

# DESIGN GUIDELINES FOR DRINKING WATER FACILITIES

MARYLAND DEPARTMENT OF THE ENVIRONMENT  
ENGINEERING AND CAPITAL PROJECTS PROGRAM

2015

---

## Minimum Requirements:

- Recommended Standards for Water Works (as revised) for Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (10-State Standards) will continue to be the main source of guidance for the program's design review and construction permit functions. The 10-State Standards can be downloaded free from <http://www.10statesstandards.com> website, or purchased as a book from the Health Education Services (HES) at <http://www.healthresearch.org/store/water-treatment-sewage-manuals/2012-edition-recommended-standards-water-works>
- Additional requirements beyond these guidelines and the 10-State Standards can also be used based on Safe Drinking Water Act, applicable State laws and regulations, and issued/final EPA Public Drinking Water Rules and/or MDE guidance.
- In addition, the owner and his/her engineer will ensure that all third party certifications or standards applicable to the project are used. This is including, but not limited to, the following:
  1. American Water Work Association (AWWA)
  2. National Science Foundation (NSF)
  3. American National Standards Institute (ANSI)
  4. International Underwriters Laboratory (UL)
  5. Guidelines for the Physical Security of Water Utilities (ANSI/ASCE/EWRI Standard 56-10)
- 10-State Standards (as revised) and these guidelines supersede all other design guidelines for Water Facilities previously issued by the Department.

- The following sections serve as addenda and amendments to the mentioned 10-State Standards' chapters and/or sections.
- At the appearance of conflicting information, these guidelines supersede the 10-State Standards, as these guidelines are intended to provide further clarifications and requirements specific for MDE.

## **ADDENDUM TO PART 1 SUBMISSION OF PLANS**

### 1.2.2 Detailed plans,

Including:

- r. General Notes with at least the following must be included:

#### **NSF Note Language**

In accordance with Code of Maryland regulations (COMAR) 26.04.01.33, Direct and Indirect Additives, suppliers of water shall only use products (any materials that come in contact with water intended for use in public water supply) that meet the applicable American National Standards Institute / NSF International (ANSI / NSF) standards for direct or indirect drinking water additives. The products can also be certified by an organization accredited by the ANSI for such testing (i.e., International Association of Plumbing and Mechanical Officials Research and Testing, Ontario CA, Underwriters Laboratory, Northbrook IL, and Water Quality Association, Lisle IL).

#### **Lead-Free Material Note Language**

In compliance with COMAR 09.20.01.03 and the Safe Drinking Water Act (Section 1417(a)(4)(8), materials that come in contact with water intended for use in public water supply shall comply with the Reduction of Lead in Drinking Water Act, which went into effect in Maryland in January 2012.

## **AMENDMENTS TO PART 4 TREATMENT**

### 4.2.3 Flocculation

e. Superstructure – A superstructure over the flocculation basins is required for groundwater treatment facilities. It is recommended for surface water treatment facilities

### 4.2.4 Sedimentation

h. Superstructure – A superstructure over the sedimentation basins is required for groundwater treatment facilities. If there is no mechanical equipment in the basins and if provisions are included for adequate monitoring under all expected weather conditions, a cover may be provided in lieu of a superstructure. A superstructure or a cover over the sedimentation basins is recommended for surface water treatment facilities.

### 4.2.6 Tube or plate settlers

b. Protection from freezing – A cover or enclosure is required for outdoor tube or plate settlers.

### 4.7.7 Protection of aerators

All aerators shall be protected from contamination by birds, insects, wind borne debris, rainfall and water draining off the exterior of the aerator. Exception may be considered for aerators treating surface water supplies and discharging to lime softening or clarification plants.

## **ADDENDUM TO PART 4 TREATMENT**

### **MDE POLICY ON RECYCLE OF WASTE STREAMS IN SURFACE WATER TREATMENT PLANTS**

The policy of the Maryland Department of the Environment (MDE) is that the practice of recycling of waste streams in existing surface water plants is permissible only under very controlled circumstances. Future surface water treatment plants will not be allowed to implement recycling without additional treatment to the recycle streams. The primary concern of MDE is the possible increased concentration of microorganisms in the waste streams that are then recirculated through the treatment plant and the potential adverse impacts this practice may cause on the treated drinking water.

The treatment of the recycle must comply with the following:

- Minimum of 2 hours of polymer-enhanced sedimentation
- Very low, continuous overflow rates ( $<0.3$  gpm/ft<sup>2</sup>)
- Low recycle ratio ( $< 5\%$ )
- Piping connections (complete with valving) to enable the first few minutes of a backwash cycle to be wasted rather than recycled
- Appurtenances to enable monitoring of recycle stream

MDE recommends that the spent backwash water supernatant be the only waste stream that is recycled due to the potentially higher number of cysts in the solids. The use of filtration, flocculation, or ozonation of the spent backwash water may also be considered.

## **AMENDMENTS TO PART 7 FINISHED WATER STORAGE**

### **7.0.6 Stored Water Age**

Finished water storage designed to facilitate fire flow requirements and meet average daily consumption shall be designed to facilitate turnover of water in the finished water storage to minimize stagnation and/or stored water age. Consideration shall be given to separate inlet and outlet pipes mixing, or other acceptable means to avoid stagnation and freezing. Poor water circulation and long detention times can lead to loss of disinfectant residual, microbial growth, formation of disinfectant byproducts, taste and odor problems, and other water quality problems.