

**The
Interim Enhanced Surface
Water Treatment Rule**

Rule Summary

- **Applicable To:**
 - **Sanitary Surveys**
 - **All Subpart H Systems**
 - **All Other Provisions**
 - **Subpart H Systems Serving 10,000 or More Persons**

Rule Summary (cont.)

- **Provisions of Rule**

- **General**

- **Prohibition of Uncovered Finished Water Storage**
 - **Disinfection Profiling and Benchmarking**
 - **Sanitary Surveys**
 - ***Cryptosporidium* Added to Definition of GWUDI**

- **Filtered Systems**

- **2-Log Removal of *Cryptosporidium***
 - **Strengthened Turbidity Standards**
 - **Individual Filter Monitoring/Reporting**
 - ◆ **Follow-Up Actions**

- **Unfiltered**

- ***Cryptosporidium* Control**

Rule Summary (cont.)

- **Compliance Dates**
 - **Uncovered Finished Water Storage**
 - 60 Days (February 1999)
 - **Disinfection Profiling and Benchmarking**
 - “Early Requirements”
 - **Other Provisions**
 - 36 Months (January 1, 2002)

Rule Structure

Structure

- **Part 141 National Primary Drinking Water Regulations**
 - **Subpart A: General**
 - **Subpart D: Reporting, PN, and Recordkeeping**
 - **Subpart F: MCLGs**
 - **Subpart H: Filtration and Disinfection**
 - **Subpart L: Disinfectant Residuals, DBP, and DBPP**
 - **Subpart O: Consumer Confidence Reports**
 - **Subpart P: Enhanced Filtration and Disinfection**

Structure (cont.)

- **Part 142 National Primary Drinking Water Regulations Implementation**
 - **Subpart B Primary Enforcement Responsibility**

Provisions of the Interim Enhanced Surface Water Treatment Rule

Subpart A – General

- **§ 141.2 Definitions**
 - Comprehensive Performance Evaluation (CPE)
 - Disinfection Profile
 - Filter Profile
 - Ground Water Under the Direct Influence of Surface Water (Revised Definition)
 - Uncovered Finished Water Storage Facility

Subpart D and Subpart F

- **Subpart D – Reporting, PN, and Recordkeeping**
 - § 141.32 Public Notification
 - Amends Microbiological Contamination PN Requirements to Include Subpart P Violations
 - Systems Will Eventually Be Required to Comply With the New Public Notification Requirements in Subpart Q
- **Subpart F – MCLGs**
 - § 141.52 MCLGs for Microbiological Contaminants
 - MCLG for *Cryptosporidium*..... Zero

Subpart H – Filtration and Disinfection

- **§ 141.70 General Requirements**
 - Subpart H Systems ³ 10,000 Must Comply With Subpart P
- **§ 141.71 Criteria for Avoiding Filtration**
 - After 36 Months Systems ³ 10,000 Must Comply With Stage 1 DBPR
- **§ 141.73 Filtration**
 - Conventional and Direct
 - After 36 Months Systems ³ 10,000 Must Meet New Turbidity Requirements
 - Slow Sand and DE Performance Standards Unchanged
 - Alternative Technologies
 - State Established Performance Standards

Subpart O – Consumer Confidence Reports

- **§ 141.153 Content of Reports**
 - **Highest Single Turbidity Measurement**
 - **Lowest Percentage of Samples Meeting Limits**
 - **Conventional and Direct**
 - ◆ 1 NTU
 - ◆ 0.3 NTU
 - **Alternative Technologies**
 - ◆ State Established Limits

Part 141 – NPDWR

Subpart P –

Enhanced Filtration and Disinfection

Structure

- **Part 141 – NPDWR**
 - **Subpart P – Enhanced Filtration and Disinfection**
 - § 141.170 General Requirements
 - § 141.171 Criteria for Avoiding Filtration
 - § 141.172 Disinfection Profiling and Benchmarking
 - § 141.173 Filtration
 - § 141.174 Filtration Sampling Requirements
 - § 141.175 Reporting and Recordkeeping Requirements

§ 141.170 General Requirements

- **Subpart H Systems ³ 10,000**
- **February 16, 1999**
 - **Uncovered Finished Water Storage Facilities**
- **January 1, 2002**
 - **Treatment Technique Expanded to Address**
 - ***Cryptosporidium***
 - ◆ **2-Log Removal** (Filtered)
 - ◆ **Watershed Control** (Unfiltered)
 - **Addition of Requirements for:**
 - **Profiling and Benchmarking**

§ 141.171 Criteria For Avoiding Filtration

- **Watershed Control**
 - Identify Activities
 - Monitor Activities
- **State Determines Adequacy in Onsite Inspection**
 - Based on:
 - Comprehensiveness of Watershed Review
 - Effectiveness of Monitoring and Controls
 - Maximization of Land Ownership and Control

§141.172 Disinfection Profiling and Benchmarking

- **A “Snap-Shot”**
- **Ensures Microbial Protection**
- **3-Step Process**
 - 1. Applicability Determination**
 - 2. Profiling**
 - 3. Benchmarking and Consultation**
- **Subpart H Systems Serving ³ 10,000**

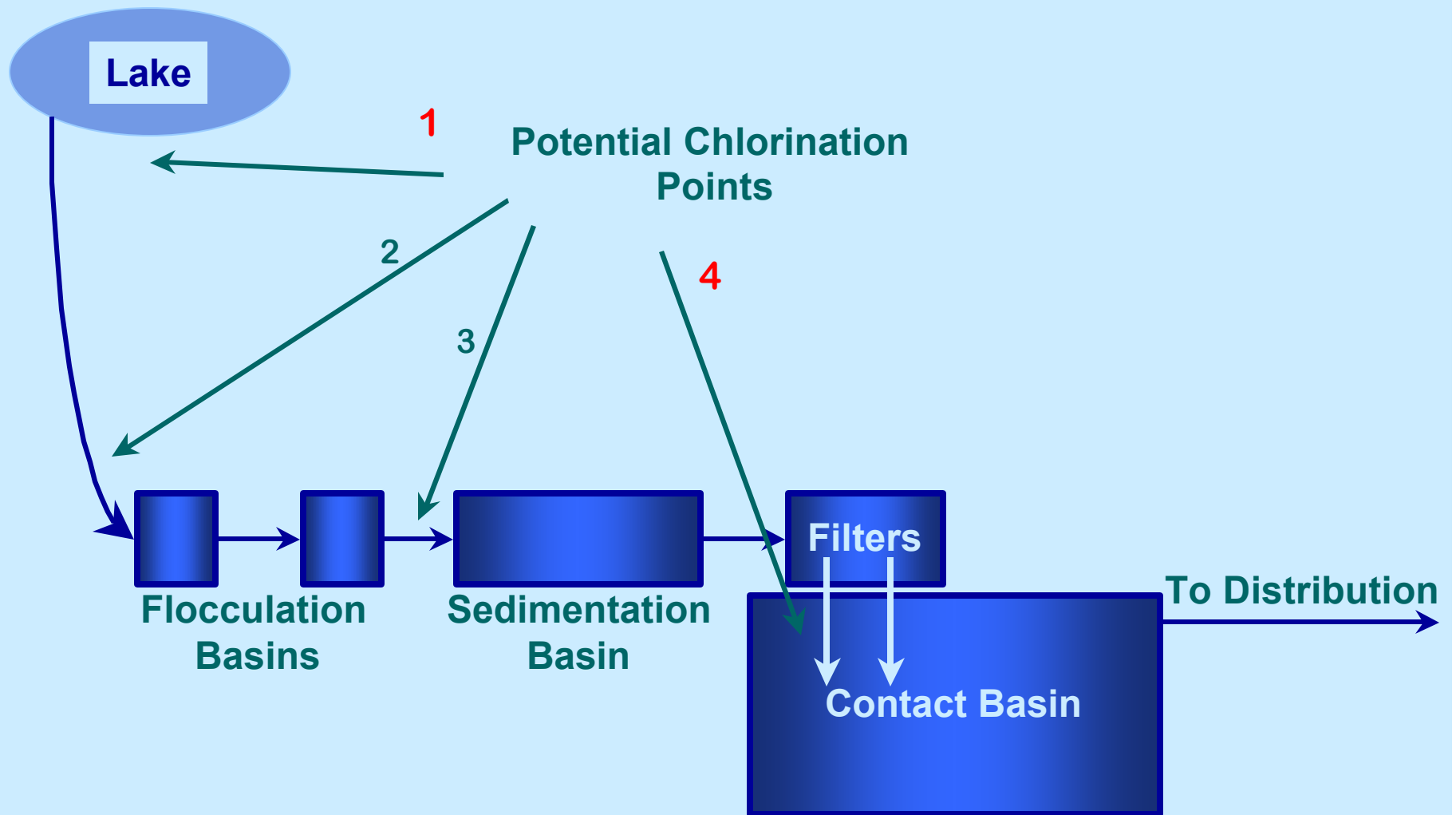
Why Develop a Disinfection Profile and Benchmark?

- **SWTR Requires**
 - 3-Log Removal and/or Inactivation of *Giardia Lamblia*
 - 4-Log Removal and/or Inactivation of Viruses
- **A Regulatory Threshold to Be Achieved**
- **The Threshold Is Often Exceeded**

Why Develop a Disinfection Profile and Benchmark?

- **IESWTR – (§141.172 Disinfection Profiling and Benchmarking)**
 - **Requires Systems That Have Elevated DBPs to Show All the CT Available**

Why Develop a Disinfection Profile and Benchmark?



Why Develop a Disinfection Profile and Benchmark?

- **Measure Changes Against Actual Inactivation**
- **Consider:**
 - **Positive and Negative Impacts**
 - **Acute and Chronic Health Risks**
 - **Alternatives**
- **Public Health Based Decision**

§141.172 Disinfection Profiling and Benchmarking

- **Step 1: Applicability Determination**
 - Determine TTHM and HAA5 Annual Averages
 - ICR Data
 - ◆ Submit by January 1, 2000
 - Monitoring
 - ◆ Complete by March 31, 2000
 - Existing Occurrence Data
 - ◆ Submit by April 1999 A “More Representative Data Set”
 - Go to Step 2 If Either Annual Average is > 80 Percent of MCL
 - Systems May Go Directly to Profiling
 - Notify the State by December 31, 1999

§141.172 Disinfection Profiling and Benchmarking

- **Step 2: Developing a Disinfection Profile**
 - **Daily Inactivation Calculations**
 - Peak Hour
 - 1 Year Minimum
 - Throughout the Plant
 - Completed by March 2001
 - **Determining Inactivation**
 - Temperature
 - pH (Chlorine)
 - Residual Disinfectant Concentration (C)
 - Contact Time (T)

§141.172 Disinfection Profiling and Benchmarking

- **Step 2: Developing a Disinfection Profile**
 - “In Lieu Of” Monitoring, Systems With 3 Years Existing Data
 - Submit by March 31, 2000
 - Substantially Equivalent
 - System Required to Monitor Until State Approves Data
 - Systems May Use Such Data “In Addition To”

§141.172 Disinfection Profiling and Benchmarking

- **Step 2: Developing a Disinfection Profile**
 - **Single Point of Application**
 - **Single Calculation at First Customer**
 - **Sequential Inactivation Calculations**
 - **Multiple Points of Application**
 - **Calculate Each Segment As Above**
 - **Sum**
 - **Disinfection Profile Must Be Kept for State Inspection**

§141.172 Disinfection Profiling and Benchmarking

- **Step 3: Calculating a Disinfection Benchmark**
 - **Before Significant Changes Can Be Made**
 - Calculate Benchmark
 - Consult With State
 - **Significant Changes Include:**
 - Point of Application
 - Disinfectant(s)
 - Process
 - Others Determined by State

§141.172 Disinfection Profiling and Benchmarking

- **Step 3: Calculating a Disinfection Benchmark**
 - Calculate Each Month's Average
 - Calculate Benchmark
 - Single Year's Data
 - ◆ Lowest Monthly Average
 - Multiple Years' Data
 - ◆ Average of Each Year's Lowest Monthly Average

§141.172 Disinfection Profiling and Benchmarking

- **Step 3: Calculating a Disinfection Benchmark**
- **Consulting With the State**
 - **System Must Submit**
 - **Description of Proposed Change**
 - **Disinfection Profile**
 - **Benchmark**
 - **Analysis of Impacts**

§141.172 Disinfection Profiling and Benchmarking

Summary of Timeframe

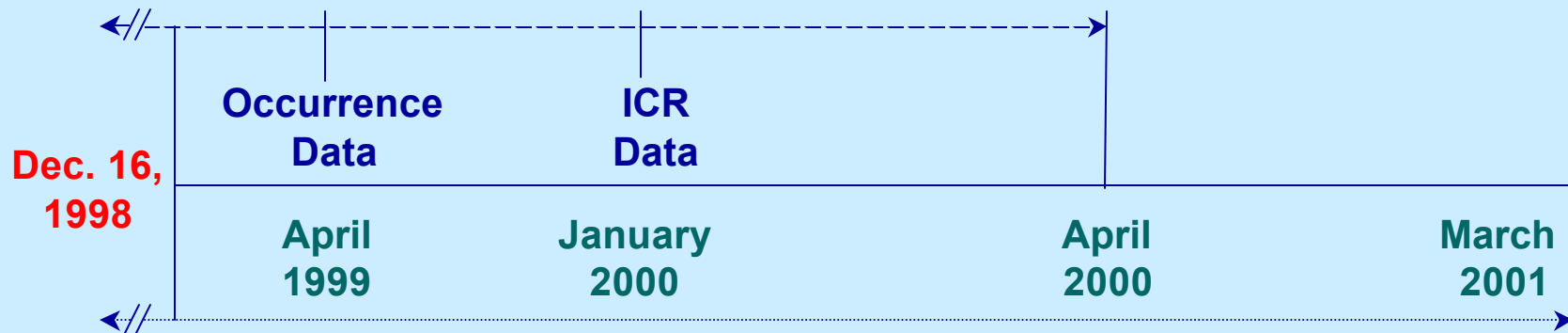
- **90 Days** (April 1999)
 - TTHM and HAA5 Data Collection
- **4 Months** (April 1999)
 - Submission of “Occurrence” Data
- **12 Months** (January 2000)
 - Submission of ICR Data
- **12 Months** (January 2000)
 - Notification of Intent to Profile
- **15 Months** (April 2000)
 - If TTHM/HAA5 \geq 80% of MCLs, Begin Profiling
- **27 Months** (March 2001)
 - Disinfection Profile Must Be Complete
 - Consultation Is Required

Compliance Date
Key Compliance Date

§141.172 Disinfection Profiling and Benchmarking

Profiling and Benchmarking Timeline

Collection of TTHM and HAA5 Data



Collection of Profiling Data

Workshop:

*Preparation of
A Disinfection Profile and Benchmark*

Part 141 – NPDWR

Subpart P

(continued)

§ 141.173 Filtration

- **Conventional and Direct Filtration**
 - 0.3 NTU in 95 Percent
 - No Greater Than 1 NTU
 - Lime Softening Plants May Acidify
- **Other Filtration Technologies**
 - Demonstration Required
 - State Will Set Performance Standards

§141.174 Filtration Sampling Requirements

- **Conventional and Direct Filtration Plants**
 - **Continuous Monitoring of Each Filter**
 - **Record Results Every 15 Minutes**
 - **Calibrate Turbidimeters**
- **Not a Treatment Technique**
- **Turbidity Excursions Trigger Actions—Not Violations**
 - **Failure to Complete Follow-up Actions Creates Violations**
- **Informational**

§141.175 Reporting and Recordkeeping

- **Conventional, Direct, and “Other State Approved” Filtration Technologies — Report by 10th of Month**
 - **Combined Filter Effluent**
 - Number of CFE Measurements
 - Number of Measurements \leq 0.3 NTU Performance Standard
 - Date and Value of Measurements $>$ 1 NTU Maximum Level
 - **Individual Filter Effluent**
 - Maintain Individual Filter Results for 3 Years
 - Report Individual Filter Results If “Follow-up Action” Is Triggered

§141.175 Reporting and Recordkeeping

- **Turbidity Excursions That Trigger Follow-up Actions:**
 - (1) **> 1.0 NTU in 2 Consecutive Measurements**
 - (2) **> 0.5 NTU in 2 Consecutive Measurements at the End of 4 Hours of Operation After Backwashing or Taking Offline**
 - (3) **> 1.0 NTU in 2 Consecutive Measurements in 3 Consecutive Months**
 - (4) **> 2.0 NTU in 2 Consecutive Measurements in 2 Consecutive Months**

§141.175 Reporting and Recordkeeping

(1) > 1.0 NTU in 2 Consecutive Measurements

– Actions:

- **Record Filter Number, Turbidity Measurement, Date(s)**
- **Produce Filter Profile Within 7 Days (If No Obvious Reason)**
- **Report That Profile Has Been Produced (or Obvious Reason) Within 10 Days After the End of Month**

§141.175 Reporting and Recordkeeping

(2) > 0.5 NTU in 2 Consecutive Measurements at the End of 4 Hours of Operation After Backwashing or Taking Offline

– Actions:

- **Record Filter Number, Turbidity Measurement, Date(s)**
- **Produce Filter Profile Within 7 Days (If No Obvious Reason)**
- **Report That Profile Has Been Produced (or Obvious Reason) Within 10 Days After the End of Month**

– Identical to Actions for Trigger No. 1

§141.175 Reporting and Recordkeeping

(3) > 1.0 NTU in 2 Consecutive Measurements in 3 Consecutive Months

- Actions:**
- Record Filter Number, Turbidity Measurement, Date(s)**
- Self-Assessment of Filter Within 14 Days**
 - Assessment of Filter Performance**
 - Filter Profile**
 - Identification/Prioritization of Factors Limiting Performance**
 - Assessment of Applicability of Corrections**
 - Preparation of Report**

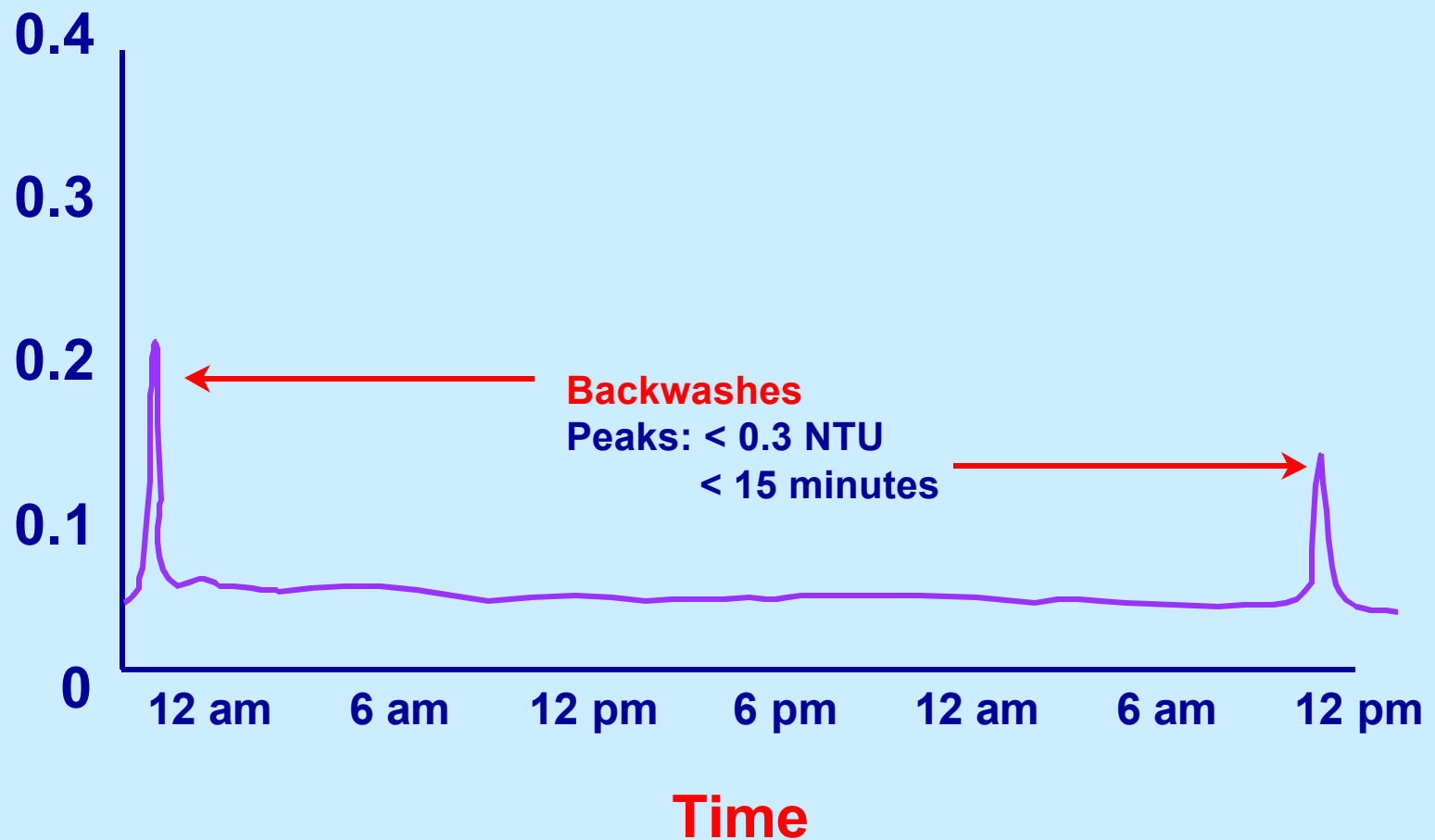
§141.175 Reporting and Recordkeeping

(4) > 2.0 NTU in 2 Consecutive Measurements in 2 Consecutive Months

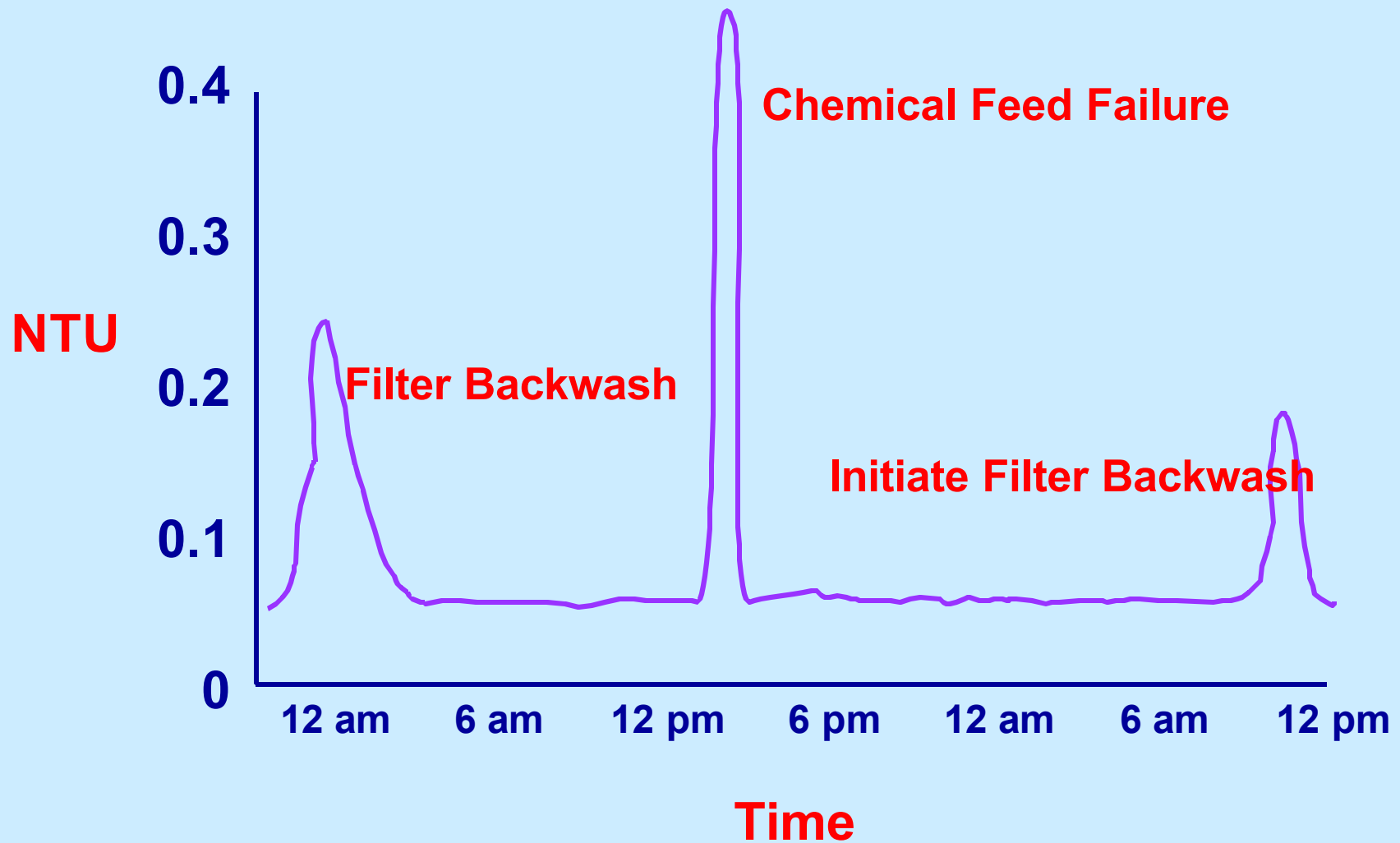
- Actions:**
- Record:**
 - Filter Number**
 - Turbidity Measurements**
 - Date(s)**
- Comprehensive Performance Evaluation**
 - Arrangements Within 30 Days**
 - Completed and Submitted Within 90 Days**

Filter Profile — Good Performance

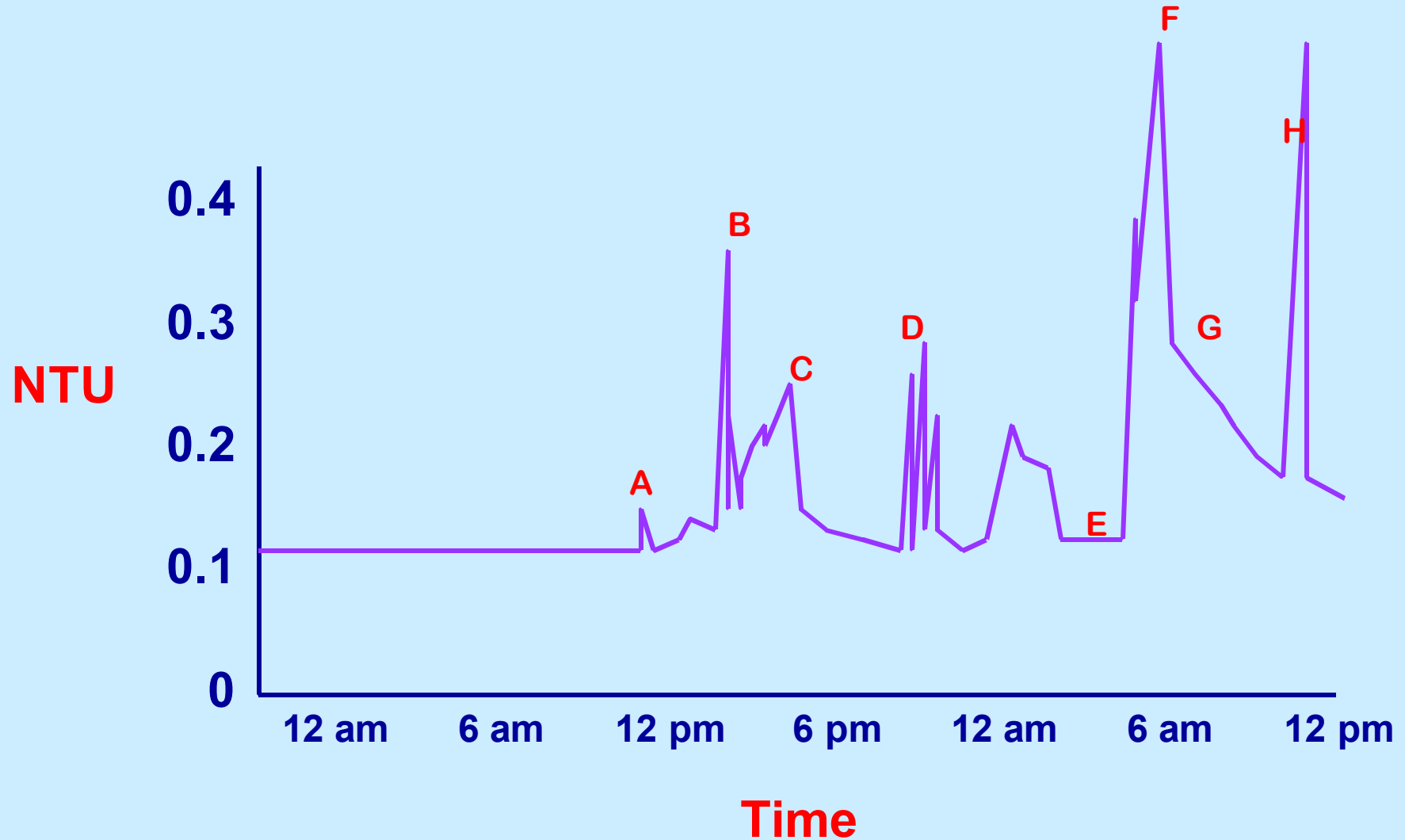
Turbidity (NTU)



Filter Profile — Turbidity Excursion



Filter Profile — Multiple Problems



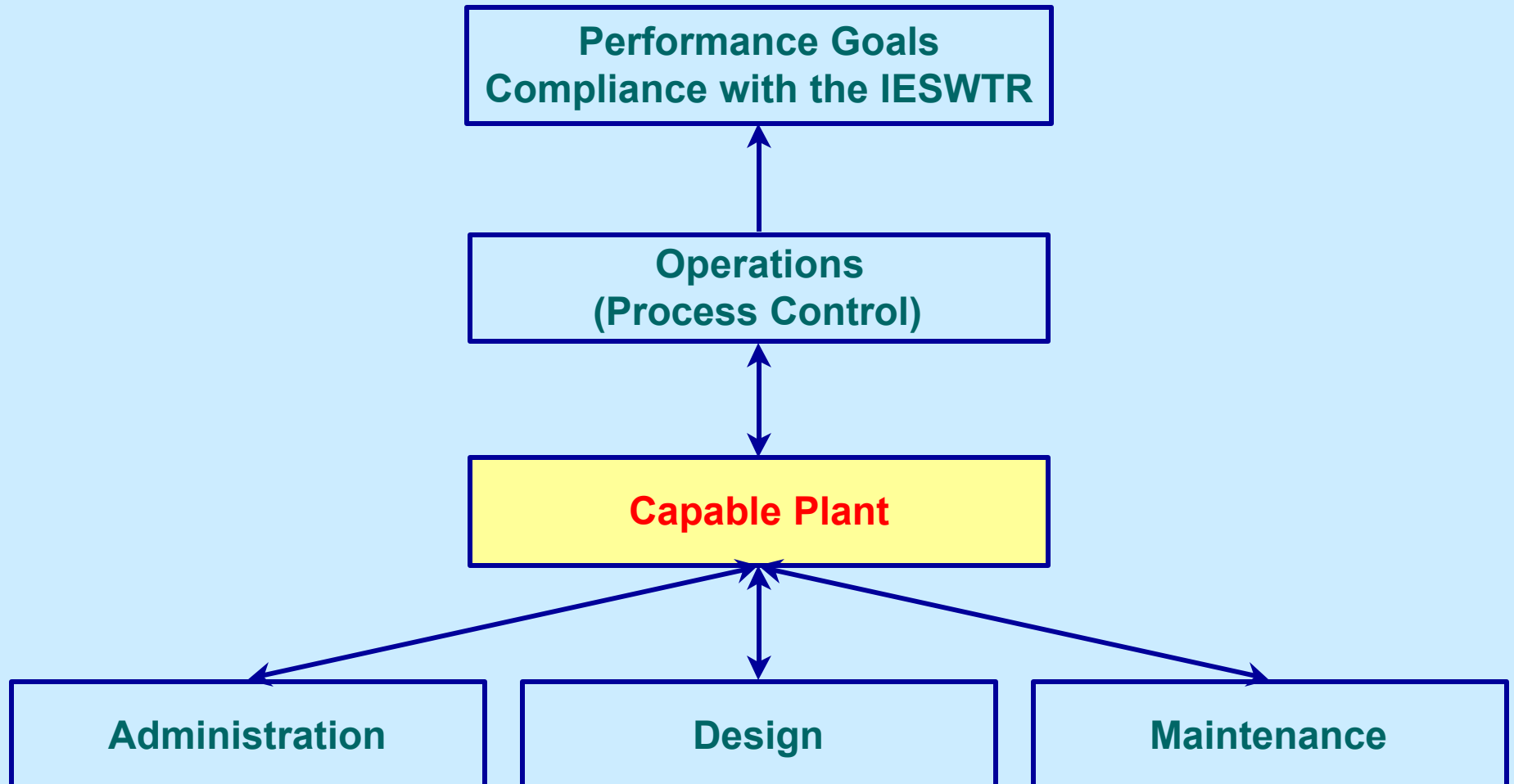
Filter Self-Assessments

- **A Filter Self-Assessment Should Include:**
 - Filter Description
 - Filter Profile
 - Hydraulic Loading Conditions
 - Media Condition and Placement
 - Support Media
 - Backwash Practices
 - Filter Rate-of-Flow Controllers
- **For Additional Information and More Detailed Procedures See:**
 - *Guidance Manual for Compliance With the IESWTR: Turbidity Provisions (Chapter 5), and*
 - *Integrated Design of Water Treatment Facilities, Kawamura*

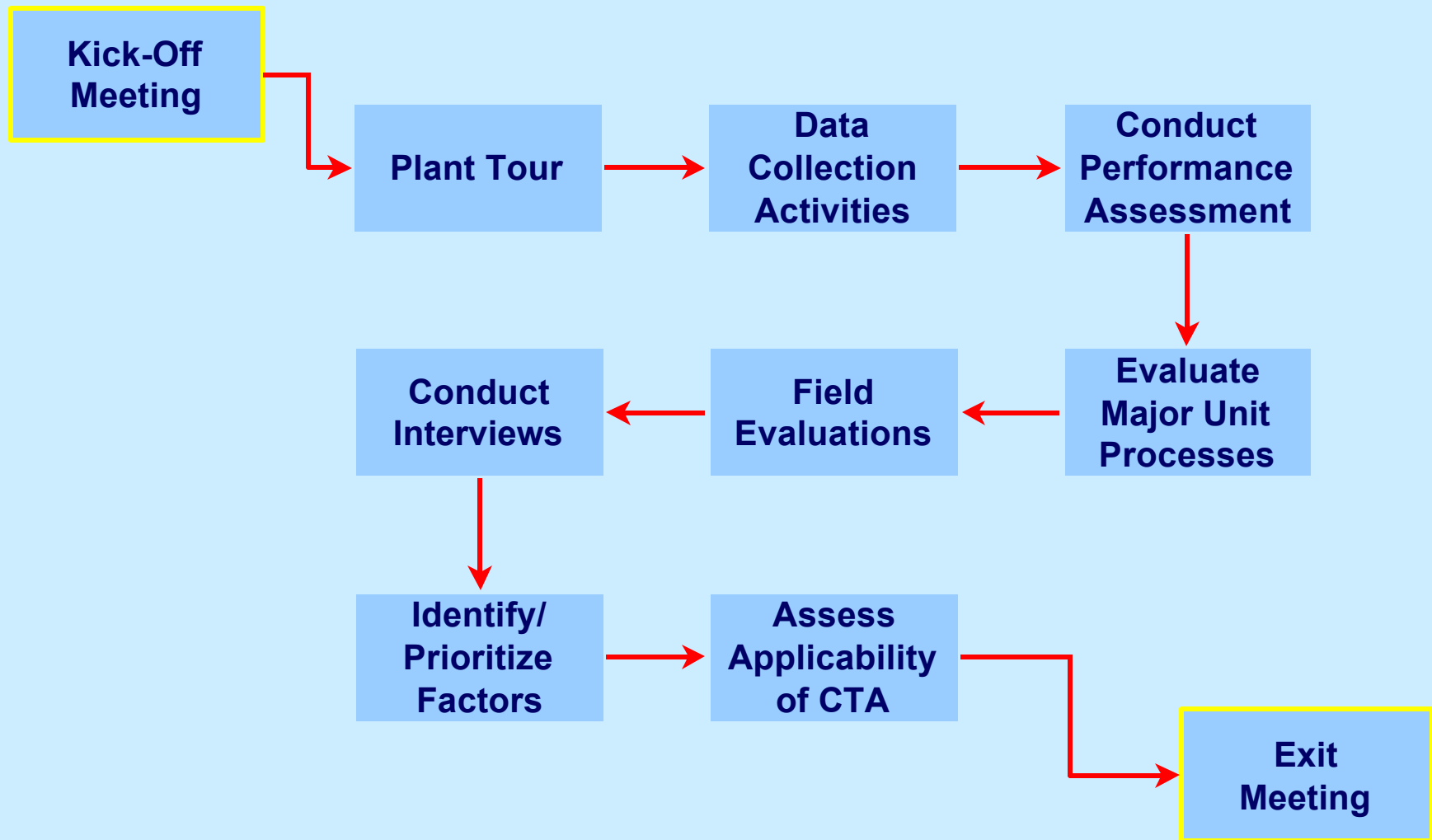
Composite Correction Program

- **A 2-Step Process**
 - **Step 1: CPE**
 - **Identify Performance Limiting Factors (4 Areas)**
 - ◆ **Design**
 - ◆ **Operation**
 - ◆ **Maintenance**
 - ◆ **Administration**
 - **Step 2: CTA**
 - **Address Identified Performance Limiting Factors**
 - ◆ **Scientific Process**

Comprehensive Performance Evaluation



On-Site CPE Activities

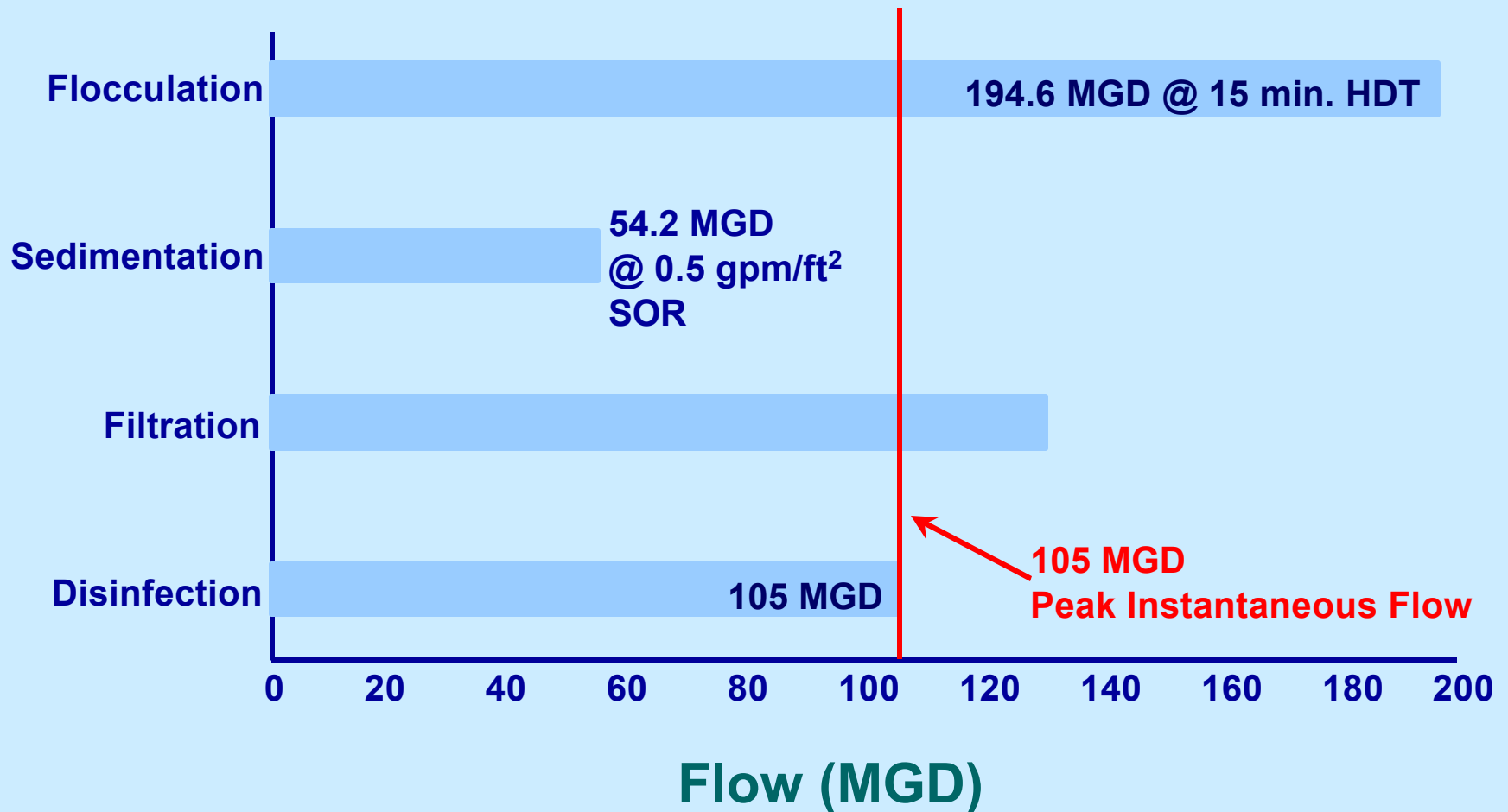


Comprehensive Performance Evaluation

- **Identify Performance Limiting Factors**
 - Design
 - Operation
 - Maintenance
 - Administration
- **Prioritize “Factors”**
 - A Factors
 - B Factors
 - C Factors

Performance Potential Graph

Major Unit Processes



Comprehensive Technical Assistance

- **Designed to Correct Factors Identified in a CPE**
- **Facilitated Process**
- **Transfer Key Skills to Plant Staff**
 - Attempts to Teach Problem Solving Skills
- **Long-term Capability**
 - 6 - 12 Months
 - Site Visits
 - Weekly Phone Consultation

Part 142 – NPDWR Implementation

Subpart B

Primary Enforcement Responsibility

§142.14 Records Kept by States

- **Turbidity Measurements Must Be Kept for at Least 1 Year**
 - **Records Must Be in a Form That Make Comparisons Possible With Limits Specified in §§ 141.71, 141.73, 141.173, and 141.175**
- **Disinfectant Residual Measurements and Other Parameters Necessary to Document Disinfection Effectiveness, in Accordance with §141.72 and §141.74, Must Be Kept for at Least 1 Year**
- **Records of Reporting Requirements of §141.75 and §141.175 Must Be Kept for No Less Than 1 Year**
- **Decisions Made Under Subpart H or Subpart P on a System-by-System and Case-by-Case Basis Must Be Made in Writing and Kept by the State**
- **Systems Consulting With the State Concerning a Modification to Disinfection Practice(s), Including Status of Consultation**

§142.14 Records Kept by States

- **Decisions That a System Using Alternative Filtration Technologies Can Consistently Achieve a 99 Percent Removal of *Cryptosporidium* Oocysts Including:**
 - **State-Set Enforceable Turbidity Limits for Each System**
 - **Copy of Decision Must Be Kept Until Decision Is Reversed or Revised**
 - **The State Must Provide Copy of Decision to System**
- **Systems Required to Do Self-Assessments, CPEs, and CCPs**

§142.15 Reports by States

- **Sanitary Surveys**
 - **List of Subpart H Systems That Have Had a Sanitary Survey Completed During the Last Year**
 - **An Annual Evaluation of the State's Compliance With the Requirements to Conduct Sanitary Surveys**
 - **Every 3 Years for CWS and**
 - **Every 5 Years for NCWS**

Code of Federal Regulations
Title 40
Part 142—NPDWR
Implementation

Subpart B—Primary Enforcement Responsibility

- **§142.16 Special Primacy Requirements**
 - **EPA’s Regulation of States for Purpose of Awarding Primacy**
- **Note: Guidance Often Goes Beyond Minimum Requirements**
 - **“Must”**
 - **“May” or “Should”**

Other Available Guidance Documents

- **Seven Technical Guidance Manuals**
 - **Disinfection Profiling and Benchmarking**
 - **Alternative Disinfectants and Oxidants**
 - **Enhanced Coagulation and Precipitative Softening**
 - **Turbidity**
 - **M-DBP Simultaneous Compliance**
 - **Sanitary Surveys**
 - **Uncovered Finished Water Reservoirs**

Other Available Guidance Documents (cont.)

- **Others**
 - **Surface Water Treatment Rule Guidance Manual**
 - **EPA's Sanitary Survey Training Materials**
 - **Implementation Guidance Manual for the IESWTR and the Stage 1 DBPR**

Interim Enhanced Surface Water Treatment Rule

Special Primacy Requirements

§142.16

IESWTR §142.16 Special Primacy Requirements

- **§142.16(b)(1) Enforceable Requirements**
 - (i) Existing
 - (ii) New
 - (iii) New
- **§142.16(b)(3) Sanitary Survey (a New Section)**
 - (i) Through (v)
- **§142.16(g) In Addition to the Requirement for Adopting Subpart P, a State's Program Revision Application Must Contain the Information Specified in This Paragraph.**
 - (1) Enforceable Requirements. Authority for CCPs, Etc.,
 - (2) State Practices and Procedures.
 - (i) More Representative Data Set,
 - (ii) Calculation of Inactivation for Viruses,
 - (iii) Consulting With PWSs,
 - (iv) Approval of Alternative Technologies and Setting Turbidity Performance Standards

IESWTR §142.16(b)(1) Enforceable Requirements

- **(ii) States Must Have Rules or Other Authority to Assure PWSs Respond in Writing to Significant Deficiencies Outlined in Sanitary Survey Reports**
 - No Later Than 45 Days,
 - Indicating How, the Deficiency Will Be Resolved; and
 - On What Schedule
- **Satisfied by:**
 - Copies of Statutes, Rules, Authorities With
 - Appropriate Sections Cited
 - May Wish to Provide a Description of Their Use

IESWTR §142.16(b)(1) Enforceable Requirements

- **(iii) States Must Have the Appropriate Rules or Other Authority to Assure PWSs Take Steps to Correct Significant Deficiencies, If Within PWS Control**
- **Satisfied by:**
 - **Copies of Statutes, Rules, Authorities With,**
 - **Appropriate Sections Cited**
 - **May Wish to Provide a Description of Their Use**
 - **May Wish to Address Authority for Administrative and/or Civil Actions With Penalties**

IESWTR §142.16(b)(3) Sanitary Survey

- **(i) States Must Conduct Sanitary Surveys That Address the 8 Components Listed in EPA/ASDWA Joint Guidance at Subpart H Systems**
 - Once Every 3 Years for Community PWSs
 - Once Every 5 Years for Noncommunity PWSs
- **Satisfied By:**
 - Scope of Sanitary Surveys
 - Capacity
 - Implementation

IESWTR §142.16(b)(3) Sanitary Survey

- **(ii) States Must Describe How They Will Decide Whether a Community PWS Has Outstanding Performance and Is Eligible for Sanitary Surveys at a Reduced Frequency**
- **Satisfied By:**
 - **A Description of the Procedure for Determining Outstanding Performance Demonstrating That**
 - **The Procedure Is Integrated Into the Sanitary Survey Process**
 - **The Procedure Provides Inspectors With Guidance Ensuring Consistent Implementation**

IESWTR §142.16(b)(3) Sanitary Survey

- **(iii) Components of a Sanitary Survey May Be Completed As Part of a Staged or Phased State Review Process Within the Established Frequency**
- **Satisfied By:**
 - **Statement That Sanitary Surveys Will Not Be Staged or**
 - **A Description of Relevant Activities That Will Be Used**
 - **How They Will Be Coordinated**
 - **Who Will Be Responsible for Follow-Up Technical Assistance or Enforcement**

IESWTR §142.16(b)(3) Sanitary Survey

- **(iv) When Conducting Sanitary Surveys, States Must Review the Disinfection Profile**
- **Satisfied By:**
 - **A Description of How the Disinfection Profiles Will Be Reviewed; the Description Should Include:**
 - **Tracking of Systems Required to Prepare Disinfection Profiles**
 - **Acceptable Format for Disinfection Profiles**
 - **Alternative Benchmarks**

IESWTR §142.16(b)(3) Sanitary Survey

- (v) The State Must Describe How It Will Determine What Deficiencies Are “Significant”
- Satisfied By:
 - A Description of the Procedures Inspectors Will Use to Determine When Deficiencies Become “Significant”
- Suggest a 3-Step Process
 - (1) Define Significant Deficiency
 - (2) Develop an Evaluation Procedure
 - (3) Develop a List of Common “Significant Deficiencies”

IESWTR §142.16(b)(3) Sanitary Survey

- (v) The State Must Describe How It Will Determine What Deficiencies Are “Significant”
- Step 1—Definition of a Significant Deficiency
 - Any Defect in a System’s Design, Operation, Maintenance, or Administration, As Well As Any Failure or Malfunction of Any System Component, That the State Determines to Cause, or Have the Potential to Cause, Unacceptable Risk to Health That Could Affect the Reliable Delivery of Safe Drinking Water.
- Alternative Definitions?

IESWTR §142.16(b)(3) Sanitary Survey

- **(v) The State Must Describe How It Will Determine What Deficiencies Are “Significant”**
- **Step 2—Develop an Evaluation Procedure**
 - **Potential for Entrance of Contaminants**
 - **Impact to Treatment**
 - **Risk to Health**

IESWTR §142.16(b)(3) Sanitary Survey

- **(v) The State Must Describe How It Will Determine What Deficiencies Are “Significant”**
- **Step 3—List of Common Significant Deficiencies**
 - **Source**
 - **Raw Water Monitoring Indicative of Gross Contamination**
 - **No Sanitary Seal**
 - **Storage**
 - **Unscreened Vents, Overflows, Etc.**
 - **Unlocked or Missing Hatch Cover**

IESWTR §142.16(g) Enforceable Requirements

- **States Must Adopt Subpart P and ...**
- **(1) States Must Have Authority to Require CCPs and Ensure Follow-Up Recommendations Are Implemented**
- **Satisfied By:**
 - **Statutes, Rules and/or Other Authorities by Which CCPs (CPEs and CTAs) Can Be Required and Implementation of Recommendations Can Be Ensured**
 - **Copies of Statutes, Rules and Authorities With Citations**
 - **An Explanation of How Authorities Will Be Used**

IESWTR §142.16(g) Enforceable Requirements (cont.)

- **States May Wish to Address:**
 - **Penalty Authority**
 - **Prioritization of Systems Needing CCP Assistance**
 - **Prioritization of “Recommendations”**
 - **A, B, and C Factors**
 - **CTA Recommendations**
 - **Third Party Approvals**

IESWTR §142.16(g) State Practices and Procedures

- **States Must Adopt Subpart P and ...**
- **(2)(i) Explain How the State Will Approve a More Representative Data Set for the Purpose of Determining If Disinfection Profiling Is Required**
- **Satisfied By:**
 - **A Demonstration That Each Situation Will Be Evaluated on a Case-by-Case Basis to Determine If an Alternative Data Set Is More Representative of Current Potential for Production of Disinfection Byproducts**

IESWTR §142.16(g) State Practices and Procedures

- **States Must Adopt Subpart P and ...**
- **(2)(ii) How the State Will Approve a Method to Calculate Logs of Inactivation for Viruses for Systems Using Chloramines or Ozone**
- **Satisfied By:**
 - **Use of Methods, Tables, and Protocol in the SWTR Guidance Manual**
 - **Other Methods Selected and Described by the State If**
 - **Technically Correct**
 - **Used in a Consistent Manner by PWSs**

IESWTR §142.16(g) State Practices and Procedures

- **States Must Adopt Subpart P and ...**
- **(2)(iii) How the State Will Consult With PWSs to Evaluate Modifications in Disinfection Practices**
- **Satisfied By:**
 - **A Description of How the State Will Consult**
- **States May Wish to Consider:**
 - **Why the Change Is Proposed**
 - **Positive and Negative Impacts (Both Acute and Chronic)**
 - **Evaluation of Alternatives**
 - **Balance Acute and Chronic Health Risks/Benefits**

IESWTR §142.16(g) State Practices and Procedures

- **States Must Adopt Subpart P and ...**
- **(2)(iv) How the State Will**
 - **Approve Alternative Filtration Technologies**
 - **Set Turbidity Performance Levels**
- **Satisfied By:**
 - **Information That Demonstrates**
 - **Such Approvals Ensure the Required Removal and/or Inactivation Requirements of the Rule**
 - **Turbidity Performance Standards Will Be Established Such That a Level of Particulate Removal Will Be Achieved That, in Combination With Disinfection, Achieves the Removal and/or Inactivation Requirements**

Alternative Technology Approvals

- **Possible Procedure?**
- **Western States' Workgroup's Consensus Protocol**
 - Evaluation of Leaching Potential
 - *Giardia/Crypto* Removal Demonstration
 - MPA
 - Surrogate Removal Evaluations
 - Particle Size Analysis Demonstration (Appendix M)
 - Live *Giardia/Crypto* Challenge Studies
 - On-Site Demonstration of Performance
 - Prior Testing on Similar Water
 - Conditional Acceptance With Performance Bond
 - Pilot Testing

Turbidity Performance Requirements

- **States Should Consider**
 - **Cyst Removal Efficiencies**
 - **Potential for Interference With Disinfection**
 - **Potential for Interference With Bacteriological Testing**
 - **The Technology**