Ohio Environmental Protection Agency
Division of Drinking and Ground Waters

(THIS POLICY DOES NOT HAVE THE FORCE OF LAW)

Guidelines for Obtaining Secondary Filtration Credit for Compliance with the LT2 Rule	Division: DDAGW Number: ENG-13-001 Category: Engineering – Policy Status: Final Issued: October 6, 2010

I. PURPOSE:

The purpose of this policy is to establish criteria for granting 0.5 log *Cryptosporidium* removal credit for a separate second-stage of filtration that consists of sand, dual media, granular activated carbon (GAC), or other fine media. This document is intended to provide a policy to public water systems and Ohio EPA staff for evaluating and approving log removal credit for a secondary stage of filtration for compliance with the Long-Term 2 Enhanced Surface Water Treatment (LT2) rule. For secondary filters being used for treatment objectives other than *Cryptosporidium* removal, additional requirements may be necessary to obtain plan approval. Those requirements are outside the scope of this policy and therefore are not included in this policy. For example, a pilot study may be required prior to installing granular activated carbon contactors for addressing exceedances of total trihalomethane and haloacetic acid maximum contaminant levels.

The federal LT2 rule allows public water systems to be granted 0.5 log *Cryptosporidium* removal credit for providing a secondary filtration treatment process and the treatment option was adopted into Ohio Administrative Code (OAC) Rule 3745-81-68 (L). The rule does not establish specific criteria for designing the secondary filters, but requires the director to grant credit based on an assessment of the design characteristics of the filtration process. This document presents a suggested approach for what constitutes an acceptable design for the secondary filters. Nothing herein should be interpreted as precluding other strategies to comply with requirements of the rule. However, deviations from these guidelines should be fully justified by documentation demonstrating equivalency acceptable to Ohio EPA.

II. BACKGROUND:

Ohio Administrative Code 3745-81-73 requires public water systems that use a surface water source, or a GWUDI source, to provide conventional filtration, direct filtration, slow sand filtration, or other filtration technology. Filtration treatment shall consistently and reliably achieve at least ninety-nine per cent (2 log) removal of *Cryptosporidium*. The Long Term 2 Surface Water Treatment (LT2) Rule allows an additional 0.5 log removal credit for water systems that install a secondary filtration system. The objective of this guideline is to achieve

consistency throughout the State of Ohio in administering provisions of the Ohio Revised Code and standard design criteria.

III. APPLICABLE REGULATIONS:

1. General requirements for filtration and disinfection of surface water sources – OAC Rule 3745-81-71.

2. Filtration of water from surface water sources – OAC Rule 3745-81-73.

3. Operational requirements- OAC Rule 3745-83-01.

4. Plan Approval - OAC rule 3745-91.

IV. OTHER APPLICABLE REFERENCES:

1. U.S. EPA "Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources" March 1991.

2. The Great Lakes Upper Mississippi River Board of State Public Health and Environmental Managers "Recommended Standard for Water Works" (RSWW) 2007.

3. Ohio EPA "Guidelines for evaluating granular activated carbon (GAC) for disinfection byproduct (DBP) precursor removal" 2007.-

V. POLICY:

A. General design criteria as required by the federal LT2 Rule and OAC Rule 3745-81-68(L):

   1. Secondary filters must be a separate second stage of granular media filtration, such as sand dual media, or granular media filtration.

   2. The first filtration stage must be preceded by a coagulation process.

   3. Both filtration stages must treat 100 percent of the treatment plant flow.

   4. Second stage filtration does not apply to bag filters, cartridge filters, or membranes.

   5. The director shall approve the treatment credit based on an assessment of the design characteristics of the filtration process.

B. Design characteristics of the filtration process which would be acceptable for complying with OAC Rule 3745-81-68 (L) is a design which complies with criteria 1 through 4 below:

1. An acceptable filtration rate for the secondary stage of filtration (other than slow sand filtration) is governed by one of the following:

   a. Filtration rate equal to or less than the filtration rate approved for the first stage.

   b. For GAC filters, the filtration rate which results from the filter being operated at an empty bed contact time of at least 10 minutes.

   c. For GAC filters, the filtration rate which results from the filter being operated at an empty bed contact time which was designed and approved for removal of other contaminants.

   d. For secondary stage slow sand filtration, a filtration rate of 45 to 150 gal/day/sf is acceptable.

   e. An alternative filtration rate justified by demonstration study results which show at least 0.5 log removal of *Cryptosporidium*.

2. An acceptable filter design is governed by the following:

   a. A filter design with an L/d ratio of $\geq$ 1000. (L=Media depth and d=media effective size)

   b. A filter design which meets backflow protection requirements of RSWW 9.0.

   c. A filter design which meets loss of head gauge requirements of RSWW 4.2.1.10.a.2, with the exception of slow sand filters.

   d. A filter design which meets backwash requirements of RSWW 4.2.1.11, with the exception of slow sand filters.

   e. For secondary anthracite and/or rapid sand filters, a media which complies with RSWW 4.2.1.6.d.1 and 2, and RSWW 4.2.1.6.e.1.

VI. HISTORY:

This policy was developed in accordance with the provisions of the Long Term 2 Surface Water Treatment Rule, 40 CFR Parts 9, 141, and 142 promulgated January 5, 2006. The Division of Drinking and Ground Waters issued this document in final form on October 6, 2010.