**ENVIRONMENTAL PROTECTION AGENCY**

**40 CFR Parts 141 and 142**

**[FRL–5851–6]**

**RIN 2040–AC73**

## Drinking Water Monitoring Requirements for Certain Chemical Contaminants—Chemical Monitoring Reform (CMR) and Permanent Monitoring Relief (PMR)

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Advance notice of proposed rulemaking.

**SUMMARY:** EPA is providing advance notice that it is planning to propose revising the drinking water monitoring requirements for sixty four chemical contaminants. These chemicals may occur in the source water of public drinking water systems, and are regulated on the basis of chronic health effects over a seventy year period. The purpose of the proposal would be to base the monitoring requirements for each water system on its risk of contamination, and to establish a uniform and simple sampling schedule for those systems without an apparent or significant risk of contamination.

EPA is also soliciting comments on draft Permanent Monitoring Relief (PMR) Guidelines under section 1418(b) of the Safe Drinking Water Act (the Act), as amended August 6, 1996. The Act requires EPA to issue guidelines, by August 6, 1997, for States to use in adopting monitoring relief under Sections 1418 and 1453.

EPA is also soliciting comments on certain other changes under consideration: the deadlines for decisions regarding ground water under the direct influence of surface water and associated filtration determinations; and reporting requirements for both public water systems and State regulatory agencies. These potential changes were raised by ''stakeholders'' in the drinking water community, through a number of public meetings convened to explore ways of reducing the burden created by the National Primary Drinking Water Regulations. Today's action requests comments on the ''stakeholder'' suggestions, which are described below under Suggestions for Regulatory Burden Reduction Other Than Chemical.

**DATES:** Written comments must be postmarked or delivered by hand by August 4, 1997. The public hearing dates are:

1. July 8, 1997, 9:00 a.m. to 5 p.m., Denver, Colorado
2. July 9, 1997, 9:00 a.m. to 5 p.m., Chicago, Illinois
3. July 22–23, 1997, 9:00 a.m. to 5 p.m., Washington, DC.

**ADDRESSES:** Send all written comments on this notice to the ''Chemical Monitoring Reform Comment Clerk; Water Docket MC–4101 (Docket # W–97–03); Environmental Protection Agency; 401 M Street, SW., Washington, DC 20460.'' Supporting documents for this proposed rulemaking are available for review at EPA's Water Docket; 401 M Street, SW., Washington, DC 20460. For access to the Docket materials, call (202) 260–3027 between 9 a.m. and 3:30 p.m. for an appointment, and reference ''Docket #W–97–03''.

The public hearings will be held in the following locations:

1. EPA, Region VIII, Rocky Mountain Room in the 2nd floor Conference Center, 999 18th Street, Denver, Colorado 80202
2. EPA, Region V, Lake Michigan Room (12th Floor), 77 West Jackson Blvd., Chicago, Illinois 60604
3. Wyndham Bristol Hotel, Room Potomac 3, 2430 Pennsylvania Ave. NW., Washington, DC 20037.

**FOR FURTHER INFORMATION CONTACT:** The Safe Drinking Water Hotline, toll free (800) 426–4791 for general information about, and copies of, this document. To speak to the rule manager about today's proposal, contact Mike Muse; Implementation & Assistance Division; Office of Ground Water and Drinking Water; EPA (4604), 401 M Street SW., Washington, DC 20460; telephone (202) 260–3874.

**SUPPLEMENTARY INFORMATION:** The Chemical Monitoring Reform portion of this document presents many possible changes to the current requirements in a detailed format, so that commenters can better assess how the concepts in this document might work in the real world. In addition, this document contains preliminary rule language so that commenters may begin to address the details of regulatory implementation. EPA is very open to suggestions for different and/or additional changes to the current requirements, and to suggestions for new or revised rule language for Chemical Monitoring Reform. After considering and incorporating the public comments, the proposed changes to the current regulations may be quite different from this document.

Concerning the Permanent Monitoring Relief Guidelines, EPA will consider the comments received in response to this notice, and will issue final guidelines by the August 6, 1997 statutory deadline. As discussed in Section I.B below, EPA anticipates that regulations may be needed in order to implement fully the Permanent Monitoring Relief guidelines. Accordingly, EPA may propose such regulations at the same time that the CMR regulations are proposed.

These changes would affect community water systems (CWSs) and non-transient, non-community water systems (NTNCWSs). Community water systems are those which serve at least 15 service connections used by year round residents, or regularly serve at least 25 year round residents e.g., cities, townships, district water authorities, private water companies serving such communities. Non-transient, non-community water systems are those which are not community water systems and which serve at least 25 of the same persons over six months of the year e.g., schools, factories or other facilities with their own separate water supply. The following table identifies the SIC code affected by this action.

| Standard industrial classification description | SIC code |
|---|---|
| Water Supply ..... | 4941 |

If your comments pertain only to Chemical Monitoring Reform, only to the Permanent Monitoring Relief Guidelines, or only to the other ideas for burden reduction (e.g., deadlines for decisions regarding ground water under the direct influence of surface water), please indicate that in the first paragraph of your comments. Commenters are requested to submit any references cited in their comments. Commenters also are requested to submit an original and 3 copies of their written comments and enclosures.

Commenters who want receipt of their comments acknowledged should include a self-addressed, stamped envelope. No facsimiles (faxes) will be accepted. The Agency would prefer for commenters to type or print comments in ink. Commenters should subtitle each issue, including the citation of the rule paragraph to which it pertains e.g., ''Detection>MCL—§ 141.23(f):''.

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*Abbreviations Used in This Document*

BAT: Best Available Technology
CWS: Community Water System
EPA: Environmental Protection Agency
FR: Federal Register
IMR: Interim Monitoring Relief
IOC: Inorganic Chemical
LFB: Laboratory Fortified Blank
MCL: Maximum Contaminant Level
MDL: Method Detection Level
NPDWR: National Primary Drinking Water Regulation
NTNCWS: Non-transient, Non-community Water System
PE: Performance Evaluation
PMR: Permanent Monitoring Relief
PQL: Practical Quantitation Level
PWS: Public Water System
RDL: Reliable Detection Level
RIA: Regulatory Impact Analysis
SDWA: Safe Drinking Water Act
SMF: Standard Monitoring Framework
SWAP: Source Water Assessment Program
SWRA: Source Water Review Area
SOC: Synthetic Organic Chemical
VOC: Volatile Organic Chemical
WHP: Wellhead Protection

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## I. Summary of Today's Document

### *A. Chemical Monitoring Reform*

The purpose of this document is to suggest regulatory changes to strengthen public health protection by reducing the chance of drinking water contamination going undetected and unaddressed, and to reduce unnecessary monitoring and reporting requirements. The reduction of unnecessary monitoring will release public resources to focus on those systems at risk of contamination, and on the contaminants posing such risk.

The current monitoring requirements, specifically those under §§ 141.23 (a) through (c) and 141.24 (f) through (k), would be replaced with a new approach that would (1) Consolidate the monitoring requirements into a sampling frequency of once every five years for those systems that States determine have very low risk of contamination, (2) require States to target the 'at risk' systems to sample at a greater frequency based on the degree of each system's vulnerability, and (3) provide for sampling during the periods of greatest vulnerability. Further, this approach would promote the implementation of source water protection to reduce systems' vulnerability.

In addition, the quality control criteria for chemical analyses would be consolidated into a separate technical criteria document that would be incorporated by reference into a final Chemical Monitoring Reform rule, as would the analytical methods and acceptance criteria for these chemicals.

### *B. Permanent Monitoring Relief (PMR) Guidelines*

Section 1418(b) of the Safe Drinking Water Act, as amended, requires EPA to issue guidelines by August 6, 1997 for States to use in adopting Permanent Monitoring Relief. Section 1418(b) authorizes a State to offer a water system relief from the Federal monitoring requirements, in accordance with the EPA guidelines, after the State's Source Water Assessment Program has been approved by EPA and the local source water assessment has been completed.

A draft of the Permanent Monitoring Relief Guidelines is presented in this document under Section III.N. The key features are (1) Sampling waivers under which systems could receive a waiver from sampling for a five year period, if there is no risk to public health, (2) the designation of surrogate sampling points under which systems could use the results from some of their sampling points for other sampling points, and (3) relaxed monitoring for nitrate under limited conditions.

The final PMR guidelines will provide sufficient information about monitoring provisions of the PMR for a State to ensure that its Source Water Assessment Program will provide the data needed for PMR if the State intends to avail itself of the alternative monitoring program available under the PMR. However, EPA believes that to allow States to implement the final guidelines, it may be necessary to revise the monitoring requirements in 40 CFR Parts 141 and 142. EPA may need to provide in the regulations that monitoring under PMR assures compliance with applicable national primary drinking water regulations, thereby allowing States to implement a monitoring plan that differs from the current requirements. Second, certain provisions of the proposed guidelines (Section III.N of this notice) would include specific forms of monitoring flexibility and minimum elements for approvable State PMR requirements that, if such provisions are to be included in the final guidelines and be binding on States, may need conforming regulations. The Agency solicits comments on what conforming changes, if any, might be needed.

EPA may propose regulatory language to support the PMR in the **Federal Register** notice proposing the CMR regulations. The Agency expects to issue final regulations for the CMR, and if necessary the PMR, by August 1998. This time-frame for regulatory support for PMR should not pose a hardship for the States or PWSs. It will take some time for many States to comply with the statutory pre-requisites for granting PMR to its public water systems (i.e., approval of a Source Water Assessment Program, completion of the relevant source water assessments, and approval of a PMR program). The Agency would expect necessary federal and State regulations to be in place well in advance of PMR implementation.

### *C. Suggestions for Regulatory Burden Reduction Other Than Chemical Monitoring Reform*

As part of the President's initiative to ''Reinvent Environmental Regulation'', EPA has been reviewing the National Primary Drinking Water Regulations (NPDWRs) to find opportunities for reducing the paperwork burden on public water systems and State drinking water agencies. Through public meetings, EPA has solicited input from States, water utilities, and environmental groups regarding ways to reduce this paperwork burden. That

process looked at all of EPA's NPDWRs and yielded a number of suggestions. Many of the suggestions made by these ''stakeholders'' are incorporated in the Chemical Monitoring Reform approach in this document. Some of the suggestions, however, were to make changes to other parts of the NPDWRs.

EPA believes certain other suggestions deserve further consideration, and is presenting these suggestions for comment, so the Agency can more fully evaluate their merits for possible inclusion in subsequent proposed rulemaking. The suggestions contained in this document involve deadlines for decisions regarding ground water under the direct influence of surface water and associated filtration determinations, and requirements for water system and State reporting. They can be found in Section III.Q. of this document. Stakeholder suggestions pertaining to lead and copper requirements were presented in the preamble for the proposal entitled, Maximum Contaminant Level Goals and National Primary Drinking Water Regulations for Lead and Copper, 60FR16348, April 12, 1996.

## II. Background

### *A. Statutory Authority*

The approach outlined in this document would amend the monitoring requirements associated with certain National Primary Drinking Water Regulations (NPDWRs) established pursuant to Section 1445 of the Safe Drinking Water Act, as amended August 6, 1996 (the ''Act''). Section 1445 of the Act provides EPA with general information collection authority. Namely, ''every person who is subject to any requirement of this title ..., shall establish and maintain such records, make such reports, conduct such monitoring, and provide such information as the Administrator may reasonably require by regulation to assist the Administrator in ... determining whether such person has acted or is acting in compliance with this title.''

### *B. Regulatory Background*

EPA first regulated chemicals in drinking water by establishing maximum contaminant levels (MCLs) and sampling requirements for nine inorganic chemicals (IOCs), and six synthetic organic chemicals (SOCs) in the Interim Primary Drinking Water Regulations of 1975. In accordance with the Safe Drinking Water Act Amendments of 1986, EPA began adding to its list of regulated chemicals. In 1987, EPA adopted standards for eight volatile organic chemicals (VOCs) in the Phase I Rule. From that point on, regulations for contaminants in drinking water have been referred to as National Primary Drinking Water Regulations (NPDWRs).

EPA has since revised the standards for some chemicals, and established new standards for other chemicals, in three separate actions: Phase II Rule—January, 1991; Phase IIB Rule—July, 1991; and Phase V Rule—July, 1992. These changes would affect sixty four (64) of the chemicals for which NPDWRs have been established (13 IOCs, 30 SOCs and 21 VOCs) as listed below in Table A.

TABLE A.—CONTAMINANTS AFFECTED BY CHEMICAL MONITORING REFORM

Inorganic Chemicals (IOCs):
[1] Antimony, [2] Arsenic, [3] Asbestos, [4] Barium, [5] Beryllium, [6] Cadmium, [7] Chromium, [8] Cyanide, [9] Fluoride, [10] Mercury, [11] Nickel, [1] [12] Selenium, [13] Thallium.

Synthetic Organic Chemicals (SOCs):
[1] 2,4-D (Formula 40 Weeder 64); [2] 2,3,7,8-TCDD (Dioxin); [3] 2,4,5-TP (Silvex); [4] Alachlor (Lasso); [5] Atrazine; [6] Benzo[a]pyrene; [7] Carbofuran; [8] Chlordane; [9] Dalapon; [10] Di(2-ethylhexyl)adipate; [11] Di(2-ethylhexyl)phthalate; [12] Dibromochloropropane (DBCP); [13] Dinoseb; [14] Diquat; [15] Endothall; [16] Endrin; [17] Ethylene dibromide (EDB); [18] Glyphosate; [19] Heptachlor epoxide; [20] Heptachlor; [21] Hexachloro-cyclopentadiene; [22] Hexachlorobenzene; [23] Lindane; [24] Methoxychlor; [25] Oxamyl (Vydate); [26] Pentachlorophenol; [27] Picloram; [28] Polychlorinated Biphenyls (PCBs); [29] Simazine; [30] Toxaphene.

Volatile Organic Chemicals ( VOCs ):
[1] 1,1-Dichloroethylene; [2] 1,1,2-Trichloroethane; [3] 1,1,1-Trichloroethane; [4] 1,2,4-Trichlorobenzene; [5] 1,2-Dichloropropane; [6] 1,2-Dichloroethane; [7] Benzene; [8] Carbon tetrachloride; [9] cis-1,2-Dichloroethylene; [10] Dichloromethane; [11] Ethylbenzene; [12] Monochlorobenzene; [13] o-Dichlorobenzene; [14] p-Dichlorobenzene; [15] Styrene; [16] Tetrachloroethylene; [17] Toluene; [18] trans-1,2-Dichloroethylene; [19] Trichloroethylene; [20] Vinyl Chloride; [21] Xylenes.

When EPA published the Phase II rule in January, 1991, it established the Standard Monitoring Framework. This framework is in effect today, and applies to all chemicals regulated under the Phase I, II, IIB and V rules, including those regulated under previous IPDWRs—except arsenic. [2] The Standard Monitoring Framework was intended to provide a uniform monitoring structure for all current and subsequent NPDWRs involving chemical contaminants. However, it soon became apparent that the Standard Monitoring Framework (a) could be redesigned to identify contaminated drinking water more quickly and effectively, (b) is too prescriptive in several areas, and (c) is complex and difficult to implement efficiently.

It also appears that the high rates of water supply contamination anticipated in the late 1980s and early 1990's, upon which the Standard Monitoring Framework is largely based (e.g., EPA cited VOC contamination of about 20% of the water systems), have not been borne out by the sampling results since then. According to the data in EPA's national data base for tracking violations (the Safe Drinking Water Information System—SDWIS), an average of about ½% or less of the systems that sample for the sixty four chemicals, had MCL violations for any one of those chemicals during 1993–1995.[3] Although the data available to EPA are not definitive, they are significant because they represent thousands of systems. EPA invites the submittal of sampling data to support or refute the preliminary findings upon which these changes are based.

(1) Monitoring Results from Phase I Unregulated Contaminants in 1988–1991

The following discussion presents chemical occurrence data that EPA States gathered from public drinking water systems. The sampling results from thirty three States [4] were compiled

[1] Although the MCL for Nickel has been stayed by a Federal Court, the monitoring requirements remain in force.

[2] Arsenic was excluded from the Standard Monitoring Framework at the time Phase II was promulgated, because revision of the arsenic MCL was thought to be imminent at that time. As indicated by Table A, these changes include arsenic.

[3] Based on 28 States reporting.

[4] The following States, Territories and home rule jurisdictions contributed data: Alabama, Arkansas,

for fourteen organic chemicals. These chemicals were sampled as unregulated contaminants under the Phase I rule in 1988 through 1991 (A Statistical Survey of the Unregulated Contaminant Data, prepared by Computer Sciences Corporation). Twelve VOCs have since been regulated, and EDB and DBCP have since been regulated as SOCs, under the Phase II, IIB or V rules.

For systems served by surface water, these data show that thirteen of the fourteen contaminants were detected at less than 3% of the facilities tested, and that the fourteenth contaminant (dichloromethane) was detected at slightly more than 5% of the facilities (see Table B). In ground water, the data show that only one contaminant (tetrachloroethylene) was detected at more than 3% of the facilities sampled (see Table C). In summary, only a small percentage of the facilities sampled has detected any of these contaminants.

TABLE B.—PHASE I SAMPLING RESULTS OF ORGANIC COMPOUNDS IN SURFACE WATER (1988–1991)

| Chemical name and (phase) | No. sites sampled [5] | No. sites w/ detects | Percent sites w/detects |
|---|---|---|---|
| cis/trans-1,2-Dichloroethylene (2) | 1,670 | 15 | 0.90% |
| Dichloromethane (5) | 1,588 | 81 | 5.10 |
| 1,2-Dichloropropane (2) | 1,581 | 5 | 0.32 |
| Ethylbenzene (2) | 1,526 | 15 | 0.98 |
| Ethylene Dibromide [EDB] (2) | 1,180 | 34 | 2.88 |
| Dibromochloropropane [DBCP] (2) | 1,204 | 28 | 2.33 |
| Monochlorobenzene (2) | 1,531 | 5 | 0.33 |
| o-Dichlorobenzene (2) | 1,504 | 3 | 0.20 |
| Styrene (2) | 1,496 | 4 | 0.27 |
| Tetrachloroethylene (2) | 1,579 | 32 | 2.03 |
| Toluene (2) | 1,529 | 37 | 2.42 |
| 1,2,4-Trichlorobenzene (5) | 1,119 | 0 | 0.00 |
| 1,1,2-Trichloroethane (5) | 1,523 | 20 | 1.31 |
| Xylenes (2) | 1,606 | 23 | 1.43 |

TABLE C.—PHASE I SAMPLING RESULTS OF ORGANIC COMPOUNDS IN GROUND WATER (1988–1991)

| Chemical name and (phase) | No. sites sampled | No. sites w/ detects | Percent sites w/detects |
|---|---|---|---|
| cis/trans-1,2-Dichloroethylene (2) | 12,798 | 205 | 1.60 |
| Dichloromethane (5) | 12,263 | 294 | 2.40 |
| 1,2-Dichloropropane (2) | 12,213 | 42 | 0.34 |
| Ethylbenzene (2) | 12,219 | 107 | 0.88 |
| Ethylene Dibromide [EDB] (2) | 9,339 | 61 | 0.65 |
| Dibromochloropropane [DBCP] (2) | 9,293 | 40 | 0.43 |
| Monochlorobenzene (2) | 12,215 | 14 | 0.11 |
| o-Dichlorobenzene (2) | 12,162 | 8 | 0.07 |
| Styrene (2) | 12,092 | 29 | 0.24 |
| Tetrachloroethylene (2) | 12,349 | 447 | 3.62 |
| Toluene (2) | 12,218 | 222 | 1.82 |
| 1,2,4-Trichlorobenzene (5) | 11,535 | 16 | 0.14 |
| 1,1,2-Trichloroethane (5) | 12,211 | 11 | 0.09 |
| Xylenes (2) | 12,743 | 150 | 1.18 |

As shown in Tables D and E, the rates of detection also vary from State to State.[6] In Table D, the detection of ethylene dibromide (EDB) in ground water ranges from < 1% of the facilities sampled in 13 of 17 States to 3.4% of the facilities in North Carolina and 12.5% of the facilities in Alabama. In Table E, the variation of ethylbenzene detections in ground water ranges from less than 1% of the facilities sampled in 12 of 20 States to 5%—5.5% in Alabama, Missouri and North Carolina.

Colorado, Delaware, District of Columbia, *Florida*, Georgia, Hawaii, Illinois, *Indiana*, Louisiana, Maryland, *Massachusetts*, Missouri, *Nebraska*, Nevada, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Vermont, Virginia, Virgin Islands, Washington, West Virginia and Wyoming. The *underlined* States reported only results showing detection. They are included here because the data were taken from a table in which the sampling results were consolidated for all the States and it was impossible to separate these States out.

[5] The report from which this data is taken describes a point as the ''number of unique sample sites and collection points'' for each water system.

[6] States reporting only results showing detections have been excluded from Tables D and E, because the data presented to EPA allowed us to identify and delete these States. Otherwise, these tables include data from the States in which laboratories reported the results of analyzing one or more samples for these specific analytes.

TABLE D.—PHASE I SAMPLING RESULTS FOR ETHYLENE DIBROMIDE [EDB] IN GROUND WATER (1988–1991)

| State name | Number of sites Sampled | Number of sites w/detects | Percent of sites w/detects |
|---|---|---|---|
| Alabama | 160 | 20 | 12.50 |
| Colorado | 18 | 0 | 0.00 |
| Delaware | 132 | 0 | 0.00 |
| Minnesota | 119 | 0 | 0.00 |
| Missouri | 130 | 0 | 0.00 |
| North Carolina | 383 | 13 | 3.39 |
| North Dakota | 374 | 0 | 0.00 |
| Nevada | 33 | 0 | 0.00 |
| New Mexico | 968 | 0 | 0.00 |
| New York | 378 | 1 | 0.26 |
| Ohio | 5,747 | 3 | 0.05 |
| Pennsylvania | 359 | 6 | 1.67 |
| Rhode Island | 159 | 0 | 0.00 |
| South Dakota | 17 | 0 | 0.00 |
| West Virginia | 97 | 0 | 0.00 |
| Wyoming | 247 | 0 | 0.00 |

TABLE E.—PHASE I SAMPLING RESULTS FOR ETHYLBENZENE IN GROUND WATER 1988–1991

| State name | No. sites sampled | No. sites w/ detects | Percent sites w/ detects |
|---|---|---|---|
| Alabama | 160 | 8 | 5.00 |
| Colorado | 30 | 0 | 0.00 |
| Delaware | 130 | 0 | 0.00 |
| Hawaii | 28 | 0 | 0.00 |
| Maryland | 131 | 2 | 1.53 |
| Minnesota | 117 | 1 | 0.85 |
| Missouri | 264 | 14 | 5.30 |
| North Carolina | 384 | 21 | 5.47 |
| North Dakota | 414 | 2 | 0.48 |
| Nevada | 58 | 0 | 0.00 |
| New Mexico | 1,217 | 10 | 0.82 |
| New York | 519 | 0 | 0.00 |
| Ohio | 5,747 | 22 | 0.38 |
| Pennsylvania | 371 | 1 | 0.27 |
| Rhode Island | 166 | 2 | 1.20 |
| South Dakota | 17 | 0 | 0.00 |
| Washington | 2,112 | 4 | 0.19 |
| West Virginia | 97 | 1 | 1.03 |
| Wyoming | 247 | 9 | 3.64 |

The data above have several shortcomings, including the fact that they are not nationally representative. The reasons for this include (1) five States reported only positive results, which are included in Tables B and C,[7] and (2) the laboratory sensitivity in detecting each contaminant is unknown, but can be assumed to vary from one State to the next. The first factor tends to skew the data in Tables B and C to an uncertain extent in favor of higher detection rates than are likely to be found in data representing a cross section of systems. The effect of the second factor is unknown. Further, the samples were probably not collected during the periods of greatest vulnerability, and many VOCs may evaporate from surface water, which may skew the results in favor of lower detection rates. Nevertheless, this is one of the largest collections of data available today, and provides substantial support for the initial conclusion that relatively few systems are contaminated.

(2) Sampling Results for Organic Compounds From 1992–1994

Several States have volunteered compilations of their sampling results for organic chemicals.[8] A detailed presentation of this data is available in the docket under, Sampling Results for Organic Compounds from 1992–1994. These results indicate VOC contamination rates that are significantly lower than those reported from the Phase I data. This difference may be due to improved waste solvent management practices mandated under the Resource Conservation & Recovery Act (RCRA), and to the closure of many of the contaminated wells identified by the Phase I monitoring.

An aggregation of these data for eleven States,[9] Table F, shows that, for

[7] Florida, Indiana, Massachusetts, Michigan and Nebraska.

[8] Although States have been sampling for most of the IOCs for 20 years, few provided useful compilations. Most IOC occurrence is geologically based, and therefore not subject to rapid change. Today's notice would represent the first set of national drinking water monitoring requirements to recognize and account for the potential of IOCs to occur as a result of human activity.

[9] Alabama, Alaska, Arkansas, California, Georgia, Kansas, Massachusetts, Mississippi, New Jersey, New Mexico and Oregon are the States that have volunteered data to the Association of State Drinking Water Administrators (ASDWA). They do not necessarily represent a valid cross section of all States, and the data for any one State may not represent a valid cross section for that State, but

a very high percentage of the several thousand sites sampled, none of the organic chemicals affected by these changes was detected. Only three VOCs were detected at more than 2% of the sites sampled ('boxed' numbers in right column). Exceedance of the MCL averaged less than 1% of the sampling points for each VOC (bottom row, second column from the right).

TABLE F.—AGGREGATED VOC COMPLIANCE SAMPLING DATA FROM SELECTED STATES

| Chemical name and (phase) | Number of sites sampled | Percent of sites w/detects < MCL | Percent of sites w/detects > MCL | Total percent of sites w/detects |
|---|---|---|---|---|
| Benzene (1) | 41,742 | 0.52 | 0.11 | 0.63 |
| Carbon Tetrachloride (1) | 41,531 | 0.45 | 0.16 | 0.61 |
| cis-1,2-Dichloroethylene (2) | 38,404 | 1.11 | 0.02 | 1.13 |
| 1,2-Dichloroethane (1) | 41,501 | 0.58 | 0.10 | 0.68 |
| 1,1-Dichloroethylene (1) | 41,514 | 0.78 | 0.08 | 0.85 |
| Dichloromethane (5) | 41,506 | 1.13 | 0.13 | 1.26 |
| 1,2-Dichloropropane (2) | 40,778 | 0.29 | 0.01 | 0.30 |
| Ethylbenzene (2) | 41,240 | 0.54 | 0.00 | 0.55 |
| Monochlorobenzene (2) | 41,713 | 0.12 | 0.00 | 0.12 |
| o-Dichlorobenzene (2) | 41,313 | 0.10 | 0.00 | 0.10 |
| p-dichlorobenzene (1) | 41,326 | 0.39 | 0.00 | 0.39 |
| Styrene (2) | 36,455 | 0.13 | 0.00 | 0.13 |
| trans-1,2-Dichloroethylene (2) | 41,453 | 0.14 | 0.00 | 0.14 |
| Tetrachloroethylene (2) | 41,789 | 3.34 | 0.61 | 3.96 |
| Toluene (2) | 41,233 | 1.05 | 0.01 | 1.06 |
| 1,2,4-Trichlorobenzene (5) | 36,388 | 0.09 | 0.00 | 0.09 |
| 1,1,1-Trichloroethane (5) | 41,523 | 2.61 | 0.00 | 2.62 |
| 1,1,2-Trichloroethane (5) | 40,990 | 0.09 | 0.02 | 0.11 |
| Trichloroethylene [TCE] (1) | 41,803 | 3.11 | 0.59 | 3.70 |
| Vinyl Chloride (1) | 41,471 | 0.06 | 0.05 | 0.11 |
| Xylenes (2) | 41,059 | 0.97 | 0.00 | 0.97 |

In the 1991 regulation, EPA offered no estimate of drinking water contamination by synthetic organic chemicals (SOCs), such as pesticides. Table G presents data gathered from ten States.[10] Only three SOCs were detected at more than 2% of the sites—Dibromochloropropane (DBCP), Di(2-ethylhexyl)-phthalate, and Di(2-ethylhexyl)-adipate. Only DBCP and phthalate exceeded the MCL at more than ½% of the sites sampled. Virtually all the DBCP detections were in California, where the product was produced and heavily used into the 1970s. Many of the phthalate and adipate detections are thought to be due to plasticizers leaching from plastic laboratory equipment containers and tubing, rather than from source water contamination.

As before, these data have several shortcomings, which include the fact that they may not be representative of the nation. The reasons for this are that (1) the data were volunteered by only a few States, and (2) the detection levels vary among these States. The effect of these factors is unknown. Also, it is unknown whether the systems for which sampling results were reported are representative of those in each State, or whether the sampling was targeted to the periods of greatest vulnerability. Based on this information, EPA believes that relatively few systems are contaminated with SOCs.

TABLE G.—AGGREGATED SOC COMPLIANCE SAMPLING DATA FROM SELECTED STATES

| Chemical name and (phase) | Number of sites sampled | Percent of sites w/detects < MCL | Percent of sites w/detects > MCL | Total percent of sites w/detects |
|---|---|---|---|---|
| Alachlor (2) | 8,798 | 0.13 | 0.00 | 0.13 |
| Atrazine (2) | 9,596 | 0.85 | 0.00 | 0.85 |
| Benzo[a]pyrene (5) | 6,074 | 0.26 | 0.00 | 0.26 |
| Carbofuran (2) | 8,214 | 0.28 | 0.00 | 0.28 |
| Chlordane (2) | 9,324 | 0.02 | 0.00 | 0.02 |
| Dalapon (5) | 7,161 | 0.47 | 0.00 | 0.47 |
| Dibromochloropropane [DBCP] (2) | 10,187 | 2.95 | 1.36 | 4.32 |
| Di(2-ethylhexyl)-adipate (5) | 4,573 | 2.01 | 0.00 | 2.01 |
| Di(2-ethylhexyl)-phthalate (5) | 6,556 | 2.81 | 0.78 | 3.58 |
| Dinoseb (5) | 7,242 | 0.33 | 0.00 | 0.33 |
| Dioxin [2,3,7,8-TCDD] (5) | 1,165 | 0.00 | 0.00 | 0.00 |
| Diquat (5) | 5,592 | 1.07 | 0.02 | 1.09 |
| Endothall (5) | 5,424 | 0.04 | 0.00 | 0.04 |
| Endrin (5) | 9,229 | 0.26 | 0.00 | 0.26 |
| Ethylene Dibromide [EDB] (2) | 10,184 | 0.16 | 0.36 | 0.52 |

these data do represent the most complete and the most current information that EPA has received.

[10] Alabama, Alaska, Arkansas, California, Georgia, Kansas, Mississippi, Oregon, New Jersey and Wisconsin are the States that have volunteered data to the Association of State Drinking Water Administrators (ASDWA). They do not necessarily represent a valid cross section of all States, and the data for any one State may not represent a valid cross section for that State, but these data do represent the most complete and the most current information that EPA has received.

TABLE G.—AGGREGATED SOC COMPLIANCE SAMPLING DATA FROM SELECTED STATES—Continued

| Chemical name and (phase) | Number of sites sampled | Percent of sites w/detects < MCL | Percent of sites w/detects > MCL | Total percent of sites w/detects |
|---|---|---|---|---|
| Glyphosate (5) | 6,796 | 0.06 | 0.00 | 0.06 |
| Heptachlor (2) | 8,770 | 0.06 | 0.01 | 0.07 |
| Heptachlor Epoxide (2) | 8,773 | 0.13 | 0.02 | 0.15 |
| Hexachlorobenzene (5) | 7,651 | 0.01 | 0.00 | 0.01 |
| Hexachlorocyclopentadiene (5) | 7,340 | 0.07 | 0.00 | 0.07 |
| Lindane (2) | 7,369 | 0.20 | 0.00 | 0.20 |
| Methoxychlor (2) | 9,224 | 0.09 | 0.00 | 0.09 |
| Oxamyl (5) | 7,626 | 0.01 | 0.00 | 0.01 |
| Picloram (5) | 4,602 | 0.02 | 0.00 | 0.02 |
| Pentachlorophenol (2) | 6,428 | 0.06 | 0.00 | 0.06 |
| Polychlorinated Biphenyls [PCBs] (2) | 7,945 | 0.04 | 0.01 | 0.05 |
| Silvex [2,4,5-TP] (2) | 8,522 | 0.55 | 0.00 | 0.55 |
| Simazine (5) | 9,608 | 0.23 | 0.01 | 0.24 |
| Toxaphene (2) | 7,373 | 0.04 | 0.00 | 0.04 |
| 2,4-D (2) | 8,739 | 0.47 | 0.00 | 0.47 |
| Avg. % Detections | ..... | 0.46 | 0.09 | 0.54 |

In summary, EPA and the States have been discussing ways to reduce unnecessary monitoring requirements and to use chemical monitoring resources more efficiently since late 1992. EPA also sought input from outside organizations through public forums. The sampling results summarized above indicate that few systems are contaminated and that contamination levels vary widely among States. EPA believes that public resources can be used more efficiently by allowing States to focus on contaminated systems and systems at relatively high risk of contamination.

*C. Overview of Approach for Chemical Monitoring Reform, Permanent Monitoring Relief and Anticipated Impact on Systems and States*

The approach outlined in this document would result in new monitoring requirements, and refine the required laboratory practices for the contaminants listed in Table A, above. [11] These new requirements would replace the current requirements for Inorganic Chemicals (IOCs), Synthetic Organic Chemicals (SOCs) and Volatile Organic Chemicals (VOCs). [12] The new monitoring requirements would be consolidated under one section (§ 141.23). The current monitoring requirements for nitrate and nitrite [13] would remain unchanged, but would be moved to § 141.24(a). The maximum contaminant levels (MCLs) and designations of best available technology (BAT) would remain unaffected, as would the monitoring requirements for unregulated contaminants. All the provisions for radionuclides would remain unaffected, as would the requirements for lead and copper, for total trihalomethanes, and for microbial contaminants. The quality control criteria for chemical analyses would be consolidated in a separate technical criteria document incorporated by reference into the rule, as would the analytical methods and acceptance criteria for these chemicals. Note that EPA may, in a separate action, reformat all of the drinking water regulations in Part 141 and that would require the citations to change accordingly.

Chemical Monitoring Reform is based on six concepts. (1) Some systems are not sampling at the appropriate time of year or with sufficient frequency to detect significant levels of contamination. Several reports, including a U.S.G.S. study of the Mississippi River Basin, entitled Contaminants in the Mississippi River, 1987–1992, U.S.G.S. Circular 1133, 1995, and an Environmental Working Group (EWG) study entitled Weed Killers by the Glass, document springtime peaks in pesticide contamination of surface water supplies. (2) The percentage of systems that are contaminated is very low. The sampling data that support this view are summarized under Regulatory Background and included in the record for this document. (3) Public resources should be focused more on the systems that are contaminated or at risk of contamination, and less on systems that have low risk of contamination. (4) Because of their first hand knowledge of each system's operating environment and vulnerability, States are better able than EPA to determine which systems are at risk of contamination and which are not. For the same reason, States are also better able to determine the time of year and frequency of sampling that are most likely to detect contamination at its highest levels. (5) Source water protection measures should be expanded to minimize the number of systems contaminated in the future. (6) The current requirements are complex, and should be streamlined.

EPA is considering addressing these concepts by revising the Federal monitoring framework, within which States operate, to provide States the flexibility to focus their resources on systems at risk of contamination. This would be accomplished by consolidating the baseline sampling requirements for all contaminants and all classes of systems into a single five year frequency, except for the 'at risk' systems. States would be assigned the responsibility to review the vulnerability of all their systems, and to schedule the 'at risk' systems to sample more frequently than once every five years based on the degree of each system's vulnerability. Further, all systems would generally be required to sample during the periods of greatest vulnerability as directed by the State. This would reduce the chance of contamination going undetected, and hence unaddressed.

The development of these system-specific sampling schedules will typically involve the identification of potential contamination source(s) and an assessment of contaminant use patterns and the resulting periods of greatest vulnerability based on the management of those sources and intervening hydrogeologic or climatic features. This targeting, assessment and

[11] The MCLs for these contaminants are listed under 40 CFR 141.11(b), 141.61(a), 141.61(c), 141.62(b)(1)–(6) and 141.62(b)(10)–(15).

[12] These requirements currently appear under §§ 141.23(a)–(c) and 141.24(f)–(k).

[13] Currently under §§ 141.23(d) and 141.23(e)

scheduling activity closely parallels the efforts required under State Source Water Assessment Programs,[14] and can be accomplished most efficiently by conducting a single assessment under both programs.

If the monitoring results for the systems sampling every five years are below ½ of the MCL, the systems would continue sampling every five years. If their sampling results are equal to or above ½ of the MCL, the systems would sample more frequently as directed by the State.

In their primacy applications to adopt Chemical Monitoring Reform, States would describe their programs to screen all systems and identify and schedule ''at risk'' systems for increased sampling, to determine the periods of greatest vulnerability, and to determine whether and how to schedule increased sampling for systems exceeding the trigger level. These State program descriptions would then undergo public review and comment, before their submittal to EPA for approval. EPA's review of the primacy applications would assure that each State has an effective plan, and the legal authority, to implement these provisions. As a last resort, EPA may intervene to schedule increased sampling for individual systems at risk of contamination, if the State fails to act. Table H highlights the main features of the Chemical Monitoring Reform approach in a flow chart.

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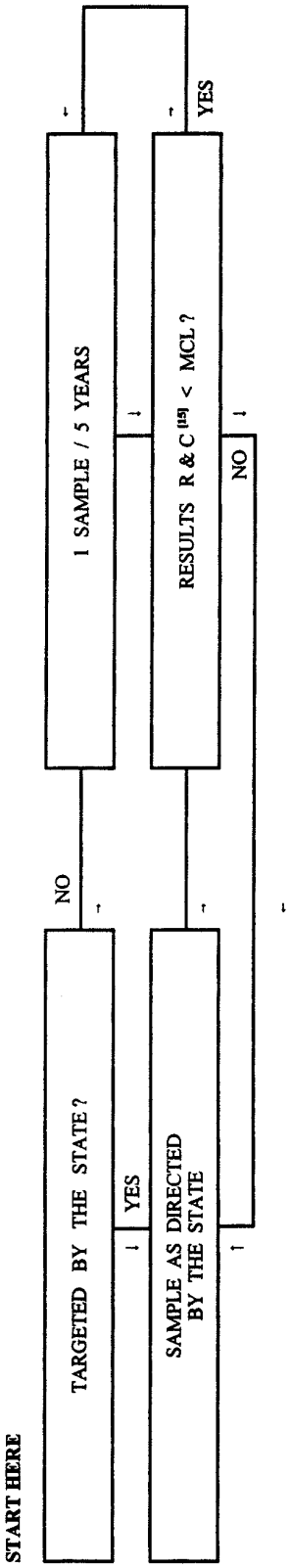
[14] State Source Water Assessment Programs are mandated under section 1453 of the Act.

TABLE H: CHEMICAL MONITORING REFORM

Sampling Frequency Decision Diagram




[15] R & C means "reliably and consistently".

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EPA expects that States will take advantage of the simplicity of today's approach. Table I illustrates the current sampling requirements starting in 1996 for most systems.[16] There are different sampling frequencies for IOCs, SOCs and VOCs. For IOCs and VOCs, the requirements vary by type of source water i.e., surface water or ground water. For SOCs, the requirements vary by size of system i.e., larger or smaller than 3,300. As with Chemical Monitoring Reform, these requirements apply to each sampling point, and many small systems have three or four sampling points.

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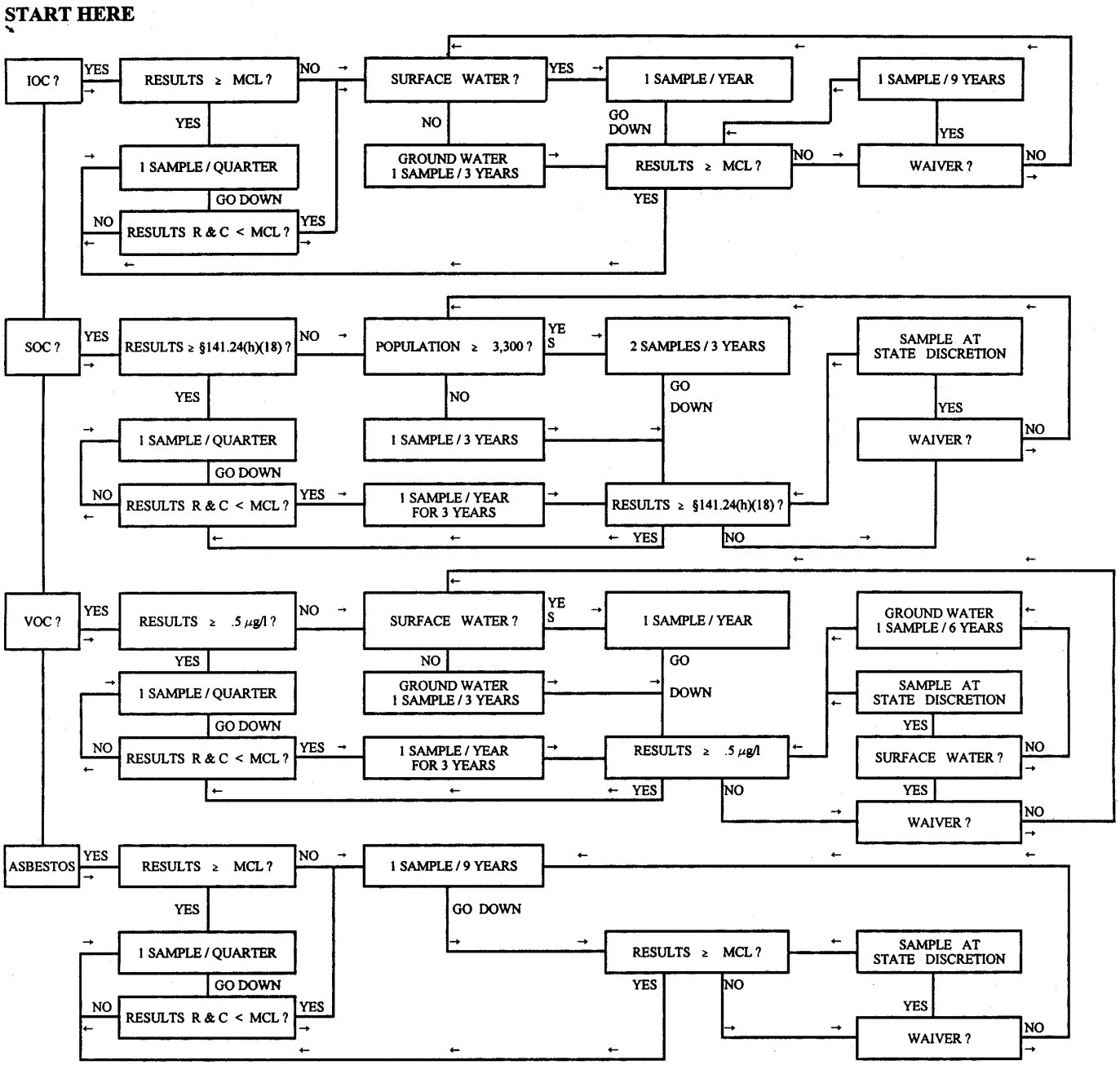
TABLE I: STANDARD MONITORING FRAMEWORK
Repeat Sampling Frequency Decision Diagram

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[16] Under the Phase V rule, systems serving < 150 service connections are not required to begin sampling for the Phase V contaminants until 1996. However, almost all States incorporated the sampling schedules of these systems into the sampling schedules under Phase II, which began in 1993, in the interests of administrative simplicity.

Before EPA finished developing these changes for Chemical Monitoring Reform, Congress enacted the 1996 Amendments to the Safe Drinking Water Act. The Amendments that are functionally related to Chemical Monitoring Reform are discussed in Section III.M. Through one of these amendments,[17] Congress authorized States that have received EPA approval of their Source Water Assessment Programs to offer Permanent Monitoring Relief to public water systems. The systems must have completed their source water assessments under the State program to be eligible for Permanent Monitoring Relief.[18] Congress also directed EPA to publish guidelines by August 6, 1997, for States to follow in developing their PMR requirements.

The new requirements of Chemical Monitoring Reform would be complemented by the draft Permanent Monitoring Relief (PMR) Guidelines in Section III.N., which will allow States to offer additional monitoring relief under specific conditions. Under the draft PMR guidelines in this document, States could allow systems to forgo monitoring of individual chemicals at specified sampling points during a five year period, either by granting a waiver, or by allowing the use of surrogate sampling results from other points. Systems could also be allowed to reduce the sampling frequency for nitrate under limited circumstances. In all cases, the State would make system-specific determinations in accordance with the PMR Guidelines.

The draft PMR guidelines provide, generally, that systems that qualify for waivers will be those with long records of no detection, and for which a vulnerability assessment unambiguously shows that the system is not at risk of contamination. Monitoring results from a sampling point(s), or from a group of points, that are used as surrogates for the results from other sampling points, will be from samples of the most vulnerable portion of the same source water serving all of the sampling points. Reduced nitrate sampling will be allowed only where the sampling results over a long period are very low and the State determines that the prognosis is for more of the same.

*D. Anticipated Impact on Systems and States*

EPA expects that States will support this approach because it provides flexibility to allocate more of their resources to contaminated systems and systems at risk of contamination, by one or more chemicals, and to reduce the monitoring burden for those systems where specific chemicals do not pose a risk to public health. For example, the same system may be at risk of contamination by certain pesticides, but have a very low risk of contamination by the other chemicals. By reducing the sampling burden at that system to one sample every five years for the low risk chemicals, the State can often 'buy enough economic elbow room' to increase the sampling frequency for the high risk pesticides without imposing a significant net increase in monitoring burden. In many cases, even where the sampling for one or more contaminants under a single laboratory method is increased, the net effect for the system may be a decrease in overall sampling costs.

EPA believes that most systems, including very small systems, would have a net decrease in sampling burden and cost and that only a small percentage of systems would have a net increase in sampling burden. Further, that net increase would occur only where the State assessment of public health risk indicates that the increase is warranted as an appropriate response to identified risk. For States, EPA believes that the net program burden would also be reduced, because the aggregate reduction in sampling frequencies would reduce the burden of tracking compliance with the sampling requirements, even though States would be required to develop plans for identifying at risk systems. This net reduction in sampling cost for the 64 chronic contaminants may provide further ''elbow room'' for systems and States to concentrate on higher priority contaminants. EPA seeks comment on this summary of the net effect of today's approach on system and State program burden.

## III. Detailed Explanation of Draft Changes to Chemical Monitoring Requirements

*A. Affected Water Systems*

Under § 141.23 of these changes, the chemical monitoring requirements would apply to all community water systems (CWSs) and non-transient, non-community water systems (NTNCWSs); this is the same as the current rule. Community water systems are those which serve at least 15 service connections used by year round residents, or regularly serve at least 25 year round residents e.g., cities, townships, district water authorities, and private water companies serving such communities. Non-transient, non-community water systems are those which are not community water systems, and which serve at least 25 of the same persons over six months of the year e.g., schools, factories or other facilities with their own separate water supply. Henceforth in this discussion, CWSs and NTNCWSs will be referred to collectively as water systems or systems.

*B. Sampling Points*

Under § 141.23(a) of these changes, all water systems would sample at each entry point to the distribution system after treatment. Under the PMR guidelines, exceptions to this may be allowed. However, some States may require sampling at each source water withdrawal point in order to quickly identify contaminated sources and initiate remedial action. States could establish alternative or additional sampling points, as long as the water delivered to the consumer is tested; this is the same as the current rule.

In addition, systems would sample at any sampling point the State designates in addition to the entry point to the distribution system. For example, systems may be vulnerable to contamination from the asbestos cement pipes in the distribution system, or to infiltration where leaking solvents have dissolved portions of polyvinyl piping. States could address these situations by determining where systems must sample in addition to the entry point to the distribution system.

*C. Time of Monitoring*

Under § 141.23(b) of these changes, sampling would generally be conducted during the periods of greatest vulnerability, according to a schedule specified by the State. Periods of greatest vulnerability mean the periods during which contamination is most likely to occur at the highest concentration at a particular sampling point, based on the history of relevant factors for that sampling point e.g., U.S. Weather Bureau rainfall averages, local pesticide application practices.

Under the current requirements, systems must sample according to nationally uniform schedules, based on prior sampling results and other factors (see 56 FR 3600–3612, January 30, 1991). The most frequent sampling is quarterly, which is designed to account for the seasonal variation in contaminant concentrations. Systems may satisfy this requirement by sampling at any time during each quarter. If systems are not sampling quarterly, they are sampling annually, triennially or less frequently, depending

[17] See section1418(b).

[18] See section 1453(a)(3)

on the type of system and the contaminant.

Because the current requirements do not specify the time of sampling more precisely, contamination may go undetected; this is especially true for systems served by surface water (particularly river systems), or by ground water under the direct influence of surface water. For example, pesticides are typically applied during the Spring and Summer months and a high frequency series of sampling results from surface water systems during this period may show frequent spikes of contamination from runoff. However, a system sampling in early April may miss the contamination, and have a false sense of security about the safety of its drinking water.

Today's approach would remedy this potential problem by assigning States the responsibility to schedule sampling during the periods of greatest vulnerability. This responsibility would require States to use sound science in assessing local patterns of contaminant use, where there are systems susceptible to significant seasonal variation in contaminant levels. The State set asides that are available from the new State Revolving Fund established under the 1996 Amendments to the Safe Drinking Water Act, for conducting source water assessments, could be used to assist States in making these determinations. EPA expects that the State schedules would evolve toward greater precision based on State experience and the growing knowledge of local industrial and agricultural practices.

There has been some concern expressed about the workload impact on the capacity of laboratories to handle a large number of samples in a short period of time. Two factors mitigate this issue. First, the number of systems that are scheduled to sample more frequently than once every five years should not be great, and sampling for the other systems, which constitute the great majority of systems, can be divided over a five year period i.e., only a fifth of the systems under the five year sampling frequency would sample each year. Second, many systems (about 80%) are served by water supplies that are not subject to significant fluctuation over time e.g., deep ground water systems in geological settings other than fractured bedrock. States could schedule these systems to sample at different periods than the surface water systems (i.e., Autumn and Winter) to further balance the work load.

EPA intends to prepare technical guidance, in consultation with the States, to assist them in scheduling sampling during the periods of greatest vulnerability, if this approach is promulgated.

*D. Responsibility to Provide Information*

Under § 141.23(c) of these changes, systems would be required to provide any information requested by the State. States may need information they do not have in their files to decide whether a system should sample more frequently than every five years. Failure by a system to provide this information would be cause for the State to schedule the system for increased sampling.

The requirement to report all sampling results, including detections and non-detections, would be continued. EPA would clarify this provision by specifying that detections equal to or greater than the laboratory's MDL [23] must be reported as detections. The reporting of detections is necessary because, if contamination is detected, it means the sampling point is vulnerable to contamination. States need this information for determining which systems may need to sample more frequently than every five years.

EPA recognizes that some detections at the MDL may be incorrectly identified as to the chemical involved, owing to the difficulty of qualitatively characterizing contamination at that level. This is a general problem that can occur at any level, and that gets worse as the level of contamination gets lower i.e., closer to the MDL. But, it is also true that detection at the MDL means there is chemical contamination in the sample. States could recommend that systems direct their laboratories to use qualitative confirmation techniques to verify or invalidate all detections (see Methods Development and Implementation for the National Pesticides Survey, Munch, D.J., Graves, R.L., Maxey, R.A., and Engel, T.M., *Environmental Science Technology,* Vol. 24, No. 10, 1990. pp.1450–1451).

*E. Mandatory Monitoring*

Under § 141.23(d)(1) of these changes, as Chemical Monitoring Reform is implemented, systems would sample according to schedules specified by the State. If the State has made a screening decision and informed the system that the State will not specify a schedule for increased monitoring, the system would sample at least once every five years at each sampling point and this sampling would be conducted during the periods of greatest vulnerability as determined by the State. If the State does not specify a period of greatest vulnerability, the system is responsible for doing so, and must describe to the State its risk-based reasons for the period it specified. For example, a system might sample at an appropriate time in May because it knows that is the peak period of pesticide application.

Sampling during the period of greatest vulnerability may require some systems to perform the same test more than once. This is because contaminants may have different periods of vulnerability and if they are covered by the same analytical method, the same test would have to be repeated. EPA seeks comment on whether this multi-period sampling might impose a significant burden, and if it would, specific examples of the burden and concrete proposals as to what might be done to reduce the burden while maintaining the capacity to monitor during vulnerable periods.

This approach is different than the current requirements, under which the systems must sample according to a nationally uniform schedule (see 40 CFR, §§ 141.23 through 24). There are four reasons why EPA is considering moving from current monitoring requirements to relying on States to schedule system specific monitoring requirements.

First, States have gained a far more complete understanding of drinking water quality as it is affected by these chemicals. Today, most systems have completed several rounds of sampling or they have been granted sampling waivers based on the State's assessment of their vulnerability to contamination. States have established a base of information and experience related to the local conditions of individual water systems within each State that did not exist in 1991. Therefore, the level of detail in the current Federal monitoring requirements may no longer be necessary.

Second, the compliance sampling results available today indicate that the number of drinking water sources contaminated with one of the chemicals affected by these changes is very low. As noted in the background discussion, the contamination of public water systems by any of the regulated organic chemicals in the systems for which sampling data was provided ranges from 5% to less than 0.5 %, and averages less than 1%.

Third, the current monitoring requirements are complex, as illustrated in the monitoring decision diagram in Table I, above. This complexity is the result of establishing nationally uniform monitoring requirements that account for the differences among types and sizes of systems and contaminants.

[23] Method Detection Limit (MDLs) are defined under 40 CFR Part 136, Appendix B.

There are sixty four chemicals, thirty two trigger levels, two types of source water (surface water, ground water), and two sizes of systems (greater than 3,300, less than 3,300).

Fourth, the current monitoring requirements assume that all systems are vulnerable to contamination, and require each system to sample at relatively high frequencies, unless the State reduces the sampling frequency by granting a sampling waiver. In order to provide relief to systems that are not vulnerable, many States have invested resources to design and implement sampling waiver programs. That investment will now assist them to narrow the focus to those water systems that are already contaminated or at risk of contamination.

Rather than initially presuming vulnerability of all systems, States' screening review should be neutral, but looking to good scientific data from State waiver programs, wellhead protection programs, source water assessments, and the like for a reasonably substantive basis to place systems in the ''at risk'' or ''not at risk'' categories. Under today's approach, States would now review the vulnerability of their systems to identify those with an apparent risk of contamination. States would schedule these systems for increased sampling according to the degree of their vulnerability. This would relieve those systems that are not contaminated, and that have little risk of contamination, of current burdens and complexity by consolidating and reducing the standard sampling frequency for all contaminants and all classes of systems to a minimum of one sample every five years. This will reduce the State resource burden enough to allow States to focus on systems that need to sample more frequently than every five years.

EPA believes the five year sampling period is protective of public health, because the sampling will be conducted during the periods of greatest vulnerability, because the States will target those systems that are contaminated or at risk of contamination to sample at a greater frequency and because the MCLs of the contaminants affected by these changes are based on chronic health effects, which for most of the contaminants covers a seventy year period. The five year period has the advantages of coinciding with several periodic, important bases for developing data that will inform State determinations, including: (1) the five year time of travel adopted by many State Wellhead Protection Programs (WHPPs) for delineating Wellhead Protection Areas and Source Water Protection Areas, (2) many State schedules for conducting sanitary surveys at small water systems, and (3) the cycle for updating section 305(b) reports which inventory the quality of the nation's surface waters.

The chemical monitoring reform work group considered other time periods for the frequency of the default sampling period and chose five years for the reasons mentioned above. EPA seeks comment on whether the Agency should propose a shorter or longer time period and, if so, why. EPA is considering default sampling periods ranging from every three years to six years.

Shorter periods, such as three years, may appear to provide nominally more protection than the five year period, but would require more State resources to administer compliance with the shorter time frame and to respond to a higher demand for waivers than would be the case under the five year period. In most cases, these additional resources would be diverted from working on high priority water systems *i.e.*, those that are already contaminated or at risk of contamination. Thus, it is not clear that a shorter time frame would automatically result in greater protection.

Six years may appear to provide more relief than five years for systems that have little risk of contamination. That would require additional State resources to develop adequate information for the ''not at risk'' determinations because, as noted above, most State Wellhead Protection Programs are referenced to a five year time of travel.

*F. Detection ≥ ½ MCL*

Under § 141.23 (e) through (f) of these changes, if any contaminant were detected at a level equal to or greater than ½ of the MCL, the system would sample according to a schedule specified by the State. This trigger level was selected by considering the need to provide an adequate margin of safety in identifying potential MCL exceedances before they occur, the capability of laboratories across the country to identify contamination below the MCL, and the need to simplify the current requirements.

When contamination is detected ≥ ½ of the MCL, States would determine the level of additional monitoring required to fully characterize the contamination. This deference to State discretion, in scheduling the follow up sampling based on local circumstances, is more effective than the current provisions at detecting MCL exceedances because the sampling schedule most likely to accurately characterize contamination depends on the history of sampling results at the sampling point and neighboring points, the susceptibility of the water supply to contamination, the most vulnerable periods of contamination, and local commercial practices. Today's approach would require States to consider those factors in establishing follow up sampling schedules. Today's approach would also require systems that exceed the MCL to take at least one sample during each of the following three quarters. And, whenever the levels of contamination may vary significantly during a quarter, the sampling schedule would have to account for the expected frequency and amplitude of that variation.

Under the current monitoring requirements, any system that exceeds the trigger level must sample every quarter. There is no requirement for systems to follow up more quickly to characterize the contamination and there is no requirement for systems to sample during the periods of greatest vulnerability. Therefore, systems could mischaracterize the extent of contamination under the current requirements.

The trigger level in these changes can be explained far more easily than the trigger levels under the current monitoring requirements, because the new trigger level would always be based on the potential for exceeding the MCL. This will enhance the ability of States and systems to assess MCL compliance, by focusing on the risk of MCL exceedances, rather than trying to figure out which trigger level applies to which contaminant.

Under the current requirements, the trigger level for organic chemicals is detection. For VOCs the detection limit is 0.5μg/l, and for SOCs the EPA specified detection limit varies by contaminant. Thirty nine percent of the trigger levels for all organic chemicals are less than 1% of the MCL and fifty three percent of them are less than 5% of the MCL. Because all sampling under today's approach would be scheduled during the periods of greatest vulnerability, the sampling results would reflect the worst case level of contamination. Additionally, all detections must be reported to States under today's approach. While it is true that detection indicates a path of contamination, most water supplies are not subject to dramatic fluctuations in contamination levels and such low level detections rarely signal imminent exceedance of the MCL, at least in monitoring samples taken during the time of greatest vulnerability. Therefore, setting the trigger level at ½MCL would be protective of public health, and would minimize the chances of

undetected MCL exceedances during other times of the year.

Under the current requirements for inorganic chemicals (IOCs), systems do not have to begin quarterly sampling until the contaminant exceeds the MCL. This approach would be protective for naturally occurring contaminants, because the natural levels of fluctuation are usually slight and slow to change. However, when these chemicals contaminate water supplies as a result of human activity, the levels of fluctuation and time periods involved tend to mimic those of organic chemicals. Since virtually all of the IOCs can occur as a result of human activity, it would be more protective to establish a trigger level below the MCL for these contaminants.

In summary, it is EPA's view that the trigger level in these changes would: (1) establish a uniform, understandable and practical criterion for increased sampling that is protective of public health; and (2) strike a reasonable balance between responding to contamination at very low levels, and taking no action until a contaminant has exceeded the MCL.

EPA is, however, seeking comment on alternatives for proposing the trigger levels, recognizing that there is no perfect level for any one contaminant under all circumstances. Three of the possible alternatives are: (1) ½ of the MCL or the practical quantitation level (PQL),[24] whichever is higher; (2) detection of the contaminant; and (3) requiring use of the most sensitive methods.

(1) Trigger=½MCL or the PQL, Whichever Is Higher

This option would have the benefit of not requiring State action until the PQL has been exceeded. This means there would be a reasonable degree of certainty that a quantifiable level of contamination has actually occurred before the State would undertake its review to establish a sampling frequency based on the specifics of the contamination. For twenty five contaminants,[25] however, the PQL equals the MCL. Therefore, this option has the potential problem of inadequately characterizing, and failing to responding to, contamination until it has exceeded the MCL.

(2) Trigger=Detection

This option would offer the benefit of providing earlier warning of contamination than the options at higher levels. However, a trigger lower than ½ of the MCL may not provide a real benefit in identifying potential MCL exceedances, because contaminant levels generally take many months to change significantly. Because the time of greatest vulnerability generally indicates the maximum level of contamination, this option would have the drawback of triggering many State reviews where MCL exceedances are unlikely, and would therefore impose a burden on States that may be unwarranted.

This option also raises the issue of defining a detection. Detection should be the lowest concentration at which a laboratory can consistently detect, and correctly identify, individual contaminants in a variety of drinking water samples. Detection is more difficult in dirty water than in clean water. Detection is also determined by other variables, including the sensitivity of the analytical method used for measurement, the sophistication and age of the laboratory testing equipment, and the training and expertise of the laboratory staff. Therefore, detection will vary by laboratory and by system. EPA has not established SOC detection criteria for laboratory certification. That issue is being addressed under the new laboratory performance requirements described below in section III.J.

(3) Require Analytical Methods With the Most Sensitive Detection Levels

Under this option, laboratories would be required to use the most sensitive analytical laboratory method for each contaminant. This may offer some assurance of early detection of low level contamination. However, many labs would be required to purchase new equipment to run these methods. This would raise the cost of the drinking water program for all systems, and could create a lab capacity problem, if many labs are unable to secure the necessary funding i.e., there would be fewer certified laboratories (and possibly an inadequate number) to conduct compliance analyses. As more contaminants become regulated, more new equipment would have to be purchased. That would further raise the cost of the program, and could make the lab capacity problem worse. Finally, due to the variability of laboratory expertise, some laboratories using the most sensitive methods may operate at higher (less sensitive) detection levels than are routinely achieved by other laboratories with more skillful personnel, who are using ostensibly less sensitive analytical methods.

G. MCL Violation Determinations

Under § 141.23(g) of these changes, all MCL violations would be determined by the average annual concentration of the contaminant. This is very similar to the current provisions for determining violations when the system has been sampling at a quarterly frequency i.e., MCL violations are based on the running annual average of the prior year's sampling results. Under today's approach, all MCL violations would be determined by the average of four consecutive quarterly values, beginning with the quarter in which the initial MCL exceedance occurs.[26] The States would schedule the sampling in each subsequent quarter to include the periods of greatest vulnerability during that quarter. Each quarterly value would be determined by the time balanced average of all samples taken in that quarter i.e., the State would divide each quarter into equal segments, and use the average of the sampling results from each segment to calculate the quarterly value. By limiting the annual calculation to four quarterly values, we would avoid skewing the annual average to the periods of highest sampling frequency.

For example, a State might divide a quarter into one month segments. The State might then schedule only one sample during each of the two months considered low vulnerability segments, and ten samples (three days apart) during the month it considers to be the high vulnerability segment. The ten samples from the high vulnerability month would be averaged to provide a single data point for that segment. The quarterly value would be the average of the three monthly data points. The State may require only one sample during those quarters in which the contaminant concentration is not expected to vary significantly.

This process of segmentation would accomplish three objectives. (1) It would yield an annual value representative of the average annual contaminant concentration that includes

[24] The PQL is the lowest concentration at which a contaminant can be reliably measured.

[25] Antimony, Thallium, Alachlor, Benzo[a]Pyrene, Chlordane, Dibromochloropropane, Di(2-ethylhexyl)phthalate, Ethylene-dibromide, Heptachlor, Heptachlor Epoxide, Hexachlorobenzene, Lindane, Polychlorinated Biphenyls, Pentachlorophenol, Toxaphene, Dioxin, Benzene, Carbon Tetrachloride, 1,2-Dichloroethane, Dichloromethane, 1,2-Dichloropropane, Tetrachloroethylene, 1,1,2-Trichloroethane, Trichloroethylene, Vinyl Chloride.

[26] Sometimes, the MCL exceedance may occur at the end of a quarter, and therefore, may not be representative of a time balanced average of multiple samples taken throughout the quarter. In this case, the State should choose to begin calculating the annual average concentration in the quarter following the quarter in which the initial MCL exceedance occurred, so that the MCL compliance determination is based on four consecutive quarterly values that are representative of each quarter.

representation from the periods of highest concentration. (2) As mentioned above, it would avoid unduly skewing the annual average to the sampling results showing the highest concentrations. (3) It would prevent systems from using periods of low concentration to load up on the sampling results that would cast a downward bias onto the annual average.

If the average of one or more quarters would cause the average annual concentration to exceed the MCL, the system would be in violation of the MCL from the end of that quarter. This assures that compliance determinations would be made as soon as the average annual contaminant levels can be established as > MCL, but not until then.

EPA also seeks comment on whether systems failing to comply with a State schedule to characterize contamination after an MCL exceedance should be required to notify the public of a potential MCL violation. Specifically, EPA is considering a provision that would require any system that has exceeded the MCL, and subsequently failed to comply with a State schedule to fully characterize the average annual contamination levels, to issue a public notice under § 141.32 within 30 days of its failure to comply with the State sampling schedule.

This notice would include the health effects language under § 141.32 for the contaminant exceeding the MCL, and would further state (a) that the MCL has been exceeded, (b) that an MCL violation is based on the average annual level of contamination, (c) that the sampling schedule to effectively characterize the average annual level of contamination is based on local circumstances of contaminant fluctuation, and (d) that the system has failed to comply with the State sampling schedule to determine whether the system is in violation of the MCL. Failure to issue a public notice in accordance with these requirements would be a violation of the Safe Drinking Water Act.

*H. Laboratory Certification Criteria*

The quality control provisions associated with measuring the chemicals covered by these changes, the approved analytical methods for measuring compliance with the MCL, and the Performance Evaluation (PE) acceptance limits for those contaminants, would be consolidated in EPA Technical Criteria Document for the Analysis of Selected Chemical Contaminants in Drinking Water (i.e. the EPA Technical Criteria Document) incorporated by reference under § 141.23(j). A copy of this document is attached to this discussion as Appendix A, so the reader may review its provisions in conjunction with the other provisions of this document. This subsection would specify that all samples must be analyzed by laboratories certified by EPA or by the State, and that the State or EPA may suspend or revoke a laboratory's certification for failure to achieve the prescribed operating requirements and standards. This provision would supersede § 141.28 for lab certification under § 141.23.

The incorporation by reference of the EPA Technical Criteria Document into the Federal Regulations means that the requirements in the technical document would be part of the regulations and would be fully enforceable. The reason for moving the laboratory provisions into a separate document is that the audience for these requirements is different than the audience for the general program monitoring requirements. State program managers, their staff and EPA Regional Office program coordinators are interested in the program requirements described in these draft changes. The State laboratory certification officers, State lab directors, EPA Regional Office laboratory certification officers and private lab personnel are mainly interested in the highly technical requirements pertaining to laboratory measurement of chemicals. A technical manual is a much better format for system technicians and laboratory analysts who need an operational reference document.

With the exception of four changes described below, and highlighted in the text of the criteria document (Appendix A), the laboratory requirements in this document are the same as the current laboratory requirements (see 40 CFR Sections 141.23–24). Since those provisions have already undergone notice and comment, EPA is not opening those provisions for further public comment today. EPA is describing the current requirements in this preamble (1) So the reader can better understand how today's approach would fit into the total structure of laboratory requirements; and (2) because these requirements are being consolidated from several parts of the current rule into the technical criteria document identified above.

In a concurrent effort to the development of today's approach, EPA has been reviewing several inexpensive methods for detecting and measuring drinking water contaminants. These are generally referred to as immuno-assays, or immuno-assay kits. They cost about $15 to $30 a test, which is much less than some of the methods currently approved, which can cost up to several hundred dollars. EPA requests comment on the following concepts.

(1) EPA has long required that laboratories pass performance evaluation (PE) samples within prescribed acceptance limits, but has not specified a frequency for these tests. All States require labs to pass these PE tests at least every year, and EPA believes that is an appropriate requirement. These changes would adopt the universal State requirement for laboratories to successfully analyze PE samples at a minimum of once each year as provided by EPA, the State, or other parties that have been approved by the State or EPA.

(2) Under the current requirements of EPA's methods, laboratories using a method for the first time must calculate their method detection limits (MDL) for each contaminant covered by that method. However, there are no parameters for the time frame over which the MDL samples must be analyzed. Therefore, EPA is considering proposing that the extraction and analysis of the MDL samples must be performed over a period of at least three days. This same procedure was adopted under the Information Collection Rule (61 FR 24354, May 14, 1996), because EPA believes that this procedure results in a more realistic MDL determination.

(3) Under the current requirements of EPA methods, laboratories must analyze a laboratory fortified blank (LFB) with each batch of samples. LFBs are quality control samples of purified water with known concentrations of certain contaminants (i.e., the regulated contaminants affected by these changes) that are subjected to laboratory analysis, as a check on the reliability of the results produced from real world samples of unknown contaminant concentrations. The requirements for LFBs are specified in the individual EPA methods, which labs must follow. Most EPA methods require laboratories to analyze LFBs at a concentration equal to ten times the method detection limit (MDL), ten times the estimated detection limit (EDL), or at a mid-point of the measurement calibration curve.

Under these changes, laboratories would have to analyze a subset of these LFBs at the trigger level of ½ of the MCL or less, and at the level used to calculate the laboratory MDL. A record of the results of each LFB would have to be maintained until the next State certification audit or for five years—whichever is longer, and would be available to the State upon request. States would make these records

available to EPA upon request. Generally, the analyses of LFBs at specified concentrations would not affect the regulatory burden under the current requirements, because those analyses must be performed anyway and the cost of performing an analysis at one contaminant level is usually the same as performing it at another level. However, EPA seeks comment on whether running LFBs at these levels, which may be lower than the current customary levels, would result in a significant increase in the incidence of recalibrating or fine tuning the laboratory measuring equipment and whether that would result in a significant increase in laboratory operating costs.

The record of each laboratory's operational sensitivity at the trigger level, and the level used to calculate the MDL, would serve the following objectives. One, the records would provide a means for States to assure that laboratory performance is sufficiently reliable to protect public health. Two, a statistical analysis of these records would provide the basis for States or EPA to establish uniform performance criteria at these levels.

These changes would require laboratories to analyze an LFB at ½ of the MCL or less at least once per week during any week in which drinking water compliance samples are analyzed. This provision would provide an ongoing check on the reliability of each laboratory's ability to identify contamination at the trigger level. These changes would also require laboratories to analyze at least one LFB per month at the concentration that was used to calculate the MDL, during any month in which drinking water compliance samples are analyzed. The purpose of this is to maintain an ongoing record of each laboratory's ability to detect low level contamination.

It is important to characterize what ''no detection'' means for each laboratory, because the systems that contract with each laboratory will be reporting all detections to the State. The States will be making system targeting decisions and sampling waiver determinations based in part on whether or not contamination has been detected at the sampling point. For this reason, today's approach is considering requiring laboratories, as a condition of certification, to maintain records of these analyses in the format in paragraph IV of the technical criteria document, at least until the next State certification audit report has been completed.

(4) These changes would set the trigger for polychlorinated biphenyls (PCBs) at 0.00025 mg/L (i.e., ½ of the MCL), measured as decachlorobiphenyl. However, the approved PCB screening methods in the technical criteria document that determine whether or not the trigger level has been exceeded do not measure decachlorobiphenyl. They measure Aroclors, the values for which can be converted to decachlorobiphenyl using the conversion table under paragraph III.A. of the technical criteria document. Laboratories must use one of the EPA approved screening methods in analyzing LFBs at the trigger level for PCBs.

*I. New Systems and New Sources*

Under § 141.23(k) of these changes, any public water system or source of water supplying a public water system that begins operation after (the publication date of the final rule), would have to demonstrate compliance with all applicable MCLs in this part within a period of time specified by the State, unless the State waives testing for certain contaminants in accordance with its approved waiver process.

*J. Sample Compositing*

The current requirements allow systems to combine two to five samples before they are analyzed for contamination. This feature allows systems to reduce sampling costs by half or more, depending upon the number of samples composited. However, this feature may allow contamination to go undetected, where the contamination in one sample is masked by dilution from the other samples. In an extreme case, contamination at the MCL in one sample could be invisible to the laboratory analysis, where it is masked by four clean samples and where the laboratory detection sensitivity is hovering at or just above one fifth of the MCL.

For this reason, EPA is considering whether to discontinue its use. Some States, however, have expressed an interest in continuing compositing under conditions that would assure the same levels of detection sensitivity as those available for single sample analyses. EPA is open to suggestions to allow sample compositing in the limited cases where the criteria for single sample analysis would not be sacrificed.

Commenters wishing to allow systems to use sample compositing under Chemical Monitoring Reform should identify which contaminants would be covered, the single sample detection criterion the State would establish for each contaminant, and explain how the detection criteria would be enforced for both single sample analyses and composited sample analyses. The single sample detection criterion should be sufficiently far below the trigger level of ½ of the MCL as to assure that quantitation at ½ of the MCL will be within reasonable precision.

That requirement will probably eliminate many contaminants as candidates for compositing, because the composite sample detection criteria must be consistent with the single sample criterion i.e., if the State sets the single sample detection criterion at one tenth of the MCL (five times lower than the quantitation at ½ of the MCL), the detection criterion for a composite of two samples would be one twentieth the MCL (i.e., ½ the single sample detection criterion) and it would be one fortieth of the MCL for a composite of four samples, etc.

*K. Records Kept by States*

40 CFR 142.14(d) (4) through (5) requires States to keep records of vulnerability and monitoring decisions. This document clarifies these provisions by describing examples of the most recent vulnerability decisions and monitoring frequency decisions. Under § 142.15(d)(4), the most recent State decisions include those related to targeting systems for increased sampling and those involving sampling points that have exceeded the trigger level. Under § 142.15(d)(5), records of the most recent monitoring frequency decisions include those based on the targeting and vulnerability determinations identified above. Included in the records would be the data that States used in making these decisions.

*L. Special State Primacy Requirements*

Under Section 1413(c) of the Safe Drinking Water Act, as amended, a State that has primary enforcement authority for all drinking water regulations, would have interim primacy for Chemical Monitoring Reform beginning on the date the State submits its regulations and a complete primacy application to EPA, and ending when the Administrator makes a determination of the primacy application.

State program revisions would include: (1) the State's regulations or implementing provisions under §§ 141.2 and 141.23; (2) the State Targeting Plan described below; and (3) State's certification that its program, including the targeting plan, is enforceable under State law. Once adopted, the State program must operate in accordance with §§ 141.2 and 141.23, the approved State Targeting Plan, and the provisions of § 142.16(e)(3) for scheduling sampling when contaminants are detected ≥ ½ of the MCL.

1. Implementing Provisions

The implementing provisions under Part 141 are:

§ 141.2 Definitions
§ 141.23(a) General (types of systems affected)
§ 141.23(b) Sampling Points
§ 141.23(c) Responsibility to Provide Information
§ 141.23(d) Mandatory Monitoring
§ 141.23(e) Detection ≥ ½ of the MCL
§ 141.23(f) Detection > MCL
§ 141.23(g) Violation Determinations
§ 141.23(h) Laboratory Certification Criteria
§ 141.23(i) New Systems & New Sources

Under § 141.23 (e) through (f) of these changes, whenever a system detects a contaminant at a concentration equal to or greater than the draft trigger level of ½ of the MCL, the system would be required to sample at an increased frequency as directed by the State. If a contaminant exceeds the MCL, the system must take at least one sample per quarter for the following three quarters, in addition to any additional samples required by the State to assure that the average annual level of contamination is fully characterized. State decisions must be documented in writing.

States would be required under § 142.16(e)(3) of these changes to include specific factors in their review of these detections, including: (i) The history of sampling results for the sampling point and for neighboring sampling points; (ii) The susceptibility of the water supply to contamination; (iii) The periods most vulnerable to contamination for the sampling point; (iv) The contaminant's solubility and other characteristics; and (v) The agricultural and commercial practices, and the efficacy of any source water protection measures that have been enacted, within the source water review area. Further, States would have to account for the estimated frequency and amplitude of contaminant fluctuation in each sampling schedule.

2. State Targeting Plans

Under today's approach, States would identify those systems that need to sample more frequently than every five years based on local vulnerability, and every system scheduled by the State to sample more frequently than every five years under § 141.23(d), must do so. Systems must also sample during the periods of greatest vulnerability as designated by the State. Under § 142.16(e)(2), States would be required to describe their strategy for implementing this flexibility in a State Targeting Plan.

Specifically, a State Targeting Plan would describe the State's plans to screen all systems to identify vulnerable systems and the sampling points that need to sample more frequently than once every five years, for determining the frequency of sampling based on the degree of vulnerability, and for updating the State's list of targeted sampling points based on changing information. The targeting plan would also describe the factors the State would consider in determining the periods of greatest vulnerability and for scheduling the time of year and frequency at which each system must sample.

A State targeting plan would also indicate that the State may require a system to sample more frequently than every five years, at a minimum, based on any one or a combination of the following factors: (1) the fate and transport of a contaminant; (2) any agricultural, commercial or industrial activity in the source water review area; (3) the susceptibility of the source water to contamination; or (4) the results of source water assessments conducted under section 1453 of the Safe Drinking Water Act. States may list additional factors upon which they would require a system to sample more frequently than every five years, and States may subsequently require systems to sample more frequently than every five years based on a factor not listed in its targeting plan.

Finally, each State would provide the EPA Regional Administrator with its initial list, or categorical description, of systems that it has targeted to sample more frequently than every five years, within one year after it has submitted a complete primacy revision application to EPA. States would be required to update this list annually, and to make it available to the public upon request. EPA seeks comment on whether one year (which is in addition to the time prior to the submission of the State's primacy revision application) is sufficient time for the screening decisions, or whether a different period is appropriate for States to inform all of their systems of their individual sampling schedules. EPA also seeks comment on whether to require systems to continue sampling in accordance with their current schedules until the State has informed them of its screening and monitoring decisions.

EPA is considering another option to the version described above. The second version includes the approach above, and would also require States to specifically target systems served by surface water, or by ground water under the direct influence of surface water, to sample more frequently than every five years, unless (or until) the State determines that increased sampling is not required based on the degree of an individual system's vulnerability to contamination (e.g., the contaminant is not used in the source water review area), or based on a finding that the risk posed by such levels of contamination is not significant. This provision would establish a presumption of vulnerability for surface water systems, and for ground water systems under the direct influence of surface water, because of their inherent susceptibility to contamination, and regardless of the presence or absence of potential contamination sources in the Watershed & Recharge Area.

EPA also seeks comment on whether the initial detection of a contaminant within the source water review area should be an alternative basis for the presumption of vulnerability. This criterion would apply to any detection from the most recent round of sampling that has not been discarded as a false detection in accordance with State sampling confirmation procedures. The presumption would not apply to detections for which the sources of contamination have been identified, and the health risk posed by the contamination has been described, to the satisfaction of the State.

3. State Certification

The requirement for States to certify that their program revisions are fully enforceable under State law is not new, but the significance of the certification under these changes would be greater than usual. In reviewing State primacy programs and certifications, EPA would give special attention to the State's authority to impose and enforce requirements for individual systems to sample more frequently than every five years, and to sample during the periods of greatest vulnerability.

4. Oversight of State Decisions

There would be two avenues for EPA intervention into State chemical monitoring decisions, short of initiating primacy withdrawal. The first method is provided by section 1431(a) of the Safe Drinking Water Act, which authorizes EPA to take such actions as necessary to protect public health, whenever a contaminant may present an imminent and substantial endangerment to public health. EPA may exercise this option under the appropriate circumstances, without regard to any other provision in these draft changes. For circumstances that do not warrant a finding of imminent and substantial endangerment, EPA would rely on 40

CFR 142.18, as presented in this document.

Section 142.18 of the current regulations authorize an EPA Regional Administrator to annul State sampling waiver determinations. This section provides EPA with an alternative to primacy withdrawal, if EPA should find a pattern of State decisions that are contrary to the approved State program. In today's action, EPA is considering increasing the list of State decisions in which a Regional Administrator can intervene to include (1) the absence of State action to require increased monitoring under §§ 141.23 (c) through (g) and (2) State decisions to grant monitoring relief under section 1418 of the Safe Drinking Water Act. EPA could issue a monitoring order to: annul a State waiver; annul a State surrogate sampling point designation; annul a State monitoring relief decision made pursuant to section 1418 of the SDWA; or make a determination to increase monitoring in the absence of State action. EPA seeks comment on which of these State decisions the Regional Administrators should be authorized to annul in addition to waivers.

Neither the current provisions, nor the possible changes described above are intended to authorize regular, random or arbitrary EPA intervention on individual State monitoring decisions. They are intended to authorize an appropriate EPA response to a pattern of State decisions which conflict substantially with the bases in an approved program on which the State has agreed to make those decisions. The EPA monitoring order would be based on a failure by the State to implement its approved program, and would take effect only after public notice and comment. This provision is a safety valve that would provide for EPA action, short of primacy withdrawal, in the face of a State's abuse of its discretion.

Finally, as explained in the overview of this document, EPA expects most States to support today's approach to reform the chemical monitoring requirements. However, as shown in the table below, some provisions in the current requirements are more stringent and some are less stringent. EPA considers the current monitoring requirements, that were published on January 30, 1991 and that have been adopted by all States, to be as stringent, taken as a whole, as the provisions in this document. Therefore, EPA is considering allowing States to continue operating under the current requirements indefinitely. EPA seeks comment on allowing States to continue under the current requirements, if they prefer to do so.

*M. Safe Drinking Water Act Amendments*

Prior to the enactment of the Safe Drinking Water Act (SDWA) Amendments of 1996, Chemical Monitoring Reform (CMR) was envisioned as a free-standing initiative for monitoring revision and burden reduction. During the development of CMR, Section 1418(b) of the SDWA Amendments directed EPA to publish, by August 6, 1997, guidance for ''Permanent Monitoring Relief'' (PMR). This PMR would authorize States to provide ''tailored alternative monitoring requirements'' for public water systems upon completion of source water assessments in States with approved programs under Section 1453 of the SDWA Amendments. This notice describes in detail below the relationship between potential characteristics of CMR, PMR, and the source water assessment activities that are required by the SDWA Amendments.

As described below, Section 1418(b) authorizes PMR's features for monitoring flexibility to be broader in coverage than CMR was framed to be. If EPA develops two parallel programs for monitoring relief, there could be substantial potential for confusion, overlap, conflict, and unnecessary expenditure of scarce resources. EPA believes that Section 1418(b) directs EPA to frame PMR as a broad program for monitoring relief. To implement the Amendments effectively and efficiently, EPA must examine the actions it is required to take under the PMR provisions of the Amendments, and ensure that its exercise of discretion to frame CMR complements rather than complicates the implementation of PMR by States and public water systems.

Today EPA provides (1) advance notice of its intent to revise current monitoring regulations to provide for targeted, heightened monitoring for systems at risk of contamination and a new, simplified framework of reduced monitoring for systems not at risk (CMR), and (2) draft guidelines for PMR which would include additional burden reduction features. This advance notice is being provided in this form for two reasons. First, while it might have been possible to frame this entire monitoring initiative as PMR under SDWA Section 1418(b), EPA has decided to issue these proposals as two joint elements—PMR and CMR. EPA developed CMR in consultation with many members of the drinking water community over a period of nearly two and a half years, most of which pre-dated the enactment of the SDWA Amendments of 1996. Congress was aware of the CMR process when it enacted additional relief in the form of PMR. EPA believes separate approaches best meshes the expectations for CMR, and its responsibilities under the 1996 Amendments for PMR.

Second, this notice contains what EPA believes to be a reasonable and coherent alignment of the several components of a more flexible but potentially more protective monitoring regime. Under the approach in this notice, States can choose to retain their approved primacy regulations for the current monitoring framework for Phase II and Phase V chemical monitoring, and adopt (or not, if they choose) the burden reduction features of PMR (additional waiver authority, surrogate sampling, reduced nitrate sampling). Or, they can choose to adopt CMR as their new primacy regulation for monitoring—which includes CMR's basic, simplified monitoring framework and its provisions requiring targeted monitoring for systems at risk of contamination—and adopt (or not) the burden reduction features of PMR.

EPA recognizes that if a State adopts CMR before it obtains approval of its Source Water Assessment Program and source water assessments are completed for individual systems, the State would be unable to grant monitoring waivers. This feature of the strategy for integrating CMR and PMR may have the unintended consequence of discouraging States from adopting CMR and retaining Phase II and V, since Phase II and V provide for waivers. To address this, EPA is considering allowing States that proceed with adopting CMR to retain their existing approved waiver programs until the expiration of the State's timetable for completing the assessments. States would not be able to renew waivers after this date, unless it has met these statutory requirements. EPA solicits comments on this issue.

EPA further seeks comment on whether or not to apply this same approach to renewing waivers to States that choose to retain the Phase II and V rules. This would preclude States from renewing waivers for any public water system for which the State has failed to complete a source water assessment after the expiration of the State's timetable for completing all such assessments. The rationale for this approach would be that it is important for States to apply any updated information generated by the assessments to waiver decisions that would be made after the assessments are completed. Although EPA is only

seeking comment on this approach, there are at least two reasons to expect that it would not be burdensome for States or systems. First, EPA is taking steps to provide States with the maximum amount of time available under the law to begin and complete their assessment program by the most cost effective and prioritized approaches possible, using up to the full amount of the more than $120 million made available for assessments by Congress. Second, any water system with an existing waiver would already have a substantial and, in some cases, the full amount of information needed for a source water assessment, meaning these systems are among the likeliest candidates for expeditious completion of assessments.

EPA believes this array of features would in general present a reasonable, coherent and effective approach, but acknowledges that alternative arrays of these features within CMR or PMR are possible. Because alternative arrays could have significant implications for coherence, operation, and (potentially) compliance with various requirements of SDWA, EPA wants to present this notice for public comment on its substance as well as on the operational implications of this particular form in which the features of monitoring are arrayed.

The following are the various key components from which a State may choose to frame its monitoring regime. EPA is requesting comment on whether to delete or rearrange any elements of CMR or PMR. A complete presentation of EPA's proposed guidelines for PMR can be found in Section III.N, below.

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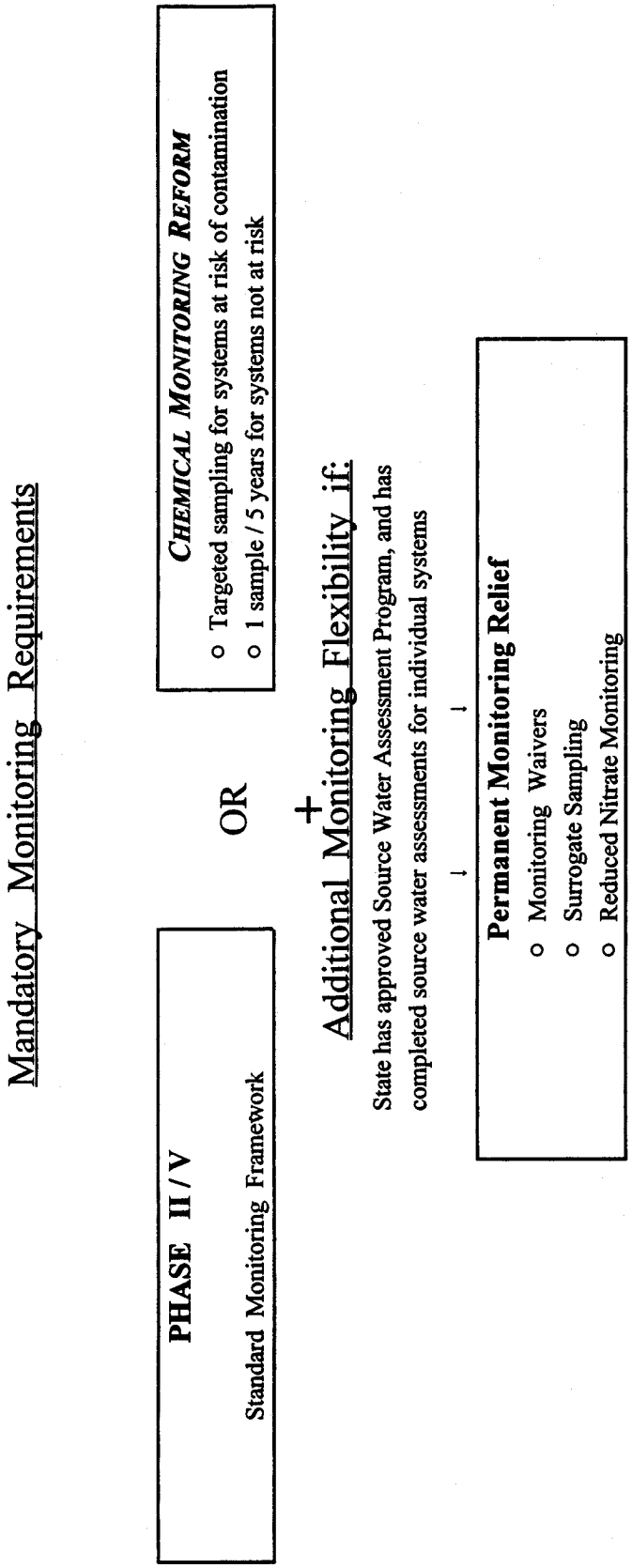


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For commenters who propose transferring to a CMR rule all or part of the burden reduction features proposed today for PMR, EPA requests that their comments also discuss what similar or different burden reduction features should be included in PMR, for which EPA is required to publish guidelines, and how they believe these two frameworks for monitoring should be coordinated, operationally and structurally. In light of Congress' enactment of Section 1418(b), if EPA is to place any of PMR's burden reduction features within CMR, specific benefits and functions that could only be achieved within CMR should be identified.

Comments proposing modifications to the monitoring requirements under CMR for systems with little to no risk of contamination (one test in five years) should address the expected public health implications of the proposed modifications.

EPA also requests comments on the basis for the monitoring requirements for systems at risk of contamination: the Phase II and Phase V requirements currently in place; the targeted approach for specifying heightened monitoring proposed as a part of CMR today; or some other approach, such as a range of monitoring frequencies EPA could specify to apply to different categories of contaminant, source water or water system conditions that would trigger increased monitoring. It is necessary to consider these requirements when commenting on PMR because Section 1418(b)(3) specifies that public water systems that are monitoring under PMR provisions and that detect contaminants at levels that are not ''reliably or consistently below'' the MCL and that do not ''eliminate the contamination problem'' must return to the monitoring frequencies specified in the applicable NPDWR (Section 1418(b)(3)(B)). Currently, the monitoring frequencies under the applicable NPDWR are those specified under the existing Standard Monitoring Framework for Phase II and Phase V contaminants, which requires quarterly monitoring for these systems. The monitoring frequencies under CMR would be the heightened monitoring requirements for systems at risk of contamination.

EPA cannot consider comments proposing the actual or effective deletion of PMR, because it is required under Section 1418(b) to publish guidelines for PMR.

Greater economic efficiency is an important value of the SDWA Amendments of 1996 because it can enable the limited funds of public water systems and States to be focused on the greatest risks to health. Nonetheless, protection of public health itself remains the dominant consideration under the SDWA. In monitoring as elsewhere in implementation of the SDWA Amendments, EPA has a statutory obligation to see that structures and decisions in PMR and CMR equally are based on the adequate scientific information necessary to ensure that public health is protected. To strengthen public confidence in drinking water safety, consumers must know that a decision to reduce monitoring of their water supplies is well-grounded in adequate scientific data and analysis of their water system, that any waiver of monitoring is based on a scientific judgement that the contaminant will not be present at problematic levels during the waiver period, and that any detection at problematic levels of a contaminant subject to reduced monitoring will quickly lead to appropriately heightened monitoring. The following discussion identifies the means to provide such scientific information.

In Section 1418, Congress expressly provided that completion for a water system of a source water assessment, pursuant to an approved State Source Water Assessment Program (SWAP) under Section 1453, was a prerequisite to granting PMR to that system. Section 1453 requires States to establish and implement SWAPs. To do this work, Section 1452(k)(1)(C) makes available to States, and allows them to obligate over 4 fiscal years, up to 10 percent of the funds allotted to them for State Revolving Funds in Fiscal Year 1997, a total of over $120 million nationally. EPA is committed in Headquarters and in the Regions to ensure successful assessments, and will as needed assist States on the Drinking Water SRF set-asides, on stretching assessment dollars by strong involvement of all capable participants in the assessments, and by encouraging exchange of information about good models for assessments and use of existing information to place within the assessments. EPA believes that this funding and support will yield useful assessments that can enable PMR to be provided where appropriate, and will place source water protection on a firm base.

The Safe Drinking Water Act Amendments of 1996 also require EPA to publish guidance for these two efforts—Source Water Assessments and Permanent Monitoring Relief—at the same time, one year after enactment (that is, on August 6, 1997). This timing ensures that, as States began to develop their SWAPs under Section 1453 guidance, they will know what information is needed to provide their systems with Permanent Monitoring Relief, and can frame their assessment programs to generate (among other things) the data necessary for PMR. EPA's draft Source Water Assessment guidance of April 4, 1997, proposed that existing delineations and source inventories done under approved State Wellhead Protection Programs would be adequate to fulfill the delineation and inventory requirements of Section 1453 for those ground water based systems. However, States should examine whether these delineations and inventories provide sufficient information to support all aspects of PMR, and should consider modifying them under their SWAPs where necessary to take full advantage of the regulatory flexibilities offered in PMR.

Under CMR, the basic monitoring frequency in the proposed rule, of 1 sample every 5 years, is to be founded on the determination that the system is not at risk. In deciding what information is necessary to make determinations under CMR, today's proposal relies on a level of information rather than the process to generate that information (that is, the source water assessment process) specified for PMR under Section 1418(b).

The kinds of data on source water, occurrence, susceptibility, use, and the like that would be generated by a source water assessment appear necessary to make adequately informed determinations for all functions of CMR: on which systems are or are not at risk, to develop a targeting plan for at-risk systems, and to specify sampling times of greatest vulnerability for systems that are not. States are not required to undertake a formal source water assessment process to generate such data for CMR, but they are required to have and apply the level of data that would be generated by an assessment to make CMR determinations. This level of data will be consistent with the criteria for completion of assessments each State has defined in their EPA-approved assessment program, and likely will vary depending on the nature and condition of a system (i.e., community or non-community, at risk or not at risk, etc.). In other words, States can apply a screen that is essentially equivalent to a source water assessment to ensure they have adequate scientific data to make CMR determinations, but they need not complete a formal assessment to do so. EPA may also include in its final source water assessment guidance (to be published no later than August 6, 1997) a provision in which States can use this ''assessment equivalence'' concept to allow the use of information generated

by States for Chemical Monitoring Reform to be used to complete source water assessments, at a level appropriate to the situation of the water system.

This data requirement (§ 142.16(e)(2)(i)(A) of these changes) should not slow CMR implementation. Many States have already gathered considerable data on contamination sources, performed vulnerability assessments, and analyzed monitoring data on these contaminants in implementing the Phase II and V rules and in developing approved waiver programs under those rules. Many States have also performed similar work in developing wellhead protection programs. States are also required to submit to EPA their source water assessment programs by February, 1999. Because EPA does not expect to promulgate final CMR regulations before August, 1998, States can thus incorporate the characteristics of completed ''assessment equivalents''—waiver programs, monitoring results, and wellhead protection programs—into their overall CMR plan, for targeting at-risk systems and providing the simplified monitoring framework for systems not at risk. States can put their overall CMR plan into effect when EPA approves their primacy regulations for CMR. They can determine which systems are or are not at risk where they have this ''assessment equivalence'' level of information.

*N. Permanent Monitoring Relief Guidelines*

Introduction

The Permanent Monitoring Relief provision of the Safe Drinking Water Act (the Act) authorizes primacy States to adopt ''tailored alternative monitoring requirements'' for most chemical contaminants. Under that provision, State monitoring relief must comply with guidance published by EPA, as well as ''assure compliance with, and enforcement of, the applicable national primary drinking water regulations.''

Congress directed EPA to publish guidelines ''for States to follow in proposing alternative monitoring requirements.'' These guidelines must (1) assure that ''public health will be protected from drinking water contamination,'' (2) require States to apply this monitoring relief ''on a contaminant-by-contaminant basis,'' and (3) require that, to be eligible for monitoring relief, a system must show that the contaminant is not present in the water supply, or, if present, is reliably and consistently below the MCL, or that ''action has been taken to eliminate the contamination problem.''

Congress also specified that each State must develop, and secure EPA approval of, a Source Water Assessment Program under section 1453 of the Act, and that a source water assessment must be complete for any system to which such alternative monitoring requirements would be available.[27] The guidance for approvable State Source Water Assessment Programs must be published by August, 6, 1997.

Overview

States may offer Permanent Monitoring Relief for the sixty four (64) contaminants listed in Table I, below, and for nitrate. Permanent Monitoring Relief is not available for microbial contaminants, for indicators thereof, or for contaminants formed within a distribution system as a result of disinfection or corrosion.

TABLE I.—CONTAMINANTS AFFECTED BY CHEMICAL MONITORING REFORM

Inorganic Chemicals (IOCs):

[1] Antimony, [2] Arsenic, [3] Asbestos, [4] Barium, [5] Beryllium, [6] Cadmium, [7] Chromium, [8] Cyanide, [9] Fluoride, [10] Mercury, [11] Nickel, [12] Selenium, [13] Thallium.

Synthetic Organic Chemicals (SOCs):

[1] 2,4-D (Formula 40 Weeder 64); [2] 2,3,7,8-TCDD (Dioxin); [3] 2,4,5-TP (Silvex); [4] Alachlor (Lasso); [5] Atrazine; [6] Benzo[a]pyrene; [7] Carbofuran; [8] Chlordane; [9] Dalapon; [10] Di(2-ethylhexyl)adipate; [11] Di(2-ethylhexyl)phthalate; [12] Dibromochloropropane (DBCP); [13] Dinoseb; [14] Diquat; [15] Endothall; [16] Endrin; [17] Ethylene dibromide (EDB); [18] Glyphosate; [19] Heptachlor epoxide; [20] Heptachlor; [21] Hexachloro-cyclopentadiene; [22] Hexachlorobenzene; [23] Lindane; [24] Methoxychlor; [25] Oxamyl (Vydate); [26] Pentachlorophenol; [27] Picloram; [28] Polychlorinated Biphenyls (PCBs); [29] Simazine; [30] Toxaphene.

Volatile Organic Chemicals (VOCs):

[1] 1,1-Dichloroethylene; [2] 1,1,2-Trichloroethane; [3] 1,1,1-Trichloroethane; [4] 1,2,4-Trichlorobenzene; [5] 1,2-Dichloropropane; [6] 1,2-Dichloroethane; [7] Benzene; [8] Carbon tetrachloride; [9] cis-1,2-Dichloroethylene; [10] Dichloromethane; [11] Ethylbenzene; [12] Monochlorobenzene; [13] o-Dichlorobenzene; [14] p-Dichlorobenzene; [15] Styrene; [16] Tetrachloroethylene; [17] Toluene; [18] trans-1,2-Dichloroethylene; [19] Trichloroethylene; [20] Vinyl Chloride; [21] Xylenes.

For contaminants identified in Table I, States could, under PMR, grant waivers to permit systems to forgo the sampling requirements of one sample every five years, and can allow systems to conduct surrogate sampling from sampling points within a system, or among two or more systems, in lieu of sampling at every entry point to the distribution system. These waiver and surrogate sampling provisions are presented in greater detail in Sections A and B, respectively. For nitrate, States could permit systems to reduce the sampling frequency from annual to biennial under certain conditions. These provisions are described in Section C. Section D explains the process for State adoption and EPA approval of Permanent Monitoring Relief and Section E provides definitions of key terms used in these guidelines.

*Section A—Sampling Waivers for Chronic Contaminants*

Under the Chemical Monitoring Reform approach, water systems would sample at a minimum of once every five years during the time of greatest vulnerability for each of the sixty four contaminants listed in Table I, above. Under the PMR guidelines, a State could allow a system to forgo monitoring at specified sampling points during a monitoring period by granting a sampling waiver.

EPA seeks comment from States and systems on whether the relief provided by five year waivers would be meaningful, in light of the cost difference between sampling once every five years or updating a vulnerability analysis to review a waiver every five years, understanding that waivers could be granted on an area wide basis, and do not have to be done on an individual system basis.

(1) *State Findings Required for Waivers:* Under PMR, a State could grant a waiver allowing a system to forgo sampling during a five year

[27] See sections 1418(b) and 1453(a)(3)

monitoring period, if the State, at a minimum, makes one of the following determinations.

(a) The State may determine that the sampling point is free of contamination and there is a high probability that it will remain so during the term of the waiver. A State may not make this determination, if the contaminant has been detected within the source water review area of the sampling point within the last five years.

(b) The State may determine that the contaminant level will remain reliably and consistently below the MCL during the sampling period based on a finding that:

(i) the natural occurrence levels are stable and the contaminant does not occur because of human activity; or

(ii) all the sources of potential contamination within the source water review area: have been identified, brought under control, and will pose no increased or additional risk of contamination to the source water withdrawal point during the sampling period; and the contaminant levels have peaked based on the history of sampling results and the duration of the contaminant in the environment; or

(iii) the treatment at the sampling point is properly operated and maintained, and is working reliably and effectively.

(c) A State may not make any of the three determinations under this paragraph, if the contaminant was detected at a level ≥ ½ of the MCL in the most recent sampling series for that sampling point.

(2) *General Considerations:* In making waiver decisions the State shall, at a minimum, consider the following factors.

(a) the fate and transport of the contaminant;

(b) the patterns of contaminant use;

(c) the location of potential contamination sources within the source water review area;

(d) the hydrogeologic features within the source water review area;

(e) the integrity of the structures delivering source water to the sampling point;

(f) the results of all source water assessments that have been completed within the source water review area;

(g) the efficacy of any source water protection measures that have been enacted, and;

(h) for waivers based on the contaminant remaining reliably and consistently below the MCL for the sampling period, the relationship of the sampling results to the MCL, the variability of the sampling results over time, and the trend of the sampling results.

(3) *System Responsibility:* Each water system granted a sampling waiver under this paragraph shall notify the State within 30 days of the time it first learns of any change in any of the conditions under which a waiver was granted.

(4) *State Review of Waiver Determinations:* The State shall review its decision to grant or renew a waiver, whenever it learns of a change in the circumstances upon which the waiver was granted. The State may amend the terms of a waiver, or revoke a waiver at any time.

(5) *Waiver Renewals:* A State may renew a sampling waiver by making the same determination it made to initially grant the waiver, after reviewing current assessments of the factors that are subject to change during the term of the waiver, and that affect the finding(s) upon which the waiver is based.

(6) *Waivers for Cyanide:* Before granting a waiver for cyanide, the State shall determine whether cyanide is present in the system's source water.

*Section B—Surrogate Sampling Points*

A State may allow a system, or several systems, to use the monitoring results from the sampling point(s) designated by the State as surrogate point(s), if the State determines that the source water serving the surrogate sampling points is drawn from the most vulnerable portion of the same contiguous source water.

(1) *Intra-system Surrogate Sampling:* For designating surrogate sampling points within one system, the State shall consider a sufficient record of the pertinent information below and the results of the source water assessments that have been completed under section 1453 of the Safe Drinking Water Act

(a) Monitoring data demonstrating that the sampling results are < ½ MCL;

(b) Well log or surface water hydrology data demonstrating that the points to be included in the surrogate sampling point program draw from the same contiguous source water; and

(c) An inventory of the potential contamination sources within the source water review area affecting all the sampling points to be included in the surrogate sampling point program.

The State shall also require the system to validate the results of the surrogate sampling points. For example, where one sampling point among three in a small system has been designated as the surrogate point, the State might require the other two points to rotate the sample every five years. This would reduce the system sampling burden by one third.

(2) *Inter-system Surrogate Sampling:* For designating surrogate sampling points among systems, a State must first receive EPA approval of its criteria and procedures for implementing an Inter-system Surrogate Sampling Point Program, that meets the criteria of this paragraph. Two or more systems may use the monitoring results from surrogate sampling points designated by the State, based on a complete assessment of the contiguous source water that has been approved by the State and that describes:

(a) The requirements for validation sampling (For example, where several sampling points among dozens in several systems have been designated as the surrogate points, the State might require the next most vulnerable tier of sampling points to ''round robin'' the sample every five years. This could significantly reduce the overall sampling burden.);

(b) The location of potential contamination sources that could affect any of the Community Water Systems or Non-transient, Non-community Water Systems drawing from the contiguous source water.

(c) The hydrogeologic features of the contiguous source water; and

(d) The relationships among potential contamination sources, the hydrogeologic features and the source water withdrawal points, with particular regard to their relative locations.

(3) *Validation Sampling:* Whenever the sampling results at a surrogate point are ≤ ½ of the MCL, the State shall require the systems to conduct validation sampling at each of the points represented by that surrogate point. Surrogate sampling shall be discontinued for that sampling point, and for any sampling points that it represents, if the contaminant is ≤ ½ MCL. The State shall then decide which sampling points to target for increased sampling, which, if any, to default to once every five years, and which, if any, may be appropriate for a smaller surrogate sampling arrangement.

(4) *System Responsibility:* Each system shall notify the State within 30 days of the time it first learns of any change in any of the conditions under which any surrogate sampling point has been designated.

(5) *State Review of Surrogate Sampling Point Designations:* The State shall review its decision to designate any surrogate sampling point, whenever it learns of a change in the circumstances upon which the point was designated.

EPA seeks comment on its distinction between intra-system surrogate sampling and inter-system surrogate sampling, and the requirements

associated with each. EPA made the distinction because it believes that inter-system surrogate sampling is likely to be more complex and require more sophisticated analyses that intra-system surrogate sampling. There may be situations, however, where inter-system surrogate sampling is simple or where intra-system surrogate sampling is complex. EPA seeks comment on whether the distinction should be made on the complexity of analyses as opposed to the intra-system and inter-systems distinction. Commenters should provide specific suggestions for making an alternative distinction.

*Section C—Reduced Nitrate Sampling*

States may reduce the nitrate monitoring frequency from annual to biennial sampling for a sampling point served exclusively by ground water under the following conditions:

(1) *Maximum Allowed Concentration:* Nitrate measured as N has not exceeded a concentration equal to or greater than 2 milligrams per liter at any time during the past ten years;

(2) *Integrity of Structures and Equipment:* The State has determined that the design and construction of the structures and equipment delivering water from the wellhead to the distribution system fully comply with current State code for such structures and equipment;

(3) *Freedom from Surface Water Intrusion:* The State has determined that the ground water serving the sampling point is not under the direct influence of surface water, and is not susceptible to significant changes in contamination levels during the period for which the sampling would be reduced e.g., not a shallow well, not in fractured bedrock;

(4) *State Determination:* The State has determined that (a) nitrate sampling is not required as a precursor to microbial or viral contamination, (b) land uses, or relevant land use based conditions (such as the effective operation of septic systems) in the area affecting the sampling point are unlikely to change in a way that would increase the risk of nitrate contamination, and (c) any contamination at the sampling point is very unlikely to exceed the 2 mg/l during the reduced sampling period;

(5) *Effect of Detection ≥ 2 mg/l:* If nitrate is detected at ≥ 2 mg/l, measured as N, the system shall return to an annual sampling frequency under the State requirements adopted pursuant to the national primary drinking water regulations; and

(6) *System Responsibility and State Review:* Each system shall notify the State within 30 days of the time it learns of any change the conditions under which the reduced sampling for nitrate has been allowed, particularly of any change in land use practices. The State shall review its decision to reduce the sampling frequency, whenever it learns of a change in the circumstances upon which its decision was based.

EPA also seeks comment on [a] whether the Agency should use a threshold other than 2 mg/l as one of the bases for reduced monitoring, [b] whether EPA should set a reduced frequency other than biennial sampling, or [c] whether EPA should establish a sliding scale of longer sampling frequencies e.g., three year frequency based on a threshold of 2 mg/l, and five year frequency based on a threshold of 1 mg/l.

*Section D—State Adoption and EPA Approval of Permanent Monitoring Relief*

The Act specifies that State Permanent Monitoring Relief provisions will be treated as ''applicable'' national primary drinking water regulations, which means they must be enforceable under both State and Federal law.[28] The Act defines an enforceable State requirement as a ''State program approved pursuant to this part.'' [29] In order to assure that the State Permanent Monitoring Relief provisions will be Federally enforceable, EPA must review and approve the State program. Therefore, any State adoption of alternative monitoring requirements to offer Permanent Monitoring Relief must be at least as stringent as these requirements and adhere to each of the following steps.

(1) *State Program Description:* The State shall describe the information it will review, and its procedures and decision criteria for issuing waivers under Section A, designating surrogate sampling points under Section B, or allowing systems to sample biennially for nitrate under Section C. At a minimum, the State Program Description shall include the criteria under Sections A–C (respectively) for each form of monitoring relief that the State proposes to offer, and specify that the State will retain a record of the most recent vulnerability determination for each sampling point, including:

(a) Those resulting in a decision to grant a sampling waiver under Section A;

(b) Those resulting in a decision to allow the use of intra-system surrogate sampling points under Section B(1); and

(c) Those resulting in the approval of source water assessments and the location of geographically targeted sampling points based on those source water assessments under Section B(2).

(2) *Notice and Comment:* The State must provide notice and opportunity for public comment on the requirements.

(3) *Attorney General Certification:* The Attorney General must certify in writing that the alternative State monitoring requirements were duly adopted under State law, are enforceable under State law, and comply with EPA's Permanent Monitoring Relief Guidelines and with §§ 1418 (b) through (c) of the Safe Drinking Water Act, as amended August 6, 1996.

(4) *State Source Water Assessment Program:* EPA must have approved the State's Source Water Assessment Program.

(5) *EPA Review and Decision:* Unless EPA notifies the State of its disapproval of the State requirements within 9 months of EPA's receipt of a complete set of the proposed State requirements, the State requirements will take effect on the date of the State's submittal of a complete program, or the effective date of its regulations, whichever occurs later.

(a) A notice of disapproval will include the identification of the part(s) of the State requirements at issue and the remedies necessary to render those parts approvable.

(b) The State requirements shall not take effect until the State has corrected the problems identified by EPA, and resubmitted its revised program for review.

(6) *EPA Review of State Determinations:* A Regional Administrator may annul a State decision to grant a waiver, to designate a surrogate sampling point, or to reduce nitrate sampling, under the procedures specified in 40 CFR, Part 142.18. EPA is seeking comment on whether to expand this authority to these and other State decisions.

*Section E—Definitions*

(1) *Contiguous source water* means, for the purposes of these guidelines, a source or several inter-connected sources of public drinking water:

(a) Comprised of surface water, or ground water, or ground water under the direct influence of surface water, or any combination thereof, that serves two or more source water withdrawal points; and

(b) From within which contamination that can reach any one of the source water withdrawal points, can also reach any of the other source water withdrawal points.

[28] See § 1418(c)

[29] See § 1414(i)(4).

(2) *Monitoring period* means a five year period during which water systems are required under 40 CFR 141.23 to take at least one sample during the time of greatest vulnerability.

(3) *Source Water Review Area (SWRA)* means the surface and subsurface area within which a contaminant can reach the source water withdrawal point, or any point between it and the entry point to the distribution system (e.g., an aqueduct), during the time between regularly scheduled samples. The size and shape will vary depending upon several factors, including the sampling period and the hydrogeologic features within the area. Where systems use ground water, the SWRA could be the Source Water Protection Area (SWPA) established under the Safe Drinking Water Act, where the SWPA is based on a time of travel delineation consistent with the sampling period i.e., 5 years. For surface water, the SWRA is the watershed upstream of the source water withdrawal point.

(4) *Surrogate sampling points* mean the sampling point(s) within a group of sampling points: within one water system e.g., under a Wellhead Protection Program, that meets the criteria for intra-system surrogate sampling point designations; or within a group of water systems, that are designated by the State as the most vulnerable to contamination and, therefore, can be used to represent all the sampling points within the group.

(5) *Validation sampling* means sampling at one or more points represented by surrogate sampling points, in order to verify that the surrogate points are representative of those sampling points.

*O. Suggestions for Regulatory Burden Reduction Other Than Chemical Monitoring Reform*

As explained in the Summary of Draft Changes, as part of the President's initiative to ''Reinvent Environmental Regulation'', EPA has been reviewing the National Primary Drinking Water Regulations (NPDWRs) to find opportunities for reducing the paperwork burden on public water systems and State drinking water agencies, and has solicited input from States, water utilities, and environmental groups. That process yielded a number of suggestions, including many which have been incorporated into the Chemical Monitoring Reform approach that is presented today. ''Stakeholders'' did, however, make suggestions other than those related to Chemical Monitoring Reform. EPA believes a few of these suggestions deserve further consideration. Consequently, we are presenting those suggestions below, and are requesting comment, data, or other relevant information on each so that the Agency can more fully evaluate their merits for possible subsequent rulemaking.

It should be noted that none of the following suggestions were unanimously embraced by all stakeholders, and some received more stakeholder support than others. The suggestions follow:

(1) Surface Water Treatment Requirements

Extend various deadlines associated with filtration of ground waters under the direct influence of surface water.

Section 142.16(b)(2)(B) of the regulations require States to determine which community water systems are served by ground water under the direct influence (GWUDI) of surface waters by June 29, 1994, and which noncommunity water systems are GWUDI by June 29, 1999. Section 141.71 of the regulations then requires that, within 18 months after a system has been designated as a GWUDI, the State must determine whether the system has to install filtration treatment or is able to avoid filtration.

It has been suggested that provisions be adopted which would allow for extensions of these two requirements. Some stakeholders believed that while many GWUDI determinations are relatively easy, others are quite complex—requiring additional time to complete. Some States also have many more such determinations to make. The suggestion was to provide States with additional time to make the determinations for these more complex cases or where an extremely large number of determinations is required. It was suggested that States be allowed additional time to make the filtration determinations where they are particularly complex or there are an extremely large number of determinations to make.

In both cases, the suggestion was to allow for such extensions on a case by case basis, possibly through a formal request to EPA for an extension for specific systems. The suggestions also envisioned that the extensions would be for a finite time period (possibly 2 to 5 years), to be specified in the federal regulations.

(2) General Reporting Requirements

(a) *Eliminate the requirement for water systems to report monitoring violations to the State.* Section 141.31(b) of the current federal regulations requires public water systems to report a violation of any regulatory requirement to the State. One such requirement is that a system must notify the State any time it fails to conduct any required monitoring. In practice, States do not typically rely on water systems to inform them of such failures. A system which does not perform some required monitoring is not likely to notify the State of that failure. Rather, States normally treat failure to receive laboratory analytical results as the indicator that monitoring did not occur. As a result, it has been suggested that the federal requirement—that systems report instances of failure to monitor—is redundant, and is serving no useful purpose. The interpretation is that since there is a Federal requirement for water systems to report analytical results of all monitoring to the State, a requirement to notify the State of a failure to monitor is, in effect, redundant, and thus unnecessary.

The intended purpose behind the requirement was to ensure that States knew where required monitoring was not occurring so that they could take some type of action to correct that failure. Advocates of this approach believe that experience suggests that purpose is being served without needing the support of the federal requirement. It has been suggested, therefore, that EPA eliminate the federal requirement that water systems must report monitoring violations to the State. Systems would still be required to report analytical results of all required monitoring to the State. With the suggested change, however, States would have the option of continuing to require systems to report monitoring failures to the State (although this would now be through State, rather than federal, regulations), or treating any failure to provide the analytical results as a monitoring failure. In either case the State would know that follow-up action was necessary—fulfilling the intent of the original federal requirement. Further, a water system would still be required to notify the public of its failure to conduct the required monitoring [§ 141.32(b)]. The consumers would, therefore, be aware that some required monitoring had not occurred and could take citizen action to resolve that failure. In addition, States would still be required to follow-up on, and resolve, such failures. Finally, States would still be required to notify EPA of all water system monitoring failures. Advocates believe that EPA would, therefore, continue to have all the information that it currently has about such failures and the Federal oversight and enforcement capabilities

would not be diminished. The suggested change would, in this view, not alter a State's knowledge about a water system's failure to monitor, a State's obligation to correct that failure, a State's obligation to report the failure to EPA, the system's obligation to inform the public about the failure, or EPA authorities to take an enforcement action against the system. The change would only give a State the flexibility to decide how it wants to arrive at a determination that a system has failed to conduct some required monitoring.

(b) *Reduce the frequency of reporting violation information to EPA.* Section 142.15(a) of the current regulations requires States to submit to the Agency, quarterly reports of; (a) new violations by public water systems, (b) new enforcement actions taken by the State against public water systems, and (c) new variances and exemptions granted by the State during the previous quarter. The violations and enforcement data include acute and chronic contaminants, violations of actual safety standards (MCLs, treatment techniques, etc), and failures to sample or report according to schedule. Some of these violations represent a greater risk to public health than others and some are more time sensitive than others. As an example, violations of acute contaminants (such as e-Coli, or fecal coliforms) or violations associated with acute contaminants (such as total coliforms), typically need to be addressed sooner than do violations of chronic contaminants. As such, the regulatory agency needs to be aware of a violation of an acute contaminant sooner than it does a violation of a chronic contaminant. Similarly, violations of maximum contaminant levels (indicating actual contamination) typically require more immediate attention than do violations of monitoring requirements. Even different types of monitoring violations deserve different levels of attention. ''Major'' monitoring violations (those in which none of the required monitoring was conducted) need to be addressed and resolved much sooner than do ''minor'' monitoring violations (those in which some, but not all of the required monitoring was conducted).

There is also a distinction in the urgency for any violation information among the different users of that information. States are typically the primary enforcement authority for the drinking water requirements, with EPA serving a secondary role. The primary enforcement authority needs to make decisions about violation severity and appropriate remedy, and therefore, typically needs information more quickly than does the secondary overseer. In States where a State agency has been delegated this primary enforcement authority, EPA typically becomes involved only when a violation is considered ''significant'', or where it is clear that EPA involvement is necessary to resolve the problem. Other than these special situations, EPA's role is one of evaluating the success of the drinking water program through the surrogate of compliance/violation statistics.

For these reasons, some stakeholders questioned EPA's need for all of the above information, on a quarterly basis. It has been suggested that EPA align the frequency of State reporting to the importance of the information to the Agency. One suggestion was to continue to require quarterly reporting of violations of all maximum contaminant levels (MCLs), treatment techniques, and State enforcement actions against those violations, but to reduce to annually all other State reporting. Another suggestion was to require quarterly reporting of all information (MCL, treatment technique, reporting, etc) related to acute contaminants, but to reduce to annually the reporting of all information related to chronic contaminants.

It should be noted that a few stakeholders believed that reducing the reporting frequency would actually increase, rather than decrease, the burden on States. Some stakeholders noted the problems and obstacles faced by States in transmitting violation data to EPA (such things as identifying why certain data is rejected by the automated data system), and believed that ''saving'' resolution of all these problems until the end of the year would actually take much more time than would have been required if done on a quarterly basis.

EPA requests comment on these suggestions and solicits ideas for other ways of reducing the frequency of reports from the State to EPA.

## List of Subjects in 40 CFR Parts 141 and 142

Environmental protection, Administrative practices and procedures, Intergovernmental relations, Reporting and recordkeeping requirements, Water supply, Indians.

Dated: June 26, 1997.

**Carol M. Browner,**

*Administrator.*

## Appendix A to Preamble: EPA Technical Criteria Document for the Analysis of Selected Chemicals in Drinking Water

(The four suggestions for change described in the preamble and subject to comment are highlighted in the following technical criteria document with [brackets].)

*Contaminant Performance Criteria:* In order to receive and retain certification for analyzing samples to determine compliance under 40 CFR 141.23 and Part 141, Subpart I, a laboratory would have to meet the following requirements.

I. *Laboratory Method Detection limits (MDLs):* Before initially using an EPA approved method to analyze compliance samples, each laboratory would calculate the MDL for each regulated contaminant covered by that method using at least seven replicates in accordance with the procedure in 40 CFR, Part 136 Appendix B, [except that the LFBs used to calculate the MDL must be extracted (if applicable), and analyzed over a period of at least three days]. The requirement to calculate the initial MDL over a three day or longer period does not apply to MDL calculations conducted before October 1, 1997.

A. Each laboratory would achieve an MDL of 0.5 µg/l for each VOC listed under § 141.61(a), an MDL of 1 µg/l for lead, and for copper—an MDL of 1 µg/l or 200 µg/l when atomic absorption direct aspiration is used.

B. Each laboratory would achieve the detection limits specified by the State for all other contaminants listed under §§ 141.11(b), 141.61(c) and 141.62(b) (1) through (6), 141.62(b) (10) through (15) and 141.82(c)(3).

II. *Ongoing Quality Control:* Each laboratory would analyze a laboratory fortified blank (LFB) with each batch of samples. The spike levels of each LFB would be as specified by the individual methods or consistent with standard laboratory practices, except that:

A. [Trigger Level LFBs—(i) Each laboratory would extract (if applicable) and analyze at least one LFB per week at a concentration equal to or less than ½ of the MCL in any week during which drinking water compliance samples are either (1) analyzed directly without the use of an extraction step; or (2) extracted for future analysis.

(ii) For polychlorinated biphenyls, the LFBs would be analyzed using an approved PCB screening method under paragraph V. of this document. The

conversion table below would be used to determine if a laboratory can detect Aroclors at ½ of the MCL.

| Aroclor | Aroclor in mg/L | Conversion factor | Decachlorobiphenyl in mg/L |
|---|---|---|---|
| 1016 | 0.00013 | 1.92 | 0.00025 |
| 1221 | 0.000095 | 2.63 | 0.00025 |
| 1232 | 0.000115 | 2.17 | 0.00025 |
| 1242 | 0.00013 | 1.92 | 0.00025 |
| 1248 | 0.00015 | 1.67 | 0.00025 |
| 1254 | 0.000165 | 1.52 | 0.00025 |
| 1260 | 0.00018 | 1.39 | 0.00025 |

(iii) In any week during which a laboratory is using method 508A to analyze drinking water compliance samples, it would extract and analyze at least one LFB at a concentration equal to or less than ½ MCL using that method.

B. MDL LFBs—Each laboratory would extract, if applicable, and analyze at least one LFB per month during any month in which drinking water compliance samples are either (1) analyzed directly without the use of an extraction step; or (2) extracted for future analysis. In either case, the laboratory would spike each LFB at the same level as that used to calculate the method detection limit in the initial demonstration of capability.]

C. Each laboratory would reliably achieve the accuracy and precision parameters, if any are specified by the State under paragraph A above, and the detection sensitivity, if any are specified by the State under paragraph B, in the analyses of these LFBs.

III. *Approved Analytical Methods, PE Samples and Acceptance Limits:* All samples used to determine compliance with the maximum contaminant levels under §§ 141.11(b), 141.61(a), 141.61(c) and 141.62(b) (1) through (6) and 141.62 (10) through (15) would be analyzed in accordance with the methods, preservation techniques and holding times specified under paragraph V. Approved Analytical Methods and Acceptance Limits Under Chemical Monitoring Reform, of this document and in the method descriptions.

A. [At a minimum, each laboratory must successfully analyze Performance Evaluation (PE) samples every year as provided by EPA, the State, or other parties that have been approved by the State or EPA.] This series of PE samples must be tested for the contaminants, and achieve the quantitative acceptance limits, under paragraph V. of this document

B. Each laboratory must achieve the quantitative acceptance limits under paragraph V. of this document for at least 80 percent of the regulated organics listed in § 141.61(a)(2) through (a)(21).

IV. *Recording Results of Sampling Analyses and Laboratory Quality Assurance Analyses:*

A. Each laboratory would report the results of all sample analyses, including all detections, in the manner and format specified by the State. For the purposes of 40CFR141.23 only, ''detection'' means any value observed in a drinking water sample that is equal to or greater than the MDL as determined by the procedures in 40CFR136, Appendix B, by paragraphs I and II. of this criteria document, and by criteria established by the State.

B. [Each laboratory would report the results of analyzing the Performance Evaluation (PE) Samples under paragraph III. to the State, at a minimum frequency of once each year.

C. Each laboratory would maintain a record of each MDL analysis and calculation under paragraph I, in the format specified by the State, until the next State laboratory certification audit report has been completed, or for five years, whichever period is longer.

D. Each laboratory would maintain a record of each LFB analysis conducted under paragraph II., in the format specified below, until the next State laboratory certification audit report has been completed, or for five years, whichever period is longer.

E. The records under Paragraphs C. and D. (above) would be provided to the State upon request, in the manner and format specified by the State.]

**Record of Analyzing Laboratory Fortified Blanks**

Purpose of LFB (check one):
☐Weekly Trigger Level Check
☐Monthly MDL Level Check

Units of Measure (check one):
☐Milligrams per Liter (mg/l)
☐Micrograms per Liter (µg/l)

Laboratory Name and Address

_____
_____
_____
_____
_____

Lab Identification Number: _____
Contact Person: _____
Phone : ( ) - _____
Method Identification : _____

Description of deviations from published method, if any (*e.g.*, columns, detectors, etc). Use reference to laboratory SOP or other QA documentation when appropriate.

_____
_____
_____
_____

| Date | Analyte | Fortified concentration | Measured concentration |
|---|---|---|---|
| | ..... | ..... | |
| | ..... | ..... | |
| | ..... | ..... | |
| | ..... | ..... | |
| | ..... | ..... | |
| | ..... | ..... | |
| | ..... | ..... | |

BILLING CODE 6567–50–P

## V. Approved Analytical Methods & Acceptance Limits Under Chemical Monitoring Reform

| Chemical & Acceptance Limit | Method Name | EPA | ASTM[13] | SM[14] | Other |
|---|---|---|---|---|---|
| **Inorganic Chemicals (IOCs)** | | | | | |
| *Antimony* ± 30% ≥ 0.006 mg/L | ICP-Mass Spectrometry | 200.8 [7] | ----- | ----- | ----- |
| | Hydride-Atomic Absorption | ----- | D-3697-92 | ----- | ----- |
| PRESERVATION & HOLDING TIME : | Atomic Absorption; Platform | 200.9 [7] | ----- | ----- | ----- |
| Conc $HNO_3$ to pH < 2 -- 6 months | Atomic Absorption; Furnace | ----- | ----- | 3113B | ----- |
| *Arsenic* NONE | Inductively Coupled Plasma | 200.7 [7] | ----- | 3120B | ----- |
| | ICP-Mass Spectrometry | 200.8 [7] | ----- | ----- | ----- |
| PRESERVATION & HOLDING TIME: | Atomic Absorption; Platform | 200.9 [7] | ---- | ----- | ----- |
| Conc $HNO_3$ to pH<2 -- 6 months | Atomic Absorption; Furnace | ----- | D-2972-93C | 3113B | ----- |
| | Hydride Atomic Absorption | ----- | D-2972-93B | 3114B | ----- |
| *Asbestos* 2 σ | Transmission Electron Microscopy | 100.1 | ----- | ----- | ----- |
| PRESERVATION & HOLDING TIME : Cool, 4° C | Transmission Electron Microscopy | 100.2 | | | |
| *Barium* ± 15% ≥ 0.15 mg/L | Inductively Coupled Plasma | 200.7 [7] | ----- | 3120B | ----- |
| | ICP-Mass Spectrometry | 200.8 [7] | ----- | ----- | ----- |
| PRESERVATION & HOLDING TIME : | Atomic Absorption; Direct | ----- | ----- | 3111D | ----- |
| Conc $HNO_3$ to pH < 2 -- 6 months | Atomic Absorption; Furnace | ----- | ----- | 3113B | ----- |
| *Beryllium* ± 15% ≥ 0.001 mg/L | Inductively Coupled Plasma | 200.7 [7] | ----- | ----- | ----- |
| | ICP-Mass Spectrometry | 200.8 [7] | ----- | ----- | ----- |
| PRESERVATION & HOLDING TIME : | Atomic Absorption; Platform | 200.9 [7] | ----- | ----- | ----- |
| Conc $HNO_3$ to pH < 2 -- 6 months | Atomic Absorption; Furnace | ----- | D-3645-93B | 3113B | ----- |
| *Cadmium* ± 20% ≥ 0.002 mg/L | Inductively Coupled Plasma | 200.7 [7] | ----- | ----- | ----- |
| | ICP-Mass Spectrometry | 200.8 [7] | ----- | ----- | ----- |
| PRESERVATION & HOLDING TIME : | Atomic Absorption; Platform | 200.9 [7] | ----- | ----- | ----- |
| Conc $HNO_3$ to pH < 2 -- 6 months | Atomic Absorption; Furnace | ----- | ----- | 3113B | ----- |
| *Chromium* ± 15% ≥ 0.01 mg/L | Inductively Coupled Plasma | 200.7 [7] | ----- | 3120B | ----- |
| | ICP-Mass Spectrometry | 200.8 [7] | ----- | ----- | ----- |
| PRESERVATION & HOLDING TIME : | Atomic Absorption; Platform | 200.9 [7] | ----- | ----- | ----- |
| Conc $HNO_3$ to pH < 2 -- 6 months | Atomic Absorption; Furnace | ----- | ----- | 3113B | ----- |
| *Cyanide* ± 25% ≥ 0.1 mg/L | Manual Distillation followed by | | | 4500-CN-C | |
| | Spectrometric, Amenable | ----- | ----- | 4500CN-G | ----- |
| | Spectrometric, Manual | ----- | D-2036-91B | 4500-CN-E | ----- |
| PRESERVATION & HOLDING TIME : | Semi-automated | ----- | D2036-91A | ----- | I-3300-85 [16] |
| Cool, 4° C, NaOH to > 12 *** --- 14 days | Selective Electrode | 335.4 [10] | ----- | 4500CN-F | ----- |
| *Fluoride* ± 10% @ 1 - 10 mg/L | Ion Chromatography | 300.0 [10] | D4327-91 | 4110B | ----- |
| | Manual Distillation; Color. SPADNS | ----- | ----- | 4500F-B,D | ----- |
| | Manual Electrode | ----- | D1179-93B | 4500F-C | ----- |
| | Automated Electrode | ----- | ----- | ----- | 380-75WE[17] |
| HOLDING TIME : 1 month | Automated Alizarin | ----- | ----- | 4500F-E | 129-71W[17] |
| *Mercury* ± 30% ≥ 0.0005 mg/L | Manual, Cold Vapor | 245.1 [7] | D3223-91 | 3112B | ----- |
| PRESERVATION & HOLDING TIME : | Automated, Cold Vapor | 245.2 [11] | ----- | ----- | ----- |
| Conc $HNO_3$ to pH < 2 -- 28 days | ICP-Mass Spectrometry | 200.8 [7] | ----- | ----- | ----- |
| *Nitrate+Nitrite*[18] ± 10% @ ≥ 0.4 mg/L | Ion Chromatography | 300.0[10] | D4327-91 | 4110B | B-1011[9] |
| | Automated Cadmium Reduction | 353.2[10] | D3867-90A | 4500-$NO_3$-F | ----- |
| PRESERVATION & HOLDING TIME: | Ion Selective Electrode | ----- | ----- | 4500-$NO_3$-D | 601[14] |
| Conc $H_2SO_4$ to pH < 2, 28 days | Manual Cadmium Reduction | ----- | D3867-90B | 4500-$NO_3$-E | ----- |
| *Nitrite* ± 15% @ ≥ 0.4 mg/L | Ion Chromatography | | | | |
| *or Nitrate*[18] ±10% @ ≥0.4 mg/L | Automated Cadmium Reduction | 300.0[10] | D4327-91 | 4110B | B-1011[9] |
| | Manual Cadmium Reduction | 353.2[10] | D3867-90A | 4500-$NO_3$-F | ----- |
| PRESERVATION & HOLDING TIME: | Spectrophotometric(Nitrite only) | ----- | D3867-90B | 4500-$NO_3$-E | ----- |
| Cool, 4°C, 48 hours | Ion Selective Electrode (Nitrate only) | ----- | ----- | 4500-$NO_3$-B | ----- |

| CHEMICAL & ACCEPTANCE LIMIT | METHOD NAME | EPA | ASTM[13] | SM[14] | OTHER |
|---|---|---|---|---|---|
| **Inorganic Chemicals [ CONTINUED ]** | | | | | |
| ***Selenium*** ± 20% ≥ 0.01 mg/L | Hydride-Atomic Absorption | ----- | D3859-93A | 3114B | ----- |
| | ICP-Mass Spectrometry | 200.8 [7] | ----- | ----- | ----- |
| PRESERVATION & HOLDING TIME : | Atomic Absorption; Platform | 200.9 [7] | ----- | ----- | ----- |
| Conc $HNO_3$ to pH < 2 -- 6 months | Atomic Absorption; Furnace | ----- | D3859-93B | 3113B | ----- |
| ***Thallium*** ± 30% ≥ 0.002 mg/L | ICP-Mass Spectrometry | 200.8 [7] | ----- | ----- | ----- |
| PRESERVATION & HOLDING TIME : | Atomic Absorption; Platform | 200.9 [7] | ----- | ----- | ----- |
| Conc $HNO_3$ to pH < 2 -- 6 months | | | | | |
| ***Lead*** ± 30% ≥ 0.005 mg/L | Atomic Absorption, Furnace | ----- | D3559-90D | 3113B | |
| PRESERVATION & HOLDING TIME : | ICP-Mass Spectrometry | 200.8 [7] | ----- | ----- | |
| Conc $HNO_3$ to pH < 2 -- 6 months | Atomic Absorption, Platform | 200.9 [7] | ----- | ----- | |
| ***Copper*** ± 10% ≥ 0.050 mg/L | Atomic Absorption, Furnace | ----- | D1688-90C | 3113B | |
| | Atomic Absorption, Direct Aspiration | ----- | D1688-90A | 3111B | |
| | ICP | 200.7 [7] | ----- | 3120B | |
| PRESERVATION & HOLDING TIME : | ICP-Mass Spectrometry | 200.8 [7] | ----- | ----- | |
| Conc $HNO_3$ to pH < 2 -- 6 months | Atomic Absorption, Platform | 200.9 [7] | ----- | ----- | |
| ***pH**** | Electrometric | 150.1 [11] | D1293-84 | 4500-$H^+$-B | |
| | ---------- | 150.2 [11] | ----- | ----- | |
| ***Conductivity**** | Conductance | ----- | D1125-91A | 2501B | |
| ***Calcium**** | EDTA titrimetric | ----- | D511-93A | 3500-Ca-D | |
| | Atomic Absorption, Direct Aspiration | ----- | D511-93B | 3113B | |
| | ICP | 200.7 [7] | ----- | 3120B | |
| ***Alkalinity**** | Titrimetric | ----- | D1067-92B | 2320B | ----- |
| | Electrometric Titration | ----- | ----- | ----- | I-1030-85[16] |
| ***Orthophosphate*** | Colorimetric, Automated, Ascorbic acid | 365.1[10] | ----- | 4500-P-F | ----- |
| | Colorimetric, Ascorbic acid, Single reagent | ----- | D515-88A | 4500-P-E | ----- |
| | Colorimetric, Phosphomolybdate; | ----- | ----- | ----- | I-1601-85[16] |
| | Automated-segmented flow; | ----- | ----- | ----- | I2601-90[16] |
| PRESERVATION & HOLDING TIME: | Automated-discrete | ----- | ----- | ----- | I2598-85[16] |
| 4°C, 48 hours max. (24 hours recommended) | Ion Chromatography | 300.0[10] | D4327-91 | 4110 | ----- |
| | Colorimetric, Molybdate blue: | ----- | ----- | ----- | I-1700-85[16] |
| | Automated-segmented flow | ----- | ----- | ----- | I-2700-85[16] |
| | Colorimetric | ----- | D859-88 | ----- | ----- |
| ***Silica**** | Molybdosilicate | ----- | ----- | 4500-Si-d | ----- |
| | Heteropoly blue | ----- | ----- | 4500-Si-E | ----- |
| | Automated method for molybdate-reactive silica | ----- | ----- | 4500-Si-F | ----- |
| | ICP | 200.7 [7] | ----- | 3120B | ----- |
| ***Temperature**** | Thermometric | ----- | ----- | 2550 | ----- |
| ***Sodium**** | ICP | 200.7 [7] | ----- | ----- | ----- |
| | Atomic Absorption; Direct aspiration | ----- | ----- | 3111B | ----- |
| **Synthetic Organic Compounds (SOCs)** | Method Name | EPA | ASTM [13] | SM[14] | OTHER |
| | Liquid-Solid Extraction, Esterification & Gas Chromatography with an Electron Capture Detector | 515.2 [4] | ----- | ----- | ----- |
| 2,4-D (Formula 40 Weeder 64)*** ± 50% | High Performance Liquid Chromatography w/ a Photodiode Array Ultraviolet Detector | 555 [4] | ----- | ----- | ----- |
| | Liquid-Liquid Extraction & Gas Chromatography with an Electron Capture Detector | 515.1 [1] | ----- | ----- | ----- |
| 2,3,7,8-TCDD (Dioxin)*** 2 σ | Liquid-Liquid Extraction & Gas Chromatography with High Resolution Mass Spectrometry Detection | 1613 [6] | ----- | ----- | ----- |
| | Liquid-Solid Extraction, Esterification & Gas Chromatography with an Electron Capture Detector | 515.2 [4] | ----- | ----- | ----- |
| 2,4,5-TP (Silvex)*** ± 50% | High Performance Liquid Chromatography w/ a Photodiode Array Ultraviolet Detector | 555 [4] | ----- | ----- | ----- |
| | Liquid-Liquid Gas Chromatography with an Electron Capture Detector | 515.1 [1] | ----- | ----- | ----- |

| CHEMICAL & ACCEPTANCE LIMIT | METHOD NAME | EPA | ASTM[13] | SM[14] | OTHER |
|---|---|---|---|---|---|
| **Synthetic Organic Compounds [ CONTINUED ]** | Method Name | EPA | ASTM [13] | SM[14] | OTHER |
| Alachlor (Lasso)*** ± 45% | Micro Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 505 [1] | ----- | ----- | ----- |
| | Liquid-liquid Extraction, Gas chromatography with Nitrogen Phosphorous Detection | 507 [1] | ----- | ----- | ----- |
| | Liquid Solid Extraction & Gas chromatography with Mass Spectrometry Detection | 525.2 [2] | ----- | ----- | ----- |
| | Liquid-Solid Extraction &Gas Chromatography with Electron Capture Detector | 508.1 [2] | ----- | ----- | ----- |
| Atrazine*** ± 45% | Micro Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 505 [1] | ----- | ----- | ----- |
| | Liquid-liquid Extraction, Gas chromatography with Nitrogen Phosphorous Detection | 507 [1] | ----- | ----- | ----- |
| | Liquid Solid Extraction & Gas chromatography with Mass Spectrometry Detection | 525.2 [2] | ----- | ----- | ----- |
| | Liquid-Solid Extraction & Gas Chromatography with Electron Capture Detector | 508.1 [2] | ----- | ----- | ----- |
| Benzo[a]pyrene*** 2 σ | Liquid Solid Extraction + Capillary Column, Gas chromatography, Mass Spectrometry | 525.2 [2] | ----- | ----- | ----- |
| | Liquid-Liquid Extraction & HPLC with Coupled Ultraviolet & Fluorescence Detection | 550 [5] | ----- | ----- | ----- |
| | Liquid-Solid Extraction & HPLC with Coupled Ultraviolet & Fluorescence Detection | 550.1 [5] | ----- | ----- | ----- |
| Carbofuran*** ± 45% | Direct Aqueous Injection HPLC with Post Column Derivatization and Fluorescence Detector | 531.1 [1] | ----- | 6610 [3] | ----- |
| Chlordane*** ± 45% | Micro Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 505 [1] | ----- | ----- | ----- |
| | Liquid-Liquid Extraction & Gas Chromatography w/an Electron Capture Detector | 508 [1] | ----- | ----- | ----- |
| | Liquid Solid Extraction & Gas chromatography with Mass Spectrometry Detection | 525.2 [2] | ----- | ----- | ----- |
| | Liquid-Solid Extraction & Gas Chromatography with Electron Capture Detector | 508.1 [2] | ----- | ----- | ----- |
| Dalapon*** 2 σ | Ion Exchange Liquid-Solid Extraction, Esterification & Gas Chromatography with Electron Capture Detection | 552.1 [4] | ----- | ----- | ----- |
| | Gas Chromatography with an Electron Capture Detector | 515.1 [1] | ----- | ----- | ----- |
| Di(2-ethylhexyl)adipate*** 2 σ | Liquid-Liquid Extraction or Liquid-Solid Extraction & Gas Chromatography with Photoionization Detection | 506 [5] | ----- | ----- | ----- |
| | Liquid Solid Extraction & Gas chromatography with Mass Spectrometry Detection | 525.2 [2] | ----- | ----- | ----- |
| Di(2-ethylhexyl)phthalate*** 2 σ | Liquid-Liquid Extraction or Liquid-Solid Extraction & Gas Chromatography with Photoionization Detection | 506 [5] | ----- | ----- | ----- |
| | Liquid Solid Extraction & Gas chromatography with Mass Spectrometry Detection | 525.2 [2] | ----- | ----- | ----- |
| Dibromochloropropane (DBCP)*** ± 40% | Micro liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 504.1 [2] | ----- | ----- | ----- |
| | Micro Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 551 [5] | ----- | ----- | ----- |
| Dinoseb*** 2 σ | Liquid-Solid Extraction, Esterification & Gas Chromatography with an Electron Capture Detector | 515.2 [4] | ----- | ----- | ----- |
| | High Performance Liquid Chromatography w/a Photodiode Array Ultraviolet Detector | 555 [4] | ----- | ----- | ----- |
| | Liquid-Liquid Extraction, Esterification & Gas Chromatography with an Electron Capture Detector | 515.1 [1] | ----- | ----- | ----- |
| Diquat*** 2 σ | Liquid-Solid Extraction & HPLC with Ultraviolet Detection Photodiode Array Detector | 549.1 [4] | ----- | ----- | ----- |
| Endothall*** 2 σ | Ion Exchange Liquid-Solid Extraction, Esterification ,and Gas Chromatography with Mass Spectrometry Detection or Flame Ionization Detection | 548.1 [4] | ----- | ----- | ----- |
| Endrin*** ± 30% | Micro Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 505 [1] | ----- | ----- | ----- |
| | Liquid-Liquid Extraction & Gas Chromatography with an Electron Capture Detector | 508 [1] | ----- | ----- | ----- |
| | Liquid Solid Extraction & Gas chromatography with Mass Spectrometry Detection | 525.2 [2] | ----- | ----- | ----- |
| | Liquid-Solid Extraction & Gas Chromatography with Electron Capture Detector | 508.1 [2] | ----- | ----- | ----- |
| Ethylene dibromide [EDB ]*** ± 40% | Micro Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 504.1 [2] | ----- | ----- | ----- |
| | Micro Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 551 [5] | ----- | ----- | ----- |
| Glyphosate*** 2 σ | Direct-Aqueous-Injection HPLC, Post-Column Derivatization with Fluorescence Detection | 547 [5] | ----- | 6651 | ----- |
| Heptachlor epoxide*** ± 45% | Micro Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 505 [1] | ----- | ----- | ----- |
| | Liquid-Liquid Extraction & Gas Chromatography with an Electron Capture Detector | 508 [1] | ----- | ----- | ----- |
| | Liquid Solid Extraction & Gas chromatography with Mass Spectrometry Detection | 525.2 [2] | ----- | ----- | ----- |
| | Liquid-Solid Extraction & Gas Chromatography with Electron Capture Detection | 508.1 [2] | ----- | ----- | ----- |

| CHEMICAL & ACCEPTANCE LIMIT | METHOD NAME | EPA | ASTM[13] | SM[14] | OTHER |
|---|---|---|---|---|---|
| **Synthetic Organic Compounds [ CONTINUED ]** | Method Name | EPA | ASTM [13] | SM[14] | OTHER |
| Heptachlor*** ± 45% | Micro Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 505 [1] | ----- | ----- | ----- |
| | Liquid-Liquid Extraction & Gas Chromatography with an Electron Capture Detector | 508 [1] | ----- | ----- | ----- |
| | Liquid Solid Extraction & Gas chromatography with Mass Spectrometry Detection | 525.2 [2] | ----- | ----- | ----- |
| | Liquid-Solid Extraction & Gas Chromatography with an Electron Capture Detector | 508.1 [2] | ----- | ----- | ----- |
| Hexachlorocyclopentadiene*** 2 σ | Micro liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 505 [1] | ----- | ----- | ----- |
| | Liquid-Liquid Extraction & Gas Chromatography with an Electron Capture Detector | 508 [1] | ----- | ----- | ----- |
| | Liquid Solid Extraction & Gas chromatography with Mass Spectrometry Detection | 525.2 [2] | ----- | ----- | ----- |
| | Liquid-Solid Extraction & Gas Chromatography with an Electron Capture Detector | 508.1 [2] | ----- | ----- | ----- |
| Hexachlorobenzene*** 2 σ | Micro Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 505 [1] | ----- | ----- | ----- |
| | Liquid-Liquid Extraction & Gas Chromatography with an Electron Capture Detector | 508 [1] | ----- | ----- | ----- |
| | Liquid Solid Extraction & Gas chromatography with Mass Spectrometry Detection | 525.2 [2] | ----- | ----- | ----- |
| | Liquid-Solid Extraction & Gas Chromatography with an Electron Capture Detector | 508.1 [2] | ----- | ----- | ----- |
| Lindane*** ± 45% | Micro Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 505 [1] | ----- | ----- | ----- |
| | Liquid-Liquid Extraction & Gas Chromatography with an Electron Capture Detector | 508 [1] | ----- | ----- | ----- |
| | Liquid Solid Extraction & Gas chromatography with Mass Spectrometry Detection | 525.2 [2] | ----- | ----- | ----- |
| | Liquid-Solid Extraction & Gas Chromatography with an Electron Capture Detector | 508.1 [2] | ----- | ----- | ----- |
| Methoxychlor*** ± 45% | Micro Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 505 [1] | ----- | ----- | ----- |
| | Liquid-Liquid Extraction & Gas Chromatography with an Electron Capture Detector | 508 [1] | ----- | ----- | ----- |
| | Liquid Solid Extraction & Gas chromatography with Mass Spectrometry Detection | 525.2 [2] | ----- | ----- | ----- |
| | Liquid-Solid Extraction & Gas Chromatography with an Electron Capture Detector | 508.1 [2] | ----- | ----- | ----- |
| Oxamyl (Vydate)*** 2 σ | Direct Aqueous Injection HPLC with Post Column Derivatization with a Fluorescence Detector | 531.1 [1] | ----- | 6610 [3] | ----- |
| Pentachlorophenol*** ± 50% | Liquid-Solid Extraction, Esterification & Gas Chromatography with an Electron Capture Detector | 515.2 [4] | ----- | ----- | ----- |
| | Liquid Solid Extraction & Gas chromatography with Mass Spectrometry Detection | 525.2 [2] | ----- | ----- | ----- |
| | High Performance Liquid Chromatography w/a Photodiode Array Ultraviolet Detector | 555 [4] | ----- | ----- | ----- |
| | Liquid-Liquid Extraction, Esterification & Gas Chromatography with an Electron Capture Detector | 515.1 [1] | ----- | ----- | ----- |
| Picloram*** 2 σ | Liquid-Solid Extraction, Esterification & Gas Chromatography with an Electron Capture Detector | 515.2 [4] | ----- | ----- | ----- |
| | High Performance Liquid Chromatography w/a Photodiode Array Ultraviolet Detector | 555 [4] | ----- | ----- | ----- |
| | Liquid-Liquid Extraction, Esterification & Gas Chromatography with an Electron Capture Detector | 515.1 [1] | ----- | ----- | ----- |
| Polychlorinated Biphenyls (PCBs)[15] *** as Aroclors as Decachlorobiphenyl 0 - 200% | Micro LLE &Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 505/508[1] | ----- | ----- | ----- |
| | Liquid-Liquid Extraction, Perchlorination & Gas Chromatography with Electron Capture Detection | 508A [1] | | | |
| Simazine*** 2 σ | Micro Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 505 [1] | ----- | ----- | ----- |
| | Liquid-liquid Extraction, Gas chromatography with Nitrogen Phosphorous Detection | 507 [1] | ----- | ----- | ----- |
| | Liquid Solid Extraction & Gas chromatography with Mass Spectrometry Detection | 525.2 [2] | ----- | ----- | ----- |
| | Liquid-Solid Extraction & Gas Chromatography with an Electron Capture Detector | 508.1 [2] | ----- | ----- | ----- |
| Toxaphene*** ± 45% | Micro Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 505 [1] | ----- | ----- | ----- |
| | Liquid-Liquid Extraction & Gas Chromatography with an Electron Capture Detector | 508 [1] | ----- | ----- | ----- |
| | Liquid Solid Extraction & Gas chromatography with Mass Spectrometry Detection | 525.2 [2] | ----- | ----- | ----- |
| **Volatile Organic Compounds ( VOCs )** | Method Name | EPA | ASTM [13] | SM[14] | OTHER |
| 1,1-Dichloroethylene*** ± 20% ≥ 0.010 mg/L ± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series | 502.2 [1] | ----- | ----- | ----- |
| | Capillary Column Gas Chromatography/Mass Spectrometry | 524.2 [4] | ----- | ----- | ----- |
| 1,1,2-Trichloroethane*** ± 20% ≥ 0.010 mg/L ± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series | 502.2 [1] | ----- | ----- | ----- |
| | Capillary Column Gas Chromatography/Mass Spectrometry | 524.2 [4] | ----- | ----- | ----- |

| CHEMICAL & ACCEPTANCE LIMIT | | METHOD NAME | EPA | ASTM[13] | SM[14] | OTHER |
|---|---|---|---|---|---|---|
| **Volatile Organic Compounds [ CONTINUED ]** | | Method Name | EPA | ASTM [13] | SM[14] | OTHER |
| 1,1,1-Trichloroethane*** | ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry<br>Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 502.2 [1]<br>524.2 [4]<br>551 [5] | -----<br>-----<br>----- | -----<br>-----<br>----- | -----<br>-----<br>----- |
| 1,2,4-Trichlorobenzene*** | ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry | 502.2 [1]<br>524.2 [4] | -----<br>----- | -----<br>----- | -----<br>----- |
| 1,2-Dichloropropane*** | ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry | 502.2 [1]<br>524.2 [4] | -----<br>----- | -----<br>----- | -----<br>----- |
| 1,2-Dichloroethane*** | ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry | 502.2 [1]<br>524.2 [4] | -----<br>----- | -----<br>----- | -----<br>----- |
| Benzene*** | ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry | 502.2 [1]<br>524.2 [4] | -----<br>----- | -----<br>----- | -----<br>----- |
| Carbon tetrachloride*** | ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry<br>Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 502.2 [1]<br>524.2 [4]<br>551 [5] | -----<br>-----<br>----- | -----<br>-----<br>----- | -----<br>-----<br>----- |
| cis-1,2-Dichloroethylene*** | ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry | 502.2 [1]<br>524.2 [4] | -----<br>----- | -----<br>----- | -----<br>----- |
| Dichloromethane*** | ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry | 502.2 [1]<br>524.2 [4] | -----<br>----- | -----<br>----- | -----<br>----- |
| Ethylbenzene*** | ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry | 502.2 [1]<br>524.2 [4] | -----<br>----- | -----<br>----- | -----<br>----- |
| Chlorobenzene*** | ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry | 502.2 [1]<br>524.2 [4] | -----<br>----- | -----<br>----- | -----<br>----- |
| 1,2-Dichlorobenzene*** | ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry | 502.2 [1]<br>524.2 [4] | -----<br>----- | -----<br>----- | -----<br>----- |
| 1,4-Dichlorobenzene*** | ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry | 502.2 [1]<br>524.2 [4] | -----<br>----- | -----<br>----- | -----<br>----- |
| Styrene*** | ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry | 502.2 [1]<br>524.2 [4] | -----<br>----- | -----<br>----- | -----<br>----- |
| Tetrachloroethylene*** | ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry<br>Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 502.2 [1]<br>524.2 [4]<br>551 [5] | -----<br>-----<br>----- | -----<br>-----<br>----- | -----<br>-----<br>----- |

| CHEMICAL & ACCEPTANCE LIMIT | METHOD NAME | EPA | ASTM[13] | SM[14] | OTHER |
|---|---|---|---|---|---|
| **Volatile Organic Compounds [ CONTINUED ]** | Method Name | EPA | ASTM [13] | SM[14] | OTHER |
| trans-1,2-Dichloroethylene*** ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry | 502.2 [1]<br>524.2 [4] | -----<br>----- | -----<br>----- | -----<br>----- |
| Trichloroethylene*** ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry<br>Liquid-Liquid Extraction & Gas Chromatography with Electron Capture Detection | 502.2 [1]<br>524.2 [4]<br>551 [5] | -----<br>-----<br>----- | -----<br>-----<br>----- | -----<br>-----<br>----- |
| Vinyl Chloride*** ± 40% | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry | 502.2 [1]<br>524.2 [4] | -----<br>----- | -----<br>----- | -----<br>----- |
| Xylenes (total)*** ± 20% ≥ 0.010 mg/L<br>± 40% < 0.010 mg/L | Purge & Trap Capillary Column Gas Chromatography with Photoionization & Electrolytic Conductivity Detectors in Series<br>Capillary Column Gas Chromatography/Mass Spectrometry | 502.2 [1]<br>524.2 [4] | -----<br>----- | -----<br>----- | -----<br>----- |

**NOTES**

1) "Methods for the Determination of Organic Compounds on Drinking Water", EPA-600/4-88-039, December 1988, revised, July 1991. This is available from the National Technical Information Service, (NTIS) PB91-231480, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. Call 800/553-6847. A nitrogen-phosphorous detector should be substituted for the electron capture detector in Method 505 (or use another approved method) to determine alachlor, atrazine and simazine, if lower detection limits are required.

2) EPA Methods 504.1, 508.1 and 525.2 are available from USEPA EMSL-Cincinnati, Cincinnati, OH 45268. Call 513/569-7586.

3) Method 6610 is contained in the "Supplement to the 18th edition of Standard Methods for the Examination of Water and Wastewater", 1994, American Public Health Association, 1015 Fifteenth street NW, Washington, D.C. 20005.

4) "Methods for the Determination of Organic Compounds in Drinking Water-Supplement II", EPA-600-R-92/129, August 1992; write, National Technical Information Service, (NTIS) PB92-207703, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. Call 800/553-6847.

5) "Methods for the Determination of Organic Compounds in Drinking Water-Supplement I", EPA/600-4-90/020, July 1990. Write, National Technical Information Service, (NTIS) PB91-146027, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. Call 800/553-6847.

6) EPA 821/B-94-005, October 1994, is available from the National Technical Information Service (NTIS), U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll-free number is 800-553-6847.

7) "Methods for the Determination of Metals in Environmental Samples-Supplement I," EPA-600/R-94-111, May 1994. This is available from the National Technical Information Service (NTIS), PB94-184942, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll-free number is 800-553-6847.

8) "Analytical Methods for Determination of Asbestos Fibers in Water," EPA/600-4-83-043, September 1983, U.S. EPA Environmental Research Laboratory, Atlanta, GA 30613.

9) Method B-1011, "Waters Test Method for Determination of Nitrite/Nitrate in Water Using Single Column Ion Chromatography", Millipore Corporation, Waters Chromatography Division, 34 maple Street, Milford, MA 01757

10) "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA/600-R-93-100, August 1993. This is available from the National Technical Information Service (NTIS), PB94-121811, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll-free number is 800-553-6847.

11) Method 245.2 is available from USEPA, EMSL, Cincinnati, OH 45268. The identical method was formerly in "Methods for Chemical Analysis of Water and Wastes", EPA/600-4-79-020, March 1983, also available at National Technical Information Service (NTIS), PB84-128677.

12) "Methods of Chemical Analysis of Water and Wastes," EPA Environmental Monitoring and Support Laboratory, March 1979.

13) The procedures shall be done in accordance with the Annual Book of *ASTM Standards*, 1994, Vols. 11.01 and 11.02, American Society for Testing and Materials. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 5529 (a) and 1 CFR Part 51. Copies may be obtained from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, S.W., Washington, DC 20460; or at the Office of the Federal Register, 800 North Capital Street, N.W., Suite 700, Washington, DC.

14) The Procedure shall be done in accordance with the Technical Bulletin 601 "Standard Method of Test for Nitrate in Drinking Water,", July 1994, PN 221890-001, Analytical Technology, Inc. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 W.S.C/ 552(a) and 1 CFR {art 51/ Copies may be obtained from ATIO Orion, 529 Main Street, Boston, MA 02129.

15) PCBs are qualitatively identified as Aroclors and measured for compliance purposes as decachlorobiphenyl ADD Methods 505, 508, 508.1 and 525.2 ???.

16) Available from Books and Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, CO 80225-0425.

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

18) Nitrate+Nitrite refers to a measurement of total nitrate. Nitrate may be measured separate from nitrite only in samples that have not been acidified and that have not been disinfected or only disinfected with a minimal oxidant, such as chloramine. Measurement of acidified samples or waters disinfected with free chlorine, chlorine dioxide or ozone provide a total nitrate (sum of nitrate plus nitrite) concentration.

*** See Methods for the information for preservation.

BILLING CODE 6560–50–C

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

## PART 141—[AMENDED]

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

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

2. Section 141.2 is amended by adding the following definitions in alphabetical order.

### § 141.2 Definitions.

* * * * *

*Periods of greatest vulnerability* means the periods during which contamination is most likely to occur at the highest concentration at a particular sampling point, based on the history of relevant factors for that sampling point e.g., Weather Bureau precipitation averages, local pesticide application practices.

* * * * *

*Time balanced average* means the average of values representing equal segments of time, which are themselves the average of individual data points within each segment of time. For example, the sampling results throughout each quarter would be divided among the months of the quarter and the individual sampling results within each month would be averaged to determine the value for that month. The quarterly value would be the average of the three monthly values.

* * * * *

3. Section 141.23 is revised to read as follows:

### § 141.23 General monitoring provisions.

(a) *General*: Each community water system (CWS) and each non-transient, non-community water system (NTNCWS)—hereafter ''system'' in §§ 141.23 and 142.16(e)—shall monitor the contaminants under §§ 141.11(b), 141.61(a), 141.61(c), 141.62(b) (1) through (6) and 141.62(b) (10) through (15) in accordance with the requirements of this section. Failure to sample, or to report to or notify the State, in accordance with this section, or as directed by the State under this section and § 142.16(e), is a violation of the Safe Drinking Water Act.

(b) *Sampling Points*:

(1) Each system shall monitor, at each entry point to the distribution system, after treatment (if any).

(2) Systems shall sample at any sampling points the State may designate in addition to the entry point to the distribution system.

(c) *Responsibility to Provide Information*:

(1) Each system shall report the results of all sampling conducted under this section to the State, including detections ≤ the Method Detection Limit (MDL), in accordance with § 141.31 and in the format prescribed by the State.

(2) Each system shall provide any information requested by the State, within the time frame and in the format specified by the State. A failure to provide this information is sufficient reason for the State to require a system to sample more frequently than every five years.

(d) *Mandatory Monitoring*:

(1) Each system shall sample at least once every five years at each sampling point for the contaminants under §§ 141.11(b), 141.61(a), 141.61(c), 141.62(b) (1) through (6) and 141.62(b) (10) through (15). (2) If, for any reason, the State directs a system to sample more frequently than once every five years, the system shall sample at the frequency specified by the State.

(3) Each system shall sample during the periods of greatest vulnerability designated by the State. If the State does not designate the periods of greatest vulnerability, the system shall determine the periods of greatest vulnerability, describe to the State the risk-based reasons for the periods it specified, and sample at those times.

(4) If any of the following VOCs are detected at ≥0.5 μg/l at any sampling point, the system shall monitor for vinyl chloride at that sampling point within 30 days: trichloroethylene; tetrachloroethylene; 1,2-dichloroethane; 1,1,1-trichloroethane; cis-1,2-dichloroethylene; trans-1,2-dichloroethylene; or 1,1-dichloroethyhlene.

(e) *Detection ≥½ of the MCL*: If a contaminant is detected ≥½ of the MCL, including detections >MCL, the system shall sample as scheduled by the State under § 142.16(e)(3).

(f) *Detection >MCL*: If the results of a sample exceed the MCL, in concert with the requirements of paragraph (e), the system shall sample during each of the following three quarters. If the State schedules multiple samples during any quarter, a time balanced average must be used to determine the value for that quarter.

(1) Once an MCL violation has been established for a contaminant under paragraph (g) of this section, the system shall sample every year for that contaminant during the period of greatest vulnerability, unless the State specifies a different sampling schedule.

(2) If an MCL violation is not established upon completion of the monitoring required under this paragraph, the system shall continue sampling as directed by the State.

(g) *MCL Violations Determinations*: A system is in violation of the MCL if :

(1) The average of the four quarterly values exceed the MCL; or

(2) Any quarterly value, or any combination of less than four quarterly values, would cause the average annual concentration to exceed the MCL.

(h) *Laboratory Certification Criteria*:

(1) All samples to determine compliance with the MCLs in §§ 141.11(b), 141.61(a), 141.61(c), 141.62(b) (1) through (6) and 141.62(b) (10) through (15) must be analyzed by laboratories certified by EPA, or by the State in accordance with, and meeting the requirements described in, *EPA Technical Criteria Document for Selected Chemical Contaminants in Drinking Water*.

(2) The State or EPA may suspend or revoke a laboratory's certification for failure to consistently achieve the standards established under this paragraph.

(i) *New Systems & New Sources*: All public water systems and sources of water supplying a public water system that begin operations after [insert publication date of the final rule], shall demonstrate compliance with all applicable MCLs in this part within a period of time specified by the State, unless the State waives testing for certain contaminants in accordance with paragraph (h) of this section. In a State where EPA has primary enforcement authority, a new system or new source must demonstrate full compliance with the MCLs in §§ 141.11(b), 141.61(a), 141.61(c), 141.62(b) (1) through (6) and 141.62(b) (10) through (15), within the period of time specified by the Regional Administrator.

## PART 142—[AMENDED]

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

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

* * * * *

5. Section 142.14 is amended by revising the introductory text of paragraph (d) and paragraphs (d)(4) and (d)(5) to read as follows:

### § 142.14 Records kept by States.

* * * * *

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

* * * * *

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

(i) Determinations related to targeting systems for increased sampling;

(ii) Determinations involving sampling points that have exceeded the trigger level;

(iii) Determinations related to the review of any such decisions that has been undertaken because of a change in the circumstances upon which the original decision was based.

(5) A record of all current monitoring requirements and frequencies for each contaminant and each sampling point, including those based on the targeting and vulnerability determinations identified under paragraph (d)(4) of this section. These records shall be kept in perpetuity, or until a more recent monitoring frequency decision has been issued.

* * * * *

6. Section 142.16(e) is revised to read as follows:

**§ 142.16 Special primacy requirements.**

* * * * *

(e) Chemical Monitoring Reform.

(1) Prior to implementing the provisions of 40 CFR 141.23, a State shall submit a primacy revision application that meets the requirements specified below. Approved State programs must operate in accordance with the provisions under § 141.23 and paragraph (e)(3) of this section and the approved State Targeting Plan.

(i) An application for approval of a State program revision to adopt the requirements under § 141.23, must include the State regulations (or implementing provisions) adopting those requirements, a description of the State Targeting Plan under paragraph (e)(2) of this section and a certification from the Attorney General that each of the provisions in its primacy revision application, and in any supplements thereto, are enforceable under State law.

(ii) The State's primacy revision application must also include a summary of public participation in the development of the State's program. At a minimum, the State process shall include an opportunity for public review of and comment upon the program elements identified above.

**Alternative I for Paragraph (e)(2)**

(e)(2) *Targeting Plans*. The State shall identify, and prescribe a sampling schedule for, each sampling point within each community water system and within each non-transient, non-community water system that may be vulnerable to contamination during the next five years. The State shall transmit its list of these sampling points to the Regional Administrator within one year after EPA has approved its primacy revision application, and thereafter upon request of the Regional Administrator. The State shall also update its list of targeted sampling points annually, and shall make the list available to the public upon request.

(i) The State shall develop a Targeting Plan describing:

(A) The State's procedures under § 141.23(d)(2) to screen all systems in order to identify vulnerable systems to sample more frequently than once every five years, and for determining the frequency of sampling based on the degree of vulnerability;

(B) The factors the State will consider in determining the periods of greatest vulnerability; and

(C) The State plans for periodically updating its list of targeted sampling points.

(ii) At a minimum, the targeting plan shall specify that a sampling point may be targeted to sample more frequently than every five years based on any one or a combination of the following factors:

(A) The fate and transport of a contaminant;

(B) The agricultural, commercial or industrial activities in the source water review area; or

(C) The susceptibility of the source water withdrawal point to contamination.

(iii) At a minimum, the State's factors for scheduling systems to sample during the periods of greatest vulnerability shall include each of the factors listed in paragraph (e)(2)(ii) of this section.

(iv) The State shall notify all systems of their sampling requirements in writing.

**Alternative II for Paragraph (e)(2)**

(e)(2) *Targeting Plans*: The State shall identify and prescribe a sampling schedule for each sampling point within each community water system and within each non-transient, non-community water system that must sample more frequently than once every five years, based on each sampling point's vulnerability to contamination. The State shall transmit its list of these sampling points to the Regional Administrator within one year after EPA has approved its primacy revision application.

(i) The State shall develop a plan describing

(A) The State's procedures under § 141.23(d)(2) to screen all systems in order to identify vulnerable systems to sample more frequently than once every five years and for determining the frequency of sampling based on the degree of vulnerability,

(B) The factors the State will consider in determining the periods of greatest vulnerability, and

(C) The State plans for periodically updating its list of targeted sampling points.

(ii) The State plan shall specifically target those sampling points served by surface water, or by ground water under the direct influence of surface water, to sample more frequently than every five years as specified by the State, unless (or until) the State determines that those points do not need to sample more frequently than every five years based on the degree of their vulnerability, or on the risk that such levels may pose to public health.

(iii) At a minimum, the targeting plan shall specify that a sampling point may be targeted to sample more frequently than every five years based on any one or a combination of the following factors:

(A) The fate and transport of a contaminant;

(B) The agricultural, commercial or industrial activities in the source water review area; or

(C) The susceptibility of the source water withdrawal point to contamination.

(iv) At a minimum, the State's factors for scheduling systems to sample during the periods of greatest vulnerability shall include each of the factors listed in paragraph (e)(2)(iii) of this section.

(v) The State shall notify all systems of their sampling requirements in writing.

(e)(3) *Detection ≥ ½ of the MCL:* Whenever the sampling result for a contaminant is ≥ ½ MCL, the State shall require the system to sample according to a special monitoring schedule, that has been designed to account for the estimated frequency and amplitude of contaminant fluctuation.

(i) In establishing a special monitoring schedule for a sampling point under this paragraph and § 141.23(e), the State shall consider:

(A) The history of sampling results for the sampling point and for neighboring sampling points;

(B) The sources of contamination and the susceptibility of the water supply to contamination;

(C) The periods of greatest vulnerability;

(D) The contaminant's solubility and other relevant characteristics; and

(E) The agricultural and commercial practices, and the efficacy of any source water protection measures that have been enacted, within the source water review area.

(ii) A State may determine that detections ≥ ½ of the MCL, but less than the MCL, will remain reliably and consistently below the MCL for five years, and may allow the system to sample at a minimum of once every five years.

(iii) The State shall document each sampling schedule, or the basis of its determination that the contaminant will remain reliably and consistently below the MCL, in writing.

* * * * *

7. Section 142.18 is revised to read as follows:

**§ 142.18 EPA Review of State Determinations.**

(a) A Regional Administrator may:

(1) Annul a State decision to grant a waiver, to designate a surrogate sampling point or to reduce nitrate monitoring under the Permanent Monitoring Relief provisions of section 1418 of the Safe Drinking Water Act; or

(2) Make a determination in the absence of State action under §§ 141.23(c) through (g)—in accordance with paragraph (b) of this section.

(b) When information available to a Regional Administrator, such as the results of an annual review, indicate that either a State monitoring determination, or the absence of a State monitoring determination, fails to apply the standards of the approved State program or of the guidelines published under section 1418(b)(2) of the Safe Drinking Water Act as amended, he may propose to annul the State monitoring determination or initiate an EPA monitoring determination by sending the State and the affected PWS a draft Monitoring Order. The draft Monitoring Order shall:

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

(2) Explain why the State determination, or absence thereof, is not in compliance with the State program and must be changed; and

(3) Describe the actions and terms of operation the PWS will be required to implement.

(c) The State and PWS shall have 60 days to comment on the draft Monitoring Order.

(d) The Regional Administrator may not issue a Monitoring Order to impose conditions less stringent than those imposed by the State.

(e) The Regional Administrator shall also provide an opportunity for comment upon the draft Monitoring Order, by

(1) Publishing a notice in a newspaper in general circulation in the communities served by the affected system; and

(2) Providing 30 days for public comment on the draft order.

(f) The State shall demonstrate that its determination is reasonable, based on its approved program.

(g) The Regional Administrator shall decide within 120 days after issuance of the draft Monitoring Order to:

(1) Issue the Monitoring Order as drafted;

(2) Issue a modified Monitoring Order; or

(3) Cancel the Monitoring Order.

(h) The Regional Administrator shall set forth the reasons for his decision, including a responsiveness summary addressing significant comments from the State, the PWS and the public.

(i) The Regional Administrator shall send a notice of his final decision to the State, the PWS and all parties who commented upon the draft Monitoring Order.

(j) The Monitoring Order shall remain in effect until canceled by the Regional Administrator. The Regional Administrator may cancel a Monitoring Order at any time, so long as he notifies those who commented on the draft order.

(k) The Regional Administrator may not delegate the signature authority for a final Monitoring Order or the cancellation of an order.

(l) Violation of the actions, or terms of operation, required by a Monitoring Order is a violation of the Safe Drinking Water Act.

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