OhioEPA
State of Ohio Environmental Protection Agency

Fact Sheet

January 2004

Continuous Turbidity Calibration Requirements

What are the requirements for monitoring turbidity at surface water treatment systems?
All surface water systems are required to monitor turbidity of the **filtered water** (combined filter effluent) either by a continuous turbidimeter or by grab samples taken at least every four hours. If a continuous turbidimeter is used, turbidity readings must be taken at least every 15 minutes. Previously, turbidity readings of the filtered water from continuous turbidimeters were required to be taken every 6 minutes. Systems may continue taking turbidity readings of the filtered water every 6 minutes or may change the frequency to every 15 minutes.

In addition, all surface water systems using either conventional or direct filtration treatment will be required to monitor the turbidity from each **individual filter effluent** every 15 minutes, as part of the Interim Enhanced Surface Water Treatment Rule and the Long Term 1 Enhanced Surface Water Treatment Rule. For surface water systems serving a population of at least 10,000 this requirement became effective on January 1, 2002. For surface water systems serving a combined population of less than 10,000 this requirement will become effective January 1, 2005, however, it is recommended that turbidimeters be installed before the compliance date.

Can turbidity monitoring of the filtered water (combined filter effluent) and the individual filter effluent be conducted at the same frequency?
Yes. Turbidity monitoring of the combined filter effluent and individual filter effluent can both be conducted at 15 minute intervals.

What are the requirements if the individual filter effluent turbidimeter is offline for greater than 15 minutes during calibration?
If a turbidimeter on an individual filter is offline for greater than 15 minutes for calibration, report that the turbidimeter was offline on the monthly report and take grab samples every 4 hours until the turbidimeter is back on line.

Where should the individual filter effluent turbidimeter be installed?
The individual filter effluent turbidimeter must be installed in accordance with manufacturer's instructions. Carefully consider the location of the sample tap. The sample tap should provide a representative sample of the water being monitored. If an individual filter is being monitored, locate the sample tap as close to the filter as possible. The sample tap should provide a sample from the centerline of the pipe, as opposed to the bottom or top of the pipe where sediment or air bubbles may interfere with sample integrity. The length of conduit between the sample tap and the turbidimeter should be minimized, to the extent possible.

What are the turbidimeter calibration/validation requirements for filtered water and individual filter effluent?
(see Table 1 on page 2)

What are the approved analytical methods for turbidimeters?
Currently, four turbidity analytical methods have been approved. Regardless of manufacturer, the turbidimeters must conform to one of the approved analytical methods and the turbidity must be reported to nearest 0.05 NTU if it is less than 1.0 NTU, and to the nearest 0.1 NTU if between 1 and 10 NTU. However, if using Hach 10133, report the turbidity to the nearest 10 NTU because of the much greater precision of this method. The analytical methods are: Great Lakes Instrument Method 2; USEPA 180.1; SM 2130B; or Hach 10133.

What are some common definitions within the analytical methods?
Calibration means a procedure which checks or adjusts an instruments accuracy by comparison with a defined standard or reference.

Calibration verification means a procedure used to check whether or not the calibration of the instrument is within certain limits.

Primary standard means a standard used to calibrate the instrument response with respect to analyte concentration.

Secondary standard means a standard that the manufacturer (or an independent testing laboratory) has certified will give instrument calibration results equivalent (within certain limits) to the results obtained when the instrument is calibrated with primary standard such as formazin. A secondary standard is used for monthly calibration verification and is monitored periodically for deterioration using a primary standard.

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Where can more information be obtained?

Much more detailed guidance is available in the USEPA *Guidance Manual for Compliance with the Interim Enhanced Surface Water Treatment Rule: Turbidity Provisions* (EPA 815-R-99-010) April 1999. A copy of the USEPA guidance manual can be obtained from the USEPA website — www.epa.gov/safewater/mdbp/mdbptg.html#turbidity. Also, call the Ohio EPA district office regarding the calibration requirements for continuous turbidimeters monitoring the effluent of individual filters, or call Jim Dolfi at (614)644-4068 in the Division of Environmental Services, Laboratory Certification Section, regarding the calibration requirements for continuous turbidimeters monitoring the filtered water.

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TABLE 1
Turbidimeter Calibration Requirements

	Filtered Water (Combined Filter Effluent)	**Individual Filter Effluent**
What is the procedure?	• Use manufacturer's procedures to calibrate the continuous turbidimeter. • Take a split sample and compare turbidity reading from the continuous turbidimeter with your certified bench top turbidimeter. • If the certified bench top turbidimeter reads 0.5 NTU or greater and the continuous turbidimeter reading varies by more than +/- 10 percent, then adjust the continuous turbidimeter to read the same as the certified bench top turbidimeter. • If the certified bench top turbidimeter reading is less than 0.5 NTU, and the continuous turbidimeter reading varies by more than +/- 0.05 NTU then adjust the continuous turbidimeter to read the same as the certified bench top turbidimeter.	• Use the manufacturer's procedures to calibrate the continuous turbidimeter. • Compare the reading from the continuous turbidimeter to a secondary standards once per month (or calibrate using a primary standard once per month). If the monthly turbidity reading deviates from the secondary standard value more than +/- 10 percent, then clean and calibrate the continuous turbidimeter using a primary standard. • Calibrate the continuous turbidimeter using a primary standard at least once per quarter.
Who must conduct the calibration?	Analyst approved by Ohio EPA to conduct turbidity analysis.	Plant personnel
What records must be kept of the calibrations?	• Date of calibration • Name of person conducting calibration • Continuous turbidimeter reading • Certified bench top turbidimeter reading	• Date of calibration • Filter number • Name of person conducting calibration • Any significant observations made • A copy of the manufacturer's calibration procedures
Who will review the information?	Division of Environmental Services	Ohio EPA survey officer during sanitary survey
How long must this information be retained?	Ten years	Three years