

# STANDARD OPERATING PROCEDURE

SOP # 12

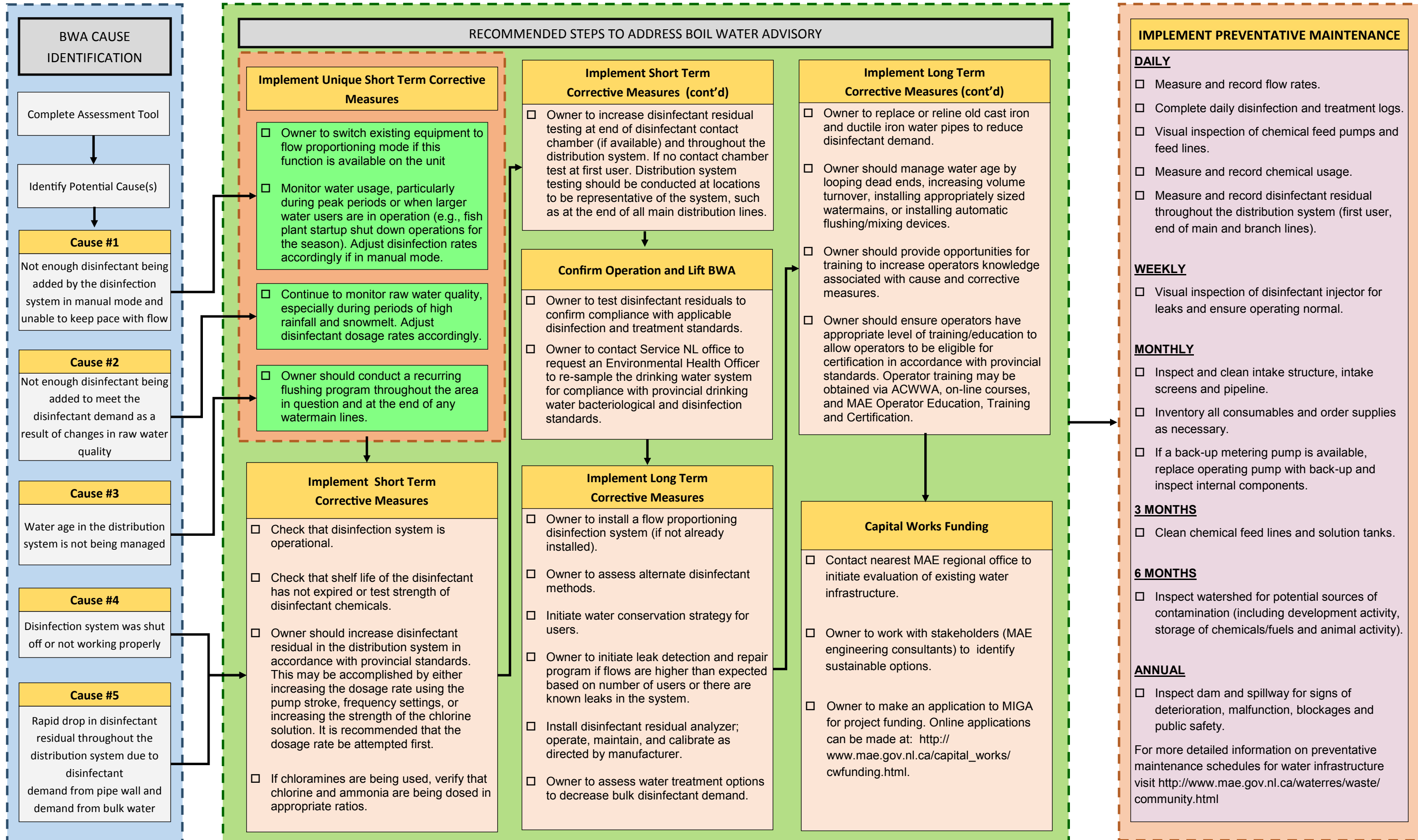
REASON CODE:

E3—Insufficient residual disinfectant in water system disinfected by means other than chlorination

REV: 0

DATE:

Dec. 2015



**BWA CAUSE IDENTIFICATION**

Complete Assessment Tool

Identify Potential Cause(s)

**Cause #1**  
Not enough disinfectant being added by the disinfection system in manual mode and unable to keep pace with flow

**Cause #2**  
Not enough disinfectant being added to meet the disinfectant demand as a result of changes in raw water quality

**Cause #3**  
Water age in the distribution system is not being managed

**Cause #4**  
Disinfection system was shut off or not working properly

**Cause #5**  
Rapid drop in disinfectant residual throughout the distribution system due to disinfectant demand from pipe wall and demand from bulk water

**RECOMMENDED STEPS TO ADDRESS BOIL WATER ADVISORY**

**Implement Unique Short Term Corrective Measures**

- Owner to switch existing equipment to flow proportioning mode if this function is available on the unit
- Monitor water usage, particularly during peak periods or when larger water users are in operation (e.g., fish plant startup shut down operations for the season). Adjust disinfection rates accordingly if in manual mode.
- Continue to monitor raw water quality, especially during periods of high rainfall and snowmelt. Adjust disinfectant dosage rates accordingly.
- Owner should conduct a recurring flushing program throughout the area in question and at the end of any watermain lines.

**Implement Short Term Corrective Measures**

- Check that disinfection system is operational.
- Check that shelf life of the disinfectant has not expired or test strength of disinfectant chemicals.
- Owner should increase disinfectant residual in the distribution system in accordance with provincial standards. This may be accomplished by either increasing the dosage rate using the pump stroke, frequency settings, or increasing the strength of the chlorine solution. It is recommended that the dosage rate be attempted first.
- If chloramines are being used, verify that chlorine and ammonia are being dosed in appropriate ratios.

**Implement Short Term Corrective Measures (cont'd)**

- Owner to increase disinfectant residual testing at end of disinfectant contact chamber (if available) and throughout the distribution system. If no contact chamber test at first user. Distribution system testing should be conducted at locations to be representative of the system, such as at the end of all main distribution lines.

**Confirm Operation and Lift BWA**

- Owner to test disinfectant residuals to confirm compliance with applicable disinfection and treatment standards.
- Owner to contact Service NL office to request an Environmental Health Officer to re-sample the drinking water system for compliance with provincial drinking water bacteriological and disinfection standards.

**Implement Long Term Corrective Measures**

- Owner to install a flow proportioning disinfection system (if not already installed).
- Owner to assess alternate disinfectant methods.
- Initiate water conservation strategy for users.
- Owner to initiate leak detection and repair program if flows are higher than expected based on number of users or there are known leaks in the system.
- Install disinfectant residual analyzer; operate, maintain, and calibrate as directed by manufacturer.
- Owner to assess water treatment options to decrease bulk disinfectant demand.

**Implement Long Term Corrective Measures (cont'd)**

- Owner to replace or reline old cast iron and ductile iron water pipes to reduce disinfectant demand.
- Owner should manage water age by looping dead ends, increasing volume turnover, installing appropriately sized watermains, or installing automatic flushing/mixing devices.
- Owner should provide opportunities for training to increase operators knowledge associated with cause and corrective measures.
- Owner should ensure operators have appropriate level of training/education to allow operators to be eligible for certification in accordance with provincial standards. Operator training may be obtained via ACWWA, on-line courses, and MAE Operator Education, Training and Certification.

**Capital Works Funding**

- Contact nearest MAE regional office to initiate evaluation of existing water infrastructure.
- Owner to work with stakeholders (MAE engineering consultants) to identify sustainable options.
- Owner to make an application to MIGA for project funding. Online applications can be made at: [http://www.mae.gov.nl.ca/capital\\_works/cwfunding.html](http://www.mae.gov.nl.ca/capital_works/cwfunding.html).

**IMPLEMENT PREVENTATIVE MAINTENANCE**

**DAILY**

- Measure and record flow rates.
- Complete daily disinfection and treatment logs.
- Visual inspection of chemical feed pumps and feed lines.
- Measure and record chemical usage.
- Measure and record disinfectant residual throughout the distribution system (first user, end of main and branch lines).

**WEEKLY**

- Visual inspection of disinfectant injector for leaks and ensure operating normal.

**MONTHLY**

- Inspect and clean intake structure, intake screens and pipeline.
- Inventory all consumables and order supplies as necessary.
- If a back-up metering pump is available, replace operating pump with back-up and inspect internal components.

**3 MONTHS**

- Clean chemical feed lines and solution tanks.

**6 MONTHS**

- Inspect watershed for potential sources of contamination (including development activity, storage of chemicals/fuels and animal activity).

**ANNUAL**

- Inspect dam and spillway for signs of deterioration, malfunction, blockages and public safety.

For more detailed information on preventative maintenance schedules for water infrastructure visit <http://www.mae.gov.nl.ca/waterres/waste/community.html>