

# Water Utility Management

Third Edition



American Water Works  
Association

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**American Water Works  
Association**

Manual of Water Supply Practices—M5

## Water Utility Management, 2nd edition

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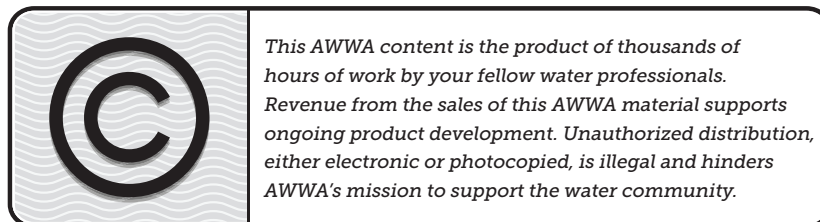
Project Manager: Melissa Valentine  
Cover Art: Melanie Yamamoto  
Production: PerfectType, Nashville, TN

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### Library of Congress Cataloging-in-Publication Data

Names: Ginley, James F., author. | Klein, Matthew (Water utility expert), author. | American Water Works Association, author.  
Title: Water utility management / by Jim Ginley and Matthew Klein.  
Other titles: M5, water utility management  
Description: Third edition. | Denver, CO : American Water Works Association, [2018] | Series: AWWA manual ; M5 | Previous editions by American Water Works Association. | Includes bibliographical references and index.  
Identifiers: LCCN 2017049003 | ISBN 9781625762474 (alk. paper)  
Subjects: LCSH: Water utilities--Management--Handbooks, manuals, etc. | Waterworks--Management--Handbooks, manuals, etc.  
Classification: LCC HD4456 .G56 2018 | DDC 363.6/1068--dc23  
LC record available at <https://lccn.loc.gov/2017049003>



ISBN: 978-1-62576-247-4  
eISBN: 978-1-61300-434-0

Printed in the United States of America  
American Water Works Association  
6666 West Quincy Avenue  
Denver, CO 80235-3098  
[awwa.org](http://awwa.org)



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## Acknowledgments



This edition of the M5 Manual, *Water Utility Management*, was developed by Jim Ginley, past chair of the Strategic Management Practices Committee. His career of nearly 30 years in the water sector as a not-for-profit association professional, utility management consultant, regulatory compliance specialist, and active volunteer contributed to the organization of many chapters. Matthew Klein, chair of Strategic Management Practices Committee and president of North Carolina and Tennessee Utilities Inc., provided new and creative solutions for the updating of M5.

The Strategic Management Practices Committee gives special thanks and recognition to the following individuals who contributed as primary authors and significant content contributors: Billie Blair, Seth Garrison, Jim Ginley, David Hanes, Stuart Karasik, Matthew Klein, Jay Madigan, David McGimpsey, Kevin Morley, Peter Nardi, Eric Rothstein, Karen Snyder, Patricia Tennyson, and Pieter Van Ry.

Additionally, the Strategic Management Practices Committee acknowledges with gratitude the peer review, suggestion of content, and editorial, administrative, and other contributions of the following volunteers: Lori Armstrong, Colleen Arnold, Alvin Bautista, Robert Boswell, Fred Bloetscher, Mike Caston, Julius Ciaccia, Catherine Curtis, Maria DeChellis, Tom DeLaura, Dale Jutila, Lee Anne Jones, Elizabeth Kelly, Prabha Kumar, Venus Larson, Manshi Low, Brian Mantz, Sharon Peters, Connie Schreppel, Doug Spiers, Mark Stanley, and Orville Watson. Finally, a special note of thanks to Marta Madigan for her graphic artistry.

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## Acronyms and Abbreviations

AMR/AMI	automated meter reading/advanced metering infrastructure
AMWA	Association of Metro Water Agencies
APD	alternative project delivery
APQC	American Productivity and Quality Center
ASP	Association for Strategic Planning
AWWA	American Water Works Association
BI	business intelligence
CAA	Clean Air Act
CCR	consumer confidence report (eCCR = electronic consumer confidence report)
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIP	capital improvement plan
CIS	customer information system
CMMS/EAM	computerized maintenance management system/enterprise asset management
CPM	capital program management
CSO	combined sewer overflow
CSR	customer service representative
CUPSS	Check Up Program for Small Systems
CWA	Clean Water Act
CWSRF	Clean Water State Revolving Fund
DCS	distributed control system
DHS	Department of Homeland Security
DWSRF	Drinking Water State Revolving Fund
EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	enterprise resource planning
ETA	Employment and Training Administration
EUM	effective utility management
FAQ	frequently asked question
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIS	financial information system
GIS	geographic information system
HMI	human-machine interface
HSE	health, safety, and environment
ICS	Incident Command System
ICS-CERT	Industrial Control Systems Cyber Emergency Response Team
I/I	infiltration and inflow
IoE	Internet of Everything
IoT	Internet of Things
IT	information technology
IWA	International Water Association
KM	knowledge management
LIMS	laboratory information management system
LIS	laboratory information system

LOS	levels of service
MCL	maximum contaminant level
NAAQS	National Ambient Air Quality Standards
NACWA	National Association of Clean Water Agencies
NCEES	National Council of Examiners for Engineering and Surveying
NIMS	National Incident Management System
NIST	National Institute of Standards and Technology
NPDES	National Pollutant Discharge Elimination System
ODMS	operations data management system
PC	personal computer
PLC	programmable logic controller
PM	preventive maintenance
POTW	publicly owned treatment works
RCM	reliability-centered maintenance
RCRA	Resources Conservation and Recovery Act
RFID	radio-frequency identification
ROI	return on investment
RTU	remote terminal unit
SaaS	software-as-a-service
SCADA	supervisory control and data acquisition
SDC	system development charge
SDWA	Safe Water Drinking Act
SIMPLE	Sustainable Infrastructure Management Program Learning Environment
SMART	specific measurable achievable relevant and time based
SSO	sanitary sewer overflow
TSCA	Toxic Substances Control Act
URI	Utility Resilience Index
US BLS	US Bureau of Labor Statistics
US DOL	US Department of Labor
USEPA	US Environment Protection Agency
UST	underground storage tank
VA	vulnerability assessment
WARN	Water and Wastewater Agency Response Network
WaterRF	Water Research Foundation
WEF	Water Environment Federation
WERF	Water Environmental Research Foundation
WIFA	Water Infrastructure Financing Authority

## Introduction

### THE NEW M5: FACILITATING SUCCESS FOR WATER AND WASTEWATER UTILITY MANAGERS

Can you imagine a city without water and wastewater utilities? Imagine whole towns drinking untreated water. Can you imagine US households without access to functioning sewer systems? The simple truth is that our modern lives are built on the premise that we will have clean water and the ability to dispose of water 24 hours a day, every day of the year. The provision of water services is fundamental to us—a matter of public health.

North American water and wastewater managers are public health providers with unparalleled track records of success. Another simple truth—in the twentieth century alone, the applications of our industry's science, tools, and trades saved more lives than any other single health development. The people who design and manage our water processes are nothing less than heroes and our target readers of the updated M5. The M5 update is here to help water and wastewater utility managers stay heroes in the twenty-first century.

Today, increasing demands, changing technologies, uncertain costs, and aging systems complicate every utility manager's role. Whether a utility is large or small, successful utility management requires more than single-subject expertise. High expectations are placed on established managers to improve their range of functionality. M5 will help experienced managers in North America and elsewhere broaden their perspectives. Newly minted utility managers will find here a means to untangling today's multiple water-wastewater utility issues and to continue taking steps toward a fulfilling career.

### A GO-TO REFERENCE FOR WHAT IS IMPORTANT TO YOU

Utility managers need a strategic process for establishing their vision, mission, and plan for achieving their most critical objectives. Chapter 3 is dedicated to utility strategy. Need a primer on performance measurement? See chapter 5. Where do you learn about establishing a cycle (a culture) of plan/do/check/act, and do that with an ethnically and educationally diverse workforce? Turn to chapter 4. Want to survey your employees in accord with the 10 attributes of the effective utility management (EUM) approach? Consider chapter 6. The updated M5 will help locate the best management resources.

This manual delivers approaches to the plans (and planning processes) that require more detail than overarching strategic planning. Managers also need to account for their specific responsibilities, which they may choose to do in a communication plan, a capital plan, a divisional business plan, and master planning of all varieties (see chapter 3). This update is designed as your road map to navigate the array of resources that are already available—in print, in electronic media, at conferences, and with peer utilities.