

ANNUAL REPORT 2006-2007



ODWAC

Ontario Drinking Water Advisory Council

*The Ontario Drinking Water Advisory Council,
known formally as the
Advisory Council on Drinking Water Quality
and Testing Standards,
is an Agency of the Government of Ontario*



www.odwac.gov.on.ca

“Advising Ontario on Drinking Water Quality”

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1.0 Message from the Chair

On behalf of the Advisory Council on Drinking Water Quality and Testing Standards, I am pleased to present this third annual report outlining our activities and achievements from May, 2006 to May, 2007.

The Council's overall mandate is to provide the Minister of the Environment with advice on all matters related to safe drinking water in Ontario. The Council members, who form a group of drinking water professionals with the sincerest desire to protect and improve the safety and quality of this province's drinking water, bring their collective knowledge and experience together to reach conclusions, and formulate concrete recommendations, through monthly meetings and working group activities.

This year, the Minister of the Environment requested the Council to provide advice on two matters: corrosion control measures with regard to reducing lead in Ontario's drinking water, and the current Ontario Drinking Water Quality Standard for Tritium. The Council undertook an intensive review of the corrosion control issue, and responded to the Minister within 6 weeks. With respect to the Tritium Standard, the Council has been meeting with stakeholders and experts and is anticipating the completion of its work by the end of 2007.

The Council also addressed a number of drinking water issues and standards as summarized in several advice letters to the Minister of the Environment. Consideration was given to 10 Canadian Drinking Water Quality Guidelines for inclusion or update as standards in Ontario. The Council also initiated consideration of other matters related to drinking water such as The *Clean Water Act, 2006*, and the Drinking Water Quality Management Standard.

The Council monitored the continuous improvement of Ontario's overall drinking water framework, and is pleased with the constant vigilance that the Minister and the Ministry of the Environment has demonstrated in continuing to implement all of the *Part Two Report of the Walkerton Inquiry* Recommendations. As well, the Council kept abreast of new developments in other jurisdictions, in order to provide the Minister of the Environment with the most current advice.

I would like to once again thank the members who have taken time from their busy schedules to selflessly contribute to and support the work of the Council. I would also like to recognize and thank the staff of the Ministry of the Environment and the Ministry of Health and Long-Term Care for their continued hard work in supporting the Council's activities.

Jim Merritt

2.0 Council Background and Mandate

On May 23, 2002, Justice O'Connor, in the *Part Two Report of the Walkerton Inquiry*, made six recommendations regarding an "Advisory Council on Standards". Specifically, Recommendation 25 states that "*In setting drinking water standards for Ontario, the Minister of the Environment should be advised by an Advisory Council on Standards*".

In recommending an Advisory Council on Standards, Justice O'Connor also noted that:

- It is reasonable to seek expertise from the Advisory Council on Standards from the broader public; as such expertise may not reside in the Ministry of the Environment.
- The benefits of an Advisory Council on Standards include transparency in process and increased public participation.
- The Advisory Council on Standards should establish its own process.
- Recommendations made to the Minister of the Environment should be made public and should be supported by the Advisory Council on Standards' rationale.
- The Advisory Council on Standards should also advise the Minister of the Environment with respect to management, treatment, testing, materials, and reporting standards.

On May 12, 2004, The Minister of the Environment announced the establishment of the Ontario Drinking Water Advisory Council (Council), known formally as the "Advisory Council on Drinking-Water Quality and Testing Standards" in the *Safe Drinking Water Act, 2002*.

Enabled under Section 4 of the *Safe Drinking Water Act, 2002*, the Council is "*to consider issues relating to standards for drinking-water quality and testing and to make recommendations to the Minister*" of the Environment, which are to be "*taken into consideration in establishing and revising standards under this Act for drinking-water quality and testing.*" (See Appendix B for *Relevant Legislation and Regulations*)

The Minister of the Environment appointed members from key professional fields representing a cross-section of academia, industry and municipalities, with expertise in the areas of microbiology, toxicology, risk assessment, engineering, utility operations, public health, and others with a record of interest and accomplishment related to drinking water. They are all active in their areas of knowledge and bring their current and direct experience to the Council's deliberations. (See Appendix F for the Council Members' Biographies)

On June 10, 2004, the Council held its inaugural meeting. The Minister of the Environment was in attendance and asked the Council to focus on four of the *Part Two Report of the Walkerton Inquiry* Recommendations that were directed to the Council:

- Recommendation #27 (Replacing Total Coliform test with *E. coli* test)
- Recommendation #28 (Protozoa Treatment Standard)
- Recommendation #29 (Desirability of a lower Turbidity limit)
- Recommendation #31 (Disinfection By-Products Review)

(See Section 5.0 for more information on Walkerton Recommendations Directed to the Council)

Also at that time, the Minister of the Environment asked the Council to provide advice on:

- Ontario Regulation 170/03 (Drinking-Water Systems), with respect to appropriate requirements for small water systems, and particularly private ones; and on the
- Ontario Regulation 903 (Wells), with respect to disinfection requirements.

Since then, the Minister of the Environment also requested that the Council review and provide advice on:

- The current Ontario Drinking Water Quality Standard (ODWQS) for Tritium, in consideration of the 1994 recommendations made by the former Ontario Advisory Committee on Environmental Standards (ACES); and
- Health Canada's "*Corrosion Control in Drinking Water Distribution Systems*" Document for Public Comment, in relation to:
 - Early implementation of corrosion control in Ontario to reduce lead at consumers' taps, and;
 - Feedback Ontario should provide to the Federal Government on the "*Corrosion Control in Drinking Water Distribution Systems*" Document.

(See Section 4.0 for more information on Requests from the Minister of the Environment)

The broad mandate of the Council is to provide advice and make recommendations to the Minister of the Environment on drinking water quality and testing standards, as well as other drinking water matters. The role of the Council includes, but is not necessarily limited to, the following core activities:

- **Requests from the Minister of the Environment:**
Providing advice on drinking water policies, practices, procedures, standards, testing methods, and related research, as requested by the Minister of the Environment. (See Section 4.0)
- **Standards Review:**
Reviewing research, scientific, and technical documentation related to drinking water quality and testing standards, including Federal-Provincial-Territorial priorities, in order to provide advice to the Minister of the Environment on standards and their applicability in Ontario.

In addition, the *Part Two Report of the Walkerton Inquiry* noted in Recommendation 26, that “*The Advisory Council on Standards should have the authority to recommend that the provincial government adopt standards for contaminants that are not on the current federal-provincial agenda.*” (See Section 6.0)
- **Council Initiatives:**
Providing recommendations on drinking water matters that the Council has become aware of and has identified as being of interest, and which may merit the attention of the Minister of the Environment. (See Section 7.0)
- **Stakeholder / General Public Consultations:**
Publishing information on the Environmental Registry and undertaking additional consultations on standards, regulations, or other drinking water matters, to solicit views from stakeholders or the general public in order to provide advice and recommendations to the Minister of the Environment.

3.0 Summary of Activities and Accomplishments

Following is a summary of activities and accomplishments for the Council's third fiscal year (May, 2006 to May, 2007):

Requests from the Minister of the Environment: *(See Section 4.0)*

- Ontario Regulation 170/03 (Drinking-Water Systems) Requirements for Smaller, Private Systems
 - Small Drinking Water Systems Program
- Ontario Regulation 903 (Wells) Disinfection Requirement
- Tritium Standard
- Corrosion Control / Lead Reduction

Walkerton Recommendations Directed to the Council: *(See Section 5.0)*

- Recommendation 27: replacing the total coliform test with an E. coli test
- Recommendation 28: protozoa treatment standard
- Recommendation 29: turbidity limit
- Recommendation 31: disinfection by-products
 - *Procedure for Disinfection of Drinking Water in Ontario*

Standards Review: *(See Section 6.0)*

Standards Reviews Completed:

- Microbial Indicators of Adverse Water Quality
- Trichloroethylene (TCE)
- Total Trihalomethanes (THMs) and Bromodichloromethane
- Methyl tertiary-butyl ether (MTBE)
- Total Coliform Standard and Corrective Actions

Standards Currently under Review:

- 2-Methyl-chlorophenoxyacetic Acid (MCPA)
- Benzene
- Chloral Hydrate
- Chlorine
- Chlorite / Chlorate
- Corrosion Control / Lead Reduction (*Also see Section 4.4 and Appendix A11*)
- Haloacetic Acids (HAAs)
- Potassium
- Radiological Characteristics
- Tritium (*Also see Section 4.3*)

Council Initiatives: (*See Section 7.0*)

Advice Transmitted to the Minister of the Environment:

- Clean Water Act (Bill 43) / Drinking Water Source Protection
- Regulation 248
- Drinking Water Quality Management Standard
- Treatment of Surface Water Used for Private Drinking Water Supplies
- Definitions and Uses of Chlorine-Related Terminologies
- Total Coliform Standard and Corrective Actions
- Federally De-Listed Pesticides in Ontario Regulation 169/03

Initiatives Under Review:

- Pharmaceuticals and Personal Care Products
- Promoting Municipal Drinking Water
- Infrastructure Protection for Municipal Drinking Water
- Small Systems Treatment Equipment
- Use of Surrogates as Indicators
- Alternative Disinfection Approaches
- Use of Trends
- Dual / Reclaimed Water Systems
- Ontario First Nations Drinking Water Quality

Areas of Ongoing Interest:

- Part Two Report of the Walkerton Inquiry Recommendations
- Ontario's Overall Drinking Water Framework

4.0 Requests from the Minister of the Environment

The Minister of the Environment can formally request the Council to provide direct advice and make recommendations on drinking water policies, practices, procedures, standards, testing methods, and related research. The following items were formally referred to the Council by the Minister:

4.1 Regulation 170 Requirements for Smaller, Private Systems

The 2005-2006 Annual Report summarized the Council's review of Ontario Regulation 170/03 (Drinking-Water Systems) with respect to the appropriateness of requirements for small water systems, and particularly private ones, and the Ministry of the Environment continues to implement the Council's recommendations.

As reported in the Council's 2005-2006 Annual Report, the Ministry of the Environment promulgated Ontario Regulation 252/05 (Non-Residential and Seasonal Residential Systems that Do Not Serve Designated Facilities) to ensure public health protection as the Ministry of the Environment continues to work with the Ministry of Health and Long-Term Care to develop a new legislative and regulatory framework, as proposed by the Council.

On June 7, 2006, the Ministry of the Environment proceeded with amendments to Ontario Regulation 170/03, in order to add clarity and flexibility to the testing and operational regimes. As well, subsequent amendments were made to the following regulations:

- Ontario Regulation 252/05 (Non-Residential and Seasonal Residential Systems that Do Not Serve Designated Facilities)
- Ontario Regulation 169/03 (Ontario Drinking-Water Quality Standards)
- Ontario Regulation 248/03 (Drinking-Water Testing Services)

The amendments, consistent with many of the recommendations made by the Council, included:

- A more stringent Ontario Drinking Water Quality Standard for Trichloroethylene (TCE);
- An updated Procedure for Disinfection of Drinking Water in Ontario (*including Turbidity Limits and a Protozoa Treatment Standard*); and
- An updated *Technical Support Document for Ontario Drinking Water Standards, Objectives, and Guidelines*.
- Removing the testing and corrective action requirements for Fecal Coliforms and Background Colony Counts from Ontario Regulation 170/03 and corrective action for Heterotrophic Plate Counts and revoking the Ontario Drinking Water Quality Standards for all three from Ontario Regulation 169/03

Small Drinking Water Systems Program

The Council remained engaged in the Ministry of Health and Long-Term Care's Small Drinking Water Systems Program, by focusing on the areas of regulatory change, a risk assessment tool, and the development of protocols, and will provide on-going advice to the Ministry of the Environment, as the Non-Residential and Seasonal Residential Systems that Do Not Serve Designated Facilities (Ontario Regulation 252/05) systems are transferred to Public Health oversight.

As well, the Chair of the Council was invited to participate in a small systems workshop, as organized by the Federal / Provincial / Territorial Committee on Drinking Water. A further workshop, focusing on the aspect of technology, is to be held in the fall of 2007.

As a postscript, on June 4, 2007, the *Health System Improvements Act, 2007* received Royal Assent. This Act includes amendments to the *Health Protection and Promotion Act* (HPPA), *Safe Drinking Water Act, 2002* (SDWA) and the *Ontario Water Resources Act* (OWRA) necessary to permit the transfer of legislative oversight for Ontario Regulation 252/05 systems from the Ministry of the Environment to the Ministry of Health and Long-Term Care.

It is anticipated that the transfer will take place following proclamation of the relevant sections of the legislation, and development of regulations and implementation tools, including a site-specific risk assessment tool, for use by Ministry of Health and Long-Term Care and public health units.

4.2 Regulation 903 Disinfection Requirement

On June 30, 2004, the Minister of the Environment formally asked the Council to provide advice on the disinfection (chlorination) requirement of Ontario Regulation 903 (Wells).

As reported in the 2005-2006 Annual Report, the Council's final advice letter on the disinfection (chlorination) requirement of Ontario Regulation 903, was transmitted to the Minister of the Environment on June 16, 2005, and made public on March 22, 2007. *(See Appendix A1)*

On March 22, 2007, the Ministry of the Environment posted a Regulation Proposal Notice on the Environmental Bill of Rights Registry for public comment. The purpose of this posting was to propose amendments to Ontario Regulation 903 to address stakeholder concerns and to respond to the recommendations of the Environmental Commissioner of Ontario and this Council, while considering safety and financial implications for well owners.

As a postscript, On July 25, 2007, Ontario Regulation 903 was updated to further strengthen the protection of drinking water, and the amendments will come into effect on December 31, 2007. The amended Regulation adopts this Council's recommendations for disinfection with regards to dosage, contact time, pumping out, and verification of free chlorine residuals, and applies to drinking water wells following initial construction, alterations and pump installation. As well, a Best Practices Manual is being developed for the regulated community.

4.3 Tritium

On February 21, 2007, the Minister of the Environment formally requested that the Council review and provide advice on the current Ontario Drinking Water Quality Standard (ODWQS) for Tritium, in consideration of the 1994 recommendations made by the former Ontario Advisory Committee on Environmental Standards (ACES).

On April 30, 2007, the Council acknowledged the request and offered the following outline of the review approach:

1. Obtain all pertinent documentation for review
2. Undertake an inter-jurisdictional comparison
3. Meet with key stakeholder groups / people
4. Host a workshop amongst experts and stakeholders
5. Develop recommendations for the Council's consensus

After the third step, the Council will assess if sufficient information is available to lead to the development of a recommendation. If this is the case, then it is expected that the Council could make a recommendation to the Minister of the Environment by the end of 2007. However, if it is concluded that key information is not available or additional work is required, then the Council will advise the Minister of the Environment of proposed changes to this work plan.

4.4 Corrosion Control / Lead Reduction

On April 20, 2007, a new Health Canada Draft Guideline Technical Document entitled “*Corrosion Control in Drinking Water Distribution Systems*”, as approved by the Federal-Provincial-Territorial Committee on Drinking Water (CDW), was made available for public comment on Health Canada's website. The focus of corrosion control is primarily related to lead exposure in community drinking water.

On April 24, 2007, the Minister of the Environment requested that the Council undertake a review of the Health Canada's “*Corrosion Control in Drinking Water Distribution Systems*” Document, with a view towards early implementation of corrosion control in Ontario to reduce lead at consumers’ taps, as well as comments that Ontario could provide to the Federal Government.

The Council responded to the Minister of the Environment on April 30, 2007, with an estimate of the timelines, balancing urgency with the need for the Council to carefully deliberate on this matter.

The Council’s review approach consisted of:

- Forming a Working Group in order to collect relative scientific and technical literature and undertake an assessment of the “*Corrosion Control in Drinking Water Distribution Systems*” Document;
- Holding a one-day workshop on May 16, 2007, with four experts in the field of corrosion control and lead in drinking water (Dr. Marc Edwards, Virginia Tech; Ian Douglas, Health Canada / City of Ottawa; France Lemieux, Health Canada; and Dr. Michèle Prévost, École Polytechnique de Montréal). Ministry of the Environment and Ministry of Health and Long-Term Care officials also attended and participated as advisors;
- Considering the recent information and work underway with respect to lead in drinking water in the City of London, Ontario;
- Presenting the Working Group’s assessment and preliminary findings to the full Council, in order to take advantage of the Members’ direct experience and knowledge, and;
- Finalizing the initial advice on early implementation of corrosion control in Ontario, taking into account input from all of the above-noted sources.

On April 26, 2007, the Ministry of the Environment also posted a Policy Proposal Notice regarding the “*Corrosion Control in Drinking Water Distribution Systems*” Guideline Technical Document on the Environmental Bill of Rights Registry for public comment up to July 20, 2007.

On May 31, 2007, the Council transmitted its initial advice the Minister of the Environment on corrosion control measures that could be implemented immediately in Ontario to reduce lead at the consumers' taps. (See Appendix A10)

As a postscript, on June 7, 2007, the Ministry of the Environment announced its lead action plan to expand water safety protection and reduce the potential for elevated levels of lead in drinking water at the tap. The action plan addressed many of the Council's recommendations, and included:

- amending Ontario Regulation 170/03 (Drinking-Water Systems), making it mandatory for municipalities and non-municipal year round residential systems to regularly sample for lead at household taps, and notify home and facility owners of the results and take corrective action in systems with elevated lead levels;
- establishing a new regulation, Ontario Regulation 243/07 (Schools, Private Schools, and Day Nurseries), requiring schools and daycares built before 1990 to flush plumbing on a daily basis, and requiring all schools, as well as daycares built before 1990, to test drinking water for lead annually;
- assisting low-income families with infants, young children or pregnant women with the cost of filters where they are recommended;
- providing expert advice to municipalities to adjust water chemistry in municipal systems to pick up less lead;
- encouraging municipalities to conduct public education campaigns, such as inserts in water bill mailings; and
- providing best practices for municipalities to help make lead line replacement more affordable for homeowners, such as on-bill financing.

On July 27, 2007, the amendments to Ontario Regulation 170/03 (Drinking-Water Systems) were posted on the Environmental Registry as a Regulation Decision Notice.

5.0 Walkerton Recommendations Directed to the Council

At the Council's inaugural meeting on June 10, 2004, the Minister of the Environment asked the Council to focus on the recommendations directed to the Council, as noted by Justice O'Connor in the *Part Two Report of the Walkerton Inquiry*:

- Recommendation 27: *“The Advisory Council on Standards should consider whether to replace the total coliform test with an E. coli test.”*
- Recommendation 28: *“No formal maximum contaminant level for protozoa should be established until real-time tests are available. The objective, as with bacteriological and viral pathogens, should be zero, and the regulations should so state; but the standard should be a treatment standard, specified in terms of log removal dependent on source water quality.”*
- Recommendation 29: *“The provincial government should seek the advice of the Advisory Council on Standards regarding the desirability of a turbidity limit that is lower than the limit specified in the federal-provincial Guidelines.”*
- Recommendation 31: *“The Advisory Council on Standards should review Ontario's standards for disinfection by-products to take account of the risks that may be posed by the by-products of all chemical and radiation-based disinfectants.”*

As a result of the Council's April 5, 2005 advice on Microbiological Indicators, on June 7, 2006, amendments were made to Ontario Regulations 170/03, 252/05, 169/03, and 248/03, and associated documents, including the elimination of testing requirements, standards, and reportable adverse results for fecal coliforms, general bacteria population expressed as background colony counts on the total coliform membrane filter, and heterotrophic plate count. (See Recommendation #27 above and Section 6.1 on Microbial Indicators of Adverse Water Quality: Walkerton Recommendation #27)

As result of the Council's September 20, 2005 advice on the “*Procedure for Disinfection of Drinking Water in Ontario*”, amendments to the Procedure were finalized on June 7, 2006, which included Turbidity Limits and a Protozoa Treatment Standard. (See Recommendations 28 and 29 above)

The Council concluded that the process of providing overall advice on Disinfection By-Products, on an on-going basis, would be best addressed by reviewing individual substances or groups of substances, specific to the particular treatment technology, through the Council's existing Standards Review process. (See Recommendation 31 above and Section 6.0 for more information on Standards Review)

6.0 Standards Review

Part of the Council's mandate is to provide advice to the Minister of the Environment on proposed drinking water standards and their applicability in Ontario. (Recommendation 25 of the *Part Two Report of the Walkerton Inquiry*, states that “*In setting drinking water standards for Ontario, the Minister of the Environment should be advised by an Advisory Council on Standards*”.

In addition, Recommendation 26 states that “*The Advisory Council on Standards should have the authority to recommend that the provincial government adopt standards for contaminants that are not on the current federal-provincial agenda.*”

In order to provide comprehensive advice on these standards, the Council reviews Health Canada's Guideline Technical Documents, comments from public consultation processes, receives expert presentations, and gathers information on the occurrence and impact that a particular substance is likely to have on the delivery of safe drinking water in Ontario.

As a result of this review, the Council may recommend endorsement of a particular Canadian Drinking Water Quality Guideline (CDWQG) as an Ontario Drinking Water Quality Standard (ODWQS), or as an Objective or Guideline, or consider a more stringent standard for Ontario, where appropriate, and may conduct independent consultations with stakeholders and technical experts as deemed necessary to recommend a standard. (*See Appendix C for the Council's Standards Review Protocol*)

Following is an update of the status of the Council's review of standards, as of May, 2007:

6.1 Standards Reviews Completed

Microbial Indicators of Adverse Water Quality: Walkerton Recommendation #27

As reported in the 2005-2006 Annual Report, on April 5, 2005, the Council transmitted its final advice letter on Microbial Indicators of Adverse Water Quality to the Minister of the Environment.

The Council reviewed and endorsed the use of Health Canada's four Draft Guideline Technical Documents on:

- Bacterial Waterborne Pathogens - Current and Emerging Organisms of Concern;
- Heterotrophic Plate Count;
- Total Coliforms; and
- *Escherichia coli*

Review of these Documents aided in the formulation of the Council's formal advice to the Minister of the Environment on Recommendation #27 of the *Part Two Report of the Walkerton Inquiry*, which states that "*The Advisory Council on Standards should consider whether to replace the total coliform test with an E. coli test.*"

It was the Council's recommendation that fecal coliforms, as an indicator of public health risk be replaced by *E. coli* as the sole indicator of recent fecal contamination.

The Council, however, deemed that the Total Coliform test still serves a valuable purpose and that its use should continue, because the presence of Total Coliforms indicates system vulnerability and a potential pathway for pathogens, and that investigation into the cause(s) of the presence of Total Coliforms should be undertaken.

On June 7, 2006, the Ministry of the Environment posted a Regulation Decision Notice on the Environmental Bill of Rights Registry, to proceed with amendments to Ontario Regulation 170/03, in order to add clarity and flexibility to the testing and operational regimes. As well, subsequent amendments were made to Ontario Regulations 252/05, 169/03, and 248/03, and associated documents, which included removing the testing and corrective action requirements for Fecal Coliforms and Background Colony Counts and corrective action for Heterotrophic Plate Counts and revoking the Ontario Drinking Water Quality Standards for these three parameters.

Methyl tertiary-butyl ether (MTBE)

On July 27, 2006, the Council transmitted its final advice letter to the Minister of the Environment, recommending that the Ministry of the Environment endorse the new Canadian Drinking Water Quality Guideline for Methyl tertiary-butyl ether (MTBE) in drinking water, as an aesthetic objective (AO) of 0.015 mg/L (15 µg/L), and adopt it as an Aesthetic Objective in Ontario, through inclusion in the "*Technical Support Document for Ontario Drinking Water Standards, Objectives, and Guidelines*" (See Appendix A9)

Trichloroethylene (TCE)

As reported in the 2005-2006 Annual Report, on June 21, 2005, the Council transmitted its final advice letter on Trichloroethylene to the Minister of the Environment, recommended that the Ministry of the Environment endorse the revised Canadian Drinking Water Quality Guideline for Trichloroethylene of 5 µg/L, and adopt it as an Ontario Drinking Water Quality Standard.

On June 7, 2006, the Ministry of the Environment posted a Regulation Decision Notice on the Environmental Bill of Rights Registry, to proceed with amendments to Ontario Regulation 169/03, including the more stringent Ontario Drinking Water Quality Standard for Trichloroethylene (TCE).

Total Trihalomethanes and Bromodichloromethane

As reported in the 2005-2006 Annual Report, on November 30, 2005, the Council transmitted its final advice letter on Total Trihalomethanes and Bromodichloromethane to the Minister of the Environment.

On April 7, 2006, the Ministry of the Environment posted a Regulation Proposal Notice on the Environmental Bill of Rights Registry for public comment, in order to seek feedback on the adoption of a more stringent Ontario Drinking Water Quality Standard of 80 µg/L for total Trihalomethanes, with a phase-in period.

The Ministry of the Environment continues to address stakeholder comments and is currently developing guidance documentation to aid small systems in preparing for the new Bromodichloromethane Standard and a revised Total Trihalomethanes Standard.

Total Coliform Standard and Corrective Actions

As reported in the 2005-2006 Annual Report, the Council transmitted its final advice letter on the Total Coliform Standard and Corrective Actions to the Minister of the Environment on June 1, 2006, and continues to remain available as a resource on this issue, in order to provide advice for the Minister of the Environment in possible dealings with the Ministry of Health and Long-Term Care on the Small Drinking Water Systems Program, or on non-regulated systems. (See Appendix A7)

6.2 Standards Currently Under Review

The following standards are still under review by the Council. The Council will continue to assess these contaminants and will provide formal advice to the Minister of the Environment in an appropriate and timely fashion. The standards include:

- 2-Methyl-chlorophenoxyacetic Acid (MCPA)
- Benzene
- Chloral Hydrate
- Chlorine
- Chlorite / Chlorate
- Corrosion Control / Lead Reduction (See Section 4.4 and Appendix A10)
- Haloacetic Acids (See appendix A8)
- Potassium
- Radiological Characteristics
- Tritium (See Section 4.3)

6.3 Standards Prioritization

Part of the Council's mandate is to provide advice and make recommendations on matters relating to the prioritization of the review and development of standards for drinking water quality for Ontario.

In addition, the *Part Two Report of the Walkerton Inquiry* noted in Recommendation 26, that “*The Advisory Council on Standards should have the authority to recommend that the provincial government adopt standards for contaminants that are not on the current federal-provincial agenda.*”

Specifically, the Council, in establishing its own process, has chosen to review, on a yearly basis, the list of priority substances as developed by the Federal-Provincial-Territorial (FPT) Committee on Drinking Water (CDW).

The purpose of this review is to recommend the addition of substances for Ontario to put forward, that may not be on the current National Priority List, as well as the re-ranking of existing substances. For the 2006-2007 Council fiscal year, a review was completed and the Council concurred with the National Priority List.

7.0 Council Initiatives

While the Minister of the Environment can request that the Council provide advice on specific matters related to drinking water, the Council can also choose to engage in matters related to drinking water, which it has identified as being of interest, and which, in its opinion, may merit the attention of the Minister of the Environment.

The process by which the Council engages in its initiatives is as follows:

- Initiatives are identified through the Council's priority-setting meeting held in June of every year.
- the Council decides whether or not to form a working group to facilitate tasks, based on the complexity of the initiative
- The Council or working group then decides how to best approach each initiative using any or all of the following means:
 - Have a Ministry of the Environment expert make a presentation to the Council
 - Have an external expert make a presentation to the Council
 - Perform a literature search
 - Hold a stakeholder and / or experts workshop
 - Facilitate a research project
- The conclusions and suggested recommendations are deliberated by the full Council, and advice is drafted for the Minister of the Environment, in cases where it is deemed to merit some attention and / or action.

Following is a brief outline of the initiatives that the Council engaged in during its third fiscal year. Even though final advice has been rendered in many cases, many of these initiatives are of an on-going nature, and the Council remains engaged from the perspective of the development and implementation of Legislative, Regulatory and policy amendments, in order to provide on-going advice to the Minister of the Environment:

7.1 Advice Transmitted to the Minister of the Environment

The Council transmitted final advice letters to the Minister of the Environment, where appropriate, on the following initiatives:

Clean Water Act (Bill 43) / Drinking Water Source Protection

As reported in the 2005-2006 Annual Report, the Council transmitted final advice letters to the Minister of the Environment on:

- Drinking Water Source Protection (November 15, 2005) (*See Appendix A2*)
- The Clean Water Act (Bill 43) (March 31, 2006) (*See Appendix A3*)

The *Clean Water Act* received Royal Assent on October 19, 2006, and many of the Council's recommendations were addressed in the *Act*. As a postscript, on July 3, 2007, the *Act* and five regulations came into effect.

The Council continues to remain engaged with the *Clean Water Act, 2006* to monitor the existing and proposed regulations and guidance documentation, in order to provide on-going advice to the Minister of the Environment.

Ontario Regulation 248/03 (Drinking-Water Testing Services)

As reported in the 2005-2006 Annual Report, the Council transmitted its final advice letter on Ontario Regulation 248/03 (Drinking-Water Testing Services) to the Minister of the Environment on January 3, 2006. Although the Council's advice was primarily focused on Recommendations 40 and 41 of the *Part Two Report of the Walkerton Inquiry* Recommendations, the advice went beyond the scope of these recommendations.

The Ministry of the Environment continues to evaluate new technologies for microbiology tests on an ongoing basis, to determine their suitability for use.

The Council continues to remain engaged with Ontario Regulation 248/03 to monitor any future amendments or guidance documentation development, in order to provide on-going advice to the Minister of the Environment.

Drinking Water Quality Management Standard

As reported in the 2005-2006 Annual Report, the Council undertook a review of the draft Drinking Water Quality Management Standard (DWQMS), and transmitted its final advice letter to the Minister of the Environment on March 31, 2006. (See Appendix A4)

On October 30, 2006, the Ministry of the Environment posted a Policy Decision Notice on the Environmental Bill of Rights Registry, finalizing the DWQMS, which took into account many of the Council's recommendations.

The Ministry of the Environment undertook a pilot program in five municipalities to implement the DWQMS and undergo audits against the standard by a third party organization, and continues to develop and implement the Licensing Program with water sector consultation.

Ontario Regulation 188/07, the Licensing of Municipal Drinking-Water Systems Regulation, came into force in May 2007, and, as a post-script, on July 31, 2007, Policy Decision Notices for the DWQMS Guidance Document, Director's Directions and Accreditation Protocol were all posted on the Environmental Registry.

Treatment of Surface Water Used for Private Drinking Water Supplies

As reported in the 2005-2006 Annual Report, the Council transmitted its final advice letter on the Treatment of Surface Water Used for Private Drinking Water Supplies to the Minister of the Environment on April 10, 2006, and continues to remain engaged in this issue, in order to provide on-going advice to the Minister of the Environment on these non-regulated systems. (See Appendix A5)

Definitions and Uses of Chlorine-Related Terminologies

As reported in the 2005-2006 Annual Report, the Council transmitted its final advice letter on the Definitions and Use of Terminology for Chlorine, Chlorination, and Chlorine Residuals to the Minister of the Environment on April 10, 2006, and continues to remain engaged in this issue, in order to provide on-going advice to the Minister of the Environment. (See Appendix A6)

On June 7, 2006, the Ministry of the Environment posted a Regulation Decision Notice on the Environmental Bill of Rights Registry, to proceed with amendments to Ontario Regulation 170/03. In order to harmonize chlorine-related definitions, subsequent amendments were also made at that time to the "*Procedure for Disinfection of Drinking Water in Ontario*".

As a postscript, on July 27, 2007, the Ministry of the Environment posted a Regulation Decision Notice on the Environmental Bill of Rights Registry, finalizing amendments to Ontario Regulation 903 (Wells), including a new definition of "*chlorinated*" being specified to mean "*disinfected with free chlorine residual*".

Federally De-Listed Pesticides in Ontario Regulation 169/03

Some pesticides have been de-listed (archived) as Canadian Drinking Water Quality Guidelines because they are no longer registered for use in Canada, and presumably would not be found in drinking water. They are still listed, however, as Ontario Drinking Water Quality Standards (ODWQS) in Ontario Regulation 169/03 (Ontario Drinking Water Quality Standards).

The Council concluded that it would be beneficial to leave these De-Listed pesticides in Ontario Regulation 169/03, since their presence in the future would indicate potential drinking water source problems that would require investigation. Since this conclusion resulted in a status-quo situation, it was not necessary to transmit an advice letter to the Minister of the Environment.

7.2 Initiatives Under Review

The Council continues to be engaged in the following initiatives with a view towards potentially providing advice to the Minister of the Environment in the future:

Pharmaceuticals and Personal Care Products

There is much research going on regarding PPCPs and the Council continues to consider the issue in terms of the concentrations being found, current and future treatment abilities and technologies, to determine any potential health-related issues for Ontario's drinking water supplies currently, and in the future.

Promoting Municipal Drinking Water

The Council continues to review the activities and initiatives the Ministry of the Environment and municipalities have been undertaking regarding education and outreach programs for promoting Ontario's municipal drinking water supplies.

Infrastructure Protection for Municipal Drinking Water

The Council continues to review the initiatives the Ministry of the Environment has been undertaking in the area of critical infrastructure protection for the security of Ontario's municipal water supplies.

The Council is pleased with the progress that the Ministry of the Environment has made in implementing the Ontario Critical Infrastructure Assurance Program (OCIAP) for the Drinking Water Sector, and the Drinking Water Quality Management Standard.

Small Systems Treatment Equipment

The Council continues to remain engaged in this issue since Recommendation #17 of the Council's 2005 *“Report and Advice on Ontario Regulation 170/03 Smaller, Private Systems Review and Recommendations”* states that *“the Ministry of the Environment work with the water treatment equipment industry to develop a system to pre-approve or certify treatment equipment.”* Pre-approved equipment would assist Public Health Inspectors to identify appropriate treatment options for owners of the smaller systems, currently under Ontario Regulation 252/05, which are to fall under the responsibility of the Ministry of Health and Long-Term Care.

Use of Surrogates as Indicators

The Council continues to research the use of surrogates as indicators which can indirectly identify the presence of other substances or group of substances that are more difficult to measure and that may have greater health implications.

Since Canadian Drinking Water Quality Guidelines are developed mostly on a substance-specific basis, the synergistic effect of mixtures is not well known, so the Council also continues to evaluate the effect of surrogates on the development of guidelines and standards, as well as additional research needs.

Alternative Disinfection Approaches

The Council continues to research how other international jurisdictions (most notably European) treat and often distribute their drinking water without the use of chlorine, and whether Ontario should consider a process to allow for alternate disinfection approaches, particularly for distributed water.

Use of Trends

The Council continues to explore the use and significance of trends for chemical and microbiological test results for drinking water, as trends may indicate an emerging problem with a source or treatment process, even before specific limits are exceeded

Dual / Reclaimed Water Systems

As part of conservation programs, some jurisdictions are starting to allow water systems whereby water is supplied in two streams: one for drinking and the other for uses like toilet flushing, lawn watering, etc. Another approach involves the use of reclaimed water for toilet and urinal flushing. The Council continues to explore the use of dual / reclaimed water systems with a view towards water quality safety, and allowing such systems in Ontario.

Ontario First Nations Drinking Water Quality

The Council continues to review issues related to Ontario First Nations drinking water quality, but has not yet provided advice as to what the Province could do to improve the protection of drinking water quality in these communities.

Justice O'Connor stated in Chapter 15 of the *Report of the Walkerton Inquiry Part Two* that First Nations communities have “*some of the poorest quality water in the province*” and that “*First Nations people...should be entitled to safe drinking water on the same terms as those prevailing in other similarly placed communities*”. He cited some of the causes as unacceptable infrastructure, and inadequate testing and inspections.

The events of Kashechewan in the fall of 2005 raised the profile of issues that are indicative of many First Nations drinking water supplies, and *The Report of the Expert Panel on Safe Drinking Water for First Nations*, released in the fall of 2006, identified the need for resources and a framework to address high risk systems in the short-term, while sustaining all systems in the future.

Ontario took a leadership role in helping Kashechewan address their situation, through the work of the Ministry of the Environment's Expert Technical Team, which provided an assessment of the drinking water and wastewater systems, and subsequently briefed Kashechewan's Chief and Band Council on recommendations for safeguarding the community's drinking water.

7.3 Areas of Ongoing Interest

The Council continues to be engaged in the following on-going initiative(s) with a view towards providing advice to the Minister of the Environment, where appropriate, in the future:

Part Two Report of the Walkerton Inquiry Recommendations

The Council reviewed the *Part Two Report of the Walkerton Inquiry* recommendations to determine whether the Ministry of the Environment's initiatives and actions have met the intent of the recommendations, by examining the associated textual explanations in the *Part Two Report*.

The Council also gave consideration to the *Part One Report of the Walkerton Inquiry* Recommendations, but determined the *Part Two* Recommendations to be more closely focused on the development and implementation of a broader drinking water framework for Ontario, and thus, more closely related to the Council's mandate to provide advice to the Minister of the Environment on the continuous improvement of drinking water in this province.

The Council is pleased with the progress that the Ministry of the Environment has made on implementing all of the *Part Two Report of the Walkerton Inquiry* Recommendations.

Ontario's Overall Drinking Water Framework

The *Safe Drinking Water Act, 2002*, and the *Clean Water Act, 2006*, and the associated Regulations, policies, and guidance documentation are the core of Ontario's drinking water framework, which the Council will continue to monitor, with respect to implementation and ongoing improvements.

Appendix A - Advice Letters

- A1 Advice on the Disinfection Requirement of Regulation 903 (Wells)
- A2 Advice on Drinking Water Source Protection
- A3 Advice on Bill 43, the Clean Water Act
- A4 Advice on the Drinking Water Quality Management Standard
- A5 Advice on the Treatment of Private Surface Water Supplies
- A6 Advice on the Use of Chlorine Definitions
- A7 Advice on Total Coliform Corrective Actions
- A8 Advice on a New Guideline for Total Haloacetic Acids
- A9 Advice on a New Methyl *tertiary*-butyl Ether (MTBE) Guideline
- A10 Advice on Corrosion Control / Lead Reduction

A1 Advice on the Disinfection Requirement of Reg. 903

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June 16, 2005

The Honourable Leona Dombrowsky
Minister of the Environment
135 St. Clair Avenue West, 12th Floor
Toronto, Ontario M4V 1P5

Dear Ms. Dombrowsky:

Re: Advice on the Disinfection Requirement of Regulation 903 (Wells)

Introduction and Issue:

In your letter to me dated June 30, 2004, you formally asked the Advisory Council on Drinking Water Quality and Testing Standards to provide you with advice on the disinfection (chlorination) requirement of Regulation 903.

The Council decided to take on a broader review of this issue. As such, the scope of our advice is not limited exclusively to the concerns raised by the Canadian Environmental Law Association (CELA) in their 2003 Environmental Bill of Rights Application for Review.

Other aspects of Regulation 903 could be reviewed by this Council in the future, but for the purposes of this request, our advice will be focused on disinfection.

The overarching principle for our focus on this issue is that water from private drinking water wells needs to be verified to be microbiologically safe, prior to human consumption.

Consultation:

Over the past several months, we have: heard from experts on wells and Regulation 903, including Ministry of the Environment staff, the Ontario Ground Water Association, and CELA; reviewed literature on disinfecting wells¹ and; drawn from our own Council members' expertise in this area.

Observations:

Several key observations were gleaned from the review:

- The disinfection requirements of Regulation 903 are focused on chlorine dosage, not chlorine residual
- Section 15 (Disinfection) applies “only to the construction and putting into operation of a new well”
- Section 17, which addresses Pump Installation, does not require disinfection, when a new pump is installed in to an existing or older well
- Section 20, which addresses Well Maintenance, does not require disinfection after work has been done on the interior of a well
- There is no requirement to test for chlorine residual after construction
- New construction, pump installation, alteration, repair, maintenance, improvement, etc. done by an owner on his / her own well (that does not serve any other family) does not require a licenced technician
- New construction, pump installation, alteration, repair, maintenance, improvement, etc. facilitated by a hired contractor, requires a licenced technician
- The OWRA definition of “construction” implies any alteration, repair, maintenance, improvement, etc., according to legal opinion
- Homeowners, property owners, licenced contractors and technicians, and unlicensed persons are all under regulatory obligation to fully comply with all construction requirements, including disinfection.
- Regulation 903 applies to a well and piping leading up to, but not including a dwelling
- Piping inside a dwelling falls under the Plumbing Code, which is now Part 7 of the Building Code
- All regulated communal systems with wells must follow AWWA’s C654 standard, as well as the *Procedure for Disinfection of Drinking Water in Ontario*, per Regulation 170, made under the *Safe Drinking Water Act, 2002*

Conclusions:

Several key conclusions were reached from our review:

- The current Regulation’s disinfection requirements seem deficient in the following areas:
 - The term “approximate” is not precise enough
 - The terms “chlorine” and “chlorinated” do not specify which form of chlorine should be monitored
 - No chlorine residual testing is required
 - No bacteriological testing is required
 - No disinfection is required for Pump Installation
 - No disinfection is required for Well Maintenance

- The scope of Regulation 903 and this Council’s advice is limited to “construction” activities as defined in the Ontario Water Resources Act and does not include on-going disinfection of the water (which falls under Regulation 170 and its procedures)
- There is a need for protocols for disinfection of both new and existing wells
- Disinfection should be undertaken under all situations, i.e. new construction, pump installation, alteration, repair, maintenance, improvement, discovered bacteriological problem, etc., consistent with Regulation 903, Regulation 170, the Ontario Water Resources Act (OWRA), and the American Water Works Association (AWWA) C654 Standard (Disinfection of Wells)
- Both Total Coliforms and *E. coli* should be used as the microbiological tests of choice for wells
- In considering the AWWA C654 standard, it was noted that it was generally intended for use with Communal Systems with wells that serve the public and that some aspects may not be practical for individual domestic wells.

Recommendations:

The intent of our advice is not to provide specific wording for a regulatory amendment, but rather it is to recommend the critical steps and actions needed to ensure potable water is available after any kind of well “construction” activity.

Following is the Council’s disinfection advice, to be carried out after construction and / or subsequent work, or in the case of a detected or suspected microbiological problem, on any private drinking water well in Ontario. Specifically, this advice should be applied to Sections 15, 17, and 20 of the current Regulation, and should be carried out by homeowners, property owners, licenced contractors and technicians, and unlicensed persons.

These steps include:

1. Dose the well, to a maximum of 200 mg/l, to ensure that, after 12 to 24 hours of contact time, the concentration of free chlorine residual is between 50 & 200 mg/l, as confirmed by testing; if not, go to step 2, and then begin again at step 1
2. Pump the well out to achieve ≤ 1 mg/l free chlorine residual
3. Take duplicate samples and test for Total Coliform and *E. coli*. The results of both samples should be zero; if yes, then the well is ready for use
4. Repeat steps 1 to 3 if any Total Coliforms or *E. Coli* are detected
5. Contact the local Health Unit for advice if Total Coliforms or *E. Coli* persist, or if 3 disinfection cycles result in positive Total Coliform and /or *E. Coli* results

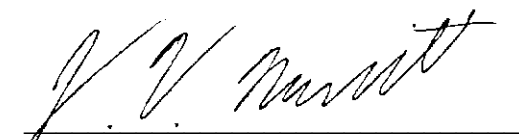
When a licenced technician is used, the technician should notify the owner of work completed, regarding the above 5 step procedure, and supply the owner with a copy of the reports, including all chlorine residuals, and all microbiological test results.

As well, the Council recommends that the use of AWWA’s C654 standard be considered and be referenced in a future guidance document.

In some circumstances a well may not be put into service immediately after development. Pumps and related equipment may be installed weeks or even months later, or replacement pumps may be installed into older, existing wells. In such cases, it is essential that disinfection and testing be conducted as outlined in the above noted 5 steps just prior to the system being put into service. This should be the case even if the final connections are made by the owner.

These changes will provide the necessary clarification to Regulation 903 in order to ensure that, after construction and / or any subsequent work, water from private drinking water wells is microbiologically safe to drink prior to human consumption. Council representatives would be pleased to meet with your staff or Ministry staff, to further explain this advice.

Sincerely,



Jim Merritt, Chair
Advisory Council on Drinking Water
Quality and Testing Standards

References:

¹ Schnieders JH. 2003. Chemical Cleaning, Disinfection & Decontamination of Water Wells. St. Paul: Johnson Screens. 227 p.

Holben RJ, Gaber M. 2003. Water Well Disinfection Manual. Lansing: Michigan Department of Environmental Quality. 50 p.

2003. Disinfection of Wells, American Water Works Association Standard C654. Denver: American Water Works Association. 11 p.

2002. Field Evaluation of Emergency Well Disinfection for Contamination Events Final Project Report. Washington: U.S. Federal Emergency Management Agency. 63 p.

2003. Water Wells Best Management Practices. Toronto: Ontario Ministry of Health and Long-Term Care. 89 p.

2005. Procedure for Disinfection of Drinking Water in Ontario (public consultation document): Ontario Ministry of the Environment. 34 p.

2004. Chlorination Methods for Drinking Water Supply Wells (Presentation by Ontario Ministry of the Environment staff member John Mayes, SDB) 60 p.

A2 Advice on Drinking Water Source Protection

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November 15, 2005

The Honourable Laurel Broten
Minister of the Environment
135 St. Clair Avenue West, 12th Floor
Toronto, Ontario M4V 1P5

Dear Ms. Broten:

**Re: Drinking Water Source Protection: Issues of Concern to the
Advisory Council on Drinking Water Quality and Testing Standards**

The Council has undertaken a review of drinking water source protection, as part of its ongoing role to advise you on matters relating to drinking water quality. For this review the Council considered the document entitled "*Watershed-Based Source Protection Planning -- A Threats Assessment Framework*" (Report) prepared for you by the Technical Experts Committee in November, 2004. The report entitled *Watershed Based Source Protection: Implementation Committee Report to the Minister of the Environment* was also considered by the Council, but it was deemed to be less applicable to the mandate of this Council. As well, at its September 16, 2005 meeting, the Council also received a briefing from Ministry of the Environment (MOE) staff regarding the status of current and future source protection activities.

The Council recognizes the important work of the Technical Experts Committee and its contribution to improving drinking water quality in Ontario.

Based on its review of the Report, the Council identified several areas that should be given consideration as the MOE moves forward with drinking water source protection legislation and regulations:

Quantification of Public Health Benefits:

From a drinking water perspective, the purpose of source protection is to provide improved protection of public health. Although this is discussed generally in the Report, the scope of the Report did not allow for expected public health benefits to be quantified. Given the potentially massive expenditures and effort proposed, it is important to provide such quantification. In particular, it is important to consider the ability of the overall drinking water system to provide a given public health benefit. Otherwise, substantial public resources may be allocated to public health protection in a non-optimal manner.

A relatively simple method of assessing the capabilities of a drinking water system (one that was used in the Council's report to the Minister on Regulation 170/03) is to identify five key barriers, which constitute a multi-barrier approach, encompassing more than just the physical aspects of the system, considered necessary for the provision of safe drinking water.

These barriers are:

- Choosing the best possible source;
- Designing and operating adequate treatment;
- Providing secure distribution between treatment facility and consumer;
- Conducting appropriate monitoring; and
- Responding in an appropriate and timely fashion to adverse monitoring results.

Figure 1, reproduced from the Council's report, illustrates conceptually how these barriers contribute to overall system security, or robustness. Although a given degree of security in the overall system can be achieved by different levels of robustness in the individual barriers, a certain minimum level of robustness in *each* of the barriers is required. A secure system requires that the 'human' and institutional components, as well as the physical 'hardware' components, also be robust.

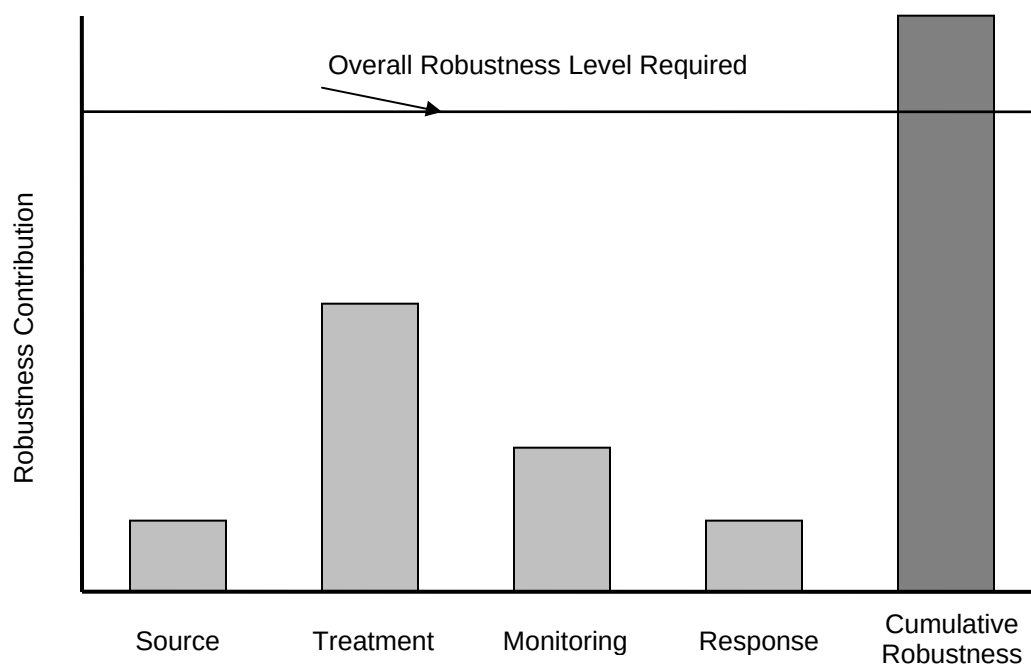


Figure1: Example of the contribution of source, treatment, monitoring and response to overall system security or robustness.

Source: The Council's report to the Minister entitled: *Report and Advice on Ontario Regulation 170/03 Smaller, Private Systems Review and Recommendations* (February, 2005)

For example, disinfection requirements for a particular water supply need to be based on the maximum reasonably expected loading of the most difficult-to-inactivate pathogen. For surface water, such loadings would normally be associated with extreme weather and runoff events. Even if extensive source water protection activities within a watershed were able to reliably reduce the maximum pathogen loading by several orders of magnitude (factors of ten), the impact on the treatment requirements would, in all likelihood, be relatively small in comparison with the source protection efforts required. Given robust treatment and monitoring, which should be present in any case, the impact on public health of the reduction in pathogen loadings in the source water might be difficult to quantify. A suggested approach is outlined in Appendix A.

The importance of a multi-barrier approach was stressed by Justice O'Connor in his *Part Two Report of the Walkerton Inquiry*, and source protection constitutes just *one* of the five barriers. It is the Council's view that consideration of the multi-barrier approach is necessary to ensure that the proposed measures for source protection will contribute optimally to maximizing the safety of drinking water for Ontarians.

The Council recommends that resources be allocated to the drinking water supply barrier(s) with the greatest potential for human health benefits, and least cost.

The Council recommends that the Ministry of the Environment attempt to quantify expected human health benefits for drinking water source protection activities, in order to focus resources effectively and efficiently on health risk minimization.

The Council recommends that the Ministry of the Environment undertake detailed consideration of a number of representative drinking water system scenarios, including cost estimates, and consult with professional communities and the public, concerning the expected health benefits from source water protection initiatives. (This approach is detailed in Appendix A)

Consideration of Types of Threats:

Although the Report discusses different types of threats (e.g. microbial, chemical), the different nature of these threats is considered at a general level in the development of proposed approaches. As an example, the threat posed by a chemical concentration that is slightly over the regulated limit is quite different than that posed by acute microbial contamination. In addition, the type of source water is an important consideration, as is the time scale over which these two examples may develop; affecting the extent to which source protection can play a major role in reducing these threats.

The Council recommends that the Ministry of the Environment consider specific microbial, chemical and radiological threats in relation to the three basic classifications of source water: surface water, groundwater under the influence of surface water and ‘true’ groundwater.

Such an approach would allow development of a threat matrix that is more directly oriented to specific health outcomes. The ability of other barriers of the overall drinking water framework to contribute to addressing these threats could then be more specifically considered. For example, the optimum relative contributions of source protection, treatment and robust monitoring / operator intervention will be different for different types of contaminants, and source waters.

Definition of Risk:

Both the probability of failure (i.e. a *hazard*, in this case presence of a contaminant) and the probability of *exposure* to the hazard must be considered to define risk (the probability of a *specified adverse outcome* resulting from *exposure* to a *hazard*). Although exposures and consequences (i.e. risks) are discussed to some extent in the Report, they are not given the same level of consideration as the occurrence of contamination. (For example, the figure on page xii in the Executive Summary shows Risk as being the existence of a threat and a pathway. The figure on page xiv and the definition of ‘Significant Risk’ on page xv do not explicitly address consequences, i.e. health outcomes.)

In other areas of its work the MOE has used the more commonly accepted definition of risk. For example, in Section 2 of the document “*Setting Environmental Quality Standards in Ontario: The Ministry of the Environment’s Standards Plan*”, risk assessment and risk management are specifically discussed. Risk assessment is defined as ‘the scientific evaluation of the likelihood of adverse health effects due to exposure of a human or non-human organism to a physical, chemical or biological agent.’ The various components of risk assessment and risk management are described. One of the components of risk assessment is exposure assessment, which involves determining ‘the concentration, frequency, duration and route of exposure of the organism to the agent’. Under risk management, the document notes that ‘where implementation of a proposed standard would require significant costs to achieve, a cost-benefits analysis is carried out’.

As discussed in the Council’s report to the Minister on Regulation 170, “The application of risk considerations to drinking water systems is well illustrated in the approach used in New Zealand.” (New Zealand Ministry of Health, 2001; www.moh.govt.nz). The Council’s report notes that, in this approach, “Both a Likelihood Scale and a Consequence Scale are used to determine risk”. For example, risk is defined as ‘low’ for an unlikely event (one which could occur once in 100 years) considered to be of minor consequence (i.e. having a minor impact on a small population). However, risk is defined as ‘extreme’ for a likely event (one that will probably occur once every one or two years) of major consequence (i.e. having a major impact on a small population). Although these definitions do not necessarily apply directly to source protection matters, they clearly indicate that definition of risk must include consideration of consequences.

The Council recommends that the Ministry of the Environment consider using a more commonly accepted and used definition of risk, involving both probability and consequence, for drinking water source protection activities.

Emphasis on Groundwater:

In the Report there is a greater emphasis placed on groundwater even though 80% of Ontario’s population derives its drinking water from *surface* sources. According to the Report, an initial emphasis on groundwater was “primarily based on the inherent complexity of the issues associated with the high variability of the subsurface environment.” This approach was confirmed by MOE staff.

Groundwater sources are important to many communities, but there needs to be an appropriate level of emphasis on surface water. Although the minimization of the probability of acute microbial contamination is only one aspect of source protection; it is an important one. Surface water and groundwater ‘under the influence of surface water’ are much more susceptible to such contamination than are ‘true’ groundwaters.

The Council recommends that proposed drinking water source protection regulations address surface water source protection issues as early as practicable.

Basis for Specific Numerical Values:

Some of the recommendations in the Report include specific numerical values, such as a minimum two hour response time for a surface water intake. An explicit basis or justification for these numerical values is not always provided. In the case of the recommended response time for a surface water intake, there is no explicit indication in the Report that it was determined in consultation with individuals having considerable operational expertise. Given the major impact that these specific values will have, if incorporated into regulations, it would be appropriate to subject them to review.

The Council recommends the development of robust justification for specific numerical values proposed prior to posting draft regulations.

Licence or Permit system for well construction:

A licence or permit system for well construction may be of value in completing the cycle of health protection, particularly for smaller and private groundwater supplies. It would also augment the work of the local health inspector for small systems. Septic systems must be approved and it seems inconsistent that there is not a similar approach for well construction.

The Council recommends that the Ministry of the Environment investigate and assess the benefits and value of introducing a licence or permit system for well construction.

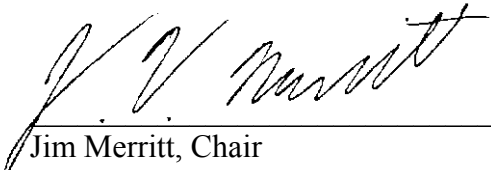
Conclusions:

The proposed drinking water source protection legislation and accompanying regulations will be important components in protecting the health of Ontarians. Source protection measures will, of course, have other important environmental benefits, but the focus in our understanding, is drinking water. The Technical Experts Committee report contains a number of recommendations that should contribute significantly to the provision of safe drinking water in Ontario, and it is reasonable to expect that the Report will form an important basis for the legislation and regulations that will be developed under the Act. If even a reasonable proportion of the recommendations become part of regulation, the impact for the provision of safe drinking water in Ontario will be immense. Implementation of the regulations, while providing important benefits, will likely involve large expenditures and commitments of time and influence in a substantial way the provision of safe drinking water in the province for decades to come.

Given its mandate to provide advice to you regarding drinking water quality issues in Ontario, the Council has considered this Report, and source protection in general, from the broader perspective of the five barriers mentioned above required to provide safe drinking water. This advice is intended to add to the advice you have already received from the Technical experts Committee. It is the Council's view that consideration of the multi-barrier approach and a risk-based approach is necessary to ensure that the proposed measures for source protection will contribute optimally to maximizing the safety of drinking water for Ontarians.

Given the importance of the issue of safe drinking water, and the potentially massive expenditures and effort recommended for source protection, the Council concluded that it should be engaged with this matter. As a first step in its contribution to improved source protection, the Council is providing you these comments and recommendations.

Sincerely,



Jim Merritt, Chair
Advisory Council on Drinking Water
Quality and Testing Standards

Attachment: Appendix A:

*Suggested Terms of Reference for an Assessment to Quantify the Public Health Benefits
(Reduction in Public Health Risk) Expected to Arise from the Introduction of Drinking Water
Source Protection Legislation and Regulations*

Appendix A

Suggested Terms of Reference for an Assessment to Quantify the Public Health Benefits (Reduction in Public Health Risk) Expected to Arise from the Introduction of Drinking Water Source Protection Legislation and Regulations

The development of effective source protection regulations requires that their benefits be quantified as explicitly as possible. This is important because of the potentially massive expenditures and effort involved over a long period of time. In particular, it is important that the overall ability of drinking water systems (i.e. incorporating the five barriers) to provide a given public health benefit (i.e. reduced level of risk) be considered. Otherwise, substantial public resources (as recommended in the Implementation Committee's Report) may be allocated to public health protection in a non-optimal manner. Resources for source protection will, in all probability, compete with resources required for other needs such as treatment plant upgrades, operator training, improved monitoring, distribution system renewal, as well as other public health priorities.

Communication is also an important component of such an investigation, both to the public and to various involved disciplines, of the health benefits (reduction in risk) to be expected from different types of source protection activities, and the role of source protection within the context of the multi-barrier approach. The Council feels that the ultimate implementation of effective source protection policies will be better facilitated via more detailed public and professional discussion of the role of source protection in the provision of safe drinking water.

Although various methods could be used to better quantify the expected risk reduction provided by source protection, one approach would be to consider, in detail, a series of representative scenarios and their risks (i.e. hazards coupled with consequences). Such scenarios could include:

- A groundwater source with a nitrate concentration approaching the regulatory limit
- A groundwater source threatened by volatile organic compounds
- A groundwater source under the influence of surface water with intensive livestock operations nearby
- An acute microbial contamination of a small surface water supply using a river as its source
- An acute microbial contamination of a large surface water supply using a river as its source
- A Great Lakes supply whose intake is periodically influenced by storm sewers and combined sewer overflows
- A First Nations community with a lake or river surface supply

- A pristine supply for a small community, where it is desired to minimize future treatment needs because of limited availability of skilled operators
- A regional groundwater supply that may be reaching capacity limitations, forcing the consideration of much more expensive alternatives.

Detailed consideration of the complete multi-barrier approach for scenarios such as these, including the estimation of costs, within the context of a rigorously applied risk identification and management framework, should provide important guidance for the setting of source protection priorities and the development of detailed regulations, which will have specific numerical values. One outcome of the study could be a hazard / outcome (i.e. risk) matrix that would provide a defined basis for priority setting.

Such a study, including the important communication component, would cost at least several hundred thousand dollars. However, it will provide excellent value in the development of regulations that, over several decades, can be expected to result in expenditures of several billion dollars. The MOE might wish to conduct the study itself, or have it done by others.

The Council would be more than pleased to work with the MOE in developing the terms of reference for such a study, and in participating with Ministry staff in a general steering role for the conduct of the investigation.

A3 Advice on Bill 43, the Clean Water Act

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March 31, 2006

The Honourable Laurel Broten
Minister of the Environment
135 St. Clair Avenue West, 12th Floor
Toronto, Ontario M4V 1P5

Dear Ms. Broten:

**Re: The Advisory Council on Drinking Water Quality and Testing Standards'
Observations and Recommendations on Bill 43, The Clean Water Act**

The Council has been actively engaged in reviewing and commenting on the Ministry of the Environment's efforts on a Drinking Water Source Protection program, including the ensuing draft *Clean Water Act* (Bill 43) that was posted in December of 2005.

The observations and recommendations offered here apply specifically to the content of the Bill in its current form after 1st Reading. The Council is also reviewing other related documents such as proposed regulations and the guidance modules, and will provide advice on these separately. The Council will also stay engaged to monitor the ongoing developments related to the progress of Bill 43.

The content of the Bill represents a significant improvement over the early draft version that was released for comment in June, 2004, and is generally consistent with the advice previously provided by the Council in November, 2005. These improvements include:

- o encouraging a strong working partnership between municipalities and conservation authorities;
 - o focusing on the safety of drinking water. Sources of drinking water are targeted through the identification of specific protection areas and activities within those areas that could threaten the safety of drinking water;
 - o identifying clearly the responsibilities of the parties (the province, municipalities, conservation authorities and activity owners);
-

- o protecting the safety of drinking water. Drinking water prevails over other legislative requirements;
- o acknowledging that surface water sources and ground water sources should be given equal consideration and attention; and
- o permitting portions of the Great Lakes to be considered in the development of protection plans, while recognizing Great Lakes agreement requirements.

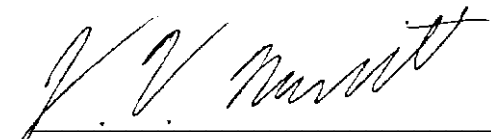
While it is clear that Bill 43 has recognized the comments and concerns of many stakeholders and interested parties, the Council feels there may be some areas that still require some clarification and focus:

- o The concept of risk is a very important feature of the work to be undertaken under the terms of the Bill. The assessment of risk occurs at two stages: during the preparation of the assessment reports and; when specific regulated activities are assessed. Proper and appropriate assessment of risk will be key to the successful protection of drinking water. The science of risk management and risk assessment is well developed and uses standardized definitions. “Risk” and “risk assessment” need to be better defined in the definitions section of the Bill taking into account standardized usage.
- o The concept of the “multi-barrier” approach was a principal feature of the Part 2 Report of the Walkerton Inquiry, and this should be recognized. Section 13 of Bill 43 sets out the contents of the assessment reports; this would be an ideal place to include an appraisal of the “barriers” to ensure that the source protection plans will maximize the use of resources in the provision of safe drinking water. The Council’s advice of November 2005 presented an overview of how the features of the “multi-barrier” approach are combined to achieve safe drinking water.
- o In relation to the two previous points, the “endpoint”, or what the legislation is expected to achieve, should be defined as clearly as possible. In some situations the "endpoint" may be ensuring an adequate quantity of water of suitable quality on an ongoing basis. In most situations however, the “endpoint” of the legislation and the accompanying regulations is to improve the protection of public health, as it may be impacted by drinking water quality. There should be a requirement that activities undertaken under the legislation be clearly and as quantitatively as possible linked to impacting either or both of these endpoints (i.e. quantifying the reduction in risk relating to the expected public health benefit). This will assist greatly in focusing the complex and potentially costly measures that will be implemented as a result of this legislation.
- o The Bill makes reference to establishing standards for “raw water supplies” and that such standards would be prescribed by regulation. The Council advises that there should be no such standards so as to not artificially direct the use of limited resources. The “multi-barrier” assessment is the best tool for determining how resources (including financial) should be allocated to each of the barriers to achieve the best drinking water quality.

The Council feels that consideration of its comments on Bill 43 represents continuous improvement in the quality of drinking water for Ontarians, through the establishment of a sound Act, underpinned by sound regulations and guidance documentation.

If you would like to discuss the advice offered here, Council representatives would be pleased to meet with you, your staff, or Ministry staff, to further explain the rationale and approach used in formulating this recommendation.

Sincerely,



Jim Merritt, Chair
Advisory Council on Drinking Water
Quality and Testing Standards

A4 Advice on the Drinking Water Quality Management Standard

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March 31, 2006

The Honourable Laurel Broten
Minister of the Environment
135 St. Clair Avenue West, 12th Floor
Toronto, Ontario M4V 1P5

Dear Ms. Broten:

**Re: The Advisory Council on Drinking Water Quality and Testing Standards'
Review and Recommendations on the proposed
Drinking Water Quality Management Standard**

As part of its broader mandate to review issues related to drinking water, the Council has undertaken a review of the draft Drinking Water Quality Management Standard (DWQMS) that was recently posted on the Environmental Registry.

In formulating its observations and recommendations on the draft DWQMS, the Council reviewed:

- Environmental Bill of Rights documentation,
- Pertinent sections of the *Safe Drinking Water Act, 2002*,
- Chapter 11 of the Part Two Report of the Walkerton Inquiry,
- The Report of the Water Strategy Expert Panel (Watertight),
- ISO standards,
- Comments from water associations in Ontario, and
- Presentations by Ministry of the Environment staff

To this end, the Council offers the following observations:

Chapter 11 of the Part Two Report of the Walkerton Inquiry recommended the need for Ontario to have a standard for the management of municipal drinking water systems, and the *Safe Drinking Water Act, 2002* incorporated those recommendations, including the requirement for Ontario to develop a quality management standard and the creation of an Accreditation Body to oversee that all Operating Agencies meet the requirements of the standard.

Chapter 11 identified two distinct management entities that were both to be addressed and managed by a comprehensive Quality Management Standard:

- Corporate Management; and
 - Operational Management
- Corporate Management:
It was recognized that both municipal and private organizations often operated a number of separate drinking water systems. These organizations were referred to as “Operating Authorities” in order to distinguish them from the owner of water systems and the staff and management that operated an individual drinking water system (either a treatment plant or a water distribution system). Corporate Management of an operating agency was deemed to be responsible for an entire water supply system or network of systems. The concern was that the operating agency, including its board of directors and senior management, understand their responsibilities and be capable of managing a large and complex organization in order to provide safe drinking water. This concern was derived directly from the Walkerton tragedy where questions were raised about the role and capability of the board and management of the water system.
 - Operational Management:
The actual operation of a water system was deemed equally important. The focus here was to be on the development of an Operational Plan for each system. The Operational Plan would be kept current and describe how the system would be operated and maintained to ensure that safe drinking water was provided to the public. The plan would be unique to each system but would also cover a mandatory number of aspects such as emergency response.

In order to provide more clarity and better focus, the Council makes the following recommendations, to be considered for implementation in the final DWQMS:

1. The proposed DWQMS appears to be more oriented and focused on the Operational Management and the Operational Plan, rather than Corporate Management. Operational Management is well developed and covers and provides a sound approach for the preparation of the plans and subsequent monitoring and reporting. In the current version of the DWQMS, Corporate Management does not appear to play a significant role until the third step (Step 3 - CHECK).

The Council recommends that the DWQMS should more clearly define and distinguish the roles and responsibilities between the Operating Authority and a system’s Operational Management.

The Council recommends that the DWQMS provide greater direction for Corporate Management and address it prior to the third step (Step 3 – CHECK).

2. The DWQMS does not clearly articulate the role of the Board of Directors and / or the Senior Management Team and their responsibilities for managing a complex organization.

The Council recommends that the DWQMS include corporate management roles and responsibilities including, but not limited to:

- ***The organization’s policies, objectives and commitment to providing safe drinking water and meeting their legislative “Standard of Care” responsibility (Safe Drinking Water Act, 2002, Section 19).***
- ***The role of the Board of Directors, CEO, CAO, officers and senior managers,***
- ***Monitoring and reporting to the owner (See Schedule 22 of Reg. 170 “Summary Report for Municipalities”),***
- ***Confirmation of emergency preparedness and response plans including public notification,***
- ***Mechanisms to ensure and maintain skills and knowledge of operational staff,***
- ***Their relationship to the Operational Plans for individual systems,***
- ***Public communications, community relations, consumer feedback***
- ***Processes to ensure that senior managers are informed, corrective actions are taken, and requirements met, and***
- ***The corporate financial plan***

3. The Report of the Water Strategy Expert Panel (Watertight) makes recommendations concerning the organization of “Operating Authorities” and the scale of such organizations.

The Council recommends that the degree to which Ontario may adopt Watertight’s recommendations may need to be considered in future revisions of the DWQMS.

4. There could be a need for clarification in the use of the terms “Accreditation” and “Certification”. These terms have established usages by various accreditation organizations, such as the International Standards Organization (ISO). The Ministry should endeavor to follow this established usage and reference should also be made to the legislative requirement to establish or identify an accreditation body.

The Council recommends that the DWQMS follow established and recognized usage for the terms “Accreditation” and “Certification”, and reference the legislative requirement to establish an accreditation body.

5. The Multi-Barrier Approach was a key component of the Walkerton Inquiry recommendations, but it does not appear to be mentioned in the DWQMS.

The Council recommends that the DWQMS incorporate the Multi-Barrier Approach, as outlined in Chapter 3 of the Part Two Report of the Walkerton Inquiry

6. The DWQMS seems to include more elements that are reactionary rather than proactive. Precautionary elements could include a regular assessment of risks and vulnerabilities, development of a security plan, and the review and assessment of operations data to optimize operations on a continuing basis.

The Council recommends that the DWQMS incorporate more precautionary elements in order to shift towards a proactive approach to the delivery of safe drinking water.

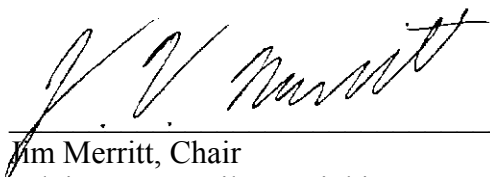
7. The description of the DWQMS' Operational Plan appears to consist only of a "general functional description of the operations" (See Section 1.15)

The Council recommends that the DWQMS include a detailed understanding of treatment processes, control, and monitoring technology, to determine how a plant actually functions. A detailed process map should be one of the Key Outputs, in addition to those listed in Section 1.17 of the draft DWQMS.

It is important that the DWQMS proceed to implementation and not be delayed as a result of the ongoing development of the *Clean Water Act*, the *Sustainable Water and Sewage Systems Act*, and their ensuing regulations.

The Council feels that if its recommendations presented here are implemented, it will promote continuous improvement in the effective, efficient, and safe delivery of quality drinking water to Ontarians.

Sincerely,



Jim Merritt, Chair
Advisory Council on Drinking Water
Quality and Testing Standards

A5 Advice on the Treatment of Surface Water Supplies

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April 10, 2006

The Honourable Laurel C. Broten
Minister of the Environment
135 St. Clair Avenue West, 12th Floor
Toronto, Ontario M4V 1P5

Dear Ms. Broten:

**Re: Advice on the Treatment of Surface Water Used for Private Drinking Water
Supplies**

Since its inception, the Council has worked on several issues relating to the need to treat drinking water derived from surface water sources. In fact, the Council, in Recommendation #13 of its “*Report and Advice on Ontario Regulation 170/03 Smaller Private Systems Review and Recommendations*” recommended that “...all surface water source drinking water systems should require some form of treatment...”. This recommendation related specifically to systems covered under Regulation 170.

The issue of treating surface water also arose during the Council’s deliberation on Regulation 903, which currently requires that all wells, including wells that are directly under the influence of surface water (GUDI), be able to produce potable water, when they are to be used as a source of water for human consumption.

In this light, it has come to the Council’s attention that private and other unregulated systems that use surface water as their source for drinking water are the *only* category of system to have *no* regulatory requirements for installation, treatment, or the provision of potable water.

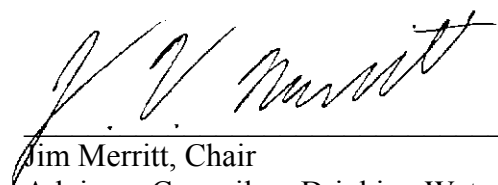
The Council recommends that all new buildings that rely on a surface water supply for drinking water purposes, and that are not subject to Reg. 170, Reg. 252, or the ensuing regulation(s) under the Health Protection and Promotion Act, should also install, use and maintain an adequate treatment system

The Council makes this recommendation because it deems untreated surface water to be inherently unsafe for use as drinking water, due to the highly variable and highly vulnerable nature of the source. Untreated surface water poses a potential risk to human health and requiring treatment on these types of installations will have likely human health benefits.

Public consultation is strongly suggested to determine the best manner in which to administer “adequate treatment” requirements for private surface water supply installations, since the range of options could vary considerably.

If you would like to discuss the advice offered here, Council representatives would be pleased to meet with you, your staff, or Ministry staff, to further explain the rationale and approach used in formulating this recommendation.

Sincerely,

A handwritten signature in black ink, appearing to read "J. V. Merritt", is written over a horizontal line.

Jim Merritt, Chair
Advisory Council on Drinking Water
Quality and Testing Standards

A6 Definitions and Uses of Chlorine-Related Terminologies

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April 10, 2006

The Honourable Laurel C. Broten
Minister of the Environment
135 St. Clair Avenue West, 12th Floor
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Dear Ms. Broten:

Re: Advice on the Definitions and the Use of Terminology for Chlorine, Chlorination, and Chlorine Residuals

Subsequent to our advice to you on the “*Procedure for Disinfection of Drinking Water in Ontario*” (Disinfection Procedure), the Council has become aware that the definitions and terminology used for chlorine, chlorination, free chlorine residual, combined chlorine residual, and total chlorine residual, as found in the Disinfection Procedure, Reg. 903, and Reg. 170, have not been applied consistently.

The Council also reviewed definitions and use of terminology for chlorine residuals from the American Water Works Association (AWWA) and the Canadian Environmental Law Association (CELA).

It was determined that, for the purposes of working definitions and terminology use for the Ministry of the Environment, the AWWA definitions are most appropriate, as they make clear distinctions between the various types of chlorine and their analytical measurement techniques, and are widely adopted in the drinking water industry.

The Council recommends that the Ministry of the Environment use, as a guide, the current AWWA definitions for free available chlorine, combined available chlorine, and total chlorine residual. These definitions should be part of the Disinfection Procedure, which should in turn, be referenced by Reg. 170 and Reg. 903, as well as any other Ministry document.

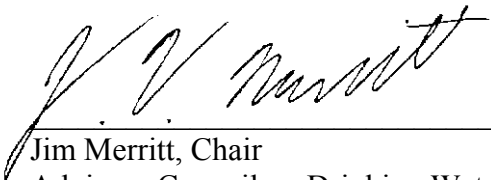
It should be noted that a descriptions of free chlorine residual and combined chlorine residual, as they appear in both Reg. 170 and the Disinfection Procedure, are synonymous with the AWWA definitions for free available chlorine and combined available chlorine, respectively. *See the attached Table 1 for more details.*

As well, in order to be consistent, Reg. 903 should use the terms “free chlorine residual” and “free chlorine residual disinfection”, instead of “chlorine” and “chlorination”.

The Council feels that its recommendation on the definitions and application of terms relating to chlorine will help to ensure consistency and clarity amongst all Ministry of the Environment regulations and documentation.

If you would like to discuss the advice offered here, Council representatives would be pleased to meet with you, your staff, or Ministry staff, to further explain the rationale and approach used in formulating this recommendation.

Sincerely,



Jim Merritt, Chair
Advisory Council on Drinking Water
Quality and Testing Standards

Attachment: Table 1: Chlorine Residual Use of Terminology and Application

Table 1: Chlorine Residual Use of Terminology and Application

Reg. 170 Terminology	Reg. 903 Terminology	Disinfection Procedure Terminology	AWWA Definition	Council's Advice / Caveat(s)
total chlorine residual	N/A	total chlorine residual	total chlorine residual: The total amount of chlorine residual present after a given contact time in a water sample, regardless of the type of chlorine. <i>See also</i> residual chlorine; total chlorine.	Use AWWA definition as a guide
free chlorine residual	chlorine	free chlorine residual	free available chlorine: The amount of chlorine available as dissolved gas (Cl ₂), hypochlorous acid (HOCl), and hypochlorite ion (OCl ⁻), that is not combined with ammonia (NH ₃) or other compounds in water. <i>See also</i> hypochlorite ion; hypochlorous acid.	Use AWWA definition as a guide with the caveat that free chlorine residual is synonymous with free available chlorine
combined chlorine residual	N/A	combined chlorine residual	combined available chlorine: The total chlorine, present as chloramine or other derivatives, that is present in a water and still available for disinfection and for oxidation of organic matter. The combined chlorine compounds are more stable than free chlorine forms, but they are somewhat slower in action. <i>See also</i> chloramines.	Use AWWA definition as a guide with the caveat that combined chlorine residual is synonymous with combined available chlorine

N/A = Not Applicable

A7 Advice on Total Coliform Corrective Actions

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June 1, 2006

The Honourable Laurel C. Broten
Minister of the Environment
135 St. Clair Avenue West, 12th Floor
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Dear Ms. Broten:

Re: Advice on Ontario's Total Coliform Standard and Positive Result Corrective Actions

After the Council's review of the Drinking-Water Systems Regulation (O. Reg. 170/03) in 2004, the Council continued to hear from stakeholders concerned that the Total Coliform Standard was too stringent, or had been changed to be more stringent.

It is therefore believed that there is some confusion around the numerical Standard versus the level for which Corrective Actions are taken, and by whom.

The fact is that the *only* Standard for Total Coliforms in Ontario is "Not Detectable", as prescribed, since 2003, in the Ontario Drinking-Water Quality Standards Regulation (O. Reg. 169/03). Previously, O. Reg. 459/00 identified any detection of coliform bacteria in drinking water as an indicator of adverse water quality. Prior to that, there was a Drinking Water Quality Objective for Total Coliforms, which was also "Not detectable".

The Council recommends that the Ministry of the Environment reinforce that the Total Coliform Standard in Ontario is "Not Detectable".

Corrective Actions are either prescribed by regulation under the *Safe Drinking Water Act*, or administered by Public Health Inspectors, under the *Health Protection and Promotion Act*.

Under the *Safe Drinking Water Act*, both the Drinking-Water Systems Regulation (O. Reg. 170/03) and the Non-Residential and Non-Municipal Seasonal Residential Systems That Do Not Serve The Public Regulation (O. Reg. 252/05) prescribe Corrective Actions to be taken when *any* positive Total Coliform results are discovered.

It is understood by the Council that a new Regulation, replacing O. Reg 252/05, is being developed for promulgation under the *Health Protection and Promotion Act*. At that time, Total Coliform Corrective Actions will be determined by Public Health Inspectors, using a mandatory Risk-Based Site-Specific Assessment for all subject facilities.

Private systems and systems that do not serve the public are currently unregulated. However, Total Coliform Corrective Actions (*and their trigger level*) may be recommended by Public Health Inspectors, and could also be subject to a Risk-Based Site-Specific process in the future.

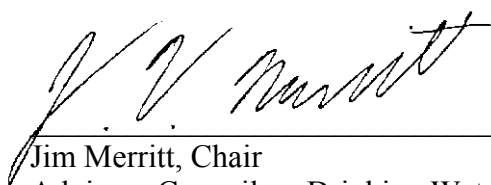
The Council has noted, however, that some representatives of both Ontario's Public Health Units and Health Canada have historically offered *direct* advice on Total Coliform Corrective Actions at trigger levels that exceed Ontario's Standard.

Total Coliforms include a large number of non-disease-causing bacteria arising from soil and vegetation. Their presence, as long as no *E. coli* is detected, indicates system vulnerability and a potential pathway for pathogens, but does not necessarily require immediate implementation of Corrective Actions such as Boil Water Advisories or the use of alternative drinking water sources. However, the Council believes that investigation into the cause(s) of the presence of Total Coliforms should be undertaken by Public Health Inspectors, as part of a Risk-Based Site-Specific Assessment process.

The Council recommends that, for systems to be regulated under the Small Drinking Water Systems Program, and for other unregulated (private) water systems, the trigger for Total Coliform Corrective Actions, in the absence of E. coli, should continue to be the provincial Standard, and that Corrective Actions should be determined using a risk-based site-specific approach, as detailed in the attached Table 1

If you would like to discuss the advice offered here, Council representatives would be pleased to meet with you, your staff, or Ministry staff, to further explain the rationale and approach used in formulating these recommendations.

Sincerely,



Jim Merritt, Chair
Advisory Council on Drinking Water
Quality and Testing Standards

Attachment: Table 1: Recommended Corrective Actions for Positive Total Coliform Results for *Small Drinking Water Systems Program* Systems and Unregulated Private Systems

Table 1: Recommended Corrective Actions for Positive Total Coliform Results for Small Drinking Water Systems Program Systems and Unregulated (Private) Systems

Program / Regulation / Jurisdiction	Classes / Types of System	Corrective Actions for: • Treated Groundwater • Treated GUDI* • Treated Surface Water • Untreated Groundwater	Corrective Actions for: • Untreated Surface Water • Untreated GUDI*
Small Drinking Water Systems Program / Pending MOHLTC Regulation / Public Health Units (Mandatory program under the <i>Health Protection and Promotion Act</i>)	• Large Municipal Non-Residential • Small Municipal Non-Residential • Non-Municipal Seasonal Residential • Large Non-Municipal Non-Residential • Small Non-Municipal Non-Residential	• Retest and notify local Public Health Unit • If positive results confirmed, further testing and actions to be determined by a Risk-Based Site-Specific Assessment by a Public Health Inspector	• The Council recommends that all untreated surface water sources (including GUDI wells) should use some form of treatment, to be determined by a Public Health Inspector using a Risk-Based Site-Specific Assessment
Voluntary program / Unregulated (Private) Systems / Public Health Units	• Private residential systems with 5 or less connections, or other private systems	• Retest • If confirmed, contact the local Public Health Unit for further testing and actions to be recommended by a Public Health Inspector	• The Council recommends that all new unregulated (private) systems “<i>Install, use and maintain an adequate treatment system</i>”** • The Public Health Inspector may recommend treatment, depending on site-specific conditions

* GUDI: Groundwater Under the Direct Influence of surface water

** See the Council’s “*Advice on the Treatment of Surface Water Used for Private Drinking Water Supplies*” Advice Letter of April 10, 2006 to the Minister of the Environment

A8 Advice on a New Guideline for Total Haloacetic Acids (HAAs)

Advisory Council on Drinking Water Quality and Testing Standards

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July 27, 2006

The Honourable Laurel C. Broten
Minister of the Environment
135 St. Clair Avenue West, 12th Floor
Toronto, Ontario M4V 1P5

Dear Ms. Broten:

Re: Guideline for Canadian Drinking Water Quality for Haloacetic Acids (HAAs) and Adoption as an Ontario Drinking Water Quality Standard

Part of the Advisory Council on Drinking Water Quality and Testing Standards' mandate is to provide you with advice on proposed drinking water standards and their applicability in Ontario.

In order to provide comprehensive advice on these standards, the Council reviews Health Canada's Documents for Public Comment, Guideline Technical Documents, comments from public consultations, and information on the occurrence and impact that a particular substance is likely to have on the delivery of safe drinking water in Ontario.

As a result of this review, the Council may recommend endorsement of a Guideline for Canadian Drinking Water Quality (GCDWQ) as an Ontario Drinking Water Quality Standard (ODWQS), or consider a more stringent standard for Ontario, where appropriate, and may conduct independent consultations with stakeholders and technical experts as deemed necessary to recommend a standard.

Health Canada, through the Federal-Provincial-Territorial process, intends to proceed to public consultation with a proposed new Guideline for Canadian Drinking Water Quality for total haloacetic acids (HAAs) in drinking water at a Maximum Acceptable Concentration of 0.08 mg/L (80 µg/L), rather than developing Guidelines for each separate haloacetic acid.

The Council has not previously provided formal advice on a proposed GCDWQ until the public consultation process was complete. However, in this instance, the Council has identified some early concerns and feels that providing comments at this time will permit Ontario to bring these concerns to the attention of those involved in the national GCDWQ-setting process.

In reviewing the Document for Public Comment for HAAs in drinking water, the Council noted that, from a health benefit perspective, the science supported a more stringent GCDWQ than is being proposed by Health Canada. This identified health level would be 0.01 mg/L, based on an “essentially negligible” cancer risk for Dichloroacetic Acid (which is a component of total HAAs for the purposes of the proposed GCDWQ).

The national process is recommending a less stringent GCDWQ because it has concluded that the 0.01 mg/L level “*cannot be achieved without compromising the effectiveness of disinfection.*” The proposed GCDWQ uses a risk management approach, resulting from the application of a cost-benefit analysis, based on the capabilities of current treatment systems. The Council, however, feels that the Document does not make a strong enough case for the proposed GCDWQ to be based on the limits of current treatment methods.

The council notes that the limited scope of the review of water treatment approaches and technology in the Document is not sufficient to conclude that the improvement of treatment approaches could not reduce HAA formation without compromising disinfection. For example, only 3 of approximately 240 citations in the Document concern treatment technologies to minimize HAA formation. The United States Environmental Protection Agency (USEPA) has published a lot of work in this area and, even though these documents may not necessarily serve as primary references, they should be considered in assessing treatment capabilities and limitations.

It was of concern to the Council that pre-cursor removal, emphasized by the USEPA as a means of controlling the formation of disinfection by-products (including HAAs), is not addressed in the Document in adequate detail. The Document notes that HAAs are difficult to remove once formed and that the best approach to limiting HAAs in finished drinking water is to prevent their formation, through removal of organic precursors from the source water. These preventative treatment technologies need to be considered in greater detail.

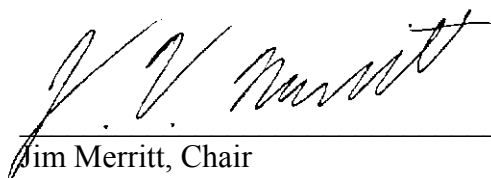
The Council also noted that Dichloroacetic Acid may be present in a high enough concentration to constitute a possible health risk, *without* leading to an exceedance of the proposed GCDWQ.

The Document appears to consider HAAs in isolation of other Disinfection By-Products, such as Trihalomethanes (THMs), as well as the concept of simultaneous compliance with criteria for both disinfection and Disinfection By-Products. The Council has previously recognized the importance of this concept in its Advice Letter to the Minister on the “*Procedure for Disinfection of Drinking Water in Ontario*”, dated September 20, 2005. Determination of the cost for Ontario systems to comply with a new HAA standard should simultaneously consider compliance with disinfection and Disinfection By-Products requirements, as well as the application of Best Management Practices and optimization efforts.

The Council also supports locational sampling, based on sites that are likely to produce the highest levels of HAAs in the distribution system. It is important to note that these locations may not necessarily be the same as those at which THMs are monitored. A good description of locational sampling to simultaneously address HAAs and other Disinfection By-Products is presented by the USEPA's *Stage 2 Disinfectants and Disinfection Byproducts Rule*.

To this end, the Council may favour an ODWQS for HAAs that is more stringent than the proposed GCDWQ. By considering the above comments at this early stage, Ontario will be in a better position to advance its commitment to maintain up-to-date, science-based ODWQS, ensuring the ongoing protection of drinking water quality in this province.

Sincerely,

A handwritten signature in black ink, appearing to read "J. V. Merritt", is written over a horizontal line.

Jim Merritt, Chair
Advisory Council on Drinking Water
Quality and Testing Standards

A9 Advice on a New Methyl tertiary-butyl ether (MTBE) Guideline

Advisory Council on Drinking Water Quality and Testing Standards

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July 27, 2006

The Honourable Laurel C. Broten
Minister of the Environment
135 St. Clair Avenue West, 12th Floor
Toronto, Ontario M4V 1P5

Dear Ms. Broten:

Re: Endorsement of the Guideline for Canadian Drinking Water Quality for MTBE, and adoption as an Aesthetic Objective in Ontario

Part of the Advisory Council on Drinking Water Quality and Testing Standards' mandate is to provide you with advice on proposed drinking water standards, objectives, and guidelines, and their applicability in Ontario.

In order to provide you comprehensive advice, the Council reviews Health Canada's Document for Public Comment, Guideline Technical Document, comments from the public consultation process, and information on the occurrence and impact that a particular substance will have on the delivery of safe drinking water in Ontario.

As a result of this review, the Council may recommend endorsement of a Guideline for Canadian Drinking Water Quality as an Ontario Drinking Water Quality Standard, Objective, or Guideline, or consider a more stringent value for Ontario, where appropriate.

Health Canada, through the Federal-Provincial-Territorial process has proposed a new Guideline for Canadian Drinking Water Quality for Methyl tertiary-butyl ether (MTBE) in drinking water as an aesthetic objective (AO) of 0.015 mg/L (15 µg/L). The Guideline has been approved by both the Committee on Drinking Water (CDW), and the Committee on Health and the Environment (CHE).

This AO is based on MTBE's odour threshold, since it was concluded that the odour of MTBE would make drinking water unacceptable to consumers at concentrations lower than those that may pose a health risk.

The Council recommends that the Ministry of the Environment endorse the new Guideline for Canadian Drinking Water Quality for Methyl *tertiary*-butyl ether (MTBE) in drinking water, as an aesthetic objective (AO) of 0.015 mg/L (15 µg/L), as approved by both the CDW and the CHE, and adopt it as an Aesthetic Objective in Ontario, through inclusion in the *“Technical Support Document for Ontario Drinking Water Standards, Objectives, and Guidelines”*

The Council feels that its recommendation on MTBE represents continuous improvement in the quality of drinking water for Ontarians, through the production of drinking water that is aesthetically acceptable to consumers, while discouraging the use of unregulated water sources.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jim Merritt', is written over a horizontal line.

Jim Merritt, Chair
Advisory Council on Drinking Water
Quality and Testing Standards

A10 Advice on Corrosion Control / Lead Reduction

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Ontario

**Advisory Council on Drinking Water
Quality and Testing Standards**

**Le Conseil consultatif sur les normes
de qualité et d'analyse de l'eau
potable**

May 31, 2007

The Honourable Laurel C. Broten
Minister of the Environment
135 St. Clair Avenue West, 12th Floor
Toronto, Ontario M4V 1P5

Dear Ms. Broten:

Re: Request for Advice on Early Implementation of Corrosion Control in Ontario and Review of Health Canada's Document for Public Comment entitled "Corrosion Control in Drinking Water Distribution Systems"

In your letter of April 24, 2007, you formally requested the Council to undertake a review of Health Canada's Document for Public Comment entitled "Corrosion Control in Drinking Water Distribution Systems", with a view towards:

- Early implementation of corrosion control in Ontario to reduce lead at the consumer's tap, and;
- Advice that Ontario should provide to the Federal Government on the "Corrosion Control in Drinking Water Distribution Systems" Document.

The Council responded to you on April 30, 2007, with an estimate of the timelines that it felt it could execute, balancing urgency with the need for the Council to carefully deliberate on this matter.

The Council's review approach consisted of:

- Forming a Working Group in order to collect relative information and undertake an assessment of the "Corrosion Control in Drinking Water Distribution Systems" Document
 - Holding a one-day workshop on May 16, 2007, with four experts in the field of lead corrosion and lead in drinking water. Ministry of the Environment and Ministry of Health and Long-Term Care officials also attended and participated as advisors
-

The experts were as follows:

- o Dr. Marc Edwards, Virginia Tech
 - o Ian Douglas, Health Canada / City of Ottawa
 - o France Lemieux, Health Canada
 - o Dr. Michèle Prévost, École Polytechnique de Montréal
- Considering the recent information and work underway with respect to lead in drinking water in the City of London
 - Presenting the Working Group's assessment and preliminary findings to the full Council on May 25, 2007, in order to take advantage of the Members' direct experience and knowledge
 - Finalizing the advice, taking into account input from all of the above-noted sources

The attached summary highlights the assessment and conclusions of the Council's review and notes specific recommendations, focusing on providing you with advice that can be implemented in Ontario ahead of the adoption of the Health Canada's "Corrosion Control in Drinking Water Distribution Systems" Document. In considering this advice, there are still many specific details to be considered by the Ministry of the Environment, particularly with respect to corrosion control measures and monitoring programs.

I would be pleased to meet with you or your staff to answer any questions regarding the Council's current advice on the issue of corrosion control.

The Council will continue to review the "Corrosion Control in Drinking Water Distribution Systems" Document as it moves through the public comment period, with a view towards potentially providing you with further advice at a later date.

Sincerely,



Jim Merritt, Chair
Advisory Council on Drinking Water
Quality and Testing Standards

Attachment1: *Summary of ODWAC Review of Drinking Water Corrosion Control Measures and Lead Reduction*

Attachment 1:

Summary of ODWAC Review of Drinking Water Corrosion Control Measures and Lead Reduction

Introduction:

A Document for Public Comment entitled “Corrosion Control in Drinking Water Distribution Systems” was posted for a 3-month public comment period by Health Canada on April 20, 2007. The Ontario Ministry of the Environment subsequently posted this Document on the Environmental Registry for public comment. Both comment periods end on July 20, 2007.

The Document’s objective is to reduce lead leaching in distribution systems and household plumbing, for the betterment of human health, with the added benefit of infrastructure protection (e.g. reduced pipe corrosion).

The Minister of the Environment asked the Advisory Council on Drinking Water Quality and Testing Standards to review this Document in order to provide early advice as to what Ontario could implement as well as what comments Ontario should provide to the Federal government.

Lead is unique amongst drinking water contaminants in that it is hard to predict or profile and problems can be very site-specific. This is due, in part, to the different behaviours of the different forms of lead (dissolved, particulate, chemical compounds), and the varying chemistry of drinking water from system to system.

Health Canada is currently reviewing its blood-lead intervention level of 10 µg/DL. Following that, they will reassess the Guideline for Canadian Drinking Water Quality for lead, which is 10 µg/L. There is world-wide convergence that 10 µg/L in drinking water is the currently accepted maximum value for the protection of human health (based on the most sensitive population subset: children under 6 years of age and pregnant women).

It should also be noted that lead in drinking water is becoming a proportionately higher source of exposure due to the success of other lead-reduction programs over the past few decades. (gasoline, paint, etc.)

The “Corrosion Control in Drinking Water Distribution Systems” Document provides a good summary of lead health risks and exposure factors. In undertaking its review, the Council had access to the extensive material available through the USEPA. As well, the Council had direct contact with experts in the field of corrosion control and lead contamination of tap water.

Observations and Findings:

The distribution water from Ontario's municipal drinking water treatment plants is safe, in regards to lead levels. The chemical characteristics, however, of treated water can lead to the dissolution of lead in the water from the Lead Service Lines leading up to homes and in the household plumbing.

Treated municipal drinking water in Ontario has been found to meet the Ontario's Lead Standard. However, drinking water at household taps may exceed the Ontario Standard. The lead in drinking water can come from 3 sources:

- Municipally owned Lead Service Lines in the distribution system and / or the privately owned Lead Service Lines leading into the home (many municipalities have a program for the replacement of Lead Service Lines)
- Lead in solder used to connect copper plumbing pipes in homes
- Lead in brass fixtures in homes

It is generally agreed that Lead Service Lines (both the municipal and private sections) are the most common source of lead problems for homeowners. The chemical characteristics of the water reaching a home can result in the leaching of lead, but adjustment of pH and alkalinity at the treatment plant can make water less corrosive. Long-term corrosion control programs take time to assess, develop, and implement, so interim measures may need to be put in place to protect home owners.

From a cost-benefit perspective, system-wide corrosion control programs have been demonstrated to be beneficial, not only from the perspective of protecting and prolonging the life of expensive infrastructure and household plumbing, but also for reducing human exposure to lead and possibly some other contaminants, resulting in continuous improvement to the quality of drinking water in Ontario.

Changes to the water chemistry to make distribution system water less corrosive is the most effective method to reduce lead, as it is protective of all 3 sources of lead exposure in drinking water in homes. In most cases, pH and Alkalinity adjustments have markedly decreased household lead levels for the majority of houses over a period of several months.

Current drinking water monitoring programs do not sample at household taps. The current required monitoring of municipal supplies is performed to verify that drinking water meets Ontario's Standards in the distribution system and as delivered to private property (i.e. delivered to the curb stop).

Both Health Canada and the Ministry of the Environment have adopted a "Source-to-Tap" approach for drinking water. Ontario has introduced a number of new requirements to implement the "Source-to-Tap" approach. Extending monitoring to household taps is an important part of completing the approach.

Although much of the focus of the Council's review was on homes, the assessment and our recommendations also apply to schools and other public and private facilities.

Council's Assessment:		
Proposed ODWAC Drinking Water Corrosion Control / Lead Reduction Strategy		
Key Components	Explanation and Details	Recommendations
1. Sampling and Monitoring	The first step is to determine if distributed water has the potential for being corrosive. Generally, distributed water with low pH and low alkalinity will cause corrosion and will require attention first. Sampling protocols are critical. Different methods can result in very different results due to the variable nature of the detection of lead, and the form and location of corrosion. The Council concluded that the sampling protocols would need to be described in detail. Initial assessment should be undertaken to determine the extent of the problem (if any), followed by post treatment change monitoring, and on-going verification. Sampling should be focused on those parts of the system that are likely to have elevated lead levels. Many potential sampling protocols were assessed, and the following issues were considered:	The Council recommends to the Ministry of the Environment that 2 monitoring programs are required: 1. Community Monitoring Program (to identify if lead is in drinking water in homes) (to be sampled from kitchen tap, with strainer / aerator on): i. 5 minute flushing, followed by ii. A 30 minute stagnation period iii. Collect 1st litre (5-6 L/min. flow rate) iv. Collect 2nd litre (5-6 L/min. flow rate) If more than 10% of the sample results exceed the Standard for lead (10 µg/L), then corrosion control measures and the Sentinel Monitoring Program should be initiated simultaneously. For all other exceedances of the 10 µg/L Lead Standard (i.e. 10 % of the sample results or less), Health Canada's proposed Protocol for Lead Sampling 2 should be generally followed. 2. Sentinel Monitoring Program (to measure corrosion control program efficacy) (to be sampled from kitchen tap, with strainer / aerator on, 15-20 homes, approximately every 2 weeks): i. 5 minute flushing, followed by

	• Typical exposure vs. worst-case • Vulnerable populations • Residential vs. non-residential • Customer convenience and flexibility • Aerators / strainers • # of sites • Methods • Follow up for customers • Dissolved vs. total lead • Outliers • Exceedances A consensus emerged that 2 types of monitoring programs are needed: 1. A Community Monitoring Program to adequately identify sources and extent of lead in household plumbing in communities, and; 2. A Sentinel Monitoring Program to evaluate corrosion control measures, when instituted. The Community Monitoring Program described in Health Canada's proposed Protocols adequately meets the need to identify sources and extent of lead in household plumbing in communities. Health Canada's Protocols are a	ii. A 30 minute stagnation period iii. Collect 1st litre, 2nd litre, 3rd litre, 4th litre, 5th litre, 6th litre, 7th litre, and 8th litre (each at 5-6 L/min. flow rate) Where possible, divide samples into 2 fractions: <u>dissolved</u> lead (filtered through 0.45 micron filter cartridge), and <u>total</u> lead. o In addition to lead, the following water quality parameters should include: ▪ Turbidity (on-site) ▪ Chlorine Residual (on-site) ▪ pH (on-site) ▪ Temperature (on-site) ▪ Flow (on-site)
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	useful guide, however, the Council recommends some changes. The Sentinel Monitoring Program is needed to provide a detailed assessment of the cause of corrosion and corrosion control effectiveness, on a sub-set of homes with Lead Service Lines, copper pipes with lead solder, and brass fixtures. Sentinel Monitoring should continue until the effectiveness of the Corrosion Control Program can be confirmed. The Council considered both a 6-hour and 30-minute stagnation period prior to taking samples. Although the 6-hour period would detect greater lead levels, the 30-minute period was deemed to be more practical while still adequately identifying homes with lead problems.	
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2. Corrosion Control	Reducing the corrosivity of drinking water supplied to households is the most important initial step. Therefore, there is an early need to determine if a municipal water supply has the potential to be corrosive. In developing a corrosion control program, the USEPA's "<i>Revised Guidance Manual for Selecting Lead and Copper Control Strategies</i>" (March, 2003) provides useful advice. Ontario's current operational range for the pH of water treatment plant distribution water is 6.5-8.5. Site-specific corrosion control measures may need to extend this range for optimal results. The first trigger to start a corrosion control protocol occurs when more than 10% of the sample results from the Community Monitoring Program exceed the Standard for lead (10 µg/L) Concurrently, the second trigger for corrosion control occurs when the distributed water has a pH below 7.5 or an Alkalinity of < 50 mg/L. The municipality should undertake a review of their system to implement changes as follows: • Assess water chemistry of distributed drinking water for	The Council recommends that the Ministry of the Environment require municipalities to assess their drinking water treatment processes to determine if there is a lead leaching problem within the distribution system, and if so, take corrective actions immediately.
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	the pH and Alkalinity triggers • Implement the Sentinel Monitoring Program • If found to be corrosive, develop an action plan, which also takes into consideration other unintended consequences associated with changing treatment regimes (e.g. disinfection, disinfection by-products) • Implement corrective actions and continue to monitor until corrections are confirmed Other water quality parameters may also be monitored depending on the specific details of the individual corrosion control plan.	
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3. Lead Service Lines	Replacement of Lead Service Lines is the next most effective measure to reduce lead levels at household taps. <i>Part Two Report of the Walkerton Inquiry Recommendation 35 states that “As part of an asset management program, Lead Service Lines should be located and replaced over time with safer materials.”</i> Many municipalities have been replacing Lead Service Lines, but at a pace that may take decades. The USEPA LCR rule recommends that 7% of Lead Service Lines be replaced annually. As well, many homeowners do not take the opportunity to replace their portion of the Lead Service Line, at the time the municipality is replacing their portion. Replacement of the municipal portion of a Lead Service Line is not effective if the private portion is not replaced. Lead levels are likely to be elevated for several months following replacement. The Council heard a number of ideas regarding encouraging homeowners to replace their sections of Lead Service Lines. Other sources of lead in drinking water in homes include: lead-based solder and plumbing fixtures. These can be significant sources and warrant restriction. Lead-based solder is still commercially	The Council recommends that the Ministry of the Environment encourage municipalities to accelerate their Lead Service Line replacements as a part of their asset management program. The Council recommends that the Ministry of the Environment develop and implement a program or programs to encourage homeowners to replace their part of the Lead Service Line supplying water to their home. Consideration should be given to the following options: • Grants or incentive programs • Direct request from a Public Health Officer • Financing to pay costs over time on water bill • Noting Lead Service Lines on property records • Disclosure on sale of property The Council recommends that the Ministry of the Environment work with the Federal Government to ban lead in solder and plumbing fixtures.
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	available and in use. Corrosion Control measures will reduce lead corrosion from the above-noted sources, but may not eliminate it from some households.	
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4. Interim Measures	The implementation of Corrosion Control measures and Lead Service Line replacement will take time so lead levels at consumer taps may remain elevated until these programs are fully effective. Therefore, measures may still be necessary to reduce lead exposure in the interim. It should be noted that interim measures must be appropriate to the unique lead problem of each individual community or part thereof. <u>Flushing:</u> Although flushing would logically seem to reduce lead levels at the tap, results are often unpredictable. Higher levels of lead can be found even after several minutes of flushing. Each home could be different. As well, the issue of water conservation may be of concern. Home owners have been asked by municipalities to reduce water usage (e.g. filling a jug with water and putting it in the refrigerator instead of running the tap until it gets cold). For most homes with elevated lead levels, flushing may be an appropriate interim measure to reduce the risk of lead exposure. <u>Point-Of-Use (POU) Devices:</u> POU devices may or may not reduce the exposure to lead due to improper use, or the size of particulate matter present. NSF	The Council recommends that the Ministry of the Environment work closely with the Ministry of Health and Long-Term Care and the Medical Officers of Health to support them in addressing and conveying information on when, why, and how to take interim measures for reducing lead exposure due to drinking water. This advice will be unique for each community or community subset.
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	certification provides some confirmation that the device is capable of reducing lead levels, however lead particulate removal is not currently certified. NSF work continues on a new standard that will certify devices for both dissolved lead and particulate lead removal. <u>Bottled water:</u> Although it is generally believed that bottled water meets the Ontario Drinking Water Quality Standard (ODWQS) of 10 µg/L, current labelling rules under the federal <i>Food and Drugs Act</i>, allow for reporting of contaminants in whole ppm. Thus, if lead were to be present at 0.04 mg/L, the bottled water manufacturer may be able to report it as 0 mg/L even though it is 4 times higher than the ODWQS. The actual lead content of bottled water should be confirmed before recommending its use. Municipalities could consider providing bottled water to consumers from the water treatment plant that serves them. This service could be provided to those homes with elevated lead levels, while corrective actions are underway. Ontario faces a challenge with waning public confidence in municipal drinking water and suggesting bottled water and POU devices could put into question Ontario's "Source-to-Tap" philosophy. These interim measures should not be seen a	
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	long-term solution. Municipalities should take all necessary measures to reduce the risk of lead exposure from drinking water in household plumbing and help improve public confidence in their drinking water supplies.	
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5. Public Communication	Public Health Officials need additional assistance to better understand the complexities of their local lead in drinking water issues and convey them to the public. The use of Fact Sheets endorsed by the Medical Officers of Health, and the Ministry of Health and Long-Term Care could be an effective means of conveying the risks of lead in drinking water to the general public. The Municipality, the Ministry of the Environment, and the Medical Officers of Health all need to work together in total cooperation. Ontario can positively influence public health by instituting system-specific corrosion control programs for reducing human exposure to lead from drinking water pipes, while having the added benefit of protecting municipal infrastructure.	The Council recommends that the Ministry of the Environment work closely with the Ministry of Health and Long-Term Care, and the Medical Officers of Health to support them in addressing and conveying the relative risks of lead in drinking water to the public and advising homeowners on appropriate interim measures. As well, the Ministry of Municipal Affairs and Housing should be kept informed.
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6. Jurisdictions / Responsibilities	The Ministry of the Environment is responsible for the Ontario Drinking Water Quality Standards and compliance. The Ministry of Health and Long-Term Care is responsible (through Public Health Units) for assessing and advising on environmental hazards relating to environmental health issues for the general public. The health risks of elevated blood-lead levels due to lead in drinking water are not well understood. Local Health Units need better information and support to assist them in responding to lead in drinking water issues. The Ministry of Municipal Affairs and Housing (MMAH) is responsible, under the Building Code, for all household plumbing (from the property line right through the home). Municipalities are responsible for the delivery of safe drinking water to homes; Therefore, they need to inform home owners of issues such as Lead Service Lines, so that home owners can make informed decisions. Responsibility for safe tap water is shared between the municipality and the home owner, due to the ownership change at the property line.	The Council recommends that the Ministry of the Environment ask the federal government to expedite the review of the blood-lead intervention level, and the ensuing and related Guideline for Canadian Drinking Water Quality as part of the Federal / Provincial / Territorial process. This work should lead to better guidance for local health authorities. The Council recommends that the Ministry of the Environment work with the Ministry of Health and Long-Term Care and the Ministry of Municipal Affairs and Housing to continue the process of moving Ontario to a complete “Source-to-Tap” framework.
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	Municipalities should be responsible for providing water that is not aggressive to the distribution system or to household plumbing (provided it is constructed of reasonable materials). There is growing interest in the drinking water framework as Ontario moves towards a true “Source-To-Tap” philosophy. All parties have some responsibility for safe drinking water. Monitoring at household taps is an important step in completing the “Source-To-Tap” framework. Correcting elevated household lead problems will require collaboration amongst the Ministry of the Environment (responsible for drinking water), the Ministry of Health and Long-Term Care (responsible for public health), and the Ministry of Municipal Affairs and Housing (responsible for household plumbing).	
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Appendix B - Relevant Legislation & Regulations

- ***Safe Drinking Water Act, 2002, Sections 4-5***

Advisory Council on Drinking-water Quality and Testing Standards

4. (1) The Minister shall establish an advisory body known in English as the “Advisory Council on Drinking-water Quality and Testing Standards” and in French as “Conseil consultatif sur les normes de qualité et d’analyse de l’eau potable” to consider issues relating to standards for drinking-water quality and testing and to make recommendations to the Minister. 2002, c. 32, s. 4 (1).

Appointment of members

(2) The members of the Advisory Council shall be appointed by the Minister. 2002, c. 32, s. 4 (2).

Notice

(3) The Advisory Council may publish information in the Registry. 2002, c. 32, s. 4 (3).

Consideration by Minister

5. The Minister shall ensure that all recommendations of the Advisory Council on Drinking-water Quality and Testing Standards are taken into consideration in establishing and revising standards under this Act for drinking-water quality and testing. 2002, c. 32, s. 5.

- ***Clean Water Act, 2006***
- **Ontario Drinking-Water Quality Standards (Ontario Regulation 169/03)**
- **Drinking-Water Systems (Ontario Regulation 170/03)**
- **Drinking-Water Testing Services (Ontario Regulation 248/03)**
- **Wells (R.R.O. 1990, Ontario Regulation 903)**
- **Non-Residential And Non-Municipal Seasonal Residential Systems That Do Not Serve Designated Facilities (Ontario Regulation 252/05)**

Appendix C - Council's Standards Review Protocol

The following summary table and detailed descriptions of the Council's Standards Review Protocol were developed to address and implement Recommendation #25 of the Part Two Report of the Walkerton Inquiry, which states that "*In setting drinking water quality standards for Ontario, the Minister of the Environment should be advised by an Advisory Council on Standards.*" The protocol focuses and guides the Council in providing timely advice to the Minister of the Environment on standards.

Summary Table

Federal Stage	MOE Stage	Council Stage				
				Issue	Input	Output
National Priority Setting	MOE Input into Priorities	1	a. Convey Substances of Interest to MOE (yearly)	Substances of Interest addressed	Proposed National Priority List	Conveyance of Substances of Interest to Minister of the Environment (<i>formal</i>)
			b. Review Final National Priority List	Substances of Interest that did NOT make the list to be addressed by MOE	Final National Priority List	Conveyance of Substances of Interest that did NOT make the list to Minister of the Environment (<i>formal</i>)
Scientific / Technical Review			No Council Involvement			
Guideline Technical Document	Review & Comment	2	a. Assess Guideline Technical Document	Concerns with document addressed	Draft Guideline Technical Document, decision sought, references, presentation	Information for formulation of advice on Ontario's position
National Public Consultation			b. Propose Interim Ontario Standard (<i>if warranted</i>) i. Undertake Independent Consultation (<i>if warranted</i>)			

Federal Stage	MOE Stage	Council Stage				
				Issue	Input	Output
Assess comments from National Public Consultation	Assess comments from National Public Consultation	3	Assess Comments from National Public Consultation	Concerns with national public comments addressed	Public comments from National consultation	Information for formulation of advice on Ontario's position
Draft Final Guideline Technical Document	Review & Comment	4	a. Assess Draft Final Guideline Technical Document b. Undertake Independent Consultation (if warranted) c. Determine and convey Position to MOE (informal)	Concerns with document addressed	Draft Final Guideline Technical Document; Presentation by MOE / HC expert	Conveyance of Council's advice to Ministry of the Environment and Minister's Office staff (informal)
	Convey Ontario's Position to CDW, CHE		No Council Involvement			
CDW, CHE Approval of Guideline Technical Document and Canadian Drinking Water Quality Guideline		5	Transmit Advice Letter to Minister (Proposed Ontario Standard, Objective, or Guideline, and operational advice, if necessary)	Concerns with Ontario public comments addressed	Public comments from Ontario consultation	Conveyance of Council's advice to Minister of the Environment (formal)
	Ontario public consultation via EBR Proposal					
	Assess EBR comments					
	Post EBR Decision		No Council Involvement			
	Revise Reg. 169, and / or other guidance documents as necessary		No Council Involvement			

Council Engagement Stage 1:

a. Convey Council's Substances of Interest to the MOE

The question before the Council at this sub-stage is:

Are there any substances of interest that are not already on the National Priority List?

Considerations:

- Does the substance have an adverse health effect?
- Is the substance known or likely to occur at levels of concern?
- Would regulating the substance provide a meaningful opportunity for risk reduction?
- Would research of this substance (which could include collecting occurrence data, treatment data, health effects data, and developing analytical methods) constitute a good use of resources and funding?

Notes:

- Must account for emerging and emergency parameters (like NDMA)
- Can suggest re-ranking of parameters
- Minister may call on Council at any time for advice

Input: Ministry of the Environment Liaison staff member to supply the Council with the *proposed* National Priority List for review. Council members then identify substances of interest (that are not already on the list) and prepare for their discussion at the June meeting of every year.

Output: Council to submit a list of substances of interest to the Minister of the Environment to be considered for inclusion in Ontario's Standards Plan, and input into the Federal-Provincial-Territorial process.

b. Review Final National Priority List

The question before the Council at this sub-stage is:

Are there any substances that the Council recommended for inclusion on the National Priority List, that did not make the List, and, if so, what action should the Council take?

This sub-stage is directly linked to Recommendation #26 of the Part Two Report of the Walkerton Inquiry, which states that “*The Advisory Council on Standards should have the authority to recommend that the provincial government adopt standards for contaminants that are not on the current federal-provincial agenda.*”

Input: Ministry of the Environment Liaison staff member to supply the Council with the *final* National Priority List for review. Council members then review the National Priority List and identify the Council’s substances of interest that did not get included, if any. The Council will then prepare for discussion of these substances to decide what steps should be taken, including whether to advise the Ministry of the Environment to undertake their own standard review.

Output: Council to convey advice on next steps for the Substances of Interest (that did not get included in the Final National Priority List) to the Minister for the Ministry of the Environment to undertake its own scientific / technical review in consideration of the preparation of a document for public consultation.

Council Engagement Stage 2:

a. Assess Guideline Technical Comment

The question before the Council at this sub-stage is:

Does the Council have any concerns with the Guideline Technical Document?

The Council's role in this stage is to assess the Guideline Technical Document arising from the National Process, relying primarily on the knowledge and experience of its members, and possibly including such aspects as economic impacts, occurrence data, treatment data, and analytical methods, with consideration given to "Nice to Have" versus "Need to Have" information.

In the event that the above-mentioned aspects cannot easily be addressed, it may be determined that additional information or work is required. If so, the following process will be initiated, in consultation with the Ministry of the Environment's Standards Development Branch (SDB), to assist the review of the substance in question:

Process for Requesting Information from the Ministry:

- Consult with SDB Director and Ministry Liaison staff member to clarify Council's request
- Consult with SDB. If deemed simple, requested information be supplied to Council through Ministry Liaison staff member
- Consult with SDB. If deemed complex, Ministry Liaison staff member to provide ideas on next steps to the Council
- If under \$25,000, Council could initiate and project-manage the research in cooperation with SDB
- If over \$25,000, Council to formally advise Minister of study / research need

Input: Guideline Technical Document, decision sought, scientific references, and a presentation by the Ministry (including information on the range of values and possible compromises made at the national level, and known and potential contentious issues), and *if required*, information per the above 5 step process for requesting information from the Minister or Ministry.

Output: Council to use information to develop advice for inclusion in the analysis and formulation of Ontario's position.

b. Propose Interim Ontario Standard (If warranted)

The question before the Council at this sub-stage is:

Does Ontario need an interim standard while the National Process is undertaken?

The Council will assess the Draft Guideline Technical Document to consider whether or not to advise Ontario to adopt an interim standard.

Input: Council to receive Draft Guideline Technical Document, and, when required, other documentation for review, decision sought, scientific references, and a presentation by the Ministry (including information on the range of values and possible compromises made at the national level, as well as known and potential contentious issues).

Output: Council to convey advice on possible interim standard to the Minister for implementation consideration by the Ministry of the Environment.

i. Undertake Independent Consultation (If warranted)

The question before the Council at this sub-stage is:

Does the Council feel that it needs to undertake its own consultation to gain a better understanding of stakeholder and public concerns?

The Council could use the following consultation methods to obtain more or different information about a standard: EBR Information Posting, peer review, stakeholder information sessions, or public meetings.

Input: Draft Guideline Technical Document

Output: Council to use information gleaned from independent consultation process to provide advice to the Ministry of the Environment, for inclusion in Ontario's position.

Council Engagement Stage 3:

Assess Comments from National Public Consultation

The question before the Council at this stage is:

Does the Council have any concerns with the comments received from the national public consultation?

The Council's role in this stage is to take into account comments received from the National public consultation process.

Input: Council to receive public comments from the national consultation.

Output: Council to use comments received for inclusion in the analysis and formulation of Ontario's position, as well as to assess the Draft Final Guidance Technical Document in Stage 4.

Council Engagement Stage 4:

a. Assess Draft Final Guideline Technical Document

The question before the Council at this sub-stage is:

Does the Council have any concerns with the Draft Final Guideline Technical Document?

This stage is positioned after public consultation, but before the Canadian Drinking Water Quality Guideline is approved, or any other document goes to the Federal-Provincial-Territorial Committee on Drinking Water (CDW) and the Federal-Provincial-Territorial Committee on Health and the Environment (CHE).

The Council's role in this stage is to assess the Draft Final Guideline Technical Document, taking into account the assessment of the comments received from the National public consultation process in Stage 3.

Input: Draft Final Guideline Technical Document; Presentation by Ministry of the Environment and / or Health Canada expert.

Output: Assessment to be used in providing advice to the Ministry of the Environment on the acceptability of the Draft Final Guideline Technical Document, in relation to Ontario.

b. Undertake Independent Consultation (If warranted)

The question before the Council at this sub-stage is:

Does the Council feel that it needs to undertake its own consultation to gain a better understanding of stakeholder and public concerns?

The Council could use the following consultation methods to obtain more or different information about a standard: EBR Information Posting, peer review, stakeholder information sessions, or public meetings.

Input: Draft Final Guideline Technical Document and comments received from the National public consultation process.

Output: Council to use information gleaned from independent consultation process to provide advice to the Ministry of the Environment, for inclusion in Ontario's position.

c. Determine and Convey Position to MOE (Informal)

There are 2 questions before the Council at this sub-stage:

1. *Should the Ontario Standard be set at a level different from the Canadian Drinking Water Quality Guideline?*
2. *How should the Standard be applied in Ontario?*

The Council's role in this stage is to propose an Ontario Drinking Water Quality Standard, Objective or Guideline, including operational advice, if deemed necessary, in order to provide advice on how the standard is to be applied in Ontario, in regards to sampling, compliance, and regulation.

It should be noted that the Council will only propose an Ontario Drinking Water Quality Standard, Objective, or Guideline that is equivalent to or more stringent than a Canadian Drinking Water Quality Guideline.

Input: Draft Final Guideline Technical Document, comments received from the National public consultation process, and information gleaned from independent consultation process, if undertaken.

Output: Council to provide informal advice to the Ministry of the Environment on the proposed Ontario Drinking Water Quality Standard, Objective, or Guideline, and its application in Ontario, if deemed necessary.

Council Engagement Stage 5:

Transmit Advice Letter to Minister (Formal)

The Council's role in this stage is to formally transmit its advice to the Minister of the Environment, on a proposed Ontario Drinking Water Quality Standard, Objective, or Guideline.

This transmittal can occur anytime after approval has been granted for the Canadian Drinking Water Quality Guideline by both the Committee on Drinking Water (CDW) and the Committee on Health and the Environment (CHE). The Council may also wait until after the Ontario consultation finishes, if it feels that the comments may be pertinent to its advice.

The advice may also outline how the standard is to be applied in Ontario, in regards to sampling, compliance, and regulation, if warranted.

It should be noted that the Council will only propose an Ontario Drinking Water Quality Standard, Objective, or Guideline that is equivalent to or more stringent than a Canadian Drinking Water Quality Guideline.

Input: Council to receive notice from Ministry Liaison staff member that both CDW and CHE have approved the final Canadian Drinking Water Quality Guideline. The Environmental Registry Proposal, including the comments received from the public consultation may also be considered.

Output: Council to provide formal advice to the Minister of the Environment on the proposed Ontario Drinking Water Quality Standard, Objective, or Guideline, and its application in Ontario, if warranted.

Appendix D - Terms of Reference

These following Terms of Reference were agreed upon by the Council and finalized by the Council's Chair and the Minister of the Environment, on November 5, 2004.

1. Definitions

In these Terms of Reference (TOR):

- a) "the Act" means the *Safe Drinking Water Act, 2002*;
- b) "the Council" means the Advisory Council on Drinking-water Quality and Testing Standards;
- c) "the Ministry" means the Ministry of the Environment;
- d) "the Chair" means the Chair of the Advisory Council on Drinking-water Quality and Testing Standards;
- e) "the Minister" means the Minister of the Environment;
- f) "the Deputy Minister" means the Deputy Minister of the Environment.

2. Preamble

The purpose of the TOR is to describe the operational, administrative and reporting relationships between the Minister and the Chair, the Chair and the Deputy Minister, and reflect the powers of the Council as an advisory agency as set out in Schedule C of the 'Agency Establishment and Accountability Directives'.

The TOR should be used in conjunction with the legislation governing the Council and its constituting instrument to determine how the Council should govern itself. This TOR does not affect, modify, limit or interfere with the responsibilities of any of its parties under law. In the event of any conflict between the TOR and any law, the law prevails.

3. Duration and Review of Terms of Reference

The TOR will become effective on the date of its signature by the parties and will remain in effect for five years or until a new TOR is agreed to by the parties.

The TOR must be reviewed at the expiry of the term or prior to that at the request of any of the parties involved.

4. Legislative Authority

The legislative authority of the Council is set out in Section 4 of the *Safe Drinking Water Act, 2002*.

5. Mandate

The mandate of the Council is to provide advice and make recommendations to the Minister of the Environment on matters related to standards for drinking-water quality and testing. Activities of the Council may include but not be limited to:

- a. Review research and scientific and technical documentation related to drinking-water quality and testing standards;
- b. Publish information in the Environmental Registry established under section 5 of the *Environmental Bill of Rights, 1993* and undertake additional consultation with and solicit views from the general public as necessary and provide feedback;
- c. Forward recommendations and their rationale to the Minister within a specified time frame;
- d. When directed by the Minister, provide advice on policies, practices and procedures to be used in the development of standards; and, priorities for the development of standards, testing methods and related research; and
- e. Make recommendations to the Minister on other matters it has identified as being priorities and which merit the attention of the Minister and/or the Ministry.

6. Guiding Principles

The parties agree that they will adhere to the following principles:

- a. The Minister recognizes that the Council is a statutory entity which exercises powers and performs duties in accordance with its mandate under the Act;
- b. The Minister recognizes that the Council operates at “arms length” from the Government;
- c. The Council acknowledges that it is accountable to the Government in exercising its mandate. Accountability is a fundamental principle to be observed in the management, administration and operations of the Council;
- d. As an agency of the Government, the Council conducts itself according to the management principles of the Government of Ontario;
- e. The Deputy Minister will ensure that the support or services provided to the Council are of the same quality and standard as provided to the Ministry’s own line divisions and branches.
- f. The Council and the Ministry must avoid duplication of services.

7. Reporting Relationships

The parties agree that:

- a. The Council is committed through the Chair to the reporting requirements as outlined in Schedule 2 (attached);
- b. The Chair will keep the Minister advised of issues or events that concerns or may concern the Minister in the exercise of his or her responsibilities;

- c. The Minister and the Chair will consult with each other on relevant public communications strategies and publications and will keep each other informed on the results of stakeholder and other public consultations and discussions;
- d. The Chair will provide reports containing the Council's advice on a specified subject and reports commissioned by the Council to the Minister. The public release of said advice or reports shall be at the discretion of the Minister; statements to the press with respect to such advice or reports are not appropriate until the report is publicly released by the Minister; and
- e. The Minister and the Chair will meet as required to discuss issues relating to the delivery of the Council's mandate.

8. Accountability

The accountability of the parties is as follows:

- a. The Minister is accountable to the Legislature for the Council's fulfillment of its mandate, its compliance with Government policies and for reporting to the Legislature on the Council's affairs;
- b. The Chair is accountable to the Minister for the performance of the Council in fulfilling its mandate and for carrying out the roles and responsibilities assigned to the Chair by Management Board of Cabinet Directives and Guidelines, the Council's constituting instrument and the TOR; and
- c. The Deputy Minister is accountable to the Minister for the performance of the Ministry in providing administrative support (including staffing and funding) to the Council and for carrying out the roles and responsibilities assigned to him or her by the Minister, by Management Board of Cabinet Directives and Guidelines, the Council's constituting instrument, and the TOR.

9. Roles and Responsibilities

The **Minister** is responsible for:

- a. Monitoring the activities of the Council to ensure that its mandate is being fulfilled and that it is in compliance with Government policies;
 - b. Reviewing, approving and presenting the estimated/recommended annual allocation for the Council as part of the Ministry's Business Plan;
 - c. Consulting with the Chair as appropriate when significant new directions for the Council are contemplated or when initiatives are taken to amend any legislation or regulations which may affect the mandate of the Council;
 - d. Ensuring that proposed changes to the governing legislation/regulation are accompanied by a recommendation on the continued need for the Council's services and the appropriateness of its mandate;
 - e. Recommend appointments and reappointments pursuant to the process for Council appointments established by legislation or by Management Board, after consultation with the Chair as appropriate; and
 - f. Meeting with the Chair of the Council as required.
-

The **Chair** is responsible for:

- a. Directing the affairs of the Council within its mandate as defined by the Act, the Council's constituting instrument and the TOR;
- b. Ensuring that the Council carries out the responsibilities assigned to the Council or its Chair under the Act, the Council's constituting instrument and the TOR;
- c. Providing advice to the Government and seeking policy direction from the Government in specific instances;
- d. Keeping the Minister advised of issues or events that concern or can reasonably be expected to concern him or her in the exercise of ministerial responsibilities;
- e. Ensuring that matters relating to the Council which are of importance to the Ministry are brought to the attention of the Minister and the Deputy Minister in a timely fashion;
- f. Recommending all formal documents related to the fulfillment of the Council's mandate to the Government for approval;
- g. Reviewing the Council's annual budget and bringing it forward to the Minister and the Deputy Minister for approval;
- h. Reviewing the Council's annual report and bringing it forward to the Minister and the Deputy Minister by July 31 of each year;
- i. Ensuring that public funds are used in accordance with management Principles of the Government of Ontario - ensuring that the Council operates within the approved funding in the fulfillment of its mandate;
- j. Attending and/or making presentations before Cabinet or committees of Cabinet or the Legislature on matters concerning the affairs of the Council when requested to do so;
- k. Notifying the Minister of appointment vacancies and making recommendations to the Minister on appointments and reappointments of Council members pursuant to the process for Council appointments established by Management Board of Cabinet;
- l. Ensuring Council compliance with Management Board of Cabinet Directives and Guidelines, and the Ministry's Administrative Policy Manual;
- m. Ensuring that conflict of interest matters are handled in accordance with Management Board Directives; and
- n. Ongoing liaison with the Director of the Ministry's Standards Development Branch to exchange information and ideas related to the administration and operation of the Ministry of the Environment and the Council as they impact upon each other.

The **Deputy Minister** is responsible for:

- a. Advising and assisting the Minister in meeting assigned ministerial responsibility with respect to the Council and ensuring that the Minister is advised of the requirements of Management Board Directive of the administration of agencies;
- b. Undertaking on behalf of the Minister, assessments of whether or not the Council is fulfilling its legislative mandate in concert with approved Government policies; identifying any need for corrective action and recommending ways to resolve any issues that are identified;
- c. Providing a framework for assessing whether the Council is fulfilling its mandate;
- d. Ensuring the ministry is providing the administrative support, financial and other services as set out in the TOR and Schedule 1 (attached) to reflect the same quality and standard as provided to the Ministry's own line divisions and branches;
- e. Meeting with the Chair, as required, to discuss matters of mutual importance to the Council and the Ministry, such as services provided by the Ministry to the Council;
- f. Informing the Council of the policies of the Ministry and the Government that apply to the Council, including financial and administrative, human resources and corporate policies, including policies in respect of French language services, freedom of information, workplace harassment and equal opportunity; and
- g. The Deputy Minister may, in accordance with the *Public Service Act* and applicable Government directives, delegate any of the powers and duties assigned to him or her by law, as they pertain to the Council.

10. Finances

- a. The Council is funded out of the Consolidated Revenue Fund pursuant to an appropriation authorized by the Legislature, unless otherwise provided.
- b. Recovered costs and other revenues, if any, are paid, as received, to the Consolidated Revenue Fund and may not be applied to as administrative expenditures for the Council unless otherwise provided by law.
- c. Financial arrangements are subject to amendment by such revenue policy directives as the Management Board of Cabinet may issue. Financial arrangements may also be changed by amendment to the Council's constituting instrument.
- d. The Council prepares estimates for inclusion in the Business Plan of the Ministry for presentation to the Legislature. The Council will deliver these estimates to the Minister and Deputy Minister in sufficient time to be analyzed and approved by the Minister and Deputy Minister. The estimates provided by the Council may, after appropriate consultation with the Chair, be altered as required.
- e. Financial procedures of the Council must be in accordance with Management Board of Cabinet Directives and Guidelines, the Ministry's Administrative Policy Manual and other directives of the Ministry and Government.

- f. Responsibility for the maintenance of documentation and information to support expenditures is assigned to the Chair as outlined in the Accounting Policy of the Ministry.

11. Audit Arrangements

- a. The affairs of the Council shall be subject to audit by both the Management Audit Branch of the Ministry and by the Provincial Auditor. The Ministry and the Council shall arrange mutually agreeable times for audit by the ministry at least once per annum.
- b. The results of any audit by Ministry staff will be shared with the Chair. The Chair will be accorded an opportunity to enter his or her comments into the audit record.
- c. The Chair shall direct to the Minister through the Ministry all correspondence of the Council with the provincial Auditor in response to the findings, conclusions and recommendations of the Provincial Auditor's report. The Chair shall consult with the Director of the Ministry's Management Audit Branch throughout the audit process.
- d. The Chair may request an external audit of the financial transactions or management controls of the Council at the Council's expense.

12. Administrative Arrangements and Support

- a. The Ministry is committed to providing the Council with the full range of financial and administrative support services either directly or through shared service agreements as outlined in Schedule 1 (attached) to this TOR. The services will be provided to the same quality and standard as provided to the Ministry's own line divisions and branches.
- b. The Council is an advisory agency as designated by the Management Board of Cabinet. The Chair will develop procedures and will operate the Council in accordance with all administrative policies established and specified in Management Board of Cabinet Directives and Guidelines and the Ministry's Administrative Policy Manual.
- c. The Council may engage persons to provide professional, technical or other assistance to or on behalf of the Council, and may provide payment or remuneration and expenses of such persons in accordance with the Government's and the Ministry's policy.
- d. If the Council requires consultant or other services, the following shall be adhered to:
 - i. the Council will use the administrative services of the Ministry in developing, tendering and administering contracts;
 - ii. all tendering will be consistent with the procedures contained within the Management Board of Cabinet Directives and Guidelines and the Ministry's Administrative Policy;
 - iii. the Council's signing authority and single/sole authority is in accordance with the Ministry Delegation of Authority Framework;

- iv. in order to avoid the duplication of services already available from the Ministry, all requests from the Council for either internal or external creative services (i.e. Web page design, desktop publishing, advertising) will be forwarded to the Communications Branch for review and approval by the Director; and
 - v. to ensure documents are in accordance with government graphic design guidelines the Council should forward any changes in graphic designs or any new documents to Communications Branch for review and approval by the Director.
- e. Legal Services to the Council are to be provided by the Ministry of the Attorney General.
- f. The Council may request outside legal assistance when it requires expertise unavailable within the Ministry of the Attorney General or when the use of a law officer of the Crown would result in any conflict of interest.
- g. The Ministry of the Attorney General must approve retention of outside legal counsel by the Council. The Council will refer to and comply with the Management Board of Cabinet Directives and Guidelines on legal services and the retention of counsel when obtaining external legal counsel.

13. Staffing and Appointments

- a. The Council is staffed by persons appointed under the *Public Service Act* and eligible for all those rights and benefits accorded under the *Public Service Act*, and relevant collective agreements.
- b. All recommendations for new appointments and reappointments to the Council will be reviewed by the Minister's Office and the Public Appointments Secretariat.
- c. The Council in its dealings with staff appointed under the *Public Service Act* is subject to Management Board of Cabinet Directives and Guidelines.
- d. The Council is also governed by:
 - i. the policies of the Civil Service Commission;
 - ii. the human resources manual of the Ministry;
 - iii. the corporate financial and administrative policies and procedures manual;
 - iv. applicable collective agreement provisions; and
 - v. any other applicable legislation or regulations.

14. Conflict of Interest

- a. All members of the Council appointed by the Minister shall abide by the conflict of interest principle and mandatory requirements set out in the Management Board of Cabinet Directives.

SCHEDULE 1: ADMINISTRATIVE SUPPORT

The Deputy Minister will ensure that the support or services provided to the Council are of the same quality and standard as provided to the Ministry's own line divisions and branches either directly or through shared services agreements:

1. **Financial Administration:** pay and benefits administration, accounts payable and technical advice, purchasing, central mail and printing services, and records and form advisory services.
2. **Human Resources Services:** classification; advice and consultation regarding recruitment procedures and staff relations; job description writing; counselling regarding career planning and staff development; and advice and consultation regarding corporate initiatives such as Occupational Health and Safety, etc. Corporate educational opportunities and career planning services are available and open to Council staff and the Ministry must assist the Chair in ensuring that these are communicated effectively to Council staff.
3. **Information Technology and Telecommunications Services:** advice and consultation.
4. **Internal Audit:** financial compliance, management, human resources and information systems audits; operational reviews and special investigations as required.
5. **Accommodation Planning:** including lease renewals.
6. **Freedom of Information Program:** services as required.
7. **French Language Services:** translation and interpretation services.
8. **Communications:** communications planning, preparation of communications documents i.e. news releases, backgrounders, posting of documents on ministry websites, assistance in the preparation of public documents.

SCHEDULE 2: REPORTING REQUIREMENTS

The Chair ensures that the following reports, statements and documents are submitted to the Minister for review and approval:

1. Annual reports are required by July 31 of each year. The Annual report should describe the Council's accomplishments and a list of activities undertaken during the preceding year; and
2. Financial reports as required by Ministry's internal financial reporting requirements; and
3. Other reports that may be required by the Council's governing legislation or regulation(s) or reports as the Minister may require from time to time.

Appendix E - Website

The Council's website, www.odwac.gov.on.ca, continued to be an important source of information for the general public, drinking water stakeholders, Ministry of the Environment, and Ministry of Health and Long-Term Care staff.

The Council's website was re-developed and updated to provide information on:

- History and establishment of the Council
- Mandate
- Requests from the Minister of the Environment
- Standards Review
- Proactive Initiatives
- Stakeholder Consultations
- Public Minutes from Council Meetings
- Reports to the Minister of the Environment
- Annual Reports
- Drinking Water-related Announcements
- Links to other Drinking Water-related Websites
- Members' Biographies
- Contact Information

Appendix F - Council Members' Biographies

Dr. Robert Andrews is Professor and Associate Chair of Research in the Department of Civil Engineering at the University of Toronto and Senior NSERC Industrial Research Chair holder in Drinking Water Research. He has obtained extensive experience in water treatment practice with many projects involving drinking water disinfection, microbial inactivation of pathogens, formation and minimization of disinfection by-products, and optimization using innovative methods and application of membrane processes for removal of emerging contaminants.

Dr. Ronald Brecher is a founding partner of GlobalTox International Consultants - a Canadian corporation that assesses the impact of toxic chemical exposures on human health. Dr. Brecher is one of about 35 Canadians certified by the American Board of Toxicology. He is an Adjunct Professor, School of Planning, at the University of Waterloo and Associated Graduate Faculty, Department of Biomedical Sciences at the University of Guelph. From 1994-2002, he was a director of the Children's Groundwater Institute. He is a past recipient of the National Science and Engineering Research Council's Industrial Research Fellowship. He is a member of the Science and Policy Advisory Board of the American Council of Science and Health.

Dr. Mary Jane Conboy is the Executive Director of Well Wise Resource Centre, a non-profit company dedicated to providing education, training, resources and research on private wells. Prior to this, she worked with well owners through her research and as a hydrogeologist for the Ontario Federation of Agriculture (OFA) and the Green Communities Canada Well Aware program. She is a licensed Geoscientist who co-authored a technical paper for the Walkerton Inquiry, worked with farmers experiencing water problems, represented OFA on provincial committees, led an audit of well projects in Ontario, and sat on an expert panel for water well sustainability in Ontario. She also chairs the Association of Professional Geoscientists of Ontario (APGO) Nutrient Management committee and the APGO working group for the Water Wells regulation, and recently co-authored a consumer's guide for private wells and a children's book on wells and the water cycle.

Michèle Giddings is the Manager of the Water Quality and Science Division in the Water Quality and Health Bureau, Healthy Environments & Consumer Safety Branch, Health Canada. She is on Health Canada's Secretariat for the Federal/Provincial/Territorial Committee on Drinking Water. She is currently co-coordinator of the Disinfectants and Disinfection By-products Working Group for the World Health Organization's Guidelines for Drinking Water Quality. Ms. Giddings has developed a number of drinking water guidelines for Health Canada and the World Health Organization.

Rod Holme is the former Vice-President of the water and wastewater division of a major international consulting company and is currently an independent consultant on drinking water. He is past President of American Water Works Association and most recently chaired their International Council. He is also Chair of the Joint Committee on Water Regulations for the Ontario Water Works Association and the Ontario Municipal Water Association. He has extensive experience in technical and project management of municipal water supplies.

Dr. Peter Huck is a Professor in the Department of Civil and Environmental Engineering, a National Science and Engineering Research Council (NSERC) Chair in Water Treatment and University Research Chair at the University of Waterloo. He has undertaken extensive research in water quality and treatment in areas such as the robustness of water treatment systems, membrane and ultra-violet treatment, the removal pharmaceuticals and endocrine disrupting substances, and the determination of pathogen loadings in watersheds, among other topics.

Dr. Alexander Hukowich is the former Medical Officer of Health for the Haliburton, Kawartha, Pine Ridge Health Unit and coroner for Northumberland County, and was nominated for the Council by the Association of Local Public Health Agencies.

Derrick Kamanga is a professional engineer with over 25 years of experience in the design, water treatability studies, membrane pilot studies, utility operation, community planning, and project management of water and wastewater treatment systems. His academic qualifications include a Master of Engineering degree, and he has written several papers including “Transportation of Pollutants by storm runoff from Agricultural Lands”. Other experiences include the preparation of Engineering Reports for several municipalities in Ontario. He has been a technical advisor to the First Nations for over 10 years, throughout Canada, and is in charge of Peer Review Engineers and prepared the first Terms of Reference for Engineering Reports covering First Nations Wastewater systems. Currently he works with the Ontario First Nations as the Senior Engineer, Water & Wastewater, where he supervises peer review engineers, manages the Aboriginal Water and Wastewater Association of Ontario (AWWAO) and consultants working for First Nations and provides training for the certification of plant operators.

Dr. Robert Lannigan is a Professor of Medicine, Microbiology and Immunology at the Schulich School of Medicine and Dentistry, University of Western Ontario. He is also a member of the Ecosystem Health Team at the same facility. His primary activity is as the medical leader of the Clinical Microbiology Laboratory of the London Laboratory Services Group, which is a city-wide diagnostic microbiology service for the London hospitals. He is a member of the American Society of Microbiology, the Canadian Hospital Infection Control Association and the Association of Medical Microbiology and Infectious Diseases, Canada, and is also a member of the Ontario Medical Association.

Jim Merritt is a senior consultant focused on environmental consulting, municipal infrastructure and water management. He has assisted clients with managing regulatory issues, operational and organizational planning and strategic assessments of environmental situations. He was the Assistant Deputy Minister of Operations Division with the Ontario Ministry of the Environment where he was responsible for environmental protection and regulatory services, including approvals and environmental assessments. He also led the establishment of the Ontario Clean Water Agency and was the vice-president responsible for water and wastewater plant operations, engineering services, computer systems and information management. While with the Ministry of the Environment he served in various Directorship positions, including Central Region, Policy and Planning Branch, and the Administrative Services Branch, and is currently the Chair of the Advisory Council on Drinking Water Quality and Testing Standards, which provides advice directly to the Ontario Minister of Environment on matters related to drinking water quality.

Dr. Ken Roberts has over 38 years experience in the field of water resources engineering and management. His experience is gained through a number of water-quality-related positions in the Ontario Ministry of the Environment (formerly the Ontario Water Resources Commission) and with XCG Consultants Ltd. He is currently an independent consultant, with experience in water and wastewater engineering, treatment and research, with a focus on drinking water. Dr. Roberts is also an Honorary Member of the American Water Works association.

John Rudnickas was the Manager of Water Quality for the City of Toronto. A chemist by training, he has extensive experience in all aspects of quality assurance / quality control in large drinking water systems, and was responsible for the management of the City of Toronto's accredited and licensed laboratory for drinking water testing. He is currently involved with the Walkerton Clean Water Centre in the training of drinking water operators, and is a member of the Ontario Water Works Association and is on the Water Quality Committee of the Canadian Water and Wastewater Association. He is also a member of the American Water Works Association.

Dr. Lesbia Smith is an Assistant Professor at the University of Toronto and Clinical Research Associate of the McMaster University Institute of Environment and Health. She holds a Medical degree, and is the former head of the Environmental Health and Toxicology Unit of the Public Health Branch of the Ontario Ministry of Health and Long-Term Care. She has researched drinking water quality and chronic diseases such as non-bladder cancer (by-products of chlorination) and Alzheimer's disease (aluminum). She has participated in the development of several Ontario Drinking Water Quality Standards. Her current work relates to human impacts of industrial emissions through human health risk assessments, including studies of the impacts on health of surface waters affected by a variety of industrial contaminants.

Robert Walton is the Director of Public Works for the County of Oxford. He is the former Manager of Water and Wastewater Services. Prior to joining the County of Oxford, Mr. Walton worked as a consulting engineer. Mr. Walton is a member of the Ontario Municipal Water Association and has served on the Drinking Water Committee of the Association of Municipalities of Ontario. He represents the Ontario Municipal Water Association, and is a Professional Engineer.

Appendix G - Contact Information

Mailing Address:

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