ANSI/AWWA **G560-22**

(First Edition)

AWWA Standard

Stormwater Management for Water Utilities

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American Water Works Association

AWWA Management Standard

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Contents

All AWWA standards follow the general format indicated subsequently. Some variations from this format may be found in a particular standard.

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Foreword

This foreword is for information only and is not a part of ANSI/AWWA G560.*

I. Introduction.

I.A. *Background.* The AWWA Utility Management G-Series Standards Program is designed to serve water, wastewater, reuse, and stormwater utilities—hereafter, the water sector; its customers; owners; service providers; and government regulators. The standards developed under the program are generally intended to improve a utility's overall operations and services. Among these standards is this effort to establish formal management and operations guidelines. These guidelines identify appropriate practices, procedures, and behaviors whose implementation will promote effective and efficient utility operations and contribute to the protection of public health, public safety, and the environment.

The Utility Management G-Series Standards were developed to assist utilities with identifying and implementing applicable best management practices. To further enhance the use of the Standards, the AWWA Utility Quality Management Committee developed both self-assessment and peer-review programs to assist utilities that choose to meet performance criteria contained within the Standards. The Committee developed a framework for the stringent expectations of all Utility Management Standards, as follows:

- Utility Management Standards are voluntary, and their intent is to provide guidance toward best management practices.
- The requirements set forth in the Standards describe best practices that are achievable but not necessarily the best of class.
- The language used in the Standards should avoid requirements related to numeric values and words such as "shall" or "must" in areas that describe or could be considered in exceedance of existing local and/or federal regulations.

AWWA's standards process has been used for more than 100 years to produce American National Standards Institute (ANSI)-approved standards for materials and processes that are used by the water sector. These standards are recognized worldwide and have been adopted by many utilities and organizations. Likewise, this management standard is developed using the same ANSI-recognized formal process. Volunteer standards committees establish standard practices in a uniform and appropriate format.

* American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036.

Formal AWWA standards committees have formed and continue to be formed to address the individual standards practices for the diverse areas of the water sector. A formal standards committee was formed in January 2015 to develop this standard for stormwater management.

AWWA has developed a series of utility management standards designed to cover the principal activities of water sector utilities. Some examples of the individual topics in this series include those for water treatment plant operation and management, distribution system operation and management, source water protection, emergency preparedness practices, security practices, communication and customer relations, business practices, water conservation program operation and management, reclaimed water operation and management, as well as wastewater collection system operation and management, and wastewater treatment plant operations and management.

Because drinking water utilities, wastewater utilities, stormwater utilities, and other management agencies often have different mandates, this first edition of ANSI/AWWA G560 is targeted specifically to drinking water utilities—that is, to provide guidance on those stormwater issues that these utilities need to address to protect their operations. Future editions of this standard, or possible future standalone AWWA standards, are planned to address stormwater issues beyond those for drinking water utilities to include stormwater management for wastewater and stormwater utilities.

The objective of this first edition of ANSI/AWWA G560 is to provide general and conceptual guidance to drinking water utilities regarding major aspects of stormwater quantity and quality management issues. Because of the complexity and variability associated with how stormwater is managed across various jurisdictions and organizations (e.g., municipal public work departments, state highway departments, and private landowners, to name a few) in North America, this standard focuses on the role of drinking water utilities to improve their operations to manage stormwater impacts on their source waters from both the quality and quantity points of view. For example, depending on the settings of a water utility, it may have to address: (1) management of stormwater generated on its properties, (2) source water protection strategies to ensure water entering the treatment facility is of appropriate quality (as outlined in ANSI/AWWA G300, Source Water Protection), (3) treatment of degraded water quality as impacted by stormwater, (4) management of stormwater quantity as a supply source (where relevant), and (5) stormflow and flooding associated with extreme events. A great deal of good technical and programmatic information is available from the American Society of Civil Engineers, Water Environment Federation, and US Environmental Protection Agency (USEPA), as well as many state and municipal

governmental entities, such as the Mile High Flood District in Denver, Colo. (see Section 2 and Appendix A for additional resources).

Because stormwater characteristics are dependent on local conditions, management practices must be matched with local factors such as hydrology, watershed characteristics, groundwater properties, land use, and development history, among others. Contaminants of concern in rural areas (e.g., pesticides and nutrients from agricultural lands) will differ from those contaminants of concern in urban areas (e.g., industrial chemicals and roadway pollutants such as deicing salts and motor vehicle fluids).

In addition, stormwater in urban areas can mix with sanitary wastewater (in combined sewers) or be conveyed in separate systems (municipal separate storm sewer systems, or MS4), which results in significant differences in water quality and microbial concerns. Therefore, different approaches and management practices should be evaluated and deployed to obtain the desirable outcome to protect source water quality. In other words, a central role in managing stormwater is coordination with programs outside of the drinking water utility to tackle local issues that would impact the operation of the drinking water utility.

Apart from the impacts on water quality, stormwater from urban areas is frequently associated with quantity issues (e.g., increased stormflow and modified baseflow) due to such factors as increased impervious surfaces (with particular concern for directly connected impervious areas), which affect water availability at the local level (e.g., difficulties to capture stormflow with shortened time of concentration and increased volume using limited storage facilities), soil compaction, speeding up flows in storm drains, channels, and gutters, and other factors. Furthermore, increased stormflow affects water quality through soil and streambank erosion, along with mobilization of contaminants in sediment and on land surfaces.

It should be stressed that interdisciplinary and cross-disciplinary approaches are essential to develop and deploy management practices on stormwater. Professionals with technical knowledge in hydrology, hydrogeology, fluvial geomorphology, hydrometeorology, hydraulics, water resources planning, landscape ecology, soil science, forestry, and land use planning, among other disciplines, are needed to manage stormwater on a local and regional level.

On the basis of the discussion above, a one-size-fits-all approach is neither effective nor efficient for managing stormwater. Therefore, the intent of this standard is to outline a framework for water utilities to formulate their strategies and programs to assess and mitigate the impacts of stormwater on their operations to protect public

health, safety, and welfare, and to address water availability (with stormwater viewed as a resource). "Ensuring long-term reliability and resiliency of water delivery, along with protecting public health from the source to the tap, are paramount for water utilities. … The management of water, wastewater, reuse, stormwater, and other lower-quality water is all closely inter-related, and each is a valuable resource. Total Water Solutions is an approach that values each of these components of the water cycle with the adage of 'one water, many solutions'" (Davis et al. 2016).[†]

I.B. *History*. This is the first edition of this standard. It was approved by the AWWA Board of Directors on Jan. 13, 2022.

I.C. *Acceptance*. There is no applicable information for this section.

II. Special Issues.

II.A. *Advisory Information on Application of Standards*. This standard includes only those requirements that are limited exclusively to stormwater management programs for water utilities. The standard does not specifically address stormwater management practices required of and implemented by entities outside of the jurisdiction of the water utilities. There are numerous references and toolkits developed by organizations that devote much of their efforts to stormwater management. In addition, the user of this standard may want to consult other AWWA management standards such as ANSI/AWWA G300, Source Water Protection; ANSI/AWWA G430, Security Practices for Operation and Management; ANSI/AWWA G440, Emergency Preparedness Practices; and ANSI/AWWA G420, Communications and Customer Relations, to name a few.

III. Use of This Standard. It is the responsibility of the user of an AWWA standard to determine that the approaches and methods described in that standard are suitable for use in the particular application being considered.

III.A. *Options and Alternatives*. The following information should be provided by the user:

1. Standard used—that is, ANSI/AWWA G560, Stormwater Management for Water Utilities, of latest revision.

2. Details of federal, state, provincial, territorial, and local requirements (Section 4).

III.B. *Modification to Standard*. There is no applicable information for this section.

[†] Davis, W.Y, C.H. Sham, T.E. Dumm, L.R. Kammereck. 2016. "Total Water Solutions: Integrated Water Resource Planning." *Journal AWWA,* 108:5:18–22.

IV. Major Revisions. This is the first edition of the standard.

V. Comments. If you have any comments or questions about this standard, please call AWWA Engineering and Technical Services at 303.794.7711, FAX at 303.795.7603, write to the department at 6666 West Quincy Avenue, Denver, CO 80235-3098, or email at standards@awwa.org.

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American Water Works Association

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AWWA Standard

Stormwater Management for Water Utilities

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes the critical requirements for the effective management of stormwater by a water utility.

Sec. 1.2 Purpose

The purpose of this standard is to define the minimum requirements for a water utility's stormwater management program, including management of stormwater on water utility sites, addressing water quality and water quantity issues, planning and design of stormwater programs, and incorporation of stormwater in integrated water resource planning and management. Stormwater management and flood control are typically the responsibility of local governments, regional flood districts, and sometimes federal agencies such as the US Army Corps of Engineers (USACE), to which the utility oftentimes provides water services. Consequently, the utility will often be working with the government's relevant programs and activities already. This standard outlines elements for water utilities to consider in managing their own stormwater and stormwater generated outside their jurisdiction.