Council Direction:

This report is provided in keeping with the Board of Health policy on communication between the Medical Officer of Health and the Board of Health, as outlined in Report PH06038.

Overview of Program Activities:

Safe Water is one of several public health programs mandated by the Ontario Ministry of Health and Long Term Care (MOHLTC) under the Mandatory Health Programs and Service Guidelines (MHPSG), 1997.

The Safe Water Program as described in the MHPSG includes obligations and mandates for the local Medical Officer of Health described in the Safe Drinking Water Act; the Clean Water Act; the Health Protection and Promotion Act, and related Memorandums of Understanding, Guidelines, and Protocols.

Goals of the Safe Water Program:

1. To reduce the incidence of water-borne illness in the population.

2. To prevent drowning in specific recreational water facilities. This goal is currently written in the Injury Prevention MHPSG, but will be moved to the Safe Water Program in the near future.
These are achieved via the following objectives:

Objective 1:
To ensure that community drinking water systems meet the health-related chemical, physical, microbiological and radiological standards as published in the Ontario Drinking Water Quality Standards (Ontario Regulation 248/06).

This is done by:

- Monitoring and responding to adverse drinking water analysis reports that are reported to the Medical Officer of Health from laboratories and the owners/operators of drinking water systems regulated under the Safe Drinking Water Act.
- Testing the microbiological quality of drinking water from water wells and cisterns that supply water to food premises and day care facilities, and responding when drinking water quality is unsafe.

Objective 2:
To reduce communicable disease transmission from waters used for bathing at public beaches.

This is done by:

- Seasonally inspecting, testing, and monitoring the recreational water quality at Hamilton’s beaches.

Objective 3:
To eliminate drowning in waters used for specified recreational purposes.

This is done by:

- Regularly inspecting publicly and privately owned and operated swimming pools, wading pools, and spas/whirlpools in accordance with relevant regulations and guidelines.

In addition PHS is mandated to provide information, education and consultation to those residents of the city who utilize a private drinking water system (i.e. well, spring or cistern) as their main source of drinking water.

Mandate/Standards:

The Safe Water MHPSG requirements and standards for the above goals and objectives are as follows:

1. For all drinking water systems that fall under the jurisdiction of the Safe Drinking Water Act, the board of health shall:
(a) **Maintain an ongoing list of all drinking water systems;**

462 drinking water systems within the limits of the City of Hamilton fall under the jurisdiction of the Safe Drinking Water Act. This number includes systems from the large municipal residential systems to the very small private systems to which the public may have access and use of the water supply. This number will likely change as Public Health staff verify the regulatory status of these systems in light of imminent regulatory changes under the Health Protection and Promotion Act.

(b) **Receive all reports of adverse drinking water test results from the drinking water systems listed in 1a. above;**

PHS receives all adverse drinking water lab analysis reports for water samples collected from drinking water systems that are regulated and registered under the Safe Drinking Water Act. These results are reported by phone and fax to the Office of the Medical Officer of Health by the laboratory and the owner/operator of the drinking water system.

A phone line is established specifically for receiving these phone calls. Under the Safe Drinking Water Act, labs and system owners/operators are not permitted to leave a message when phoning in an adverse lab result to the Medical Officer of Health. Therefore, PHS “adverse report lab line” extension has been placed on six different phones and will ring until it is answered (i.e. there is no voice mail).

In addition, PHS has an afterhours answering service that immediately forwards adverse drinking water reports to a Public Health Inspector as part of PHS on-call system for afterhours and weekends emergency service.

The number of adverse drinking water test results reported to the Medical Officer of Health for drinking water systems that fall under the Safe Drinking Water Act are as follows;

<table>
<thead>
<tr>
<th>Year</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007 to date (June12th)</td>
<td>47</td>
</tr>
<tr>
<td>2006</td>
<td>144</td>
</tr>
<tr>
<td>2005</td>
<td>176</td>
</tr>
<tr>
<td>2004</td>
<td>220</td>
</tr>
</tbody>
</table>

The downward trend is attributed to regulatory changes in mid 2006 which removed Background Colony Counts on a Total Coliform analysis and Heterotrophic Plate Counts from the adverse reporting requirements. Additionally, it is likely that drinking water system owners/operators are becoming more sensitive and consistent with the need to practice good sampling technique to avoid false positive results.

(c) **Have a written protocol for dealing with adverse drinking water test results from the drinking water systems listed in 1a. above;**
PHS maintains a policies and procedures, and draft operational guidelines for the investigation and follow up of reports of adverse drinking water quality. This manual is updated when new information is received from the MOHLTC, new literature or evidence becomes available, and when local or other health unit experiences suggest revisions need to be made. On June 11, 2007, the MOHLTC released a revised “Response to Adverse Drinking Water Quality Incidents Guidance Document”. This document will be adopted and used in addition to our own operational guidelines.

(d) Act immediately in accordance with the Ontario Drinking Water Quality Standards (Ontario Regulation 248/06) to protect the health of the public whenever an adverse drinking water test result is received.

All reports of adverse water test results from testing laboratories or water system owners/operators are acted upon immediately.

Adverse water test result details are documented and forwarded by PHS administrative staff immediately for assessment by a Public Health Inspector. Public Health Inspectors promptly review these reports and consult with the system owner regarding appropriate corrective action, and ensure additional public health precautions or action are implemented where indicated by a risk assessment and drinking water protocols and guidelines.

The number of drinking water advisories issued by the Medical Officer of Health for drinking water systems is as follows;

- 2007 to date (June12th); 6
- 2006; 11
- 2005; 14
- 2004; 31

Similar to the trend in adverse water reports above, the downward suggests that drinking water system owners/operators are becoming more sensitive to and consistent in ensuring good sampling technique, thus avoiding false positive results, especially when performing confirmatory testing.

2. With respect to owner/occupier inquiries of private water systems, the board of health shall:

(a) interpret water analysis reports;

(b) provide information regarding the potential health effects; and

(c) provide information about the health-related parameters as per the Ontario Drinking Water Quality Standards.

Residents may contact PHS at (905) 546-2189 for interpretation of water analysis reports for private wells. A Public Health Inspector is available to provide
consultation. To date in 2007 (June 13th) the PHS Safe Water Hotline has received 208 calls. In 2006 398 calls were received.

The MOHLTC Public Health Laboratory forwards all lab results for all water samples collected and submitted for testing from private wells. To date in 2007 (June 13th) 2126 private well water samples were submitted by Hamilton residents for bacteria testing. 5168 samples were submitted in 2006.

In 2006 approximately 30% of tested samples from private wells had significant bacterial growth. Approximately 5% of all 2006 samples contained E.coli bacteria.

3. The board of health shall inspect bathing beaches, including the taking of water quality samples for testing at a minimum of one sample per week from each sample site and a minimum of five sample sites per beach. The inspections shall begin prior to and continue over the entire bathing season, in accordance with the requirements of the Ministry of Health Beach Management Protocol (January 1, 1998).

PHS provides a beach water quality monitoring program at City of Hamilton beaches beginning on the Tuesday after Victoria Day and running throughout the summer with the last sampling occurring on the Tuesday before Labour Day. This program monitors the bacteriological water quality to ensure its safety for the public. Water samples are tested for *Escherichia coli*, which is used as an indicator organism for the presence of faecal contamination in the water.

Water samples are usually taken at the beginning of each week, with a couple days required for laboratory analysis and reporting. Warning signs in the beach area are posted should the test results indicate the water may be unsafe due to bacterial contamination. PHS also reports unsafe swimming conditions on the City of Hamilton Website, on the PHS Safe Water Hotline (905 546 2189), and through media releases.

Eight beach swimming areas are routinely sampled due to their regular use by the general public. These include the two Hamilton Harbour beaches: Bayfront and Pier 4 beaches. Sampling also occurs along the shores of Lake Ontario, which has been divided into three sections. These three areas are; along Beach Boulevard, an area on Van Wagner’s Beach Boulevard; and an area in Confederation Park. The swimming areas at Binbrook, Christie, and Valens Conservation Areas are also part of the sampling program.

The following chart shows the percentage of days that Lake Ontario Beaches and Hamilton Harbour Beaches were safe for swimming during the 1995-2006 swimming seasons, based on acceptable levels of *Escherichia coli* (E.coli) bacteria in the water.

When average levels (geometric mean) of E.coli exceed 100 bacteria per 100 ml of water, the beach is considered unsafe for swimming. As shown by the chart, microbiological quality of the recreational water at the two Hamilton Harbour
beaches declined significantly over the last decade. As reported to the Board at its April 23, 2007 meeting, PHS has been working with Public Works and the CCIW to implement bird exclusion measures which appear to be reversing this trend at one Harbour beach.

![Graph of Percentage of Days When Hamilton Beaches Bacteriologically Safe For Swimming]

The Inspection of public spas and pools falls under the Injury Prevention public health programs mandated by the Ontario Ministry of Health and Long Term Care (MOHLTC) under the Mandatory Health Programs and Service Guidelines (MHPSG), 1997.

One of the objectives of the injury prevention program is to eliminate drowning in waters used for specified recreational purposes. The following outlines the requirements and standards described in the MHPSG’s and activities provided by the recreational water component of the Safe Water Program in Hamilton:

1. **The board of health shall:**

   (a) inspect public pools at least two times per year and no less than once every three months while operating to ensure compliance with Ontario Regulation, Public Pools;

   (b) inspect public wading pools, at least two times per year and no less than once every three months while operating to ensure compliance with the Ministry of Health Standards for Public Wading Pools Protocol (January 1, 1998);

   (c) inspect public spas once per year while operating to ensure compliance with the Ministry of Health Operation of Public Spas Protocol (January 1, 1998);

   (d) make additional inspections of public pools, public wading pools and public spas as necessary to ensure correction of non-compliance with Ontario Regulation, Public
Pools, or the appropriate Ministry of Health Standards for Public Wading Pools Protocol (January 1, 1998) and Ministry of Health Operation of Public Spas Protocol (January 1, 1998) observed during previous inspection(s), and to investigate bather complaints, and

(e) ensure the availability of information regarding the health and safety-related operational procedures applicable to public pools, public wading pools and public spas.

There are currently 117 public swimming pools, 34 spas/whirlpools and 9 wading pools in Hamilton. Inspection data for these facilities for 2006 appear in the table below.

<table>
<thead>
<tr>
<th></th>
<th>Swimming Pools</th>
<th>Spas</th>
<th>Wading Pools</th>
</tr>
</thead>
<tbody>
<tr>
<td># Inspections</td>
<td>362</td>
<td>124</td>
<td>12</td>
</tr>
<tr>
<td># Re-inspections</td>
<td>67</td>
<td>32</td>
<td>1</td>
</tr>
<tr>
<td># Complaints</td>
<td>6</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Public swimming pool operators are provided annually with information related to safe pool operation and their responsibilities under the Regulation. Information related to spa operation is also made available to operators on request.

**Additional Drinking Water Mandates**

**Safe Drinking Water Act and Regulations Thereunder**

The Safe Drinking Water Act and Regulations thereunder have been in effect since 2003. This legislation specifically obliges the local Medical Officer of Health to take action, provide comment, consultation, or recommendations in the following circumstances for approximately 462 drinking water systems in Hamilton that are believed to be regulated under the Safe Drinking Water (and soon the Health Protection Act);

- The fragmentation of a waterworks
- Suspending or revoking an approval to operate a waterworks
- The staying of an appeal of a license suspension
- Reporting, receiving, and assessing adverse water test results and corrective actions for regulated drinking water systems, and issuing directions to diminish the risk to public health.
- Relief from regulatory requirements
- Municipal consent to build or operate a non-municipal drinking water system
- In the event of a Minister’s Order, a Director’s Order, a Notice of Emergency Response, or an Order to Provide Service
- The supply of water from a deficient drinking water system

**Memorandum of Understanding between the MOHLTC and the MOE (Ministry of Environment)**
On March 15, 2005, a Memorandum of Understanding between the MOHLTC and MOE regarding the Safe Drinking Water Act and The Health Protection and Promotion Act became effective. The goal of the Safe Water Mandatory Program made under the Health Protection and Promotion Act (HPPA) is to reduce the incidence of water-borne illness in the population, and boards of health are required to comply with the mandatory programs, and the Ministry of the Environment (MOE) has a responsibility to control and regulate drinking water systems and drinking water testing. Therefore, it is appropriate to identify and clarify the roles of the MOE and boards of health responding to notifications and indicators of adverse drinking water quality at regulated and non-regulated drinking water systems. Medical Officers of Health report directly to boards of health on issues relating to public health programs and services, including the Safe Water Program under the Mandatory Health Programs and Services Guidelines. This Memorandum of Understanding (MOU) is meant to clarify the roles of both the Ministry of Health and Long Term Care (MOHLTC) and MOE respecting drinking water systems, both regulated and unregulated.

In this MOU, the local Medical Officers of Health are obliged to;

1. Review adverse drinking water reports for implications pertaining to drinking water health hazards;
2. Provide the MOE local office immediately upon issuance, copies of BOIL Water Advisories, Boil Water Orders and Drinking Water Advisories and revocations of advisories and orders issued by the MOH;
3. Provide advice to the MOE local office regarding the existence of indicators of adverse drinking water quality as defined in the Regulations;
4. Consult with the MOE Director on the circumstances which gave rise to an order relating to an imminent water health Hazard;
5. Provide written advice to the MOE Director when a deficient drinking water system is the subject of an emergency response notice, regarding continues provision of water for a domestic purpose other than for consumption or food preparation;
6. Provide professional engineers with all information that relates to a drinking water system and consult with him or her on an assessment of the system and identify all the potential health related issues and concerns that relate to the system;
7. Maintain a procedure for documenting the receipts of reports of adverse test results and other problems from operators/owners of drinking water systems and laboratories performing analyses on drinking water;
8. Discuss with the office of the local MOE, reports of adverse results and the actions taken or proposed to be taken by the MOH in responding to the report;
9. Consult with and provide advice to an MOE Director on any deficiency at a drinking water system found during an inspection or during a response to an adverse result;
10. Undertake inspections, review reports and respond to complaints and adverse water reports at drinking water systems at private systems supplying water to five or less individual residences, to which the drinking water Regulations do not apply.
Resources/Budget:

The resources and budget for the Safe Water Program (including the swimming pool and spa inspection program) is 9.8 FTEs with a 2007 budget of $1,143,940. 75% of the Safe Water Program budget is funded by the MOHLTC, and 25% of the budget is funded locally.

How Are We Doing?

Impact on health of Hamiltonians;

There has not been an outbreak of water-borne illness on record amongst Hamilton residents due to an exposure to a source of drinking water or recreational water within the City of Hamilton.

Unfortunately, there have been significant outbreaks of water-borne illness elsewhere in Ontario, Canada, and internationally. Water-borne outbreaks of illness associated with drinking water systems and recreational water facilities and beaches tend to be associated with high morbidity rates and there is a real risk of mortality, depending on the causative agent, the degree of exposure, and personal health risk factors.

Due to outbreaks of water-borne illness, and specifically the drinking water tragedy in Walkerton, drinking water legislation and regulation has changed significantly in the Province of Ontario. These changes have clarified and broadened the role and authority of local MOHs in the area of safe drinking water.

The combination of broader Medical Officer of Health authority under the current drinking water legislation and increased local disease surveillance will further the very positive impact of the Safe Water Program on the health of Hamiltonians.

Comparison to peer communities

The number of adverse water quality incidents (AWQI) for four health units is shown below. AWQIs are lab analysis results that indicate the quality of a drinking water sample from a regulated drinking water system does not meet the Ontario Drinking Water Standards (Regulation 169). According to the Safe Drinking Water Act, all of these must be reported to the office of the Medical Officer of Health. There is significant variation amongst health units regarding the number and type of regulated drinking water systems within health unit boundaries.

The number of AWQIs for Hamilton, Ottawa, Windsor, and London health units is as follows;

<table>
<thead>
<tr>
<th></th>
<th>2007 to date (June19th)</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamilton</td>
<td>47</td>
<td>144</td>
</tr>
<tr>
<td>Ottawa</td>
<td>41</td>
<td>208</td>
</tr>
<tr>
<td>Windsor/Essex</td>
<td>42</td>
<td>96</td>
</tr>
<tr>
<td>London</td>
<td>40</td>
<td>82</td>
</tr>
</tbody>
</table>
Emerging Issues/Opportunities:

The Safe Water Program is currently undertaking a number of initiatives to meet the challenges posed by pending changes to provincial drinking water legislation. These changes will place additional mandates on local health departments across the province.

Transfer of Regulatory Oversight from the MOE to Local Health Units to Inspect Small Drinking Water Systems

The provincial Safe Drinking Water Act and the Health Protection and Promotion Act have been recently amended to facilitate the transfer of responsibility for the inspection of small drinking water systems from the Ministry of the Environment to the Ministry of Health and Long Term Care and, subsequently, to local health departments. This transfer is proposed for early 2008. These systems consist of smaller municipal and non-municipal drinking water systems serving small businesses, community parks, trailer parks, motels, churches, etc. There are approximately 17,200 of these systems province-wide, with 400 estimated to be located within the city of Hamilton. The MOHLTC has advised local health departments they will be responsible for inspection and regulation of these systems. The MOHLTC has indicated that 100% funding for this transfer will be available for a two year planning and start-up period, followed by 75% funding thereafter. The City of Hamilton (and other municipalities) submitted written opposition to the MOHLTC in February 2007 to object to the proposed funding structure. Details of the funding structures and availability have yet to be announced. Carrying out this additional mandate will require more staff resources.

In preparation for the transfer, all known small drinking water systems located in the city of Hamilton have been inventoried and added to the program’s water system tracking database. In addition, in collaboration with the McMaster Institute of Environment and Health, this database is being updated this summer to allow the addition of all small drinking water systems to the city’s Geographic Information Systems (GIS) database.

Clean Water Act (Source Water Protection)

The Ministry of the Environment is developing the Clean Water Act and regulations as part of a multi-barrier approach to protect existing and future drinking water sources. This Act will require the establishment of Source Protection Authorities within defined Source Protection Areas (typically delineated according to Conservation Watersheds). A Source Protection Plan must be developed for each Source Protection Area.

A Source Protection Committee will develop a Source Protection Plan that sets out policies to mitigate imminent threats to drinking water sources. Imminent drinking water threats are defined to include an existing or future activity or a condition from a past activity that has the potential to affect the quality or quantity of any water that is or may be used as a source of drinking water.
The municipality is responsible for regulating and enforcing drinking water threats in accordance with the source protection plan.

The municipality may enter into an agreement with other agencies such as the Board of Health, or Conservation Authority to undertake work to manage, mitigate or eliminate drinking water threats. The enforcing agency will designate a Permit Official who will be responsible for program delivery by permit inspectors.

Resource needs for such a program will depend on the objectives and service goals of the source water protection plan for each watershed. There will be significant resource demands placed on the municipality to:

- promote the program to land owners,
- provide input into the development of the source water protection plans
- ongoing implementation and enforcement services

The MOHs role on Source Protection Committees or with implementation of the Source Protection Plan or other Clean Water Act requirements is not clear at this point.

**Provincial Groundwater Monitoring Network**

The Provincial Groundwater Monitoring Program is an MOE program designed to monitor baseline groundwater levels and chemistry. There are 462 monitoring wells across the province. As part of the program the MOE notifies the Local Health Unit, Municipality, and Conservation Authority of an exceedence relating to a health related parameter listed in Regulation 169 under the Safe Drinking Water Act.

A total of 15 wells are located within Hamilton. The MOHLTC has indicated that local Medical Officers of Health are to review PGMN well adverse test results and take action when indicated.

**Water hauler (truck) inspections**

In 2006, PHS started a water hauler/truck inspection program. A total of 11 potable water haulage businesses are located in Hamilton. These businesses operate approximately 23 water haulage vehicles. These vehicles can typically haul 2000-4000 gallons of potable water per load for distribution to residential homes and businesses that use cisterns as a water source. These water haulers obtain potable water from filling stations connected to municipal water. Hamilton has 9 filling stations; two of these filling stations are municipally owned and operated, and 7 are privately owned.

To ensure that potable water is delivered in a safe and sanitary manner, the Health Protection Division inspects potable water haulage vehicles two times per year and visit filling stations annually. Water haulers provide drinking water to a significant number of locations locally, yet they remain to be unregulated and uninspected in most of the Province.

Water Haulers are also used as temporary or emergency sources of drinking water for affected users during drinking water advisory situations, and when repairs or upgrades...
are being made to drinking water systems so the supply of safe water to users is not interrupted.

Public Education

The Safe Water Program public education and outreach primarily focuses on homeowners whose water supply is from private wells or cisterns. Media releases are sent out annually on World Water Day (March 22nd) reminding rural residents with private wells and cisterns to test the safety of their private water supply, to know where their well is located, and to make sure that their water supply is constructed properly and protected from sources of contamination.

Well water information kits including sample water bottles, best practices booklets titled *Keeping your Well Water Safe to Drink*, and City of Hamilton Safe Water pamphlets are available year-round at Municipal Service Centres. Water samples submitted to Municipal Service Centres are transported to the Ministry of Health and Long-Term Care Public Health Lab for analysis.

In 2006 PHS added six new information and water sample bottle pick-up locations in the rural areas of Hamilton. Water samples cannot be brought back to these locations.

These six locations include:
- Highland Country Markets, 432 Highland Road East, Stoney Creek
- Dee’s Bakery, formerly Beverly Township, 1817 Regional Road 97, Valens
- Copetown General Store, 2012 Governors Road, Copetown
- Carlisle Post Office, Centre Road, Carlisle
- Rockton General Store, 791 Old Highway 8, Rockton
- Waterloo-Oxford Co-operative Inc., 7 Margaret Street, Lynden.

Another public education component of the Safe Water Program is the participation in various rural fall fairs. These rural fairs have served as additional well water information and water bottle pick-up locations. PHS staff attend these fall fairs to answer well water related questions.

In 2005-2006 PHS staff has participated in:
- Ancaster Fair
- Binbrook Fair
- Rockton Fair

In 2007, PHS initiated a novel public education approach. Post cards were mailed to approximately 10,000 rural properties that were believed to not be connected to the municipal water supply (i.e. private wells/cisterns are used). The message sent was that 75% of all rural homeowners do not test their well water for bacteria. A list of all water bottle pick-up and drop-off locations and Municipal Services Centres were included in this post card. Contact information was also provided.
It is estimated that only 25% of rural residents take advantage of the free well water testing program provided by the MOHLTC Public Health Lab on Fennell Avenue. PHS initiated the post card mail out regarding the free water sampling program to over 10,000 rural Hamilton addresses in order to increase uptake of the free water testing program.

**Conclusion:**
A safe supply of drinking water is something that Canadians take for granted. However, drinking water tragedies have demonstrated that vigilance must always be maintained. The amendments to the Safe Drinking Water Act and the Clean Water Act will place even more responsibility on local Boards of Health and public health departments to ensure that the risks to communities from outbreaks of waterborne disease are minimised.

Inspecting and monitoring recreational water facilities and beaches is also an effective public health intervention that protects the health of Hamiltonians. Further intervention at Bayfront and Pier 4 beaches is likely necessary to ensure these beaches are available for recreation.

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Elizabeth Richardson, MD, MHSc, FRCPC
Medical Officer of Health
Public Health Services