ONTARIO'S QUALITY MANAGEMENT SYSTEM EXPERIENCE

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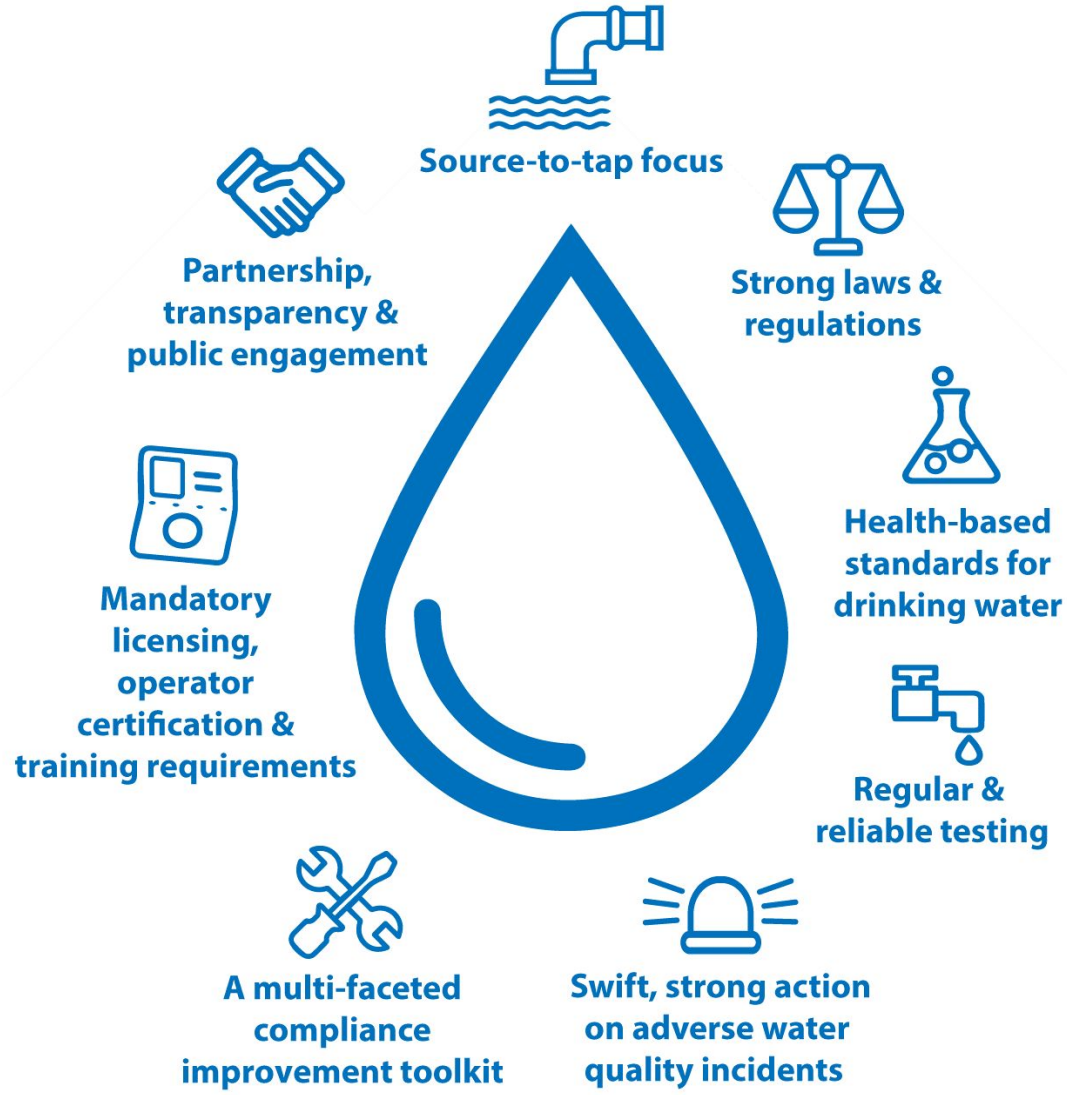
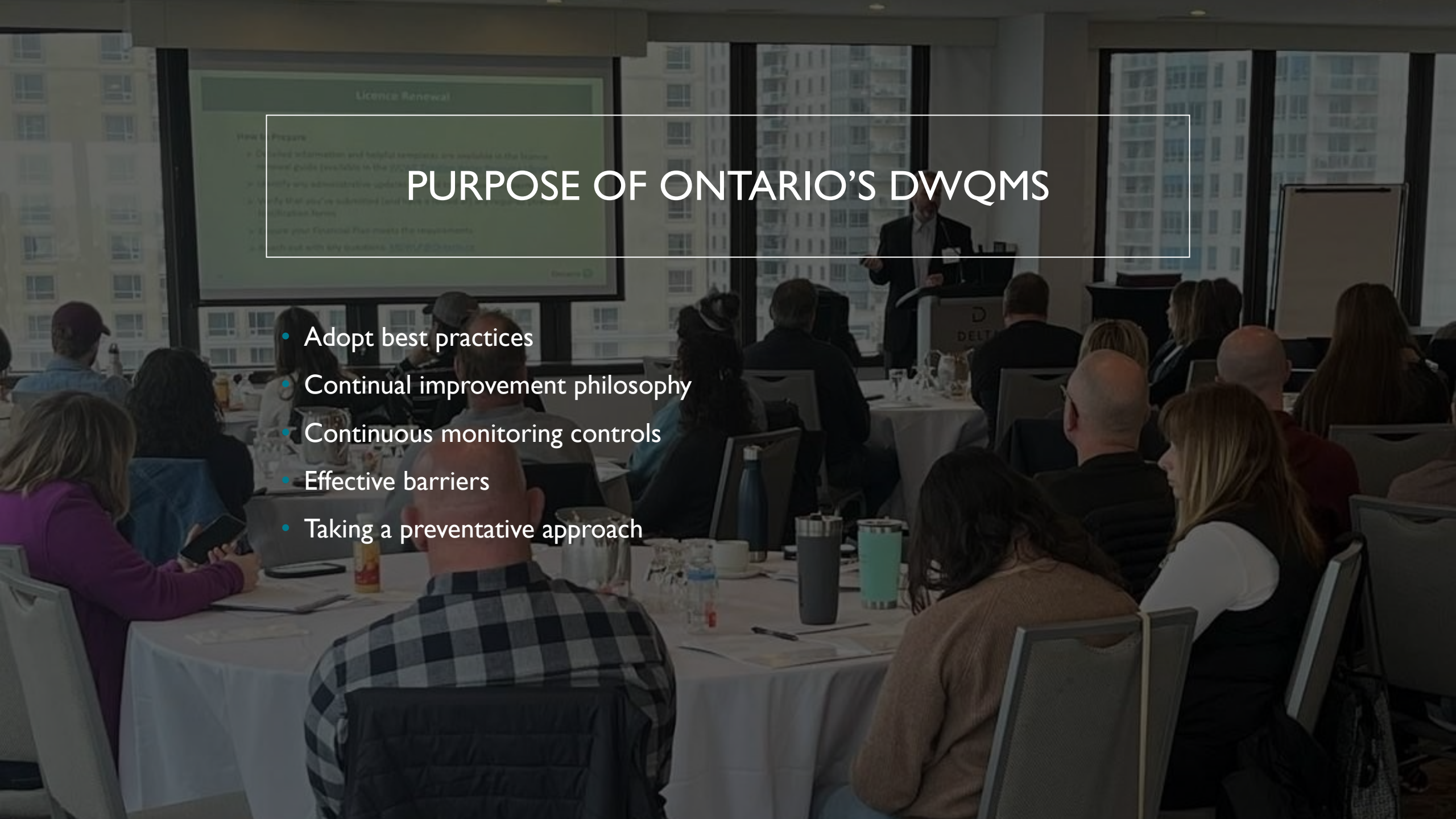
ONTARIO'S FRAMEWORK

- Ontario's drinking water protection framework is a multi-barrier approach to that uses multiple layers of protection from source-to-tap to ensure clean drinking water.
- Strong focus on system operations through strict licensing of systems and operators, mandatory training and continuing education, and frequent operational checks and water monitoring.
- Requires implementation of a quality management system, consideration of best practices and ongoing continual improvement of system operations.





PURPOSE OF ONTARIO'S DWQMS

- Adopt best practices
- Continual improvement philosophy
- Continuous monitoring controls
- Effective barriers
- Taking a preventative approach

THE STANDARD

A component of **mandatory licensing** of municipal drinking water systems in Ontario, the DWQMS expands the focus and reliance on technical solutions to include the people responsible for managing and operating the system and the strategies they adopt to ensure safe drinking water

Key requirements:

- Operational plans
- Risk Assessment
- Management Review
- Internal and Third-Party Audits
- Continual Improvement
- Document and Records Control

DEVELOPMENT OF THE FRAMEWORK

- Developed in partnership between Ontario's Ministry of the Environment, Conservation and Parks (MECP) and Ontario's water sector.
- Considers principles of Quality Management (e.g., ISO 9001), Environmental Management (e.g., ISO 14001) and Hazard Analysis and Critical Control Points (HACCP) used in the food industry.
- Supported by ongoing outreach, education and guidance by the province.
- Initial pilots and roll-out carefully staged, with a strong emphasis on collaboration, testing, gradual implementation and peer support.

PILOT SYSTEMS

- Initially piloted with a select group of municipalities across Ontario to test the feasibility of implementing a quality management system tailored to drinking water operations.
- Pilot municipalities included a mix of large and small systems to ensure the framework could be scaled and adapted.
- Key objectives were to test the 21 Elements of the DWQMS, develop and refine operational plans, assess the practicality of third-party audits and accreditation protocols and gather feedback to improve the standard

IMPLEMENTATION

Municipalities required to:

- Develop and maintain an operational plan conforming to the DWQMS
- Demonstrate conformance to the DWQMS by obtaining accreditation from a third-party provider ("accreditation body")

Gradual Transition

- Requirements linked to mandatory licensing of municipal drinking water systems phased in over a 1.5-year period
- Limited scope "transitional" accreditation available for system that documented their quality management system but were still in the process of implementing it.

DWQMS 2.0 (2017)

- Clarified expectations regarding timeframes (e.g., "once every calendar year")
- Enhanced risk assessment requirements, establishing a list of hazards and hazardous events that must be considered by all systems
- Improved linkage between elements related to risk assessment and infrastructure planning
- Upgraded requirements for continual improvement, placing greater emphasis on the use of best management practices to enhance system performance

DWQMS 3.0 (Proposed 2025)

- Expected to provide clarification, reflect current practice in municipal residential drinking water systems, and enable auditing of practices used to summarize monitoring data

LESSONS LEARNED FROM IMPLEMENTATION

RISK IDENTIFICATION & MANAGEMENT

Element 7: Risk Assessment

Element 8: Risk Assessment Outcomes

Element 13: Essential Supplies and Services

Element 14: Review and Provision of Infrastructure

Element 18: Emergency Management

WHY/HOW DO THE RISK ASSESSMENT

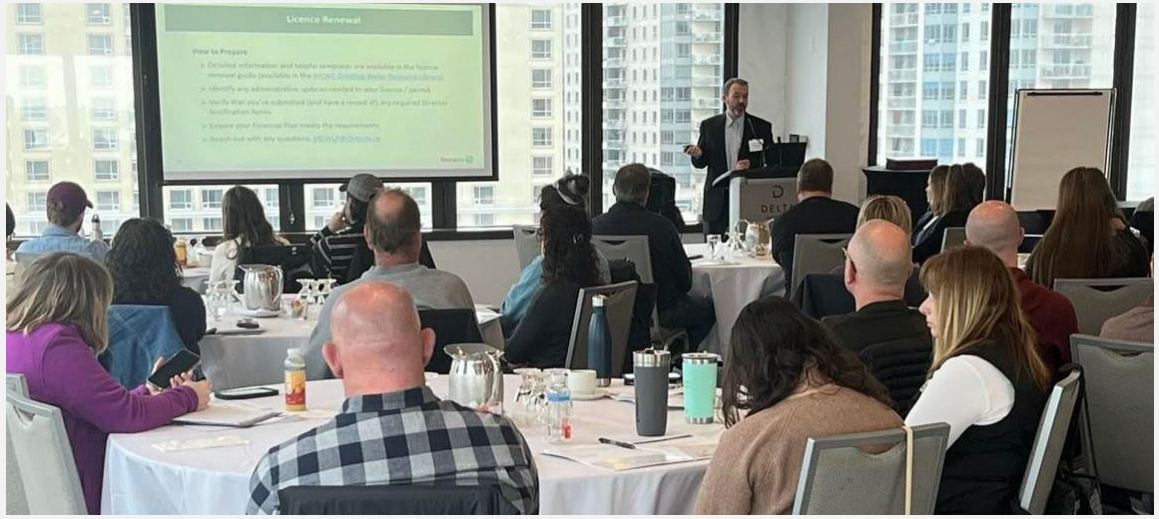
- Not designed to be one-size-fits-all
- Part of wholistic and effective management of the DWS
- Involvement and buy-in from all disciplines is critical (engineering, operations, management, procurement, I&C/SCADA, H&S, etc.)
- Prioritize identified risks
  - Take action for occurrences that have higher risks or impacts
- Driver for improvements that help achieve compliance

LESSONS LEARNED

- Can be a valuable tool for identifying critical assets
- Supplier and/or supply chain vulnerability
- Pandemic and emergency preparedness and response
- Identify regulatory/policy gaps (e.g. backflow and cross connection prevention)
- Can be a driver for broader initiatives, including Master Plans, Asset Management Planning, etc.

BENEFITS OF DWQMS

PRACTICAL BENEFITS

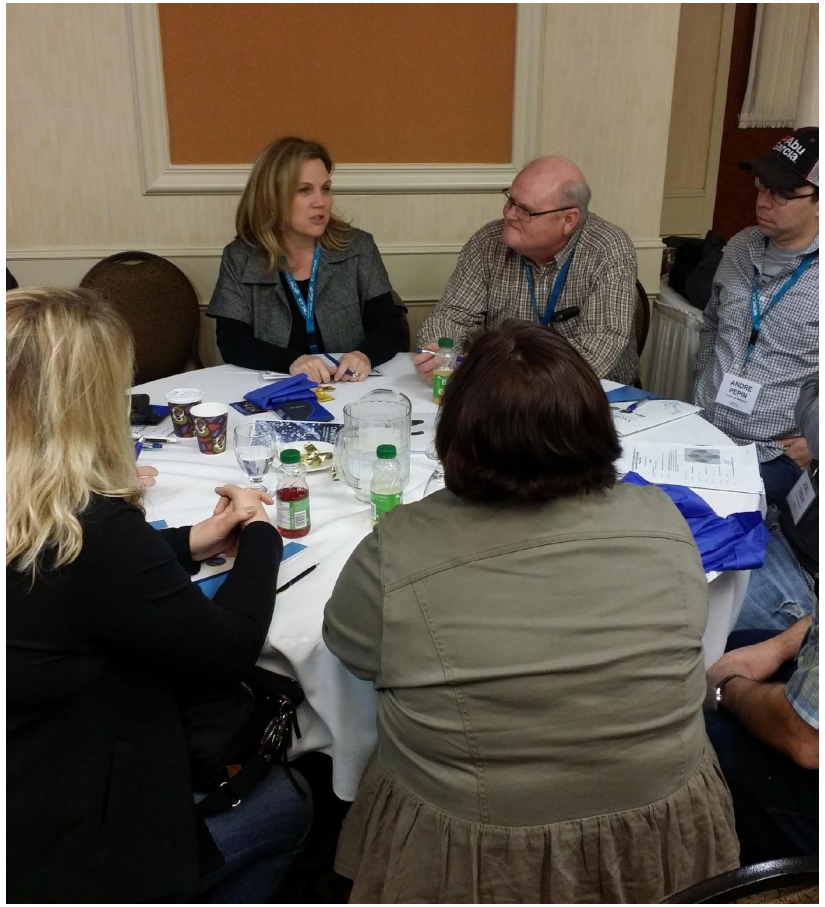


- Access to historical trends and knowledge base of drinking water system
- Improved organization of information and document control
- Prepared and resilient to threats/changes to the system
  - New programs
  - Change in resources
  - Updated maintenance procedures
  - Emergency preparedness

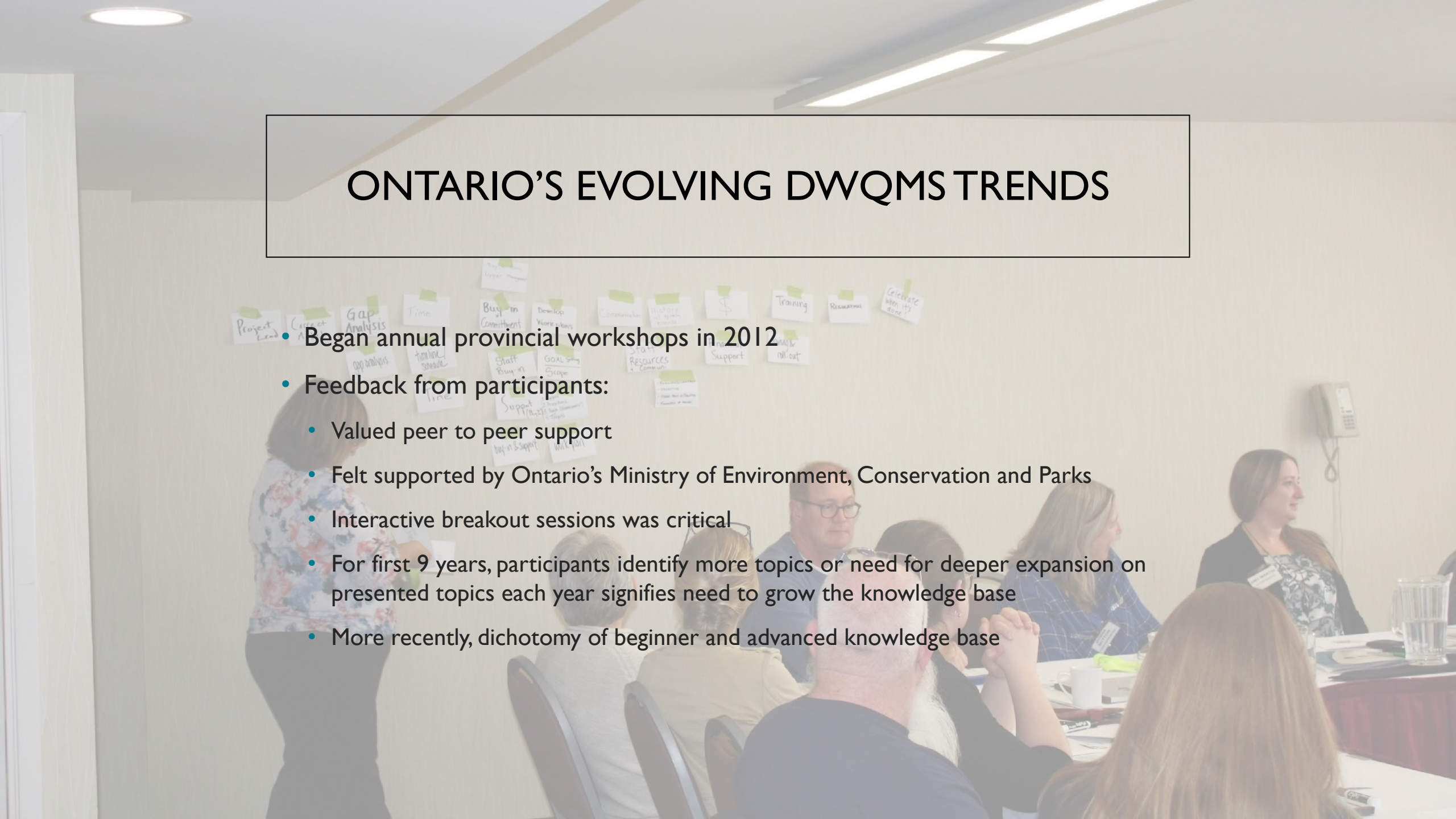
BENEFITS

Community:

- DWQMS introduced standardized language that is transferrable despite size and scale of water systems
  - e.g. how to conduct internal audits for small and large municipal systems
- Strong peer to peer support to share ideas



ONTARIO'S EVOLVING DWQMS TRENDS



- Began annual provincial workshops in 2012
- Feedback from participants:
  - Valued peer to peer support
  - Felt supported by Ontario's Ministry of Environment, Conservation and Parks
  - Interactive breakout sessions was critical
  - For first 9 years, participants identify more topics or need for deeper expansion on presented topics each year signifies need to grow the knowledge base
  - More recently, dichotomy of beginner and advanced knowledge base

- Examples of peer-to-peer idea sharing:
  - Share different approaches to staffing challenges
  - Strategize when supplier/service provider cannot meet their obligations
  - Share best management practices in all facets of drinking water system
  - Perform root cause analysis when facing a non-compliance
  - Brainstorm ways to protect drinking water systems from cyber security attacks

PROVINCIAL WORKSHOPS TO STRENGTHEN COMMUNITY

HOW TO GET CONNECTED?

- Municipal Water/Wastewater Regulatory Committee – a free forum for employees of system owners and operating authorities to discuss compliance with respect to water and wastewater systems.