco Standards International, Inc., 230 Polaris Avenue, No. C, Mountain View, California 94043.

(b) If the result of a turbidity analysis indicates that the maximum allowable limit has been exceeded, the sampling and measurement shall be confirmed by resampling as soon as practicable and preferably within one hour. If the repeat sample confirms that the maximum allowable limit has been exceeded, the supplier of water shall report to the State within 48 hours. The repeat sample shall be the sample used for the purpose of calculating the monthly average. If the monthly average of the daily samples exceeds the maximum allowable limit, or if the average of two samples taken on consecutive days exceeds 5 TU, the supplier of water shall report to the State and notify the public as directed in §§141.31 and 141.32.

(c) Sampling for non-community water systems shall begin within two years after the effective date of this part.

(d) The requirements of this §141.22 shall apply only to public water systems which use water obtained in whole or in part from surface sources.

(e) The State has the authority to determine compliance or initiate enforcement action based upon analytical results or other information compiled by their sanctioned representatives and agencies.

[40 FR 59570, Dec. 24, 1975, as amended at 45 FR 57344, Aug. 27, 1980; 47 FR 8998, Mar. 3, 1982; 47 FR 10998, Mar. 12, 1982; 54 FR 27527, June 29, 1989]

§ 141.23 Inorganic chemical sampling and analytical requirements.

Community water systems shall conduct monitoring to determine compliance with the maximum contaminant levels specified in § 141.62 in accordance with this section. Non-transient, non-community water systems shall conduct monitoring to determine compliance with the maximum contaminant levels specified in § 141.62 in accordance with this section. Transient, non-community water systems shall conduct monitoring to determine compliance with the nitrate and nitrite maximum contaminant levels in § 141.11 and § 141.62 (as appropriate) in accordance with this section.

(a) Monitoring shall be conducted as follows:

(1) Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point) beginning in the compliance period starting January 1, 1993. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(2) Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment (hereafter called a sampling point) beginning in the compliance period beginning January 1, 1993. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

NOTE: For purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources.

(3) If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

(4) The State may reduce the total number of samples which must be analyzed by allowing the use of compositing. Composite samples from a maximum of five samples are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory.

(i) If the concentration in the composite sample is greater than or equal to one-fifth of the MCL of any inorganic chemical, then a follow-up sample must be taken within 14 days at each sampling point included in the composite. These samples must be analyzed for the contaminants which exceeded one-fifth of the MCL in the composite sample. Detection limits for each analytical method and MCLs for each inorganic contaminant are the following:

DETECTION LIMITS FOR INORGANIC CONTAMINANTS

Contaminant	MCL (mg/l)	Methodology	Detection limit (mg/l)
Antimony	0.006	Atomic Absorption; Furnace	0.003
			0.0008[6]
		ICP-Mass Spectrometry	0.0004
		Hydride-Atomic Absorption	0.001
Asbestos	7 MFL[2]	Transmission Electron Microscopy	0.01 MFL
Barium	2	Atomic Absorption; furnace technique	0.002
		Atomic Absorption; direct aspiration	0.1
		Inductively Coupled Plasma	0.002 (0.001)[1]
Beryllium	0.004	Atomic Absorption; Furnace	0.0002
		xl	0.00002[6]
		Inductively Coupled Plasma[3]	0.0003
		ICP-Mass Spectrometry	0.0003
Cadmium	0.005	Atomic Absorption; furnace technique	0.0001
		Inductively Coupled Plasma	0.001[1]
Chromium	0.1	Atomic Absorption; furnace technique	0.001
		Inductively Coupled Plasma	0.007 (0.001)[1]

DETECTION LIMITS FOR INORGANIC CONTAMINANTS—Continued

Contaminant	MCL (mg/l)	Methodology	Detection limit (mg/l)
Cyanide	0.2	Distillation, Spectrophotometric[4]	0.02
		Distillation, Automated, Spectrophotometric[4]	0.005
		Distillation, Selective Electrode[4]	0.05
		Distillation, Amenable, Spectrophotometric[5]	0.02
Mercury	0.002	Manual Cold Vapor Technique	0.0002
		Automated Cold Vapor Technique	0.0002
Nickel	0.1	Atomic Absorption; Furnace	0.001 0.0006[6]
		Inductively Coupled Plasma[3]	0.005
		ICP-Mass Spectrometry	0.0005
Nitrate	10 (as N)	Manual Cadmium Reduction	0.01
		Automated Hydrazine Reduction	0.01
		Automated Cadmium Reduction	0.05
		Ion Selective Electrode	1
		Ion Chromatography	0.01
Nitrite	1 (as N)	Spectrophotometric	0.01
		Automated Cadmium Reduction	0.05
		Manual Cadmium Reduction	0.01
		Ion Chromatography	0.004
Selenium	0.05	Atomic Absorption; furnace	0.002
		Atomic Absorption; gaseous hydride	0.002
Thallium	0.002	Atomic Absorption; Furnace	0.001 0.0007[6]
		ICP-Mass Spectrometry	0.0003

[1] Using concentration technique in Appendix A to EPA Method 200.7.

[2] MFL = million fibers per liter >10 μm.

[3] Using a 2X preconcentration step as noted in Method 200.7. Lower MDLs may be achieved when using a 4X preconcentration.

[4] Screening method for total cyanides.

[5] Measures "free" cyanides.

[6] Lower MDLs are reported using stabilized temperature graphite furnace atomic absorption.

(ii) If the population served by the system is >3,300 persons, then compositing may only be permitted by the State at sampling points within a single system. In systems serving ≤3,300 persons, the State may permit compositing among different systems provided the 5-sample limit is maintained.

(iii) If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these instead of resampling. The duplicates must be analyzed and the results reported to the State within 14 days of collection.

(5) The frequency of monitoring for asbestos shall be in accordance with paragraph (b) of this section; the frequency of monitoring for barium, cadmium, chromium, fluoride, mercury, and selenium shall be in accordance with paragraph (c) of this section; the frequency of monitoring for nitrate shall be in accordance with paragraph (d) of this section; and the frequency of monitoring for nitrite shall be in accordance with paragraph (e) of this section.

(b) The frequency of monitoring conducted to determine compliance with the maximum contaminant level for asbestos specified in § 141.62(b) shall be conducted as follows:

(1) Each community and non-transient, non-community water system is required to monitor for asbestos during the first three-year compliance period of each nine-year compliance cycle beginning in the compliance period starting January 1, 1993.

(2) If the system believes it is not vulnerable to either asbestos contamination in its source water or due to corrosion of asbestos-cement pipe, or both, it may apply to the State for a waiver of the monitoring requirement in paragraph (b)(1) of this section. If the State grants the waiver, the system is not required to monitor.

(3) The State may grant a waiver based on a consideration of the following factors:

(i) Potential asbestos contamination of the water source, and

(ii) The use of asbestos-cement pipe for finished water distribution and the corrosive nature of the water.

(4) A waiver remains in effect until the completion of the three-year compliance period. Systems not receiving a waiver must monitor in accordance with the provisions of paragraph (b)(1) of this section.

(5) A system vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

(6) A system vulnerable to asbestos contamination due solely to source water shall monitor in accordance with the provision of paragraph (a) of this section.

(7) A system vulnerable to asbestos contamination due both to its source water supply and corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

(8) A system which exceeds the maximum contaminant levels as determined in § 141.23(i) of this section shall monitor quarterly beginning in the next quarter after the violation occurred.

(9) The State may decrease the quarterly monitoring requirement to the frequency specified in paragraph (b)(1) of this section provided the State has determined that the system is reliably and consistently below the maximum contaminant level. In no case can a State make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface (or combined surface/ground) water system takes a minimum of four quarterly samples.

(10) If monitoring data collected after January 1, 1990 are generally consistent with the requirements of § 141.23(b), then the State may allow systems to use that data to satisfy the monitoring requirement for the initial compliance period beginning January 1, 1993.

(c) The frequency of monitoring conducted to determine compliance with the maximum contaminant levels in § 141.62 for antimony, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium and thallium shall be as follows:

(1) Groundwater systems shall take one sample at each sampling point once every three years. Surface water systems (or combined surface/ground) shall take one sample annually at each sampling point.

(2) The system may apply to the State for a waiver from the monitoring frequencies specified in paragraph (c)(1) of this section.

(3) A condition of the waiver shall require that a system shall take a minimum of one sample while the waiver is effective. The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

(4) The State may grant a waiver provided surface water systems have monitored annually for at least three years and groundwater systems have conducted a minimum of three rounds of monitoring. (At least one sample shall have been taken since January 1, 1990). Both surface and groundwater systems shall demonstrate that all previous analytical results were less than the maximum contaminant level. Systems that use a new water source are not eligible for a waiver until three rounds of monitoring from the new source have been completed.

(5) In determining the appropriate reduced monitoring frequency, the State shall consider:

(i) Reported concentrations from all previous monitoring;

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

(iii) Other factors which may affect contaminant concentrations such as changes in groundwater pumping rates, changes in the system's configuration, changes in the system's operating prcoedures, or changes in stream flows or characteristics.

(6) A decision by the State to grant a waiver shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the State or upon an application by the public water system. The public water system shall specify the basis for its request. The State shall review and, where appropriate, revise its determination of the appropriate monitoring frequency when the system submits new monitoring data or when other data relevant to the system's appropriate monitoring frequency become available.

(7) Systems which exceed the maximum contaminant levels as calculated in § 141.23(i) of this section shall monitor quarterly beginning in the next quarter after the violation occurred.

(8) The State may decrease the quarterly monitoring requirement to the frequencies specified in paragraphs (c)(1) and (c)(2) of this section provided it has determined that the system is reliably and consistently below the maximum contaminant level. In no case can a State make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

(d) All public water systems (community; non-transient, non-community; and transient, non-community systems) shall monitor to determine compliance with the maximum contaminant level for nitrate in § 141.62.

(1) Community and non-transient, non-community water systems served by groundwater systems shall monitor annually beginning January 1, 1993; systems served by surface water shall monitor quarterly beginning January 1, 1993.

(2) For community and non-transient, non-community water systems, the repeat monitoring frequency for groundwater systems shall be quarterly for at least one year following any one sample in which the concentration is ≥50 percent of the MCL. The State may allow a groundwater system to reduce the sampling frequency to annually after four consecutive quarterly samples are reliably and consistently less than the MCL.

(3) For community and non-transient, non-community water systems, the State may allow a surface water system to reduce the sampling frequency to annually if all analytical results from four consecutive quarters are <50 percent of the MCL. A surface water system shall return to quarterly monitoring if any one sample is <50 percent of the MCL.

(4) Each transient non-community water system shall monitor annually beginning January 1, 1993.

(5) After the initial round of quarterly sampling is completed, each community and non-transient non-community system which is monitoring annually shall take subsequent samples during the quarter(s) which previously resulted in the highest analytical result.

(e) All public water systems (community; non-transient, non-community; and transient, non-community systems) shall monitor to determine compliance with the maximum contaminant level for nitrite in § 141.62(b).

(1) All public water systems shall take one sample at each sampling point in the compliance period beginning January 1, 1993 and ending December 31, 1995.

(2) After the initial sample, systems where an analytical result for nitrite is <50 percent of the MCL shall monitor at the frequency specified by the State.

(3) For community, non-transient, non-community, and transient non-community water systems, the repeat monitoring frequency for any water system shall be quarterly for at least one year following any one sample in which the concentration is ≥50 percent of the MCL. The State may allow a system to reduce the sampling frequency to annually after determining the system is reliably and consistently less than the MCL.

(4) Systems which are monitoring annually shall take each subsequent sample during the quarter(s) which previously resulted in the highest analytical result.

(f) Confirmation samples:

(1) Where the results of sampling for asbestos, barium, cadmium, chromium, fluoride, mercury, or selenium indicate an exceedance of the maximum contaminant level, the State may require that one additional sample be collected as soon as possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point.

(2) Where nitrate or nitrite sampling results indicate an exceedance of the maximum contaminant level, the system shall take a confirmation sample within 24 hours of the system's receipt of notification of the analytical results of the first sample. Systems unable to comply with the 24-hour sampling requirement must immediately notify the consumers served by the area served by the public water system in accordance with § 141.32. Systems exercising this option must take and ana-

lyze a confirmation sample within two weeks of notification of the analytical results of the first sample.

(3) If a State-required confirmation sample is taken for any contaminant, then the results of the initial and confirmation sample shall be averaged. The resulting average shall be used to determine the system's compliance in accordance with paragraph (i) of this section. States have the discretion to delete results of obvious sampling errors.

(g) The State may require more frequent monitoring than specified in paragraphs (b), (c), (d) and (e) of this section or may require confirmation samples for positive and negative results at its discretion.

(h) Systems may apply to the State to conduct more frequent monitoring than the minimum monitoring frequencies specified in this section.

(i) Compliance with §§ 141.11 or 141.62(b) (as appropriate) shall be determined based on the analytical result(s) obtained at each sampling point.

(1) For systems which are conducting monitoring at a frequency greater than annual, compliance with the maximum contaminant levels for antimony, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium and thallium is determined by a running annual average at any sampling point. If the average at any sampling point is greater than the MCL, then the system is out of compliance. If any one sample would cause the annual average to be exceeded, then the system is our of compliance immediately. Any sample below the method detection limit shall be calculated at zero for the purpose of determining the annual average.

(2) For systems which are monitoring annually, or less frequently, the system is out of compliance with the maximum contaminant levels for asbestos, barium, cadmium, chromium, fluoride, mercury and selenium if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the State, the determination of compliance will be based on the average of the two samples.

(3) Compliance with the maximum contaminant levels for nitrate and nitrate is determined based on one sample if the levels of these contaminants are below the MCLs. If the levels of nitrate and/or nitrite exceed the MCLs in the initial sample, a confirmation sample is required in accordance with paragraph (f)(2) of this section, and compliance shall be determined based on the average of the initial and confirmation samples.

(4) If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the State may allow the system to give public notice to only the area served by that portion of the system which is out of compliance.

(j) Each public water system shall monitor at the time designated by the State during each compliance period.

(k) Inorganic analysis:

(1) Analysis for asbestos, barium, cadmium, chromium, mercury, nitrate, nitrite, and selenium shall be conducted using the following methods:

INORGANIC CONTAMINANTS ANALYTICAL METHODS

Contaminant	Methodology[11]	EPA[1]	Reference (Method No.)		
			ASTM[2]	SM[3]	Other
Asbestos	Transmission Electron Microscopy.	EPA[9]			
Barium	Atomic absorption; furnace technique.	208.2		304	
	Atomic absorption; direct aspiration.	208.1		303C	
	Inductively-coupled plasma	200.7[1.6]			
Cadmium	Atomic absorption; furnace technique.	213.2		304	
	Inductively-coupled plasma	200.7A[6]			
Chromium	Atomic absorption; furnace technique.	218.2		304[7]	
	Inductively-coupled plasma	200.7[1.6]			
Mercury	Manual cold vapor technique	245.1	D3223–86	303F	

INORGANIC CONTAMINANTS ANALYTICAL METHODS—Continued

Contaminant	Methodology[11]	EPA[1]	Reference (Method No.)		
			ASTM[2]	SM[3]	Other
	Automated cold vapor technique.	245.2			
Nitrate	Manual cadmium reduction	353.3	D3867–90	418C	
	Automated hydrazine reduction.	353.1			
	Automated cadmium reduction	353.2	D3867–90	418F	
	Ion selective electrode				WeWWG/5880[5]
	Ion chromatography	300.0			B–1011[10]
Nitrite	Spectrophotometric	354.1			
	Automated cadmium reduction	353.2	D3867–90	418F	
	Manual cadmium reduction	353.3	D3867–90	418C	
	Ion chromatography	300.0			B–1011[10]
Selenium	Atomic absorption; gaseous hydride.				
	Atomic absorption; furnace technique.	270.2	D3859–88	304[8]	

[1] Methods of Chemical Analysis of Water and Wastes," EPA Environmental Monitoring and Support Laboratory, Cincinnati, OH 45268 (EPA–600/4–79–020), March 1983. Available from ORD Publications, CERI, EPA, Cincinnati, OH 45268.

[2] Annual Book of ASTM Standards, Vol. 11.01 American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

[3] "Standard Methods for the Examination of Water and Wastewater," 16th edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, 1985.

[4] "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments," Techniques of Water-Resources Investigations of the U.S. Geological Survey Books, Chapter A1, 1989, Open-File Report 85–495. Available from Open-File Services Section, Western Distribution Branch, U.S. Geological Survey, MS 306 Box 24525, Denver Federal Center, Denver, CO 80225.

[5] "Orion Guide to Water and Wastewater Analysis." Form WeWWG/5880, p. 5, 1985. Orion Research, Inc., Cambridge, MA.

[6] 200.7A "Inductively-Coupled Plasma Atomic Emission Analysis of Drinking Water," Appendix to Method 200.7, March, 1987, U.S. EPA, Environmental Monitoring and Support Laboratory, Cincinnati, OH 45268.

[7] The addition of 1 mL of 30% H_2O_2 to each 100 mL of standards and samples is required before analysis.

[8] Prior to dilution of the Se calibration standard, add 2 mL of 30% H_2O_2 for each 100 mL of standard.

[9] "Analytical Method for Determination of Asbestos Fibers in Water," EPA–600/4–83–043, September 1983, U.S. EPA, Environmental Research Laboratory, Athens, GA 30613.

[10] "Waters Test Method for the Determination of Nitrite/Nitrate in Water Using Single Column Ion Chromatography, Method B–1011, Millipore Corporation, Waters Chromatography Division, 34 Maple Street, Milford, MA 01757.

[11] For approved analytical procedures for metals, the technique applicable to total metals must be used.

(2) Analyses for arsenic shall be conducted using the following methods:

Method[1] 206.2, Atomic Absorption Furnace Technique; or Method[1] 206.3, or Method[4] D2972–88B, or Method[2] 307A, or Method[3] I-1062–85, Atomic Absorption—Gaseous Hydride; or Method[1] 206.4, or Method[4] D–2972–88A, or Method[2] 307B, Spectrophotometric, Silver Diethyl-dithiocarbamate; or Method 200.7A, Inductively Coupled Plasma Technique[5].

(3) Analyses for fluoride shall be conducted using the following methods:

---

[1] "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, CERI, EPA, Cincinnati, Ohio 45268. For approved analytical procedures for metals, the technique applicable to total metals must be used.

[2] "Standard Methods for the Examination of Water and Wastewater," 16th Edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, 1985.

[3] Techniques of Water-Resources Investigation of the United States Geological Survey, Chapter A-1, "Methods for Determiantion of Inorganic Substances in Water and Fluvial Sediments," Book 5, 1979, Stock #014-001-03177-9. Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

[4] Annual Book of ASTM Standards, part 31 Water, American Society for Testing and Materials, 1976 Race Street, Philadelphia, Pennsylvania 19103.

[5] Appendix to Method 200.7, March 1987, U.S. EPA, Environmental Monitoring Systems Laboratory, Cincinnati, OH 45268.

METHODOLOGY FOR FLUORIDE

Methodology	Reference (Method No.)[1]			
	EPA[2]	ASTM[4]	SM[5]	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[6]
Automated ion selective electrode	....			380-75WE[7]

* * * * * *

---

[1] "Methods of Chemical Analysis of Water and Wastes," EPA Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268 (EPA-600/4-79-020), March 1983. Available from ORD Publications, CERI, EPA, Cincinnati, Ohio 45268. For approved analytical procedures for metals, the technique applicable to total metals must be used.

[2] [Reserved]

[3] [Reserved]

[4] Annual Book of ASTM Standards, part 31 Water. American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

[5] "Standard Methods for the Examination of Water and Wastewater," 16th Edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, 1985.

[6] "Fluoride in Water and Wastewater, Industrial Method = 129-71W." Technicon Industrial Systems, Tarrytown, New York 10591. December 1972.

[7] "Flouride in Water and Wastewater," Technicon Industrial Sytems, Tarrytown, New York 10591. February 1976.

(4) Analysis for the listed inorganic contaminants shall be conducted using the following methods:

Contaminant	Methodogy	EPA[1, 5, 12]	ASTM[2]	SM[3]	USGS[4]	Other
Antimony	Atomic Absorption; Furnace[6]	[1]204.2		3113		
	Atomic Absorption; Platform[6]	[5]220.9				
	ICP-Mass Spectrometry[6]	[5]200.8				
	Hydride-Atomic Absorption[9]	....	D-3697-87			
Asbestos	Transmission Electron Microscopy	[12]EPA				
Barium	Atomic Absorption; Furnace[6]	[1]208.2		3113B		
	Atomic Absorption; Direct[6]	[1]208.1		3111D		
	Inductively Coupled Plasma[6]	[5]200.7		3120		
Beryllium	*Atomic Absorption; Furnace*[6]	[1]210.2	D-3645-84B	3113		
	Atomic Absorption; Platform[6]	[5]200.9				
	Inductively Coupled Plasma[6]	[5]200.7		3120		
	ICP-Mass Spectrometry[6]	[5]200.8				
Cadmium	Atomic Absorption; Furnace[6]	[1]213.2		3113B		
	Inductively Coupled Plasma[6]	[5]200.7				
Chromium	Atomic Absorption; Furnace[6]	[1]218.2		3113B		
	Inductively Coupled Plasma[6]	[5]200.7		3120		
Cyanide	Distillation, Spec.	[1]335.2	D-2036-89A	4500-CN-D	I330085	
	Distillation, Automated, Spec.	[1]335.3		4500-CN-E		
	Distillation, Selective Electrode	....	D-2036-89A	4500-CN-F		
	Distillation, Amenable, Spec.	[1]335.1	D-2036-89B	4500-CN-G		
Mercury	Manual Cold Vapor Technique[9]	[1]245.1	D3223-86	3112B		
	Automated Cold Vapor Technique[9]	[1]245.2				
Nickel	Atomic Absorption; Furnace[6]	[1]249.2		3113		
	Atomic Absorption; Platform[6]	[5]200.9				
	Atomic Absorption; Direct[6]	[1]249.1		3111B		
	Inductively Coupled Plasma[6]	[5]200.7		3120		
	ICP-Mass Spectrometry[6]	[5]200.8				
Nitrate	Manual Cadmium Reduction	[1]353.3	D3867-90	4500-NO_3-E		
	Automated Hydrazine Reduction	[1]353.1				
	Automated Cadmium Reduction	[1]353.2	D3867-90	4500-NO_3-F		
	Ion Selective Electrode	....				WeWWG/5880[7]
	Ion Chromatography	[11]300.0				B-1011[8]
Nitrite	Spectophometric	[1]354.1				
	Automated Cadmium Reduction	[1]353.2	D3867-90	4500-NO_3-F		
	Manual Cadmium Reduction	[1]353.3	D3867-90	4500-NO_3-E		
	Ion Chromatography	[11]300.0				B-1011[8]
Selenium	Hydride-Atomic Absorption[9]	....	D3859-84A	3114B		
	Atomic Absorption; Furnace[6, 10]	[1]270.2	D3859-88	3113B		
Thallium	Atomic Absorption; Furnace[6]	[1]279.2		3113		
	Atomic Absorption; Platform[6]	[5]200.9				
	ICP-Mass Spectrometry[6]	[5]200.8				

[1] *"Methods of Chemical Analysis of Water and Wastes,"* EPA Environmental Monitoring Systems Laboratory, Cincinnati, OH 45268 March 1983. EPA-600/4-79-020.

[2] Annual Book of ASTM Standards, Vols. 11.01 and 11.02, 1991, American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

[3] "Standard Methods for the Examination of Water and Wastewater," 17th edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, 1989.

[4] Techniques of Water Resources Investigations of the U.S. Geological Survey, "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments," Book 5, Chapter A-1, Third Edition, 1989. Available at Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

[5] "Methods for the Determination of Metals in Environmental Samples." Available at NTIS, PB 91-231498.

[6] Samples that contain less than 1 NTU (nephelometric turbidity unit) and are properly preserved (conc HNO_3 to pH <2) may be analyzed directly (without digestion) for total metals, otherwise, digestion is required. Turbidity must be measured on the preserved samples just prior to the initiation of metal analysis. When digestion is required, the total recoverable technique as defined in the method must be used.

[7] "Orion Guide to Water and Wastewater Analysis." Form WeWWG/5880, p. 5, 1985. Orion Research, Inc., Cambridge, MA.

[8] "Waters Test Method for Determination of Nitrite/Nitrate in Water Using Single Column Ion Chromatography, Method B–1011, Millipore Corporation, Waters Chromatography Division, 34 Maple Street, Milford, MA 01757.

[9] For the gaseous hydride determinations of antimony and selenium and for the determination of mercury by the cold vapor techniques, the proper digestion technique as defined in the method must be followed to ensure the element is in the proper state for analyses.

[10] Add 2 ml of 30% H_2O_2 and an appropriate concentration of matrix modifier $Ni(NO_3)_2+6H_20$ (nickel nitrate) to samples.

[11] "Method 300. Determination of Inorganic Anions in Water by Ion Chromatography." Inorganic Chemistry Branch, Environmental Monitoring Systems Laboratory. August 1991.

[12] "Analytical Method For Determination of Asbestos Fibers in Water," EPA–600/4–83–043, September 1983, U.S. EPA Environmental Research Laboratory, Athens, GA 30613.

(5) Sample collection for antimony, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium, and thallium under this section shall be conducted using the sample preservation, container, and maximum holding time procedures specified in the table below:

Contaminant	Preservative[1]	Container[2]	Time[3]
Antimony	Conc HNO_3 to pH <2	P or G	6 months.
Asbestos	Cool, 4°C	P or G	
Barium	Conc HNO_3 to pH <2	P or G	6 months.
Beryllium	Conc HNO_3 to pH <2	P or G	6 months.
Cadmium	Conc HNO_3 to pH <2	P or G	6 months.
Chromium	Conc HNO_3 to pH <2	P or G	6 months.
Cyanide	Cool, 4°C, NAOH to pH >12[4]	P or G	14 days.
Fluoride	None	P or G	1 month.
Mercury	Conc HNO_3 to pH <2	P or G	28 days.
Nickel	Conc HNO_3 to pH <2	P or G	6 months.
Nitrate			
Chlorinated	Cool, 4°C	P or G	28 days.
Non-chlorinated	Conc H_2SO_4 to pH <2	P or G	14 days.
Nitrite	Cool, 4°C	P or G	48 hours.
Selenium	Conc HNO_3 to pH <2	P or G	6 months.
Thallium	Conc HNO_3 to pH <2	P or G	6 months.

[1] If HNO_3 cannot be used because of shipping restrictions, sample may be initially preserved by icing and immediately shipping it to the laboratory. Upon receipt in the laboratory, the sample must be acidified with conc HNO_3 to pH <2 and held for 16 hours before analysis.

[2] P=plastic, hard or soft; G=glass, hard or soft.

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

[4] See method(s) for the information for preservation.

(6) Analysis under this section shall only be conducted by laboratories that have been certified by EPA or the State. Laboratories may conduct sample analysis under provisional certification until January 1, 1996. To receive certification to conduct analyses for antimony, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite and selenium and thallium, the laboratory must:

(i) Analyze Performance Evaluation samples which include those substances provided by EPA Environmental Monitoring Systems Laboratory or equivalent samples provided by the State.

(ii) Achieve quantitative results on the analyses that are within the following acceptance limits:

Contaminant	Acceptance limit
Antimony	6#30 at ≥0.006 mg/l
Asbestos	2 standard deviations based on study statistics.
Barium	±15% at ≥0.15 mg/l
Beryllium	±15% at ≥0.001 mg/l
Cadmium	±20% at ≥0.002 mg/l
Chromium	±15% at ≥0.01 mg/l
Cyanide	±25% at ≥0.1 mg/l
Fluoride	±10% at ≥1 to 10 mg/l
Mercury	±30% at ≥0.0005 mg/l
Nickel	±15% at ≥0.01 mg/l
Nitrate	±10% at ≥0.4 mg/l
Nitrite	±15% at ≥0.4 mg/l
Selenium	±20% at ≥0.01 mg/l
Thallium	±30% at ≥0.002 mg/l

(l) Analyses for the purpose of determining compliance with §141.11 shall be conducted using the requirements specified in paragraphs (l) through (q) of this section.

(1) Analyses for all community water systems utilizing surface water sources shall be completed by June 24, 1978. These analyses shall be repeated at yearly intervals.

(2) Analyses for all community water systems utilizing only ground water sources shall be completed by June 24, 1979. These analyses shall be repeated at three-year intervals.

(3) For non-community water systems, whether supplied by surface or ground sources, analyses for nitrate shall be completed by December 24, 1980. These analyses shall be repeated at intervals determined by the State.

(4) The State has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by their sanctioned representatives and agencies.

(m) If the result of an analysis made under paragraph (l) of this section indicates that the level of any contaminant listed in §141.11 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.

(n) When the average of four analyses made pursuant to paragraph (m) of this section, rounded to the same number of significant figures as the maximum contaminant level for the substance in question, exceeds the maximum contaminant level, the supplier of water shall notify the State pursuant to §141.31 and give notice to the public pursuant to §141.32. Monitoring after public notification shall be at a frequency designated by the State and shall continue until the maximum contaminant level has not been exceeded in two successive samples or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

(o) The provisions of paragraphs (m) and (n) of this section notwithstanding, compliance with the maximum contaminant level for nitrate shall be determined on the basis of the mean of two analyses. When a level exceeding the maximum contaminant level for nitrate is found, a second analysis shall be initiated within 24 hours, and if the mean of the two analyses exceeds the maximum contaminant level, the supplier of water shall report his findings to the State pursuant to §141.31 and shall notify the public pursuant to §141.32.

(p) For the initial analyses required by paragraph (l) (1), (2) or (3) of this section, data for surface waters acquired within one year prior to the effective date and data for ground waters acquired within 3 years prior to the effective date of this part may be substituted at the discretion of the State.

(q) Analyses conducted to determine compliance with §141.11 shall be made in accordance with the following methods, or their equivalent as determined by the Administrator.

(1) Arsenic-Method[1] 206.2, Atomic Absorption Furnace Technique; or Method[1] 206.3, or Method[4] D2972–88B or Method[2] 307A, or Method[3] I-1062–85, Atomic Absorption—Gaseous Hydride; or Method[1] 206.4, or Method[4] D–2972–88A, or Method[2] 307B, Spectrophotometric, Silver Diethyldithiocarbamate; or Method[8] 200.7, Inductively Coupled Plasma Technique.

(2) Barium-Method[1] 208.1 or Method[2] 308, Atomic Absorption—Direct Aspiration; or Method[1] 208.2, Atomic Absorption Furnace Technique; or Method[8] 200.7, Inductively Coupled Plasma Technique.

(3) Camium-Method[1] 213.1 or Method[4] D 3557–78A or B, or Method[2] 310A, Atomic Absorption—Direct Aspiration; or Method[1] 213.2 Atomic Absorption Furnace Technique; or Method[8] 200.7, Inductively Coupledd Plasma Technique.

(4) Chromium-Method[1] 218.1 or Method[4] D 1687–77D, or Method[2] 312A, Atomic Absorption—Direct Aspiration; or Chromium-Method[1] 218.2 Atomic Absorption Furnace Technique; or Method[8] 200.7, Inductively Couple Plasma Technique.

(5) Mercury-Method[1] 245.1, or Method[4] D–3223–69, or Method[2] 320A, Manual Cold Vapor Technique; or Method[1] 245.2, Automated Cold Vapor Technique.

(6) Nitrate-Method[1] 352.1, or Method[4] D–992–71, or Method[1] 353.3, or Method[4] D–3867–79B, or Method[2] 418–C, Spectrometric, Cadmium Reduction; Method[1] 353.1, Automated Hydrazine Reduction; or Method[1] 353.2, or Method[4] D–3867–79A, or Method[2] 418F, Automated Cadmium Reduction.

(7) Selenium-Method[1] 270.2, Atomic Absorption Furnace Technique; or Method[1] 270.3; or Method[3] I–1667–85, or Method[4] D–3859–79, or Method[2] 303F, Hydride Generation—Atomic Absorption Spectrophotometry.

(8) Lead-Method[1] 239.1 or Method[4] D3559–78A or B, or Method[2] 301–A II or III, pp. 148–152, Atomic Absorption—Direct Aspiration; or Method[1] 239.2, Atomic Absorption Furnace Technique; or Method[8] 200.7, Inductively Coupled Plasma Technique.

[56 FR 3579, Jan. 30, 1991, as amended at 56 FR 30274, July 1, 1991; 57 FR 31838, July 17, 1992]

§ 141.24 Organic chemicals other than total trihalomethanes, sampling and analytical requirements.

(a) Monitoring of endrin for purposes of determining compliance with the maximum contaminant level listed in § 141.12(a) shall be conducted as follows:

(1) For all community water systems utilizing surface water sources, analyses shall be completed within one year following the effective date of this part. Samples analyzed shall be collected during the period of the year designated by the State as the period when contamination by pesticides is most likely to occur. These analyses shall be repeated at intervals specified by the State but in no event less frequently than at three year intervals.

(2) For community water systems utilizing only ground water sources, analyses shall be completed by those systems specified by the State.

---

[1] "Methods of Chemical Analysis of Water and Wastes," EPA Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268 (EPA–600/4–79–020), March 1983. Available from ORD Publications, CERI, EPA, Cincinnati, Ohio 45268. For approved analytical procedures for metals, the technique applicable to total metals must be used.

[2] "Standard Methods for the Examination of Water and Wastewater," 16th Edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, 1985.

[3] 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, 1979, Stock #024–001–03177–9. Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

[4] Annual Book of ASTM Standards, part 31 Water, American Society for Testing and Materials, 1976 Race Street, Philadelphia, Pennsylvania 19103.

[5] [Reserved].

[6] "Inductively Coupled Plasma-Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes—Method 200.7" with Appendix to Method 200.7 entitled, "Inductively Coupled Plasma-Atomic Emission Analysis of Drinking Water." March 1987. Available from EPA's Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268.

(3) The State has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by their sanctioned representatives and agencies.

(b) If the result of an analysis made pursuant to paragraph (a) of this section indicates that the level of any contaminant listed in § 141.24 (a) and (b) exceeds the maximum contaminant level, the supplier of water shall report to the State within 7 days and initiate three additional analyses within one month.

(c) When the average of four analyses made pursuant to paragraph (b) of this section, rounded to the same number of significant figures as the maximum contaminant level for the substance in question, exceeds the maximum contaminant level, the supplier of water shall report to the State pursuant to § 141.31 and give notice to the public pursuant to § 141.32. Monitoring after public notification shall be at a frequency designated by the State and shall continue until the maximum contaminant level has not been exceeded in two successive samples or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

(d) For the initial analysis required by paragraphs (a) (1) and (2) of this section, data for surface water acquired within one year prior to the effective date of this part and data for ground water acquired within three years prior to the effective date of this part may be substituted at the discretion of the State.

(e) Analysis made to determine compliance with the maximum contaminant level for endrin in § 141.12(a) shall be made in accordance with EPA Methods 505, "Analysis of Organohalide Pestcides and Commercial Polychlorinated Biphenyl Products (Aroclors) in Water by Microextraction and Gas Chromatography" and 508, "Determination of Chlorinated Pesticides in Water by Gas Chromatography With an Electron Capture Detector." The Methods are contained in "Methods for the Determination of Organic Compounds in Drinking Water," ORD Publications, CERI, EPA/600/4-88/039, December 1988. These methods are available from the National Technical Information Service (NTIS), U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161. The toll-free number is 1-800-336-4700.

(f) Beginning with the initial compliance period, analysis of the contaminants listed in § 141.61(a) (1) through (21) for the purpose of determining compliance with the maximum contaminant level shall be conducted as follows:

(1) Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source, treatment plant, or within the distribution system.

(2) Surface water systems (or combined surface/ground) shall take a minimum of one sample at points in the distribution system that are representative of each source or at each entry point to the distribution system after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source, treatment plant, or within the distribution system.

(3) If the system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used).

(4) Each community and non-transient non-community water system shall take four consecutive quarterly samples for each contaminant listed in § 141.61(a) (2) through 21 during each compliance period, beginning in the initial compliance period.

(5) If the initial monitoring for contaminants listed in § 141.61(a) (1) through (8) and the monitoring for the contaminants listed in § 141.61(a) (9) through (21) as allowed in paragraph (f)(18) has been completed by December 31, 1992, and the system did not detect any contaminant listed in § 141.61(a) (1)

through (21), then each ground and surface water system shall take one sample annually beginning with the initial compliance period.

(6) After a minimum of three years of annual sampling, the State may allow groundwater systems with no previous detection of any contaiminant listed in § 141.61(a) to take one sample during each compliance period.

(7) Each community and non-transient ground water system which does not detect a contaminant listed in § 141.61(a) (1) through (21) may apply to the State for a waiver from the requirements of paragraphs (f)(5) and (f)(6) of this section after completing the initial monitoring. (For purposes of this section, detection is defined as ≥0.0005 mg/l.) A waiver shall be effective for no more than six years (two compliance periods). States may also issue waivers to small systems for the initial round of monitoring for 1,2,4-trichlorobenzene.

(8) A State may grant a waiver after evaluating the following factor(s):

(i) Knowledge of previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the system. If a determination by the State reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted.

(ii) If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted.

(A) Previous analytical results.

(B) The proximity of the system to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities.

(C) The environmental persistence and transport of the contaminants.

(D) The number of persons served by the public water system and the proximity of a smaller system to a larger system.

(E) How well the water source is protected against contamination, such as whether it is a surface or groundwater system. Groundwater systems must consider factors such as depth of the well, the type of soil, and wellhead protection. Surface water systems must consider watershed protection.

(9) As a condition of the waiver a groundwater system must take one sample at each sampling point during the time the waiver is effective (i.e., one sample during two compliance periods or six years) and update its vulnerability assessment considering the factors listed in paragraph (f)(8) of this section. Based on this vulnerability assessment the State must reconfirm that the system is non-vulnerable. If the State does not make this reconfirmation within three years of the initial determination, then the waiver is invalidated and the system is required to sample annually as specified in paragraph (5) of this section.

(10) Each community and non-transient surface water system which does not detect a contaminant listed in § 141.61(a) (1) through (21) may apply to the State for a waiver from the requirements of (f)(5) of this section after completing the initial monitoring. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Systems meeting this criterion must be determined by the State to be non-vulnerable based on a vulnerability assessment during each compliance period. Each system receiving a waiver shall sample at the frequency specified by the State (if any).

(11) If a contaminant listed in § 141.61(a) (2) through (21) is detected at a level exceeding 0.0005 mg/l in any sample, then:

(i) The system must monitor quarterly at each sampling point which resulted in a detection.

(ii) The State may decrease the quarterly monitoring requirement speci fied in paragraph (f)(11)(i) of this section provided it has determined that the system is reliably and consistently below the maximum contaminant level. In no case shall the State make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

(iii) If the State determines that the system is reliably and consistently below the MCL, the State may allow the system to monitor annually. Systems which monitor annually must monitor during the quarter(s) which previously yielded the highest analytical result.

(iv) Systems which have three consecutive annual samples with no detection of a contaminant may apply to the State for a waiver as specified in paragraph (f)(7) of this section.

(v) Groundwater systems which have detected one or more of the following two-carbon organic compounds: trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, or 1,1-dichloroethylene shall monitor quarterly for vinyl chloride. A vinyl chloride sample shall be taken at each sampling point at which one or more of the two-carbon organic compounds was detected. If the results of the first analysis do not detect vinyl chloride, the State may reduce the quarterly monitoring frequency of vinyl chloride monitoring to one sample during each compliance period. Surface water systems are required to monitor for vinyl chloride as specified by the State.

(12) Systems which violate the requirements of §141.61(a) (1) through (21), as determined by paragraph (f)(15) of this section, must monitor quarterly. After a minimum of four consecutive quarterly samples which show the system is in compliance as specified in paragraph (f)(15) of this section the system and the State determines that the system is reliably and consistently below the maximum contaminant level, the system may monitor at the frequency and times specified in paragraph (f)(11)(iii) of this section.

(13) The State may require a confirmation sample for positive or negative results. If a confirmation sample is required by the State, the result must be averaged with the first sampling result and the average is used for the compliance determination as specified by paragraph (f)(15). States have discretion to delete results of obvious sampling errors from this calculation.

(14) The State may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collection.

(i) If the concentration in the composite sample is ≥ 0.0005 mg/l for any contaminant listed in §141.61(a), then a follow-up sample must be taken and analyzed within 14 days from each sampling point included in the composite.

(ii) If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these instead of resampling. The duplicate must be analyzed and the results reported to the State within 14 days of collection.

(iii) Compositing may only be permitted by the State at sampling points within a single system, unless the population served by the system is $\geq 3{,}300$ persons. In systems serving $\geq 3{,}300$ persons, the State may permit compositing among different systems provided the 5-sample limit is maintained.

(iv) Compositing samples prior to GC analysis.

(A) Add 5 ml or equal larger amounts of each sample (up to 5 samples are allowed) to a 25 ml glass syringe. Special precautions must be made to maintain zero headspace in the syringe.

(B) The samples must be cooled at 4°C during this step to minimize volatilization losses.

(C) Mix well and draw out a 5-ml aliquot for analysis.

(D) Follow sample introduction, purging, and desorption steps described in the method.

(E) If less than five samples are used for compositing, a proportionately small syringe may be used.

(v) Compositing samples prior to GC/MS analysis.

(A) Inject 5-ml or equal larger amounts of each aqueous sample (up to 5 samples are allowed) into a 25-ml purging device using the sample introduction technique described in the method.

(B) The total volume of the sample in the purging device must be 25 ml.

(C) Purge and desorb as described in the method.

(15) Compliance with §141.61(a) (1) through (21) shall be determined based on the analytical results obtained at each sampling point.

(i) For systems which are conducting monitoring at a frequency greater than annual, compliance is determined by a running annual average of all samples taken at each sampling point. If the annual average of any sampling point is greater than the MCL, then the system is out of compliance. If the initial sample or a subsequent sample would cause the annual average to be exceeded, then the system is out of compliance immediately.

(ii) If monitoring is conducted annually, or less frequently, the system is out of compliance if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the State, the determination of compliance will be based on the average of two samples.

(iii) If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the State may allow the system to give public notice to only that area served by that portion of the system which is out of compliance.

(16) Analysis for the contaminants listed in §141.61(a) (1) through (21) shall be conducted using the following EPA methods or their equivalent as approved by EPA. These methods are contained in Methods for the Determination of Organic Compounds in Drinking Water, EPA/600/4-88/039, and are available from the National Technical Information Service (NTIS) NTIS PB91-231480 and PB91-146027, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll-free number is 800-336-4700.

(i) Method 502.1, "Volatile Halogenated Organic Chemicals in Water by Purge and Trap Gas Chromatography."

(ii) Method 502.2, "Volatile Organic Compounds in Water by Purge and Trap Capillary Column Gas Chromatography with Photoionization and Electrolytic Conductivity Detectors in Series."

(iii) Method 503.1, "Volatile Aromatic and Unsaturated Organic Compounds in Water by Purge and Trap Gas Chromatography."

(iv) Method 524.1, "Measurement of Purgeable Organic Compounds in Water by Purged Column Gas Chromatography/Mass Spectrometry."

(v) Method 524.2, "Measurement of Purgeable Organic Compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry."

(17) Analysis under this section shall only be conducted by laboratories that are certified by EPA or the State according to the following conditions (laboratories may conduct sample analysis under provisional certification until January 1, 1996):

(i) To receive certification to conduct analyses for the contaminants in §141.61(a) (2) through (21) the laboratory must:

(A) Analyze Performance Evaluation samples which include these substances provided by EPA Environmental Monitoring Systems Laboratory or equivalent samples provided by the State.

(B) Achieve the quantitative acceptance limits under paragraphs (f)(17)(i) (C) and (D) of this section for at least 80 percent of the regulated organic chemicals listed in §141.61(a) (2) through (21).

(C) Achieve quantitative results on the analyses performed under paragraph (f)(17)(i)(A) of this section that are within ±20% of the actual amount of the substances in the Performance Evaluation sample when the actual amount is greater than or equal to 0.010 mg/l.

(D) Achieve quantitative results on the analyses performed under paragraph (f)(17)(i)(A) of this section that are within ±40 percent of the actual amount of the substances in the Performance Evaluation sample when the actual amount is less than 0.010 mg/l.

(E) Achieve a method detection limit of 0.0005 mg/l, according to the procedures in Appendix B of Part 136.

(ii) To receive certification for vinyl chloride, the laboratory must:

(A) Analyze Performance Evaluation samples provided by EPA Environmental Monitoring Systems Laboratory or equivalent samples provided by the State.

(B) Achieve quantitative results on the analyses performed under paragraph (f)(17)(ii)(A) of this section that are within ±40 percent of the actual amount of vinyl chloride in the Performance Evaluation sample.

(C) Achieve a method detection limit of 0.0005 mg/l, according to the procedures in appendix B of part 136.

(D) Obtain certification for the contaminants listed in §141.61(a)(2) through (21).

(18) States may allow the use of monitoring data collected after January 1, 1988, required under section 1445 of the Act for purposes of initial monitoring compliance. If the data are generally consistent with the other requirements of this section, the State may use these data (i.e., a single sample rather than four quarterly samples) to satisfy the initial monitoring requirement of paragraph (f)(4) of this section. Systems which use grandfathered samples and did not detect any contaminant listed §141.61(a)(2) through (21) shall begin monitoring annually in accordance with paragraph (f)(5) of this section beginning with the initial compliance period.

(19) States may increase required monitoring where necessary to detect variations within the system.

(20) Each approved laboratory must determine the method detection limit (MDL), as defined in appendix B to part 136, at which it is capable of detecting VOCs. The acceptable MDL is 0.0005 mg/l. This concentration is the detection concentration for purposes of this section.

(21) Each public water system shall monitor at the time designated by the State within each compliance period.

(g) For systems in operation before January 1, 1993, for purposes of initial monitoring, analysis of the contaminants listed in §141.61(a) (1) through (8) for purposes of determining compliance with the maximum contaminant levels shall be conducted as follows:

(1) Ground-water systems shall sample at points of entry to the distribution system representative of each well after any application of treatment. Sampling must be conducted at the same location(s) or more representative location(s) every three months for one year except as provided in paragraph (g)(8)(i) of this section.

(2) Surface water systems shall sample at points in the distribution system representative of each source or at entry points to the distribution system after any application of treatment. Surface water systems must sample each source every three months except as provided in paragraph (g)(8)(ii) of this section. Sampling must be conducted at the same location or a more representative location each quarter.

(3) 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 of normal operating conditions.

(4) All community water systems and non-transient, non-community water systems serving more than 10,000 people shall analyze all distribution or entry-point samples, as appropriate, representing all source waters beginning no later than January 1, 1988. All community water systems and non-transient non-community water systems serving from 3,300 to 10,000 people shall analyze all distribution or entry-point samples, as required in this paragraph (g), representing source waters no later than January 1, 1989. All other community and non-transient, non-community water systems shall analyze distribution or entry-point samples, as required in this paragraph (g), representing all source waters beginning no later than January 1, 1991.

(5) The State or EPA may require confirmation samples for positive or negative results. If a confirmation sample(s) is required by EPA or the State, then the sample result(s) should be averaged with the first sampling result and used for compliance determination in accordance with (g)(9) of this section. States have discretion to delete results of obvious sampling errors from this calculation.

(6) Analysis for vinyl chloride is required only for ground water systems that have detected one or more of the following two-carbon organic compounds: Trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-

dichloroethylene, or 1,1-dichloroethylene. The analysis for vinyl chloride is required at each distribution or entry point at which one or more of the two-carbon organic compounds were found. If the first analysis does not detect vinyl chloride, the State may reduce the frequency of vinyl chloride monitoring to once every three years for that sample location or other sample locations which are more representative of the same source. Surface water systems may be required to analyze for vinyl chloride at the discretion of the State.

(7) A State or individual public water systems may choose to composite up to five samples from one or more public water systems. Compositing of samples is to be done in the laboratory by the procedures listed below. Samples must be analyzed within fourteen days of collection. If any organic contaminant listed in §141.61(a) VOC is detected in the original composite sample, a sample from each source that made up the composite sample must be reanalyzed individually within fourteen days from sampling. The sample for reanalysis cannot be the original sample but can be a duplicate sample. If duplicates of the original samples are not available, new samples must be taken from each source used in the original composite and analyzed for VOCs. Reanalysis must be accomplished within fourteen days of the second sample. To composite samples, the following procedure must be followed:

(i) Compositing samples prior to GC analysis.

(A) Add 5 ml or equal larger amounts of each sample (up to 5 samples are allowed) to a 25 ml glass syringe. Special precautions must be made to maintain zero headspace in the syringe.

(B) The samples must be cooled at −4° C during this step to minimize volatilization losses.

(C) Mix well and draw out a 5-ml aliquot for analysis.

(D) Follow sample introduction, purging, and desorption steps described in the method.

(E) If less than five samples are used for compositing, a proportionately smaller syringe may be used.

(ii) Compositing samples prior to GC/MS analysis.

(A) Inject 5-ml or equal larger amounts of each aqueous sample (up to 5 samples are allowed) into a 25-ml purging device using the sample introduction technique described in the method.

(B) The total volume of the sample in the purging device must be 25 ml.

(C) Purge and desorb as described in the method.

(8) The State may reduce the monitoring frequency specified in paragraphs (g)(1) and (2) of this section, as explained in this paragraph.

(9) Compliance with §141.61(a) shall be determined based on the results of running annual average of quarterly sampling for each sampling location. If one location's average is greater than the MCL, then the system shall be deemed to be out of compliance. If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, only that part of the system that exceeds any MCL as specified in §141.61(a) will be deemed out of compliance. States may reduce the public notice requirement to that portion of the system which is out of compliance. If any one sample result would cause the annual average to be exceeded, then the system shall be deemed to be out of compliance immediately. For systems that only take one sample per location because no VOCs were detected, compliance shall be based on that one sample.

(10) Analysis under this paragraph shall be conducted using the following EPA methods or their equivalent as approved by EPA. These methods are contained in "Methods for the Determination of Organic Compounds in Finished Drinking Water and Raw Source Water," September 1986, available from Environmental and Support Laboratory (EMSL), EPA, Cincinnati, OH 45268 or the State.

(i) Method 502.1, "Volatile Halogenated Organic Chemicals in Water by Purge and Trap Gas Chromatography."

(ii) Method 503.1, "Volatile Aromatic and Unsaturated Organic Compounds in Water by Purge and Trap Gas Chromatography."

(iii) Method 524.1, "Volatile Organic Compounds in Water by Purge and

Trap Gas Chromatography/Mass Spectrometry."

(iv) Method 524.2, "Volatile Organic Compounds in Water by Purge and Trap Capillary Column Gas Chromatography/Mass Spectrometry."

(v) Method 502.2, "Volatile Organic Compounds in Water by Purge and Trap Capillary Gas Chromatography with Photoionization and Electrolytic Conductivity Detectors in Series."

(11) Analysis under this section shall only be conducted by laboratories that have received conditional approval by EPA or the State according to the following conditions:

(i) To receive conditional approval to conduct analyses for benzene, vinyl chloride, carbon tetrachloride, 1,2-dichloroethane, trichloroethylene, 1,1-dichloroethylene, 1,1,1-trichloroethane, and paradichlorobenzene the laboratory must:

(A) Analyze Performance Evaluation samples which include these substances provided by EPA Environmental Monitoring and Support Laboratory or equivalent samples provided by the State.

(B) Achieve the quantitative acceptance limits under paragraphs (g)(11)(i)(C) and (g)(11)(i)(D) of this section for at least six of the seven subject organic chemicals. States may allow fewer than six of the seven.

(C) Achieve quantitative results on the analyses performed under (g)(11)(i)(A) that are within ±20 percent of the actual amount of the substances in the Performance Evaluation sample when the actual amount is greater than or equal to 0.010 mg/l.

(D) Achieve quantitative results on the analyses performed under (g)((11)(i)(A) of this section that are within ±40 percent of the actual amount of the substances in the Performance Evaluation sample when the active amount is less than 0.010 mg/l.

(E) Achieve a method detection limit of 0.0005 mg/l, according to the procedures in appendix B of part 136.

(F) Be currently approved by EPA or the State for the analyses of trihalomethanes under §141.30.

(ii) To receive conditional approval for vinyl chloride, the laboratory must:

(A) Analyze Performance Evaluation samples provided by EPA Environmental Monitoring and Support Laboratory or equivalent samples provided by the State.

(B) Achieve quantitative results on the analyses performed under (g)(11)(ii)(A) of this section that are within ±40 percent of the actual amount of vinyl chloride in the Performance Evaluation sample.

(C) Achieve a method detection limit of 0.0005 mg/l, according to the procedures in appendix B of part 136.

(D) Receive approval or be currently approved by EPA or the State under (g)(11)(i) of this section.

(12) States have the authority to allow the use of monitoring data collected after January 1, 1983, for purposes of monitoring compliance. If the data is consistent with the other requirements in this paragraph, States may use that data to represent the initial monitoring if the system is determined by the State not to be vulnerable under the requirements of this section. In addition, the results of EPA's Ground Water Supply Survey can be used in a similar manner for systems supplied by a single well.

(13) States may increase required monitoring where necessary to detect variations within the system.

(14) The State has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by their sanctioned representatives and agencies.

(15) Each approved laboratory must determine the method detection limit (MDL), as defined in appendix B to part 136, at which it is capable of detecting VOCs. The acceptable MDL is 0.0005 mg/l. This concentration is the detection level for purposes of paragraphs (g) (5), (6), (7), and (8) of this section.

(h) Analysis of the contaminants listed in §141.61(c) for the purposes of determining compliance with the maximum contaminant level shall be conducted as follows:[7]

(1) Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after

---

[7] Monitoring for the contaminants aldicarb, aldicarb sulfoxide, and aldicarb sulfone shall be conducted in accordance with §141.40.

treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(2) Surface water systems shall take a minimum of one sample at points in the distribution system that are representative of each source or at each entry point to the distribution system after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

NOTE: For purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources.

(3) If the system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used).

(4) Monitoring frequency:

(i) Each community and non-transient non-community water system shall take four consecutive quarterly samples for each contaminant listed in §141.61(c) during each compliance period beginning with the compliance period starting January 1, 1993.

(ii) Systems serving more than 3,300 persons which do not detect a contaminant in the initial compliance period may reduce the sampling frequency to a minimum of two quarterly samples in one year during each repeat compliance period.

(iii) Systems serving less than or equal to 3,300 persons which do not detect a contaminant in the initial compliance period may reduce the sampling frequency to a minimum of one sample during each repeat compliance period.

(5) Each community and non-transient water system may apply to the State for a waiver from the requirement of paragraph (h)(4) of this section. A system must reapply for a waiver for each compliance period.

(6) A State may grant a waiver after evaluating the following factor(s): Knowledge of previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the system. If a determination by the State reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted. If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted.

(i) Previous analytical results.

(ii) The proximity of the system to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities. Non-point sources include the use of pesticides to control insect and weed pests on agricultural areas, forest lands, home and gardens, and other land application uses.

(iii) The environmental persistence and transport of the pesticide or PCBs.

(iv) How well the water source is protected against contamination due to such factors as depth of the well and the type of soil and the integrity of the well casing.

(v) Elevated nitrate levels at the water supply source.

(vi) Use of PCBs in equipment used in the production, storage, or distribution of water (i.e., PCBs used in pumps, transformers, etc.).

(7) If an organic contaminant listed in §141.61(c) is detected (as defined by paragraph (h)(18) of this section) in any sample, then:

(i) Each system must monitor quarterly at each sampling point which resulted in a detection.

(ii) The State may decrease the quarterly monitoring requirement specified in paragraph (h)(7)(i) of this section provided it has determined that the system is reliably and consistently below the maximum contaminant level. In no case shall the State make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

(iii) After the State determines the system is reliably and consistently below the maximum contaminant level the State may allow the system to monitor annually. Systems which monitor annually must monitor during the quarter that previously yielded the highest analytical result.

(iv) Systems which have 3 consecutive annual samples with no detection of a contaminant may apply to the State for a waiver as specified in paragraph (h)(6) of this section.

(v) If monitoring results in detection of one or more of certain related contaminants (aldicarb, aldicarb sulfone, aldicarb sulfoxide and heptachlor, heptachlor epoxide), then subsequent monitoring shall analyze for all related contaminants.

(8) Systems which violate the requirements of §141.61(c) as determined by paragraph (h)(11) of this section must monitor quarterly. After a minimum of four quarterly samples show the system is in compliance and the State determines the system is reliably and consistently below the MCL, as specified in paragraph (h)(11) of this section, the system shall monitor at the frequency specified in paragraph (h)(7)(iii) of this section.

(9) The State may require a confirmation sample for positive or negative results. If a confirmation sample is required by the State, the result must be averaged with the first sampling result and the average used for the compliance determination as specified by paragraph (h)(11) of this section. States have discretion to delete results of obvious sampling errors from this calculation.

(10) The State may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collection.

(11) Compliance with §141.61(c) shall be determined based on the analytical results obtained at each sampling point.

(i) For systems which are conducting monitoring at a frequency greater than annual, compliance is determined by a running annual average of all samples taken at each sampling point. If the annual average of any sampling point is greater than the MCL, then the system is out of compliance. If the initial sample or a subsequent sample would cause the annual average to be exceeded, then the system is out of compliance immediately. Any samples below the detection limit shall be calculated as zero for purposes of determining the annual average.

(ii) If monitoring is conducted annually, or less frequently, the system is out of compliance if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the State, the determination of compliance will be based on the average of two samples.

(iii) If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the State may allow the system to give public notice to only that portion of the system which is out of compliance.

(12) Analysis for the contaminants listed in §141.61(c) shall be conducted using the following EPA methods or their equivalent as approved by EPA. These methods are contained in "Methods for the Determination of Organic Compounds in Drinking Water," ORD Publications, CERI, EPA/600/4-88/039, December 1988. These documents are available from the National Technical Information Service (NTIS), U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll-free number is 1-800-336-4700.

(i) Method 504, "1,2-Dibromoethane (EDB) and 1,2-Dibromo-3-chloropropane (DBCP) in Water by Microextraction and Gas Chromatography." Method 504 can be used to measure dibromochloropropane (DBCP) and ethylene dibromide (EDB).

(ii) Method 505, "Analysis of Organohalide Pesticides and Commercial Polychlorinated Biphenyl Products (Aroclors) in Water by Microextraction and Gas Chromatography." Method 505 can be used to measure alachlor, atrazine, chlordane, endrin, heptachlor, heptachlor epoxide, hexachlorobenzene, hexachlorocyclopentadiene, lindane, methoxychlor, toxaphene and simazine. Method 505 can be used as a screen for PCBs.

(iii) Method 507, "Determination of Nitrogen- and Phosphorus-Containing Pesticides in Ground Water by Gas Chromatography with a Nitrogen-Phosphorus Detector." Method 507 can be used to measure alachlor, atrazine and simazine.

(iv) Method 508, "Determination of Chlorinated Pesticides in Water by Gas Chromatography with an Electron Capture Detector." Method 508 can be used to measure chlordane, endrin, heptachlor, heptachlor epoxide, hexachlorobenzene, lindane, methoxychlor and toxaphene. Method 508 can be used as a screen for PCBs.

(v) Method 508A, "Screening for Polychlorinated Biphenyls by Perchlorination and Gas Chromatography." Method 508A is used to quantitate PCBs as decachlorobiphenyl if detected in Method 505 or 508.

(vi) Method 515.1, "Determination of Chlorinated Acids in Water by Gas Chromatography with an Electron Capture Detector." Method 515.1 can be used to measure 2,4-D, dalapon, dinoseb, pentachlorophenol, picloram and 2,4,5-TP (Silvex).

(vii) Method 525.1, "Determination of Organic Compounds in Drinking Water by Liquid-Solid Extraction and Capillary Column Gas Chromatography/Mass Spectrometry." Method 525.1 can be used to measure alachlor, atrazine, chlordane, di(2-ethylhexyl)adipate, di(2-ethylhexyl)phthalate, endrin, heptachlor, heptachlor epoxide, hexachlorobenzene, hexachlorocyclopentadiene, lindane, methoxychlor, pentachlorphenol, polynuclear aromatic hydrocarbons, simazine, and toxaphene.

(viii) Method 531.1, "Measurement of N-Methyl Carbamoyloximes and N-Methyl Carbamates in Water by Direct Aqueous Injection HPLC with Post-Column Derivatization." Method 531.1 can be used to measure aldicarb, aldicarb sulfoxide, aldicarb sulfone, carbofuran and oxamyl.

(ix) Method 1613, "Tetra- through Octa- Chlorinated Dioxins and Furans by Isotope Dilution." Method 1613 can be used to measure 2,3,7,8-TCDD (dioxin). This method is available from USEPA-OST, Sample Control Center, P.O. Box 1407, Alexandria, VA 22313.

(x) Method 547, "Analysis of Glyphosate in Drinking Water by Direct Aqueous Injection HPLC with Post-Column Derivatization" Method 547 can be used to measure glyphosate.

(xi) Method 548, "Determination of Endothall in Aqueous Samples." Method 548 can be used to measure endothall.

(xii) Method 549, "Determination of Diquat and Paraquat in Drinking Water by High Performance Liquid Chromatography with Ultraviolet Detection." Method 549 can be used to measure diquat.

(xiii) Method 550, "Determination of Polycyclic Aromatic Hydrocarbons in Drinking Water by Liquid-Liquid Extraction and HPLC with Coupled Ultraviolet and Fluorescence Detection". Method 550 can be used to measure benzo(a)pyrene and other polynuclear aromatic hydrocarbons.

(xiv) Method 550.1, "Determination of Polycyclic Aromatic Hydrocarbons in Drinking Water by Liquid-Solid Extraction and HPLC with Coupled Ultraviolet and Fluorescence Detection". Method 550.1 can be used to measure benzo(a)pyrene and other polynuclear aromatic hydrocarbons.

(13) Analysis for PCBs shall be conducted as follows:

(i) Each system which monitors for PCBs shall analyze each sample using either Method 505 or Method 508 (see paragraph (h)(12) of this section).

(ii) If PCBs (as one of seven Aroclors) are detected (as designated in this paragraph) in any sample analyzed using Method 505 or 508, the system shall reanalyze the sample using Method 508A to quantitate PCBs (as decachlorobiphenyl).

Aroclor	Detection limit (mg/l)
1016	0.00008
1221	0.02
1232	0.0005
1242	0.0003
1248	0.0001
1254	0.0001
1260	0.0002

(iii) Compliance with the PCB MCL all be determined based upon the antitative results of analyses using Method 508A.

(14) If monitoring data collected after January 1, 1990, are generally consistent with the requirements of § 141.24(h), then the State may allow systems to use that data to satisfy the monitoring requirement for the initial compliance period beginning January 1, 1993.

(15) The State may increase the required monitoring frequency, where necessary, to detect variations within the system (e.g., fluctuations in concentration due to seasonal use, changes in water source).

(16) The State has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by their sanctioned representatives and agencies.

(17) Each public water system shall monitor at the time designated by the State within each compliance period.

(18) Detection as used in this paragraph shall be defined as greater than or equal to the following concentrations for each contaminant.

Contaminant	Detection limit (mg/l)
Alachlor	.0002
Aldicarb	.0005
Aldicarb sulfoxide	.0005
Aldicarb sulfone	.0008
Atrazine	.0001
Benzo[a]pyrene	.00002
Carbofuran	.0009
Chlordane	.0002
Dalapon	.001
Dibromochloropropane (DBCP)	.00002
Di (2-ethylhexyl) adipate	.0006
Di (2-ethylhexyl) phthalate	.0006
Dinoseb	.0002
Diquat	.0004
2,4-D	.0001
Endothall	.009
Endrin	.00001
Ethylene dibromide (EDB)	.00001
Glyphosate	.006
Heptachlor	.00004
Heptachlor epoxide	.00002
Hexachlorobenzene	.0001
Hexachlorocyclopentadiene	.0001
Lindane	.00002
Methoxychlor	.0001
Oxamyl	.002
Picloram	.0001
Polychlorinated biphenyls (PCBs) (as decachlorobiphenyl)	.0001
Pentachlorophenol	.00004
Simazine	.00007
Toxaphene	.001
3,7,8-TCDD (Dioxin)	.000000005
,5-TP (Silvex)	.0002

(19) Anaylsis under this section shall only be conducted by laboratories that have received certification by EPA or the State and have met the following conditions:

(i) To receive certification to conduct analyses for the contaminants in § 141.61(c) the laboratory must:

(A) Analyze Performance Evaluation samples which include those substances provided by EPA Environmental Monitoring and Support Laboratory or equivalent samples provided by the State.

(B) Achieve quantitative results on the analyses that are within the following acceptance limits:

Contaminant	Acceptance limits (percent)
DBCP	±40
EDB	±40.
Alachlor	±45.
Atrazine	±45.
Benzo[a]pyrene	2 standard deviations.
Carbofuran	±45.
Chlordane	±45.
Dalapon	2 standard deviations.
Di(2-ethylhexyl)adipate	2 standard deviations.
Di(2-ethylhexyl)phthalate	2 standard deviations.
Dinoseb	2 standard deviations.
Diquat	2 standard deviations.
Endothall	2 standard deviations.
Endrin	±30.
Glyphosate	2 standard deviations.
Heptachlor	±45.
Heptachlor epoxide	±45.
Hexachlorobenzene	2 standard deviations.
Hexachloro- cyclopentadiene	2 standard deviations.
Lindane	±45.
Methoxychlor	±45.
Oxamyl	2 standard deviations.
PCBs (as Decachlorobiphenyl)	0–200.
Picloram	2 standard deviations.
Simazine	2 standard deviations.
Toxaphene	±45.
Aldicarb	2 standard deviations.
Aldicarb sulfoxide	2 standard deviations.
Aldicarb sulfone	2 standard deviations.
Pentachlorophenol	±50.
2,3,7,8-TCDD (Dioxin)	2 standard deviations.
2,4-D	±50.
2,4,5-TP (Silvex)	±50.

(ii) [Reserved]

(Approved by the Office of Management and Budget under control number 2040–0090)

[40 FR 59570, Dec. 24, 1975, as amended at 44 FR 68641, Nov. 29, 1979; 45 FR 57345, Aug. 27, 1980; 47 FR 10998, Mar. 12, 1982; 52 FR 25712, July 8, 1987; 53 FR 5147, Feb. 19, 1988; 53 FR 25110, July 1, 1988; 56 FR 3583, Jan. 30, 1991; 56 FR 30277, July 1, 1991; 57 FR 22178, May 27, 1992; 57 FR 31841, July 17, 1992]

§ 141.25 Analytical methods for radioactivity.

(a) The methods specified in *Interim Radiochemical Methodology for Drinking Water*, Environmental Monitoring and Support Laboratory, EPA-600/4-75-008, USEPA, Cincinnati, Ohio 45268, or those listed below, are to be used to determine compliance with §§141.15 and 141.16 (radioactivity) except in cases where alternative methods have been approved in accordance with §141.27.

(1) Gross Alpha and Beta—Method 302 "Gross Alpha and Beta Radioactivity in Water" *Standard Methods for the Examination of Water and Wastewater*, 13th Edition, American Public Health Association, New York, NY., 1971.

(2) Total Radium—Method 304 "Radium in Water by Precipitation" Ibid.

(3) Radium-226—Method 305 "Radium-226 by Radon in Water" Ibid.

(4) Strontium-89,90 — Method 303 "Total Strontium and Strontium-90 in Water" Ibid.

(5) Tritium—Method 306 "Tritium in Water" Ibid.

(6) Cesium-134 — ASTM D-2459 "Gamma Spectrometry in Water," *1975 Annual Book of ASTM Standards, Water and Atmospheric Analysis*, Part 31, American Society for Testing and Materials, Philadelphia, PA. (1975).

(7) Uranium—ASTM D-2907 "Microquantities of Uranium in Water by Fluorometry," Ibid.

(b) When the identification and measurement of radionuclides other than those listed in paragraph (a) of this section is required, the following references are to be used, except in cases where alternative methods have been approved in accordance with §141.27.

(1) *Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions*, H. L. Krieger and S. Gold, EPA-R4-73-014. USEPA, Cincinnati, Ohio, May 1973.

(2) *HASL Procedure Manual*, Edited by John H. Harley. HASL 300, ERDA Health and Safety Laboratory, New York, NY., 1973.

(c) For the purpose of monitoring radioactivity concentrations in drinking water, the required sensitivity of the radioanalysis is defined in terms of a detection limit. The detection limit shall be that concentration which can be counted with a precision of plus or minus 100 percent at the 95 percent confidence level (1.96σ where σ is the standard deviation of the net counting rate of the sample).

(1) To determine compliance with §141.15(a) the detection limit shall not exceed 1 pCi/1. To determine compliance with §141.15(b) the detection limit shall not exceed 3 pCi/1.

(2) To determine compliance with §141.16 the detection limits shall not exceed the concentrations listed in Table B.

TABLE B—DETECTION LIMITS FOR MAN-MADE BETA PARTICLE AND PHOTON EMITTERS

Radionuclide	Detection limit
Tritium	1,000 pCi/1.
Strontium–89	10 pCi/1.
Strontium–90	2 pCi/1.
Iodine–131	1 pCi/1.
Cesium–134	10 pCi/1.
Gross beta	4 pCi/1.
Other radionuclides	1/10 of the applicable limit.

(d) To judge compliance with the maximum contaminant levels listed in §§141.15 and 141.16, averages of data shall be used and shall be rounded to the same number of significant figures as the maximum contaminant level for the substance in question.

(e) The State has the authority to determine compliance or initiate enforcement action based upon analytical results or other information compiled by their sanctioned representatives and agencies.

[41 FR 28404, July 9, 1976, as amended at 45 FR 57345, Aug. 27, 1980]

§ 141.26 Monitoring frequency for radioactivity in community water systems.

(a) Monitoring requirements for gross alpha particle activity, radium-226 and radium-228.

(1) Initial sampling to determine compliance with §141.15 shall begin within two years of the effective date of these regulations and the analysis shall be completed within three years of the effective date of these regulations. Compliance shall be based on the analysis of an annual composite of four consecutive quarterly samples or the average of the analyses of four samples obtained at quarterly intervals.

(i) A gross alpha particle activity measurement may be substituted for the required radium-226 and radium-228 analysis *Provided*, That the measured gross alpha particle activity does not exceed 5 pCi/l at a confidence level of 95 percent (1.65σ where σ is the standard deviation of the net counting rate of the sample). In localities where radium-228 may be present in drinking water, it is recommended that the State require radium-226 and/or radium-228 analyses when the gross alpha particle activity exceeds 2 pCi/l.

(ii) When the gross alpha particle activity exceeds 5 pCi/l, the same or an equivalent sample shall be analyzed for radium-226. If the concentration of radium-226 exceeds 3 pCi/l the same or an equivalent sample shall be analyzed for radium-228.

(2) For the initial analysis required by paragraph (a)(1) of this section, data acquired within one year prior to the effective date of this part may be substituted at the discretion of the State.

(3) Suppliers of water shall monitor at least once every four years following the procedure required by paragraph (a)(1) of this section. At the discretion of the State, when an annual record taken in conformance with paragraph (a)(1) of this section has established that the average annual concentration is less than half the maximum contaminant levels established by § 141.15, analysis of a single sample may be substituted for the quarterly sampling procedure required by paragraph (a)(1) of this section.

(i) More frequent monitoring shall be conducted when ordered by the State in the vicinity of mining or other operations which may contribute alpha particle radioactivity to either surface or ground water sources of drinking water.

(ii) A supplier of water shall monitor in conformance with paragraph (a)(1) of this section within one year of the introduction of a new water source for a community water system. More frequent monitoring shall be conducted when ordered by the State in the event of possible contamination or when changes in the distribution system or treatment processing occur which may increase the concentration of radioactivity in finished water.

(iii) A community water system using two or more sources having different concentrations of radioactivity shall monitor source water, in addition to water from a free-flowing tap, when ordered by the State.

(iv) Monitoring for compliance with § 141.15 after the initial period need not include radium-228 *except when* required by the State, *Provided*, That the average annual concentration of radium-228 has been assayed at least once using the quarterly sampling procedure required by paragraph (a)(1) of this section.

(v) Suppliers of water shall conduct annual monitoring of any community water system in which the radium-226 concentration exceeds 3 pCi/l, when ordered by the State.

(4) If the average annual maximum contaminant level for gross alpha particle activity or total radium as set forth in § 141.15 is exceeded, the supplier of a community water system shall give notice to the State pursuant to § 141.31 and notify the public as required by § 141.32. Monitoring at quarterly intervals shall be continued until the annual average concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

(b) Monitoring requirements for manmade radioactivity in community water systems.

(1) Within two years of the effective date of this part, systems using surface water sources and serving more than 100,000 persons and such other community water systems as are designated by the State shall be monitored for compliance with § 141.16 by analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples. Compliance with § 141.16 may be assumed without further analysis if the average annual concentration of gross beta particle activity is less than 50 pCi/l and if the average annual concentrations of tritium and strontium-90 are less than those listed in Table A, *Provided*, That if both radionuclides are present the sum of their annual dose equivalents to bone marrow shall not exceed 4 millirem/year.

(i) If the gross beta particle activity exceeds 50 pCi/l, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance with § 141.16.

(ii) Suppliers of water shall conduct additional monitoring, as ordered by the State, to determine the concentration of man-made radioactivity in principal watersheds designated by the State.

(iii) At the discretion of the State, suppliers of water utilizing only ground waters may be required to monitor for man-made radioactivity.

(2) For the initial analysis required by paragraph (b)(1) of this section data acquired within one year prior to the effective date of this part may be substituted at the discretion of the State.

(3) After the initial analysis required by paragraph (b)(1) of this section suppliers of water shall monitor at least every four years following the procedure given in paragraph (b)(1) of this section.

(4) Within two years of the effective date of these regulations the supplier of any community water system designated by the State as utilizing waters contaminated by effluents from nuclear facilities shall initiate quarterly monitoring for gross beta particle and iodine–131 radioactivity and annual monitoring for strontium–90 and tritium.

(i) Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples or the analysis of a composite of three monthly samples. The former is recommended. If the gross beta particle activity in a sample exceeds 15 pCi/1, the same or an equivalent sample shall be analyzed for strontium–89 and cesium–134. If the gross beta particle activity exceeds 50 pCi/1, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance with § 141.16.

(ii) For iodine–131, a composite of five consecutive daily samples shall be analyzed once each quarter. As ordered by the State, more frequent monitoring shall be conducted when iodine–131 is identified in the finished water.

(iii) Annual monitoring for strontium–90 and tritium shall be conducted by means of the analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples. The latter procedure is recommended.

(iv) The State may allow the substitution of environmental surveillance data taken in conjunction with a nuclear facility for direct monitoring of manmade radioactivity by the supplier of water where the State determines such data is applicable to a particular community water system.

(5) If the average annual maximum contaminant level for man-made radioactivity set forth in § 141.16 is exceeded, the operator of a community water system shall give notice to the State pursuant to § 141.31 and to the public as required by § 141.32. Monitoring at monthly intervals shall be continued until the concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

[41 FR 28404, July 9, 1976]

§ 141.27 Alternate analytical techniques.

(a) With the written permission of the State, concurred in by the Administrator of the U.S. EPA, an alternate analytical technique may be employed. An alternate technique shall be accepted only if it is substantially equivalent to the prescribed test in both precision and accuracy as it relates to the determination of compliance with any MCL. The use of the alternate analytical technique shall not decrease the frequency of monitoring required by this part.

[45 FR 57345, Aug. 27, 1980]

§ 141.28 Approved laboratories.

(a) For the purpose of determining compliance with §§ 141.21 through 141.27, 141.41 and 141.42, samples may be considered only if they have been analyzed by a laboratory approved by the State except that measurements for turbidity, free chlorine residual, temperature and pH may be performed by any person acceptable to the State.

(b) Nothing in this part shall be construed to preclude the State or any duly designated representative of the State from taking samples or from using the results from such samples to determine compliance by a supplier of water with the applicable requirements of this part.

[45 FR 57345, Aug. 27, 1980; 47 FR 10999, Mar. 12, 1982]

§141.29 Monitoring of consecutive public water systems.

When a public water system supplies water to one or more other public water systems, the State may modify the monitoring requirements imposed by this part to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes. Any modified monitoring shall be conducted pursuant to a schedule specified by the State and concurred in by the Administrator of the U.S. Environmental Protection Agency.

§141.30 Total trihalomethanes sampling, analytical and other requirements.

(a) Community water system which serve a population of 10,000 or more individuals and which add a disinfectant (oxidant) to the water in any part of the drinking water treatment process shall analyze for total trihalomethanes in accordance with this section. For systems serving 75,000 or more individuals, sampling and analyses shall begin not later than 1 year after the date of promulgation of this regulation. For systems serving 10,000 to 74,999 individuals, sampling and analyses shall begin not later than 3 years after the date of promulgation of this regulation. For the purpose of this section, the minimum number of samples required to be taken by the system shall be based on the number of treatment plants used by the system, except that multiple wells drawing raw water from a single aquifer may, with the State approval, be considered one treatment plant for determining the minimum number of samples. All samples taken within an established frequency shall be collected within a 24-hour period.

(b)(1) For all community water systems utilizing surface water sources in whole or in part, and for all community water systems utilizing only ground water sources that have not been determined by the State to qualify for the monitoring requirements of paragraph (c) of this section, analyses for total trihalomethanes shall be performed at quarterly intervals on at least four water samples for each treatment plant used by the system. At least 25 percent of the samples shall be taken at locations within the distribution system reflecting the maximum residence time of the water in the system. The remaining 75 percent shall be taken at representative locations in the distribution system, taking into account number of persons served, different sources of water and different treatment methods employed. The results of all analyses per quarter shall be arithmetically averaged and reported to the State within 30 days of the system's receipt of such results. Results shall also be reported to EPA until such monitoring requirements have been adopted by the State. All samples collected shall be used in the computation of the average, unless the analytical results are invalidated for technical reasons. Sampling and analyses shall be conducted in accordance with the methods listed in paragraph (e) of this section.

(2) Upon the written request of a community water system, the monitoring frequency required by paragraph (b)(1) of this section may be reduced by the State to a minimum of one sample analyzed for TTHMs per quarter taken at a point in the distribution system reflecting the maximum residence time of the water in the system, upon a written determination by the State that the data from at least 1 year of monitoring in accordance with paragraph (b)(1) of this section and local conditions demonstrate that total trihalomethane concentrations will be consistently below the maximum contaminant level.

(3) If at any time during which the reduced monitoring frequency prescribed under this paragraph applies, the results from any analysis exceed 0.10 mg/l of TTHMs and such results are confirmed by at least one check sample taken promptly after such results are received, or if the system makes any significant change to its source of water or treatment program, the sys-

tem shall immediately begin monitoring in accordance with the requirements of paragraph (b)(1) of this section, which monitoring shall continue for at least 1 year before the frequency may be reduced again. At the option of the State, a system's monitoring frequency may and should be increased above the minimum in those cases where it is necessary to detect variations of TTHM levels within the distribution system.

(c)(1) Upon written request to the State, a community water system utilizing only ground water sources may seek to have the monitoring frequency required by paragraph (b)(1) of this section reduced to a minimum of one sample for maximum TTHM potential per year for each treatment plant used by the system taken at a point in the distribution system reflecting maximum residence time of the water in the system. The system shall submit to the State the results of at least one sample analyzed for maximum TTHM potential for each treatment plant used by the system taken at a point in the distribution system reflecting the maximum residence time of the water in the system. The system's monitoring frequency may only be reduced upon a written determination by the State that, based upon the data submitted by the system, the system has a maximum TTHM potential of less than 0.10 mg/l and that, based upon an assessment of the local conditions of the system, the system is not likely to approach or exceed the maximum contaminant level for total TTHMs. The results of all analyses shall be reported to the State within 30 days of the system's receipt of such results. Results shall also be reported to EPA until such monitoring requirements have been adopted by the State. All samples collected shall be used for determining whether the system must comply with the monitoring requirements of paragraph (b) of this section, unless the analytical results are invalidated for technical reasons. Sampling and analyses shall be conducted in accordance with the methods listed in paragraph (e) of this section.

(2) If at any time during which the reduced monitoring frequency prescribed under paragraph (c)(1) of this section applies, the results from any analysis taken by the system for maximum TTHM potential are equal to or greater than 0.10 mg/l, and such results are confirmed by at least one check sample taken promptly after such results are received, the system shall immediately begin monitoring in accordance with the requirements of paragraph (b) of this section and such monitoring shall continue for at least one year before the frequency may be reduced again. In the event of any significant change to the system's raw water or treatment program, the system shall immediately analyze an additional sample for maximum TTHM potential taken at a point in the distribution system reflecting maximum residence time of the water in the system for the purpose of determining whether the system must comply with the monitoring requirements of paragraph (b) of this section. At the option of the State, monitoring frequencies may and should be increased above the minimum in those cases where this is necessary to detect variation of TTHM levels within the distribution system.

(d) Compliance with § 141.12(c) shall be determined based on a running annual average of quarterly samples collected by the system as prescribed in paragraph (b)(1) or (2) of this section. If the average of samples covering any 12 month period exceeds the Maximum Contaminant Level, the supplier of water shall report to the State pursuant to § 141.31 and notify the public pursuant to § 141.32. Monitoring after public notification shall be at a frequency designated by the State and shall continue until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

(e) Sampling and analyses made pursuant to this section shall be conducted by one of the following EPA approved methods:

(1) "The Analysis of Trihalomethanes in Drinking Waters by the Purge and Trap Method," Method 501.1, EMSL, EPA Cincinnati, Ohio.

(2) "The Analysis of Trihalomethanes in Drinking Water by Liquid/Liquid Extraction," Method 501.2, EMSL, EPA Cincinnati, Ohio.

Samples for TTHM shall be dechlorinated upon collection to prevent further production of Trihalomethanes, according to the procedures described in the above two methods. Samples for maximum TTHM potential should not be dechlorinated, and should be held for seven days at 25° C (or above) prior to analysis, according to the procedures described in the above two methods.

(f) Before a community water system makes any significant modifications to its existing treatment process for the purposes of achieving compliance with §141.12(c), such system must submit and obtain State approval of a detailed plan setting forth its proposed modification and those safeguards that it will implement to ensure that the bacteriological quality of the drinking water served by such system will not be adversely affected by such modification. Each system shall comply with the provisions set forth in the State-approved plan. At a minimum, a State approved plan shall require the system modifying its disinfection practice to:

(1) Evaluate the water system for sanitary defects and evaluate the source water for biological quality;

(2) Evaluate its existing treatment practices and consider improvements that will minimize disinfectant demand and optimize finished water quality throughout the distribution system;

(3) Provide baseline water quality survey data of the distribution system. Such data should include the results from monitoring for coliform and fecal coliform bacteria, fecal streptococci, standard plate counts at 35° C and 20° C, phosphate, ammonia nitrogen and total organic carbon. Virus studies should be required where source waters are heavily contaminated with sewage effluent;

(4) Conduct additional monitoring to assure continued maintenance of optimal biological quality in finished water, for example, when chloramines are introduced as disinfectants or when pre-chlorination is being discontinued. Additional monitoring should also be required by the State for chlorate, chlorite and chlorine dioxide when chlorine dioxide is used. Standard plate count analyses should also be required by the State as appropriate before and after any modifications;

(5) Consider inclusion in the plan of provisions to maintain an active disinfectant residual throughout the distribution system at all times during and after the modification.

[44 FR 68641, Nov. 29, 1979, as amended at 45 FR 15545, 15547, Mar. 11, 1980]

APPENDIX A—SUMMARY OF PUBLIC COMMENTS AND EPA RESPONSES ON PROPOSED AMENDMENTS TO THE NATIONAL INTERIM PRIMARY DRINKING WATER REGULATIONS FOR CONTROL OF TRIHALOMETHANES IN DRINKING WATER

[44 FR 68642, Nov. 29, 1979]

APPENDIX B—SUMMARY OF MAJOR COMMENTS (FOR RESPONSES, SEE APPENDIX A)

[44 FR 68666, Nov. 29, 1979]

EDITORIAL NOTE: Appendices A and B appearing at 44 FR 68642 and 68666, Nov. 29, 1979, are not codified in the Code of Federal Regulations.

APPENDIX C—ANALYSIS OF TRIHALOMETHANES

PART I—THE ANALYSIS OF TRIHALOMETHANES IN DRINKING WATER BY THE PURGE AND TRAP METHOD

1. Scope

1.1 This method (1) is applicable in the determination of four trihalomethanes, i.e. chloroform, dichlorobromomethane, dibromochloromethane, and bromoform in finished drinking water, raw source water, or drinking water in any stage of treatment. The concentration of these four compounds is totaled to determine total trihalomethanes (TTHM).

1.2 For compounds other than the above-mentioned trihalomethanes, or for other sample sources, the analyst must demonstrate the usefulness of the method by collecting precision and accuracy data on actual samples as described (2).

1.3 Although the actual detection limits are highly dependent upon the gas chromatographic column and detector employed, the method can be used over a concentration range of approximately 0.5 to 1500 micrograms per liter.

1.4 Well in excess of 100 different water supplies have been analyzed using this method. Supplementary analyses using gas chromatography mass spectrometry (GC/MS) have shown that there is no evidence of interference in the determination of trihalomethanes (3). For this reason, it is not necessary to analyze the raw source water as is required with the Liquid/Liquid Extraction Method (4).

2. *Summary*

2.2 Trihalomethanes are extracted by an inert gas which is bubbled through the aqueous sample. The trihalomethanes, along with other organic constituents which exhibit low water solubility and a vapor pressure significantly greater than water, are efficiently transferred from the aqueous phase to the gaseous phase. These compounds are swept from the purging device and are trapped in a short column containing a suitable sorbent. After a predetermined period of time, the trapped components are thermally desorbed and backflushed onto the head of a gas chromatographic column and separated under programmed conditions. Measurement is accomplished with a halogen specific detector such as electrolytic conductivity or microcoulometric titration.

2.3 Confirmatory analyses are performed using dissimilar columns, or by mass spectrometry (5).

2.4 Aqueous standards and unknowns are extracted and analyzed under identical conditions in order to compensate for extraction losses.

2.5 The total analysis time, assuming the absence of other organohalides, is approximately 35 minutes per sample.

3. *Interferences*

3.1 Impurities contained in the purge gas and organic compounds outgasing from the plumbing ahead of the trap usually account for the majority of contamination problems. The presence of such inteferences are easily monitored as a part of the quality control program. Sample blanks are normally run between each set of samples. When a positive trihalomethane response is noted in the sample blank, the analyst should analyze a method blank. Method blanks are run by charging the purging device with organic-free water and analyzing in the normal manner.

If any trihalomethane is noted in the method blank in excess of 0.4 μg/l, the analyst should change the purge gas source and regenerate the molecular sieve purge gas filter. *Subtracting the blank values is not recommended.* The use of non-TFE plastic tubing, non-TFE thread sealants, or flow controllers with rubber components should be avoided since such materials generally outgas organic compounds which will be concentrated in the trap during the purge operation. Such out-gasing problems are common whenever new equipment is put into service; as time progresses, minor out-gasing problems generally cure themselves.

3.2 Several instances of accidental sample contamination have been noted and attributed to diffusion of volatile organics through the septum seal and into the sample during shipment and storage. The sample blank is used as a monitor for this problem.

3.3 For compounds that are not efficiently purged, such as bromoform, small variations in sample volume, purge time, purge flow rate, or purge temperature can affect the analytical result. Therefore, samples and standards must be analyzed under identical conditions.

3.4 Cross-contamination can occur whenever high-level and low-level samples are sequentially analyzed. To reduce this likelihood, the purging device and sample syringe should be rinsed twice between samples with organic-free water. Whenever an unusually concentrated sample is encountered, it is highly recommended that it be followed by a sample blank analysis to ensure that sample cross contamination does not occur. For samples containing large amounts of water soluble materials, it may be necessary to wash out the purging device with a soap solution, rinse with distilled water, and then dry in a 105° C oven between analyses.

3.5 Qualitative misidentifications are a problem in using gas chromatographic analysis. Whenever samples whose qualitative nature is unknown are analyzed, the following precautionary measures should be incorporated into the analysis.

3.5.1 Perform duplicate analyses using the two recommended columns (4.2.1 and 4.2.2) which provide different retention order and retention times for the trihalomethanes and other organohalides.

3.5.2 Whenever possible, use GC/MS techniques which provide unequivocal qualitative identifications (5).

4. *Apparatus*

4.1 The purge and trap equipment consists of three separate pieces of apparatus: the purging device, trap, and desorber. Construction details for a purging device and an easily automated trap-desorber hybrid which has proven to be exceptionally efficient and reproducible are shown in Figures 1 through 4 and described in 4.1.1. through 4.1.3. An earlier acceptable version of the above-mentioned equipment is described in (1).

4.1.1 Purging Device—Construction details are given in Figure 1 for an all-glass 5 ml purging device. The glass frit installed at the base of the sample chamber allows finely divided gas bubbles to pass through the sample while the sample is restrained above the frit. Gaseous volumes above the sample are kept to a minimum to eliminate dead volume effects, yet allowing sufficient space for most foams to disperse. The inlet and exit ports are constructed from heavy-walled ¼-inch glass tubing so that leak-free removable connections can be made using "finger-tight" compression fittings containing Teflon ferrules. The removable foam trap is used ontrol samples that foam.

.2 Trapping Device—The trap (Figure 2) is a short gas chromatographic column which at <35° C retards the flow of the compounds of interest while venting the purge gas and, depending on which sorbent is used, much of the water vapor. The trap should be constructed with a low thermal mass so that it can be heated to 180° C in less than 1 minute for efficient desorption, then rapidly cooled to room temperature for recycling. Variations in the trap ID, wall thickness, sorbents, sorbent packing order, and sorbent mass could adversely affect the trapping and desorption efficiencies for compounds discussed in this text. For this reason, it is important to faithfully reproduce the trap configurations recommended in Figure 2. Traps containing Tenax only, or combinations of Tenax and other sorbents are acceptable for this analysis.

4.1.3 Desorber assembly—Details for the desorber are shown in Figures 3, and 4. With the 6-port valve in the Purge Sorb position (Figure 3), the effluent from the purging device passes through the trap where the flow rate of the organics is retarded. The GC carrier gas also passes through the 6-port valve and is returned to the GC. With the 6-port valve in the Purge-Sorb position, the operation of the GC is in no way impaired; therefore, routine liquid injection analyses can be formed using the gas chromatograph. er the sample has been purged, the 6-port valve is turned to the desorb position (Figure 4). In this configuration the trap is coupled in series with the gas chromatographic column allowing the carrier gas to backflush the trapped materials into the analytical column. Just as the valve is actuated, the power is turned on to the resistance wire wrapped around the trap. The power is supplied by an electronic temperature controller. Using this device, the trap is rapidly heated to 180° C and then maintained at 180° C with minimal temperature overshoot. The trapped compounds are released as a "plug" to the gas chromatograph. Normally, packed columns with theoretical efficiencies near 500 plates/foot under programmed temperature conditions can accept such desorb injections without altering peak geometry. Substituting a non-controlled power supply, such as a manually-operated variable transformer, will provide nonreproductible retention times and poor quantitative data unless Injection Procedure (8.9.2) is used.

4.1.4 Several Purge and Trap Devices are now commercially available. It is recommended that the following be taken into consideration if a unit is to be purchased:

a. Be sure that the unit is completely compatible with the gas chromatograph to be sed for the analysis.

b. Use a 5-ml purging device similar to that shown in Figure 1.

c. Be sure the Tenax portion of the trap meets or exceeds the dimensions shown in Figure 2.

d. With the exception of sample introduction, select a unit that has as many of the purge trap functions automated as possible.

4.2 Gas chromatograph—The chromatograph must be temperature programmable and equipped with a halide specific detector.

4.2.1 Column I is an unusually efficient column which provides outstanding separations for a wide variety of organic compounds. Because of its ability to resolve trihalomethanes from other organochlorine compounds, column I should be used as the primary analytical column (see Table 1 for retention data using this column).

4.2.1.1 Column I parameters: Dimensions—8 feet long x 0.1 inch ID stainless steel or glass tubing. Packing—1% SP-1000 on Carbopack-B (60/80) mesh. Carrier Gas—helium at 40 ml/minute. Temperature program sequence: 45° C isothermal for 3 minutes, program at 8° C/minute to 220° C then hold for 15 minutes or until all compounds have eluted.

NOTE: It has been found that during handling, packing, and programming, active sites are exposed on the Carbopack-B packing. This results in tailing peak geometry and poor resolution of many constituents. To correct this, pack the first 5 cm of the column with 3% SP-1000 on Chromosorb-W 60/80 followed by the Carbopack-B packing. Condition the precolumn and the Carbopack columns with carrier gas flow at 220° C overnight. Pneumatic shocks and rough treatment of packed columns will cause excessive fracturing of the Carbopack. If pressure in excess of 60 psi is required to obtain 40 ml/minute carrier flow, then the column should be repacked.

4.2.1.2 Acceptable column equivalent to Column I: Dimensions—8 feet long x 0.1 inch ID stainless steel or glass tubing. Packing—0.2% Carbowax 1500 on Carbopack-C (80/100) mesh. Carrier Gas—helium at 40 ml/minute. Temperature program sequence—60° C isothermal for 3 minutes, program at 8° C /minute to 160° C, then hold for 2 minutes or until all compounds have eluted.

NOTE: It has been found that during handling, packing, and programming, active sites are exposed on the Carbopack-C packing. This results in poor resolution of constituents and poor peak geometry. To correct this, place a 1 ft. 0.125 in. OD x 0.1 in. ID stainless steel column packed with 3% Carbowax 1500 on Chromosorb-W 60/80 mesh in series before the Carbopack-C column. Condition the precolumn and the Carbopack columns with carrier gas flow at 190° C overnight. The two columns may be retained in series for routine analyses. Trihalomethane retention times are listed in Table 1.

4.2.2 Column II provides unique organohalide-trihalomethane separations when compared to those obtained from Column I (see Figures 5 and 6). However, since the resolution between various compounds is generally not as good as those with Column I, it is recommended that Column II be used as a qualitative confirmatory column for unknown samples when GC/MS confirmation is not possible.

4.2.2.1 Column II parameters: Dimensions—6 feet long x 0.1 inch ID stainless steel or glass. Packing—n-octane on Porisil-C (100/120 mesh). Carrier Gas—helium at 40 cc/minute. Temperature program sequence—50° C isothermal for 3 minutes, program at 6°/minute to 170° C, then hold for 4 minutes or until all compounds have eluted. Trihalomethane retention times are listed in Table 1.

5.8 Organic-free water is defined as water free of interference when employed in the purge and trap analysis.

5.8.1 Organic-free water is generated by passing tap water through a carbon filter bed containing about 1 lb. of activated carbon. Change the activated carbon bed whenever the concentration of any trihalomethane exceeds 0.4 µg/l.

5.8.2 A Millipore Super-Q Water System or its equivalent may be used to generate organic-free water.

5.8.3 Organic-free water may also be prepared by boiling water for 15 minutes. Subsequently, while maintaining the temperature at 90° C, bubble a contaminant-free inert gas through the water for one hour. While still hot, transfer the water to a narrow-mouth screw-cap bottle with a Teflon seal.

5.8.4 Test organic free water each day it is used by analyzing according to Section 8.

5.9 Standards.[a]

5.9.1 Bromoform—96%—available from Aldrich Chemical Company.

5.9.2 Bromodichloromethane 97%—available from Aldrich Chemical Company.

5.9.3 Chlorodibromomethane—available from Columbia Chemical Inc., Columbia, S.C.

5.9.4 Chloroform—99%—available from Aldrich Chemical Company.

5.10 Standard Stock Solutions

5.10.1 Place about 9.8 ml of methyl alcohol into a ground glass stoppered 10 ml volumetric flask.

5.10.2 Allow the flask to stand unstoppered about 10 minutes or until all alcohol wetted surfaces have dried.

5.10.3 Weigh the flask to the nearest 0.1 mg.

5.10.4 Using a 100 µl syringe, immediately add 2 drops of the reference standard to the flask, then reweigh. *Be sure that the 2 drops fall directly into the alcohol without contacting the neck of the flask.*

5.10.5 Dilute to volume, stopper, then mix by inverting the flask several times.

5.10.6 Transfer the solution to a dated and labeled 15 ml screw cap bottle with a Teflon cap liner.

NOTE: Because of the toxicity of trihalomethanes, it is necessary to prepare primary dilutions in a hood. It is further recommended that a NIOSH/MESA approved toxic gas respirator be used when the analyst handles high concentrations of such materials.

5.10.7 Calculate the concentration in micrograms per microliter from the net gain in weight.

5.10.8 Store the solution at 4° C.

NOTE: All standard solutions prepared in methyl alcohol are stable up to 4 weeks when stored under these conditions. They should be discarded after that time has elapsed.

5.11 Aqueous Calibration Standard Precautions.

5.11.1 In order to prepare accurate aqueous standard solutions, the following precautions must be observed.

a. Do not inject more than 20 µl of alcoholic standards into 100 ml of organic-free water.

b. Use of 25 µl Hamilton 702N microsyringe or equivalent. (Variations in needle geometry will adversely affect the ability to deliver reproducible volumes of methanolic standards into water.)

c. Rapidly inject the alcoholic standard into the expanded area of the filled volumetric flask. Remove the needle as fast as possible after injection.

d. Mix aqueous standards by inverting the flask three times only.

e. Discard the contents contained in the neck of the flask. Fill the sample syringe from the standard solution contained in the expanded area of the flask as directed in Section 8.5.

f. Never use pipets to dilute or transfer samples or aqueous standards.

g. Aqueous standards when stored with a headspace are not stable and should be discarded after one hour.

h. Aqueous standards can be stored according to Sections 6.4 and 8.6.

5.11.2 Prepare, from the standard stock solutions, secondary dilution mixtures in methyl alcohol so that a 20 µl injection into 100 ml or organic-free water will generate a calibration standard which produces a response close (±10%) to that of the sample (See 9.1).

5.11.3 Purge and analyze the aqueous calibration standards in the same manner as the samples.

5.11.4 Other calibration procedures (3) which require the delivery of less than 20 µl

---

[a] As a precautionary measure, all standards must be checked for purity by boiling point determinations or GC/MS assays (5).

of a methanolic standard into a 5.0 ml volume of water already contained in the sample syringe are acceptable only if the methanolic standard is delivered by the solvent flush technique (6).

5.12 Quality Check Standard (2.0 μg/l)

5.12.1 From the standard stock solutions, prepare a secondary dilution in methyl alcohol containing 10 ng/μl of each trihalomethane (See Section 5.10.8 Note).

5.12.2 Daily, inject 20.0 μl of this mixture into 100.0 ml of organic-free water ana analyze according to Section 8.

6. *Sample Collection and Handling*

6.1. The sample containers should have a total volume of at least 25 ml.

6.1.1 Narrow mouth screw cap bottles with the TFE fluorocarbon face silicone sepata cap liners are strongly recommended.

6.2 Sample Bottle Preparation

6.2.1 Wash all sample bottles and TFE seals in detergent. Rinse with tap water and finally with distilled water.

6.2.2 Allow the bottles and seals to air dry at room temperature, then place in a 105° C oven for one hour, then allow to cool in a area known to be free of organics.

NOTE: Do not heat the TFE seals for extended period of time (>1 hour) because the silicone layer slowly degrades at 105° C.

6.2.3 When cool, seal the bottles using the TFE seals that will be used for sealing the samples.

6.3 Sample Stabilization—A chemical reducing agent (Section 5.6) is added to the sample in order to arrest the formation of trihalo-methanes after sample collection (3, 7). *Do not add the reducing agent to samples when data on maximum trihalomethane formation is desired.* If chemical stabilization is employed, the reagent is also added to the blanks. The chemical agent (2.5 to 3 mg/40 ml) is added to the empty sample bottles just prior to shipping to the sampling site.

6.4 Sample Collection

6.4.1 Collect all samples in duplicate.

6.4.2 Fill the sample bottles in such a manner that no air bubbles pass through the sample as the bottle is filled.

6.4.3 Seal the bottles so that no air bubbles are entrapped in it.

6.4.4 Maintain the hermetic seal on the sample bottle until analysis.

6.4.5 Sampling from a water tap.

6.4.5.1 Turn on water and allow the system to flush until the temperature of the water has stabilized. Adjust the flow to about 500 ml/minute and collect duplicate samples from the flowing stream.

6.4.6 Sampling from an open body of water.

6.4.6.1 Fill a 1-quart wide-mouth bottle with sample from a representative area. Carefully fill duplicate sample bottles from the 1-quart bottle as noted in 6.4.2.

6.4.7 If a chemical reducing agent has been added to the sample bottles, fill with sample just to overflowing, seal the bottle, and shake vigorously for 1 minute.

6.4.8 Sealing practice for septum seal screw cap bottles.

6.4.8.1 Open the bottle and fill to overflowing, place on a level surface, position the TFE side of the septum seal upon the convex sample meniscus and seal the bottle by screwing the cap on tightly.

6.4.8.2 Invert the sample and lightly tap the cap on a solid surface. The absence of entrapped air indicates a successful seal. If bubbles are present, open the bottle, add a few additional drops of sample and reseal the bottle as above.

6.4.9 Blanks.

6.4.9.1 Prepare blanks in duplicate at the laboratory by filling and sealing sample bottles with organic-free water just prior to shipping the sample bottles to the sampling site.

6.4.9.2 If the sample is to be stabilized, add an identical amount of stabilization reagent to the blanks.

6.4.9.3 Ship the blanks to and from the sampling site along with the sample bottles.

6.4.9.4 Store the blanks and the samples collected at a given site (sample set) together. A sample set is defined as all the samples collected at a given site (i.e., at a water treatment plant, the duplicate raw source waters, the duplicate finished waters and the duplicate blank samples comprise the sample set).

6.5 When samples have been collected according to Section 6, no measurable loss of trihalomethanes has been detected over extended periods of storage time (3). It is recommended that all samples be analyzed within 14 days of collection.

7. *Conditioning Traps*

7.1 Condition newly packed traps overnight at 180° C with an inert gas flow of at least 20 ml/min.

7.1.1 Vent the trap effluent to the room, not to the analytical column.

7.2 Prior to daily use, condition traps 10 minutes while backflushing at 180° C. It may be beneficial to routinely condition traps overnight while backflushing at 180° C.

7.2.1 The trap may be vented to the analytical column; however, after conditioning, the column must be programmed prior to use.

8. *Extraction and Analysis*

8.1 Adjust the purge gas (nitrogen or helium) flow rate to 40 ml/min.

8.2 Attach the trap inlet to the purging device. Turn the valve to the purge-sorb position (Figure 3).

8.3 Open the syringe valve located on the purging device sample introduction needle.

8.4 Remove the plungers from two 5 ml syringes and attach a closed syringe valve to each.

8.5 Open the sample bottle and carefully pour the sample into one of the syringe barrels until it overflows. Replace the syringe plunger and compress the sample. Open the syringe valve and vent any residual air while adjusting the sample volume to 5.0 ml. Close the valve.

8.6 Fill the second syringe in an identical manner from the same sample bottle. This second syringe is reserved for a duplicate analysis, if necessary (See Sections 9.3 and 9.4).

8.7 Attach the syringe-valve assembly to the syringe valve on the purging device.

8.8 Open the syringe valve and inject the sample into the purging chamber. Close both valves. Purge the sample for 11.0±.05 minutes.

8.9 After the 11-minute purge time, attach the trap to the chromatograph (turn the valve to the desorb position) and introduce the trapped materials to the GC column by rapidly heating the trap to 180°C while backflushing the trap with an inert gas between 20 and 60 ml/min for 4 minutes.

8.9.1 If the trap can be rapidly heated to 180°C and maintained at this temperature, the GC analysis can begin as the sample is desorbed, i.e., the column is at the initial 45°C operating temperature. The equipment described in Figure 4 will perform accordingly.

8.9.2 With other types of equipment (see Section 4.1.4 and Reference 1) where the trap is not rapidly heated or is not heated in a reproducible manner, it may be necessary to transfer the contents of the trap into the analytical column at <30°C where it is once again trapped. Once the transfer is complete (4 minutes), the column is rapidly heated to the initial operating temperature for analysis.

8.9.3 If injection procedure 8.9.1 is used and the early eluting peaks in the resulting chromatogram have poor geometry or variable retention times, then Section 8.9.2 should be used.

8.10 After the extracted sample is introduced into the gas chromatograph, empty the gas purging device using the sample introduction syringe, followed by two 5-ml flushes of organic-free water. When the purging device is emptied, leave the syringe valve open allowing the purge gas to vent through the sample introduction needle.

8.11 Analyze each sample and sample blank from the sample set in an identical manner (see Section 6.4.9.4) on the same day.

8.12 Prepare calibration standards from the standard stock solutions (Section 5.10) in organic-free water that are close to the unknown in trihalomethane composition and concentration (Section 9.1). The concentrations should be such that only 20 μl or less of the secondary dilution need be added to 100 ml of organic-free water to produce a standard at the same level as the unknown.

8.13 As an alternative to Section 8.12, prepare a calibration curve for each trihalomethane containing at least 3 points, two of which must bracket the unknown.

9. *Analytical Quality Control*

9.1 Analyze the 2 μg/l check sample daily before any samples are analyzed. Instrument status checks and lower limit of detection estimations based upon response factor calculations at five times the noise level are obtained from these data. In addition, response factor data obtained from the 2 μg/l check standard can be used to estimate the concentration of the unknowns. From this information, the appropriate standard dilutions can be determined.

9.2 Analyze the sample blank to monitor for potential interferences as described in Sections 3.1, 3.2, and 3.4.

9.3 Spiked Samples

9.3.1 For laboratories analyzing more than 10 samples a day, each 10th sample should be a laboratory generated spike which closely duplicates the average finished drinking water in trihalomethane composition and concentration. Prepare the spiked sample in organic-free water as described in Section 5.11.

9.3.2 For laboratories analyzing less than 10 samples daily, each time the analysis is performed, analyze at least 1 laboratory generated spike sample which closely duplicates the average finished drinking water in trihalomethane composition and concentration. Prepare the spiked sample in organic-free water as described in Section 5.11.

9.4 Randomly select and analyze 10% of all samples in duplicate.

9.4.1 Analyze all samples in duplicate which appear to deviate more than 30% from any established norm.

9.5 Maintain an up-to-date log on the accuracy and precision data collected in Sections 9.3 and 9.4. If results are significantly different than those cited in Section 11.1, the analyst should check out the entire analyses scheme to determine why the laboratory's precision and accuracy limits are greater.

9.6 Quarterly, spike an EMSL-Cincinnati trihalo- methane quality control sample into organic-free water and analyze.

9.6.1 The results of the EMSL trihalomethane quality control sample should agree within 20% of the true value for each trihalomethane. If they do not then the analyst must check each step in the standard generation procedure to solve the problem (Sections 5.9, 5.10, and 5.11).

9.7 Maintain a record of the retention times for each trihalomethane using data gathered from spiked samples and standards.

9.7.1 Daily calculate the average retention time for each trihalomethane and the variance encountered for the analyses.

9.7.2 If individual trihalomethane retention time varies by more than 10% over an eight hour period or does not fall with 10% of an established norm, the system is "out of control." The source of retention data variation must be corrected before acceptable data can be generated.

10. *Calculations*

10.1 Locate each trihalomethane in the sample chromatogram by comparing the retention time of the suspect peak to the data gathered in 9.7.1. The retention time of the suspect peak must fall within the limits established in 9.7.1 for single column identification.

10.2 Calculate the concentration of the samples by comparing the peak height or peak areas of the samples to the standard peak height (8.12). Round off the data to the nearest µg/l or two significant figures.

$$\mu g/l = \frac{\text{peak height sample}}{\text{peak height standard}} \times (\text{conc. std. } \mu g/l)$$

10.3 Report the results obtained from the lower limit of detection estimates along with the data for the samples.

10.4 Calculate the total trihalomethane concentration (TTHM) by summing the 4 individual trihalomethane concentrations in µg/l. TTHM (µg/l)=(Conc. $CHCl_3$)+(Conc. $CHBrCl_2$)+(Conc. $CHBr_2Cl$)+(Conc. CHBr).

10.5 Calculate the limit of detection (LOD) for each trihalomethane not detected using the following criteria:

$$\text{LOD } (\mu g/l) = \frac{A \times ATT}{B \times ATT} \quad (2\ \mu g/l)$$

where

B=peak height (mm) of 2 µg/l quality check standard

A=5 times the noise level in (mm) at the exact retention time of the trihalomethane or the baseline displacement in (mm) from the theoretical zero at the exact retention time of the trihalomethane.

ATT=Attenuation factor

11. *Accuracy and Precision*

11.1 One liter of organic-free water was spiked with the trihalomethanes and used to fill septum seal vials which were stored under ambient conditions. The spiked samples were randomly analyzed over a 2-week period of time. The single laboratory data listed in Table II reflect the errors due to the analytical procedure and storage.

REFERENCES

1. Bellar, T. A., J. J. Lichtenberg, Determining Volatile Organics at the Microgram per Litre Levels by Gas Chromatography, Journal AWWA., *66*, 739 (December 1974).

2. "Handbook for Analytical Quality Control in Water and Wastewater Laboratories," Analytical Quality Control Laboratory, National Environmental Research Center, Cincinnati, Ohio, June 1972.

3. Brass, H. J., et al., "National Organic Monitoring Survey: Sampling and Purgeable Organic Compounds, Drinking Water Quality Through Source Protection," R. B. Pojasek, Editor, Ann Arbor Science, p. 398, 1977.

4. "The Analysis of Trihalomethanes in Finished Water by the Liquid/Liquid Extraction Method, Method 501.2" Environmental Monitoring and Support Labortory, Environmental Research Center, Cincinnati, Ohio, 45268, May 15, 1979.

5. Budde, W. L. and J. W. Eichelberger, "Organics Analysis Using Gas Chromatography-Mass Spectrometry," Ann Arbor Science, Ann Arbor, Michigan, 1979.

6. White, L. D. et al., "Convenient Optimized Method for the Analysis of Selected Solvent Vapors in the Industrial Atmosphere," AIHA Journal, Vol. 31, p. 225, 1970.

7. Kopfler, F. C., et al. "GC/MS Determination of Volatiles for the National Organics Reconnaissance Survey (NORS) or Drinking Water, Identification and Analysis of Organic Pollutants in Water," L. H. Keith, Editor, Ann Arbor Science, p. 87, 1976.

TABLE I—RETENTION DATA FOR TRIHALOMETHANES

Trihalomethane	Retention time minutes		
	Column I 1% sp1000 Carbopack B	Acceptable Alternative to column I 0.4% Carbowax Carbopack	Column II n-octane Porasil-C
Chloroform	10.7	8.2	12.2
Bromodichloromethane	13.7	10.8	14.7
Chlorodibromomethane (Dibromochloromethane)	16.5	13.2	16.6
Bromoform	19.2	15.7	19.2

TABLE II—SINGLE LABORATORY ACCURACY AND PRECISION FOR TRIHALOMETHANES

Spike µg/l	Number samples	Mean µg/l	Precision standard deviation	Accuracy percent recovery
Chloroform				
1.2	12	1.2	0.14	100
12.0	8	11	0.16	92
119.0	11	105	7.9	88
Bromodichloromethane				
1.6	12	1.5	0.05	94
16.0	8	15	0.39	94
160.0	11	145	10.2	91

TABLE II—SINGLE LABORATORY ACCURACY AND PRECISION FOR TRIHALOMETHANES—Continued

Spike µg/l	Number samples	Mean µg/l	Precision standard deviation	Accuracy percent recovery
Chlorodibromomethane				
2.0	12	1.9	0.09	95
20.0	8	19	0.70	95
196.0	11	185	10.8	94

TABLE II—SINGLE LABORATORY ACCURACY AND PRECISION FOR TRIHALOMETHANES—Continued

Spike µg/l	Number samples	Mean µg/l	Precision standard deviation	Accuracy percent recovery
Bromoform				
2.3	12	2.3	0.16	100
23.0	8	23	1.38	100
231.0	11	223	16.3	97

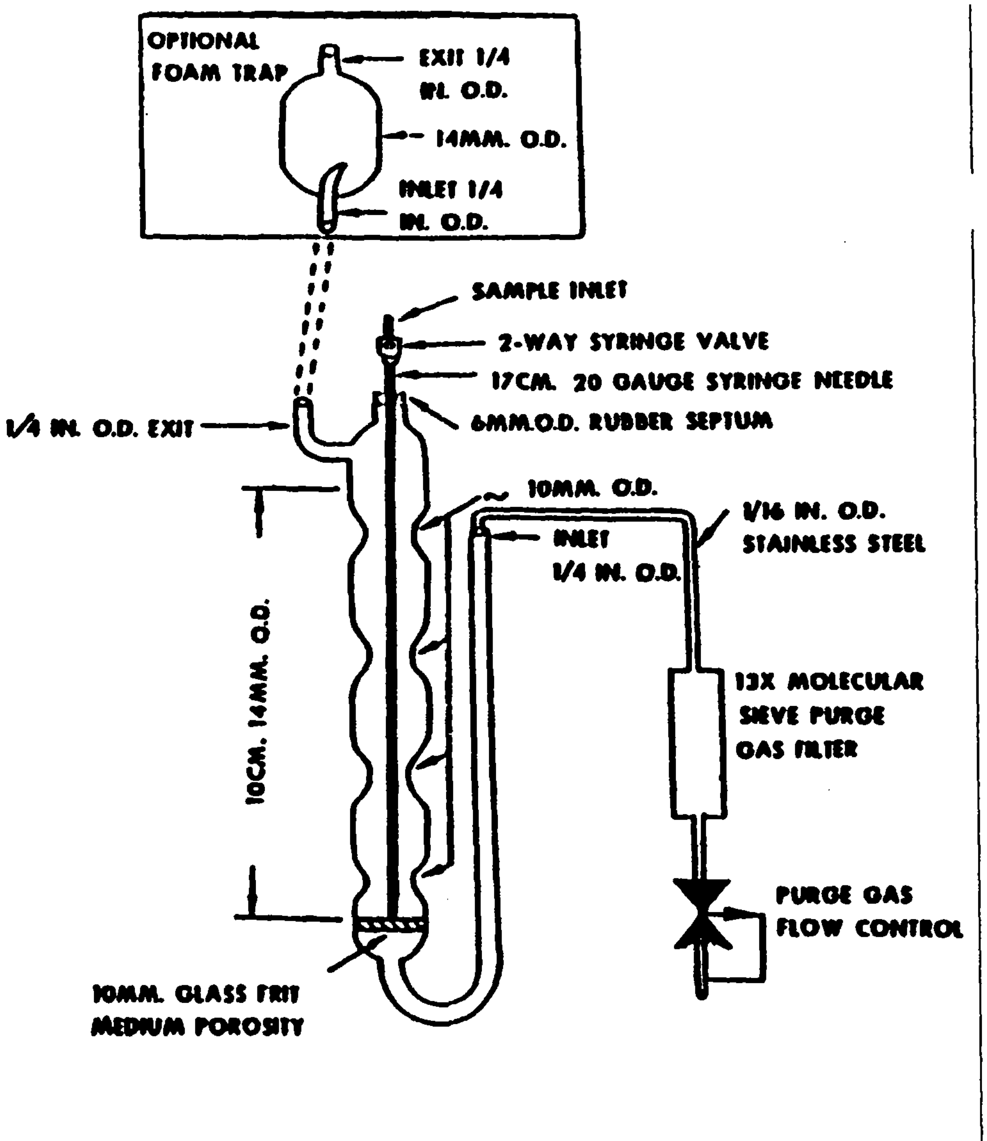

FIGURE 1. PURGING DEVICE

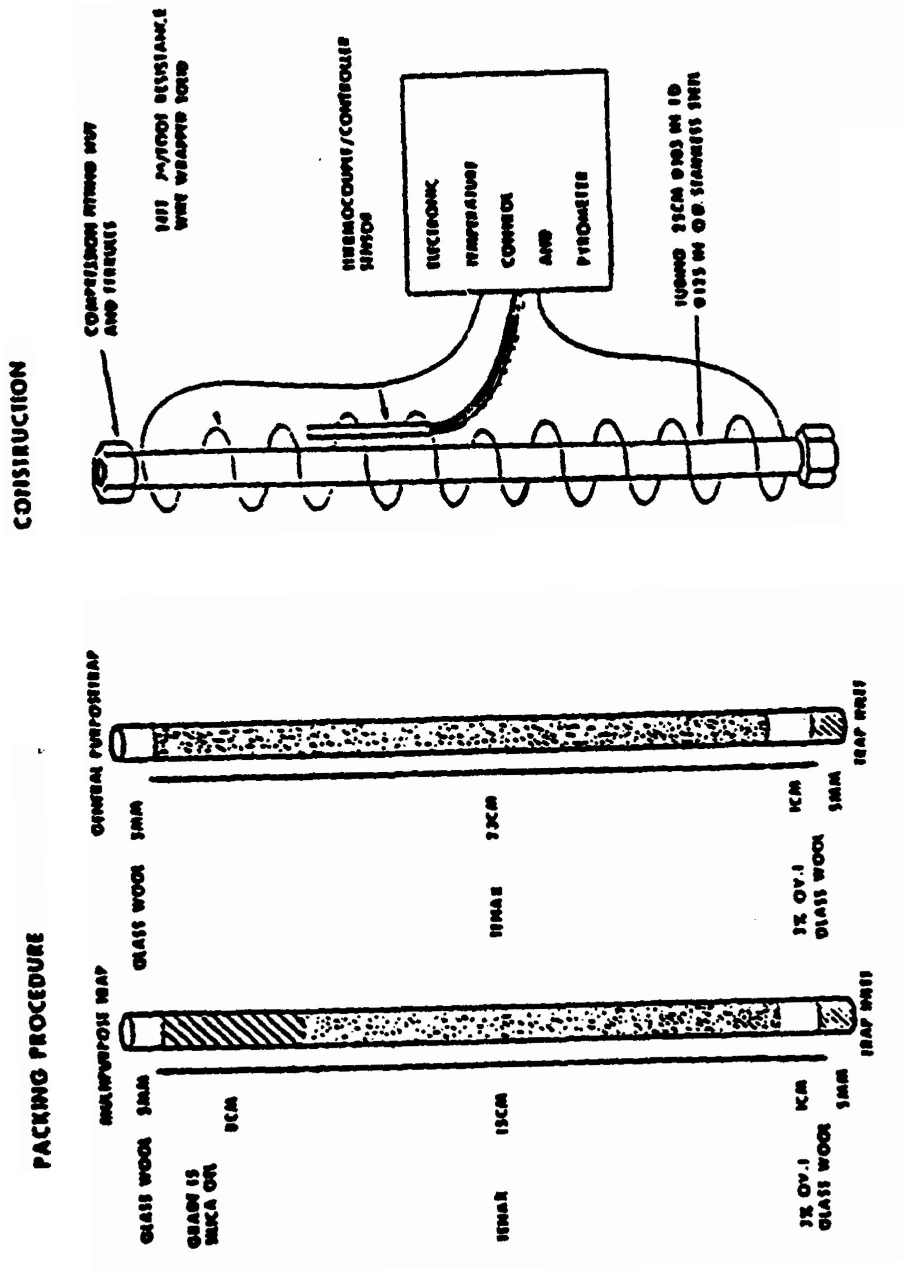

FIGURE 2 TRAP

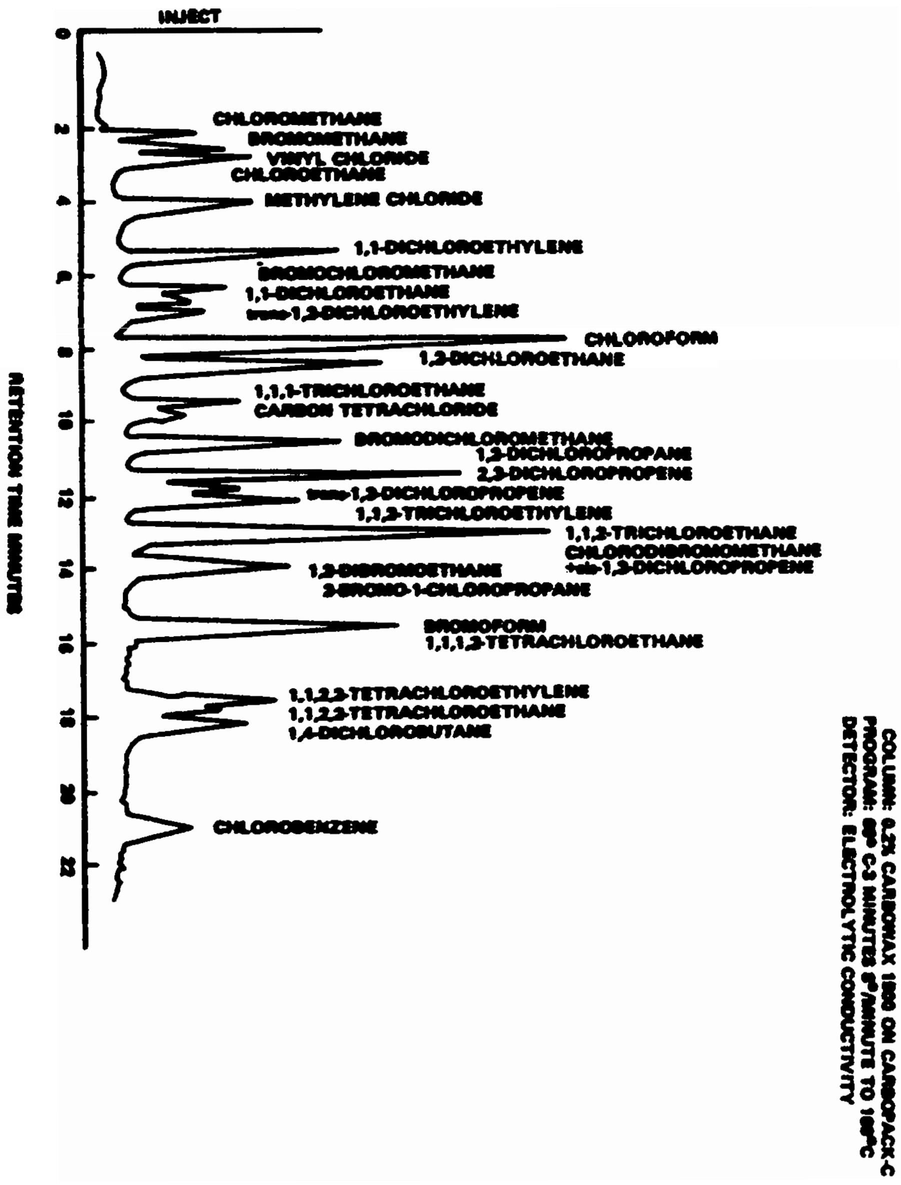

Figure 5 CHROMATROGRAM OF ORGANOHALIDES

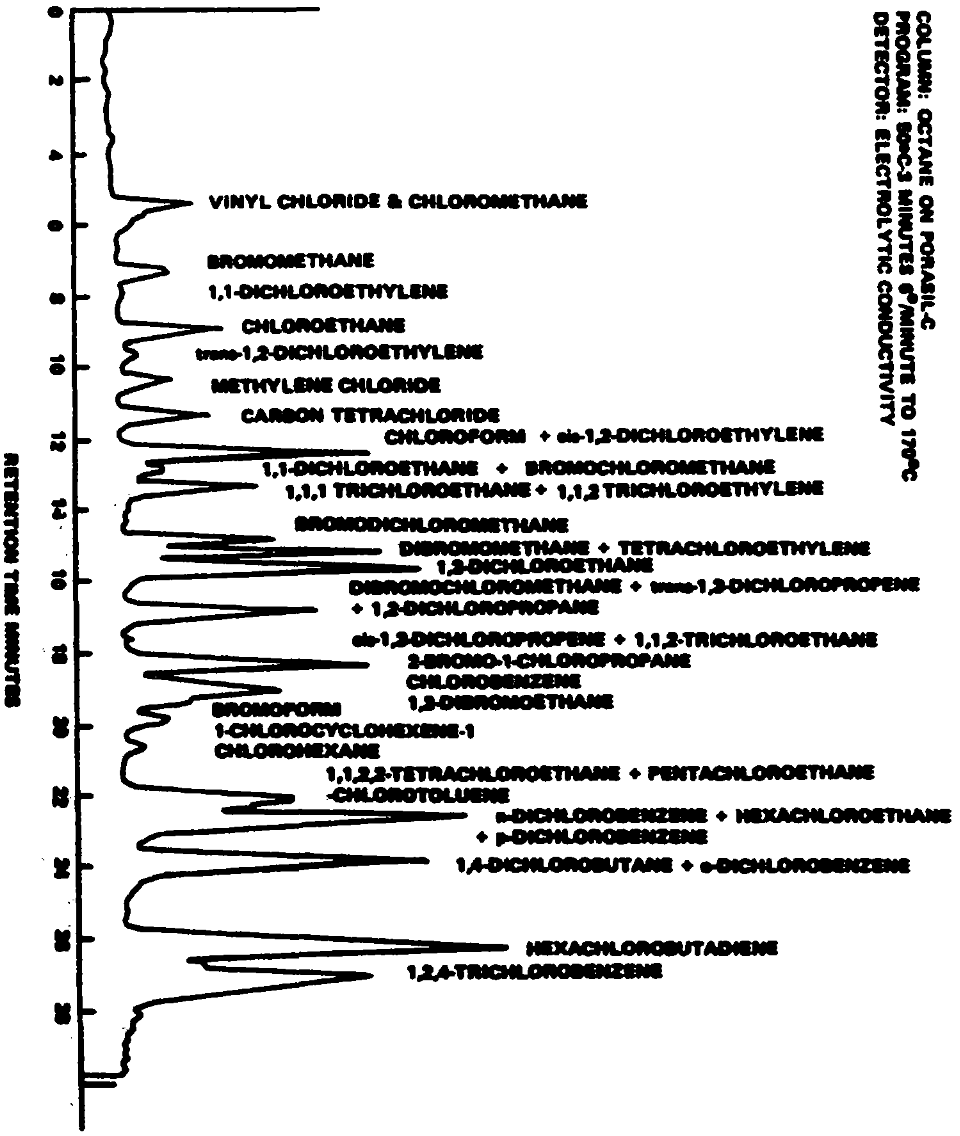

Figure 6 CHROMATROGRAM OF ORGANOHALIDES

PART II—ANALYSIS OF TRIHALOMETHANES IN DRINKING WATER BY LIQUID/LIQUID EXTRACTION

1. *Scope.*

1.1 This method (1,2) is applicable only to the determination of four trihalomethanes, i.e., chloroform, bromodichloromethane, chlorodibromomethane, and bromoform in finished drinking water, drinking water during intermediate stages of treatment, and the raw source water.

1.2 For compounds other than the abovementioned trihalomethanes, or for other sample sources, the analyst must demonstrate the usefulness of the method by collecting precision and accuracy data on actual samples as described in (3) and provide qualitative confirmation of results by Gas Chromatography/Mass Spectrometry (GC/MS) (4).

1.3 Qualitative analyses using GC/MS or the purge and trap method (5) must be performed to characterize each raw source water if peaks appear as interferences in the raw source analysis.

1.4 The method has been shown to be useful for the trihalomethanes over a concentration range from approximately 0.5 to 200 µg/l. Actual detection limits are highly dependent upon the characteristics of the gas chromatographic system used.

2. *Summary*

2.1 Ten milliliters of sample are extracted one time with 2 ml of solvent. Three µl of the extract are then injected into a gas chromatograph equipped with a linearized electron capture detector for separation and analysis.

2.2 The extraction and analysis time is 10 to 50 minutes per sample depending upon the analytical conditions chosen. (See Table 1 and Figures 1, 2, and 3.)

2.3 Confirmatory evidence is obtained using dissimilar columns and temperature programming. When component concentrations are sufficiently high (>50 µg/l), halogen specific detectors may be employed for improved specificity.

2.4 Unequivocal confirmatory analyses at high levels (>50 µg/l) can be performed using GC/MS in place of the electron capture detector. At levels below 50 µg/l, unequivocal confirmation can only be performed by the purge and trap technique using GC/MS (4, 5).

2.5 Standards dosed into organic free water and the samples are extracted and analyzed in an identical manner in order to compensate for possible extraction losses.

2.6 The concentration of each trihalomethane is summed and reported as total trihalomethanes in µg/l.

3. *Interferences*

3.1 Impurities contained in the extracting solvent usually account for the majority of the analytical problems. Solvent blanks should be analyzed before a new bottle of solvent is used to extract samples. Indirect daily checks on the extracting solvent are obtained by monitoring the sample blanks (6.4.10). Whenever an interference is noted in the sample blank, the analyst should reanalyze the extracting solvent. The extraction solvent should be discarded whenever a high level (>10 µg/l) of interfering compounds are traced to it. Low level interferences generally can be removed by distillation or column chromatography (6); however, it is generally more economical to obtain a new source of solvent or select one of the approved alternative solvents listed in Section 5.1. Interference free solvent is defined as a solvent containing less than 0.4 µg/l individual trihalomethane interference. Protect interference-free solvents by storing in a nonlaboratory area known to be free of organochlorine solvents. *Subtracting blank values is not recommended.*

3.2 Several instances of accidental sample contamination have been attributed to diffusion of volatile organics through the septum seal on the sample bottle during shipment and storage. The sample blank (6.4.10) is used to monitor for this problem.

3.3 This liquid/liquid extraction technique efficiently extracts a wide boiling range of non-polar organic compounds and, in addition, extracts the polar organic components of the sample with varying efficiencies. In order to perform the trihalomethane analysis as rapidly as possible with sensitivities in the low µg/l range, it is necessary to use the semi-specific electron capture detector and chromatographic columns which have relatively poor resolving power. Because of these concessions, the probability of experiencing chromatographic interferences is high. Trihalomethanes are primarily products of the chlorination process and generally do not appear in the raw source water. The absence of peaks in the raw source water analysis with retention times similar to the trihalomethanes is generally adequate evidence of an interference-free finished drinking water analysis. Because of these possible interferences, in addition to each finished drinking water analysis, a representative raw source water (6.4.5) must be analyzed. When potential interferences are noted in the raw source water analysis, the alternate chromatographic columns must be used to reanalyze the sample set. If interferences are still noted, qualitative identifications should be performed according to Sections 2.3 and 2.4. If the peaks are confirmed to be other than trihalomethanes and add significantly to the total trihalomethane value in the finished drinking water analysis, then the sample set must be analyzed by the purge and trap method (5).

4. *Apparatus*

4.1 Extraction vessel—A 15 ml total volume glass vessel with a Teflon lined screwcap is required to efficiently extract the samples.

4.1.1 For samples that do not form emulsions 10 ml screw-cap flasks with a Teflon faced septum (total volume is ml) are recommended. Flasks and caps—Pierce—#13310 or equivalent. Septa—Teflon silicone—Pierce #12718 or equivalent.

4.1.2 For samples that form emulsions (turbid source water) 15 ml screw cap centrifuge tubes with a Teflon cap liner are recommended. Centrifuge tube—Corning 8062–15 or equivalent.

4.2 Sampling containers—40 ml screw cap sealed with Teflon faced silicone septa. Vials and caps—Pierce #13075 or equivalent. Septa—Pierce #12722 or equivalent.

4.3 Micro syringes—10, 100 µl.

4.4 Micro syringe—25 µl with a 2-inch by 0.006-inch needle—Hamilton 702N or equivalent.

4.5 Syringes—10 ml glass hypodermic with luerlok tip (2 each).

4.6 Syringe valve—2-way with luer ends (2 each)—Hamilton #86570—1FM1 or equivalent.

4.7 Pipette—2.0 ml transfer.

4.8 Glass stoppered volumetric flasks—10 and 100 ml.

4.9 Gas chromatograph with linearized electron capture detector. (Recommended option—temperature programmable. See Section 4.12.)

4.10 Column A—4 mm ID x 2m long glass packed with 3% SP–1000 on Supelcoport (100/120 mesh) operated at 50°C with 60 ml/min flow. (See Figure 1 for a sample chromatogram and Table 1 for retention data.)

4.11 Column B—2 mm ID x 2m long glass packed with 10% squalane on Chromosorb WAW (80/100 mesh) operated at 67°C with 25 ml/min flow. This column is recommended as the primary analytical column. Trichloroethylene, a common raw source water contaminate, coelutes with bromodichloromethane. (See Figure 2 for a sample chromatogram and Table 1 for retention data.)

4.12 Column C—2 mm ID x 3m long glass packed with 6% OV–11/4% SP–2100 on Supelcoport (100/120 mesh) temperature program 45°C for 12 minutes, then program at 1°/minute to 70°C with a 25 ml/min flow. (See Figure 3 for a sample chromatogram and Table I for retention data.)

4.13 Standard storage containers—15 ml amber screw-cap septum bottles with Teflon faced silicone septa. Bottles and caps—Pierce #19830 or equivalent. Septa—Pierce #12716 or equivalent.

5. *Reagents*

5.1 Extraction solvent—(See 3.1). Recommended—Pentane[a]. Alternative—hexane, methylcyclohexane or 2,2,4-trimethylpentane.

5.2 Methyl alcohol—ACS Reagent Grade.

5.3 Free and combined chlorine reducing agents—Sodium thiosulfate ACS Reagent Grade—sodium sulfite ACS Reagent Grade.

5.4 Activated carbon—Filtrasorb—200, available from Calgon Corporation, Pittsburgh, PA, or equivalent.

5.5 Standards.[b]

5.5.1 Bromoform 96%—available from Aldrich Chemical Company.

5.5.2 Bromodichloromethane 97%—available from Aldrich Chemical Company.

5.5.3 Chlorodibromomethane—available from Columbia Chemical, Incorporated, Columbia, S.C.

5.5.4 Chloroform 99%—available from Aldrich Chemical Company.

5.6 Organic-free water—Organic-free water is defined as water free of interference when employed in the procedure described herein.

5.6.1 Organic-free water is generated by passing tap water through a carbon filter bed containing carbon. Change the activated carbon whenever the concentration of any trihalomethane exceeds 0.4 µg/l.

5.6.2 A Millipore Super-Q Water System or its equivalent may be used to generate organic-free deionized water.

5.6.3 Organic-free water may also be prepared by boiling water for 15 minutes. Subsequently, while maintaining the temperature at 90° C, bubble a contaminant free inert gas through the water at 100 ml/minute for one hour. While still hot, transfer the water to a narrow mouth screw cap bottle with a Teflon seal.

5.6.4 Test organic free water each day it is used by analyzing it according to Section 7.

5.7 Standard stock solutions.

---

[a] Pentane has been selected as the best solvent for this analysis because it elutes, on all of the columns, well before any of the trihalomethanes. High altitudes or laboratory temperatures in excess of 75°F may make the use of this solvent impractical. For these reasons, alternative solvents are acceptable; however, the analyst may experience baseline variances in the elution areas of the trihalomethanes due to coelution of these solvents. The degree of difficulty appears to be dependent upon the design and condition of the electron capture detector. Such problems should be insignificant when concentrations of the coeluting trihalomethane are in excess of 5 µg/l.

[b] As a precautionary measure, all standards must be checked for purity by boiling point determinations or GC/MS assays.

5.7.1 Fill a 10.0 ml ground glass stoppered volumetric flask with approximately 9.8 ml of methyl alcohol.

5.7.2 Allow the flask to stand unstoppered about 10 minutes or until all alcohol wetted surfaces dry.

5.7.3 Weigh the unstoppered flask to the nearest 0.1 mg.

5.7.4 Using a 100 µl syringe, immediately add 2 to 3 drops of the reference standard to the flask, then reweigh. *Be sure that the reference standard falls directly into the alcohol without contacting the neck of the flask.*

5.7.5 Dilute to volume, stopper, then mix by inverting the flask several times.

5.7.6 Transfer the standard solution to a dated and labeled 15 ml screw-cap bottle with a Teflon cap liner.

NOTE: Because of the toxicity of trihalomethanes, it is necessary to prepare primary dilutions in a hood. It is further recommended that a NIOSH/MESA-approved toxic gas respirator be used when the analyst handles high concentrations of such materials.

5.7.7 Calculate the concentration in micrograms per microliter from the net gain in weight.

5.7.8 Store the solution at 4° C.

NOTE: All standard solutions prepared in methyl alcohol are stable up to 4 weeks when stored under these conditions. They should be discarded after that time has elapsed.

5.8 Aqueous calibration standard precautions.

5.8.1 In order to prepare accurate aqueous standard solutions, the following precautions must be observed:

a. Do not inject more than 20 µl of alcoholic standards into 100 ml of organic-free water.

b. Use a 25 µl Hamilton 702N microsyringe or equivalent. (Variations in needle geometry will adversely affect the ability to deliver reproducible volumes of methanolic standards into water.)

c. Rapidly inject the aloholic standard into the expanded area of the filled volumetric flask. Remove the needle as fast as possible after injection.

d. Mix aqueous standards by inverting the flask three times only.

e. Discard the contents contained in the neck of the flask. Fill the sample syringe from the standard solution contained in the expanded area of the flask as directed in Section 7.

f. Never use pipets to dilute or transfer samples and aqueous standards.

g. Aqueous standards, when stored with a headspace, are not stable and should be discarded after one hour. Aqueous standards can be stored according to Sections 6.4.9 and 7.2.

5.9 Calibration standards.

5.9.1 Prepare, from the standard stock solutions, a multicomponent secondary dilution mixture in methyl alcohol so that a 20 µl injection into 100 ml of organic-free water will generate a calibration standard which produces a response close (± 25%) to that of the unknown. (See 8.1.)

5.9.2 Alternative calibration procedure.

5.9.2.1 Construct a calibration curve for each trihalomethane containing a minimum of 3 different concentrations. Two of the concentrations must bracket each unknown.

5.9.3 Extract and analyze the aqueous calibration standards in the same manner as the unknowns.

5.9.4 Other calibration procedures (7) which require the delivery of less than 20 µl of methanolic standards to 10.0 ml volumes of water contained in the sample syringe are acceptable only if the methanolic standard is delivered by the solvent flush technique (8).

5.10 Quality Check Standard Mixture.

5.10.1 Prepare, from the standard stock solutions, a secondary dilution mixture in methyl alcohol that contains 10.0 ng/µl of each compound. (See 5.7.6 and 5.7.8.)

5.10.2 Daily, prepare and analyze a 2.0 µg/l aqueous dilution from this mixture by dosing 20.0 µl into 100 ml of organic-free water (See Section 8.1).

6. *Sample Collection and Handling.*

6.1 The sample containers should have a total volume of at least 25 ml.

6.1.1 Narrow-mouth screw-cap bottles with the TFE fluorocarbon faced silicone septa cap liners are strongly recommended.

6.2 Glassware Preparation.

6.2.1 Wash all sample bottles, TFE seals, and extraction flasks in detergent. Rinse with tap water and finally with distilled water.

6.2.2 Allow the bottles and seals to air dry, then place in an 105° C oven for 1 hour, then allow to cool in an area known to be free of organics.

NOTE: Do not heat the TFE seals for extended periods of time (>1 hour) because the silicone layer slowly degrades at 105° C.

6.2.3 When cool, seal the bottles using the TFE seals that will be used for sealing the samples.

6.3 Sample stabilization—A chemical reducing agent (Section 5.3) is added to all samples in order to arrest the formation of additional trihalomethanes after sample collection (7,9) and to eliminate the possibility of free chlorine reacting with impurities in the extraction solvent to form interfering organohalides. *DO NOT ADD THE REDUCING AGENT TO SAMPLES AT COLLECTION TIME WHEN DATA FOR MAXIMUM TRIHALOMETHANE FORMATION IS DESIRED.* If chemical stabilization is employed, then the reagent is also added to the blanks. The chemical agent (2.5 to 3 mg/40 ml) is added in crystalline form to the empty sample bottle just prior to shipping to the sampling site. If chemical stabilization is not employed at sampling time then the reducing agent is added just before extraction.

6.4 Sample Collection.

6.4.1 Collect all samples in duplicate.

6.4.2 Fill the sample bottles in such a manner that no air bubbles pass through the sample as the bottle is filled.

6.4.3 Seal the bottle so that no air bubbles are entrapped in it.

6.4.4 Maintain the hermetic seal on the sample bottle until analysis.

6.4.5 The raw source water sample history should resemble the finished drinking water. The average retention time of the finished drinking water within the water plant should be taken into account when sampling the raw source water.

6.4.6 Sampling from a water tap.

6.4.6.1 Turn on the water and allow the system to flush until the temperature of the water has stabilized. Adjust the flow to about 500 ml/minute and collect duplicate samples from the flowing stream.

6.4.7 Sampling from an open body of water.

6.4.7.1 Fill a 1-quart wide-mouth bottle with sample from a representative area. Carefully fill duplicate sample bottles from the 1-quart bottle as in 6.4.

6.4.8 If a chemical reducing agent has been added to the sample bottles, fill with sample just to overflowing, seal the bottle, and shake vigorously for 1 minute.

6.4.9 Sealing practice for septum seal screw cap bottles.

6.4.9.1 Open the bottle and fill to overflowing. Place on a level surface. Position the TFE side of the septum seal upon the convex sample meniscus and seal the bottle by screwing the cap on tightly.

6.4.9.2 Invert the sample and lightly tap the cap on a solid surface. The absence of entrapped air indicates a successful seal. If bubbles are present, open the bottle, add a few additional drops of sample, then reseal bottle as above.

6.4.10 Sample blanks.

6.4.10.1 Prepare blanks in duplicate at the laboratory by filling and sealing sample bottles with organic-free water just prior to shipping the sample bottles to the sampling site.

6.4.10.2 If the sample is to be stabilized, add an identical amount of reducing agent to the blanks.

6.4.10.3 Ship the blanks to and from the sampling site along with the sample bottles.

6.4.10.4 Store the blanks and the samples, collected at a given site (sample set), together in a protected area known to be free from contamination. A sample set is defined as all the samples collected at a given site (i.e., at a water treatment plant, duplicate raw source water, duplicate finished water and the duplicate sample blanks comprise the sample set).

6.5 When samples are collected and stored under these conditions, no measurable loss of trihalomethanes has been detected over extended periods of time (7). It is recommended that the samples be analyzed within 14 days of collection.

7. *Extraction and Analysis.*

7.1 Remove the plungers from two 10-ml syringes and attach a closed syringe valve to each.

7.2 Open the sample bottle[◦] (or standard) and carefully pour the sample into one of the syringe barrels until it overflows. Replace the plunger and compress the sample. Open the syringe valve and vent any residue air while adjusting the sample volume to 10.0 ml. Close the valve.

7.3 Fill the second syringe in an identical manner from the same sample bottle. This syringe is reserved for a replicate analysis (see 8.3 and 8.4).

7.4 Pipette 2.0 ml of extraction solvent into a clean extraction flask.

7.5 Carefully inject the contents of the syringe into the extraction flask.

7.6 Seal with a Teflon faced septum.

7.7 Shake vigorously for 1 minute.

7.8 Let stand until the phases separate (∫60 seconds).

7.8.1 If the phases do not separate on standing then centrifugation can be used to facilitate separation.

7.9 Analyze the sample by injecting 3.0 µl (solvent flush technique, (8)) of the upper (organic) phase into the gas chromatograph.

8. *Analytical Quality Control.*

8.1 A 2 µg/l quality check standard (See 5.10) should be extracted and analyzed each day before any samples are analyzed. Instrument status checks and lower limit of detection estimations based upon response factor calculations at 5 times the noise level are obtained from these data. In addition, the data obtained from the quality check standard can be used to estimate the concentration of the unknowns. From this information the appropriate standards can be determined.

8.2 Analyze the sample blank and the raw source water to monitor for potential interferences as described in Sections 3.1, 3.2, and 3.3.

8.3 Spiked samples.

8.3.1 For those laboratories analyzing more than 10 samples a day, each 10th sample analyzed should be a laboratory-generated spike which closely duplicates the av-

---

[◦] If for any reason the chemical reducing agent has not been added to the sample, then it must be added just prior to analyses at the rate of 2.5 to 3 mg/40 ml or by adding 1 mg directly to the sample in the extraction flask.

erage finished drinking water in trihalomethane composition and concentration. Prepare the spiked sample in organic-free water as described in Section 5.9.

8.3.2 In those laboratories analyzing less than 10 samples daily, each time the analysis is performed, analyze at least one laboratory generated spike sample which closely duplicates the average finished drinking water in trihalomethane composition and concentration. Prepare the spiked sample in organic-free water as described in section 5.9.

8.3.3 Maintain an up-to-date log on the accuracy and precision data collected in Sections 8.3 and 8.4. If results are significantly different than those cited in Section 10.1, the analyst should check out the entire analysis scheme to determine why the laboratory's precision and accuracy limits are greater.

8.4 Randomly select and analyze 10% of all samples in duplicate.

8.5 Analyze all samples in duplicate which appear to deviate more than 30% from any established norm.

8.6 Quarterly, spike an EMSL-Cincinnati trihalomethane quality control sample into organic-free water and analyze.

8.6.1 The results of the EMSL trihalomethane quality control sample should agree within 20% of the true value for each trihalomethane. If they do not, the analyst must check each step in the standard generation procedure to solve the problem.

8.7 It is important that the analyst be aware of the linear response characteristics of the electron capture system that is utilized. Calibration curves should be generated and rechecked quarterly for each trihalomethane over the concentration range encountered in the samples in order to confirm the linear response range of the system. Quantitative data cannot be calculated from non-linear responses. Whenever non-linear responses are noted, the analyst must dilute the sample for reanalysis.

8.8 Maintain a record of the retention times for each trihalomethane using data gathered from spiked samples and standards.

8.8.1 Daily calculate the average retention time for each trihalomethane and the variance encountered for the analyses.

8.8.2 If individual trihalomethane retention time varies by more than 10% over an eight hour period or does not fall within 10% of an established norm, the system is "out of control." The source of retention data variation must be corrected before acceptable data can be generated.

9. Calculations.

9.1 Locate each trihalomethane in the sample chromatogram by comparing the retention time of the suspect peak to the data gathered in 8.8.1. The retention time of the suspect peak must fall within the limits established in 8.8.1 for a single column identification.

9.2 Calculate the concentration of each trihalomethane by comparing the peak heights or peak areas of the samples to those of the standards. Round off the data to the nearest μg/l or two significant figures.

Concentration, μg/l = sample peak height/standard peak height × standard concentration, μg/l.

9.3 Calculate the total trihalomethane concentration (TTHM) by summing the 4 individual trihalomethane concentrations in μg/l: TTHM (μg/l) = (conc. $CHCl_3$)+(conc. $CHBrCl_2$)+(conc. $CHBr_2Cl$)+(conc. $CHBr_3$)

9.4 Calculate the limit of detection (LOD) for each trihalomethane not detected using the following criteria:

$$\text{LOD }(\mu g/l) = \frac{(A \times ATT)}{(B \times ATT) \times (2\ \mu g/l)}$$

Where:

B = peak height (mm) of 2 μg/l quality check standard

A = 5 times the noise level in mm at the exact retention time of the trihalomethane or the base line displacement in mm from theoretical zero at the exact retention time for the trihalomethane.

ATT = attenuation factor.

9.5 Report the results obtained from the lower limit of detection estimates along with the data for the samples.

10. Precision and Accuracy

10.1 Single lab precision and accuracy. The data in Table II were generated by spiking organic-free water with trihalomethanes as described in 5.9. The mixtures were analyzed by the analyst as true unknowns.

TABLE 1—RETENTION TIMES FOR TRIHALOMETHANES

Trihalomethane	Retention time minutes		
	Column A	Column B	Column C
Chloroform	1.0	1.3	4.9
Bromodichloromethane	1.5	[a]2.5	11.0
Chlorodibromomethane	2.6	5.6	23.1
(Dibromochloromethane) bromoform	5.5	10.9	39.4

[a] On this column, trichloroethylene, a common raw source water contaminate, coelutes with bromodichloromethane.

TABLE II—SINGLE LABORATORY ACCURACY AND PRECISION

Compound	Dose level µg/l	Number of samples	Mean µg/l	Precision relative standard deviation, percent	Accuracy percent recovery
$CHCl_3$	9.1	5	10	11	110
$CHCl_3$	69	3	73	5.3	106
$CHBrCl_2$	1.2	5	1.3	9.8	108
$CHBrCl_2$	12	2	15	1.4	125
$CHBr_2Cl$	2.7	5	2.0	17	74
$CHBr_2Cl$	17	3	16	9.9	94
$CHBr_3$	2.9	5	2.2	10	76
$CHBr_3$	14	3	16	12	114

REFERENCES

1. Mieure, J. P., "A Rapid and Sensitive Method for Determining Volatile Organohalides in Water," *Journal AWWA, 69*, 60, 1977.

2. Reding, R., et al. "THM's in Drinking Water: Analysis by LLE and Comparison to Purge and Trap", Organics Analysis in Water and Wastewater, STP 686 ASTM, 1979.

3. "Handbook for Analytical Quality Control in Water and Waste water Laboratories," Analytical Quality Control Laboratory, National Environmental Research Center, Cincinnati, Ohio, June 1972.

4. Budde, W. L., J. W. Eichelberger, "Organic Analysis Using Gas Chromatography-Mass Spectrometry," Ann Arbor Science, Ann Arbor, Michigan, 1979.

5. "The Analysis of Trihalomethanes in Finished Water by the Purge and Trap Method," Environmental Monitoring and Support Laboratory, Environmental Research Center, Cincinnati, Ohio, 45268, May 15, 1979.

6. Richard J. J.; G. A. Junk, "Liquid Extraction for Rapid Determination of Halomethanes in Water, *Journal AWWA, 69* 62, January 1977.

7. Brass, H. J., et al., "National Organic Monitoring Survey: Sampling and Purgeable Organic Compounds, Drinking Water Quality Through Source Protection," R. B. Pojasek, Editor, Ann Arbor Science, p. 398, 1977.

8. White, L. D., et al. "Convenient Optimized Method for the Analysis of Selected Solvent Vapors in Industrial Atmosphere," AIHA Journal, Vol. 31, p. 225, 1970.

9. Kopfler, F. C., et al. "GC/MS Determination of Volatiles for the National Organics Reconnaissance Survey (NORS) or Drinking Water, Identification and Analysis of Organic Pollutants in Water," L. H. Keith, Editor, Ann Arbor Science, p. 87, 1976.

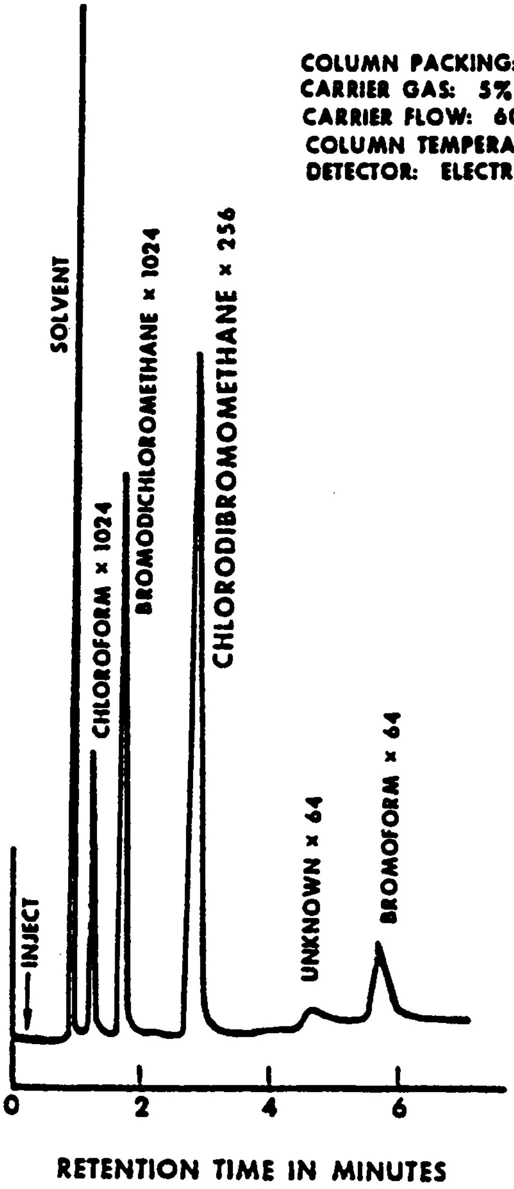

FIGURE 1. FINISHED WATER EXTRACT

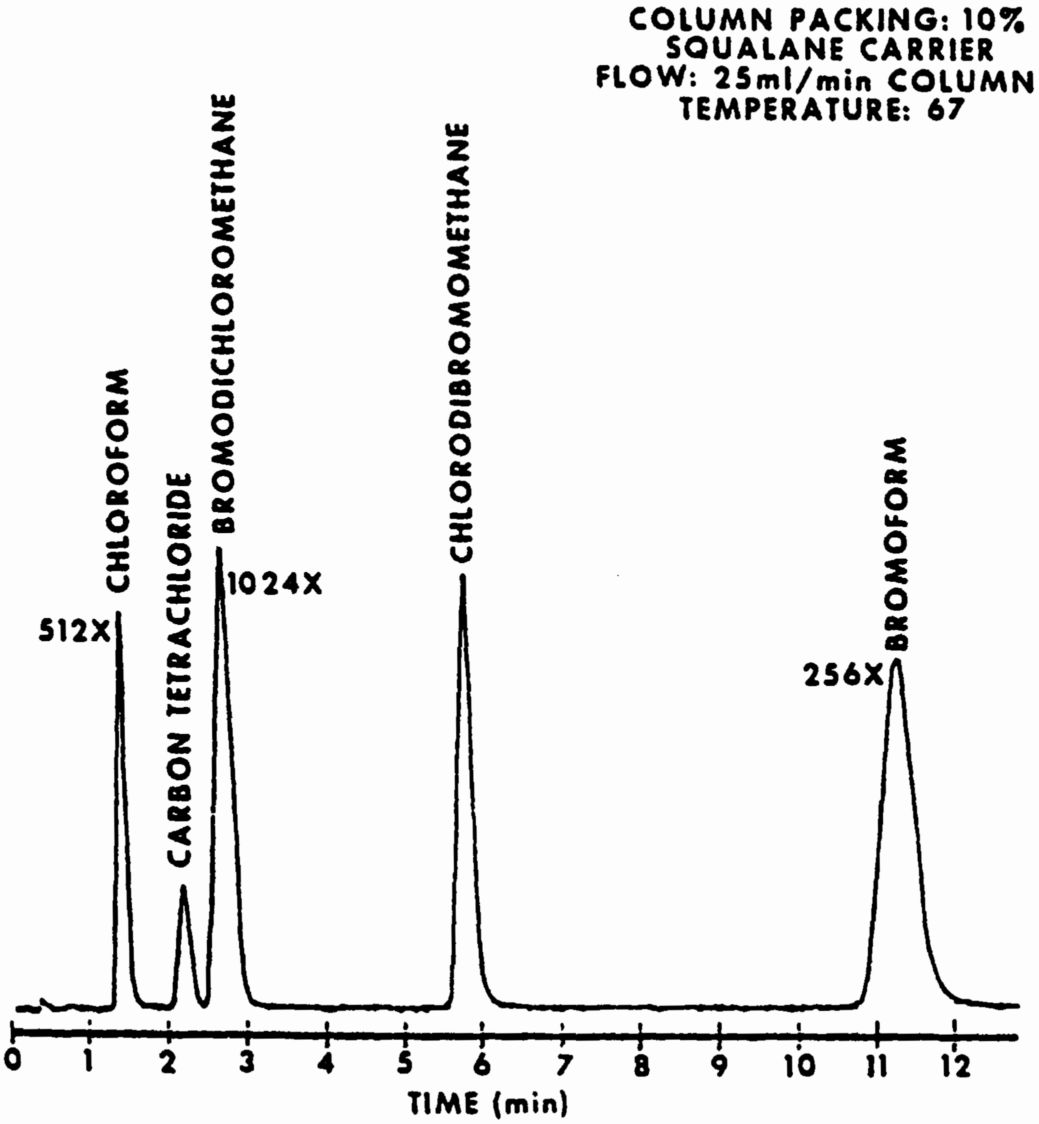

FIGURE 2. EXTRACT OF STANDARD

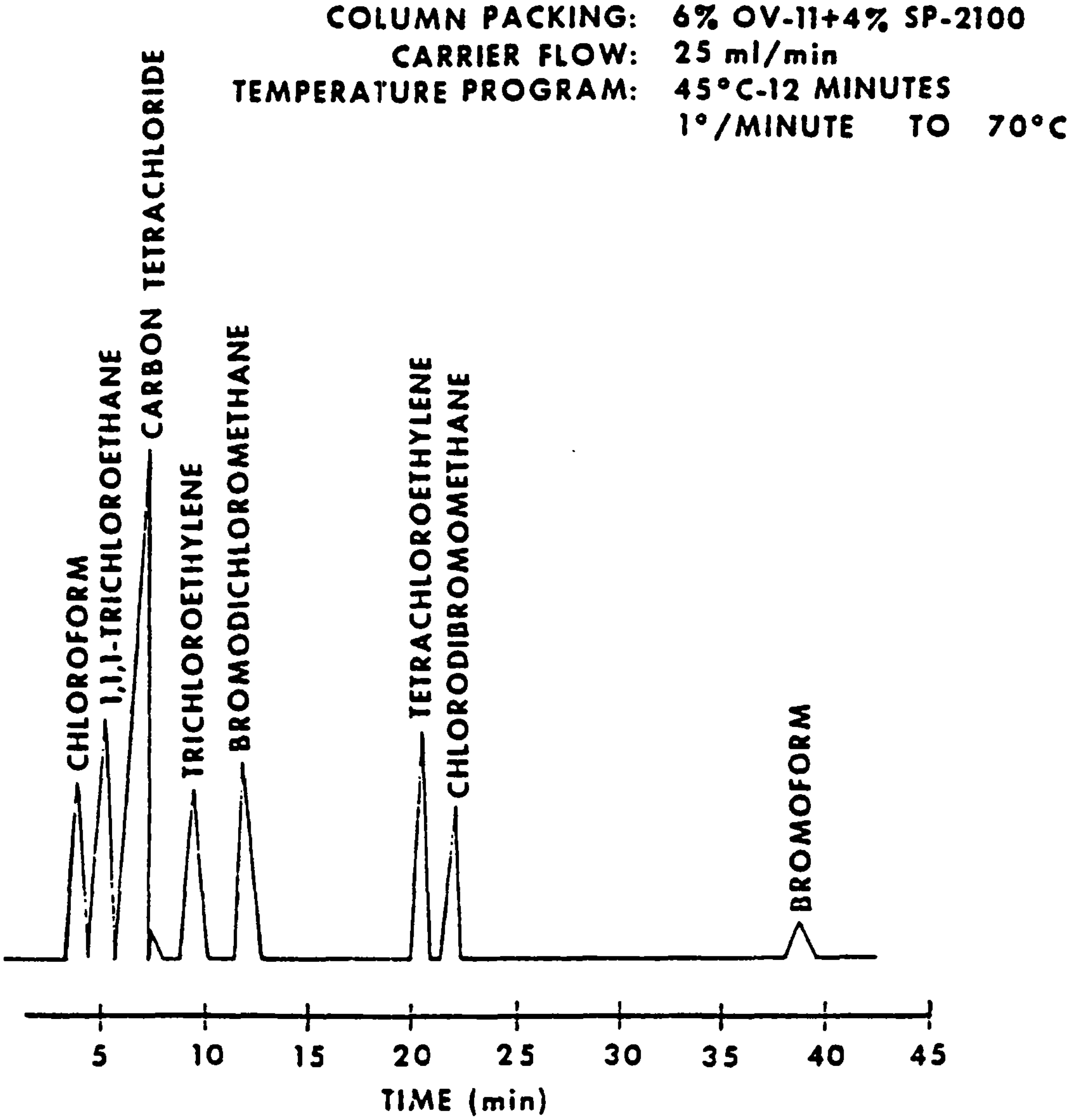

FIGURE 3. EXTRACT OF STANDARD

PART III—DETERMINATION OF MAXIMUM TOTAL TRIHALOMETHANE POTENTIAL (MTP)

The water sample used for this determination is taken from a point in the distribution system that reflects maximum residence time. Procedures for sample collection and handling are given in EMSL Methods 501.1 and 501.2. No reducing agent is added to "quench" the chemical reaction producing THMs at the time of sample collection. The intent is to permit the level of THM precursors to be depleted and the concentration of the THMs to be maximized for the supply being tested.

Four experimental parameters affecting maximum THM production are pH, temperature, reaction time and the presence of a disinfectant residual. These parameters are dealt with as follows:

Measure the disinfectant residual at the selected sampling point. Proceed only if a measurable disinfectant residual is present. Collect triplicate 40 ml water samples at the pH prevailing at the time of sampling, and prepare a method blank according to the EMSL methods. Seal and store these samples together for 7 days at 25°C or above. After this time period, open one of the sample containers and check for disinfectant residual. Absence of a disinfectant residual invalidates the sample for further analyses. Once a disinfectant residual has been demonstrated, open another of the sealed samples and determine total THM concentration using either of the EMSL analytical methods.

[44 FR 68672, Nov. 29, 1979]

Subpart D—Reporting, Public Notification and Recordkeeping

§ 141.31 Reporting requirements.

(a) Except where a shorter period is specified in this part, the supplier of water shall report to the State the results of any test measurement or analysis required by this part within (1) The first ten days following the month in which the result is received, or (2) the first ten days following the end of the required monitoring period as stipulated by the State, whichever of these is shortest.

(b) Except where a different reporting period is specified in this part, the supplier of water must report to the State within 48 hours the failure to comply with any national primary drinking water regulation (including failure to comply with monitoring requirements) set forth in this part.

(c) The supplier of water is not required to report analytical results to the State in cases where a State laboratory performs the analysis and reports the results to the State office which would normally receive such notification from the supplier.

(d) The water supply system, within ten days of completion of each public notification required pursuant to § 141.32, shall submit to the State a representative copy of each type of notice distributed, published, posted, and/or made available to the persons served by the system and/or to the media.

(e) The water supply system shall submit to the State within the time stated in the request copies of any records required to be maintained under § 141.33 hereof or copies of any documents then in existence which the State or the Administrator is entitled to inspect pursuant to the authority of section 1445 of the Safe Drinking Water Act or the equivalent provisions of State law.

[40 FR 59570, Dec. 24, 1975, as amended at 45 FR 57345, Aug. 27, 1980]

§ 141.32 Public notification.

The requirements in this section are effective April 28, 1989. The requirements of § 141.36 apply until April 28, 1989.

(a) *Maximum contaminant level (MCL), treatment technique, and variance and exemption schedule violations.* The owner or operator of a public water system which fails to comply with an applicable MCL or treatment technique established by this part or which fails to comply with the requirements of any schedule prescribed pursuant to a variance or exemption, shall notify persons served by the system as follows:

(1) Except as provided in paragraph (a)(3) of this section, the owner or operator of a public water system must give notice:

(i) By publication in a daily newspaper of general circulation in the area served by the system as soon as possible, but in no case later than 14 days after the violation or failure. If the area served by a public water system is not served by a daily newspaper of general circulation, notice shall instead be given by publication in a weekly news-

Contaminant	MCLG (mg/l)
Chromium	0.1
Copper	1.3
Cyanide (as free Cyanide)	.2
Fluoride	4.0
Lead	zero
Mercury	0.002
Nickel	.1
Nitrate	10 (as Nitrogen).
Nitrite	1 (as Nitrogen).
Total Nitrate+Nitrite	10 (as Nitrogen).
Selenium	0.05
Thallium	.0005

[50 FR 47155, Nov. 14, 1985, as amended at 52 FR 20674, June 2, 1987; 56 FR 3593, Jan. 30, 1991; 56 FR 26548, June 7, 1991; 56 FR 30280, July 1, 1991; 57 FR 31846, July 17, 1992]

EFFECTIVE DATE NOTE: At 57 FR 31846, July 17, 1992, §141.51 was amended in the table by adding entries for Antimony, Beryllium, Cyanide, Nickel, and Thallium, effective January 17, 1994.

§141.52 Maximum contaminant level goals for microbiological contaminants.

MCLGs for the following contaminants are as indicated:

Contaminant	MCLG
(1) *Giardia lamblia*	zero
(2) Viruses	zero
(3) *Legionella*	zero
(4) Total coliforms (including fecal coliforms and *Escherichia coli*).	zero.

[54 FR 27527, 27566, June 29, 1989; 55 FR 25064, June 19, 1990]

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

§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.

(3) The effective date for paragraphs (a)(19) through (a)(21) and (c)(19) through (c)(33) of §141.61 is January 17, 1994.

(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.

(3) The effective date for paragraphs (b)(11) through (b)(15) of §141.62 is January 17, 1994.

[56 FR 3593, Jan. 30, 1991, as amended at 57 FR 31846, July 17, 1992]

§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) 56–23–5	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) 78–87–5	1,2-Dichloropropane	0.005
(11) 100–41–4	Ethylbenzene	0.7
(12) 108–90–7	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) 108–88–3	Toluene	1
(17) 156–60–5	trans-1,2-Dichloroethylene	0.1
(18) 1330–20–7	Xylenes (total)	10
(19) 75–09–2	Dichloromethane	0.005
(20) 120–82–1	1,2,4-Trichloro- benzene	.07
(21) 79–00–5	1,1,2-Trichloro- ethane	.005

(b) The Administrator, pursuant to section 1412 of the Act, hereby identifies as indicated in the Table below granular activated carbon (GAC), packed tower aeration (PTA), or oxidation (OX) as the best technology treatment technique, or other means available for achieving compliance with the maximum contaminant level for synthetic 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.	Contaminant	GAC	PTA	OX
50–32–8	Benzo[a]pyrene	X	....	
75–99–0	Dalapon	X	....	
75–09–2	Dichloromethane	....	X	
103–23–1	Di (2-ethylhexyl) adipate	X	X	
117–81–7	Di (2-ethylhexyl) phthalate	X	....	
88–85–7	Dinoseb	X	....	
85–00–7	Diquat	X	....	
145–73–3	Endothall	X	....	
72–20–8	Endrin	X	....	
1071–53–6	Glyphosate	....	....	X
118–74–1	Hexachlorobenzene	X	....	
77–47–3	Hexachlorocyclopentadiene	X	X	
23135–22–0	Oxamyl (Vydate)	X	....	
1918–02–1	Picloram	X	....	
122–34–9	Simazine	X	....	
120–82–1	1,2,4-Trichlorobenzene	X	X	
79–00–5	1,1,2-Trichloroethane	X	X	
1746–01–6	2,3,7,8-TCDD (Dioxin)	X	....	

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

CAS No.	Contaminant	MCL (mg/l)
(1) 15972–60–8	Alachlor	0.002
(2) 116–06–3	Aldicarb	0.003
(3) 1646–87–3	Aldicarb sulfoxide	0.004
(4) 1646–87–4	Aldicarb sulfone	0.003
(5) 1912–24–9	Atrazine	0.003
(6) 1563–66–2	Carbofuran	0.04
(7) 57–74–9	Chlordane	0.002
(8) 96–12–8	Dibromochloropropane	0.0002
(9) 94–75–7	2,4-D	0.07
(10) 106–93–4	Ethylene dibromide	0.00005
(11) 76–44–8	Heptachlor	0.0004
(12) 1024–57–3	Heptachlor epoxide	0.0002
(13) 58–89–9	Lindane	0.0002
(14) 72–43–5	Methoxychlor	0.04
(15) 1336–36–3	Polychlorinated biphenyls	0.0005
(16) 87–86–5	Pentachlorophenol	0.001
(17) 8001–35–2	Toxaphene	0.003
(18) 93–72–1	2,4,5-TP	0.05
(19) 50–32–8	Benzo[a]pyrene	0.0002
(20) 75–99–0	Dalapon	0.2
(21) 103–23–1	Di(2-ethylhexyl) adipate	0.4
(22) 117–81–7	Di(2-ethylhexyl) phthalate	0.006
(23) 88–85–7	Dinoseb	0.007
(24) 85–00–7	Diquat	0.02
(25) 145–73–3	Endothall	0.1
(26) 72–20–8	Endrin	0.002
(27) 1071–53–6	Glyphosate	0.7
(28) 118–74–1	Hexacholorbenzene	0.001
(29) 77–47–4	Hexachlorocyclopentadiene	0.05
(30) 23135–22–0	Oxamyl (Vydate)	0.2
(31) 1918–02–1	Picloram	0.5
(32) 122–34–9	Simazine	0.004
(33) 1746–01–6	2,3,7,8-TCDD (Dioxin)	3×10^{-8}

[56 FR 3593, Jan. 30, 1991, as amended at 56 FR 30280, July 1, 1991; 57 FR 31846, July 17, 1992]

EFFECTIVE DATE NOTE: At 57 FR 31846, July 17, 1992, § 141.61 was amended by adding paragraph (a)(19) through (21), by revising paragraph (b) including the table, by revising the introductory text to paragraph (c), and by adding paragraphs (c)(19) through (25) and (27) through (33), effective January 17, 1994. For the convenience of the user, the superseded text follows:

§ 141.61 Maximum contaminant levels for organic contaminants.

* * * * *

(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
15972-60-8	Alachlor	X	
116-06-3	Aldicarb	X	
1646-88-4	Aldicarb sulfone	X	
1646-87-3	Aldicarb sulfoxide	X	
1912-24-9	Atrazine	X	
71-43-2	Benzene	X	X
1563-66-2	Carbofuran	X	
56-23-5	Carbon tetrachloride	X	X
57-74-9	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
156-60-5	trans-1,2-Dichloroethylene	X	X
75-35-4	1,1-Dichloroethylene	X	X
78-87-5	1,2-Dichloropropane	X	X
106-93-4	Ethylene Dibromide (EDB)	X	X
100-41-4	Ethylbenzene	X	X
76-44-8	Heptachlor	X	
1024-57-3	Heptachlor epoxide	X	
58-89-9	Lindane	X	
72-43-5	Methoxychlor	X	
108-90-7	Monochlorobenzene	X	X
106-46-7	para-Dichlorobenzene	X	X
1336-36-3	Polychlorinated biphenyls (PCB)	X	
87-86-5	Pentachlorophenol	X	
100-42-5	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
79-01-6	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.

* * * * *

§ 141.62 Maximum contaminant levels for inorganic contaminants.

(a) [Reserved]

(b) The maximum contaminant levels for inorganic contaminants specified in paragraphs (b)(2)—(6), (b)(10), and (b)(11)—(15) 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 (b)(7), (b)(8), and (b)(9) of this section apply to community water systems; non-transient, non-community water systems; and transient non-community water systems.

Contaminant	MCL (mg/l)
(1) Fluoride	4.0
(2) Asbestos	7 Million Fibers/liter (longer than 10 μm).
(3) Barium	2
(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 and Nitrite	10 (as Nitrogen)
(10) Selenium	0.05
(11) Antimony	0.006
(12) Beryllium	0.004
(13) Cyanide (as free Cyanide).	0.2
(14) Nickel	0.1
(15) Thallium	0.002

(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 levels for inorganic contaminants identified in paragraph (b) of this section, except fluoride:

BAT FOR INORGANIC COMPOUNDS LISTED IN SECTION 141.62(B)

Chemical Name	BAT(s)
Antimony	2,7
Asbestos	2,3,8
Barium	5,6,7,9
Beryllium	1,2,5,6,7
Cadmium	2,5,6,7
Chromium	2,5,6[2],7
Cyanide	5,7,10
Mercury	2[1],4,6[1],7[1]
Nickel	5,6,7
Nitrate	5,7,9
Nitrite	5,7
Selenium	1,2[3],6,7,9
Thallium	1,5

[1] BAT only if influent Hg concentrations ≤10μg/1.
[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
10=Chlorine
11=Ultraviolent

[56 FR 3594, Jan. 30, 1991, as amended at 56 FR 30280, July 1, 1991; 57 FR 31847, July 17, 1992]

EFFECTIVE DATE NOTE: At 57 FR 31847, July 17, 1992, §141.62 was amended by revising the introductory text to paragraph (b), by adding paragraphs (b)(11) through (15), and by revising paragraph (c) including the table, effective January 17, 1994. For the convenience of the user, the superseded text follows:

§ 141.62 Maximum contaminant levels for inorganic contaminants.

* * * * *

(b) The maximum contaminant levels for inorganic contaminants specified in paragraphs (b) (2) through (6) and (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.

* * * * *

(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[2],7
Mercury	2[1],4,6[1],7[1]
Nitrate	5,7,9
Nitrite	5,7
Selenium	1,2[3],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

TABLE 1.3—CT VALUES ($CT_{99.9}$) for 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE AT 10.0 °C[1]—Continued

Free residual (mg/l)	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
2.0	87	104	124	150	182	221	265
2.2	89	105	127	153	186	225	271
2.4	90	107	129	157	190	230	276
2.6	92	110	131	160	194	234	281
2.8	93	111	134	163	197	239	287
3.0	95	113	137	166	201	243	292

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

TABLE 1.4—CT VALUES ($CT_{99.9}$) for 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE AT 15.0 °C[1]

Free residual (mg/l)	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	49	59	70	83	99	118	140
0.6	50	60	72	86	102	122	146
0.8	52	61	73	88	105	126	151
1.0	53	63	75	90	108	130	156
1.2	54	64	76	92	111	134	160
1.4	55	65	78	94	114	137	165
1.6	56	66	79	96	116	141	169
1.8	57	68	81	98	119	144	173
2.0	58	69	83	100	122	147	177
2.2	59	70	85	102	124	150	181
2.4	60	72	86	105	127	153	184
2.6	61	73	88	107	129	156	188
2.8	62	74	89	109	132	159	191
3.0	63	76	91	111	134	162	195

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

TABLE 1.5—CT Values ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE AT 20 °C[1]

Free residual (mg/l)	pH						
	≤ 6.0	6.5	7.0	7.5	8.0	8.5	≤ 9.0
≤ 0.4	36	44	52	62	74	89	105
0.6 ...	38	45	54	64	77	92	109
0.8 ...	39	46	55	66	79	95	113
1.0 ...	39	47	56	67	81	98	117
1.2 ...	40	48	57	69	83	100	120
1.4 ...	41	49	58	70	85	103	123
1.6 ...	42	50	59	72	87	105	126
1.8 ...	43	51	61	74	89	108	129
2.0 ...	44	52	62	75	91	110	132
2.2 ...	44	53	63	77	93	113	135
2.4 ...	45	54	65	78	95	115	138
2.6 ...	46	55	66	80	97	117	141
2.8 ...	47	56	67	81	99	119	143
3.0 ...	47	57	68	83	101	122	146

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

TABLE 1.6—CT Values ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE AT 25 °C[1] AND HIGHER

Free residual (mg/l)	pH						
	≤ 6.0	6.5	7.0	7.5	8.0	8.5	≤ 9.0
≤ 0.4	24	29	35	42	50	59	70
0.6 ...	25	30	36	43	51	61	73
0.8 ...	26	31	37	44	53	63	75
1.0 ...	26	31	37	45	54	65	78
1.2 ...	27	32	38	46	55	67	80
1.4 ...	27	33	39	47	57	69	82
1.6 ...	28	33	40	48	58	70	84
1.8 ...	29	34	41	49	60	72	86
2.0 ...	29	35	41	50	61	74	88
2.2 ...	30	35	42	51	62	75	90
2.4 ...	30	36	43	52	63	77	92
2.6 ...	31	37	44	53	65	78	94
2.8 ...	31	37	45	54	66	80	96
3.0 ...	32	38	46	55	67	81	97

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

TABLE 2.1—CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY CHLORINE DIOXIDE AND OZONE[1]

	Temperature					
	< 1 °C	5 °C	10 °C	15 °C	20 °C	≥ 25 °C
Chlorine dioxide	63	26	23	19	15	11
Ozone	2.9	1.9	1.4	0.95	0.72	0.48

[1] These CT values achieve greater than 99.99 percent inactivation of viruses. CT values between the indicated temperatures may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature for determining $CT_{99.9}$ values between indicated temperatures.

TABLE 3.1—CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY CHLORAMINES[1]

Temperature					
< 1 °C	5 °C	10 °C	15 °C	20 °C	25 °C
3,800	2,200	1,850	1,500	1,100	750

[1] These values are for pH values of 6 to 9. These CT values may be assumed to achieve greater than 99.99 percent inactivation of viruses only if chlorine is added and mixed in the water prior to the addition of ammonia. If this condition is not met, the system must demonstrate, based on on-site studies or other information, as approved by the State, that the system is achieving at least 99.99 percent inactivation of viruses. CT values between the indicated temperatures may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature for determining $CT_{99.9}$ values between indicated temperatures.

(4) The total inactivation ratio must be calculated as follows:

(i) If the system uses only one point of disinfectant application, the system may determine the total inactivation ratio based on either of the following two methods:

(A) One inactivation ratio ($CTcalc/CT_{99.9}$) is determined before or at the first customer during peak hourly flow and if the $CTcalc/CT_{99.9} \geq 1.0$, the 99.9 percent *Giardia lamblia* inactivation requirement has been achieved; or

(B) Successive $CTcalc/CT_{99.9}$ values, representing sequential inactivation ratios, are determined between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the following method must be used to calculate the total inactivation ratio:

(1) Determine $\frac{CTcalc}{CT_{99.9}}$ for each sequence.

(2) Add the $\frac{CTcalc}{CT_{99.9}}$ values together $\left(\Sigma \frac{(CTcalc)}{CT_{99.9}} \right)$

(3) If $\Sigma \left(\frac{CTcalc}{CT_{99.9}} \right) \geq 1.0$, the 99.9 percent *Giardia* *lamblia* inactivation requirement has been achieved.

(ii) If the system uses more than one point of disinfectant application before or at the first customer, the system must determine the CT value of each disinfection sequence immediately prior to the next point of disinfectant application during peak hourly flow. The $CTcalc/CT_{99.9}$ value of each sequence and

$$\Sigma \frac{CTcalc}{CT_{99.9}}$$

must be calculated using the method in paragraph (b)(4)(i)(B) of this section to determine if the system is in compliance with §142.72(a).

(iii) Although not required, the total percent inactivation for a system with one or more points of residual disinfectant concentration monitoring may be calculated by solving the following equation:

$$\text{Percent inactivation} = 100 - \frac{100}{10^z}$$

$$\text{where } z = 3 \times 7 + \frac{CTcalc}{CT_{99.9}},$$

(5) The residual disinfectant concentration of the water entering the distribution system must be monitored continuously, and the lowest value must be recorded each day, except that if there is a failure in the continuous monitoring equipment, grab sampling every 4 hours may be conducted in lieu of continuous monitoring, but for no

meet the criteria in §141.84(c) shall equal at least 7 percent of the initial number of lead lines identified under paragraph (a) of this section (or the percentage specified by the State under §141.84(f)).

(3) The annual letter submitted to the State under paragraph (e)(2) of this section shall contain the following information:

(i) The number of lead service lines scheduled to be replaced during the previous year of the system's replacement schedule;

(ii) The number and location of each lead service line replaced during the previous year of the system's replacement schedule;

(iii) If measured, the water lead concentration and location of each lead service line sampled, the sampling method, and the date of sampling.

(4) As soon as practicable, but in no case later than three months after a system exceeds the lead action level in sampling referred to in §141.84(a), any system seeking to rebut the presumption that it has control over the entire lead service line pursuant to §141.84(d) shall submit a letter to the State describing the legal authority (e.g., state statutes, municipal ordinances, public service contracts or other applicable legal authority) which limits the system's control over the service lines and the extent of the system's control.

(f) *Public education program reporting requirements.* By December 31st of each year, any water system that is subject to the public education requirements in §141.85 shall submit a letter to the State demonstrating that the system has delivered the public education materials that meet the content requirements in §141.85(a) and (b) and the delivery requirements in §141.85(c). This information shall include a list of all the newspapers, radio stations, television stations, facilities and organizations to which the system delivered public education materials during the previous year. The water system shall submit the letter required by this paragraph annually for as long as it exceeds the lead action level.

(g) *Reporting of additional monitoring data.* Any system which collects sampling data in addition to that required by this subpart shall report the results to the State by the end of the applicable monitoring period under §§141.86, 141.87 and §141.88 during which the samples are collected.

[56 FR 26548, June 7, 1991; 57 FR 28789, June 29, 1992]

§ 141.91 Recordkeeping requirements.

Any system subject to the requirements of this subpart shall retain on its premises original records of all sampling data and analyses, reports, surveys, letters, evaluations, schedules, State determinations, and any other information required by §141.81 through §141.88. Each water system shall retain the records required by this section for no fewer than 12 years.

Subpart J—Use of Non-Centralized Treatment Devices

SOURCE: 52 FR 25716, July 8, 1987, unless otherwise noted.

§ 141.100 Criteria and procedures for public water systems using point-of-entry devices.

(a) Public water systems may use point-of-entry devices to comply with maximum contaminant levels only if they meet the requirements of this section.

(b) It is the responsibility of the public water system to operate and maintain the point-of-entry treatment system.

(c) The public water system must develop and obtain State approval for a monitoring plan before point-of-entry devices are installed for compliance. Under the plan approved by the State, point-of-entry devices must provide health protection equivalent to central water treatment. "Equivalent" means that the water would meet all national primary drinking water regulations and would be of acceptable quality similar to water distributed by a well-operated central treatment plant. In addition to the VOCs, monitoring must include physical measurements and observations such as total flow treated and mechanical condition of the treatment equipment.

(d) Effective technology must be properly applied under a plan approved by the State and the microbio-

Commonwealth of the Northern Mariana Islands
Coastal Resources Management
Office of the Governor
Saipan, Mariana Islands 96950

CABLE ADDRESS
GOV. NMI SAIPAN
TELS. 234-6623 /7320

NOTICE OF PROPOSED REGULATIONS AND FEE REQUIREMENT FOR CRM MAJOR SITING PERMIT HOLDERS REQUESTING EXTENSIONS

The CNMI Coastal Resources Management Program hereby notifies the general public that it proposes to adopt regulations which will require a fifty percent (50%) fee (half of the original permit fee) for CRM Major Siting Permit holders granted an extension of the original time frame for project completion of the permit. The Administrator of Coastal Resources Management is authorized to do so under 2 CMC Section 1511 (3) B and this adoption is done in accordance with the Administrative Procedures Act, 1 CMC 9101, et.seq. Interested persons may obtain copies of the proposed fee change from the Coastal Resources Management Office located in the second floor of the Morgen Building, San Jose, Saipan.

Anyone interested in commenting on the proposed fee change may do so in writing within thirty (30) days from the date this notice is published in the Commonwealth Register.

Comments should be sent to:

Administrator
Coastal Resources Management
Office of the Governor
2nd Floor Morgen Building
Saipan, MP 96950

Date: 7/13/94

MANUEL C. SABLAN
Administrator, Coastal Resources Management

Date: 7/13/94

DONNA CRUZ
Governor's Secretary

Date of Filing: 7/13/94

SOLEDAD B. SASAMATO
Registrar of Corporations

Commonwealth of the Northern Mariana Islands
Coastal Resources Management
Office of the Governor
Saipan, Mariana Islands 96950

CABLE ADDRESS
GOV. NMI SAIPAN
TELS. 234-6623/7320

NOTISIAN PUPBLIKU

Notisia ni ma'propoponi regulasion yan apas niman ginagagao pot CRM I mayot na lugat dueñon I lisensia manman rekuekuesta exstension siha.

I CNMI Coastal Resources Management na Prugrama este hu notitisia I Henerat Pupbliku na'mapropoponi siha na'uma'adopta regulasion siha segun iman ginagagao na sinkuenta pot siento (50%) na'apas (lamita gi orihinat na' apas) para I CRM gi Mayot na'lugat komo dueñon I lisensia ha'rekuekuesta exstension pot lisensia. I Atministradot Coastal Resources Management I'na authorisa na'hucho'gue gi papa 2 CMC Seksiona 1511 (3) B yan pot este mohayan ma'adopta este segun gi atministratibo na'akton lai, 1(CMC 9101, et. seq. Iman interesao na petsonas sina man-manule kopia siha pot I ma'propoponi na'apas ni matulaika ginen I Coastal Resources Management na'ofisina ni gaige gi segundo bibienda gi as Morgen na guma, giya San Jose, Saipan.

Maseha hayi ni gai interes muna halom komentu pot I man-ma'propoponi na'apas ni man-matulaika uma'na fan halom tinigi siha gi halom trenta (30) dias, ginen I fecha pot este na notisia ni ma'pupblika gi rehistran I Commonwealth.

Komentu debi humana halom guato:

Atministradot
Coastal Resources Management
Ofisinan I Gobietno
Segundo na bibienda gi as Morgen na Guma
Saipan, MP 96950

Fecha: 7/13/94

MANUEL C. SABLAN
ATMINISTRADOT
COASTAL RESOURCES MANAGEMENT NA OFISINA

Fecha: 7/13/94

DONNA J. CRUZ
SEKITARIAN GOBIETNO

MA'FECHA: 7/13/94
I manahalomña

SOLEDAD B. SASAMOTO
REHISTRAN I KOPORASION

Commonwealth of the Northern Mariana Islands
Coastal Resources Management
Office of the Governor
Saipan, Mariana Islands 96950

CABLE ADDRESS
GOV. NMI SAIPAN
TELS. 234-6623/7320

ARONGORONG REEL FFEERUL
ALLEGHUL ABWOS NGALIIR
CRM MAJOR SITING PERMIT HOLDERS NGARE RE TINGOR EXTENSION

CNMI Coastal Resources Management Program, nge arongaar towlap igha ekke mángiiy bwe ebwele adaptáálí allégh kka ebwele nisisiita limeigh percent (50%) abwós (esóbw mellól miliwe schéschéél abwós) ngáliir schóókka CRM Permit Holders ikka rebwal kke tingór extension sángi schéschéél ráálil we re ngálleer lisensiya me ngáre permit. Administradoodul Coastal Resouces Management nge eyoor bwángil bwe ebwe féérú allégh kkaal sángi bwángil me ailééwal mille CMC Tálil ye 1511 (3) B nge adoption yeel nge e fféér sángi ailééwal Administrative Procedures Act, 1 CMC 9101, et. seq. Aramas ye e tipáli nge emmwel schagh rebwe ló bweibwógh kkopiyaal allégh kkaal mellól Bwulasiyool Coastal Resources Management iye elo aruwoowal bibenda mellól Morgen Building, San Jose, Seipél

Aramas ye e tipáli bwe ebwe atotoolong meta mángemángil me tipal reel alléghúl abwós kkaal nge emmwel schagh bwe ebwe ischiitiw llól eliiigh (30) rál sángi gha e toowow arongorong yeel mellól Commonwealth Register.

Nge rebwe afanga ngáli address yeel:

Administrator
Coastal Resources Mangement
Office of the Governor
2nd Floor Morgen Building
Saipan, MP 96950

Rál: 7/13/94

MANUEL C. SABLAN
Administration, Coastal Resouces Management

Rál: 7/13/94

DONNA J. CRUZ
Governor's Secretary

Rálil igha e file: 7/13/94

SOLEDAD B. SASAMOTO
Registrar of Corporations

Commonwealth of the Northern Mariana Islands
Coastal Resources Management
Office of the Governor
Saipan, Mariana Islands 96950

CABLE ADDRESS
GOV. NMI SAIPAN
TELS. 234-6623/7320

COASTAL RESOURCE MANAGEMENT OFFICE
PROPOSED REGULATIONS AND FEE REQUIREMENT FOR CRM MAJOR SITING PERMIT HOLDERS REQUESTING EXTENSIONS

Section 1. Authority. The Administrator of Coastal Resources Management, pursuant to its powers, duties and authorities under Public law 3-47, 2 CMC Section 1511 (3)B, as amended.

Section 2. Purpose and Findings. The Administrator finds that many permit applications are received for what appears to be speculative purposes only and this can interfere with long term planning efforts. Therefore,in order to ensure the permit holder's intention to develop the project are genuine, the following changes are required.

Section 3. Section 12 (C)(ii) - new section to replace existing section:

Timing and Duration. Permitted physical development of the project site subject to a CRM Permit shall begin within the time frame specified for project commencement on the permit. The maximum time limit allowed for project commencement shall be one (1) year. The project shall be completed within the time frame specified on the permit for project completion. The maximum time limit allowed for project completion shall be three (3) years unless it can be demonstrated the scope of the project requires additional time for construction purposes(only). Upon project completion, the permittee shall deliver a Completion Certificate to the CRM Office. If the project is not completed within the time frame specified in the permit, the permit will be reviewed by the CRM Administrator who will do one of the of the following: 1) extend or amend the permit or 2) terminate the permit. If the CRM Administrator grants an extension of the permit, a fee equaling fifty percent (50%) of the original permit fee shall be assessed. The CRM Administrator shall have the discretion to waive this fee if the project has been substantially completed. Substantial completion means, the project is over seventy-five (75%) structurally complete as certified by a CNMI registered Architect or Engineer.

All conditions attached to the permit shall be of perpetual validity unless action is taken to amend, suspend, revoke or otherwise modify the CRM Permit.

(no changes beyond this point)

Date: 7/13/94

MSablan

MANUEL C. SABLAN
Administrator, Coastal Resources Management

Acknowledged: Donna J Cruz
DONNA J. CRUZ
Governor's Office

Date: 7/13/94

Date of Filing: 7/13/94

SOLEDAD B. SASAMOTO
Registrar of Corporations

PUBLIC NOTICE

PROPOSED AMENDMENTS TO THE COMMONWEALTH UTILITIES CORPORATION'S ELECTRIC SERVICE REGULATIONS

The Commonwealth Utilities Corporation Board of Directors, pursuant to the authority of the **Commonwealth Utilities Corporation Act** and in accordance with the provisions of the **Administrative Procedure Act,** hereby gives notice to the public of its proposed amendments to the Commonwealth Utilities Corporation Electric Service Regulations. The proposed revised regulations are published herewith.

All interested persons are requested to submit data, views or arguments, in writing, concerning the proposed Amendments to the Commonwealth Utilities Corporation's Regulations. Written comments must be submitted to the Executive Director, Commonwealth Utilities Corporation, not later than the close of business thirty (30) calendar days following the date of publication of this Notice.

Dated this 12th day of July, 1994:

TIMOTHY P. VILLAGOMEZ
Executive Director
Commonwealth Utilities Corporation

Received by: DONNA J. CRUZ
Office of the Governor

Filed by: SOLEDAD B. SASAMOTO
Registrar of Corporations

Date: 7/12/94

Date: 7/12/94

NUTISIAN PUPBLIKU

I MAPROPOPONI NA AMENDASION GI REGULASION COMMONWEALTH UTILITIES CORPORATIONS PUT REGULASION SETBISIUN ELEKTRISIDA

I Commonwealth Utilities Corporation Board of Directors, sigun gi aturidat ginen i Commonwealth Utilities Corporation Act, yan sigun gi prubinsion ginen i Administrative Act, ginen este ha nuttitisia i pupbliku put i ha propoponi na amendasion gi Regulasion Commonwealth Utilities Corporations Put Regulasion Setbisiun Elektrisida. I mapropoponi yan ribisa na regulasion mapupblika guini.

Hayi interesao na petsona malago' mamatinas komentu, put i mapropoponi siha na Amendasion gi halom Regulasion Commonwealth Utilities Corporations, siña ha ha tuge' papa ya u ma submiti guatu gi Executive Director, Commonwealth Utilities Corporations ti u atrasao desde mahuchom i bisnis gi halom trenta (30) dias desde mapupblika huyong este na Nutisia.

Ma fecha gi dia 12th Juliu, 1994.

Timothy Villagomez

TIMOTHY P. VILLAGOMEZ
Executive Director
Commonwealth Utilities Corporations

Rinisibi as: Donna J Cruz
DONNA J. CRUZ
Ofisinan Gobietno

Fecha: 7/12/94

Ma file as:
SOLEDAD B. SASAMOTO
Registrar of Corporations

Fecha: 7/12/94

ARONGORONGOL TOWLAP

FFÉÉRÚL LLIWEL MELLÓL ÓWTOL
ALLÉGHÚL DENGKKI MELLÓL
COMMONWEALTH UTILITIES CORPORATIONS

Schóól Board of Directors mellól Coomonwealth Utilities Corporations, sángi bwángiir ígha re ngalleer mefaal mille Commonwealth Utilities Corporation Act, fengál meiye Administrative Procedure Act, nge rekke arongaar towlap bwe ebwe ayoora lliiwel mellól ówtol Alléghúl Commonwealth Utilities Corporations reel Dengkki. Llíwel kkaal nge ebwele toowow.

Aramas ye e tipáli nge emmwel schagh bwe ebwe ischiitiw meta mángemángil me tipal reel lliiwel kka llól Alléghúl Commonwealth Utilities Corporations. Emmwel schagh bwe rebwe afanga ngáli Executive Director, Commonwealth Utilities Corporations, essóbw luu sángi eliigh (30) rál sángi ígha e toowow arongorong yeel.

E fféér llól rááli ye 12th Ulliyo, 1994:

TIMOTHY P. VILLAGOMEZ
Executive Director
CommonwealthUtilities Corporation

Rísibiliyaal:
DONNA J. CRUZ
Bwulasiyool Gubenno

File-liiyal:
SOLEDAD B. SASAMOTO
Registrar of Corporation

Rál: 7/12/94

Rál: 7/12/94

Proposed Amendments To CUC Electric Service Regulations

Part 5. Application for Service

5.1 A separate application for electric service shall be made for each service connection unless otherwise authorized by CUC.

5.2 Each applicant for electric service shall be required to sign an application form provided by the CUC and to:

5.2.1 Pay a deposit for electric service pursuant to Part 6 of these Regulations; and

5.2.2 If necessary, execute an easement using standard CUC forms, such easement being at no cost to CUC.

5.3. The application is a request to provide electric service and, until approved, does not bind the CUC to provide such service, nor does it bind the customer to take service for a longer period than the minimum requirements of the rate. All customers of the CUC whether they have signed an application for service or not, shall comply with the rules, regulations, policies and rate schedules of the CUC. Approved applications become contracts by which the customer becomes responsible to pay for all power consumed, as measured by the power meter, until the customer's account is closed out.

5.4. If an application for service is canceled prior to the establishment of service, the deposit shall be applied to any charges applicable in accordance with the rate schedules and the excess portion of the deposit, if any, shall be returned. The customer shall be advised of the reason(s) for any deduction from the deposit. Upon discontinuance of service, the CUC shall refund the customer's deposit by applying it to the customer's account and/or issuing a check.

5.5. Customers shall give the CUC written notice of the extent and nature of any increase in demand of electric service resulting from the change in size, character or extent of equipment or operations for which service was originally supplied. The notice shall be given before making any such change(s).

5.6. The CUC shall, if no undue hardship to its existing customers is likely to result therefrom, furnish temporary service under the following conditions:

5.6.1. The applicant shall pay, in advance or otherwise as required by the CUC, the estimated cost of service connection. Commercial rates shall be applicable.

5.6.2. The applicant shall pay a deposit, as described above, prior to installation of service connection, except that the amount of deposit shall not exceed the estimated bill for power consumption for the duration of service plus the cost of service connection.

5.7. If at any time the character of a temporary load changes so that, in the opinion of the CUC, the customer may be classified as permanent, the amount of payment made in excess of that required for permanent service shall be refunded to the customer. The payment made in excess by the applicant shall be calculated on the basis of the extension rule in effect at the time of status change. Total refunds shall not exceed the amount deposited and no interest shall be paid on the amount advanced.

5.8. No transfer of accounts shall be permitted. When a customer moves from one location to another, the account for the first location shall be closed out and an application must be submitted for receiving service to the second location.

5.9. Electric power sold by CUC to a customer shall not be resold by the customer to third parties. A commercial customer may allocate the cost of electric power among tenants.

5.9.1. In instances involving the allocation of the cost of electric service to tenants where the tenants are metered, the meters must be ANSI (American National Standards Institute) rated C-12.1 with cyclometer dials.

Part 6: <u>Security Deposits</u>

6.1. The Commonwealth Utilities Corporation shall collect from every customer account a two (2) month security deposit.

6.2. The CUC Engineering Division shall be responsible for calculating the actual cost of the customer's deposit based on a sliding scale of estimated kilowatt usage. Customers may be required to provide blueprints, electrical load calculations or building code certificates.

6.3. After a customer has utilized the CUC full time for a period of one (1) year, the customer will have established a credit history with the Corporation. At that time, the customer may request his deposit be recalculated based on actual kilowatt usage rather than the sliding scale.

6.4. After one year of established use, and annually thereafter, the CUC may also recalculate the security deposit.

6.5. All adjustments to the original security deposit shall be calculated by averaging the two (2) highest months of actual kilowatt hour usage during the one year period. In the event that the actual customer usage is fifteen (15) percent higher or lower than the estimate used in rule 6.2, then the Corporation shall adjust, either higher or lower, any the security deposit based on the new calculations.

6.6. Adjustments in the customer security deposit shall appear on the regular monthly bill either in the form of a credit or in the form of an additional payment required by the customer.

6.7. Customers who are found to owe an additional security deposit are obligated to pay such amount or their services are subject to disconnection as with any past due bill.

Part 6.8: Accountability of Security Deposits

6.8.1. The Corporation shall be liable for all security deposits received and shall ensure that all security deposits are deposited into an interest-earning account and that such account shall be separate from all other Corporation accounts.

6.8.2. The Corporation may use the balance in the security deposit account to credit all existing customers (a) who terminate their account; (b) who qualify for a refund; or (c) whose accounts are past due and scheduled for disconnection, but for no other purposes not specifically mentioned in this Part or related to security deposits.

6.8.3. The Corporation's Comptroller and other individuals who have access to said account shall be held liable for any misuse or misappropriation of any and all money deposited. Liability shall include employee termination, reimbursement and/or criminal charges.

6.8.4. The Corporation Comptroller shall prepare for the Board of Directors a monthly report which explicitly details deposits and withdrawals, and categorizes account action.

Part 6.9: Refunding the Security Deposits

6.9.1. Upon the termination of a utility account, and if applicable, the customer shall receive a full, cash refund of any remaining deposit.

6.9.2. Partial refunds may be made prior to the termination of utility services for commercial customers who have previously paid a three (3) month deposit, if (a) they have established a good credit history, and (b) the Board of Directors has determined that funds are available for that purpose.

6.9.3. Upon determination of funding availability, the Board may return partial security deposits to qualifying customers (up to an amount which will leave the equivalent of the security deposit which would be required pursuant to the rules set forth in Part 6.1 - 6.6) either in the form of a credit on the utility account or in cash.

6.9.4. No portion of this policy is retroactive. Customers may not disconnect utility services in order to reconnect under the new policy. If they attempt to do so, they will be subject to the previous policy requiring a three (3) month security deposit and be required to pay a reconnection fee pursuant to Part 22.

Part 17. Non-Payment of Bills

17.1 Upon becoming past due, all bills incur a 1% late charge. This charge becomes part of the balance due. Thereafter, interest on the past due balance accrues at the rate of one (1%) percent per month, compounded yearly.

17.2 All customers with past due bills are subject to disconnection for non-payment.

17.3 Before it may disconnect a customer for non-payment of a bill, the CUC must serve a delinquency notice on a customer at any time after any account becomes past due.

17.3.1 CUC may serve delinquency notices by mail to any customer to whom it regularly sends bills by mail. Where the customer is not regularly billed by mail, CUC must serve the delinquency notice personally upon an adult at the service location, and obtain an acknowledgment of receipt. Refusal to acknowledge receipt waives service.

17.3.2 Service is considered to have been accomplished upon deposit of the properly addressed delinquency notice into the U.S. Mail, with proper postage.

17.4 Any amount past due shall be paid within fourteen (14) calendar days after the date of service of a disconnect notice to prevent disconnection.

17.4.1 The delinquency notice shall be valid for 45 days from the date of service. If the customer remains delinquent, but has not been disconnected after 45 days, a new delinquency notice must be served and 14 additional days must pass before the customer may be disconnected.

17.5 Subject to the provisions of this Part, a customer's service may be discontinued for non-payment of a bill for service rendered previously at any location served by the CUC.

17.6 Upon payment of a past due bill after disconnection of service, the customer shall be responsible for payment of any reconnection charge prior to resumption of service.

17.7 If a customer makes an agreement with CUC establishing a payment schedule in return for CUC's agreement not to disconnect or to reconnect that customer's service, and the customer breaches that agreement, CUC shall serve the customer with notice not less than five (5) days before disconnecting the customer's service. Service shall be pursuant to Part 17.3.1 and 17.3.2.

Part 18. Disputes

18.1 All bills rendered by the CUC are assumed correct unless a request for an investigation of a bill is initiated by the customer within fifteen (15) days of presentation.

18.2 When a customer and the CUC fail to agree on the amount of a bill for electric service, the dispute between the parties shall be adjudicated in accordance with the Administrative Procedures Act (1 CMC 9108 et. seq.).

18.3 In the event of disagreement and/or adjudication of a bill, the customer shall pay the undisputed portion of a challenged billing and any unchallenged additional billings received before agreement is reached or the adjudication process is completed. Failure by a customer to pay such amount shall constitute a basis for discontinuance of electric service by the CUC.

Part 19. Fraud

19.1 The CUC may refuse to provide service, or may discontinue existing service if the acts of the customer or the condition upon the customer's premises are such as to reasonably indicate an intent to defraud the CUC (e.g. meter tampering, connection without a meter, broken seals, etc.).

19.1.1 Except where the condition constitutes a health or safety hazard, CUC shall give a customer not less than five (5) days written notice of the illegal condition prior to disconnection. Notice shall be pursuant to Part 17.3.1 and 17.3.2.

19.2 Persons who have connected illegally to CUC electric lines shall be subject to immediate disconnection. Before reconnection, the person must pay the estimated cost of electric service over the length of time the illegal connection was active plus other penalties which may be assessed. The person must file an application with CUC before being considered for reconnection of electric service.

Part 20. Non-Compliance with Rate Schedules

20.1 Except as otherwise specifically provided in these regulations, the CUC may discontinue service to a customer for non-compliance with rate schedules.

Part 21. Customer's Request for Discontinuance of Service

21.1 When a customer desires to terminate responsibility for service, the customer shall give the CUC not less than five (5) days notice and state the date on which termination of service is to become effective.

21.2 A customer shall be responsible for all service furnished at the customer's premises until five (5) days after receipt of such notice by the CUC or until the date of termination specified in the notice, whichever date is later in time.

Part 22. Deposits In-Lieu of Payments & Disconnections

22.1. Should any customer be disconnected, the customer's security deposit shall automatically be applied toward the balance due on the account.

22.2. Should a customer who has been disconnected desire to have utility services re-connected, the customer must re-establish a two (2) month security deposit pursuant to rules 6.2 or 6.3, whichever applies. Customers who have been disconnected must pay in full all deposits before services are restored.

22.3. The CUC shall require payment in full of a reconnection charge before restoring service which has been disconnected for any of the reasons stated in parts 8 and 17 through 21 of these regulations.

22.3.1 Commercial re-connection fees shall be the greater of $150 or ten (10) percent of the monthly utility bill. This amount will be calculated by averaging the two (2) highest months during the last 12 month period times point ten percent (.10).

22.3.2 Residential re-connection fees shall be $150.

PUBLIC NOTICE

OF THE

PROPOSED AMENDMENT TO THE IMMIGRATION REGULATIONS SECTION 403(a)(b)(c)(d), 405-REGISTRATION AND SECTION 1201 FEES

The Office of the Attorney General of the Commonwealth of the Northern Mariana Islands hereby notifies the Commonwealth of its intent to adopt these proposed amendments promulgated pursuant to its authority under Section 4312(b)(1) of the Commonwealth Entry and Deportation Act of 1983 as amended.

The Attorney General of the Commonwealth of the Northern Mariana Islands urges the public to submit written comments and recommendations regarding these amendments within thirty (30) days after this publication. Please submit your comments to the following:

Ms. Virginia S. Sablan
Office of the Attorney General
2nd Floor, Admin. Bldg.
Capitol Hill, Saipan, MP 96950

Dated this 14th day of July, 1994

Herbert D. Soll
Herbert D. Soll,
Acting Attorney General

Virginia S. Sablan
Assistant Attorney General
In Charge of Immigration

Filed by:

Act.
Soledad B. Sasamoto
Registrar of Corporations

Received by:

Donna J. Cruz
Office of the Governor

NUTISIAN PUBLIKU

PARA I

MAPROPOPNI NA AMENDASION GI REGULASION PARA I OFFICINAN I IMMIGRATION SEKSION 403, 405 YAN 1201

I Officinan i Attorney General para i Commonwealth of the Northern Mariana Islands ha nuttitisia i pupbliku put i ha propoponi ha amendasion go regulasion I Immigration put regulasion setbisiun Registrasion yan Fees. I mapropoponi yan ribisa na regulations mapupblika guini.

Hayi interesao na petsona malago' mamatinas komentu, put i mapropoponi siha na Amendasion gi halom Regualsion Immigration sina ha ha tuge' papa ya u ma submiti guatu gi Officinan I Attorney General. Ti u atrasao desde mahuchom i bisnis gi halom trenta (30) dias desde mapupblika huyong este na Nutisia.

Ms. Virginia S. Sablan
Office of the Attorney General
2nd Floor, Admin. Bldg.
Capitol Hill, Saipan, MP 96950

Ma fecha gi dia 14th Juliu, 1994

Herbert D. Soll
Herbert D. Soll,
Acting Attorney General

Henry Wigglesworth
For Virginia S. Sablan
Assistant Attorney General

Ma file as:

Remedio M. Hallman
Acnt. Soledad B. Sasamoto
Registrar of Corporations

Ma Rinisibi as:

Donna J. Cruz
Donna J. Cruz
Officinan I Gobietnu

OFFICE OF IMMIGRATION

PROPOSED AMENDMENT

Proposed Amendment to the Immigration Regulations
Sections 403, 405 and 1201

Section 403. Registration is amended to read as follows:

A. Any alien who intends to remain in the Commonwealth for more than ninety (90) days shall register within 90 days after entry with the Office of Immigration.

B. Any alien who is issued a renewal of his or her employment or business permit shall register within ten (10) business days after the issuance of the renewal.

C. Parents and legal guardians of alien children and wards are responsible for the registration of such children and wards who are under the age of 18.

D. An employer shall ensure that any alien in his or her emloy has registered in accordance with these regulations. An employer's responsibility under this section is in addition to and does not diminish the responsibility of an alien.

Section 405. Registered Alien Card is amended to read as follows:

No Registered Alien Card shall issue until the alien has paid a twenty five dollar ($25.00) application processing fee to the Treasurer of the Commonwealth of the Northern Mariana Islands.

Section 1201. Fees is amended to read as follows:

The following schedule of non-refundable fees shall apply :

A.	Certificate of Identity	$ 25.00
B.	Vessel or Aircraft Permission to Land	$100.00
C.	Foreign Investor Visa	$500.00
D.	Regular Term Business Entry Permit (application and renewal)	$100.00
E.	Long Term Business Entry Permit and Immediate Relatives (application and renewal)	$500.00
F.	One year Business Entry Permit (Formerly 706(a))	$250.00
G.	All other Entry Permits (application, extensions and renewal)	$100.00
H.	Alien Registered Card	$ 25.00
I.	Duplicate Copies of Permits and Alien Registration Card	$ 25.00

COMMONWEALTH OF THE NORTHERN MARIANAS OFFICIAL SEAL

COMMONWEALTH ZONING BOARD
P.O. Box 2109, Saipan, MP 96950
Tel. Nos. (670) 235-5018/5019 • Fax No. (670) 235-5020

July 15, 1994

NOTICE OF ADOPTION OF THE PROPOSED REGULATIONS TO THE SAIPAN ZONING LAW ON THE SAIPAN ZONING SCHEDULE FOR THE TERMINATION OF ILLEGAL PROPERTY USES

The Commonwealth Zoning Board ("CZB") hereby provides notice to the general public that it has adopted the Proposed Regulations to the Saipan Zoning Law on the Saipan Zoning Schedule for the Termination of Illegal Property Uses. Said regulations were published in the Commonwealth Register on April 15, 1994, Vol. 16, No. 04, pages 11814-19.

These Regulations take effect ten (10) days after this publication in the Commonwealth Register.

Issued by:
BENIGNO R. FITIAL
Chairman, CZB
7-8-94
Date

Received by:
DONNA CRUZ
Governor's Office
7/8/94
Date

Filed and Recorded by:
SOLEDAD B. SASAMOTO
Registrar of Corporation
7/8/94
Date

CERTIFICATION OF ADOPTION OF THE PROPOSED REGULATIONS TO THE SAIPAN ZONING LAW ON THE SAIPAN ZONING SCHEDULE FOR TERMINATION OF OFF-SITE SIGNS

I, Benigno R. Fitial, Chairman of the Commonwealth Zoning Board, by my signature below, do hereby certify that the Proposed Regulations to the Saipan Zoning Law regarding the Proposed Saipan Zoning Schedule for the Termination of Illegal Property Uses were published in the Commonwealth Register on April 15, 1994 at pages 11814 to 11819 have been adopted by the Commonwealth Zoning Board on June 23, 1994.

I declare under penalty of perjury that the foregoing is true and correct and that this declaration was executed on 8th day of July, 1994, at Saipan, Commonwealth of the Northern Mariana Islands.

Benigno Fitial

Benigno R. Fitial
Chairman

NUTISIA PUT MA ADATAN I MARPOPONI NA REGULASION GI REGULASION SAIPAN ZONING PUT SAIPAN ZONING SCHEDULE GI TEMINASION ILEGAT NA MA USAN PROPIEDAT

I Commonwealth Zoning Board ("CZB") ha nutitisia i pupbliku henerat na esta ha adapta i Mapropoponi na Regulasion gi Regulasion Saipan Zoning put Saipan Zoning Schedule para Tetminasion Ilegat Na Ma'usan Propiedat. Este siha na Regulasion manmapupblika huyong gi halom Rehistran Commonwealth gi Abrit 15, 1994, Baluma 16, Numiru 04, pahina 11814 asta 19.

Este na Regulasion u fanefektibu gi halom dies (10) dias despues di mapupblika huyong este na nutisia gi halom Rehistran Commonwealth.

Linaknos: ______________________
BENIGNO R. FITIAL
Chairman, CZB

7-8-94
Fecha

Rinisibi as: ______________________
DONNA J. CRUZ

7/8/94
Fecha

Ma file yan
Rinekod as: ______________________
SOLEDAD B. SASMOTO
Registrar of Corporations

7/8/94
Fecha

ARONGORONG REEL ADOPTION-UL ALLÉGH MELLÓL ALLÉGHÚL SAIPAN ZONING LAW REEL SAIPAN ZONING SCHEDULE REEL AKKYÚLÓÓL YÁYÁÁL FALÚW NGÁRE ESE FIL

Schóól Commonwealth Zoning Board ("CZB") nge rekke arongaar towlap igha aa adaptáálí Allégh kkewe llól Alléghúl Saipan Zoning Reel Saipan Zoning Schedule Reel Akkayúlóól Yáyáál Falúw ngáre ese fil. Allégh kkaal nge aa takkal toowow mellól Commonwealth Register wóól Abriid 15, 1994, Vol. 16, No. 04, schéél tiliigh kka 11814-19.

Allégh kkaal nge ebwe aléghéléghéló llól seigh (10) rál sángi igha e toowow arongorong yeel mellól Commonwealth Register.

Férúúyál: ______________________
BENIGNO R. FITIAL
Chairman, CZB

7-8-94
Rál

Aramas ye e Risibi: ______________________
DONNA CRUZ
Bwulasiyool Gubenno

7/8/94
Rál

File-liiyal: ______________________
SOLEDAD B. SASAMOTO
Registrar of Corporations

7/8/94
Rál

SAIPAN ZONING SCHEDULE FOR THE TERMINATION OF ILLEGAL PROPERTY USES

Section 1. Unless otherwise provided for by statute or regulation, all land uses or facilities that were not lawfully established prior to April 30, 1993 shall be terminated and/or closed to operation within ten (10) days of receipt of notice from the Zoning Administrator pursuant to the procedures set forth in Saipan Zoning Law Section 13902.

Section 2. Notwithstanding any regulation that sets forth a time period for persons or business entities to comply with a "stop and cease-and-desist order" issued pursuant to SZL Section 13902, if the Zoning Administrator finds that: (a) a violation of the SZL jeopardizes public health, safety, or welfare, and imperatively requires immediate preventative or remedial action, or (b) that a cited violation is being expanded in any manner subsequent to the issuance of the order, the Zoning Administrator may issue a "stop and cease-and-desist order" pursuant to SZL Section 13902 that requires compliance immediately upon its issuance.

Commonwealth of the Northern Mariana Islands
Department of Public Health & Environmental Services
Division of Environmental Quality
P.O. Box 1304
Saipan, Mariana Islands 96950

Tels: (670) 234-6114/6984
Fax: (670) 234-1003

PUBLIC NOTICE
ADOPTION OF AMENDMENT TO DRINKING WATER REGULATIONS PROMULGATED UNDER THE AUTHORITY OF
2 CMC §§ 3101 to 3134 and 1 CMC §§ 2601 to 2605
by the
DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENTAL SERVICES

The Director of the Department of Public Health and Environmental Services, of the Commonwealth of the Northern Mariana Islands (CNMI), in accordance with 2 CMC §§ 3101 to 3134 and 1 CMC §§ 2601 to 2605, proposes amendments to the existing CNMI Drinking Water Regulations. These changes conform with the requirements imposed on the Commonwealth in the Federal Safe Drinking Water Act. The adopted changes pertain to the requirements related to lead and copper at certain exposure levels. The proposed contamination resulting from the corrosion of plumbing materials.

Copies of the Drinking Water Regulations are available and may be obtained from the Department of PublicHealth and Environmental Services, Division of Environmental Quality, P.O. Box 1304, Saipan, MP 96950, located on the third floor of the Morgen Building in San Jose, Saipan, MP 96950.

Date: 7/1/94

DR. ISAMU J. ABRAHAM, Director
Public Health and Environmental Services

Date: 7/1/94

MIRIAM K. SEMAN,Chief
Division of Environmental Quality

Filed by:
Date: 7/5/94

SOLEDAD B. SASAMOTO
Registrar of Corporations

Received at Governor's Office:
Date: 7/5/94

DONNA J. CRUZ

Commonwealth of the Northern Mariana Islands
Department of Public Health & Environmental Services
Division of Environmental Quality
P.O. Box 1304
Saipan, Mariana Islands 96950

Tels: (670) 234-6114/6984
Fax: (670) 234-1003

NUTISIAN PUPBLIKU
I MA′ ADOPTA NA AMENDASION GI REGULASION HANOM MA GIMEN
SIGUN GI ATURIDAT I
2 CMC §§ 3103 ASTA 3134 YAN 1 CMC §§ 2601 ASTA 2605
GINEN
DIPATAMENTON PUBLIC HEALTH YAN ENVIRONMENTAL SERVICES

I Direktot Dipatamenton Public Health yan Environmental Services gi halom i Commonwealth of the Northern Mariana Islands (CNMI), sigun gi aturidat ginen 2 CMC §§ 3103 asta 3134 yan 1 CMC 2601 asta 2605, ni ma′ adopta na Regulasion Hanom Ma gimen. Este siha na tinulaika para u akonfotma yan ayu i ma imposta i Commonwealth ginen Federal Safe Drinking Water Act. I ma′ adopta na tinulaika put i nisisariu siha na nisisidat put lead yan copper sigun gi bali-ñiha. I ma adopta na Regulasion ha rekomenda na todu sisteman hanom pupbliku u chomma′ i tinake (corrosion) yan ribaha i binenun lead komu resutta ginen materiat muna'maolek paip hanom.

Hayi interesao siña ha muna'halom komentu, rekomendasion yan interes put i ma′ adopta na Regulasion Hanom Magimen. Todu komentu debi di u fanmatuge′ papa ya u masubmiti halom gi Dipatamenton PublicHealth yan Environmental Services, Division of Environmental Quality, mina tres bibenda hulo′ gi Morgen Building giya San Jose, Saipan (P.O. Box 1304, Saipan, MP 96950), gi halom trenta (30) dias desde mapupblika huyong este na nutisia gi Rehistran Commonwealth.

Hayi interesao na petsona siña mañule kopian i ma′ adopta na Regulasion Hanom Magimen gi Ufisinan Dipatamenton Public Health yan Environmental Services, Division of Environmental Quality, mina′ tres bibenda gi Morgen Building giya San Jose, Saipan, MP 96950.

Fecha: 7/1/94

DR. ISAMU J. ABRAHAM, Director
PublicHealth and Environmental Services

Fecha: 7/1/94

MIRIAM K. SEMAN, Chief
Division of Environmental Quality

Ma "file" as:

Fecha: 7/4/94

SOLEDAD B. SASAMOTO
Registrar of Corporations

Marisibi gi Ofisinan Gobietno

Fecha: 7/5/94

DONNA J. CRUZ

Commonwealth of the Northern Mariana Islands
Department of Public Health & Environmental Services
Division of Environmental Quality
P.O. Box 1304
Saipan, Mariana Islands 96950

Tels: (670) 234-6114/6984
Fax: (670) 234-1003

ARONGORONGOL TOWLAP
ADAPTAAL ALLÉGH REEL LLIWEL MELLÓL ÓWTOL ALLÉGHÚL SCHALÚL ÚÚL IYE E FFÉÉR SÁNGI BWÁNGIL
2 CMC §§ 3101 ngáli 3134 me 1 CMC §§ 2601 ngáli 2605
Sángi
DIPATAMENTOOL PUBLIC HEALTH ME ENVIRONMENTAL SERVICES

Direktoodul Dipatamentool Public Health me Environmental Services mellól Commonwealth of the Northern Mariana Islands (CNMI), sángi ailééwal me bwángil 2 CMC §§ 3101 ngáli 3134 me 1 CMC §§ 2601 ngáli 2605, nge ebwe ayoora lliiwel mellól ówtol Alléghúl Schalúl Úúl iye eyoor ighila CNMI. Lliiwel kkaal nge ebwe ghol fengál me me akkúle ye e atiwiligh ngáli Commonwealth sángi Federal Safe Drinking Water Act. Lliiwel kkaal nge ebwe ayoora mille ebwe ghitighiitiw llapal milikka lead me copper. Lliiwel kkaal nge ayoora mille alongal schaal kka towlap e yááyá nge essóbw ghi yoor binenool tinaaki (faleparang) sángi yáyáál peiráághil paip.

Mángemáng me tiip reel lliiwel kka llól Alléghúl Schalúl Úúl nge rekke tingór sángiir towlap bwe rebwe ischiitiw nge raa afanga ngáli Depatamentool Public Health me Environmental Services, Division of Environmental Quality, iye elo aiyeluuwal bibenda mellól Morgen Building iye elo San Jose, Saipan (P.O. Box 1304, Saipan, MP 96950) llól eliigh (30) rál sángi igha e toowow arongorong yeel mellól Commonwealth Register.

Aramas ye e tipáli nge emmwel schagh bwe ebweló bweibwogh kkopiyaal Alléghúl Schalúl Úúl mellól Bwulasiyool Depatamentool Public Health me Environmental Services, Division of Environmental Quality, iye elo aiyeluuwal bibenda mellól Morgen Building San Jose, Saipan, MP 96950.

Rál: 7/1/94

DR. ISAMU J. ABRAHAM, Director
Public Health and Environmental Services

Rál: 7/1/94

MIRIAM K. SEMAN, Chief
Division of Environmental Quality

File'liiyal:

Rál 7/4/94

SOLEDAD B. SASAMOTO
Registrar of Corporations

Igha re risibi me Bwulasiyool Gubenno:

Rál: 7/5/94

DONNA J. CRUZ

COMMONWEALTH HEALTH CENTER
OFFICE OF THE DIRECTOR
GOVERNMENT OF THE NORTHERN MARIANA ISLANDS
DEPARTMENT OF PUBLIC HEALTH-ENVIRONMENTAL SERVICES

CERTIFICATION

I, Dr. Isamu J. Abraham, the Director of the Department of Public Health and Environmental Services which is promulgating the revisions to the Drinking Water Regulations as hereinabove set forth, by signature below I hereby certify that such revisions to the regulations are a true, complete, and correct copy of the revisions of the Drinking Water Regulations formally adopted by the Department of Public Health and Environmental Services. I declare under penalty of perjury that the foregoing is true and correct and that this declaration was executed on the 1st ~~th~~ day of July 1994 at Saipan, Commonwealth of the Northern Mariana Islands.

DR. ISAMU J. ABRAHAM
Department of Public Health and
Environmental Services

P.O. BOX 409 CK, SAIPAN, CM 96950
TELEPHONE (670) 234-8950/51/52/53/54, TELEX 783-744 PHES SPN

Revisions to the Drinking Water Regulations

Additions to Part 3 Definitions.

3.63 "Action level" means in relation to the concentration of lead or copper in water specified in 11.1.1(C) which determines, in some cases, the treatment requirements contained in Part 11 that a water system is required to complete.

3.64 "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, 1996 and ends December 31, 1998; the second begins January 1, 1999 and ends December 31, 2001; the third begins January 1, 2002 and ends December 31, 2004.

3.65 "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, 1996 to December 31, 1998; the second from January 1, 1999 to December 31, 2001; the third from January 1, 2002 to December 31, 2004.

3.66 "Corrosion inhibitor" means a substance capable of reducing the corrosivity of water toward metal plumbing materials, especially lead and copper, by forming a protective film on the interior surface of those materials.

3.67 "Effective corrosion inhibitor residual", for the purpose lead and copper as discussed in Part 11, means a concentration sufficient to form a passivating film on the interior walls of a pipe.

3.68 "First draw sample" means a one-liter sample of tap water, collected in accordance with 11.7.2(b), that has been standing in plumbing pipes at least 6 hours and is collected without flushing the tap.

3.69 "Initial Compliance Period" means the first full three-year compliance period which begins January 1, 1996.

3.70 "Large water system", for the purpose of Part 11 only, means a water system that serves more than 50,000 persons.

3.71 "Lead service line", means a service line made of lead which connects the water main to the building inlet and any lead pigtail, gooseneck or other fitting which is connected to such lead line.

3.72 "Medium-size water system", for the purpose of Part 11 only, means a water system that serves greater than 3,300 and less than or equal to 50,000 persons.

3.73 "Optimal corrosion control treatment", for the purpose of Part 11 only, means the corrosion control treatment that minimizes the lead and copper concentrations at users' taps while insuring that the treatment does not cause the water system to violate any national primary drinking water regulations.

3.74 "Repeat Compliance Period" means any subsequent compliance period after the initial compliance period.

3.75 "Service line sample" means a one-liter sample of water, collected in accordance with 11.7.2(c), that has been standing for at least 6 hours in a service line.

3.76 "Single family structure," for the purpose of Part 11 only, means a building constructed as a single-family residence that is currently used as either a residence or a place of business.

3.77 "Small water system", for the purpose of Part 11 only, means a water system that serves 3,300 persons or fewer.

Part 5.5.1(b) Maximum Contaminant Levels for Inorganic Chemicals, level for lead is deleted * *

Part 6.5 is amended by adding paragraphs (l) and (m) to read as follows:

(l) Lead. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that lead is a health concern at certain exposure levels. Materials that contain lead have frequently been used in the construction of water supply distribution systems, and plumbing systems in private homes and other buildings. The most commonly found materials include service lines, pipes, brass and bronze fixtures, and solders and fluxes. Lead in these materials can contaminate drinking water as a result of the corrosion that takes place when water comes into contact with those materials. Lead can cause a variety of adverse health effects in humans. At relatively low levels of exposure, these effects may include interference with red blood cell chemistry, delays in normal physical and mental development in babies and young children, slight deficits in the attention span, hearing, and learning abilities of children, and slight increases in the blood pressure of some adults. EPA's national primary drinking water regulation requires all public water systems to optimize corrosion control to minimize lead contamination resulting from the corrosion of plumbing materials. Public water systems serving 50,000 people or fewer that have lead concentrations below 15 parts per billion (ppb) in more than 90% of tap water samples (the EPA "action level") have optimized their corrosion control treatment. Any water system that exceeds the action level must also monitor their source water to determine whether treatment to remove lead in source water is needed. Any water system that continues to exceed the action level after installation of corrosion control and/or source water treatment must eventually replace all lead service lines contributing in excess of 15 ppb of lead to drinking water. Any water system that exceeds the action level must also undertake a public education program to inform consumers of ways they can reduce their exposure to potentially high levels of lead in drinking water.

(m) Copper. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that copper is a health concern at certain exposure levels. Copper, a reddish-brown metal, is often used to plumb residential and commercial structures that are connected to water distribution systems. Copper contaminating drinking water as a corrosion by-product occurs as the result of the corrosion of copper pipes that remain in contact with water for a prolonged period of time. Copper is an essential nutrient, but at high doses it has been shown to cause stomach and intestinal distress, liver and kidney damage, and anemia. Persons with Wilson's disease may be at a higher risk of health effects due to copper than the general public. EPA's national primary drinking water regulation requires all public water systems to install optimal corrosion control to minimize copper contamination resulting from the corrosion of plumbing materials. Public water systems serving 50,000 people or fewer that have copper concentrations below 1.3 parts per million (ppm) in more than 90% of tap water samples (the EPA "action level") are not required to install or improve their treatment. Any water system that exceeds the action level must also monitor their source water to determine whether treatment to remove copper in source water is needed.

The existing Part 11 is changed to Part 14

The existing Part 12 is changed to Part 15
The existing Part 13 is changed to Part 16

Part 12 and 13 are reserved for future use

A new Part 11 is added to read as follows:

11. Control of Lead and Copper

- 11.1 General requirements.
- 11.2 Applicability of corrosion control treatment steps to small, medium-size and large water systems.
- 11.3 Description of corrosion control treatment requirements.
- 11.4 Source water treatment requirements.
- 11.5 Lead service line replacement requirements.
- 11.6 Public education and supplemental monitoring requirements.
- 11.7 Monitoring requirements for lead and copper in tap water.
- 11.8 Monitoring requirements for water quality parameters.
- 11.9 Monitoring requirements for lead and copper in source water.
- 11.10 Analytical methods.
- 11.11 Reporting requirements.
- 11.12 Recordkeeping requirements.

11.1. General requirements.

11.1.1 Applicability

(a) Unless otherwise indicated, each of the provisions of Part 11 applies to community water systems and non-transient, non-community water systems (hereinafter referred to as "water systems" or "systems").

(b) Scope These regulations establish a treatment technique that includes requirements for corrosion control treatment, source water treatment, lead service line replacement, and public education. These requirements are triggered, in some cases, by lead and copper action levels measured in samples collected at consumers' taps.

(c) Lead and copper action levels:

(1) The lead action level is exceeded if the concentration of lead in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with 11.7 is greater than 0.015 mg/L (i.e., if the "90th percentile" lead level is greater than 0.015

mg/L).

(2) The copper action level is exceeded if the concentration of copper in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with 11.7 is greater than 1.3 mg/L (i.e., if the "90th percentile" copper level is greater than 1.3 mg/L).

(3) The 90th percentile lead and copper levels shall be computed as follows:

(i) The results of all lead or copper samples taken during a monitoring period shall be placed in ascending order from the sample with the lowest concentration to the sample with the highest concentration. Each sampling result shall be assigned a number, ascending by single integers beginning with the number 1 for the sample with the lowest contaminant level. The number assigned to the sample with the highest contaminant level shall be equal to the total number of samples taken.

(ii) The number of samples taken during the monitoring period shall be multiplied by 0.9.

(iii) The contaminant concentration in the numbered sample yielded by the calculation 11.1.1(c)(3)(ii) is the 90th percentile contaminant level.

(iv) For water systems serving fewer than 100 people that collect 5 samples per monitoring period, the 90th percentile is computed by taking the average of the highest and second highest concentrations.

(d) Corrosion control treatment requirements

(1) All water systems shall install and operate optimal corrosion control treatment as defined in 3.70.

(2) Any water system that complies with the applicable corrosion control treatment requirements specified by the Division under 11.2 and 11.3 shall be deemed in compliance with the treatment requirement

contained 11.1.1(d)(1).

(e) Source water treatment requirements

Any system exceeding the lead or copper action level shall implement all applicable source water treatment requirements specified by the Division under 11.4.

(f) Lead service line replacement requirements

Any system exceeding the lead action level after implementation of applicable corrosion control and source water treatment requirements shall complete the lead service line replacement requirements contained in 11.5.

(g) Public education requirements

Any system exceeding the lead action level shall implement the public education requirements contained in 11.6.

(h) Monitoring and analytical requirements

Tap water monitoring for lead and copper, monitoring for water quality parameters, source water monitoring for lead and copper, and analyses of the monitoring results under this subpart shall be completed in compliance with 11.7, 11.8, 11.9, and 11.10.

(i) Reporting requirements

Systems shall report to the Division any information required by the treatment provisions of 11.1 and 11.11.

(j) Recordkeeping requirements

Systems shall maintain records in accordance with 11.1.1(k), 11.12.

(k) Violation of national primary drinking water regulations

Failure to comply with the applicable requirements of 11.1-, including requirements established by the Division pursuant to these provisions, shall constitute a violation of the national primary drinking water regulations for lead and/or copper.

11.2. Applicability of corrosion control treatment steps to

small, medium-size and large water systems.

11.2.1 Systems shall complete the applicable corrosion control treatment requirements described in 11.3 by the deadlines 11.2.

(a) A large system (serving >50,000 persons) shall complete the corrosion control treatment steps specified in 11.2.4, unless it is deemed to have optimized corrosion control under 11.2.2(b) and 11.2.2(c).

(b) A small system (serving ≤3300 persons) and a medium-size system (serving >3,300 and ≤50,000 persons) shall complete the corrosion control treatment steps specified in 11.2.5, unless it is deemed to have optimized corrosion control under 11.2.2(a), 11.2.2(b), or 11.2.2(c).

11.2.2 A system is deemed to have optimized corrosion control and is not required to complete the applicable corrosion control treatment steps identified in this section if the system satisfies one of the following criteria:

(a) A small or medium-size water system is deemed to have optimized corrosion control if the system meets the lead and copper action levels during each of two consecutive six-month monitoring periods conducted in accordance with 11.7.

(b) Any water system may be deemed by the Division to have optimized corrosion control treatment if the system demonstrates to the satisfaction of the Division that it has conducted activities equivalent to the corrosion control steps applicable to such system under this section. If the Division makes this determination, it shall provide the system with written notice explaining the basis for its decision and shall specify the water quality control parameters representing optimal corrosion control in accordance with 11.3.6. A system shall provide the Division with the following information in order to support a determination under this paragraph:

(1) the results of all test samples collected for each of the water quality parameters in 11.3.3(c).

(2) a report explaining the test methods used by the water system to evaluate the corrosion control

treatments listed in 11.3.3(a), the results of all tests conducted, and the basis for the system's selection of optimal corrosion control treatment;

(3) a report explaining how corrosion control has been installed and how it is being maintained to insure minimal lead and copper concentrations at consumers' taps; and

(4) the results of tap water samples collected in accordance with 11.7 at least once every six months for one year after corrosion control has been installed.

(c) Any water system is deemed to have optimized corrosion control if it submits results of tap water monitoring conducted in accordance with 11.7 and source water monitoring conducted in accordance with 11.9 that demonstrates for two consecutive six-month monitoring periods that the difference between the 90th percentile tap water lead level computed under 11.1.1(c)(3), and the highest source water lead concentration, is less than the Practical Quantitation Level for lead specified in 11.10.1(a)(2).

11.2.3 Any small or medium-size water system that is required to complete the corrosion control steps due to its exceedance of the lead or copper action level may cease completing the treatment steps whenever the system meets both action levels during each of two consecutive monitoring periods conducted pursuant to 11.7 and submits the results to the Division. If any such water system thereafter exceeds the lead or copper action level during any monitoring period, the system (or the Division, as the case may be) shall recommence completion of the applicable treatment steps, beginning with the first treatment step which was not previously completed in its entirety. The Division may require a system to repeat treatment steps previously completed by the system where the Division determines that this is necessary to implement properly the treatment requirements of this section. The Division shall notify the system in writing of such a determination and explain the basis for its decision.

11.2.4 Treatment steps and deadlines for large systems

Except as provided in 11.2.2(b) and 11.2.2(c), large systems shall complete the following corrosion control treatment steps (described in the referenced portions of 11.3, 11.7, and 11.8 by the indicated dates.

(a) Step 1: The system shall conduct initial monitoring (11.7.4(a) and 11.8.2) during two consecutive six-month monitoring periods by July 1995.

(b) Step 2: The system shall complete corrosion control studies (11.3.3) by January 1, 1996.

(c) Step 3: The Division shall designate optimal corrosion control treatment (11.3.4) by July 1, 1996.

(d) Step 4: The system shall install optimal corrosion control treatment (11.3.5) by January 1, 1997.

(e) Step 5: The system shall complete follow-up sampling (11.7.4(b) and 11.8.3) by January 1, 1998.

(f) Step 6: The Division shall review installation of treatment and designate optimal water quality control parameters (11.3.6) by July 1, 1998.

(g) Step 7: The system shall operate in compliance with the Division-specified optimal water quality control parameters (11.3.7) and continue to conduct tap sampling (11.7.4(c)) and 11.8.4).

11.2.5 Treatment steps and deadlines for small and medium-size systems

Except as provided in 11.2.2, small and medium-size systems shall complete the following corrosion control treatment steps (described in the referenced portions of 11.3, 11.7 and 11.8) by the indicated time periods.

(a) Step 1: The system shall conduct initial tap sampling (11.7.4(a) and 11.8.2) until the system either exceeds the lead or copper action level or becomes eligible for reduced monitoring under 11.7.4(d). A system exceeding the lead or copper action level shall recommend optimal corrosion control treatment (11.3.1) within six months after it exceeds one of the action levels.

(b) Step 2: Within 12 months after a system exceeds the lead or copper action level, the Division may require the system to perform corrosion control studies (11.3.2). If the Division does not require the system to perform such studies, the Division shall specify optimal corrosion control treatment (11.3.4) within the following timeframes:

(1) for medium-size systems, within 18 months after such system exceeds the lead or copper action level,

(2) for small systems, within 24 months after such system exceeds the lead or copper action level.

(c) Step 3: If the Division requires a system to perform corrosion control studies under step 2, the system shall complete the studies (11.3.3) within 18 months after the Division requires that such studies be conducted.

(d) Step 4: If the system has performed corrosion control studies under step 2, the Division shall designate optimal corrosion control treatment (11.3.4) within 6 months after completion of step 3.

(e) Step 5: The system shall install optimal corrosion control treatment (11.3.5) within 24 months after the Division designates such treatment.

(f) Step 6: The system shall complete follow-up sampling (11.7.4(b) and 11.8.3) within 36 months after the Division designates optimal corrosion control treatment.

(g) Step 7: The Division shall review the system's installation of treatment and designate optimal water quality control parameters (11.3.6) within 6 months after completion of step 6.

(h) Step 8: The system shall operate in compliance with the Division-designated optimal water quality control parameters (11.3.7) and continue to conduct tap sampling (11.7.4(c) and 11.8.4).

11.3. Description of corrosion control treatment requirements.

Each system shall complete the corrosion control treatment requirements described below which are applicable to such system under 11.2.

11.3.1 System recommendation regarding corrosion control treatment

Based upon the results of lead and copper tap monitoring and water quality parameter monitoring, small and medium-size water systems exceeding the lead or copper action level shall recommend installation of one or more of the corrosion control treatments listed in 11.3.3(a) which the system believes constitutes optimal corrosion control for that system. The Division may require the system to conduct additional water quality parameter monitoring in accordance with 11.8.2 to assist the Division in reviewing the system's recommendation.

11.3.2 Division decision to require studies of corrosion control treatment (applicable to small and medium-size systems)

The Division may require any small or medium-size system that exceeds the lead or copper action level to perform corrosion control studies 11.3.3 to identify optimal corrosion control treatment for the system.

11.3.3 Performance of corrosion control studies

(a) Any public water system performing corrosion control studies shall evaluate the effectiveness of each of the following treatments, and, if appropriate, combinations of the following treatments to identify the optimal corrosion control treatment for that system:

(1) alkalinity and pH adjustment;

(2) calcium hardness adjustment; and

(3) the addition of a phosphate or silicate based corrosion inhibitor at a concentration sufficient to maintain an effective residual concentration in all test tap samples.

(b) The water system shall evaluate each of the corrosion control treatments using either pipe rig/loop tests, metal coupon tests, partial-system tests, or analyses based on documented analogous treatments with other systems of similar size, water chemistry and distribution system configuration.

(c) The water system shall measure the following water quality parameters in any tests conducted under this paragraph before and after evaluating the corrosion control treatments listed above:

(1) lead;
(2) copper;
(3) pH;
(4) alkalinity;
(5) calcium;
(6) conductivity;
(7) orthophosphate (when an inhibitor containing a phosphate compound is used);
(8) silicate (when an inhibitor containing a silicate compound is used);
(9) water temperature.

(d) The water system shall identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment and document such constraints with at least one of the following:

(1) data and documentation showing that a particular corrosion control treatment has adversely affected other water treatment processes when used by another water system with comparable water quality characteristics; and/or

(2) data and documentation demonstrating that the water system has previously attempted to evaluate a particular corrosion control treatment and has found that the treatment is ineffective or adversely affects other water quality treatment processes.

(e) The water system shall evaluate the effect of the chemicals used for corrosion control treatment on other water quality treatment processes.

(f) On the basis of an analysis of the data generated during each evaluation, the water system shall recommend to the Division in writing the treatment option that the corrosion control studies indicate constitutes optimal corrosion control treatment for that system. The water system shall provide a rationale for its recommendation along with all supporting documentation specified in 11.3.3(a) through 11.3.3(e).

11.3.4 Division designation of optimal corrosion control treatment

(a) Based upon consideration of available information including, where applicable, studies performed under 11.3.3 and a system's recommended treatment alternative, the Division shall either approve the corrosion control treatment option recommended by the system, or designate alternative corrosion control treatment(s) from among those listed in 11.3.3(a). When designating optimal treatment the Division shall consider the effects that additional corrosion control treatment will have on water quality parameters and on other water quality treatment processes.

(b) The Division shall notify the system of its decision on optimal corrosion control treatment in writing and explain the basis for this determination. If the Division requests additional information to aid its review, the water system shall provide the information.

11.3.5 Installation of optimal corrosion control

Each system shall properly install and operate throughout its distribution system the optimal corrosion control treatment designated by the Division under 11.3.4.

11.3.6 Division review of treatment and specification of optimal water quality control parameters

The Division shall evaluate the results of all lead and copper tap samples and water quality parameter samples submitted by the water system and determine whether the system has properly installed and operated the optimal corrosion control treatment designated by the Division in 11.3.4. Upon reviewing the results of tap water and water quality parameter monitoring by the system, both before and after the system installs optimal corrosion control treatment, the Division shall designate:

(a) a minimum value or a range of values for pH measured at each entry point to the distribution system;

(b) a minimum pH value, measured in all tap samples. Such value shall be equal to or greater than 7.0, unless the Division determines that meeting a pH level of 7.0 is not technologically feasible or is not necessary for the system to optimize corrosion control;

(c) if a corrosion inhibitor is used, a minimum concentration or a range of concentrations for the inhibitor, measured at each entry point to the distribution system and in all tap samples, that the Division determines is necessary to form a passivating film on the interior walls of the pipes of the distribution system;

(d) if alkalinity is adjusted as part of optimal corrosion control treatment, a minimum concentration or a range of concentrations for alkalinity, measured at each entry point to the distribution system and in all tap samples;

(e) if calcium carbonate stabilization is used as part of corrosion control, a minimum concentration or a range of concentrations for calcium, measured in all tap samples. The values for the applicable water quality control parameters listed above shall be those that the Division determines to reflect optimal corrosion control treatment for the system. The Division may designate values for additional water quality control parameters determined by the Division to reflect optimal corrosion control for the system. The Division shall notify the system in writing of these determinations and explain the basis for its decisions.

11.3.7 Continued Operation and Monitoring

All systems shall maintain water quality parameter values at or above minimum values or within ranges designated by the Division 11.3.6 in each sample collected under 11.8.4. If the water quality parameter value of any sample is below the minimum value or outside the range designated by the Division, then the system is out of compliance with this paragraph. As specified in 11.8.4, the system may take a confirmation sample for any water quality parameter value no later than 3 days after the first sample. If a confirmation sample is taken, the result must be averaged with the first sampling result and the average must be used for any compliance determinations under this paragraph. Division has discretion to delete results of obvious sampling errors from this calculation.

11.3.8 Modification of Division treatment decisions

Upon its own initiative or in response to a request by a water system or other interested party, a Division may modify its determination of the optimal corrosion control treatment 11.3.4 or optimal water quality control parameters under 11.3.6. A request for modification by a system or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The Division may modify its determination where it concludes that such change is necessary to ensure that the system continues to optimize corrosion control treatment. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the Division's decision, and provide an implementation schedule for completing the treatment modifications.

11.3.9 Treatment decisions by EPA in lieu of the Division

Pursuant to the procedures in 40 CFR §142.19, the EPA Regional Administrator may review treatment determinations made by the Division under paragraphs 11.3.4, 11.3.6, or ? and issue federal treatment determinations consistent with the requirements of those paragraphs where the Regional Administrator finds that:

(a) the Division has failed to issue a treatment determination by the applicable deadlines contained in 11.2,

(b) the Division has abused its discretion in a substantial number of cases or in cases affecting a substantial population, or

(c) the technical aspects of the Division's determination would be indefensible in an expected Federal enforcement action taken against a system.

11.4. Source water treatment requirements.

Systems shall complete the applicable source water monitoring and treatment requirements (described in the referenced portions of 11.4.2, and in 11.7, and 11.9) by the following deadlines.

11.4.1 Deadlines for Completing Source Water Treatment Steps

(a) Step 1: A system exceeding the lead or copper action level shall complete lead and copper source water monitoring (11.9.2) and make a treatment recommendation to the Division (?) within 6 months after exceeding the lead or copper action level.

(b) Step 2: The Division shall make a determination regarding source water treatment (11.4.2(b)) within 6 months after submission of monitoring results under step 1.

(c) Step 3: If the Division requires installation of source water treatment, the system shall install the treatment (11.4.2(c)) within 24 months after completion of step 2.

(d) Step 4: The system shall complete follow-up tap water monitoring (11.7.4(b) and source water monitoring (11.9.3) within 36 months after completion of step 2.

(e) Step 5: The Division shall review the system's installation and operation of source water treatment and specify maximum permissible source water levels (11.4.2(d) within 6 months after completion of step 4.

(f) Step 6: The system shall operate in compliance with the Division-specified maximum permissible lead and copper source water levels (11.4.2(d)) and continue source water monitoring (11.9.4).

11.4.2 Description of Source Water Treatment Requirements

(a) System treatment recommendation

Any system which exceeds the lead or copper action level shall recommend in writing to the Division the installation and operation of one of the source water treatments listed in 11.4.2(b). A system may recommend that no treatment be installed based upon a demonstration that source water treatment is not necessary to minimize lead and copper levels at users' taps.

(b) Division determination regarding source water treatment

The Division shall complete an evaluation of the results of all source water samples submitted by the water system to determine whether source water treatment is necessary to minimize lead or copper levels in water delivered to users' taps. If the Division determines that treatment is needed, the Division shall either require installation and operation of the source water treatment recommended by the system (if any) or require the installation and operation of another source water treatment from among the following: ion exchange, reverse osmosis, lime softening or coagulation/filtration. If the Division requests additional information to aid in its review, the water system shall provide the information by the date specified by the Division in its request. The Division shall notify the system in writing of its determination and set forth the basis for its decision.

(c) Installation of source water treatment

Each system shall properly install and operate the source water treatment designated by the Division under 11.4.2(b).

(d) Division review of source water treatment and specification of maximum permissible source water levels

The Division shall review the source water samples taken by the water system both before and after the system installs source water treatment, and determine whether the system has properly installed and operated the source water treatment designated by the Division. Based upon its review, the Division shall designate the maximum permissible lead and copper concentrations for finished water entering the distribution system. Such levels shall reflect the contaminant removal capability of the treatment properly operated and maintained. The Division shall notify the system in writing and explain the basis for its decision.

(e) Continued operation and maintenance

Each water system shall maintain lead and copper levels below the maximum permissible concentrations designated by the Division at each sampling point monitored in accordance with 11.9. The system is out of compliance with this paragraph if the level of lead or copper at any sampling point is greater than the maximum permissible concentration designated by the Division.

(f) Modification of Division treatment decisions

Upon its own initiative or in response to a request by a water system or other interested party, a Division may modify its determination of the source water treatment under 11.4.2(b), or maximum permissible lead and copper concentrations for finished water entering the distribution system under 11.4.2(d). A request for modification by a system or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The Division may modify its determination where it concludes that such change is necessary to ensure that the system continues to minimize lead and copper concentrations in source water. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the Division's decision, and provide an implementation schedule for completing the treatment modifications.

(g) Treatment decisions by EPA in lieu of the Division

Pursuant to the procedures in 40 CRF 142.19, the EPA Regional Administrator may review treatment determinations made by the Division under 11.4.2(b) , 11.4.2(d), or 11.4.2(e) and issue federal treatment determinations consistent with the requirements of those paragraphs where the Administrator finds that:

(1) the Division has failed to issue a treatment determination by the applicable deadlines contained in 11.4.1,

(2) the Division has abused its discretion in a substantial number of cases or in cases affecting a substantial population, or

(3) the technical aspects of a Division's determination would be indefensible in an expected Federal enforcement action taken against a system.

11.5. Lead service line replacement requirements.

11.5.1 Systems that fail to meet the lead action level in tap samples taken pursuant to 11.7.4(b), after installing corrosion control and/or source water treatment (whichever sampling occurs later), shall replace lead service lines in accordance with the requirements of this section. If a system is in violation of 11.2 or 11.4 for failure to install source water or corrosion control treatment, the Division may require the system to commence lead service line replacement under this section after the date by which the system was required to conduct monitoring under 11.7.4(b) has passed.

11.5.2 A system shall replace annually at least 7 percent of the initial number of lead service lines in its distribution system. The initial number of lead service lines is the number of lead lines in place at the time the replacement program begins. The system shall identify the initial number of lead service lines in its distribution system based upon a materials evaluation, including the evaluation required under 11.7.1. The first year of lead service line replacement shall begin on the date the action level was exceeded in tap sampling referenced in 11.5.1.

11.5.3 A system is not required to replace an individual lead service line if the lead concentration in all service line samples from that line, taken pursuant to 11.7.2(c), is less than or equal to 0.015 mg/L.

11.5.4 A water system shall replace the entire service line (up to the building inlet) unless it demonstrates to the satisfaction of the Division under 11.5.5 that it controls less than the entire service line. In such cases, the system shall replace the portion of the line which the Division determines is under the system's control. The system shall notify the user served by the line that the system will replace the portion of the service line under its control and shall offer to replace the building owner's portion of the line, but is not required to bear the cost of replacing the building owner's portion of the line. For buildings where only a portion of the lead service line is replaced, the water system shall inform the resident(s) that the system will collect a first flush tap water sample after partial replacement of the service line is completed if the resident(s) so desire. In cases where the resident(s) accept the offer, the system shall collect the sample and report the results to the resident(s) within 14 days following partial lead service line replacement.

11.5.5 A water system is presumed to control the entire lead service line (up to the building inlet) unless the system demonstrates to the satisfaction of the Division, in a letter submitted under 11.11.5, that it does not have any of the following forms of control over the entire line (as defined by state statutes, municipal ordinances, public service contracts or other applicable legal authority):

authority to set standards for construction, repair, or maintenance of the line, authority to replace, repair, or maintain the service line, or ownership of the service line. The Division shall review the information supplied by the system and determine whether the system controls less than the entire service line and, in such cases, shall determine the extent of the system's control. The Division's determination shall be in writing and explain the basis for its decision.

11.5.6 The Division shall require a system to replace lead service lines on a shorter schedule than that required by this section, taking into account the number of lead service lines in the system, where such a shorter replacement schedule is feasible. The Division shall make this determination in writing and notify the system of its finding within 6 months after the system is triggered into lead service line replacement based on monitoring referenced in 11.5.1.

11.5.7 Any system may cease replacing lead service lines whenever lead service line samples collected pursuant to 11.7.4(c) meet the lead action level during each of two consecutive monitoring periods and the system submits the results to the Division. If the lead service line samples in any such water system thereafter exceeds the lead action level, the system shall recommence replacing lead service lines, pursuant to ?.

11.5.8 To demonstrate compliance with 11.5.1 through 11.5.4, a system shall report to the Division the information specified in 11.11.5.

11.6. **Public education and supplemental monitoring requirements.**

A water system that exceeds the lead action level based on tap water samples collected in accordance with 11.7 shall deliver the public education materials contained in 11.6.1 and 11.6.2 in accordance with the requirements in 11.6.3.

11.6.1 Content of written materials. A water system shall include the following text in all of the printed materials it distributes through its lead public education program. Any additional information presented by a system shall be consistent with the information below and be in plain

English that can be understood by laypersons.

(a) INTRODUCTION

The United Divisions Environmental Protection Agency (EPA), the CNMI Division of Environmental Quality, and [insert name of water supplier] are concerned about lead in your drinking water. Although most homes have very low levels of lead in their drinking water, some homes in the community have lead levels above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Under CNMI and Federal law we are required to have a program in place to minimize lead in your drinking water by [insert date when corrosion control will be completed for your system]. This program includes corrosion control treatment, source water treatment, and public education. We are also required to replace each lead service line that we control if the line contributes lead concentrations of 15 ppb or more after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at [insert water system's phone number]. This brochure explains the simple steps you can take to protect you and your family by reducing your exposure to lead in drinking water.

(b) HEALTH EFFECTS OF LEAD

Lead is a common metal found throughout the environment in lead-based paint, air, soil, household dust, food, certain types of pottery porcelain and pewter, and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that won't hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination -- like dirt and dust -- that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.

(c) LEAD IN DRINKING WATER

Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure, particularly the exposure of infants who drink baby formulas and concentrated juices that are mixed with water. The EPA estimates that drinking water can make up 20 percent or more of a person's total exposure to lead.

(1) Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead-based solder used to join copper pipe, brass and chrome plated brass faucets, and in some cases, pipes made of lead that connect your house to the water main (service lines). In 1986, Congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials to 8.0%.

(2) When water stands in lead pipes or plumbing systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon after returning from work or school, can contain fairly high levels of lead.

(d) STEPS YOU CAN TAKE IN THE HOME TO REDUCE EXPOSURE TO LEAD IN DRINKING WATER

(1) Despite our best efforts mentioned earlier to control water corrosivity and remove lead from the water supply, lead levels in some homes or buildings can be high. To find out whether you need to take action in your own home, have your drinking water tested to determine if it contains excessive concentrations of lead. Testing the water is essential because you cannot see, taste, or smell lead in drinking water. Some local laboratories that can provide this service are listed at the end of this booklet. For more information on having your water tested, please call [insert phone number of water system].

(2) If a water test indicates that the drinking water drawn from a tap in your home contains lead above

15 ppb, then you should take the following precautions:

(i) Let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than six hours. The longer water resides in your home's plumbing the more lead it may contain. Flushing the tap means running the cold water faucet until the water gets noticeably colder, usually about 15-30 seconds. If your house has a lead service line to the water main, you may have to flush the water for a longer time, perhaps one minute, before drinking. Although toilet flushing or showering flushes water through a portion of your home's plumbing system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing tap water is a simple and inexpensive measure you can take to protect your family's health. It usually uses less than one or two gallons of water and costs less than [insert a cost estimate based on flushing two times a day for 30 days] per month. To conserve water, fill a couple of bottles for drinking water after flushing the tap, and whenever possible use the first flush water to wash the dishes or water the plants. If you live in a high-rise building, letting the water flow before using it may not work to lessen your risk from lead. The plumbing systems have more, and sometimes larger pipes than smaller buildings. Ask your landlord for help in locating the source of the lead and for advice on reducing the lead level.

(ii) Try not to cook with, or drink water from the hot water tap. Hot water can dissolve more lead more quickly than cold water. If you need hot water, draw water from the cold tap and heat it on the stove.

(iii) Remove loose lead solder and debris from the plumbing materials installed in newly constructed homes, or homes in which the plumbing has recently been replaced, by removing the faucet strainers from all taps and running the water from 3 to 5 minutes. Thereafter, periodically remove the strainers and flush out any debris that has accumulated over time.

(iv) If your copper pipes are joined with lead solder that has been installed illegally since it was banned in 1986, notify the plumber who did the work and request that he or she replace the lead solder with lead-free solder. Lead solder looks dull gray, and when scratched with a key looks shiny. In addition, notify the Division of Environmental Quality about the violation.

(v) Determine whether or not the service line that connects your home or apartment to the water main is made of lead. The best way to determine if your service line is made of lead is by either hiring a qualified plumber to inspect the line or by contacting the plumbing contractor who installed the line. You may be able to identify the plumbing contractor by checking the CNMI's Building Code Safety Officer's record of building permits which should be maintained in the files of the Building Code Safety Officer. A licensed plumber can at the same time check to see if your homes's plumbing contains lead solder, lead pipes, or pipe fittings that contain lead. The public water system that delivers water to your home should also maintain records of the materials located in the distribution system. If the service line that connects your dwelling to the water main contributes more than 15 ppb to drinking water, after our comprehensive treatment program is in place, we are required to replace the line. If the line is only partially controlled by the [insert the name of the entity that cotrols the line] we are required to provide you with information on how to replace your portion of the service line, and offer to replace that portion of the line at your expense and take a follow-up tap water sample within 14 days of the replacement. Acceptable replacement alternatives include copper, steel, iron, and plastic pipes.

(vi) Have an electrician check your wiring. If grounding wires from the electrical system are attached to your pipes, corrosion may be greater. Check with an electrician or your local electrical code to determine if your wiring can be grounded elsewhere. DO NOT attempt to change the wiring yourself because improper grounding can cause electrical shock and fire hazards.

(3) The steps described above will reduce the lead concentrations in your drinking water. However, if a water test indicates that the drinking water coming from your tap contains lead concentrations in excess of 15 ppb after flushing, or after we have completed our actions to minimize lead levels, then you may want to take the following additional measures:

(i) Purchase or lease a home treatment device. Home treatment devices are limited in that each unit treats only the water that flows from the faucet to which it is connected, and all of the devices require periodic maintenance and replacement. Devices such as reverse osmosis systems or distillers can effectively remove lead from your drinking water. Some activated carbon filters <u>may</u> reduce lead levels at the tap, however all lead reduction claims should be investigated. Be sure to check the actual performance of a specific home treatment device before and after installing the unit.

(ii) Purchase bottled water for drinking and cooking.

(4) You can consult a variety of sources for additional information. Your family doctor or pediatrician can perform a blood test for lead and provide you with information about the health effects of lead. Government agencies that can be contacted include:

(i) The Commonwealth Utilities Corporation at [insert phone number] can provide you with information about your community's water supply, and a list of local laboratories that have been certified by EPA for testing water quality;

(ii) The Department of Public Works, Building Safety Officer at [insert phone number] can provide you with information about building permit records that should contain the names of plumbing contractors that plumbed your home; and

(iii) The Department of Public Health and Environmental Service - on Rota, Saipan, and Tinain at [insert phone number] can provide you with information about the health effects of lead and how you can have your child's blood tested.

(5) The following is a list of some Division approved laboratories in your area that you can call to have your water tested for lead. [Insert names and phone numbers of at least two laboratories].

11.6.2 Content of broadcast materials.

A water system shall include the following information in all public service announcements submitted under its lead public education program to television and radio stations for broadcasting:

(a) Why should everyone want to know the facts about lead and drinking water? Because unhealthy amounts of lead can enter drinking water through the plumbing in your home. That's why I urge you to do what I did. I had my water tested for [insert free or $ per sample]. You can contact the [insert the name of the city or water system] for information on testing and on simple ways to reduce your exposure to lead in drinking water.

(b) To have your water tested for lead, or to get more information about this public health concern, please call [insert the phone number of the Commonwealth Utilities Corporation or water system].

11.6.3 Delivery of a public education program

(a) In communities where a significant proportion of the population speaks a language other than English, public education materials shall be communicated in the appropriate language(s).

(b) A community water system that fails to meet the lead action level on the basis of tap water samples collected in accordance with 11.7 shall, within 60 days:

(1) insert notices in each customer's water utility bill containing the information in paragraph (a) of this section, along with the following alert on the water bill itself in large print: "SOME HOMES IN THIS COMMUNITY HAVE ELEVATED LEAD LEVELS IN THEIR DRINKING WATER. LEAD CAN POSE A SIGNIFICANT RISK TO YOUR HEALTH. PLEASE READ THE ENCLOSED NOTICE FOR FURTHER INFORMATION."

(2) submit the information in 11.6.1 to the editorial departments of the major daily and weekly newspapers circulated throughout the community.

(3) deliver pamphlets and/or brochures that contain the public education materials in 11.6.1(b) and 11.6.1(d) to facilities and organizations, including the following:

(i) public schools, private schools and the Public School System Board;
(ii) Rota, Saipan, and Tinian Public Health Departments;
(iii) Women, Infants, and Children and/or Head Start Program(s) whenever available;
(iv) public and private hospitals and/or clinics;
(v) pediatricians;
(vi) family planning clinics; and
(vii) local welfare agencies.

(4) submit the public service announcement in 11.6.2 to at least five of the radio and television stations with the largest audiences that broadcast to the community served by the water system.

(c) A community water system shall repeat the tasks contained in 11.6.3(b)(1) , 11.6.3(b)(2) ,and 11.6.3(b)(3) every 12 months, and the tasks contained in paragraphs 11.6.3(b)(4) of this section every 6 months for as long as the system exceeds the lead action level.

(d) Within 60 days after it exceeds the lead action level, a non-transient non-community water system shall deliver the public education materials contained in 11.6.1(a), 11.6.1(b), and 11.6.1(d) as follows:

(1) post informational posters on lead in drinking water in a public place or common area in each of the

buildings served by the system; and

(2) distribute informational pamphlets and/or brochures on lead in drinking water to each person served by the non-transient non-community water system.

(e) A non-transient noncommunity water system shall repeat the tasks contained in 11.6.3(d) at least once during each calendar year in which the system exceeds the lead action level.

(f) A water system may discontinue delivery of public education materials if the system has met the lead action level during the most recent six-month monitoring period conducted pursuant to 11.7. Such a system shall recommence public education in accordance with this section if it subsequently exceeds the lead action level during any monitoring period.

11.6.4 Supplemental monitoring and notification of results.

A water system that fails to meet the lead action level on the basis of tap samples collected in accordance with 11.7 shall offer to sample the tap water of any customer who requests it. The system is not required to pay for collecting or analyzing the sample, nor is the system required to collect and analyze the sample itself.

11.7. Monitoring requirements for lead and copper in tap water.

11.7.1 Sample site location

(a) By the applicable date for commencement of monitoring under 11.7.4(a), each water system shall complete a materials evaluation of its distribution system in order to identify a pool of targeted sampling sites that meets the requirements of 11.7, and which is sufficiently large to ensure that the water system can collect the number of lead and copper tap samples required in 11.7.3. All sites from which first draw samples are collected shall be selected from this pool of targeted sampling sites. Sampling sites may not include faucets that have point-of-use or point-of-entry treatment devices designed to remove inorganic contaminants.

(b) A water system shall use the information on lead, copper, and galvanized steel that it is required to collect under 5.5.4 [special monitoring for corrosivity characteristics] when conducting a materials evaluation. When an evaluation of the information collected pursuant to 5.5.4 is insufficient to locate the requisite number of lead and copper sampling sites that meet the targeting criteria in 11.7.1, the water system shall review the sources of information listed below in order to identify a sufficient number of sampling sites. In addition, the system shall seek to collect such information where possible in the course of its normal operations (e.g., checking service line materials when reading water meters or performing maintenance activities):

(1) all plumbing codes, permits, and records in the files of the building department(s) which indicate the plumbing materials that are installed within publicly and privately owned structures connected to the distribution system;

(2) all inspections and records of the distribution system that indicate the material composition of the service connections that connect a structure to the distribution system; and

(3) all existing water quality information, which includes the results of all prior analyses of the system or individual structures connected to the system, indicating locations that may be particularly susceptible to high lead or copper concentrations.

(c) The sampling sites selected for a community water system's sampling pool ("tier 1 sampling sites") shall consist of single family structures that:

(1) contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or

(2) are served by a lead service line.

When multiple-family residences comprise at least 20 percent of the structures served by a water system, the system may include these types of structures in its sampling pool.

(d) Any community water system with insufficient tier 1 sampling sites shall complete its sampling pool with "tier

2 sampling sites", consisting of buildings, including multiple-family residences that:

(1) contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or

(2) are served by a lead service line.

(e) Any community water system with insufficient tier 1 and tier 2 sampling sites shall complete its sampling pool with "tier 3 sampling sites", consisting of single family structures that contain copper pipes with lead solder installed before 1983.

(f) The sampling sites selected for a non-transient non-community water system ("tier 1 sampling sites") shall consist of buildings that:

(1) contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or

(2) are served by a lead service line.

(g) A non-transient non-community water system with insufficient tier 1 sites that meet the targeting criteria in 11.7.1(f) shall complete its sampling pool with sampling sites that contain copper pipes with lead solder installed before 1983.

(h) Any water system whose sampling pool does not consist exclusively of tier 1 sites shall demonstrate in a letter submitted to the Division under 11.11.1(b) why a review of the information listed in 11.7.1(b) was inadequate to locate a sufficient number of tier 1 sites. Any community water system which includes tier 3 sampling sites in its sampling pool shall demonstrate in such a letter why it was unable to locate a sufficient number of tier 1 and tier 2 sampling sites.

(i) Any water system whose distribution system contains lead service lines shall draw 50 percent of the samples it collects during each monitoring period from sites that contain lead pipes, or copper pipes with lead solder, and 50 percent of those samples from sites served by a lead service line. A water system that cannot identify a sufficient number of sampling sites served by a lead service line shall demonstrate in a letter submitted to the Division under 11.11.1(d) why the system was unable to locate a sufficient number of such sites. Such a water system shall collect lead service line samples from all of the sites identified as being served by such lines.

11.7.2 Sample collection methods

(a) All tap samples for lead and copper collected in accordance with this subpart, with the exception of lead service line samples collected under 11.5.3, shall be first draw samples.

(b) Each first-draw tap sample for lead and copper shall be one liter in volume and have stood motionless in the plumbing system of each sampling site for at least six hours. First draw samples from residential housing shall be collected from the cold-water kitchen tap or bathroom sink tap. First-draw samples from a non-residential building shall be collected at an interior tap from which water is typically drawn for consumption. First draw samples may be collected by the system or the system may allow residents to collect first draw samples after instructing the residents of the sampling procedures specified in this paragraph. If a system allows residents to perform sampling, the system may not challenge, based on alleged errors in sample collection, the accuracy of sampling results.

(c) Each service line sample shall be one liter in volume and have stood motionless in the lead service line for at least six hours. Lead service line samples shall be collected in one of the following three ways:

(1) at the tap after flushing the volume of water between the tap and the lead service line. The volume of water shall be calculated based on the interior diameter and length of the pipe between the tap and the lead service line;

(2) tapping directly into the lead service line; or

(3) if the sampling site is a building constructed as a single-family residence, allowing the water to run until there is a significant change in temperature which would be indicative of water that has been

standing in the lead service line.

(4) A water system shall collect each first draw tap sample from the same sampling site from which it collected a previous sample. If, for any reason, the water system cannot gain entry to a sampling site in order to collect a follow-up tap sample, the system may collect the follow-up tap sample from another sampling site in its sampling pool as long as the new site meets the same targeting criteria, and is within reasonable proximity of the original site.

11.7.3 Number of samples

Water systems shall collect at least one sample during each monitoring period specified in 11.7.4 from the number of sites listed in the first column below ("standard monitoring"). A system conducting reduced monitoring under 11.7.4(d) may collect one sample from the number of sites specified in the second column below during each monitoring period specified in 11.7.4(d).

System Size (# People Served)	# of sites (Standard Monitoring)	# of sites (Reduced Monitoring)
Greater Than 100,000	100	50
10,001-100,000	60	30
3,301 to 10,000	40	20
501 to 3,300	20	10
101 to 500	10	5
Less than or equal to 100	5	5

11.7.4 Timing of monitoring

(a) Initial tap sampling

The first six-month monitoring period for small, medium-size and large systems shall begin on the following dates:

System Size (# People Served)	First six-month Monitoring Period Begins On
Greater than 50,000	January 1, 1992
3,301 to 50,000	July 1, 1992
Less Than or Equal to 3,300	July 1, 1993

(1) All large systems shall monitor during two consecutive six-month periods.

(2) All small and medium-size systems shall monitor during each six-month monitoring period until:

(i) the system exceeds the lead or copper action level and is therefore required to implement the corrosion control treatment requirements under 11.2, in which case the system shall continue monitoring in accordance with 11.7.4(b), or

(ii) the system meets the lead or copper action levels during two consecutive six-month monitoring periods, in which case the system may reduce monitoring in accordance with 11.7.4(d).

(b) Monitoring after installation of corrosion control and source water treatment

(1) Any large system which installs optimal corrosion control treatment pursuant to 11.2.4(d)shall monitor during two consecutive six-month monitoring periods by the date specified in 11.2.4(e).

(2) Any small or medium-size system which installs optimal corrosion control treatment pursuant to 11.2.5(e) shall monitor during two consecutive six-month monitoring periods by the date specified in 11.2.5(f).

(3) Any system which installs source water treatment pursuant to 11.4.1(c) shall monitor during two consecutive six-month monitoring periods by the date specified in 11.4.1(d).

(c) Monitoring after Division specifies water quality parameter values for optimal corrosion control

After the Division specifies the values for water quality control parameters under 11.3.6, the system shall monitor during each subsequent six-month monitoring period, with the first monitoring period to begin on the date the Division specifies the optimal values under
11.3.6.

(d) Reduced monitoring

(1) A small or medium-size water system that meets the lead and copper action levels during each of two consecutive six-month monitoring periods may reduce the number of samples in accordance with 11.7.3, and reduce the frequency of sampling to once per year.

(2) Any water system that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Division under 11.3.6 during each of two consecutive six-month monitoring periods may request that the Division allow the system to reduce the frequency of monitoring to once per year and to reduce the number of lead and copper samples in accordance with 11.7.3. The Division shall review the information submitted by the water system and shall make its decision in writing, setting forth the basis for its determination. The Division shall review, and where appropriate, revise its determination when the system submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

(3) A small or medium-size water system that meets the lead and copper action levels during three consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every three years. Any water system that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Division under 11.3.6 during three consecutive years of monitoring may request that the Division allow the system to reduce the frequency of monitoring from annually to once every three years. The Division shall review the information submitted by the water system and shall make its decision in writing, setting forth the basis for its determination. The Division shall review, and where appropriate, revise its determination when the system submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

(4) A water system that reduces the number and frequency of sampling shall collect these samples from sites included in the pool of targeted sampling sites identified in 11.7.1. Systems sampling annually or less frequently shall conduct the lead and copper tap sampling during the months of June, July, August or September.

(5) A small or medium-size water system subject to reduced monitoring that exceeds the lead or copper action level shall resume sampling in accordance 11.7.4(c) and collect the number of samples specified for standard monitoring under paragraph (c) of this section. Any water system subject to reduced monitoring frequency that fails to operate within the range of values for the water quality control parameters specified by the Division under 11.3.6 shall resume tap water sampling in accordance with 11.7.4(c) and collect the number of samples specified for standard monitoring under 11.7.3.

11.7.5 Additional monitoring by systems

The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the system and the Division in making any determinations (i.e., calculating the 90th percentile lead or copper level) under Part 11.

11.8. **Monitoring requirements for water quality parameters.**

All large water systems and all small and medium-size systems that exceed the lead or copper action level shall monitor water quality parameters in addition to lead and copper in accordance with 11.8. The requirements of 11.8 are summarized in the table at the end of 11.8.

11.8.1 General Requirements

(a) Sample collection methods

(1) Tap samples shall be representative of water quality throughout the distribution system taking into account the number of persons served, the different sources of water, the different treatment methods employed by the system, and seasonal variability. Tap sampling under this section is not required to be

conducted at taps targeted for lead and copper sampling under 11.7.1. [Note: Systems may find it convenient to conduct tap sampling for water quality parameters at sites used for coliform sampling under 5.3.]

(2) Samples collected at the entry point(s) to the distribution system shall be from locations representative of each source after treatment. If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

(b) Number of samples

(1) Systems shall collect two tap samples for applicable water quality parameters during each monitoring period specified under 11.8.2 through 11.8.5 from the following number of sites.

System Size (# People Served)	# of Sites For Water Quality Parameters
Greater than 100,000	25
10,001-100,000	10
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
Less Than 100	1

(2) Systems shall collect two samples for each applicable water quality parameter at each entry point to the distribution system during each monitoring period specified in 11.8.2 through 11.8.5. During each monitoring period specified in 11.8.3, systems shall collect one sample for each applicable water quality parameter at each entry point to the distribution system.

11.8.2 Initial Sampling

All large water systems shall measure the applicable water quality parameters as specified below at taps and at each entry point to the distribution system during each six-month monitoring period specified in 11.7.4(a). All small and medium-size systems shall measure the applicable water quality parameters at the locations specified below during each six-month monitoring period specified in 11.7.4(a) during which the system exceeds the lead or copper action level.

(a) At taps:

(1) pH;

(2) alkalinity;

(3) orthophosphate, when an inhibitor containing a phosphate compound is used;

(4) silica, when an inhibitor containing a silicate compound is used;

(5) calcium;

(6) conductivity; and

(7) water temperature.

(b) At each entry point to the distribution system: all of the applicable parameters listed in 11.8.2(a)

11.8.3 <u>Monitoring after installation of corrosion control</u>

Any large system which installs optimal corrosion control treatment pursuant to 11.2.4(d) shall measure the water quality parameters at the locations and frequencies specified below during each six-month monitoring period specified in 11.7.4(b)(1). Any small or medium-size system which installs optimal corrosion control treatment shall conduct such monitoring during each six-month monitoring period specified in 11.7.4(b)(2) in which the system exceeds the lead or copper action level.

(a) At taps, two samples for:

(1) pH;

(2) alkalinity;

(3) orthophosphate, when an inhibitor containing a phosphate compound is used;

(4) silica, when an inhibitor containing a silicate compound is used;

(5) calcium, when calcium carbonate stabilization is used as part of corrosion control.

(b) At each entry point to the distribution system, one sample every two weeks (bi-weekly) for:

(1) pH;

(2) when alkalinity is adjusted as part of optimal corrosion control, a reading of the dosage rate of the chemical used to adjust alkalinity, and the alkalinity concentration; and

(3) when a corrosion inhibitor is used as part of optimal corrosion control, a reading of the dosage rate of the inhibitor used, and the concentration of orthophosphate or silica (whichever is applicable).

11.8.4 Monitoring after Division specifies water quality parameter values for optimal corrosion control

After the Division specifies the values for applicable water quality control parameters reflecting optimal corrosion control treatment under 11.3.6, all large systems shall measure the applicable water quality parameters in accordance with 11.8.3 during each monitoring period specified in 11.7.4(c). Any small or medium-size system shall conduct such monitoring during each monitoring period specified in 11.7.4(c) in which the system exceeds the lead or copper action level. The system may take a confirmation sample for any water quality parameter value no later than 3 days after the first sample. If a confirmation sample is taken, the result must be averaged with the first sampling result and the average must be used for any compliance determinations under 11.3.7. Division has the discretion to delete results of obvious sampling errors from this calculation.

11.8.5 Reduced monitoring

(a) Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment during each of two consecutive six-month monitoring periods under 11.8.4 shall continue monitoring at the entry point(s) to the distribution system as specified in 11.8.3(b). Such system may collect two tap samples for applicable water quality parameters from the following reduced number of sites during each six-month monitoring period.

System Size (# People Served)	Reduced # of Sites for Water Quality Parameters
Greater than 100,000	10
10,001 to 100,000	7
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
Less than 100	1

(b) Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the Division under 11.3.6 during three consecutive years of monitoring may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in 11.8.5(a) from every six months to annually.

(c) A water system that conducts sampling annually shall collect these samples evenly throughout the year so as to reflect seasonal variability.

(d) Any water system subject to reduced monitoring frequency that fails to operate within the range of values for the water quality parameters specified by the Division under 11.3.6 shall resume tap water sampling in accordance with the number and frequency requirements in 11.8.3.

11.8.6 Additional monitoring by systems

The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the system and the Division in making any determinations (i.e., determining concentrations of water quality parameters) under this 11.8 or 11.3.

SUMMARY OF MONITORING REQUIREMENTS FOR WATER QUALITY PARAMETERS[1]

Monitoring Period	Parameters[2]	Location	Frequency
Initial Monitoring	pH, alkalinity, orthophosphate or silica[3], calcium, conductivity, temperature	Taps and at entry point(s) to distribution system	Every 6 months
After Installation of Corrosion Control	pH, alkalinity, orthophosphate or silica[3], calcium[4]	Taps	Every 6 months
	pH, alkalinity dosage rate and concentration (if alkalinity adjusted as part of corrosion control), inhibitor dosage rate and inhibitor residual[5]	Entry point(s) to distribution system	Biweekly
After Division Specifies Parameter Values For Optimal Corrosion Control	pH, alkalinity, orthophosphate or silica[3], calcium[4]	Taps	Every 6 months
	pH, alkalinity dosage rate and concentration (if alkalinity adjusted as part of corrosion control), inhibitor dosage rate and inhibitor residual[5]	Entry point(s) to distribution system	Biweekly
Reduced Monitoring	pH, alkalinity, orthophosphate or silica[3], calcium[4]	Taps	Every 6 months at a reduced number of sites
	pH, alkalinity dosage rate and concentration (if alkalinity adjusted as part of corrosion control), inhibitor dosage rate and inhibitor residual[5]	Entry point(s) to distribution system	Biweekly

---

[1] Table is for illustrative purposes; consult the text of this section for precise regulatory requirements.

[2] Small and medium-size systems have to monitor for water quality parameters only during monitoring periods in which the system exceeds the lead or copper action level.

[3] Orthophosphate must be measured only when an inhibitor containing a phosphate compound is used. Silica must be measured only when an inhibitor containing silicate compound is used.

[4] Calcium must be measured only when calcium carbonate stabilization is used as part of corrosion control.

[5] Inhibitor dosage rates, inhibitor residual concentrations must be measured when an inhibitor is used.

11.9. **Monitoring requirements for lead and copper in source water.**

11.9.1 Sample location, collection methods, and number of samples

(a) A water system that fails to meet the lead or copper action level on the basis of tap samples collected in accordance with 11.7 shall collect lead and copper source water samples in accordance with the requirements regarding sample location, number of samples, and collection methods specified in 5.5 [inorganic chemical sampling].
[Note: The timing of sampling for lead and copper shall be in accordance with 11.9.2 and 11.9.3, and not dates specified in 5.5].

(b) Where the results of sampling indicate an exceedance of maximum permissible source water levels established under 11.4.2(d), the Division may require that one additional sample be collected as soon as possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point. If a Division-required confirmation sample is taken for lead or copper, then the results of the initial and confirmation sample shall be averaged in determining compliance with the Division-specified maximum permissible levels. Any sample value below the detection limit shall be considered to be zero. Any value above the detection limit but below the PQL shall either be considered as the measured value or be considered one-half the PQL.

11.9.2 Monitoring frequency after system exceeds tap water action level

Any system which exceeds the lead or copper action level at the tap shall collect one source water sample from each entry point to the distribution system within six months after the exceedance.

11.9.3 Monitoring frequency after installation of source water treatment

Any system which installs source water treatment pursuant to 11.4.1(b) shall collect an additional source water sample from each entry point to the distribution system during two consecutive six-month monitoring periods by the deadline specified in 11.4.1(d).

11.9.4 Monitoring frequency after Division specifies maximum permissible source water levels or determines that source water treatment is not needed

(a) A system shall monitor at the frequency specified below in cases where the Division specifies maximum permissible source water levels under 11.4.2(d) or determines that the system is not required to install source water treatment under 11.4.2(b).

(1) A water system using only groundwater shall collect samples once during the three-year compliance period (as that term is defined in Part 3) in effect when the applicable Division determination under 11.9.4(a) is made. Such systems shall collect samples once during each subsequent compliance period.

(2) A water system using surface water (or a combination of surface and groundwater) shall collect samples once during each year, the first annual monitoring period to begin on the date on which the applicable Division determination is made under 11.9.4(a).

(b) A system is not required to conduct source water sampling for lead and/or copper if the system meets the action level for the specific contaminant in tap water samples during the entire source water sampling period applicable to the system under paragraph 11.9.4(a)(1) or 11.9.4(a)(2).

11.9.5 Reduced monitoring frequency

(a) A water system using only groundwater which demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and/or copper concentrations specified by the Division in 11.4.2(d) during at least three consecutive compliance periods under 11.9.4(a) may reduce the monitoring frequency for lead and/or copper to once during each nine-year compliance cycle (as that term is defined in 3).

(b) A water system using surface water (or a combination of surface and ground waters) which demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the Division in 17 for at least three consecutive years may reduce the monitoring frequency in 11.9.4(a) to once during each nine-year compliance cycle (as that term is defined in 5.5.2).

(c) A water system that uses a new source of water is not eligible for reduced monitoring for lead and/or copper until concentrations in samples collected from the new source during three consecutive monitoring periods are below the maximum permissible lead and copper concentrations specified by the Division in 11.4.1(e).

11.10. **Analytical Methods.**

11.10.1 Analyses for lead, copper, pH, conductivity, calcium, alkalinity, orthophosphate, silica, and temperature shall be conducted using the following methods:

ANALYTICAL METHODS

Contaminant	Methodology[9]	Reference (Method Number) EPA[1]	ASTM[2]	SM[3]	USGS[4]
Lead	Atomic absorption; furnace technique	239.2	D3559-85D	3113	
	Inductively-coupled plasma; mass spectrometry	200.8[6]			
	Atomic absorption; platform furnace technique	200.9[7]			
Copper	Atomic absorption; furnace technique	220.2	D1688-90C	3113	
	Atomic absorption; direct aspiration	220.1	D1688-90A	3111-B	
	Inductively-coupled plasma	200.7[5]		3120	
	Inductively-coupled plasma; mass spectrometry	200.8[6]			
	Atomic absorption; platform furnace	200.9[7]			
pH	Electrometric	150.1 150.2	D1293-84B	4500-H$^+$	
Conductivity	Conductance	120.1	D1125-82B	2510	
Calcium	EDTA titrimetric	215.2	D511-88A	3500-Ca-D	
	Atomic absorption; direct aspiration	215.1	D511-88B	3111-B	
	Inductively-coupled plasma	200.7[5]		3120	
Alkalinity	Titrimetric	310.1	D1067-88B	2320	
	Electrometric titration				
Ortho-phosphate, unfiltered, no digestion or hydrolysis	Colorimetric, automated, ascorbic acid	365.1		4500-P-F	
	Colorimetric, ascorbic acid, two reagent	365.3			
	Colorimetric, ascorbic acid, single reagent	365.2	D515-88A	4500-P-E	
	Colorimetric, phosphomolybdate;		I-1601-85		
	automated-segmented flow;		I-2601-85		
	automated discrete		I-2598-85		
	Ion Chromatography	600.0[8]	D4327-88	4110	

ANALYTICAL METHODS (Continued)

Contaminant	Methodology[9]	Reference (Method Number) EPA[1]	ASTM[2]	SM[3]	USGS[4]

Silica	Colorimetric, molybdate blue; automated-segmented flow		I-1700-85 I-2700-85	
	Colorimetric	370.1	D859-88	
	Molybdosilicate		4500-Si-D	
	Heteropoly blue		4500-Si-E	
	Automated method for molybdate-reactive silica		4500-Si-F	
	Inductively-coupled plasma	200.7[5]		3120
Temperature	Thermometric			2550

---

[1] The procedures 239.2, 220.2, 220.1, 150.1, 150.2, 120.1, 215.2, 215.1, 310.1, 365.1, 365.3, 365.2, and 370.1 are incorporated by reference and shall be done in accordance with "Methods for Chemical Analysis of Water and Wastes," EPA Environmental Monitoring and Support Laboratory, Cincinnati, OH (EPA-600/4-79-020), Revised March 1983, pp. 239.2-1 through 239.2-2 and metals-1 through metals-19, 220.2-1 through 220.2-2 and metals-1 through metals-19, 220.1-1 through 220.1-2 and metals-1 through metals-19, 150.1-1 through 150.1-3, 150.2-1 through 150.2-3, 120.1-1 through 120.1-3, 215.2-1 through 215.2-3, 215.1-1 through 215.1-2, 310.1-1 through 310.1-3, 365.1-1 through 365.1-9, 365.3-1 through 365.3-4, 365.2-1 through 365.2-6, and 370.1-1 through 370.1-5, respectively. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies may be obtained from ORD Publications, CERI, EPA, Cincinnati, OH 45268. Copies may be inspected at the United Divisions Environmental Protection Agency, 401 M Street, SW., Room EB-15, Washington, D.C. 20460 or at the Office of the Federal Register, 1100 L Street, NW., Room 8401, Washington, D.C.

[2] The procedures D3559-85D, D1688-90C, D1688-90A, D1293-84B, D1125-82B, D511-88A, D511-88B, D1067-88B, D515-88A, D4327-88, and D859-88 are incorporated by reference and shall be done in accordance with Annual Book of ASTM Standards, Vol. 11.01, American Society for Testing and Materials, 1990, 401-403, 352-353, 349-350, 212-214, 137-138, 309-312, 312-314, 123-124, 459-462, 260-265, and 479-481, respectively. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies may be obtained from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103. Copies may be inspected at the United Divisions Environmental Protection Agency, 401 M Street, SW., Room EB-15, Washington, D.C. 20460 or at the Office of the Federal Register, 1100 L Street, NW., Room 8401, Washington, D.C.

[3] The procedures 3113, 3111-B, 3120, 4500-H^+, 2510, 3500-Ca-D, 3120, 2320, 4500-P-F, 4500-P-E, 4110, 4500-Si-D, 4500-Si-E, 4500-Si-F, and 2550 are incorporated by reference and shall be done in accordance with "Standard Methods for the Examination of Water and Wastewater," 17th Edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, 1989, pp. 3-32 through 3-43, 3-20 through 3-23, 3-53 through 3-63, 4-94 through 4-102, 2-57 through 2-61, 3-85 through 3-87, 3-20 thru 3-23, 3-53 thru 3-63, 2-35 through 2-39, 4-178 through 4-181, 4-177 through 4-178, 4-2 through 4-6, 4-184 through 4-187, 4-188 through 4-189, 4-189 through 4-191, and 2-80 through 2-81, respectively. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies may be obtained from the American Water Works Association, Customer Services, 6666 West Quincy Avenue, Denver, Co

80235, Phone (303) 794-7711. Copies may be inspected at the United Divisions Environmental Protection Agency, 401 M Street, SW., Room EB-15, Washington, D.C. 20460 or at the Office of the Federal Register, 1100 L Street, NW., Room 8401, Washington, D.C.

[4] The procedures I-1030-85, I-1601-85, I-2601-85, I-2598-85, I-1700-85, and I-2700-85 are incorporated by reference and shall be done in accordance with "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments," 3rd edition, U.S. Department of Interior , U.S. Geological Survey, 1989, pp. 55-56, 381-382, 383-385, 387-388, 415-416, and 417-419, respectively. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies may be purchased from the Books and Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, Co 80225. Copies may be inspected at the United Divisions Environmental Protection Agency, 401 M Street, SW., Room EB-15, Washington, D.C. 20460 or at the Office of the Federal Register, 1100 L Street, NW., Room 8401, Washington, D.C.

[5] "Determination of Metals and Trace Elements in Water and Wastes by Inductively-Coupled Plasma Atomic Emission Spectrometry," Revision 3.2, August 1990, U.S. EPA, EMSL. This document is available from U.S. EPA, EMSL, Cincinnati, OH 45268.

[6] "Determination of Trace Elements in Water and Wastes by Inductively-Coupled Plasma-Mass Spectrometry," Method 200.8, August 1990, Revision 4.3, U.S. EPA EMSL. This document is available from U.S. EPA, EMSL, Cincinnati, OH 45268.

[7] "Determination of Trace Elements by Stabilized Temperature Graphite Furnace Atomic Absorption Spectrometry," Method 200.9, August 1990, U.S. EPA EMSL. This document is available from U.S. EPA, EMSL, Cincinnati, OH 45268.

[8] "Determination of Inorganic Ions in Water by Ion Chromatography," Method 300.0, December 1989, U.S. EPA EMSL. This document is available from U.S. EPA, EMSL, Cincinnati, OH 45268.

[9] For analyzing lead and copper, the technique applicable to total metals must be used and samples cannot be filtered.

(a) Analyses under this section shall only be conducted by laboratories that have been certified by EPA or the Division. To obtain certification to conduct analyses for lead and copper, laboratories must:

(1) Analyze performance evaluation samples which include lead and copper provided by EPA Environmental Monitoring and Support Laboratory or equivalent samples provided by the Division; and

(2) Achieve quantitative acceptance limits as follows:

(i) Lead: ±30 percent of the actual amount in the Performance Evaluation sample when the actual amount is greater than or equal to 0.005 mg/L, and

(ii) Copper: ±10 percent of the actual amount in the Performance Evaluation sample when the actual amount is greater than or equal to 0.050 mg/L;

(3) Achieve method detection limits according to the procedures in Appendix B of 40 CFR Part 136 follows:

(i) Lead: 0.001 mg/L (only if source water compositing is done under 5.5.2); and

(ii) Copper: 0.001 mg/L or 0.020 mg/L when atomic absorption direct aspiration is used (only if source water compositing is done under 5.5.2); or

(4) Be currently certified by EPA or the Division to perform analyses to the specifications described in 11.10.1(b).

(b) Divisions has the authority to allow the use of previously collected monitoring data for purposes of monitoring, if the data were collected an analyzed in accordance with the requirements Part 11.

(c) All lead levels measured between the PQL and the MDL must be either reported as measured or they can be reported as one-half the PQL (0.0025 mg/L). All levels below the lead MDL must be reported as zero.

(d) All copper levels measured between the PQL and the MDL must be either reported as measured or they can be reported as one-half the PQL (0.025 mg/L). All levels below the copper MDL must be reported as zero.

11.11. **Reporting requirements.**

All water systems shall report all of the following information to the Division in accordance with 11.11.

11.11.1 Reporting requirements for tap water monitoring for lead and copper and for water quality parameter monitoring

(a) A water system shall report the information specified below for all tap water samples within the first 10 days following the end of each applicable monitoring period specified in 11.7 and 11.8 and 11.9 (i.e., every six-months, annually, or every 3 years).

(1) the results of all tap samples for lead and copper including the location of each site and the criteria under 11.7.1(c), (d), (e), (f), and/or (g) under which the site was selected for the system's sampling pool;

(2) a certification that each first draw sample collected by the water system is one-liter in volume and, to the best of their knowledge, has stood motionless in the service line, or in the interior plumbing of a sampling site, for at least six hours;

(3) where residents collected samples, a certification that each tap sample collected by the residents was taken after the water system informed them of proper sampling procedures specified in 11.7.2(b);

(4) the 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each monitoring period (calculated in accordance with 11.1.1(c)(3));

(5) with the exception of initial tap sampling conducted pursuant to 11.7.4(a), the system shall designate any site which was not sampled during previous monitoring periods, and include an explanation of why sampling sites have changed;

(6) the results of all tap samples for pH, and where applicable, alkalinity, calcium, conductivity, temperature, and orthophosphate or silica collected under 11.8.2 through 11.8.5;

(7) the results of all samples collected at the entry point(s) to the distribution system for applicable water quality parameters under 11.8.2 through 11.8.5.

(b) By the applicable date in 11.7.4(a) for commencement of monitoring, each community water system which does not complete its targeted sampling pool with tier 1 sampling sites meeting the criteria in 11.7.1(c) shall send a letter to the Division justifying its selection of tier 2 and/or tier 3 sampling sites under 11.7.1(d) and/or 11.7.1(e).

(c) By the applicable date in 11.7.4(a) for commencement of monitoring, each non-transient, non-community water system which does not complete its sampling pool with tier 1 sampling sites meeting the criteria in 11.7.1(f) shall send a letter to the Division justifying its selection of sampling sites under 11.7.1(g).

(d) By the applicable date in 11.7.4(a) for commencement of monitoring, each water system with lead service lines that is not able to locate the number of sites served by such lines required under 11.7.1(i) shall send a letter to the Division demonstrating why it was unable to locate a sufficient number of such sites based upon the information listed in 11.7.1(b).

(e) Each water system that requests that the Division reduce the number and frequency of sampling shall provide the information required under 11.7.4(d).

11.11.2 <u>Source water monitoring reporting requirements</u>

(a) A water system shall report the sampling results for all source water samples collected in accordance with 11.9 within the first 10 days following the end of each source water monitoring period (i.e., annually, per compliance period, per compliance cycle) specified in 11.9.

(b) With the exception of the first round of source water sampling conducted pursuant to 11.9.2, the system shall specify any site which was not sampled during previous monitoring periods, and include an explanation of why the sampling point has changed.

11.11.3 <u>Corrosion control treatment reporting requirements</u>

By the applicable dates under 11.2, systems shall report the following information:

(a) for systems demonstrating that they have already optimized corrosion control, information required in 11.2.2 (a) or 11.2.2 (b) .

(b) for systems required to optimize corrosion control, their recommendation regarding optimal corrosion control treatment under 11.3.1.

(c) for systems required to evaluate the effectiveness of corrosion control treatments under 11.3.3, the information required by that paragraph.

(d) for systems required to install optimal corrosion control designated by the Division under 11.3.4, a letter certifying that the system has completed installing that treatment.

11.11.4 <u>Source water treatment reporting requirements</u>

By the applicable dates in 11.4, systems shall provide the following information to the Division:

(a) if required under 11.4.2(a), their recommendation regarding source water treatment;

(b) for systems required to install source water treatment under 11.4.2(b), a letter certifying that the system has completed installing the treatment designated by the Division within 24 months after the Division designated the treatment.

11.11.5 <u>Lead service line replacement reporting requirements</u>

Systems shall report the following information to the Division to demonstrate compliance with the requirements of 11.5:

(a) Within 12 months after a system exceeds the lead action level in sampling referred to in 11.5.1, the system shall demonstrate in writing to the Division that it has conducted a materials evaluation, including the evaluation in 11.7.1, to identify the initial number of lead service lines in its distribution system, and shall provide the Division with the system's schedule for replacing annually at least 7 percent of the initial number of lead service lines in its distribution system.

(b) Within 12 months after a system exceeds the lead action level in sampling referred to in 11.5.1, and every 12 months thereafter, the system shall demonstrate to the Division in writing that the system has either:

(1) replaced in the previous 12 months at least 7 percent of the initial lead service lines (or a greater number of lines specified by the Division under 11.5.6) in its distribution system, or

(2) conducted sampling which demonstrates that the lead concentration in all service line samples from an individual line(s), taken pursuant to 11.7.2(c), is less than or equal to 0.015 mg/L. In such cases, the total number of lines replaced and/or which meet the criteria in 11.7.2(d) shall equal at least 7 percent of the initial number of lead lines identified under 11.11.1 (or the percentage specified by the Division under 11.7.2(e).

(c) The annual letter submitted to the Division under 11.11.5(b) shall contain the following information:

(1) the number of lead service lines scheduled to be replaced during the previous year of the system's replacement schedule;

(2) the number and location of each lead service line replaced during the previous year of the system's replacement schedule;

(3) if measured, the water lead concentration and location of each lead service line sampled, the sampling method, and the date of sampling.

(d) As soon as practicable, but in no case later than three months after a system exceeds the lead action level in sampling referred to in 11.5.1, any system seeking to rebut the presumption that it has control over the entire lead service line pursuant to 11.5.4 shall submit a letter to the Division describing the legal authority (e.g., state statutes, municipal ordinances, public service contracts or other applicable legal authority) which limits the system's control over the service lines and the extent of the system's control.

11.11.6 Public education program reporting requirements

By December 31st of each year, any water system that is subject to the public education requirements in 11.6 shall submit a letter to the Division demonstrating that the system has delivered the public education materials that meet the content requirements in 11.6.1 and 11.6.2 and the delivery requirements in 11.6.3. This information shall include a list of all the newspapers, radio stations, television stations, facilities and organizations to which the system delivered public education materials during the previous year. The water system shall submit the letter required by this paragraph annually for as long as it exceeds the lead action level.

11.11.7 Reporting of additional monitoring data

Any system which collects sampling data in addition to that required by this subpart shall report the results to the Division by the end of the applicable monitoring period under 11.7, 11.8, and 11.9 during which the samples are collected.

11.12. **Recordkeeping requirements.**

Any system subject to the requirements of Part 11 shall retain on its premises original records of all sampling data and analyses, reports, surveys, letters, evaluations, schedules, Division determinations, and any other information required by 11.2 through 11.9. Each water system shall retain the records required by this section for no fewer than 12 years.