



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
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OFFICE OF  
WATER

**MEMORANDUM**

SUBJECT: Definitions of Conventional Filtration Treatment and Direct Filtration

FROM: Ronald Bergman, Chief *Ronald Bergman*  
Drinking Water Protection Branch

TO: Drinking Water Branch Chiefs  
Regions I-X

In an effort to ensure consistent implementation of drinking water regulations across the country and to fully protect public health, I am issuing this memo to reiterate the meaning of the terms "conventional filtration treatment" and "direct filtration." We hope that this memo will assist states in making determinations about whether or not a system is using conventional filtration treatment.

In recent years, the Office of Ground Water and Drinking Water (OGWDW) has received a number of questions regarding what constitutes conventional filtration treatment and when a system should be characterized as using direct filtration. In addition, we have found that some primacy agencies may not be consistently applying the definition of these terms. Improperly classifying a treatment plant reduces public health protection.

If a conventional filtration treatment or direct filtration plant has been misclassified as an alternative treatment plant, it is not meeting the requirements for enhanced coagulation (conventional filtration treatment only), filter backwash recycling, combined filter effluent turbidity limits, and individual filter effluent monitoring. These misclassified treatment plants may be out of compliance with their appropriate regulations and may not protect public health to the extent required.

**Definitions of Conventional and Direct Filtration**

EPA's regulations and guidance are clear on the definitions of conventional filtration treatment and direct filtration. Conventional filtration treatment is defined under 40 CFR 141.2 as "a series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial particulate removal." Direct filtration is defined in 40 CFR 141.2 as "a series of processes including coagulation and filtration but excluding sedimentation resulting in substantial particulate removal." Sedimentation is defined in 40 CFR 141.2 as "a process for removal of solids before filtration by gravity or separation."

### Regulation and Supporting Guidance

The preamble for the Long Term 2 Enhanced Surface Water Treatment Rule (LT2) (71 FR 654, January 5, 2006) addressed the issue of what constitutes conventional filtration treatment. Conventional Filtration Treatment (p. 675 Table IV B-2 footnote 1) is said to "apply to a treatment train using separate, sequential, unit processes for coagulation/flocculation, clarification, and granular media filtration. Clarification includes any solid/liquid separation process following coagulation/flocculation where accumulated solids are removed during this separate component of the treatment system."

The preamble for LT2 also clarifies what EPA means by designation of conventional filtration treatment through the review of clarification process performance studies. Specifically, these studies indicate that plants using clarification processes other than sedimentation that are located after coagulation and prior to filtration can achieve performance equivalent to conventional filtration treatment plants. Based on these studies, any treatment train that includes coagulation/flocculation, clarification and granular media filtration (e.g., sand-ballasted clarification or dissolved air floatation) may be regarded as conventional filtration treatment and awarded treatment credit as conventional filtration treatment.

EPA guidance for the filtration and disinfection requirements, *The Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources* (March 1991 Edition, Section 4.3.3), includes a reference to the Ten State Standards<sup>1</sup> which states -

The minimum criteria in the Ten State Standards for conventional filtration treatment are considered sufficient for the purposes of complying with the SWTR with the following addition: The criteria for sedimentation should be expanded to include other methods of solids removal including dissolved air floatation. Plate separation and upflow-solids contact clarifiers included in the 1987 Ten State Standards should also be considered.

In addition, EPA's guidance in Section 4.2.1(e), footnote 1, summarizes that package plants, depending upon the type of treatment units in place, could be categorized as conventional filtration treatment, direct filtration, slow sand filtration, diatomaceous earth filtration or alternate technology at the discretion of the state.

### Implementation Recommendations

For alternative filtration technologies, existing regulatory provisions require a removal demonstration under 40 CFR 141.73(d) for *Giardia*, and 40 CFR 141.173(b) for *Cryptosporidium*. The alternative technologies have to satisfy removal requirements at the regulatory turbidity limit (or alternative performance criteria) over an expected range of source water conditions. Examples of other alternative performance criteria include, but are not limited to, removal/inactivation of viruses and *Giardia lamblia*. Systems must demonstrate to the state how the alternative technologies are operated and that they will routinely meet state specified criteria to be awarded treatment credit.

<sup>1</sup> Ten State Standards are public water supply standards established by GLUMRB, a water board of ten Midwest states. This guidance is highly respected and widely used by state regulatory agencies. The standards can be accessed from this website: <http://10statesstandards.com/waterstandards.html>

Conventional filtration treatment plants without the capacity to meet enhanced coagulation TOC (Step 1) removal requirements due to water quality parameters or operational constraints may qualify for alternative compliance criteria or may apply for TOC (Step 2) removal requirements. Conventional filtration treatment plants must apply for alternative minimum TOC removal (Step 2) requirements within three months of failure to achieve TOC removals required by 40 CFR 141.135(b)(2). The state may make those requirements retroactive for the purposes of determining compliance. A Step 2 removal application at a minimum must include results of bench- or pilot-scale testing conducted under 40 CFR 141.135(b)(4)(i). These results must be used in determining the alternate enhanced coagulation TOC removal requirement.

#### Conclusion

States must be consistent in applying the provisions associated with conventional, direct, and alternative filtration technologies. States must designate the technology to be implemented by the water system, specify all associated treatment and performance criteria (e.g., turbidity limits, flow rates, etc.), assign the appropriate filtration credit and require compliance with precursor removal requirements in 40 CFR 141.135 as appropriate.

If you have additional questions about conventional filtration treatment and direct filtration, please contact Ed Moriarty, of my staff, at 202-564-3864.

cc: Jim Taft, ASDWA  
MDBP Workgroup