Backflow Prevention and Cross-connection Control

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Associated Policies/Documents: Refer Part 5 of policy

Responsible Owner: Manager – Water Asset Planning & Development

Record Number: POL24/143

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1. Policy Purpose

The objectives of this policy are:

- To minimise public health risk
- To separate and protect the quality of the drinking water supply in Council's water reticulation system from real or potential hazards
- To ensure cross-connection control is properly managed within properties
- To define responsibilities for plumbers and property owners

2. Objectives

2.1 Policy Statement

As drinking water quality standards have increased across Australia due to community expectations, a greater focus has been given to the prevention of contamination of water reticulation systems.

State Government and Australian Standards have regulated cross-connection control and backflow prevention for a long period of time. The commencement of the Plumbing and Drainage Act 2011 established NSW Fair Trading as the single plumbing and drainage regulator in NSW. Shoalhaven City Council, under delegation from NSW Fair Trading, is required to take measures to ensure compliance and assist in the protection of public health.

Shoalhaven City Council is the statutory authority responsible under the Local Government Act 1993 for water supply in the City of Shoalhaven. "Council" in this document refers to "Shoalhaven City Council".

This policy forms part of the conditions for approval to draw water from the Council drinking water supply under Section 68 Part B (2) of the Local Government Act 1993.

3. Definitions

Term	Meaning
Backflow	• Flow in a direction contrary to the normal or intended direction of flow; and/or • The unintended flow of water from a potentially polluted source into a drinking water supply. Backflow generally occurs from a property to the water supply system in instances where there is a pressure differential between the water main and the property and can occur as back siphonage or back pressure.
Back siphonage	Reversal of flow of water caused by negative pressure in the distributing pipes of a water service or supply. Occurs when the water supply pressure falls below atmospheric pressure, usually due to a break in the water main, or if there is a significant draw on the water supply e.g., through firefighting activities.

Back pressure	A reversal of water flow caused by the downstream pressure becoming greater than the supply pressure. Occurs where the pressure downstream (within a property) becomes greater than the pressure upstream i.e., a property's water pressure is greater than the main water supply.
Backflow Prevention Device	A device to prevent the reverse flow of water from a potentially polluted source into the drinking water supply system or Network Utility Operator's water supply. The device is either testable or non-testable. Only testable devices are required to be registered with Council. For typical household meters, backflow is prevented through a non-testable backflow device integrated with the water meter.
Cross-connection	Any connection or arrangement, physical or otherwise, between any drinking water supply system either directly or indirectly connected to a water main, and any fixture, storage tank, receptacle, equipment, or device through which it may be possible for any non-drinking, used, unclean, polluted, or contaminated water, or any other substance, to enter any part of the drinking water system under any conditions.
Cross-connection control	The control of risk to mitigate potential contamination into the drinking water supply system or Network Utility Operator's water supply.
Standards	When used in this policy refer to Codes, Australian Standards, and Legislation listed in Section 5 of this policy.
NCC	National Construction Code
PCA	Plumbing Code of Australia. The PCA is Volume 3 of the National Construction Code (NCC) issued by the Australian Building Codes Board (ABCB).
Hazard Ratings	A level of potential toxicity that may cause contamination in a drinking water system, having a rating of *Low Hazard, Medium Hazard or High Hazard*, determined in accordance with NCC Volume 3. • *High hazard* - Any conditions, device, or practice which in connection with the water supply has potential to cause death • *Medium hazard* - Any condition, device, or practice which in connection with the water supply has the potential to endanger health • *Low hazard* - Any condition, device, or practice which in connection with the water supply would constitute a nuisance but not endanger health or cause injury
NUO	Network Utility Operator (as defined in the PCA).

	Shoalhaven Water, Council's Water Utility, is the NUO referenced in this policy.
Individual Backflow Protection	The installation of a backflow prevention device at the point where a water service connects to a single fixture or appliance.
Zone Backflow Protection	The installation of a backflow prevention device at the point where a water service is connected to multiple fixtures or appliance, with no backflow prevention device installed as individual protection downstream of this point.
Containment Backflow Protection	The installation of a backflow prevention device at the point of connection of a Network Utility Operator's water supply to a site. A containment device is installed immediately downstream of the water meter(s) serving a property.

4. Roles and Responsibilities

4.1 Provisions

4.1.1 Cross-connection Control

Only drinking water shall be supplied to plumbing fixtures or outlets used for drinking, bathing, culinary use, or the processing of food, medical or pharmaceutical products. All water supply systems shall be designed, installed, and maintained to prevent contaminants from being introduced into drinking water supply systems.

No device or system that may permit the introduction of any foreign substance into the water service shall be connected directly or indirectly to any other part of the water supply system (including fire protection, garden watering and irrigating systems) or to any temporary attachment to the water service without a method of cross-connection control and backflow prevention.

4.1.2 Backflow Prevention Assessment

Cross-connections and Backflow Prevention requirements are to be assessed and Individual, Zone and Containment Hazard Ratings determined in accordance with the PCA and AS/NZS 3500.1.

Backflow prevention devices shall then be selected and installed in accordance with the PCA and AS3500.1.

Containment protection hazard ratings are required to be determined according to the NCC building classification and in accordance with the PCA (currently in Specification 41).

Council, as the NUO, prescribes the following variations to the PCA for containment protection:

- All class 7b buildings are deemed high hazard.
- Containment hazard is considered the same as the highest hazard posed within the site. For example, a hose tap at a grease arrestor requires a high hazard device, therefore the backflow prevention device required for containment protection is also required to be a high hazard device.

- Premises where the hazard is unknown or where inspection is restricted, such as self-storage facilities, are deemed high hazard.
- Where a building has multiple building classifications (in accordance with the NCC) or the premise contains more than 1 building, each having different building classifications (in accordance with the NCC), the building classification with the highest hazard rating will be used to determine containment protection.
- Any premises with a fire service shall comply with Section 4.1.8 of this policy.

Where potential for cross-connection may occur between subdivided or strata properties, appropriate backflow devices must be fitted for site containment at each strata property. Such devices must be consistent with the highest hazard rating within the strata properties.

Council may at any time, where it deems necessary, require that a formal assessment in the form of a backflow survey be undertaken or require that backflow prevention device/s be installed.

4.1.3 Backflow Survey

Council requires a backflow survey to be submitted as required by a condition of a development application, complying development certificate, Shoalhaven Water Certificate of Compliance/Water Development Notice or as deemed necessary in accordance with Section 4.1.2 of this policy.

Council requires the backflow survey to be undertaken by an accredited backflow plumber or a hydraulic consultant/engineer and submitted in writing to Council. The survey shall include the following information:

- Hydraulic consultant or plumber's name, address, and qualifications (e.g., license no.)
- Address of the property being surveyed
- Building classification of the buildings/structures on the property, determined in accordance with the NCC
- Hazard rating/s within the premises
- Type and location of proposed device/s, and
- Certify that the hazard rating, type, and location of devices have been determined, selected, and located in accordance with the PCA and AS/NZS 3500.1

For large or complex sites, the survey shall be accompanied by a hydraulic plan showing location and type of backflow devices proposed.

The results of the survey shall be ratified by Council prior to installation, and written acknowledgement will be provided to the customer on acceptance of the survey.

Backflow prevention devices specified on the survey are to be installed, tested, and registered with Council prior to occupation or commencement of the approved use or within the timeframe specified in the acknowledgment.

4.1.4 Initial Installation and Registration of Backflow Devices

The property owner must undertake the necessary arrangements to install, test and register backflow devices in accordance with the Standards and this policy by:

- Engaging a licensed plumber for installation of such devices

- Submitting a Certificate of Compliance (CoC) for plumbing and drainage works in accordance with the Plumbing and Drainage Act 2011, referencing the serial numbers of all new testable device/s
- Engaging a licensed, accredited backflow plumber authorised by Council for testing of such devices
- Ensuring the submission to Council of an initial test report for each testable device installed on the property to initiate the registration process
- Payment of the fee for inspection of the installation and initial registration of the device(s) installed. Please note: Additional inspection fees may be applied where further inspections are required due to non-compliance with the installation requirements of the Standards (Refer Section 4.1.12 – Plumber Responsibilities)

The month of the initial test date becomes the anniversary month for annual testing purposes.

4.1.5 Annual Registration, Testing and Maintenance of Backflow Devices

All testable backflow prevention devices are required to be tested at intervals not exceeding twelve (12) months.

Each year the property owner(s) must ensure that all testable devices are tested by the designated anniversary date and are maintained if required.

Council shall give notice to the property owner(s), or their designated contact person, approximately four (4) weeks in advance of when annual testing and certification of devices is required and due. The notice will include the annual registration fee.

Testing, and maintenance where necessary, must be carried out by a licensed accredited backflow plumber in accordance with the Standards. Results of the testing and maintenance must be submitted in the form of a test report compliant with the AS/NZS 2548.3 and must be forwarded to Council once completed and prior to the test due date. Council must be advised if the results cannot be forwarded due to a delay with maintenance or replacement.

Where a containment device has been replaced, an inspection of the installation of the replacement device will be carried out by Council to ensure compliance with the Standards.

A CoC shall be provided by the installing plumber for all replacement devices (containment, individual and Zone devices).

Annual registration of the device shall be deemed completed when:

- The test report has been received, reviewed, and accepted by Council, and
- Installation of any replacement device/s is compliant, and a CoC has been submitted for any such device, and
- Payment of the annual registration fee has been received.

Where the review by Council finds that the test report results or details or installation do not comply with the requirements of the standard, the report will be rejected, and registration will not be completed. The responsible plumber and/or property owner/representative will be advised to rectify.

Formal notice will be issued if the test reports for all devices on a property have not been received, or registration has not been completed within two (2) weeks of the due date. A late fee will apply for

each four (4) week period (or part thereof) overdue, for each outstanding device, until registration is complete. Council may also act in accordance with clause 4.1.6.

4.1.6 Failure to Install, Register, Test or Maintain Devices

Where an owner has failed to ensure installation, registration, testing or maintenance of backflow prevention devices(s), Council may do one or more of the following (as applicable):

- Send formal notification and issue a late fee, per device, for each four-week period overdue
- Test the device and charge a fee to the property owner
- Correct the installation configuration of a device in line with the requirements of the Standards and pass the cost of the works on to the property owner
- Apply a water flow restrictor to the metered water service for the property, and charge a fee for the removal of the restrictor
- Disconnect the water service if Council believes that the hazard presented by the activities on the property presents an unacceptable risk to the water supply and charge a fee for the disconnection/reconnection.

Where a plumber has failed to install, test, or submit test reports for backflow prevention device/s in accordance with the Standards, Council may do the following (as applicable):

- Send formal notification to rectify the non-compliance
- Issue a defect notice in accordance with the Plumbing and Drainage Act 2011
- Charge a reinspection fee directly to the plumber
- Refuse to accept test reports from a plumber or remove a plumber from Council's list of accredited backflow plumbers (usually where there have been recurrent issues)
- Issue Penalty Infringement Notices in accordance with relevant legislation

4.1.7 Removal or Change of Device

If the process or activity at the premises has changed and the hazard rating changes, the property owner must submit a backflow survey in accordance with section 4.1.3 of this policy. In addition to the requirements of section 4.1.3, the survey shall identify the reason for such change of hazard rating. The results of the survey shall be ratified by Council prior to removal, installation or modification of the device, and written acknowledgement will be provided to the customer on acceptance of the survey.

At any time where a device is added, removed, or changed, council must be advised in writing.

4.1.8 Fire Service Requirements

Owners of properties with separate hydrant and sprinkler fire services must install a testable double check detector assembly (DCDA). The device must be installed close to where the water service crosses the property boundary and upstream of any booster assembly or off-take.

Isolation valves must be installed in accordance with AS2419.1 and shall be full-flow outside screw and yoke wheel-operated gate valves of the indicating type, or low torque wheel-operated multi-turn post indicator ball valves, or gear-operated butterfly valves.

Council may allow lesser backflow prevention measures for domestic sprinkler systems or small drencher (wall wetting sprinkler) systems. This will be considered on a case by case basis and will require the submission of a hydraulic plan showing the location and type of backflow prevention.

Please note that the reduction of pressure across a backflow prevention device needs to be considered during the hydraulic design phase of a project to ensure minimum pressure requirements are met for fire services.

4.1.9 Standpipes

Any standpipe connected to Council's water supply must have a testable backflow prevention device immediately after the standpipe. Alternatively, and only if the standpipe is used solely for the filling of a dedicated tanker or vessel (eg water carter), the vehicle or vessel is required to have a permanent air gap installed that complies with the requirements for a Registered Air Gap (RAG) as per the Standards. The backflow prevention device is required to be installed, tested and registered in accordance with 4.1.4.

4.1.10 Reclaimed Water Supplies

Premises with a reclaimed water supply are required to install on the drinking water supply, a backflow containment device suitable for high hazard. The device must be either a Registered Break Tank (RBT) or a Reduced Pressure Zone Device (RPZD).

4.1.11 Relevant Registers

Council will compile and update on a regular basis:

- A register of properties and their owners/occupiers where testable backflow prevention devices are installed.
- A register of installed testable backflow prevention devices for each property.
- A register of authorised licensed plumbers qualified in backflow prevention device testing.

The list of local authorised licensed plumbers who are qualified in "Backflow Prevention" are available on Shoalhaven Water's website - www.shoalwater.nsw.gov.au.

4.1.12 Responsibilities

Plumbers

A licensed plumber must install all backflow prevention devices to comply with the Standards and submit a CoC for all new and replacement device installations.

Only a licensed backflow accredited plumber may test/commission the devices.

Prior to acceptance of test reports, Council shall be provided with evidence of the plumber's backflow accreditation (only required on the first occasion a plumber submits test reports to Council) and current test equipment calibration certificate.

Plumbers must submit the Test & Maintenance Report to Council as soon as practicable after testing the device.

Penalties may apply where a plumber has failed to submit completed test reports within a reasonable timeframe.

Where a plumber has been notified to rectify the installation of a new or replacement backflow prevention device to comply with the Standards, and multiple additional inspections are required, the plumber responsible for the work may be charged a reinspection fee and/or be issued with a defect notice and penalty infringement notice(s) in accordance with the Plumbing & Drainage Act 2011.

Property Owners

The property owner must ensure that all backflow prevention devices installed comply with this policy. This includes installation, maintenance and testing of the device or devices in accordance with the Standards. Where rectification works have been notified by Council, the property owner is to ensure the works are carried out within the time specified.

The property owner is responsible for ensuring that all relevant documents are submitted to Council and that fees are paid within the required timeframes. Property owners may elect to delegate this responsibility to the property occupiers, however without written evidence supporting this delegation, Council will continue to deem the property owner responsible.

4.1.13 Fees and Charges

Fees and charges relating to backflow prevention are in accordance with the current, annually produced "Delivery Program and Operational Plan".

Council is not responsible for the cost of engaging a plumber for the installation and/or testing and maintenance of backflow prevention devices.

4.2 Implementation

Section 7 of the Plumbing & Drainage Act 2011 requires that plumbing and drainage work must comply with the PCA, and other standards or requirements prescribed by the legislation.

The PCA requires that water services be designed, constructed, and installed to operate in a way that avoids the likelihood of contamination of any part of the drinking water supply, and minimises any adverse impact on building occupants, the NUO's infrastructure, property and the environment. Furthermore, the PCA also specifies that the design, construction, installation, replacement, repair, alteration, and maintenance of water services must be in accordance with AS/NZS 3500.1.

Council has certain responsibilities that impact the requirement for backflow prevention and cross-connection control in the Shoalhaven. They are as follows:

- To provide drinking water to Australian Drinking Water Guidelines 2011 within the water supply reticulation systems up to and including meters on property boundaries
- For the approval, testing and inspection of water supply and sewerage plumbing within property boundaries, under delegation from NSW Fair Trading
- For the protection of public health in compliance with the Local Government Act, 1993 and the Public Health Act, 2010

Council is responsible for the regulation of containment, zone, and individual backflow prevention in the Shoalhaven. Shoalhaven Water, Council's Water Utility, maintains the register of all testable backflow prevention devices and manages the annual testing program and associated compliance activities. The backflow register and testing program includes all testable backflow prevention devices installed on properties within the Shoalhaven Region.

5. Related Legislation, Policies or Procedures

This policy should be read in conjunction with the following documents or legislation:

- NCC Volume Three - Plumbing Code of Australia (PCA)

- Plumbing and Drainage Act 2011
- Local Government Act 1993
- AS/NZS 3500.1 Plumbing and drainage – Part 1: Water Services (AS/NZS 3500.1)
- AS/NZS 2845.1 Water supply – Backflow prevention devices – Part 1: Material, design, and performance requirements (AS/NZS 2845.1)
- AS/NZS 2845.2 Water supply – Backflow prevention devices – Part 2: Registered air gaps and registered break tanks (AS/NZS 2845.2)
- AS/NZS 2845.3 Water supply – Backflow prevention devices – Part 3: Field testing and maintenance of testable devices (AS/NZS 2845.2)
- National Construction Code – Cross-connection control handbook, ABCB
- Shoalhaven Local Approvals Policy
- Metered Standpipe and Bulk Water Filling Station Policy

6. Risk Assessment

Risks identified against the Council Risk categories

Risk Category	Risk	Notes
Reputation	Council is not meeting its obligations for the supply of clean drinking water to its customers	This policy for management of backflow prevention in the Shoalhaven contributes to Council's obligation to provide drinking water to the Australian Drinking Water Guidelines 2011
	Installation of backflow devices do not meet the Standards	This policy requires inspection and approval of backflow device installations to the applicable Standards
Financial	Contamination of the drinking water supply could impose a financial cost to Council for cleanup operations	This policy provides the framework for a backflow prevention management program to mitigate the risk of contamination of the water supply from hazardous sites.
People	Contaminated drinking water affecting public health	This policy provides the framework for a backflow prevention management and compliance program that meets or exceeds the requirements of the PCA and Standards.
Environment	This policy does not impose an environmental risk	N/A

Risk Category	Risk	Notes
Property and Infrastructure	Non-compliant design or work to relevant standards	This policy outlines the assessment of backflow prevention design through the requirement for backflow surveys, and requires installations and testing is completed to Standards.
Governance (probity, transparency, resilience to scrutiny)	As the Network Utility Operator, Council has some requirements that vary from the PCA	Network Utility Operators may set rules that prescribe containment protection which differs from the PCA specifications. This policy specifies Council variations for containment backflow protection.

7. Data and Reporting

N/A

8. Monitoring and Review

In accordance with s165 (4) of the Local Government Act 1993, this policy will be reviewed within one year of the election of every new Council.

9. Ownership and Approval

9.1 Public policy

Responsibility	Responsible Owner
Directorate	Shoalhaven Water – Water Asset Planning & Development
Endorsement	Director Shoalhaven Water
Approval/Adoption	Council