

United States
Environmental Protection
Agency

Office of Water
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ALTERNATIVE MONITORING GUIDELINES

OVERVIEW

These guidelines for alternative monitoring, formerly referred to as Permanent Monitoring Relief (PMR), are being issued pursuant to section 1418(b) of the Safe Drinking Water Act (SDWA), which requires the Environmental Protection Agency (EPA) to issue guidelines for states to follow in proposing alternative monitoring requirements for chemical contaminants. Congress recognized that as a state gains a better understanding of the contamination sources that may affect the quality of a drinking water supply, the state would be in an appropriate position to tailor the monitoring requirements for the system while continuing to provide effective public health protection. The SDWA, therefore, provides that a state may allow a system to implement the alternative monitoring offered by these guidelines, if the state has an approved source water assessment program, and has completed a source water assessment for that system. The SDWA further requires EPA to issue guidance for states to use in meeting these source water assessment requirements, and directs EPA to issue the source water assessment guidance at the same time as these alternative monitoring guidelines. Accordingly, the source water assessment guidance was issued on August 6, 1997.

On July 3, 1997, EPA published draft guidelines in the Federal Register [62 FR 36100] in conjunction with an Advance Notice of Proposed Rule Making (ANPRM) for revising the federal chemical monitoring requirements (then referred to as *Chemical Monitoring Reform*). The draft guidelines were included in that notice in order to consolidate all of the draft changes to the federal provisions for chemical monitoring into a single document. These alternative monitoring guidelines have been developed after considering timely public comments received on the draft guidelines.

EPA mentioned in the July 3 notice that regulations might be needed in order to implement fully the alternative monitoring guidelines. Pursuant to the statute, alternative monitoring must assure compliance with applicable national primary drinking water regulations. To permit states to implement monitoring provisions that differ from the current requirements, EPA plans to propose alternative monitoring as regulations in conjunction with the proposal of the CMR regulations. Until such time as the provisions for alternative monitoring have been promulgated as regulations, these guidelines do not impose legally binding requirements on EPA, states or the regulated community. In compliance with the SDWA Amendments of 1996, they are intended to assist states in developing source water assessment programs that will generate the information to enable States to offer alternative monitoring to water systems in appropriate circumstances. EPA expects

to issue final regulations for CMR and alternative monitoring in a single regulation for monitoring revision by August 6, 1998. This time frame for regulatory support of alternative monitoring should not pose a hardship for the states or public water systems (PWSs). It will take some time for many states to comply with the statutory pre-requisites concerning source water protection for granting alternative monitoring to its public water systems.

Under Section 1418(b) of the SDWA, the alternative monitoring guidelines must ensure that the public health will be protected from drinking water contamination, that a state program will apply on a contaminant-by-contaminant basis and that a public water system must show the state that the contaminant is not present in the drinking water supply or, if present, is reliably and consistently below the maximum contaminant level. The guidelines must further require that if a contaminant is detected at levels at or above the maximum contaminant level or is no longer reliably or consistently below the maximum contaminant level, the system must either demonstrate that the contamination source has been removed or that other action has been taken to eliminate the contamination or test for the detected contaminant according to the applicable national primary drinking water regulation.

The SDWA further provides that the alternative monitoring shall not apply to regulated microbiological contaminants (or indicators thereof), disinfectants and disinfection by-products, or corrosion by-products. The guidelines apply to the chemicals listed in the following table and to nitrate, as described in the sections below.

CHRONIC CHEMICAL CONTAMINANTS

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

After weighing the statutory requirements and considering public comment, EPA is providing states the option of offering three forms of alternative monitoring: monitoring waivers, surrogate sampling and reduced nitrate monitoring. These forms are described in detail below. For waivers and surrogate sampling, EPA considers 1/2 of the MCL the highest concentration at which a contaminant may be judged to be reliably and consistently < MCL, especially considering that five year renewable waivers could mean that the system would not be required to sample for a 10 year period or longer. For nitrate, EPA considers 2 mg/L as the threshold for determining that a system is reliably and consistently < MCL. Although 2 mg/L is 20% of the MCL, it was selected because nitrate has acute health effects and a greater safety factor is appropriate to provide effective public health protection from drinking water contamination.

A state with an approved source water assessment program may complete the source water assessments for a specific contaminant and grant alternative monitoring for that contaminant, even if the state has not yet completed assessments for the remaining contaminants. Although the SDWA specifies that the monitoring program apply on a contaminant by contaminant basis, states are not precluded from conducting area-wide assessments covering many systems and may, therefore, grant alternative monitoring to all the systems in the area-wide assessment consistent with the results of the assessment.

States are expected to incorporate the information gathered through the source water assessments in making waiver decisions, in designating surrogate sampling points and in conducting analyses to support reduced nitrate sampling. States are also expected to review changes to the conditions on which these forms of alternative monitoring are based before renewing them. An update to the source water assessment may provide this information. States are, therefore, encouraged to integrate the activities required for decisions related to alternative monitoring and the very similar activities supporting the source water assessment program to make them complementary.

SPECIFIC ALTERNATIVE MONITORING PROVISIONS & CRITERIA

States may offer alternative monitoring under Sections A and B for the sixty-four (64) contaminants listed in the table above, and under Section C for nitrate.

SECTION A -- SAMPLING WAIVERS FOR CHRONIC CONTAMINANTS

(1) ***State Findings Required for Waivers:*** A state may grant a waiver allowing a system to forgo sampling during a five year monitoring period, if the state, at a minimum, makes one of the following determinations:

- (a) 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; or
- (b) 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; and
 - (iv) the highest contaminant levels are $< 1/2$ MCL.

(2) **General Considerations:** In making waiver decisions the state should, 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 should 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 should 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 should 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 should 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 $< 1/2$ 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 should also require the system to periodically 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.

(2) ***Inter-system Surrogate Sampling:*** For designating surrogate sampling points among systems, a state first needs to 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 $\geq 1/2$ of the MCL, the state should require the systems to conduct validation sampling at each of the points

represented by that surrogate point. Surrogate sampling should be discontinued for that sampling point, and for any sampling points that it represents, if the contaminant is $\geq 1/2$ MCL. The state should 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 should 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 should review its decision to designate any surrogate sampling point, whenever it learns of a change in the circumstances upon which the point was designated.

SECTION C -- REDUCED NITRATE SAMPLING

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

(1) ***State Findings:*** States should allow this reduction in nitrate sampling only under the following conditions:

- (a) ***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; and
- (b) ***Integrity of Structures & 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; and
- (c) ***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; and
- (d) ***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 unlikely to exceed the 2 mg/l during the reduced sampling period.

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

(3) ***System Responsibility & State Review:*** Each system should notify the state within 30 days of the time it learns of any change in the conditions under which the reduced sampling for nitrate has

been allowed, particularly of any change in land use practices. The state will review its decision to reduce the sampling frequency, whenever it learns of a change in the circumstances upon which its decision was based.

SECTION D - 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.
- (2) ***Monitoring period*** means the period during which water systems are required under federal regulations to take at least one sample.
- (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, the hydrogeologic features within the area, and particularly a specific contaminant's fate and transport. 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.

STATE ADOPTION & EPA APPROVAL OF ALTERNATIVE MONITORING

The Act specifies that state alternative monitoring provisions will be treated as "applicable" national primary drinking water regulations, which means they must be enforceable under both state and Federal law¹. The Act defines an enforceable state requirement as a "state program

¹ See §1418(c)

approved pursuant to this part²." In order to assure that the state alternative monitoring provisions will be federally enforceable, EPA will review and approve the state program. Therefore, any state adoption of alternative monitoring requirements must be at least as stringent as the federal program and adhere to each of the following steps.

(1) ***State Program Description:*** The state will 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* should include the criteria under Sections A - C (respectively) for each form of alternative monitoring 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 & Comment:*** The state should provide notice and opportunity for public comment on the state program.

(3) ***Attorney General Certification:*** The Attorney General needs to certify in writing that the alternative state monitoring requirements were duly adopted under state law, are enforceable under state law, and provide adequate authority to meet EPA's alternative monitoring guidelines.

(4) ***State source water assessment program:*** The state must obtain EPA approval of its source water assessment program.

(5) ***EPA Review & Decision:*** Under section 1428(c)(1), a state's program submittal will be reviewed in conformance with 40 CFR 142.10-.12.

(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.

(7) ***State Reporting:*** EPA will address state reporting requirements in the subsequent rulemaking for *Chemical Monitoring Reform*, which will incorporate these guidelines.

² See §1414(i)(4).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WSG 112

Date Signed: August 1997

Dear Colleague:

I am pleased to transmit the guidelines for alternative monitoring (formerly known as Permanent Monitoring Relief (PMR)), which the Environmental Protection Agency (EPA) has prepared pursuant to the requirements of Section 1418 of the Safe Drinking Water Act (SDWA), as amended in August 1996. States have the discretion to decide whether or not to adopt these guidelines. States that elect to offer alternative monitoring must meet the requirements of Section 1453 of the SDWA to develop and obtain EPA approval of their source water assessment programs, and to complete a source water assessment for the systems that will use alternative monitoring. Guidance for states to use in meeting the source water assessment requirements has also been issued pursuant to Section 1453 of the SDWA.

These alternative monitoring provisions were developed in conjunction with an effort to revise the chemical monitoring regulations, which has been known as Chemical Monitoring Reform. EPA expects to promulgate revisions to the chemical monitoring regulations in August, 1998. EPA plans to incorporate these alternative monitoring guidelines into the chemical monitoring regulations, in order to consolidate the federal provisions for chemical monitoring in a single, comprehensive regulation.

Before developing these provisions, EPA held three stakeholder meetings and then formed an EPA/State work group to evaluate the issues raised by the stakeholders. EPA issued these guidelines in draft form on July 3, 1997, for public comment, and held public meetings in Denver, Chicago, and Washington D.C. to explain the provisions and solicit comments. This document reflects the results of that process with respect to the alternative monitoring guidelines.

We appreciate the efforts of each stakeholder, and hope to continue using a collaborative process in developing other federal policies and guidelines. With the issuance of these guidelines, the time for planning and action moves to the states. We encourage states to work with their regional offices in designing their source water assessment programs and strategies for adopting and implementing these alternative monitoring provisions.

Sincerely,

Robert Perciasepe
Assistant Administrator