Tauranga City Council and

Western Bay of Plenty District Council

HYGIENE
CODE OF PRACTICE
FOR WATER SUPPLY SYSTEMS

JANUARY 2009 (Updated April 2010)

Approved for Release:

[Signature]
General Manager City Waters TCC

[Signature]
Utilities Manager WBoPDC
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Revision History

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<th>Version No</th>
<th>Prepared By</th>
<th>Description</th>
<th>Date</th>
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<td>0</td>
<td>Peter Bahrs</td>
<td>Draft</td>
<td>25 November 2008</td>
</tr>
<tr>
<td>1</td>
<td>Peter Bahrs</td>
<td>Final</td>
<td>29 January 2009</td>
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<tr>
<td>2</td>
<td>Graeme Mills/Paul Van den Berg</td>
<td>2010 annual update</td>
<td>20 April 2010</td>
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The summary of changes made in Revision 1 of this code includes the following:

- Amalgamation of the TCC and WBOPDC HCoP to ensure consistent hygiene practice in the Bay of Plenty region covered by the two Councils.
- To update the HCoP to incorporate requirements of the Health (Drinking Water) Amendment Act 2007.
- To align the HCoP to the principles of NZS 4404: 2004 Land Development and Sub-Division Engineering which covers disinfection of new pipes.
- To have a single HCoP to deal with new and existing water systems.
- To apply a risk based approach to hygiene practice when undertaking pipe maintenance / repairs.

Change Control and Updates to the HCoP

This Code of Practice is a controlled document and is to be reviewed at least annually by at least two suitably competent representatives of each Council. The changes together with reasons for the change is to be included as part of the revision history of this document and will be captured in the following table. Changes to be agreed and signed by the Council Representatives and the page countersigned by the General Manager City Waters TCC and the Utilities Manager WBOPDC.

Change Control Table:

<table>
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<tr>
<th>Amendment Date</th>
<th>HCoP Ref</th>
<th>Edit Type</th>
<th>Amendment / Addition / Deletion</th>
<th>Reason for Change</th>
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<tr>
<td>14 April 10</td>
<td>3.4</td>
<td>Addition</td>
<td>Addition. Item 3.4.5 Reference to MOH Public Health Risk Management Plan Guide Appendix 1 “Good Hygiene Practices for Staff Working on Drinking-Water Supplies</td>
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<td></td>
<td></td>
<td></td>
<td>To include the reference to the PHRMP</td>
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<tr>
<td>14 April 10</td>
<td>4.1</td>
<td>Addition</td>
<td>Addition to heading to include “and Associated Fittings”</td>
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<td></td>
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<td></td>
<td>To ensure fittings are also included.</td>
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<tr>
<td>14 April 10</td>
<td>4.1.3</td>
<td>Addition</td>
<td>Council reserve the right to request that any main is CCTV inspected prior to any connection approval being issued</td>
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<td></td>
<td></td>
<td></td>
<td>Provides Council the opportunity to deal with poor installation practices after pipe in place.</td>
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Joint Hygiene Code of Practice Western Bay of Plenty District Council & Tauranga City Council
Date Prepared: November 2008   Effective Date: January 2009

TCC 2310383
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<td>14 April 10</td>
<td>Amendment</td>
<td>4.1.4</td>
<td>&quot;12 hours&quot; changed to &quot;between 18 and 24&quot; hours</td>
<td>A more practical timing for contractor application.</td>
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<tr>
<td>14 April 10</td>
<td>Addition</td>
<td>3.4.2</td>
<td>&quot;catchment&quot;</td>
<td>This area is included in respect to vehicle access.</td>
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<tr>
<td>14 April 10</td>
<td>Amendment</td>
<td>4.1.5</td>
<td>Relocate the words &quot;within seven days &quot;to after successful bacteriological testing.</td>
<td>To ensure time relates to the appropriate part of the process.</td>
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<tr>
<td>14 April 10</td>
<td>Addition</td>
<td>4.2</td>
<td>Addition to heading to include &quot;and Associated Fittings&quot;</td>
<td>To ensure fittings are also included.</td>
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<td>14 April 10</td>
<td>Addition</td>
<td>4.2.1</td>
<td>When using hydrants, ensure that any detritus or debris is removed from the hydrant box to &quot;below the standpipe connection flange&quot; prior to fitting standpipe.</td>
<td>To ensure area within the hydrant box is free of debris prior to connection standpipe.</td>
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<tr>
<td>14 April 10</td>
<td>Addition</td>
<td>4.2.4</td>
<td>Addition to include the number of samples and where these are taken from</td>
<td>To better meet with our PHRMP (recommended by MoH)</td>
</tr>
<tr>
<td>14 April 10</td>
<td>Addition</td>
<td>4.2.4</td>
<td>Addition to include &quot;chemical&quot; contamination</td>
<td>To meet compliance with our PHRMP (recommended by MoH)</td>
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<tr>
<td>14 April 10</td>
<td>Reference</td>
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<td>Addition of new Code reference</td>
<td>To include proposed title change from Code of Practice for Development to Infrastructure Development Code (IDC)</td>
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<tr>
<td>14 April 10</td>
<td>Amendment</td>
<td>Appendix &quot;A&quot;</td>
<td>Change title to witness</td>
<td>Council officer is only a &quot;witness&quot;. The authorisation is by the consent holders representative</td>
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# Definitions

<table>
<thead>
<tr>
<th><strong>Appointed Representative</strong> – a representative appointed in writing and has the authority to act on behalf of the principal or client</th>
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<tbody>
<tr>
<td><strong>Approved Water Tanker</strong> – Water tankers compliant with the New Zealand Drinking Water Standard</td>
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<tr>
<td><strong>Authorised Officer</strong> – Authorised Officer of either TCC or WBOPDC. Instruction under this code can only be received from the authorised officer for the Council for which they hold authority</td>
</tr>
<tr>
<td><strong>AWWA</strong> – American Water Works Association</td>
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<tr>
<td><strong>CAC - Council Approved Contractor</strong> – Contractor approved through Council’s Licensing and/or other approval system</td>
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<tr>
<td><strong>Controlling Officer</strong> – The responsible, competent person to ensure on site activities (including disinfection) are undertaken according to the HCoP</td>
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<tr>
<td><strong>EBOP</strong> – Environment Bay of Plenty</td>
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<tr>
<td><strong>Engineer (Chartered Professional Engineer)</strong> – has the meaning as set out in the Chartered Professional Engineer Act of New Zealand</td>
</tr>
<tr>
<td><strong>FAC</strong> – Free Available Chlorine</td>
</tr>
<tr>
<td><strong>HCoP</strong> – Hygiene Code of Practice for WBOPDC and TCC</td>
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<tr>
<td><strong>High Risk</strong> – Any condition that has the potential to cause death</td>
</tr>
<tr>
<td><strong>IANZ Laboratory</strong> – Laboratory approved by the Ministry of Health as defined in the Health (Drinking Water) Amendment Act 2007</td>
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<tr>
<td><strong>Low Risk</strong> – Any condition that would constitute a nuisance by colour, taste or odour but not injure or endanger health</td>
</tr>
<tr>
<td><strong>Medium Risk</strong> – Any condition that has the potential to injure or endanger health</td>
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<tr>
<td><strong>MSDS</strong> – Material Safety Data Sheet</td>
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<tr>
<td><strong>OSH</strong> – Occupational Safety and Health</td>
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<tr>
<td><strong>Principal / Client</strong> – the person who employs the contractor to undertake infrastructure installation, testing and disinfection</td>
</tr>
<tr>
<td><strong>RMA</strong> – Resource Management Act</td>
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<tr>
<td><strong>TCC</strong> – Tauranga City Council</td>
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<tr>
<td><strong>WBOPDC</strong> – Western Bay of Plenty District Council</td>
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<tr>
<td><strong>WHO</strong> – World Health Organisation</td>
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</table>
2 Objectives Of The Hygiene Code Of Practice

The importance to the community of a consistently safe water supply cannot be overstated. Therefore it is vital that all personnel working with water supplies take the strictest possible precautions to avoid any contamination which might endanger public health.

This HCoP has been developed as a mandatory document outlining work practices required to prevent the contamination of the Council’s public water supplies. All personnel operating, maintaining or extending the water supply are expected to be fully aware of the Code’s contents and shall comply with the requirements of the Code at all times. The Code applies equally to Council employees, contractors’ employees and all other personnel working on the Council’s water supply system.

The objectives of the HCoP are to:

- Comply with the Health Act 1956 and in particular to the Health (Drinking Water) Amendment Act 2007, together with the Public Health Risk Management Plans required under this legislation.
- Ensure that the water supplied to customers, meets the Council's Public Health objectives for their customers.
- Align the sanitary and hygiene requirements under the Building Act to those in the Health Act and its amendments.
- Meet the current New Zealand Drinking Water Standard or as amended
- Comply with the Resource Management Act, 1991
- Minimise demerit points under the Ministry of Health, Water Supply Grading System, and
- Afford a high level of security against water contamination due to commissioning of / or maintenance on the water supply systems whether this is new or existing infrastructure.

The purpose of HCoP is to eliminate sources of contamination, which can lead to negative public health impacts which can occur during the construction, commissioning, operation or repair of water infrastructure, or during the storage and handling of pipes, fittings, pumps etc. prior to installation.

3 General Information / Requirements

3.1 Coverage
This document outlines the recommended practice for hygiene procedures and disinfection of the water supply systems. Where possible, use has been made of existing standards or reference material, to provide a more consistent approach to hygiene and disinfection practices.

The key situations covered are:

- New Mains associated valves and fittings
- Repairs of exiting mains and associated valves and fittings
- Newly installed reservoirs or tanks
- Existing Reservoirs or tanks
3.2 Competency

3.2.1 Council has adopted the requirements as outlined in the Public Health Grading of Community Drinking-Water Supplies 2003 Explanatory Notes and Grading Forms, Appendix C as a basis of competency. This requires that the qualification held by the operational staff directly responsible for the day-to-day operation of the water distribution system must hold a National Certificate in Water Reticulation (Service Person) (Level 3) with strands in water and wastewater or equivalent.

3.2.2 The controlling officer or the person performing the practice must be fully aware of all legislative requirements which govern this code of practice.

3.2.3 The controlling officer or the person performing the practice must be qualified and competent to perform the task to be undertaken (to 3.2.1 above), to understand the risks associated with the task and to ensure public health of the water supply system is maintained.

3.3 Testing

All chemical and bacteriological testing required under this code shall be done by a Ministry of Health approved testing laboratory chosen by the Contractor. The contractor shall organise (including appropriate advance notice) and pay for the testing, and forward copies of results to the Council or the Council's representative as soon as practical after the tests are completed. This is required prior to Council considering approval to continue with any further activity unless otherwise agreed.

3.4 Cleanliness and Hygiene Practice for Vehicles, Tools and Equipment

The following practices are required to mitigate the potential for tools and equipment to introduce sources of contamination when water distribution systems are being constructed or have been opened for repairs:

3.4.1 A methodology of cleanliness is to be established for all equipment, machinery, pipes and fittings prior to use on all works, and requires that all materials and equipment used in direct contact with the water supply system must be clean and disinfected. All equipment is to be cleaned of dirt and debris and disinfected (using 100 mg/L chlorine solution) before use.

3.4.2 Vehicles, tools and maintenance workers equipment and clothing for water supply and sewage operations shall be segregated as far as practicable. A high standard of cleanliness is required for vehicles (including the backs of utes, trucks etc). The contractor to show, through their quality assurance and health and safety plans, that they have mitigated all potential risks.

3.4.3 All vehicles are to have hand cleaning agents (soap; preferably antiseptic) available for staff.

3.4.4 Sufficient supplies of cleaning detergents, disinfectant solutions, antibacterial lubricants, etc. to undertake the task, must be available and used to ensure contamination of the water supply system is prevented.


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1 Vehicles used for carrying or handling sewage or sludge or have been used to transport contaminated equipment shall only enter a water treatment or catchment site with the specific authorisation of water treatment staff.
3.5 **Hygiene Practice for Personnel**

The following steps shall be taken to minimize the potential for personnel being the source of contamination when water distribution systems are being constructed or have been opened for repairs:

3.5.1 Wherever practical personnel should be dedicated to working on the water supply system, and not alternate between water and wastewater supply. A clear hygiene control methodology must be approved and followed under circumstances where this movement is undertaken.

3.5.2 The importance of all personnel maintaining a high standard of personal hygiene cannot be overstressed.

3.5.3 **Medical Certification:** All personnel that undertake maintenance or construction work\(^2\) that involves, or potentially involves direct contact with water in the system must obtain a Doctor's medical clearance certifying that they are not carriers of potentially water borne diseases\(^3\) under the following conditions:
- prior to employment on the water system;
- on an annual basis thereafter;
- following overseas travel to countries with endemic water borne disease;
- following any serious illness see 3.5.4 below.

3.5.4 **Medical Health:** If personnel have suffered diarrhoea or any notifiable disease or gastrointestinal illness, with or without vomiting, they shall not undertake works that involves or potentially involves direct contact with water supplies until a further medical clearance certificate has been obtained stating that they are clear of the disease. Any further tests as prescribed by the Doctor to determine evidence of infection shall be carried out. Workers are to report gastrointestinal illness and are not to work with water systems components until they can provide a medical certificate stating that they are clear of the disease. All staff should be encouraged to report medical issues without prejudice to their employment situation.

3.5.5 **Site Facilities:** Satisfactory toilet arrangements must be made for all personnel working on water supply activities and hands must be washed thoroughly after using any toilet facilities. It is imperative that a lack of toilet arrangements does not lead to contamination of water supplies. Where permanent or temporary toilet facilities are provided on site, these must be maintained in a clean and hygienic condition and arrangements made for regular and safe disposal of toilet wastes. For work on sites where there are no toilet facilities, alternative hygienic arrangements must be agreed locally, and all personnel concerned formally told of the arrangement. In all situations involving water supply work, adequate hand washing facilities, using soap and water or a suitable anti-septic hand cream, must be provided.

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\(^2\) Examples of this type of work include repairs to treatment plant equipment, repairs to distribution system controls and equipment, opening / entering water storage reservoirs, water mains repairs, making connections to the water supply system.

\(^3\) Current MoH recommendations require faecal specimens to be tested for the presence of Shigella, Salmonella, Campylobacter, hepatitis A, Glandia, Cryptosporidium

Joint Hygiene Code of Practice Western Bay of Plenty District Council & Tauranga City Council

tcc 2310383

Date Prepared: November 2008 Effective Date: January 2009
3.6 Other Considerations:

- Other points of hygiene consideration include:
- An approved methodology must be provided and followed when potable water is used for filling, testing and disinfecting a new water system including service connections.
- Bactericidal lubricant is to be used for all rings and gaskets coming into contact with the water in the system.
- Manufacturer's guidelines of their installation and operation of pipes and fittings must be followed.
- In addition the "precautionary working practices" as outlined in Appendix B must be adhered to.

4 Method Of Cleaning And Disinfection

All bacteriological testing, where required under this code of practice, shall be done by an Approved IANZ Laboratory chosen by the Contractor. The contractor shall organise (including appropriate advance notice) and pay for the testing, and forward copies of results to the Council or the Council's representative as soon as practical after the tests are completed. This is required before approval will be given to commission and bring the system online for water supply.

4.1 New main and Associated Fittings

4.1.1 General Conditions

Before being put into service, each section of new water main, including all fittings and service connection pipes, shall be disinfected to protect the health and safety of the water consumers. New water mains will not be accepted to be put into service until all of the requirements below have been successfully completed, and copies of the successful tests and associated documentation have been received and approved by the council or the council's representative. The principle adopted is to achieve water main disinfection in a practical manner while minimising the impact on the environment. The key outcome is to ensure the main and associated fittings are free of organisms that could impact on public health.

4.1.2 Installation Practice

All manufacturers' installation requirements for pipes and the associated fittings must be met.

4.1.3 Mains Cleaning

The cleaning of the main prior to disinfection is as important at the disinfection process itself. The main shall first be thoroughly flushed in sections through hydrant or wash out points with sufficient volume and velocity (minimum velocity of 1.5 m/s) of water to remove all foreign matter. The flow of water shall be from one direction at any time, and depending on the position of the flushing point(s), flushing may be required alternatively from opposite directions to ensure thorough flushing of the main has been achieved (consideration must be given to water volume displaced, velocity, removal of debris, clarity etc.).

The water used for flushing must be potable and must be applied by either:

- Connecting to a live water main, with appropriate backflow device or
- An Approved Water Tanker filled with potable water.
Air scouring and swabbing the main may be used in preference to flushing where the pipe diameter makes developing sufficient velocity difficult. Where the minimum velocity can not be achieved a cleaning methodology is to be submitted for approval by council.

Council reserve the right to request that any main is CCTV inspected prior to any connection approval being issued

4.1.4 Levels of Disinfection
The disinfection of new mains will follow successful leak and pressure testing of the mains and shall be undertaken in accordance with the principles of NZS 4404: 2004 with the following requirements:

After mains cleaning, the main shall be slowly filled with potable water and sufficient disinfectant to achieve a uniform concentration of free available chlorine with a minimum FAC concentration of 15 mg/l in the main. This is to be confirmed by FAC testing.

The disinfectant to be used will be sodium hypochlorite solution with sufficient active Chlorine to achieve disinfection levels indicated below. A concentrated sodium hypochlorite solution contains 10%-15% of Chlorine. When polyethylene pipe is being disinfected the concentrated chlorine solution must not come into contact with the pipe as concentrations greater than 12% can chemically attack and degrade polyethylene. Note: the concentration of sodium hypochlorite solution deteriorates on storage.

The desired level of chlorine concentration, to ensure a minimum of 15 mg/l FAC once introduced into the pipe, is produced by thoroughly mixing sufficient sodium hypochlorite (NaOCl) with potable water in a clean disinfected tanker. The initial solution is recommended to be greater than the minimum level of FAC to ensure final FAC on filling is at the required level. Note: some pipe linings may exert additional chlorine demand and in these instances a higher chlorine dose must be applied to ensure the required disinfection levels are achieved. The MSDS and manufacturer's guidelines for handling sodium hypochlorite must be adhered to at all times.

A suitable solution of chlorinated water shall be introduced at the filling point of the section of the main to be disinfected and filled in such a way to ensure no air is trapped in the system. While in contact with chlorinated water, all valves, hydrants and other fittings on the pipe section shall be operated at least once to allow the chlorinated water to pass through them and under valves seats etc. to ensure all parts of the main to be disinfected, are reached. The main shall then be left full of this chlorinated water for a minimum of 12 hours.

Between 18 and 24 hours the residual chlorine concentration must not be less than 5 mg/L FAC. This to be confirmed by testing the FAC. If this requirement is not achieved, the chlorination procedures shall be repeated. When this disinfection requirement is achieved, the higher chlorinated water in the main and service connection pipes shall then be flushed out and de-chlorinated to a maximum FAC of 0.5 mg/l before discharging (a discharge resource consent may be required for this discharge). The flushing shall continue until the chlorine concentration inside the water main is between 0.5 and 1.0mg/L FAC (test required).
Following a successful chlorination procedure above and prior to connecting to the reticulation system, the main shall be tested for the presence of *E. coli*. If water quality tests do not show compliance with water quality requirements the flushing and disinfection process will need to be repeated until test results demonstrate compliance.

### 4.1.5 Connection Procedure / Hook Up

It is important to note the restrictions faced when undertaking disinfecting and testing procedures. Once a pipe has had a successful bacteriological test and the connection is approved by Council, it must either be connected to the mains system within seven days, or re-flushed. If only flushing is carried out, the pipe must then be connected in a further seven days failing which it must be re-disinfected, re-sampled and then the time period for connection restarts. For this reason it is essential that persons undertaking this work adhere to the Council shutdown procedures and liaise with Council to plan the connection processes (including shutdown methodology approval, public notification etc.), otherwise the connection may not be available before the period expires.

Once the new water system has met the requirements of Council including Code of Practice and these have been accepted by Council the contractor shall complete a "Water Connection Application". Upon receipt Council will issue "Water Connection Approval" to allow the connection to the live reticulation system to be undertaken.

- The hook up must be undertaken by a CAC.
- The connection process is considered as a medium risk situation and therefore the CAC will adopt the appropriate disinfection procedure for the risk.

### 4.1.6 Compliance

The Principal/Contractor shall provide the documentation as shown in Appendix A below. Council reserves the right to be present during compliance testing. Written notification is required at least 2 working days prior to testing.

The producer statement must be signed by the Principal / Client or the Contractor’s representative.

### 4.2 Mains and Associated Fittings Repairs

#### 4.2.1 General Conditions

This covers work on existing mains while they are in service; this includes the repair and maintenance arising during normal operation and installation, replacement and removal of fittings during connection of new mains and disconnection of redundant mains. Only Council’s Maintenance Contractor is allowed to undertake this type of work. The contractor shall follow the hygiene and disinfection procedures outlined below:

To prevent ingress of contamination at the point of work, draining water mains through hydrants shall be done where all of the section of pipe being drained is fully intact, i.e. where the pipe has no cut or broken areas. A "Contractors" type standpipe is to be used for de-pressurising water mains. Where no hydrant is fitted, an appropriate scour point will be used.
Water mains that have been cut or broken shall only be drained through the cut or broken area (e.g. where a piece of pipe has been removed to install a branch tee). During these operations the level of the contamination in the trench must be drained and kept well below (at least 500 mm) the cut area of the pipe.

When using hydrants, ensure that any detritus or debris is removed from the hydrant box to “below the standpipe connection flange” prior to fitting standpipe.

The disinfection of repaired mains depends on the risk criteria as outlined below:

4.2.2 Low Risk Situations
Low risk situations are where the pressure in the pipe is maintained while carrying out work which involves cutting or tapping into the live main (e.g. installing service connection, or a branch connection using live tapping techniques)

The procedure shall be:
- Spray all surfaces of fittings and the exterior of the water main with 1% m/v Chlorine (10,000mg/l) solution. The CAC shall have an approved methodology in place to prepare the required Chlorine solution.

4.2.3 Medium Risk
Medium risk situation are where the pressure in the pipe is removed by controlled draining of the pipe into the trench excavation under the point where the pipe is cut, but no external liquid or solid material makes any contact at all with the pipe’s interior, i.e. little possibility of contamination (e.g. cutting in a branch tee, or repair where the trench is thoroughly dewatered)

The procedure shall be:
- Spray all surfaces of fittings, and the interior of both open ends of the water main with 1% m/v Chlorine (10,000mg/l) solution.
- After completion of the work, flush the water main out through hydrants on either end of the break. The principles of flushing must be consistent with those outlined in the section on mains cleaning above (4.1.3).

4.2.4 High Risk
High-risk situations are where any external liquid or solid material has made contact with the cut or broken area of the pipe or has entered the pipe a fitting, i.e. contamination has occurred.

The procedure shall include:
Where ever possible positive pressure shall be maintained to prevent further contamination. This will not be possible for pipe breaks on larger pipe sizes so extreme care shall be exercised in these circumstances.

- Immediately inform the Authorised Officer of Council or Council’s Water Operations Engineer when the situation arises
- Isolate the water main to prevent further travel of the contaminated water.
- If practical, also isolate all affected service connections
- If the excavation is badly contaminated, apply liberal amounts of HTH powder or 1%m/v Chlorine (10,000 mg/l) solution using the spray bottle to spray around the affected areas to reduce the risk of contamination.
- Drain the water main through the cut section while keeping the trench water level well below the level of the cut pipe.
- While maintaining this water level in the trench, flush as much of the contaminated material as possible from the water main through the cut area by opening valves at either end of the reticulation system.
- After completion of work, follow the disinfection procedure; by shock dosing the main using a water tanker filled with predetermined chlorine strength.
- In cases of emergency when the system must be returned to service as soon as possible, a FAC of 325 mg/l with a contact time of at least 15 minutes may be used with prior approval from Council. The affected section can be flushed and returned to service provided the FAC is not less than 300 mg/l at the end of the 15 minute period. Ensure all chlorination, disposal of super chlorinated water and flushing procedures are followed.
- For all high risk situations two (2) bacteriological water samples shall be taken upstream and downstream of the repair, by an individual that has received appropriate training in water sampling procedures, and samples to be sent to an accredited laboratory, (note samples to be packaged and cooled as specified by the laboratory). Although the laboratory bacteriological results will not be available until after the water main has been livened the sampling is intended to provide a record of the effectiveness of the disinfection procedures. In the event of a positive result appropriate actions in accordance with incident plans will be implemented.

**Note:** In the event of any possible contamination from a sewer or similar high risk source prior approval of the cleaning, disinfection and reinstatement methodology must be obtained from Council before the water main can be repaired and returned to service.

Where entry of a *chemical* contaminant into the main may have occurred, sampling should also be undertaken to confirm that its concentration is not a health risk.

### 4.3 Reservoirs and Tanks

#### 4.3.1 General Conditions

Before being put into service, each reservoir or tank, including all fittings, shall be disinfected to protect the health and safety of the water consumers. New, refurbished or cleaned reservoirs will not be accepted to be put into service until the requirements of an agreed cleaning and disinfection methodology has successfully been met and copies of the successful tests and associated documentation have been received and approved by the Council or Council’s representative.

All safety protocols including working at height and confined space entry works will be carried under OSH requirements and Councils health and safety policies.
4.3.2 In situ Inspections / Cleaning with Divers and Suction Lines
There are instances where a reservoir or tank is inspected and/or cleaned while still in operation using divers. Prior to any in situ cleaning or inspection an access, cleaning, hygiene and disinfection methodology specific to each reservoir/tank, must be produced by the CAC and approved by the Council or Council’s representative. All requirements of an agreed methodology must be demonstrated and documented. All relevant documentation must be provided following completion of the work to the Council or Council’s representative.

4.3.3 Principles Required by Methodology
Divers/persons entering the reservoir to meet health requirements (see items 3.5) associated with working in a potable water reservoir/tank.

The methodology of cleaning and disinfection of diving suit and footwear must be provided and approved by Council prior to any work being undertaken. To avoid contamination of water in reservoir, all diving, cleaning, inspection equipment and clothing used by the diver(s) should be disinfected immediately prior to use within the water storage and reservoir. A chlorine footbath is to be used at the reservoir site for use prior to any tank entry.

Council will arrange bacteriological testing of the water in the facility following any diving, inspections, cleaning, etc. This would be required either for audit purposes or where the risk is high this will be needed prior to placing the reservoir back in service.

4.3.4 Inspections / Cleaning / Maintenance Requiring the Draining of the Potable Water Reservoir or Tank
The CAC to provide a methodology to drain and clean the reservoir and this must be approved by the Council prior to work commencing. This methodology needs to ensure that the draining does not negatively impact on the water supply quality and any discharges to the environment meet compliance criteria (including but not restricted to the RMA, EBOP discharge limitations, Freshwater Plans, BOP Regional Water & Land Plan). If clean water is to be disposed to a water course, particular attention is to be given to the potential of the discharge to cause downstream erosion or alteration to the natural water course.

Methodology to ensure, as a minimum, that the following interventions are included once any sediment has been removed:

- Removal of materials that are not part of the structural or operating facilities of the tank (i.e. all scaffolding, planks, tools, rags, etc).
- The method of cleaning the surfaces of the walls, floor, and operating facilities (this could include thorough cleaning using a high-pressure water jet, sweeping, scrubbing, or alternative effective means).
- The removal of all water, dirt, and foreign material accumulated in this cleaning operation and how this will be discharged or removed from the storage facility.
- Similarly the methodology should as a minimum deal with the following once the cleaning operation is complete.
- Checking all potential contamination access points for functionality and condition (i.e. vent screen, overflow screen, and any other screened openings).
- Methods to be taken to prevent the introduction of dirt or other foreign material once cleaning has been completed.
4.3.5 Disinfection of Reservoir or Tank
This to be undertaken as per an agreed approved methodology. For routine inspections, the objective of the disinfection procedure is to achieve full disinfection of the reservoir floor, while at the same time minimising the inconvenience associated with disposing of a large volume of highly chlorinated water. Council will arrange bacteriological testing of the water once all activities are completed and once disinfection has been undertaken. A negative *E. coli* result is required prior to placing the reservoir back in service. A failed bacteriological test may require the reservoir to be emptied (with due consideration for discharge requirements) and then re-disinfected.
References:

- Tauranga City Council Water Supply Hygiene Code of Practice 2005
- Western Bay of Plenty District Council Water Reticulation Disinfection Code of Practice 2006
- Western Bay of Plenty District Council Water Supply System Cleaning Code of Practice 2006
- Tauranga City Council Code of Practice for Development 2006 (or subsequent amendment to IDC)
- Ministry of Health, Drinking-Water Standards for New Zealand
- Health (Drinking Water) Amendment Act 2007
  - Chapter 4 Maintenance and survey of distribution systems, Dammika Vitanage, Francis Pamminger and Tony Vourtanis
  - Chapter 5 Precautions during construction and repairs Richard Ainsworth and David Holt
- Ministry of Health, Amendments to the Public Health Grading Criteria 2003
## APPENDIX A Producer Statement Water System: Disinfection

<table>
<thead>
<tr>
<th>Items</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource Consent / Contract No.</td>
<td></td>
</tr>
<tr>
<td>Location of Work Street Address:</td>
<td></td>
</tr>
<tr>
<td>Town / Area</td>
<td></td>
</tr>
<tr>
<td>Total length &amp; size of Pipe / volume of Reservoir disinfected</td>
<td></td>
</tr>
<tr>
<td>Type of Pipe / Reservoir</td>
<td></td>
</tr>
<tr>
<td>Chlorine dose applied (FAC mg/l)</td>
<td></td>
</tr>
<tr>
<td>Chlorine FAC mg/l (after Contact time)</td>
<td></td>
</tr>
<tr>
<td>Date time start / finish &amp; Contact Period (hrs)</td>
<td></td>
</tr>
<tr>
<td>Chlorine Residual in main / reservoir after final flush (FAC mg/l)</td>
<td></td>
</tr>
<tr>
<td>Chlorine Residual after de-chlorination (mg/l) in discharged water</td>
<td></td>
</tr>
<tr>
<td>Date of De-chlorination / discharge</td>
<td></td>
</tr>
<tr>
<td>Bacteriological results</td>
<td>Attach Results (Must be original from JANZ Laboratory)</td>
</tr>
<tr>
<td>Principal /Client name:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Contact person:</td>
<td></td>
</tr>
<tr>
<td>Contact phone:</td>
<td></td>
</tr>
<tr>
<td>Contractor/ Company Name</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Engineer (CPE) involved:</td>
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</tr>
<tr>
<td>Council witness</td>
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</tr>
<tr>
<td>Contact phone:</td>
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</tr>
<tr>
<td>Comments:</td>
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<tr>
<td>Name:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
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<tr>
<td>Date:</td>
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Joint Hygiene Code of Practice Western Bay of Plenty District Council & Tauranga City Council
Date Prepared: November 2008   Effective Date: January 2009

TCC 2310383
APPENDIX B – Precautionary Working Practices


- When working with pipes and fittings on site, ensure that they are protected from contamination by storing off the ground, capping the ends of pipes and liners, and keeping fittings in wrappings until the time of use.
- Ensure that the open ends of pipes in trenches are plugged and watertight when not being worked on or when there is a risk of the trench flooding.
- Excavate trenches to below the pipe level to provide a sump, and keep as dry as possible to prevent water entering a pipe or fitting.
- Ensure that sealing materials and lubricants are clean and certified as suitable for contact with potable water supplies.
- Protect unattended trenches and engineering sites from vandals and animals.
- If a part of the distribution system has been taken out of service for an extended period, treat it as a potentially contaminated new installation. Apply the flushing, disinfection and microbiological sampling procedures that are normally applied to new installations.
- If a part of the distribution system is to be abandoned, ensure that all boundaries with the live system are effectively closed with especially secure and marked valves, or are capped. Create boundaries to minimize dead legs on the live system and ensure that the location of the abandoned system is recorded for future reference.
- When planning new installations and renovation works, make sure that the plans include valves, injection and washout points to facilitate effective cleaning and disinfection of the pipe work.