



Backflow Prevention Policy

This policy explains the required safety devices and systems to be used when injecting effluent, fertilisers, herbicides, pesticides and other agrichemicals (“agrchemicals”) into an on-farm irrigation system connected to the Ashburton Lyndhurst Irrigation Ltd. (“ALIL”) Pressurised Scheme.

The specific hazard being guarded against is effluent, fertiliser or other agrichemicals being drawn into the water supply.

ALIL Property off takes (POTs) are not fitted with anything that would stop water flowing backwards from the farm into the ALIL system. Normally, the higher pressure from the ALIL system prevents water flowing into the ALIL system, however if the ALIL pipe is drained for any reason or if there are pressure fluctuations in the system this can mean that reverse flow occurs. It is extremely important that water contaminated with effluent, fertiliser or other agrichemicals does not enter the ALIL system.

ALIL’s backflow prevention policy is based on the Irrigation New Zealand document “New Zealand Guideline for the Safe Management of Irrigation Systems with Effluent, Fertiliser and/or Agrichemical Injection”, (a copy of which may be obtained by visiting the INZ website at <http://irrigationnz.co.nz/wp-content/uploads/2014/03/2014-03-04-Agrichemical-Injection-Guidelines.pdf>, or by requesting one from the Ashburton Lyndhurst office.) The major requirements for agrichemical injection systems as discussed in this document are outlined below.

1. A backflow prevention device must be installed between the POT and the point of the injection. While either a chemigation valve or a double check valve may be used, chemigation valves have many advantages over double check valves and therefore ALIL recommends the use of a chemigation valves as the preferred option for backflow prevention.
2. An air/vacuum breaker must be installed as part of the backflow prevention system. Chemigation valves come fitted with vacuum breakers. A double check valve arrangement requires a vacuum breaker be fitted on top of the pipe upstream of the check valve to prevent back siphoning.
3. Backflow prevention devices are to be tested by a suitably trained technician, prior to being made operational and at least once in every 12 months thereafter. Regular maintenance of all other parts of the system is required to be documented.
 - a. ALIL Staff or other trained personnel are to conduct testing of the backflow prevention devices at least annually. ALIL adopts ECAN’s Chemigation Valve Test Sheet as the testing standard.
 - b. The backflow prevention system must be fitted with the valves and ports necessary for testing to be carried out. Chemigation valves come fitted with the required test ports. A double check valve arrangement requires the installation of at least two isolation valves (one after each check valve), as well as test ports for each check valve for purposes of pressurising the upstream side to test the integrity of the seal.

4. Where infrastructure, such as pump stations, already have two check valves, this may be a viable option, however a number of issues will need to be addressed:
 - a. Make and model of the existing check valves will need to be confirmed and recorded (check they are spring loaded and have resilient seats).
 - b. Make and model of existing air valves will need to be confirmed and recorded (check they are located in the right place and can act as vacuum breaks).
 - c. Suitable test ports and isolation valves will need to be confirmed and retrofitted if needed.
 - d. The installation would need to be inspected and checked, then valves tested and certified by a suitably qualified person.
 - e. If the pumpstation is on the RDR, the above would need to be provided to ECan for approval.

5. A small check valve is recommended in the injection line to prevent water flowing from the shareholder's irrigation system into an agrichemical mixing tank (refer to INZ Guidelines for details).

6. An anti-syphon device or vacuum breaker is recommended in the injection line to prevent agrichemicals being syphoned from a mixing tank into the system (refer to INZ Guidelines for details).

7. An interlock device is recommended. This is a mechanical and/or electrical device to ensure that if the irrigation stops, the injection pump will also stop (refer to INZ Guidelines for details).

8. ALIL will keep a register of shareholders using fertigation/chemigation. Shareholders are to provide the following for the register:
 - a. Details of the agrichemicals to be used.
 - b. A map detailing the irrigation and proposed fertigation/chemigation reticulation.
 - c. A drawing of the section of pipework at the point of injection detailing all associated valves and control equipment.
 - d. Details of the backflow prevention installed including test certificates and location.
 - e. A description of the interlocks in place, both electrical and/or mechanical and the methodology to demonstrate that a shutdown of the effluent pump in the event that the main irrigation pump stops.
 - f. Results and dates of initial and scheduled testing.