

Requirement for the use of chemigation valves for backflow prevention in Canterbury



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This document provides information on chemigation valves for backflow prevention in Canterbury and is aligned with the New Zealand Guideline for the Safe Management of Irrigation Systems with Effluent, Fertiliser and/or Agrichemical Injection (2014).

It is intended for designers and installers of agricultural irrigation systems incorporating the dispersal of dairy effluent by injection into that system.

The design, installation and testing procedures do not amend or replace other industry performance indicators, guidelines, codes of practice or standards relating to sanitary systems or community drinking water supplies.

All decisions made in respect of design, selection and installation must also comply with existing statutes, regulations and other legal requirements.

2.0 INTRODUCTION

The intensification of land-use in Canterbury and expansion of the dairy industry has meant nutrient management has become an essential part of sustainable farming.

The move towards sustainable irrigation practices in both the arable and dairy industries means irrigation equipment now incorporates new and advanced technologies to maximise efficiency.

Environment Canterbury along with Irrigation New Zealand and the wider irrigation industry have identified the need for an efficient backflow prevention device that is cost effective and is suitable for the agricultural irrigation sector where there is a low level risk of contamination of the primary water source.

Chemigation valves are designed to protect water supplies from agricultural chemicals and have been used successfully for many years in the United States where they are required to meet the American Society of Agricultural and Biological Engineers Standard ASABE EP409.1.

Based on this successful model Environment Canterbury, with the support of Irrigation New Zealand, endorses the use of chemigation valves that comply with this standard, providing certain criteria is met, as outlined in this document.

This document will focus primarily on but not limited to the disposal of dairy effluent and compliance with these requirements will mitigate the risk of harm to farm personnel and livestock, and protect the water source from contamination, as required in the Land and Water Regional Plan.

Any breach or deviation from these requirements will be taken seriously and remedial action may be taken at a cost to the consent holder.

The use of chemigation valves is appropriate where the risk of water contamination is low. If the risk of contamination is high then a Reduced Pressure Zone Device (RPZD) must be installed. This is vital if the water source supplies potable water for community use, or it is located close to a community water supply.

3.0 VALVE SPECIFICATIONS

A chemigation check valve must comply with the American Society of Agricultural and Biological Engineers Standard ASABE EP409.1 Safety Devices for Chemigation.

The chemigation valve should comprise the following:

- A spring loaded check valve with positive closing action and water tight seal that is not metal to metal
- A low flow pressure drain valve installed on the bottom side of the valve body, upstream of the main check valve to drain away any minor check valve leakage.
- An air/vacuum relief valve installed on top of the pipe upstream of the check valve to prevent back siphonage. This can be combined with an inspection port to check for leaks and/or inspection of the low pressure drain valve.
- A test port downstream of the check valve for purposes of pressurising the chamber to test the integrity of the check valve seal.
- Be manufactured from sound, durable, corrosion resistant materials suitable for contact with the complete range of agrichemicals intended for use in the system, including springs, seals, valve body and connections.

4.0 APPLICATION REQUIREMENTS

It is not uncommon for farm water sources to supply water for purposes other than just irrigation. For this reason the installation of a chemigation valve as a backflow prevention device must be approved by Environment Canterbury to ensure the most appropriate device and system is chosen.

Device installers must contact Environment Canterbury to discuss the options available during the design phase and provide the following information:

- The resource consent number and related bore/SWAP number(s).
- A farm map detailing the irrigation and proposed effluent reticulation.
- Detail of any cross connection between the irrigation and dairy shed supply.
- A drawing of the section of pipework at the point of injection detailing the location of the chemigation valve and all other associated valves and control equipment.
- A detailed description of the interlocks in place, both electrical and/or mechanical and the methodology to demonstrate the shut down of the effluent pump in the event that the main irrigation pump stops.

4.1 DAIRY SHED SUPPLY

Water supplied for use in dairy sheds is deemed to be potable and falls under the requirements of the New Zealand Building Code.

Water supplied to a dairy shed which also makes up water for irrigation into which agrichemicals including dairy effluent have been injected requires a higher level of backflow protection.

In most cases the requirement would be for a RPZ device to be used however consideration would be given to using two chemigation valves in tandem once the level of risk had been established.

5.0 INSTALLATION REQUIREMENTS

To ensure the integrity of the primary water source from potential contamination, the installation of a chemigation valve in isolation is inadequate. It must be installed in combination with all other safety measures to offer certainty that the system is protected.

The key requirements for all chemigation backflow prevention valves and systems include –

- They must be positioned, orientated and installed according to the manufacturer's specifications between the water source and the point of effluent injection.
- They must be mounted at a sufficient height above ground level (minimum of 300mm) to prevent the low flow pressure drain valve from being submerged by localised flooding. If the drain valve is within 6 meters of a water source a pipe should be provided to carry drainage away.
- They must be installed downstream of any water measuring device.
- There must be an isolation valve downstream of the chemigation valve to facilitate pressure testing. Attention should be given to the positioning of the isolation valve to ensure that the moving disc does not interfere with the operation of the chemigation valve.
- A suitable non-return valve must be fitted in the effluent injection line to prevent irrigation water making its way back to the effluent storage facility with the potential to cause spillage.
- A means of interlocking the effluent pump with the irrigation system, either electrically or mechanically must be in place to ensure that the effluent pump is switched off in the event that the irrigation system shuts down for any reason.

6.0 TESTING

The testing of chemigation valves should be carried out by a suitably qualified person who is the authorised representative of the company conducting the test.

6.1 TESTING PROCEEDURE

All valves shall be tested prior to being made operational and at least once in every 12 months thereafter.

With the downstream isolation valve closed, the discharge chamber of the chemigation valve should be pressurised via the test port to a pressure not less than the rated operational pressure of the device. The valve should sustain this pressure for a period of not less than 30 minutes.

The recording of the test should be done with a pressure data-logging device that will produce a traceable record of the test in either a table or graphic format of pressure against time. This test data must be submitted as part of the test certificate.

7.0 REPORTING

A test certificate must be submitted to Environment Canterbury within one month of either a commissioning or annual inspection test being carried out.

The test certificate should include the following details:

- Resource consent number, bore/swap number
- Consent holders address and contact details

The make, model, size and location of valve including GPS coordinated in NZTM format

- The system operating pressure and applied test pressure
- A photo showing the installed Chemigation valve with associated pipe work and fittings
- Comments relevant to the test
- Graph or table of the test results
- Dated and signed by the person carrying out the test.

7.1 TEST CERTIFICATE TEMPLATE

Chemigation Valve Certificate of Compliance

Consent No.: CRC		Bore/SWAP:	
Consent Holder:		Contact:	Phone:
Address:			
Valve Make:		Model:	Size:
Valve Location:			GPS Co.Ord. (NZ Topo Map)
System Working Pressure:		Applied Test Pressure:	
Photograph			
Comments/Observations:			
Tested By:		Date Tested:	
Test Result: Passed / Failed		Signature:	Next Test Date:

Test certificates should be emailed to water.metering@ecan.govt.nz or posted to PO Box 345 Christchurch.