

# 1. INTRODUCTION

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## 1.1 Purpose of Document

The Interim Enhanced Surface Water Treatment Rule (IESWTR) establishes a number of provisions related to the performance of filters in drinking water treatment. These provisions include treatment technique requirements restricting turbidity levels in the combined filter effluent, as well as monitoring requirements for individual filters at conventional and direct filtration plants. These requirements are designed to decrease the risk from waterborne microbial pathogens by limiting levels of particulate material in finished water.

The objective of the guidance manual is to provide public water systems (PWSs) with guidance for complying with the turbidity provisions found within the IESWTR. The primary audience of the guidance manual is utility personnel at public water systems which utilize filtration and the staff of state drinking water programs that work with PWSs to protect water quality.

The document is divided into two sections. The first section contains technical information regarding specific requirements of the IESWTR relating to turbidity and is intended for experienced operators and others in the regulated community. The second section of the document provides background on concepts surrounding turbidity and serves as a primer for less experienced operators and individuals.

## 1.2 Summary of Chapters

As noted, the document is broken up into two sections. The first section of the manual outlines the specific requirements of the rule and includes detailed information specific to the rule. Section 1 consists of Chapters 2 through 6:

### **Chapter 2 - Turbidity Requirements: IESWTR**

Chapter 2 outlines the regulatory requirements, reporting and recordkeeping requirements, and additional compliance aspects of the IESWTR related to turbidity. Flow charts are provided which graphically demonstrate the requirements.

### **Chapter 3 - Turbidity Methods & Measurement**

Chapter 3 provides information regarding approved turbidity methods, analytical issues associated with turbidimeters and turbidity measurement, quality assurance and quality control issues, and data collection and management issues.

### **Chapter 4 – Approach for Compliance**

Chapter 4 provides information on EPA's suggested approach for compliance with turbidity requirements of the IESWTR. Plant optimization is the focus of this chapter, and areas are highlighted which, in the experience of the Agency and other water professionals, most often can be improved to optimize water treatment at systems. Two programs, the Composite Correction Program and the Partnership for Safe Drinking Water, are briefly discussed as systems are encouraged to utilize these programs to optimize plant performance.

### **Chapter 5 – Individual Filter Self Assessment**

Chapter 5 provides detailed guidance on conducting a filter self assessment. Necessary components are discussed including conducting filter profiles, assessing hydraulic loading conditions, and assessing support media and underdrains. Systems may be required to conduct an individual filter self assessment based on individual filter monitoring results.

### **Chapter 6 – Comprehensive Performance Evaluation**

Chapter 6 provides a general overview of the Composite Correction Program (CCP) and specifically the first component of the CCP, the Comprehensive Performance Evaluation (CPE). Fundamental concepts are discussed including major CPE components, standard CPE activities and CPE quality control measures. Systems may be required to arrange for a CPE based on individual filter monitoring results.

The second section of the manual provides background in order to provide readers with an understanding of basic concepts that underlie turbidity and the provisions found in the IESWTR.

### **Chapter 7 – Importance of Turbidity**

Chapter 7 provides an introduction into the importance of turbidity and includes background on turbidity as a water quality parameter. It discusses the significance of turbidity to human health, provides a brief discussion of waterborne disease outbreaks, and the relationship between turbidity removal and pathogen removal.

### **Chapter 8 – Particles Contributing to Turbidity**

Chapter 8 provides an overview of the characteristics of particles which contribute to turbidity. The section provides brief discussions of organic, inorganic, and biotic particles, particles created during the treatment process, and a brief introduction into the electrokinetic properties of particles.

### **Chapter 9 – Turbidity in Source Water**

Chapter 9 describes the various factors that effect turbidity in rivers, lakes and reservoirs, and groundwater under the direct influence (GWUDI). The chapter also includes information on other watershed considerations that effect turbidity.

### **Chapter 10 – Turbidity Through the Treatment Process**

Chapter 10 provides a general description of the typical treatment processes intended to remove suspended solids and reduce turbidity as well as information on the level of turbidity reduction that is commonly achieved through each.

### **Chapter 11 – Basic Turbidimeter Design and Concepts**

Chapter 11 provides readers with basic information on turbidimeter designs, measuring principals, design configurations, and various types of turbidimeters.

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