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LOCAL FOCUS.

Drinking Water Safety Plans and Regulation of Drinking Water for Alberta: Proposed Changes

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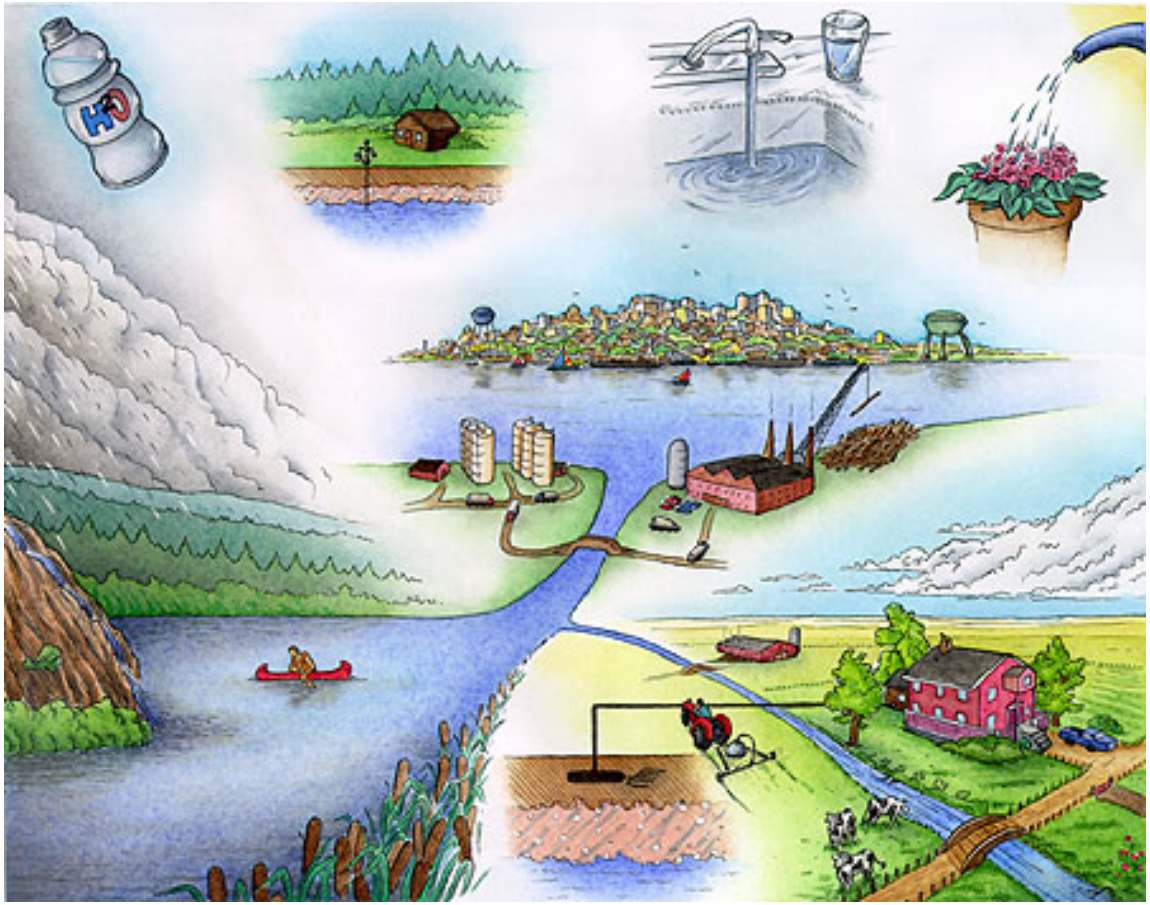
Introduction



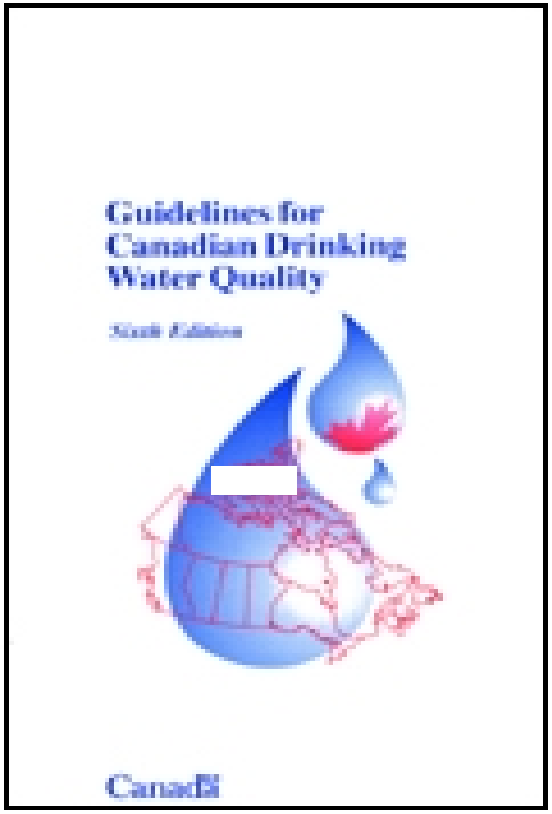
Source-to-Tap

- legislation
- protection
- drinking water systems
- performance assurance
- knowledge

•Health Canada

• Federal/Provincial/Territorial Committee on Drinking Water.

• Guidelines for Canadian Drinking Water Quality (GCDWQ)



What is a Drinking Water Safety Plan?

"The most effective means of securing the safety of a drinking water supply is through the use of a **comprehensive risk assessment** and **risk management approach** that encompasses all steps in the water supply from catchment to consumer"

WHO 2011

Alberta Version of DWSP

- Represents a **system-wide approach** to ensuring that the quality of water delivered to consumers is of good and consistent quality
- Based on a **comprehensive assessment of risk factors** that could adversely affect the quality of water delivered to consumers, and sets out how these risk factors are to be monitored and managed.

Why do we need a DWSP?

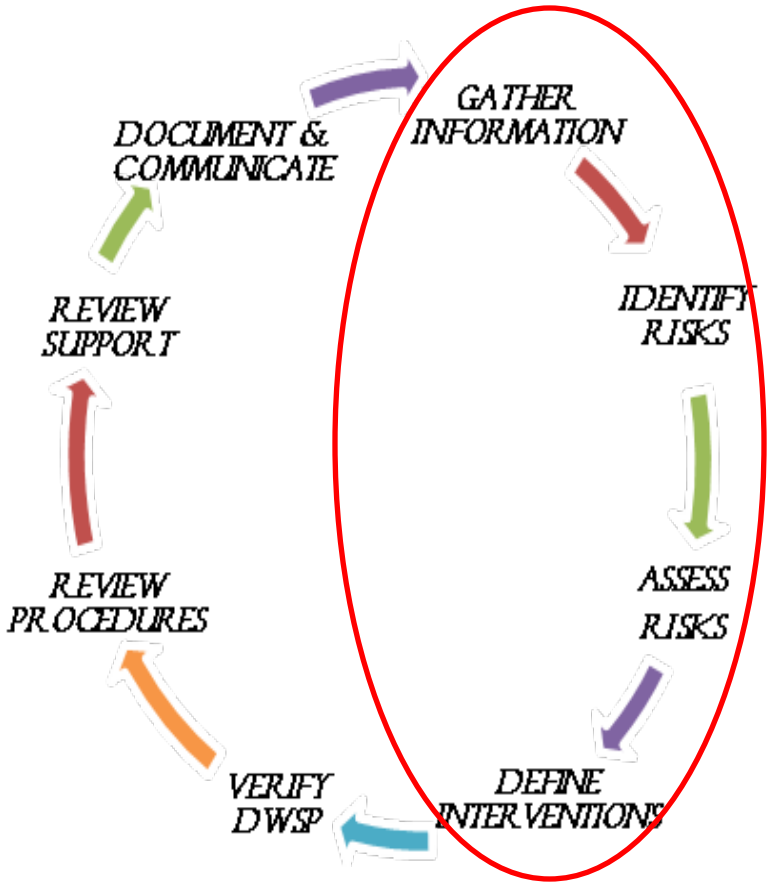
- Regulatory approach is a prescriptive one based on ability to meet certain standards
- DWSP's are a regulated requirement for most Municipal Water Systems in Alberta.
- The regulations may prescribe a robust system, but if a compromise is detected, issue has already occurred – reactive approach
- DWSP provide a proactive approach of dealing with risks (real or potential) which enhances the assurance to provide the best quality water and to better protect the public

Benefits

- Develop a better understanding of risk, how this is controlled & identify potential weak points in current processes
- Take a step back and look at things from a different perspective
- Help identify critical maintenance and investment requirements
- Make your asset more robust, make water quality safer, make operators lives easier

DRINKING WATER SAFETY PLAN – Principal Processes

- Collecting and collating the best information
- Analysing and understanding the risks
- Assessing correctly what is required to be done in order to reduce risks to an acceptable level.
- Determining how to obtain the necessary resources to achieve this



DWSP – Development and Implementation

- Developed an MS-Excel template for completing DWSP
  - Jump-start process with 190 typical risks identified
- Hired consultant to prepare and deliver 15 workshops (free) across the province in late 2011 and early 2012.
  - 251 municipalities attended
- Another ½ day workshop at Banff Seminar on March 12 am
  - 33 municipalities attended

Drinking water systems regulated by AESRD by population (2012)

Population	Number of waterworks systems
<500	434
>500 - < 1500	94
>1500 – 10,000	82
> 10, 000	30

DWSP Replaces Risk Assessment

- All regulated waterworks systems will be required to conduct a DWSP
- DWSP replaces the Risk Assessment
  - 2006 Municipal Standards and Guidelines, section 1.13 required a risk assessment from source to tap be conducted every 5 years
  - Approvals and HQGW required to conduct a Risk Assessment every 5 years effective April 1, 2009
  - Distribution only systems were not required to do Risk Assessment but will be required to do a DWSP

What is a Risk?

- “The Probability of something happening that will impact on water safety – It is measured in terms of Likelihood and Consequence”

Risk Scoring

Likelihood - Probability that the event will happen

Consequence – The assessed outcome of any hazardous event

Obvious Risks

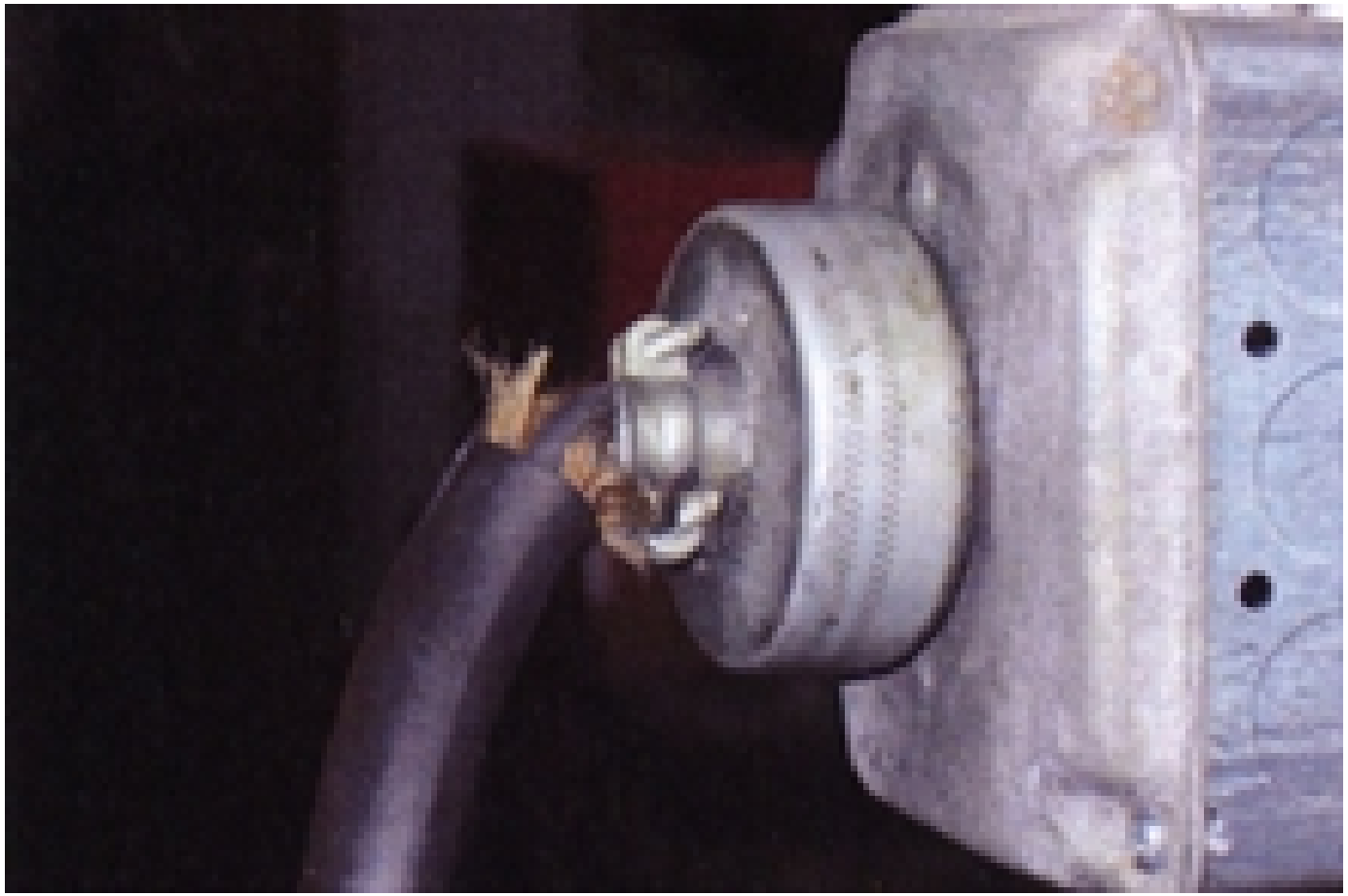
Not so obvious Risk

Not so obvious Risk

Sooner or Later!!!!

Chemical delivery points

Workplace Safety Mentality



Control Measure

Any action or activity that is **currently used** to prevent or eliminate a hazard or reduce the risk of it occurring to an acceptable level

Risk

For the Drinking Water Safety Plan risk is defined as the product of likelihood times consequence:

Risk = Likelihood x Consequence

Likelihood

Likelihood Table

Likelihood	Definition	Value
Not applicable	Does not apply in this water supply system	0
Most Unlikely	Conceivable but extremely small chance of happening in next 4-5 years	1
Unlikely	Is possible and cannot be ruled out in next 4-5 years.	2
Medium	As likely as not to happen in next 4-5 years.	4
Probable	Would be expected to happen in next 4-5 years but there is a small chance it may not.	8
Almost Certain	Would be confident this will happen at least once in next 4-5 years	16

Consequence

Consequence Table

Consequence	Definition	Value
Not applicable	Does not apply in this water supply system	0
Insignificant	Wholesome water or interruption < 8 hrs	1
Minor	Short term or localised non-compliance, non health related e.g. aesthetic or interruption 8-12 hrs	2
Moderate	Widespread aesthetic issues or long term non compliance, not health related or interruption 12-24 hrs	4
Severe	Potential Illness or interruption >24 - 48 hrs	8
Catastrophic	Actual illness or potential long term health effects or interruption >48 hrs	16

Risk Matrix

			Consequence Descriptor				
	Score	Not Applicable	Insignificant	Minor	Moderate	Severe	Catastrophic
	Not Applicable	0	**1**	**2**	**4**	**8**	**16**
Likelihood Descriptor	Most Unlikely	**1**	1	2	4	8	16
	Unlikely	**2**	2	4	8	16	32
	Medium	**4**	4	8	16	32	64
	Probable	**8**	8	16	32	64	128
	Almost Certain	**16**	16	32	64	128	256

"High Risk"

Note: The score of "0" should only be applied if the risk is not applicable in this water supply system.

Source Risks – Catchment

Example risks:

Contamination by animals

Agriculture

Forestry

Sewerage

Lake turnover

Turbidity following heavy rain

Not enough water

Source Risks – Wells

Example risks:

Contaminated water entering well from surface

Iron / Manganese issues

Contamination of aquifer

Contamination of spring collection chamber

Source Risks – Assets

Example risks

Mechanical failure of pumps

Loss of power

Main break

Sediment issues

Contamination of water in storage

Treatment Risks - General

General:

- Dosing
- Meeting water demand
- Vandalism
- Breaks/Leaks
- Loss of power
- Operational practices
- Contamination of chemicals

Treatment Risks - Process

Process:

- Filtration failure
- Mechanical failure of pumps
- Lack of disinfection
- Sludge breakthrough
- Telemetry
- Inadequate treatment
- Media loss
- Incorrect media

Treatment Risks – Treated Storage

Treated storage:

- Vandalism
- Rainwater ingress
- Disturbance of sediment in reservoir
- Inadequate storage

NETWORK NODE

Network Risks

BREAKS

Mechanical Failure

Incorrect materials

Sedimentation

Incorrect Operation

Third party contamination – cross connections

Infiltration

Corrosion

Water age

+ more

Mechanical failure of pumps

Loss of power

Contamination – lubricants

Incorrect sizing

Infiltration

Water age

Absence of residual protection

Inappropriate cleaning

Vandalism

Customer Node

Customer Risks

At Risk Customers

Water outage

Water quality & contamination

Commercial & Industrial

Water outage

Cross-connection

Water quality

Residential Risks

Contamination of water

Use of incorrect materials

Poor plumbing practice

Failure to follow codes of practice

Outage & quality

Environment DWSP

- **Targeted consultation process**

Drinking-water Regulation – the 3 P's

- **Protective**
  - More protective of public health
- **Proportionate**
  - How regs affect different type of systems – not one size fits all
- **Practical**
  - More practical in their application

*New systems approach to provide oversight of 2600 systems

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New Drinking-water Regulation

- Rescind
  - Potable Water Regulation
  - Part 2 of Nuisance and General Sanitation Reg
- Jointly with ESRD and AHS
- Outcome-focus regulatory approach to manage risk using a DWSP approach

Drinking-water Regulation

- Shared responsibility with ESRD and AHS
- Allows a one-window approach
- Avoids confusion over who is responsible
- Will eliminate approvals/registrations

Drinking-water Regulation

- All **outcome-based** requirements for drinking-water systems will be housed in one regulation.
  - Shift from regulatory approach (input driven methodology)
  - Approach based around risk assessment and risk management
  - Allows for practical steps to minimize risk

Drinking-water Regulation

Category 1

- Systems incorporated under *Municipal Government Act* serving >300 people
- Any private utility serving >300 people
- Regional Service Commissions (all)

Category 2

- Systems incorporated under *Municipal Government Act* serving ≤300 people
- Public systems (no cap)
- Private systems serving > 50 people
- 'Release' arrangements to move eligible systems to Category 3

Category 3

- Groups of properties serving ≤ 50 people on a common distribution system
- Private access/private ownership properties
- No commercial or public activity

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Drinking-water Regulation

- A Category 1 or Category 2 drinking-water system may apply for an '**undertaking' (a legal 'promise')** to allow time to comply with new Drinking-water Quality Standards or operational standards, subject to approval from ESRD and AHS.
  - *"Contravention is deemed negligible impact to public health"*
  - 5 year cycle

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Drinking-water Regulation

- All Category 1 and Category 2 drinking-water systems will require a '**Letter of Authority**' to allow them to operate.
- A 'Letter of Authority' will be issued by the lead regulatory authority.
  - Replaces approvals & registrations
  - Simplifies application process to be completed

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Drinking-water Regulation

- Every drinking-water system shall have a **Drinking Water Safety Plan** appropriate to the size and complexity of the system and shall act on the results of the Drinking-water Safety Plan to ensure that the water is safe for human consumption.
  - Revised and simplified form for AHS systems

Drinking-water Regulation

- A **third-party compliance audit** of the Drinking-water Safety Plan will be developed and adopted **within 3 years** of the coming into force date of the Regulation.
  - ESRD to provide oversight – audit criteria
  - Accredited training program for 3rd party auditors
  - Becomes the compliance check – potentially shifts liability to auditors!

Drinking-water Regulation

- Category 1 and Category 2 drinking-water systems shall implement the Water Treatment **Security Standard.**
  - Developed and ready as part of Stds & Guide
  - Self-assessment form available and required
  - Specific advice for the protection of electronic devices (cyber security)
  -

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Drinking-water Regulation

- Drinking-water system operators will develop and maintain a **distribution operation and maintenance strategy** (DOMS).
  - Guidance and templates to be developed

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Drinking-water Regulation

- If a water order (such as a boil water order) is in place for more than 72 hours, an **alternative source of drinking-water** must be provided by the owner.
  - eg. bottled water

Drinking-water Regulation

- The **supply** (not carriage) of bulk water will be regulated under the Drinking-water Regulation.

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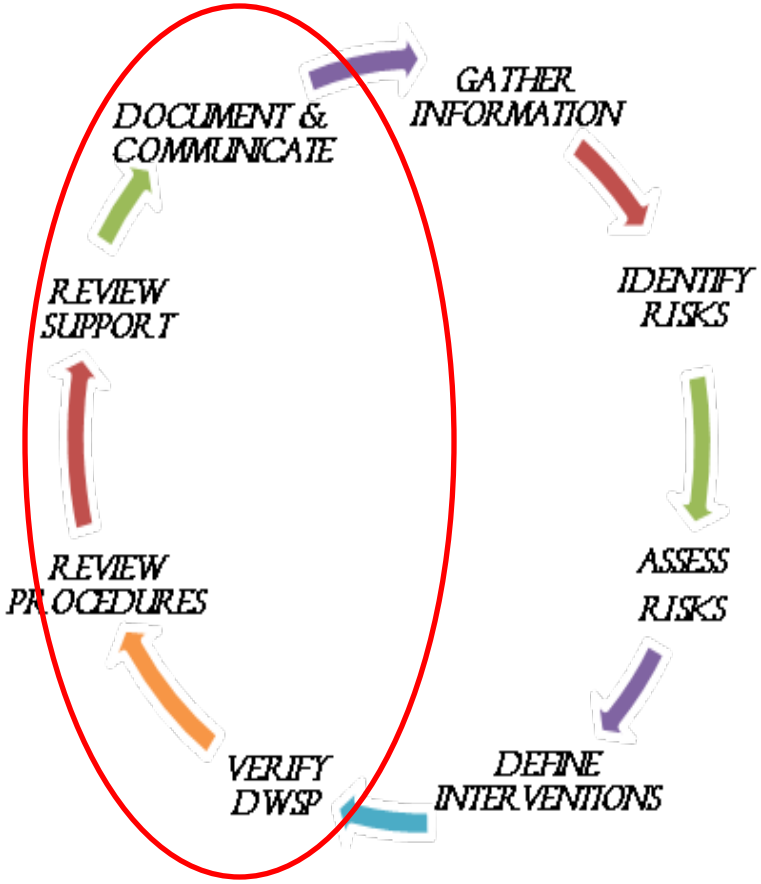

Drinking-water Standard

Based on a review by DW Expert Panel and Canadian Water Network - 2013

Expert Panel

- Dr. Steve Hrudey, U of A
- Dr. Nicholas Ashbolt, U of A
- Dr. Monica Emelko, U of Waterloo
- Dr. Graham Gagnon, U of Dalhousie
- Dr. Mark LeChevallier, American Water
- Dr. Eva Nieminski, Utah Dept of Env.
- Chair/Author Jim Merritt, Merritt & Associates
  (previously with Ontario Ministry of Environment)

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Drinking-water Standard

- **Replace** the Existing Standards and Guidelines for Municipal Waterworks with a single Drinking-water System Standard.
  - Based on DWSP and Know Your System
  - Risk Assessment – Risk Management concept
  - Eliminate the Guidelines section
  - Allows consultants to design, implement DW treatment and new technology “fit-for-purpose”

Drinking-water Standard

- Performance-based regulatory approach
  - Streamlined to emphasize expectations of performance
  - Required outcome or level of performance is written into regulation
  - Must include mechanisms to track and evaluate performance
  - Professional responsibility in achieving performance

Drinking-water Standard

- Enhanced source water protection requirements
- Mandatory membership – WPAC's

Drinking-water Standard

- Prescribed monitoring requirements
- Increased emphasis on operational manual requirements
- Prudent fiscal planning (full-cost accounting)
- Enforcement – internal and external audits

Drinking-water Standard

- The **use of temporary water supply services** will be controlled to ensure adequate drinking-water quality is maintained when such supplies are being operated.

Drinking-water Standard

- A provincial **Water Hygiene Card** to be introduced within 5 years of the coming into force of the Standard.
  - Any person working on waterworks system
  - Employees and contractors
  - Health screening element
  - 3-yr expiry
  - Based on UK model

Summary

If proposed changes are enacted:

- DWSP's will become increasingly important.
- Risk Management Expertise will be required as part of your utility operations team.
- Source Water Protection will become more prevalent at the local level.
- Opens the door for creative and innovative solutions rather than prescriptive standards.

Questions