

Document Owner: Manager Customer Planning

Disinfection of Drinking Water Network Repairs

This Standard Operating Procedure (SOP) covers work undertaken on repairs within the drinking water network. This work needs to be undertaken with the utmost care, following best practice as the network is exposed and must be safeguarded against contamination, both bacteriological and chemical. Disinfection is key to preventing contamination of the water supply during maintenance and should be an integral part of the standard repair procedures.

Health & Safety and Operational Information

Hazard Indicators



Personal Protection



Health and Safety Information

- Health and Safety documentation.
- Sodium Hypochlorite Solution Material Safety Data Sheet.

Operation's & Maintenance Documentation

- Disinfection of Drinking Water Network Repairs SOP.

Customer Information (Confidential)

- Vulnerable customers (DHB supplied list)
- Priority customers (WWL)

Priority Customer Categories

- Schools and childcare
- Commercial premises
- Hospitals
- Retirement homes/villages
- Correction facilities
- Military installations
- Oil and gas refinery

Emergency Procedure / Escalation

Emergency

- Make "Site Safe" and isolate risks to people or property with resources at hand
- All forms of chlorine have hazardous substance storage and handling requirements. All people using these chemicals should be aware of the requirements identified in the material safety data sheets
- Key phone numbers

Escalate if extra resources required or problems occur!

- Escalate to Team Leader and inform of the issues faced and/or expected resources required if necessary.
- If FAC <0.3mg/l and >0.2mg/l after flushing until clear, flush again and re-test. If reading still low return pipe to service and escalate to team leader.
- If FAC <0.2MG/L after flushing until clear, flush again and re-test. If still <0.2mg/l **Do Not** return the pipe to service and escalate to SDM and Head of Network Performance.

Additional Documentation

- Wellington Water Hygiene Code of Practice.
- Laminated Disinfection Procedure Sheet.
- HachD300 FAC Meter Test Procedure Sheet
- Wellington Water – Potable Water Shutdown (Reactive) – Maintenance Procedure

Required Skills, Competencies (Qualifications and/or Certifications)

Competent persons only – NZ Certificate in Infrastructure Works (PCM) Level 3 or higher Drinking Water Strand

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Standard Operating Procedure

Required Equipment

Equipment and Information	Details
Fully Equipped Vehicle	Ensure vehicle, plant, equipment and materials appropriate to the day's work schedule is available.
Spray bottle containing Sodium Hypochlorite solution and swabbing material	<p>Ensure full spray bottle containing Sodium Hypochlorite (1%) solution and sufficient clean swabbing material is in the vehicle before leaving the depot. The bottle is to be stored in such a way that it cannot tip or spill</p> <p>If the bottle is not full, use the following mixing ratio to have a full spray bottle of chlorine solution at correct strength (1%):</p> <ul style="list-style-type: none"> - decant 70ml of "Crystal Water" Sodium Hypochlorite 15-17% Solution into a 1 litre spray bottle, fill the spray bottle with water - It is mandatory to use Crystal Water 15-17% Sodium Hypochlorite solution, available from Hynds Water <p>Ensure you are wearing appropriate PPE including gloves and eye protection, take care not to breathe in the fumes and not to spill any undiluted chemical on yourself or others.</p> <p>Solution is to be replaced weekly as the strength degrades over time.</p>
Vulnerable & Priority Lists (Confidential)	Ensure that you have access to the Vulnerable and Priority lists.

Perform the work - Disinfection

Action	Trade	Action Details
Maintenance	Serviceperson	When pipes and fittings are transported to site, the pipes should be capped where feasible and these caps remain in place until the pipe is used. Pipe and fittings are to be stored off the ground to prevent entry of dirt and vermin.
Maintenance	Serviceperson	Prior to work starting, an assessment of the risk of contamination to the network will be undertaken and the result indicated on the RCP. A photograph of both sides of the completed RCP is to be photographed and attached to the Maximo work order.
Maintenance	Serviceperson	<p>All tools contacting the water supply or its parts, particularly cutting surfaces, must be adequately disinfected using the 1% chlorine solution, prior to commencing work and subsequently as necessary when tools contact soil or backfill material.</p> <p>All fittings and pipes shall be sprayed and swabbed with a 1% chlorine solution and protected from contamination.</p> <p>A photograph of the spray bottle will be included in the before and after photographs on the Maximo work order.</p>
Maintenance	Serviceperson	<p>The internal surfaces of the open ends of pipes shall be sprayed and swabbed with the 1% chlorine solution. Care shall be taken to ensure water from the trench does not enter the pipeline, this may be achieved by:</p> <ul style="list-style-type: none"> - Shutting down the network during the repair. - Excavating deep enough that water in the bottom of the trench is below the pipe. Greater than 150mm. - Dewatering the trench to remove water.

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Perform the work – Disinfection

Action	Trade	Action Details
Maintenance	Serviceperson	If the repair is to be left for an extended period, the ends of the exposed pipe are to be capped to prevent small animals and dirt getting into the network.
Maintenance	Serviceperson	After the repair is made the repaired pipe shall be flushed so that potable water is drawn through the repair location until the water is clear or 3x the volume of the pipe in the repaired area has passed through the pipe.
Maintenance	Serviceperson	<p>A Freely Available Chlorine test must be done on the clear flush water.</p> <p>For small repairs on pipes less than 150mm, a Freely Available Chlorine (FAC) "colour" test will be sufficient and a photograph attached to the Maximo job order.</p> <p>For 150mm diameter pipes and larger and critical assets that feed hospitals, schools, prisons etc., a digital FAC test must be done and the reading photographed and attached to the Maximo job order. If the reading is above 0.3mg/l, return the pipe to service, If the reading is below 0.3mg/l but above 0.2mg/l flush the pipe again for an equal time as first flush to ensure that we are testing the mains water, take another FAC test, if there is greater than 0.2mg/l return the pipe to service and report result to the team leader. If the FAC reading is less than 0.2mg/l, flush the pipe again for an equal time as first flush to ensure that we are testing the mains water, take another FAC test, if there is less than 0.2mg/l FAC, DO NOT return the pipe to service and escalate to SDM and The Head of Network Performance.</p> <p>For these assets, an E.Coli and Total Coliforms test is required as an assurance that the repair has not contaminated the network. The sample will be taken by Eurofins and organized by the Water Team Leader in charge of the incident. If there is an FAC reading above 0.2mg/l the network may be returned to service while waiting for the laboratory results.</p> <p>If there is a chlorine residual in all cases, photograph the result and attach to the job in Maximo. Return main to service.</p>
Maintenance	Serviceperson	<p>Separate tools should be used on drinking water and wastewater networks. Where this is not possible, or tools become contaminated by wastewater they shall be thoroughly cleaned and disinfected with the 1% chlorine solution before using them again.</p> <p>Equipment and plant that has been used on wastewater networks or in a manner that may contaminate the drinking water network should be cleaned and disinfected before use.</p>