

Section 2.7. Non-Potable Water Systems

2.7.1. Connection

2.7.1.1. Not Permitted

- 1) A non-*potable water system* shall not be connected to a *potable water system*.

2.7.2. Piping Identification

2.7.2.1. Piping Identification

- 1) All non-*potable water* distribution system piping shall be purple in colour and conform to the requirements of NSF-rw and NSF/ANSI 14, “Plastics Piping System Components and Related Materials.”
- 2) All other non-*potable water* piping shall conform to the requirements of CAN/CSA-B128.1, “Design and Installation of Non-Potable Water Systems.”

2.7.3. Location

2.7.3.1. Pipes

- 1) Non-*potable water* piping shall not be located
 - a) where food is prepared in a food-processing plant,
 - b) above food-handling equipment,
 - c) above a non-pressurized *potable water* tank, or
 - d) above a cover of a pressurized *potable water* tank.

2.7.3.2. Outlets

- 1) An outlet from a non-*potable water system* shall not be located where it can discharge into
 - a) a sink or lavatory,
 - b) a *fixture* into which an outlet from a *potable water system* is discharged, or
 - c) a *fixture* that is used for the preparation, handling or dispensing of food, drink or products that are intended for human consumption.

(See Note A-2.7.3.2.(1).)

2.7.4. Alternate Water Source Systems Installed Prior to January 1, 2019

2.7.4.1. Requirements for Alternate Water Source Systems Installed Prior to January 1, 2019

- 1) An *operating permit* shall be obtained.
- 2) The *operating permit* number assigned to the *alternate water source system* shall be posted on a sign or plate that is securely fastened to the *alternate water source system* in a location that is conspicuously visible and constructed of a durable, weather resistant material.
- 3) The *Chief Building Official* shall be notified within 30 days of any changes to the information that was last provided to the *City* with regard to the *operating permit*, in the form prescribed by the *Chief Building Official*.
- 4) Water quality shall comply with the water quality standards, testing, documentation, and reporting requirements set out in Articles 2.7.7.1. and 2.7.7.2.
- 5) If a test result shows that the water quality fails to meet any of the standards set out in Table 2.7.7.1., the response set out in Table 2.7.4.1. shall be undertaken.

Table 2.7.4.1.
Required Response to Failure to Meet Water Quality Standards
 Forming part of Sentence 2.7.4.1.(5)

Parameter	Test Result	Required Response
<i>E. coli</i>	100 or more CFU (Colony Forming Units) per 100 mL or 100 or more MPN (Most Probable Number) per 100 mL	1. Immediately supply the <i>alternate water source system</i> with <i>potable</i> water only; and 2. Immediately notify the <i>Chief Building Official</i> .
Turbidity	> 15 NTU (Nephelometric Turbidity Units)	
Temperature	> 25°C	

6) The *alternate water source system* shall be maintained in accordance with any manufacturer’s specifications.

7) If the *alternate water source system* is in use, cross connection control tests shall be performed as required by CAN/CSA-B128.1, “Design and Installation of Non-Potable Water Systems.”

2.7.4.2. No Other Requirements

1) *Alternate water source systems* installed prior to January 1, 2019 need not comply with any other requirements set out in Subsections 2.7.5. through 2.7.8.

2.7.5. Alternate Water Source Systems

2.7.5.1. Alternate Water Sources

1) An *alternate water source system* shall collect only rainwater from roof surfaces or similar areas that do not allow the passage of vehicular traffic and are above grade, and where hydrocarbon-based fuels, hazardous materials, or fertilizers are not stored or used on such surfaces, or *clear-water waste*, or both.

2) An *alternate water source system* shall not collect *perimeter drainage water, groundwater, storm water, greywater, or blackwater*.

2.7.5.2. Mandatory and Optional Uses

1) An *alternate water source system* shall use treated non-*potable* water in lieu of *potable* water for the mandatory uses set out in Table 2.7.5.2.

2) An *alternate water source system* may use treated non-*potable* water in lieu of *potable* water for the optional uses set out in Table 2.7.5.2.

3) Non-*potable* water shall not be used in lieu of *potable* water for any other uses.

Table 2.7.5.2. (continued)
Mandatory and Optional Uses for Treated Non-potable Water
 Forming part of Sentences 2.7.5.2.(1) and (2)

Non- <i>potable</i> Water Source	Mandatory Uses for Treated Non- <i>potable</i> Water	Optional Uses for Treated Non- <i>potable</i> Water
Rainwater from roof surfaces or similar areas that do not allow the passage of vehicular traffic and are above grade, and where hydrocarbon-based fuels, hazardous materials, or fertilizers are not stored or used on such surfaces	Water closets, urinals and trap primers	Irrigation of non-food purpose plants, make-up water for boilers, make-up water for cooling towers or tempering of discharge.

Table 2.7.5.2. (continued)
Mandatory and Optional Uses for Treated Non-potable Water
 Forming part of Sentences 2.7.5.2.(1) and (2)

Non-potable Water Source	Mandatory Uses for Treated Non-potable Water	Optional Uses for Treated Non-potable Water
Clear-water waste	Water closets, urinals and trap primers	Irrigation of non-food purpose plants, make-up water for boilers, make-up water for cooling towers or tempering of discharge.
Perimeter drainage water	Not permitted	Not permitted
Groundwater	Not permitted	Not permitted
Storm water	Not permitted	Not permitted
Greywater	Not permitted	Not permitted
Blackwater	Not permitted	Not permitted

2.7.5.3. Occupancy

1) Before occupancy of a *building* is permitted, an *alternate water source system* shall be commissioned in accordance with Article 2.7.5.4., and an *operating permit* shall be obtained in accordance with Article 2.7.5.5.

2.7.5.4. Commissioning

- 1) In order to commission an *alternate water source system*
 - a) the non-potable water shall be tested by an *accredited laboratory* for *E. coli* weekly for a period of 4 weeks with samples being drawn from the sampling port as referenced in Sentence 2.7.6.9.(1), and test results shall be provided to the *Chief Building Official*, and
 - b) written confirmation that the *alternate water source system* operates in conformance with the operating manual shall be provided to the *Chief Building Official* by the *registered professional of record*, and a cross connection control test shall be performed and witnessed by the *Chief Building Official*.

2.7.5.5. Operating Permit

- 1) An *operating permit* shall be obtained for an *alternate water source system*.
- 2) The *operating permit* number assigned to the *alternate water source system* shall be posted on a sign or plate that is securely fastened to the *alternate water source system* in a location that is conspicuously visible and constructed of a durable, weather resistant material.
- 3) The *Chief Building Official* shall be notified within 30 days of any changes to the information that was last provided to the *City* with regard to the *operating permit*, in the form prescribed by the *Chief Building Official*.

2.7.5.6. Continued Operation

1) Once an *operating permit* has been issued, an *alternate water source system* shall operate continuously unless written approval to discontinue its use has been obtained from the *Chief Building Official* or *City Engineer*.

2.7.6. Design

2.7.6.1. Professional Design

1) An *alternate water source system* shall be designed by a *registered professional* and shall be designed to prioritize the use of non-potable water.

2.7.6.2. Pipe Sizing

- 1) Except as required by Sentence (2), non-potable distribution piping shall be sized according to Subsection 2.6.3.

- 2) *Dwelling units* within a *building* with an *alternate water source system* shall be equipped with
 - a) tank type water closets, and
 - b) *non-potable* distribution piping sized in conformance with the IAPMO Water Demand Calculator.

2.7.6.3. Continuity of Supply

- 1) A secondary water supply shall be provided.

2.7.6.4. Backflow Prevention

- 1) An *air gap* at least two times the size of the discharge opening shall be installed for the *potable* water make-up supply.

2.7.6.5. Removal of Particulates and Impurities

- 1) Provision shall be made upstream of the *cistern* to remove the accumulation of particulates and impurities before they enter the *cistern*.

2.7.6.6. Cistern Security

- 1) *Cisterns* shall be secured to prevent tampering and unintended or unauthorized entry either by a lockable device or another *approved* method, and all penetrations shall be sealed to prevent insect or vermin entry.

2.7.6.7. Minimum Withdrawal Level

(See Note A-2.7.6.7, 2.7.6.8. and 2.7.6.9.)

- 1) Water shall be withdrawn a minimum of 0.3 m from the base of the *cistern*.

2.7.6.8. Water Metering Requirements

(See Note A-2.7.6.7, 2.7.6.8. and 2.7.6.9.)

- 1) A water meter shall be installed and located within 1.5 m of the *potable* water make-up supply and shall be capable of recording the volume of *potable* water being supplied.
- 2) A water meter shall be installed and located on the *non-potable* water outlet prior to distribution and shall be capable of recording the volume of *non-potable* water being supplied to the distribution piping.

2.7.6.9. Water Quality Sampling Locations

(See Note A-2.7.6.7, 2.7.6.8. and 2.7.6.9.)

- 1) A sampling port, and provision for continuous in-line measurements required in order to conform with Table 2.7.7.1., shall be installed and located downstream of the water meter at the *non-potable* water outlet and prior to distribution.

2.7.6.10. Alerts

- 1) All monitoring devices referred to in Sentence 2.7.6.9.(1) above shall be capable of activating an *alert* that is designed to activate continuously for the duration of the *alert* condition whenever the water quality fails to meet the standards set out in Table 2.7.7.1.

2.7.6.11. Power Interruption

- 1) If a *building* is required to have an emergency system generator, provision shall be made for the continued operation of any mandatory uses for *non-potable* water listed in Table 2.7.5.2. in the event of a power interruption.

2.7.7. Water Quality Standards

2.7.7.1. Water Quality Standards, Testing, and Documentation

- 1) Water quality shall meet the standards set out in Table 2.7.7.1.
- 2) Water quality shall be tested as set out in Table 2.7.7.1.
- 3) All test results shall be documented as set out in Table 2.7.7.1., and documentation shall be retained for no less than 24 months.

Table 2.7.7.1.
Water Quality Standards, Testing, and Documentation
 Forming part of Sentences 2.7.7.1.(1), (2), and (3)

Applicability	Parameter	Standard	Testing Type and Frequency	Testing Result Documentation Requirement
Any non-potable water source	Temperature	< 20°C	Continuous	Daily
Any non-potable water source	Turbidity	< 10 NTU (Nephelometric Turbidity Units)	Daily, and one laboratory sample tested every 3 months	Daily, plus all laboratory tests
Any non-potable water source	<i>E. coli</i>	< 100 CFU (Colony Forming Units) per 100 mL or < 100 MPN (Most Probable Number) per 100 mL	One laboratory sample tested by an <i>accredited laboratory</i> every 3 months	All laboratory tests

2.7.7.2. Water Quality Reporting

- 1) Water quality reports containing all documentation required by Sentence 2.7.7.1.(3) shall be submitted to the *Chief Building Official* before the end of the third month following the issuance of an *operating permit*, and then every 3 months thereafter.

2.7.7.3. Required Response to Failure to Meet Water Quality Standards

- 1) If a test result shows that the water quality fails to meet a standard set out in Table 2.7.7.1., the response set out in Table 2.7.7.3 shall be undertaken.

Table 2.7.7.3.
Required Response to Failure to Meet Water Quality Standards
 Forming part of Sentence 2.7.7.3.(1)

Parameter	Test Result	Required Response
Turbidity	Between 10 and 15 NTU (Nephelometric Turbidity Units)	Take the appropriate corrective action as set out in the operating manual. 1. Immediately supply the <i>alternate water source system</i> with <i>potable</i> water only; 2. Immediately notify the <i>Chief Building Official</i> ; and 3. Take the appropriate corrective action as set out in the operating manual.
Temperature	20°C to 25°C	
<i>E. coli</i>	100 or more CFU (Colony Forming Units) per 100 mL or 100 or more MPN (Most Probable Number) per 100 mL	
Turbidity	> 15 NTU (Nephelometric Turbidity Units)	
Temperature	> 25°C	

2.7.8. Operating Manual and Maintenance

2.7.8.1. Operating Manual

- 1) An operating manual shall be supplied to the *owner* or representative of the *owner* by the designer of the *alternate water source system* and shall be stamped by a *registered professional of record*, and shall include the following
 - a) address and location of the *alternate water source system*,
 - b) system designer contact details,
 - c) a simplified process flow diagram,
 - d) a schematic of the entire system showing locations of all system components,
 - e) instructions on operating, maintaining, and inspecting the system,
 - f) required frequency of maintenance and inspections,
 - g) instructions on deactivating and restarting the system for repair or other purposes,
 - h) details on the corrective action that shall be taken if the water quality fails to meet the standards set out in Table 2.7.7.1., and
 - i) safety data sheets.

2.7.8.2. Maintenance

- 1) *Alternate water source systems* shall be maintained in accordance with the operating manual and any manufacturer's specifications.
- 2) Cross connection control tests shall be performed as required by CAN/CSA-B128.1, "Design and Installation of Non-Potable Water Systems."
- 3) A maintenance log shall be maintained and shall include
 - a) the address and location of the *alternate water source system*,
 - b) the name and contact information of the *owner*,
 - c) a record of inspections and any maintenance performed within the last 24 months,
 - d) details of any changes or alterations made to the system at any time after commissioning,
 - e) a record of water quality test results as set out in Article 2.7.7.1., including the name of the person and company conducting the test,
 - f) copies of water quality reports prepared and submitted in accordance with Article 2.7.7.2 within the last 24 months, and
 - g) if a water quality test fails to meet a standard defined in Table 2.7.7.1., a description of the extent of the deviation from the standard, the corrective action taken, a record of any required notification, and the outcome of the corrective action, including all applicable dates and times.

2.7.8.3. Request for Operating Manual or Maintenance Log

- 1) The operating manual and the maintenance log shall be made available on such request to the *Chief Building Official* or *City Engineer*.