Standard Methods
For the Examination of Water and Wastewater

Standard Methods Part 9000 Update

Microbiological Analysis of Water and Wastewater

Elizabeth Turner – Part 9000 Coordinator

Standard Methods Organization Today

- Sponsored by APHA, AWWA, and WEF
- Voluntary Consensus Standards Body

> "*Organizations which plan, develop, establish, or coordinate voluntary consensus standards using agreed-upon procedures.*"
> OMB Circular A -119-Revised (1998)

- Plan, Develop, Establish and Coordinate standards & test methods
  - Aquatic Biology Identification
  - Aquatic Toxicity Methods
  - Microbiological Methods
  - Radiological Methods
  - Water and wastewater analysis (physical, chemical, organic, and inorganic)
- Two "Employees" + a bunch of Volunteers

APHA
AWWA WEF

Standard Methods Organization Today

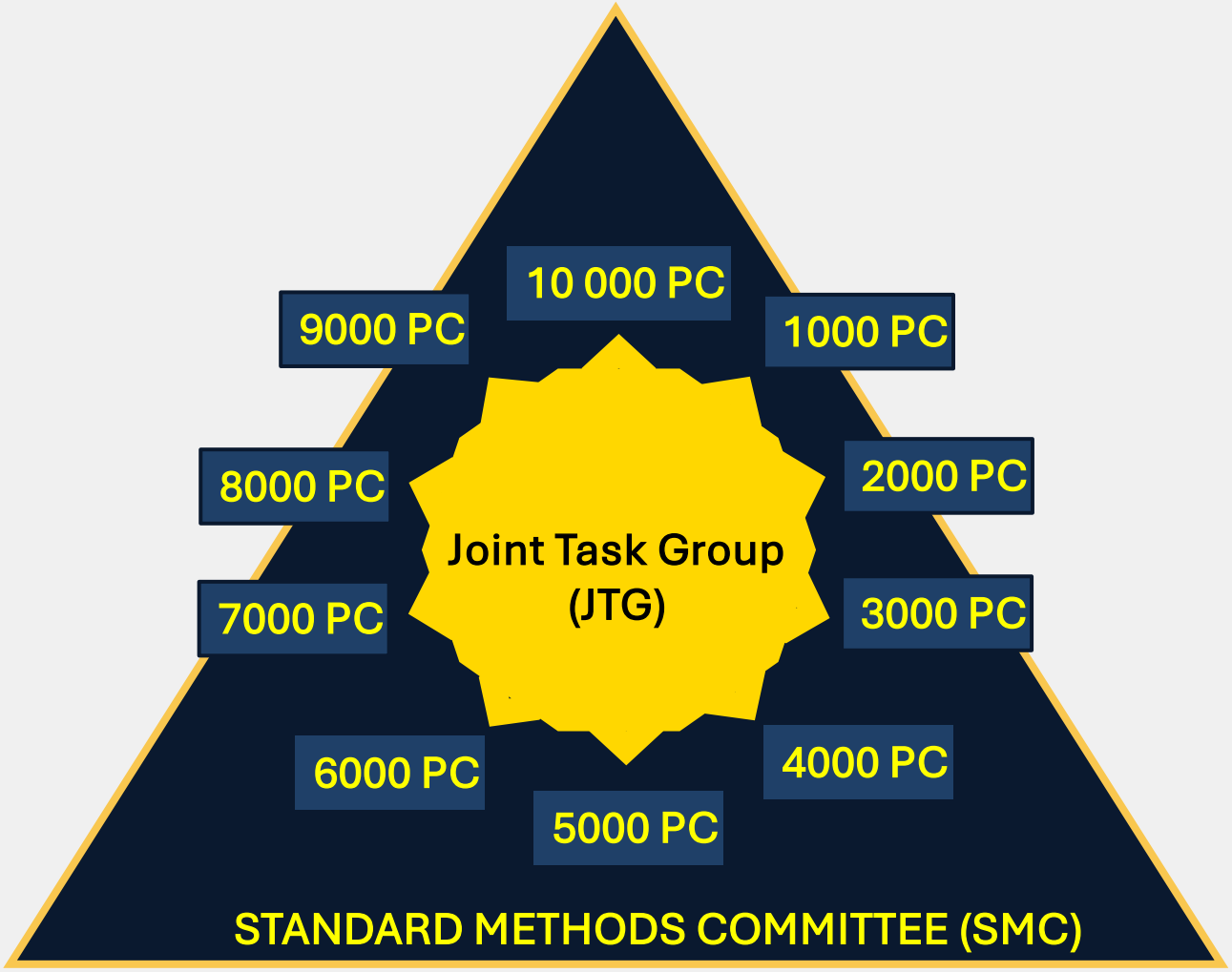
Joint Editorial Board
AWWA – William Lipps
WEF – Terry Baxter
APHA - Vacant

Standard Methods Manager

Nathan Edman

Managing Editor & Web Site

Sophia Cook

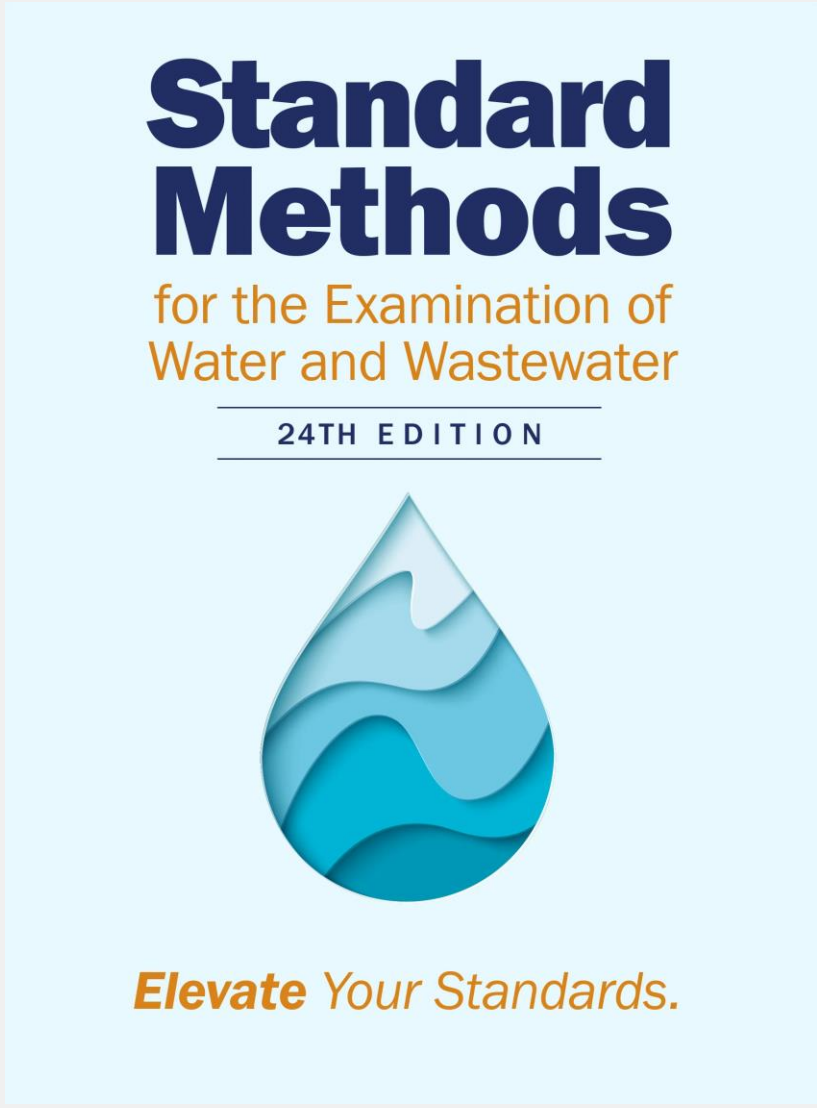


Standard Methods

APHA AWWA WEF

Brief History – A Journey of 131 years

- 1894 - APHA Montreal Meeting
  - Dr. Wyatt Johnson expresses need for “more uniform and efficient” methods
- 1895 - APHA New York Meeting
  - Subcommittee formed
  - “Draw up procedures” on bacteriological methods
- 1897 - APHA Philadelphia Meeting
  - Report of the Bacteriological Committee
  - Work published in 1898
- 1989 - APHA Minneapolis Meeting
  - Subcommittee tasked to extend work to include “all other” water analyses
- 1905 - Standard Methods of Water Analysis



APHA AWWA WEF

Brief History – A Journey of 131 years

Results from work initiated in 1894

The

Journal of Infectious Diseases

FOUNDED BY THE MEMORIAL INSTITUTE FOR INFECTIOUS DISEASES

Supplement No. 1, May, 1905

REPORT OF COMMITTEE ON STANDARD METHODS OF WATER ANALYSIS TO THE LABORATORY SECTION OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

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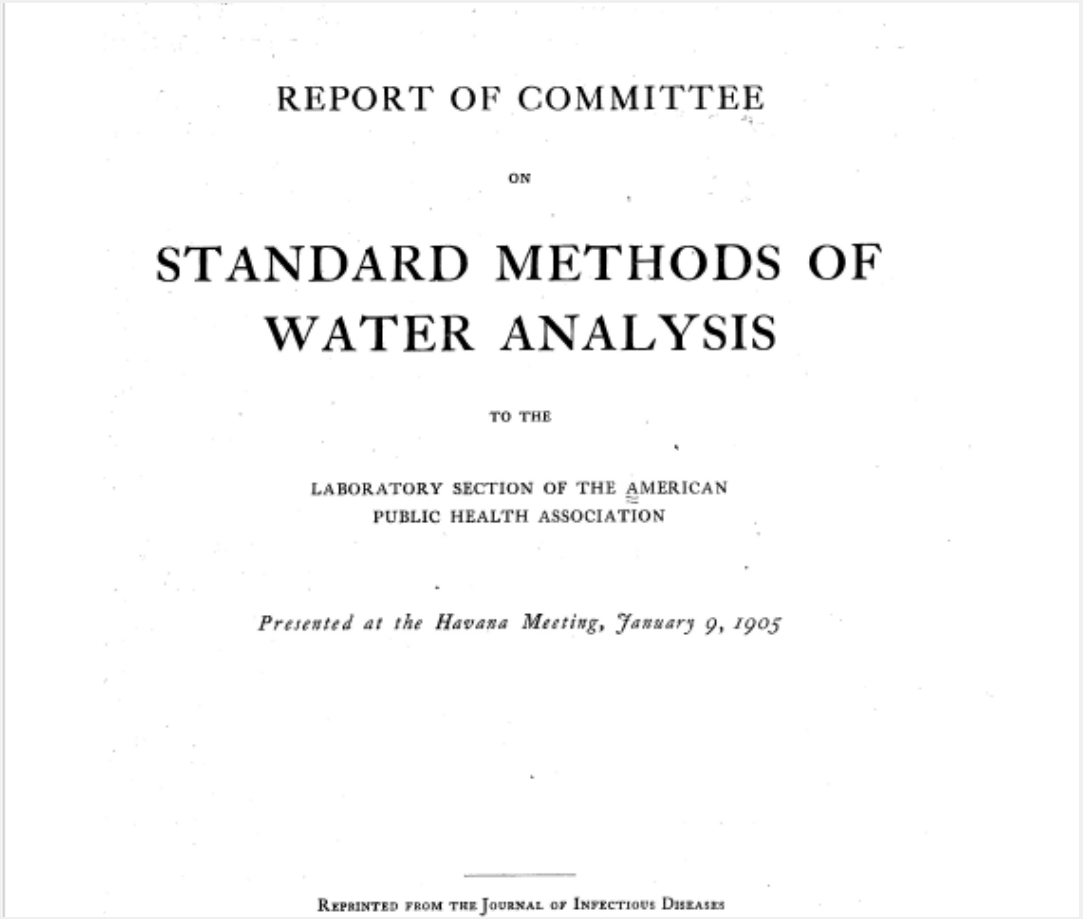


REPORT OF COMMITTEE

ON

STANDARD METHODS OF WATER ANALYSIS

TO THE

LABORATORY SECTION OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

Presented at the Havana Meeting, January 9, 1905

REPRINTED FROM THE JOURNAL OF INFECTIOUS DISEASES

Standard Methods

APHA AWWA WEF

Part 9000 Organization

Category	Method
Quality Control	9020 Quality Assurance / Quality Control 9030 Laboratory Apparatus 9040 Washing Labware 9050 Culture Media and Buffered Dilution Water 9060 Samples
Techniques associated with multiple organisms	9211 Rapid Detection Methods 9212 Stressed, Injured, or Viable But Not Culturable Bacteria
General Bacteria Detection	9215 Heterotrophic Plate Count 9216 Direct Total Microbial Count 9217 Biodegradable Organic Matter 9218 Aerobic Endospores
Techniques associated with Coliforms	9221 Multiple-Tube Fermentation Technique for Members of the coliform Group 9222 Membrane Filter Technique for Members of the Coliform Group 9223 Enzyme Substrate Coliform Test 9225 Differentiation of Coliform Bacteria

Standard Methods

Part 9000 Organization

Category	Method
Organism Specific with Multiple Techniques	9224 Detection of Coliphages 9230 *Fecal Enterococci* 9240 Iron and Sulfur Bacteria 9245 Nitrifying Bacteria 9250 Detection of *Actinomycetes* 9262 *Aeromonas* 9264 *Campylobacter* 9266 Diarrheagenic *Escherichia Coli* 9268 *Legionella* 9270 *Leptospira* 9272 *Mycobacterium* 9274 *Salmonella* 9276 *Shigella* 9278 *Vibrio* 9280 *Yersinia Enterocolitica*

Part 9000 Organization

Category	Method
Viruses	9510 Detection of Enteric Viruses
Fungi	9610 Detection of Fungi
Protozoans	9711 Pathogenic Protozoa 9750 Detection of *Naegleria fowleri* in Water
Matrix with multiple organisms and techniques	9213 Recreational Waters

Part 9000 – Microbiological Analysis, 24th Edition Updates

New Methods

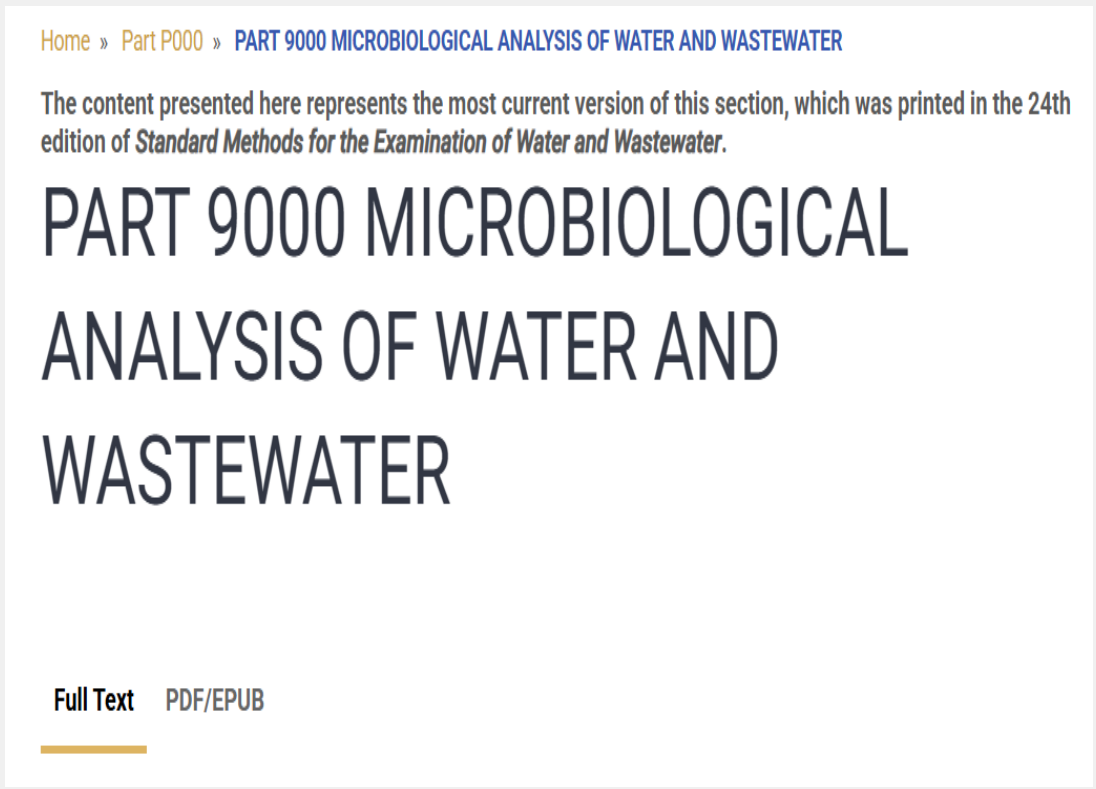
- 9224 Detection of Coliphages G. Commercial Methods - Fast Phage Procedure
- 9224 Detection of Coliphages H. Membrane Filter Procedure
- 9230 Fecal Enterococci E. Quantitative PCR for Enterococci
- 9750 *Naegleria fowleri* (NEW)

Part 9000 – Microbiological Analysis, 24th Edition Updates

Technically Updated Methods

- 9030 Laboratory apparatus
- 9040 Washing Labware
- 9050 Culture Media and Buffered Dilution Water
- 9212 Stressed, Injured or Viable but not Culturable Bacteria
- 9215 Heterotrophic Plate Count
- 9217 Biodegradable Organic Matter
- 9218 Aerobic Endospores
- 9222 Membrane Filter Technique for Members of the Coliform Group
- 9224 Detection of Coliphages
- 9230 Fecal Enterococci
- 9268 Legionella
- 9270 Leptospira
- 9711 Pathogenic Protozoa

Part 9000 – Microbiological Analysis, 24th Edition Updates



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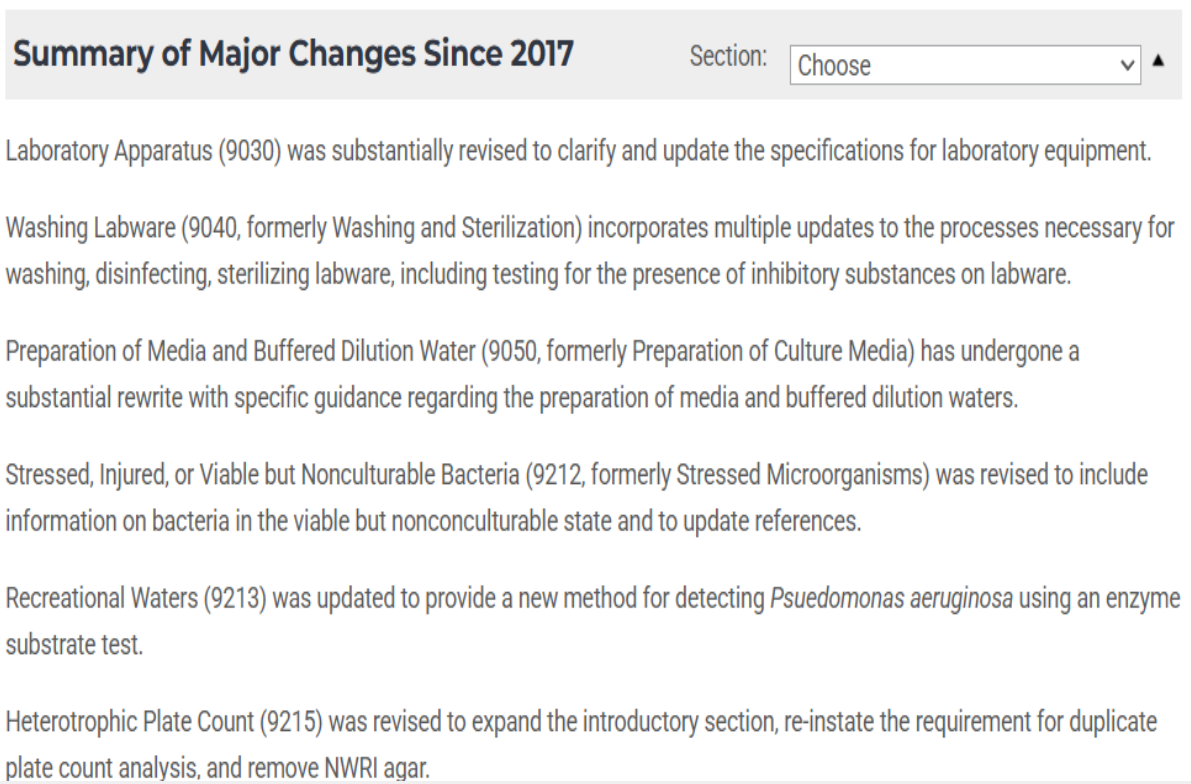
The content presented here represents the most current version of this section, which was printed in the 24th edition of *Standard Methods for the Examination of Water and Wastewater*.

PART 9000 MICROBIOLOGICAL ANALYSIS OF WATER AND WASTEWATER

Full Text PDF/EPUB



Summary of Major Changes Since 2017 Section: Choose

Laboratory Apparatus (9030) was substantially revised to clarify and update the specifications for laboratory equipment.

Washing Labware (9040, formerly Washing and Sterilization) incorporates multiple updates to the processes necessary for washing, disinfecting, sterilizing labware, including testing for the presence of inhibitory substances on labware.

Preparation of Media and Buffered Dilution Water (9050, formerly Preparation of Culture Media) has undergone a substantial rewrite with specific guidance regarding the preparation of media and buffered dilution waters.

Stressed, Injured, or Viable but Nonculturable Bacteria (9212, formerly Stressed Microorganisms) was revised to include information on bacteria in the viable but nonconculturable state and to update references.

Recreational Waters (9213) was updated to provide a new method for detecting *Psuedomonas aeruginosa* using an enzyme substrate test.

Heterotrophic Plate Count (9215) was revised to expand the introductory section, re-instate the requirement for duplicate plate count analysis, and remove NWRI agar.

Standard Methods

Part 9000 – Current Activities

SM 9020 Quality Assurance / Quality Control

JTG Chair: Cody Danielson

Member Name	Member Name
Patsy Root	William Northeimer
Maria Friedman	Kailash Srivastava
Robin Cook	Kareem Farouk
Elizabeth Turner	Mike Gao
Yildez Chambers-Velarde	Leka Papazisi
Carlos Henrique Menezes	

Comment Ballot October 2024 used to develop JTG Charge

Part 9000 – Current Activities

SM 9213 F, G *Pseudomonas aeruginosa*

JTG Chair: Yildiz Chambers-Velarde

Member Name	Member Name
Laura Boczek	Patsy Root
Joe Guzman	Eric Thompson

Part 9000 – Current Activities

SM 9215 Heterotrophic Plate Count

JTG Chair: Mark W. LeChevallier

Member Name	Member Name
Crystal Ybanez	Eric Duderstadt
Laura Boczek	William Northeimer
Robin Cook	Sharon Sweeny
Shawn Debois	Crystal Ybanez

Part 9000 – Current Activities

SM 9223 Enzyme Substrate Coliform Test

JTG Chair: Robin Cook

Member Name	Member Name
Carlos Henrique	Eric C. Thompson
April Schumacher	Christabel Monteiro
Shawn E. Dubois	Helena Solo-Gabriele
Alma McCammond	Gil Dichter
Michael Michaud	Tracy Bone
Elisa Snyder	

Part 9000 – Current Activities

SM 9230 D Fecal Enterococci

JTG Chair: Susan Mizoguchi

Member Name	Member Name
Robert Dean	Laura Boczek
Shawn Dubois	Gil Dichter
Eric Thompson	Josephine Longoria

Part 9000 – Current Activities

SM 9810 Guidance for Concentration of Microbial Targets Within Wastewater and Wastewater-Impacted Samples

JTG Chairs: Nancy Lin and Alshae Logan

Member Name	Member Name	Member Name
Akin Babatola	Robbie Barbero	Samendra Sherchan
Sarah Philo	Alex Chik	Alexandria Boehm
Mary Vail	Stephen Brown	Joshuas Steele
Devrim Kaya	Samual Forry	Andrew Rainey
Leka Papazisi	Scott Keely	Denise O'Sullivan
Brenna McGruder-Rawson	Nichole Brinkman	
Ishi Keenum	Camila Silva	

Began as a project under NIST.

Part 9000 – Future Activities

Method	Last Technical Revision
SM 9221 Multiple Tube Fermentation Technique for Members of the Coliform Group	2014
9216 Direct Microbial Count	2014
9610 Fungi	2014

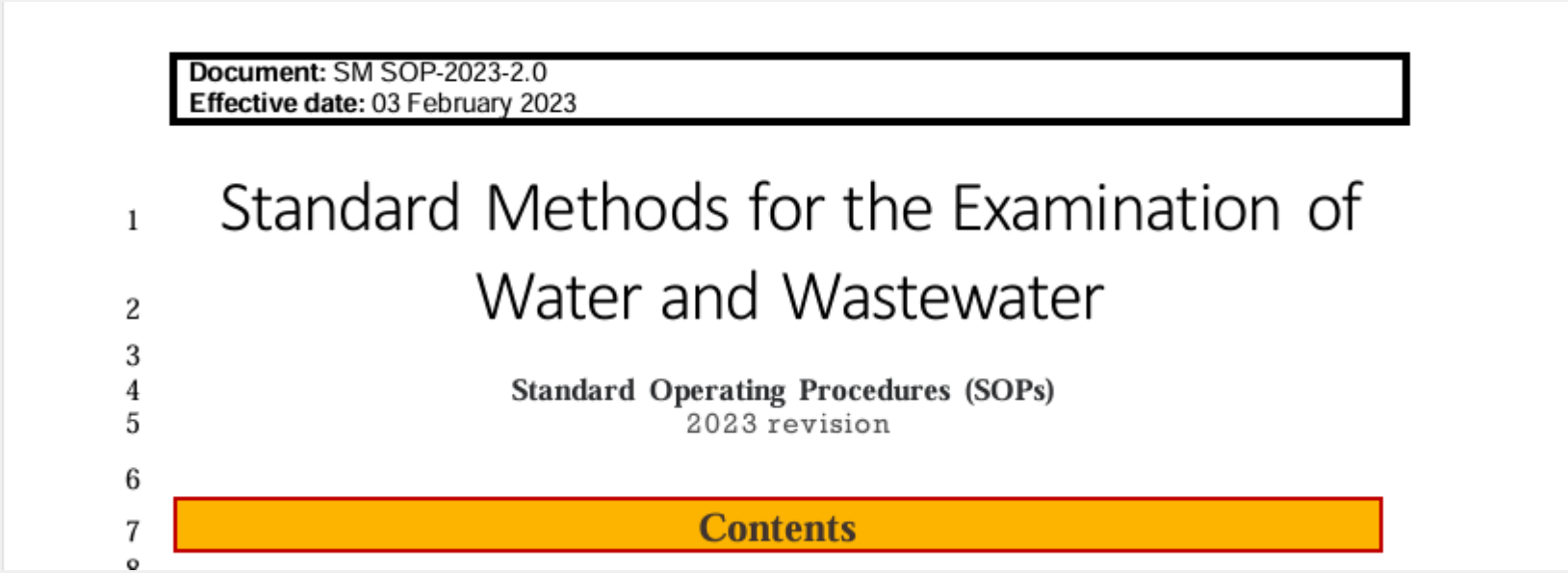
Next Steps:

1. Comment Ballot
2. Development of a JTG, as needed
3. Method Revision

APHA AWWA WEF

Standard Methods Operations

- Standard Methods SOP (February 3, 2023)
  - Culmination of effort that documents
    - “What we do” and “How we do it
  - Opportunity to clarify and provide guidance
    - “Process” “Roles & Responsibilities” “Participation”
  - Ensure alignment with OMB Circular A-119 and ANSI



Document: SM SOP-2023-2.0
Effective date: 03 February 2023

Standard Methods for the Examination of Water and Wastewater

Standard Operating Procedures (SOPs)
2023 revision

Contents

Standard Methods

Getting Involved with Standard Methods

How to Get Involved

Contact:

Nathan Edman, Standard Methods Manager
NEdman@awwa.org

Request Materials to Join SMC
Complete Information Form & Return to Nathan

Or

https://www.standardmethods.org/methodactivitynotification
Download Materials & Complete Information Form
Send Information Form to Nathan Edman

Value of Being Involved

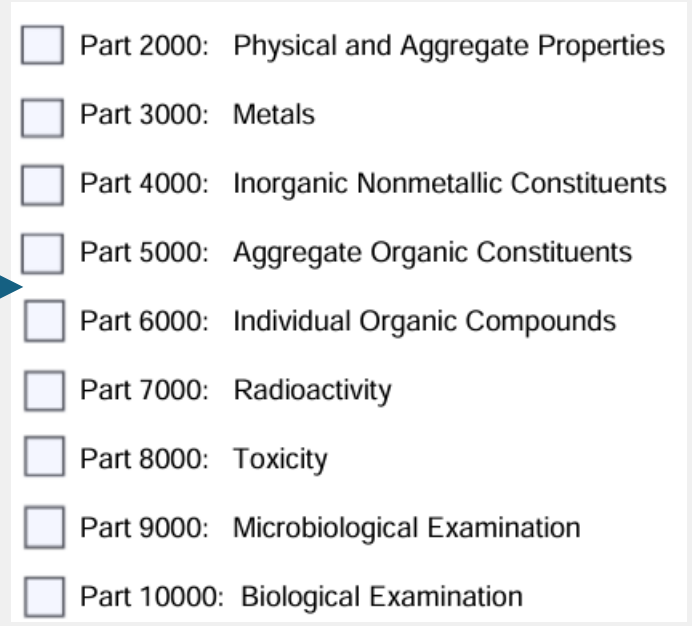
- SMC members contribute to ensuring methods are of benefit to laboratory community
- All SMC members are listed in published book
- JTG members become published authors of new and updated methods + complimentary online subscription (if access not already through employer)
- JTG Chairs receive complimentary book edition where their work appears in
- Service as PC or JEB makes your life more complex – who doesn't want that! Oh, and a complimentary book.

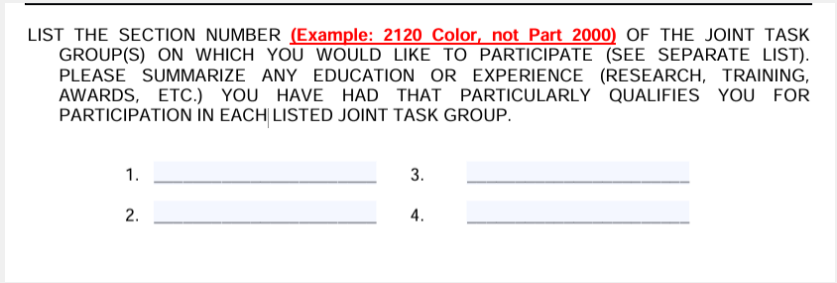
Standard Methods

Involvement with Standard Methods

Standard Methods Committee

- Members = *Breadth & Depth of Expertise*
  - Application step
  - Relevant expertise
  - Cost = $0 + time volunteering
- Review & Ballot Methods (Approve)
  - Full SMC
  - Focused SMC (Part 8000)
- Remain Active, 50% in 5-yrs
- May participate on JTGs
- Questions & Concerns





Joint Task Group

- SMC members
  - High Interest/expertise in Method Being Updated or Developed
- Volunteering Time Commitment
  - Duration of activity
  - Employer ‘s blessing
- Participation of Laboratory?
  - Employer’s blessing
- Authors of the Method
- Review & Ballot JTG Method
- Upon SMC Approval
  - JTG work is done, deactivated
  - JTG Chair remains active

Thanks for Listening

Got Questions?

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Acknowledgements: Thanks to Terry Baxter for slides from his 2025 CA ELAP presentation