

**Manitoba Water
Stewardship**

**Terms of Reference for Assessment of
Water System Infrastructure and Water Supply
Sources for Semi-Public Water Systems**

Date: June 2007

**Prepared for
Office of Drinking Water
Prepared by**



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Manitoba 

TERMS OF REFERENCE

FOR

**ASSESSMENT OF WATER SYSTEM
INFRASTRUCTURE AND WATER SUPPLY
SOURCES**

For Semi-Public Water Systems

Approval Guideline ODW-AG-03

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**TERMS OF REFERENCE
FOR
ASSESSMENT OF WATER SYSTEM INFRASTRUCTURE AND
WATER SUPPLY SOURCES – FOR SEMI-PUBLIC WATER SYSTEMS
April 2004**

1.0 DEFINITIONS

The following definitions apply throughout this document:

Assessor – means an individual deemed to be qualified by the Office of Drinking Water to undertake assessments of Semi-Public Water Systems, and who;

(a) is competent by virtue of training and/or experience relating to drinking water supplies to engage in practices that fulfil the requirements of this Terms of Reference, and

(b) is not an employee of the Owner of the Water System being reviewed, and

(c) has been contracted by the Owner of the Water System to prepare a System Assessment Report to verify that the Water System is capable of achieving current environmental standards in accordance with these Terms of Reference.

(d) shall be a Professional Engineer where required by the Office of Drinking Water.

AWWA – means the “American Water Works Association” and its associated Standards, Manuals, White Papers and Policies.

Domestic Purposes – means the use of water for personal hygiene, drinking, preparing food or washing dishes or other items that come into contact with food, or other purposes prescribed by regulation.

DWS Act – means the “Drinking Water Safety Act” assented to August 9, 2002 and as amended from time to time.

Engineer – means a Professional Engineer as defined in the *Engineering and Geoscientific Professions Act* and who;

(a) is competent by virtue of training and experience in engineering relating to drinking water supplies to engage in practices that fulfil the requirements of these Terms of Reference, and

(b) is not an employee of the Owner of the Water System being reviewed, and

(c) has been contracted by the Owner of the Water System to prepare a System Assessment Report to determine whether the Water System is capable of achieving current quality and environmental standards in accordance with these Terms of Reference.

GCDWQ – means the latest version of the “Guidelines for Canadian Drinking Water Quality”, and as amended from time to time.

ODW – means the “Office of Drinking Water”.

Owner – means that person who is responsible for the ongoing operation of the water system, or in charge of managing that operation, and if the water system or part of it is owned by more than one person or is jointly owned, includes all of those Owners.

Private Water System – means a Water System that supplies water only to one private residence, or despite supplying water to commercial premises or to more than one private residence, is designated under clause 2(a) under the DWS Act as a Private Water System.

Provincial Standards – means the health related parameters as described in the Drinking Water Quality Standards Regulation in force under the Drinking Water Safety Act.

Public Water System – means a Water System that has 15 or more service connections, or has fewer than 15 service connections, but is designated under clause 2(b) under the DWS Act as a public water system.

System Assessment Report or Report – means the “Assessment of Water System Infrastructure And Water Supply Sources” referenced in the DWS Act and the deliverable product of these Terms of Reference.

Semi-Public Water System – means a Water System that is not a Public Water System or a Private Water System.

SWTR – means “Long Term 1 Enhanced Surface Water Treatment Rule” promulgated in January 2002 by the US Environmental Protection Agency, and as amended from time to time.

Ten State Standards – means the latest version of the “Recommended Standards for Water Works” as issued by the ‘Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers’, and as amended from time to time.

Water System – means a well, or a device or structure or an assemblage of devices and structures, used or intended to be used for the production, treatment, storage and/or delivery of potable water for domestic purposes.

2.0 OBJECTIVES

These Terms of Reference have been prepared in support of Section 9, ASSESSMENTS OF WATER SYSTEM INFRASTRUCTURE AND WATER SUPPLY SOURCES, of the DWS Act. The assessments are to be completed by a qualified assessor, with applicable experience in drinking water supplies. The Assessor must be deemed qualified by the ODW to undertake the assessment of the Water System; and where directed by the ODW, the Assessor shall be a Professional Engineer.

The objective of the Report is to carry out an onsite evaluation to identify, analyse and mitigate any potential adverse health risks associated with the Water System in a “source to tap” methodology. The Report shall focus on the **microbiological (bacterial and microbial)** health risks associated with the Water System, as well as those parameters listed in the Operating Licence (where a licence has been issued) and any specific parameters identified by the ODW. The Report shall establish whether the Water System’s source, facilities, equipment and operations are effective in producing safe drinking water, and meet regulations in force under the Public Health Act and the DWS Act. The level of effort and depth of the Report should reflect the Water System size, complexity and risks.

3.0 GENERAL REQUIREMENTS

The Assessor preparing the Report is required to carry out an onsite evaluation and to establish contact with the regional Drinking Water Officer. The Report is to identify the risks to public health and shall make recommendations as necessary for operational and physical improvements that should be implemented to mitigate against these risks.

The Report must include:

- 3.1 A compilation of existing Permits and Licences for the Water System.
- 3.2 A review of any previous studies and reports relating to the Water System.
- 3.3 A characterization of the raw water supply source(s), and a description of any source water protection measures being implemented.
- 3.4 A description of the Water System and operations.
- 3.5 A characterization of the treated water, and a description of who is using the water.
- 3.6 An assessment of the potential for microbiological contamination, as well as any chemical and physical parameters identified by the ODW and listed in the Operating Licence (where a licence has been issued).
- 3.7 An assessment of the physical works associated with the Water System.

4.0 COMPILATION OF PERMITS AND LICENCES

- 4.1 The Assessor shall compile Permit(s) and Licence(s) for the Water System from the Owner, and include a copy of these as an Appendix to the Report.
- 4.2 The Assessor shall prepare a listing of these Permits and Licences in chronological order summarizing the Permit and Licence number, as well as a brief description of the works approved for each Permit and Licence and a summary of terms and conditions.

5.0 CHARACTERIZATION OF THE RAW WATER SUPPLY SOURCE(S).

- 5.1 The Assessor shall characterize the raw water of each individual source of the Water System's raw water supply, including all back-up supplies. For the purpose of characterization, parameters to be evaluated shall focus on microbiological quality. The Assessor shall utilize the source raw water sampling and analysis records available from the Owner and the ODW, and any additional sampling and analysis that may need to be undertaken for a characterization appropriate to the source. A copy of these records is to be included as an Appendix to the Report.
- 5.2 The Assessor shall, if applicable, provide a preliminary determination of whether a groundwater supply is under the direct influence of surface water based on available evidence, and indicate the need for additional studies if required.
- 5.3 Based on the raw water characterization, the Assessor shall:
 - Determine raw water quality conformance to the microbiological GCDWQ and Provincial Standards, whichever is the most stringent.
 - Determine raw water quality conformance to those parameters listed in the Water System's Operating Licence (where a licence has been issued), as well as those identified by the ODW.
 - Identify parameters that may impact treatment of the water, and influence operation of the system.
 - Identify treatment options that may be necessary to assure conformance to the Provincial Standards, and any parameters listed in the Operating Licence.
 - Identify any emerging issues that may impact the water source.

6.0 DESCRIPTION OF THE WATER SYSTEM AND OPERATIONS

- 6.1 The Assessor shall prepare a description of the Water System, including works for the collection, production, treatment, storage and/or delivery system of potable water.
- 6.2 This description shall be in sufficient detail to permit the ODW to utilize this description for an Operating Licence for the Water System.
- 6.3 The description of works shall also include a schematic process flow diagram of the Water System with process units and equipment identified, as well as points of connection to the distribution system.
- 6.4 This description shall include the types, number and sizes of all process units and equipment, including waste stream treatment and disposal facilities, and shall include critical process design parameters.
- 6.5 The Report shall include an evaluation of the Water System's long term sustainability, reliability of operation, consistency of quality, remaining service life and short- and -long-term upgrading needs.
- 6.6 The Assessor shall provide a brief review of operations, including documenting the number of employees and the number of hours on average each employee spends on operating the Water System.
- 6.7 The Report shall include a summary of water production and consumption quantities for a minimum three-year period.

7.0 CHARACTERIZATION OF THE TREATED WATER

- 7.1 The Assessor shall characterize the treated water at the treatment facility and in the distribution system. For the purpose of characterization, parameters to be evaluated shall focus on the microbiological. The Assessor shall utilize the treated water sampling and analysis records available from the Owner and the ODW, and any additional sampling and analysis that may need to be undertaken for a characterization appropriate to the source. A copy of these records is to be included as an Appendix to the Report.
- 7.2 Based on treated water characterization, the Assessor shall:
 - Determine treated water quality conformance to the bacteriological and microbial GCDWQ and Provincial Standards, whichever is the most stringent.
 - Determine treated water quality conformance to any other chemical or physical water quality standards identified in the Water System's Operating Licence (where a licence has been issued), as well as those identified by the ODW.
 - Identify any emerging issues that may impact the treated water quality.

8.0 ASSESSMENT OF THE POTENTIAL FOR MICROBIOLOGICAL CONTAMINATION

- 8.1 The Assessor shall undertake a review of the complete Water System to assess the potential for microbiological contamination using the following:
 - A review of the intake/well physical works, treatment works including storage facilities for the purpose of identifying potential sources and pathways of microbiological contamination to the physical works. Items to be reviewed include, but are not limited to; well head protection, watershed land uses,

agricultural/economic/industrial activities, waste treatment, potential developments, natural protective features and known threats.

- A review of available records of treated water quality testing for parameters that exceeded the Provincial Standards, and any parameters listed in the Water System's Operating Licence, over the last five years.
 - A review of any source water protection activities that are being implemented to assess whether they are sufficient to maintain consistent source water quality.
- 8.2 The Assessor shall undertake a review of results of bacteriological and disinfection residual sampling and analysis taken from the distribution system for the purpose of identifying locations within the distribution system which may need further assessment as potential sources of bacterial contamination, or respecting disinfection residual enhancements using the following:
- A review of available records of microbiological testing in the distribution system over the last five years.
 - A review of the distribution system details, including service connections. The review shall include a review of pipe materials, age of system, lead connections, known breaks in the distribution system and suspected deficiencies.
- 8.3 The Assessor shall review cross connection control and backflow prevention programs, flushing/swabbing programs and any start-up and shutdown protocols, where applicable, and make recommendations for improvements that may be required to mitigate against the potential for microbiological contamination of the drinking water.
- 8.4 The Assessor shall review the standard operating procedures and/or contingency plans for ensuring distribution system water quality during disruptions in system integrity. The Assessor shall also identify any emergency contingency plans that exist and if they are regularly reviewed and practiced by staff.
- 8.5 Should, at any time during the assessment, the Assessor discover direct sources of microbiological contamination, or malfunctioning disinfection equipment, or any system directly relating to microbiological contamination, the Assessor shall immediately notify the regional Drinking Water Officer, the ODW and the Owner.
- 8.6 Should, at any time during the assessment, the Assessor discover a situation where workplace safety is at risk, the Assessor shall immediately notify the Workplace Health and Safety Officer, the regional Drinking Water Officer, the ODW and the Owner.
- 8.7 The Assessor shall make recommendations as necessary for operational and physical improvements that should be implemented to mitigate against the potential for contamination.

9.0 ASSESSMENT OF PHYSICAL WORKS ASSOCIATED WITH THE WATER SYSTEM

- 9.1 The Assessor shall review the existing Water System with particular attention to the works necessary to ensure the robustness of the system utilizing the multiple barrier concept. The review should consider documents such as the Canada and Manitoba Plumbing Codes, as they pertain to water quality and safety.

- 9.2 The Assessor shall determine if the Water System, including disinfection procedures, is being operated in compliance with the Public Health Act, the DWS Act and all regulations in force under these Acts.
- 9.3 The Assessor shall review those parts of the existing building(s) or structure housing the treatment equipment, mechanical, HVAC and electrical systems as to their general condition and potential to affect water quality and reliability of service.
- 9.4 The Assessor shall make recommendations as necessary for operational and physical improvements that should be implemented to achieve compliance with regulations.

10.0 PREPARATION AND SUBMISSION OF A REPORT

- 10.1 The Assessor shall prepare a written Report outlining the findings and recommendations that shall be relied upon by the ODW in support of further decisions to be made by the ODW. The completed Report shall be to the satisfaction of the ODW.
- 10.2 Five (5) bound copies of the Report shall be submitted to the Owner. The Report shall also be submitted electronically in PDF format on compact disk. All supporting documents are to be digitized/scanned, and included in the PDF file.
- 10.3 The Assessor shall complete Form ODW0001-4 and attach a copy to each Report.
- 10.4 The Owner shall review the Report and forward three (3) copies to the ODW with the completed Form ODW0001-3.
- 10.5 Within one year of the completion of the Report, the Owner shall submit to the ODW an action plan detailing the tasks to be taken to address any deficiencies noted in the Report, and the schedule of implementation. **The Owner shall correct any critical issues identified in the Report as posing an immediate health risk within 30 days, or within a timeline approved by the ODW.**

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APPENDICES

- APPENDIX A - COPIES OF PERMITS AND LICENCES
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**NOTICE OF COMPLETION OF AN ASSESSMENT OF WATER SYSTEM INFRASTRUCTURE
AND WATER SUPPLY SOURCES FOR A SEMI-PUBLIC WATER SYSTEM**

TO BE COMPLETED BY THE OWNER:		Date of Report: <i>(yyyy/mm/dd)</i>
Name of Water System:		Community Code:
Category of Water System:	Raw Water Source: (Surface/Groundwater/GUDI/Combined)	
Location of Water System:		Population Served:
Water System Owner Name:	Telephone:	Fax:
Water System Owner Address:		
OPERATING LICENCE NUMBER AND DATE OF ISSUE (Where available): As issued under the Drinking Water Safety Act		
<u>Operating Licence Number:</u>	<u>Date of Issue:</u> <i>(yyyy/mm/dd)</i>	
<p>I certify that:</p> <ol style="list-style-type: none"> 1. The attached Report was prepared by an Assessor who has been pre-qualified by the Office of Drinking Water to undertake system assessments of Semi-Public Water Systems as stipulated in the Terms of Reference for this Water System Assessment, and who is not an employee of the Water System Owner. 2. I have read the Report, and it is consistent with my understanding of the Water System. 3. I understand the Report to the best of my ability. 4. The information provided to the Assessor, for the basis of this report, was accurate and complete to the best of my ability. <p>The undersigned is the person, or the person designated by the Owner as being, responsible for the Water System:</p> <p>Signature of Owner: _____</p> <p>Name of Owner: _____</p> <p>Title: _____</p> <p>Date Signed: _____</p>		

TO BE COMPLETED BY THE ASSESSOR:	Date of Report: (yyyy/mm/dd)
Name of Water System:	Community Code:
<p>I certify that:</p> <ol style="list-style-type: none"> 1. I prepared this Report for this Water System. 2. I am deemed to be qualified by the Office of Drinking Water to undertake system assessments for Semi-Public Water Systems, and I am in good standing with the ODW. 3. I have relevant experience relating to drinking water supplies. 4. I have visited the Water System for the preparation of this Report. 5. This Report was prepared in accordance with the "Terms of Reference for Assessment of Water System Infrastructure And Water Supply Sources – For Semi-Public Water Systems". <p style="text-align: center;">DECLARATION</p> <p>"I, the undersigned, hereby declare that to the best of my knowledge, the information contained herein and the information in support of this submission is complete and accurate.</p> <p>I further declare that this submission has been prepared in reasonable accordance with the published Terms of Reference for this submission, despite any qualifications in the agreement contracting me, and I acknowledge that the Office of Drinking Water and the Owner will be relying on the accuracy of this Report."</p> <p>Name of Assessor: _____</p> <p>Signature of Assessor: _____</p> <p>Date Signed: _____</p> <p>Name of Company: _____</p> <p>Full Address: _____</p> <p>Telephone: _____ Fax: _____</p> <p>Email: _____</p>	
<p><i>This completed form is to be included with the Report submission to the Owner, in both hard copy format and PDF version.</i></p>	