

PUBLIC HEALTH ENGINEERING GUIDELINE: SANITARY PROCEDURES WHEN REPAIRING EXISTING WATERMANS

The following procedures are based on AWWA standard C651 (2005) *Disinfecting Water Mains* and apply when existing mains lose pressure and are wholly or partially dewatered. After completing 1) trench treatment, 2) swabbing, 3) flushing, and 4) optional disinfection, the existing main may be returned to service **immediately** in order to minimise the time customers are without water. *Leaks or breaks that are repaired with clamping devices while the mains remain under positive pressure generally present little risk and may require only swabbing with dilute hypochlorite solution (per 2. below).*

1. **Trench treatment.** When an existing watermain is broken open, either by accident or by design, the excavation will likely be wet and may be badly contaminated from nearby sewers. Liberal quantities of hypochlorite applied to open trench areas will lessen the danger from this pollution. Tablets are recommended, because they dissolve slowly and continue to release hypochlorite as water is pumped out of the excavation.
2. **Swabbing with 1% hypochlorite solution.** The interior of pipe and fittings (particularly couplings and sleeves) used in making the repair should be swabbed or sprayed with a 5:1 dilution of household bleach (6% NaOCl) before they are installed.
3. **Flushing.** Thorough flushing is the most practical means of removing contamination introduced during repairs. If valve and hydrant/blowoff locations permit, flushing toward the work location from both directions is recommended. Flushing may be started as soon as the repairs are completed and should continue until turbid water is eliminated.
4. **Optional disinfection.** Where practical, and where the efficacy of flushing alone is in doubt, the section of the main in which the break is located must be isolated, all service connections shut off, and the section flushed and chlorinated with $\text{Ca}(\text{OCl})_2$ granules or equivalent (not tablets). The dose may be as much as 300 mg/L and the contact time as little as 15 min. After chlorination, flushing may be resumed and continued until turbid water is eliminated and the chlorine concentration in the water exiting the main is no higher than the prevailing water in the distribution system or that which is acceptable for domestic use.
5. **Bacteriological samples.** Bacteriological samples should be taken after repairs are completed to provide a record for determining the procedure's effectiveness. Samples for bacteriological analysis need to be collected in standard sterile bacteriological bottles treated with sodium thiosulphate, provided by Northern Health or an approved lab. If no other sampling port is available, well-flushed fire hydrants may be used although they do not represent optimum sampling conditions. If the direction of flow is unknown, then samples should be taken on each side of the main break. If positive bacteriological samples are recorded, then the situation must be evaluated by the operator to consider corrective action.