



Standard Guide for Operation of a Gaging Station¹

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1. Scope

1.1 The guide covers procedures used commonly for the systematic collection of streamflow information. Continuous streamflow information is necessary for understanding the amount and variability of water for many uses, including water supply, waste dilution, irrigation, hydropower, and reservoir design.

1.2 The procedures described in this guide are used widely by those responsible for the collection of streamflow data, for example, the U.S. Geological Survey, Bureau of Reclamation, U.S. Army Corps of Engineers, U.S. Department of Agriculture, Water Survey Canada, and many state and provincial agencies. The procedures are generally from internal documents of the preceding agencies, which have become the defacto standards used in North America.

1.3 It is the responsibility of the user of the guide to determine the acceptability of a specific device or procedure to meet operational requirements. Compatibility between sensors, recorders, retrieval equipment, and operational systems is necessary, and data requirements and environmental operating conditions must be considered in equipment selection.

1.4 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

D 1129 Terminology Relating to Water²

D 1941 Test Method for Open Channel Flow Measurement of Water with the Parshall Flume²

D 3858 Practice for Open-Channel Flow Measurement of Water by Velocity-Area Method²

D 5129 Test Method for Open Channel Flow Measurement

of Water Indirectly by Using Width Contractions²

D 5130 Test Method for Open-Channel Flow Measurement of Water Indirectly by Slope-Area Method²

D 5242 Test Method for Open-Channel Flow Measurement of Water with Thin-Plate Weirs²

D 5243 Test Method for Open-Channel Flow Measurement of Water Indirectly at Culverts²

D 5388 Test Method for Indirect Measurements of Discharge by Step-Backwater Method²

D 5389 Test Method for Open Channel Flow Measurement by Acoustic Velocity Meter Systems²

D 5390 Test Method for Open Channel Flow Measurement of Water with Palmer-Bowlus Flumes²

D 5413 Test Method for Measurement of Water Levels in Open-Water Bodies²

D 5541 Practice for Developing Stage-Discharge Relation for Open-Channel Flow²

2.2 ISO Standards:³

ISO 1100 Liquid Flow Measurement in Open Channels—Part I: Establishment and Operation of a Gauging Station

ISO 6416 Measurement of Discharge by Ultrasonic (Acoustic) Method

3. Terminology

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

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *control*—the physical properties of a channel, which determine the relationship between the stage and discharge of a location in the channel.

3.2.2 *datum*—a level plane that represents zero elevation.

3.2.3 *discharge*—the volume of water flowing through a cross-section in a unit of time, including sediment or other solids that may be dissolved in or mixed with the water; usually cubic feet per second (ft^3/s) or metres per second (m/s).

3.2.4 *elevation*—the vertical distance from a datum to a point; also termed stage or gage height.

3.2.5 *gage*—a generic term that includes water level measuring devices.

3.2.6 *gage datum*—a datum whose surface is at the zero elevation of all of the gages at a gaging station. This datum is

¹ This guide is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.07 on Sediments, Geomorphology, and Open-Channel Flow.

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² Annual Book of ASTM Standards, Vol. 11.01.

³ *Measurement of Liquid Flow in Open Channels*, ISO Standards Handbook 16, 1983. Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

