

# Backflow Prevention Policy

## 1. Introduction

The Council is committed to providing safe, high quality drinking water to all Waimakariri District residents and businesses that are connected to a public water supply scheme. This Backflow Prevention Policy assists the Council to meet this commitment by setting out the Council's objectives and strategies that will ensure that its public water supplies are protected from contamination through approved backflow prevention devices or methods and avoidance of cross connections. This policy explains how the Council will ensure effective backflow prevention at the boundary between private property and the Council road reserve, and in doing so protect public water supplies from contamination.

The Council protects public health by taking measures to prevent backflow at the property boundary, which marks the location where the Council's water supply network joins with the privately owned supply pipe on the customers' property (i.e. the point of supply).

Backflow is usually caused by a pressure differential between the Council's water supply network and the customer owned private water reticulation. This can be caused by either backpressure, back-siphonage or cross connection. The resulting imbalance can cause water to be either sucked or pushed into the Council's water supply network, creating a potential health risk for other connected properties on the water supply network.

Back-siphonage is one of the most likely causes of backflow into the Council's water main from any property. Back-siphonage can be caused by any of the following: a burst water main, water being pumped from a fire hydrant during firefighting, or high water use at another location in the water supply network. Any of these factors can cause a loss of pressure in the Council's water supply network that can cause water to be sucked back into the network from a customer's premises.

Back pressure may be caused where heating, pumping or industrial manufacturing systems are connected to a Council's water supply and the pressure in the customer's system exceeds the pressure in the Council's water supply system.

## 2. Policy objectives

This policy seeks to protect public health and safety by managing the risk of backflow to avoid contaminants from any private property entering the Council water supply network. The objectives of the policy are to:

- Protect public health and safety by effectively preventing backflow and appropriately managing situations where there is a risk of backflow occurring in order to adequately manage the risk; and
- Meet all relevant legislative requirements.

This policy seeks to achieve these objectives through the Water Services Act. These documents allow Council to manage the risk of backflow from private properties into the Council water supply network either by requiring that the property owner install the required backflow prevention device/s, or by allowing Council to install the appropriate device and recover the associated costs.

The policy also seeks to:

- Protect the integrity and quality of the Council's water supply network by ensuring that unsafe water does not flow into the Council's water supply network
- Protect safe water supplies from potential hazards by outlining requirements for installation, management and maintenance of backflow prevention devices
- Identify the criteria where backflow prevention devices are required for low, medium or high hazard sites and the degree of protection required
- Identify the requirements to install and test backflow prevention devices for all customers
- Avoid cross-connection of safe water supplies with unsafe water supplies by establishing a framework which identifies and specifies responsibilities and actions that must be taken in situations where cross connection may occur.

### 3. Regulatory and policy context

This section explains the Council's responsibility to manage backflow in context of legislative requirements, national standards and national guidance documents. It explains how the Council's approach to managing the risk of backflow is supported by a wider national legislative and regulatory framework.

#### 3.1. Management of backflow

This policy sets out the approach the Council will take to ensure contaminants from a private property are prevented from entering the Council's water supply network at the point of supply. The policy does not address backflow requirements within buildings or structures on a customer's premises. This is the responsibility of the building owner under the New Zealand Building Code.

Any water, including water in a customer's supply pipe, could potentially be contaminated. The policy, in seeking to prevent backflow, treats all water on a customer's premises as potentially contaminated. The intent of a backflow prevention device is to prevent movement of potentially contaminated water or other liquid from private property back into the Council water supply network.

#### 3.2. Legal requirements

The Building Act 2004 (Building Act) requires buildings to be safe and sanitary and the occupants safeguarded from potential illness. To this end, the Building Act contains provisions for the management of backflow within buildings located on private premises. The Building Act also imposes building consent requirements for devices installed either at the property boundary (on the customer's side of the toby), or for devices located inside a building. For the latter, this internal protection is required as close as possible to the source of potential contamination within the building. The customer has responsibility to ensure the building is configured so that it will not negatively impact the Council network.

This policy only provides protection from backflow for the water supply network at the property boundary, noting the internal building protection is a responsibility of the property owner.

The Water Services Act 2021 (Water Services Act) requires the Waimakariri District Council to protect drinking water quality for all its customers. The Water Services Act guides the Council's development of a backflow prevention policy intended to protect public water supplies. It specifically provides for the installation of backflow prevention devices.

The following are relevant clauses extracted from the Water Services Act.

#### **27 Duty to protect against risk of backflow**

- (1) *If a drinking water supply includes reticulation, the drinking water supplier must ensure that the supply arrangements protect against the risk of backflow.*

- (2) *If there is a risk of backflow in a reticulated drinking water supply, the drinking water supplier may—*
- (a) *Install a backflow prevention device and require the owner of the premises to reimburse the supplier for the cost of installation, maintenance, and ongoing testing of the device; or*
  - (b) *Require the owner of the premises to install, maintain, and test a backflow prevention device that incorporates a verifiable monitoring system in accordance with any requirements imposed by the supplier.*
- (3) *A person who installs a backflow protection device must take all reasonable steps to ensure it operates in a way that does not compromise the operation of any fire extinguisher system connected to the drinking water supply.*

The Water Services Act sets out the requirements for the supply of safe and sufficient drinking water to communities, and states penalties and offences for parties that contaminate a public drinking water supply.

Part 2A (Drinking Water) of the Health Act 1956 was repealed on 15<sup>th</sup> November 2021, so no longer includes reference to drinking-water regulatory activities. However, section 23 of the Health Act 1956 still provides the ability to develop bylaws to protect public health. The Local Government Act 2002 (Local Government Act) provides Council with the ability to make bylaws for the purpose of protecting, promoting and maintaining public health and safety. The Local Government Act also states it is an offence to pollute a public water supply and gives a Council the power to stop the supply to respond to an event that may endanger public health.

The following legislation, and subsequent revisions of, are also relevant:

- The Health and Safety at Work Act 2015
- The Plumbing, Gasfitters and Drainlayers Act 2006
- The Resource Management Act 1991.

The Waimakariri District Council Water Supply Bylaw 2018 made under provisions of both the Local Government Act 2002 and the Water Services Act includes requirements for backflow prevention at the property boundary, in accordance with this policy. This, alongside the Water Services Act, are the primary mechanisms through which the Council can presently enforce its Backflow Prevention Policy. The Bylaw provides rules and enforcement mechanisms and enables prosecutions as required through the District Court. It requires an approved backflow prevention device or adequate air gap separation as applicable on all connections to a Council water supply.

### **3.3. Regulations**

The New Zealand Building Code (NZBC clause G12) is contained in the Building Act First Schedule of the Building Regulation 1992 (see Appendix 2). Its provisions require water supply systems to be installed in a manner that avoids likelihood of contamination within the water supply network. It also identifies risks, hazards and introduces the requirement for IQP's (Independently Qualified Person) to test backflow prevention devices.

The following regulations and subsequent revisions of are also relevant:

- Camping Ground Regulations 1985
- Food Regulations 2015.

### **3.4. Standards**

The following standards or subsequent revisions are relevant to the prevention and risk management of backflow affecting public water supplies. These are:

- New Zealand Drinking Water Standards 2005 (revised 2018)
- AS/NZS 2845.1:2010 Water Supply: Backflow Prevention Devices: Materials, Design and Performance requirements

- AS/NZS 3500.1:2021 Plumbing and Drainage: Water Services
- NZS 4541:2007 Automatic Fire Sprinkler Systems
- New Zealand Backflow Testing Standard 2019: Field Testing of Backflow Prevention Devices and Verification of Air Gaps.

### 3.5. Guidelines and plans

The following guidelines and/or plans are relevant to managing the risk of backflow in the Waimakariri District:

- Boundary Backflow Prevention for Drinking Water Supplies 2019, published by Water NZ
- National Code of Practice for Utility Operators' Access to Transport Corridors
- Waimakariri District Council Engineering Code of Practice
- Drinking Water Safety Plans have been prepared for the district water supplies. Drinking Water Safety Plans identify the barriers that are required to prevent contaminated water or other substances entering each scheme, including backflow prevention, avoidance of any cross connection, and other barriers such as mains location, testing and repair procedures, mains flushing, filtration and chlorination. Drinking Water Safety Plans also identify required improvements and their associated timeframes.

## 4. Policy statement

### 4.1. Application

All new and existing customers that will or currently receive a supply of safe water from the Council are required to comply with all of the requirements of this policy.

### 4.2. Backflow prevention requirements responsibilities

This section (4.2) outlines what level of protection is required at each site. Section 4.3 outlines how this is achieved at existing connections, and Section 4.4 outlines how this applies to new connections.

#### 4.2.1. Low hazard

Low hazard sites are required to have a non-testable dual check backflow prevention device in place at the property boundary. Backflow prevention devices for low hazard sites are required to be located on the Council's side of the point of supply and are contained within the toby at the point of supply, for standard connection sizes. These devices are owned and maintained by the Council.

#### 4.2.2. Medium hazard

This section applies to all medium hazard sites, with the exception of fire connections (refer section 4.2.4), or restricted connections (refer section 4.2.5).

Medium hazard sites are required to have a fully testable double check backflow prevention device at, or as near as practicable, to the property boundary at the point of supply.

The Council normally owns and maintains these devices. Typically standard 15 – 25mm diameter devices would be installed within the toby at the property boundary on the road reserve, and larger size devices up to 50mm in an above ground box. Standard Drawing 600-409B within the Council's Engineering Code of Practice shall be referred to for specific details and requirements. For connection sizes larger than 50mm, a specific design is required and shall be submitted to Council for approval.

#### Location of device

The device may either be installed immediately on the Council's side of the property boundary, as near as practicable to the property boundary, or immediately on the customer's side of the property boundary, within the road reserve, subject to agreement with the customer.

The decision regarding the most appropriate place to install the device must be made in conjunction with Council at the time the installation is being applied for / required, and will ultimately be at Council's discretion.

#### Installation of devices

Devices shall be installed by an approved and suitably qualified Water Reticulation Worker, as defined in the Council's Hygiene Code of Practice for Work on Public Water Supplies.

#### Certification of devices

Council shall be notified of all new devices immediately following installation, and Council shall organise the testing of the device by an IQP to ensure it has been installed and is functioning correctly. Any faults identified during testing shall be rectified by the device owner.

#### Accessibility of devices

All devices must be accessible for testing at all times.

### 4.2.3. High hazard

This section applies to all high hazard sites, with the exception of fire connections (in which case Section 4.2.4 applies), or restricted connections (in which case 4.2.5 applies).

#### Nature of device

All high hazard sites are required to have reduced pressure zone backflow prevention devices installed. For common connection sizes (15 to 50mm internal diameter), this shall be constructed in accordance with the Standard Drawing 600-409A within the Council's Engineering Code of Practice. For connection sizes larger than this, specific design will be required and shall be submitted to Council for approval.

#### Location of device

The device may either be installed immediately on the customer's side of the property boundary, as near as practicable to the property boundary, or immediately on the Council's side of the property boundary within the road reserve, subject to Council approval.

The location relative to the property boundary is important with respect to the Building Act, as the Building Act applies to devices within the private property, but not to devices outside of the property boundary. The decision regarding the most appropriate place to install the device must be made in conjunction with Council at the time the installation is being applied for / required, and will ultimately be at Council's discretion. The device must be located above ground, protected by a suitable chamber or barrier/bollards, with lockable access to protect the device from physical damage.

#### Installation of devices

Devices shall generally be installed by a Certifying Plumber.

#### Certification of devices

Council shall be notified of all new devices immediately following installation, and Council shall organise the testing of the device by an IQP to ensure it has been installed and is functioning correctly. Any faults identified during testing shall be rectified by the device owner.

#### Accessibility of devices

All devices must be accessible for testing at all times.

#### Ownership of device

All high hazard devices shall be owned by the property owner, unless specific agreement is made otherwise.

A scenario in which a high hazard device may be owned by Council, is one in which the device is installed by Council on the Council side of the Point of Supply under Section 27 of the Water Services Act. It is noted however under this scenario, while Council would own this device, Council could recover any costs associated with this device from the relevant property owner in accordance with the Water Services Act.

#### 4.2.4. Fire connections

All Fire Systems must comply with Section 2.2 of Part 2: Code of Practice in Boundary Backflow Prevention for Drinking Water Supplies 2019, published by Water New Zealand. Key requirements from this code are outlined below:

- Fire sprinkler systems fed solely from the water supply without auxiliary water supplies must have a double check valve assembly installed
- Systems containing hazardous additives used for firefighting (foam or antifreeze) must have reduced pressure zone devices installed
- Backflow prevention devices associated with fire systems shall be installed in the sprinkler valve house, or other secured environment approved by the water supplier
- In accordance with NZS 4541 Automatic Fire Sprinkler Systems, all valves on a connection serving a sprinkler system (other than a domestic sprinkler system) shall be alarmed and/or monitored for unauthorised operation. The exception to this is the underground sluice valve at the public main connection, which does not require monitoring.

#### 4.2.5. Restricted supplies

Customers receiving a restricted supply of water from a Council water supply are required to provide an adequate air gap separation to prevent backflow from a privately owned water storage tank entering the Council's water supply network. In addition, the Council also provides and maintains boundary non-testable single check backflow prevention devices on the Council's side of the point of supply.

Air gaps on private water storage tanks shall comply with Section G12 of the New Zealand Building Code, as outlined on Standard Drawing 600-403 of the Council's Engineering Code of Practice.

#### 4.2.6. All connection types

The customer shall not interfere with any approved boundary backflow prevention device in any way. The customer must ensure the Council will always have easy access to the device for the purposes of testing, monitoring or inspection as applicable.

There shall be no bypassing of boundary devices other than with another approved device.

Parallel devices may be used to ensure continuity of supply during testing of devices, such that the main device can be bypassed by a secondary device, and vice versa, to allow testing of both devices to be conducted without interruption to supply. If a customer wishes to minimise any disruptions to supply during testing by installing parallel devices, the additional device shall be installed at the customer's cost regardless of the hazard class and device type required.

### 4.3. Present practice and existing customer (retrofitting)

This section sets out the processes that will be followed, and how costs will be apportioned, for customers who have existing connections that do not currently have the required devices installed to meet the requirements of Section 4.2.

#### 4.3.1. Low hazard

The Council will inspect and ensure all low hazard sites have an approved boundary backflow prevention device as part of the toby manifold located at the point of supply. These costs will be met by Council.

#### 4.3.2. Medium hazard

This section applies to all medium hazard sites, with the exception of fire connections (refer section 4.3.4), or restricted connections (refer section 4.3.5).

The Council will identify and ensure all medium hazard sites have an approved device located at the property boundary (in accordance with Section 4.2.2). The Council will install these devices. Initial upgrades of devices for existing customers with connection sizes up to 25mm will be funded by the Council.

Devices for larger connections (>25mm) are required to be funded by the property owner, with a subsidy from Council. The subsidy provided will be equal to the estimated value of a standard connection size (up to 25mm), and the property owner covering the 'extra-over' costs associated with the increase in size.

Devices will thereafter be owned and maintained by the Council.

#### 4.3.3. High hazard

This section applies to all high hazard sites, with the exception of fire connections (refer section 4.3.4), or restricted connections (refer section 4.3.5).

Council will identify and ensure all high hazard sites have an approved device located at the property boundary (in accordance with Section 4.2.3). As high hazard boundary devices are required to be owned by the property owner, the costs associated with their installation shall be met by the property owner. The process for ensuring requirements at all high hazard sites are met are:

- The Council shall survey existing properties to determine their hazard class
- Where it is determined that a property meets the criteria of a high hazard property, the property owner will be required to fund the installation of an appropriate backflow prevention device
- In general, installation of devices shall be completed by the property owner engaging a Certifying Plumber to complete the installation immediately on the private side of the boundary (at the property owner's cost), downstream of the point of supply, in accordance with the requirements set out in this Policy
- Installations on the public side of the property boundary may only be done with approval from the Council. Circumstances where this may be approved would be:
  - If there is no feasible location on the private side of the boundary (i.e. if the building is built right up to the property boundary). In this case, the device would still be owned by the property owner. Or;
  - Where the provisions in the Water Services Act are exercised whereby the Council can complete the installation on the Council side of the boundary without requiring prior approval of the property owner, with the Council becoming the owner of this device, while still retaining the right to recover costs associated with this from the property owner.

#### 4.3.4. Fire connections

The Council will inspect and ensure all fire connections have approved boundary backflow prevention devices, in accordance with 4.2.4.

The process for ensuring requirements at sites with dedicated fire connections are met are:

- The Council shall survey existing properties with fire connections to determine their hazard class
- The appropriate device type (double check valve, or reduced pressure zone device) shall be selected as per 4.2.4. In general, installation of these devices shall be completed by the property owner engaging a Certifying Plumber to complete the installation at the property owner's cost, downstream of the point of supply, in accordance with the requirements set out in this Policy

- Installations on the public side of the property boundary may only be done with approval from the Council. Circumstances where this may be approved would be:
  - If there is no feasible location on the private side of the boundary (i.e. if the building is built right up to the property boundary and it is not feasible to install it within the sprinkler valve house within the building). In this case, the device would still be owned by the property owner; or
  - Where the provisions in the Water Services Act are exercised whereby the Council can complete the installation on the Council side of the boundary without requiring prior approval of the property owner, with the Council becoming the owner of this device, while still retaining the right to recover costs associated with this from the property owner.

#### 4.3.5. Restricted supplies

The Council will inspect and ensure all restricted connections have an approved single check (non-testable) boundary backflow prevention device as part of the toby manifold located at the point of supply. These costs will be met by Council.

In addition, the customer is required to provide a registered air gap within the water storage tank on the customer's property. There are to be no cross connections in between the toby manifold and the customer's tank. In order to verify the suitability of air gaps at private tanks, the Council may:

- Inspect private tanks to confirm the presence and suitability of an air gap
- Require that the necessary overflow pipes be installed to create an air gap, where it is not already present or adequate
- Carry out formal verification of the air gap in accordance with the NZ Backflow Testing Standard 2011, if deemed necessary.

#### 4.4. Future / New connections

##### General requirements

This section outlines processes to be followed to ensure adequate backflow prevention is applied to properties that apply for new connections to the Council supply. This should be read in conjunction with the Council's Water Supply Bylaw, which covers general procedures for assessing new connection applications.

As part of the new connection application, the customer must provide information as to the activities they will be undertaking on their property, which the Council will use to assign an appropriate hazard class to that property. The applicant shall then cover the costs of an appropriate device to be installed, which shall be identified in accordance with Section 4.2 of this Policy.

New connections may also need to comply with Building Consent requirements, where applicable.

For Fire Connections, these devices will be subject to Building Consent requirements, and shall be included on the building's compliance schedule for its annual Building Warrant of Fitness.

#### 4.5. Change of use of water supply

##### General requirements

In any situation where the customer proposes to change the water use at any premises that would result in a revised backflow risk category, the customer must notify the Council in writing of the proposed new water use. If the customer is in doubt, it is recommended that they get in contact with the Council to clarify.

The Council will then assess and confirm in writing the revised hazard class for that property. If a new device type is required to be installed, the costs of installing the new device and removing the old device shall be met by the customer. The device shall be selected and installed in accordance with Section 3.2.



New connections may also need to comply with Building Consent requirements, where applicable.

#### 4.6. Maintenance and replacement of damaged devices

The Council will repair any damaged medium or low hazard backflow prevention device owned by Council. The Council may repair or replace any damaged high hazard device owned by the customer and charge the customer for this work, or allow the customer to complete the repairs to the satisfaction of the Council. If repairs are not completed within the timeframe specified by Council, Council may undertake the repairs and recover costs from the customer.

#### 4.7. Specification and manufacture of boundary backflow prevention devices

##### 4.7.1. Specification of devices

The following table specifies the minimum required backflow prevention devices to be used in relation to the assessed level of hazard and risk presented by a customer's use of water from a Council water supply.

Assessed Level of Hazard Risk / Type of Connection	Property boundary device at point of supply	
	Council Side	Customer Side
Low <sup>1</sup>	Dual check valve (Council owned)	
Medium	Double check valve (Council owned)	
High <sup>2</sup>	Isolation valve <sup>3</sup> (Council owned)	Reduced pressure zone valve (Customer owned)
Restricted	Single check valve (Council owned)	Registered air gap (Customer owned)
Dedicated Fire Connection: Medium	Isolation valve (Council owned)	Double check valve (Customer owned)
Dedicated Fire Connection: High	Isolation valve (Council owned)	Reduced pressure zone (Customer owned)

*Note 1: Only dual check valves required for low hazard sites or customer's receiving restricted supplies may be non-testable. Any double check valve or any other device required for a medium or high hazard site or for fire connections must be fully testable.*

*Note 2: In certain circumstances the Council may install a reduced pressure zone backflow prevention device on the Council side, in accordance with the Water Services Act.*

*Note 3: For smaller sized connections (<25mm), a standard toby manifold shall be used on the Council side of the point of supply as the isolation valve. For larger connections (>25mm), a standard isolation valve shall be used rather than a toby manifold.*

The Council will specify and approve the type of backflow prevention device that is to be used for each customer subject to assessment of the customer's actual or proposed water use activities and the associated assessed degree of risk of backflow from those activities. The devices to be approved will be rated according to the highest assessed risk at that site.

Non dedicated fire connections will not be permitted.

Only an IQP who is also a Certifying Plumber, appointed to undertake this function by the Council, can install a boundary backflow prevention device that is located on private property.

##### 4.7.2. Manufacture of backflow prevention devices

All backflow prevention devices used in the Waimakariri District must be manufactured in accordance with AS/NZS 2845.1 Water Supply: Backflow Prevention Devices: Materials, Design and Performance Requirements.

#### 4.7.3. Installation of boundary backflow prevention devices

Device installation will comply with the Part 2 - Code of Practice for Boundary Backflow Prevention within the Water New Zealand document "Boundary Backflow Prevention for Drinking Water Supplies" published by Water New Zealand, Sections 2.1 – 2.2. The Standard Drawings within the Council's Engineering Code of Practice shall be referred to for specific details and requirements.

Devices installed on a fire connection shall be New Zealand Insurance Council approved.

#### 4.8. Fire hydrant standpipes / temporary connections

Where contractors require to take water from the Council system, they shall do so from an approved 'Tanker Filling Point' which are dedicated hydrants throughout the district installed for this purpose, with permanent RPZ installations upstream of the hydrant to protect the public supply from contamination. A permit from the Council is required to access these tanker filling points.

Where it is not practicable to use a tanker filling point, contractors may apply to the Council to take water from a hydrant, which will be considered on a case by case basis, at the discretion of Council staff. Generally, where approval is given to access a hydrant that is not at a tanker filling point, the process to access shall include the Council providing an RPZ fitted to a standpipe to the contractor to ensure protection of the public supply is achieved. The Council may recover costs associated with the supply of the RPZ / standpipe and any other supervision of this activity.

#### 4.9. Property boundary device inspecting and testing

The Council will test all backflow prevention devices on the property boundaries of high and medium hazard sites at least once every year, except for fire connections. Fire connections are tested under the building WoF.

The Council will inspect the non-testable devices at low hazard sites from time to time as required in response to identification of issues or as a part of its general water supply network maintenance programme.

All testing of backflow prevention devices will be performed by an Independent Qualified Person (IQP) as specified under the Building Act. This person must be suitably qualified to test backflow prevention devices, assess hazards and provide written documentation. All testing will be in accordance with Section 2.3 of the Code of Practice for Boundary Backflow Prevention in Boundary Backflow Prevention for Drinking Water Supplies 2019 published by Water New Zealand, or any subsequent revision to that document.

Testing will be undertaken at each of the following times:

- Immediately after any device installation
- On completion of any maintenance work
- After a backflow or suspected backflow incident (medium and high hazard devices)
- At the request of an Environmental Health Officer, Building Consent Officer or Building Inspector, Dangerous Goods Inspector, the Water Asset Manager, 3 Waters Manager or the Water Unit Manager.
- All registered air gaps may also be inspected and verified, up to annually.

Where continuous supply is needed, two devices in parallel will be required to enable testing to be carried out without interruption of flow. The additional device will be provided by the customer at the customer's expense.

#### 4.10. Backflow prevention risk assessment

The risk and backflow hazards at each property will be assessed by a qualified Backflow Surveyor who will meet all of the required Unit Standards and other requirements for Backflow Surveying (see policy definitions).

#### 4.11. Enforcement and disputes

The Council may disconnect or restrict the customer's water supply if the customer fails to meet any of the requirements of this policy, in accordance with enforcement provisions outlined in the Local Government Act and the Council's Water Supply Bylaw 2018. The Council will make every effort to give notice of an intention to disconnect, in accordance with the degree of risk presented by that customer, and the period specified in the notice shall not be longer than 30 days. The customer will have the time specified in the notice to rectify the situation to the satisfaction of the Council.

Alternatively, the Council may install a device that is required to manage the backflow hazard generated by a customer and recover costs of device purchase, installation and testing from that customer in accordance with Section 27 of the Water Services Act.

In the event however that a potentially serious hazard to the water supply exists, then the Council may disconnect the supply immediately. Reconnection to the supply shall not be undertaken until the appropriate remedy has been made by the customer. All costs associated with remedying the problem must be met by the customer.

If a dispute arises over the level of risk or the type of backflow prevention device required at the property boundary, then the Water Unit Manager, 3 Waters Manager or Water Asset Manager shall nominate the device to be used. If the level of risk is unclear or unknown, then a reduced pressure zone backflow preventer shall be installed.

Contamination incidents will be managed and addressed in accordance with any Drinking Water Safety Plan that has been adopted for any Council water supply scheme.

#### 4.12. Exemptions

In particular circumstances a backflow prevention device may be approved that is appropriate to manage the level of assessed risk to the Council's water supply network, where it differs from other requirements within this policy. An exemption to any requirement of this policy may be granted in writing only at the discretion of the Manager Utilities and Roading.

#### 4.13. Documentation

The Council will develop a register of backflow prevention devices in place at all high and medium sites. The register will indicate the type of device and whether it is located on the Council's or customer's side of the point of supply. If the latter, the exact location of the device (e.g. outside or inside a building and exact location within a building) will be recorded.

Results of all tests and maintenance undertaken on each device will also be recorded.

### 5. Definitions

**Air gap separation** - A physical separation between the free flowing discharge end of a safe water supply pipeline, and the highest overflow level of the receiving vessel, used to prevent backflow.

**Backflow** - The unplanned reversal of flow of water or mixtures of water and contaminants into the water supply network.

**Backflow prevention device** - A device to prevent backflow of potentially contaminated water back into the public supply. These include:

- Air gap devices (verifiable), as defined in the NZ backflow testing standard 2011
- Dual check valves (non-testable), as defined in AS/NZS 2545.1:2010
- Double check valves (DCV) (testable) , as defined in AS/NZS 2545.1:2010
- Reduced pressure zone (RPZ) devices (testable), as defined in AS/NZS 2545.1:2010.

**Back pressure** - Refers to a situation where the pressure in the downstream (customer's) plumbing is greater than the pressure in the water supplier's mains resulting in a reversal of normal flow direction and thereby possible contamination of the mains water.

**Back siphonage** - Refers to a situation where the pressure in the water supplier's main is less than the pressure in the downstream (customer's) plumbing, resulting in a reversal of normal flow direction and potential contamination of the mains water by water being sucked back into the water supplier's main.

**Backflow surveyor** - A person suitably qualified to identify the risk of backflow at any site and hazards present at the site, qualified as described in Appendix 6 of the Boundary Backflow Prevention for Drinking Water Supplies, 2019, published by Water New Zealand, or any subsequent revisions of that publication. The Backflow Surveyor must achieve all required Unit Standards as required at any time.

**Boundary backflow prevention device** - Any backflow prevention device located at or near the point of supply as defined by the water supplier, usually close to the property boundary.

**Certifying plumber** - A person licensed under the Plumbers, Gasfitters and Drainlayers Act 2006.

**Connection** - The service pipe from the Council's water main to the point of supply that is owned and maintained by the Council and includes any pipes, valves, manifolds, water meters, backflow prevention device that is installed on the Council's side of the point of supply and the protection structure for any such backflow prevention device, and the water meter box.

**Cross connection** - An actual or potential connection between the safe water supply and a non- safe water supply or pipework containing a contaminant, e.g. a public water supply to a rain water supply.

**Customer** - The owner of any property who has obtained the right to use, or direct the manner of use of, water supplied by the Council to any premises.

**Extraordinary supply** - A category of an on demand supply including all purposes for which water is supplied other than ordinary domestic supply and which may be subject to specific conditions and limitations.

**High hazard site** - The premises at which any condition, device or practice is in place, is occurring, or has the potential to occur, which, in connection with the safe water supply system, has the potential to cause death. Examples of high hazard sites are referenced in Appendix 1.

**Independent qualified person (IQP)** - An independent qualified person under the Building Act 2004. This person must be suitably qualified to test backflow prevention devices, assess hazards and provide written documentation. This person must also meet all requirements of Appendix 6 of the Boundary Backflow Prevention for Drinking Water Supplies, 2019, published by Water New Zealand, or any subsequent revisions of that publication. The IQP/ Backflow Tester must achieve all required Unit Standards that are required at any time.

**Low hazard site** - The premises at which any condition, device or practice is in place or is occurring which, in connection with the safe water supply system, would constitute a nuisance, by colour, odour or taste, but not injure or endanger health. Examples of low hazard sites are referenced in Appendix 1.

**Medium hazard site** - means the premises at which any condition, device or practice is in place or is occurring which, in connection with the safe water supply system, has the potential to injure or endanger health. Examples of medium hazard sites are referenced in Appendix 1.

**On demand supply** - A supply which is available directly to the customer without restriction of flow from the point of supply subject to the agreed levels of service.

**Ordinary supply** - A category of an on demand supply used solely for domestic purposes, excluding any identified extraordinary water use.

**Point of supply** - The point where the connection meets the supply pipe and it marks the boundary of responsibility between the customer and the Council, irrespective of property boundaries.

**Premises** – Premises means:

- a) A property or allotment which is held under a separate certificate of title or for which a separate certificate of title may be issued and in respect of which a building consent has been or may be issued; or
- b) A building or part of a building that has been defined as an individual unit by a cross-lease; unit title or company lease and for which a certificate of title is available; or
- c) Land held in public ownership (e.g. reserve) for a particular purpose.

**Restricted supply (trickle feed supply)** - A type of water supply where a limited flow is supplied by a flow control device, and storage is provided on-site by the customer to cater for demand fluctuations.

**Safe** - Drinking water as defined in the Water Services Act, means drinking water that is unlikely to cause a serious risk of death, injury, or illness:

- a) Immediately or over time; and
- b) Whether or not the serious risk is caused by –
  - (i) The consumption or use of drinking water; or
  - (ii) Other causes together with the consumption or use of drinking water

**Service pipe** - The section of water pipe between the water main and the point of supply that is owned and maintained by the Council.

**Supply pipe** - The section of pipe between the point of supply and the customer's premises that is installed, owned and maintained by the customer.

**Water supply network** - All the components of the Council water supply between the point of abstraction from the natural environment and the point of supply. This includes but is not limited to: wells, infiltration galleries, intake structures, open raw water storage ponds and/or lakes, falling mains, treatment plants, treated water reservoirs, trunk mains, service mains, rider mains, pump stations and pumps, valves, hydrants, scour lines, service pipes, connections, meters, backflow prevention devices and tobies.

## 6. Links to other council policies and community outcomes

### 6.1. Water supply bylaw

This policy outlines the approach the council will take in giving effect to the Waimakariri District Water Supply Bylaw 2018. The Water Supply Bylaw Section 15 contains provisions to manage backflow in the Waimakariri District. This policy will be used as a tool to assist the council to effectively implement the approach to backflow prevention outlined in the Bylaw.

### 6.2. Community outcomes

This policy gives effect to the following outcome:

- Core utility services are sustainable, low emissions, resilient, affordable; and provided in a timely manner

**7. Questions**

Any questions regarding this policy should be directed to the Water Asset Manager in the first instance.

**8. Effective date**

5 April 2022

**9. Review date**

This policy will be reviewed within five years of the date of its adoption, by 05 April 2027.

**10. Policy owned by**

Manager, Utilities and Roading

**11. Approval**

Adopted by Waimakariri District Council on 05 April 2022

## Appendix 1: Examples of common types of activities that may require backflow prevention

This Appendix provides examples of common types of activities that may present a particular level of hazard and risk of backflow. The actual level of risk in each case must be verified by a Backflow Surveyor, and can be verified through reference to clause G12 of the Building Code (Appendix 2). This Appendix can be used only for the purpose of guidance in applying the various provisions of the policy and may assist in determination of priorities for inspections and additional testing. Any doubt over the level of risk should be resolved through reference to clause G12 of the Building Code, the risk definitions in this policy and by a physical assessment of the risk or combination of risks at any site.

### Low Hazard Sites:

- Ordinary domestic premises (e.g. standard 15mm-20mm Nominal Bore (NB) connection).

### Medium Hazard Sites:

- Ordinary domestic premises with swimming pools, spa pools, fish ponds or fountains that are connected to the households plumbing
- Commercial premises unless otherwise identified as high hazard sites
- Restaurants and cafes
- Home based commercial enterprises
- Farms, agricultural premises and rural lifestyle premises (connected to on-demand water supplies) that use any of the following: greenhouses, dams, other auxiliary water supplies, or stock water (without use of chemicals), unless these are otherwise identified as high hazard sites
- Water used for cleaning, steam cleaning and cooling activities
- Public toilets and urinals
- Hose connections (other than those used by ordinary domestic households)
- Irrigation and sprinkler systems without chemicals (other than those used by ordinary domestic households)
- Rainwater tanks connecting to household plumbing and other auxiliary water supplies
- Drink dispensers with carbonators
- Deionised water, reverse osmosis units and equipment cooling without chemicals
- Building hydrant systems
- Air conditioning units, heat exchangers and other water cooled equipment (assuming not connected to a sewage system and/or not treated with chemicals)
- Various fire protection systems, including fire sprinkler systems and fire sprinkler secondary water and fire hose reels not using chemicals
- Solar heating systems not otherwise identified as a high hazard.

### High Hazard Sites:

- Industrial sites
- Plating and chemical companies/plants
- Boiler, chiller, and cooling tower make up water
- Chemical dispensers and chemical injectors
- Chlorinators
- Autoclaves and sterilisers
- Systems containing chemicals such as anti-freeze, anti-corrosion, biocides or fungicides
- Beauty salons, barber shops and hairdressers
- Irrigation systems using chemigation/fertigation or greenhouses using chemical injectors or steam generating facilities

- Farms or agricultural premises using cow sheds, slurry pits or stock water with added chemicals
- Air conditioning units, heat exchangers and other water cooled equipment (if potentially connected to the sewage system or treated with chemicals)
- Irrigation and sprinkler systems with chemicals added to the water or applied to the ground
- Hose taps with high hazard situations like mixing of pesticides
- Fire protection systems specifically using toxic chemicals
- Dental surgeries
- Convalescent and Nursing Homes
- Crematoria and Mortuaries
- Wastewater pump stations, sump ejectors and treatment sites
- Laboratories
- Medical facilities (including hospitals, medical laboratories and general practice offices)
- Car and factory washing facilities
- Schools and Universities
- Laundries, Dry Cleaners and Dye Works
- Veterinary Hospitals and Clinics, Animal Grooming Establishments, pest control equipment
- Photography and x-ray machines
- Marinas, Yacht Clubs, Piers and Docks
- Tank trucks and Sprayers
- Automobile repair and related industries
- Solar heating systems that include reservoirs and/or solar collector fluids which may have antifreeze, toxic corrosion inhibitors, or non-potable water
- Food processing such as bottling companies, canneries and meat packing facilities that use fertilisers or wastes, or caustics, acids, detergents or other compounds used in cleaning or sterilising, or cooling towers and circulating systems, or steam generating facilities and lines which may be contaminated with boiler compounds.



### 3.0 Protection of Potable Water

#### 3.1 Drawn water not to be returned

**3.1.1** Water drawn from the *water main* shall be prevented from returning to that system by avoiding *cross connections* or *backflow*.

#### 3.2 Cross connections prohibited

**3.2.1** The *water supply system* shall be installed so that there is no likelihood of *cross connection* between:

- a) A *potable water supply system* and a non-*potable water supply system*,
- b) A *potable water supply system* connected to a *water main*, and any water from another source including a private water supply,
- c) A *potable water supply system* and any bathing facilities including swimming, spa or paddling pools, and
- d) A *potable water supply system* and pipes, *fixtures* or equipment (including boilers and pumps) containing chemicals, liquids, gases or other non-*potable* substances.

#### 3.3 Cross Connection Hazard

##### 3.3.1 High hazard

Any condition, device or practice which, in connection with the *potable water supply system*, has the potential to cause death.

**COMMENT:**

High hazard may include but not necessarily be limited to:

- a) Autoclaves and sterilisers
- b) Systems containing chemicals such as anti-freeze, anti-corrosion, biocides, or fungicides
- c) Beauty salon and hairdresser's sinks
- d) Boiler, chiller and cooling tower make-up water
- e) Car and factory washing facilities
- f) Chemical dispensers
- g) Chemical injectors
- h) Chlorinators
- i) Dental equipment
- j) Direct heat exchangers
- k) Fire sprinkler systems and fire hydrant systems that use toxic or hazardous water

- l) Hose taps associated with High hazard situations like mixing of pesticides
- m) Irrigation systems with chemicals
- n) Laboratories
- o) Mortuaries
- p) Pest control equipment
- q) Photography and X-ray machines
- r) Piers and docks
- s) Sewage pumps and sump ejectors
- t) Sluice sinks and bed pan washers
- u) Livestock water supply with added chemicals
- v) Veterinary equipment

**Note:** The examples given are not an exhaustive list. Where there is doubt comparison must be made to the hazard definitions.

##### 3.3.2 Medium hazard

Any condition, device or practice which, in connection with the *potable water supply system*, has the potential to injure or endanger health.

**COMMENT:**

Medium hazard may include but not necessarily be limited to:

- a) Appliances, vehicles or equipment
- b) Auxiliary water supplies such as pumped and non-pumped fire sprinkler secondary water
- c) Deionised water, reverse osmosis units and equipment cooling without chemicals
- d) Fire sprinkler systems and *building* hydrant systems
- e) Hose taps and fire hose reels associated with Medium hazard
- f) Irrigation systems with underground controllers
- g) Irrigation without chemicals
- h) Livestock water supply without added chemicals
- i) Untreated water storage tanks
- j) Water and steam cleaning
- k) Water for equipment cooling
- l) Drink dispensers with carbonators
- m) Swimming pools, spas and fountains

**Note:** The examples given are not an exhaustive list. Where there is doubt comparison must be made to the hazard definitions.

**3.3.3 Low hazard**

Any condition, device or practice which, in connection with the *potable water supply system*, would constitute a nuisance, by colour, odour or taste, but not injure or endanger health.

**COMMENT:**

Low hazard may include but not necessarily be limited to:

- a) Drink dispensers (except carbonators).

**Note:** The example given is not an exhaustive list. Where there is doubt comparison must be made to the hazard definitions.

**3.4 Backflow protection**

**3.4.1** Backflow protection shall be provided where it is possible for water or *contaminants* to *backflow* into the *potable water supply system*.

**COMMENT:**

The protection of non-potable water used for personal hygiene is contained in Paragraph 4.1.

**3.4.2** Backflow protection shall be determined by identifying the individual *cross connection* hazard(s) and *backflow* protection required. Water from each hazard shall be regarded as non-potable until an appropriate *backflow* protection is installed.

**3.4.3** Backflow protection shall be achieved by:

- a) An *air gap*, in accordance with Paragraph 3.5, or
- b) A *backflow prevention device* selected in accordance with Paragraphs 3.4.4 and 3.4.5.

**3.4.4** Backflow protection shall be appropriate to the *cross connection* hazard contained in Paragraph 3.3.

**3.4.5** The selection of the appropriate *backflow* protection for the *cross connection* hazard is given in Table 2.

**COMMENT:**

Table 2 includes *air gap* separation.

Type of backflow protection		CROSS CONNECTION HAZARD					
		HIGH		MEDIUM		LOW	
		back-pressure	back-siphonage	back-pressure	back-siphonage	back-pressure	back-siphonage
<i>Air gap</i> (see <b>Note 1</b> )		✓	✓	✓	✓	✓	✓
Reduced pressure zone device		✓	✓	✓	✓	✓	✓
Double check valve assembly (see <b>Note 2</b> )				✓	✓	✓	✓
Pressure type vacuum breaker (see <b>Note 3</b> )			✓		✓		✓
Atmospheric vacuum breaker (see <b>Note 4</b> )			✓		✓		✓

Note:

1. *Air gaps* must not be installed in a *toxic environment*.
2. Double check valves can be installed in a medium and low hazard *toxic environment*.
3. Pressure type vacuum breakers are designed to vent at 7 kPa or less. However, they require a significantly higher pressure to reset and must be installed only in systems which provide pressures sufficient to ensure full closing of the valve.
4. Hose outlet vacuum breakers are a specific type of atmospheric vacuum breaker.