A copy of the comment that does not contain CBI must be submitted for inclusion in the public record. Information not marked confidential will be included in the public docket by EPA without prior notice. The public docket is available for public inspection in Rm. 119 at the Virginia address given above, from 8:30 a.m. to 4 p.m., Monday through Friday, excluding legal holidays.

This Notice and the proposed guidance document described herein are available by mail or electronically. To obtain electronic copies follow the instructions listed under Unit I. of this document. To obtain copies by mail contact: Elizabeth Doyle, Office of Pesticide Programs, Health Effects Division (7509C), Environmental Protection Agency, 401 M St., SW., Washington, DC 20460. Office location, telephone number, and e-mail address: Rm. 718G, Crystal Mall #2, 1921 Jefferson Davis Highway, Arlington, VA, (703) 308–2722, e-mail: doyle.elizabeth@epamail.epa.gov.

FOR FURTHER INFORMATION CONTACT: Elizabeth Doyle at the address or telephone number listed above.

SUPPLEMENTARY INFORMATION:

I. Electronic Availability

A. Internet

Electronic copies of this document and the guidance document are available from the EPA Home Page at the Federal Register--Environmental Documents entry for this document under ''Laws and Regulations'' (http://www.epa.gov/fedrgstr/). Copies are also available electronically from EPA's Office of Pesticide Programs Home Page (http://www.epa.gov/pesticides) under ''FQPA, Science Issues.''

B. Fax-On-Demand

Using a faxphone call 202–401–0527 and select item 6055 for a copy of the guidance document.

II. Background

This **Federal Register** notice announces the availability of the proposed EPA pesticide policy guidance document entitled ''Guidance for Identifying Pesticide Chemicals That Have a Common Mechanism of Toxicity, for Use in Assessing the Cumulative Toxic Effects of Pesticides.'' This guidance document was developed by EPA in response to the recent amendments to FIFRA and the Federal Food, Drug, and Cosmetic Act (FFDCA) as promulgated by the Food Quality Protection Act of 1996 (FQPA). These amendments require EPA to consider in their process of determining safety of a given pesticide the possibility of cumulative toxic effects resulting from aggregate exposure to the pesticide and other pesticides that are toxic from a common mechanism. Hence, in assessing the risks posed by a given pesticide, EPA must also assess the combined risks to human health that can result from exposure to the pesticide and other pesticides that have a common mechanism of toxicity. The guidance document describes the approach that EPA will use for identifying and categorizing pesticide chemicals that have common mechanisms of toxicity for purposes of assessing the cumulative toxic effects of such pesticides. Specifically, the proposed guidance document describes:

- EPA's interpretation of common mechanism of toxicity with respect to making a determination of safety under FFDCA as amended by FQPA.
- The specific steps that need to be taken for identifying, inferring, or refuting a common mechanism of toxicity.
- The types of data (and their sources) that are needed for doing so.
- How these data are to be used in making decisions regarding common mechanisms of toxicity.
- Factors that will be considered when conducting combined risk assessments that characterize whether or not cumulative toxic effects can reasonably be expected to occur following exposure to two or more pesticide substances that are toxic from a common mechanism.

III. Comments

All public comments concerning the background document were presented to the FIFRA Scientific Advisory Panel prior to the March 1997 meeting. The background document and comments were discussed openly at the meeting. Changes recommended by the Panel concerning the background document were fully considered by EPA when finalizing the guidance document. The recommended changes, as well as a summary of the Agency's responses to the changes, are filed in public docket.

IV. Public Record and Electronic Submissions

The official record for this action, as well as the public version, has been established for this action under docket control number ''OPP–00542'' (including comments and data submitted electronically as described below). A public version of this record, including printed, paper versions of electronic comments, which does not include any information claimed as CBI, is available for inspection from 8:30 a.m. to 4 p.m., Monday through Friday, excluding legal holidays. The official record is located at the Virginia address in ''ADDRESSES'' at the beginning of this document.

Electronic comments can be sent directly to EPA at:

opp-docket@epamail.epa.gov

Electronic comments must be submitted as an ASCII file avoiding the use of special characters and any form of encryption. Comment and data will also be accepted on disks in Wordperfect 5.1/6.1 or ASCII file format. All comments and data in electronic form must be identified by the docket control number ''OPP–00542.'' Electronic comments on this document may be filed online at many Federal Depository Libraries.

List of Subjects

Environmental protection, Administrative practice and procedure, Agricultural commodities, Pesticides and pests.

Dated: July 23, 1998.

Stephen L. Johnson,

Acting Director, Office of Pesticide Programs.

[FR Doc. 98–21037 Filed 8–5–98; 8:45 am]

BILLING CODE 6560–50–F

ENVIRONMENTAL PROTECTION AGENCY

[FRL–6137–3]

Announcement of Small System Compliance Technology Lists for Existing National Primary Drinking Water Regulations and Findings Concerning Variance Technologies

AGENCY: Environmental Protection Agency.

ACTION: Notice of lists of technologies and upcoming release of guidance and supporting documents.

SUMMARY: The Environmental Protection Agency (EPA) announces the Small System Compliance Technology Lists and the upcoming release of three guidance documents and three supporting documents. These lists, guidance and supporting documents are related to the provisions in the Safe Drinking Water Act (SDWA), as amended in 1996. The three guidance documents are: EPA–815–R–98–001, Small System Compliance Technology List for the Surface Water Treatment Rule and Total Coliform Rule which includes an update of the existing document-EPA 815–R–97–002; EPA–815–R–98–002, Small System Compliance Technology List for the

Non-Microbial Contaminants Regulated Before 1996; EPA–815–R–98–003, Variance Technology Findings for Contaminants Regulated Before 1996. The three supporting documents are: National-Level Affordability Criteria Under the 1996 Amendments to the Safe Drinking Water Act; An Assessment of the Vulnerability of Non-Community Water Systems to SDWA Cost Increases; and Cost Evaluation of Small System Compliance Options: Point-of-Use and Point-of-Entry Treatment Units.

DATES: The lists of technologies are provided with today's notice. The guidance manuals and supporting documents will be released beginning September 15, 1998.

ADDRESSES: Please contact the Safe Drinking Water Hotline, at phone: (800) 426–4791, fax: (703) 285–1101, or by e-mail at <hotline-sdwa@epamail.epa.gov> to request copies of the guidance and supporting documents beginning September 15, 1998. The guidance documents will also be available on the Internet at <www.epa.gov/OGWDW/> after September 15, 1998.

FOR FURTHER INFORMATION CONTACT: For general information about the availability of these guidance and supporting documents, please contact the Safe Drinking Water Hotline, at phone: (800) 426–4791, fax: (703) 285–1101, or by e-mail at: <hotline-sdwa@epamail.epa.gov>. For other information on Technologies for Small Drinking Water Systems please contact Jeffrey Kempic, Phone: (202) 260–9567, Fax: (202) 260–3762 or Tara Cameron, Phone: (202) 260–3702, Fax: (202) 260–3762 at the U.S. Environmental Protection Agency.

SUPPLEMENTARY INFORMATION:

Table of Contents

I. Background

A. Treatment Technologies Under the SDWA

The National Primary Drinking Water Regulations (NPDWRs) promulgated prior to the 1996 SDWA Amendments include both maximum contaminant levels (MCLs) and treatment techniques. For the NPDWRs where an MCL was promulgated, Section 1412(b)(4)(B) of the SDWA required EPA to set the MCL as close to the maximum contaminant level goal as is feasible. For the NPDWRs where a treatment technique was promulgated, Section 1412(b)(7)(A) of the SDWA specified the conditions under which the Administrator can promulgate a treatment technique in lieu of an MCL. In those cases, the Administrator must identify those treatment techniques which, in the Administrator's judgement, would prevent known or anticipated adverse effects on the health of persons to the extent feasible. Section 1412(b)(4)(D) of the SDWA states that ''the term 'feasible' means feasible with the use of the best technology, treatment techniques and other means which the Administrator finds, after examination for efficacy under field conditions and not solely under laboratory conditions, are available (taking cost into consideration).''

The cost assessments for the feasibility determinations have historically been based upon impacts to regional and large metropolitan water systems serving populations greater than 50,000 persons. This standard was established when the SDWA was enacted in 1974 [H.R. Rep. No. 93–1185 at 118 (1974)] and when the Act was amended in 1986 [132 Cong. Rec. S6287 (May 21, 1986)]. Since large systems served as the basis for the feasibility determinations, the technical and/or cost considerations associated with these technologies often made them inappropriate or unavailable for small water systems. The 1996 amendments to the SDWA specifically require EPA to make small system technology assessments for both existing and future regulations.

B. Small Systems Options: Compliance and Variance Technologies

For the evaluation of technologies, the SDWA identifies three categories of small systems. The categories are defined in Section 1412(b)(4)(E)(ii) and are as follows: public water systems serving (1) a population of 10,000 or fewer but more than 3,300; (2) a population of 3,300 or fewer but more than 500; and (3) a population of 500 or fewer but more than 25. The SDWA directs EPA to make technology assessments for each of these three size categories in all future regulations establishing an MCL or treatment technique. In addition, SDWA identifies two classes of technologies for small systems for future National Primary Drinking Water Regulations (NPDWRs): compliance technologies and variance technologies. A compliance technology may refer to both a technology or other means that is affordable and that achieves compliance with the maximum contaminant level (MCL) and to a technology or other means that satisfies a treatment technique requirement. Possible compliance technologies include packaged or modular systems and point-of-entry (POE) or point-of-use (POU) treatment units [see Section 1412(b)(4)(E)(ii)]. Variance technologies are only specified for those system size/source water quality combinations for which there are no listed compliance technologies [Section 1412(b)(15)(A)]. Thus, the listing of a compliance technology for a size category/source water combination prohibits the listing of variance technologies for that combination. While variance technologies may not achieve compliance with the MCL or treatment technique requirement, they must achieve the maximum reduction or inactivation efficiency that is affordable considering the size of the system and the quality of the source water. Variance technologies must also achieve a level of contaminant reduction that is protective of public health [Section 1412(b)(15)(B)].

There are two mandatory lists of compliance technologies that will be developed for the existing MCL and treatment technique rules. By August 6, 1997, the Administrator was required to list technologies that meet the surface water treatment rule (SWTR) for each of the three size categories [Section 1412(b)(4)(E)(v)]. This deadline was met and the list was published in the **Federal Register** on August 11, 1997. By August 6, 1998, after consultation with the States, the Administrator must issue a list of technologies that achieve compliance with the MCLs or treatment technique requirements for other existing NPDWRs. By August 6, 1998, after consultation with the States, the Administrator must issue, if applicable, guidance or regulations for variance technologies for the existing NPDWRs for which a small system variance can be granted. When variance technologies are listed, EPA must provide any assumptions used in determining affordability, taking into consideration the number of persons served by such systems [Section 1412(b)(15)(C)]. Small system variances are not available for all contaminants [see Section 1415(e)(6)]. When small system variances are not available under the SDWA, variance technologies will not be listed.

Although the statute is silent concerning whether small system compliance technologies for existing regulations should be affordable, EPA believes that the better approach under the statute is that affordability should be evaluated for future regulations and

existing regulations where the statute allows variance technologies. If the candidate technologies are not evaluated against an affordable technology criterion, then compliance technologies would exist for all of the existing regulations regardless of the source water quality. The existing best available technologies (BATs) or treatment techniques would become the compliance technologies for small systems, which was the case prior to the 1996 Amendments. EPA does not believe that result to be what Congress intended. As a result, EPA will evaluate small system technologies against an affordable technology criterion for those existing regulations where small system variances or variance technologies are not prohibited by the SDWA. When affordable compliance technologies are identified for these contaminants, technologies that can achieve compliance but did not meet the affordability criterion will also be identified. This is consistent with EPA's approach to the compliance technology list for the SWTR and the views of stakeholders. EPA will list these technologies and indicate that they did not pass the affordable technology criterion rather than limit the information on options available to systems. For those regulations where the SDWA prohibits small system variances or variance technologies, affordability will not be considered in the evaluation of compliance technologies because there would be no function to doing so (all systems subject to the rule must comply).

All of the 80 currently regulated contaminants were considered in forming the compliance technology lists. Compliance technologies have not been listed for aldicarb, aldicarb sulfoxide, aldicarb sulfone, and nickel since the NPDWRs for these contaminants are not in effect. All of the 80 currently regulated contaminants either have affordable compliance technologies or are not eligible for variance technologies because of prohibitions in the SDWA. Thus, there are no variance technologies listed for the currently regulated contaminants in this listing. The rationale for not listing any variance technologies is described in Section IV. Section IV also contains a discussion on EPA's perspective regarding future revisions to these listings.

The SDWA, as amended, does not specify the format for the compliance technology lists. Section 1412(b)(15)(D) does state that the variance technology lists can be issued either through guidance or regulations. Moreover, the lists provided in today's notice are informational and interpretive and do not require changes to the associated National Primary Drinking Water Regulations. Thus, EPA believes the compliance technology lists issued today are appropriately provided through this notice and the referenced guidance documents rather than through rulemaking.

C. Small System Compliance Technology Lists and Product-Specificity

The small system compliance lists will not be product-specific since EPA's Office of Ground Water and Drinking Water does not have the resources to review each product for each potential application, nor does EPA feel it would be appropriate to do so. However, information on specific products may soon be available through another mechanism. The EPA Office of Research and Development has a pilot project under the Environmental Technology Verification (ETV) Program to provide technology purchasers with performance data generated by independent third parties. The EPA and National Sanitation Foundation (NSF) International are cooperatively organizing and conducting this pilot project in part to address the needs of community water systems for verification testing of packaged drinking water treatment systems. The ETV pilot project includes development of verification protocols and test plans, independent testing and validation of packaged equipment, government/industry partnerships to obtain credible cost and performance data, and preparation of product verification reports for wide-spread dissemination.

II. Update to the Small System Compliance Technology List for the Surface Water Treatment Rule and Total Coliform Rule

A. Small System Compliance Technology List for the Surface Water Treatment Rule (SWTR)

A1. Overview

The Small System Compliance Technology List for the SWTR was published in the **Federal Register** on August 11, 1997 (62 Fed. Reg., 42987). The August 1997 notice announced that the SWTR list would be updated in 1998. This notice provides this update to the SWTR list and announces the upcoming release of the updated supporting guidance document.

A2. Description of Updated SWTR List

This update contains information on applicability ranges and other issues that a water system should consider prior to selecting a disinfection or filtration technology. The level of detail that is provided concerning these factors was discussed at a public meeting concerning technologies for small drinking water systems held on May 18 and 19, 1998 in Washington, D.C. Additional information that is incorporated into this list of compliance technologies includes: (1) influent water quality range and considerations; (2) an evaluation of microbial (Giardia and viruses) log removal credits for technologies not originally listed in the SWTR; and (3) additional technical limitations. The guidance manual contains information on operation and maintenance requirements, waste disposal, potential disinfection by-products and other technical concerns related to finished water quality.

EPA has revised the listing for one of the disinfection technologies on the 1997 list. EPA has recharacterized ''mixed oxidant disinfection'' as ''on-site oxidant generation'' in the 1998 compliance technology list for the SWTR. In this process, an electric current is passed through a continuous-flow brine (salt) solution within a cell. After dilution, the electrolyzed brine solution containing the concentrated disinfectant is injected into the water for treatment. Recent research has not determined that additional oxidants other than free chlorine are produced to a significant degree by this process. The guidance manual contains additional detail on the recharacterization of this technology.

EPA also evaluated several new or ''emerging'' disinfection and filtration technologies that merit consideration for small system application. The disinfection technologies that were evaluated were: advanced oxidation or ''perozone'' (the combined use of ozone and hydrogen peroxide), pulsed ultraviolet radiation (UV), and ultraviolet oxidation (the combined use of UV and chemical oxidants). EPA has determined that these technologies should still be classified as ''emerging technologies'' due to (1) lack of data on microorganism inactivation rates and (2) insufficient data regarding their performance in small systems. EPA will further evaluate these technologies as information becomes available for possible inclusion in a future update to the compliance technology list for the SWTR. The guidance manual contains a more detailed discussion of the data needs for these technologies. Backwashable depth filters was the one form of filtration technology that was evaluated. Backwashable depth filters were found viable for small systems and

were added to the compliance technology list for the SWTR.

EPA is not listing point-of-use (POU) and point-of-entry (POE) devices as compliance technologies for the SWTR. The 1996 SDWA specifically prohibits POU devices as compliance technologies for microbial contaminants [Section 1412(b)(4)(E)(ii)]. While POE devices are not prohibited, there are several difficulties that would need to be overcome and questions answered before POE devices could be considered as viable treatment options for microbial contaminants. For instance, how would disinfection be applied? The National Research Council, a principal operating agency of the National Academy of Sciences, advises that POE devices not be used for disinfection purposes since ''control of acute disease should be accomplished with the highest feasible degree of competence.'' (National Research Council. *Safe Water From Every Tap: Improving Water Service to Small Communities*. National Academy Press. Washington, D.C. 1997.) Since disinfection following filtration is considered good engineering practice, the absence of disinfection following POE filtration devices presents an obstacle to the use of these devices for these purposes. Finally, if POE devices were used in spite of such considerations, what would be the required monitoring frequency? Since microbial contaminants pose potential acute health threats, monitoring requirements would necessarily be extensive. In light of this difficulty, monitoring requirements alone may make POE devices inapplicable as small systems technologies for SWTR compliance.

Future lists may be expanded to include additional technologies as current performance informational deficiencies are addressed. The SWTR small system compliance technology list will continue to evolve over time as updates are published.

B. Compliance Technologies for the Total Coliform Rule (TCR)

EPA promulgated the TCR in June 1989. The TCR contains a listing of ''best technologies, treatment techniques, or other means available for achieving compliance with the maximum contaminant level (MCL) for total coliforms'' [40 CFR § 141.63 (d)]. At the time these techniques were codified, no specific notation as to applicability to categories of public water system size was included. However, as discussed above, with passage of the Safe Drinking Water Act Amendments of 1996, EPA is to specify compliance technologies for three small water system size categories, defined by the Act as those serving 10,000–3,301 persons; 3,300–501 persons; and 500–25 persons.

EPA presented stakeholders with a proposed TCR compliance technology list at the May 1998 meeting. This proposed listing was essentially the same as the means of compliance listed in the final TCR. EPA has received no substantive comments on the listing or technical information that would warrant a substantive change to the means of compliance specified in 1989. Therefore, the Agency is listing the same treatment techniques and other means for small systems compliance as were codified in the 1989 rule. Under SDWA, variances are not allowed for regulations that control microbiological contamination; thus there are no variance technologies for this rule.

C. Availability of a Guidance Document Regarding This List

This list is supported by the updated guidance document entitled ''Small System Compliance Technology List for the Surface Water Treatment Rule and Total Coliform Rule'' that will be released on September 15, 1998. The guidance document is organized into several chapters describing the listed small system compliance technologies for the SWTR and TCR. Chapter 1 discusses the requirements of the 1996 amendments to the SDWA and the approach EPA followed to meet those requirements. Chapter 2 discusses the list of technologies that were evaluated for the compliance technology list. Chapter 3 discusses the compliance technologies for the Total Coliform Rule. Chapter 4 discusses emerging technologies and issues for further considerations.

D. May 18–19, 1998 Stakeholder Meeting

EPA held a stakeholder meeting on May 18 and 19, 1998. The meeting took place at RESOLVE, 1255 23rd Street, N.W., Washington, D.C. Approximately 50 people registered and participated at the meeting. Stakeholders included representatives from public water utilities, state regulatory agencies, public interest groups, the public health community, research community, equipment manufacturers and other related industries. At the meeting, EPA presented the proposed draft 1998 listings for the SWTR and TCR to stakeholders. The main discussions centered on EPA's tabulations of listed and ''emerging'' technologies for the SWTR, and to a lesser extent on TCR technologies. The tables provided detailed information as researched by EPA on the following subject areas: treatment efficacy, including ranges of microbial inactivation; treatment complexity and operator skill levels required; byproducts formed (both chemical and physical byproducts of treatment); raw water quality concerns; and other important limitations of the listed treatments. Stakeholder discussions were fruitful and resulted in several proposed changes to EPA's draft listing. Proposed changes included the following:

- Stakeholders suggested that EPA group several of the ''emerging'' technologies into the ''advanced oxidation'' heading; and, that modifications to traditional ultraviolet radiation be grouped together as ''advanced ultraviolet'' treatment.
- Stakeholders generally agreed with EPA that the above-referenced advanced treatments should still be considered ''emerging'' due to some gaps in information, such as the lack of availability of treatment efficacy data and/or operational data in a small systems or drinking water setting. It was also noted that the above-cited EPA/NSF verification program may provide results on the testing of some of the disinfection technologies later in the year, which may be reviewed prior to the next listing for the subject microbial regulations.
- EPA was advised to include the caveat that bag filters should be handled carefully due to the fragility of the materials, and that seals on cartridge filters can be damaged and require special attention.
- EPA was advised that, in reference to bag and cartridge filtration, it would not be advisable to specify maximum raw water turbidity levels (i.e., the 2 to 3 nephelometric turbidity units (NTU) cited). Such limits may be more a function of pretreatment and system economy, and that levels up to 10–30 NTU have been treated successfully.
- EPA was advised that many U.S. small drinking water systems are currently using ozonation for primary disinfection and that the International Ozone Association has recently compiled and presented operational case study data (a tabulated listing and presentation by R. Rice at the May 1998 NSF/WHO/PAHO Small Systems Symposium were provided to EPA); however, it is generally believed that ''advanced'' combinations involving ozone have yet to be demonstrated for small systems and that they may in fact not be practical for small systems. Ozone representatives also pointed out that previously cited cleaning problems have been largely overcome in the past 5 years due to use of pure oxygen feeds

(in lieu of air feed) in the newer ozone generators.

- Many stakeholders have indicated that an annual update to the SWTR listing of technologies would be appropriate in order to capture any developments in the treatment technology field.
- No specific changes or substantive comments were received relative to the proposed TCR listing of compliance technologies,.

This 1998 list and the supporting guidance document reflect the input from stakeholders.

E. List of Compliance Technologies for the SWTR and TCR

The following tables contain the 1998 list of compliance technologies for the SWTR and the TCR for the three small system size categories. A more detailed description of each technology can be found in the guidance document. The three population size categories of small public water systems as defined in the SDWA are those serving: 10,000–3,301 persons, 3,300–501 persons, and 500–25 persons. The technologies are listed for all three size categories; however, systems should examine the ''Limitations'' column before selecting a technology. This column contains information that could limit the applicability of the technology for some systems within a size category or categories. Water treatment plant operator skill requirements vary with each piece of unit technology. The tables for filtration and disinfection technologies include a skill level for each technology ranging from basic to advanced. For a piece of unit technology that requires ''basic operator skill'', an operator with minimal experience in the water treatment field can perform the necessary system operation and monitoring if provided with written instruction. ''Intermediate operator skill'' implies that the operator understands the principles of water treatment and has a knowledge of the regulatory framework. ''Advanced operator skill'' implies that the operator possesses a thorough understanding of the principles of system operation, including water treatment and regulatory requirements. The ''operator skill level required'' column in the tables refers to the skill level needed for the unit technology. If pretreatment is required, the required operator skill levels will likely increase.

These lists will be updated in August 1999 if new information becomes available. The updated list would include new technologies or additional information on existing technologies. A description of each technology can be found in the guidance document. The water quality issues and technology limitations noted for the technologies in this notice are general limitations. The guidance manual contains site-specific limitations and water quality issues that systems should consider before selecting a treatment technology. The guidance manual also contains additional information on the by-products produced by the disinfection technologies and the waste generated by filtration processes.

TABLE 1.—SWTR COMPLIANCE TECHNOLOGY TABLE: DISINFECTION

Unit technology	Limitations (see footnotes)	Operator skill Level Required	Raw water quality range and considerations	Removals: Log Giardia & Log Virus w/ CT's indicated in () [1]
Free Chlorine	(a, b)	Basic	Better with high quality. High iron or manganese may require sequestration or physical removal.	3 log (104) & 4 log (6).
Ozone	(c, d)	Intermediate	Better with high quality. High iron or manganese may require sequestration or physical removal.	3 log (1.43) & 4 log (1.0).
Chloramines	(e)	Intermediate	Better with high quality. Ammonia dose should be tempered by natural ammonia levels in water.	3 log (1850) & 4 log (1491).
Chlorine Dioxide	(f)	Intermediate	Better with high quality	3 log (23) & 4 log (25).
On-Site Oxidant Generation.	(g)	Basic	Better with high quality	Research pending on CT values. Use free chlorine.
Ultraviolet Radiation	(h)	Basic	Relatively clean source water required. Iron, natural organic matter and turbidity affect UV dose.	1 log Giardia (80–120) & 4 log viruses (90–140) mWsec/cm2 doses in parentheses [2].

[1] CT (Concentration x Time), in mg-min/L, based upon 1989 Surface Water Treatment Rule Guidance Manual. Temp. 10 C, mid-pH range, unless otherwise indicated.

[2] UV dose is product of mW/cm2 (intensity) x sec (time); bases of viral inactivation ranges are rotavirus and MS–2 tests .

Limitations Footnotes to Table 1: SWTR Compliance Technology Table: Disinfection

[a] Providing adequate CT (time /storage) may be a problem for some supplies.

[b] Chlorine gas requires special caution in handling and storage, and operator training.

[c] Ozone leaks represent hazard: air monitoring required.

[d] Ozone used as primary disinfectant (i.e., no residual protection).

[e] Long CT. Requires care in monitoring of ratio of added chlorine to ammonia.

[f] Chlorine dioxide requires special storage and handling precautions.

[g] Oxidants other than chlorine not detected in solution by significant research effort. CT should be based on free chlorine until new research determines appropriate CT values for electrolyzed salt brine.

[h] No disinfectant residual protection for distributed water.

TABLE 2.—SWTR COMPLIANCE TECHNOLOGY TABLE: FILTRATION

Unit technology	Limitations (see footnotes)	Operator skill level required	Raw water quality range and considerations	Removals: Log Giardia & Log Virus
Conventional Filtration (includes dual-stage and dissolved air flotation).	(a)	Advanced	Wide range of water quality. DAF more applicable for removing particulate matter that doesn't readily settle: algae, high color, low turbidity (up to 30–50 NTU) and low-density turbidity.	2–3 log Giardia & 1 log viruses.

TABLE 2.—SWTR COMPLIANCE TECHNOLOGY TABLE: FILTRATION—Continued

Unit technology	Limitations (see footnotes)	Operator skill level required	Raw water quality range and considerations	Removals: Log Giardia & Log Virus
Direct Filtration (includes in-line filtration).	(a)	Advanced	High quality. Suggested limits: average turbidity 10 NTU; maximum turbidity 20 NTU; 40 color units; algae on a case-by-case basis.[1].	0.5 log Giardia & 1–2 log viruses (1.5–2 log Giard. w/coagulation).
Slow Sand Filtration	(b)	Basic	Very high quality or pre-treatment. Pre-treatment required if raw water is high in turbidity, color, and/or algae.	4 log Giardia & 1–6 log viruses.
Diatomaceous Earth Filtration.	(c)	Intermediate	Very high quality or pre-treatment. Pre-treatment required if raw water is high in turbidity, color, and/or algae.	''Very effective'' for Giardia; low bacteria and virus removal.
Reverse Osmosis	(d, e, f)	Advanced	Requires pre-filtrations for surface water—may include removal of turbidity, iron, and/or manganese. Hardness and dissolved solids may also affect performance.	Very effective (cyst and viruses).
Nanofiltration	(e)	Intermediate	Very high quality of pre-treatment. See reverse osmosis pre-treatment.	Very effective (cyst and viruses).
Ultrafiltration	(g)	Basic	High quality or pre-treatment	Very effective Giardia, >5–6.
Microfiltration	(g)	Basic	High quality or pre-treatment required	Very effective Giardia, >5–6 log; Partial removal viruses.
Bag Filtration	(g, h, i)	Basic	Very high quality or pre-treatment required, due to low particulate loading capacity. Pre-treatment if high turbidity or algae.	Variable Giardia removals & Disinfection required for virus credit.
Cartridge Filtration	(g, h, i)	Basic	Very high quality or pre-treatment required, due to low particulate loading capacity. Pre-treatment if high turbidity or algae.	Variable Giardia removals & Disinfection required for virus credit.
Backwashable Depth Filtration.[3].	(g, h, i)	Basic	Very high quality or pre-treatment required, due to low particulate loading capacity. Pre-treatment if high turbidity or algae.	Variable Giardia removals & Disinfection required for virus credit.

[1] National Research Council, Committee on Small Water Supply Systems. ''Safe Water From Every Tap: Improving Water Service to Small Communities.'' National Academy Press, Washington, D.C. 1997.

[2] Adham, S.S., Jacangelo, J.G., and Laine, J.M. ''Characteristics and Costs of MF and UF Plants.'' *Journal American Water Works Association*, May 1996.

[3] New technology added by this notice.

Limitations Footnotes to Table 2: SWTR Compliance Technology Table: Filtration

[a] Involves coagulation. Coagulation chemistry requires advanced operator skill and extensive monitoring. A system needs to have direct full-time access or full-time remote access to a skilled operator to use this technology properly.

[b] Water service interruptions can occur during the periodic filter-to-waste cycle, which can last from six hours to two weeks.

[c] Filter cake should be discarded if filtration is interrupted. For this reason, intermittent use is not practical. Recycling the filtered water can remove this potential problem.

[d] Blending (combining treated water with untreated raw water) cannot be practiced at risk of increasing microbial concentrations in finished water.

[e] Post-disinfection recommended as a safety measure and for residual maintenance.

[f] Post-treatment corrosion control will be needed prior to distribution.

[g] Disinfection required for viral inactivation.

[h] Site-specific pilot testing prior to installation likely to be needed to ensure adequate performance.

[i] Technologies may be more applicable to system serving fewer than 3,300 people.

TABLE 3.—COMPLIANCE TECHNOLOGY TABLE FOR THE TOTAL COLIFORM RULE

40 CFR §141.63(d)—Best technologies or other means to comply (Complexity level indicated)	Comments/Water quality concerns
Protection of wells from contamination, i.e., placement and construction of well(s) (Basic).	Ten States Standards and other standards (AWWA A100–90) apply; interfacing with other programs essential (e.g., source water protection program).
Maintenance of a disinfection residual for distribution system protection (Intermediate).	Source water constituents may affect disinfection: iron, manganese, organics, ammonia, other factors may affect dosage and water quality. TCR remains unspecific on type/amount of disinfectant, as each type differs in concentration, time, temperature, pH, interaction with other constituents, etc.
Proper maintenance of distribution system: pipe repair/replacement, main flushing programs, storage/reservoir and O&M programs (including cross-connection control/ backflow prevention), and maintenance of positive pressure throughout (Intermediate).	O&M programs particularly important for smaller systems needing to maintain water purity. States may vary on distribution protection measures. See also EPA's Cross-Connection Control Manual (# EPA 570/9–89–007).

TABLE 3.—COMPLIANCE TECHNOLOGY TABLE FOR THE TOTAL COLIFORM RULE—Continued

40 CFR §141.63(d)—Best technologies or other means to comply (Complexity level indicated)	Comments/Water quality concerns
Filtration and/or Disinfection of surface water or other groundwater under direct influence; or disinfection of groundwater (Basic thru Advanced).	Same issues as cited above under maintaining disinfection residual; pretreatment requirements affect complexity of operation. Refer to SWTR Compliance Technology List; and other regulations under development.
Groundwaters: Compliance with State Well-Head Protection Program (Intermediate).	EPA/State WHPP implementation (per §1428 SDWA): may be used to assess vulnerability to contamination, and in determination of sampling and sanitary survey frequencies.

III. Small System Compliance Technology Lists for the Non-Microbial Contaminants Regulated Before 1996

A. Overview

This notice announces the Small System Compliance Technology List for the non-microbial contaminants regulated before 1996. The list is divided by contaminant type into lists for inorganics (IOCs), volatile organic compounds (VOCs), pesticides and other synthetic organic compounds (SOCs), and radionuclides. Technologies for the removal of these contaminants were evaluated for performance and applicability to small systems. Criteria for evaluation included availability of published performance assessments, general limitations to use by the various small systems size categories, raw water quality requirements, and required operator skill level.

There is one noteworthy group of technologies included on the compliance technology lists for IOCs, SOCs, and radionuclides. Point-of-use (POU) devices have been identified as compliance technologies. Section 1412(b)(4)(E)(ii) of the SDWA identifies POU treatment units as an option for compliance technologies. This section also identifies Point-of-Entry (POE) devices as a compliance technology option. Section 1412(b)(4)(E)(ii) stipulates that ''point-of-entry and point-of-use treatment units shall be owned, controlled, and maintained by the public water system or by a person under contract with the public water system to ensure proper operation and maintenance and compliance with the MCL or treatment technique and equipped with mechanical warnings to ensure that customers are automatically notified of operational problems.'' Other conditions in this section of the SDWA include: ''If the American National Standards Institute has issued product standards applicable to a specific type of POE or POU treatment unit, individual units of that type shall not be accepted for compliance with a MCL or treatment technique unless they are independently certified in accordance with such standards.''

In order to list POU treatment units as compliance technologies, EPA had to delete the part of 40 CFR 141.101 that prohibited POU devices to be used to comply with an MCL. A final rule was published in the **Federal Register** on June 11, 1998 deleting the prohibition on the use of POU devices as compliance technologies. As previously mentioned, POU devices are listed as compliance technologies for IOCs, SOCs, and radionuclides. POU devices are not listed for VOCs because they do not address all routes of exposure. POE devices are still considered emerging technologies because of waste disposal and cost considerations. POE devices may be included on an updated list in 1999. For more detail on POU and POE devices, see the guidance manual entitled ''Compliance Technology List for Non-Microbial Contaminants Regulated Before 1996'' and the supporting document entitled ''Cost Evaluation of Small System Compliance Options: Point-of-Use and Point-of-Entry Treatment Units.''

Technologies for which sufficient information exists for evaluations are listed as compliance technologies. Those for which incomplete information exists, but which appear promising enough to be further evaluated, are listed as ''emerging technologies.'' Emerging technologies are only included in the guidance manuals. These compliance technology lists will be updated in 1999 if new information becomes available. The updated lists will provide further information on the listed compliance technology lists and may include additional technologies. In general, all of the compliance technology lists will continue to evolve over time as information is made available and as updates are published.

B. Availability of a Guidance Document

The guidance document supporting these lists is entitled ''Small System Compliance Technology List for the Non-Microbial Contaminants Regulated Before 1996.'' The document may be obtained from EPA by calling the Safe Drinking Water Hotline at (800) 426–4791 after September 15, 1998. It is also accessible via the Internet at <www.epa.gov/OGWDW/Pubs/index.html> after September 15, 1998.

The guidance document is divided into chapters describing the SDWA requirements concerning the list, the technologies being evaluated, along with the criteria and other information necessary for evaluation, the annotated list of technologies chosen as compliance technologies, and the annotated list of technologies that require further evaluation. EPA expects to update this guidance document in 1999.

C. Compliance Technology List for the Non-Microbial Contaminants Regulated Before 1996

The following tables contain the initial list of compliance technologies for the three small system size categories for the non-microbial contaminants regulated before 1996: Inorganic contaminants (IOCs), volatile organic contaminants (VOCs), synthetic organic contaminants (SOCs), and radionuclides. A discussion of each technology can be found in the guidance document along with a more detailed analysis of technology limitations.

C1. Compliance Technologies for Inorganic Contaminants (IOCs)

Table 4 contains the technologies that have been identified as compliance technologies for at least one IOC. The table contains the same structure as other tables with a list of limitations that are contained in the footnotes and operator skill level and raw water quality issues for general operation of the technology. The guidance manual will have more detailed information on the application of the technologies for particular contaminants.

TABLE 4.—TECHNOLOGIES FOR IOCS

Unit technology	Limitations (see footnotes)	Operator skill level required	Raw water quality range
1. Activated Alumina	(a)	Advanced	Ground waters, Competing anion concentrations will affect run length.
2. Ion Exchange (IX)		Intermediate	Ground waters with low total dissolved solids, Competing ion concentrations will affect run length.
3. Lime Softening	(b)	Advanced	Hard ground and surface waters.
4. Coagulation/Filtration	(c)	Advanced	Can treat wide range of water quality.
5. Reverse Osmosis (RO)	(d)	Advanced	Surface water usually require pre-filtration.
6. Alkaline Chlorination	(e)	Basic	All ground waters.
7. Ozone Oxidation		Intermediate	All ground waters.
8. Direct Filtration		Advanced	Needs high raw water quality.
9. Diatomaceous earth filtration.		Intermediate	Needs very high raw water quality.
10. Granular Activated Carbon.		Basic	Surface waters may require prefiltration.
11. Electrodialysis Reversal		Advanced	Requires prefiltration for surface water.
12. POU—IX	(f)	Basic	Same as Technology #2.
13. POU—RO	(f)	Basic	Same as Technology #5.
14. Calcium Carbonate Precipitation.	(g)	Basic	Waters with high levels of alkalinity and calcium.
15. pH and alkalinity adjustment (chemical feed).	(g)	Basic	All ranges.
16. pH and alkalinity adjustment (limestone contactor).	(h)	Basic	Waters that are low in iron and turbidity. Raw water should be soft and slightly acidic.
17. Inhibitors		Basic	All ranges.
18. Aeration	(i)	Basic	Waters with moderate to high carbon dioxide content.

Limitations Footnotes to the Technology Tables for IOCs

[a] Chemicals required during regeneration and pH adjustment may be difficult for small systems to handle.
[b] Softening chemistry may be too complex for small systems.
[c] It may not be advisable to install coagulation/filtration solely for inorganics removal.
[d] If all of the influent water is treated, post-treatment corrosion control will be necessary.
[e] pH must exceed pH 8.5 to ensure complete oxidation without build-up of cyanogen chloride.
[f] When POU devices are used for compliance, programs for long-term operation, maintenance, and monitoring must be provided by water utility to ensure proper performance (see Section III.A of this notice).
[g] Some chemical feeds require high degree of operator attention to avoid plugging.
[h] This technology is recommended primarily for the smallest size category.
[i] Any of the first five aeration technologies listed for volatile organic contaminants can be used.

The background section indicated that EPA would identify affordable compliance technologies for those existing regulations where small system variances or variance technologies are not prohibited by the SDWA. There are statutory prohibitions against small system variances or variance technologies for 13 of the 17 IOCs. Table 5 contains the compliance technologies for the four IOCs where affordability was considered. Affordability only plays a role in removing some of the options in the smallest size category. The technology costs are based on treatment of all of the water. The technologies that did not meet the affordability criteria in the smallest size category are also identified in the next column called other compliance technologies. These technologies may be affordable if the concentration of the contaminant is low enough that a portion of the influent stream can be treated and blended with an untreated portion to still meet the MCL. Systems and States should consider these options under those circumstances. Table 6 contains the compliance technologies for the remaining thirteen IOCs where affordability was not considered due to statutory prohibitions. The statutory prohibitions on variance technologies and small system variances are discussed in detail in Section IV of this notice.

TABLE 5.—COMPLIANCE TECHNOLOGIES BY SYSTEM SIZE CATEGORY FOR THOSE IOC NPDWRS WHERE AFFORDABILITY IS CONSIDERED

Inorganic Contaminant	Compliance Technologies for System Size Categories (Population Served)			
	25–500 (afford)	25–500 (other)	501–3,300 (afford)	3,301–10,000 (afford)
Antimony	13	4, 5	4, 5, 13	4, 5, 13.
Asbestos	8, 9, 15, 17	4	4, 8, 9, 15, 17	4, 8, 9, 15, 17.
Cyanide	2, 6, 7	5	2, 5, 6, 7	2, 5, 6, 7.
Lead	2, 12, 13, 14, 15, 16, 17, 18.	3, 4, 5	2, 3, 4, 5, 12, 13, 14, 15, 16, 17, 18.	2, 3, 4, 5, 12, 13, 14, 15, 16, 17, 18.

TABLE 6.—COMPLIANCE TECHNOLOGIES BY SYSTEM SIZE CATEGORY FOR THOSE IOC NPDWRS WHERE AFFORDABILITY IS NOT CONSIDERED

Inorganic contaminant	Compliance technologies for system size categories (Population served)		
	25–500	501–3,300	3,301–10,000
Arsenic	1, 2, 3, 4, 5, 11, 12, 13	1, 2, 3, 4, 5, 11, 12, 13	1, 2, 3, 4, 5, 11, 12, 13.
Barium	2, 3, 4, 5, 11, 12, 13	2, 3, 4, 5, 11, 12, 13	2, 3, 4, 5, 11, 12, 13.
Beryllium	1, 2, 3, 4, 5, 12, 13	1, 2, 3, 4, 5, 12, 13	1, 2, 3, 4, 5, 12, 13.
Cadmium	2, 3, 4, 5, 12, 13	2, 3, 4, 5, 12, 13	2, 3, 4, 5, 12, 13.
Chromium	2, 3,[a] 4, 5, 12, 13	2, 3,[a] 4, 5, 12, 13	2, 3,[a] 4, 5, 12, 13.
Copper	2, 3, 4, 5, 12, 13, 15, 16, 17, 18	2, 3, 4, 5, 12, 13, 15, 16, 17, 18	2, 3, 4, 5, 12, 13, 15, 16, 17, 18.
Fluoride	1, 5, 13	1, 5, 13	1, 5, 13.
Mercury	3,[b] 4,[b] 5,[b] 10	3,[b] 4,[b] 5,[b] 10	3,[b] 4,[b] 5,[b] 10.
Nitrate	2, 5, 11	2, 5, 11	2, 5, 11.
Nitrite	2, 5	2, 5	2, 5.
Nitrate + Nitrite	2, 5, 11	2, 5, 11	2, 5, 11.
Selenium	1, 2,[c] 3, 4,[d] 5, 11,[d] 13	1, 2,[c] 3, 4,[d] 5, 11,[d] 13	1, 2,[c] 3, 4,[d] 5, 11,[d] 13.
Thallium	1, 2, 12	1, 2, 12	1, 2, 12.

Footnotes for Table 6: Compliance Technologies for IOCs (affordability not considered)

[a] Compliance technology for Chromium III only.
[b] Compliance technologies only when influent mercury concentrations ≤ 10 μg/L.
[c] Compliance technology for Selenium VI only.
[d] Compliance technology for Selenium IV only.

C2. Compliance Technologies for Volatile Organic Contaminants (VOCs)

Table 7 contains the technologies that have been identified as compliance technologies for at least one VOC. The table contains the same structure as other tables with a list of limitations that are contained in the footnotes and operator skill level and raw water quality issues.

TABLE 7.—TECHNOLOGIES FOR VOCS

Unit technology	Limitations (see footnotes)	Operator skill level required [1]	Raw water quality range [1]
1. Packed Tower Aeration (PTA)	([a])	Intermediate	All ground waters.
2. Diffused Aeration	([a b])	Basic	All ground waters.
3. Multi-Stage Bubble Aerators	([a c])	Basic	All ground waters.
4. Tray Aeration	([a d])	Basic	All ground waters.
5. Shallow Tray Aeration	([a e])	Basic	All ground waters.
6. Spray Aeration	([a f])	Basic	All ground waters.
7. Mechanical Aeration	([a g])	Basic	All ground waters.
8. Granular Activated Carbon (GAC).	([h])	Basic	All ground waters.

[1] National Research Council (NRC). Safe Water from Every Tap: Improving Water Service to Small Communities. National Academy Press. Washington, DC. 1997.

Limitations Footnotes to the Technology Tables for VOCs

[a] Pretreatment for the removal of microorganisms, iron, manganese, and excessive particulate matter may be needed. Post-treatment disinfection may have to be used.
[b] May not be as efficient as other aeration methods because it does not provide for convective movement of the water thus limiting air-water contact. It is generally used only to adapt existing plant equipment.
[c] These units are highly efficient, however the efficiency depends upon the air-to-water ratio.
[d] Costs may increase if a forced draft is used. Slime and algae growth can be a problem, but can be controlled with chemicals such as copper sulfate or chlorine.
[e] These units require high air/water ratios (100–900 m^3/m^3)
[f] For use only when low removal levels are needed to reach an MCL because these systems may not be as energy efficient as other aeration methods because of the contacting system.
[g] For use only when low removal levels are needed to reach an MCL because these systems may not be as energy efficient as other aeration methods because of the contacting system. The units often require large basins, long residence times, and high energy inputs which may increase costs.
[h] See the SOCs compliance technology table for limitation regarding these technologies.

The background section indicated that EPA would identify affordable compliance technologies for those existing regulations where small system variances or variance technologies are not prohibited by the SDWA. There are statutory prohibitions against small system variances or variance technologies for 2 of the 21 VOCs. Table 8 contains the compliance technologies for the 19 VOCs where affordability was considered. Affordability only plays a role in removing options in the smallest size category. The technology costs are based on treatment of all of the water. The technologies that did not meet the affordability criteria in the smallest size category are also identified in the next column called ''other compliance technologies.'' These technologies may be affordable if the concentration of the contaminant is low enough that a portion of the influent stream can be treated and blended with an untreated portion to still meet the MCL. This blending would reduce both the capital and operating and maintenance costs of the process. Systems and States should consider these options under those circumstances. Table 9 contains the compliance technologies for the remaining two VOCs where affordability was not considered due to statutory prohibitions. The statutory prohibitions on variance technologies and small system variances are discussed in detail in Section IV of this notice.

TABLE 8.—COMPLIANCE TECHNOLOGIES BY SYSTEM SIZE CATEGORY FOR THOSE VOC NPDWRS WHERE AFFORDABILITY IS CONSIDERED

Volatile organic contaminant	Compliance technologies for system size categories (Population served)			
	25–500 (afford)	25–500 (other)	501–3,300 (afford)	3,301–10,000 (afford)
Benzene	1, 2, 3, 4, 5	8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.
Carbon Tetrachloride	1, 2, 3, 4, 5	8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.
Chlorobenzene	1, 2, 3, 4, 5, 6, 7	8	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 4, 5, 6, 7, 8.
cis-1,2-Dichlorobenzene	1, 2, 3, 4, 5	8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.
1,2-Dichloroethane	1, 2, 3, 4, 5	8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.
1,1-Dichloroethylene	1, 2, 3, 4, 5	8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.
Dichloromethane	1, 2, 3, 4, 5	8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.
1,2-Dichloropropane	1, 2, 3, 4, 5	8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.
Ethylbenzene	1, 2, 3, 4, 5	8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.
o-Dichlorobenzene	1, 2, 3, 4, 5	8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.
p-Dichlorobenzene	1, 2, 3, 4, 5	8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.
Tetrachloroethylene	1, 2, 3, 4, 5	8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.
Toluene	1, 2, 3, 4, 5	8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.
trans-1,2-Dichloroethylene	1, 2, 3, 4, 5	8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.
1,2,4-Trichlorobenzene	1, 2, 3, 4, 5	8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.
1,1,1-Trichloroethane	1, 2, 3, 4, 5, 6	8	1, 2, 3, 4, 5, 6, 8	1, 2, 3, 4, 5, 6, 8.
1,1,2-Trichloroethane	1, 2, 3, 4, 5,	8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.
Trichloroethylene	1, 2, 3, 4, 5, 6, 7	8	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 4, 5, 6, 7, 8.
Xylenes (total)	1, 2, 3, 4, 5	8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.

TABLE 9.—COMPLIANCE TECHNOLOGIES BY SYSTEM SIZE CATEGORY FOR THOSE VOC NPDWRS WHERE AFFORDABILITY IS NOT CONSIDERED

Volatile organic contaminant	Compliance technologies for system size categories (Population served)		
	25–500	501–3,300	3,301–10,000
Styrene	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.
Vinyl Chloride	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8	1, 2, 3, 4, 5, 8.

C3. Compliance Technologies for SOCs (Pesticides and Other SOCs).

Table 10 contains the technologies that have been identified as compliance technologies for at least one SOC. The table contains the same structure as other tables with a list of limitations that are contained in the footnotes and operator skill level and raw water quality issues.

TABLE 10.—TECHNOLOGIES FOR SOCS

Unit technology	Limitations (see footnotes)	Operator skill level required [1]	Raw water quality range and considerations [1]
1. Granular Activated Carbon (GAC).		Basic	Surface water may require pre-filtration.
2. Point of Use (POU) GAC	(a)	Basic	Surface water may require pre-filtration.
3. Powdered Activated Carbon	(b)	Intermediate	All waters.
4. Chlorination	(c)	Basic	Better with high quality water.
5. Ozonation	(c)	Basic	Better with high quality waters.
6. Packed Tower Aeration (PTA)	(d)	Intermediate	All ground waters.
7. Diffused Aeration	(d, e)	Basic	All ground waters.
8. Multi-Stage Bubble Aerators	(d f)	Basic	All ground waters.
9. Tray Aeration	(d g)	Basic	All ground waters.
10. Shallow Tray Aeration	(d f)	Basic	All ground waters.

[1] National Research Council (NRC). Safe Water from Every Tap: Improving Water Service to Small Communities. National Academy Press. Washington, DC. 1997.

Limitations footnotes for Table 10: Technologies for SOCs

[a] When POU devices are used for compliance, programs for long-term operation, maintenance, and monitoring must be provided by water utility to ensure proper performance (see Section III.A of this notice).

[b] Most applicable to small systems that already have a process train including basins mixing, precipitation or sedimentation, and filtration. Site specific design should be based on studies conducted on the system's particular water.

[c] See the SWTR compliance technology tables for limitations associated with this technology.

[d] Pretreatment for the removal of microorganisms, iron, manganese, and excessive particulate matter may be needed. Post-treatment disinfection may have to be used.

[e] May not be as efficient as other aeration methods because it does not provide for convective movement of the water thus limiting air-water contact. It is generally used only to adapt existing plant equipment.

[f] This units are highly efficient, however the efficiency depends upon the air-to-water ratio.

[g] Costs may increase if a forced draft is used.

The background section indicated that EPA would identify affordable compliance technologies for those existing regulations where small system variances or variance technologies are not prohibited by the SDWA. There are statutory prohibitions against small system variances or variance technologies for 14 of the 32 SOCs. Table 11 contains the compliance technologies for the 18 SOCs where affordability was considered. Affordability only plays a role in removing options in the smallest size category. The technology costs are based on treatment of all of the water. The technologies that did not meet the affordability criteria in the smallest size category are also identified in the next column called ''other compliance technologies.'' These technologies may be affordable if the concentration of the contaminant is low enough that a portion of the influent stream can be treated and blended with an untreated portion to still meet the MCL. This blending would reduce both the capital and operating and maintenance costs of the process. Systems and States should consider these options under those circumstances. Table 12 contains the compliance technologies for the remaining fourteen SOCs where affordability was not considered due to statutory prohibitions. The statutory prohibitions on variance technologies and small system variances are discussed in detail in Section IV of this notice.

TABLE 11.—COMPLIANCE TECHNOLOGIES BY SYSTEM SIZE CATEGORY FOR THOSE SOC NPDWRS WHERE AFFORDABILITY IS CONSIDERED

Contaminant	Compliance technologies for system size categories (Population served)			
	25–500 (afford)	25–500 (other)	501–3,300 (afford)	3,301–10,000 (afford)
Alachlor	2, 3[a]	1	1, 2, 3	1, 2, 3.
Atrazine	2, 3	1	1, 2, 3	1, 2, 3.
Carbofuran	2, 3	1	1, 2, 3	1, 2, 3.
Dibromochloropropane	2, 3, 6, 7, 8, 9, 10	1	1, 2, 3, 6, 7, 8, 9, 10	1, 2, 3, 6, 7, 8, 9, 10.
2,4-D	2, 3	1	1, 2, 3	1, 2, 3.
Lindane	2, 3	1	1, 2, 3	1, 2, 3.
Methoxychlor	2, 3	1	1, 2, 3	1, 2, 3.
Pentachlorophenol	2, 3	1	1, 2, 3	1, 2, 3.
Dalapon	2, 3	1	1, 2, 3	1, 2, 3.
Di(2-ethylhexyl) adipate	2, 3, 6, 7, 8, 9, 10	1	1, 2, 3, 6, 7, 8, 9, 10	1, 2, 3, 6, 7, 8, 9, 10.
Di(2-ethylhexyl) phthalate	2, 3	1	1, 2, 3	1, 2, 3.
Dinoseb	2, 3	1	1, 2, 3	1, 2, 3
Diquat	2, 3	1	1, 2, 3	1, 2, 3.
Endothall	2, 3	1	1, 2, 3	1, 2, 3.
Glyphosate	4, 5		4, 5	4, 5.
Hexachlorocyclopentadiene	2, 3, 6, 7, 8, 9, 10	1	1, 2, 3, 6, 7, 8, 9, 10	1, 2, 3, 6, 7, 8, 9, 10.
Picloram	2, 3	1	1, 2, 3	1, 2, 3.
Simazine	2, 3	1	1, 2, 3	1, 2, 3.

[a] This affordability determination assumes that the small system already has the appropriate treatment train in place for mixing, contact, and filtration.

TABLE 12.—COMPLIANCE TECHNOLOGIES BY SYSTEM SIZE CATEGORY FOR THOSE SOC NPDWRS WHERE AFFORDABILITY IS NOT CONSIDERED

Contaminant	Compliance technologies for system size categories (population served)		
	25–500	501–3,300	3,300–10,000
Chlordane	1, 2, 3	1, 2, 3,	1, 2, 3.
Ethylene Dibromide	1, 2, 3, 6, 7, 8, 9, 10	1, 2, 3, 6, 7, 8, 9, 10	1, 2, 3, 6, 7, 8, 9, 10.
Heptachlor	1, 2, 3	1, 2, 3,	1, 2, 3.
Heptachlor Epoxide	1, 2, 3	1, 2, 3,	1, 2, 3.
Polychlorinated Biphenyls	1, 2, 3	1, 2, 3,	1, 2, 3.
Toxaphene	1, 2, 3	1, 2, 3,	1, 2, 3.
2,4,5-TP	1, 2, 3	1, 2, 3,	1, 2, 3.
Benzo(a)pyrene	1, 2, 3	1, 2, 3,	1, 2, 3.
Endrin	1, 2, 3	1, 2, 3,	1, 2, 3.
Hexachlorobenzene	1, 2, 3	1, 2, 3,	1, 2, 3.
Oxamyl	1, 2, 3	1, 2, 3,	1, 2, 3.
2,3,7,8-TCDD (Dioxin)	1, 2, 3	1, 2, 3,	1, 2, 3.
Acrylamide	N/A (treatment technique)	N/A (treatment technique)	N/A (treatment technique).
Epichlorohydrin	N/A	N/A	N/A.

C4. Compliance Technologies for Radionuclides

Table 13 contains the technologies that have been identified as compliance technologies for at least one radionuclide. The table contains the same structure as other tables with a list of limitations that are contained in the footnotes and operator skill level and raw water quality issues.

TABLE 13.—Technologies for Radionuclides

Unit technologies	Limitations (see footnotes)	Operator skill level required [1]	Raw water quality range & considerations
1. Ion Exchange (IE)	(a)	Intermediate	All ground waters.
2. Point of Use (POU) IE	(b)	Basic	All ground waters.
3. Reverse Osmosis (RO)	(c)	Advanced	Surface waters. usually require pre-filtration.
4. POU RO	(b)	Basic	Surface waters usually require pre-filtration.
5. Lime Softening	(d)	Advanced	All waters.
6. Green Sand Filtration	(e)	Basic	
7. Co-precipitation with Barium Sulfate.	(f)	Intermediate to Advanced	Ground waters with suitable water quality.
8. Electrodialysis/Electrodialysis Reversal.		Basic to Intermediate	All ground waters.
9. Pre-formed Hydrous Manganese Oxide Filtration.	(g)	Intermediate	All ground waters.

[1] National Research Council (NRC). Safe Water from Every Tap: Improving Water Service to Small Communities. National Academy Press. Washington, D.C. 1997.

Limitations Footnotes to Table 13: Technologies for Radionuclides

[a] The regeneration solution contains high concentrations of the contaminant ions. Disposal options should be carefully considered before choosing this technology.

[a] When POU devices are used for compliance, programs for long-term operation, maintenance, and monitoring must be provided by water utility to ensure proper performance (see Section III.A of this notice).

[c] Reject water disposal options should be carefully considered before choosing this technology. See other RO limitations described in the SWTR Compliance Technologies Table.

[d] The combination of variable source water quality and the complexity of the chemistry involved in lime softening may make this technology too complex for small surface water systems.

[e] Removal efficiencies can vary depending on water quality.

[f] This technology may be very limited in application to small systems. Since the process requires static mixing, detention basins, and filtration, it is most applicable to systems with sufficiently high sulfate levels that already have a suitable filtration treatment train in place.

[g] This technology is most applicable to small systems that already have filtration in place.

The background section indicated that EPA would identify affordable compliance technologies for those existing regulations where small system variances or variance technologies are not prohibited by the SDWA. There are statutory prohibitions against small system variances for all three radionuclides. Table 14 contains the compliance technologies the three radionuclides without considering affordability due to statutory prohibitions. The statutory prohibitions on variance technologies and small system variances are discussed in detail in Section IV of this notice.

TABLE 14.—Compliance Technologies by System Size Category for Radionuclide NPDWRs, Affordability is Not Considered

Contaminant	Compliance technologies [1] for system size categories (Population Served)		
	25–500	501–3,300	3,300–10,000
Combined radium-226 and radium-228.	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9.
Gross alpha particle activity	3, 4	3, 4	3, 4.
Total beta particle activity and photon activity, average annual concentration.	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4.

[1] (Note: 1) Numbers correspond to those assigned to technologies found in the Compliance Technologies Table for Radionuclides.

D. Stakeholder Involvement and State Consultation

EPA held a stakeholder meeting on May 18 and 19, 1998. The meeting took place at RESOLVE, 1255 23rd Street, N.W., Washington, D.C. Approximately 50 people registered and participated in the meeting. Representatives from nine States were present at the meeting (either at Resolve or on the conference lines) and several others received the material that was sent out prior to the meeting for review. A draft of the ''Cost Evaluation of Small System Compliance Options: Point-of-Use and Point-of-Entry Treatment Units'' was sent out prior to the meeting.

Compliance technology options were presented for each group of contaminants: IOCs, VOC, SOCs and radionuclides on the second day of the stakeholder meeting. A final presentation on POU and POE devices

followed the sessions on the contaminant groups. Since most of the compliance technologies identified for these groups of contaminants were the best available technologies (BATs) listed in the regulations, there were very few significant comments on those presentations. There were a number of significant comments on the POU and POE options, since they were not listed as BATs. The significant comments on the compliance technology list for the non-microbial contaminants regulated before 1996 are as follows:

- One State representative noted that the precipitation approach can cause problems for consumers' water heating tanks. Several stakeholders indicated that pH adjustment using limestone contactors is the least complex process. EPA has included both of these options as compliance technologies for lead. The precipitation approach is not listed as a compliance technology for copper.
- Residuals management was identified as a major factor that would influence technology selection for IOCs. The guidance provides additional details on the residuals produced by each process.
- Stakeholders recommended the inclusion of mechanical aeration and spray aeration, where appropriate, for VOCs along with the limitations that might limit their applicability.
- Stakeholders believed that more data is needed on removal of pesticides by technologies other than carbon, such as membranes. EPA has listed these technologies as ''emerging'' technologies and hopes to generate more data over the coming year.
- Residuals management was identified as a major factor that would influence technology selection for radionuclides. Stakeholders recommended that EPA investigate discharges to septic systems when POU reverse osmosis or ion exchange systems are used as compliance technologies.
- States and other stakeholders recommended that EPA consider listing POU devices as compliance technologies for nitrate by adding a public education component. POU devices are listed as an emerging technology, while EPA determines the necessary requirements of a public education program for nitrate.
- States and other stakeholders agreed with EPA's assessment that POU devices would not be appropriate for VOCs because they do not address all exposure pathways.
- EPA indicated that the cost estimates for POU and POE options were based on conservative assumptions about water consumption and monitoring requirements. Stakeholders did provide comments on these assumptions and EPA will develop other cost estimates.

At the end of the stakeholder meeting, EPA indicated that it welcomed comments on any of the material in the presentations on compliance technology options for non-microbial contaminants. The only comments received dealt with the assumptions used to estimate POU and POE costs for water systems.

IV. Variance Technology Findings for Contaminants Regulated Before 1996

A1. Overview

As previously discussed, compliance and variance technologies are mutually exclusive. The two compliance technology list sections provided compliance technologies for all of the 80 regulated contaminants, including affordable compliance technologies for all classes of small systems where appropriate. Thus, EPA will not, at this time, be listing variance technologies for any existing NPDWR.

The following is a brief discussion of the Agency's approach for determining whether and which variance technologies should be listed for existing regulated drinking water contaminants, as required under SDWA Section 1412(b)(15)(D). The guidance manual contains more detail, as noted earlier. Because this is the first time that EPA has undertaken the variance technology analysis required under the amended SDWA (which includes new findings concerning ''affordability'' and ''protectiveness'') and given the relatively short time for development of this analysis, EPA considers the methodology described here and the resulting finding of no variance technologies to be an initial screening effort, rather than a final determination of any kind. In addition, by enabling EPA to list compliance and variance technologies rather than specifying them by regulation, the statute specifically contemplates that this analysis (and any resulting list) would be subject to revision based on new information and petitions from interested parties. EPA would be very interested in suggestions from the public, and particularly from States, about how to improve the methodology outlined here and discussed in the guidance and in variance technologies that EPA should consider in revising and updating any future variance technology list.

In summary, EPA's methodology is as follows. A two-stage screening process was used to identify those contaminants that would be compared against the national-level affordability criteria. Three contaminants were removed prior to the two-stage screening process. The current total trihalomethane regulation only applies to systems serving greater than 10,000 people. Therefore, small systems do not have to meet the existing standard, so neither compliance nor variance technologies will be listed. Acrylamide and epichlorohydrin are compounds associated with chemical additives used in drinking water treatment. These contaminants are regulated through a treatment technique that requires a certification that the product of the dose and monomer concentration will not exceed certain levels. Treatment technology is not installed to remove the contaminants under this treatment technique. As such, there are no compliance or variance technologies for either of these two contaminants. Table 16 at the end of this section summarizes the process that was used on each contaminant.

A2. Two-Stage Screening Process for Variance Technology Eligibility

The first stage of the screening process was an evaluation of statutory screens that limit the availability of small system variances or variance technologies. There are three statutory screens. The first two prohibit small system variances. The sole purpose of the listing of variance technologies is to enable small systems to obtain a small system variance. Therefore, when these small system variances are not available under the SDWA, variance technologies will not be specified. The third statutory screen is a restriction on the listing of variance technologies.

The first statutory screen is in Section 1415(e)(6)(B) of the SDWA. Small system variances are not available for any microbial contaminant (including a bacterium, virus, or other organism) or an indicator or treatment technique for a microbial contaminant. This screen removes 6 contaminants from the consideration for variance technologies.

The second statutory screen is in Section 1415(e)(6)(A) of the SDWA. Small system variances are not available for any MCL or treatment technique with respect to which a NPDWR was promulgated prior to January 1, 1986. The Variance and Exemption Rule describes EPA's interpretation of this section of the SDWA (see 63 Fed. Reg. 19442; April 20, 1998). For this analysis, variance technologies are not available for those contaminants where the pre-1986 MCL has been retained or raised. This screen removes 12 contaminants from consideration.

The final statutory screen is in Section 1412(b)(15)(B) of the SDWA. The Administrator shall not identify any

variance technology under this paragraph, unless the Administrator has determined, considering the quality of the source water to be treated and the expected useful life of the technology, that the variance technology is protective of public health. The procedures developed by EPA to define ''protective of public health'' levels are described in detail in the guidance document for the variance technology screening effort. In summary, EPA used available data to estimate Unreasonable Risk to Health (URTH) values for the contaminants remaining after the first two screens. The URTH values were used as a surrogate for the protection of public health requirement of Section 1412(b)(15)(B) because the URTH values are based on a short-term exposure of up to 7 years. Section 1412(b)(15)(B) requires that the variance technology be protective of public health for the expected useful life of the technology. Most technologies will have expected useful lives greater than 7 years, so a concentration that is protective of public health would need to be less than or equal to the URTH value. For 19 contaminants, the derived URTH value was equal to the MCL or very close to the MCL. For these 19 contaminants, it was determined that in order to be protective of public health, the MCL had to be met. Since the MCL is the treatment standard, compliance technologies are the only alternative. Variance technologies are not listed for these contaminants.

The second stage of the screening process involved affordability screens and evaluations. Since the statute authorizes a variance technology listing only where compliance technologies are unaffordable for any category of small systems, any contaminant that has a low-cost compliance technology will not have variance technologies. For this screen, the best available technologies listed in the regulations were examined and technologies that imposed an increase of less than $300/household/year for each size category were identified to screen for affordability. The technologies that met this screening criterion were aeration, aeration plus chlorination, corrosion control, and oxidation. This screen removed 24 contaminants from consideration.

The next affordability screen involved an evaluation of compliance monitoring data and National Pesticide Survey data for the remaining 16 contaminants (14 pesticides). EPA assumed that if there were no violations, existing technologies for compliance have been affordable. Six pesticides were removed from consideration based on the following criteria: no detections in the National Pesticide Survey, MCLs at least one order of magnitude higher than the reporting limit for the compliance monitoring data, and a low positive rate in the compliance data with no MCL exceedances. Violations for the remaining 10 contaminants were then examined in the Safe Drinking Water Information System (SDWIS). Since only systems with violations of the MCL will require treatment, 5 contaminants were removed because there were no MCL violations.

The results of the two-stage screening process were that only five contaminants remained eligible for variance technologies and would proceed through a more extensive affordability analysis. These five contaminants were: antimony, asbestos, atrazine, di-(2-ethylhexyl) phthalate and lindane. The extensive affordability analysis used national-level affordability criteria to determine if there is an affordable compliance technology. The derivation of the national-level affordability criteria are described below.

A3. National-Level Affordability Criteria

As discussed in the background section, EPA did evaluate technologies for each small size category against an affordable technology criterion for those regulations where a small system variance could be granted. These size category-dependent affordable technology criteria are collectively referred to as ''national-level affordability criteria.'' This nomenclature has been used to distinguish the national-level affordability criteria from the affordability criteria that States will use for determinations affecting individual systems. EPA published information regarding these ''State-level'' affordability criteria in February, 1998 (EPA–816–R–98–002, *Information for States on Developing Affordability Criteria for Drinking Water*). Technologies determined to be ''unaffordable'' under the national-level affordability criteria may still be affordable for a specific system within the size category, in which case the system may install that technology if it so chooses. Conversely, if a financially disadvantaged small water system out of compliance with a NPDWR cannot afford any of the compliance technologies that are determined to be ''affordable'' under the national-level affordability criteria, one option for that system would be to apply to the State for an exemption. Other options are described in the EPA document cited above, *Information for States on Developing Affordability Criteria for Drinking Water.*

To determine if there are any affordable compliance technologies for a given NPDWR, the national-level affordability criteria are compared against the cost estimates for the applicable treatment technologies. To make this comparison, there must be a consistent unit of measure for both parameters. The selected approach was to measure user burden as the increase to annual household water bills that would result from installation of treatment. For community water systems, the household was selected as the most sensitive user for cost increases (see background document entitled *National-Level Affordability Criteria Under the 1996 Amendments of the Safe Drinking Water Act*). A second document evaluated non-community water systems (NCWS) and compared their vulnerability to cost increases with households in community water systems (see background document entitled *An Assessment of the Vulnerability of Non-community Water Systems to SDWA Cost Increases*). The conclusion based on this comparison was that the categories of NCWS were either not vulnerable to SDWA-related treatment cost increases or were less vulnerable to SDWA-related treatment cost increases than a typical household.

A summary of the methodology used to determine the national-level affordability criteria is described below. The household is the focus of the national-level affordability analysis. Treatment technology costs are presumed affordable to the typical household if they can be shown to be within an affordability index range (defined as a range of percentages of median household income) that appears reasonable when compared to other household expenditures. This approach is based on the assumption that affordability to the median household served by the CWS can serve as an adequate proxy for the affordability of technologies to the system itself. EPA has chosen to express the water system financial and operational characteristics using their median values, which is a measure of their respective central tendencies. EPA believes that the national-level affordability criteria should describe the characteristics of typical systems and should not address extreme situations where costs might be extremely low or excessively burdensome.

After selecting the impacts on households as the measure for comparing national-level affordability and treatment costs, a consistent set of units was needed to make the

comparison. The treatment cost models produce rate increases measured in dollars/thousand gallons ($/kgal). Annual household water consumption is needed to convert the treatment technology costs into the increase in annual household water bills. Multiplying the rate increase by the annual household consumption yields the increase to annual household water bills ($/household/year increase).

The national-level affordability criteria have two major components: current annual water bills (baseline) and the affordability threshold. The current annual household water bills were subtracted from the affordability threshold to determine the maximum increase that can be imposed by treatment and still be considered affordable. This difference was compared with the converted treatment costs to make the affordable technology determinations. This difference is called the available expenditure margin.

The affordability threshold was determined by comparing the cost of public water supply for households with other household expenditures and risk-averting behavior. National expenditure estimates were derived to illustrate the current allocation of household income across a range of general household expenditures. This consumer expenditure data provided a basis for determining the affordability threshold by comparing baseline household water costs to median household income (MHI) to determine the financial impact of increased water costs on households.

There are three parameters needed for each size category to perform the affordable technology analysis. These parameters are: annual household consumption, current annual water bills, and median household income. The annual household water consumption and the current annual water bills were derived directly from data in the 1995 Community Water System Survey. The median household income data were derived by linking the CWSS data with data in the 1990 Census using zip codes.

The national-level affordability criteria are based on an affordability threshold of 2.5% of the median household income (MHI). The rationale for the selection of 2.5% MHI as the affordability threshold is provided in the guidance document entitled ''Variance Technology Findings for Contaminants Regulated Before 1996.'' For each size category, median values have been used for annual household water consumption, baseline annual water bills, and median household income. The baseline water bills ranged from 0.75% to 0.78% MHI in the three size categories. Thus, the available expenditure margin were approximately 1.75% MHI for each size category. The following table summarizes the national-level affordability criteria and shows the maximum increase that could occur using these criteria. Most systems would not be expected to actually experience cost increases of this magnitude if a compliance technology was installed. Many compliance technologies impose substantially lower household costs. For example, the screening process examined several technologies that imposed less than $300/household per year increases in all three size categories. Appendix F of the ''National-Level Affordability Criteria Under the 1996 Amendments to the Safe Drinking Water Act'' report lists mitigating measures that could reduce the impact on households. In addition, the national-level affordability criteria do not consider the impact of financial assistance from State Revolving Fund loans or other sources. This financial assistance could also reduce the impact on households in those systems that qualify for financial assistance.

TABLE 15.—National-Level Affordability Criteria

System size population served	Baseline			Affordability threshold (2.5% MHI)	Available expenditure margin ($/hh/year increase)
	Mean MHI	Water bills ($/hh/yr)	Water bills (%MHI)		
25–500	$30,626	$228	0.75	$766	$537
501–3,300	26,672	204	0.76	667	463
3,301–10,000	27,641	217	0.78	691	474

A4. Affordable Technology Analysis using National-Level Affordability Criteria

Violation data on the five contaminants that passed through the screening process were used to estimate the needed removal efficiency. The highest violation for each contaminant was determined and confirmed with the State. Technology cost estimates to reach the MCL from the highest confirmed violation were compared against the available expenditure margin for each size category (see Table 15). Technology cost estimates were derived for both central treatment options and centrally-managed Point-of-Use and Point-of-Entry device options. The procedures followed for this analysis are described in detail in the background document entitled ''Variance Technology Findings for Contaminants Regulated Prior to 1996.'' Based on this analysis, an affordable compliance technology was found for each of the five contaminants for all system sizes and expected source water qualities. For most of the system size/source water quality combinations, there are multiple affordable technologies. The following table summarizes the rationale for a finding of no variance technologies for each of the 80 regulated contaminants.

TABLE 16.—RATIONALE FOR THE LACK OF VARIANCE TECHNOLOGIES FOR REGULATED CONTAMINANTS

Contaminant	Rationale
Giardia lamblia	Section 1415(e)(6)(B) of SDWA.
Legionella	Section 1415(e)(6)(B) of SDWA.

TABLE 16.—RATIONALE FOR THE LACK OF VARIANCE TECHNOLOGIES FOR REGULATED CONTAMINANTS—Continued

Contaminant	Rationale
Standard Plate Count	Section 1415(e)(6)(B) of SDWA.
Turbidity	Section 1415(e)(6)(B) of SDWA.
Viruses	Section 1415(e)(6)(B) of SDWA.
Total Coliform	Section 1415(e)(6)(B) of SDWA.
Arsenic	Section 1415(e)(6)(A) of SDWA.
Beta particle & photon radioactivity.	Section 1415(e)(6)(A) of SDWA.
Gross alpha particle activity.	Section 1415(e)(6)(A) of SDWA.
Radium 226 & 228 (combined).	Section 1415(e)(6)(A) of SDWA.

TABLE 16.—RATIONALE FOR THE LACK OF VARIANCE TECHNOLOGIES FOR REGULATED CONTAMINANTS—Continued

Contaminant	Rationale
Total Trihalomethanes	MCL does not apply (applies only to systems > 10,000 people).
Benzene	Affordability Screen.
Carbon Tetrachloride	Affordability Screen.
p-Dichlorobenzene	Affordability Screen.
1,2-Dichloroethane	Affordability Screen.
1,1-Dichloroethylene	Affordability Screen.
1,1,1-Trichloroethane	Affordability Screen.
Trichloroethylene	Affordability Screen.
Vinyl Chloride	Section 1412(b)(15)(B)
Chlorobenzene	Affordability Screen.
o-Dichlorobenzene	Affordability Screen.
cis-1,2-Dichloroethylene.	Affordability Screen.
trans-1,2-Dichloroethylene.	Affordability Screen.
1,2-Dichloropropane	Affordability Screen.
Ethylbenzene	Affordability Screen.
Styrene	Section 1412(b)(15)(B).
Tetrachloroethylene	Affordability Screen.
Toluene	Affordability Screen.
Xylenes (total)	Affordability Screen.
Dichloromethane	Affordability Screen.
1,2,4-Trichlorobenzene.	Affordability Screen.
1,1,2-Trichloroethane	Affordability Screen.
Alachlor	Violation Screen.
Atrazine	Affordable Technology Found.
Carbofuran	Violation Screen.
Chlordane	Section 1412(b)(15)(B).
Dibromochloropropane.	Affordability Screen.
2,4-D	Violation Screen.
Ethylene Dibromide	Section 1412(b)(15)(B).
Heptachlor	Section 1412(b)(15)(B).
Heptachlor Epoxide	Section 1412(b)(15)(B).
Lindane	Affordable Technology Found.
Methoxychlor	Violation Screen.
Polychlorinated Biphenyls.	Section 1412(b)(15)(B).
Pentachlorophenol	Violation Screen.
Toxaphene	Section 1412(b)(15)(B).
2,4,5-TP	Section 1415(e)(6)(A).
Benzo(a)pyrene	Section 1412(b)(15)(B).
Dalapon	Violation Screen.
Di(2-ethylhexyl) adipate.	Affordability Screen.
Di(2-ethylhexyl) phthalate.	Affordable Technology Found.
Dinoseb	Violation Screen.
Diquat	Violation Screen.
Endothall	Violation Screen.
Endrin	Section 1415(e)(6)(A).
Glyphosate	Affordability Screen
Hexachlorobenzene	Section 1412(b)(15)(B).
Hexachlorocyclopentadiene.	Affordability Screen.
Oxamyl	Section 1412(b)(15)(B).
Picloram	Violation Screen.
Simazine	Violation Screen.
2,3,7,8-TCDD (Dioxin)	Section 1412(b)(15)(B).
Acrylamide	Not a technology-based NPDWR.
Epichlorohydrin	Not a technology-based NPDWR.
Fluoride	Section 1415(e)(6)(A).
Asbestos	Affordable Technology Found.
Barium	Section 1415(e)(6)(A).
Cadmium	Section 1412(b)(15)(B).
Chromium	Section 1415(e)(6)(A).
Mercury	Section 1415(e)(6)(A).
Nitrate (as N)	Section 1415(e)(6)(A).
Nitrite (as N)	Section 1412(b)(15)(B).
Total Nitrate & Nitrite (as N).	Section 1412(b)(15)(B).
Selenium	Section 1415(e)(6)(A).
Antimony	Affordable Technology Found.
Beryllium	Section 1412(b)(15)(B).
Cyanide (as free cyanide).	Section 1412(b)(15)(B).
Thallium	Section 1412(b)(15)(B).
Lead	Affordability Screen.
Copper	Section 1412(b)(15)(B).

Based on the evaluation outlined above, EPA has found that there is currently no basis to list variance technologies for any of the 80 regulated contaminants. EPA believes that this is a reasonable outcome. One of the findings in the National-Level Affordability Criteria Document is that water has historically been underpriced, and as a result, prices have increased at a higher rate over the last several years than other household utilities as demonstrated by the consumer price index for utilities. Since water rates are increasing faster than median household incomes, additional treatment, beyond that currently required, may increasingly become ''unaffordable'' based on the national-level affordability criteria. Another factor that will increase treatment costs is the promulgation of new regulations. The application of treatment technology to comply with those regulations will increase the baseline water bills. Thus, while variance technologies are not being specified for the existing regulations, they may well be listed for future regulations since the available expenditure margin will shrink as additional treatment is required.

B. Availability of guidance document explaining why there is no need at present for any variance technology

This list is supported by the updated guidance document entitled ''Variance Technology Findings for Contaminants Regulated Before 1996'' that will be released on September 15, 1998. The guidance document provides more detail on the two-stage screening process, the national-level affordability criteria and the finding that there is currently no basis to list variance technologies for the 80 regulated contaminants.

C. Stakeholder Involvement and State Consultation

EPA held a stakeholder meeting on May 18 and 19, 1998. The meeting took place at RESOLVE, 1255 23rd Street, N.W., Washington, D.C. Approximately 50 people registered and participated in the meeting. Representatives from nine States were present at the meeting (either at Resolve or on the conference lines) and several others received the material that was sent out prior to the meeting for review. A draft of the ''National-Level Affordability Criteria Under the 1996 Amendments to the Safe Drinking Water Act'' was sent out prior to the meeting.

The first topic discussed on May 18, 1998 was the two-stage screening process that identified only five of the eighty regulated contaminants as being potential candidates for variance technologies. The major comments from general stakeholders and comments from States are summarized below:

- The occurrence screen generated comments from both general stakeholders and States. Both were concerned that systems with problems could be overlooked in the data sources used by EPA. EPA stated that the lists are not static documents and that they can be updated if new data are received. For variance technologies, this new data is not limited to technology performance. EPA noted that if data are received showing violations for contaminants removed by the occurrence screens, then EPA would use this data to determine if the system needed a variance technology. As was

previously noted, EPA believes that the results of this analysis would be subject to revision based on new information and petitions from interested parties.

- EPA presented several options for the statutory prohibition in Section 1415(e)(6)(A) of the SDWA that was used as one of the screens. States preferred the lead option, which was that variance technologies might be available for those pre-1986 NPDWRs where the MCL was lowered after 1986. This lead option was used in the final two-stage screening process for variance technologies.
- Some stakeholders questioned whether any relief is being provided because the initial screening process left so few contaminants eligible for variance technologies. EPA emphasized that variances are intended to be the exception and that the goal is to bring as many water systems into compliance as possible. EPA also emphasized that the same procedures would be used for future regulations and that variance technologies might play a larger role in those regulations.
- A number of State attendees at both the May 1998 stakeholder meeting and the July 1997 stakeholder meeting have indicated that they did not think there was a need for variance technologies for the existing regulations in their State. Ten States attended the July 1997 stakeholder meeting and heard the initial discussion on variance technologies.

Another topic discussed at the stakeholder meeting on May 18, 1998 was the national-level affordability criteria. This topic was broken into three parts: an overview, establishment of the baseline, and options for the affordability threshold. The comments on this topic were concentrated on the development of the baseline and the identification of the range of options for national-level affordability criteria. The major comments are summarized below:

- Baseline values were determined for three parameters: annual household water consumption, median household income, and current annual water bills. Stakeholders were asked if separate baselines should be established for ground water and surface water systems. Stakeholders stated that separate baselines should be established, but that the distinction between ground water and surface water systems was less significant in small systems because most rely on ground water. EPA evaluated the data and determined that there was very little distinction between ground water systems and surface water systems, so separate baselines were not established.
- Stakeholders were asked if there were other mechanisms to estimate median household income (MHI) for customers served by small water systems. One stakeholder suggested using lower income levels instead of the median. EPA stated that the national-level affordability criteria should describe the characteristics of typical systems and typical households and should not address extreme situations where costs might be extremely low or excessively burdensome. The median was chosen because it is a measure of central tendency. EPA also noted that it did not have data on current water bills and annual household water consumption for households with lower income levels. EPA stated that it would be inconsistent to use the median values for existing water bills and annual consumption with lower income levels.
- Stakeholders were also asked if mean or median values for the three parameters should be used in establishing the national-level affordability criteria. Stakeholders recommended consistency rather than a preference for using means or medians. Median values were used for all three parameters.
- An initial range for the affordability threshold was identified at the meeting. This range was from 1.5% to 3% MHI. Stakeholders, in general, did not express a strong opinion about where the affordability threshold should be set within that range. One State offered that 1.5% should be used, since it was the lowest value within the range. EPA selected 2.5% based on the rationale described in Part A of this Section.

At the end of the meeting, EPA indicated that it would accept comments on the two-stage screening process and the national-level affordability criteria through the middle of June. EPA stated that comments received by then could be incorporated into the analysis to determine their impact. EPA did not receive any comments from stakeholders after the meeting on either the screening process or the national-level affordability criteria.

Dated: July 31, 1998.

J. Charles Fox,

Acting Assistant Administrator, Office of Water Environmental Protection Agency.

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FEDERAL COMMUNICATIONS COMMISSION

[CC Docket No. 92–237; DA 98–1529]

Next Meeting of the North American Numbering Council

AGENCY: Federal Communications Commission.

ACTION: Notice.

SUMMARY: On July 31, 1998, the Commission released a public notice announcing the August 19–20, 1998, meeting and agenda of the North American Numbering Council (NANC). The intended effect of this action is to make the public aware of the NANC's next meeting and its Agenda.

FOR FURTHER INFORMATION CONTACT: Linda Simms, at (202) 418–2330 or via the Internet at lsimms@fcc.gov or Jeannie Grimes at (202) 418–2313 or jgrimes@fcc.gov. The address is: Network Services Division, Common Carrier Bureau, Federal Communications Commission, 2000 M Street, NW, Suite 235, Washington, DC 20554. The fax number is: (202) 418–7314. The TTY number is: (202) 418–0484.

SUPPLEMENTARY INFORMATION: Released: July 31, 1998.

The next meeting of the North American Numbering Council (NANC) will be held on Wednesday, August 19, from 8:30 a.m., until 5:00 p.m., and on Thursday, August 20, 1998, from 8:30 a.m., until 12 noon at the Federal Communications Commission, 1919 M Street, NW, Room 856, Washington, D.C.

This meeting will be open to members of the general public. The FCC will attempt to accommodate as many people as possible. Admittance, however will be limited to the seating available. The public may submit written statements to the NANC, which must be received two business days before the meeting. In addition, oral statements at the meeting by parties or entities not represented on the NANC will be permitted to the extent time permits. Such statements will be limited to five minutes in length by any one party or entity, and requests to make an oral statement must be received two business days before each meeting. Requests to make an oral statement or provide written comments to the NANC should be sent to Linda Simms at the address under **FOR FURTHER INFORMATION CONTACT,** stated above.

Proposed Agenda

The planned agenda for the August 19–20, meeting is as follows: