



Standard Guide for QC of Screening Methods in Water¹

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1. Scope

1.1 This guide covers general considerations for the Quality Control practices for use with screening methods for organic and inorganic constituents in water. Methods are provided by various standard setting bodies, governmental agencies, as well as many domestic and international manufacturers.

1.2 This guide provides general QC procedures that are applicable to a broad range of screening methodologies. These procedures help to ensure the quality of data that is generated. Additional, method-specific or project specific requirements may be necessary. This guide also includes general considerations regarding proper utilization of screening methods.

2. Referenced Documents

2.1 ASTM Standards:

D 1129 Terminology Relating to Water²

D 4840 Guide for Sampling Chain-of-Custody Procedures²

D 5172 Guide for Documenting the Standard Operating Procedures Used for the Analysis of Water²

D 5847 Practice for Writing Quality Control Specifications for Standard Test Methods for Water Analysis³

D 5905 Practice for the Preparation of Substitute Wastewater²

3. Terminology

3.1 *Definitions*—For definitions of terms used in this guide, refer to Terminology D 1129 and Practice D 5847.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *action level, n*—a concentration of the analyte of concern at which some further action is required or suggested.

3.2.2 *batch, n*—a set (group) of samples analyzed such that results of analysis of the QC samples analyzed with the batch are indicative of the quality of the results of analysis of samples in the batch. The number of samples in the batch is defined by the task group responsible for the method.

3.2.2.1 *Discussion*—See Practice D 5847 for definition and discussion of batch and batch size.

3.2.3 *false negative, n*—a negative response for a sample that contains the target analyte(s) at or above the stated action level.

3.2.4 *false positive, n*—a positive response for a sample that contains the target analyte(s) below the stated action level.

3.2.5 *qualitative method, n*—a validated method that detects presence or absence of an analyte at a specified screening limit.

3.2.6 *screening limit, n*—the concentration of analyte that can be determined with a given certainty. The task group responsible for the method establishes the determination of the screening limit.

3.2.7 *screening method, n*—a method that is used to separate or categorize samples.

3.2.7.1 *Discussion*—An example would be a method that provides results that would be used to separate samples into those that contain an analyte above or below a specified action level.

3.2.8 *semi-quantitative method Type 1, n*—a method whose results are given in specified, discrete concentration ranges.

3.2.8.1 *Discussion*—Two types of examples of this would include semi-quantitative immunoassays or test strips. The cutoff concentration of the ranges has been predefined.

3.2.9 *semi-quantitative method Type 2, n*—a method whose results are reported as a single number along with the stated uncertainty.

3.2.9.1 *Discussion*—The uncertainty will be reported as (standard deviation of x at a concentration of y). The values of x and y can be established from the Initial Demonstration of Performance study.

4. Significance and Use

4.1 Screening methods are often used to determine the presence or absence of a specific analyte, groups of analytes, classes of compounds or other indicators of chemical compounds in order to determine if further analysis or action is necessary. The determination whether to proceed with further action is useful in reducing the number of negative results for which the screening method serves as a surrogate.

¹ This guide is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.05 on Inorganic Constituents in Water.

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² *Annual Book of ASTM Standards*, Vol 11.01.

³ *Annual Book of ASTM Standards*, Vol 11.02.