

Ensuring Turbidity Meter Accuracy

Water systems subject to the Surface Water Treatment Rules (SWTR) are required to monitor the turbidity of filtered water at individual filters and at the confluence point with certain frequency through an operation day. These requirements ensure proper measurement of turbidity removal and allows for any troubleshooting within a certain window of time. While continuous monitoring (every 15 minute recording interval) of the individual filter turbidity is required, compliance monitoring of turbidity at the confluence of all filtered water is required every 4 hours during operation and can be conducted using either benchtop or online continuous monitoring turbidimeters. Confluence monitoring may be done more frequent than once every 4 hours, but the data interval must be constant. Users should follow the manufacturer’s calibration, verification, and instrument maintenance recommendations, and keep records. Refer to the table below to ensure the integrity of the data collected.

Location	Type	Verification Frequency	Calibration Frequency
Individual Filter Effluent	Continuous	Weekly but no less frequent than monthly, and after every calibration w/primary or secondary standard or comparison to a benchtop unit	Quarterly or sooner if verification results show variance of greater than ± 0.05 NTU. To be conducted with w/EPA approved primary standard [†]
Filter confluence (if data will/may be used for compliance)	Continuous	Weekly and after every calibration w/primary or secondary standard or comparison to a benchtop unit	
Other (e.g. raw, settled, filtered, etc.) if data will not be used for compliance)	Continuous	Recommended – Weekly and after every calibration w/primary or secondary standard or comparison to a benchtop unit	Recommended - Quarterly w/EPA approved primary standard [†]
Filter confluence	Benchtop	Daily, and after every calibration. Verify using a primary or secondary standard	Quarterly or sooner if verification results show variance of ± 0.05 NTU. To be conducted with w/EPA approved primary standard

† Quarterly wet verification with primary standard in lieu of quarterly calibration is described in the March 4, 2020 memo from EGLE.

Definitions*: **Calibration** is a procedure that adjusts the accuracy of an instrument by comparison with a standard or reference. Calibration must be done with EPA approved primary standards and following the manufacturer’s recommended procedures. **Verification** is the procedure that checks the accuracy of an instrument by comparison with a standard or reference. Verification conducted immediately after calibration an instrument allows to check that the calibration was done correctly and could be recalibrated if indicated by verification. Turbidity standards used for calibration and verification should have defined and reproducible turbidity values. All calibrations must be eventually traceable to an EPA approved **Primary Standard** that can be prepared from concentrate. Some examples include Formazin, StabCal, ProCal (not sealed) etc. **Secondary Standards** used for verification can be wet, sealed, or dry standards used for day to day use and should be checked periodically against a primary standard. To ensure accurate results, it is important to follow manufacturer’s recommended installation, cleaning, and maintenance recommendations.