Council Briefing Agenda

Date:	Thursday, 11 February, 2021
Time:	10:30 am
Location:	Council Chamber Forum North, Rust Avenue Whangarei
Elected Members:	Her Worship the Mayor Sheryl Mai (Chairperson) Cr Gavin Benney Cr Vince Cocurullo Cr Nicholas Connop Cr Ken Couper Cr Tricia Cutforth Cr Shelley Deeming Cr Jayne Golightly Cr Phil Halse Cr Greg Innes Cr Greg Martin Cr Anna Murphy Cr Carol Peters Cr Simon Reid

For any queries regarding this meeting please contact the Whangarei District Council on (09) 430-4200.

2.1. Backflow Prevention Policy and Code of Practice

Meeting:	Council Briefing
Date of meeting:	11th February 2021
Reporting officer:	Andrew Venmore

1 Purpose

To inform Council about the proposed updated Backflow Prevention Policy and Code of Practice.

2 Background

Whangarei District Council Water Quality Policy requires Water Services to maintain a multi barrier approach to water quality. One of the key barriers to contamination is backflow prevention. This backflow prevention policy outlines Whangarei District Council's (Council) commitment to the protection of the potable water.

The Health (Drinking Water) Amendment Act 2019 guides water suppliers in respect to the development of a backflow prevention policy to protect the water supply. Council will achieve this aim through effective and efficient enforcement of the Water Supply Bylaw, the Backflow Prevention Code of Practice and public education.

The current policy is due for review. The Water Service department has completed the review of the policy and the proposed amended draft policy is attached for Council's consideration. The current policy was still relevant; however, the following minor amendments have been made:

- Change/simplify language without changing the content
- Update legislations relevant to the area of backflow prevention
- Add a section about alternate supplies for clarity in Section 4 and Appendix A as follows:
    - "Alternate supplies such as rainwater tanks or springs are unlikely to comply with drinking water standards and may become contaminated"
    - "The hazards normally found at properties with private water supplies would be cross connections between public water supplies and:
        - 1 Rainwater tanks
        - 2 Spring sources
        - 3 Bores
        - 4 Rivers and Streams
        - 5 Small dams
- Transferal into new template

The policy's next review date is set for 2025.

3 Discussion

The new policy is a 'refresh' of the existing policy dated June 2015 with minor changes.

Having considered the Significance and Engagement Policy this proposal or decision is not considered significant and the public will be informed via agenda publication on the website or Council News.

The recommendation is therefore that Council approve and adopt the Backflow Prevention Policy and Code of Practice.

4 Attachments

1. Proposed Policy: Backflow Prevention Policy and Code of Practice (‘clean’ copy)
2. Proposed Policy: Backflow Prevention Policy and Code of Practice (with track changes)

Whangarei District Council

Backflow Prevention Policy and Code of Practice

Policy 0020

Drinking-water quality policy			
Group	Infrastructure	**Business owner**	Water
Date adopted	February 2021	**Adopted by**	Council
Review Cycle	5 years (statutory)	**Last Review date**	NA

Table of Content

Backflow Prevention Policy and Code of Practice			
Audience (Primary)	Internal	**Business Owner (Dept)**	Water
Policy Author		**Review date**	June 2015

Whangarei District Council Water Quality Policy requires Water Services to maintain a multi barrier approach to water quality. One of the key barriers to contamination is backflow prevention. This backflow prevention policy outlines Whangarei District Council's (Council) commitment to the protection of the potable water.

The Health (Drinking Water) Amendment Act 2019 guides water suppliers in respect to the development of a backflow prevention policy to protect the water supply. Council will achieve this aim through effective and efficient enforcement of the Water Supply Bylaw, the following Backflow Prevention Code of Practice and public education.

Policy Statement

To minimise the risk that the water supply once treated, becomes contaminated, Council requires that an appropriate level of backflow prevention is provided on all water connections. When implementing this requirement Council shall consider the following:

- All new connections require a type of backflow prevention at the point of supply between the customer and the water supplier
- The type of backflow prevention device being dependant on the risk to the water supply posed by the customer
- Generally domestic/ordinary use connections will have a non-testable dual check device and commercial/extraordinary use customers will require a testable backflow prevention device at the point of supply.
- Point of supply or boundary backflow prevention devices are vested to Council and will be maintained and replaced as required, with the option given to the customer to retain ownership.
- Testing of boundary backflow prevention devices will be done at least annually and after maintenance.
- A schedule of targeted rates for backflow prevention devices of different sizes will be included in the Annual and Long Term Plans. The appropriate charge will be added to the customer's water account.
- Existing extraordinary, use as defined by the bylaw (generally commercial and industrial connections), without adequate backflow prevention are to be upgraded at the customers cost. These will be prioritised according to potential risk and customers will be given the option to install the device or have Council install and pass on the cost.
- Existing ordinary use as defined by the bylaw (domestic) connections without backflow prevention will be upgraded when the meters are replaced.
- Periodic surveying of existing connections will be undertaken to determine any change of use requiring upgrading of backflow prevention.
- Enforcement where necessary will be as set out in the Water Supply Bylaw.

Code of Practice

1. Introduction

Backflow can happen unintentionally when pressures change resulting in a reversal in the flow of the water supply which can then cause contamination to flow back into the supply system as a result of back pressure or back siphonage. To prevent this from occurring Council requires a mechanical backflow prevention device on all connections at the point of supply.

This document seeks to provide a guideline to achieving the aims of the Water Supply Bylaw 2012 and Backflow Policy in practical sense that is clear for both Council staff and customers.

Both Water Services and Building Control staff manage backflow prevention, and this document is intended to bring together all Council requirements.

The enforcement and monitoring of backflow prevention is an essential Water Services activity for ensuring the protection of public health.

1.1. Definitions

Auxiliary Water Supply	means any water supply on or available to any premises other than a public water supply.
Backflow	is the undesirable flow of a liquid or a contaminant back into the potable public water supply. There are two types of backflow: Back pressure and back siphonage.
Backflow Prevention Device	means a device designed to prevent backflow due to back pressure or back siphonage. For the purposes of this code of practice this refers to devices installed at the property boundary or point of supply.
Back Pressure	occurs when the pressure in the downstream plumbing is higher than the supply pressure, thus 'pushing' the water or other substances back into the supply line.
Back Siphonage	occurs when a temporary drop in water pressure occurs and water is siphoned into the drinking water pipeline.
Containment	means the prevention of backflow into the public system by the installation of backflow prevention device on the property boundary
Cross Connection	means an actual or potential connection between the potable water supply and an auxiliary supply or pipe work containing a contaminant.
Customer	means owner or occupier of a property who is responsible for the water reticulation within that property.
IQP	Independent Qualified Person under the Building Act 2004. Suitably qualified to test backflow prevention devices, assess hazards and provide written documentation. Wherever this is referenced in the document it shall also be interpreted to mean IQP as per the Boundary Backflow Prevention for Drinking Water Supplies Code of Practice 2012.
LBP	Licensed Building Practitioner as per Section 298-301 of Building Act 2004.
Potable Water	is water that is suitable for human consumption and as defined by the Drinking water Standard of New Zealand 2005 (revised 2018).

2. Legislation

The following are some of the principle acts and Regulations that are relevant to the area of backflow prevention and cross connection control.

2.1. The Building Act 2004

The Building Act requires that buildings are safe and sanitary and the occupants are safeguarded from possible illness.

The Act requires an annually renewable Building Warrant of Fitness (for non-residential buildings) to ensure the specified systems stated in the compliance schedule are operating correctly. The compliance schedule includes any backflow preventers installed at the source of possible contamination.

The Building Act calls upon the Building Code in the Building Regulations 1992, specifically, Schedule 1, G12 Water Supplies regarding backflow prevention. The code requires that water supply systems be installed in a manner that avoids the likelihood of contamination within both the system and the water main. It also identifies the level of risk for certain hazards and introduces the requirement for IQPs to test backflow prevention devices. This is the minimum acceptable standard to comply with the Building Act. However, Council requires additional measures to ensure effective protection of the water supply.

All property owners must take all necessary measures on their side of the point of supply to prevent water which has been drawn from the public water supply or from any other source returning to that supply.

2.2. Health Act 1956

The Health Act requires that adequate water supplies are provided to communities. Any buildings being built, sold or let must have an adequate and convenient supply of wholesome water.

The Act also provides for council “To make bylaws under and for the purposes of this Act or any other Act authorising the making of bylaws for the protection of public health”, refer section 23.

The Act further states that it is an offence to pollute a public drinking water supply under Section 60 and can incur a fine.

2.3. Health (Drinking Water) Amendment Act 2007

These require that a backflow preventer be fitted in situations where a network supplier (Water Services) considers a need to protect the distribution system from risks of pollution caused by water and other substances on properties connected to the system.

The regulations require:

- Water Services to install a suitable backflow prevention device on the council side of the point of supply; and the owner of the property to reimburse council for the cost of the backflow prevention device including installation, testing and ongoing maintenance.
- or
- Water Services to allow the owner of the property to install a suitable backflow prevention device as close as practicable to the boundary of the property
- Water Services to require the owner to repair or modify any faulty backflow prevention device.

They also require Water Services to ensure the backflow prevention device is tested at least once a year. The costs for conducting the annual test shall be met by the property owner.

2.4. Council’s Water Supply Bylaw

This requires that the public water supply be protected where a cross-connection may contaminate the public water supply. The bylaw requires a backflow prevention device on all connections in most cases this is a non testable dual check on ordinary use (domestic supply) and a testable device on extraordinary use (industrial and commercial connections). The bylaw contains typical layouts of different connection types and fittings details with the location of the point of supply.

2.5. Health and Safety at Work Act 2015

This Act provides for prevention of harm to employees at work. It makes the employer responsible for providing and maintaining a safe working environment for employees. The employer must ensure that hazards are identified and eliminated or minimized.

2.6. Local Government Act 2002

Under the Local Government Act Council may make bylaws as it thinks fit for the purposes of “protecting, promoting, and maintain public health and safety”, Section 145.

This Act also states that it is an offence to pollute the water supply of a Local Authority and also gives Council the power to stop the water supply in response to an event that may become a danger to public health.

2.7. Other Legislation

Other Acts and Regulations which may impact on the requirements for backflow prevention include:

- Camping Ground Regulations 1985

- Civil Defence Emergency Management Act 2002
- Consumer Guarantees Act 1993
- Crimes Act 1961
- Education (Early Childhood Centre) Regulations 2008
- Employment Contracts Act 1991
- Food (Safety) Regulations 2002
- Food Act 2014
- Food Hygiene Regulations 1974
- Game Regulations 1975
- Local Government Rating Act 2002
- Old People's Homes Regulations 1987
- Public Works Act 1981
- Resource Management Act 1991
- Soil Conservation and Rivers Control Act 1941.

2.8. Relevant Standards and Guidelines

- Backflow Prevention for Drinking Water Suppliers Code of Practice 2012, published by NZ Water
- New Zealand Drinking Water Standards 2005 (revised 2018)
- Public Health Risk Management Plan Guide 'Distribution System – Backflow Prevention', version 1, Ref D2.4 published by Ministry of Health
- Public Health Grading of Community Drinking-Water Supplies and Guidelines
- Council's Environmental Engineering Standards
- AS/NZS 2845.1:2010 Water supply - Backflow prevention devices - materials, design and Performance requirements
- AS/NZS 3500.1:2018 Plumbing and drainage - Standards - Water Services
- New Zealand Industry Standard: Field testing of backflow prevention devices and verification of air gaps.

3. Council's General Requirements

As a result of the above legislation, Council requires the following backflow prevention devices installed:

a Source (point of risk) protection

For buildings covered by the Building Act an appropriate backflow prevention device must be installed as close as possible to the source of potential contamination. The type of device used shall be in accordance with the Building Code Approved Document G12.

b Zone protection

Generally only applicable within large industrial or commercial complexes and is usually required to separate workshop areas from offices and communal areas.

c Boundary (containment) protection

In addition to the internal backflow prevention and in accordance with the Health (Drinking Water) Amendment Act 2007 an appropriate backflow prevention device must be installed on Council service pipe as close as practicable to the point of supply. The device shall be rated according to the highest risk on the site.

Where the water connection is an extra ordinary use or a specific risk is identified the boundary protection device installed shall be fully testable with the minimum standard being a double check valve. Extra ordinary use as defined by the Water Supply Bylaw includes all commercial and industrial customers. For all other properties with ordinary use which is domestic use only a dual check valve device will suffice.

All costs associated with the installation, maintenance and testing of backflow preventers shall be met by the customer. However, Council may undertake these works and charge the customer in accordance with the Funding Policy and the Schedule of Fees and Charges.

3.1. Ownership of Boundary Backflow Devices

The point of supply is the location of change of ownership from Council to the property owner. The point of supply as defines by the Water Supply Bylaw 2012, being directly downstream of the water meter and/or backflow prevention device. Therefore, boundary backflow devices are in Council ownership. However, there is an option for the property owner to retain ownership if they wish by written agreement with Council.

3.2. Roles and Responsibilities

Various departments within Council as well as customers have responsibilities under the aforementioned acts and regulations. Council's requirements for backflow prevention and cross connection control fall into two distinct areas; Water Services requirements and the Building Compliance requirements.

3.2.1. Water Services Department

Water Services responsibilities are governed primarily by the Health (Drinking Water) Amendment Act. This gives Water Services a general responsibility for the safety of the public water supply system. The Act requires Water Services to ensure that containment devices are provided at the boundary of all properties with a potential risk of cross connection. This cross connection could be made either accidentally or deliberately and boundary protection is independent of any internal backflow prevention.

Water Services may need to inspect the property to determine the level of risk and re-assess the requirements upon being informed of a change of water use within the property. Water Services require that all costs associated with the installation, testing, maintenance and possible replacement or upgrading of boundary backflow prevention are borne by the property owner. This will also include provision of isolation valves and strainers.

Water Services are required to ensure that all boundary backflow preventers are tested annually. Water Services may undertake to do the testing and keep records of the test results. The cost of the testing may then be passed on to the property owners as a uniform annual charge on the water rates or invoiced separately.

3.2.2. Building Compliance Department

The Building Compliance Department is responsible for ensuring compliance with the Building Act and Building Code. Various Acts of Parliament are focused on protecting the building occupants and users from possible dangers, including cross connections and backflow. It is the customer's responsibility under these regulations to protect the occupants, and they must install and test backflow preventers where required under the Building Act.

Where a backflow has not been installed, has the wrong hazard rating or fails a test; the compliance department may issue a Notice to Fix under the Building Act 2004. Failure to comply with a Notice To Fix is an offence and has an infringement fee of $1,000 or if taken to prosecution a maximum fine of $200,000 and $20,000 for every day that the offence continues.

If the backflow preventer forms part of the compliance schedule for the building, the Building Warrant of Fitness cannot be renewed until the annual test has been done and Form 12A had been completed by a Council approved IQP.

3.2.3. Customer Responsibility

The customer (building owner or employer) is responsible for the protection of all employees and visitors to the site as well as protecting the public supply. It is the customer's responsibility to install and maintain all backflow prevention devices as may be required by the relevant Acts, Regulations and Bylaws. The customer and their approved building certifiers shall ensure that on initial construction all necessary backflow preventers are installed and added to the Building Compliances Schedule and Water Services database for boundary devices. The customer shall ensure that the backflow devices installed meet the current standards. Should the standards be amended then it shall be the customer's responsibility to fully comply with the new standards.

The customer shall arrange for the internal backflow devices to be tested in accordance with the relevant regulations and the Building Compliance Schedule. The customer shall keep all test reports for a minimum of two years. Also after any renovations requiring consent the customer shall ensure that cross connections are avoided or backflow preventers installed to conform to the Building Act and Health (Drinking Water) Amendment Act. The customer shall allow Council staff or appointed representatives access to the site by

prior arrangement for the purpose of checking for cross connections and compliance with this document. They shall also provide a person knowledgeable in the water layout of the property to assist with the inspection. The customer shall also be responsible for obtaining the necessary permits and consents prior to any plumbing alterations or changes of building or water use.

The customer shall be responsible for the payment of all fees and costs associated with permits, installation, maintenance, testing or removal of devices as may be required in this document.

Failure to meet the requirements of this document may result in the disconnection of the customer's water supply (see section 5).

4. Types of Hazards

Details of specific types of hazards are included in Appendices A and B; however there are many common installations which require backflow protection, regardless of the nature of the activities conducted on the premises. The hazard rating supplied in brackets is a general assessment and the specific hazard for an installation may differ when in doubt use to the hazard definitions in section 4.1 below.

These types of installations include:

Air conditioning units, heat exchangers and other water cooled equipment (Medium)
This equipment may be contaminated with algae or bacterial slime.
If potentially connected to the sewage system or treated with chemicals. **(High)**

Agricultural (Medium)
Stock water can be contaminated with bacterial slime
Supplies to cow sheds that could be contaminated with stock effluent or stock water with direct injection of chemicals **(High)**

Boilers (High)
Chemicals are often added and water made non potable.

Public toilets and urinals (Medium)
These are usually connected to the sewage system and often contain cleaning agents in the water stored for flushing.

Hose connections (Medium)
When hoses are connected they can easily become submerged in a contaminated non-potable liquid.
Common hazard areas are wash down areas and hose taps close to grease traps.

Swimming pools, spa pools and fish ponds (Medium)
May be contaminated with algae or bacterial slime or treated with chemicals. They are typically filled either by fixed piping or hose which may be left running below water level.

Irrigation and sprinkler systems (Medium)
Any below ground or pop up system would constitute a risk.
Chemicals added to the water or applied to the ground. **(High)**

Auxiliary sources (Medium)
Water pumped with a booster pump and held in a storage reservoir for use (i.e. on upper floors of multi-storied buildings) which could backflow into the potable system with a loss in pressure in the distribution main. The quality of auxiliary water supplies will typically not comply with relevant standards of potable for consumption.

Alternate Supply (Medium)

Alternate supplies such as rainwater tanks or springs are unlikely to comply with drinking water standards and may become contaminated.

Fire protection systems (Medium)
The water in these systems is often poor quality as no usage occurs for months on end.
If toxic chemicals are added to these systems. (High)

4.1. Levels of Risk

The levels of risk to public health identified relates to a hazard rating as defined in G12 of the Building Code are:

Hazard Rating	Description
High Hazard	Any condition, device or practice which, in connection with the potable water supply system, has the potential to cause death.
Medium Hazard	Any condition, device or practice which, in connection with the potable water supply system, has the potential to injure or endanger health.
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.

A full list of hazards and their classifications of table 1 from G12 is included in Appendix B.

Unless otherwise exempted, Water Services require that an appropriate and testable boundary protection device be provided as close as practicable to the boundary on Council's service pipe of any property containing either a high hazard or a medium hazard.

Exemptions may be granted at the discretion of Water Services where it is agreed that there is no significant potential for a cross connection to be made either accidentally or intentionally that could result in contamination of the public water supply. Examples of situations where exemption may be granted include:

- Situations where the point of supply is at an elevation 10.5 metres or more higher than the identified hazard. (For back siphonage hazards only).
- Spa pools, fish ponds or rainwater tanks of total volume less than 1000L.
- Interior spa pools where the method of filling is unlikely to result in cross connection.

Should a dispute arise over the level of risk, or the backflow prevention device required at the boundary, the Water Services Manager shall nominate the device. Where it is unclear as to the level of risk or for reasons the water usage is unknown a Reduced Pressure Zone backflow preventer shall be installed.

All other properties shall have dual check valves incorporated within the water meter installation.

5. Disconnection of Water Supply

Where a hazard or potential hazard to the water supply exists and is not remedied within a reasonable period of time (as specified by Water Services but not longer than 30 days from the date of notification) Water Services may disconnect the water supply to the customer. Other instances where a disconnection of the water supply would be considered include but are not limited to:

- Unprotected, direct or indirect connection between a contaminant and the public water supply
- Removal or bypassing of a boundary backflow preventer.

Disconnection of the water supply may be undertaken in accordance with the following legislation; The Local Government Act 2002 , the Council's Water Supply Bylaw 2012 and the current versions of the Water Services Act.

Water Service will make every effort to inform customers in advance of disconnection. However, in the event that a potentially serious hazard to the public water supply exists the connection to that property may be disconnected immediately. Reconnection of the supply shall not be undertaken until the appropriate action has been undertaken to the satisfaction of the Water Services Manager. The cost of the disconnection, and reconnection if applicable, shall be met by the consumer. Failure to provide sufficient backflow prevention inside a premises or building as required under the Building Act or other regulations shall be deemed an offence under those regulations. Any penalties or actions to be taken shall be in accordance with the relevant legislation and at the discretion of the Building Control Department and/or the Drinking Water Regulator.

5.1. Backflow Incidents

Notwithstanding any legal action that may result from a backflow incident the cost of rectifying contamination of the public water supply shall be the responsibility of those allowing the backflow to occur.

6. Types of Backflow Preventers

The types of backflow preventers are categorised in accordance with the level of risk, low, medium or high (See Appendix B). However, certain devices may not be suitable in all situations even if they have the correct hazard rating. For example an air gap would often be impractical as a boundary device. The types of devices depending on location are shown below:

Hazard	Boundary (Containment) Device	Source (Point of Risk) Device
Low Hazard	Dual check valve	Dual check valve Dual check valve with atmospheric port Hose connection vacuum breaker
Medium Hazard	Double check valve Double check detector	Double check valve Atmospheric vacuum breaker Pressure vacuum breaker Spill proof vacuum breaker
High Hazard	Reduced pressure zone Reduced pressure zone detector	Reduced pressure zone Registered air gap

A brief description of each device is in Appendix C.

6.1. Backflow Manufacture

All backflow prevention devices shall be manufactured in accordance with AS/NZS 2845.1 Water supply Backflow prevention devices Materials, design and performance requirements. For Boundary devices on the property boundary, only top entry backflow preventers complying with AS 2845.1 shall be used. See Water Services Approved Materials List for approved models.

It is important to ensure that the correct device is chosen for the potential hazard. It is also essential that the installer and tester are fully aware of the installation requirements and operating characteristic of all devices. If in doubt a higher level of protection should be used.

7. Installation of Backflow Preventers

7.1. Installation requirements

Before a boundary backflow preventer can be installed or removed consent must be obtained from Water Services. Water Services may request the owner to undertake a comprehensive survey of the site by a qualified IQP. Installation of a backflow prevention device may be required following any of the following events:

- Building Consent for construction of a new building or alteration of an existing building
- Public Utility Application
- Change of Use Application
- Property inspection by Council's backflow contractor

For new buildings with a new water connection the consent will come with the approval for the water connection in the form of an approved drawing stating the type of device required. When a change in the use of the building occurs a "Change of Use Application" must be made to Water Services who will inform the customer if any change to the boundary backflow prevention is required. Where the applicant is unsure of the final use of the water supply Water Services may allow a double check valve to be installed. However, should the water subsequently be used for high hazard activities the backflow preventer shall be upgraded at the customer's expense. For internal backflow preventers as required by the Building Act a building consent will also be required.

All source (point of risk) devices shall be installed as near as practicable to the potential source of contamination (appliance) while still in an easily accessible position for maintenance and testing.

All backflow preventers must be installed with isolating valves and a line strainer upstream. The only exception being on fire sprinkler lines when strainers shall not be used unless the make and model is approved by the Insurance Council. The isolating valves must be ball valves or resilient seated gate valves

for large (greater than 40mm) devices and shall be installed adjacent to the backflow preventer. All high hazard devices shall be installed above ground in a securely fenced / housed or caged area with a lockable access to protect from physical damage. The installation of high hazard devices shall be such that discharge from the relief valve can drain and does not cause damage.

No device shall be bypassed unless the bypass is also fitted with a device appropriate for the same hazard rating.

New source (point of risk) protection devices will be added to that buildings compliance schedule. All boundary (containment) protection devices will be added to Council's property database.

The installation of internal backflow prevention devices shall only be undertaken by a craftsman plumber or by a licensed plumber working under the direction of a craftsman plumber. For boundary devices Council only Licensed Contractors or contractors specifically approved by Water Services shall be allowed to install the backflow preventer.

All devices shall be installed in accordance with Council's Environmental Engineering Standards, this document, and the manufacturer's recommendations. The device shall be tested immediately following installation to prove compliance with all requirements. This shall be carried out by a registered IQP.

7.2. Installation Considerations

When installing a backflow prevention device the following criteria need to be considered:

- Level of risk
- Appropriate backflow prevention device for level of risk
- Location of backflow prevention device (at source or boundary)
- Appropriate backflow prevention device for type of water use downstream - consideration must be given to the head losses through the device and appropriate size of connection to meet anticipated flow rates
- Ease of access for testing, maintenance and replacement
- Manufacturer's recommendations
- Pressure loss across device
- Safety of testing for maintenance personnel
- Continuity of supply while testing. A bypass line may be required, also with a backflow preventer
- Installation above ground level or with adequate functioning drainage where no part of the device can become submerged
- Protection, from vandalism, traffic, hazardous environments
- Approved brand (a copy of the latest list of Approved Materials shall be obtained from Water Services)

8. Testing

It is a requirement under the Building Act 2004 that all internal backflow preventers are tested within the required time frame by an IQP. This will normally be part of the building's Compliance Schedule. An IQP is defined within the building act as being "a person who:

a Has no financial interest in the building, other than as a qualified person; and

b Is accepted by the territorial authority as being appropriately qualified to undertake the inspection and maintenance of the feature or system concerned."

Boundary devices that are not part of the building compliance schedule shall be tested annually by an IQP or as directed by the Water Services Manager. Water Services may undertake the testing of boundary devices and recover the cost from the consumer. Alternatively Water Services may allow the consumer to organise the test and forward the test certificate to Water Services.

8.1. IQP's Responsibilities

The IQP shall inform both the customer and Council if the level of protection offered by the backflow device is at any time found to be insufficient for the highest hazard on the property.

The IQP shall report any unsanitary plumbing practices and report any unprotected backflow risks to Council.

The individual who holds the IQP status shall inform Council if he leaves a company, and/or joins a new company and wishes to continue to operate as an IQP.

8.2. Qualifications

Council requires that all approved IQPs have a thorough knowledge of backflow prevention and cross connection control. They must be able to recognise potential backflow hazards as well as testing devices. An IQP must be able to advise property owners on backflow requirements and be familiar with all acts and regulations pertaining to backflow and cross connection issues. In addition, they shall have attended and passed an approved course of not less than 40 hours duration or obtained competency in unit standards US23847 and US23848.For qualified plumbers have obtained competency in unit standard US2117.

In order to keep up to date with changes in regulations, equipment and procedures, each IQP must also attend a recognised refresher course at least every three years.

8.3. Registration

Persons wishing to become registered as an IQP, as specified in the Building Regulations, for Section G – “Any automatic backflow preventer connected to a potable water supply” with the Whangarei District shall complete the relevant application form. They shall enclose with their application a copy of the qualification certification (or refresher certificate if applicable), medical certificate signed by their doctor (Water Services Hygiene Code, WSMQ1 form), their test kit serial number with a copy of current calibration verification along with the appropriate application fee. If the applicant has the correct qualifications and is deemed suitable Council will notify the applicant and include their name to the IQP register.

8.4. Re-Registration

Every year all IQPs shall re-register with Council in order to maintain their approved status. The IQP will be contacted by Council and asked to reapply before a certain date. The applicant shall apply in writing enclosing the appropriate fee, a copy of their test kit annual calibration report and their refresher course certification if due. If all details are in order then approved status will be granted for a further year.

8.5. Removal of IQP Status

If in the opinion of the Water Services Manager or Building Control Manager, an IQP has not undertaken their obligations to a satisfactory level then Council may immediately withdraw their IQP status. Reasons approved status might be withdrawn are:

- Failure to adequately test backflow preventers
- Failure to comply with this policy
- Failure to comply with the relevant acts and regulations
- Breaches of OSH regulations
- Poor, unsafe or unhygienic work practices.

For minor offences Council may first issue a written warning, but reserves the right to immediately remove IQP status for serious breaches. Council may ask an IQP to re-sit the 40 hour course before reapplication for approved status. However, Council shall be under no obligation to reinstate any IQP who has been removed from the register.

8.6. Company IQP Status

Only individuals are eligible for IQP status. Companies with IQP on their staff may advertise as such but the status is attached to the individual only. Council will keep a record of companies who have IQP on their staff and the companies will be listed in Council’s IQP register. Should the individual leave the company the company will immediately be removed from the register. Only IQP employed or contracted by the company shall be allowed to test backflow preventers and sign report forms.

8.7. Insurance

All IQPs must hold current public liability and/or professional indemnity insurance suitable for the type of areas in which they will be working.

8.8. Hygiene Requirements

Every IQP shall be familiar with the requirements of the Water Services Hygiene Code of Practice for persons working on potable water mains. IQPs shall obtain a blue card by getting medical clearance from their doctor in accordance with the requirements of the hygiene code. The blue card (medical clearance) shall be kept up to date. Failure to do so may result in the removal of IQP status.

8.9. Test Procedures

Testing procedures for backflow preventers shall be in accordance with the New Zealand Industry Standard: Field testing of backflow prevention devices and verification of air gaps and/or the American EPA Cross Connection Control Manual. In addition, visual checks will also be required for registered break pressure tanks and atmospheric vacuum breakers. Testing shall be done at the following times:

- Immediately after installation
- Annually
- On completion of any maintenance work
- After a backflow or suspected backflow incident
- At the request of the Drinking Water Regulator, Building Control Officer, Dangerous Goods Inspector or Water Services Manager.

The test procedures shall be as per the New Zealand Industry Standard. The test forms for backflow prevention devices shall be as shown in Appendix M of that document or Appendix E of this document.

Note For boundary backflow prevention devices the registration number of the device and the meter number to which it is attached must be included.

Prior to the annual test of a backflow preventer the line strainer must first be cleaned.

8.9.1. Test Equipment

The test equipment used shall be the correct type for the device being tested. The equipment shall be a recognised make and model and not a “homemade” device. The test kit shall have a maximum working pressure of a least 1200kPa, and shall have colour coded hoses for ease of use. It is recommended that each hose should contain an in-line filter which should be cleaned out regularly.

Calibration tests shall be done annually by an International Accreditation New Zealand (IANZ) registered testing laboratory, or Water Services approved laboratory. The calibration frequency should be those set out in The New Zealand Industry Standard: Field testing of backflow prevention devices and verification of air gaps. Current calibration test certificates must be forward at the time of re-registration.

8.9.2. Test Tags (for Boundary Devices only)

The “test completed” tag shall be attached to the boundary backflow device on completion of a successful test. The tags shall be durable with a 5 year date grid. The IQP shall drill a hole in the date grid corresponding to the date of the successful test. The tag shall be securely fastened to the backflow, clearly visible and legible. Test tags shall only be obtained through the Whangarei District Council.

8.9.3. Backflow Registration Numbers (for Boundary Devices only)

Each boundary backflow shall have a unique registration number. This registration number shall be stamped on the front of the test tag. The test tags with the number must be obtained from Water Services prior to the installation test for a new backflow.

If a device requires a new tag (i.e. if testing date on tag has expired), then a new tag shall be securely fastened to the backflow. Both the old and the new registration numbers must be written on the report forms, and all other correspondence to Water Services regarding individual backflow prevention devices.

8.9.4. Test Certificate

The backflow prevention test form is to be completed for every test (as per Appendix E), and returned to Whangarei District Council within five (5) working days. The form shall have the following information:

- Type of test (initial, annual etc.)
- Owner details (name, address)
- IQP details (name, IQP number)
- Device details (location, make, model, size, serial number)

- Unique backflow registration number (if tag requires replacement then both old and new number shall be recorded)
- Associated water meter number (for boundary devices only)
- Type of hazard (for internal backflow preventers only)
- Strainer cleaning
- Test results
- Maintenance work undertaken
- Pass / Fail result
- Test kit information (make, serial number, calibration date)
- Additional information if required
- IQP signature and date of test

9. Surveying

The surveying of properties for cross connections and potential backflow problems shall be undertaken by persons experienced in this field. They shall have attended a recognised backflow survey course of not less than 3 days duration. The surveyor shall have a survey accreditation ID card that shall be carried at all times when undertaking surveys. The surveyor shall have the necessary public liability and professional indemnity insurances as required by Council.

Two types of survey may be undertaken:

- A highest hazard survey only determines the highest hazard on a property and is used to determine the level of boundary backflow prevention required.
- A full survey should determine all risks and possible cross connections which may prove hazardous to the occupants.

On completion of a survey, a report should be submitted to the relevant Council department and a copy should be kept by the surveyor. Further descriptions of survey requirements are at Appendix F.

10. Acknowledgements

Much of the information for this policy came from the following sources:

- Water New Zealand, Backflow Prevention Code of Practice for Water Supplier
- Department of Housing, New Zealand Building Code Acceptable Solutions G12/AS1
- The Master Plumbers, Gasfitters and Drainlayers NZ and Water New Zealand, New Zealand Industry Standard: Field testing of backflow prevention devices and verification of air gaps
- USEPA Cross-Connection Control Manual
- Unitec Backflow Survey Course Notes

Appendix A Specific Hazards: Examples of Facilities and Hazard Ratings

This Appendix gives examples and guidance for the overall hazard when determining the boundary backflow required in the types of premises described. The hazard rating supplied in brackets is a general assessment and the overall hazard for the specific site may differ when in doubt use to the hazard definitions in section 4.1.

Sewage Plants, Pump Stations and Water Reduction Facilities (High)

The hazards normally found in plants of this type include cross connections between the public water supply and:

1 Sewage pumps for priming, cleaning, flushing or unclogging purposes.

2 Water operated sewage sump ejectors.

3 Chlorinators using potable water when disinfecting wastewater.

4 Sewer lines for purpose of disposing of filter or softener backwash water or water from cooling systems.

Plating and Chemical Companies (High)

The hazards normally found in plants of this type include cross connections between the public water supply and:

1 Plating facilities involving the use of highly toxic cyanides, heavy metals in solution, acids and caustic solutions.

2 Plating solution filtering equipment with pumps and circulating lines.

3 Tanks, vats or other vessels used in painting, de-scaling, anodizing, cleaning, stripping, oxidizing, etc for the preparation or finishing of productions.

4 Steam generating facilities and lines which may be contaminated with boiler compounds.

5 Water cooled equipment which may be sewer connected such as compressors, heat exchangers, and air conditioning equipment.

Hospitals (High)

The hazards normally found in facilities of this type include cross connections between the public supply and:

1 Contaminated or sewer connected equipment such as bedpans, washers, flush valve toilets and urinals, autoclaves, specimen tanks, sterilizers, aspirators, autopsy and mortuary equipment laboratories.

2 Sewer lines for the purpose of disposing of filter or softener backwash water.

3 Water cooled equipment such as compressors, heat exchangers, air conditioning equipment, etc.

4 High pressured coil system.

5 Cooling towers which may be heavily contaminated with bird droppings, vermin, algae, etc., or with toxic water treatment compounds.

6 Steam generating facilities and lines.

7 Kitchen and food processing equipment including dishwashers, icemakers, carbonated beverage machines.

8 Haemodialysis units.

9 Auxiliary emergency water supplies.

Convalescent and Nursing Homes (High)

The hazards normally found in facilities of this type include cross connections between the public water supply and:

1 Contaminated or sewer connected equipment such as bedpan washers, flush valve toilets, urinals and whirlpool baths.

2 Kitchen and food processing equipment including dishwashers, ice-makers, carbonated beverage machines.

3 Auxiliary emergency water supplies.

Funeral Homes and Mortuaries (High)

The hazards normally found in this type of facility include cross connection between the public water supply and:

1 Prep room equipment such as hose connections and aspirators.

2 Boilers with chemicals added.

Schools and Universities (High)

The hazards normally to be found in a facility of this type include cross connections between the public water system and:

1 Contaminated and/or sewer connected facilities such as inadequately protected flush valve toilets, urinals, aspirators, retorts, pipette tube washers, etc.

2 Laboratory equipment which may be chemically or bacteriologically contaminated.

3 Steam sterilizers, autoclaves, specimen tanks, autopsy and morgue equipment.

4 Sewer connected plumbing fixtures such as flush valve toilets and urinals.

5 Steam generating facilities and lines, which may be contaminated with boiler compounds.

6 Water cooled equipment which may be sewer connected such as compressors, heat exchangers, air conditioning equipment, etc.

7 High pressured coil systems.

8 Irrigation systems which may be equipped with pumps, injectors, or other facilities for injecting chemicals or subject to contamination from submerged inlets, auxiliary water supplies, or polluted or contaminated waters.

9 Tanks, automatic film processing machines or facilities.

10 Auxiliary water supplies.

11 Lab sinks and other hose connections.

Medical Laboratories (High)

The hazards normally found in this type of facility are cross connections between the public water supply and:

1 Lab sinks and hose connections.

2 Pipette washers, sterilizers, autoclaves, etc.

3 Sewer lines for the purpose of disposing of samples.

4 Filter equipment, deionizers, membrane filters and distillers.

Car Wash Facilities (High)

The hazard normally found with this type of facility would be a cross connection between the public water supply and:

1 The scrubber and rinser plumbing, which would enable a re-circulating pump to force recycled water back into the public water supply.

Veterinary Hospitals, Grooming Establishments (High)

The hazards normally found in this type of facility would be a cross connection between the public water supply and:

1 Bath tubs where animals are washed with chemicals for treatment of fleas, skin disorders, etc.

2 Hoses used to wash wastes from pens and run areas.

3 Medical equipment such as x-ray development.

Marinas, Yacht Clubs and Docks (High)

The hazards normally found in water front facilities include cross connection between the public water supply and:

1 Outlets available for supplying water to docks using common garden hoses.

2 Large supply lines used to supply drinking water for larger seagoing vessels.

3 Kitchen/restaurant facilities such as dishwashers, ice machines, carbonated beverage machines.

4 Gas tanks which hydraulically raise gas levels.

5 Cooling towers.

6 Fire protection systems.

7 High pressure washing systems.

8 Motor testing tank with bottom feeds.

Swimming Pools (Medium)

The hazards normally found at swimming pools are cross connections between public water supply and:

1 Below rim inlets.

2 Hoses left running and dropped into the pools.

3 Direct connections at the chlorination equipment.

4 Steam generating facilities and lines which may be contaminated with boiler compounds.

Greenhouses (Medium)

The hazards normally found at greenhouses are cross connections between the public water supply and:

1 Irrigation systems.

2 Hoses left running on the floor or in planters where there is a possibility of back siphonage.

However **(High)** if facility includes

3 Chemical injectors.

4 Steam generating facilities which may be contaminated with boiler compounds.

Farms and Agricultural Facilities (Medium)

The hazards normally found with farms and agricultural facilities are a cross connection between the public water supply and:

1 Stock troughs

2 Chillers

3 Dams and other auxiliary supplies

However **(High)** if facility includes

4 Cowsheds and slurry pits

5 Irrigation systems with chemigation/fertigation.

Tank Trucks and Sprayers (High)

The hazards normally found with tank trucks and sprayers are a cross connection between the public water supply and:

1 A fill pipe which becomes submerged in the tank during filling.

2 Hydroseeders, sweepers, sewer vacuums, sewer rodders or lawn maintenance equipment which may be subject to back siphonage during use.

Automobile Repair and Related Industries (High)

The hazards normally found with these types of facilities are cross connections between the public water supply and:

1 Submerged inlets into testing tanks where chemicals are present.

2 Rinse hoses lying on the floor stuck into tanks.

3 Steam generating lines which may be contaminated with boiler compounds.

Laundries, Dry Cleaners and Dye Works (High)

The hazards normally found in this type of facility are a cross connection between the public water and:

1 Laundry machines having under rim inlets.

2 Steam generating facilities which may be contaminated with boiler compounds.

3 Water storage tanks equipped with re-circulating pumps

4 Dye vats using chemicals.

5 High pressure coil heat exchangers.

6 Sewer connected compressors.

7 Dry cleaning equipment with solvents and heat exchangers.

Solar Heating Systems (Medium)

The hazards normally found with solar heating and/or cooling systems include cross connections between the public water supply and:

1 Single wall heat exchangers between the consumer's water and non-potable water.

2 Negative pressure zones created by circulation pumps.

However **(High)** if facility includes

3 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 (Medium)

The hazards normally found in this type of facility would be cross connections between the public water supply and:

1 Steam connected facilities such as pressure cookers, autoclaves, retorts etc.

2 Equipment used for washing, cooking, cleaning, blanching, flushing, or fluming or for transmission of foods.

However **(High)** if facility includes

3 Fertilizers or wastes.

4 Can and bottle washing machines and lines where caustics, acids, detergents and other compounds are used in cleaning, sterilising etc.

5 Cooling towers and circulating systems which may be contaminated with bird droppings, vermin, algae, bacterial slimes or with toxic water treatment compounds.

6 Steam generating facilities and lines which may be contaminated with boiler compounds.

Beauty Salons - Barber Shops - Beauty Schools (Medium)

The hazards normally found in these facilities are cross connections between the public water supply and:

1 Hair wash sinks that have hoses for rinsing hair during washing, dying or other chemical treatments.

Doctors' and Dentists' Offices (High)

The hazards normally found in these facilities are cross connections between the public water supply and:

1 Autoclaves.

2 Specimen tanks.

3 Sterilisers.

4 Aspirators.

5 Laboratory sinks.

6 Dental suction hoses.

7 X-ray equipment.

8 Air compressor lines.

9 Water cooled equipment such as air conditioning equipment which may be connected to sewers.

Restaurants and Cafes (Medium)

The hazards normally found in these types of facilities would be cross connections between public water supplies and:

1 Dishwashing sinks particularly with detergent injectors.

2 Deep sinks with aspirators with soap, detergents etc.

3 Cleaner's sinks.

4 Toilets and urinals.

5 Air conditioning units piped directly to sewers.

6 Steam generating facilities which may be contaminated with boiler compounds.

7 Water cooled equipment such as air conditioners, which may be connected to the sewers.

8 Garbage can washers.

9 Garbage disposal units.

10 Soda equipment, espresso boilers with salt filters.

11 Lawn sprinklers.

Alternate Water Supplies

The hazards normally found at properties with private water supplies would be cross connections between public water supplies and:

1 Rainwater tanks

2 Spring sources

3 Bores

4 Rivers and Streams

5 Small dams

Appendix B Hazard Levels: New Zealand Building Code G12/AS1

Below the type of hazard is taken from G12/AS1 of the Building Code and gives a good indication of the devices required for particular situations.

Note The final decision as to which device is required shall be made by the Water Services Manager.

Type of Hazard	Acceptable Devices
High may include but not necessarily be limited to: a Autoclaves and sterilizers 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	• Registered air gap • Reduced pressure backflow prevention device
Medium 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 carbonates	• Registered air gap • Reduced pressure backflow prevention device • Double check valve

m Swimming pools, spas and fountains	
Low may include but not necessarily be limited to: a Drink dispensers (except carbonators)	As above plus • Hose connection vacuum break • Dual check valve

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

Appendix C Backflow Prevention Devices

Hose Connection Vacuum Breakers

This device can be attached to the outlet of any standard hose bib tap and prevents back siphonage only. It will not work under back pressure or continuous pressure conditions. A similar device is also available for laboratory outlets.

Dual Check Valves

These are in line non testable devices which are suitable for continuous pressure applications in low hazard applications.

Dual Check Valves with Atmospheric Port

As above, but with an atmospheric vent. This allows water to discharge to atmosphere if the second check valve does not close correctly.

Double Check Valve

These are fully testable and can be used for back siphonage and back pressure conditions. They may only be used to protect against a contaminant that could at worst cause illness, hence they are classified as medium hazard devices.

Double Check Detector Assembly

This is specifically designed for fire sprinkler lines where backflow prevention is combined with the need to detect unauthorised water usage or leakage. It incorporates a large and a small double check valve in parallel with a meter on the smaller line. It provides the same level of protection as a double check valve however it will detect small flows. Large flows, such as in the event of a fire, will go through the large line and hence not be recorded. This assembly has carefully matched components and cannot be field assembled from stock double check valves.

Atmospheric Vacuum Breaker

These devices are used to protect against back siphonage of a pollutant only. They should not be subject to back pressure and are therefore only to be used on open ended pipeline such as irrigation systems or garden hoses with no downstream valves. They are not suitable as boundary devices and should be installed a minimum of 150mm above all downstream piping. They may also only be used for a maximum of 12 hours out of any 24 hour period as long usage may cause the seat to stick. Whilst atmospheric vacuum breakers cannot be tested, they can be opened and checked to ensure they are working correctly. This should be done on an annual basis.

Pressure Vacuum Breaker

These devices are similar to the atmospheric vacuum breaker and are only suitable for back siphonage conditions. They can however be used under constant pressure conditions and can be tested in line. They must be installed at least 300mm above all downstream outlets.

Spill Proof Vacuum Breakers

Similar to the pressure vacuum breaker but can be installed in areas where spillage of water from the device is not wanted. They are testable and only suitable for protection against back siphonage. They must be installed in accordance with the manufacturer’s recommendations and are not suitable as boundary devices.

Reduced Pressure Zone

These devices are acceptable for contaminants that can cause illness or death as they are rated for high hazards. They will protect against both back pressure and back siphonage and are fully testable. They must be installed above ground in a free draining area.

Reduced Pressure Zone Detector Assembly

This is specifically designed for fire sprinkler lines which use chemical additives and where backflow prevention is combined with the need to detect unauthorised water usage or leakage. It incorporates a large and a small reduced pressure zone backflow preventer in parallel with a meter on the smaller line. It provides the same level of protection as a reduced pressure zone device, however it will detect small flows. Large flows, such as in the event of a fire, will go through the large line and hence not be recorded. This

assembly has carefully matched components and cannot be field assembled from stock reduced pressure zone valves. This device must be assembled above ground in a free draining area.

Registered Air Gap or Break Tank

Air gaps are non mechanical devices which when installed correctly offer high hazard protection against both back siphonage and back pressure. The air gap should be at least two times the diameter of the inlet pipe and not less than 25mm. Air gaps are usually used at the end of a service for a reservoir or storage tank. The resultant loss of pressure may mean that a booster pump is required. At an air gap, the potable water is in contact with the surrounding air, so it must not be installed in a toxic environment. Air gaps should be registered and inspected annually to ensure that they have not been bypassed and the overflow capacity is sufficient.

Appendix D Backflow Testing Procedure

Fully Testable Devices

The following procedure shall be followed when testing backflow prevention devices using a recognised test kit:

- Determine appropriate date and time with property owner
- Confirm model and size of backflow preventers to be tested and ensure correct test kit (calibrated) is available
- Check with building occupants prior to shutting of water to building, area or equipment

  Note If testing fire line or sprinkler backflow preventer, the Fire Service or monitoring company will also need to be notified
- Check installation is correct, including correct level of protection, and all test ports accessible. If not owner should be notified and test delayed until problem fixed
- Check no health and safety risks at test site. See Appendix A of the New Zealand Industry Standard: Field testing of backflow prevention devices and verification of air gaps
- Prior to testing the line strainer must be cleaned
- Undertake test in accordance with correct procedure (New Zealand Industry Standard: Field testing of backflow prevention devices and verification of air gaps; or USEPA Manual)
- Complete test certificate form Appendix E or appropriate form from New Zealand Industry Standard: Field testing of backflow prevention devices and verification of air gaps
- Should the device fail, the owner's permission must be sought before undertaking any maintenance work
- Mark test complete tag, or attach new tag to backflow device and mark
- Report to building occupiers when test is complete and water restored
- Submit test report forms to correct authority.

  Boundary Devices – Water Services

  Internal Devices – Building Control Authority
- The tester should give a copy to the Council and keep a copy of the report form themselves for a period of not less than two years.

Atmospheric Vacuum Breakers

The procedure for atmospheric vacuum breakers is similar to that for fully testable devices. The only difference is the test itself. As there are no test ports the device has to be dismantled to visually inspect the disk seating for sticking or damage. The test procedure is Appendix K of New Zealand Industry Standard: Field testing of backflow prevention devices and verification of air gaps with a report form in appendix M that can be used.

Registered Air Gaps

A registered air gap or break tank requires no physical testing as such. However they do require examination at intervals the same as fully testable devices. The test procedure is obtained by following the checklist and verifying the air gap as detailed in Appendix C of New Zealand Industry Standard: Field testing of backflow prevention devices with a report form in appendix M that can be used.

Appendix E WDC Backflow Prevention Device Test Certificate Form

A Copy of the test form is overleaf.

Private Bag 9023 | Whangarei 0148 | New Zealand
T: 09 430 4200 | 0800 WDC INFO | 0800 932 463 | F: 09 438 7632
W: www.wdc.govt.nz | E: mailroom@wdc.govt.nz

Inspection and Maintenance Form for Backflow Prevention Devices

❒ Initial test ❒ Retest ❒ Annual test ❒ Other

Owner/Occupier _____

Address _____

_____

IQP Name _____ WDC IQP No _____

Device Details

❒ Containment backflow ❒ Internal backflow

Backflow Registration No _____ Hazard _____

Associated Meter No _____ ❒ High risk ❒ Medium risk

Device location _____

Make _____ Model _____

Size _____ Serial No _____

❒ Strainer cleaned

	Reduced Pressure Zone Devices			Pressure Vacuum Breaker	
	Double Check Devices		Relief valve	Air inlet	Check valve
	First check	Second check			
Initial test	❒ DC closed tight RP kpa ❒ Leaked	❒ Closed tight ❒ Leaked	Opened at kpa	Opened at kpa ❒ Did not open	kpa ❒ Leaked
Maintenance undertaken, parts & materials used					
Test after maintenance	❒ Closed tight RP kpa	❒ Closed tight	Opened at: kpa	Opened at kpa	kpa

❒ Pass ❒Fail

Test kit make _____ Serial No _____

Date test kit last verified _____

Remarks *(correct hazard rating, suitable location, recommended course of action, etc)*

_____

_____

_____

_____

IQP Signature _____ Date of test

Appendix F Requirements for Backflow Surveys

The procedures to be followed when conducting a full backflow survey are as follows:

- A letter of intent should be sent to the water customer at least one week prior to the inspection
- Whenever possible the customer or their agent should accompany the surveyor on the inspection. A copy of the drawings of the water layout should also be requested
- The surveyor must carry ID and wear the correct safety gear for the property
- The survey should start at the property boundary and continue to the last free flowing outlet
- The report should be collated during the survey. Notes and sketches (if possible photographs) should be made of all areas requiring backflow protection
- Any existing or potential cross connections should be noted on the report
- Recommendations for corrective actions should also be documented and discussed with the owner
- The report should be signed by the inspector and countersigned by the owner who also keeps a copy
- A follow up inspection date should also be in the report
- If the surveyor discovers a situation where contaminants are in the process of or suspected of entering the distribution system they shall inform the utility immediately

The highest hazard survey should include as many of the above items as are required to determine the hazard rating of the property.

Whangarei District Council

Backflow Prevention Policy and Code of Practice

Policy 0020

Drinking-water quality policy			
Group	Infrastructure	**Business owner**	Water
Date adopted	February 2021	**Adopted by**	Council
Review Cycle	5 years (statutory)	**Last Review date**	NA

Table of Content

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Backflow Prevention Policy and Code of Practice			
Audience (Primary)	Internal	**Business Owner (Dept)**	Water
Policy Author		**Review date**	June 2015

Whangarei District Council Water Quality Policy requires Water Services to maintain a multi barrier ~~aproach~~approach to water quality. One of the key barriers to contamination is backflow prevention. ~~A Council community outcome as stated in the 2012 Long Term Plan is "vibrant and healthy communities" a fundamental to healthy communities and one of the ways in which Council contributes to this outcome is the provision of clean, potable water.~~ This backflow prevention policy outlines Whangarei District Council's (Council) commitment to the protection of the potable water.

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The Health (Drinking Water) Amendment Act 2019 guides water suppliers in respect to the development of a backflow prevention policy to protect the water supply. Council will achieve this aim through effective and efficient enforcement of the Water Supply Bylaw, the following Backflow Prevention Code of Practice and public education.

Policy Statement

To minimise the risk that the water supply once treated, becomes contaminated, Council requires that an appropriate level of backflow prevention is provided on all water connections. When implementing this requirement Council shall consider the following:

- All new connections require a type of backflow prevention at the point of supply between the customer and the water supplier
- The type of backflow prevention device being dependant on the risk to the water supply posed by the customer
- Generally domestic/ordinary use connections will have a non-testable dual check device and commercial/extraordinary use customers will require a testable backflow prevention device at the point of supply.
- Point of supply or boundary backflow prevention devices are vested to Council and will be maintained and replaced as required, with the option given to the customer to retain ownership.
- Testing of~~able~~ boundary backflow prevention devices will be done ~~so~~ at least annually and after maintenance.
- A schedule of targeted rates for backflow prevention devices of different sizes will be included in the Annual and Long Term Plans. The appropriate charge will be added to the customer's water account.
- Existing extraordinary, use as defined by the bylaw (generally commercial and industrial connections), without adequate backflow prevention are to be upgraded at the customers cost. These will be prioritised according to potential risk and customers will be given the option to install the device or have Council install and pass on the cost.
- Existing ordinary use as defined by the bylaw (domestic) connections without backflow prevention will be upgraded when the meters are replaced.
- Periodic surveying of existing connections will be undertaken to determine any change of use requiring upgrading of backflow prevention.
- Enforcement where necessary will be as set out in the Water Supply Bylaw.

Code of Practice

1. Introduction

Backflow can happen unintentionally when pressures change resulting in a reversal in the flow of the water supply which can then cause~~s~~ contamination to flow back into the supply system as a result of back pressure or back siphonage. To prevent this from occurring Council requires a mechanical backflow prevention device on all connections at the point of supply.

This document seeks to provide a guideline to achieving the aims of the Water Supply Bylaw 2012 and Backflow Policy in practical sense that is clear for both Council staff and customers.

Both Water Services and Building Control staff manage ~~the~~ backflow prevention ~~issue~~, and this document is intended to bring together all Council requirements.

The enforcement and monitoring of backflow prevention is an essential Water Services activity ~~for Water Services~~ for ensuring the protection of public health.

1.1. Definitions

Auxiliary Water Supply	means any water supply on or available to any premises other than a public water supply.
Backflow	is the undesirable flow of a liquid or a contaminant back into the potable public water supply. There are two types of backflow: Back pressure and back siphonage.
Backflow Prevention Device	means a device designed to prevent backflow due to back pressure or back siphonage. For the purposes of this code of practice this refers to devices installed at the property boundary or point of supply.
Back Pressure	occurs when the pressure in the downstream plumbing is higher than the supply pressure, thus 'pushing' the water or other substances back into the supply line.
Back Siphonage	occurs when a temporary drop in water pressure occurs and water is siphoned into the drinking water pipeline.
Containment	means the prevention of backflow into the public system by the installation of backflow prevention device on the property boundary
Cross Connection	means an actual or potential connection between the potable water supply and an auxiliary supply or pipe work containing a contaminant.
Customer	means owner or occupier of a property who is responsible for the water reticulation within that property.
IQP	Independent Qualified Person under the Building Act 2004. Suitably qualified to test backflow prevention devices, assess hazards and provide written documentation. Wherever this is referenced in the document it shall also be interpreted to mean IQP as per the Boundary Backflow Prevention for Drinking Water Supplies Code of Practice 2012.~~Backflow Prevention for Water Supplies Code of Practice 2012.~~
LBP	

Licensed Building Practitioner as per Section 298-301 of Building Act 2004.

Potable Water — is water that is suitable for human consumption and as defined by the Drinking water Standard of New Zealand 2005 (revised 2018).

2. Legislation

The following are some of the principle acts and Regulations that are relevant to the area of backflow prevention and cross connection control.

2.1. The Building Act 2004

The Building Act requires that buildings are safe and sanitary and the occupants are safeguarded from possible illness.

The Act requires an annually renewable Building Warrant of Fitness (for non-residential buildings) to ensure the specified systems stated in the compliance schedule are operating correctly. The compliance schedule includes any backflow preventers installed at the source of possible contamination.

The Building Act calls upon the Building Code in the Building Regulations 1992, specifically, Schedule 1, G12 Water Supplies regarding backflow prevention. The code requires that water supply systems be installed in a manner that avoids the likelihood of contamination within both the system and the water main. It also identifies the level of risk for certain hazards and introduces the requirement for IQPs to test backflow prevention devices. This is the minimum acceptable standard to comply with the Building Act. However, Council requires additional measures to ensure effective protection of the water supply.

All property owners must take all necessary measures on their side of the point of supply to prevent water which has been drawn from the public water supply or from any other source returning to that supply.

2.2. Health Act 1956

The Health Act requires that adequate water supplies are provided to communities. Any buildings being built, sold or let must have an adequate and convenient supply of wholesome water.

The Act also provides for council “To make bylaws under and for the purposes of this Act or any other Act authorising the making of bylaws for the protection of public health”, refer section 23.

The Act further states that it is an offence to pollute a public drinking water supply under Section 60 and can incur a fine.

2.3. Health (Drinking Water) Amendment Act 2007

These require that a backflow preventer be fitted in situations where a network supplier (Water Services) considers a need to protect the distribution system from risks of pollution caused by water and other substances on properties connected to the system.

The regulations require:

- Water Services to install a suitable backflow prevention device on the council side of the point of supply; and the owner of the property to reimburse council for the cost of the backflow prevention device including installation, testing and ongoing maintenance.
- or
- Water Services to allow the owner of the property to install a suitable backflow prevention device as close as practicable to the boundary of the property
- Water Services to require the owner to repair or modify any faulty backflow prevention device.

They also require Water Services to ensure the backflow prevention device is tested at least once a year. The costs for conducting the annual test shall be met by the property owner.

2.4. Council’s Water Supply Bylaw

This requires that the public water supply be protected where a cross-connection may contaminate the public water supply. The bylaw requires a backflow prevention device on all connections in most cases this is a non testable dual check on ordinary use (domestic supply) and a testable device on extraordinary use (industrial and commercial connections). The bylaw contains typical layouts of different connection types and fittings details with the location of the point of supply.

2.5. Health and Safety ~~in Employment Act 1992~~at Work Act 2015

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This Act provides for prevention of harm to employees at work. It makes the employer responsible for providing and maintaining a safe working environment for employees. The employer must ensure that hazards are identified and eliminated or minimized.

2.6. Local Government Act 2002

Under the Local Government Act Council may make bylaws as it thinks fit for the purposes of "protecting, promoting, and maintain public health and safety", Section 145.

This Act also states that it is an offence to pollute the water supply of a Local Authority and also gives Council the power to stop the water supply in response to an event that may become a danger to public health.

2.7. Other Legislation

Other Acts and Regulations which may impact on the requirements for backflow prevention include:

- Camping Ground Regulations 1985
- Civil Defence Emergency Management Act 2002
- Consumer Guarantees Act 1993
- Crimes Act 1961
- Education (Early Childhood Centre) Regulations ~~1998~~2008
- Employment Contracts Act 1991
- Food (Safety) Regulations 2002
- Food Act 2014~~1981~~
- Food Hygiene Regulations 1974
- Game Regulations 1975
- Local Government Rating Act 2002
- Old People's Homes Regulations 1987
- Public Works Act 1981
- Resource Management Act 1991
- Soil Conservation and Rivers Control Act 1941.

2.8. Relevant Standards and Guidelines

- Backflow Prevention for Drinking Water Suppliers Code of Practice 2012, published by NZ Water
- New Zealand Drinking Water Standards 2005 (revised 201~~0~~8)
- Public Health Risk Management Plan Guide 'Distribution System – Backflow Prevention', version 1, Ref D2.4 published by Ministry of Health
- Public Health Grading of Community Drinking-Water Supplies and Guidelines
- Council's Environmental Engineering Standards
- AS/NZS 2845.1:2010 ~~AS/NZS 2845.1:1998~~ Water supply - Backflow prevention devices - materials, design and Performance requirements
- AS/NZS 3500.1:2018 Plumbing and drainage - Standards - Water Services~~AS/NZS 3500.1:2003 National plumbing and drainage – Water Services~~
- New Zealand Industry Standard: Field testing of backflow prevention devices and verification of air gaps.

3. Council's General Requirements

As a result of the above legislation, Council requires the following backflow prevention devices installed:

a Source (point of risk) protection

For buildings covered by the Building Act an appropriate backflow prevention device must be installed as close as possible to the source of potential contamination. The type of device used shall be in accordance with the Building Code Approved Document G12.

b Zone protection

Generally only applicable within large industrial or commercial complexes and is usually required to separate workshop areas from offices and communal areas.

c Boundary (containment) protection

In addition to the internal backflow prevention and in accordance with the Health (Drinking Water) Amendment Act 2007 an appropriate backflow prevention device must be installed on Council service pipe as close as practicable to the point of supply. The device shall be rated according to the highest risk on the site.

Where the water connection is an extra ordinary use or a specific risk is identified the boundary protection device installed shall be fully testable with the minimum standard being a double check valve. Extra ordinary use as defined by the Water Supply Bylaw includes all commercial and industrial customers. For all other properties with ordinary use which is domestic use only a dual check valve device will suffice.

All costs associated with the installation, maintenance and testing of backflow preventers shall be met by the customer. However, Council may undertake these works and charge the customer in accordance with the Funding Policy and the Schedule of Fees and Charges.

3.1. Ownership of Boundary Backflow Devices

The point of supply is the location of change of ownership from Council to the property owner. The point of supply as defines by the Water Supply Bylaw 2012, being directly downstream of the water meter and/or backflow prevention device. Therefore, boundary backflow devices are in Council ownership. However, there is an option for the property owner to retain ownership if they wish by written agreement with Council.

3.2. Roles and Responsibilities

Various departments within Council as well as customers have responsibilities under the aforementioned acts and regulations. Council's requirements for backflow prevention and cross connection control fall into two distinct areas; Water Services requirements and the Building Compliance requirements.

3.2.1. Water Services Department

Water Services responsibilities are governed primarily by the Health (Drinking Water) Amendment Act. This gives Water Services a general responsibility for the safety of the public water supply system. The Act requires Water Services to ensure that containment devices are provided at the boundary of all properties with a potential risk of cross connection. This cross connection could be made either accidentally or deliberately and boundary protection is independent of any internal backflow prevention.

Water Services may need to inspect the property to determine the level of risk and re-assess the requirements upon being informed of a change of water use within the property. Water Services require that all costs associated with the installation, testing, maintenance and possible replacement or upgrading of boundary backflow prevention are borne by the property owner. This will also include provision of isolation valves and strainers.

Water Services are required to ensure that all boundary backflow preventers are tested annually. Water Services may undertake to do the testing and keep records of the test results. The cost of the testing may then be passed on to the property owners as a uniform annual charge on the water rates or invoiced separately.

3.2.2. Building Compliance Department

The Building Compliance Department is responsible for ensuring compliance with the Building Act and Building Code. Various Acts of Parliament are focused on protecting the building occupants and users from possible dangers, including cross connections and backflow. It is the customer's responsibility under these regulations to protect the occupants, and they must install and test backflow preventers where required under the Building Act.

Where a backflow has not been installed, has the wrong hazard rating or fails a test; the compliance ~~division~~ department may issue a Notice to Fix under the Building Act 2004. Failure to comply with a Notice

To Fix is an offence and has an infringement fee of $1,000 or if taken to prosecution a maximum fine of $200,000 and $20,000 for every day that the offence continues.

If the backflow preventer forms part of the compliance schedule for the building, the Building Warrant of Fitness cannot be renewed until the annual test has been done and Form 12A had been completed by a Council approved IQP.

3.2.3. Customer Responsibility

The customer (building owner or employer) is responsible for the protection of all employees and visitors to the site as well as protecting the public supply. It is the customer's responsibility to install and maintain all backflow prevention devices as may be required by the relevant Acts, Regulations and Bylaws. The customer and their approved building certifiers shall ensure that on initial construction all necessary backflow preventers are installed and added to the Building Compliances Schedule and Water Services database for boundary devices. The customer shall ensure that the backflow devices installed meet the current standards. Should the standards be amended then it shall be the customer's responsibility to fully comply with the new standards.

The customer shall arrange for the internal backflow devices to be tested in accordance with the relevant regulations and the Building Compliance Schedule. The customer shall keep all test reports for a minimum of two years. Also after any renovations requiring consent the customer shall ensure that cross connections are avoided or backflow preventers installed to conform to the Building Act and Health (Drinking Water) Amendment Act. The customer shall allow Council staff or appointed representatives access to the site by prior arrangement for the purpose of checking for cross connections and compliance with this document. They shall also provide a person knowledgeable in the water layout of the property to assist with the inspection. The customer shall also be responsible for obtaining the necessary permits and consents prior to any plumbing alterations or changes of building or water use.

The customer shall be responsible for the payment of all fees and costs associated with permits, installation, maintenance, testing or removal of devices as may be required in this document.

Failure to meet the requirements of this document may result in the disconnection of the customer's water supply (see section 5).

4. Types of Hazards

Details of specific types of hazards are included in Appendices A and B; however there are many common installations which require backflow protection, regardless of the nature of the activities conducted on the premises. The hazard rating supplied in brackets is a general assessment and the specific hazard for an installation may differ when in doubt use to the hazard definitions in section 4.1 below.

These types of installations include:

Air conditioning units, heat exchangers and other water cooled equipment (Medium)
This equipment may be contaminated with algae or bacterial slime.
If potentially connected to the sewage system or treated with chemicals. **(High)**

Agricultural (Medium)
Stock water can be contaminated with bacterial slime
Supplies to cow sheds that could be contaminated with stock effluent or stock water with direct injection of chemicals **(High)**

Boilers (High)
Chemicals are often added and water made non potable.

Public toilets and urinals (Medium)
These are usually connected to the sewage system and often contain cleaning agents in the water stored for flushing.

Hose connections (Medium)
When hoses are connected they can easily become submerged in a contaminated non-potable liquid. Common hazard areas are wash down areas and hose taps close to grease traps.

Swimming pools, spa pools and fish ponds (Medium)
May be contaminated with algae or bacterial slime or treated with chemicals. They are typically filled either by fixed piping or hose which may be left running below water level.

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Irrigation and sprinkler systems (Medium)
Any below ground or pop up system would constitute a risk.
Chemicals added to the water or applied to the ground. **(High)**

Auxiliary sources (Medium)
-Water pumped with a booster pump and held in a storage reservoir for use (i.e. on upper floors of multi-storied buildings) which could backflow into the potable system with a loss in pressure in the distribution main. The quality of auxiliary water supplies will typically not comply with relevant standards of potable for consumption.

Alternate Supply (Medium)

Alternate supplies such as rainwater tanks or springs are unlikely to comply with drinking water standards and may be contaminated.

Fire protection systems (Medium)
The water in these systems is often poor quality as no usage occurs for months on end.
If toxic chemicals are added to these systems. (High)

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4.1. Levels of Risk

The levels of risk to public health identified relates to a hazard rating as defined in G12 of the Building Code are:

Hazard Rating	Description
High Hazard	Any condition, device or practice which, in connection with the potable water supply system, has the potential to cause death.
Medium Hazard	Any condition, device or practice which, in connection with the potable water supply system, has the potential to injure or endanger health.
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.

A full list of hazards and their classifications of table 1 from G12 is included in Appendix B.

Unless otherwise exempted, Water Services require that an appropriate and testable boundary protection device be provided as close as practicable to the boundary on Council's service pipe of any property containing either a high hazard or a medium hazard.

Exemptions may be granted at the discretion of Water Services where it is agreed that there is no significant potential for a cross connection to be made either accidentally or intentionally that could result in contamination of the public water supply. Examples of situations where exemption may be granted include:

- Situations where the point of supply is at an elevation 10.5 metres or more higher than the identified hazard. (For back siphonage hazards only).
- Spa pools, fish ponds or rainwater tanks of total volume less than 1000L.
- Interior spa pools where the method of filling is unlikely to result in cross connection.

Should a dispute arise over the level of risk, or the backflow prevention device required at the boundary, the Water Services Manager shall nominate the device. Where it is unclear as to the level of risk or for reasons the water usage is unknown a Reduced Pressure Zone backflow preventer shall be installed.

All other properties shall have dual check valves incorporated within the water meter installation.

5. Disconnection of Water Supply

Where a hazard or potential hazard to the water supply exists and is not remedied within a reasonable period of time (as specified by Water Services but not longer than 30 days from the date of notification) Water Services may disconnect the water supply to the customer. Other instances where a disconnection of the water supply would be considered include but are not limited to:

- Unprotected, direct or indirect connection between a contaminant and the public water supply

- Removal or bypassing of a boundary backflow preventer.

Disconnection of the water supply may be undertaken in accordance with the following legislation; The Local Government Act 2002 ~~an~~, the ~~d~~ Council's Water Supply Bylaw 2012 and the current versions of the Water Services Act. ~~.~~

Water Service will make every effort to inform customers in advance of disconnection. However, in the event that a potentially serious hazard to the public water supply exists the connection to that property may be disconnected immediately. Reconnection of the supply shall not be undertaken until the appropriate action has been undertaken to the satisfaction of the Water Services Manager. The cost of the disconnection, and reconnection if applicable, shall be met by the consumer. Failure to provide sufficient backflow prevention inside a premises or building as required under the Building Act or other regulations shall be deemed an offence under those regulations. Any penalties or actions to be taken shall be in accordance with the relevant legislation and at the discretion of the Building ~~Compliance~~ Control Department and/or the ~~Medical Officer of Health~~Drinking Water Regulator.

5.1. Backflow Incidents

Notwithstanding any legal action that may result from a backflow incident the cost of rectifying contamination of the public water supply shall be the responsibility of those ~~causing~~ allowing the backflow to occur.

6. Types of Backflow Preventers

The types of backflow preventers are categorised in accordance with the level of risk, low, medium or high (See Appendix B). However, certain devices may not be suitable in all situations even if they have the correct hazard rating. For example an air gap would often be impractical as a boundary device. The types of devices depending on location are shown below:

Hazard	Boundary (Containment) Device	Source (Point of Risk) Device
Low Hazard	Dual check valve	Dual check valve Dual check valve with atmospheric port Hose connection vacuum breaker
Medium Hazard	Double check valve Double check detector	Double check valve Atmospheric vacuum breaker Pressure vacuum breaker Spill proof vacuum breaker
High Hazard	Reduced pressure zone Reduced pressure zone detector	Reduced pressure zone Registered air gap

A brief description of each device is in Appendix C.

6.1. Backflow Manufacture

All backflow prevention devices shall be manufactured in accordance with AS/NZS 2845.1 Water supply Backflow prevention devices Materials, design and performance requirements. For Boundary devices on the property boundary, only top entry backflow preventers complying with AS 2845.1 shall be used. See Water Services Approved Materials List for approved models.

It is important to ensure that the correct device is chosen for the potential hazard. It is also essential that the installer and tester are fully aware of the installation requirements and operating characteristic of all devices. If in doubt a higher level of protection should be used.

7. Installation of Backflow Preventers

7.1. Installation requirements

Before a boundary backflow preventer can be installed or removed consent must be obtained from Water Services. Water Services may request the owner to undertake a comprehensive survey of the site by a qualified IQP. Installation of a backflow prevention device may be required following any of the following events:

- Building Consent for construction of a new building or alteration of an existing building

- Public Utility Application
- Change of Use Application
- Property inspection by Council's backflow contractor

For new buildings with a new water connection the consent will come with the approval for the water connection in the form of an approved drawing stating the type of device required. When a change in the use of the building occurs a "Change of Use Application" must be made to Water Services who will inform the customer if any change to the boundary backflow prevention is required. Where the applicant is unsure of the final use of the water supply Water Services may allow a double check valve to be installed. However, should the water subsequently be used for high hazard activities the backflow preventer shall be upgraded at the customer's expense. For internal backflow preventers as required by the Building Act a building consent will also be required.

All source (point of risk) devices shall be installed as near as practicable to the potential source of contamination (appliance) while still in an easily accessible position for maintenance and testing.

All backflow preventers must be installed with isolating valves and a line strainer upstream. The only exception being on fire sprinkler lines when strainers shall not be used unless the make and model is approved by the Insurance Council. The isolating valves must be ball valves or resilient seated gate valves for large (greater than 40mm) devices and shall be installed adjacent to the backflow preventer. All high hazard devices shall be installed above ground in a securely fenced / housed or caged area with a lockable access to protect from physical damage. The installation of high hazard devices shall be such that discharge from the relief valve can drain and does not cause damage.

No device shall be bypassed unless the bypass is also fitted with a device appropriate for the same hazard rating.

New source (point of risk) protection devices will be added to that buildings compliance schedule. All boundary (containment) protection devices will be added to Council's property database.

The installation of internal backflow prevention devices shall only be undertaken by a craftsman plumber or by a licensed plumber working under the direction of a craftsman plumber. For boundary devices Council only Licensed Contractors or contractors specifically approved by Water Services shall be allowed to install the backflow preventer.

All devices shall be installed in accordance with Council's Environmental Engineering Standards, this document, and the manufacturer's recommendations. The device shall be tested immediately following installation to prove compliance with all requirements. This shall be carried out by a registered IQP.

7.2. Installation Considerations

When installing a backflow prevention device the following criteria need to be considered:

- Level of risk
- Appropriate backflow prevention device for level of risk
- Location of backflow prevention device (at source or boundary)
- Appropriate backflow prevention device for type of water use downstream - consideration must be given to the head losses through the device and appropriate size of connection to meet anticipated flow rates
- Ease of access for testing, maintenance and replacement
- Manufacturer's recommendations
- Pressure loss across device
- Safety of testing for maintenance personnel
- Continuity of supply while testing. A bypass line may be required, also with a backflow preventer
- Installation above ground level or with adequate functioning drainage where no part of the device can become submerged
- Protection, from vandalism, traffic, hazardous environments
- Approved brand (a copy of the latest list of Approved Materials shall be obtained from Water Services)

8. Testing

It is a requirement under the Building Act 2004 that all internal backflow preventers are tested within the required time frame by an IQP. This will normally be part of the building's Compliance Schedule. An IQP is defined within the building act as being "a person who:

a Has no financial interest in the building, other than as a qualified person; and

b Is accepted by the territorial authority as being appropriately qualified to undertake the inspection and maintenance of the feature or system concerned."

Boundary devices that are not part of the building compliance schedule shall be tested annually by an IQP or as directed by the Water Services Manager. Water Services may undertake the testing of boundary devices and recover the cost from the consumer. Alternatively Water Services may allow the consumer to organise the test and forward the test certificate to Water Services.

8.1. IQP's Responsibilities

The IQP shall inform both the customer and Council if the level of protection offered by the backflow device is at any time found to be insufficient for the highest hazard on the property.

The IQP shall report any unsanitary plumbing practices and report any unprotected backflow risks to Council.

The individual who holds the IQP status shall inform Council if he leaves a company, and/or joins a new company and wishes to continue to operate as an IQP.

8.2. Qualifications

Council requires that all approved IQPs have a thorough knowledge of backflow prevention and cross connection control. They must be able to recognise potential backflow hazards as well as testing devices. An IQP must be able to advise property owners on backflow requirements and be familiar with all acts and regulations pertaining to backflow and cross connection issues. In addition they shall have attended and passed an approved course of not less than 40 hours duration or obtained competency in unit standards US23847 and US23848.For qualified plumbers have obtained competency in unit standard US2117.

In order to keep up to date with changes in regulations, equipment and procedures, each IQP must also attend a recognised refresher course at least every three years.

8.3. Registration

Persons wishing to become registered as an IQP, as specified in the Building Regulations, for Section G – "Any automatic backflow preventer connected to a potable water supply" with the Whangarei District shall complete the relevant application form. They shall enclose with their application a copy of the qualification certification (or refresher certificate if applicable), medical certificate signed by their doctor (Water Services Hygiene Code, WSMQ1 form), their test kit serial number with a copy of current calibration verification along with the appropriate application fee. If the applicant has the correct qualifications and is deemed suitable Council will notify the applicant and include their name to the IQP register.

8.4. Re-Registration

Every year all IQPs shall re-register with Council in order to maintain their approved status. The IQP will be contacted by Council and asked to reapply before a certain date. The applicant shall apply in writing enclosing the appropriate fee, a copy of their test kit annual calibration report and their refresher course certification if due. If all details are in order then approved status will be granted for a further year.

8.5. Removal of IQP Status

If in the opinion of the Water Services Manager or ~~Compliance Division~~Building Control Manager, an IQP has not undertaken their obligations to a satisfactory level then Council may immediately withdraw their IQP status. Reasons approved status might be withdrawn are:

- Failure to adequately test backflow preventers
- Failure to comply with this policy
- Failure to comply with the relevant acts and regulations
- Breaches of OSH regulations
- Poor, unsafe or unhygienic work practices.

For minor offences Council may first issue a written warning, but reserves the right to immediately remove IQP status for serious breaches. Council may ask an IQP to re-sit the 40 hour course before reapplication for approved status. However, Council shall be under no obligation to reinstate any IQP who has been removed from the register.

8.6. Company IQP Status

Only individuals are eligible for IQP status. Companies with IQP on their staff may advertise as such but the status is attached to the individual only. Council will keep a record of companies who have IQP on their staff and the companies will be listed in Council's IQP register. Should the individual leave the company the company will immediately be removed from the register. Only IQP employed or contracted by the company shall be allowed to test backflow preventers and sign report forms.

8.7. Insurance

All IQPs must hold current public liability and/or professional indemnity insurance suitable for the type of areas in which they will be working.

8.8. Hygiene Requirements

Every IQP shall be familiar with the requirements of the Water Services Hygiene Code of Practice for persons working on potable water mains. IQPs shall obtain a blue card by getting medical clearance from their doctor in accordance with the requirements of the hygiene code. The blue card (medical clearance) shall be kept up to date. Failure to do so may result in the removal of IQP status.

8.9. Test Procedures

Testing procedures for backflow preventers shall be in accordance with the New Zealand Industry Standard: Field testing of backflow prevention devices and verification of air gaps and/or the American EPA Cross Connection Control Manual. In addition visual checks will also be required for registered break pressure tanks and atmospheric vacuum breakers. Testing shall be done at the following times:

- Immediately after installation
- Annually
- On completion of any maintenance work
- After a backflow or suspected backflow incident
- At the request of the ~~Area Health Officer~~Drinking Water Regulator, Building Control Officer, Dangerous Goods Inspector or Water Services Manager.

The test procedures shall be as per the New Zealand Industry Standard. The test forms for backflow prevention devices shall be as shown in Appendix M of that document or Appendix E of this document.

Note For boundary backflow prevention devices the registration number of the device and the meter number to which it is attached must be included.

Prior to the annual test of a backflow preventer the line strainer must first be cleaned.

8.9.1. Test Equipment

The test equipment used shall be the correct type for the device being tested. The equipment shall be a recognised make and model and not a "homemade" device. The test kit shall have a maximum working pressure of a least 1200kPa, and shall have colour coded hoses for ease of use. It is recommended that each hose should contain an in-line filter which should be cleaned out regularly.

Calibration tests shall be done annually by an International Accreditation New Zealand (IANZ) registered testing laboratory, or Water Services approved laboratory. The calibration frequency should be those set out in The New Zealand Industry Standard: Field testing of backflow prevention devices and verification of air gaps. Current calibration test certificates must be forward at the time of re-registration.

8.9.2. Test Tags (for Boundary Devices only)

The "test completed" tag shall be attached to the boundary backflow device on completion of a successful test. The tags shall be durable with a 5 year date grid. The IQP shall drill a hole in the date grid corresponding to the date of the successful test. The tag shall be securely fastened to the backflow, clearly visible and legible. Test tags shall only be obtained through the Whangarei District Council.

8.9.3. Backflow Registration Numbers (for Boundary Devices only)

Each boundary backflow shall have a unique registration number. This registration number shall be stamped on the front of the test tag. The test tags with the number must be obtained from Water Services prior to the installation test for a new backflow.

If a device requires a new tag (i.e. if testing date on tag has expired), then a new tag shall be securely fastened to the backflow. Both the old and the new registration numbers must be written on the report forms, and all other correspondence to Water Services regarding individual backflow prevention devices.

8.9.4. Test Certificate

The backflow prevention test form is to be completed for every test (as per Appendix E), and returned to Whangarei District Council within five (5) working days. The form shall have the following information:

- Type of test (initial, annual etc.)
- Owner details (name, address)
- IQP details (name, IQP number)
- Device details (location, make, model, size, serial number)
- Unique backflow registration number (if tag requires replacement then both old and new number shall be recorded)
- Associated water meter number (for boundary devices only)
- Type of hazard (for internal backflow preventers only)
- Strainer cleaning
- Test results
- Maintenance work undertaken
- Pass / Fail result
- Test kit information (make, serial number, calibration date)
- Additional information if required
- IQP signature and date of test

9. Surveying

The surveying of properties for cross connections and potential backflow problems shall be undertaken by persons experienced in this field. They shall have attended a recognised backflow survey course of not less than 3 days duration. The surveyor shall have a survey accreditation ID card that shall be carried at all times when undertaking surveys. The surveyor shall have the necessary public liability and professional indemnity insurances as required by Council.

Two types of survey may be undertaken:

- A highest hazard survey only determines the highest hazard on a property and is used to determine the level of boundary backflow prevention required.
- A full survey should determine all risks and possible cross connections which may prove hazardous to the occupants.

On completion of a survey, a report should be submitted to ~~the owner or occupie~~the relevant Council department ~~r.~~ and a~~A~~ copy should be kept by the surveyor ~~and, if working for Council, a copy forwarded to the relevant Council department~~. Further descriptions of survey requirements are at Appendix F.

10. Acknowledgements

Much of the information for this policy came from the following sources:

- Water New Zealand, Backflow Prevention Code of Practice for Water Supplier
- Department of Housing, New Zealand Building Code Acceptable Solutions G12/AS1
- The Master Plumbers, Gasfitters and Drainlayers NZ and Water New Zealand, New Zealand Industry Standard: Field testing of backflow prevention devices and verification of air gaps
- USEPA Cross-Connection Control Manual
- Unitec Backflow Survey Course Notes

Appendix A Specific Hazards: Examples of Facilities and Hazard Ratings

This Appendix gives examples and guidance for the overall hazard when determining the boundary backflow required in the types of premises described. The hazard rating supplied in brackets is a general assessment and the overall hazard for the specific site may differ when in doubt use to the hazard definitions in section 4.1.

Sewage Plants, Pump Stations and Water Reduction Facilities (High)

The hazards normally found in plants of this type include cross connections between the public water supply and:

1 Sewage pumps for priming, cleaning, flushing or unclogging purposes.

2 Water operated sewage sump ejectors.

3 Chlorinators using potable water when disinfecting wastewater.

4 Sewer lines for purpose of disposing of filter or softener backwash water or water from cooling systems.

Plating and Chemical Companies (High)

The hazards normally found in plants of this type include cross connections between the public water supply and:

1 Plating facilities involving the use of highly toxic cyanides, heavy metals in solution, acids and caustic solutions.

2 Plating solution filtering equipment with pumps and circulating lines.

3 Tanks, vats or other vessels used in painting, de-scaling, anodizing, cleaning, stripping, oxidizing, etc for the preparation or finishing of productions.

4 Steam generating facilities and lines which may be contaminated with boiler compounds.

5 Water cooled equipment which may be sewer connected such as compressors, heat exchangers, and air conditioning equipment.

Hospitals (High)

The hazards normally found in facilities of this type include cross connections between the public supply and:

1 Contaminated or sewer connected equipment such as bedpans, washers, flush valve toilets and urinals, autoclaves, specimen tanks, sterilizers, aspirators, autopsy and mortuary equipment laboratories.

2 Sewer lines for the purpose of disposing of filter or softener backwash water.

3 Water cooled equipment such as compressors, heat exchangers, air conditioning equipment, etc.

4 High pressured coil system.

5 Cooling towers which may be heavily contaminated with bird droppings, vermin, algae, etc., or with toxic water treatment compounds.

6 Steam generating facilities and lines.

7 Kitchen and food processing equipment including dishwashers, icemakers, carbonated beverage machines.

8 Haemodialysis units.

9 Auxiliary emergency water supplies.

Convalescent and Nursing Homes (High)

The hazards normally found in facilities of this type include cross connections between the public water supply and:

1 Contaminated or sewer connected equipment such as bedpan washers, flush valve toilets, urinals and whirlpool baths.

2 Kitchen and food processing equipment including dishwashers, ice-makers, carbonated beverage machines.

3 Auxiliary emergency water supplies.

Funeral Homes and Mortuaries (High)

The hazards normally found in this type of facility include cross connection between the public water supply and:

1 Prep room equipment such as hose connections and aspirators.

2 Boilers with chemicals added.

Schools and Universities (High)

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The hazards normally to be found in a facility of this type include cross connections between the public water system and:

1 Contaminated and/or sewer connected facilities such as inadequately protected flush valve toilets, urinals, aspirators, retorts, pipette tube washers, etc.

2 Laboratory equipment which may be chemically or bacteriologically contaminated.

3 Steam sterilizers, autoclaves, specimen tanks, autopsy and morgue equipment.

4 Sewer connected plumbing fixtures such as flush valve toilets and urinals.

5 Steam generating facilities and lines, which may be contaminated with boiler compounds.

6 Water cooled equipment which may be sewer connected such as compressors, heat exchangers, air conditioning equipment, etc.

7 High pressured coil systems.

8 Irrigation systems which may be equipped with pumps, injectors, or other facilities for injecting chemicals or subject to contamination from submerged inlets, auxiliary water supplies, or polluted or contaminated waters.

9 Tanks, automatic film processing machines or facilities.

10 Auxiliary water supplies.

11 Lab sinks and other hose connections.

Medical Laboratories (High)

The hazards normally found in this type of facility are cross connections between the public water supply and:

1 Lab sinks and hose connections.

2 Pipette washers, sterilizers, autoclaves, etc.

3 Sewer lines for the purpose of disposing of samples.

4 Filter equipment, deionizers, membrane filters and distillers.

Car Wash Facilities (High)

The hazard normally found with this type of facility would be a cross connection between the public water supply and:

1 The scrubber and rinser plumbing, which would enable a re-circulating pump to force recycled water back into the public water supply.

Veterinary Hospitals, Grooming Establishments (High)

The hazards normally found in this type of facility would be a cross connection between the public water supply and:

1 Bath tubs where animals are washed with chemicals for treatment of fleas, skin disorders, etc.

2 Hoses used to wash wastes from pens and run areas.

3 Medical equipment such as x-ray development.

Marinas, Yacht Clubs and Docks (High)

The hazards normally found in water front facilities include cross connection between the public water supply and:

1 Outlets available for supplying water to docks using common garden hoses.

2 Large supply lines used to supply drinking water for larger seagoing vessels.

3 Kitchen/restaurant facilities such as dishwashers, ice machines, carbonated beverage machines.

4 Gas tanks which hydraulically raise gas levels.

5 Cooling towers.

6 Fire protection systems.

7 High pressure washing systems.

8 Motor testing tank with bottom feeds.

Swimming Pools (Medium)

The hazards normally found at swimming pools are cross connections between public water supply and:

1 Below rim inlets.

2 Hoses left running and dropped into the pools.

3 Direct connections at the chlorination equipment.

4 Steam generating facilities and lines which may be contaminated with boiler compounds.

Greenhouses (Medium)

The hazards normally found at greenhouses are cross connections between the public water supply and:

1 Irrigation systems.

2 Hoses left running on the floor or in planters where there is a possibility of back siphonage.

However **(High)** if facility includes

3 Chemical injectors.

4 Steam generating facilities which may be contaminated with boiler compounds.

Farms and Agricultural Facilities (Medium)

The hazards normally found with farms and agricultural facilities are a cross connection between the public water supply and:

1 Stock troughs

2 Chillers

3 Dams and other auxiliary supplies

However **(High)** if facility includes

4 Cowsheds and slurry pits

5 Irrigation systems with chemigation/fertigation.

Tank Trucks and Sprayers (High)

The hazards normally found with tank trucks and sprayers are a cross connection between the public water supply and:

1 A fill pipe which becomes submerged in the tank during filling.

2 Hydroseeders, sweepers, sewer vacuums, sewer rodders or lawn maintenance equipment which may be subject to back siphonage during use.

Automobile Repair and Related Industries (High)

The hazards normally found with these types of facilities are cross connections between the public water supply and:

1 Submerged inlets into testing tanks where chemicals are present.

2 Rinse hoses lying on the floor stuck into tanks.

3 Steam generating lines which may be contaminated with boiler compounds.

Laundries, Dry Cleaners and Dye Works (High)

The hazards normally found in this type of facility are a cross connection between the public water and:

1 Laundry machines having under rim inlets.

2 Steam generating facilities which may be contaminated with boiler compounds.

3 Water storage tanks equipped with re-circulating pumps

4 Dye vats using chemicals.

5 High pressure coil heat exchangers.

6 Sewer connected compressors.

7 Dry cleaning equipment with solvents and heat exchangers.

Solar Heating Systems (Medium)

The hazards normally found with solar heating and/or cooling systems include cross connections between the public water supply and:

1 Single wall heat exchangers between the consumer's water and non-potable water.

2 Negative pressure zones created by circulation pumps.

However **(High)** if facility includes

3 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 (Medium)

The hazards normally found in this type of facility would be cross connections between the public water supply and:

1 Steam connected facilities such as pressure cookers, autoclaves, retorts etc.

2 Equipment used for washing, cooking, cleaning, blanching, flushing, or fluming or for transmission of foods.

However **(High)** if facility includes

3 Fertilizers or wastes.

4 Can and bottle washing machines and lines where caustics, acids, detergents and other compounds are used in cleaning, sterilising etc.

5 Cooling towers and circulating systems which may be contaminated with bird droppings, vermin, algae, bacterial slimes or with toxic water treatment compounds.

6 Steam generating facilities and lines which may be contaminated with boiler compounds.

Beauty Salons - Barber Shops - Beauty Schools (Medium)

The hazards normally found in these facilities are cross connections between the public water supply and:

1 Hair wash sinks that have hoses for rinsing hair during washing, dying or other chemical treatments.

Doctors' and Dentists' Offices (High)

The hazards normally found in these facilities are cross connections between the public water supply and:

1 Autoclaves.

2 Specimen tanks.

3 Sterilisers.

4 Aspirators.
5 Laboratory sinks.
6 Dental suction hoses.
7 X-ray equipment.
8 Air compressor lines.
9 Water cooled equipment such as air conditioning equipment which may be connected to sewers.

Restaurants and Cafes (Medium)

The hazards normally found in these types of facilities would be cross connections between public water supplies and:

1 Dishwashing sinks particularly with detergent injectors.
2 Deep sinks with aspirators with soap, detergents etc.
3 Cleaner's sinks.
4 Toilets and urinals.
5 Air conditioning units piped directly to sewers.
6 Steam generating facilities which may be contaminated with boiler compounds.
7 Water cooled equipment such as air conditioners, which may be connected to the sewers.
8 Garbage can washers.
9 Garbage disposal units.
10 Soda equipment, espresso boilers with salt filters.
11 Lawn sprinklers.

Alternate Water Supplies

The hazards normally found at properties with private water supplies would be cross connections between public water supplies and:

1 Rainwater tanks
2 Spring sources
3 Bores
4 Rivers and Streams
5 Small dams

Appendix B Hazard Levels: New Zealand Building Code G12/AS1

Below the type of hazard is taken from G12/AS1 of the Building Code and gives a good indication of the devices required for particular situations.

Note The final decision as to which device is required shall be made by the Water Services Manager.

Type of Hazard	Acceptable Devices
High may include but not necessarily be limited to: a -Autoclaves and sterilizers 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	• Registered air gap • Reduced pressure backflow prevention device
Medium 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 carbonates	• Registered air gap • Reduced pressure backflow prevention device • Double check valve

m Swimming pools, spas and fountains	
Low may include but not necessarily be limited to: a Drink dispensers (except carbonators)	As above plus • Hose connection vacuum break • Dual check valve

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

Appendix C Backflow Prevention Devices

Hose Connection Vacuum Breakers

This device can be attached to the outlet of any standard hose bib tap and prevents back siphonage only. It will not work under back pressure or continuous pressure conditions. A similar device is also available for laboratory outlets.

Dual Check Valves

These are in line non testable devices which are suitable for continuous pressure applications in low hazard applications.

Dual Check Valves with Atmospheric Port

As above, but with an atmospheric vent. This allows water to discharge to atmosphere if the second check valve does not close correctly.

Double Check Valve

These are fully testable and can be used for back siphonage and back pressure conditions. They may only be used to protect against a contaminant that could at worst cause illness, hence they are classified as medium hazard devices.

Double Check Detector Assembly

This is specifically designed for fire sprinkler lines where backflow prevention is combined with the need to detect unauthorised water usage or leakage. It incorporates a large and a small double check valve in parallel with a meter on the smaller line. It provides the same level of protection as a double check valve however it will detect small flows. Large flows, such as in the event of a fire, will go through the large line and hence not be recorded. This assembly has carefully matched components and cannot be field assembled from stock double check valves.

Atmospheric Vacuum Breaker

These devices are used to protect against back siphonage of a pollutant only. They should not be subject to back pressure and are therefore only to be used on open ended pipeline such as irrigation systems or garden hoses with no downstream valves. They are not suitable as boundary devices and should be installed a minimum of 150mm above all downstream piping. They may also only be used for a maximum of 12 hours out of any 24 hour period as long usage may cause the seat to stick. Whilst atmospheric vacuum breakers cannot be tested, they can be opened and checked to ensure they are working correctly. This should be done on an annual basis.

Pressure Vacuum Breaker

These devices are similar to the atmospheric vacuum breaker and are only suitable for back siphonage conditions. They can however be used under constant pressure conditions and can be tested in line. They must be installed at least 300mm above all downstream outlets.

Spill Proof Vacuum Breakers

Similar to the pressure vacuum breaker but can be installed in areas where spillage of water from the device is not wanted. They are testable and only suitable for protection against back siphonage. They must be installed in accordance with the manufacturer's recommendations and are not suitable as boundary devices.

Reduced Pressure Zone

These devices are acceptable for contaminants that can cause illness or death as they are rated for high hazards. They will protect against both back pressure and back siphonage and are fully testable. They must be installed above ground in a free draining area.

Reduced Pressure Zone Detector Assembly

This is specifically designed for fire sprinkler lines which use chemical additives and where backflow prevention is combined with the need to detect unauthorised water usage or leakage. It incorporates a large and a small reduced pressure zone backflow preventer in parallel with a meter on the smaller line. It provides the same level of protection as a reduced pressure zone device, however it will detect small flows. Large flows, such as in the event of a fire, will go through the large line and hence not be recorded. This

assembly has carefully matched components and cannot be field assembled from stock reduced pressure zone valves. This device must be assembled above ground in a free draining area.

Registered Air Gap or Break Tank

Air gaps are non mechanical devices which when installed correctly offer high hazard protection against both back siphonage and back pressure. The air gap should be at least two times the diameter of the inlet pipe and not less than 25mm. Air gaps are usually used at the end of a service for a reservoir or storage tank. The resultant loss of pressure may mean that a booster pump is required. At an air gap, the potable water is in contact with the surrounding air, so it must not be installed in a toxic environment. Air gaps should be registered and inspected annually to ensure that they have not been bypassed and the overflow capacity is sufficient.

Appendix D Backflow Testing Procedure

Fully Testable Devices

The following procedure shall be followed when testing backflow prevention devices using a recognised test kit:

- Determine appropriate date and time with property owner
- Confirm model and size of backflow preventers to be tested and ensure correct test kit (calibrated) is available
- Check with building occupants prior to shutting of water to building, area or equipment

  Note If testing fire line or sprinkler backflow preventer, the Fire Service or monitoring company will also need to be notified
- Check installation is correct, including correct level of protection, and all test ports accessible. If not owner should be notified and test delayed until problem fixed
- Check no health and safety risks at test site. See Appendix A of the New Zealand Industry Standard: Field testing of backflow prevention devices and verification of air gaps
- Prior to testing the line strainer must be cleaned
- Undertake test in accordance with correct procedure (New Zealand Industry Standard: Field testing of backflow prevention devices and verification of air gaps; or USEPA Manual)
- Complete test certificate form Appendix E or appropriate form from New Zealand Industry Standard: Field testing of backflow prevention devices and verification of air gaps
- Should the device fail, the owner's permission must be sought before undertaking any maintenance work
- Mark test complete tag, or attach new tag to backflow device and mark
- Report to building occupiers when test is complete and water restored
- Submit test report forms to correct authority.

  Boundary Devices – Water Services

  Internal Devices – Building Control Authority
- The tester should give a copy to the ~~owner~~ Council and keep a copy of the report form themselves for a period of not less than two years.

Atmospheric Vacuum Breakers

The procedure for atmospheric vacuum breakers is similar to that for fully testable devices. The only difference is the test itself. As there are no test ports the device has to be dismantled to visually inspect the disk seating for sticking or damage. The test procedure is Appendix K of New Zealand Industry Standard: Field testing of backflow prevention devices and verification of air gaps with a report form in appendix M that can be used.

Registered Air Gaps

A registered air gap or break tank requires no physical testing as such. However they do require examination at intervals the same as fully testable devices. The test procedure is obtained by following the checklist and verifying the air gap as detailed in Appendix C of New Zealand Industry Standard: Field testing of backflow prevention devices with a report form in appendix M that can be used.

Appendix E WDC Backflow Prevention Device Test Certificate Form

A Copy of the test form is overleaf.

Private Bag 9023 | Whangarei 0148 | New Zealand
T: 09 430 4200 | 0800 WDC INFO | 0800 932 463 | F: 09 438 7632
W: www.wdc.govt.nz | E: mailroom@wdc.govt.nz

Whangarei District Council

Inspection and Maintenance Form for Backflow Prevention Devices

❒ Initial test ❒ Retest ❒ Annual test ❒ Other

Owner/Occupier _____

Address _____

_____

IQP Name _____ WDC IQP No _____

Device Details ~~**Device Details**~~

❒ Containment backflow ❒ Internal backflow

Backflow Registration No _____ Hazard _____

Associated Meter No _____ ❒ High risk ❒ Medium risk

Device location _____

Make _____ Model _____

Size _____ Serial No _____

❒ Strainer cleaned

	Reduced Pressure Zone Devices			Pressure Vacuum Breaker	
	Double Check Devices		Relief valve	Air inlet	Check valve
	First check	Second check			
Initial test	❒ DC closed tight RP kpa ❒ Leaked	❒ Closed tight ❒ Leaked	Opened at kpa	Opened at kpa ❒ Did not open	_____ kpa ❒ Leaked
Maintenance undertaken, parts & materials used					
Test after maintenance	❒ Closed tight RP kpa	❒ Closed tight	Opened at: kpa	Opened at kpa	_____ kpa

❒ Pass ❒Fail

Test kit make _____ Serial ~~N~~No _____

Date test kit last verified _____

Remarks *(correct hazard rating, suitable location, recommended course of action, etc)*

_____

_____

_____

_____

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IQP Signature

Date of test

Appendix F Requirements for Backflow Surveys

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The procedures to be followed when conducting a full backflow survey are as follows:

- A letter of intent should be sent to the water customer at least one week prior to the inspection
- Whenever possible the customer or their agent should accompany the surveyor on the inspection. A copy of the drawings of the water layout should also be requested
- The surveyor must carry ID and wear the correct safety gear for the property
- The survey should start at the property boundary and continue to the last free flowing outlet
- The report should be collated during the survey. Notes and sketches (if possible photographs) should be made of all areas requiring backflow protection
- Any existing or potential cross connections should be noted on the report
- Recommendations for corrective actions should also be documented and discussed with the owner
- The report should be signed by the inspector and countersigned by the owner who also keeps a copy
- A follow up inspection date should also be in the report
- If the surveyor discovers a situation where contaminants are in the process of or suspected of entering the distribution system they shall inform the utility immediately

The highest hazard survey should include as many of the above items as are required to determine the hazard rating of the property.

2.2 Update on Three Waters DIA Request for Information

Meeting:	Council Briefing
Date of meeting:	11 February 2021
Reporting officer:	Shelley Wharton (Manager Infrastructure Planning & Capital Works)

1 Purpose

The purpose of this report is to update Council on the process and outcomes of responding to the Department of Internal Affairs' Three Waters Request for Information.

2 Background

In July 2020, the Government announced a $761 million funding package to provide post COVID-19 stimulus to maintain and improve three waters infrastructure, support a three year programme of reform of local government water service delivery arrangements (reform programme), and support the establishment of Taumata Arowai, the new Water Services Regulator.

A joint Central/Local Government Three Waters Steering Committee has been established to provide oversight and guidance to support progress towards reform, and to assist in engaging with local government, iwi/ Māori, and other water sector stakeholders on options and proposals.

The reform programme is designed to support economic recovery, and address persistent systemic issues facing the three waters sector, through a combination of:

- Stimulating investment, to assist economic recovery through job creation, and maintain investment in water infrastructure renewals and maintenance; and
- Reforming current water service delivery, into larger scale providers, to realise significant economic, public health, environmental, and other benefits over the medium to long term

Initial funding from the stimulus package has been made available to those councils that agree to participate in the first stage of the reform programme through a Memorandum of Understanding.

Council resolved at the 27 August 2020 Council meeting to sign up to participate in the Memorandum of Understanding (MoU), along with all the other Councils in New Zealand. The MoU includes a requirement to share information.

As part of this MoU the Department of Internal Affairs (DIA) issued a detailed Request for Information (RFI) to all councils on 23 October 2020 with a response deadline of 1 February 2021. The RFI Guidance Document is attached for information.

3 Discussion

The DIA is using consultants from the Water Industry Commission for Scotland (WICS) and Ernst Young to gather and analyse data to inform the Three Waters Reform process. WICS provided the RFI templates, training and support to councils to complete the RFI.

Whangarei District Council (WDC) is in the group which had to provide more comprehensive information through completing Workbook 1.

A person from the Society of Local Government Managers (SOLGM) was allocated to each council to provide additional support throughout this RFI process.

The following is an outline of the process followed by WDC staff to complete the RFI:

- Infrastructure Managers undertook an initial review of the RFI questions to identify the people required.
- Due to the large amount of people, tasks, coordination and tight deadlines the RFI needed to be managed as a project.
- An RFI project team was established involving around 20 people from across the organisation plus external support as allowed for in the DIA stimulus funding.
- The project team was briefed, and then used the online training, guidance documents, supporting schedules and regular Q&A updates to ensure work was being done correctly to meet DIA's requirements.
- The project team met weekly to monitor and manage progress, allocate out work tasks, and update reports.
- Key staff attended the weekly online clinics and attended weekly meetings with WICS and SOLGM.
- Weekly progress reports were submitted to our SOLGM representative.
- Where possible we have worked collaboratively with Far North District Council and Kaipara District Council to support each other.
- Completed sections of the RFI spreadsheet were submitted for early review by WICS and Ernst Young. Feedback was responded to and data amended accordingly.
- Three versions of the full workbook were submitted during January for review by WICS and Ernst Young.
- The completed Final RFI was submitted ahead of deadline on Thursday 28 January 2020 as 5 documents:
    1. Final RFI Workbook 1 (excel spreadsheet)
    2. Attachment 1 – Organisation Charts
    3. Attachment 2 – Growth Strategy
    4. Attachment 3 – Infrastructure Strategy audited draft version for LTP 2021-31
    5. Attachment 4 – Infrastructure Asset Valuation Report as at June 2019

During February 2021 the data submitted will be analysed by DIA and their consultants. There may be further queries which WDC's project team will have to respond to up to the end of February.

Due to similar requests from a number of councils, each council will have a feedback session on their RFI response.

Overall the RFI has been an intense process, and a lot of work on top of 'business as usual' work. Much of the data requested is not normally reported on by WDC, which was challenging but also showed areas where better data could be used to inform infrastructure management and investment decision making. Both WICS and SOLGM gave us very positive comments about how we managed the Request for Information.

The DIA will use the information, analysis and any recommendations from their consultants to guide them in the next steps of the Three Waters Reform process. It is possible that

further requests for information could be sent to councils before the Memorandum of Understanding expires on 30 June 2021.

4 Attachments

DIA Three Waters Reform – Request for Information Guidance Document

Te Tari Taiwhenua
Internal Affairs

Three Waters Reform Programme

Request for information

23 October 2020

Guidance document

Te Tari Taiwhenua
Internal Affairs

Request for Information for the Three Waters Reform Programme

At a glance

1 The Crown has signed Memoranda of Understanding with all eligible local authorities and provided stimulus funding to support economic recovery and transform the delivery of three waters services. The Memoranda of Understanding included a commitment to share information to support the Three Waters Reform Programme.

2 The Department of Internal Affairs, in partnership with the Steering Committee, is seeking information from local authorities to support detailed modelling and analysis. This will enable informed decision-making as part of the Programme, and is consistent with the sector's desire for more detailed evidence at the local level.

3 We acknowledge the significant demands on local authorities at this time and have made support available to help them complete this Request for Information. This includes email helpdesk, webinars, regular updates, and technical support.

4 All local authorities must provide a base level of information to inform analysis of the policy, commercial and financial impacts, and advantages of reform.

5 A sample of local authorities have been selected to provide more detailed information to enable more applied analysis. Where they are able to do so, remaining local authorities are encouraged to provide this additional information. Greater levels of support, including more proactive and direct contact, will be provided to local authorities that were selected or choose to join the sample.

Te Tari Taiwhenua
Internal Affairs

Section 1: Overview

Context for this RfI

1. The Crown has signed Memoranda of Understanding (MoU) with all eligible local authorities to support improved three waters service delivery for communities, with the aim of realising significant public health, environmental, economic, and other benefits over the medium to long term.
2. As part of the Three Waters Reform Programme (the Reform Programme) MoU, the Crown has provided stimulus funding to support economic recovery post COVID-19 and address persistent systemic issues in the three waters sector.
3. During engagement with the sector between July and August 2020, a clear desire was expressed for more detailed modelling and analysis of the potential impacts and advantages of reform at a local level. The MoU also signalled there would be open sharing of information over the course of the Programme.

Purpose of this RfI

4. The purpose of this Request for Information (RfI) is to specify the information and data requirements signalled by the MoU. The information provided through the RfI process will inform the analysis to be undertaken by the Department of Internal Affairs (DIA) in partnership with the Three Waters Steering Committee (the Steering Committee), to advise Ministers on the relative merits of the water services delivery reform options.
5. The intention is to provide the outcomes of this analysis (including access to the underlying data), once this is complete. A process is currently underway to determine how this can implemented in a way that protects and maintains the confidentiality of information provided by local authorities.

The information being requested

6. The information requested in this RfI is required to support an additional level of detail in the analysis for the Programme.
7. DIA has commissioned work from specialist economic, financial, and commercial advisors to support this analysis, including:
    - Detailed economic modelling by the independent economic regulator for the Scottish water and wastewater industry, the Water Industry Commission for Scotland (WICS).
    - Financial and commercial modelling by Ernst & Young and Mafic Partners.
8. This analysis will provide a better understanding of the current state of the three waters related asset base, asset condition, the operating environment, commercial and financial arrangements, and the forecast investment plans. It will also help to identify the potential

impacts of reform on the local government sector relative to the status quo. These areas were consistently identified as needing further evidence and detailed cost and benefit modelling during workshops with the sector throughout July and August.

9. Table 1 summarises the requested information and its intended purpose.

Table 1: RfI Response Template information requested

Ref.	Section	Purpose	Description
AA	Qualitative	Analysis of commercial and charging arrangements, including asset management, financing, and service delivery. Analysis of current arrangements for funding, managing, and delivering stormwater systems.	• Pricing • Commercial contracts • Financing • Stormwater management • Infrastructure strategy • Land and asset valuations • Consents
A	Base information	Analysis of factors that could affect operating costs and future growth investment.	• Properties and population served • Water volumes and losses • Wastewater and storm water volumes and loads
B	Levels of service	Analysis of factors that impact on current levels of service and the scope for greater efficiency.	• Water availability • Pressure and interruptions • Wastewater flooding • Customer contact • Security of supply
C	Quality and environment outputs	Analysis of factors that impact on current levels of service and the scope for greater efficiency.	• Water quality compliance • Wastewater compliance
E	Operating costs and efficiency	Analysis of factors that impact on cost effectiveness and the scope for greater efficiency.	• Activity based costing for the water, wastewater, and stormwater • Information on the drivers of operating costs
F	Current and forecast financial information	Analysis to enable economic and financial modelling, and to understand potential commercial positions of the new entities.	• Profit and loss • Balance sheet • Cash flow statement • Analysis of revenue • Analysis of borrowing

Ref.	Section	Purpose	Description
G	Investment plan	Analysis of current levels of investment and the renewals backlog.	• Investment expenditure • Investment plan
J	Asset replacement	To test the estimates for economic depreciation.	• Replacement cost by asset type • Expected asset lives by asset type

Provision of more detailed information by selected local authorities

10. The request has been structured to enable more detailed economic analysis to be undertaken on a representative sample of councils. This approach will ensure we can undertake a robust analysis to inform the options for reform without placing significant demands on local authority resources.
11. Local authorities selected to form the representative sample were chosen to ensure an appropriate spread of local authority types, geographies, and underlying drivers of need. The following characteristics were considered when determining the representative sample:
    - Local authorities from the North and South Island
    - Local authorities from each Regional Council grouping
    - Local authorities with major population centres
    - Local authorities from metro, provincial and rural areas
    - Local authorities situated in areas of high population growth
    - Local authorities that have recently undertaken detailed surveys to inform reports
    - Local authorities that have already – or are in the process of – providing detailed information to WICS
    - Local authorities with materially lower or higher reported asset values or expenditure (e.g. unit operating expenditure)
    - Local authorities with access to funding from the Three Waters Infrastructure Fund.
12. A sampling approach has been taken in recognition of the greater information requirements placed on these local authorities.
13. Any local authority not selected as part of the representative sample is encouraged to consider whether they can provide the more detailed information sought. This will provide local authorities with more detailed evidence and modelling to improve understanding of the current state and its associated challenges. It will also support more informed decision-making at a local level as the Reform Programme progresses.

14. The local authorities selected for the representative sample are identified in Appendix 2.

15. Any local authorities that choose to provide more detailed information (leading to the subsequent completion of Workbook I), must communicate their decision by email to threewaters@dia.govt.nz by Friday, 6 November 2020.

Support available to local authorities to complete this request

16. DIA is conscious of the significance of this request and has taken steps to make support available to local authorities.

17. This support will include:

    - **Guidance materials** including this document, RfI Response Templates and RfI Supporting Schedules with instructions for completing the templates.
    - **Introductory webinars** to launch the RfI and guide local authorities through the requirements.
    - **An email helpdesk** for local authorities to send questions to. These questions will be directed to the relevant leads within DIA to respond.
    - **Pre-recorded guidance videos,** released in the first two weeks of the RfI process to guide local authorities through each section of the RfI Response Template.
    - **Weekly clinics** for local authorities to ask WICS and/or the relevant leads at DIA questions.

18. Some local authorities indicated in their Delivery Plans that they may apply stimulus funding to support their engagement with this work.

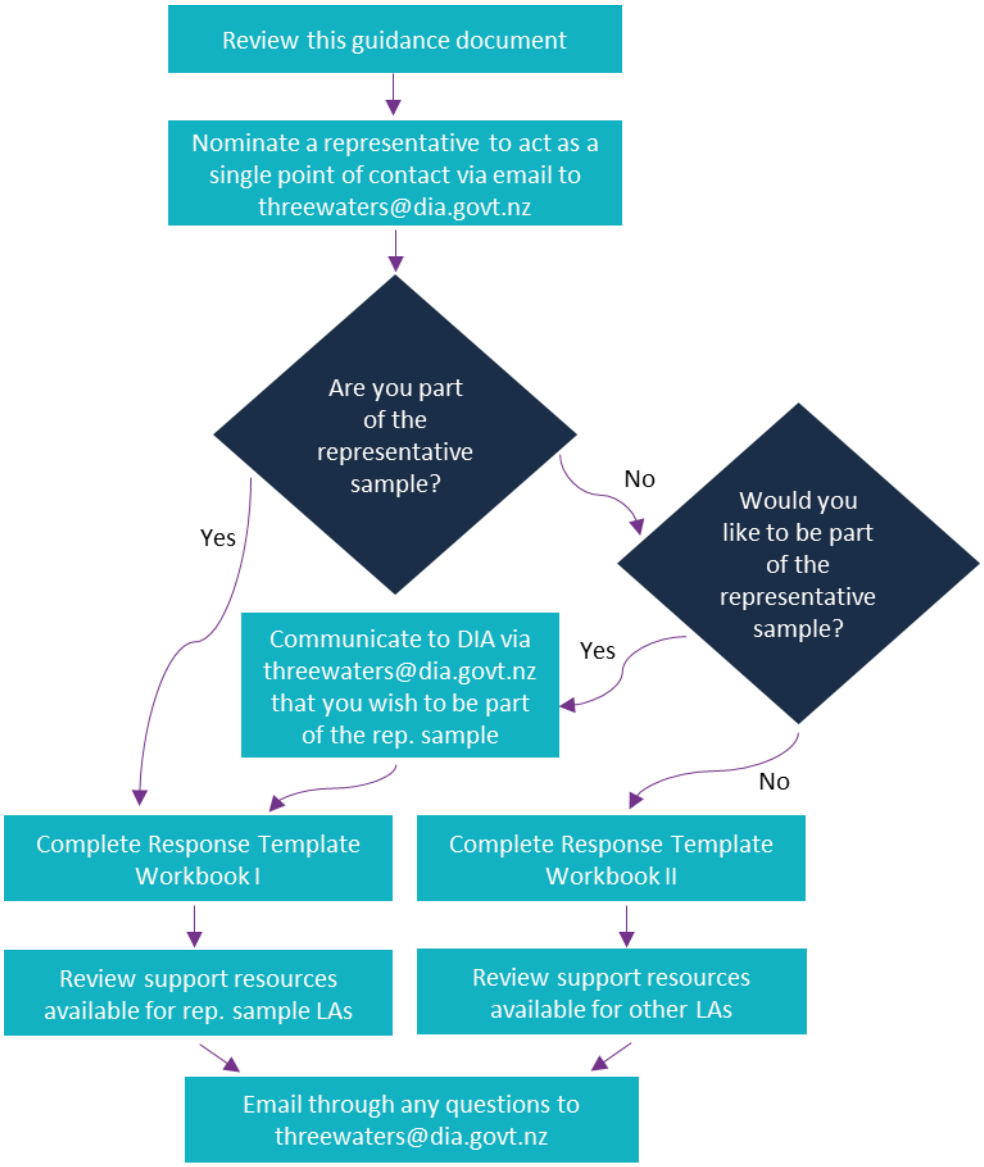
19. Any local authority may opt to redirect up to $60,000 of their Stimulus Funding toward acquiring resource to support its response to the RFI. To avoid doubt, this does not represent additional funding payable from the DIA to the local authority. Local authorities are not required to resubmit their Delivery Plan should they choose to do this. Should you choose to do this, a line item must be added to the Milestone Table recording the amount apportioned to support for the RfI process at the first quarterly report.

20. Local authorities may want to consider whether value would be derived from sharing resources across regions and multi-regions where this makes sense.

21. Local authorities selected for the representative sample will have access to more direct and proactive forms of support, for example, direct contact with technical advisers and ‘hands-on’ support with responding to the RfI. This recognises the greater requirements these local authorities will need to meet. This assistance will also be extended to other local authorities that choose to respond to the more detailed request.

22. The decision tree below is intended to provide clarity to local authorities on the relevant RfI Response Template Workbook to complete, and which support resources are available.

Figure 1: Decision tree



RfI timeline

23. Key dates for the RfI are summarised in Table 2.

24. We understand this timeline is challenging – in order to meet the Reform Programme deadlines set by Ministers, all local authorities must meet the dates specified below. Local authorities play a crucial part in this reform and carry significant responsibility. As such, we will endeavour to provide support through different mediums and work with local authorities to meet specified timelines. Receiving information on time will be critical to enable good decisions and will

significantly contribute towards the overall success of the Reform Programme.

Table 2: RfI timeline

RfI Process Items	Date
Webinar 1: Introducing the RfI	Wednesday, 21 October 2020 – 8:00 – 9.00
RfI released	**Friday, 23 October 2020**
Deadline for responses from local authorities who wish to respond to the more detailed information request	**Friday, 6 November 2020**
DIA providing support to local authorities for information requests	Wednesday, 21 October 2020 – Monday, 1 February 2021
Webinar 2: Overview of RfI Response Templates	Wednesday, 28 October 2020 – 9:00 – 10:00
Weekly clinics to provide additional guidance and an opportunity to ask questions	Tuesday, 3 November 2020 – Tuesday, 8 December 2020
Notifications for RfI updates or clarifications from DIA throughout the RfI period	Wednesday, 21 October 2020 – Monday, 1 February 2021
Deadline for questions to the nominated DIA inbox (threewaters@dia.govt.nz)	Friday, 22 January 2021
Response deadline (for all local authorities)	**Monday, 1 February 2021**
DIA to review RfI responses and ask clarification questions	Monday, 30 November 2020 – Friday, 26 February 2021

25. Both webinars will be recorded and be made available to all local authorities.
26. Separate recordings that provide guidance for each section of the RfI Response Templates will also be available on https://www.dia.govt.nz/Three-Waters-Reform-RfI, within two weeks following the release of the RfI.
27. In addition to the individual recordings, weekly clinics will be scheduled. Weekly clinics will be facilitated as an open forum for questions and answers and may include short presentations to address common issues and experiences. These provide a platform for local authorities to receive additional guidance and support. All clinics will be recorded and made available through https://www.dia.govt.nz/Three-Waters-Reform-RfI.

Table 3: Weekly clinic timeline

Date	Time
Tuesday, 3 Nov 2020	8am – 11am
Tuesday, 10-Nov 2020	8am – 11am
Tuesday, 17 Nov 2020	8am – 11am
Tuesday, 24 Nov 2020	8am – 11am
Tuesday, 1 Dec 2020	8am – 11am
Tuesday, 8 Dec 2020	8am – 11am

28. Clinics after 8 December will be scheduled on an ad-hoc basis and will respond to the needs, questions, and matters of significance raised by Local Authorities as the RfI progresses.

Submitting your response

29. In submitting your response, you must use the RfI Response Template provided. This is an Excel document that you can edit. Local authorities selected for the representative sample (and those choosing to provide more detailed information) must use **RfI Response Template Workbook I**. All other local authorities must use **RfI Response Template Workbook II**. Please check you have provided all information requested in the specified format.
30. Completed 'Request for Information Response Templates' should be sent to the following DIA email address with reference to "RfI" in the subject line: threewaters@dia.govt.nz
31. Due to the short timelines for reviewing the information provided, local authorities should submit the RfI Response Template upon completion i.e. do not wait until the due date.
32. Additionally, local authorities are encouraged to submit each section of the RfI template as these are completed. This may mean that you submit certain sections in advance of others.
33. Please ensure the completed RfI Response Template is submitted by the response deadline of **1 February 2021**. Further details on the Response Templates are provided in SECTION 2.

How to contact us?

34. If anything is unclear or you have any questions, please direct all enquiries to the following DIA email address with reference to "RfI" in the subject line: threewaters@dia.govt.nz
35. The enquiry will be directed to the most appropriate party and DIA will endeavour to respond to your request as soon as possible.

Our RfI process, terms, and conditions

36. By submitting the Response Templates, the local authority agrees to the terms contained in the RfI for the Programme in respect of all material submitted and all matters related to the RfI Response Template.

Next steps for local authorities

1) Read this guidance document and the response templates and review information on available on https://www.dia.govt.nz/Three-Waters-Reform-RfI
2) Send any questions about the templates, process or anything else to do with the RfI to threewaters@dia.govt.nz (please refer to "RfI' in the subject line)
3) Nominate a single representative responsible for co-ordinating the RfI response. Send their name and contact details to threewaters@dia.govt.nz
4) Attend the webinar to be held on Wednesday, 28 October 2020
5) Identify and make available the subject matter experts and key personnel within your organisation who have access to the information specified in this RfI
6) Begin filling out the response templates

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Section 2: RfI Response Templates and how to complete these

RfI Response Templates

37. The RfI Response Templates contain the data requests that are to be populated under this RfI.

38. There are two RfI Response Template Workbooks. Local authorities should only complete one workbook as shown below in Table 4. The local authorities selected for the representative sample are identified in Appendix 2.

39. As noted in SECTION 1, local authorities not selected as part of the representative sample can choose to provide more detailed information and complete Workbook I instead of Workbook II. Further information is shown in Figure 1 and Table 4 below.

Table 4: RfI Response Templates

Local authority	RfI Response Templates
Representative Sample local authorities Local authorities choosing to provide more detailed information	Workbook I
All other local authorities.	Workbook II

40. The table below provides an overview of the information requested in both Workbook I and Workbook II.

Table 5: Information requested (summary)

Template Reference	Section
AA	Qualitative information
A	Base information
B	Levels of service
C	Quality and environmental outputs
E	Operating costs and efficiency
F	Current and forecast financial information
G	Investment plan
J	Asset replacement

RfI Supporting Schedules

41. RfI Supporting Schedules have been developed to provide generic guidance for key elements within each section (e.g. section overview) and specific guidance for requests within each section where required (e.g. line by line definitions).

42. It is important that each section of the RfI Response Template is completed in conjunction with reading the RfI Supporting Schedules.

Template personnel completion

43. In completing the RfI Response Templates, we recognise a variety of people across different areas of expertise, functions and roles may be required. For example: Utilities Data Analysts, Water and Wastewater Engineers and Asset Managers, Finance Officers, Strategic Planning Consultants, Customer Service, and IT staff involved in GIS and asset information systems.

44. To facilitate the completion of the templates effectively, it is recommended that each local authority identify a co-ordinator to gather information from all personnel involved (refer to the point above). Having one person completing the RfI Response Templates will ensure a consistent approach to gathering and providing the information.

Template requirements

45. The RfI Response Template contains detailed instructions to aid completion. A summary of these instructions is provided in the table below.

Table 6: Summary of instructions - summary template

	Description
1	

Colour	Description	LA Input cell (insert data)	Calculation cell (do not alter)
	Orange cells indicate where relevant data should be inputted, including supplementary commentary.	✓	
	Yellow cells indicate data input fields that are also requested by the 2020 Water New Zealand, National performance review and for those local authorities who are participating in the NPR. If applicable, the NPR reference is provided in dark grey cells to the right-hand side of the worksheet.	✓	
	Green cells indicate where local authorities must select from the dropdown menu.	✓	
	Light grey cells indicate where local authorities input the sources of the information provided. This will help with potential queries on specific line items in the quality assurance process, and any future process of a similar nature.	✓	
	Blue cells indicate where cells lookup information contained in other worksheets.		✓

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	Description			
		Pink cells indicate calculations. Do not alter these cells.		✓
		Dark grey cells. Do not use or alter these cells.		✓
	Ok	Worksheet and Template level error check cells, do not alter these cells.		✓

2	Local authorities must only input data or formulae into any cells shaded in orange, yellow, green or light grey. All orange, yellow and green highlighted cells must contain a response.
3	Local authorities must select a response from the drop-down box in any cells shaded green.
4	All inputs should be provided in accordance with the unit and time period defined in each tab.
5	All monetary values should be entered in New Zealand Dollars as indicated by the unit for each item required.
6	If there are insufficient rows within the RfI Response Template, it is expected that the local authorities will add rows as required, noting all changes, and ensuring that the totals and summary worksheets remain accurate.
7	Local authorities should add supporting explanatory notes in the in the orange 'comment' and light grey 'further notes' cells provided to add explanatory comments and provide details on any assumptions used.
8	The 'Units' field describes the intended Unit required for each response. For example, a Unit that states $'000 requires monetary values to presented in thousands. The units are described in each Supporting Schedule.
9	Field Types described the purpose of each line item. A Field Type of 'C' denotes calculated fields and 'I' denotes where inputs are required. Additional detail on the Field Types is provided in the Supporting Guidance where relevant.

Confidence grades

46. This RfI includes a confidence grading system which requires local authorities to apply a level of confidence to each request.

47. The confidence grade system has been developed to provide a reasoned basis for local authorities to qualify information in respect to reliability and accuracy. It is essential that proper care and a high level of application is given to the assignment of confidence grades to data requiring such annexation.

48. The confidence grading has two elements:

    - Reliability bands (A to D); and
    - Accuracy bands (1 to 6).

49. The reliability bands are assigned according to the source of the information.

Table 7: Confidence levels

Reliability Band	Description
A	Sound textual records, procedures, investigations, or analysis properly documented and recognised as the best method of assessment.
B	As for 'A' but with minor shortcomings. Examples include old assessment, some missing documentation, some reliance on unconfirmed reports, or some use of extrapolation.
C	Extrapolation from limited sample for which Grade A or B data is available.
D	Unconfirmed verbal reports, cursory inspections, or analysis.

50. Accuracy bands provide the margin of error around the central estimate.

Table 8: Accuracy bands

Accuracy Band	Accuracy to or within +/-
1	1%
2	5%
3	10%
4	25%
5	50%
6	100%
X*	Accuracy outside +/- 100 %, zero or small numbers or otherwise incompatible, see example below.

* The X grade is only likely to be appropriate where a zero has been entered.

51. The overall confidence grade is a combination of the reliability and accuracy band. For example:

- A2: Data based on sound records etc. (A, highly reliable) and estimated to be within +/- 5% (accuracy band 2);
- C4: Data based on extrapolation from a limited sample (C, unreliable) and estimated to be within +/- 25% (accuracy band 4);
- AX: Data based on sound records etc. (A, highly reliable) but value too small to calculate any meaningful accuracy percentage.

52. Certain reliability and accuracy band combinations are considered to be incompatible; for example, A5 and A6 or D1 and D2.

53. When selecting a confidence grade from the drop-down boxes provided in the template, you must include explanatory comments for responses with lower confidence levels in the Comments Field.

Information source

54. Each line item in the RfI Response Templates contains a light grey cell for the local authority to insert the source of the information used to populate each respective field. It is recommended that these cells are completed for each request. This will help with potential queries on specific line items in the quality assurance process, and any future process of a similar nature.

Comments and further notes

55. Each request line in the RfI Response Template include a comments box. This comment box provides an opportunity for local authorities to add explanatory commentary to identify the key assumptions underpinning each response. It also provides an opportunity for local authorities to add explanatory comments to support their response.

56. Local authorities are encouraged to use this as a means of providing broader context and justification around the way in which the responses have been filled.

57. For example, if there is a request to provide information in respect of assets or services that cross boundaries or are shared between local authorities (e.g. a wastewater treatment plant), the assumptions or proportion of the asset or service for your local authority should be included and noted in the template response comment field.

58. A light grey text box at the bottom of each worksheet provides an opportunity to add further notes where require

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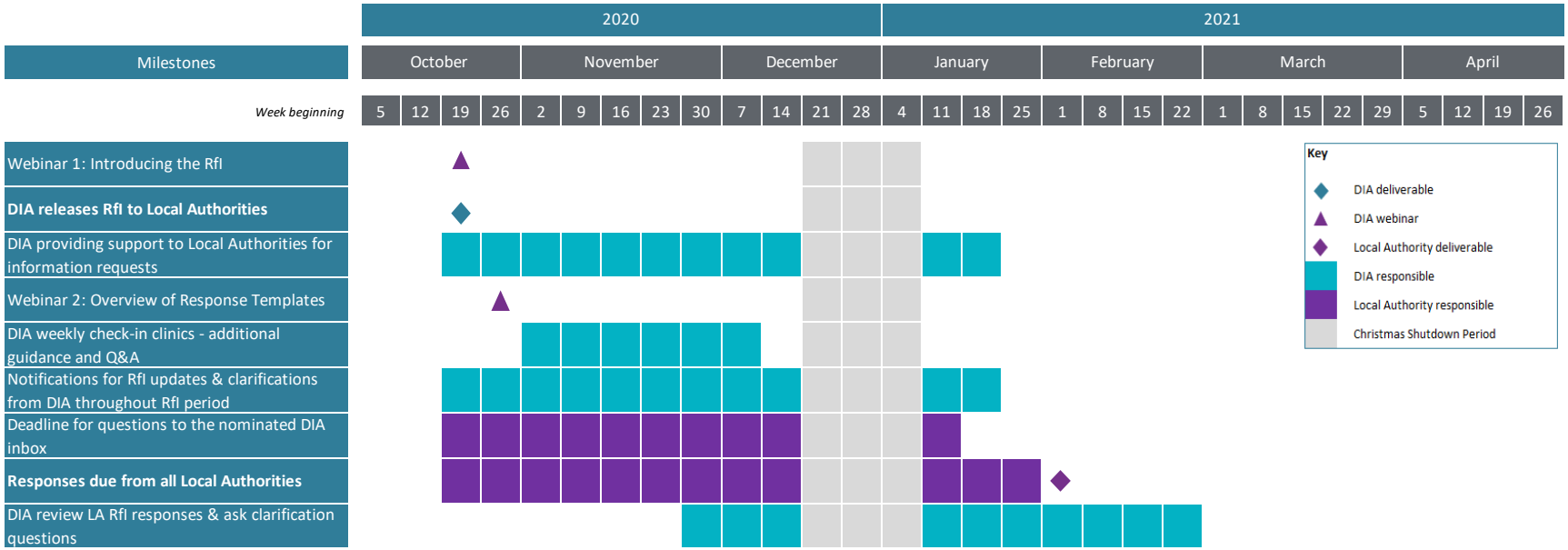
SECTION 3: RfI process and support available to local authorities

Timeline

59. The chart below presents the timeline visually.



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Pre-submission of RfI

RfI notices

60. All notices to a local authority in relation to this RfI (local authority notice) will be sent via email to the local authority's nominated representative for the RfI. Local authority notices will be consecutively numbered and will form part of the RfI.

61. Where DIA makes clarifications or changes to this RfI:

    - It will advise all local authorities by way of Notice
    - The response deadline may be extended (at the sole discretion of DIA).

Support provided to all local authorities

62. Support will be made available for local authorities to engage in this RfI process. This includes:

    - **Guidance materials** including this document, RfI Response Templates and RfI Supporting Schedules with instructions for completing the response templates.
    - **Introductory webinars** to launch the RfI and guide Local Authorities through the requirements.
    - **An email helpdesk** for Local Authorities to send questions to. These questions will be directed to the relevant leads within DIA to respond.
    - **Pre-recorded guidance videos,** released in the first two weeks of the RfI process to guide Local Authorities through each section of the RfI template.
    - **Weekly clinics** for Local Authorities to ask WICS and/or the relevant leads at DIA questions.

Table 9: Virtual briefings detail

Virtual briefings	Intended audience	Content	Date
Webinar 1: Introducing the RfI	• Chief Executives • Asset Managers • Technical CFOs • Strategic planning team.	During this webinar, DIA will provide context around the RfI, the RfI process, and the RfI Response Templates.	Wednesday, 21 October 2020 – 8:00 – 9:00
Webinar 2: Overview of RfI Response Templates	• Asset Managers • Technical CFOs • Strategic planning team.	During this webinar WICS will provide further technical detail on the RfI and what the data requested will be used for.	Wednesday, 28 October 2020 – 9:00 – 10:00
Weekly clinics	• Asset Managers • Technical CFOs • Strategic planning team.	Weekly clinics to provide additional guidance and an opportunity to ask questions.	Tuesday, 3 November 2020 – Tuesday, 8 December 2020

63. All webinar recordings, template recordings, updates, supporting guidance and frequently asked questions will be available in the RfI section on the official Three Waters Reform website at https://www.dia.govt.nz/Three-Waters-Reform-RfI

Support provided to local authorities that provide the more detailed information

64. Local authorities selected for the representative sample will have access to more direct and proactive forms of support, for example direct contact with technical advisers and 'hands-on' support with responding to the RfI. This recognises the greater requirements these local authorities will need to meet.

65. This assistance will also be extended to other local authorities that choose to respond to the more detailed request.

66. Local authorities will have direct access to expert advice from the Water Industry Commission for Scotland (WICS), the independent economic water regulator in Scotland. This will allow for one-to-one phone and video calls to ask questions about the templates, the analysis this will be used for and guidance on how to prepare responses. WICS bring a wealth of experience and expertise, not only from their experience in Scotland, but from having undertaken improvement processes for providers in other jurisdictions.

67. Local authorities will also have access to more proactive, on-the-ground support sector support. This will involve face-to-face engagements at a local and regional level, weekly engagement throughout the RfI period, and on-call support to help resolve any issues or questions.

Using stimulus funding to support the RfI

68. Some local authorities indicated in their Delivery Plans that they may apply stimulus funding to support their engagement with this work.

69. Any local authority may opt to redirect up to $60,000 of their Stimulus Funding toward acquiring resource to support its response to the RfI. To avoid doubt, this does not represent additional funding payable from the DIA to the local authority. Local authorities are not required to resubmit their Delivery Plan should they choose to do this. Should you choose to do this, a line item must be added to the Milestone Table recording the amount apportioned to support for the RfI process at the first quarterly report.

70. Local authorities may want to consider whether value would be derived from sharing resources across regions and multi-regions where this makes sense.

Clarification questions

71. If local authorities have questions, or if there is perceived ambiguity in the RfI documents, they should seek clarification from DIA. All requests for clarification must be sent to the nominated DIA inbox threewaters@dia.govt.nz DIA will co-ordinate and distribute the request to the most appropriate party and endeavour to respond to the local authority's request as quickly as possible.

72. If the request is of sufficient importance to all local authorities, specific guidance will be provided during a future weekly clinic.

73. In certain circumstances, DIA may also provide details of the question and answer to all local authorities. In doing so DIA may summarise the local authority's question on the Q&A Repository and will not disclose the local authority's identity.

Response submission

How to submit a response

74. Completed 'Request for Information Response Templates' should be sent to the nominated DIA inbox: threewaters@dia.govt.nz

75. Each local authority is responsible for ensuring that its response is received by DIA at threewaters@dia.govt.nz on or before the deadline for responses of **1 February 2021**. DIA will acknowledge receipt of each response.

76. DIA intends to rely on all information provided by the local authority. In submitting a response, local authorities must check that all information is:

    - True, accurate within a confidence grade and complete and not misleading in any material respect; and
    - Does not contain material that will breach a third party's intellectual property rights.

77. If a local authority is unable to complete any part of the template requested due to insufficient available information or uncertainty, the local authority is encouraged to raise a query to the nominated DIA

inbox and we will endeavour to respond to the query in a timely manner or put you in contact with the party best able to assist with resolving the query.

Submitting information before the response deadline

78. Due to the short timelines for reviewing the information provided, local authorities should submit each Template Section of the RfI as they areready. This may mean that you submit certain sections in advance of others.

79. Please ensure that all templates are submitted by the response deadlines.

Review phase

80. After receiving the submissions, DIA and its advisors will review the information provided by the local authority. DIA may reach out to the local authority with clarification questions. The local authority should provide the clarification or additional information in the format requested and in a timely manner.

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SECTION 4: Response requirements

82. This section specifies the basis upon which each local authority is required to submit their information. It is important that each local authority complies with the information and instructions provided below to support consistency in the information review.

83. To enable the DIA to review and analyse each response in an efficient and effective manner, each local authority is required to comply with the following instructions for its response.

Compliant response

84. We ask that local authorities submit a compliant response:

- Adhere to the response formats specified in each section of this RfI, including using the RfI Response Templates and supporting guidance where provided, and clearly referencing the response to specific questions for ease of evaluation.
- Responses must be sufficiently detailed to enable assessment by the DIA without requiring further clarification or information from the local authority.

Local authority details

85. Each local authority is required to nominate a single representative who will be responsible for co-ordinating the RfI response and send their name and contact details to threewaters@dia.govt.nz

Intellectual Property and ownership

86. Following submission, any responses submitted to DIA as part of this RfI will become the physical property of DIA and will not be returned to the local authority.

87. Subject to paragraph 68 below, DIA owns all intellectual property in the document, the RfI templates and any related guidance document.

88. The local authority may retain its intellectual property rights in the material it submits as part of its response to this RfI. However, subject to any confidentiality obligations below, it grants DIA (and its employees, agents, suppliers and contractors) a non-exclusive, perpetual licence to retain, use, copy, and disclose such material for any purpose related to the RfI process, the wider reform or any related activities as described in this request for information.

Confidentiality

89. For the purposes of this document and any response templates, Confidential Information means information that is marked as “confidential” or “commercial in confidence” by the local authority. Local authorities agree to only mark information this way if they consider they would withhold such information under section 7 of the Local Government Official Information and Meetings Act 1987 should it be requested under that Act. To avoid doubt, such assessment will

not be the deciding factor should DIA be asked to release the Confidential Information under an Official Information Act 1982 request.

90. DIA, and its employees, agents, suppliers, and contractors may use, copy, or disclose any and all information (other than Confidential Information) provided by the local authority in relation to this RfI for any of the purposes described in this RfI. To avoid doubt this includes the right to share such information with:

    - All economic, financial, commercial, legal, other advisors, and suppliers
    - Other local authorities and local body entities
    - Ministers
    - Other public sector agencies

91. DIA will not disclose Confidential Information to any person or organisation unless:

    - That person or organisation is an employee, agent, supplier, or contractor who needs to know the information in order to perform tasks in relation to one of the purposes described in this request for information, on a strict no share basis
    - The Confidential Information has become public knowledge by no fault of DIA
    - The local authority gives DIA prior written approval to make the disclosure
    - The Confidential Information is included in an aggregated dataset that does not identify the individual data
    - The disclosure of Confidential Information is required under the Official Information Act 1982, the Local Government Official Information or Meetings Act 1987, or under a Parliamentary process, provided DIA will give the local authority as much advance notice as possible of the disclosure

92. DIA reserves the right to verify any details provided in response to the RfI. Local authorities should note that verification may involve having the details audited by DIA appointed auditors.

93. When writing any Cabinet paper, or other official document, DIA may use information provided by a local authority within the terms of this provision without attributing that information to the local authority.

94. All information provided (including Confidential Information) is subject to release under the Official Information Act 1982, the Local Government Official Information or Meetings Act 1987, or as a result of a Parliamentary question or process. DIA will advise the local authority of such questions as they arise, but the views of the local authority will not be determinative in deciding whether or not to release.

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Appendix 1. Glossary

96. Capitalised terms used in this RfI and defined in the glossary have the meanings given to them below.

Table 10: Glossary

Term	Description
DIA	Department of Internal Affairs
MoU	Memorandum of Understanding
NPR	Water New Zealand National Performance Review
Reform Programme	Three Waters Reform Programme
RfI	Request for Information
RfI Notices	A written notice which will be issued by DIA to all local authorities.
RfI Supporting Schedules	General and specific guidance provided to complete the RfI Response Template. Please ensure the RfI Supporting Schedules are read in line with the RfI Response Template.
RfI Response Template	The Excel template which local authorities should use to submit the information requested.
WICS	Water Industry Commission of Scotland

Appendix 2. Local authorities

97. The table below sets out those local authorities that are selected to be part of the Representative Sample and to complete RfI Response Template Workbook I. Unless choosing to provide more detailed information in Workbook I, the other local authorities are to complete RfI Response Template Workbook II.

Table 11: Local authorities

#	Local authority	Territory	Island	LGNZ classification	Rep. sample Workbook I	Other LAs Workbook II
1	Ashburton	Canterbury	South	Provincial		✓
2	Auckland	Auckland	South	Metro	✓	
3	Buller	West Coast	North	Rural		✓
4	Carterton	Wellington	South	Rural		✓
5	Central Hawke's Bay	Hawke's Bay	North	Rural	✓	
6	Central Otago	Otago	North	Provincial	✓	
7	Chatham Islands	Chatham Islands	South	Rural		✓
8	Christchurch	Canterbury	South	Metro	✓	
9	Clutha	Otago	South	Rural	✓	
10	Dunedin	Otago	South	Metro	✓	
11	Far North	Northland	South	Provincial	✓	
12	Gisborne	Gisborne	North	Provincial	✓	
13	Gore	Southland	North	Rural	✓	
14	Greater Wellington	Wellington region	North	Regional		✓
15	Grey	West Coast	South	Rural		✓
16	Hamilton	Waikato	South	Metro	✓	
17	Hastings	Hawke's Bay	North	Provincial	✓	
18	Hauraki	Waikato	North	Rural		✓
19	Horowhenua	Manawatu-Wanganui	North	Provincial		✓
20	Hurunui	Canterbury	North	Rural		✓
21	Hutt City	Wellington	North	Metro	✓	
22	Invercargill	Southland	South	Provincial	✓	
23	Kaikoura	Canterbury	South	Rural		✓
24	Kaipara	Northland	South	Provincial		✓
25	Kapiti Coast	Wellington	North	Provincial	✓	
26	Kawerau	Bay of Plenty	North	Rural		✓
27	Mackenzie	Canterbury	North	Rural		✓
28	Manawatu	Manawatu-Wanganui	South	Provincial	✓	
29	Marlborough	Marlborough	North	Provincial		✓

#	Local authority	Territory	Island	LGNZ classification	Rep. sample Workbook I	Other LAs Workbook II
30	Masterton	Wellington	South	Provincial		✓
31	Matamata-Piako	Waikato	North	Provincial		✓
32	Napier	Hawke's Bay	North	Provincial	✓	
33	Nelson	Nelson	North	Provincial	✓	
34	New Plymouth	Taranaki	South	Provincial	✓	
35	Opotiki	Bay of Plenty	North	Rural		✓
36	Otorohanga	Waikato	North	Rural	✓	
37	Palmerston North	Manawatu-Wanganui	North	Metro	✓	
38	Porirua	Wellington	North	Metro	✓	
39	Queenstown Lakes	Otago	North	Metro	✓	
40	Rangitikei	Manawatu-Wanganui / Hawke's Bay	South	Rural		✓
41	Rotorua Lakes	Waikato/BoP	North	Provincial	✓	
42	Ruapehu	Manawatu-Wanganui	North	Rural		✓
43	Selwyn	Canterbury	North	Provincial		✓
44	South Taranaki	Taranaki	South	Provincial		✓
45	South Waikato	Waikato	North	Provincial		✓
46	South Wairarapa	Wellington	North	Rural	✓	
47	Southland	Southland	North	Provincial	✓	
48	Stratford	Taranaki/M-W	South	Rural		✓
49	Tararua	Manawatu-Wanganui	North	Rural		✓
50	Tasman	Tasman	North	Provincial	✓	
51	Taupo	Bay of Plenty	South	Provincial		✓
52	Tauranga	Bay of Plenty (BoP)	North	Metro	✓	
53	Thames-Coromandel	Waikato	North	Provincial		✓
54	Timaru	Canterbury	North	Provincial	✓	
55	Upper Hutt	Wellington	South	Metro	✓	
56	Waikato	Hamilton	North	Provincial	✓	
57	Waimakariri	Canterbury	North	Provincial	✓	
58	Waimate	Canterbury / Otago	South	Rural	✓	
59	Waipa	Waikato	South	Provincial		✓
60	Wairoa	Hawke's Bay	North	Rural	✓	
61	Waitaki	Canterbury	North	Provincial		✓
62	Waitomo	Waikato	South	Rural		✓

#	Local authority	Territory	Island	LGNZ classification	Rep. sample Workbook I	Other LAs Workbook II
63	Wellington	Wellington	North	Metro	✓	
64	Western Bay of Plenty	Bay of Plenty	North	Provincial	✓	
65	Westland	West Coast	North	Rural		✓
66	Whakatane	Bay of Plenty	South	Provincial		✓
67	Whanganui	Manawatu-Wanganui	North	Provincial	✓	
	Whangarei	Northland	North	Metro	✓	

2.3. Whangarei Airport Location Option Study Briefing

Meeting:	Council Briefing
Date of meeting:	11 February 2021
Reporting officer:	Simon Weston (General Manager Infrastructure)

1 Purpose

To provide a background information update to council of the Whangarei Airport Location Option Study project.

2 Background

Concerns raised in 2014 regarding the long-term suitability of the Onerahi Airport to meet the future needs of the district and Northland region resulted in a strategic review of the Whangarei District Airport at Onerahi.

This report is to provide an update on the background information of the project, to date.

This update will be provided at the meeting via presentation.