

Response to Adverse Drinking Water Quality Incidents

**This document is in support of the Safe
Water Program, Drinking Water Protocol**

**Environmental Health Branch
Public Health Division
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This guidance document is intended to support boards of health in responding to adverse drinking water quality incidents. This document is not intended to provide legal advice or to be a substitute for the professional judgment of medical officers of health or local board of health staff. Board of health staff should consult with legal counsel as appropriate.

Purpose

The purpose of this document is to provide guidance to assist local boards of health, specifically public health inspectors (PHI) and medical officers of health (MOH) in providing appropriate response to adverse conditions that may impact the quality of a drinking water supply and pose a potential for illness through its use. Because it is very difficult to remove all contaminants from a source water supply, and in order to ensure a safe drinking water supply, a multi-barrier approach should be applied to protect the water from source to tap.

This document is referenced in the Drinking Water Protocol, under the Safe Water Program of the Ontario Public Health Standards. Specifically, under Section 2 b) of the Drinking Water Protocol, boards of health are required to act on drinking water-related complaints and reports within 24 hours of notification of the complaint or report to determine the appropriate response required, and in so doing, are directed to refer to the most current version of the Response to Adverse Drinking Water Quality Incidents Guidance Document for information.

Legislative and Regulatory Oversight

Municipal and non-municipal year-round residential systems and those systems that serve designated facilities are regulated by Ontario Regulation 170/03 (*Drinking Water Systems*) under the *Safe Drinking Water Act, 2002* (SDWA).

Municipal and non-municipal seasonal residential water systems and those that serve public facilities other than designated facilities are regulated under the *Health Protection and Promotion Act* (HPPA). For these systems, Ontario Regulation 318/08 (*Transitional – Small Drinking Water Systems*) sets the basic operational requirements until an inspection and site-specific risk assessment has been completed by a PHI. Once the system has been inspected and a directive is issued by the PHI, the operational requirements such as water testing frequency, treatment requirements, etc, will be established in accordance with Ontario Regulation 319/08 (*Small Drinking Water Systems*).

All regulations noted above place responsibility upon owners and operators to operate drinking water systems in a manner that prevents users from being exposed to unsafe drinking water.

The HPPA assigns the responsibility for community health protection to the MOHs and PHIs. The regulations under the HPPA and SDWA direct operators and operating authorities to follow the advice of the local MOH. Local boards of health should recognize that if appropriate action is being taken by owners/operators, additional action may not be required by the PHI or MOH.

Notification of Adverse Incidents and Response

Under the current regulatory regime, the owner/operator of a drinking water system is obligated to notify the users of conditions that have the immediate potential for putting the consumers' health at risk. The owner/operator of a drinking water system is also required to notify the MOH and to follow up with any instruction that may be issued by an MOH.

When the MOH or PHI receives information about adverse water quality, they should perform a risk analysis to assess the potential health impact the adverse water quality may have on users. Where necessary, the MOH or PHI must take appropriate action to protect public health.

While owners and operators of drinking water systems are responsible for the provision of safe drinking water, MOHs have statutory powers to inspect and manage health hazards under the

HPPA. The MOH or PHI may institute measures that provide the necessary assurances that consumers have been notified of adverse water quality. The MOH or PHI may also provide instructions to users or owner/operators of a drinking water system on how to mitigate the risk and ensure that the owner/operator of the affected drinking water system is taking necessary corrective actions.

Ministry of Health and Long-Term Care (MOHLTC) Requirements

In order to monitor and report on the status of provincial drinking water quality, the MOHLTC must be informed of incidents that have the potential for exposing users to risk. The MOHLTC has created an online *Adverse Drinking Water Quality Reporting System* that enables local boards of health to report information, as well as provide for the efficient and detailed reporting of drinking water advisories (including boil or drinking water advisories and/or orders). As indicated in Section 4 a) ii) of the Drinking Water Protocol, the board of health is required to report all adverse drinking water notifications in a timely manner and as directed by the ministry including as a minimum: date issued, date rescinded and corrective measures taken..

The notification system applies to all notices or orders issued for public drinking water systems regardless of whether these were issued by a local municipality, water system owner or operator, MOH or PHI.

MOHLTC Reporting Structure

The MOHLTC system is a web-based information reporting and notification application that feeds directly into a retrievable database. There are also two forms that allow local board of health staff to notify the MOHLTC when a notice, order or direction has been issued or rescinded. The database can be updated with changes to adverse water quality responses and record when full use of the water system is resumed. The MOHLTC's online reporting system can be accessed at the following URL:

<http://apps.publichealthontario.ca/DWAdvisory/Login.aspx>

There are three general categories of notices in the reporting structure:

1. **Boil Water Advisory (BWA):**
This is used when boiling the water is adequate to render the water safe for use.
2. **Drinking Water Advisory (DWA):**
This is used when action other than boiling the water is necessary to protect users.
3. **Boil/Drinking Water Order (B/DWO):** This is used when an MOH or PHI has issued an order under section 13 of the HPPA detailing what actions must be taken by the water system owner/operator.

General Preparedness of Local Boards of Health

Boards of health should:

- Confirm that the drinking water system owner or operators are aware of their obligation to report and provide information to the MOH with regard to certain adverse incidents.
- Have an effective communication plan that involves all appropriate community partners in the process of disseminating correct information about adverse water quality incidents in a timely manner.

- Be accessible to operators of a drinking water system for reporting events involving adverse water quality and be available to provide advice on taking appropriate action on a 24/7 basis.
- Develop and maintain a plan of action for responding to adverse drinking water quality incidents that includes actions to enable the local board of health to address such situations in the event that the owner or operator of a drinking water system is unavailable or uncooperative.
- Develop and maintain policies, procedures and relevant information (e.g. draft media releases, notification letters, etc.) that may be necessary for the effective management and timely response to an adverse water quality incident.
- Ensure that the local board of health staff are adequately trained and resource material is available and accessible on a 24/7 basis to effectively respond to adverse water quality incidents.

Relationships with Key Partners and Stakeholders

Communications and strong working relationships should be initiated and maintained between the local boards of health and key partners such as:

- Owners or operators of all regulated drinking water systems (SDWA and HPPA);
- Local Ministry of the Environment (MOE) officials;
- Testing laboratories;
- Local media;
- Local government officials;
- Neighbouring local boards of health.

Regular communication with key partners and stakeholders will provide a foundation for effective information exchange and co-operation when responding to adverse water quality incidents.

Local Water Quality Advisory Group

In the case of a municipal system, the owner/operators should be encouraged to form a local water quality advisory group for the development of local emergency plans as a means of ensuring proactive planning and communication. The development of the plan may include consulting with:

- Representatives from the health unit (including communications personnel)
- Municipal leaders and key stakeholders from involved municipalities
- Public works staff involved with water treatment, distribution, sampling or other aspects of providing drinking water.
- Representatives from appropriate associations, such as Ontario Clean Water Association (OCWA), [Canadian Water and Wastewater Association](#) (CWWA), Conservation Ontario
- Emergency planners for the municipality, county or region
- Representatives from MOE
- Representatives from laboratories

A local emergency plan should:

- Define roles and responsibilities of all agencies involved
- Establish terms of reference for the advisory group

- Maintain a current list of municipal emergency contacts
- Outline specific response procedures for adverse water quality incidents including a communications plan

A local water quality advisory group, or some of the members, may act as a response team in the event of adverse water quality incidents. The response team may:

- Provide advice in support of the MOH's decision to issue/rescind drinking water quality notices, advisories or orders where these actions may be required.
- Implement the communications plan
- Oversee the situation and identify remediation measures
- Implement an education campaign, if required

This section is consistent with Recommendation 77 in Part 2 of Justice O'Connor's Report of the Walkerton Inquiry, which states that:

"A steering group should be established within each public health area in the province, comprised of representatives of affected local hospitals, municipalities, local Ministry of Environment and Energy offices and local boards of health, for the purpose of developing in a coordinated fashion emergency response plans for the control of, or the response to, infectious diseases and public health hazard outbreaks."

General Direction Tools

Recommended action upon receipt of a report of an adverse drinking water quality incident:

- Verify in a timely fashion that the information is correct;
- Establish contact with the owner or operator of the drinking water system if they have not called the local board of health;
- Determine the potential for adverse health outcomes based on a risk analysis based on available information. This could vary from verifying the existence of an adverse situation to conducting a risk analysis of the event;
- Confirm that requirements of applicable legislation for corrective action to adverse results are being implemented and that these actions are sufficient to prevent adverse outcomes. Ongoing consultation with the local office of the MOE during adverse water quality incidents is recommended.

If the situation does not indicate the possibility of adverse health outcomes

- Record and file.

If the situation does indicate possibility of adverse health outcomes

- Determine what action(s) have been taken to prevent adverse health outcomes;
- Determine if the action(s) taken to remediate the situation will be sufficient to prevent adverse outcomes.

Note:

For MOE and MOHLTC regulated systems several corrective measures are prescribed in regulations. The MOH or PHI should verify that those corrective actions are being carried out, and only where necessary add to those requirements.

If actions taken by the owner/operator are sufficient to prevent adverse health outcomes

- Record the event using the MOHLTC reporting and notification system and continue with observation and tracking using unique incident number.

If actions taken by the owner/operator are deemed to be insufficient to prevent adverse health outcomes:

- A site visit by the public health inspector may be required. For response to O. Reg. 170/03 drinking water systems, these visits should be carried out in conjunction with the local MOE Inspector if possible.
- Based on the situation and available information the PHI may order or otherwise direct the owner/operator to issue notices to the users.
- If owner/operator is not providing notification to the users in a timely manner, the PHI may take necessary steps to inform users of an unsafe water condition.

Considerations When Discontinuing a Drinking Water Supply

Although discontinuing the use of a water supply may be an option for consideration in protecting users from consuming unsafe water, this approach may not be an appropriate response to adverse drinking water incidents. Discontinuing any drinking water system, especially those that are complex or very large may lead to additional risk situations that must be considered. These include:

- Pressure in the water lines may still allow water flow to continue to some users.
- Infiltration of contaminants into the distribution system may occur due to backflow or back siphonage caused by variances in the water pressure.
- Restart of water flow and treatment may affect the water quality and may take some time for the water to return to normal conditions.
- Many drinking water systems are relied upon for emergency services such as fire fighting.
- Where the water supply is discontinued, arrangements for an alternate supply should be made.

Suggested Means of Communicating with Drinking Water Users

A number of options for effectively communicating adverse conditions to drinking water users should be considered by owners/operators and public health staff based on the site conditions and the number of users. One or more of the following options may be used as deemed necessary.

1. Provide written notices to each user

- Door-to-door delivery is the timeliest approach and ensures users have received notification. This is often the most effective means of communication for smaller systems but is time consuming for larger drinking water systems. Door-to-door delivery may be used in addition to other means of communication.

2. Notification by phone

- Where phone numbers are known for drinking water users, notification by phone is often the fastest way to provide information about adverse water quality conditions. Some communities have automatic phone dialling systems which can get the message out with a minimum of staff effort.
- This approach may be complemented by written postings of notices to ensure the message is continued until corrections to the system are made.

- Where there are operations such as hospitals, daycares and food premises this is the timeliest approach and should be considered even if other means of communication are used.

3. Notification through Local Media

- The local media such as radio, newspaper or TV are an important communication partner to disseminate notifications for adverse water quality incidents. Sample templates for media releases should be developed by the local board of health to quickly provide relevant information to the media.

Appendix A – Quicklist for Specific Responses to Adverse Water Quality Incidents

The following section provides additional detail and reference materials that may be of assistance in responding to specific adverse water quality incidents. In depth knowledge of the legislation and supporting documents listed below will promote effective response to any adverse drinking water quality incident.

Note: For MOE and MOHLTC regulated systems, several corrective measures are prescribed in Regulations. The MOH or PHI should verify that those corrective actions are being carried out and where necessary, require additional actions.

Responses to Specific Adverse Incidents	Guidance Documents and other Resources
<p>1. Link to a disease outbreak</p> <p>A probable link between a water system and disease outbreak is sufficient reason to provide directions to the users or give directions to discontinue the provision of drinking water from the system.</p>	<ul style="list-style-type: none"> ▪ Health Protection and Promotion Act ▪ Ontario Public Health Standards ▪ Safe Drinking Water Act, 2002
<p>2. Presence of disease-causing micro-organisms (For example: <i>E. coli</i> O157, <i>Salmonella</i>, <i>Giardia</i>, etc.)</p> <p>The presence of a disease causing organisms (e.g. <i>E. coli</i> O157, <i>Campylobacter</i>, <i>Salmonella</i>, <i>Giardia</i> or <i>Cryptosporidium</i>), in the drinking water supply should result in an immediate response.</p> <ul style="list-style-type: none"> ▪ For all disease causing organisms, except protozoa, directions should be provided to the users, or directions given to discontinue the provision of drinking water from the system. ▪ Although it is preferred that there is no viable evidence of protozoa (e.g. <i>Giardia</i> and <i>Cryptosporidium</i>), consideration should be given to the possibility that levels detected may only indicate normal background counts or be incapable of causing adverse health effects. ▪ The presence and quality of treatment, at the time of testing would also need to be reviewed. If the filtration system was operating poorly or was inoperative and history of the water source shows high potential for protozoa, provide directions to the users or give directions to discontinue the provision of drinking water from the system. 	<ul style="list-style-type: none"> ▪ Health Protection and Promotion Act ▪ Ontario Public Health Standards ▪ Safe Drinking Water Act, 2002 ▪ Guideline Technical Document - Bacterial Waterborne Pathogens: Current and Emerging Organisms of Concern (GCDWQ) ▪ Guideline Technical Document - Protozoa: Giardia and Cryptosporidium (GCDWQ)
<p>3. Presence of <i>Escherichia coli</i></p> <p>Disease causing organisms may not be present. This finding indicates that fecal contamination may have occurred.</p> <ul style="list-style-type: none"> ▪ Review the history of the findings. Compare if the results of samples from the affected site(s) are different from other samples taken within a reasonable timeframe or proximity. ▪ Determine whether the disinfection systems are operating and whether all other aspects of the system were working as designed. i.e. Determine and confirm current disinfection residual and the residual at time of sampling result of most recent water tests, and historical sampling results. ▪ Observe status of corrective action requirements outlined in O. Reg. 170/03, O. Reg. 318/08 or O. Reg. 319/08 and other applicable legislation are being followed. Consider need for additional action. 	<ul style="list-style-type: none"> ▪ Health Protection and Promotion Act ▪ Ontario Public Health Standards ▪ O. Reg. 318/08 (Transitional – Small Drinking Water Systems) ▪ O. Reg. 319/08 (Small Drinking Water Systems) ▪ Safe Drinking Water Act, 2002 ▪ Ontario Drinking Water Quality Standards O. Reg. 169/03 (ODWQS) ▪ O. Reg. 170/03 (Drinking-Water Systems) ▪ Ontario's Drinking Water Quality Management Standard ▪ Guideline Technical Document – Escherichia coli (GCDWQ)

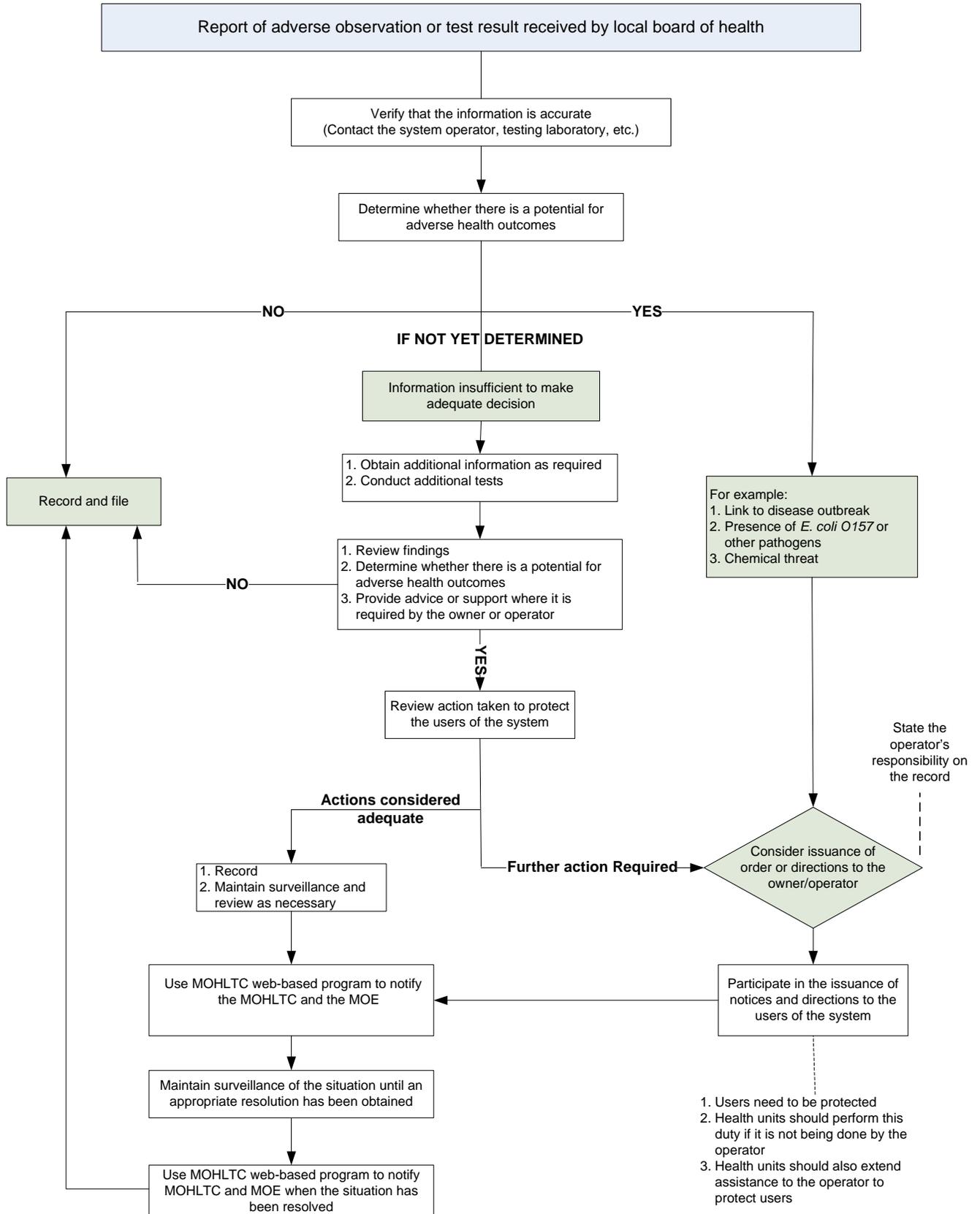
Responses to Specific Adverse Incidents	Guidance Documents and other Resources
<ul style="list-style-type: none"> ▪ If information indicates that the safety of the water system has not been compromised, resample, retest and re-evaluate. <p>If information indicates that the water system cannot be considered safe, directions should be provided to the users or give directions to discontinue the provision of drinking water from the system.</p>	
<p>4. Presence of Total Coliforms</p> <p>Disease causing organisms may not be present. This finding indicates that the integrity of the water system may have been compromised.</p> <ul style="list-style-type: none"> ▪ Request or arrange for immediate re-sampling to gain clearer knowledge of systems operation. ▪ Confirm if corrective action requirements outlined in O. Reg. 170/03, O. Reg. 318/08 or O. Reg. 319/08 and other applicable legislation are being followed. Suggest additional action if applicable. ▪ Review current disinfection residual, and at time of sampling, result of most recent water result, and historical sampling results. ▪ Assist in determining applicable action. <p>If re-sampling results show presence of total coliforms:</p> <ul style="list-style-type: none"> ▪ Review history of the findings. Compare if the results of samples from the affected site(s) are different from other samples taken within a reasonable timeframe or proximity. ▪ Consider the significance of the colony count of total coliforms. ▪ Review status of the disinfection systems and whether all other aspects of the system are working as designed. ▪ Confirm status of corrective action requirements outlined in O. Reg. 170/03, O. Reg. 318/08 or O. Reg. 319/08 and other applicable legislation are being followed. Consider need for additional action. ▪ Suggest applicable action that may be needed. <p>If information indicates that the water system cannot be considered safe, provide directions to the users or give directions to discontinue the provision of drinking water from the system.</p>	<ul style="list-style-type: none"> ▪ Health Protection and Promotion Act, ▪ Ontario Public Health Standards ▪ O. Reg. 318/08 (Transitional – Small Drinking Water Systems) ▪ O. Reg. 319/08 (Small Drinking Water Systems) ▪ Safe Drinking Water Act, 2002 ▪ Ontario Drinking Water Quality Standards O. Reg. 169/03 (ODWQS) ▪ O. Reg. 170/03 (Drinking-Water Systems) ▪ Ontario's Drinking Water Quality Management Standard ▪ Guideline Technical Document – Total Coliforms (GCDWQ)
<p>5. Presence of other pathogenic micro-organisms (<i>Aeromonas</i> spp., <i>Pseudomonas aeruginosa</i>, <i>Staphylococcus aureus</i>, <i>Clostridium</i> spp., or fecal / Group D streptococci)</p> <p>Although these organisms are capable of causing disease, exposure through water may not necessarily lead to illness. Their presence is a strong indication that the drinking water system lacks appropriate protection (disinfection) or the protection to the water in the system has failed (backflow or pipe breakage).</p> <ul style="list-style-type: none"> ▪ Review the history of the findings. Compare if the results of samples from the affected site(s) are different from other samples taken within a reasonable timeframe or proximity. ▪ Review status of disinfection systems and whether all other aspects of the system are working as designed. ▪ Confirm status of corrective action requirements outlined in O. 	<ul style="list-style-type: none"> ▪ Health Protection and Promotion Act, ▪ Ontario Public Health Standards ▪ O. Reg. 318/08 (Transitional – Small Drinking Water Systems) ▪ O. Reg. 319/08 (Small Drinking Water Systems) ▪ Safe Drinking Water Act, 2002 ▪ Ontario Drinking Water Quality Standards O. Reg. 169/03 (ODWQS) ▪ O. Reg. 170/03 (Drinking-Water Systems) ▪ Ontario's Drinking Water Quality Management Standard ▪ O. Reg. 170/03 (Drinking-Water Systems)

Responses to Specific Adverse Incidents	Guidance Documents and other Resources
<p>Reg. 170/03, O. Reg. 318/08 or O. Reg. 319/08 and other applicable legislation are being followed. Consider need for additional action.</p> <ul style="list-style-type: none"> ▪ If information indicates that the safety of the water system has not been compromised, resample, retest and re-evaluate. <p>If information indicates that the water system cannot be considered safe, provide directions to the users or give directions to discontinue the provision of drinking water from the system.</p>	<ul style="list-style-type: none"> ▪ From Source to Tap: Guidance on Multi-Barrier Approach to Safe Drinking Water (2004) ▪ Guideline Technical Document - Bacterial Waterborne Pathogens: Current and Emerging Organisms of Concern (GCDWQ)
<p>6. Ontario Drinking Water Quality Standards requirements for: (Chemical or Radiological Parameters, Sodium in exceedence of 20 mg/L and the Presence of unlisted pesticides)</p> <p>Chemical parameters are based on the potential to cause adverse health effects. There are three major issues to consider: i) level of contamination; ii) level of exposure which relates to amount of water consumed or direct contact; iii) susceptibility of the users.</p> <p><u>Examples for consideration:</u></p> <ul style="list-style-type: none"> ○ Levels of nitrate double the ODWQS are an immediate concern to children under the age of six months but would not be of significance to adult only populations (GCDWQ). ○ Levels of lead double the ODWQS are of greater concern to those children under six years of age or those of lower body weight and an alternate supply desired quickly. The older and large portion of our population may not require a short term response. ○ Elevated sodium levels in a restaurant's individual water supply may not be a significant concern, whereas the same level of sodium in a community supply may have a potential impact on residents on sodium reduced diets. <ul style="list-style-type: none"> ▪ Except in cases of direct contamination, or a chemical spill near the water source, there is usually sufficient time to review the situation, consult with others and take an informed approach to the users. ▪ If conditions are such that contamination is a significant health threat with short-term exposure or actual level of contamination is unknown and should be avoided then provide directions to the users or give directions to discontinue the provision of drinking water from the system. ▪ Confirm if requirements of applicable legislation for corrective action to adverse results are being implemented. 	<ul style="list-style-type: none"> ▪ Health Protection and Promotion Act, ▪ Ontario Public Health Standards ▪ O. Reg. 318/08 (Transitional – Small Drinking Water Systems) ▪ O. Reg. 319/08 (Small Drinking Water Systems) ▪ Safe Drinking Water Act, 2002 ▪ Ontario Drinking Water Quality Standards O. Reg. 169/03 (ODWQS) ▪ O. Reg. 170/03 (Drinking-Water Systems) ▪ Ontario's Drinking Water Quality Management Standard ▪ Guideline Technical Document – Chemical/Physical Parameters (GCDWQ) ▪ Guideline Technical Document – Radiological characteristics (GCDWQ) ▪ Response to Standard Exceedances of Lead in Drinking Water Supplies under O. Reg. 170/03
<p>7. Low disinfectant level (Below 0.05 mg/L for free chlorine or below 0.25 mg/L for combined chlorine or loss of disinfection)</p> <p>Indicates that there may be a breach in the piping system or that disinfectant treatment process is not functioning sufficiently to maintain an adequate level of disinfectant.</p> <ul style="list-style-type: none"> ▪ Review situation with the operator of the system and determine corrective action. <p><u>Examples for consideration:</u></p> <ul style="list-style-type: none"> ○ An intermittent low disinfectant level with no potential of 	<ul style="list-style-type: none"> ▪ Health Protection and Promotion Act, ▪ Ontario Public Health Standards ▪ O. Reg. 318/08 (Transitional – Small Drinking Water Systems) ▪ O. Reg. 319/08 (Small Drinking Water Systems) ▪ Safe Drinking Water Act, 2002 ▪ Ontario Drinking Water Quality Standards O. Reg. 169/03 (ODWQS) ▪ O. Reg. 170/03 (Drinking-Water Systems)

Responses to Specific Adverse Incidents	Guidance Documents and other Resources
<p>post treatment contamination may not require immediate user notification.</p> <ul style="list-style-type: none"> ○ Chronically low disinfection levels to a specific section of a distribution system may be reason to keep users informed and to do additional bacteriological testing. <p>If appropriate level of disinfectant is not available to ensure provision of safe water quality, provide directions to the users or give directions to discontinue the provision of drinking water from the system.</p>	<p><i>Systems)</i></p> <ul style="list-style-type: none"> ▪ <i>Procedure For Disinfection of Drinking Water in Ontario</i> ▪ <i>Ontario's Drinking Water Quality Management Standard</i> ▪ <i>Guideline Technical Document – Chemical/Physical Parameters: Chloramine (GCDWQ)</i> ▪ <i>Guideline Technical Document – Chemical/Physical Parameters: Chloride (GCDWQ)</i>
<p>8. Post-filtration turbidity exceeds 1.0 Nephelometric Turbidity Units (NTU)</p> <p>An indication that the filtration system may not be adequately filtering to a level that is necessary for the disinfection process to work properly or an indication that filtration may not be sufficient to control the presence of protozoa.</p> <ul style="list-style-type: none"> ▪ Review situation with the operator of the system and determine if intervention is necessary. ▪ If it is determined that an elevated level will interfere with the provision of safe drinking water or that the source of turbidity indicates a new contamination risk to the system provide directions to the users or give directions to discontinue the provision of drinking water from the system. 	<ul style="list-style-type: none"> ▪ <i>Health Protection and Promotion Act,</i> ▪ <i>Ontario Public Health Standards</i> ▪ <i>O. Reg. 318/08 (Transitional – Small Drinking Water Systems)</i> ▪ <i>O. Reg. 319/08 (Small Drinking Water Systems)</i> ▪ <i>Safe Drinking Water Act, 2002</i> ▪ <i>Ontario Drinking Water Quality Standards O. Reg. 169/03 (ODWQS)</i> ▪ <i>O. Reg. 170/03 (Drinking-Water Systems)</i> ▪ <i>Procedure For Disinfection of Drinking Water in Ontario</i> ▪ <i>Ontario's Drinking Water Quality Management Standard</i> ▪ <i>Guideline Technical Document – Chemical/Physical Parameters: Turbidity (GCDWQ)</i>
<p>9. Indication of failure of protective disinfecting or mechanical containment (e.g., pressure gauges show a drop to below 20 psi)</p> <p>Water main breaks or power failure resulting in loss of system pressure or similar incidents may lead to direct contamination or contamination through back siphonage or pressurized backflow.</p> <ul style="list-style-type: none"> ▪ Review situation with the operator of the system and determine if intervention is necessary. <p><u>Examples for consideration:</u></p> <ul style="list-style-type: none"> ○ Systems that operate under high pressure may not become contaminated since water pressure would produce a flow away from the system. ○ Systems designed with backflow protection or plumbing use that would not lead to back siphonage may prevent contamination and therefore not present a risk to the users. <ul style="list-style-type: none"> ▪ If contamination is suspected provide directions to the users or give directions to discontinue the provision of drinking water from the system. 	<ul style="list-style-type: none"> ▪ <i>Health Protection and Promotion Act,</i> ▪ <i>Ontario Public Health Standards</i> ▪ <i>O. Reg. 318/08 (Transitional – Small Drinking Water Systems)</i> ▪ <i>O. Reg. 319/08 (Small Drinking Water Systems)</i> ▪ <i>Safe Drinking Water Act, 2002</i> ▪ <i>Ontario Drinking Water Quality Standards O. Reg. 169/03 (ODWQS)</i> ▪ <i>O. Reg. 170/03 (Drinking-Water Systems)</i> ▪ <i>Procedure For Disinfection of Drinking Water in Ontario</i> ▪ <i>Ontario's Drinking Water Quality Management Standard</i>

Responses to Specific Adverse Incidents	Guidance Documents and other Resources
<p>10. Water security breach</p> <p>This is a situation where a deliberate act (vandalism or terrorist act) may have caused contamination to a drinking water system.</p> <p>The medical officer of health should:</p> <ul style="list-style-type: none"> ▪ Consult with the local MOE office and the owner or operating authority of the drinking water system and any others, i.e. law enforcement officials. ▪ Consider issuing a drinking water advisory to the public, and to operators of designated facilities and other facilities affected by the advisory if it is determined that the security breach is or may present a credible risk to users. ▪ Provide directions to the owner or operating authority of the drinking-water system to notify users of a drinking water advisory at the affected part(s) of the distribution system and specify what action(s) are to be taken regarding public warnings, including when and how notices are given. ▪ Maintain communication with the MOE, owner or operators and other applicable agencies. <p>The advisory should be maintained until it has been determined that the drinking water system is no longer a risk or potential risk to users and the drinking water system where applicable is confirmed by the MOE as operating in compliance with O. Reg. 170/03 and O. Reg. 318/08 or O. Reg. 319/08.</p>	<ul style="list-style-type: none"> ▪ Health Protection and Promotion Act, ▪ Ontario Public Health Standards ▪ O. Reg. 318/08 (Transitional – Small Drinking Water Systems) ▪ O. Reg. 319/08 (Small Drinking Water Systems) ▪ Safe Drinking Water Act, 2002 ▪ O. Reg. 170/03 (Drinking-Water Systems) ▪ Ontario’s Drinking Water Quality Management Standard ▪ O. Reg. 170/03 (Drinking-Water Systems) ▪ From Source to Tap: Guidance on Multi-Barrier Approach to Safe Drinking Water (2004) ▪ Guideline Technical Document - Bacterial Waterborne Pathogens: Current and Emerging Organisms of Concern (GCDWQ)
<p>11. Source water impacts or other threats to the drinking water system (Chemical spills or cyanobacterial bloom (blue-green algae))</p> <p>These are situation that may have an effect on the source water quality which could also affect the delivery of safe drinking water.</p> <p>The medical officer of health should:</p> <ul style="list-style-type: none"> ▪ Consult with the local MOE office and the owner or operating authority of the drinking water system and any others as applicable. ▪ Consider issuing a drinking water advisory to the public, and to operators of designated facilities and other facilities affected by the situation if it is determined that the event is or may present a public health risk to users. ▪ Provide directions to the owner or operating authority of the drinking-water system to notify users of a drinking water advisory at the affected part(s) of the distribution system and specify what action(s) are to be taken regarding public warnings, including when and how notices are given. ▪ Maintain communication with the MOE, owners or operators and applicable others. <p>The advisory should be maintained until it has been determined that the drinking water system is no longer a risk or pose a potential risk to users and the drinking water system where applicable is confirmed by the MOE as operating in compliance with O. Reg. 170/03, O. Reg. 318/08 or O. Reg. 319/08.</p>	<ul style="list-style-type: none"> ▪ Health Protection and Promotion Act, ▪ Ontario Public Health Standards ▪ O. Reg. 318/08 (Transitional – Small Drinking Water Systems) ▪ O. Reg. 319/08 (Small Drinking Water Systems) ▪ Safe Drinking Water Act, 2002 ▪ O. Reg. 170/03 (Drinking-Water Systems) ▪ Ontario’s Drinking Water Quality Management Standard ▪ O. Reg. 170/03 (Drinking-Water Systems)

Appendix B – Decision Tree for Response to Adverse Observations or Test Results



Appendix C – References/Resources

1. Canadian Council of Ministers of the Environment. (2004). *From Source to Tap: Guidance on the Multi-Barrier Approach to Safe Drinking Water*.
http://www.ccme.ca/assets/pdf/mba_guidance_doc_e.pdf

2. Health Canada. Guidelines for Canadian Drinking Water Quality: Supporting Documents (most current online versions). Water, Air and Climate Change Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario.
<http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/>

Summary – PDF version (2008): http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/sum_guide-res_recom/summary-sommaire-eng.pdf

Guidelines for Canadian Drinking Water Quality – Guideline Technical Documents

a. Microbiological Parameters

Introduction (2002): http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/microbio-eng.pdf

Escherichia coli (2006): http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/escherichia_coli/escherichia_coli-eng.pdf

Total Coliforms (2006): http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/coliforms-coliformes/coliforms-coliformes-eng.pdf

Protozoa (2004): http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/protozoa/protozoa.pdf

Enteric Viruses (2004): http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/enteric-enterovirus/enteric-enterovirus-eng.pdf

Guidance for Issuing and Rescinding Boil Water Advisories (2001). http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/boil_water-eau_ebullition/boil_water-ebullition_eau-eng.pdf

Heterotrophic Plate Count (2006): http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/heterotrophic-heterotrophes/heterotrophic-heterotrophes-eng.pdf

Bacterial Waterborne Pathogens – Current and Emerging Organisms of Concern (2006): http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/pathogens-pathogenes/pathogenes-pathogenes-eng.pdf

b. Chemical or Physical Parameters

Chloramines (1996): http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/chloramines/chloramines-eng.pdf

Chloride (1987): http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/chloride-chlorure/chloride-chlorure-eng.pdf

Nitrate/Nitrite (1992): http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/nitrate_nitrite/nitrate_nitrite-eng.pdf

Sodium (1992): http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/sodium/sodium-eng.pdf

Turbidity (2003): http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/turbidity/turbidity-eng.pdf

c. Radiological Parameters

Radiological Characteristics (1995): http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/radiological_characteristics/radiological-radiologiques-eng.pdf

3. Government of Ontario. *Ontario Statutes and Regulations – E-Laws*. <http://www.e-laws.gov.on.ca/>
4. Ontario Ministry of the Environment. *Ontario’s Drinking Water Quality Management Standard* (2006). http://www.ene.gov.on.ca/envision/env_reg/er/documents/2006/Drinking%20Water%20Quality%20Management%20Standard%20-%20October%202006.pdf
5. Ontario Ministry of the Environment. *Procedure for Disinfection of Drinking Water in Ontario* (2006). <http://www.ene.gov.on.ca/envision/gp/4448e01.pdf>
6. Ontario Ministry of Health and Long-Term Care. *Procedure for Disinfection of Drinking Water in Ontario* (2008). http://www.health.gov.on.ca/english/public/program/pubhealth/safewater/docs/sdws_disinfection_manual_20081128.pdf
7. Ontario Ministry of Health and Long-Term Care. *Procedure for Corrective Action for Small Drinking Water Systems that are Not Currently Using Chlorine* (2008). http://www.health.gov.on.ca/english/public/program/pubhealth/safewater/docs/sdws_correctiveaction_20081128.pdf
8. Ontario Ministry of Health and Long-Term Care (Public Health Branch). *Ontario Public Health Standards* (2008). http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/index.html