# REGULATORY BARRIERS TO ON-SITE WATER REUSE

## Introduction

On-site water reuse technology has great potential as a water conservation measure. It can also reduce the need for the infrastructure expansion required for water distribution and collection. Although there are some applications of residential on-site water reuse in Canada, this approach to water conservation is still largely unknown and is consequently often overlooked as a possibility.

As part of a research program addressing water conservation, CMHC commissioned a study to examine national, provincial and municipal regulatory barriers to the implementation of on-site water reuse technologies.

## Research Program

The study involved a number of steps:

- Individuals in industry and government were approached for their input.
- Researchers reviewed the available literature on Canadian water reuse.
- Four regulatory areas were identified for review—health, environment, plumbing/building codes and municipal by-laws.
- Four potential categories of reuse were identified—potable, human contact, indirect uses and irrigation.
- Researchers designed a questionnaire and administered it to selected individuals.

## Results

During the research program, it became apparent that water reuse is mostly a conceptual issue that may arise in the future, rather than a technical or procedural issue of today. Only one potential type of reuse (toilet flushing) seemed to have any possibility of being widely used in the current regulatory and health protection climate.

### GENERAL RESULTS

The study found that, generally, the subject of water reuse is meeting with positive interest, particularly in light of the overall objective of ensuring a safe and sustainable water supply. All parties consulted agreed that a high-quality water source is essential for drinking water. That requirement eliminates the potential for pipe-to-pipe reuse where treated effluent is redistributed into the potable water system.

However, greywater reuse (involving water from sinks, tubs, showers and washing) will most likely be considered for more widespread application in the near future.

### BARRIERS AT THE NATIONAL LEVEL

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The study found no outright prohibition of on-site water reuse: however, three regulatory instruments at the national level could affect implementation. These are:

- The Guidelines for Canadian Drinking Water Quality (1996).
- The Guidelines for Canadian Recreational Water Quality (1992).
- The National Plumbing Code of Canada (1995).

The study report notes that water quality guidelines (both for drinking and recreational water) may impede the implementation of on-site water reuse technology by imposing unrealistic or inappropriate quality standards.

The National Plumbing Code (NPC) provides for alternative systems (such as dual water distribution systems within sites); this provision makes it possible to apply reuse technology. However, other

provisions call for every water distribution system to be connected to a potable water supply. The NPC also prohibits the discharge of non-potable water through outlets such as faucets or toilets.

A number of those contacted during the study identified technical requirements that, if addressed in the NPC, would facilitate the implementation of an on-site water reuse system. The requirements included the following:

- colour coding of pipe material to identify water reuse plumbing components;
- guidance on appropriate backflow preventers specific to reuse systems;
- guidance on cross-connection prevention specific to reuse systems;
- pressure differences between potable and non-potable systems; and
- location of water reuse pipes within a building.

### BARRIERS AT THE PROVINCIAL/TERRITORIAL LEVEL

The study report identifies and describes key issues raised with regard to the relevant regulations and regulatory barriers in each of the provinces and territories and also at the municipal level.

Health concerns were paramount. Health officials at all levels of government across Canada expressed concerns about the safety of on-site water reuse applications. They identified the following practical issues regarding the protection of public health:

- lack of a standard for the equipment needed and for the quality of water produced from recycled wastewater;
- the potential for risk from recycled viruses and bacteria;
- effluent storage and subsequent distribution to the appropriate fixture;
- management of excess effluent if the storage facility is full;
- making up a shortfall if necessary and protection from cross connections;
- management and treatment of recycled liquid (with soap scum, etc.);
- odour management for recycled liquid;
- long-term maintenance of storage and delivery equipment and water closets; and
- effective ongoing monitoring of water quality.

These issues are not dealt with specifically in existing Canadian legislation; however, provincial Public Health officials do have the power to deny any application of on-site water reuse until they are assured that it poses no threat.

From a technical perspective, the barriers in the NPC are carried over to the provinces and territories through their respective plumbing codes. On the other hand, the study report notes that these can be overcome, as provincial codes do allow a degree of innovation.

According to the study report, certain municipal bylaws relating to sewage disposal could be interpreted as barriers to on-site water reuse.

## Implications for the Housing Industry

Health and environment agencies, municipal bylaws and codes may regulate on-site water reuse. However, the study report indicates that there are few absolute barriers to on-site water reuse in Canada for individual buildings. Therefore, as long as existing regulations are sufficiently flexible, a broad opening of regulations to permit water reuse systems is perhaps unnecessary.

Health concerns are, and will continue to be, a key barrier to the implementation of water reuse technology. Verified proof of the safety of on-site systems with regard to public health could therefore facilitate adoption of on-site reuse technology.

A Code of Good Practice and documented case studies demonstrating the existence of practical and safe systems should be developed to provide guidance and assurance to decision-makers and to address the additional barriers created largely by attitudes and misconceptions.

The study report notes that, even if all regulatory and attitudinal barriers are removed, on-site reuse of water may not become widespread in Canada unless certain economic issues are not resolved. The economic issues in question are:

- the cost of using new external water versus the cost of capturing and reusing water already in the system; and
- the fact that the cost of water delivered to a site and the charges applied for the removal of wastewater do not fully cover the costs of providing this service.

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**Research Report:** Regulatory Barriers to On-Site Water Reuse, 1998

**Research Consultant:** Canadian Water and Wastewater Association

A full report on this project is available from the Canadian Housing Information Centre at the address below.

**Housing Research at CMHC**

Under Part IX of the National Housing Act, the Government of Canada provides funds to CMHC to conduct research into the social, economic and technical aspects of housing and related fields, and to undertake the publishing and distribution of the results of this research.

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