



# AGENDA

## Policy & Planning

Tuesday 2 February 2021, 10.30am

## Policy and Planning Committee

02 February 2021 10:30 AM

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**Purpose of Policy and Planning Committee meeting**

This committee attends to all matters of resource management, biosecurity and related environment policy.

**Responsibilities**

Prepare and review regional policy statements, plans and strategies and convene as a Hearing Committee as and when required for the hearing of submissions.

Monitor plan and policy implementation.

Develop biosecurity policy.

Advocate, as appropriate, for the Taranaki region.

Other policy initiatives.

Endorse submissions prepared in response to the policy initiatives of organisations.

**Membership of Policy and Planning Committee**

Councillor C L Littlewood (Chairperson)	Councillor N W Walker (Deputy Chairperson)
Councillor M G Davey	Councillor M J McDonald
Councillor D H McIntyre	Councillor C S Williamson
Councillor E D Van Der Leden	Councillor D N MacLeod (ex officio)
Councillor M P Joyce (ex officio)	
<b>Representative Members</b>	
Councillor C Young (STDC)	Councillor S Hitchcock (NPDC)
Councillor G Boyde (SDC)	Mr P Moeahu (Iwi Representative)
Ms B Bigham (Iwi Representative)	Ms L Tester (Iwi Representative)

**Health and Safety Message**

**Emergency Procedure**

In the event of an emergency, please exit through the emergency door in the committee room by the kitchen.

If you require assistance to exit please see a staff member.

Once you reach the bottom of the stairs make your way to the assembly point at the birdcage. Staff will guide you to an alternative route if necessary.

**Earthquake**

If there is an earthquake - drop, cover and hold where possible.

Please remain where you are until further instruction is given.



**Date** 2 February 2021

**Subject:** **Confirmation of Minutes - 24 November 2020**

**Approved by:** A D McLay, Director - Resource Management  
S J Ruru, Chief Executive

**Document:** 2674653

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### **Recommendations**

That the Policy and Planning Committee of the Taranaki Regional Council:

- a) takes as read and confirms the minutes and resolutions of the Policy and Planning Committee meeting held in the Taranaki Regional Council Chambers on Tuesday 24 November 2020 at 10.34am
- b) notes the recommendations therein were adopted by the Taranaki Regional Council on Tuesday 15 December 2020.

### **Appendices/Attachments**

Document 2646148: Minutes Policy and Planning Committee meeting – 24 November 2020





**Date** 24 November 2020, 10.34am  
**Venue:** Taranaki Regional Council chambers, 47 Cloten Road, Stratford  
**Document:** 2646148

<b>Members</b>	Councillors	C L Littlewood	Committee Chairperson
		N W Walker	Committee Deputy Chairperson
		M J McDonald	
		D H McIntyre	
		E D Van Der Leden	
		C S Williamson	
		M P Joyce	ex officio ( <i>zoom</i> )

<b>Representative Members</b>	Councillor	C Young	South Taranaki District Council
	Mr	P Moeahu	Iwi Representative
	Ms	L Tester	Iwi Representative
	Ms	B Bigham	Iwi Representative ( <i>zoom</i> )

<b>Attending</b>	Councillors	D L Lean	
		T Cloke	
	Messrs	K Holswich	Iwi Representative
		E Bailey	Iwi Representative
	Ms	S J Ruru	Chief Executive
		M J Nield	Director - Corporate Services
	Messrs	A D McLay	Director - Resource Management
		G K Bedford	Director - Environment Quality
	D Harrison	D Harrison	Director - Operations
		C Spurdle	Planning Manager
	S Tamarapa	S Tamarapa	Iwi Communications Officer
		P Ledingham	Communications Adviser
	Ms	K Holland	Communications Adviser
	Ms	J Reader	Communications Manager
	Miss	L Davidson	Committee Administrator

Two members of the public.

The meeting was adjourned at 10.34 and reconvened at 11am.

**Apologies** Apologies were received from Councillor D N MacLeod and representative members Councillor S Hitchcock - New Plymouth District Council, Councillor G Boyde - Stratford District Council and Mr P Muir – Federated Farmers.

Littlewood/McDonald

**Notification of Late items** There were no late items.

**1. Confirmation of Minutes – 13 October 2020**

**Resolved**

That the Policy and Planning Committee of the Taranaki Regional Council:

- a) takes as read and confirms the minutes of the Policy and Planning Committee Meeting of the Taranaki Regional Council held in the Taranaki Regional Council chambers, 47 Cloten Road, Stratford on Tuesday 13 October at 10.30am
- b) notes the recommendations therein were adopted by the Taranaki Regional Council on Tuesday 3 November 2020.

Williamson/McDonald

**Matters arising**

There were no matters arising.

**2. Te Rūnanga o Ngāti Mutunga Mauri Compass Assessment of the Urenui and Mimitangiatua Rivers**

- 2.1 The memorandum is presented for Members information on a cultural monitoring project report, produced by Te Rūnanga o Ngāti Mutunga, entitled *Te Rūnanga o Ngāti Mutunga Mauri Compass Assessment of the Urenui River and the Mimitangiatua River*.
- 2.2 It was noted that the presentation of this item was given earlier during the Consents and Regulatory Committee meeting and members of the Policy and Planning Committee were in attendance.
- 2.3 Following the presentation comments were made that it would be appreciated if Officers could report back a more substantive response. Ngāti Mutunga have made a number of commitments for action and it would be good to know how the Council will respond on the future use of the compass tool and potential partnerships with iwi.

**Recommended**

That the Taranaki Regional Council:

- a) receives the memorandum and the Te Rūnanga o Ngāti Mutunga Mauri Compass Assessment of the Urenui River and the Mimitangiatua River 2020 report
- b) notes the report provides an insight into the application of cultural health indicators and mātauranga Māori combined with western science indicators
- c) notes that report assists the Council in understanding Te Mana o Te Wai, mātauranga Māori, and the importance of mahinga kai which are given new prominence and priority under the NPS-FM 2020

- d) notes consultation with iwi in the region on the provisions of the NPS-FM 2020 will be undertaken
- e) congratulates Te Rūnanga o Ngāti Mutunga and everyone involved in the project. Williamson/Walker

### **3. Representation Arrangements - Māori Constituency**

- 3.1 Mr S J Ruru, Chief Executive, spoke to the memorandum seeking endorsement of the Local Government NZ position in relation to the removal of the poll provisions applying to the creation of Māori wards/constituencies under the Local Electoral Act 2001.

#### **Recommended**

That the Taranaki Regional Council:

- a) receives the report entitled *Representation Arrangements - Māori Constituency*
- b) determines that this decision be recognised as not significant in terms of section 76 of the Local Government Act 2002
- c) determines that it has complied with the decision-making provisions of the Local Government Act 2002 to the extent necessary in relation to this decision; and in accordance with section 79 of the Act determines that it does not require further information, further assessment of options or further analysis of costs and benefits or advantages and disadvantages prior to making a decision on this matter.
- d) supports the efforts of Local Government NZ (LGNZ) to amend the provisions in the Local Electoral Act 2001 to remove the poll provisions applying to Māori wards and constituencies
- e) supports the efforts of LGNZ to have provision being made for the Local Government Commission to consider appeals associated with Māori wards and constituencies and for appropriate criteria to enable the consideration of such appeals being inserted into the Local Electoral Act 2001
- f) forwards this resolution to the Taranaki Mayoral Forum for its consideration. Moeahu/Van Der Leden

### **4. Implementation of Governments Essential Freshwater Programme and the visit by the Chief Freshwater Commissioner**

- 4.1 Mr A D McLay, Director – Resource Management, spoke to the memorandum outlining for Members information the development of a draft *Taranaki Regional Council Implementation Plan for Essential Freshwater*.
- 4.2 It was noted that the significant funding implications will be considered as part of the Long Term Plan process.

**Recommended**

That the Taranaki Regional Council:

- a) receives this memorandum entitled *Implementation of Essential Freshwater and the visit by the Chief Freshwater Commissioner*
- b) notes that Government released the Essential Freshwater package in August 2020 with new planning, monitoring and regulatory requirements that Council must give effect to
- c) notes that the Essential Freshwater package imposes significant new and additional requirements and costs on Council that will be considered as part of the Long-term planning process
- d) notes that staff are developing an Essential Freshwater implementation plan that will be submitted to Council for formal approval once finalised
- e) notes that Peter Skelton, Chief Freshwater Commissioner, will be addressing Councillors, iwi and other representatives on our committees, and the executive team directly after this meeting.

Williamson/Walker

**5. Engagement with Iwi and Hapū**

- 5.1 Mr G K Bedford, Director – Environment Quality, spoke to the memorandum providing the Committee with a summary and brief examples of engagement between Council staff and iwi and hapū, as requested at the 13 October meeting of this Committee.
- 5.2 Members noted it was great to see the wide range of engagement that is taking place. In future memos, instead of just listing the engagement it would be beneficial to report on whether it had delivered the desired result for Iwi and Hapū.

**Recommended**

That the Taranaki Regional Council:

- a) receives the memorandum *Engagement with Iwi and Hapū*
- b) notes the contents of the memorandum.

Van Der Leden/McDonald

There being no further business, the Committee Chairperson, Councillor C L Littlewood, declared the meeting of the Policy and Planning Committee closed at 11.22pm. The meeting closed with a Karakia.

**Confirmed**

**Policy and Planning  
Chairperson:** \_\_\_\_\_

**C L Littlewood  
Tuesday 2 February 2021**



**Date** 2 February 2021

**Subject:** **Section 32 position paper - Sites of significance to Māori**

**Approved by:** A D McLay, Director - Resource Management  
S J Ruru, Chief Executive

**Document:** 2642937

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### **Purpose**

1. The purpose of this memorandum is to introduce for Members' information the report *Sites of significance to Māori*.
2. This report is contributing to the review of the freshwater, soil and air plans, including the section 32 analysis that forms part of that review.
3. A presentation on the project and its outcomes will be made at the meeting.

### **Executive summary**

4. The Taranaki Regional Council (the Council) has commenced a review of its air, freshwater and soil plans under the *Resource Management Act 1991* (RMA). As part of this review, the Council has commenced a project to identify sites of significance to Māori, which will be scheduled in a new *Natural Resources Plan*.
5. Tangata whenua have strong historical, cultural and spiritual associations with sites and places of particular significance to them.
6. Use and development activities can result in the destruction of or damage to these sites or places, including associated values, qualities and features.
7. The sites of significance identification project (the project) aims to establish a comprehensive spatial layer for Taranaki sites of significance to Māori. It is part of a wider engagement process with tangata whenua that not only identifies the sites but also seeks to strengthen protection mechanisms under the RMA to avoid further destruction and misuse of sites of significance to Māori within the Taranaki region.
8. The project was separated in to two stages. Stage one involved Council researching, locating and mapping sites of significance using publically available information. Stage two of the project involves interested iwi and hapū reviewing, amending and verifying mapped sites of significance as part of a verification process.
9. The attached report summarises the issues, methodology and work done to date to identify and map sites of significance in Taranaki. The report also presents a suite of

recommendations to be implemented through the new *Natural Resources Plan* to better protect sites of significance. The report is appended to this agenda item.

10. Finally, it is noted that the project is a joint project with some financial support from Stratford and South Taranaki district councils. This Council is taking the lead and the project is continuing. Council will continue to work with iwi and hapū during stage two of the project to finish verifying the sites. Mapped information will be shared with Stratford and South Taranaki district councils in due course (noting New Plymouth District has been running their own comprehensive process).

## Recommendations

That the Taranaki Regional Council:

- a) receives this memorandum entitled *Section 32 position paper - Sites of significance to Māori*
- b) notes that the findings of this report are contributing to the development of Plan provisions and spatial information seeking to protect sites of significance to Māori
- c) notes that as part of the sites of significance project approximately 800 sites have so far been identified
- d) notes the policy recommendations presented in section 6.2 of the report
- e) notes that the sites of significance identification process is ongoing and that Council will be further collaborating with tangata whenua to verify sites with the aim of completing the identification of all sites of significance to Māori across Taranaki.

## Background

11. The Council has commenced a review of its air, freshwater and soil plans under the RMA to develop a new plan - the Natural Resource Plan. As part of that review, the Council has undertaken research, investigations and engagement with iwi and hapū to identify and locate historically significant sites of Māori origin within the Taranaki region.
12. Various use and development activities can have direct impacts on sites of significance to Māori. These activities include land use, subdivision (district councils' responsibilities), discharges to land or water and vegetation removal, some of these activities can damage or reduce access to wāhi tapu, pa, urupa and mahinga kai. Site degradation can be accidental as well as deliberate, so it is essential that sites are mapped to avoid such events. Any loss or damage to historic heritage sites may be irreversible which has a negative impact on the cultural associations Māori have with the site.
13. There are a large number of sites in the Taranaki region that have high importance to tangata whenua. Plan policies and rules protecting sites of significance can only be effective if sites are known to Council. Prior to the project there was incomplete or insufficient spatial information which can potentially lead to a site's destruction. Council has commenced this project to map and record sites of significance to avoid, remedy or mitigate any adverse effects arising from use and development activities.
14. There are a number of protection mechanisms and policies relating to sites of significance to Māori. Local authorities have the statutory responsibility to recognise and provide for the protection of historic heritage from inappropriate use and development. A number of matters set out in section 6 and 7 of the RMA provide the mandate and responsibility for cultural heritage identification and protection. The RMA outlines the issue as a matter of national importance. Relevant provisions of the RMA are appended for your information.



15. Other policies relating to the identification of sites of significance to Māori can be located in the *Regional Policy Statement for Taranaki 2011*, *National Policy Statement for Freshwater 2020*, *Heritage New Zealand Pouhere Taonga Act 2014*, *Te tiriti o Waitangi* settlements, and the Taranaki Iwi Environmental Management Plans.
16. Tangata whenua have strong historical, cultural and spiritual associations with the land, and it is important that this is recognised in regional policy, planning and consenting processes. Through commencing the project the Council aims to provide for these cultural associations by protecting sites of significance and allowing tangata whenua as kaitiaki to contribute in determining the best approach when working with the sites in resource management.
17. To ensure consistency of information the complete sites of significance dataset gathered by the Council will be shared with South Taranaki and Stratford district councils, both organisations have financially contributed to this project and will use the information in their operations.

### **Sites of significance to Māori project**

18. The Council has over the years worked with iwi on sites of significance type projects. There have been issues with developing this more widely, using information technology and receiving iwi support. The sites of significance to Māori project was socialised in early 2019 with Taranaki iwi and hapū and stage one began in November 2019.
19. The Wai Māori working group were informed of the sites of significance project and were given the opportunity to contribute to the project processes. Updates of the projects progression and any challenges that had arisen were communicated to the working group at each of the monthly meetings. Email updates were also provided to the group.
20. Stage one of the project involved a Council officer researching through publically available information. Articles, old maps, books, video clips, photographs, treaty settlements and archived information were used to research site information in this stage. Sites were then mapped on Arc GIS Pro and included associated historical information, references and the New Zealand Archaeological Association description.
21. On the completion of stage one of the project, individual iwi map portals were produced and sent to interested iwi and hapū members. The map portals held all the information found on the Council sites of significance to Māori layer on Arc GIS Pro. An excel spreadsheet with all of the information was also sent to iwi and hapū. This process allowed for iwi and hapū to make direct changes and modifications on to the spreadsheet and provide feedback prior to meeting with Council officers.
22. Stage two of the project relied on iwi and hapū participation to verify the sites which were mapped and identified in stage one of the project. Iwi and hapū members were contacted through the Wai Māori working group and were invited to meet with Council officers when they were available to do so.
23. Meetings between iwi/hapū and Council officers were organised to start making additions, deletions and modifications to the sites of significance layer on Arc GIS Pro. The Shapefile for the site could be modified during these meetings to encompass the site in its entirety and associated attribute information such as the name, type and history of a site could be modified.
24. Tangata whenua participation is crucial to the success of the project, and the Council will continue to closely work with iwi and hapū to verify and confirm remaining sites.

### Report on Sites of significance to Māori - progress to date

25. The purpose of the *Sites of significance to Māori report* is to provide a summary of the evaluation undertaken in accordance with Section 32 of the RMA. The report contains a summary of the issues, methods and policies relating to sites of significance to Māori and the processes undertaken during the project.
26. Council officers have engaged with every iwi in Taranaki about the project. Most iwi have directed Council to engage at the hapū level, which officers have duly done. Due to varying iwi/hapu capacity and interest in the project, progress varies significantly around the region. Stage two is expected to still take some time to complete.
27. Sixty-four sites were recorded in the South Taranaki and Stratford district plans prior to the commencement of this project. To date approximately 800 sites have been located through the sites of significance to Māori project (noting that an additional 800 sites have been identified as part of the New Plymouth District Plan process and will duly be incorporated into the Council's datasets subject to iwi/hapū confirmation).
28. Iwi and hapū that have worked with the Council in identifying sites of significance have had the option of signing a memorandum of understanding with the Council. The memorandum addresses information sharing and exchange, the management of datasets and consultation with iwi and hapū. One memorandum of understanding has been signed with Ngati Rahiri hapū and Council officers are working on one with Ngāruahine iwi.
29. Throughout the project, the Council has identified a substantial increase in the number of known sites. However, it is inevitable that new sites will continue to be discovered over time as new archaeological evidence for sites is found. The Council will continue working with iwi/hapū as more sites are discovered and to ensure that sites of significance to Māori are preserved for future generations.

### Policy Implications

30. The sites of significance identification project is part of broader effort to better protect sites and places of particular importance to Māori. In addition to developing comprehensive spatial information. Council has been engaging with tangata whenua to consider the adequacy, efficiency and effectiveness of current Plan provisions and to inform the development of a new *Natural Resources Plan*.
31. Based upon the issues and feedback received to date through the Wai Māori Group and other tangata whenua feedback, section 6 of the report sets out a number of recommendations. These are summarised as follows:
  - **More directive policy provisions:** Current operative regional plans presently contain a plethora of objectives and policies addressing (explicitly or implicitly) tangata whenua values, including sites of significance. However, the policies are generally framed as guidance with no added weight when considering and providing for the protection of sites of significance from other activities and or conflicting uses and values. It is recommended that new policies (with appropriate linkages to other activity-specific policies) more explicitly address and provide for the protection of sites of significance, taonga species, and the wider recognition and provision for the relationship of tangata whenua culture, values and traditions with the wider environment.
  - **Explicit standards terms and conditions:** To give effect, to the revised policies it is recommended that regional rules (for permitted and controlled activities) be

prepared to explicitly provide for the protection of sites of significance. Such matters are generally bundled under broader environmental effects.

- **Tougher rule hierarchy to better protect sites of significance:** In addition, to explicit standards terms and conditions for controlled and permitted activities, other rules, standards, terms and conditions are recommended to prohibit certain activities from having adverse effects on sites of significance, set out buffer distances for avoiding or notifying works that are going to occur in or near sites of significance. For 'riskier' activities rules will make such activities a discretionary, non-complying or prohibited activity.
- **New schedules and the provision of online mapping identifying known sites of significance:** Sites of significance to be mapped and scheduled with the revised Plan provisions and consenting processes to ensure resource use and development activities in or near these sites do not harm the site and associated values.

32. In addition to the recommended plan changes, other methods in supporting iwi and hapū efforts to protect sites of significance include Mana whakahono a rohe agreements, memoranda of understanding, mapping support for iwi and hapū, financial assistance and the provision of site information.

### **Where to from here**

33. The Council is still actively working on stage two of the project, which relies on iwi and hapū participation. Once sites of significance to Māori are identified and verified by tangata whenua the information collated will be incorporated and scheduled into the new *Natural Resources Plan*, stage two of the project will continue to be undertaken and progressed until the new plan is notified in late 2023.

34. Stage two of the project involves tangata whenua identifying/confirming sites (and relevant information including reciting historical events) with Council mapping those sites on Arc GIS Pro. Tangata whenua input can be quite a long process and may span a number of meetings. The Council understands this engagement can be difficult for the smaller iwi and hapū. Council officers will continue to be flexible and supportive when completing this process.

35. As part of the engagement process, it is likely that other iwi and hapū will be interested in memorandum of understanding addressing the management and maintenance of relevant datasets. Council officers will continue to develop memorandum of understandings and ensure they are tailored to individual iwi and hapū needs.

36. With the collaborative effort in the mapping of sites, iwi and hapū will be able to access all ArcGIS sites of significance information that has been verified and confirmed by their members. Iwi and hapū authorities will have the opportunity to continue updating sites of significance information in their rohe.

### **Financial considerations—LTP/Annual Plan**

37. This memorandum and the associated recommendations are consistent with the Council's adopted Long-Term Plan and estimates. Any financial information included in this memorandum has been prepared in accordance with generally accepted accounting practice.

### **Policy considerations**

38. This memorandum and the associated recommendations are consistent with the policy documents and positions adopted by this Council under various legislative frameworks including, but not restricted to, the *Local Government Act 2002*, the *Resource Management Act 1991* and the *Local Government Official Information and Meetings Act 1987*.

### **Iwi considerations**

39. This memorandum and the associated recommendations are consistent with the Council's policy for the development of Māori capacity to contribute to decision-making processes (schedule 10 of the *Local Government Act 2002*) as outlined in the adopted long-term plan and/or annual plan. Similarly, iwi involvement in adopted work programmes has been recognised in the preparation of this memorandum.
40. Iwi and hapū had an integral role in the sites of significance project and are being consulted throughout the Project. The Council recognises that tangata whenua are the custodians of the sites of significance information. Iwi were engaged with through regular Wai Maori working group meetings. Iwi and hapū representatives have also been contacted to meet with Council officers to discuss the sites of significance processes and verify all site information.
41. Iwi environmental management plans have also evaluated as part of the regulatory and planning framework to help guide the project. Relevant provisions are appended (Appendix I) in to the Sites of significance to Māori report.

### **Community considerations**

42. This memorandum and the associated recommendations have considered the views of the community, interested and affected parties and those views have been recognised in the preparation of this memorandum.

### **Legal considerations**

43. This memorandum and the associated recommendations comply with the appropriate statutory requirements imposed upon the Council.

### **Appendices/Attachments**

Document 2688576: Sites of significance to Māori in Taranaki: Review of the freshwater, soil and air plans

# Sites of significance to Māori in Taranaki

Review of the freshwater, soil and air plans





**Taranaki Regional Council**

Private Bag 713

Stratford 4352

February 2021

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## Preface

'Sites of significance to Māori' are sites, places and things that are of special cultural, spiritual, historical and traditional associations to iwi or hapū. These places provide the district with a sense of our history and a connection to our ancestors. They remind us of important battles and events, where they occurred and when.

It is important that sites and areas of significance to Māori and associated values are identified and protected under the *Resource Management Act 1991* (the RMA). Historically a variety of use and development activities, including earthworks, grazing, discharges to water, and coastal erosion have seen damage and desecration of these sites, - sometimes deliberate, sometimes accidental. The lack of publicly available information identifying sites of significance and their recognition in regional and district plans is a contributing factor to the damage and desecration of these sites over time.

The Taranaki Regional Council (the Council) has commenced a review of its air, freshwater and soil plans under the RMA. As part of that review, the Council has undertaken research, investigations and engagement with iwi and hapū to identify and locate historically significant sites of Māori origin within the Taranaki region.

The information collated during the project is to be incorporated and scheduled in a new plan – *Proposed Natural Resources Plan* – to promote their protection from adverse effects associated with the use and development of air, land and freshwater resources (as per Council's responsibilities under the RMA).

The report sets out the methodology to identify sites of significance, including the findings to date. As noted in the report, the identification of sites of significance involves the following two component parts.

- The first stage of the project involving the Council conducting a literature review and research using publically available resources to identify and locate sites of significance.
- The second stage of the project, involves the Council engaging directly with relevant iwi and hapū to review and verify sites of significance in their rohe. All information will go through a peer review process with local iwi/hapū before becoming verified and confirmed. Iwi and hapū have an integral role in this project and were continuously consulted throughout.

The project is ongoing. To date, 1600 Māori historical sites of significance in the Taranaki region have been identified. Of these 130 sites have been verified by the relevant iwi and hapū with approximately another 700 probable or possible sites also identified but yet to be verified by iwi/hapū.

Complete sites of significance information gathered by the Council will be shared with South Taranaki and Stratford district councils, both organisation have financially contributed to this project.

Throughout this project, the councils have identified a substantial increase in the number of known sites. However, it is inevitable that new sites will continue to be discovered over time as new archaeological evidence for sites is found. The councils will continue working with iwi/ hapū as more sites are discovered and to ensure that sites of significance to Māori are preserved for future generations.

As previously noted, the key resource management issue for sites of significance to Māori is the damage or loss of sites if they are not identified and protected from inappropriate use and development; activities and the loss of access to these sites.

The report therefore makes a number of recommendations for Council's consideration to address threats and risks to sites of significance to Māori. They are:

- More directive policy provisions for inclusion in a new *Natural Resources Plan* that explicitly address the protection of historic heritage values, including sites of significance, the protection of taonga species, and recognition and provision for the relationship of tangata whenua culture, values and traditions with the wider environment.
- Explicit standards terms and conditions for regional rules in a new *Natural Resources Plan* that, in relation to permitted and controlled activities, require activities to avoid or mitigate effects on sites of significance. For controlled and restricted discretionary activities it is also recommended that matters of discretion or control explicitly include consideration of adverse effects on historic heritage and sites of significance to Māori.

- Activities having more than minor adverse effects on sites of significance will be given a discretionary, non-complying or prohibited status in the new *Natural Resources Plan*.
- New schedules and the provision of online mapping identifying known sites of significance. The identification of a site has particular implications in relation to the application of policies, activity status, and consenting requirements, included affected party status and consultation/notification requirements.
- Develop mana whakahono a rohe agreement(s) setting out the agreed working relationships between Council (and district councils) and interested iwi authorities on partnership, policy development, consenting and monitoring under the RMA.
- Develop memoranda of understanding with interested iwi and hapū setting out an agreed process for developing, maintaining and protecting iwi/hapū information and knowledge residing on Council maps and data sets, including how 'silent file' will be managed.
- Provide online mapping support and assistance for iwi and hapū involving the maintenance and sharing of a Council GIS viewer for sites and areas of significance to Māori that can also be accessed by iwi/hapū groups within the region.
- Consider financial assistance from the Council's Environmental Enhancement Grant fund for projects supporting the protection of sites of significance to Māori, including associated values.
- Where appropriate provide the public with information and advice about the location of sites and areas of significance, to offer 'visibility' for sites that have previously been unknown or incorrectly located, and to encourage wider appreciation and understanding of the mana and wairua of these sites and areas of significance to Māori, including the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.

The identification and mapping of sites of significance to Māori, in conjunction with the proposed changes, are anticipated to substantially improve their protection. There is considerable work left to do noting that a *Proposed Natural Resources Plan* is planned to be publicly notified in late 2023. However, it is a challenge that the Council is committed to meeting with the help and assistance of iwi and hapū o Taranaki.

# 1 Introduction

*This section introduces the report on sites of significance to Māori.*

## 1.1 Purpose

The purpose of this report is to set out future directions for the Taranaki Regional Council (the Council) to protect historic sites of significance to Māori in accordance with its responsibilities under the *Resource Management Act 1991* (the RMA).

This report also sets out the findings of an exercise to identify and map sites of significance to Māori and contributes to the review of the air, freshwater and soil plans and the development of a new *Natural Resources Plan for Taranaki*.

## 1.2 Whakapapa (background)

Taranaki has a long history stretching back to early Polynesian settlement and the subsequent arrival of Europeans.

The protection of historic heritage, including sites of significance to Māori is a matter of national importance (refer section 2.1.1 below). This report focuses on that aspect of historic heritage relating to sites of significance to Māori.

‘Sites of significance to Māori’ are sites, places and things that iwi or hapū have special cultural, spiritual, historical and traditional associations to. They provide the region with a sense of Taranaki history and a connection with ancestors. They may remind us of important battles and events, where they occurred and when. They include:

- Urupa (Burial ground)
- Pa (Traditional settlement)
- Kainga (Housing)
- Mahinga kai (area which food sources are gathered and/or prepared)<sup>1</sup>

- Wāhi tapu (Sacred place)<sup>2</sup>
- Wāhi taonga (Treasured sites)
- Marae
- Māori historic reserves
- Maara (Gardens to grow food)
- Māori fortress
- Papakainga
- Tauranga waka (Canoe landing)
- Pits/terraces.

The protection of sites of significance however is more than just protecting aspects of historic heritage. It also contributes to the protection of broader cultural values.

Māori have a strong spiritual bond with Papatūānuku (the earth mother). Accordingly, the health of the land is an essential part of who tangata whenua are and is vital to their identity and well-being.

Māori further perceive natural and physical resources such as land, air, water and the coast as a taonga (invaluable treasure) which has been gifted by their tipuna (ancestors) for the benefit and use of their descendants. This taonga imposes a responsibility on the tangata whenua, as kaitiaki (guardians), to ensure that the resource is conserved and handed on to future generation.

The relationship of Māori to sites of significance provides a link with both ancestors and future generations it confirms tribal and kinship ties and in doing so established a sense of tribal identity and continuity.

Māori see themselves as the kaitiaki of the land. Kaitiakitanga is an inherent intergenerational responsibility of those who are tangata whenua to ensure the mauri of the environment and cultural resources are healthy and strong<sup>3</sup>.

In the role of kaitiaki the tangata whenua want to ensure these resources are protected and enhanced

<sup>1</sup> Traditionally the land was rich in natural resources providing for rongoa (plant medicines), kai (food) and other materials used for domestic, burial, ceremonial and cultural purposes. Māori seek that mahinga kai areas are managed in a way that allows people to continue gathering kai (food) in the way their ancestors did.

<sup>2</sup> Wāhi tapu can hold tangible and intangible values which transcend on to future generations.

<sup>3</sup> Mauri (life force) is the essential quality and vitality of a being or entity. It is an intrinsic value which was created through the union of Ranginui and Papatūānuku and became living when they separated. Mauri can be used to measure the health of a place. The mauri of an area or landscape cannot protect itself against unnatural changes such as land modification or destruction.



and that ecosystems are preserved for future generations. However, this Council also has an important role in the protection and preservation of sites of significance to Māori.

It is important that sites of significance are identified and protected in regional plans.

As elsewhere across New Zealand, historically a variety of use and development activities regulated by this Council have been responsible for the loss and/or degradation of sites and places that are of special cultural, spiritual, historical and traditional associations to Māori.

For example, activities such as land disturbance, subdivision, land modification and discharges can destroy evidence of an event (such as removal of bones, hangi stones, pits, and midden) as well as making it more difficult to make connections with the past. Adverse effects on sites of significance to Māori can be deliberate or accidental.

The Council is therefore seeking to strengthen its regional plan provisions that regulate activities that can have an impact on sites of significance to Māori. As part of its regional plan development, Council is working with local iwi and hapū to identify, map (as appropriate) and schedule sites of significance in a *Proposed Natural Resources Plan* to ensure their protection.

This report, and the associated (but ongoing) identification and mapping of sites of significance to Māori, contributes to the review of the air, freshwater and soil plans and the development of a new *Natural Resources Plan for Taranaki*.

### 1.3 Scope and structure

As previously noted, the Council is currently reviewing its air, freshwater and soil plans under the RMA. As part of the review the Council is developing the new *Natural Resources Plan for Taranaki*.

This report summarises Council progress so far in identifying and mapping sites of significance to Māori.

Through the plan making process there is an opportunity to identify sites of significance to Māori and review current policies, rules and consenting processes in terms of their efficiency and effectiveness in protecting these sites from adverse environmental effects arising from the use and development of resources.

Of note, while as part of the preparation, considerable progress has been made in developing a comprehensive dataset of known sites of significance – the process is not complete. More engagement and working with individual iwi and hapū is going to be

required to complete the dataset before a new Natural Resources Plan is publicly notified in late 2023.

Section 1 introduces the report and background information.

Section 2 sets out a statutory and planning context (including relevant case law) for protecting sites of significance with a particular focus on the Council's roles and responsibilities under the RMA.

Section 3 outlines the problem/issue to be addressed.

Section 4 outlines the investigation, engagement and collaborative process being adopted to identify sites of significance in the Taranaki region, including aim, approach and principles followed, the methodology, and the information being gathered.

Section 5 presents the key findings of the investigation, engagement and collaborative process to date. The section provides an overview of the number and type of sites so far been identified and mapped (at the time of writing this report), plus challenges and limitations noted so far.

Section 6 sets out the process/further work needed to be undertaken by the Council. The section also sets out recommendations in relation to the protection of sites of significance to Māori, including the benefits and costs of those recommendations for the Council to consider as part of the Plan review.

A glossary of key terms used in this report and references used in its preparation are presented at the back. Appendices are also presented at the back of the report.

## 2 The statutory and planning context

*This section identifies statutes, regulations and planning documents relevant to the protection of sites of significance to Māori.*

### 2.1 Legislative background

#### 2.1.1 Resource Management Act 1991 (RMA)

The purpose of this Act is “...to promote the sustainable management of natural and physical resources.”

Under the RMA, “sustainable management” means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while—

- (a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations;
- (b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and
- (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.

In achieving the purpose of the RMA, the Council, when exercising its functions and powers under the Act, must give effect to the following matters of national importance (as listed in sections 6, 7 and 8 of the RMA). Those matters of national importance of particular relevance to the protection of historic and cultural values, including sites of significance, are:

#### **Section 6** Matters of national importance

*“In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:*

- ...
- (e) *the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga;*
  - (f) *the protection of historic heritage from inappropriate subdivision, use, and development;*
  - (g) *the protection of protected customary rights ...”*

#### **Section 7** Other matters

*“In achieving the purpose of this Act, all persons*

*exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to—*

- (a) *kaitiakitanga;*
- (aa) *the ethic of stewardship ...”*

#### **Section 8** Treaty of Waitangi

*“In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).”*

Part 3 of the RMA sets out restrictions to control adverse effects associated with use and development activities. In relation to this Council’s statutory functions and plan reviews, the following statutory restrictions apply:

- restrictions on the use of land (section 9 of the RMA)
- restrictions on certain uses of beds of lakes and rivers (section 13 of the RMA)
- restrictions relating to the taking, use, damming or diversion of water (section 14 of the RMA)
- restrictions relating to the discharge of contaminants or water to land or to water (section 15 of the RMA)
- restrictions relating to the discharge of contaminants to air from any industrial or trade premise or from any other source in a manner that contravenes a regional rule (section 15 of the RMA).

Activities covered by sections 13, 14, and 15 of the RMA may not be undertaken unless expressly allowed by a national environmental standard, a rule in a regional plan or a resource consent.

#### 2.1.2 Heritage New Zealand Pouhere Taonga Act 2014

Another statute of particular relevance to this report is the *Heritage New Zealand Pouhere Taonga Act 2014*. Heritage New Zealand Pouhere Taonga is a Crown entity and the administering agency for that Act.

Pursuant to section 42 of that Act:

*“...Archaeological sites not to be modified or destroyed*

- (1) *Unless an authority is granted under section 48, 56(1)(b), or 62 in respect of an archaeological site, no person may modify or destroy, or cause to be modified or destroyed, the whole or any part of that site if that person knows, or ought reasonably to have suspected, that the site is an archaeological site.*
- (2) *Subsection (1) applies whether or not an archaeological site is a recorded archaeological site or is entered on—*
  - (a) *the New Zealand Heritage List/Rārangi Kōrero under subpart 1 of Part 4; or*
  - (b) *the Landmarks list made under subpart 2 of Part 4.*
- (3) *Despite subsection (1), an authority is not required to permit work on a building that is an archaeological site unless the work will result in the demolition of the whole of the building.*

Section 43 [Declaration of archaeological site] of the *Heritage New Zealand Pouhere Taonga Act* reads as follows:

- (1) *Heritage New Zealand Pouhere Taonga may, on reasonable grounds, declare any place to be an archaeological site if the place—*
  - (a) *was associated with human activity in or after 1900 or is the site of the wreck of any vessel where that wreck occurred in or after 1900; and*
  - (b) *provides, or may be able to provide, through investigation by archaeological methods, significant evidence relating to the historical and cultural heritage of New Zealand.*
- (2) *A declaration under subsection (1) must be made—*
  - (a) *by notice in the Gazette; and*
  - (b) *by public notice.*
- (3) *As soon as practicable after a declaration is made, Heritage New Zealand Pouhere Taonga must give a notice setting out the terms of the declaration—*
  - (a) *to the affected owner (and the occupier, if different from the owner); and*
  - (b) *to every other person with a registered interest in the site; and*
  - (c) *to the relevant local authorities; and*
  - (d) *to the appropriate iwi or hapū."*

### 2.1.3 Settlement legislation

At the time of writing, there are seven settlement acts that apply in the Taranaki region — the *Ngāti Tama Settlement Act 2003*, *Ngāti Mutunga Claims Settlement Act 2006*, *Te Aitiawa Claims Settlement Act 2016*, *Taranaki Iwi Claims Settlement Act 2016*, *Ngāruahine Claims Settlement Act 2016*, *Ngāti Ruanui Claims*

*Settlement Act 2003*, and *Ngaa Rauru Kaitahi Claims Settlement Act 2005*.

The aforementioned acts require that statutory acknowledgements be appended to regional plan and generally identify some sites and places of special significance.

One outstanding settlement relating to Ngāti Maru is expected in the near future.

## 2.2 Planning documents

### 2.2.1 National Policy Statements

National policy statements (NPS) are instruments issued by the Government under sections 45 and 46 of the RMA. NPSs state objectives and policies for matters of national significance that are relevant to achieving the purpose of the RMA, which regional plans must give effect to, to ensure national consistency on their subject matter. There are currently four national policy statements.

Of particular relevance to the freshwater, soil and air plan reviews and the protection of historic heritage and sites of significance to Māori is the *National Policy Statement for Freshwater Management 2020* (NPS-FM).

The NPS-FM sets out directions on freshwater management and requires councils to identify freshwater values, including mahinga kai.

Under the NPS-FM councils must give effect to Te Mana o te Wai, which means involving and working with tangata whenua to set out long-term visions in regional policy statements.

Te Mana o Te wai recognises the health of freshwater and is about restoring and preserving the balance between the water, the wider environment, and the community. The NPS-FM will allow for greater involvement by tangata whenua in policy development and resource management processes.

Many sites are connected to, surrounded by or are located in freshwater environments therefore having a strong link to the NPS-FM. Council engaged with iwi and hapū throughout the project with the common goal of ensuring sites are protected and preserved.

Another NPS of relevance, is the *New Zealand Coastal Policy Statement*. Objective 11 and Policy 15 of the NZCPS provides direction to councils on protecting the constituent parts of historic heritage from adverse effects in the coastal environment.

Objective 3 of the NZCPS also requires that councils "...take account of the principles of the Treaty of Waitangi, recognise the role of tangata whenua as

*kaitiaki and provide for tangata whenua involvement in management of the coastal environment by:*

- *recognising the ongoing and enduring relationship of tangata whenua over their lands, rohe and resources;*
- *promoting meaningful relationships and interactions between tangata whenua and persons exercising functions and powers under the Act;*
- *incorporating mātauranga Māori into sustainable management practices; and*
- *recognising and protecting characteristics of the coastal environment that are of special value to tangata whenua."*

### 2.2.2 National Planning Standards

Released in April 2019, the purpose of the National Planning Standards is to improve consistency in plan and policy statement structure, format and content.

National planning standards standardise the basic elements of RMA plans and policy statements and seek to improve consistency across New Zealand in terms of plan and policy statement structure, format and content. RMA plans and policy statements must comply with relevant directions set out in national planning standards. The first set of national planning standards were promulgated in 2019 and set out directions to provide for nationally consistent:

- Structure
- Format
- Definitions
- Noise and vibration metrics
- Electronic functionality and accessibility.

Of particular relevance is the application of the planning template in respect of historic heritage. Currently, in accordance with the definition of "historic heritage" under the RMA, sites of significance had been largely treated as a sub-set of historic heritage. However, the National Planning Standards now require regional policy statements and regional and district plans to split provisions for sites and areas of significance to Māori from historic heritage and archaeological sites.

### 2.2.3 Regional Policy Statement

Regional councils are obliged to prepare a regional policy statement.

The *Regional Policy Statement for Taranaki 2010* (RPS) provides an overview of the resource management issues of the region and policies and methods to

achieve integrated management of the natural and physical resources of the region.

Section 16 [Tangata whenua] of the RPS identified the need to recognise cultural and spiritual values of tangata whenua in resource management processes as one of four resource management issues of significance to iwi authorities. In relation to addressing that issue, the following provisions were included in Section 16.3 of the RPS.

#### **REL OBJECTIVE 1**

*"To recognise and provide for the cultural and traditional relationship of Māori with their ancestral lands, water, air, coastal environment, wāhi tapu and other sites and taonga within the Taranaki region."*

#### **REL POLICY 3**

*"Wāhi tapu and other sites or features of historical or cultural significance to iwi, and hapū and the cultural and spiritual values associated with ancestral lands, fresh water, air and the coast, will be protected from the adverse effects of activities, as far as is practicable and in a manner, which is consistent with the purpose of the Act."*

### 2.2.4 Regional plans

As previously noted the Council is currently reviewing its freshwater, soil and air plans.

The provisions of a regional plan have legal force under the RMA. Regional plans contain objectives, policies and rules that have the force and effect of regulation.

Plan rules may 'permit' (without requiring a resource consent) use and development activities, require a resource consent, or 'prohibit activities outright'.

In relation to the resource consenting process, rules may classify activities that would otherwise be restricted by sections 13, 14 and 15 of the RMA, as:

- **Permitted:** A resource consent is not required for the activity if it complies with the requirements, conditions, and permissions.
- **Controlled:** A resource consent is required before the activity can be carried out. The consent authority can impose conditions on the resource consent restricted to the matter over which control is reserved and the activity must comply with the requirements, conditions and permissions.
- **Restricted discretionary:** The consent authority's power to decline a consent, or to grant a consent and to impose conditions on the consent, is restricted to the matters over which discretion is restricted.

- **Discretionary:** The consent authority may decline the consent or grant the consent with or without conditions if granted the activity will comply with the requirements, conditions and permissions.
- **Non-complying:** A resource consent application is required for the activity. The consent authority may decline the consent or grant the consent with or without conditions
- **Prohibited activity:** No application to a resource consent can be made for the activity and the consent authority will not grant a consent.

The current freshwater, soil and air plans already contain provisions that protect historic heritage and sites of significance to Māori. However, through the plan review the Council is seeking to strengthen its guidance and direction.

#### 2.2.5 Iwi Environmental Management Plans

Iwi environmental management plans are planning documents recognised by an iwi authority (the authority that represents an iwi and that is recognised by that iwi as having authority to do so). Pursuant to Section 66 of the RMA the Council, when preparing or changing a regional plan, must take into account any relevant planning document recognised by an iwi authority.

At the time of writing there are six iwi management plans lodged with Council or in the final stages of drafting in Taranaki which provide direction to local authorities.

The iwi environmental management plans have been used by the Council to inform this report and the sites of significance project. Iwi management plan provisions of particular relevance to this report relate to:

- Best practice when engaging with iwi/hapū
- Ensuring iwi/hapū interests are recognised
- Providing for the relationship Māori have with their ancestral lands
- Acknowledging the issues identified and direction from the planning documents
- Identifying significant areas of cultural significance documents in the plans
- Facilitating knowledge transfer and capturing mātauranga Māori.

Iwi have expressed their wishes that they be made affected parties on any resource consent application that affect their sites of significance.

**Appendix 1** summarises the issues identified/direction from those iwi planning documents regarding wāhi tapu.

#### 2.2.6 Statutory acknowledgements

Statutory acknowledgements are statements in Treaty of Waitangi settlements between Crown and tangata whenua (generally iwi) that are intended to recognise the mana of tangata whenua groups in relation to identified sites and areas.

Statutory acknowledgements are an acknowledgement by the Crown of the particular cultural, spiritual, historic, and traditional association of an iwi with each statutory site and area.

Text for statutory acknowledgements is included in the schedules to each relevant Claims Settlement Act. The locations for statutory acknowledgement areas are shown on Survey Office (SO) plans. While these plans do not indicate the precise boundaries of the statutory acknowledgement area, they do indicate the location as nearly as possible.

Statutory acknowledgements are only over Crown land and may apply to land, rivers, lakes, wetlands, a landscape feature, or a particular part of the coastal marine area. Where a statutory acknowledgement relates to a river, lake, wetland or coastal area, it only applies to that part of the bed in Crown ownership or control.

While the only legal requirement with regards to statutory acknowledgements in the preparation of plans is to attach them to the plan, they provide a clear statement of the interests of tangata whenua that has been used to inform this report and the supporting engagement and investigations. For example, the statutory acknowledgements have been used as a starting point to identify areas of importance to an iwi.

## 3 What's the problem?

*This section outlines issues and problems relating to the protection of sites of significance to Māori that the review of the freshwater, soil and air plans seeks to address.*

### 3.1 Destruction and or modification of sites

Use and development activities that can impact on heritage values are many and varied. They include earthworks, subdivision, and discharges to land, air or water. To what degree the impact affects the historic heritage depends on the values and the scale and location of the activity.

Sites of significance are being physically destroyed and modified from inappropriate use, development and activities. Many sites have been destroyed overtime – either accidentally or deliberately. Earthworks are an activity of particular concern.

Activities in and near sites of significance to Māori may also have a broader impact on tangata whenua values. For example, discharges may have an adverse effect on the mana, mauri and wairua of sites of significance and the relationship of Māori and their culture and traditions with their ancestral lands, water and wāhi tapu. Activities can impact on the presence/abundance of mahinga kai and/or taonga species, which in turn has an impact on the mana of the iwi or hapū, including their ability to feed themselves and guests.

It may also impact on their social, cultural and/or economic well-being and cultural identity. Wāhi tapu, sites or places of cultural significance, and customary resources are integral to the identity, well-being and cultural integrity of tangata whenua.

The destruction and/or degradation of culturally significant sites is extremely concerning for mana whenua and is identified as a significant issue in all iwi management plans.

### 3.2 RMA mechanism to better protect sites

Current operative Regional Policy Statement and regional plans contain provisions for the protection of sites of significance to Māori. The Freshwater Plan, for example, contains explicit provisions that identify adverse effects on mahinga kai and the protection of wāhi tapu and other taonga as matters of regional significance. However, supporting policies are, arguably, not directive enough and do not prioritise where there are competing or conflicting values and uses.

Standards, terms and conditions for permitted and controlled activities also do not explicitly address the protection of cultural values and/or sites of significance to Māori.

The operative regional plans also do not have maps and/or schedules identifying sites of significance. This means Council and/or resource users may not even know particular values exist yet alone might be at risk from use and development activities.

The inclusion of revised rules and policies that specifically address cultural values, including sites of significance to Māori is necessary. This should also include consideration of setback distances for particular 'riskier' activities in and near sites of significance. Setback distances might trigger additional consenting and/or notification/engagement considerations such as requirements to consult with the relevant iwi or hapū and/or undertake cultural impact assessment.

### 3.3 Poor or incomplete information

One of the challenges of protecting sites of significance to Māori is the lack of awareness and information about important sites and site values.

Many archaeological sites, particularly Māori sites of interest (e.g. taonga or wāhi tapu sites) have not been recorded or clearly identified – yet alone given some statutory protection.

The destruction of sites of significance can be accidental – often due to a land occupier or resource user not being aware of the historical and cultural significance of a particular site or place.



Records of historical sites are incomplete and fragmented across a plethora of data sources – many not easily accessible.

In recent times, Taranaki councils have sought to better identify and map sites of significance to Māori as part of ensuring that adverse effects from use and development are avoided, remedied or mitigated. New Plymouth District Council as part of the review of their district plan identified and scheduled approximately 823 sites excluding those relating to coastal and freshwater. As part of its plan reviews, Taranaki Regional Council is doing likewise.

Prior to the commencement of the Project, there was no comprehensive electronically available mapped layer for Taranaki relating to sites of significance to Māori. The lack of spatial information leaves sites vulnerable to being destroyed and the cultural values associated with the site to be disregarded.

Of note, at the time of writing this report, there were only 64 scheduled sites of significance in the South Taranaki District Plan and none in the Stratford District Plan.

Of note, new previously unknown sites will always be identified over time.

## 4 Sites of significance identification project

*This section outlines the approach, aim and method adopted by the Council to work with iwi and hapū to identify and map sites of significance to Māori.*

### 4.1 Aims of the project

The sites of significance identification project aims to inform the review of the freshwater, soil and air plans in order to better protect sites of significance to Māori. The project does this by:

- Providing a comprehensive data set that identifies, locates and maps all sites of significance to Māori in the Taranaki region.
- Providing for individual sites of significance information on the associated values.
- Ensuring RMA planning and consenting processes are aware of known sites of significance and adopt appropriate avoidance, remediation and mitigation measures.
- Better recognising and providing for the relationship iwi/hapū have with sites of significance, including the exercise by mana-whenua of kaitiakitanga over all parts of the land, water, air and coast.
- Empowering iwi/hapū to apply tikanga and mātauranga Māori to the resource management decision making processes.
- Gathering dispersed knowledge about the history of the land and its natural resources that can also be used for educational purposes to promote wider and better understanding of tangata whenua values.

### 4.2 Overall approach and principles

In brief, the identification project involves:

1. verifying the location of known sites currently listed in district and regional plans and, where possible, identifying their extent and values; and identifying further sites and where possible identifying their extent and values for inclusion in the Proposed Natural Resources Plan. For owners and developers the identification provides certainty that the activity they wish to undergo will not have significant adverse effects to sites of cultural importance and will enable a

swift process when contacting iwi and hapū authorities if and when required.

As a first principle, iwi and hapū are the custodians of information relating to their values. Iwi and hapū are therefore best placed to review and confirm their information. The project does not require a comprehensive archaeological and spatial survey of each site or area of significance; and therefore the engagement of archaeologists and/or surveyors was not considered necessary. Instead, the approach adopted was for Council to liaise directly with local iwi and hapū on identifying their sites of significance and setting up a process to ensure their views are integrated into the RMA planning framework.

Set out below are some key principles that underpinned the Council's approach.

#### **Principle 1: Intellectual ownership:**

All information on sites of significance (including maps, stories, and historical accounts) remain the cultural property of the relevant iwi, hapū, whanau and marae in accordance with their kaitiaki.

The Council recognises that the knowledge pertaining to the location, extent and significance of these sites belong to the iwi and hapū which they relate to. With this understanding the Council will work collaboratively with iwi and hapū to identify the levels of access respective parties will have to site information. Iwi and hapū will be responsible for informing the Council on what degree of information sharing they see as appropriate for each site.

#### **Principle 2: Iwi/hapū led**

Identification of the location of sites and areas of significance to Māori has and continues to be an iwi/hapū-led process, with Council helping to map the GPS coordinates that provide visibility for these sites, which have been unavailable for many years. For iwi and hapū this provides for the site to be recognised in a way that protects the cultural, spiritual and historical importance.

The project is part of an on-going focus on building relationships between Council, landowners and iwi/hapū to ensure better protection and management of sites over time.

#### **Principle 3: Early engagement**

Early engagement on Plan reviews assist with relationship building and confidence in the review process as well as providing for a process of policy co-

design. This leads to better outcomes for both tangata whenua and the Council in the development and implementation of a proposed Plan. Tangata whenua were informed and involved in the very initial stages of the sites of significance to Māori project.

**Principle 4: Regulatory certainty and clarity**

The identification of the location of sites and areas of significance to Māori linked to revised RMA policies and rules (for inclusion in a revised regional plan) provides certainty to Council, owners and developers.

- create GIS polygons (Shapefiles) showing the location and indicative boundary of the extent of each site
- create an attributes table, a description of the site, its attributes, its values, and other supporting information.

Stage 1 was largely completed by August 2020. At that time, Council had reviewed most publically available resources.

### 4.3 Methodology

This project is the first time sites of significance to Māori across Taranaki have been identified in a systematic way.<sup>4</sup> The project was commenced in late 2019 and was developed as a two stage process.

#### 4.3.2 Stage 2: Tangata whenua engagement and verification

Once Stage 1 was completed, a map portal was produced to share with interested iwi and hapū. Stage two is reliant on iwi and hapū engagement. Tangata whenua engagement was (and continues to be) a fundamental part of the project.

#### 4.3.1 Stage 1: Literature review and desktop analysis

Stage 1 of the project involved Council, as a starting point, undertaking a literature review and desktop analysis for information identifying the location and values of sites and places of significance to iwi and hapū in the Taranaki region.

The Council recognises that tangata whenua, as the kaitiaki of the land, have a crucial part in the decision making processes of resource management. Furthermore, iwi and hapū hold the knowledge and are the custodians of information pertaining to a sites location, history and significance.

Individual iwi and hapū were contacted and invited to meet with Council officers undertaking the sites of significance identification project. This was an opportunity for Council officers to meet with representatives from individual iwi and hapū and outline the project, its aims and the approach to be undertaken. It was also an opportunity for iwi and hapū to discuss their expectations of the project, including the planning, engagement and collaborative outcomes anticipated.

Accordingly, Stage 2 involves Council working with relevant iwi and hapū to confirm and verify sites located in Stage 1 of the project, and/or making the appropriate additions, deletions and amendments based upon their knowledge.

Throughout the project, Council officer's ensured iwi and hapū were kept updated and the opportunity was always there to organise face to face meetings.

All relevant iwi and hapū o Taranaki were individually contacted outlining the project and seeking their support and input. Council officers were always available throughout the process to meet with interested iwi and hapū members

Stage 1 of the project involved researching and collating **publically** available resources for information on potential sites of significance to Māori. This involved not only a literature review but also an analysis of historical maps and photographs. Information was collated on ArcGIS Pro and displayed on a map,

As identified in many iwi management plans, hui (meetings) kanohi ki te kanohi (face to face) was the preferred method of engagement.

In relation to each site, information collated was then analysed and used to:

Prior to any meeting, a comprehensive written introduction to the project was provided to iwi/hapū representatives to promote the project and provide them with information to pass on to others.

Initial hui were organised with representatives of interested iwi and hapū to discuss the project and to

<sup>4</sup> When this project was introduced there was a lack of categorised information on sites of significance to Māori, particularly in south Taranaki and Stratford. Scheduled sites in current district and regional plans were minimal and incomplete. Accordingly, South Taranaki and Stratford district councils agreed to contribute to this project so that there was a single process and information would be shared and incorporated (in due course) into relevant regional and district plans. Prior to the commencement of the project New Plymouth District Council had already completed a similar process within their district.

ensure iwi/hapū comfort and commitment to the identification of sites of significance in their rohe.<sup>5</sup>

Where there was interest, Council would then organise a workshop with interested iwi and hapū representatives at their offices, marae, homes or Council offices (according to their preference) to review and verify Council information. To assist this process, and prior to any workshop, Council would develop and forward a web-based portal showing all sites of significance in the relevant rohe that had so far been identified through the desktop analysis.

If the workshop was held at the Council offices, Council and iwi/hapū representatives would verify sites (and supporting information) directly onto Arc GIS Pro. This included amending and including new information directly into the Council's datasets under the supervision of the iwi/hapū representative(s).

If the hui was held outside of the Council offices, new and amended information would necessarily have to be uploaded when the Council officer was back in the office. An exchange of correspondence and/or follow-up hui would be held to ensure that all the new/amended/verified information had been correctly included onto the Council's datasets.

Only after all polygons and supporting information had been confirmed by the relevant iwi and hapū, would the site then be labelled as 'verified'. Of note, based upon the views of iwi and hapū, mapping information was 'tailored' to reflect the sensitivity of particular sites and places. For example:

- Sites of high sensitivity do not have to be identified as a singular point. A block of surrounding land (section) was on occasion outlined so as to not identify the exact location of a particularly sensitive feature or attribute.
- If the site's extent is of sensitivity, a singular point could be used to identify the site, a buffer area was then mapped to encompass the significant area and alert a red flag area.
- Associated information such as the site name, historic stories, and site findings may be restricted where iwi/ hapū see appropriate. In such cases, the site was identified on the map without the related information. In such cases an activity might trigger a red flag and interested parties would be required to engage with the appropriate iwi or hapū.
- A silent file can be used for sites of high sensitivity to iwi/ hapū which would only allow

for restrictive access to information. The degree of information that will be made publicly available is determined by the relevant iwi and hapū. Silent file sites will be scheduled as such in the *Proposed Natural Resources Plan*. The Plan will also advise the reader to contact the Council if they require further information.

Of note, throughout the 'life' of the project, the Wai Māori Group has provided input and been kept updated throughout the project.

#### **Tangata whenua are custodians of their own information**

Each iwi/ hapū has its own way of maintaining knowledge regarding sites of significance, including wāhi tapu. Most of it may lie with the kaumatua.

Each iwi/hapū has different levels of 'comfort' in terms of their willingness to share their information with external organisations such as the Council. This reinforced the importance of having individual hui to discuss concerns, identify potential issues and develop solutions to the benefit of both parties.

The willingness of iwi and hapū to participate in this project generally reflected their relationship with Council (e.g. trust), capacity constraints, or differing views of the merits of the project held within iwi/hapū.

Between December 2019 and November 2020, Council officers attended eight meetings and hui to discuss the sites of significance project and/or verify site information.

Consultation with iwi and hapū was documented on an excel spreadsheet, the record of communication was important for tracking the progression of the project in relation to particular iwi/hapū.

#### **4.3.3 Engagement with the Wai Māori group**

In addition to the above, the Council works with a group called the 'Wai Māori Working Group' made up of mandated representatives from iwi and hapū throughout the region.

The Wai Māori Working Group was formed in 2019 specifically to provide input and feedback as part of the review of the Council's regional plans and the development of the new *Natural Resources Plan*.

Through this working group the Council seeks to address key aspects relating to tangata whenua including identifying cultural values, policy

<sup>5</sup> Meeting were initially targeted iwi and hapū of south Taranaki due to the paucity of readily publically accessible information there. This is in comparison to north Taranaki where New Plymouth District Council and local iwi/hapū have undertaken a separate and comprehensive process as part of their district plan review.

development by co-design, limit setting and establishing mātauranga Māori monitoring methods. The Wai Māori group allows opportunity for traditional knowledge systems to be acknowledged, maintained and protected through resource management processes.

Representatives from iwi and hapū are invited to meet six-weekly to attend the Wai Māori meeting where a number of resource management topics are discussed. During the meetings an update is provided on the sites of significance project and any advancements that have been made. Iwi representatives can take the information back to their respective iwi/hapū to discuss and provide comment on.

Email updates were also sent out to the Wai Māori group which updated members on how the sites of significance project was progressing.<sup>6</sup>

Key information and points shared and raised by the Wai Māori working group are summarised below:

- Even with good intentions it is evident that the operative plan is not ensuring wāhi tapu considerations are being adequately addressed through resource management processes.
- There is no comprehensive and accessible mapped information for sites of significance making it difficult to determine an affected party status for iwi and hapū.
- Some hapū may not feel comfortable for all of their sites of significance to be recorded and made publicly available.<sup>7</sup>
- The 'Identification of sites and areas of significance recording guide' was presented to the Wai Maori group in late 2019.
- Important as part of this process, that Council work and engage with tangata whenua on research, information requirements.
- A position paper on sites of significance was produced by the Wai Māori working group and the independent facilitator. The paper summarised the key issues presented in Iwi Environmental Management Plans which outlined the importance of designing a policy and rule framework which is informed by tangata whenua, with the aim of protecting sites of significance and the relationship tangata whenua have with these areas.
- Important that location and information on sites of significance are not publically available until formally verified by relevant iwi and/or hapū.

- Sites of significance must undergo a thorough verification process that recognises that only tangata whenua can identify their association, values and history of a site before a site could be confirmed and scheduled.
- Some iwi and hapū members were concerned that once the Regional Council obtained sites of significance data that the Council would no longer engage with iwi and hapū when sites of significance were involved in a resource consents.
- Need memoranda of understanding that acknowledges that holding this data 'does not replace or lessen' the Council's requirements to engage with iwi and hapū when necessary. This reassurance was appreciated by iwi and hapū authorities and members.

**Appendix II** sets out a schedule of the engagement undertaken as part of the sites of significance identification project (and other related matters).

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<sup>6</sup> The working group has been supportive of the need to identify and better protect sites of significance to Māori and members have been continually updated throughout the process.

<sup>7</sup> In response to this concern, the Council stated it would work with relevant iwi/hapū to ensure that information accessibility, sharing and visibility would be tailored to the individual hapū/iwi requests.

## 4.4 Information being gathered on sites of significance

### 4.4.1 Shape files:

When a site was identified and located it was mapped out on ArcGIS Pro as a polygon.

The indicative outline of the site boundary was created with the aim to encompass the site in its entirety.

In most cases only the visible features were used as an indicator of the site's extent. The property outline was often used for sites such as urupa and marae.

Because a site's physical features may have degraded over time due to grazing, earth works, and other land use activities, polygons need to be confirmed by the relevant iwi/hapū.

Shape files identifying sites of significance throughout Taranaki have been generated, maintained and updated throughout the process.

As previously noted, upon completion of Stage 1, Council developed a map portal, which was sent out to the relevant iwi/hapū identifying all known sites of significance in their rohe.

The map portals were located on the TRC local maps website, each iwi had a secure login and password. The iwi maps would display sites of significance and the associated attribute information within their iwi rohe boundaries.

The map portal was sent out to iwi/hapū that indicated they were interested in working with the Council on Stage 2 of the project to assist in the review and identification of known sites of significance (and prior to any Stage 2 meetings).

### 4.4.2 Online information and attribute table

The attribute table is an Excel spreadsheet summarising the following core Council information in relation to each identified site of significance.

#### Information sources:

The source of information for each site can be found by clicking on a site of significance and is located under the 'Source' heading

A number of online and physical resources were used during this stage to gather as much information as possible. These resources included:

- Puke Ariki research centre;
- Archived books, photographs and maps;
- Maps (Old, cadastral, topographic);

- Library books;
- Articles;
- Desktop search;
- Newspaper clippings; and
- Deeds of settlement

#### Attribute information:

Information about a particular site was summarised and input in to the attribute table on Arc GIS Pro. This information can be viewed by clicking on a site and is displayed as a pop up.

Sites with very limited information were initially listed as 'Possible' and sites with abundant/accurate information were listed as 'Probable'. This was used as a guide to inform the subsequent iwi/hapū verification processes.

The attribute table columns are as follows:

**SiteID:** Site identification number to be used in the proposed *Natural Resources Plan*.

**Name:** Name of the site

**Type:** Type of site, i.e. urupa, pa, marae

**Commentary:** Summary of information regarding the sites significance, i.e. history and values

**Site Description:** Account of what the physical landscape looks like based off of satellite imagery, i.e. land features, fencing

**Source:** The resources used to provide any of the information for the individual site

**Iwi:** The iwi with the historical, spiritual, and cultural associations with the site (iwi overlay used to identify this on ArcGIS Pro)

**Hapū:** The hapū with the historical, spiritual, and cultural associations with the site.

**NZAA number:** New Zealand Archaeological Association ID Number, potentially associated with the site (if applicable)

**NZAA Description:** New Zealand Archaeological Association description, potentially associated with the site (if applicable)



## 5 Findings

*This section provides a summary of sites of significance to Māori so far identified through this project, plus an indication of the 'job' outstanding.*

### 5.1 Preamble

At the commencement of the sites of significance project, there were approximately 880 sites of significance to Māori identified in RMA plans across Taranaki.

New Plymouth District, which has commenced a review of its District Plan had scheduled 824 sites of significance in its Proposed Plan. This process has been very comprehensive and represents the best information (for New Plymouth District only) at this point in time.

South Taranaki District, which has just completed its District Plan review has 34 sites identified in Schedule 1B [Historic Sites and sites of significance to Tangata Whenua] of its District Plan.

Stratford District has 30 sites scheduled in Appendix 6 [Known heritage resources of significance] of their Plan but these are a combination of Māori and non-Māori sites.

Council will work closely with iwi and hapū in the New Plymouth District to seek their permission to build on the information already gathered (subject to any refinements at the direction of the relevant iwi or hapū).

In south Taranaki and Stratford districts, there is a paucity of information and this was where the project focused its efforts.

### 5.2 Number and type of sites of significance in Taranaki

Approximately 826 possible, probable and confirmed sites of significance to Māori have been mapped as at 31 December 2020. In addition there are another 824 sites identified by the New Plymouth District that this Council anticipates it will also add to its total dataset in due course.

Set out in Table 1 is a summary of possible, probable and confirmed sites in the Taranaki Region.

Table 1: Possible, probable and confirmed site

Identification	Number of sites
Possible	362
Probable	313
Ngati Rahiri confirmed	101
Ngāruahine confirmed	29

Set out in Table 2 is a breakdown of types of the possible, probable and confirmed sites of significance in Taranaki, including silent files.

Table 2: Site types identified in Taranaki

Site type	Number of sites
Pa	409
Conservation Area	155
Urupa	93
Marginal strip	44
Kainga	35
Marae	31
Historic/Scenic reserve or site	28
Pits/terraces	21
Recreation reserve	14
Wāhi tapu	13
Other	72

Set out in Table 3 is an overview of the total number of possible, probable and confirmed sites by rohe (noting this excludes the 824 additional sites identified by the New Plymouth District).

Table 3: Number of sites by rohe

Rohe	Number of sites
Ngati Tama	22
Ngati Mutunga	29
Te Atiawa	140
Ngati Maru	25
Taranaki	172



Ngāruahine	112
Ngati Ruanui	128
Ngaa Rauru	90

As at the time of writing this report, the following iwi/hapū have been in discussions with verifying or transferring their sites of significance information; Ngati Tama, Te Atiawa, Ngati Maru, Ngāruahine and Ngaa Rauru. Although so far only the Ngati Rahiri hapū and part of Ngāruahine have confirmed their sites. For further iwi engagement details please see Appendix II.

**Figure 1** overleaf identifies the indicative location of sites of significance so far identified through this project, including those identified by the New Plymouth District Council.

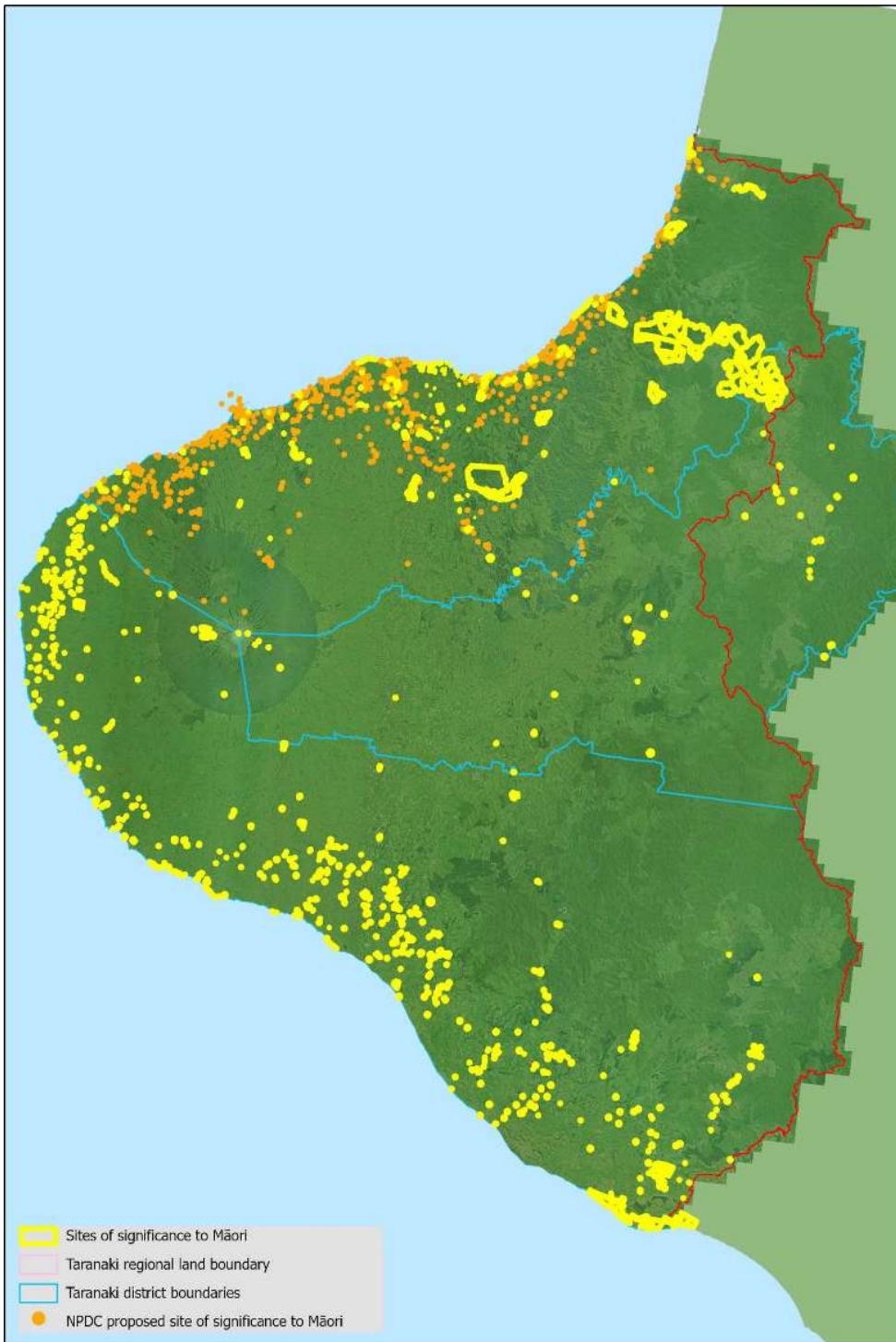
section with setting up the mapping component of Stage 1 of the project, this required a lot of time and attention. On occasion there were capacity issues with GIS being able to assist in a timely fashion. This meant other Council staff had to upskill in the use of GIS and it sometimes meant that GIS mapping and editing took longer to complete.

- **Iwi and hapū participation and capacity:** There are capacity constraints for some iwi/hapū who did not have enough resourcing to be engaged throughout the project. Some of the smaller iwi/hapū may have had to prioritise other work and therefore could not be involved with the sites of significance to Māori project, although Council staff were available to discuss different processes if this was the case.

### 5.3 Challenges and constraints

Challenges are to be expected when taking on projects of this nature and scope. Challenges and constraints noted during the sites of significance identification project and which might inform lessons and learnings for the remainder of the project include:

- **Incomplete information:** Stage one of the project required extensive researching of existing information that was publically available. However, existing information gathered was often incomplete. Also, there was often missing pieces of information relating to the site. For example site type, name or historical commentary was not found during the research stage, this creates uncertainty and questions the accuracy of information.
- **Dispersed information:** Publicly available resources used to research sites of significance to Māori were dispersed (online resources, books, articles and library archived resources), it was challenging to collate all of the information required for the site.
- **Alignment between regional and district planning processes:** Assumptions that Council could adopt, align and obtain mapping information already gathered by New Plymouth District Council (as part of their district plan review) did not eventuate. NPDC are only prepared to exchange their sites of significance datasets with the express permission of iwi and hapū. While iwi and hapū preference was for the Regional Council to work directly with them rather than obtaining information from the District Council.
- **Internal GIS capacity:** The Council's GIS section was tasked with assisting the Policy



**Figure 1** Sites of significance to Māori in the Taranaki region



## 6 Where to from here?

*This section sets out recommendations in relation to the protection of sites of significance to Māori, including the benefits and costs of those recommendations.*

### 6.1 Process from here

The identification of sites of significance by Council will be an ongoing process. It is expected that as the project progresses, and the knowledge from iwi and hapū is added, more sites will be collated.

Council has engaged with all iwi and hapū o Taranaki as part of this project. This engagement will continue when iwi and hapū are ready to complete site verification.

The *Proposed Natural Resources Plan* is anticipated to be publicly notified by late 2023. Council will be endeavouring to work with those iwi or hapū not yet participating in the project to get their support and cooperation to identify, review and verify their sites of significance as soon as possible. If need be, Council will work with willing iwi and hapū right up to the date of public notification of a Proposed Natural Resources Plan.

Post public notification and adoption of a new Natural Resources Plan, it is likely that new sites will be discovered. Ensuring that such sites are given the same legal status and level of protection as the 'known' sites will need to be provided for in any new planning framework.

### 6.2 Recommendations

#### 6.2.1 Plan changes

The sites of significance identification project is part of a broader effort to better protect sites and places of particular importance to Māori.

In addition to developing comprehensive spatial information, Council has been engaging with tangata whenua to consider the adequacy, efficiency and effectiveness of current Plan provisions.

Tangata whenua views<sup>8</sup> on a policy framework will be incorporated into new plan provisions. As appropriate these will be aligned with other relevant statutory or planning considerations such as the *Heritage New Zealand Pouhere Taonga Act*.

Based upon the issues and feedback received to date through the Wai Māori Group and other tangata whenua feedback (refer section 4.3.3. and Appendix II), the following Plan changes are recommended:

- **More directive policy provisions<sup>9</sup>**

Current operative regional plans presently contain a plethora of objectives and policies addressing (explicitly or implicitly) tangata whenua values, including sites of significance. However, the policies are generally framed as guidance with no added weight when considering and providing for the protection of sites of significance from other activities and or conflicting uses and values.

It is recommended that new policies (with appropriate linkages to other activity-specific policies) be developed and included in a new Natural Resources Plan. The new policies will explicitly address the protection of historic heritage values, including sites of significance, the protection of taonga species, and recognition and provision for the relationship of tangata whenua culture, values and traditions with the wider environment.

In relation to the historic heritage policy (which includes sites of significance) it is recommended that use and development activities be required to "*avoid significant adverse effects*". The policy intent of these directions mean that if an activity may have more than minor adverse effects on known sites of significance, a resource consent will need to be obtained with conditions imposed to ensure they do not negatively impact on the site of significance.

- **Explicit standards terms and conditions in regional rules**

<sup>8</sup> More explicit objectives and policies will continue to be framed up with contributions from, amongst others, of the Wai Māori working group.

<sup>9</sup> In addition, tangata whenua principles and values are recommended to be integrated throughout the Proposed Natural Resources Plan, including provisions relating to te mana o te wai and mātauranga Maori.

To give effect, to the revised policies it is recommended that regional rules be prepared to explicitly address and ensure activities cannot have more than minor adverse effects on the environment.

Current operative regional plans presently do not contain explicit standards, terms and conditions addressing tangata whenua values, including sites of significance. Such matters are generally bundled under broader environmental effects.

For permitted and controlled activities, it is recommended relevant regional rules include explicit standards terms and conditions that require activities to avoid or mitigate effects on sites of significance (as outlined in this report). In particular, standards, terms and conditions are recommended that:

- Prohibit certain activities from having adverse effects on sites of significant; and/or
- Set out buffer distances for avoiding or notifying works that are going to occur in or near sites of significance.

For controlled and restricted discretionary activities it is also recommended that matters of discretion or control explicitly include consideration of adverse effects on historic heritage and sites of significance.

- **Discretionary, non-complying or prohibited status for activities having more than minor adverse effects on sites of significance**

To give effect to the revised policies, it is further recommended that activities having more than minor adverse effects on the sites of significance be made discretionary, non-complying or prohibited.

That is to say that activities classified as permitted or controlled but do not comply with the relevant standard, terms or conditions necessarily will have an adverse effect on sites of significant but there is certainly a risk. Accordingly, such activities and their effects on sites of significance need to be properly considered and vetted through a consenting process with, as a minimum the ability to decline the resource consent application.

- **New schedules and the provision of online mapping identifying known sites of significance**

Sites of significance require comprehensive and accurate mapping to ensure sites are recognised in regional plans and consenting

processes for use and development activities in or near these sites.

When a resource user is applying for a consent an accessible layer for consenting officers to analyse will create a more accurate assessment of whether a site will be affected. An affected party determination can then be made as to whether iwi and hapū need to provide comment on the consent.

For permitted activities that generally have less than minor adverse effects, resource users will be able to ensure their activities do indeed avoid, remedy or mitigate adverse effects on sites of significance that may be more sensitive to such activities than is the 'norm'.

### 6.2.2 Other methods

In addition to Plan changes, Council will consider other methods to support iwi and hapū efforts to protect sites of significance, including:

- **Mana whakahono a rohe agreement(s)**

The Council is currently working with iwi authorities (excluding Ngati Ruanui) and the three district councils to develop a mana whakahono a rohe agreement for Taranaki.

Mana whakahono a rohe agreements are a statutory agreement under the RMA setting out the agreed working relationships between Council and iwi. As part of that agreement there is an opportunity for iwi and Council to set out consenting processes (amongst other things) on who does, what and when in relation to consent applications for activities that may impact on sites of significance and associated values. This includes notification requirements, affected party status, and the need for cultural impact reports.

- **Memoranda of understanding**

It is recommended that Council work with interested iwi and hapū to develop memoranda of understanding setting out the agreed process for developing and maintaining their information and knowledge residing on Council maps and data sets.

Memoranda of understanding between the Council and iwi/hapū authorities would clearly set out Council's commitment (and iwi/hapū expectations) on how information on sites of

significance will be maintained and protected, including how 'silent file' will be managed.<sup>10</sup>

- **Online mapping support and assistance for iwi and hapū**

The Council map portals which are set up for iwi and hapū will be provided to the relevant parties to use as they see fit and for their purposes.

This will involve maintenance and sharing of a Council GIS viewer for sites and areas of significance to Māori that can also be accessed by iwi/hapū groups within the region.

The Council should also continue to actively engage with iwi and hapū to continue developing the sites of significance data and, as appropriate, refine and amend the dataset to improve its accuracy. It is inevitable that new historically significant sites to Māori will be found and it is critical that these sites also be captured on ArcGIS Pro by the Council to ensure they are also protected under the RMA.

- **Financial assistance**

Consider financial assistance from the Council's Environmental Enhancement Grant fund for projects supporting the protection of sites of significance to Māori, including associated values.

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<sup>10</sup> 'Silent files' refer to sites and places where the exact location will not be identified and/or be made publicly available. Site information accessibility will vary due to the cultural sensitivity of each site. It was crucial that the processes for protecting the information was at the forefront of the project when collecting sensitive information from iwi and hapū.

## Policy and Planning Committee - Sites of Significance

### 6.2.3 Benefits and cost of Plan changes

Set out below is a brief summary of the key benefits and costs of the recommendations relating to sites of significance to Maori.

Recommendation(s)	Benefits	Costs	Efficiency & effectiveness
<b>More explicit &amp; directive policy provisions</b>	Increased policy certainty & clarity Increased regulatory protection Gives effect to sections 5, 6(e), (f) & (g), 7(a), & 8 RMA	May impose additional costs on resource users May preclude some activities from occurring	The recommendation best allows for the consideration and weighing between sometimes competing uses & values
<b>Explicit standards terms &amp; conditions in regional rules</b>	Increased certainty & clarity via rules Increased regulatory protection Gives effect to sections 5, 6(e), (f) & (g), 7(a) & 8 RMA	May impose additional costs on resource users	As above. However, this recommendation would also ensure that minor activities consider their effects if they are located in or near sites of significance
<b>Discretionary, non-complying or prohibited status for activities having more than minor adverse effects on sites of significance</b>	Increased regulatory protection via rules Allows for solutions to issues to be 'tailored' via consenting process Likelihood of greater iwi/hapū input Gives effect to sections 5, 6(e), (f) & (g), 7(a) & 8 RMA	May impose additional costs on resource users No certainty that the activity will be allowed	This recommendation is part of a regulatory framework that provides greater regulatory protection of identified sites via the consenting process associated with 'riskier' activities
<b>New schedules &amp; the provision of online mapping identifying known sites of significance</b>	Increased certainty & clarity via policies & rules Allows for buffer distances to be included in rules & the adoption of a precautionary approach Allows avoidance, remediation & mitigation measures to be adopted in or near known sites exist Increased iwi/hapū input/engagement in RMA processes	Additional costs on Council to identify & map sites Likely that some sites will remain 'unknown' or 'undiscovered'	This recommendation is efficient & effective. It better enables Council to enforce the protection of sites identified, mapped & scheduled in the Plan. Resource users are also better able to comply with rules & take action to avoid, remedy or mitigate their effects on scheduled & mapped sites. It will also assist in determining 'affected party' status for iwi/hapū
<b>Mana whakahono a rohe agreement(s)</b>	Increased certainty & clarity for councils & iwi relating to engagement processes Presence/absence of a listed site may determine whether tangata whenua are an affected party Increased iwi/hapū input/engagement in RMA processes	Reaching agreement can be time consuming for parties Not all iwi may choose to be a party of a mana whakahono a rohe agreement	This recommendation is efficient. An agreement allows for a streamlined planning, consenting & engagement processes addressing how iwi must be engaged on certain matter, including sites of significance

Policy and Planning Committee - Sites of Significance

Recommendation(s)	Benefits	Costs	Efficiency & effectiveness
	Better recognises & provides for the relationship of tangata whenua Gives effect to sections 5, 6(e), (f) & (g), 7(a) & 8 RMA		
<b>Memoranda of understanding (specific to sites of significance information)</b>	Increased certainty & clarity for Council & relevant iwi/hapū on the ongoing day-to-day management & protection of information provided by the iwi/hapū	No cost to Council	This recommendation is efficient. An agreement ensures there is a clear undertaking by both Council & iwi/hapū in relation to managing and protecting information provided by the iwi/hapū
<b>Online mapping support and assistance for iwi &amp; hapū</b>	Builds iwi capacity to participate in RMA processes Empowers iwi/hapū exercise of kaitiakitanga	Low cost to Council	This recommendation is efficient & effective as it supports & empowers iwi/hapū efforts to participate in RMA processes & protect their sites
<b>Provision of financial assistance to protect sites of significance</b>	Increased voluntary/active protection of sites of significance	Low cost to Council	This recommendation is efficient & effective as it supports & adds value to regulatory efforts to protect sites. It is applied on a case-by-case basis
<b>Provision of information on sites of significance</b>	Informs & supports landowners to manage, maintain and preserve sites of significance Promotes public awareness of mātauranga Māori, kaitiakitanga & the value of protecting sites Increased voluntary/active protection of sites of significance	Low cost to Council	This recommendation is efficient & effective method as it supports & adds value to regulatory efforts to protect sites  A lack of community awareness & appreciation of sites of significance has contributed to the neglect & sometime the destruction and misuse of sites of significance. Through public information there is an opportunity to address this (where it is appropriate)A
<p><b>Reasonable practicable option:</b> The preferred management approach is for stronger protection for sites of significance to Māori. The recommendations above and further detailed in sections 6.2.1 &amp; 6.2.2. of this report are essentially a variation on the current approach but involves the Council being much more explicit &amp; directive in its policies &amp; rules to better protect sites of significance. It involves the adoption of a policy framework &amp; a tightening of the rules in a new Natural Resources Plan that seeks to avoid significant adverse effects on sites &amp; places that have been identified and mapped. The approach is generally consistent with that recommended by Heritage New Zealand in its Model Rules for RMA Regional and District Plans (historic buildings) and that sought by tangata whenua in relation to identifying and protecting sites of cultural significance.</p> <p>The alternative to the proposed provisions is the <i>status quo</i>, i.e. do nothing further to the current operative provisions &amp; do not identify &amp; map sites of significance. However, an assessment of the benefits &amp; costs of the two options shows clear benefits arising from the proposed changes that outweigh the costs, &amp; that the preferred management approach is the most appropriate way of achieving the Plan objectives.</p>			





## Glossary

### Hapū

Sub-tribe, usually a number of whanau (families) of people of Māori descent with a common ancestor. When combined or brought together create an iwi (tribe) of Māori people.

### Historic heritage—

- a) means those natural and physical resources that contribute to an understanding and appreciation of New Zealand's history and cultures, deriving from any of the following qualities:
  - i) archaeological
  - ii) architectural
  - iii) cultural
  - iv) historic
  - v) scientific:
  - vi) technological; and
- b) includes—
  - i) historic sites, structures, places, and areas; and
  - ii) archaeological sites; and
  - iii) sites of significance to Māori, including wāhi tapu; and
  - iv) surroundings associated with the natural and physical resources

### Iwi

Tribe or group of people of Māori descent. Comprised of many hapū (sub-tribes). An iwi normally occupies a particular area of land, which has been in their possession for many generations.

### Kaitiaki

The custodian, guardians of resources ensuring the preservation and protection of an area. In most cases the kaitiaki are the tangata whenua of the particular land.

### Kaitiakitanga

The exercise of guardianship by the tangata whenua of an area accordance with tikanga Māori in relation to natural and physical resources; and includes the ethic of stewardship.

### Mātauranga Māori

Māori customary knowledge, traditional knowledge or intergenerational knowledge. Including the Māori world view and perspectives, Māori creativity and cultural practices.

### Mana whenua

Māori territorial rights and the power associated with possession and occupation of tribal land.

### Mauri

Life principle, vital essence, special nature, a material symbol of a life principle, source of emotions. The essential quality and vitality of a being or entity. All natural and physical resources possess a mauri.

### Papatūānuku

Earth, earth mother and wife of Ranginui – all living things originate from them.

### Ranginui

Atua of the sky and husband of Papatūānuku, from union originate all living things.

### Tangata whenua

In relation to a particular area, means the iwi or hapū that holds mana whenua over the area. The indigenous people born of the whenua, where the peoples ancestors have lived.

### Taonga

Treasure and/or prized possession. Applied to anything considered to be of value including socially or culturally valuable objects, resources, phenomenon, ideas and techniques.

### Tikanga

The customary system of values and practices that have developed over time and are deeply embedded in the social context for Māori.

### Wāhi tapu

A place that is sacred to Māori in a traditional, spiritual, religious, ritual or mythological sense.

### Wāhi tapu area

Means land that contains 1 or more wāhi tapu.

### Wāhi tūpuna

Means a place important to Māori for its ancestral significance and associated cultural and traditional values, and a reference to wāhi tūpuna includes a reference, as the context requires, to—

- a) wāhi tipuna:
- b) wāhi tupuna:
- c) wāhi tipuna.

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- Taranaki Regional Council, 2019, Proposed Coastal Plan for Taranaki – Council decisions version 2019
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## Appendix 1: Relevant provisions in iwi management plans

Plan	Relevant provisions
<p><b>Ngāti Mutunga – Iwi Environmental Management Plan (DRAFT)</b></p>	<p>Outcomes sought for wāhi tapu/sites of significance (these terms are used interchangeably) in the plan are twofold:</p> <ol style="list-style-type: none"> <li>1) To ensure the protection and safety of wāhi tapu within the Ngāti Mutunga boundaries according to the tikanga of the Iwi; and</li> <li>2) To establish clear procedures within NPDC, TRC and other organisations, that acknowledge the status of the Iwi and allow for the Iwi to be involved in the decision making about any wāhi tapu.</li> </ol> <p>The plan identifies the rohe of Ngāti Mutunga as a cultural landscape within which there are areas which are considered to be sites of significant and/or wāhi tapu. The broader landscape is fundamental to interpret/acknowledge/protect wāhi tapu. It also notes that there is potential to encounter historic heritage across the rohe of Ngāti Mutunga, and that the archaeological record is incomplete; this must be considered through resource management processes (through accidental discovery protocol, policy around the discovery of kōiwi and the like).</p> <p>The plan requires all activities on or within 50 metres of a site to be prohibited.</p> <p>The plan outlines specific activities requiring management when in excess of 50 metres outside of the outer 'extent' of a wāhi tapu; these include:</p> <ul style="list-style-type: none"> <li>• Production forestry (establishment and harvesting);</li> <li>• Subdivision;</li> <li>• Discharge to land, air or water;</li> <li>• Indirect discharge to water;</li> <li>• Earthworks;</li> <li>• Taking of surface or ground water;</li> <li>• Quarrying or mining; or</li> <li>• Marine farms.</li> </ul> <p>It is expected that these activities will engage Cultural Impact Assessment (CIA) to inform the consideration of that application.</p> <p>Other outcomes include provision of access, correct use of names, encouraging voluntary protection, and engagement with landowners to understand, appreciate and protect sites.</p> <p>The plan is clear; from a process perspective the engagement of Ngāti Mutunga to undertake their role as kaitiaki of/for sites must be recognised and provided for through the implementation of resource management processes (pre-application, through the consent process, and through implementation/conditions of consent). Ngāti Mutunga will consider these on a case-by-case basis.</p>
<p><b>Ngāa Rauru Kaitiaki – Puutaiao Management Plan</b></p>	<p>Puutaiao Management Plan includes a number of provisions which address the protection of wāhi tapu; these include:</p> <ul style="list-style-type: none"> <li>• Objective 1.1: to establish, grow and maintain relationships which maximise the ability of Ngāa Rauru Kaitiaki to exercise kaitiakitanga over resources within our rohe.</li> <li>• Objective 5.1: to ensure that Ngāa Taonga Tuku Iho are managed appropriately in accordance with Ngāa Raurutanga.</li> </ul> <p>These objectives are implemented by policies which expressly require the protection of heritage as an integral part of the identity of Ngāa Rauru.</p> <p>Subdivision and any modification and development that would cause adverse effects on qualities and features that contribute to the cultural, spiritual and historical values are specifically listed in policies as types of development/use that impact on Ngāa Taonga Tuku Iho</p> <p>Collaboration with local and territorial authorities on the development and implementation of resource management plan is a key method set out in the plan to achieve this.</p>

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Plan	Relevant provisions
<p><b>Te Ātiawa – Tai Tangata, Tai Whenua, Tai Ao</b></p>	<p>Tai Tangata, Tai Whenua, Tai Ao includes a specific chapter addressing this issue - Te Tai Hekenui. Objectives of the plan includes:</p> <ul style="list-style-type: none"> <li>• Acknowledge and protect geographical areas with a concentration of interconnected wāhi tapu/wāhi taonga, urupā and sites of significance to Māori.</li> <li>• Ensure that wāhi tapu/wāhi taonga, urupā and sites of significance to Māori within our Te Ātiawa rohe are protected from damage, modification, desecration, destruction and loss of access.</li> <li>• Require access to be provided to Te Ātiawa wāhi tapu/ wāhi taonga, urupā and sites of significance to Māori at the time of development.</li> </ul> <p>A number of policies and methods are set to achieve these objectives; these generally include:</p> <ol style="list-style-type: none"> <li>1) wāhi tapu/ wāhi taonga, urupā and sites of significance to Māori and other features do not exist in isolation and form a cultural landscape that must be recognised and provided for.</li> <li>2) individual wāhi tapu/ wāhi taonga, urupā and sites of significance to Māori require identification and protection.</li> <li>3) recognising that the advice of kaumatua and holders of knowledge from Ngā Hapū o Te Ātiawa regarding the location, significance and management of wāhi tapu/wāhi taonga, urupā and sites of significance to Māori supersedes other sources of information through the decision-making process.</li> <li>4) the provision of access secured to a site at time of development.</li> <li>5) a number of planning tools to manage adverse effects on wāhi tapu, on a case by case basis (e.g. known sites vs highly likely of encounter vs low likely hood of encounter). Tools include cultural landscapes, listing and protection, resource consent conditions, s.221 notices, On-call procedures/Accidental Discovery protocol and the like.</li> </ol>
<p><b>Taranaki Iwi – Taiao, Taiora</b></p>	<p>Taiao, Taiora takes an atua based approach to identify issues across the rohe of Taranaki Iwi, and sets out provisions to address those issues. With respect to wāhi tapu, the plan has identified that poorly designed subdivision and development can lead to unsustainable and inefficient land use and the destruction of wāhi tapu and other important sites.</p> <p>Provisions of Taiao, Taiora relevant to wāhi tapu include:</p> <ul style="list-style-type: none"> <li>• Papatūānuku Policy 11 – New urban development will be designed in a manner which reflects the environmental and cultural values of the site, including... <ul style="list-style-type: none"> <li>○ Protection of sensitive areas;</li> <li>○ In consultation with tangata whenua, incorporating the cultural values and histories into the names and design of the development...</li> </ul> </li> <li>• Papatūānuku Policy 12 – Any landscape assessments undertaken will consider the underlying cultural values as an important and inseparable element of that landscape.</li> <li>• Papatūānuku Policy 14 – Taranaki Iwi will not support... <ul style="list-style-type: none"> <li>○ Any subdivision and development that adversely impacts the important cultural values associated with landscapes of importance to Taranaki Iwi (hapū, marae/pā)...</li> </ul> </li> </ul>
<p><b>Ngaruahine – Kaitiaki Plan (DRAFT)</b></p>	<p>The Kaitiaki Plan includes a number of general policies regarding wāhi tapu, and specific policies for activities within proximity of sites.</p> <p>General policies address the relationship of Ngaruahine with wāhi tapu (that must be recognised and protected, and expressly states that only tangata whenua are able to determine the impact use/development has on this relationship.</p> <p>Ngaruahine will work with central and local government to identify sites, and require the use of correct names for those sites/places/areas. Ngaruahine and local authorities to co-design policies and methods in plans which protect wāhi tapu. A co-design approach to resource consent conditions, or archaeological authority conditions is identified as a further method to ensure wāhi tapu are protected through resource management processes.</p> <p>The Kaitiaki plan is clear that methods must include the prohibition of all activities within an agreed distance to the site, as well as any resource consent applications within 1km of a site undertaking an assessment of effects on the site that may result from their proposal (this may include site assessments, walkovers, CIA or archaeological investigation).</p> <p>100 metres is identified as being the minimum setback for all activities requiring resource consent, a setback for fencing, and a restriction on tree clearance activities without the express permission of Iwi and hapū.</p> <p>A number of tools are identified to implement these policies including registration of sites on the HNZPT list, covenants, zoning, reserve status', s.221 notices and CIA.</p>

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Plan	Relevant provisions
<p><b>Ngāti Ruanui Environmental Management Plan</b></p>	<p>Four objectives are identified in the Environmental Management Plan as follows:</p> <ul style="list-style-type: none"> <li>• To prevent the destruction, damage and/or alteration of wāhi tapu.</li> <li>• To formalise the protection of wāhi tapu.</li> <li>• To raise awareness of the significance of wāhi tapu.</li> <li>• To record the <i>wāhi tapu to Ngāti Ruanui</i>.</li> </ul> <p>The plan includes policy direction for Local Authorities which sets out an expectation that Ngāti Ruanui:</p> <ul style="list-style-type: none"> <li>• Shall work with local and regional councils with a view to formalising and protecting its wāhi tapu under the RMA, including the development of specific plan change programmes.</li> <li>• Develop protocols to help assist the protection and recognition of wāhi tapu, including methodologies for using silent files.</li> <li>• Identifying pilot projects to showcase different methods of protection.</li> <li>• Consider <i>the use of wāhi tapu areas and/or zones with regional and district plan as a specific layer of policy and performance measure control</i>.</li> </ul>

## Appendix II: Schedule of tangata whenua engagement on sites of significance

<b>Ngati Te Whiti</b>	<p>28/04/2020 Initial contact made with hapū members</p> <p>29/05/2020 Te Atiawa map portal and spreadsheet sent to hapū members</p> <p>18/06/2020 Map portal follow up email from Council</p> <p>22/07/2020 Contact from hapū member in order to organise a meeting</p>
<b>Pukerangiora</b>	<p>08/05/2020 Initial contact made with hapū members</p> <p>29/05/2020 Te Atiawa map portal and spreadsheet sent to hapū members</p> <p>18/06/2020 Map portal follow up email from Council</p> <p>24/08/2020 Email correspondence to schedule the initial meeting to discuss the project</p>
<b>Manukorihi</b>	<p>03/05/2020 Initial contact made by hapū member to the council following Wai Māori correspondence being sent out</p> <p>04/05/2020 Hapū member acknowledges Wai Māori meeting updates from the Council.</p> <p>29/05/2020 Te Atiawa map portal and spreadsheet sent to hapū members</p> <p>18/06/2020 Map portal follow up email from Council, response by hapū members to organise a suitable time to have a meeting at the Council</p> <p>13/07/2020 Meeting at the Regional Council with a hapū member to discuss information held by NPDC and preferred methods of information transfer</p> <p>14/08/2020 Hapū member met with Council officers at the Regional Council and discussed options going forward with correcting information and transferring NPDC data</p> <p>24/08/2020 Email confirmation that an email with an attached request letter from the hapū had been sent to NPDC by a hapū member so that the Regional Council can access this information</p>
<b>Puketapu</b>	<p>15/07/2020 Following Wai Māori working group discussions the Te Atiawa map portal was sent to hapū members</p>
<b>Ngati Rahiri</b>	<p>30/04/2020 Phone call to hapū members to finalise site information that has been provided to the Regional Council, meeting time is scheduled</p> <p>29/05/2020 Te Atiawa map portal and spreadsheet sent to hapū members</p> <p>15/07/2020 Login details were re-sent to hapū members, ensuring the shared information was correct.</p>
<b>Ngaruahine</b>	<p>30/04/2020 Initial contact made by iwi member to the Council following Wai Māori correspondence being sent out</p> <p>30/04/2020 Hapū member got in contact to organise a suitable time to meet and discuss the project</p> <p>29/05/2020 Map portal was shared</p> <p>18/06/2020 Map portal follow up email from Council</p> <p>07/07/2020 Meeting with iwi members to discuss sites of significance and begin making amendments to the sites of significance information</p> <p>12/08/2020 A follow up meeting was held at the Regional Council to continue identifying and confirming sites of significance</p> <p>18/08/2020 Email sent to the Ngaruahine iwi office to ask for contact information of iwi members that would be interested in working on the project, a draft MOU was attached for their information and review.</p> <p>09/09/2020 Feedback on the MOU was given by the iwi and a revised version was sent back.</p> <p>08/10/2020 Email sent by the council to hapū chairpersons, two hapū members replied in response to this email.</p>
<b>Taranaki</b>	<p>04/05/2020 Hapū member requested a meetings to review what had been gathered to date</p> <p>05/05/2020 Initial contact made with iwi members who would like to receive site information</p> <p>29/05/2020 Taranaki map portal and spreadsheet sent to iwi members</p> <p>13/06/2020 Hapū member requested a hard copy of the information and amp, Council officers suggested a meeting to discuss the project and handover hard copies of the sites of significance information</p>



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<b>Ngati Ruanui</b>	<p>2019 Initial meeting at the Ngati Ruanui offices where a Council officer shared a PowerPoint presentation and explained the processes and purpose of the project.</p> <p>29/05/2020 Ngati Ruanui map portal and spreadsheet sent to iwi members</p> <p>18/06/2020 Map portal follow up email from Council</p> <p>03/07/2020 Iwi member sent an email stating that they were starting to look over sites of significance and would be in contact</p> <p>18/08/2020 Council officer follow up from the prior engagement</p>
<b>Ngaa Rauru</b>	<p>02/06/2020 Council officers received a call from a hapū member requesting the iwi map</p> <p>04/06/2020 Ngaa Rauru map portal was shared with iwi members</p> <p>18/06/2020 Map portal follow up email from Council</p> <p>06/2020 Phone call with a hapū member, recommendations going forward with the project</p> <p>14/07/2020 Email sent to Ngaa Rauru office introducing the project and to organise a suitable time for a meeting</p> <p>27/07/2020 Meeting held at the Regional Council with Ngaa Rauru iwi members. Identifying and amending sites on ArcGIS Pro</p> <p>14/11/2020 Following Ngaa Rauru concerns over the project a meeting was scheduled at the Regional Council with three Council officers</p> <p>23/11/2020 Council officer received an email from a Ngaa Rauru member which was an invitation to take part in GIS training and assist iwi with sites of significance mapping</p> <p>03/12/2020 Microsoft teams meeting with Ngaa Rauru, GIS specialist, a Council officer was able to join this meeting</p> <p>04/12/2020 Email sent to Ngaa Rauru encouraging a meeting at the regional Council so Council officers can show exactly what they have completed during the project. Meeting to be scheduled in 2021</p>
<b>Ngati Mutunga</b>	<p>23/06/2020 Meeting at Ngati Mutunga with Council officers who discussed and outlined the projects processes and desired outcomes. Sharing of information and MOU information was also talked about.</p>
<b>Ngati Maru</b>	<p>Brief initial meeting at the TRC with iwi member to discuss the project. Iwi have produced comprehensive sites of significance maps for their Deed of Settlement which could eventually be used by Council officers.</p>
<b>Ngati Tama</b>	<p>17/06/2020 Email to iwi member outlining the project processes and asking permission to access site information from NPDC</p> <p>19/09/2020 Email from iwi member permitting NPDC to share information with the Regional Council</p> <p>19/06/2020 Regional Council forwards iwi approval to NPDC asking if any further information is required</p> <p>23/06/2020 Email back from NPDC notes that a meeting would have to occur between NPDC and Ngati Tama before information can be securely shared</p>



**Date** 2 February 2021

**Subject:** **Analysis of Air Quality-related Incidents**

**Approved by:** G K Bedford, Director - Environment Quality  
S J Ruru, Chief Executive

**Document:** 2678657

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### **Purpose**

1. The purpose of this memorandum is to present the results of an analysis of complaints and incidents related to air quality in the Taranaki region since the *Regional Air Quality Plan for Taranaki* (RAQP) came into effect (July 2011), together with a more detailed analysis of incidents in 2020. It is intended that the findings of the assessment can be used by the Council, community and iwi representatives on its committees, and the community at large, to inform the development of the *Natural Resources Plan* (NRP).

### **Executive summary**

2. The number of complaints/incidents relating to air quality in Taranaki that the Council deals with each year (about 200) is second only to the number of complaints and incidents relating to fresh water. Notwithstanding the excellent quality of the air environment in Taranaki, the importance of appropriate controls and regulatory management to maintain that quality and attendant public expectations is thereby emphasized.
3. The analysis of incidents shows that there is only a negligible number of incidents related to air quality, that are not covered by either a resource consent or provisions within the RAQP. That is, there is nothing 'slipping through the gaps' that needs to be addressed within the next generation plan (the NRP).
4. The analysis shows that the Council's monitoring, liaison, and if needs be enforcement of consents is very effective, achieving extremely high levels of compliance and low levels of justified complaint. The average annual rate of non-compliance from around 320 active air discharge permits is barely more than 2%, or 8 events per year. The importance of the Council's commitment to effective, regular, and comprehensive compliance monitoring in delivering the desired environmental outcomes is underscored.
5. For consented sites, the main cause of an incident in 2020 was an odour issue.
6. Likewise, the number of complaints concerning activities for which a consent is not required, demonstrates the importance of both having generic controls within the

RAQP, and of adequately resourcing the Council's investigative function. More than two-thirds of all complaints and incidents relate to such activities rather than to consents. Only 25% of the complaints are typically found to be justified upon investigation. Reasons for the relatively high number of complaints, and why an ultimate goal of having no complaints ('perfect air quality') is completely unrealistic, are discussed in the attached memorandum.

7. The main cause of an incident arising from a deemed permitted activity was smoke; over 60% of all incidents dealt with according to relevant RAQP provisions rather than an applicable consent arose from smoke (including combustion of prohibited materials). More smoke-related incidents were found to be non-compliant, than incidents involving any other effects. The value of having these generic controls in the RAQP, and the continuing need to ensure public implementation of them, is clear.
8. Where non-compliance is determined, it is primarily because a breach of operational controls (failure to follow specified good practice) can be unambiguously established, rather than being able to prove a breach of an air quality standard or limit (an unacceptable environmental effect). Inherent difficulties with proving the latter are discussed in the report. The value of specifying technically robust best practices in the RAQP and within individual consents, alongside limits upon environmental consequences, is thus highlighted.

## Recommendations

That the Taranaki Regional Council:

- a) receives the memorandum *Analysis of Air-Quality-related Incidents*
- b) notes its findings, that the Council's current regulatory regime appears robust for upholding and enhancing regional and local air quality
- c) references the agenda memorandum and accompanying internal memorandum at the time of its consideration of the sections of the *Natural Resources Plan* relating to air quality.

## Background

9. Taranaki was one of the first regions in New Zealand to have an operative RAQP in effect. The current RAQP is the second iteration, and is due for review. The operational and environmental performance of individual consent holders as determined by compliance monitoring is annually reported to the Council, while investigations into specific complaints and incidents arising from any source are reported to the Council every six weeks. While Council has always been committed to effective and comprehensive investigations and monitoring of environmental quality, a comprehensive assessment of all air quality incidents for the past decade would provide an informative overview of the suitability of the RAQP and an evaluation of the effectiveness of the Council's management of air quality as a whole.
10. The Council is required to review its regional plans at a frequency not exceeding ten years. The Committee has been previously informed of the intention to incorporate the next RAQP into an integrated *Natural Resources Plan* (NRP), currently in development, that will bring together regional planning across fresh water, land and soil, and air quality management. As part of the process, a review of the current air quality management regime would serve to identify its strengths together with any weaknesses or gaps to be addressed within the next generation of planning.

11. Such an analysis has therefore been carried out, and is reported in the attached internal memorandum *Analysis of air quality-related incidents and complaints*. All incidents and complaints recorded by this Council over the past decade (ie since the current RAQP came into effect) were reviewed to identify sources, effects, relevant controls, and outcomes of investigations, together with a more detailed analysis of all individual events in 2020 (being the most recent period).
12. The RAQP was developed with opportunities for input extended to iwi, stakeholders, and the community at large. It reflects the values and expectations of regional and local representatives, submitters and stakeholders, as well as regional, national, and international expert input. This process identified those industrial and trade activities for which a site-specific consent is required (in some cases, the RAQP further specifies particular environmental and operational matters to be taken into account by the Council in granting a consent); it identified other industrial and trade activities for which a consent would not be required as long as operational and environmental performance requirements specified in the RAQP were being met; and it identified non-industrial and trade activities (that would otherwise be exempt from any form of control or limit upon effects, through Section 15 (2) of the RMA) that would have to adhere to a rule in the RAQP.

### Issues

13. Air quality in the Taranaki region is rated 'good' to 'excellent' by the criteria used by the Ministry for the Environment, across almost all measures. It is the understanding of officers that the Taranaki region is the only region in New Zealand which has not recorded an exceedance of the *National Environmental Standards for Air Quality* (2011). Nevertheless, the Council deals with approximately 200 complaints or incidents related to air quality every year.
14. Section 7.3 of the RAQP specifies that the Taranaki Regional Council is required by Section 35 of the Act to undertake monitoring and keep records. The Taranaki Regional Council must monitor:
  - the state of the environment (to the extent necessary to carry out the Council's functions under the Act);
  - the efficiency and effectiveness of policies, rules, or other methods in this Plan;
  - the exercise of any transferred functions, powers or duties;
  - and the exercise of discharge to air permits;and take any action that is appropriate to the circumstances.
15. It is suggested that the assessment summarised below demonstrates that the Council's regulatory, advocatory, and educational regime for air quality, has been efficient and effective in maintaining and enhancing air quality in the region. It has also been effective in responding to community expectations.

### Discussion

16. Despite the fact that the region has good to excellent air quality and a known high rate of consent holder compliance, the number of complaints/incidents relating to air quality in Taranaki each year (about 200) is second only to the number of complaints and incidents relating to fresh water that the Council deals with. The assessment considers incidents arising from consented sites, from activities that are covered by a rule in the

RAQP but for which a consent is not required, and from natural, unknown, or unregulated sources.

17. The analysis of incidents shows that there is only a negligible number of incidents related to air quality, that are not covered by either a resource consent or provisions within the RAQP. In 2020 there were a couple of complaints relating to a smell on the coast, cow manure, or effluent treatment, and a few for pollen. That is, there is nothing 'slipping through the gaps' that needs to be addressed within the next generation plan (the NRP). It should be noted that in any case Section 17 of the RMA confers a general power upon the Council to act to protect the environment even in the absence of specific provisions.
18. The analysis shows that the Council's monitoring, liaison, and if needs be enforcement of consents is very effective, achieving extremely high levels of compliance and low levels of complaint. The average annual rate of non-compliance from around 320 active air discharge permits is barely more than 2%, or 8 events per year. The importance of the Council's commitment to effective, regular, and comprehensive compliance monitoring in delivering the desired environmental outcomes is underscored.
19. For consented sites, the main cause of an incident in 2020 was an odour issue.
20. Just 3 consented sites (a composting operation and two subdivision developments) were responsible for more than half of all non-compliant incidents at consented sites in 2020. The same 3 sites together with a fertiliser/soil conditioning storage company and a small number of broiler poultry farms, gave rise to two-thirds of all incidents involving consented sites dealt with by the Council during the year.
21. By far the biggest majority of complaints and incidents (69%, or over two-thirds) dealt with by the Council are in connection with a possible breach of the RAQP, rather than a breach of a consent or of another of the Council's plans. In addition, 5 times as many complaints about non-consented activities are upheld upon investigation than is the case when investigating consented activities.
22. However, still only 25% of the complaints are typically found to be justified upon investigation. Reasons for the relatively high number of complaints, and why an ultimate goal of having no complaints ('perfect air quality') is unrealistic, are discussed in the attached memorandum.
23. The main cause of an incident arising from an otherwise permitted activity was smoke: over 60% of all incidents dealt with according to relevant RAQP provisions rather than an applicable consent arose from smoke (including discovering the combustion of prohibited materials). More smoke-related incidents were found to be non-compliant, than incidents involving any other effects. Smoke events occurred across urban, rural, and industrial localities.
24. The Council has transferred the function of monitoring and responding to incidents concerning urban backyard fires, to NPDC and SDC (STDC chose not to accept transfer). SDC have advised that they dealt with a further 26 urban smoke incidents during 2020. NPDC have advised that in 2018 they dealt with 129 complaints re smoke and fire, with 128 specifically related to smoke nuisance and smell; in the first 11 months of 2019 they dealt with 118. Around 80% of complaints related to outdoor fires- rubbish fires and burn-offs (mainly, but not exclusively, in urban areas).
25. The number of complaints concerning activities for which a consent is not required, demonstrates the importance of having generic controls within the RAQP, of adequately

resourcing the Council's investigative function, and the continuing need to ensure public implementation of them.

26. In 36% of cases over the past decade, no effects could be found or proven upon investigation. This category was the largest single category of 'effects'. This does not necessarily mean that there was no effect at all; the effect may have been transitory (diminishing or disappearing by the time of investigation), or may have been below the RAQP threshold of being offensive and objectionable in the case of amenity-related effects.
27. While in 2020 odour gave rise to about one-third more incidents than did smoke, the number of smoke-related incidents that were found to be non-compliant was almost double the number of non-compliant odour incidents. In other words, a smoke incident is far more likely to be found to be non-compliant than an odour episode. In large part this is due to the means by which compliance is determined: for smoke, this depends in part on the nature of materials that are being burnt- these are prescribed in the RAQP- and in part on the locality - burning in defined urban areas is prohibited. Thus in the case of a fire, it is usually clear when there is non-compliance, quite separately from having to determine the nature and scale of effects.
28. Where non-compliance for any activity was determined, it was primarily because a breach of operational controls (failure to follow specified good practice) could be unambiguously established, rather than being able to prove a breach of an air quality standard or limit (an unacceptable environmental effect). Inherent difficulties with proving the latter are discussed in the report. The value of specifying technically robust best practices in the RAQP and within individual consents, alongside limits upon environmental consequences, is thus highlighted.
29. The report notes the importance of maintaining an effective complaint response capacity and capability, as a much greater proportion of incidents arise from public complaints rather than by discovery upon inspection or by self-notification.
30. The overall impression generated from the analysis is that the RAQP and its implementation have provided an effective and efficient means of maintaining and enhancing air quality in Taranaki. There is good environmental performance and effective monitoring of air discharges from consented activities, but for diffuse sources (those activities not managed through a consenting and monitoring regime), community performance is more variable. The provisions in the RAQP relating to activities that are widespread in nature and amenable to generic controls rather than specific consenting appear to be very effective in providing a workable regulatory framework, as almost no air quality incidents have been identified that are not addressed by provisions within the RAQP.

### **Financial considerations—LTP/Annual Plan**

31. This memorandum and the associated recommendations are consistent with the Council's adopted Long-Term Plan and estimates. Any financial information included in this memorandum has been prepared in accordance with generally accepted accounting practice.

### **Policy considerations**

32. This memorandum and the associated recommendations are consistent with the policy documents and positions adopted by this Council under various legislative frameworks

including, but not restricted to, the *Local Government Act 2002*, the *Resource Management Act 1991* and the *Local Government Official Information and Meetings Act 1987*.

### **Iwi considerations**

33. This memorandum and the associated recommendations are consistent with the Council's policy for the development of Māori capacity to contribute to decision-making processes (schedule 10 of the *Local Government Act 2002*) as outlined in the adopted long-term plan and/or annual plan. Similarly, iwi involvement in adopted work programmes has been recognised in the preparation of this memorandum. It is acknowledged that iwi were not significantly involved in the development of the RAQP in 2011.

### **Community considerations**

34. This memorandum and the associated recommendations have considered the views of the community, interested and affected parties and those views have been recognised in the preparation of this memorandum.

### **Legal considerations**

35. This memorandum and the associated recommendations comply with the appropriate statutory requirements imposed upon the Council.

### **Appendices/Attachments**

Document 2672452: *Analysis of air quality-related incidents and complaints*

## Memorandum

**To** Jo Bielski, Senior Policy Analyst  
**From** Gary Bedford, Director - Environment Quality  
**Document** 2672452  
**Date** 15 January 2021

### Analysis of air quality-related incidents and complaints

#### Purpose

The purpose of this memorandum is to present an analysis of causes, types, and degrees of compliance associated with air quality-related incidents in Taranaki since 2011 (the year in which the current *Regional Air Quality Plan for Taranaki* [RAQP] came into effect). The findings of this assessment are intended for reference to inform the review of the existing RAQP during the Council's development of the air quality sections of the *Natural Resources Plan* (NRP) (in preparation).

#### Summary

The number of complaints/incidents relating to air quality in Taranaki is second only to the complaints and incidents relating to fresh water that the Council deals with.

Notwithstanding the excellent quality of the air environment in Taranaki, the importance of appropriate controls and regulatory management to maintain that quality and attendant public expectations is thereby emphasized.

The analysis of incidents shows that there is only a negligible number of incidents related to air quality, that are not covered by either a resource consent or provisions within the RAQP. That is, there is nothing 'slipping through the gaps' that needs to be addressed within the NRP. Having noted that, in any case Section 17 of the RMA enables the Council to take action on any environmental matter even if not explicitly addressed within a regional plan.

The analysis shows that the Council's monitoring, liaison, and if needs be enforcement of consents is very effective, achieving extremely high levels of compliance and low levels of complaint. The average annual rate of non-compliance is barely more than 2%, or 8 events per year. A very small number of consented sites are proving problematic; the Council applies the full suite of enforcement tools in such cases in accordance with the Council's policies. The importance of the Council's commitment to effective, regular, and comprehensive compliance monitoring is underscored.

For consented sites, the main cause of an incident in 2020 was an odour issue.

Likewise, the number of complaints concerning activities for which a consent is not required, demonstrates the importance of both having generic controls within the RAQP, and of adequately resourcing the Council's investigation function and capacity. More than two-thirds of all complaints relate to such activities. Only 25% of the complaints are typically found to be justified upon investigation. Reasons for this are set out below.



The main cause of an incident for permitted activities was smoke- over 60% of all incidents dealt with according to RAQP provisions rather than consent conditions arose from smoke (including the combustion of prohibited materials). More smoke-related incidents were found to be non-compliant, than incidents involving any other effects. The value of having these generic controls in the RAQP, and the continuing need to ensure public implementation of them, is clear.

## **Recommendation**

It is recommended that the findings of this analysis be considered during the development of the air quality content for the Natural Resources Plan.

## **Background**

With the review of the RAQP 2011 now underway, it is useful to analyse the nature of incidents related to air quality in the region, in order to ascertain whether the controls established through the RAQP and consents arising are pitched at an appropriate level and provide sufficient scope across activities of interest or potential concern. If controls are too stringent, then they will impose unnecessary compliance costs upon operators (via requirement for unjustified abatement equipment, additional monitoring points, etc) and also on the Council and community (via the development of unjustified regulatory standards, the processing and reporting of over-elaborate consents, triggering and dealing with complaints without foundation in environmental effects, etc). On the other hand, if controls are too lax or overlook particular emissions or activities altogether, then the community and natural environment will be subject to unacceptable adverse effects- health, amenity, natural character, etc.

## **Discussion**

A record and analysis of all air quality-related incidents and complaints recorded since 1 July 2011 until 30 June 2020 has been generated. The spreadsheet is attached.

Set out below is an interpretation of the data. In terms of the limited information held in the UIR database, and the number of incidents related to air quality that have been recorded over this time (2000 events), a full analysis down to the level of every individual event cannot be provided. A more detailed assessment of events recorded during 2020 has also been undertaken, to provide some further insights. Some of the comments below must therefore of necessity be speculative. Nevertheless some broad themes emerge.

**Sources of reports:** Complaints from the community about air quality are a significant component of the total number of complaints about the environment received by the Council. It remains important that the Council maintains and publicises its round-the-clock incident reporting and investigation service.

**Number of incidents:** Typically over the course of a year, complaints related to air quality vary between 20-35% of the total number of complaints, and are second in number to complaints related to fresh water. This suggests we continue to need provisions relating to air quality management in the region, via a regional plan, and that capability and capacity to provide air quality management remains a core priority for this Council.

**Compliance and non-compliance at consented sites:** while over the course of the last 10 years, the Council has dealt with 447 complaints from external parties about activities on consented sites, only a very small percentage (15%) have been found to be justified. Another way of expressing this is that the Council finds an average of less than 8 complaints per year in respect of sites and activities holding resource consents, to be justified. With about 320 air discharge consents active in the region, the average annual rate of non-compliance is barely more than 2%, and furthermore has reduced in recent years [and see paragraph g) below].

The number of complaints annually about consented sites has varied significantly- an almost 3-fold variation- and has reduced in recent years in parallel with the reduction in proven non-compliance. The proportion of complaints about consented sites represents around one-quarter of all air quality complaints received by the Council- that is, most of the complaints the Council has to deal with are generated in connection with sites or activities other than on sites holding an air consent.

The total number of incidents associated with consented sites (whether compliant or non-compliant) during the last nine years peaked very early on (2012-13) in the last decade, and over the last 3 years has held at a level about one-third of that previous number. The total number of recorded incidents peaked in 2013-2014, then fell rapidly to its lowest number in 2016-17, but has since risen somewhat to a level typical of the first five years since the current RAQP came into effect. As a proportion of all incidents dealt with by the Council, incidents associated with consented sites are reducing.

It is noted that consents are granted with conditions that are aligned with the provisions in the RAQP. That is, they represent the consensus of the community at the time of development of the RAQP in terms of expectations around air quality. There was no significant mood at the time of preparation of the current RAQP, for widespread change in conditions and considerations related to consented activities.

There are several possible interpretations for the continuing number of complaints associated with consented sites.

- (a) there are some complainants, whose views around acceptable air quality are out of alignment with the community at large. This encompasses the fact that for the most common causes of complaint re consented sites, the most common cause of complaint is 'odour'<sup>1</sup>, and the relevant standard re consent compliance is usually that of whether the discharge is 'objectionable or offensive' (rather than clear failure to provide best practice controls). While there are objective tests that can be (and are) applied to the interpretation and application of this standard, the reality is that any given individual can be over-sensitive or sensitized to an effect, to a degree greater than that of the reasonable ordinary person. The Council can thus expect to always be receiving complaints that cannot be upheld in enforcement proceedings, even if justified in the view of the complainant. The factors that must be evaluated when assessing exposure include the frequency, intensity, duration, characteristics (inherent offensiveness or pleasantness), sensitivity of the location, and timing (eg exposure during working hours vs exposure during a weekend). These are known as the FIDOLT factors.
- (b) Council officers are called upon to respond to many more incidents that are found to be unproven, than are found to be having unacceptable effects as defined in the current RAQP. The definition of what is 'offensive or objectionable' relates to how a reasonable

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<sup>1</sup> In 2020, 73% of all incidents and 69% of all proven non-compliances relating to consented sites, arose because of odour. Dust caused 17% of incidents (a higher proportion than usual), and smoke 8%.

and ordinary person would react; as community expectations around environmental quality rise, the community will become less tolerant and this standard will become more stringent in its application.

- (c) From time to time Council officers identify a small number of serial complainants, who for their own reasons will lodge a complaint or multiple complaints that cannot be upheld upon investigation. For example, the underlying cause may be a grievance against the activity or against the Council.
- (d) In somewhat similar vein, Council officers have recognised that when a consent is coming up for renewal, then if it is somewhat contentious there can be a burst of complaints about the site, thereby putting pressure on the consent applicant and Council to impose more stringent controls and limitations. In such situations the Council remains duty-bound to investigate the complaints diligently and impartially- the local community may be implicitly alerting the Council to an issue of some local significance but which hitherto was ignored or tolerated even if intolerable.
- (e) Many air emission events are transitory in nature, such as a small rubbish fire, an odour-causing event arising from a process upset or poor operational control that is quickly corrected, or an odour impact that disappears as the wind direction and speed change. While the Council operates an on-site response capacity around the clock, there is inevitably some elapsed time before arrival of an investigating officer at the place of complaint. Therefore, even if a complaint was valid at the moment of lodging a complaint, it may remain unproven upon subsequent on-site investigation. In some cases, complainants do not register a complaint until some hours or days afterwards, so that investigation to a definitive conclusion is further hindered.
- (f) The data shows that the number of non-compliance events discovered by Council staff during the course of inspections of consented activities, is smaller than the number reported by the community at large. This is not surprising. Even at the most intensively monitored sites, Council staff will be on site for much less than 1% of the year, whereas members of the public will be passing by or living in close proximity to each site for essentially 100% of the time.
- (g) It should also be remembered that the Council's approach to compliance monitoring is that it is proactive, focused on identifying and eliminating or minimising potential causes of a non-compliance event by continually reviewing site equipment and controls, process management, and staff awareness. There can therefore be any number of interventions, instructions, and guidances provided by the Council (whilst not acting as consultants) that are not recorded on the Council's incident register. These are however highlighted in the annual compliance reports provided by the Council to the consent holder and public each year, for the sake of transparency. Such interventions will be recorded on the incident register only if the likelihood of or need for formal enforcement proceedings arises, because of a significant issue.
- (h) Finally, the reality is that at a very small number of consented sites, process controls and operational management fail to provide adequate protection of air quality in the locality. Just 3 sites (a composting operation and two subdivision developments) were responsible for more than half all non-compliant incidents at consented sites in 2020, and the same 3 sites together with a fertiliser/soil conditioning storage company and a small number of broiler poultry farms, gave rise to two-thirds of all incidents involving consented sites dealt with by the Council during the year.

This analysis proves a very high rate of compliance and environmental performance across almost all consented sites, as well as the effectiveness of the Council's educational, monitoring, and enforcement programmes.

**Natural events:** it is noteworthy that the Council receives several complaints every year about phenomena that turn out to be natural in origin. The usual cause is the release of pollen from trees in spring, mistaken by complainants as being some sort of chemical dust.

**Compliance and non-compliance with the RAQP:** by far the biggest majority of complaints (69%, or over two-thirds) are in connection with a possible breach of the RAQP, rather than a breach of a consent or of another of the Council's plans. The Council typically receives almost 3 times as many complaints about non-consented activities as it does about sites for which an air discharge permit is held, and in addition, 5 times as many complaints about non-consented activities are upheld upon investigation than is the case when investigating consented activities. However, still only 25% of the complaints are typically found to be justified upon investigation.

The proportion of complaints that were upheld, compared with the total number of complaints received, was at its highest in the first two years after the current RAQP came into force; it has been relatively steady since then. This suggests an early period of having to educate people in the new rules of the RAQP. Half of all justified complaints occurred within the first three years of the RAQP coming into effect, and two-thirds of all complaints that upon investigation were not upheld, occurred within the first 5 years of the RAQP coming into effect. This likewise suggests a 'settling-in' time, as people adjusted to the new provisions (especially those relating to backyard rubbish fires).

Complaints relating to either an unproven or actual breach of the RAQP fell to their lowest in the 2016/2017 year; since then, numbers in both categories have slowly but steadily increased, reflecting an increasing number of incidents involving dust or smoke effects, or no proven effect. The reasons for these increases are unclear, although anecdotally staff related the peak numbers in the latest year to the indirect consequences of the covid pandemic, which meant more people stayed in their homes, were more exposed to and more inclined to complain about air quality impacts affecting them, and undertook more property maintenance activities (alongside a shut-down on waste disposal options).

As noted above, for consented sites, the main cause of an incident in 2020 was an odour issue; by contrast, the main cause of an incident for other activities was smoke- over 60% of all incidents dealt with according to RAQP provisions arose from smoke (including the combustion of prohibited materials). The value of having these generic controls in the RAQP, and the continuing need to ensure public awareness of them, is clear.

As with incidents arising at consented sites, the number of incidents reported by Council staff is considerably lower than the number reported by the public at large; reasons for this variation are discussed above. However, the relative numbers indicate that Council staff are much more likely to report an incident than members of the community; and incidents reported by Council staff are much more likely to be found to be non-compliant- while only 25% of complaints from the public about activities on non-consented sites are upheld, almost 75% of reports from Council staff are upheld. As should be the case, this indicates a high awareness of RAQP permissions and restrictions by Council staff.

**Self-notification by consent-holders:** the Council seeks to encourage a pro-active relationship between consent holders and its staff, whereby consent holders proactively contact the Council if there is a potential or emerging issue, so that it can be resolved in a timely and effective manner. The record of these formal notifications is over and above all matters raised during site inspections or other communications between consent holders

and the Council, and a register entry is generally made only when there is likely to be a significant issue and it is important as a matter of record to document the time and nature of contact between the two parties.

**Effects of discharges to air:** In 36% of cases over the past decade, no effects could be found or proven upon investigation. This category was the largest single category of effects. As discussed above, this does not necessarily mean that there was no effect at all; the effect may have been transitory (diminishing or disappearing by the time of investigation), or may have been below the RAQP threshold of being offensive and objectionable in the case of amenity-related effects. The second most common category of effect was odour. This was the cause of a report in 30% of all recorded incidents, and was the underlying effect in 48% of all situations where an effect was detected. However, in the last couple of years odour has become less significant, with other categories (no effect determined; dust; smoke) becoming more common. Smoke is the cause of complaints in 24% of events where a cause can be identified, and has become increasingly more common over the last 4 years. Likewise, dust complaints have increased more than 5-fold over the last 4 years, from their lowest number ever in 2016-17 to close to their highest ever in 2019-20.

For whatever reason, 2013-14 gave rise to the highest number of incidents for dust and odour, and the highest total annual number of complaints.

While in 2020 odour gave rise to about one-third more incidents than did smoke, the number of smoke-related incidents that were found to be non-compliant was almost double the number of non-compliant odour incidents. In other words, a smoke incident is far more likely to be found to be non-compliant than an odour episode. In large part this is due to the means by which compliance is determined: for smoke, this relates in part to the nature of materials that are being burnt- these are prescribed in the RAQP- and in part to the locality- burning in defined urban areas is prohibited. Thus in the case of a fire, it is usually clear when there is non-compliance, quite separately from having to determine the nature and scale of effects. The difficulties with determining non-compliance in the case of an odour event are described above in (a) to (d).

**Summary:** the overall impression generated from the analysis is that there is good environmental management and effective monitoring of air discharges from consented activities, but for diffuse sources (those activities not managed through a consenting and monitoring regime), community performance is more variable. The provisions in the RAQP relating to activities that are general in nature and amenable to generic controls rather than specific consenting appear to be very effective in providing a regulatory framework, as almost no air quality incidents have been identified that are not addressed by provisions within the RAQP. It should also be noted that it is not necessary for an activity and its effects to be controlled via consent or a RAQP, in order for the Council to be able to address it- Section 17 of the RMA provides a general power for enforcement intervention.

Policy and Planning Committee - Analysis of Air Quality-related Incidents

Air Incidents from 1st July 2011 to 30th June 2020

(FRODO 2671925)

Incident Source	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	total
Complaint	214	230	323	265	223	128	166	173	208	1930
Self-Notification	7	5	1	2	1	0	2	2	1	21
TRC Staff	5	6	8	4	2	3	2	6	5	41
										<b>1992</b>

Incident Source	Compliance status	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	Total
Complaint	Consent Compliance	51	64	50	63	56	30	28	22	24	388
	Consent Non-Compliance	9	21	6	5	1	5	5	6	11	69
	Not Applicable/Natural Event	3	4	3	6	2	1	4	0	0	23
	Prohibited Activity	8	0	0	1	0	0	0	0	0	9
	RAQP Allowed	76	81	187	157	137	77	91	108	117	1031
	RAQP Breach	44	52	72	26	23	8	29	33	50	337
	RAQP Not Addressed	21	7	5	5	4	3	1	1	0	47
	RCP Allowed	0	0	0	1	0	0	4	0	1	6
	RFWP Allowed	1	1	0	1	0	4	4	3	4	18
	RFWP Breach	1	0	0	0	0	0	0	0	1	2
Self-Notification	Consent Compliance	2	1	0	0	0	0	0	0	1	4
	Consent Non-Compliance	5	4	0	1	1	0	1	1	0	13
	RAQP Allowed	0	0	0	0	0	0	1	0	0	1
	RAQP Breach	0	0	1	0	0	0	0	0	0	1
	RFWP Allowed	0	0	0	0	0	0	0	1	0	1
TRC Staff	RFWP Breach	0	0	0	1	0	0	0	0	0	1
	Consent Compliance	0	0	1	1	0	0	0	0	0	2
	Consent Non-Compliance	4	3	0	2	2	0	1	1	0	13
	Not Applicable/Natural Event	0	0	1	0	0	0	0	0	0	1
	Prohibited Activity	1	1	1	0	0	0	0	1	0	4
	RAQP Allowed	0	1	1	0	0	1	0	1	2	6
	RAQP Breach	0	1	4	1	0	2	1	3	3	15
											<b>1992</b>

Policy and Planning Committee - Analysis of Air Quality-related Incidents

<b>Effects</b>	<b>2011/2012</b>	<b>2012/2013</b>	<b>2013/2014</b>	<b>2014/2015</b>	<b>2015/2016</b>	<b>2016/2017</b>	<b>2017/2018</b>	<b>2018/2019</b>	<b>2019/2020</b>	<b>Total</b>
Dust	17	19	43	25	28	7	30	32	37	238
No Effect	119	100	108	113	87	50	55	48	69	749
Odour	50	75	132	84	78	48	43	58	57	625
Other	20	21	24	12	14	8	15	6	9	129
Smoke	46	46	35	42	22	18	29	38	43	319
										<b><u>2060</u></b>

<b>Consent Related</b>	<b>2011/2012</b>	<b>2012/2013</b>	<b>2013/2014</b>	<b>2014/2015</b>	<b>2015/2016</b>	<b>2016/2017</b>	<b>2017/2018</b>	<b>2018/2019</b>	<b>2019/2020</b>	<b>Total</b>
Consented Activity	71	94	79	91	79	50	37	32	42	575
No Consent	155	147	253	180	147	81	133	149	172	1417
										<b><u>1992</u></b>



**Date** 2 February 2021

**Subject:** **Quantitative Microbial Risk Assessment - results of pilot study and initiation of second stage programme**

**Approved by:** G K Bedford, Director - Environment Quality  
S J Ruru, Chief Executive

**Document:** 2680071

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### **Purpose**

1. The purpose of this memorandum is to inform the Committee of completion and publication of Stage One of a study into pathogenic and indicator micro-organisms in rivers in New Zealand, and the initiation of the study's Stage Two, with the ultimate intention to bring about an improvement in the monitoring and interpretation of results for public health protection. The memorandum is presented for information.

### **Executive summary**

2. The national studies being undertaken comprise a quantitative microbial risk assessment (QMRA) of waters being used for recreational and immersive purposes. Only a select number of sites are being used; one of the sites chosen is the Waitara River, at Bertrand Road.
3. The report on the first suite of sampling (the Phase One pilot study) has now been published and is briefly discussed below. The second stage has been approved and funded by the Ministry for the Environment, and has just been initiated.
4. The studies are intended to provide more meaningful and relevant data to support a review of New Zealand's current standards and guidelines for recreational water quality, which are recognised as being based on outdated data.
5. The Phase One study has provided this Council with provisional but significant data regarding the microbiological state of the Waitara River, which would otherwise have been expensive to obtain. The information will be considerably expanded by the Phase Two study.
6. Both Phases have involved liaison with members of Pukerangiora and Otaraua Hapu. Both Phases involve officers of this Council undertaking the field work of sampling and sample preparation.



## Recommendations

That the Taranaki Regional Council:

- a) receives the memorandum ' *Quantitative Microbial Risk Assessment- results of pilot study and initiation of second stage programme*'
- b) notes the inclusion of the Waitara River in the study
- c) notes the objective of the national study is to improve interpretation of microbial water quality data in respect of public health significance.

## Background

7. The Council is committed through its *Regional Freshwater Plan for Taranaki* to undertake or support research of benefit to freshwater understanding and management in the region.
8. The use of freshwater for recreation is a cherished activity for many New Zealanders. Tangata whenua value water as taonga, and the ability to safely use water is a fundamental expectation for iwi, including immersion in water bodies for cultural practices.
9. Regional councils are proactive in monitoring popular recreational spots and other sites. This monitoring shows that nationally there are a small proportion of popular sites where there is consistently a high risk to human health. There is a much greater number of sites where the risk to swimmers is low for most of the time, but there can be an elevated risk on occasion. Most sites pose a low risk most of the time.
10. The way this data is integrated into public health-based gradings has created confusion and concern, and some misunderstanding, around the actual health risks associated with immersive use of natural water bodies. Gradings are based on prevailing assumptions around the relationship between land use and the risk of exposure to and subsequent infection from pathogenic micro-organisms. Indicator micro-organisms, rather than actual pathogenic micro-organisms, are used to suggest relative risk. 'Acceptable' risk versus 'unacceptable' risk is set at one single point on what is in reality a continuum of risk, so that risk has been defined in binary (pass/fail) instead of progressive (a very fuzzy overall trend with large variability at any point) terms. There is widespread confusion between 'health risk' gradings (which are inherently precautionary and in addition incorporate many factors other than proven water quality) and measured 'water quality'. It is now recognised that past sanitary surveys used for deriving guideline criteria have made assumptions around sources and associated human health risk that are erroneous. As a result, it is widely recognised within the scientific and technical communities that the standards, limits, and guidelines set out by Ministry for the Environment in the 2020 NPS and elsewhere do not represent the real risk of infection or illness in today's environment.
11. There is the likelihood that some water users get the impression that water quality and risks to their health are worse than is really the case. The guidelines used to report risk at popular swimming sites are a good precautionary public health management tool but are not designed to assess and communicate the state of our environment.
12. Since about 2010, the regional sector and specialist water quality experts have been calling for new surveys of bacteriological water quality in New Zealand and consequent revision of the guidelines, to take into account factors such as wet weather and wet flow risk versus dry weather and low flow risk; hitherto unrecognised sources such as aquatic

birds; and multiple simultaneous sources. Officers of this Council have been intimately involved in discussions, workshops, reports and position papers, proposal briefs, and submissions to the Ministry for the Environment, advocating for funding for a study to generate New Zealand-specific and up to date microbial risk data, to inform such a revision. In 2020, funding was finally given, to Environmental Science and Research (ESR) to conduct a pilot study into re-determining the public health risk from micro-organisms in fresh water. The pilot study was agreed to in order to determine the most effective way of subsequently undertaking a more comprehensive study, including testing the suitability of sites, the practicality of sampling methodologies, the most cost-effective and informative analyses, and the resourcing requirements for a full-scale study. The overall programme is identified as a quantitative microbial risk assessment study (QMRA).

## Discussion

13. Sixteen sites were selected for the pilot study, across a variety of rivers chosen to represent multiple land uses and other variables. Rivers were selected on the basis of known relatively higher indicator bacteria levels, in order to enhance the possibility of establishing meaningful relationships between indicator bacteria and pathogenic micro-organisms. Officers of this Council were able to ensure one site was in Taranaki. The Waitara River at Bertrand Rd was chosen to represent a predominantly dairying catchment. Other catchment land uses were initially characterised as urban or sheep and beef.
14. A key feature of the study was that catchments and sites were to be selected and the field work undertaken after consultation with iwi and hapu representatives. Officers of this Council initiated and continued to support the liaison between ESR and representatives of Pukerangiora and Otaraua Hapu.
15. Analyses were undertaken for a suite of indicator bacteria, pathogenic bacteria and viruses, and faecal source tracker markers, as well as a range of standard water quality attributes. Specifically, analyses were undertaken for Escherichia coliforms, enterococci, Campylobacter, Salmonella, Shiga toxin-producing E. coli (STEC), Cryptosporidium, Giardia, norovirus, enterovirus, adenovirus, and a set of faecal source tracking (FST) markers (human, ruminant and wildfowl).
16. The value of participation by this Council lay not only in the anticipation of meaningful revised national guidelines in the future, but in gaining a suite of detailed microbiological data for the Waitara River that would otherwise have been a considerable cost for this Council to obtain on its own account. Staff have also received specialist training in some technically demanding water sampling techniques that are likely to become more common in the future.
17. Field work was undertaken by officers of this Council on three occasions in February and March 2020, being completed despite covid restrictions. A total of 52 samples across the 16 sites were collected.
18. The report on the findings of the pilot study has now been released by MfE. It is available at <https://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/quantitative-microbial-risk-assessment-pilot-study.pdf>
19. Faecal bacteria markers for birdlife were found in every sample, were the only marker present on every occasion, and for 10 of the samples, were the only marker present. Two of these samples were collected from dairying or sheep and beef catchments, and

without the faecal source testing would have been deemed to prove livestock pollution, not birdlife pollution.

20. All six rivers in urban catchments showed human faecal pollution, as did several of the rivers in pastoral landscapes. Conversely, there were rivers in both dairying and sheep and beef catchments that did not show ruminant contamination. Many samples showed more than one source of faecal pollution.
21. In simple terms, Phase One of the QMRA study has already shown that predominant landscape land use is not a good indicator of likely sources of faecal pollution, and that focusing on only one obvious source may not achieve a satisfactory reduction in public health terms.
22. The most common pathogenic bacteria were *Campylobacter*, detected in around 80% of samples and in almost all rivers, and *Salmonella*, present in about one-quarter of samples, and in half the rivers. *Giardia* was detected in almost all samples in almost all study catchments. Noroviruses were detected in five rivers, and enterovirus in two rivers. However, the concentrations of viruses in the samples were too low to quantify. There is limited evidence from this study or others that virus concentrations will correlate with other indicator organisms, except at very high concentrations.
23. The need for reliable risk assessment and scenario modelling, in addition to direct water quality sampling, has now become more evident. That is, direct measurements and current grading algorithms alone do not necessarily provide meaningful and comprehensive information to the public on health-associated water quality or a sound basis for effective water quality interventions.
24. Because of the relatively limited sampling regime in Phase One of the QMRA, it is not appropriate to draw definitive conclusions about the Waitara River from its results. The much more detailed study in Phase Two (see below) will increase our confidence and understanding of its microbial water quality. In terms of general and provisional findings, the study found that:-
  - the Waitara River had the lowest median counts of *E. coli* of the dairy catchments sampled during the study, and its counts were far lower than in all the 6 urban catchments.
  - In a dry weather sample, the dominant source of faecal pollution in the Waitara River was wildfowl; the concentration of indicator bacteria on that occasion was well above recreational guidelines. In damp or wet weather, bacteria counts were higher and were dominated by ruminant sources.
  - *Salmonella* was never detected; *campylobacter* and *giardia* were detected only in the dry weather sample.
  - No viruses were detected in any of the Waitara River samples.
  - Markers of faecal pollution from a human source/s were found in all three samples.
25. MfE have now agreed to fund Phase Two of the national QMRA study. The main feature of Phase Two is that sampling will continue over a much longer period, in order to capture a range of flow and weather conditions and ascertain how related health risk may change. A refined suite of analyses will be conducted. Officers of this Council are again, undertaking the field sampling and sample despatch roles. Sampling began in late January, and will continue weekly until the end of May. An invitation has again been extended to iwi representatives to attend sampling events if they so choose.

26. The Council will be informed of the results and implications of the Phase Two study once they are received.

### **Financial considerations—LTP/Annual Plan**

27. This memorandum and the associated recommendations are consistent with the Council's adopted Long-Term Plan and estimates. Any financial information included in this memorandum has been prepared in accordance with generally accepted accounting practice.

### **Policy considerations**

28. This memorandum and the associated recommendations are consistent with the policy documents and positions adopted by this Council under various legislative frameworks including, but not restricted to, the *Local Government Act 2002*, the *Resource Management Act 1991* and the *Local Government Official Information and Meetings Act 1987*.

### **Iwi considerations**

29. This memorandum and the associated recommendations are consistent with the Council's policy for the development of Māori capacity to contribute to decision-making processes (schedule 10 of the *Local Government Act 2002*) as outlined in the adopted long-term plan and/or annual plan. Similarly, iwi involvement in adopted work programmes has been recognised in the preparation of this memorandum.

### **Community considerations**

30. This memorandum and the associated recommendations have considered the views of the community, interested and affected parties and those views have been recognised in the preparation of this memorandum.

### **Legal considerations**

31. This memorandum and the associated recommendations comply with the appropriate statutory requirements imposed upon the Council.



**Date** 2 February 2021

**Subject:** **Submission on NZ Standard for Management of Agrichemicals**

**Approved by:** G K Bedford, Director - Environment Quality  
S J Ruru, Chief Executive

**Document:** 2680930

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### **Purpose**

1. The purpose of this memorandum is to:
  - inform the Committee of the submission on the draft Standard NZS 8409:2021 Management of Agrichemicals, which was submitted to Standards New Zealand by 1 February 2021; and
  - enable the Committee to retroactively approve that submission.

### **Executive summary**

2. This item was prepared to inform members of the submission presented in the Council's name on the redraft of the Management of Agrichemicals standard. This draft national standard is a redraft and updating of the current standard, which the current *Regional Air Quality Plan for Taranaki* closely followed. Officers supported the re-drafted standard, which looked to maintain and update the current levels of management to reflect best practice and to capture a wider range of agrichemicals and uses. Most of the submission focused on addressing drafting details and improving the clarity and comprehensiveness of the proposed standard. There were no points of fundamental concern. The closing date for submissions was 1 February, which prevented the draft being presented to the Committee for consideration and adoption in the usual way.

### **Recommendations**

That the Taranaki Regional Council:

- a) receives this memorandum, *Submission on NZ Standard for Management of Agrichemicals*
- b) adopts (alternatively amends) the submission on the draft NZS 8409:2021 Management of Agrichemicals.

## Background

3. The current NZS 8409:2004 provides practical and specific guidance on the safe, responsible and effective management of agrichemicals, including plant protection products (such as herbicides, insecticides, fungicides), veterinary medicines, and agricultural use of detergents and sanitizers.
4. The proposed revised standard incorporates key changes, including:
  - Recent changes to legislation – in particular changes related to storage, and training and competency;
  - Updated hazard classifications to reflect the international GHS classification system being adopted;
  - Inclusion of dairy detergents and sanitisers, but exclusion of fumigants;
  - Updated and expanded off-label guidelines to align with current industry practice;
  - New spray planning requirements including a requirement for an on-site risk assessment prior to spray application;
  - Revised requirements for notification and signage;
  - Changes to good practice in areas such as PPE, recycling and disposal;
  - Changes in application technology such as UAVs and robotics;
  - Wider agrichemical use is included, for example, conservation, revegetation work and vegetation control within powerline corridors.
5. The draft standard was available for comment for a period of 12 weeks from mid-November. Closing date for submissions was 1 February 2021.
6. Officers reviewed the draft submission and were largely in agreement with what was proposed. The opportunities for improvement that they saw were around points of:
  - Clarification and ease of reference for users – for example, greater information on where to look for guidance on management of fumigants.
  - Alignment with other regulatory instruments – for example, using definitions from the RMA where applicable, and highlighting instances where the interpretation used varied from legislation.
  - Improving the comprehensiveness of the standard – for example, suggesting additional provisions to manage disposal and decontamination (both included in the “use” of agrichemicals as per Council jurisdiction).
7. The submission sent to Standards New Zealand in mid-January 2021 is attached to this memorandum for members’ information and reference.
8. Officers note that future requirements and obligations for use of agrichemicals within Taranaki are yet to be considered and decided by the Council and community in the revision of the current *Regional Air Quality Plan for Taranaki*. Notwithstanding that, officers considered that the re-drafted Standard, together with the amendments proposed by officers, is consistent with and enhances current regional management of agrichemicals and the expectations of the regional community.
9. Standards New Zealand/MBIE were advised that the submission as lodged is provisional and subject to final ratification/amendment by the Council.

### **Financial considerations—LTP/Annual Plan**

10. This memorandum and the associated recommendations are consistent with the Council's adopted Long-Term Plan and estimates. Any financial information included in this memorandum has been prepared in accordance with generally accepted accounting practice.

### **Policy considerations**

11. This memorandum and the associated recommendations are consistent with the policy documents and positions adopted by this Council under various legislative frameworks including, but not restricted to, the *Local Government Act 2002*, the *Resource Management Act 1991* and the *Local Government Official Information and Meetings Act 1987*.

### **Iwi considerations**

12. This memorandum and the associated recommendations are consistent with the Council's policy for the development of Māori capacity to contribute to decision-making processes (schedule 10 of the *Local Government Act 2002*) as outlined in the adopted long-term plan and/or annual plan.

### **Community considerations**

13. This memorandum and the associated recommendations have considered the views of the community, interested and affected parties and those views have been recognised in the preparation of this memorandum.

### **Legal considerations**

14. This memorandum and the associated recommendations comply with the appropriate statutory requirements imposed upon the Council.

### **Appendices/Attachments**

Document 2688987: Draft New Zealand Standard – Management of Agrichemicals – Public Comment Draft

Document 2657641: Submission on draft standard NZS 8409:2021 Management of Agrichemicals

**DRAFT**

**New Zealand Standard**

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**Draft Number: DZ  
8409:2021**

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**Management of  
agrchemicals  
Public comment draft**

**Committee: P8409**

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IT MAY BE ALTERED BEFORE FINAL PUBLICATION

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Standards New Zealand

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PO Box 1473, Wellington 6140

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## Public comment information

### Status

This document is a proposed New Zealand standard under the Standards and Accreditation Act 2015. Issued as a draft in this form, it provides the required statutory opportunity for consideration and comment by the bodies and persons having an interest in the standard.

### How to comment

Closing date for comments **1 February 2021**

There are two preferred methods for submitting comments.

- (1) You can submit comments via the Standards New Zealand website at <https://www.standards.govt.nz/developing-standards/comment-on-draft-standards/> in the 'New Zealand draft standards' tab, using the 'submit comments' button below this standard's entry. The electronic system is limited to text only and does not recognise engineering notation, equations or symbols.
- (2) You can submit comments using the downloadable public comment form, available at <https://www.standards.govt.nz/assets/Drafts/DZ8409-PC-Form.docx>. Please email the completed form to [SNZPublicComments@mbie.govt.nz](mailto:SNZPublicComments@mbie.govt.nz).

### Please read before commenting

To help you send in your comments, please read the following.

- (a) Comments are invited, preferably in electronic format, on the technical content, wording, and general arrangement of this draft.
- (b) Editorial matters (that is spelling, punctuation, grammar, numbering, references, and so on) will be corrected before final publication.
- (c) Please do not return marked-up drafts as comments.
- (d) When completing the public comment form, ensure that the number of this draft, your name and organisation (if applicable) is recorded. Please place relevant clause numbers beside each comment.
- (e) Please provide supporting reasons and suggested wording, for each comment. Where you consider that specific content is too simplistic, too complex or too detailed, provide an alternative.
- (f) If the draft is acceptable without change, an acknowledgement to this effect would be appreciated.
- (g) Normally no acknowledgement of comment is sent. All comments received by the due date will be put before the relevant development committee. Where appropriate, changes will be incorporated before the standard is formally approved.

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## **Committee representation**

This standard was prepared by the P8409 Committee. The membership of the committee was approved by the New Zealand Standards Approval Board and appointed by the New Zealand Standards Executive under the Standards and Accreditation Act 2015.

The committee consisted of representatives of the following nominating organisations:

Agcarm  
Civil Aviation Authority of New Zealand  
DCANZ  
Department of Conservation  
Environmental Protection Authority  
Federated Farmers of New Zealand  
Forest Owners Association  
Foundation for Arable Research  
Greater Wellington Regional Council  
Horticulture New Zealand Limited  
Marlborough District Council  
Ministry for Primary Industries  
New Zealand Agricultural Aviation Association  
New Zealand Apples and Pears Inc.  
New Zealand Winegrowers  
New Zealand Agrichemical Education Trust  
Rural Contractors New Zealand Inc.  
WorkSafe New Zealand  
ZESPRI International Ltd

## **Acknowledgement**

Standards New Zealand gratefully acknowledges the contribution of time and expertise from all those involved in developing this standard.

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**DZ 8409:2021**

New Zealand Standard

**Management of  
agrchemicals**

**Superseding NZS 8409:2004**

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**DRAFT ONLY****COMMITTEE IN CONFIDENCE****Referenced documents**

Reference is made in this document to the following:

**New Zealand standards**

NZS 5433:2012 Transport of dangerous goods on land

**Joint Australian/New Zealand standards**

AS/NZS 3833:2007 The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers

AS/NZS 1715:2009 Selection, use and maintenance of respiratory protective equipment

AS/NZS 1716:2012 Respiratory protective devices

**American standards**

ASABE S572.1 Droplet size classification

**European standards**

EN 15695-1:2009 Agricultural tractors and self-propelled sprayers – Protection of the operator (driver) against hazardous substances

EN 374-1:2016 Protective gloves against dangerous chemicals and micro-organisms

**Other publications**

*AIRCARE™ Code of Practice for aerial application of vertebrate toxic agents.* NZAA, 2011.

NZCP1 Design and operation of farm dairies

SAA/SNZ HB 76:2010 Dangerous goods – Initial emergency response guide

*UN Recommendations on the Transport of Dangerous Goods. Model Regulations.* 15th ed. New York and Geneva: United Nations, 2007.

Vétek, G, Timus, A, Chubinishvili, M et al. *Integrated pest management of major pests and diseases in eastern Europe and the Caucasus.* Budapest: Food and Agriculture Organization of the United Nations, 2017.

*Vertebrate Toxic Agents: Minimum requirements for safe use and handling, best practice guidelines.* National Pest Control Agencies, 2018.

**New Zealand legislation**

Agricultural Compounds and Veterinary Medicines Act 1997

Agricultural Compounds and Veterinary Medicines (Exemptions and Prohibited Substances) Regulations 2011

Animal Products Act 1999

Civil Aviation Rules

Food Act 2014

Food Notice: Maximum Residue Levels for Agricultural Compounds 2020

Food Regulations 2015

Hazardous Substances and New Organisms Act 1996

Hazardous Substances (Classes 6, 8, and 9 Controls) Regulations 2001

Hazardous Substances (Disposal) Notice 2017

Hazardous Substances (Enforcement Officer Qualifications) Notice 2015

Hazardous Substances (Forms and Information) Notice 2017

Hazardous Substances (Importers and Manufacturers) Notice 2015

Hazardous Substances (Hazard Classification) Notice 2020

Hazardous Substances (Hazardous Property Controls) Notice 2017

Hazardous Substances (Labelling) Notice 2017

Hazardous Substances (Minimum Degrees of Hazard) Notice 2017

Hazardous Substances (Packaging) Notice 2017

Hazardous Substances (Safety Data Sheets) Notice 2017

Health and Safety at Work Act 2015

Health and Safety at Work (General Risk and Workplace Management) Regulations 2016

Health and Safety at Work (Hazardous Substances) Regulations 2017

Land Transport Act 1998

Land Transport Rule: Dangerous Goods 2005

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Pesticides (Vertebrate Pest Control) Regulations 1983  
Resource Management Act 1991

**Websites**

[www.epa.govt.nz](http://www.epa.govt.nz)

[www.growsafe.co.nz](http://www.growsafe.co.nz)

[www.mpi.govt.nz](http://www.mpi.govt.nz)

[www.worksafe.govt.nz](http://www.worksafe.govt.nz)

[www.wormwise.co.nz](http://www.wormwise.co.nz)

**Latest revisions**

The users of this standard should ensure that their copies of the above-mentioned New Zealand standards are the latest revisions. Amendments to referenced New Zealand and joint Australian/New Zealand standards can be found on [www.standards.govt.nz](http://www.standards.govt.nz).

**Review of standards**

Suggestions for improvement of this standard will be welcomed. They should be sent to the Manager, Standards New Zealand, PO Box 1473, Wellington 6140.

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## Foreword

This standard revises and supersedes NZS 8409:2004. It provides practical and specific guidance on the safe, responsible, and effective management of agrichemicals, including plant protection products (such as herbicides, insecticides, and fungicides), veterinary medicines, and agricultural use of detergents and sanitisers.

Agrichemical use is considered under six headings:

- (a) What is the risk from the use of agrichemicals?
- (b) Where does the responsibility to manage the risk lie?
- (c) What information is needed to understand the risk?
- (d) What actions need to be taken to manage the risk?
- (e) What needs to be recorded or documented?
- (f) Is the agrichemical user competent to manage the risks?

Changes in the regulatory environment in 2017 have been the primary driver of this update to NZS 8409. Most agrichemicals covered by this standard are classified as hazardous substances. The Hazardous Substances Regulations 2017 are a significant determinant of the rules applying to hazardous substances and these regulations only apply to the workplace. Consequently, a key change to the scope of the standard is to limit its application to the workplace.

The Environment Protection Authority (EPA) have advised a move from our current system of classification of hazards to the GHS (Globally Harmonized System of Classification and Labelling of Chemicals). This is being progressively introduced onto agrichemical labels and product data. The Hazardous Substances (Hazard Classification) Notice 2020 has not yet been approved by the EPA Board. There are a number of changes arising from the implementation of this notice that will be incorporated into the final document

This standard provides both the new and the old classifications when discussing hazard classifications including a translation table in Appendix A. For ease of understanding, new terms such as 'high human toxicity', 'high ecotoxicity' and 'very high human toxicity' have been introduced to reflect common groupings of classes subject to particular controls under the Hazardous Substances Regulations or the EPA Notices.

Appendix C of the standard includes requirements for the preparation of a spray plan, notification of affected parties, and signage when spraying. The concept of an 'on-site risk assessment' to be undertaken immediately prior to spraying is also introduced. This risk assessment is an opportunity to consider whether the job can be done safely and effectively given the conditions on-site on the day.

Appendix R covering personal protective equipment (PPE) has been rewritten to reflect the changes to technology and the regulatory environment. A new subsection has been added on the assessment of risk factors along with a table of risk factors similar to the widely used spray drift table of risk factors. There is also a new section on the use of enclosed vehicle cabs and procedures for avoiding contamination. More detail has also been provided on the selection of gloves.

The operational code NZCP1 for farm dairies is currently draft, so changes to this will need to be incorporated.

This standard is divided into seven sections:

1. Introduction
2. Management of agrichemicals
3. Land transport of agrichemicals
4. Storage and supply of agrichemicals
5. Use of agrichemicals
6. Disposal of agrichemicals and containers
7. Emergency preparedness and management.



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## 1 Introduction

### 1.1 Scope

#### 1.1.1 *General*

This standard sets out the requirements for the safe, responsible, and effective management of agrichemicals in the workplace by suppliers and users in New Zealand. It incorporates the significant changes to the regulatory framework for hazardous substances from 1 December 2017. With regard to occupational use of hazardous substances in the workplace, responsibility for the health and safety of people moved to WorkSafe under the Health and Safety at Work Act 2015 (HSWA), and responsibility for the environment stayed with the Environmental Protection Authority (EPA) under the Hazardous Substances and New Organisms Act 1996 (HSNO Act).

The risk management approach used in this standard is described in section 2 and then elaborated on for each of the major activities of transport, storage, use, and disposal in sections 3 to 6. Planning for and dealing with emergencies with respect to agrichemicals is covered in section 7.

#### 1.1.2 *Inclusions*

This standard applies to the management of agrichemicals, namely:

- (a) Plant protection products for agriculture, horticulture, forestry, conservation, amenity, and infrastructure use;
- (b) Veterinary medicines; and
- (c) Detergents and sanitisers used in an agricultural context.

NOTE –

- (1) Plant protection products include herbicides, insecticides, fungicides, and biological agents. See 1.3 for definitions of the terms 'agrchemical' and 'plant protection product'.
- (2) The term 'agricultural context' includes any activity involving the management of land and water resources in the production of animals and/or plant crops up until the point of slaughter/harvest.

#### 1.1.3 *Exclusions*

This standard does not apply to the management of the following:

- (a) Fumigants, including those used in an agricultural context;
- (b) Vertebrate toxic agents (VTAs) for pest control;

NOTE – Occasional references to fumigants or VTAs in this standard provide context on how the requirements for their use differ from agrichemicals. This is not intended as guidance on their use.

- (c) Fertilisers; and

NOTE – See 1.3 for the definition of fertiliser.

- (d) Oral nutritional compounds.

NOTE – An oral nutritional compound is a substance ingested by an animal as feed, or a nutritional preparation intended for oral administration to an animal to achieve a nutritional benefit.

#### 1.1.4 *Target audience*

This standard is intended for any person using agrichemicals in the workplace. While it can provide a useful guide to good practice for those using agrichemicals in non-work environments, that is not the intended purpose of this standard.

The users of the standard will include suppliers, which includes retail outlets and distributors, and users, which includes contractors (both ground and aerial) and others who use agrichemicals in the course of their business (for example, farmers, growers, foresters, and those in the nursery, turf, amenity, and conservation industries and infrastructure management).

The responsibilities, in terms of compliance with this standard, depend on the user category (for example, supplier or user) and the hazards associated with the agrichemical being used.

The obligation to comply with this standard depends on the way in which the standard is referred to or used by industries, for example, in market assurance programmes, or referenced in regional plans. The requirements ('shall' statements) of this standard must be complied with once the standard is adopted by users of agrichemicals.

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In some cases, there may be specific codes of practice that have additional requirements to this standard in relation to agrichemicals, in which cases users should comply with the industry code as well as this standard.

**1.2 Interpretation****1.2.1 Compliance**

For the purposes of this standard, the word 'shall' refers to requirements that are essential for compliance with the standard while the word 'should' refers to practices that are advised, are recommended, or are industry best practice. 'Shall' statements in this standard include both regulatory requirements and minimum agreed industry requirements.

**1.2.2 Layout**

The standard is divided into seven sections. Each section sets out the performance requirements to be met. Information and guidance to assist in complying with these performance requirements is provided in a series of appendices.

The terms 'normative' and 'informative' have been used in this standard to define the application of the appendix to which they apply. A 'normative' appendix forms an integral part of the body of a standard which, for reasons of convenience, is placed after the body of the standard. An 'informative' appendix is only for information and guidance.

**1.3 Definitions**

Only terms used in this standard, or used in a different form than that given in a technical or English dictionary, are defined. For the purposes of this standard, the following terms and definitions shall apply:

<b>Absorption</b>	<b>The movement of a chemical into plants, animals (including humans), and microorganisms or any substrate.</b>
<b>Accreditation</b>	Formal recognition that an organisation meets the requirements of a specified standard. This is usually determined through an audit by an independent third party.
<b>Activated charcoal</b>	Porous, processed charcoal which adsorbs contaminants from liquids and gases.
<b>Active ingredient</b>	The active constituent of any formulated agrichemical as distinct from any carriers, surfactants, and diluents.
<b>Acute poisoning</b>	A measure of the toxic effects of a single exposure to agrichemicals occurring within a short time after that exposure.
<b>Adjuvant</b>	Any substance other than water that is designed to enhance the effectiveness, reduce drift, or act as a synergist when added to any agrichemical application mixture (for example, surfactants, wetters, stickers, and fillers).
<b>Adsorption</b>	The process whereby chemicals are held or bound to a surface by physical or electrostatic attraction. Clay and organic soils have a high adsorptive capacity.
<b>Adverse effect or adverse event</b>	An unfavourable or unintended outcome from the use of an agrichemical, regardless of whether it was used as per the label or not. A key element in the Resource Management Act 1991 (RMA) is 'to avoid, remedy or mitigate any adverse effects on the environment'. An adverse event may include cases where an animal health product did not work.
<b>Agitation</b>	The process of stirring or mixing in a container.

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<b>Agrichemical</b>	An agricultural compound that is used in any agriculture, horticulture, forestry, amenity, conservation, or related land or infrastructure management activity, to eradicate, modify, or control flora and fauna. For the purposes of this standard, it includes dairy detergents and sanitisers and excludes fertilisers, animal feed, and oral nutritional compounds.
<b>Agricultural compound</b>	<p>Any substance, mixture of substances, or biological compound used or intended for use in the direct management of plants and animals, or to be applied to the land, place, or water on or in which the plants and animals are managed, for the following purposes:</p> <ul style="list-style-type: none"> <li>(a) Managing or eradicating pests, including vertebrate pests;</li> <li>(b) Maintaining, promoting, or regulating plant or animal productivity and performance or reproduction;</li> <li>(c) Fulfilling nutritional requirements;</li> <li>(d) The manipulation, capture, or immobilisation of animals;</li> <li>(e) Diagnosing the condition of animals;</li> <li>(f) Preventing or treating conditions of animals;</li> <li>(g) Enhancing the effectiveness of an agricultural compound used for the treatment of plants and animals; or</li> <li>(h) Marking animals</li> </ul> <p>and includes any veterinary medicine, substance, mixture of substances, or biological compound used for post-harvest treatment of raw primary produce; anything used or intended to be used as feed for animals; and any substance, mixture of substances, or biological compound declared to be an agricultural compound for the purposes of the Agricultural Compounds and Veterinary Medicines (ACVM) Act 1997 by Order in Council.</p>
<b>Agricultural use</b>	Used in the management of animals, or for cultivating the soil for production of food crops, or other products of the soil, or aquatic horticulture. Sometimes referred to as primary production, but primary production often includes other sub-industries such as aquaculture and fisheries.
<b>Alternative use</b>	The use of an agrichemical in a situation other than that originally intended, (for example, application to another crop). It may be an acceptable method for disposal of unwanted agrichemicals. See also off-label use.
<b>Amenity areas</b>	Areas used for recreational purposes such as parks, playgrounds, and reserves. Amenity areas may be public places or may be privately owned.
<b>Anthelmintic</b>	A chemical used to control parasitic worms in animals.
<b>Antibiotic</b>	A chemical produced by a microorganism which is capable of destroying other microorganisms, especially bacteria (for example, streptomycin, cycloheximide, and penicillin).
<b>Antidote</b>	A practical treatment for poisoning to offset the harmful effects.

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<b>Application rate (AR)</b>	The amount of spray mixture (product plus diluent) applied to a plant, animal, or unit of surface area, for example, m <sup>2</sup> or ha. May also be called the volume application rate.
<b>Applicator</b>	Any person with specific responsibility for application of any agrichemical. Where application is delegated to employees, it also includes the person(s) directly supervising those employees.
<b>Avoid</b>	Take all practicable steps to prevent occurrence.
<b>Bacteria</b>	Microscopic organisms, some of which are capable of producing diseases in plants and animals; controlled by a bactericide or bacteriostat.
<b>Bacteriostat</b>	A chemical which brings growth of bacteria to a halt but does not kill bacteria.
<b>Bait</b>	A food or other substance used to attract a pest to a chemical or trap where it will be destroyed or captured.
<b>Beneficial insect</b>	Insect that is useful or helpful to humans (for example, pollinators, and parasites and predators of pests).
<b>Bio control</b>	Control of pests using predators, parasites, and disease-causing organisms. May be naturally occurring or introduced.
<b>Biological agents</b>	Products such as growth regulators, biostimulants, and nitrate inhibitors. Includes microbiological compounds but not macroorganisms such as insects (refer to Ministry for Primary Industries (MPI) definition).
<b>Buffer zone</b>	The specified horizontal distance between an identified sensitive area and the (downwind) edge of an area where agrichemicals are being applied.
<b>Bunded area</b>	An area which has a raised perimeter to prevent the escape of any spilled liquids.
<b>Calibrate/calibration</b>	To adjust application equipment so that a known amount of product is applied to a given area.
<b>Carbamates</b>	A group of compounds, based primarily on carbamic acid. Products include fungicides, herbicides, and insecticides (for example, carbaryl, lannate, mancozeb, and eradican).
<b>Carrier</b>	An inert solid or fluid added to an active ingredient to make an agrichemical formulation. A carrier can also be the material, usually water or oil, used to dilute the formulated product for application.
<b>Certification</b>	Formal procedure by which an accredited or authorised person or agency assesses and verifies (and attests in writing by issuing a certificate) the knowledge or competency of an individual, in accordance with established requirements or standards.

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<b>Certified handler</b>	A person who holds a current certified handler test certificate certifying that the person has satisfied the requirements of the Health and Safety at Work (Hazardous Substances) Regulations 2017 (Hazardous Substances Regulations) in relation to a certified handler for one or more hazard classifications or hazardous substances. Certified handler test certificates are only issued by compliance certifiers appointed under HSWA regulations.
<b>Chemical name</b>	The technical name of the active ingredient in the formulated product. This complex name is derived from the chemical name of the active ingredient in the formulated product.
<b>Cholinesterase</b>	An essential chemical catalyst (enzyme) found in the nervous system of humans and many other animals, which inactivates acetylcholine.
<b>Chronic poisoning</b>	A measure of the toxic effects of long-term, repeated exposure to agrichemicals.
<b>Clean</b>	To rinse thoroughly (usually with water) to remove or dilute any remaining agrichemical.
<b>Compatible</b>	Chemicals are compatible if they can be mixed without reducing the effectiveness of any individual chemical.
<b>Compliance certificate</b>	A certificate issued by a compliance certifier in accordance with Part 6 of the Hazardous Substances Regulations which certifies that a requirement specified in the HSWA regulations has been met.
<b>Compliance certifier</b>	A person who is authorised under Part 6 of the Hazardous Substances Regulations to issue compliance certificates.
<b>Concentration</b>	The amount of active ingredient in a given volume or weight of formulated product.
<b>Consignor</b>	Any person who: (a) transports their own dangerous goods; (b) engages a prime contractor, either directly or through an agent, to transport dangerous goods; or (c) has possession of, or control over, dangerous goods immediately before the goods are transported.
<b>Contact re-entry time</b>	The minimum time required to elapse before a treated area can be re-entered without protection.
<b>Container</b>	Anything in which agrichemicals may be packed, enclosed, or covered prior to application.
<b>Contamination</b>	The presence of an unwanted substance in or on a plant, animal, soil, water, air, or structure (see also residue).
<b>Contractor/contract use</b>	Any person or organisation (including management companies) that administers, applies, or causes to be applied any agrichemical for hire or reward upon agreement with the owner, occupier, or

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	manager of any land or animals. It does not include an employee, an owner, an occupier, or a manager.
<b>Corrosive</b>	A strong acid or alkali that will severely burn living tissue such as the skin, mouth, and stomach, or cause injury to eyes.
<b>Crop</b>	Any plants growing where desired.
<b>Dangerous goods</b>	Substances that have the properties described in table A of the Land Transport Rule: Dangerous Goods 2005 (Dangerous Goods Rule). All dangerous goods have a UN number.
<b>Dangerous goods declaration (DGD)</b>	A document that may be required to be carried on vehicles that shows what is being carried, how it is packaged, and the quantity being carried, and contains a declaration which verifies this information.
<b>Decontaminate</b>	A specific procedure to remove or neutralise any remaining agrichemical.
<b>Degradation</b>	The process by which a chemical compound is broken down to a simpler compound by the action of microorganisms, water, air, sunlight, or other agents. Degradation products are usually less toxic than the original compound.
<b>Deposit</b>	The occurrence of a chemical on a treated surface after application (see also residue).
<b>Diluent</b>	Any liquid, solid, or gaseous material used to dilute or carry an active ingredient.
<b>Dip</b>	An ectoparasiticide.
<b>Dip wash</b>	Mixture of water and dip concentrate.
<b>Dipping bath</b>	An open-topped tank used to contain dip wash for immersing livestock.
<b>Direct supervision</b>	Direct supervision requires the supervisor to be present at the application site. It requires the supervisor to provide detailed instructions, be able to see the worker, be aware of the worker's actions, and be able to intervene or correct actions in a timely manner if required. The supervisor must be able to provide immediate assistance in the event of an emergency.
<b>Disposal</b>	The actions required to remove any unwanted agrichemical or agrichemical containers from long- or short-term storage by only accepted and/or approved methods.
<b>Distributor</b>	Someone who distributes (including retailing) products whose registration is held by others (includes resellers). For the purpose of this standard, distributors are a type of supplier.
<b>Documentation</b>	Evidence and information prepared by a user or handler of agrichemicals either in handwritten or electronic format that

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	provides an authentic record or verification of practice, for example, inventory, spray diary, incident reports.
<b>Dose/dosage</b>	Quantity of agrichemical applied to a given site, target, or animal.
<b>Drift</b>	The movement of airborne agrichemical as droplets, vapour, or solid particles away from the target application area. (Also see related definitions of drift hazard and non-target species.)
<b>Drift hazard</b>	The hazard associated with drift and movement anywhere other than the target application area which may result in an adverse effect to human health, animal health, or the environment.
<b>Drift reduction technologies (DRTs)</b>	Spray application technologies which reduce spray drift risk relative to a benchmark technology. The benchmark is usually a common hydraulic nozzle and the drift reduction is specified as percent drift reduction, for example, an air induction (AI) type nozzle can reduce drift by 80% to 90% relative to a standard nozzle. DRTs are used to reduce buffer zones adjacent to areas which are sensitive to potential spray drift.
<b>Dust</b>	A finely ground, dry formulation containing active ingredient and inert carrier or diluent such as clay or talc.
<b>Ecotoxic</b>	Capable of causing ill health, injury, or death to any living organism. Refer to EPA Hazard Classification Notice for detailed definition.
<b>Ectoparasiticide</b>	An agrichemical used to control ectoparasites (for example, sheep dips).
<b>Emergency procedure</b>	The actions required to minimise impact and injury to human health and the environment resulting from an accident with agrichemicals.
<b>Emergency response information (ERI)</b>	Information concerning the identification and hazards specific to the dangerous goods, and the recommended procedures to use in the event of an emergency.
<b>Emulsifiable concentrate</b>	A formulation produced by dissolving the active ingredient and an emulsifying agent in a suitable solvent. When added to water, an emulsion is formed.
<b>Emulsion</b>	Fine dispersion of particles or droplets of one liquid in another liquid.
<b>Endangered species</b>	Individual plants or animals with a population which has been reduced to the point where survival of the species is threatened.
<b>Environment</b>	The environment is the following: <ul style="list-style-type: none"> <li>(a) Ecosystems and their constituent parts, including people and communities;</li> <li>(b) All natural and physical resources;</li> <li>(c) Amenity values; and</li> <li>(d) The social, economic, aesthetic, and cultural conditions which affect, or are affected by, (a), (b), and (c) above.</li> </ul>

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NOTE – Refer to the RMA.

<b>Environmental exposure limit (EEL)</b>	The maximum concentration of a substance in an environmental medium as set: (a) under section 77B of the HSNO Act, unless the EPA has set the limit for guidance only; or (b) by the EPA under the EPA Hazardous Property Controls Notice, unless the EPA has determined that the limit is no longer applicable (see A1.5 in Appendix A).
<b>Fertiliser</b>	Any substance or biological compound, in solid or liquid form, that is described as, or held out to be suitable for, sustaining or increasing the growth, productivity, or quality of soils, plants, or, indirectly, animals through the application of essential nutrients to plants or soils. Refer to the Ministry for the Environment's National Planning Standards for a fuller definition of fertiliser.
<b>Foliar fertiliser</b>	A water-soluble fertiliser applied to a plant's foliage.
<b>Formulation</b>	An agrichemical preparation in such a form that, with or without the addition of bulk liquid or powder, it is ready for application to the target.
<b>Fumigant</b>	A substance with very high human toxicity that is used in its gaseous state for the purpose of destroying rodents, pests, other plant or animal organisms, or fungi.
<b>Fungi (singular fungus)</b>	Non-chlorophyll-bearing plants, living as saprophytes or parasites. Some infect and cause diseases in plants, animals, and humans or destroy wood and fibre products (for example, rusts, mildews, moulds, smuts). Others are beneficial, for example, decomposers and human food sources. Controlled by a fungicide.
<b>Fungicide</b>	Any agrichemical that is specifically designed to control, eradicate, or interrupt the growth processes of fungal organisms.
<b>Global positioning system (GPS)</b>	A global navigation satellite system that provides location, velocity, and time synchronisation to GPS receivers on earth.
<b>Good agricultural practice (GAP)</b>	The recommended or authorised usage of an agrichemical under practical conditions at any stage of production, storage, transportation, distribution, and processing of food, agricultural commodity, or animal feed. GAP aims for the minimum quantity of agrichemical necessary to achieve adequate control, applied in a manner so as to leave a residue which is the smallest amount practicable. Note the difference between GAP and quality assurance schemes such as NZGAP or GLOBALG.A.P.
<b>Granule</b>	A dry agrichemical formulation. The active ingredient is either mixed with or coated on to an inert carrier to form a small, ready-to-use, low-concentrate particle which does not normally present a drift hazard. Pellets differ from granules only in their precise uniformity, larger size, and shape. There can be many types of granule formulations.



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<b>Groundwater</b>	Water occupying openings, cavities, or spaces in soils or rocks under the surface of the ground, and from which bore water is obtained or surface springs are formed.
<b>Hazard</b>	The hazard presented by a substance is its potential to cause harm.
<b>Hazardous substance</b>	Any substance with one or more of the following properties: explosiveness, flammability, capacity to oxidise, corrosiveness, toxicity and ecotoxicity, as defined in the EPA Hazard Classification Notice.
<b>HAZCHEM code</b>	An emergency action code for emergency services, giving basic details for initial emergency management.
<b>Herbicide</b>	An agrichemical that is specifically designed to kill or eradicate unwanted plants.
<b>High ecotoxicity</b>	Property of an agrichemical that is hazardous to the aquatic environment – acute or chronic – category 1 (HSNO class 9.1A); or that is hazardous to the terrestrial environment and listed in Table 1A of Schedule 9 of the EPA Hazard Classification Notice (HSNO classes 9.2A, 9.3A, or 9.4A); or deemed to be so as part of its HSNO product approval.
<b>High human toxicity</b>	Property of an agrichemical with high hazard classification for human health. Includes products classified as acute toxicity categories 1 - 3, germ cell mutagenicity category 1, carcinogenicity category 1 and skin corrosion categories 1A and B ((HSNO classes 6.1A, 6.1B, and 6.1C, plus 6.6A, 6.7A, 8.2A, and 8.2B). See also very high human toxicity.
<b>Host</b>	A plant or animal on, or in, which a pest lives.
<b>HSNO approval number</b>	A number allocated by the EPA when a product is approved for use in New Zealand. Although the majority of products currently have hazardous substances registration (HSR) numbers, there are also approvals for substances covered by containment approvals (that is, trial work and development, which have HSC numbers but are still HSNO approval numbers).
<b>HSNO class</b>	Hazard classification under the EPA Hazard Classification Notice 2017, used prior to the implementation of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) in 2021.
<b>HSR number</b>	Hazardous substances registration number. This number is the HSNO approval number for the product and can be found on the HSNO approval documentation and the EPA approval database. It is required to be included on SDSs and is often printed on agrichemical labels.
<b>Hydrolysis</b>	The breakdown of a chemical in the presence of water.

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<b>Illegal residue</b>	A quantity of agrichemical remaining in an animal or crop at slaughter or harvest which either is above the maximum residue level (MRL) or is not allowed to be used on the crop or animal.
<b>Immunity</b>	The principle by which the body is protected from the invasion of certain diseases.
<b>Incompatible</b>	Two or more materials which cannot be successfully mixed or used together.
<b>Indirect supervision</b>	Indirect supervision means the provision of guidance and oversight of a delegated task through written and verbal communication. The supervisor should be contactable and available to assist if required. Guidance should be specific to the task, that is, the product, equipment used, and application time and place, and should include a requirement for the applicator to undertake an on-site risk assessment prior to starting the task.
<b>Information</b>	Written information provided to a user or handler of agrichemicals to enable safe handling and use of agrichemicals, for example, safety data sheet (SDS), dangerous goods declaration (DGD), or product safety card (PSC).
<b>Insecticide</b>	An agrichemical that is specifically designed to control, eradicate, or interrupt the growth processes of insects.
<b>Integrated pest management (IPM)</b>	An ecologically based pest control strategy which may include the judicious use of agrichemicals and other control measures.
<b>Invertebrate pollinator</b>	An invertebrate agent that moves pollen from the male anthers of a flower to the female stigma of a flower, including bees, pollen wasps, ants, hoverflies, butterflies, moths, and flower beetles.
<b>Label</b>	Any written, pictorial, or other descriptive information on any agrichemical container, or other information leaflets supplied to be read in conjunction with the container label.
<b>Label guidance</b>	Information on the label that provides recommendations and advice on the use of the product but that is not a regulatory requirement.
<b>LD<sub>50</sub> (lethal dose 50)</b>	The relative measure of the short-term toxicity of an agrichemical. It refers to the dosage sufficient to kill 50% of a test animal population to which it is given. It is measured in milligrams per kilogram of body weight (mg/kg).
<b>Leaching</b>	The movement of a substance through soil with water.
<b>Local authority</b>	A regional council, unitary council, or city or district council. General term to include both regional authorities and territorial authorities. See Appendix A.
<b>Low toxicity</b>	Property of an agrichemical which has hazard classifications other than those set out in the definitions of 'high human toxicity' or 'high ecotoxicity' or which has no hazardous classification.

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<b>Manufacturer</b>	An organisation that manufactures agrichemicals. Manufacture, in relation to any agricultural compound, means to make up, prepare, produce, or process the agricultural compound, and includes the packing of an agricultural compound in a container for the purposes of sale. For the purpose of this standard, manufacturers are a type of supplier.
<b>Marker</b>	Any person employed to mark the boundaries of, and flight lines for, a treatment area.
<b>Maximum residue level (MRL)</b>	Maximum amount of residue of an agrichemical or veterinary medicine which may legally remain on or in food or stock feed at harvest or slaughter, expressed in milligrams per kilogram (mg/kg).
<b>Metabolite</b>	A compound derived from changes in the active ingredient through chemical or biological reactions. The metabolite is usually simpler in chemical structure than the original compound.
<b>Microbial degradation</b>	Breakdown of a chemical by microorganisms.
<b>Microorganism</b>	An organism which is so small it cannot be seen without the aid of a microscope.
<b>National poisons centre</b>	A 24/7 poisons information service located in Dunedin.
<b>Nematicide</b>	An agrichemical to kill nematodes.
<b>Non-target species</b>	Any plant or animal other than the intended target(s) of an agrichemical application.
<b>NZGAP</b>	Certification scheme for New Zealand-grown fruit and vegetables to ensure safe and sustainable production practices to markets which is owned by Horticulture New Zealand.
<b>Off-label use</b>	Use of an agrichemical for purposes, or at rates, other than the label guidance.
<b>On-site risk assessment</b>	A risk assessment undertaken at the application site immediately prior to spraying. See 5.2.5.3.
<b>Oral nutritional compounds</b>	A substance ingested by an animal as feed, or a nutritional preparation intended for oral administration to an animal to achieve a nutritional benefit. Nutritional benefit means contributing to the normal physiological function and metabolic homeostasis of an animal achieved by the oral provision of nutrients.
<b>Organophosphates</b>	Agrichemicals and animal endoparasiticides and ectoparasiticides which contain the element phosphorus. Most are non-persistent insecticides, miticides, and nematicides. Many are highly toxic (for example, Maldison, parathion, diazinon, and trichlorfon).
<b>Parasite</b>	A living organism that completes its life cycle on another living organism.
<b>Parasiticide</b>	A plant or animal health product used for the control of internal and/or external parasites.

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<b>Person-in-charge (PIC)</b>	Any person or organisation at whose direction, or upon whose authority, an agrichemical is used. When used in relation to obligations under the HSWA, this has the same meaning as 'person controlling a business or undertaking' (PCBU). When used in relation to the Land Transport Act, this has the same meaning as 'person in control'.
<b>Personal protective equipment (PPE)</b>	The items of apparel and equipment, including respiratory protection, worn by a person and intended either to prevent the occurrence of harm to the person or to minimise any harm that may occur from hazards present in the workplace or hazards that may arise in the course of work.
<b>Pest</b>	An undesirable organism (bacteria, insect, fungus, nematode, weed, virus, animal) which is injurious to humans, desirable plants and animals, manufactured products, or natural products.
<b>Pesticide</b>	Any substance or mixture of substances represented by the registrant as suitable for the eradication or control of any pest, whether by way of modification of behaviour or development or otherwise; and includes any substance or mixture of substances represented by the registrant as suitable for use as a plant growth regulator, defoliant, or desiccant, and also any substance to which section 112 of the ACVM Act applies. See also agrichemical, agricultural compound.
<b>Phytotoxic</b>	Harmful to plants.
<b>Placard</b>	Any of the following attached to the outside of vehicles, or freight containers: <ul style="list-style-type: none"> <li>(a) Enlarged versions of individual class labels;</li> <li>(b) A black and orange striped label with either 'Dangerous' or 'Hazardous' written on it; or</li> <li>(c) A HAZCHEM placard.</li> </ul> <p>NOTE – For non-vehicular use, the term signage is used.</p>
<b>Plant protection product</b>	A type of agrichemical that includes herbicides, insecticides, fungicides, and biological agents, for example, inhibitors, growth regulators, microbiological compounds (bio pesticides).
<b>Pool chemical</b>	Any chemical used as an additive to swimming pool water for the purpose of disinfection or water clarification, or stabilisation.
<b>PPM</b>	Parts per million (or mg/kg, milligrams/kilogram). A means to express amounts of chemicals in or on food, plants, animals, water, soil, or air, for example, one part per million is equivalent to 1 millimetre in 1 kilometre.
<b>Predator</b>	An animal which attacks, feeds on, and kills other animals (for example, hawks, stoats, fish, and many insects and mites).
<b>Pre-harvest interval (PHI)</b>	The minimum amount of time between the last application of an agrichemical and when the crop can be harvested. The PHI is the same as the withholding period (WHP).

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<b>Prime contractor</b>	In relation to the transport of dangerous goods, the person who undertakes responsibility for the transport of those goods from one place to another, but does not include an employee or subcontractor employed or engaged by that person for that purpose. It does include a person transporting goods owned by that person.
<b>Private landfill</b>	Any privately owned or operated disposal area.
<b>Product rate</b>	The amount of product applied to a plant, animal, or unit of surface area, for example, ml/kg of bodyweight, L/100 metre row or kg/ha. Sometimes confused with the application rate, which refers to the amount of spray mixture (product plus diluent) applied.
<b>Product safety card</b>	A shortened version of the SDS – describes properties and use of substance.
<b>Protected place</b>	As defined in the Hazardous Substances Regulations. It includes residential dwellings, schools, places of worships, care facilities, and any factory, warehouse, or workshop where people are regularly employed but does not include a small office or building associated with a place where agrichemicals are handled.
<b>Protective clothing</b>	Any specified system, clothing, or device, including respirators, worn to prevent skin contact, inhalation, or ingestion of any agrichemicals.
<b>Public landfill</b>	Any refuse treatment site, landfill site, recycling facility, or refuse transfer station the operation of which is under the control of any central, regional, or local government and has authorised leachate management and disposal.
<b>Public place</b>	Any place freely open to and frequented, or likely to be frequented, by the public. Individual regional or district plans may have more specific definitions of public places.
<b>Quarantine</b>	Regulatory control against the introduction and dissemination of plant and animal pests (animals, insects, weeds, and disease-causing organisms) into new areas. Involves inspection, treatment, and destruction of contaminated materials/plants/animals or their parts.
<b>Regional authority</b>	A regional council or unitary council. A regional authority is a type of local authority. See Appendix A for more detail.
<b>Regional plan</b>	Any plan developed by a regional authority, including the regional component of a unitary plan. Also known as air, natural resource, and environment plans.
<b>Registered chemical applicator (RCA)</b>	Any person who is, for the time being, recognised as a registered agrichemical applicator in accordance with the scheme of registration conducted by the New Zealand Agrichemical Education Trust.

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<b>Regulator</b>	A representative of one of the regulatory bodies for the use of agrichemicals, including WorkSafe inspectors and MPI enforcement officers.
<b>Regulatory conditions</b>	All regulatory requirements relating to the use of the product, including any conditions of product registration. See 2.2.6.
<b>Reinforcement</b>	Addition of chemical only to a dip wash.
<b>Replenishment</b>	Addition of both chemical and water to the dip wash at the initial concentration, or higher, as recommended on the label.
<b>Residue</b>	The active ingredient or its breakdown product(s) which remains in or on the target or species immediately following treatment.
<b>Resistance</b>	A genetic change from being sensitive to being resistant, which is passed on to successive generations. It is not a change in the host or the agrichemical.
<b>Respirator</b>	Any device that provides protection against the inhalation of any agrichemical by the process of supplied air or the filtering of air.
<b>Restricted veterinary medicines (RVMs)</b>	RVMs are registered by ACVM with restrictions on sale, purchase, and use. Registered veterinarians can use and issue authorisations for purchase and use of RVMs. Non-veterinarians may sell RVMs but must have an MPI-approved operating plan.
<b>Retail outlet</b>	An area at premises where agrichemicals are displayed for sale to users and the general public. The term includes any area where agrichemicals are received and stored at premises prior to being displayed for sale.
<b>Retailer</b>	Generally taken to mean point of sale of agrichemicals, particularly rural retailers. For the purposes of this standard, retailers are a type of supplier.
<b>Risk</b>	The risk from a substance is the likelihood that it will result in harm to people or the environment, in the actual circumstances of use. Risk equals hazard multiplied by exposure.
<b>Run-off</b>	The movement of water and associated materials on the soil surface.
<b>Safe work instrument (SWI)</b>	A tool in the HSWA that can provide supplementary terms or provisions to the Act or other regulations. The SWI enables variations to the regulations and tend to be for specific substances.
<b>Safety data sheet (SDS)</b>	A document that describes the properties and uses of a substance, that is, identity, chemical and physical properties, health hazard information, precautions for use, and safe handling information.
<b>Segregation</b>	The total physical separation, under transport or in storage, of any agrichemicals and/or other substances likely to react with, or contaminate, other goods.

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<b>Sensitive area</b>	Areas with an identified risk of suffering an adverse effect as a result of unintended exposure to agrichemicals. See B4 in Appendix B for examples of sensitive areas. Individual regional or district plans may have more specific definitions of sensitive areas.
<b>Separation</b>	The isolation of dangerous goods stores from protected places, public places, boundaries, or other dangerous goods stores.
<b>Spot spraying</b>	Application to small areas, usually in relation to herbicides used to treat individual weeds.
<b>Spray plan</b>	Document developed by a landowner or occupier that identifies who may be affected by the application of agrichemicals, the strategies to minimise the risk to those that may be affected, and the processes used to notify those that may be affected. See C3 in Appendix C.
<b>Sprayer/application equipment</b>	Any mechanical equipment that can be used for the application of agrichemicals. Sprayers include equipment such as boom, strip, air-blast, knapsack, and pressure sprayers, fixed and rotary wing aircraft applicators, unmanned aerial vehicles (UAVs), robotic applicators, dusters, granule applicators, aerosols, and wick wiper/roller applicators.
<b>Storage area</b>	Any building or part of a building, including cabinets, or designated outdoor area used for the storage of any agrichemical, whether continually or occasionally.
<b>Stripping</b>	Removal of chemical from the dip or post-harvest treatment.
<b>Sump</b>	Any tank into which used dip drains and fresh dip is introduced, and from which dip wash is pumped to the spray nozzles of a shower dip.
<b>Supplier</b>	A person who supplies agrichemicals by way of gift, sale, exchange, lease, hire, or hire purchase. Suppliers include retailers, distributors, and manufacturers.
<b>Surfactant</b>	Any chemical that increases the wetting, spreading, or penetrability properties of agrichemicals.
<b>Suspension</b>	A chemical mixture consisting of fine particles dispersed or floating in a liquid, usually water or oil (for example, wettable powders in water).
<b>Target application area</b>	The intended physical target of the agrichemical application. Referred to as application plot in the EPA Hazardous Property Controls Notice.
<b>Territorial authority</b>	A city or district council or unitary council. A territorial authority is a type of local authority. See Appendix A for more details.
<b>Tolerable exposure limit (TEL)</b>	The maximum concentration of a substance in an environmental medium as set: (a) under section 77B of the HSNO Act, unless the EPA has set the limit for guidance only; or (b) by the EPA under the Hazardous Substances (Classes 6, 8, and 9 Controls)

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	Regulations 2001, unless the EPA has determined that the limit is no longer applicable (see A1.5).
<b>Toxic</b>	Refers to a substance which is poisonous.
<b>Toxicity</b>	The degree or extent to which a chemical or substance is poisonous.
<b>Track spacing</b>	Distance between successive passes of application.
<b>Tracking</b>	Under the Hazardous Substances Regulations, the location and movement of some substances must be recorded at each stage of its life cycle, though to the point of final disposal.
<b>Trade name</b>	The name, number, or other designation of a specific product or device made by a manufacturer or formulator, often registered as a trademark.
<b>Ultra low volume (ULV)</b>	Sprays which are applied as undiluted formulation at 5 to 6 L/ha or less.
<b>UN number</b>	The number assigned by the United Nations and used to identify (and classify) particular chemicals.
<b>Use</b>	The purchase, transport, storage, application, or disposal of any agrichemical.
<b>User</b>	Any person who uses any agrichemical, or who causes any agrichemical to be used.
<b>Vaccines</b>	Preparations of living or dead microorganisms or their components which will, upon administration, produce protection against a disease.
<b>Vapour pressure</b>	A measure of the extent to which a substance evaporates (becomes a gas or vapour) under ambient conditions of temperature and pressure. The higher the vapour pressure, the more volatile the chemical and the easier it will evaporate.
<b>Very high human toxicity</b>	Property of an agrichemical with very high acute toxicity hazard classification for human health, that is, an LD <sub>50</sub> of less than 50 mg/kg of body weight (HSNO class 6.1A, 6.1B).
<b>Veterinary medicine</b>	Any substance, mixture of substances, or biological compound used or intended for use in the direct management of an animal.
<b>Veterinary operating instruction (VOI)</b>	A VOI is a set of instructions from an authorising veterinarian (AV) to a non-veterinarian to hold RVMs in anticipation of their use, and to use RVMs only in accordance with the AV's instructions in circumstances in which the AV will not be carrying out a case-specific consultation.
<b>Virus</b>	Ultramicroscopic parasite composed of proteins and nucleic acids. Viruses can multiply only in living tissues and cause many animal and plant diseases.



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<b>Volatility</b>	The degree to which a substance changes from a liquid or solid state to a gas at ordinary temperatures when exposed to air.
<b>Volume median diameter (VMD)</b>	The droplet diameter (in microns) such that 50% of the spray is in droplets of smaller diameter.
<b>Volume rate</b>	The flow rate or output from a nozzle or sprayer or per side of sprayer in L/min.
<b>Water body</b>	Fresh water or geothermal water in a river, lake, stream, pond, wetland, or aquifer, or any part thereof, that is not located within the coastal marine area.
<b>Wildlife</b>	All animals, including insects and fish, that are living in a wild or undomesticated state.
<b>Withholding period (WHP)</b>	The minimum time set either voluntarily or by label or industry requirement between completion of the last agrichemical application and the harvesting of any crop, animal, or animal product for either human or animal consumption or use. See also pre-harvest interval.
<b>Worker</b>	A worker is defined in HSWA section 19.
<b>Workplace</b>	A place where work is being carried out, or is customarily carried out, for a business or undertaking.

#### 1.4 Abbreviations

ACVM	Agricultural Compounds and Veterinary Medicines (Act and regulations)
AI	Air induction
AR	Application rate
ASABE	American Society of Agricultural and Biological Engineers
BCPC	British Crop Protection Council
CAA	Civil Aviation Authority
CDA	Controlled droplet application
CSL	Controlled substance licence
DG	Dangerous good
DGD	Dangerous goods declaration
DRT	Drift reduction technologies
EC	Emulsifiable concentrate
EEL	Environmental exposure limit
EPA	Environmental Protection Authority
ERI	Emergency response information
GAP	Good agricultural practice
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
GPS	Global positioning system (for navigation)
ha	Hectare
HSNO	Hazardous Substances and New Organisms (Act and regulations)
HSR	Hazardous substances registration

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HSWA	Health and Safety at Work Act 2015
IBC	Intermediate bulk container
IPM	Integrated pest management
LCC	Location compliance certificate
LD <sub>50</sub>	Lethal dose 50
Mg/L	Milligrams per litre
MPI	Ministry for Primary Industries
MRL	Maximum residue level
N.O.S.	Not otherwise specified
NZCP1	New Zealand Code of Practice: Design and Operation of Farm Dairies
NZTA	New Zealand Transport Agency
PAPR	Powered air purifying respirator
PCBU	Person controlling a business or undertaking
PG	Packing group
PHI	Pre-harvest interval
PIC	Person-in-charge
PPE	Personal protective equipment
PPM	Parts per million
PSC	Product safety card
PTO	Power take off
PWM	Pulse width modulation
RAPID	Rural address property identification
RCA	Registered chemical applicator
REI	Restricted entry interval
RMA	Resource Management Act 1991
RPD	Respiratory protective device
RVM	Restricted veterinary medicine
SCBA	Self-contained breathing apparatus
SDS	Safety data sheet
SWI	Safe work instrument
TEL	Tolerable exposure limit
UAV	Unmanned aerial vehicle
ULV	Ultra low volume
UN	United Nations
UNRTDG	United Nations Recommendations on the Transport of Dangerous Goods
U/s	Unit standard
UVM	Unrestricted veterinary medicine
VMD	Volume median diameter
VOI	Veterinary operating instruction
VTA	Vertebrate toxic agent

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## **1.5 Compliance with legislation**

### **1.5.1 *Civil liability***

Anyone involved in the management of agrichemicals, whether through transport, storage, application, or disposal, has a responsibility under common law to ensure that their actions do not cause injury to other people or to the environment. In this respect, negligence is defined as a breach of legal duty to take all reasonable care to prevent such injury. If negligence can be shown over any aspect of agrichemical management, it is probable that any individual, business, local government authority, or national government authority would be held responsible and therefore liable to claims for redress or compensation, or both.

### **1.5.2 *Criminal liability***

Principal legislation relevant to this standard includes the Hazardous Substances and New Organisms Act 1996 (HSNO Act), the Resource Management Act 1991 (RMA), the Health and Safety at Work Act 2015 (HSWA), the Agricultural Compounds and Veterinary Medicines Act 1997 (ACVM Act), the Food Act 2014, and the Land Transport Act 1998, along with associated regulations and legislative instruments.

Failure to comply with the regulatory requirements for agrichemical use is an offence. Criminal liability will accrue under each of these Acts for different offences. Of note is the provision for strict liability under the HSWA – for many offences it is not necessary to prove the defendant intended to commit the offence, nor is it possible to contract out of the liability. Courts may require any convicted party to mitigate or remedy adverse effects.

See Appendix A for a full list of relevant legislation that needs to be complied with.

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## **2 Management of agrichemicals**

### **2.1 Scope**

Section 2 deals with the important principles of good management of agrichemicals. The approach used, which is followed in each of the following sections of the standard, is to first consider what the risks involved are, so that the people responsible for managing those risks can be identified. The individual will require certain information, and will need to take certain actions to meet their responsibilities, and part of that will involve documentation procedures. Finally, the individual must be competent if they are to discharge their responsibilities satisfactorily.

### **2.2 Risk**

#### **2.2.1 General**

Suppliers and users shall manage any risks associated with the use of agrichemicals. This includes risks to human health and the environment under the Hazardous Substances and New Organisms Act 1996 (HSNO Act) and the Health and Safety at Work Act 2015 (HSWA), and risks to trade in primary produce, animal welfare, and agricultural security under the Agricultural Compounds and Veterinary Medicines Act 1997 (ACVM Act). Under the Resource Management Act 1991 (RMA) there is a requirement to avoid, remedy, or mitigate adverse effects on the environment associated with the use of agrichemicals.

Agrichemicals may pose risks to human health, the environment, and market access, so there are many aspects to consider. Most risks are anticipated and controlled by legislation and subsequent regulation. However, ultimately it is the users who determine the actual human, environmental, and market risk posed by the way in which a product is used.

#### **2.2.2 Identification of need**

The requirement to manage the risk posed by an agrichemical product arises when a need to use such a product has been identified. Fundamental to risk management is accurate identification of the biological threat to be managed, which is an integral part of properly managed agrichemical use. Agrichemicals should be used only in response to an identified need. Users shall comply with industry requirements and agrichemical use programmes that govern the type, and uses, of agrichemicals with particular animals, crops, or situations (see Appendix D).

#### **2.2.3 Identification of risk**

Under the HSWA, the person-in-charge (PIC) has a duty to identify and manage risk in the workplace and shall identify the risks associated with transport, handling, and applying agrichemicals.

NOTE – The HSWA uses the term person controlling a business or undertaking (PCBU) in place of PIC.

Users shall also consider the hazards associated with the agrichemical to be used, as indicated by the label and other product information (see Appendix E).

Avoiding impacts on the environment, particularly any adverse effects from spray drift, contamination of water, or disposal of unused agrichemical and agrichemical containers, shall be a prime consideration (see Appendices B and N).

#### **2.2.4 Management of risk**

Risks to human health and safety and to the environment from agrichemical hazards shall be managed using the HSWA's hierarchy of controls:

- (a) Elimination (physically remove the hazard);
- (b) Minimisation through substitution (replace the hazard with a lesser hazard), isolation (isolate people from the hazard), or engineering controls;
- (c) Administrative controls (change the way people work); and
- (d) Use of personal protective equipment (PPE).

The hierarchy starts with the most effective controls and moves down to those least effective.

Users shall actively apply this hierarchy of control by using a product with the lowest toxicity or risk which would be effective for the identified need in conjunction with application techniques which pose the lowest exposure possible to the user and the environment. For example, applying dry granules through a prill applicator poses a lower hazard compared with applying liquids with a knapsack sprayer.

#### **2.2.5 Risk management system**

The essential parts of a system to manage any risks include the following:

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- (a) Identification of need and risk;
- (b) Clear allocation of responsibilities;
- (c) Accurate and up-to-date information on the characteristics and properties of the agrichemical, its effects on human health and safety and the environment, and the risks to trade in primary produce, animal welfare, and biosecurity;
- (d) Adherence to best practice during use of agrichemicals, including actions to mitigate risk;
- (e) Proper documentation; and
- (f) Adequate education and training of agrichemical users.

**2.2.6 Controls**

While most agrichemicals are considered hazardous substances under the HSNO Act, the controls imposed on the use of any given agrichemical will depend on the degree of risk arising throughout its life cycle. Some agrichemicals will have a limited/simple set of controls, while other, more hazardous agrichemicals will have more comprehensive controls.

There are four main types of controls:

- (a) Workplace aggregate quantities – These controls relate to the overall risk at a workplace from hazardous substances and are usually based on total quantities of the different hazard classes. For example, if threshold quantities of ecotoxic substances are exceeded, secondary containment is required;
- (b) Hazardous property controls – These relate to the hazardous property (for example, explosives, flammability, oxidising capacity, toxicity, and corrosiveness) and ecotoxicity of the substance. For example, there is a requirement for products with very high human toxicity (HSNO classes 6.1A and 6.1B) to be under the control of a certified handler, irrespective of quantity;
- (c) Product-specific controls – These are controls applied to a specific substance based on an assessment of the risks in its use. These additional controls arise from an assessment by the EPA and are implemented through HSNO section 77A controls or HSWA safe work instruments (SWIs). For example, the application rate of some products is restricted; buffer zones or a specific spray quality may be required; and
- (d) HSNO permissions – Where the HSNO approval for a product requires a permission for the intended use, a permission may be granted by the EPA, or a delegated agency. Permissions supplement the approval controls, and specific requirements that are operationally or geographically specific to an intended use. Such requirements may include notification, environmental monitoring, and detailed annual reporting to the EPA.

NOTE – There are also some controls relating to specific human health hazards, for example, respirable dust.

Collectively, these controls are referred to within this standard as the 'regulatory conditions' applying to a product. It is an offence to use a product outside of these regulatory conditions.

For agrichemical users, the key points are:

- (e) Know the controls assigned to the product; and
- (f) Know where to find the controls (see Appendix E).

**2.3 Responsibilities****2.3.1 General**

All suppliers and users shall avoid, remedy, or mitigate any adverse effect on the health of the user and the environment arising from the supply or use of agrichemicals. They shall be aware of the local government rules and requirements in relation to agrichemicals. For any activity related to the supply or use of agrichemicals, the health of the user, other people, and the environment shall be considered and all reasonable steps taken to avoid risk. For both suppliers and users, the PIC shall obtain up-to-date safety data sheets (SDSs) for the agrichemicals used on a property and shall prepare emergency plans according to the quantity and type of agrichemicals and the situation involved (section 7).

Under the HSWA, the PIC has an overall duty to identify and manage risk in the workplace. The PIC shall ensure the risks associated with hazardous substances under their control are correctly managed to protect the health and safety of people, the environment, and trade. Training and/or supervision in safe use of agrichemicals and ensuring emergency procedures and specific controls are in place and inventories are up-to-date are key to this.

**2.3.2 HSWA**

The HSWA and the associated Health and Safety at Work (General Risk and Workplace Management) Regulations 2016 set out the duties of PICs and their workers to ensure safety in the workplace.

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The PIC shall take all practicable steps to ensure that they, their employees, and contractors and their employees are not harmed while carrying out the work they are engaged to do. Where more than one PIC is involved in a workplace activity, each PIC shall, so far as is reasonably practicable, consult, cooperate with, and coordinate activities with all other PICs involved. This includes communication with contractors (applicators) about any hazards specific to their farm or place of work that the contractor could not reasonably be expected to be aware of (for example, wires or cables that may present a hazard to aerial applicators).

All workers shall take all practicable steps to ensure their own safety and the safety of others.

## **2.4 Workplace information**

### **2.4.1 General**

Suppliers shall provide, and users shall obtain, all the information needed to ensure safe, responsible, and effective management and use of agrichemicals. Workplace information needs to be readily available within the workplace to any person responsible for managing or using agrichemicals. Ensuring that the information is readily available within the workplace shall be the responsibility of the PIC.

NOTE – See Appendix E for more detailed information regarding labels, SDSs, and product safety cards (PSCs).

### **2.4.2 Information sources**

#### *2.4.2.1 Agrichemical product labels*

A product label conveys information that is needed to achieve safe, responsible, and effective use. The product label includes any pack inserts.

Agrichemical users shall comply with the requirements of the HSNO Act (risks to human health and safety and the environment), the HSWA (risks to human health and safety), and the ACVM Act (breaches of the New Zealand (Maximum Residue Levels for Agricultural Compounds) Food Notice, risks to trade in primary produce, animal welfare, and agricultural security) as described by the directions or requirements on the product label.

In addition, under the ACVM Act users shall comply with conditions imposed on agrichemicals exempted from registration or on registered agrichemical trade name products.

NOTE – Provision for off-label use of plant protection products and unrestricted veterinary medicines (UVMs) is described in Appendix D.

#### *2.4.2.2 SDSs*

The SDS for an agrichemical provides information on the possible hazards of the agrichemical and how it may be safely moved, used, disposed of, and stored. It contains information on the potential health effects of exposure and how to work safely with the agrichemical. It also contains hazard information on the use, transport, storage, handling, and emergency procedures related to that agrichemical.

An SDS will supplement information from a variety of other sources such as labels and package inserts.

NOTE – Suppliers are required to make a copy of an SDS available to all purchasers of agrichemicals.

#### *2.4.2.3 Product safety cards*

A product safety card (PSC) includes information on agrichemicals as hazardous substances as well as dangerous goods (transport and storage). These cards summarise key information from the SDS.

#### *2.4.2.4 Agrichemical use programmes*

Users shall comply with industry requirements and agrichemical use programmes that govern the type, and uses, of agrichemicals with particular animals, crops, or situations (see Appendix D). These programmes are available from industry bodies and form part of supply agreements, codes of practice, or treatment programmes.

#### *2.4.2.5 Other sources of information*

Additional specific product information is available on the EPA website and in the NZ Food Safety section of the MPI website. This can include use information that is not required to be placed on the product label, such as maximum residue levels (MRLs) and withholding periods (WHPs) that relate to food standards. Use of a product shall comply with all the controls imposed on the product, not all of which are necessarily required to be detailed on the product label (see 2.2.6).

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NOTE –

- (1) See Appendix A for details of the HSNO regulations and classification system, and details of food standards.
- (2) See Appendix E for other sources of information.

## **2.5 Documentation**

### **2.5.1 General**

There are legislative requirements for documentation, including the HSWA, the HSNO Act, the Transport Act and their associated regulations and notices; and regional plans, prepared by local authorities under the RMA. Good documentation will assist with demonstrating compliance with guidelines and requirements set out in this standard.

All applications (use) of plant protection products and veterinary medicines in the workplace shall be appropriately recorded. The application of plant protection products in particular is considered a discharge to the environment requiring records to be kept as described in regional plans. Records of use are commonly known as spray diaries, the detail of which shall reflect the nature of the product, its use, and risk to people and the environment.

Record of use shall be matched to records of tracking where tracking is required for some classes of product under the HSWA. In relation to plant protection products this includes products with very high human toxicity (HSNO classes 6.1A and 6.1B).

All workplaces with agrichemicals on-site shall have an inventory of products on-site. This enables risks from the storage of agrichemicals to be identified and assessed.

### **2.5.2 Suppliers**

Suppliers shall keep documentation of the following:

- (a) Receipt of goods – The appropriate dangerous goods declaration (DGD), where required, for inwards goods;
- (b) Products in store – An inventory (list) of all products held in store and an SDS or equivalent for every product held (see 4.2.2);
- (c) Dispatch – A DGD, where required (see 3.6.5);
- (d) Certification and licensing of facilities and equipment, including appropriate licences or certificates for any facility that is part of agrichemical supply (see 4.3.3);
- (e) Training and certification of staff;
- (f) Emergency response plan and testing (see 7.6); and
- (g) Tracking records, where required (see 5.2.6.2).

NOTE – Regional and district plans may have specific requirements for record-keeping in relation to agrichemical use.

### **2.5.3 Users**

Agrichemical users shall keep the following types of documentation:

- (a) Spray plan, written cleaning procedure, authorisations for restricted veterinary medicines (RVMS) (see section 5);
- (b) On-site risk assessments for application of plant protection products (see 5.2.5.3);
- (c) Product use records for veterinary medicines and plant protection products (see section 5);
- (d) Training records;
- (e) Certification and licencing (see 4.3.3);
- (f) Tracking records if required (see 5.2.6.2);
- (g) PPE maintenance records;
- (h) Emergency plan and testing (see 7.6); and
- (i) Storage inventory, including an SDS for each product in the store (see 4.2.2).

## **2.6 Competency of personnel**

Suppliers and users of agrichemicals shall be appropriately trained and/or qualified to carry out their duties and responsibilities set out in this standard, including the minimisation of risks of adverse events. This includes the following:

- (a) Provision of information on any hazardous substances used;
- (b) Training and instruction; and
- (c) Appropriate period of practical experience under direct supervision.

Under the Hazardous Substances Regulations, handlers of some very highly toxic agrichemicals may require additional certification as a certified handler.

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The EPA also has requirements for competency/qualified person for certain classes of ecotoxic agrichemicals applied under certain circumstances. Refer to the Hazardous Substances (Hazardous Property Controls) Notice 2017 for details.

NOTE – See Appendix F for guidance on appropriate qualification and training programmes.



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### **3 Land transport of agrichemicals**

#### **3.1 Scope**

Section 3 explains the requirements for all agrichemical users, whether they are suppliers, consignors, or users, when transporting agrichemicals by road. The main risks relate to exposure of people or the environment to concentrated agrichemicals as a result of spillage, or the effects of one or more agrichemicals being mixed, from a spillage from their containers. The transport life cycle includes consignment, loading, transport, and unloading, as well as packaging during transport.

The term 'dangerous goods' is used internationally to describe products that are dangerous for transport. Dangerous goods are those substances (or articles) classified as dangerous for transport by the United Nations (UN) Committee of Experts on the Transport of Dangerous Goods. Dangerous goods therefore have a UN number.

Outside of transport, the term 'hazardous substances' is used for products that exceed the hazard thresholds specified in the Globally Harmonised System of Classification and Labelling of Chemicals (GHS).

NOTE – See G1 in Appendix G for more information on the different hazard classification systems.

#### **3.2 Application of the Dangerous Goods Rule**

##### **3.2.1 General**

The purpose for which dangerous goods are transported and the nature, quantity, and use of dangerous goods carried determine the rules that apply.

##### **3.2.2 Transport of agrichemicals that are not dangerous goods**

The Land Transport Rule: Dangerous Goods 2005 (Dangerous Goods Rule) does not apply to agrichemicals that are not classified as dangerous goods for transport. However, they may still be subject to controls under the HSNO Act or HSWA regime. Clause 3.4 applies to all agrichemicals whether or not they are classified as dangerous goods for transport.

##### **3.2.3 Transport of agrichemicals for use as tools-of-trade**

Agrichemicals transported for use as tools-of-trade, for agricultural use, or for a commercial purpose, but not for hire or direct reward and below specified quantity limits, have less stringent controls in the Dangerous Goods Rule. Clause 3.5 specifies quantity limits (Table 1) and other requirements for carrying dangerous goods when these requirements are met.

##### **3.2.4 Transport of agrichemicals for hire or direct reward**

All dangerous goods transported for hire or direct reward are required to comply with all relevant requirements in the Dangerous Goods Rule. The requirements of the Dangerous Goods Rule are summarised in 3.6. Carriage for hire or direct reward generally means that the carrier is being paid to transport the product.

NOTE – For full details of the requirements for transporting dangerous goods on land, refer to the Dangerous Goods Rule and NZS 5433 or contact Waka Kotahi NZ Transport Agency.

#### **3.3 Responsibility**

##### **3.3.1 Compliance with Dangerous Goods Rule**

The Dangerous Goods Rule applies to everyone involved in the transport of dangerous goods on land. The PIC shall be responsible for ensuring that all workers comply with the Dangerous Goods Rule.

When agrichemicals are transported, the driver, the consignor, and all other parties involved in handling the goods shall be responsible for complying with the Dangerous Goods Rule, as well as the HSWA, the HSNO Act, and associated regulations.

NOTE – See G2 and Figure G1 to establish specific responsibilities.

##### **3.3.2 Roles**

Responsibilities for emergency planning for transport relate to the roles in the transport chain. For agrichemicals, in most cases, the consignor will be the retailer who has sold the products, that is, supplied the agrichemicals.

The goods will then be transported by the prime contractor. For transport of dangerous goods, the prime contractor is the PIC who is responsible for the transport of goods from one place to another. It includes

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a PIC transporting goods owned by that PIC, but not an employee or subcontractor engaged by that PIC for the purpose. When transport arises from the sale of products to a user, the prime contractor will be one of the following:

- (a) A transport company providing the service to the retailer and delivering to the retailer's customer;
- (b) The retailer itself delivering to their customer; or
- (c) The customer picking up the product themselves.

The driver of the vehicle will be one of the following:

- (d) An employee or owner/operator of the transport company;
- (e) An employee or owner/operator of the retailer; or
- (f) An employee or owner/operator of the customer.

Where the transport of products has not been initiated by the product sale by a retailer, the roles may be different. For example, if a contract sprayer or farmer is supplying the products to another person or workplace, they would be the consignor. They are also likely to be the prime contractor if transporting themselves. The driver is likely to be an employee of the contractor or farmer.

### **3.3.3** *Responsibility to supply emergency information*

The consignor of agrichemicals is responsible for supplying emergency response information (ERI) (see 3.7.2) under the Dangerous Goods Rule unless the driver indicates they already have this information. When emergency response plans are required (see Table H1 in Appendix H), the PIC shall be responsible for ensuring the emergency response plans include transport where applicable.

### **3.3.4** *Transport accidents*

It shall be the responsibility of the person(s) consigning, loading, transporting, and unloading agrichemicals to be aware of suitable procedures to be followed in the event of an accident. Generic emergency plans for a breakdown or spillage during transport are provided in H5.

## **3.4 General requirements for agrichemical transport**

### **3.4.1** *General*

Clause 3.4 applies to everyone who transports agrichemicals (users and suppliers) and to all agrichemicals whether they are classified as dangerous goods for transport or not and irrespective of quantity.

Agrichemicals shall not be transported on land passenger service vehicles, including public transport such as buses and passenger trains.

### **3.4.2** *Load protection*

Where the packaging is not waterproof, the load shall also be well protected from water.

### **3.4.3** *Safe loading*

All agrichemicals shall be securely loaded so that they remain in position and do not spill or fall from the vehicle, despite normal movement during transport. It is recommended that a spill kit is carried to enable effective management of any spillage.

### **3.4.4** *Food*

No food, food packaging material, or food containers shall be carried with any agrichemicals that have toxic or corrosive properties, unless segregated from the agrichemicals (see Table G2).

### **3.4.5** *Security*

All agrichemicals being transported shall be secured at all times to prevent unauthorised access.

### **3.4.6** *Loading and unloading*

All care shall be taken during loading and unloading of the agrichemicals to prevent damage to the container, spillage of the contents, or contamination of people, animals, or the environment.

### **3.4.7** *HSWA and HSNO requirements*

Users and suppliers of agrichemicals that are hazardous substances shall also comply with HSWA and HSNO controls relevant to transport. This includes requirements for packaging, marking, and labelling; emergency preparedness; and worker competency.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****3.5 Transport of dangerous goods for agricultural use within quantity limits****3.5.1 General**

Clause 3.5 applies where the agrichemicals are being transported for agricultural use (as tools-of-trade, but not for hire or direct reward) and the quantity is within the limits specified in Dangerous Goods Rule Schedule 1. (Loads of agrichemicals that are in excess of the quantity limits shall be transported as described in 3.6 of this standard.) Clause 3.5 will apply to most users of agrichemicals, including contractors and suppliers' representatives, provided they do not charge for transporting the goods and they are within the quantity limits. (See Table 1.)

**3.5.2 Agricultural use quantity limits**

The quantity limits for dangerous goods commonly transported for agricultural use, according to class and packing group, are shown in Table 1. This is an extract from Dangerous Goods Rule Schedule 1, which includes full details for other classes of dangerous goods.

**Table 1 – Quantity limits for dangerous goods transported for domestic or recreational purposes, for use as tools-of-trade, for agricultural use, or for a commercial purpose, but not transported for hire or direct reward**

Dangerous goods class or division	Class or division name	Packing group	Maximum quantity
3	Flammable liquids	I	5 L
		II or III	250 L
5.1	Oxidising substances	I	5 kg (solids, powders, etc.); or 5 L (liquids)
6.1	Toxic substances	II	50 kg (solids, powders, etc.); or 50 L (liquids)
8	Corrosive substances	III	250 kg (solids, powders, etc.); or 250 L (liquids)
9	Miscellaneous dangerous goods		
9.1	For class 9.1 products with UN numbers 3077 and 3082		1000 kg or 1000 L if they are being used as tools-of-trade for agricultural use
Mixed loads	<p>The maximum quantity for a mixed load is an aggregate amount of 500, using the following units: kilograms (solids, powders, etc., including the weight of the packaging), litres (liquids), litres water capacity (gases).</p> <p>The maximum quantity for a mixed load is exceeded if the quantity for any class or division in the load exceeds the limit specified for that class or division.</p>		

NOTE – See G1.4 for explanation of packing groups.

**3.5.3 Packaging**

All agrichemicals being transported shall be in undamaged, original packaging that complies with HSNO packaging requirements for the substance. Packaging that has been opened shall have the lid securely closed so that the contents do not leak. A leaking container shall not be transported. If leaking or damaged containers of agrichemicals require transport, they shall be repackaged in appropriate, undamaged packaging or be placed in salvageable packaging.

**3.5.4 Marking and labelling**

The outer packaging of agrichemicals that are dangerous goods being transported shall comply with HSNO packaging requirements and shall be clearly marked or labelled with the appropriate dangerous goods class labels, the proper shipping name, and the UN number. All other agrichemicals shall have the common or trade name clearly visible on the packaging.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****3.5.5** *Transport documents*

DGDs are not required for agrichemicals transported for agricultural use, within the quantity limits in Dangerous Goods Rule Schedule 1 (see Table 1). Although there is dispensation for DGDs, ERI such as a PSC or SDS (which identifies the agrichemicals, their hazards, and what to do in an emergency) shall be carried for all dangerous goods loaded on the vehicle (see 3.7.2).

Documentation for products that are required to be tracked under the Hazardous Substances Regulations shall meet the tracking requirements (see 5.2.6.2).

**3.5.6** *Segregation*

When agrichemicals transported for agricultural purposes are within the limits in Dangerous Goods Rule Schedule 1, they shall be separated from dangerous goods they might react with and separated from food items they might contaminate. While not a legal requirement, it is strongly recommended the full segregation requirements in Table G2 be complied with whenever any quantity of dangerous goods is transported.

**3.5.7** *Placarding*

Dangerous goods placards are not required on a vehicle carrying agrichemicals for agricultural use provided the agrichemicals are within the quantity limits in Dangerous Goods Rule Schedule 1 (see Table 1).

**3.5.8** *Transport procedures*

All agrichemicals shall be consigned, loaded, segregated, secured, transported, and unloaded safely to minimise risk to the community or environment. The vehicle shall be suitable for the load and there shall be nothing in the load space that could damage packaging or contaminate its contents. When flammable products are transported, a suitable fire extinguisher shall be carried on the vehicle.

During the transport of agrichemicals with high human toxicity, the vehicle shall not be left unattended, unless the agrichemicals are secured in a locked compartment of the vehicle.

**3.6 Transport for hire or reward or for agricultural use in large quantities****3.6.1** *General*

This section applies to transport of any quantity of dangerous goods by transport service operators (for hire or direct reward), and to suppliers and users who transport dangerous goods for agricultural use in quantities greater than the maximum quantities listed in Dangerous Goods Rule Schedule 1 (see Table 1).

**3.6.2** *Quantity limits*

There are no maximum quantity limits that apply to dangerous goods transported in accordance with this section, but the full requirements of the Dangerous Goods Rule and NZS 5433 shall be followed.

**3.6.3** *Packaging*

Packaging shall be appropriate for the nature and quantity of the agrichemicals and shall be sufficiently robust for it to remain intact for all normal transport conditions. Packaging shall be as prescribed in NZS 5433 and HSNO packaging requirements.

**3.6.4** *Marking and labelling*

Agrichemicals transported on land shall be appropriately, visibly, and durably labelled and marked to identify the hazard they present. Irrelevant or misleading labels shall be removed from the packaging before transport.

Outer packaging or sole packaging shall be identified with class labels, the proper shipping name, and the UN number. Labels shall be as prescribed in NZS 5433. Any inner and outer packaging shall be labelled in accordance with the Hazardous Substances (Labelling) Notice 2017 (EPA Labelling Notice).

**3.6.5** *Transport documents*

Agrichemicals transported on land for agricultural use in quantities above those listed in Table 1 or for hire and reward shall be accompanied by transport documents, including a DGD. The DGD contains information that identifies the agrichemicals, their hazards, the quantity loaded on the vehicle, and who consigned the goods for transport. Documents shall comply with Dangerous Goods Rule section 5, be carried in a holder on the driver's door, and be passed to the next person responsible for the agrichemicals when they are delivered.

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In addition to the DGD, ERI shall always be carried for all the dangerous goods in the load (see 3.7.2).

**3.6.6 Segregation**

Agrichemicals transported on land shall be segregated from other dangerous goods with which they might react and from any food item they may contaminate in accordance with the Dangerous Goods Rule. Table G2 shows the segregation requirements that apply when dangerous goods are transported for hire or direct reward or when the quantity transported for agricultural purposes is greater than the limits in Dangerous Goods Rule Schedule 1.

**3.6.7 Placarding**

Vehicles transporting more than 50 L/kg of agrichemicals that are classified as dangerous goods shall display placards identifying the class of dangerous goods in accordance with the Dangerous Goods Rule. This applies to users and suppliers transporting dangerous goods for hire or direct reward and also when transporting dangerous goods for agricultural purposes, if the quantities exceed the limits in Dangerous Goods Rule Schedule 1. Placards shall be as prescribed in NZS 5433.

**3.6.8 Transport procedures**

All agrichemicals shall be consigned, loaded, segregated, secured, transported, and unloaded safely to minimise risk to the community or environment. All of the provisions set out in 3.5.8 apply, including requirements for at least one fire extinguisher and ensuring the security of agrichemicals that must be under the control of a certified handler.

The Dangerous Goods Rule, which includes requirements relating to vehicle suitability and maintenance, emergency equipment, parking while goods are in transit, load security, ERI, and stopping at railway level crossings, shall apply. These requirements apply to transport for hire and reward or for agricultural use in quantities above those listed in Table 1.

**3.7 Transport emergencies****3.7.1 General**

All people involved in handling, storing, transporting, or using agrichemicals shall have appropriate plans to deal with emergencies. ERI is needed to deal with emergencies that have arisen. Emergency management involves planning for emergencies before they occur (see H5.1).

**3.7.2 Emergency response information**

ERI (which identifies the agrichemicals, their hazards and what to do in an emergency) shall be carried in the cab of the vehicle when agrichemicals that are classified as dangerous goods are being transported. ERI can be provided in a number of ways, such as a PSC, an SDS, or as part of an emergency response plan (see J8 in Appendix J). When a DGD is required for transport (see 3.6.5), ERI may be included in or attached to that document.

Suppliers shall be responsible for providing ERI to all people who transport dangerous goods, either as tools-of-trade or for hire or direct reward. See H5.1.1.

**3.7.3 Emergency management**

For transport on land, compliance with HSWA emergency management will be achieved if the agrichemicals are carried in accordance with the Dangerous Goods Rule.

**3.7.4 Driver instruction**

Adequate training, instruction, and information shall be given to all drivers on the procedures to follow in the event of a spill, fire, crash, or other emergency during transport. The PIC shall ensure the driver is adequately supervised until they have gained adequate knowledge and experience.

**3.8 Competency**

Every person or organisation involved in any activity related to the transport of agrichemicals shall undertake that activity safely and in full compliance with all relevant requirements, shall be able to demonstrate knowledge of the hazards associated with the agrichemicals, safe transport practices, and emergency procedures, and shall ensure that their knowledge is current.

The driver shall have a current dangerous goods endorsement on the driver's licence if transporting dangerous goods for agricultural use where the quantities carried exceed those given in Table 1 or if transporting dangerous goods for hire and direct reward.

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NOTE – The driver's licence endorsement is not an acceptable alternative for a certified handler certificate for transport of dangerous goods carried in a tank wagon.

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## **4 Storage and supply of agrichemicals**

### **4.1 Scope**

This section sets out requirements and recommendations for the safe storage and supply by suppliers and users of packaged agrichemicals. Agrichemicals classified as hazardous substances under the Hazardous Substances (Hazard Classification) Notice 2020 (EPA Hazard Classification Notice) will be subject to the controls applied under the Hazardous Substances Regulations for physical and human health hazard classes and under the EPA Hazardous Property Controls Notice for ecotoxic substances.

A retail outlet includes any area where the agrichemicals are received, stored, and displayed on shelves prior to being sold. Clause 4.3.2 sets out the restrictions on the retail supply of agrichemicals.

### **4.2 Risk management**

#### **4.2.1 General**

Suppliers and users shall manage any risks associated with the storage of agrichemicals to protect people, property, animals, and the environment. This includes risks to human health and safety and the environment under the Resource Management Act (RMA), the Hazardous Substances and New Organisms Act (HSNO Act), and the Health and Safety at Work Act (HSWA), and risks to trade in primary produce, animal welfare, and biosecurity under the Agricultural Compounds and Veterinary Medicines Act (ACVM Act).

Under the RMA, there is a duty for suppliers and users to avoid, mitigate, or remedy adverse effects on the environment associated with the storage of hazardous substances. Agrichemical storage facilities may require RMA consent from territorial or regional authorities. This may include assessment under their rules in district or regional plans, for example, if there are significant water and cross-boundary contamination issues, and significant quantities of restricted hazardous substances are to be stored.

The risk management principles that follow apply to all agrichemical stores. The specific requirements will depend on the quantities and type of agrichemicals stored and the purpose for which they are stored.

NOTE – Appendix A provides a summary of Acts referred to and other legislation that directly affects the storage of agrichemicals.

#### **4.2.2 Risk identification**

Agrichemicals pose a risk to people and the environment in the event of exposure. The main risks from agrichemical exposure in relation to storage include unauthorised access; intentional or unintentional ingestion or skin exposure; explosion from mixing incompatible products or during a fire; spillage from leaks, punctures, or upset containers; and inappropriate use due to incorrect labelling of containers.

Safe storage is key to minimising the risk of exposure to agrichemicals (hazardous substances). Store only what you need, and ensure incompatible substances are kept separated and any decanted products are stored in the correct and labelled container.

The first step in effective safety management is to recognise and understand the hazards. Knowing what agrichemicals are on-site is an essential part of emergency preparedness as it enables the person in charge (PIC) to assess the level of risk.

All workplaces with agrichemicals on-site shall have an inventory of products. An inventory is a complete list of the maximum likely quantity of each of the hazardous substances that may be held on-site at any one time. (See J for details of what should be included in an inventory.)

NOTE – This definition of an inventory is slightly different from an up-to-date listing of what agrichemicals are held in stock at any point in time. An inventory of actual stock will meet the requirements of (a) and (e) below but not the other uses.

An inventory is used to do the following:

- (a) Identify the risks from hazardous substances at the workplace;
- (b) Determine the physical requirements of premises used to store designated hazardous substances;
- (c) Determine the relevant licences, consents, or compliance certificates needed for the site;
- (d) Identify the relevant legislation and industry performance standards appropriate to the site, for example, what signage or secondary containment is required; and
- (e) Provide Fire and Emergency NZ with critical information in the event of an emergency.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****4.3 Responsibility****4.3.1 General**

All suppliers, retailers, and users have a duty to avoid, mitigate, or remedy any adverse effect on people, property, or environment arising from the storage of agrichemicals, including the following:

- (a) Safe handling practices and the safety of property and other persons;
- (b) Appropriate information, documentation, and record-keeping;
- (c) Staff training;
- (d) Compliance with regulatory requirements;
- (e) Emergency procedure planning and the provision of safety information; and
- (f) Maintenance of safe storage areas (housekeeping).

The PIC shall hold the appropriate licences or compliance certificates for any agrichemical storage facility. Under the Hazardous Substances Regulations, a hazardous substances location compliance certificate (LCC) is required where the amounts of hazardous substances stored exceed threshold levels set out in Table J7. These certificates can be obtained from any appropriate compliance certifier (see [www.worksafe.govt.nz](http://www.worksafe.govt.nz) for details). LCCs are not required for ecotoxic substances.

**4.3.2 Sale or transfer of agrichemicals**

Only agrichemicals in their original packaging shall be sold, or transferred to another workplace.

The retailer shall ensure that the agrichemicals that require certified handlers are only supplied to users with certified handler certification.

Some classes of hazardous substances are restricted by the EPA Hazardous Property Controls Notice to use in workplaces only under the control of a competent person (see Table 2). Evidence that a competent person in a workplace will accept responsibility for the product is required.

NOTE – See Appendix F for definition of a competent person.

**Table 2 – Hazard classes with restrictions on sale or transfer**

<b>GHS classification</b>	<b>HSNO hazard class</b>	<b>Must be tracked</b>	<b>Must be under the control of a certified handler</b>	<b>Can only be sold or transferred to a 'competent person' for use in a workplace</b>
Flammable liquids category 1 (except petrol)	3.1A	Yes	No	Yes
Oxidising solid or liquid category 1	5.1.1A	Yes	No	Yes
Organic peroxide Type A	5.2A	Yes	No	Yes
Organic peroxide Type B	5.2B	Yes	No	Yes
Acute toxicity (oral, dermal, or inhalation) category 1	6.1A	Yes	Yes	Yes
Acute toxicity (oral, dermal, or inhalation) category 2	6.1B	Yes	Yes	Yes
Acute toxicity (oral, dermal, or inhalation) category 3	6.1C	No	No	Yes
Carcinogenicity category 1	6.7A	No	No	Yes
Skin corrosion category 1A	8.2A	No	No	Yes

NOTE –

- (1) Only hazard classes relevant to agrichemicals included. Refer to the EPA Hazardous Property Controls Notice for a full list.
- (2) Other products may have a specific control determined by the EPA that limits their sale only to certified handlers or a 'competent person'. This will be written on the product label.



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Any licences, consents, or permits to operate the store shall be acquired, including the following:

- (a) Building warrant of fitness;
- (b) Hazardous substance location compliance certificate;
- (c) Certified handler;
- (d) Controlled substance licence (CSL);
- (e) Resource consent; and
- (f) FENZ fire evacuation scheme or procedure.

NOTE – See Table J7 for details of the thresholds for LCCs.

For many user stores with low volumes, such certification is expected to be minimal.

**4.4 Information**

The essential parts of an effective storage system for suppliers and users to manage any risks are outlined below. All of these require detailed knowledge of the specific products stored and used. SDSs will provide the required information. Specifically, section 7 of the SDS covers storage requirements and section 10 covers incompatibility and segregation requirements for a product. Storage requirements are set out in Appendix J.

Product information shall be provided to employees, and in a form they can understand.

**4.5 Actions****4.5.1 Suitability of the store****4.5.1.1 Location**

Agrichemical storage buildings shall be sited so that the risk of contamination of people, crops, animals, and the environment is minimised. Separation distances from other public and protected places, boundaries, water bodies, bores, and drains shall be determined prior to building new storage facilities (see Appendix J). Suppliers and users shall take account of the zone allowances under their local authority and any zoning and/or regional rule restrictions provided in local authority plans and conditions of supply agreements such as NZCP1 and NZGAP.

NOTE – Storage facilities for hazardous substances requiring an LCC will need to be notified to WorkSafe and may also require resource consent from local authorities.

**4.5.1.2 Specifications**

Agrichemicals shall be stored only in suitable buildings and places which take into account the following:

- (a) Fire protection;
- (b) Nearby water supply;
- (c) Types and amounts of agrichemicals stored;
- (d) Fire extinguishers;
- (e) Moisture and heat control;
- (f) Ventilation;
- (g) Spill containment;
- (h) Access to the store (security and emergency exit); and
- (i) Signage.

See Appendix J for further details.

NOTE –

- (1) Unsuitable storage areas include private dwellings, pump sheds, and any area that cannot be locked and secured.
- (2) Agrichemical storage buildings may also be required to meet territorial authority requirements and building consents.
- (3) Under the Hazardous Substances Regulations, LCCs may be required for premises storing flammable, oxidising, acutely toxic, or corrosive agrichemicals (HSNO classes 2 to 6, 8) (see Table J7).

**4.5.1.3 Transit storage/transit depots**

A transit depot is a permanent place that is designed to hold hazardous substances in unopened containers while they are in transit. It excludes the means of transport, and excludes any place where

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the substances are held for sale or supply. The substances can be held in the depot for no more than 3 days.

These can include consignment or agency stores or transport depots where product is en route to retailers or users (for example, spraying contractor depots).

In any event these transit depots shall be built to the same specifications as any other storage facility. There are significant notification and handling controls required.

#### 4.5.1.4 *Signage*

The Hazardous Substances Regulations include specific requirements for signs according to the quantity and hazard classification of the substance. See J6 for details of thresholds and signage requirements for premises storing hazardous substances.

Signage shall be used on outside walls of defined storage areas. The minimum signage required is 'HAZCHEM Agrichemicals'. All signs shall be fixed so that they are clearly visible for all normal lines of approach.

### 4.5.2 *Store management*

#### 4.5.2.1 *Security and access*

At all times, agrichemical storage areas shall be managed in such a way that they are inaccessible to children and other unauthorised persons. Agrichemicals with high human toxicity shall be kept securely to restrict access to only those people authorised by the PIC.

Agrichemicals with very high human toxicity (and any other product whose HSNO approval requires it to be under the control of a certified handler) shall only be accessible to certified handlers or to persons who are being guided by a certified handler who shall be available at the workplace to provide assistance as necessary. Where there are multiple users of an agrichemical store, this may require agrichemicals required to be under the control of a certified handler to be stored in a secure compartment within the main agrichemical store.

#### 4.5.2.2 *Separation and segregation*

Appropriate separation and segregation strategies shall be developed and maintained for the store (see J8). Refer to section 10 of the product's SDS for product-specific information.

#### 4.5.2.3 *Packaging*

Suppliers shall ensure that packaging maintains its integrity throughout all stages of manufacture, transport, storage, retail, and use. All agrichemical packaging shall meet the requirements of the Hazardous Substances (Packaging) Notice 2017 (EPA Packaging Notice).

Products shall only be decanted for use within the workplace. Decanting for resale is illegal.

Users shall ensure that agrichemicals are kept in appropriate packaging and remain properly labelled. See J12.5.

## 4.6 **Documentation**

### 4.6.1 *Supplier*

#### 4.6.1.1 *Product information*

Manufacturers and importers of agrichemicals shall produce product information for their products. Retailers shall hold and offer documentation specific to each agrichemical stored or supplied. The documentation shall include the following:

- (a) SDSs;
- (b) PSC where available;
- (c) Emergency response information (ERI) for those transporting dangerous goods; and
- (d) Dangerous goods declaration (DGD) when required.

NOTE – The EPA Labelling Notice specifies documentation requirements for the sale or supply of some substances according to their hazard classification.

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An inventory of agrichemicals shall be maintained by suppliers, including the following:

- (a) Product name;
- (b) Date received;
- (c) Quantity stored (actual or maximum likely);
- (d) Storage location;
- (e) Any specific storage and segregation requirements for the product; and
- (f) If disposed of – how and when.

SDSs shall be available for all products in the store. Records shall be maintained for at least 12 months. Where tracked substances are disposed of, records shall be kept for 3 years.

The storage inventory shall be located in a safe position away from agrichemical storage. The storage inventory shall be readily available to the emergency services in the event of an emergency.

The inventory shall also include details of any hazardous waste on the site, including the nature of the waste, the quantity, its location, and any specific storage requirements.

**4.6.1.3 Sales records – Restricted and tracked sales**

The retailer shall hold and maintain a record of sales of all products with restrictions on their sale (see Table 2). Details of the sales shall be kept in a secure place for at least 12 months after the date of the last entry.

**4.6.1.4 Sales records – Restricted veterinary medicines**

The supplier shall hold and maintain records of restricted veterinary medicines (RVMs) sold, and to whom, in accordance with an MPI-approved operating plan.

NOTE – RVMs may only be supplied with authorisation from an authorised person such as a veterinarian.

**4.6.1.5 Emergency response plan**

An emergency response plan for the site, including an inventory of the types, quantities, and locations of stored agrichemicals, shall be prepared and provided to Fire and Emergency NZ for review if requested (see section 7 and Appendix H).

**4.6.2 User**

The documentation requirements relating to an agrichemical store are:

- (a) Inventory (see 4.2.2);
- (b) Product information – Users shall acquire and hold documentation specific to each agrichemical stored. In addition to the product label, the documentation shall include the SDS for each product stored;
- (c) Tracking records where required (see 5.2.6.2); and
- (d) Emergency response plan (see Appendix H).

**4.7 Competency****4.7.1 General**

All persons involved in the handling and storage of agrichemicals shall be suitably trained and/or qualified.

NOTE – See Appendix F for guidance on suitable training courses.

**4.7.2 Supplier**

People owning or managing agrichemical retail stores shall have appropriate training, information, and supervision on the agrichemicals stored, and be familiar with their hazard characteristics.

Certified handler qualifications are required for managing agrichemicals with specific hazard classifications (refer to the product information). When a certified handler is not present on-site, there shall be no access to products required to be under the control of a certified handler. At least one certified handler should be placed in charge of the security and tracking requirements of such agrichemicals.

**4.7.3 User**

All users shall have appropriate training, information, and supervision for their role.

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It is recommended that the PIC give one person responsibility for the conditions of the store and the management of its contents.

This person shall have appropriate qualifications or training (see Appendix F), including a certified handler compliance certificate if storing hazardous substances with very high human toxicity and, where required, a controlled substance licence (CSL). This person should have a good understanding of how to correctly handle hazardous materials and prepare an emergency response plan. They also need to understand the principles of product separation and segregation, and possible consequences of careless handling.

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## **5 Use of agrichemicals**

### **5.1 Scope**

Hazards to people or the environment from agrichemical use shall be managed in accordance with WorkSafe's hierarchy of controls as described in 2.2.4. The particular issues are safe handling, mixing and loading practices, and safe use of agrichemicals. Users determine the ultimate human, environmental, and market risks a product poses by the actions they take.

Responsibilities for the various tasks in agrichemical use must be clearly allocated and the people carrying out the required tasks must be competent to do so. In many cases written records must be kept.

In this section, agrichemicals are broken into three categories:

- (a) Plant protection products (for example, herbicides, insecticides, fungicides, and biological agents) (see 5.2);
- (b) Veterinary medicines and animal health products (for example, dips, drenches, vaccines, pain relief) (see 5.3); and
- (c) Detergents and sanitising agents used in an agricultural context (see 5.4).

Additionally, there are brief notes on the use of the following types of agrichemicals, with an emphasis on providing direction to detailed guidance:

- (d) Fumigants used on farms, orchards, and horticultural areas (see 5.5); and
- (e) Vertebrate toxic agents (VTAs) (see 5.6).

NOTE – A summary of the various Acts and other legislation that directly affect the use of all agrichemicals is provided in Appendix A.

### **5.2 Safe use of plant protection products**

#### **5.2.1 General**

Clause 5.2 sets out the elements of safe use for plant protection products, including products for agriculture, horticulture, forestry, conservation, amenity, and infrastructure use, and all herbicides, insecticides, fungicides, and biological agents.

#### **5.2.2 Risk identification**

The main risks relate to exposure of people and the environment to plant protection products as a result of spillage of undiluted product during handling, mixing, and loading, and contamination of any off-target areas and non-target organisms through spray drift or run-off. The particular issues are therefore safe handling, mixing and loading practices, and safe application of plant protection products. Plant protection products are applied using a wide range of methods, including handheld, vehicle-mounted and aerial (see Appendix K), which present a wide range of risk profiles.

Risk is a function of the hazard (the potential to cause harm) and exposure to that hazard (the opportunity for harm to be caused).

#### **5.2.3 Responsibilities**

For any use of plant protection products, there is a range of tasks. In some cases, an individual such as an owner-operator will carry out all the tasks. In other cases, different people may carry out these tasks, for example, an employee. Contractors are also commonly hired to apply plant protection products. In all these cases, the PIC of the business retains overall responsibility for identification and management of risk. Where a contractor is hired, the PIC and the contractor (also a PIC) shall consult, cooperate, and coordinate to manage risk. Contractors, their subcontractors, and their employees are classed as the workers of the person who has decided to apply a plant protection product, that is, the lead PIC. These PICs (lead and hired contractor) will often share duties in relation to health and safety of the people and environment at risk. These overlapping duties should be shared in an agreed practical manner.

In relation to personal, environmental, and market risks, these responsibilities include the following:

- (a) Users shall know and comply with all regulatory requirements when using plant protection products;
- (b) Applicators shall take all reasonable steps to ensure that plant protection products are used appropriately and accurately, and are confined to target application areas. Target application areas shall be accurately identified and quantified, and the amount of agrichemical and the volume of diluent required shall be accurately calculated based on that information;

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- (c) Application methods shall be used which minimise the risk of adverse effects on any off-target areas. For spray applications where drift hazard is high, and alternative methods of application or formulation do not provide an acceptable reduction of the hazard, agrichemicals shall not be applied (see Appendix B);
- (d) At all times during handling, application, and disposal stages of plant protection products, users shall minimise personal exposure (oral, dermal, and respiratory);
- (e) Users shall take precautions to minimise the likelihood of spills occurring. See L3 in Appendix L on how to reduce the risks of spills during mixing; and
- (f) Users shall not apply ecotoxic plant protection products to non-target invertebrate pollinators, except in accordance with the relevant EPA approvals and the conditions of registration (or exemptions from registration) imposed under the ACVM Act. This includes any area where bees are foraging, or where any plant or flower, likely to be visited by bees or other invertebrate pollinators, is in flower or likely to flower within the period specified on the label.

#### **5.2.4** *Information*

Applicators shall follow regulatory conditions relating to the application of products. Plant protection products should be used as recommended in the product information, and in particular, on the product label. See Appendix D for guidance on off-label use of products.

Users shall comply with industry requirements and agrichemical use programmes that govern the type, and uses, of agrichemicals for a specific crop or market. These programmes are available from industry bodies and often form part of market supply agreements.

Applicators, including contractors, should refer to the spray plan prepared for the application area and use this as guidance. The spray plan will cover notification, sensitive areas, and recommended approaches to managing risk for the application area.

Guidance on the use of buffer zones and shelter belts is set out in Appendix B. Buffer zones specified in regulatory conditions for a product and any local regulations shall be implemented.

#### **5.2.5** *Actions*

##### **5.2.5.1** *Planning*

Any person who is likely to be directly affected by the application of plant protection products has a right to information about the operation. The PIC of the property on which the spraying is to take place shall communicate, at least once a year, with any person who is likely to be directly affected by the application, and inform them that a spray plan (see C2) has been prepared and is available on request.

Applicators shall identify any sensitive areas and describe any situations likely to result in a drift hazard on a spray plan. The spray plan shall describe the measures to be taken that will avoid the drift hazard (see Appendix B). The spray plan should also identify any particular regulatory conditions that apply to the use of the planned product, so these are incorporated into the planning process.

##### **5.2.5.2** *Notification and signage*

Notification shall be given in accordance with C3 and any requirements of the regional plan. Notification provides a potentially affected party with the opportunity to take action to mitigate any potential spray drift effects. For example, greenhouse growers can close vents to limit the chance that spray drift enters the greenhouse. It is important that such parties are notified so that they can take action if they wish.

For public places and amenity areas, prior notice of spray application shall be given using appropriate media such as websites, local newspapers, or door-to-door advice. In addition, on-site or on-vehicle signage shall be displayed during application and for up to 72 hours after.

For application on private property, prior notification shall be given to any party likely to be affected. Consideration shall be given to the use of signage to advise other parties of potential risks.

Where agrichemical application is likely to directly affect beekeeping, prior notification shall be given to any party likely to be affected.

NOTE – Refer to specific product labels for details.

##### **5.2.5.3** *On-site risk assessment*

Prior to commencing application, a risk assessment shall be undertaken for the application site. After considering the spray plan, the risk assessment shall include consideration of the following:

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- (a) Confirmation of the target application area;
- (b) Appropriateness of product for the weed, pest, or crop;
- (c) Location of sensitive areas;
- (d) Weather conditions (wind speed, wind direction, humidity and temperature, atmospheric stability);
- (e) Appropriateness of particle size and release height, particularly in relation to sensitive areas and buffer zones;
- (f) Presence and condition of shelter belts;
- (g) Fit for purpose equipment and PPE;
- (h) Confirmation that notification has been carried out and required signage is in place (see C3 and C4);
- (i) Confirmation that any relevant regulatory requirements can be complied with; and
- (j) Confirmation that any other risk factors, including those identified in the spray plan, are being managed.

**5.2.5.4 Mixing sites**

Plant protection products are applied in a wide variety of places, especially by contractors who can work over a wide geographic area. As a result, handling, measuring, mixing, and loading may not always occur at a fixed location or on one property. As mixing sites have specific risks associated with them, specific direction is given here.

No agrichemicals shall be stored or mixed without proper management of the risk of any spillage entering water bodies, or otherwise contaminating the environment (see Appendix L). Mixing sites shall comply with these minimum requirements::

- (a) Containers – All empty containers shall be triple rinsed before being securely stored or recycled (see Appendix M);
- (b) Disposal of washings – Washings from empty containers or application equipment shall be contained and disposed of by methods consistent with this standard (see Appendix M);
- (c) Field storage – Agrichemicals awaiting use at a field mixing site shall not be accessible to livestock, children, or unauthorised persons and shall be kept closed to minimise the risk of spillage; and
- (d) Washing facilities – Users shall note the requirements of the HSWA to minimise any harm to personnel that agrichemical spillage could cause. Adequate washing and/or changing facilities shall be provided, including a supply of clean water.

Users shall not mix or prepare any agrichemical products within minimum stipulated distances from food processing areas or sources of water supply (as for permanent and semi-permanent storage, see J3.1). Minimum separation distances from operational areas may also apply to delivery sites within the workplace.

**5.2.5.5 Mixing procedures**

Users should comply with mixing instructions on the container label for both agrichemicals and adjuvants. See L3 for more guidance on mixing procedures.

Users should prepare only sufficient agrichemical for the task at hand and for the time available for application, and shall wear appropriate protective equipment during the mixing procedure.

Users should follow the manufacturer's instructions for the correct mixing order for plant protection products. The checklist for mixing agrichemicals should include:

- (a) Decontamination – Where different products are to be applied or administered, users should check that the equipment to be used has been decontaminated since the previous use. Where necessary, decontaminate before proceeding (see L6);
- (b) Correct product – Users shall ensure that the correct chemical has been identified, and the required mixture rate established;
- (c) Water supply – Users should ensure that the water supply is suitable for the product to be used, that there is no leakage in the pumping equipment and connections, and that there is no chance of spillage or back siphon to the water source. At all times, filling of spray tanks should be supervised so that the water supply cannot be contaminated (see N4 in Appendix N and L2); and
- (d) Spillage – Users shall, where practical, clean up any spills as soon as they occur (see H3 for spill management).

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#### 5.2.5.6 *Application equipment*

Users should select application equipment that minimises the potential contamination hazard to the applicator and the environment. Equipment should be appropriate for the safe and effective application of plant protection products:

- (a) Spray application equipment shall be configured to produce droplet sizes appropriate to the product and target, while minimising the amount of small, drift-prone droplets (see Appendices B and K);
- (b) Equipment shall be capable of achieving the required accuracy in the amount of agrichemical to be delivered or applied;
- (c) All equipment used to apply or administer agrichemicals shall be maintained to a satisfactory standard; and
- (d) Only equipment that is accurately calibrated for the task at hand shall be used (see Appendix K). Calibration checks shall be undertaken at intervals consistent with equipment usage, and by persons who have demonstrated calibration competence.

#### 5.2.5.7 *Spray drift*

The user shall be responsible for minimising spray drift. Users shall take all reasonable steps to ensure that no adverse effects occur beyond the application area and shall ensure that relevant tolerable exposure limits (TEs) and environmental exposure limits (EELs) are not exceeded (a regulatory requirement). Appendix B provides guidance on appropriate procedures.

Application of plant protection products by some methods increases the potential for exposure to those products compared with other methods. For example, increasing release height and distance between the nozzle and the target and directing spray up, as compared with down, increases the risk for off-target losses due to spray drift to occur. In all cases, users shall exercise the utmost care when applying agrichemicals, and take note of the factors below:

- (a) Weather conditions – No agrichemical application should be made unless wind speed and wind direction at the application site are known and are not expected to create adverse off-target effects to people or property (see Appendix B);
- (b) Application technique – When agrichemicals are applied, there is the potential for off-target movement (see Appendix B). Applicators shall be aware of the ways in which off-target movement of spray can occur. The applicator should take all reasonable care to avoid or mitigate the hazard by applying the following techniques:
  - (i) Spraying in a cross-wind, where the direction and strength of the airflow is predictable and is expected to move any spray drift away from sensitive areas, thereby minimising any drift hazard
  - (ii) Not spraying hazardous chemicals (likely to cause damage) in calm (zero wind) conditions, when the drift movement direction cannot be determined, or when inversion conditions exist or may arise following application
  - (iii) Not applying volatile agrichemicals in calm conditions where the ambient temperature and humidity are such that evaporation and subsequent spray drift is likely (see Table B1 and N2 for volatility information)
  - (iv) Not activating spray equipment when the spray is directed away from the intended spray target
  - (v) Minimising the distance between the sprayer and the spray target consistent with adequate spray coverage being achieved.

Where appropriate (or required as part of a product approval), buffer zones shall be used to minimise spray drift hazard to sensitive areas. However, applicators shall not rely exclusively on buffer zones or shelter belts to eliminate spray drift hazard.

#### 5.2.5.8 *Summary of tasks*

The various tasks associated with an application of a plant protection product are summarised below.

The user shall be responsible for minimising potential risks to themselves, employees, the public, animals, and the environment at all stages.

Prior to application, the user shall be responsible for the following:

- (a) Accurate identification of the target;
- (b) Identifying the lowest-hazard product that will be effective;



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- (c) Confirming that the product is registered (or specifically exempt from registration) under the ACVM Act and if hazardous, approved under the HSNO Act and checking ability to comply with the conditions of use;
- (d) Calibration of equipment (see Appendix K);
- (e) Adequate notification of the intention to undertake agrichemical application where that is required (see Appendix C);
- (f) Proper procedures and contingency plans to handle adverse events, including accidental spillage, first aid emergencies, adverse event reporting, and the receiving and handling of complaints arising from the application of agrichemicals (see Appendix P);
- (g) Checking all relevant regional plans to ensure the use will comply with any rules and any necessary resource consents have been obtained;
- (h) Notwithstanding instructions from a client, ensuring that work does not infringe any statute, regulation, or delegated legislation, and that all necessary licences, accreditation, and approvals for the intended use are valid and current (see Appendix A); and
- (i) Appropriate medical tests, where organophosphates and carbamates are used, to monitor exposure to agrichemicals before and during a spray season (see Appendix D).

Immediately prior to application, the user shall be responsible for the following:

- (j) Review of all on-site operations, including any emergency procedures and contingency plans and on-site risk assessment just prior to application (see 5.2.5.3);
- (k) Proper identification and accurate measuring and mixing of the agrichemical to be applied or administered, and the safe and efficient delivery of the mixed agrichemical into the application equipment;
- (l) Safe and efficient conduct of operations at the mixing and/or loading site (see Appendix L); and
- (m) Provision, use, and maintenance of PPE, including protective clothing, and ensuring that those engaged in the application or administration of agrichemicals are competent in the use of such equipment (see Appendices, F, R, and K).

During application, the user shall be responsible for the following:

- (n) Using agrichemicals in accordance with the product label, including controls imposed on its use as part of the ACVM registration and HSNO approval (see 2.2.6 and Appendix D);
- (o) Making decisions on the continuation or cessation of field operations, including stopping the operation if:
  - (i) Persons not involved in the operation become exposed to the agrichemical being used, or
  - (ii) Changes in weather conditions cause spray drift from the agrichemical application to become a risk to vegetation, animals, people, or property outside the target area (see Appendix B); and
- (p) Ensuring that no unauthorised people are in the application (target) area.

After application, the user shall be responsible for the following:

- (q) Proper storage prior to recycling of used containers. Where a contractor leaves agrichemical containers with a client, the client should be advised of their responsibility for proper storage or disposal (see section 6);
- (r) Proper cleaning of equipment and PPE and safe disposal of any washings; and
- (s) Recording event in spray record and, if required, updating tracking records.

### **5.2.6 Documentation**

#### *5.2.6.1 Record of application*

WorkSafe and the EPA specify requirements for keeping records of the use of plant protection products based on the hazard classification of the product and the circumstances of that use, for example, will the public be present or is it likely the product will leave the application site and enter water or the air? These records shall be available to regulators on request and may be used as evidence for a defence if legal action is taken.

There are other important reasons to keep good records:

- (a) A regional plan may require records of agrichemical use to be kept, in accordance with this standard;
- (b) Spray diaries form part of quality assurance and market access programmes such as NZGAP;
- (c) If users of plant protection products become involved with possible off-target spray complaints, good records of actual agrichemical use will be essential (see P4);

Other benefits of good record-keeping include the following:

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- (d) Proactive management of pest problems;
- (e) Crucial information for managing resistance to products;
- (f) Planning of integrated pest management control programmes;
- (g) Easier, more accurate budgeting;
- (h) Performance data on agrichemical used (what happened last time); and
- (i) Evidence for any product effectiveness investigations.

All applications of plant protection products shall be appropriately recorded in a paper or electronic format. The amount of detail will depend on the circumstances. For example, minimal records are needed for the ad hoc use of herbicides for controlling vegetation around a yard or routine daily pedestrian application of pastoral weed control where a simple note in a diary will be sufficient. Detailed records will be appropriate for more widespread herbicide application or for insecticides and fungicides, particularly for export crops. In many situations, a map of the application area and any sensitive areas will be needed.

The following information shall be included in a spray record or in an associated document that can be easily cross-referenced:

- (j) The name and address of the applicator;
- (k) The full trade name of the products, including any additives used;
- (l) The date of each application or discharge of the product;
- (m) The amount of the product applied or discharged (dosage, for example, kg or L/ha or per 100 L or grams/dose), the water volume application rate (if applicable);
- (n) Purpose of application (target pest, weed, disease, foliar fertiliser, or growth regulator);
- (o) The method of application (for example, boomsprayer, knapsack); and
- (p) The location where the substance was applied or discharged (including electronic positional data records of flight and discharge for aerial application).

Plus, for all applications of organophosphates and carbamates, all applications of high human toxicity (HSNO classes 6.1A, 6.1B, 6.1C, 6.6A, 6.7A, 8.2A, and 8.2B) products and for all substances applied to or discharged into the air using motorised equipment, the spray record shall include the following:

- (q) Start and finish time of application;
- (r) A description of the weather conditions (wind speed and direction, temperature, humidity) when the substance was applied or discharged; and
- (s) Identification of sensitive areas and measures taken (for example, sprayer set-up, nozzle selection) to ensure no significant adverse effects beyond the target application area.

Plus, for highly ecotoxic (HSNO classes 9.1A, 9.2A, 9.3A, and 9.4A) substances, or any other substances with a special control requiring this information to be recorded, the following shall also be noted:

- (t) HSNO approval number (for example, hazardous substances registration (HSR) number on label and SDS) for application of these products when more than 3 kg is applied during a 24-hour period. These records shall be kept for at least 3 years after the date on which the product that the record relates to is applied or discharged.

Other useful information to include in a spray record is the following:

- (u) Withholding period (WHP) or PHI;
- (v) Factors which may influence effectiveness of the agrichemical used, such as growth stage of crop, age of stock;
- (w) Any agrichemical incident such as spillage and action taken, including variations to the spray plan;
- (x) Disposal of any unused agrichemical or empty containers; and
- (y) Results achieved – While this can only be filled in later, the information is important in planning future agrichemical use.

NOTE –

- (1) Specific industry or regulatory requirements for recording agrichemical applications or use may also apply. Refer to regulatory conditions of the product, regional plans, industry guidelines, and market access programmes.
- (2) Spray records may also be known as spray diaries.

#### 5.2.6.2 *Tracking record*

Substances listed in Hazardous Substances Regulations Schedule 26 require tracking. These substances which have been assigned the tracking control can be identified by reference to the product label, PSC, or SDS and are listed in Table 3.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****Table 3 – Hazard classifications requiring tracking as default control (plant protection products only)**

Hazard classes requiring tracking as default control
Flammable liquid category 1 (HSNO class 3.1A)
Flammable liquid category 1 (HSNO class 3.1B)
Oxidiser substance category 1 (HSNO class 5.1.1A)
Acute toxicity category 1 (HSNO class 6.1A)
Acute toxicity category 2 (HSNO class 6.1B)

NOTE – There are product-specific exemptions to these default controls, for example, petrol, and also tracking controls on specific individual products from other hazard classes.

Tracking records shall include the following:

- (a) The name of the substance;
- (b) The quantity of the tracked substance;
- (c) The location of the substance with sufficient detail to enable the substance to be physically located by a regulator within 1 hour of arriving at the workplace;
- (d) The identity of the competent person who is in control of the substance, including name, position within their organisation, physical work address, and, if applicable, details of their certified handler compliance certificate; and
- (e) Details of the place to which the substance will be transferred or the manner of disposal of the substance.

Tracking records shall be kept for at least 3 years (1 year if supplier).

#### **5.2.7 Competency**

In all cases, those applying agrichemicals shall be appropriately qualified and shall be familiar with requirements of this standard, any requirements of the local body air quality plan relevant to their area, as well as the label guidance and regulatory conditions for the products being used.

Handlers of some agrichemicals may require certification as a certified handler under HSWA. Refer to the product label, product information, or supplier.

NOTE - See Appendix F for full details of training and competency requirements.

### **5.3 Safe use of veterinary medicines and animal health products**

#### **5.3.1 Risk identification**

Clause 5.3 covers veterinary medicines, including restricted veterinary medicines (RVMs) and unrestricted veterinary medicines (UVMs). UVMs may be freely purchased by anyone. RVMs are available only with authorisation from a veterinarian, or may be used only by or under the control of a veterinarian.

The risks associated with incorrect use of RVMs, UVMs, and animal health products are as follows:

- (a) Unacceptable residues detected in animal products such as meat, milk, wool, or offspring;
- (b) Adverse animal welfare outcomes due to either reduced effectiveness of the veterinary medicine or an adverse drug event;
- (c) Over or incorrect use resulting in build-up of resistance in the target organism; and
- (d) Exposure of workers and the environment to hazardous substances from incorrect use or poor stewardship of veterinary medicines, for example, inadvertent injection of workers administering the product.

#### **5.3.2 Responsibilities**

Responsibilities are as listed in 2.3.

#### **5.3.3 Information**

##### **5.3.3.1 Safe use of veterinary medicines as per label or authorisation**

All veterinary medicines, except for certain product groups that are exempt, require registration under the ACVM Act. 'Conditions of registration' are applied to products when they are registered. Conditions

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applying to users of the product appear on the product label and constitute an important part of 'safe use'. Users shall follow the instructions given by the authorising veterinarian.

NOTE – For operational guidelines, refer to information and codes of practice developed by the National Animal Ethics Advisory Committee (NAEAC) and the Australian and New Zealand Council for the Care of Animals in Research and Teaching (ANZCCART).

#### 5.3.3.2 *Use of veterinary medicines other than as provided for on the label ('discretionary use')*

A veterinary medicine shall not be used by any person on animals or in a manner specifically prohibited in the current conditions of registration for that trade name product. 'Off-label' or 'discretionary' use of RVMs and UVMs is permitted at the discretion of a registered veterinarian under authorised circumstances (see D4.3).

Products that are exempt from ACVM registration shall be used only as recommended in the information provided with the product unless the alternative use is under veterinary supervision or authorisation, or a veterinary operating instruction (VOI).

The safe practices in relation to mixing and equipment set out in 5.2.5.4 to 5.2.5.6 also apply to veterinary medicines and animal health products.

#### 5.3.4 *Documentation*

The product name, methods of treatment, and date the product(s) are used shall be recorded for all production animal treatments with veterinary medicines. Batch number, expiry date, and animal identification number should also be documented to meet market/processor requirements.

All restricted veterinary medicines (RVMs) held on farm shall be recorded on an authorisation that is currently in force. If non-expired RVMs from the previous season are carried forward, they should be included on the current season's authorisation if they are not returned or appropriately disposed of.

Records shall be kept of the administration details for all animal treatments regardless of whether a milk WHP applies.

NOTE – Such information is required to be recorded by farmers to comply with NZCP1 and for the 'animal status declaration' (mandated under the Animal Products Act 1999) that is required for the sale (including sale for slaughter and processing, and store sale) of all sheep (including lambs), cattle (except bobby calves), deer, goats, pigs, alpacas, llamas, horses, ostriches, and emus.

Billing records kept by veterinarians detailing the drugs used/administered or prescribed may suffice for animal products, but will not identify the animal(s) treated unless the veterinarian administered the treatment directly.

Users shall be aware of the hazard class (if any) of the veterinary medicine and comply with any controls under HSNO or HSWA, including tracking if required (see 5.2.6.2).

#### 5.3.5 *Competency*

In all cases, those administering veterinary medicines shall be appropriately qualified (where RVMs are used); shall be familiar with requirements of this standard, the conditions of registration (or exemption from registration), the Animal Welfare Act, and related codes of welfare; and shall be capable of understanding and following the instructions of the authorising veterinarian.

### **5.4 Safe agricultural use of detergents and sanitising agents**

#### 5.4.1 *Risk identification*

Clause 5.4 covers detergents and sanitisers, and other compounds that are used for cleaning and sanitising facilities and equipment where food products are handled on farm. In addition to the safe practices outlined in section 2 and sections on handling and mixing, mixing sites, mixing procedures, and application equipment in 5.2.5.4 to 5.2.5.6, the following guidelines apply. See also Appendix L. Only cleaning and sanitising compounds that have been approved under the Animal Products Act shall be used in areas in which animal products are harvested and/or processed.

The risks associated with incorrect use of detergents and sanitising agents include the following:

- (a) Explosive reactions between incompatible products;
- (b) Generation of toxic gases from combining reactive products;
- (c) Unacceptable product residue levels in milk or meat products;
- (d) Unacceptable biological contamination of milk products (milk downgrades); and
- (e) Adverse effects on people or the environment.

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Responsibilities are as listed in 2.3.

**5.4.3 Information**

Where detergents and sanitisers are used in the dairy and meat industry, their use is regulated via the Animal Products Act. The conditions applied to the approval relating to directions for use will be clearly stated on the label or supplied in the accompanying documentation (for example, if the sanitiser must be washed from the surface prior to use, this must be stated). The approval looks for effective hygiene and no adverse food safety or other side effects for usage per instructions.

The NZ Food Safety section of the MPI website provides a list of approved detergents, sanitisers, and other compounds used in farm dairies to clean, sanitise, or maintain the milking plant under the Animal Products Act. This list includes the conditions of use under which the product was approved. Only detergents and sanitisers approved by MPI for use in farm dairies shall be used.

Specific requirements are set out in the operational code NZCP1 for farm dairies. Key requirements include the following:

- (a) All farm dairies require a written cleaning procedure that is laminated and displayed prominently in the farm dairy;
- (b) The procedures shall be written clearly so that someone who has never worked in that dairy before can accurately follow the procedure; and
- (c) All products used in farm dairies shall be on the MPI dairies register. They shall have a sticker or mark indicating they have been checked against the register and are approved for use in the dairy.

**5.4.4 Actions – use of dairy detergents and sanitisers****5.4.4.1 Mixing and preparation**

Users should comply with mixing instructions on the container label, including amounts to use, temperature, and frequency of use. Users should prepare only sufficient chemical for the task at hand and shall wear appropriate PPE during the mixing procedure. Product labels and SDSs outline the appropriate PPE to be worn during use.

Containers and measuring utensils used for preparation of detergents or sanitisers shall not be used for the mixing or preparation of any other agrichemical. Use separate jugs for decanting/measuring out acids and alkalis or rinse thoroughly between use with acid and alkali products – separate jugs is best practice.

Detergents and sanitisers shall be used at the correct strength and temperature and in the correct sequence or combinations as per the label. Users shall not mix alkaline products with acid products. Never mix chlorinated products with acid, as this can produce a poisonous gas, and always add the chemical to the water, not the water to the chemical. Users shall ensure that powdered detergents are completely dissolved before use.

**5.4.4.2 Effective cleaning**

There are four elements to effective cleaning:

- (a) Residence time – The correct amount of time for the chemical to be in contact with the surfaces to be cleaned or sanitised;
- (b) Amount – The correct amount of product used;
- (c) Temperature – Maintaining the correct temperature for the required residence time; and
- (d) Agitation – Making sure that the product is properly mixed and that all the surfaces to be cleaned are brought into contact with the product.

After cleaning, all detergents and sanitisers shall be rinsed from food surfaces with compliant water prior to use.

Users shall ensure that spent or waste detergent or sanitisers are sufficiently diluted so that the concentration is below the hazard threshold set for that product before disposal in the general waste stream from the premises.

**5.4.5 Documentation**

Users shall be aware of the hazard class (if any) of the dairy detergents and sanitisers and comply with any controls under HSNO or the HSWA, including tracking if required (see 5.2.6.2).

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There is no formal requirement to record the use of detergents or sanitiser. Invoices for product received on the farm could be examined to determine the quantity of product used if required.

**5.4.6 Competency**

All users shall be appropriately trained in the safe use of detergents and sanitising agents (see Appendix F).

**5.5 Safe use of compounds for agricultural produce, soil, or greenhouse fumigation****5.5.1 General**

Fumigants are volatile hazardous substances with very high human toxicity. Agricultural uses include the control of pests within grain storage and soil disinfestation. Fumigants have stringent and often substance-specific controls that differ from the requirements set out in this standard. There are additional requirements for all fumigants, such as training and certification, notification, PPE, and signage. Higher-risk fumigants have specific controls imposed on their use, such as buffer zones, soil conditions, and entry restrictions.

**5.5.2 Sources of information**

For full details of requirements, refer to the following:

- (a) The product label;
- (b) Hazardous Substances Regulations Parts 13 and 14;
- (c) Any safe work instrument (SWI) for the specific product; and
- (d) EPA product-specific controls.

NOTE – Use of fumigants is a specialist activity and it is recommended to seek assistance from a trained and licensed professional.

**5.6 Safe use of vertebrate toxic agents (VTAs)****5.6.1 General**

VTAs are highly toxic and designed to kill mammalian pests. Agricultural uses include the control of rodents, rabbits, and possums. VTAs have stringent and often substance-specific controls that differ from the requirements set out in this standard. There are additional requirements for all VTAs, such as training and certification, notification, PPE, and signage. Most VTAs have specific controls imposed on their use, such as buffer zones, soil conditions, and entry restrictions, and may require permissions from other organisations, such as the Department of Conservation and Ministry of Health, for individual applications.

**5.6.2 Sources of information**

For full details of requirements, refer to the following:

- (a) The product label;
- (b) Hazardous Substances Regulations regulation 13;
- (c) Any SWI for the specific product;
- (d) EPA product-specific controls;
- (e) *Vertebrate Toxic Agents: Minimum requirements for safe use and handling, best practice guidelines*, published by National Pest Control Agencies 2018 and available at [www.bionet.nz](http://www.bionet.nz); and
- (f) *AIRCARE™ Code of Practice for aerial application of vertebrate toxic agents*, 2011, published by NZAAA.

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## **6 Disposal of agrichemicals and containers**

### **6.1 Scope**

Section 6 deals with the safe disposal of concentrate agrichemical, surplus agrichemical spray mixture, sprayer washings, and empty agrichemical containers. It also covers the disposal of spilt agrichemical, contaminated absorbent material, and contaminated personal protective equipment (PPE, see Appendix R for further information on decontaminating PPE). In situations where there is no suitable disposal option immediately available, the material shall be securely stored until safe disposal can be carried out.

### **6.2 Risk management**

Accurate planning of the quantities of agrichemicals required for use and subsequently mixed to dilute form reduces the need to dispose of agrichemical. The main risks are that agrichemicals will be unintentionally released to the wider environment in concentrations above the threshold limits set and hence cause adverse effects. The process of disposal of empty containers, or handling contaminated garments, can also provide a route for the release of hazardous substances into the environment.

Agrichemical use generates empty waste containers that need to be disposed of by the safest means possible and in compliance with regulatory requirements. No one handling or using agrichemicals or their waste containers shall knowingly dispose of them in a manner that will adversely affect human health or the environment or is not in accordance with the Hazardous Substances (Disposal) Notice 2017 (EPA Disposal Notice) and any local authority requirements.

### **6.3 Responsibilities**

The owner of any agrichemical is responsible for the safe disposal of any unwanted agrichemical concentrate and of the container. The method of disposal shall not result in any adverse effect on the health of people or the environment.

There are specific requirements for the disposal of each agrichemical and the container. Refer to product label, or other information accompanying the product (for example, safety data sheets (SDSs) and product safety cards (PSCs)).

NOTE – Some agrichemicals and their containers (if not clean) will require disposal by certified handlers.

### **6.4 Information**

Suppliers shall provide, and users shall obtain, all the information needed to ensure the safe disposal of agrichemicals and their containers. The product label, SDS, or PSC (where available) for the agrichemical will have relevant information. (See Appendix E.)

Details of the regulatory requirements for the disposal of hazardous substances are set out in the EPA Disposal Notice.

### **6.5 Safe practice for disposal**

#### **6.5.1 General**

Unwanted agrichemicals should be disposed of as soon as possible. If a suitable disposal option is not immediately available, unwanted agrichemicals shall be kept safe and secure in a lockable agrichemical storage facility. Disposal shall be undertaken wearing protective clothing designated for the agrichemicals concerned.

Detailed information on disposal options and the safe storage of unwanted agrichemicals is given in Appendix M.

#### **6.5.2 Disposal of unwanted agrichemicals (concentrates)**

Unwanted agrichemicals should be disposed of as soon as possible. If a suitable disposal option is not immediately available, unwanted agrichemicals shall be kept safe and secure in a lockable agrichemical storage facility. If the (original) container has deteriorated, sit the whole container inside a leakproof container capable of holding the maximum quantity of unwanted agrichemical in the event the original container fails. It is important to ensure that the replacement container is compatible with any solvents in the agrichemical.

Suppliers shall ensure that the product is correctly labelled. If the label has deteriorated, the label should be replaced. At a minimum, the product name, and appropriate hazard pictogram or statement, shall be written on the container. Alternatively, transfer the contents to an empty original container for the

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identical product. If the contents of the container are unknown, then the container should be labelled 'Unknown Agrichemical' and be managed as though it has both high human and environmental toxicity.

NOTE – Caution – Not all plastics will tolerate the solvents in emulsifiable concentrates (ECs) and can deteriorate rapidly if they come into contact with the solvent.

### **6.5.3 Disposal of dilute mixes of agrichemicals**

The need to dispose of spray mix of agricultural compounds and plant protection products, veterinary medicines (dips), or other diluted preparations should be minimised by careful assessment of the quantity needed to just complete the job in hand. Spraying unused mix on to the target area is an option provided there is no chance of compromising acceptable residue levels for the crop or target for treatment in the intended market, or any other regulatory thresholds such as maximum application rates. Pre-harvest intervals (PHIs) may need to be adjusted to compensate for the additional application. Use of headlands and grassed tracks are alternative options in this case, provided the same strip is not repeatedly used. Other options include storage in dedicated tanks for later use – do not mix herbicides with insecticides or fungicides and check compatibility of products before mixing.

Diluted agrichemicals also arise from internal and external cleaning of spray equipment. Treatment systems based on biodegradation can be used to manage this waste (see M4).

NOTE –

- (1) Some agrichemicals lose activity if not used immediately following mixing.
- (2) See M3 for more details of disposal of agrichemical mixtures, M4 for management of sprayer washings, and M6 for disposal of stock dip effluent.

### **6.5.4 Disposal of contaminated PPE**

#### **6.5.4.1 Contaminated clothing**

Thoroughly launder clothing contaminated with agrichemicals (separate from other clothing) before reuse. If clothing is seriously contaminated, discard as solid material.

#### **6.5.4.2 Disposal of solid material**

All material recovered from protective clothing should be disposed of safely as for agrichemical concentrate (see M2).

### **6.5.5 Agrichemical containers**

#### **6.5.5.1 Reuse of containers**

Unless being refilled with an identical product, all containers shall be thoroughly cleaned before reuse. If a container is reused for other purposes, it shall only be refilled with a similar agrichemical. The old label shall be removed and an appropriate label or product information shall be attached. Product information (for example, SDS) should be checked to ensure the container is suitable for the new product.

No container shall be used to contain any substance for human or animal consumption.

Some types of containers, such as intermediate bulk containers (IBCs), may be able to be returned to the supplier for reuse.

#### **6.5.5.2 Recycling of containers**

Where possible, empty containers (metal or plastic) shall be recycled by being returned to the supplier or 'handed in' to a recognised recycling service such as Agrecovery. All bungs and caps shall be removed and disposed of separately. All containers shall be triple rinsed. Triple rinsing should be completed at the time of emptying the container and the rinsate added to the spray tank. Containers should be kept dry while awaiting recycling.

#### **6.5.5.3 Disposal of containers**

Where recycling or reuse is not possible, the container shall be triple rinsed and then made unusable and not capable of holding any substance by flattening, holing, or breaking. The irreversibly damaged container and any bungs or caps may then be disposed of either to a public landfill that accepts used and washed agrichemical containers, or to a private landfill that is a permitted activity or has resource



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consents granted by a local authority. Triple rinsing of plastic lined and waxed cardboard containers shall also be carried out to help ensure complete removal of residues before container disposal.

Plastic containers shall not be burnt except at an appropriate, environmentally sound incineration facility.

NOTE – See M7 for more details of disposal of empty agrichemical containers.

**6.5.6** *Disposal of used needles and syringes*

Used needles and syringes shall be disposed of safely out of reach of children. Syringes must be rendered inoperable before disposal. If no suitable 'sharps' container is available, used needles can be stored in an empty plastic container (such as a plastic milk bottle) and disposed of in ways that protect both people and the environment. Sharps containers should be delivered back to suppliers for disposal.

**6.5.7** *Disposal of spilt agrichemical and contaminated absorbent material*

Unless there is a major upset like a punctured 1000 L container, actual spills are likely to be small (jug or open container knocked over) so potential volumes of product spilt by applicators will be small. Small amounts (up to 50 L) of contaminated (used) absorbent material or contaminated soil can be treated in a similar way to spray washings (see M5).

Alternatively, and for larger spills, contact your local council or hazardous waste disposal contractor.

**6.6 Documentation**

Users shall be aware of the hazard class of the agrichemical and comply with any tracking requirements under the HSWA. Refer to the product label, SDS, or PSC, and 5.2.6.2.

**6.7 Competency**

All persons involved in the disposal of agrichemicals and their containers shall be suitably trained and/or qualified (see Appendix F). Disposal of some agrichemicals may require a certified handler – refer to the product label, SDS, or PSC.

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## **7 Emergency preparedness and management**

### **7.1 Scope**

Section 7 covers the need to anticipate incidents or adverse events with agrichemicals, and to have a plan ready to implement when such events occur. The Hazardous Substances Regulations prescribe the requirements to plan for and manage any emergency involving a hazardous substance, and there are also requirements under the General Risk and Workplace Management Regulations and the EPA Hazardous Property Controls Notice for ecotoxic products. Section 7 addresses how to prepare for agrichemical emergencies and the need to have an emergency response plan. An outline of the information needed and actions to take in an emergency is given. Detailed information is provided in Appendix H.

NOTE – An emergency response plan forms part of the emergency management system.

### **7.2 Risk management**

#### **7.2.1 Risk identification**

Although there are risks from diluted agrichemicals in a spray mixture, the major risks involve concentrated undiluted product and include the following:

- (a) Accidental occupational human exposure;
- (b) Spillage;
- (c) Fire (consequential, explosion, emissions, and escape of firefighting water); and
- (d) Environmental contamination and adverse effects (for example, transport or forklift accidents, earthquake).

An inventory of maximum likely quantities of hazardous substances shall be prepared for the workplace. An inventory is critical to enable emergency services to identify and assess the hazards at the site and helps ensure they use the right equipment and methods to deal with the emergency. See Appendix J for details on how to prepare an inventory.

The key identifiers required by emergency services in the first instance, such as product name and UN number, are required to be listed in the inventory. Having the hazard class of each product included on the inventory is also helpful for emergency services.

In the event of an emergency, identify the actual products and type of hazard involved at a safe distance before getting physically involved. If the agrichemical cannot be safely identified, then it should be treated as the most hazardous known to be on the site.

#### **7.2.2 Risk management**

The person in charge (PIC) shall prepare an emergency response plan covering all reasonably foreseeable emergencies at the workplace. The plan shall take into account the substances present at the workplace or likely to be present, the size and location of the workplace, the nature of activities (for example, storage, transport, use), and the number of people at the workplace.

The emergency response plan shall include the following information:

- (a) A description of the actions to be taken, including advising people that an emergency has arisen and what action they should take, helping any person injured, and getting the emergency under control;
- (b) The identity of everyone who has responsibility for specified tasks, including how to contact them, what their skills are, and what they are expected to do;
- (c) Details of how to get information about hazardous properties of any substance, what equipment is needed to manage the emergency, where it is and what it is for, and how to contact any emergency service provider; and
- (d) A summary of the maximum likely amounts of the hazardous substances at the site and their location (that is, an inventory).

See Appendix H for full details of emergency response plans. Note that additional detail is required in the emergency response plan if quantities of hazardous products at the workplace exceed the thresholds set out in Table H1.

Emergency plans shall be tested at least annually and records kept of the tests and any revisions made to the plan. Testing shall cover the range of emergencies addressed in the plan.

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### **7.3 Responsibilities**

Employers and employees, including the self-employed, have duties under the HSWA to ensure the workplace is safe (see 2.3). Employers shall be aware of their responsibilities and take all practicable steps to ensure the safety of employees while at work.

The PIC shall prepare emergency response plans for all reasonably foreseeable emergencies detailing what actions to take. This plan shall be made available to every person who has a specific responsibility for any actions to be taken under the emergency response plan. The plan shall also be made available for review to local emergency services, for example, Fire and Emergency NZ.

The equipment, material, and people specified in the plan shall be available. The people specified by the plan shall be able to reach the site in the time specified in the plan and be able to perform the duties and provide the advice required within a specified time.

All agrichemical users shall be aware of basic first aid as laid out in Appendix Q. Where required, suppliers and users shall hold a certified handler compliance certificate.

The PIC of any agrichemical operation shall be responsible for the collection, collation, and use of product information supplied with the agrichemical.

### **7.4 Information**

#### **7.4.1** *Product-specific information*

For hazard classification information and emergency response advice on specific products, refer to the SDS, the PSC, or the supplier of the agrichemical.

When transporting dangerous goods on the road, the driver transporting those dangerous goods shall also carry emergency response information (ERI) (see 3.7.2 and H5).

#### **7.4.2** *Emergency procedures*

WorkSafe provides detailed guidance on how to prepare an emergency plan and a range of templates for emergency management.

### **7.5 Actions in an emergency**

#### **7.5.1** *Emergency preparation*

##### **7.5.1.1** *First aid cabinets*

An appropriate first aid cabinet for general accidents and emergencies shall be provided. See Appendix Q for details.

##### **7.5.1.2** *Protective clothing and equipment*

As employers, suppliers and users shall provide or make accessible suitable protective clothing and equipment where agrichemicals are used in the workplace by their employees. As employees, including the self-employed, suppliers and users shall use the protective equipment provided or made available. See Appendix R for details of protective equipment.

##### **7.5.1.3** *Spill kits*

All equipment included in the emergency plan shall be available. Equipment shall be replaced as required. See H3.2 for details of clean-up equipment such as spill kits.

Where required, neutralising chemicals shall form part of the emergency response kits.

##### **7.5.1.4** *Fire extinguishers*

At least one 30B-rated fire extinguisher shall be available on-site outside and close to agrichemical store. Table J4 lists the quantities of flammable and oxidising substances that require fire extinguishers.

#### **7.5.2** *Emergency response*

In the event of an emergency, the actions to take are summarised below. See Appendix H for more specific information, including clean-up procedures.

- (a) Assess the situation

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Assess the scope of emergency. For example: is the spill major or minor? Are fumes or gas present? Is a chemical reaction under way? Can immediately available staff and resources cope, or should emergency services be called? See Table H2 for factors determining whether a spill is major or minor.

**(b) Keep people safe**

Evacuate people from the area. Warn other people on the site and prevent people from coming into the area. Put on suitable PPE before entering the area.

**(c) Raise the alarm**

Depending on the best assessment of the scope of emergency, call either emergency responses on 111, the relevant emergency 24-hour number, or the regional council pollution hotline without delay. For any emergency, time is important, so raise the appropriate alarm first. Always advise others of your plans before attempting any human rescue or salvage.

**(d) Attend to any casualties**

Administer first aid. See Appendix Q. Ensure suitable PPE is worn and contamination is avoided.

**(e) Manage the situation**

If it is safe to do so, seek to control the incident and minimise adverse effects. Contain the fire or spill. Do not allow spilled agrichemical to enter any body of water, including storm water drains. See H3.3.

**(f) Review the event**

Undertake a review of what happened, how well the emergency plan was implemented, and what improvements could be made to the emergency management system.

**7.6 Documentation**

In addition to the emergency response plan, the following documentation shall be retained:

- (a) Copies of the emergency response plan – Under the Hazardous Substances Regulations, an emergency response plan shall be available to every person who is identified in the plan as having responsibility for actions, and to every emergency service provider identified in it. The PIC shall maintain duplicate copies of the emergency response plans in locations on-site that are easily accessible to emergency services coming on to the property;
- (b) Testing of the emergency response plan – Records of emergency drills and testing of the plan undertaken and the results of those tests shall be kept for at least 2 years after the testing;
- (c) Location compliance certificate – The PIC of a hazardous substance location shall ensure that where required, a location compliance certificate (LCC) is obtained for that location (see J11 for detail). A full emergency response plan will be required as part of the compliance criteria;
- (d) Accident register – A record shall be kept of significant spills and accidents (see P3). Users should notify the respective regional council in the event of any accidental spillage or unintended introduction of agrichemical into the environment (and any actions taken). Significant spills that enter water bodies, storm-water drains, or unsealed ground shall be reported to local authorities.

NOTE – Incidents involving serious harm (potential or actual) to people are required to be reported to WorkSafe. See P3.3.

**7.7 Competency**

Suppliers and users shall be appropriately trained and knowledgeable in the management of hazardous substances (agrchemicals) and the development of emergency management systems, including emergency response plans. See Appendix F.

The PIC shall ensure all workers know what to do if an emergency arises. Train new staff so they know what to do in an emergency, such as a chemical spill, fire, earthquake, or poisoning accident. Run regular refresher training for existing staff. Ensure contractors working on-site know how to respond in an emergency.

All agrichemical users shall be aware of routes of poisoning, symptoms of poisoning, and basic first aid as laid out in Appendix Q. Users should undertake first aid training relevant to their work activities.

Where required, suppliers and users shall hold a certified handler compliance certificate.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****APPENDIX A – LEGISLATION AND AGRICHEMICAL USE**

(Informative)

**A1 Central government****A1.1 General**

This standard is consistent with current legislation (at date of publication) governing use of agrichemicals, and in some instances, goes further. The main items of legislation, along with a brief statement on what each item covers, are provided below. Legislation covering specific uses such as transport is given at the start of the relevant section.

The regulatory environment for hazardous substances, including agrichemicals, changed significantly on 1 December 2017. With regard to use of hazardous substances in the workplace, responsibility for the health and safety of people lies with WorkSafe under the HSWA, and responsibility for the environment sits with the EPA under the HSNO Act.

The common usage name of each Act, regulations, or notice as used in this standard is provided in brackets after the proper name.

**A1.2 Health and Safety at Work Act 2015 (HSWA)**

This Act relates to the health and safety of employees and other people at work, or affected by the work of other people. The HSWA came into force on 4 April 2016 and replaced the Health and Safety in Employment Act 1992.

The main purpose of the HSWA is to provide for a balanced framework to secure the health and safety of workers and workplaces. Under the HSWA, workers and other persons should be given the highest level of protection against harm to their health, safety, and welfare as is reasonably practicable.

It shifts the focus from hazard spotting to managing critical risks – actions that reduce workplace harm rather than trivial hazards. The Act's key emphasis is on **everyone** in the workplace being responsible for health and safety: the business (PCBU), officers (directors and senior managers), workers (employees, contractors, and subcontractors), and visitors to the workplace.

NOTE – This standard uses PIC in place of PCBU. See 1.3.

**A1.3 Health and Safety at Work (General Risk and Workplace Management) Regulations 2016 (General Risk and Workplace Management Regulations)**

These regulations set out general requirements related to managing risk. Firstly, a PCBU must identify hazards that could give rise to reasonably foreseeable risks to health and safety. It must then manage these risks using the HSWA's hierarchy of controls: elimination and minimisation (substitution, isolation, engineering controls, administrative controls, PPE).

There is also a requirement to monitor the implementation of the controls, and review their effectiveness, particularly when risks change.

These regulations also have some specific requirements:

- (a) Employers are required to provide suitable protective clothing and equipment unless the employee willingly provides their own, and the employer is satisfied that the clothing the employee provides is suitable;
- (b) People aged under 15 should not be handling hazardous substances;
- (c) A PCBU must ensure that health monitoring is provided to a worker who works for the PCBU if the worker is carrying out ongoing work involving a substance hazardous to health that is specified in an SWI as requiring health monitoring and there is a serious risk to the worker's health because of exposure to the substance hazardous to health.

**A1.4 Health and Safety at Work (Hazardous Substances) Regulations 2017 (Hazardous Substances Regulations)**

These regulations came into effect on 1 December 2017 and replaced previous provisions within the HSNO Act. They set out how hazardous substances (other than ecotoxic) are to be managed within the workplace to reduce the risks to health and safety:

- (a) **Parts 2–5** cover general provisions related to the use of hazardous substances. This includes the following:
  - (iii) Labelling

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- (iv) Signage
  - (v) SDSs
  - (vi) Packaging
  - (vii) Inventory
  - (viii) Risk management
  - (ix) Certified handlers
  - (x) Supervision and training of workers
  - (xi) Emergency management;
- (b) **Part 6** sets out the rules and processes for issuing compliance certificates and authorising compliance certifiers;
- (c) **Part 7** sets out the controlled substance licence (CSL) requirements;
- (d) **Parts 8–15** set out specific rules related to individual hazard classes or groups of substances such as flammables, toxics, fumigants, or gases under pressure;
- (e) **Parts 16–17** cover special equipment (tank wagons and transportable containers, stationary container systems, and process containers);
- (f) **Part 18** covers special conditions for laboratories; and
- (g) **Part 19** covers tracking requirements.

There are also a large number of schedules that set out the details of hazard classes and thresholds at which each of the rules apply.

These regulations are complemented by a set of safe work instruments (SWIs) that can add or modify some of these requirements.

#### **A1.5 Hazardous Substances and New Organisms Act 1996 (HSNO Act)**

The HSNO Act was substantially amended in December 2017 when management for the safe use of hazardous substances in the workplace was included under the HSWA. The process of assessment and approval of hazardous substances is retained under the HSNO Act. Hazardous substances imported into, or manufactured in, New Zealand, must have an appropriate HSNO approval. The HSNO Act classifies a substance's hazard(s) and sets the requirements that relate to labelling, packaging, SDSs, and disposal. It also sets controls to manage the effects of hazardous substances on the environment and human health. While workplace use of hazardous substances falls largely under the HSWA, use of hazardous substances in non-workplaces is covered by the HSNO Act. These requirements are set out in a series of EPA notices. Table A1 outlines the various EPA notices and summarises the scope and purpose of each.

Under the HSNO Act, a substance is considered to be hazardous when it has an effect more hazardous than any one or more of the defined thresholds for any of the following intrinsic properties:

- (a) Explosiveness;
- (b) Flammability;
- (c) Oxidising capacity;
- (d) Corrosiveness;
- (e) Toxicity; and
- (f) Ecotoxicity.

A toxic substance is defined as being 'capable of causing ill health in, or injury to, human beings' and an ecotoxic substance as being 'capable of causing ill health, injury, or death to any living organism'.

NOTE – Clause A3 sets out the full list of hazard classifications set under the EPA Hazard Classification Notice.

A threshold is the amount or concentration of a substance that is likely to cause an adverse effect on people or the environment. It is a trigger level for an effect that may, on consideration by the EPA, require controls on the substance to meet the purpose of the HSNO Act because of the intrinsic properties of the substance. Risk-based controls may also be set, following an assessment of risks associated with the way the substance is used.

Section 77B of the HSNO Act also enables the setting of tolerable exposure limits (TELs) for toxic substances (HSNO class 6). Once a TEL has been set, then by law, no person or place where a person may be, may be exposed to a level of the substance that exceeds the TEL. Further, a person must not use a toxic substance (HSNO class 6) in a manner that would result in the TEL set for that substance being exceeded.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****Table A1 – Summary of EPA notices**

Title of EPA notice (and short name)	Summary of notice
Hazardous Substances (Minimum Degrees of Hazard) Notice 2017 (EPA Minimum Degrees of Hazard Notice)	Information for checking whether a substance should be defined as hazardous, for different types of hazard. The minimum degrees of hazard needed before a substance is considered as a hazardous substance under the HSNO Act are laid out.
Hazardous Substances (Hazard Classification) Notice 2020 (EPA Hazard Classification Notice)	The classification system for hazardous substances in New Zealand, and the criteria for each hazard classification. See A3.
Hazardous Substances (Labelling) Notice 2017 (EPA Labelling Notice)	Rules for the information that must be included on the labels of hazardous substances. Based on the Globally Harmonised System of Classification and Labelling (GHS) provisions.
Hazardous Substances (Packaging) Notice 2017 (EPA Packaging Notice)	Rules for the packaging of hazardous substances, including the rules for child-resistant packaging.
Hazardous Substances (Safety Data Sheets) Notice 2017 (EPA Safety Data Sheets Notice)	Rules for the format and content of an SDS. All SDSs need to be in the 16-header format in line with the GHS provisions.
Hazardous Substances (Disposal) Notice 2017 (EPA Disposal Notice)	National minimum standard for the disposal of hazardous substances.
Hazardous Substances (Hazardous Property Controls) Notice 2017 (EPA Hazardous Property Controls Notice)	<p>Rules to protect the general public when using and storing hazardous substances in places outside of work.</p> <p>Rules to protect the environment when using and storing ecotoxic (HSNO class 9) hazardous substances. Most of these rules are relevant to both workplaces and non-workplaces, and many of these rules relate to the use of agrichemicals. Includes training and competency requirements for some classes of ecotoxic products.</p> <p>Under the EPA Hazardous Property Controls Notice, environmental exposure limits (EELs) for ecotoxic substances can be set. Once an EEL has been set, then by law, a person must not use an ecotoxic substance in a manner that allows the EEL set for that substance to be exceeded in the environmental medium concerned (water, soil, or sediment).</p>
Hazardous Substances (Forms and Information) Notice 2017	Information you need to provide to the EPA if you are applying for an approval for a hazardous substance under the HSNO Act.
Hazardous Substances (Importers and Manufacturers) Notice 2015	Requires most people or businesses that make or import hazardous substances to provide the EPA with some basic contact information to enable the EPA to communicate with them.
Hazardous Substances (Enforcement Officer Qualifications) Notice 2015	Qualifications a person needs to be a warranted hazardous substances enforcement officer.

The EPA's decisions on hazardous substance applications and an up-to-date database of current controls can be found on its website ([www.epa.govt.nz](http://www.epa.govt.nz)). Controls may be varied from the defaults, and

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this source should therefore be consulted for controls set for specific substance approvals. Some agrichemicals, especially adjuvants and veterinary medicines, are approved under group standards. A group standard sets out conditions of safe use for a group of hazardous substances.

Part of the approvals of a plant protection product may include the requirement to obtain a permission, issued under section 95A of the HSNO Act. The requirement to obtain a section 95A permission is typically made a prerequisite of use of a substance where there need to be specific local or operation-specific considerations. Examples of hazardous substances that have permission requirements imposed include VTAs and aquatic herbicides.

These permissions are usually issued to specific users and require those users to follow additional requirements, and are supplementary to the controls that are specified in the HSNO approval for the substance. Conditions specified in the permission may address aspects of an application or operation for which there are geographically specific concerns. Other requirements specified in permissions include providing annual reports, residue testing, monitoring, reporting of individual applications, specific signage and consultation, and limitations on time and frequency of application. The additional control requirements are recorded in a permission document, issued to the user by the delegated decision maker for the permission in question.

The issuing of section 95A permissions in some instances has been delegated by the EPA to other agencies. For example, issuing the required permissions for use of 1080 has been delegated to the Department of Conservation and Ministry of Health. In such situation the delegated authority should be consulted.

There are close links with the ACVM Act (see A1.6) that provide for registering (or exempting) the products of specific producers or manufacturers. The statutory responsibility for determining whether an agricultural compound is a hazardous substance in terms of the HSNO Act rests with the EPA. In practice, such determinations are generally made by the product proprietor.

#### **A1.6 Agricultural Compounds and Veterinary Medicines Act 1997 (ACVM Act)**

The ACVM Act requires agricultural compounds to be authorised before they can be imported, manufactured, sold, and used in the management of plants and animals. They include such products as agricultural chemicals, fertilisers, stock food, pet food, and veterinary medicines. The purpose of the Act is to manage the following risks associated with agricultural compounds:

- (a) Risks to public health;
- (b) Risks to trade in primary produce;
- (c) Risks to animal welfare; and
- (d) Risks to agricultural security.

It also ensures that domestic food residue standards are not breached by the use of agrichemical compounds, and that sufficient consumer information is provided about agricultural compounds.

A small number of low-risk agricultural compounds are exempt from registration under the ACVM Act. These are set out in Schedule 2 of the Agricultural Compounds and Veterinary Medicines (Exemptions and Prohibited Substances) Regulations 2011 (ACVM Regulations) and include products such as pH buffers and drift retardants. There are conditions relating to the manufacturing, importing, and selling of exempt agricultural compounds, such as provision of information to the user.

#### **A1.7 Food Act 2014**

Residues that may occur in foods from the use of agrichemicals are subject to requirements under the Food Act 2014 before that food can be sold. This means it must comply with a notice and the Food Regulations 2015. MRLs for agrichemicals in food are set out in the New Zealand (Maximum Residue Levels for Agricultural Compounds) Food Notice (MRL Food Notice). This notice is amended regularly to reflect changes in the use of agricultural compounds in the production of food.

When setting or amending MRLs, the Director-General of MPI must take the following into account:

- (a) The need to protect public health;
- (b) The desirability of avoiding unnecessary restrictions on trade;
- (c) The desirability of maintaining consistency between New Zealand's food standards and those standards that apply internationally;
- (d) New Zealand's obligations under any relevant international treaty, agreement, convention, or protocol, and, in particular, under the Australia-New Zealand Joint Food Standards Agreement; and
- (e) Such other matters as appropriate.



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The requirements for the content of the MRL Food Notice are set out in Part 6 of the Food Regulations 2015, allowing for the promulgation of MRLs for agricultural compounds as well as the promulgation of exemptions from compliance with MRLs. It also sets a default MRL of 0.1 mg/kg where no specific MRL or MRL exemption exists.

In addition to establishing requirements on domestically produced foods, the regulations also outline the residue level compliance requirements for imported foods.

**A1.8 Animal Products Act 1999**

The Animal Products Act provides a legal framework for processing of animal material into food, such as meat and dairy products. Its objective is to minimise and manage risks to human or animal health arising from the production and processing of animal material and products, and to facilitate the entry of animal material and products into overseas markets by providing the controls and mechanisms needed to give and to safeguard official assurances for entry into those markets.

Under the Act, businesses processing animal material must operate under a registered risk management programme which identifies and manages known biological, chemical, and physical hazards and other risk factors. Agrichemicals used in the dairy industry such as dairy detergents and sanitisers must be approved under the Animal Products Act.

**A1.9 Civil Aviation Act 1990**

The Civil Aviation Rules are made by the Minister of Transport under the Civil Aviation Act and set out the legal framework for aerial operations in New Zealand. Relevant rules include the following:

- (a) Part 61 relating to pilot licence requirements for agricultural use;
- (b) Part 102 covering unmanned aircraft operators; and
- (c) Part 137 stipulating rules additional to, and exceptions from, Part 91 general operating and flight rules, for pilots carrying out or being trained to carry out agricultural operations.

Advisory Circulars are issued by the Director of the Civil Aviation Authority (CAA) and provide explanatory information and examples of how to comply with the Civil Aviation Rules.

**A1.10 Resource Management Act 1991 (RMA)**

The purpose of the RMA is to promote sustainable management of natural and physical resources and provide a framework for the management and use of air, land, and water, as well as providing for the well-being of people and communities and a duty to avoid, remedy, or mitigate adverse effects on the environment.

The Act also seeks to manage discharges of contaminants to air, land, or water. Use of agrichemicals are classed as a discharge and managed by regional councils through regional plans and resource consents, if required.

Land use, which includes storage of agrichemicals, is managed by territorial authorities through district plans.

Activities are classified as permitted, controlled, discretionary, non-complying, or prohibited, depending on the adverse effects that may be a result of the activity. Consents are required for all activities other than those that are permitted. Permitted activities normally have conditions attached to them that are required to be met by users to ensure that adverse effects are avoided. Application of agrichemicals is usually able to be carried out as a permitted activity, as long as conditions are met.

In the event that there is a failure to comply with permitted activity conditions, resource consents, or the general duty to avoid, remedy, or mitigate adverse effects, a local authority can take enforcement action.

**A2 Local government****A2.1 General**

Local government consists of 11 regional councils, 6 unitary authorities (with both regional and territorial functions), and 61 territorial authorities (11 city councils and 50 district councils). These organisations regulate through policies and plans to ensure sustainable management of the local environment. These functions are implemented via objectives, policies, and methods in regional policy statements, regional and local authority plans, and resource consents. The rules in regional plans have the force of law under the RMA (section 68(2)). Section 338(1) sets out the penalties for offences against the Act.

Agrichemical users need to be aware of the requirements of regional and territorial authorities that refer to agrichemicals.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****A2.2 Regional authorities**

Regional councils are required to develop a regional policy statement identifying significant environmental issues and responses for the region. Regional authorities may also develop and administer a regional plan. Many regional plans include a specific section on agrichemical use, as it is a discharge to air, land, or water, and because of concern about spray drift.

Except for direct discharge into water, it is likely that most agrichemical applications will not require resource consent, and will be permitted subject to compliance with relevant conditions in a regional plan, and with controls specified in the HSNO approval for the substance concerned and relevant HSWA regulations.

Provisions which could be adopted in regional plans include the following:

- (a) Requiring compliance with relevant sections of industry codes of practice (such as this standard);
- (b) Requiring compliance with stricter requirements than industry codes of practice due to specific regional characteristics;
- (c) Requiring discharge permits if permitted activity conditions cannot be met, such as discharges to water; and
- (d) Identification of environmentally sensitive areas and setting of controls around the storage and use of hazardous substances, which may include site management and emergency plans.

**A2.3 Territorial authorities**

Territorial authorities, that is, city, district, and unitary councils, have responsibility for making decisions on land use and managing the effects of land use. Territorial authorities must develop district plans that identify and manage environmental issues related to land use.

These plans may include sections addressing the storage of hazardous substances (including agrichemicals). In some cases, resource consent may be required for such storage.

**A3 Hazard classifications**

The classification systems for the HSNO hazardous properties are set out in the EPA Hazard Classification Notice.

In 2020, New Zealand adopted the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) with minor modifications to reflect the New Zealand situation. The GHS describes the nature and severity of a chemical hazard by hazard class and hazard category. The GHS hazard class gives the nature of a chemical hazard, and the hazard category is the division of criteria within each hazard class.

There are 17 hazard classes in the 'physical hazard' grouping:

- (a) Explosives;
- (b) Flammable gases;
- (c) Aerosols;
- (d) Oxidising gases;
- (e) Gases under pressure;
- (f) Flammable liquids;
- (g) Flammable solids;
- (h) Self-reactive substances and mixtures;
- (i) Pyrophoric liquids;
- (j) Pyrophoric solids;
- (k) Self-heating substances and mixtures;
- (l) Substances and mixtures which, in contact with water, emit flammable gases;
- (m) Oxidising liquids;
- (n) Oxidising solids;
- (o) Organic peroxides;
- (p) Corrosive to metals; and
- (q) Desensitised explosives.

There are 10 hazard classes in the 'health hazard' grouping:

- (r) Acute toxicity (oral/dermal/inhalation);
- (s) Skin corrosion/irritation;
- (t) Serious eye damage/eye irritation;
- (u) Respiratory or skin sensitisation;
- (v) Germ cell mutagenicity;

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- (w) Carcinogenicity;
- (x) Reproductive toxicology;
- (y) Specific target organ toxicity – single exposure;
- (z) Specific target organ toxicity – repeated exposure; and
- (aa) Aspiration hazard.

There are two hazard classes in the 'environmental hazard' grouping:

- (bb) Hazardous to the aquatic environment (acute/chronic); and
- (cc) Hazardous to the terrestrial environment (a non-GHS classification adopted for New Zealand).

NOTE – Refer to the EPA for more information.

Most of the plant protection products and veterinary medicines covered in this standard will be classified in the 'health hazard' and 'environmental hazard' classes, with some in the corrosiveness and oxidising capacity classes. Dairy detergents and sanitisers are likely to be in the corrosiveness or oxidising capacity classes.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****Table A2 – GHS hazard classifications – full list**

<b>Class</b>	<b>Categories (or Types or Divisions as noted)</b>						
<b>Physical hazards</b>							
Explosives (Divisions)	Unstable	1.1	1.2	1.3	1.4	1.5	1.6
Desensitised explosives	1	2	3	4			
Flammable gases	1A	1B	2				
Aerosols	1	2	3				
Gases under pressure	Compressed gas	Liquefied gas	Refrigerated liquefied gas	Dissolved gas			
Flammable liquids	1	2	3	4			
Flammable solids	1	2					
Self-reactive substances and mixtures (Types)	A	B	C	D	E	F	G
Pyrophoric liquid, pyrophoric solids, self-heating substances and mixtures	Pyrophoric liquid 1	Pyrophoric solid 1	Self-heating 1	Self-heating 2			
Substances and mixtures which, in contact with water, emit flammable gases	1	2	3				
Oxidising liquids	1	2	3				
Oxidising solids	1	2	3				
Oxidising gases	1						
Organic peroxides (Types)	A	B	C	D	E	F	G
Corrosive to metals	1						
<b>Health hazards</b>							
Acute toxicity (oral)	1	2	3	4			
Acute toxicity (dermal)	1	2	3	4			
Acute toxicity (inhalation)	1	2	3	4			
Aspiration hazard	1						
Skin corrosion/irritation	1A	1B	1C	2			
Serious eye damage/eye irritation	1	2					
Respiratory or skin sensitisation	Respiratory 1	Contact 1					
Germ cell mutagenicity	1	2					
Carcinogenicity	1	2					
Reproductive toxicity	1	2	On or via lactation				
Specific target organ toxicity – single exposure	1	2	3				
Specific target organ toxicity – repeated exposure	1	2					
<b>Environmental hazards</b>							
Hazardous to the aquatic environment (acute)	1						
Hazardous to the aquatic environment (chronic)	1	2	3	4			
Hazardous to the terrestrial environment (not GHS)	Soil organisms	Terrestrial vertebrates	Terrestrial invertebrates	Designed for biocidal action			

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## **APPENDIX B – SPRAY DRIFT HAZARD AND WEATHER CONDITIONS**

(Informative)

### **B1 Scope**

This appendix deals with the management of plant protection products that are applied using pressurised spray equipment. It covers the assessment of potential impacts arising from spray drift, the assessment of risks, and how to manage spray operations to minimise the likelihood of adverse effects from spray drift.

### **B2 Responsibilities**

Application of agrichemicals in particulate form, whether as solids or liquids (droplets), inevitably means some losses occur in transferring the agrichemical to the target. Any person who applies an agrichemical shall take all reasonable steps to ensure that the substance does not cause any significant adverse effects beyond the target application area.

Records shall be kept of the measures taken to ensure there are no adverse effects beyond the target application area. See 5.2.6.1 for details.

There are also some product-specific conditions to reduce the spray drift risk, such as spray quality and buffer zones. Refer to label conditions for specific controls.

### **B3 Off-target movement**

Off-target movement of spray, that is, spray drift, occurs in two main ways:

- (a) Primary drift – The movement of spray as droplets; and
- (b) Secondary drift – The movement of spray-contaminated dust, soil, or sand particles and movement of spray as a vapour (gaseous phase).

There are a number of factors that can affect both forms of drift, including droplet size, spray release height (relative to the ground or inversions), and wind speed. Vapour pressure (volatility) of the agrichemical can affect secondary drift where it occurs by volatilisation from the target surface after deposition. In view of the two types of drift, an internationally accepted definition of drift has been developed.

Drift (of agrichemical) means the physical movement of agrichemical through the air at the time of application or soon thereafter to any off-target site. The movement of agrichemical caused by erosion, migration, volatility, or windblown soil particles to off-target sites that occurs after the application is not included in the definition unless specifically addressed on the product label, with respect to drift control requirements.

The applicator is responsible for primary drift because it occurs at the time of spraying and the means of minimising primary drift are within the control of the applicator. Factors related to the application equipment (for example, droplet size, height of release of the spray) can be adjusted by the applicator, who can also make judgements about the weather (for example, wind speed, wind direction).

Physical movement of agrichemical can also occur as vapour at the time of spraying so can be considered primary drift. The applicator can demonstrate responsibility by selecting agrichemicals that are known to have low volatility (product label information) and choosing weather conditions that are not conducive to volatilisation of the agrichemical at the time of application.

Research shows that vapour drift occurs mostly as secondary drift. The applicator has little or no control over secondary drift apart from selection of non-volatile agrichemicals and prediction of the weather condition in the period following the agrichemical application (see Appendix N and B8 for further comment on vapour drift).

### **B4 Sensitive areas**

Assessing drift hazard is partly a function of the existence of any sensitive areas, and therefore before spraying, users shall identify and record any sensitive areas located near the target area as part of the on-site risk assessment (see 5.2.5.3). Responsible agrichemical application means being able to demonstrate, by production of a map, sketch, field notes, or other documentation, that this requirement has been met.

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NOTE – District and regional councils may have definitions of sensitive area or sensitive activities that differ from or are additional to the examples below.

The following are examples of sensitive areas (except where the area involved is the intended spray target):

- (a) Residential buildings;
- (b) Commercial buildings;
- (c) Schools, playgroups and care facilities;
- (d) Public places and amenity areas where people congregate;
- (e) Public water supply catchments and intakes;
- (f) Water bodies and associated riparian vegetation;
- (g) Sensitive crops, animals, or farming systems (for example, organic farms, greenhouses, traditional food and herb gathering areas, beekeeping);
- (h) Wetlands, indigenous vegetation habitat areas, and reserves; and
- (i) Public roads.

**B5 Drift hazard**

The hazard from spray drift depends on two main factors:

- (a) The extent of drift (how much spray is drifting and how far it is likely to travel); and
- (b) What is put at risk from spray drift.

In many cases, the extent of crop injury from drift is dependent on the factors of toxicity/ecotoxicity of the product, concentration of the agrichemical, and time available for uptake. This means that even low concentrations in time can produce injury. This explains the recognition of high hazard under apparently calm conditions.

Table B1 provides guidance for applicators, summarising the main factors affecting any hazard associated with spray drift. Spray applications in high hazard situations should be avoided or very carefully managed. Users should note that additional factors, such as adequate notification to those who may be at risk so that they can take precautionary action, may effectively reduce drift hazard. Note also that some products have specific controls on their use to minimise risks of spray drift.

**Table B1 – Drift hazard guidance chart**

<b>Potential drift hazard scale</b>			
<b>Factor</b>	<b>High hazard</b>	<b>Low hazard</b>	<b>Comment</b>
Wind speed	Zero/very low (less than 1 m/s) or greater than 6 m/s	Steady (1–3 m/s)	Measure or estimate using anemometer or smoke
Wind direction	Unpredictable	Predictable, and away from sensitive areas	Use wind vane/sock or smoke to indicate
Humidity	Low (delta T > 8°C)	High (delta T < 4°C)	Measure, using whirling psychrometer
Atmospheric stability	Inversion layer present	No inversion layer	Use cold smoke to indicate
Maximum height of release of agrchemical	> 1.5 m above the target	< 0.5 m above the target	Application technique (see 5.2.5.7)
Particle (droplet) size	< 50 microns diameter	> 250 microns diameter	Larger droplets reduce risk of drift (see K2.2)

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Volatility of agrichemical	High (vapour pressure > 10 mPa)	Low (vapour pressure < 0.1 mPa)	Check product label, SDS, or PSC
Sensitive area	Close (< 100 m) away	None, or more than 1 km distant	Identify on spray plan or on-site risk assessment (see C2 and 5.2.5.3)
Buffer zone	None	Yes (> 100 m)	Guideline only. Check HSNO approval controls for product-specific buffer zones
Shelter belts	No shelter	Live shelter, > 3 m high and 1 m thick	Not applicable for herbicides
Sprayer control	Unmanned	Manned	On-board applicator quicker to respond to changes in risk during operation
Toxicity/ecotoxicity	High human toxicity, or high ecotoxicity	Low toxicity	Use least toxic product suitable for task

NOTE –

- (1) The potential drift hazard scale is given as high or low, and intermediate situations should be rated accordingly. For example, a droplet size of 150 microns diameter would represent a moderate drift hazard.
- (2) Some factors can be changed to reduce the hazard rating, for example, use lower volatility chemical, larger droplet size.
- (3) All of the weather-related factors are to be assessed at the application site at the time of application.
- (4) Toxicity of the agrichemical has been included on the chart, but hazard classification is only one indicator of toxicity and is not always sufficient. For example, herbicide selectivity could be a factor. In all cases, users should select the least toxic agrichemical that is suitable for the specific application. Check the label and product information. See 1.3 for definition of high and low toxicity.
- (5) 1 m/sec = 3.6 km/h; 6 m/sec = 20 km/h (approx.).
- (6) In addition to the factors listed, spray drift retardants and speed of application by boom sprayer are additional considerations with less impact.
- (7) Smoke should be produced from a (cold) smoke-generating device. Lighting of a fire to generate 'smoke' is not acceptable practice and may give false reading for inversion layers.

## **B6 Weather conditions**

### **B6.1 General**

The important weather conditions at the application site are set out in the following sections. The weather conditions shall be recorded on agrichemical application records as set out in 5.2.6.1.

The key message is – do not apply agrichemical sprays or dusts unless the wind direction and speed are known.

### **B6.2 Wind direction**

Spray can be moved away from the application site (target area) by any wind. The wind direction is also important with respect to the application technique. Where possible all applications should be made with a cross-wind, starting at the downwind edge. Smoke generators, or other reliable indicators of wind speed and direction, should be used at the application site where conditions dictate.

### **B6.3 Wind speed**

Very low wind speeds usually mean the wind direction is unpredictable. Higher wind speeds mean a stable wind direction, and may also give better spray penetration into some crops, by turbulent mixing. Spraying should not be carried out in high winds (see Table B1).

### **B6.4 Inversions**

#### **B6.4.1 Condition favouring inversions**

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An inversion condition develops when a band of warmer air develops at some height above the ground. It most commonly forms when air close to the ground cools rapidly as a result of heat loss by radiation to a cloudless sky. The presence of an inversion can be detected by measuring air temperatures and wind speeds at various heights, but for practical purposes, the easiest method is to use smoke from a smoke-generating device. Like the driftable fine droplets, smoke, rising vertically, cannot pass through the inversion layer, but travels horizontally, usually just below the layer of warm air.

NOTE – Do not rely on smoky fires to generate the smoke, as the thermal updraught from the fire may allow the smoke to penetrate the inversion layer, and thereby hide its presence, or overcome a light wind movement. Use non-heat-producing smoke generators.

**B6.4.2 Spraying advice**

Spraying under inversion conditions means the final destination of the chemical cannot be predicted with any certainty, and should only be carried out if the spray droplets are non-evaporative, are discharged below the inversion layer, and are greater than 250 microns in diameter.

**B6.5 Katabatic winds**

Katabatic winds flow downhill and are caused by cold air sinking down a slope: this usually occurs early in the morning. Winds of up to 6 knots (3 m/sec or 10 km/h) may flow out of valley systems some considerable distance across flat country.

**B6.6 Anabatic winds**

Anabatic winds flow uphill, and are caused by warm air rising up the slope as the sun warms them. Anabatic winds usually follow katabatic winds in the morning. When wind speeds are low (less than 2–3 km/h), wind direction can be unpredictable.

**B6.7 Temperature and relative humidity****B6.7.1 Temperature**

High air temperatures mean rapid evaporation of spray droplets. The rate of evaporation is also affected by relative humidity. For example, at a relative humidity of 50%, a droplet evaporates faster in warmer air than in cold air.

**B6.7.2 Relative humidity**

Relative humidity can easily be measured using a whirling psychrometer, which has two thermometers. The bulb of one thermometer is covered with a moist wick, which dries in the air, lowering the temperature of the bulb. The difference between the dry bulb and wet bulb is called the wet bulb depression or delta T. The greater delta T, the greater the evaporation potential for spray droplets.

Generally, spraying of water-based agrichemicals should not be carried out when delta T is greater than 8°C. For low and ultra low volume (ULV) applications (less than 10 L/ha), delta T should be less than 4°C.

**B7 Buffer zones and shelter belts****B7.1 Use of buffer zones**

Off-target movement of spray is affected by a large number of interrelated factors, including weather conditions, spray characteristics, and application technique. A buffer zone between the application site and a sensitive area may reduce the risk to that sensitive area. Users shall comply with any buffer zone control specified for a product by the EPA. Users shall also check and comply with any regional council requirements for buffer zones.

A buffer zone works by allowing the agrichemical to disperse to concentrations low enough not to present a risk (for example, to avoid exceeding any environmental exposure limit (EEL) set). The use of shelter belts to intercept and retain the agrichemical may effectively reduce the width of the buffer zone required. However, for herbicides, particularly those used for total vegetation control, live shelter will also be affected by the spray, so it will not be useful in those situations.

The following factors also affect the width of a buffer zone:

- (a) Application technique (for example, projecting spray into the air);
- (b) The agrichemical used (for example, volatility, toxicity, application rate); and
- (c) The physical nature of the shelter belt.

**B7.2 Buffer zone guidelines**



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It is vital that the guidelines given below are regarded as that – guidelines, which represent the best estimate for three typical application types. Buffer zones, with or without shelter belts, merely provide an opportunity for concentrations of agrichemical to fall sufficiently so that the risk to sensitive areas beyond the buffer zone becomes sufficiently low that adverse effects do not arise. However, depending on the particular circumstances, there is no guarantee that this can be achieved. Therefore, buffer zones are only one of many methods to manage and reduce drift hazard.

Table B2 gives suggested minimum distances between the downwind edge of the target area and the sensitive area. These are for guidance when no mandatory buffer zones have been specified in product controls. There are computer-based spray droplet drift prediction models that can be used to give more detailed information for specific situations. Spray Advisor is a New Zealand example, and TOPPS-PROWADIS is a European example.

**Table B2 – Guidance for buffer zones**

Application method	Distance (metres)	
	With live shelter	Without live shelter
Boom sprayer	2	10
Air-blast sprayer	10	30
Aerial application	100	300

NOTE – These distances are subject to the following:

- (1) The equipment used (boom, air-blast, aircraft) being calibrated and operated correctly;
- (2) All other appropriate strategies being observed to reduce spray drift hazard (Table B1); and
- (3) Shelter being complete and without gaps at the base.

### **B7.3 Shelter belt characteristics**

Shelter belts will not eliminate spray drift, but can have a significant effect in reducing the amount of spray moving off target. The physical structure of the shelter belt is important with respect to its effectiveness. These are the general conclusions:

- (a) Natural (live) shelter is much more effective than artificial shelter;
- (b) The porosity and density of the shelter is important – a minimum thickness of 1 m and a porosity of about 50% is recommended;
- (c) Porosity and density are a function of the thickness of the shelter;
- (d) For effective reductions in wind speed (and hence drift reduction) the width to height ratio of shelter is critical. A width to height ratio of about 3.5 is recommended, that is, a shelter 3.5–4 m high should be a minimum of 1 m wide (thick);
- (e) Shelter species is also important, as needle-like leaves are more effective at capturing droplets than broad leaves. Evergreen species will provide more protection throughout the year than deciduous species; and
- (f) Any spray released at or above shelter height will not be contained by the shelter.

## **B8 Vapour drift**

### **B8.1 General**

As a general rule, spraying of agrichemicals that are volatile should take place in conditions where the temperature following application is likely to decrease rather than increase (see Appendix N). That will help manage the risk of secondary drift, that is, chemical volatilising from the target plants sometime after spraying has ended.

### **B8.2 Rate of volatilisation**

These are the two main factors controlling the rate of volatilisation:

- (a) The vapour pressure of the agrichemical (high vapour pressure, high volatilisation); and
- (b) The moisture status of the soil or plant surface (high moisture content, high volatilisation).

There are many other factors that also affect the rate of volatilisation of an agrichemical from a target surface. These include airflow (up to 10 times the rate in still air), temperature (0.5% per °C), rate of penetration into the target surface, formulation, presence of any adjuvant, and chemical/air interfacial area. The major factors in vapour movement are wind velocity and turbulence.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****B8.3 Minimising the vapour drift hazard**

Research indicates that the hazard from vapour drift and volatilisation is mostly due to the volatilisation of agrichemical from the target surface following application (secondary drift) and not from evaporation from spray droplets during application (primary drift), although both can and do occur. There are a number of ways in which an applicator can minimise the vapour drift hazard. The following points should be noted:

- (a) Read and follow advisory information provided on the label;
- (b) Use spray quality as coarse as possible (that is, large droplets), consistent with getting adequate coverage at the selected application rate;
- (c) Ensure that soil-applied products are incorporated into the soil immediately following application;
- (d) Minimise the distance between the target plant and the discharge point of the spray to reduce the opportunity for primary drift;
- (e) Use low-volatility formulations;
- (f) Conditions where the wind direction is unstable and likely to change in the period following application (up to 12 hours) increases the hazard where more volatile agrichemicals are used. Also, increases in air temperature following application will increase volatility and increase the downwind drift hazard distance; and
- (g) Do not spray where the conditions are considered too uncertain to be sure about managing any vapour drift hazard.

**B9 Proximity of spray applicator**

Vehicle-mounted sprayers are traditionally operated by a person on board. That person can respond directly to changes in risk during operation. For example, a pilot may notice a new and sensitive neighbouring crop from the air, or an orchardist may notice an unauthorised person entering an application area while travelling in the orchard. Operators of remotely controlled sprayers such as those mounted on unmanned aerial vehicles (UAVs) and robotic vehicles are not in a position to notice and respond quickly to changes in risk.

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## **APPENDIX C – PLANNING, NOTIFICATION, AND SIGNAGE FOR APPLICATION OF PLANT PROTECTION PRODUCTS**

(Normative)

### **C1 Introduction**

This appendix applies to both ground and aerial application of plant protection products. Good communication between those using agrichemicals and those potentially affected by the use of agrichemicals is critical.

Users shall check the appropriate local authority rules and any product-specific regulatory conditions for signage or notification.

### **C2 Development of a spray plan**

#### **C2.1 General**

The purpose of a spray plan is to identify the risks to the environment associated with planned agrichemical use and explain how they will be managed to avoid or minimise any adverse effects on people and the environment. It does not take the place of an on-site risk assessment by the applicator on the day but provides an overall framework for consideration of the environmental risks. Spray drift is a key risk to manage, but not the only risk.

The person in charge (PIC) of the application of agrichemicals is responsible for preparing a spray plan. In instances where contractors are engaged for the application of agrichemicals, they may assist with the preparation of the spray plan but the PIC retains responsibility for ensuring the spray plan is prepared.

#### **C2.2 Contents of a spray plan**

The spray plan shall be reviewed annually or when there is any significant change to operations, for example, planting different crops, change of application equipment, removal of shelter belts, or changes to the surrounding environment such as new use for nearby properties.

To satisfy the requirements of this standard, a spray plan shall be prepared and shall include the following information:

- (a) Planned activity:
  - (i) Details of the crops or pests likely to be sprayed
  - (ii) The types of chemical (for example, insecticide, herbicide, fungicide) that are likely to be used during the year
  - (iii) The times of the year that spraying is likely to occur;
- (b) Sensitive areas and non-target organisms:
  - (i) Identification of any sensitive areas likely to be affected by the application of agrichemicals considering things such as houses, schools, roads, nearby crops, beehives, water bodies, greenhouses, and plants in flower (bees)
  - (ii) Consideration shall also be given to agrichemicals that may present a specific hazard to non-target organisms, for example, bee or vertebrate toxicity
  - (iii) A plan or map detailing the location of all sensitive areas that may be affected;

NOTE – See 1.3 for definition of sensitive areas.

- (c) Details for notification for each sensitive area:
  - (i) Names and contact details of people who will be notified of the spray application
  - (ii) When and how they will be notified
  - (iii) Any agreed changes to the standard notification requirements (see C3); and
- (d) Strategies to manage potential risk:
  - (i) Appropriate training and certification for the product being used and method of application (see Appendix F)
  - (ii) Actions to be undertaken to avoid adverse effects beyond the target application area (see Appendix B)
  - (iii) Requirement for a risk assessment to be undertaken by the applicator just prior to application, including an assessment of weather conditions (see 5.2.5.3).

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NOTE – There can be additional local authority requirements for air quality and discharges into air, and other product-specific regulatory conditions.

### **C2.3 Communication of spray plan**

Any person or any owner of any sensitive area likely to be directly affected by the application of agrichemicals has a right to information about the operation. The owner or occupier of the property on which the spraying is to take place shall inform, at intervals of no more than a year, any person who is likely to be directly affected by the application that a spray plan has been prepared and is available on request.

The spray plan shall be made available to the local authority or other enforcement agencies on request.

Communication of the spray plan shall also be in accordance with any specific requirements of the local authority.

## **C3 Notification**

### **C3.1 General**

Notification of the intention to spray is intended to inform people who could be affected, and provide the opportunity for them to take action to avoid or minimise potential exposure of themselves, their children, or their property to specific applications of agrichemicals. It is also important to communicate cancellation and rescheduling of spray activities.

However, the timing of spray application is extremely dependent on weather conditions and stage of pest and crop growth. Consequently, flexibility in notification requirements enables spraying to be undertaken in optimum conditions which could reduce both the risks of spray drift and improve efficacy of the application.

Electronic communication enables quick communication with potentially affected parties.

Notification to satisfy the requirements of this standard for different use situations is set out below. However, users shall check and comply with appropriate local authority requirements and any product-specific requirements relating to notification set under HSNO.

NOTE – Notification does not prevent spray drift and does not lessen a user's responsibilities regarding the identification and recording of sensitive areas adjacent to the site of any agrichemical application or managing the operation to avoid possible adverse effects of spray drift.

### **C3.2 Application on private property**

Where application is by motorised equipment within 50 m of an identified sensitive area, notification shall be given to the owner or occupier of the sensitive area. Such notification shall meet the following requirements:

- (a) Unless otherwise agreed in writing with the affected party, notification shall be given at least 12 hours and no more than 3 weeks prior to application, or in accordance with regional plan requirements or product-specific controls if these are more restrictive;

NOTE –

- (1) Agreements between the user and the affected party for notification time frames may be product- or equipment-specific.
  - (2) Products with specific notification controls set under the HSNO Act cannot be reduced by negotiation with the affected party. Similarly, regional plan requirements cannot be reduced by negotiation. Note also that some notification controls are in working days, which has a specific legal definition.
- (b) Notification information shall include:
- (i) The location of the application
  - (ii) The expected date, time, and duration of the application
  - (iii) The name of the product or the type of product(s) planned to be applied (for example, herbicide, fungicide, insecticide)
  - (iv) The name of the organisation undertaking the spray application
  - (v) Contact details of the applicator.

NOTE – It may also be useful to provide information on the measures to be taken to reduce the risk of spray drift (or copy of the spray plan outlining these measures) and any suggested actions for the affected party to undertake.

- (c) Notification may be given verbally or in writing. Verbal is not recommended unless acknowledged in writing by the affected party. Records of notification should be kept.

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NOTE – Writing includes electronic means such as text or email.

**C3.3 Application of agrichemicals by a contractor**

Contractors shall ensure that appropriate notification has been given by the client to the affected parties before commencing application. If agreed in writing, the contractor may undertake the notification on behalf of their client.

**C3.4 Application in public places and amenity areas**

Where application is undertaken in or near public places and amenity areas, notification shall be given to potentially affected parties and meet the following requirements:

- (a) Notification shall be given no less than 1 week prior to application, or in accordance with regional plan requirements or any product-specific regulatory requirements if these are more restrictive;
- (b) Notification information shall include:
  - (i) The district, street, or location to be treated
  - (ii) The period of use
  - (iii) The name of the product or the type of product(s) to be applied (herbicide, insecticide, fungicide)
  - (iv) The reason for use (for example, vegetation control)
  - (v) Where or how further information can be obtained
  - (vi) Any other information required by a HSNO product approval or regional plan rule; and
- (c) Notification of spray application shall be given using an appropriate method of communication, for example, prior notice in local newspapers, door-to-door advice, email, websites or online noticeboards, social media, on-site signage, and signage on application equipment.

**C4 Signage****C4.1 General**

Signs can be used at the application site to advise that agrichemical application is being or has been carried out.

Signs shall be:

- (a) In English and easily understood;
- (b) Legible at a minimum distance of 10 m under varying conditions (for example, rain or low light); and
- (c) Resistant to sunlight and require little maintenance.

Signage used on public roads shall comply with NZ Transport Agency (NZTA) requirements.

**C4.2 Application on private property**

On private property, signs should be displayed on all normal lines of approach to an area treated, or being treated, with agrichemicals to minimise risks to visitors to the site and to advise all staff of potential hazards. This may include signage at the entrance to the property.

For application areas adjacent to public roads, cycleways, or footpaths, consideration should be given to the use of signage based on the risk to users of the road, cycleway, or footpath and the number of people potentially affected.

Signs should be there during agrichemical use and should remain in place for a period equivalent to the restricted entry interval (REI) for the agrichemical used (refer to product information or supplier).

The sign shall clearly indicate the type of agrichemical used, for example, herbicide, insecticide, or fungicide; the date of application; and any REI. Contact details of the PIC of the spray application should also be included.

NOTE – Users should check with the appropriate local authority for any requirements for signage, and also check the product information for any product-specific controls.

**C4.3 Application in public places***C4.3.1 Ground-based application*

Signs shall be displayed on all normal lines of approach to an area treated, or being treated, with agrichemicals in the following situations:

- (a) Public places, for any agrichemical use; and
- (b) Other areas that may be accessible to the public such as schools and golf courses.

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Signs shall be there during agrichemical use and shall remain in place for a period equivalent to the REI for the agrichemical used (refer to product information or supplier). Where practical and indicated by the number of people potentially present at the application site, signs should remain in place for at least 24 hours. Signs shall be removed within 72 hours of application or the end of the REI, whichever is the later.

The sign shall clearly indicate the name or type of agrichemical used, for example, herbicide, insecticide, or fungicide; the date of application; the name and contact details of the PIC of the application; and any REI.

NOTE – Users should check with the appropriate local authority for any requirements for signage, and also check the product information for any product-specific controls.

#### *C4.3.2 Application from vehicles*

The following applies for spraying in public places from vehicles:

- (a) Vehicles or equipment used for applying agrichemicals shall have an appropriate sign, for example, 'Agrichemical Spraying in Progress (Herbicide/Insecticide/Fungicide)'. The name of the local authority or contractor shall be displayed.
- (b) Appropriate temporary hazard warning signs shall be used where spray vehicles are likely to pose a hazard to motorists. Such signs shall comply with requirements of traffic regulations – check with NZTA.

#### **C4.4 Indoor applications**

Signs shall be displayed outside the application area at every routine point of entry into an indoor area treated with agrichemicals with a restricted entry interval.

Signs shall include the following information:

- (a) Toxic to humans;
- (b) Entry prohibited unless PPE worn;
- (c) Date of spraying;
- (d) Start time and end time of REI; and
- (e) Organisation name.

Signs shall be removed within 72 hours of application or the end of the REI, whichever is the later.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****APPENDIX D – AGRICHEMICAL SELECTION**

(Informative)

**D1 Introduction**

Agrichemicals covered in this standard include plant protection products (for example, insecticides, fungicides, herbicides, and plant growth regulators), veterinary medicines (for example, dips, drenches, vaccines, and pain relief), and detergents and sanitisers used for food production on farms.

Of the range of factors that govern the selection and use of these products the most important is the identification of need – what is the problem and what will use of the agrichemical achieve?

Once a need has been identified, the factors to be considered include the following:

- (a) Product label claims (efficacy, mode of action);
- (b) Ability to comply with regulatory conditions;
- (c) Hazards, including human health (acute and chronic) and environmental (spray drift, water and soil contamination, sensitive areas, environmental persistence);
- (d) Animal welfare;
- (e) Resistance;
- (f) Withholding periods (WHPs) or pre-harvest intervals (PHIs);
- (g) Residues and contamination; and
- (h) Destination market requirements.

There is a range of information sources to help in the decision-making on the selection of the right product. (See Appendix E.)

Agrichemicals should be used as recommended in the product information and, in particular, on the label.

**D2 Residues and withholding periods (WHPs)****D2.1 Residues**

Label claims for any agrichemical used on food-producing crops and animals require an assessment of the agrichemical's residues. This residue information is assessed in relation to the good agricultural practice (GAP) use of the agrichemical. This means the least amount of product to do the job (both plant and animal efficacy and safety). Once GAP has been established (which also includes setting a WHP), the level of residue at the time of slaughter or harvest of the crop or animal is determined. Provided there is no food safety concern, then an MRL is established. When using the agrichemical as per the label instructions, residues in the crop or animal should comply with the MRL established.

Many factors influence the amount, nature, and distribution of potential residues, ranging from the chemical formulation and metabolism, dose or application rate, and method of application to the WHP established. Also, the fate of residues is influenced by the food-producing crop or animal. So even using the same application rate and WHP for an agrichemical on two different commodities can lead to a significantly different level of residues in each commodity. Hence extrapolating the residue level from the crop/animal stated on the label to one not on the label is not recommended.

**D2.2 WHP**

The WHP or PHI stated on the label is the time from last application of the agrichemical to harvest of the crop, slaughter of the animal, collection of the food commodity, for example, milk, and grazing of animals. Establishment of a WHP is based on GAP. Part of GAP includes ensuring the WHP fits with usual grower/farmer management practices. Not following the WHP (or other label directions) could mean residues in the food-producing crop or animal do not comply with the MRL. Selling a food commodity with residues above the MRL is illegal.

NOTE – From 2020, the default WHP for all products is 1 day.

For export of food-producing crops, industry sectors may set longer WHPs than that stated on the label. This is because overseas markets may not have MRLs for the agrichemical/commodity combination, or if they do, the MRL is lower than that established in New Zealand. Users should check to see whether there are any export requirements before using the agrichemical. Export produce that is found to have excess residues (greater than the MRL) is normally dumped, at great cost to the grower and exporter.

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The residue level in food-producing crops and animals is not directly related to the length of the WHP. A longer WHP does not necessarily mean higher or lower residues; it means the time taken for the residues to fall below the MRL is longer. This also applies to shorter WHPs – a shorter WHP does not necessarily indicate a higher or lower MRL, just that the time required for residues to fall below the MRL is shorter.

Currently MRLs are set in the MRL Food Notice. A database of MRLs can be found on the NZ Food Safety page of the MPI website.

It is an offence to sell any primary produce that contains residues that exceed the MRL in the MRL Food Notice. Since there will be no information provided with the product for unspecified uses, the user will have to find out what would be adequate measures to ensure that residues, or unnecessary pain and distress to animals, do not occur. Information contained in this standard is designed to assist a user to do that.

### **D3 Plant protection products**

#### **D3.1 Approval and registration**

Plant protection products used in primary production require an authorisation under the ACVM Act before they can be imported, manufactured, sold, or used. There are two main types of authorisation:

- (a) Registration; and
- (b) Exemption from registration via regulations.

Most plant protection products used to control pests and diseases require registration, with a few exemptions from registration for low-risk products, for example, products to protect the crop from climatic conditions such as sunburn.

An HSNO product approval is required before a product is registered under the ACVM Act. The product approval process will assess the product's hazards and use, and determine whether default controls under HSWA and HSNO notices are sufficient, or whether additional product-specific controls are required.

#### **D3.2 Off-label (discretionary) use**

Using plant protection products in a manner not consistent with the label guidance is referred to as off-label or discretionary use and is at the risk of the user. No endorsement or warranty may be assumed for that use. The responsibility for violative residues and liability for inefficacy, damage, or loss caused by the unspecified use must be accepted by the user.

Users shall check first that there are no controls/conditions that restrict off-label use, before considering using the agrichemical off-label. A restriction could include prohibiting any off-label use at all or limiting the maximum application rate, timing, or WHP that may be used. All these restrictions are generally stated on the label but are also stated on ACVM and EPA databases for agrichemicals.

NOTE – Off-label use shall comply with regulatory conditions, including HSWA controls, and products must be authorised for use in New Zealand (see D3.1).

Off-label use is permitted as it is recognised that for some use situations there are no products with a label claim for that specific use. The main reason why a product has no such label claim is that the size of the market for the specific use does not provide a sufficient commercial return to justify the field trials to obtain evidence on a WHP in New Zealand.

While off-label use is allowed (for most registered agricultural compounds under the ACVM Act), users are responsible for ensuring that off-label use of products is necessary, safe, and compliant. An important step is to determine first whether it is necessary to use a product off-label. If there are products with a label claim for that use situation, then these should be used rather than using another product off-label. While the flexibility of being able to use products off-label is critical, users are unable to rely on label directions to ensure regulatory controls are complied with. Without label guidance, there is a risk that off-label use may result in exceedance of MRLs or other compliance breaches.

NOTE – The off-label use of plant protection products on pasture or other animal feed may lead to unacceptable residues in the meat, milk, or other products of grazing animals.

When using a product off-label, apart from considering efficacy and plant safety aspects, users shall ensure residues in food-producing crops do not exceed the lower of the following:

- (a) The specified residue level in the current MRL Food Notice; and
- (b) The default of 0.1 mg/kg where there is no specified MRL for an agrichemical/food combination.



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NOTE – Additional/different MRL requirements may apply when product is being exported.

Users should be very cautious in relying on extrapolating WHPs stated on the label for food or feed crops. As mentioned in D2.2, the length of a WHP is not an indicator of the level of residues in a crop, nor should it be assumed the residue profile in one crop will be the same in another. In addition, it should not be assumed that overseas label guidance for a crop will result in similar residue decay in New Zealand – a WHP providing an MRL overseas for a crop will not necessarily be able to be used in the New Zealand context to give the same MRL.

It is an offence to sell any produce that contains residues that exceed the MRL in the MRL Food Notice.

NOTE –

- (1) NZGAP provides a decision tree for determining if a plant protection product can be used off-label and a checklist for ensuring compliance with off-label use.
- (2) In situations where controls have been set as part of an EPA permission, the users intending off-label use will need to ensure that the intended use complies with the controls specified in the HSNO approval documentation, including the HSNO permission and letters of approval to approved users, and their own internal best practice documents. If in doubt, consult with EPA.

### **D3.3 Own use**

There are situations where the PIC of a property wishes to utilise a generic substance for use on their own land to manage pest/diseases/conditions of crops and animals. The generic substance is something that is not labelled or advertised to be used as an agrichemical. An example is salt, which is sold as a food at a supermarket. When purchased, the salt remains as a food until the landowner mixes it with water and applies to their land for a task such as weed control. At that point, it is no longer a generic substance; rather, it is an agricultural compound.

There is an exemption to allow own use under the ACVM Regulations. Without this exemption, own use would be illegal. The exemption also allows the PIC to contract a third person to apply the own-use compound on the PIC's land.

However, there are some restrictions. Certain purposes are prohibited from this own-use exemption, such as using it for vertebrate pest control or as an antibiotic. In addition, the own-use exemption does not extend to the PIC selling (which includes gifting) the own-use compound to another person. It would be illegal to do this unless it was either registered or consistent with another exemption category. If a contractor is employed by the PIC to apply the compound, the PIC shall ensure the contractor is advised of the requirements they need to comply with.

## **D4 Veterinary medicines**

### **D4.1 Authorisation and registration**

Under the ACVM Act, all products used to manage animals are veterinary medicines. They fall into three categories:

#### **(a) Exempt from registration**

Some products used on animals do not require registration under the ACVM Act and are referred to as 'exempt from registration'. These include topical products such as hoof creams, non-medicated oral nutritional supplements, some antiseptics, and some homeopathic remedies for animals where there is no significant pain or distress involved. Exempt products carry no ACVM registration number on the label. However, there are general requirements covering their manufacture, sale, and use, which are specified in the ACVM regulations.

#### **(b) Unrestricted veterinary medicines**

Some veterinary medicines registered under the ACVM Act can be sold freely without a veterinary authorisation (often referred to as a prescription) and are termed 'unrestricted veterinary medicines' (UVMs) (previously referred to as 'over-the-counter'). UVMs shall not be used in a manner specifically prohibited in the conditions of registration.

#### **(c) Restricted veterinary medicines**

Some registered veterinary medicines are restricted, meaning they cannot be sold over the counter. Such veterinary medicines are classed as restricted veterinary medicines (RVMs), meaning only an authorised person such as a registered veterinarian can authorise their sale and use. Where the veterinarian allows the user to administer the RVM, they issue a veterinary authorisation with

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instructions the user shall follow to administer the RVM to the animal or animals. Veterinary authorisations for future supply of an RVM have a period of supply of between 4 and 12 months, after which the RVM is no longer authorised unless the authorisation is renewed. Veterinary medicines that are classed under HSNO as hazardous substances or new organisms shall be used in accordance with applicable HSNO controls.

#### **D4.2 Use of veterinary medicines**

Veterinary medicines should be used as recommended in the product information and, in particular, on the label. This is because the uses on the label have been assessed for efficacy and safety, and residues (if applicable). Compared with plant protection products, there are additional factors to consider such as animal welfare and the potential for residues in different tissues (milk and/or meat, eggs, wool) or in offspring.

#### **D4.3 Off-label use**

The section above on off-label use of plant production products is also relevant for veterinary medicines. There are additional requirements if using a veterinary medicine off-label:

- (a) Those veterinary medicines which require an authorisation by a veterinarian can only be used off-label under the instruction of the authorising veterinarian; and
- (b) For UVMs, there is a legal requirement for the user to seek advice from an appropriately qualified source and confirm that the intended use is not likely to cause unnecessary or unreasonable pain or distress in the animal treated.

Furthermore, off-label use in food-producing animals could cause significant trade issues when the animal commodity is exported if there are unacceptable residues.

#### **D4.4 Own use**

The section above on own use of plant production products is also relevant for veterinary medicines. There are additional considerations, including animal welfare and management of residues in food-producing animals due to export requirements.

#### **D4.5 Use of ectoparasiticides and anthelmintics (drenches)<sup>1</sup>**

##### *D4.5.1 Ectoparasiticides*

For ectoparasiticides, awareness, field observation, and correct identification of the target pest is important. The veterinarian is a prime source of information. In addition to the selection factors set out in D1, the following are considerations when selecting the veterinary medicine to use:

- (a) Animal safety (general health and age of the animal can be an important consideration, for example, lambs versus older sheep);
- (b) Human safety (sensitisation, toxicity);
- (c) WHP (for example, residues in milk and meat);
- (d) Spectrum of activity (lice only, fly and lice, ticks only); and
- (e) Efficacy of the product, including resistance.

As with the other agrichemicals, most veterinary medicines carry WHPs, that is, the periods after treatment within which animals may not be slaughtered and their products may not be processed, manufactured, or used for human consumption.

##### *D4.5.2 Anthelmintics*

In addition to the selection factors set out in D1, the following are important points relating to the use of anthelmintics (including oral products, pour-ons, and injectables):

- (a) Each farm is unique and effective worm management may differ from farm to farm;
- (b) Drenching strategies will need to be tailored to suit individual farms and stock classes, so seek advice;
- (c) Farms should have an animal management plan and knowledge of parasites present on the farm;
- (d) Avoid using an ineffective drench – match the product to the parasite;
- (e) Perform faecal egg count reduction test (FECRT) to check impact;
- (f) Frequency of use;
- (g) Form of available anthelmintic (oral drench, injectable, pour-on, controlled release);
- (h) Ensuring adequate (correct) dose volume;

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<sup>1</sup> This is a brief summary only. If in doubt, consult a veterinarian.

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- (i) Drenching stock of appropriate age or parasite status;
- (j) Leaving some animals untreated where appropriate in order to slow the development of anthelmintic resistance (that is, refugia);
- (k) Use in a preventative capacity for parasite control; and
- (l) Administration method.

For up-to-date information, seek advice from a veterinarian or Wormwise.

## **D5 Detergents and sanitisers**

### **D5.1 Product approval**

The NZ Food Safety section of the MPI website provides a list of approved detergents, sanitisers, and other compound used in farm dairies to clean, sanitise, or maintain the milking plant under the Animal Products Act. This list includes the conditions of use under which the product was approved.

### **D5.2 Conditions of use**

Where detergents and sanitisers are in use in the dairy and meat industry, their use is regulated via the Animal Products Act. If they are hazardous substances, there are also conditions of use under the HSWA.

Conditions set in the HSNO product approval relating to directions for use are clearly stated on the label or supplied in the accompanying documentation (for example, if the sanitiser must be washed from the surface prior to use, this must be stated). The approval assesses effective hygiene and absence of adverse food safety or other side effects for usage per instructions.

## **D6 Integrated pest management (IPM)**

### **D6.1 Definition of IPM**

The following is the definition of IPM adopted by the Food and Agriculture Organization of the United Nations (2017)<sup>2</sup>:

'Integrated Pest Management (IPM) means the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimise risks to human health and the environment. IPM emphasises the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms.'

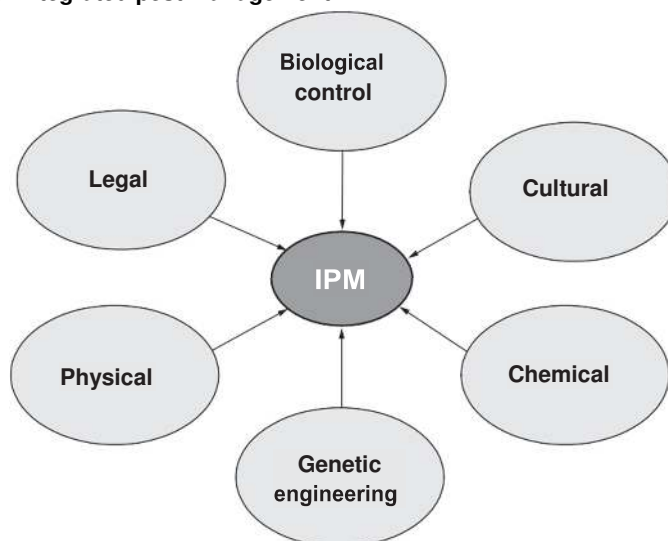
### **D6.2 Full range of pest control techniques**

IPM allows primary producers to control diseases, insects, weeds, and other pests in a cost-effective and environmentally and socially acceptable way. The key words are 'all available pest control techniques'. Successful practitioners of IPM evaluate the potential cost-effectiveness of each alternative as well as the whole control strategy. Accountability for implementation of IPM ultimately rests with the producer. It will only be adopted if it is seen to be practical and to add value to production.

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<sup>2</sup> *Integrated pest management of major pest and disease in eastern Europe and the Caucasus.*

**Figure D1 – Elements of integrated pest management**



Many IPM alternatives are preventative or indirect crop protection measures. These include time-honoured agronomic treatments like breeding, crop rotation, irrigation management, and effective crop husbandry. They also include practices that maintain adequate populations of beneficial insects. New technologies also come into play. Biotechnology, for example, can impart pest resistance into a crop from a third organism. Also included are legal parameters such as crop export quarantines that ensure crops bound for market are pest-free and healthy to eat. Other IPM alternatives are classified as interventional or direct. These include chemical control; bio-control, for example, using an insect predator to control a pest; and cultural and sanitation methods that remove alternative host plants and destroy pest habitat.

Implementing IPM for crop protection reduces the risk of pests (weeds, insects, or fungi) becoming resistant to agrichemical products.

**D7 Resistance to agrichemicals**

The development of resistance to agrichemicals can be defined as the ability of a proportion of the pest, parasite, or microorganism population to survive applications of a chemical applied at the rate that was formerly effective. Once resistance has developed it is difficult and costly to reverse it.

The development of resistance is influenced by a number of factors, including the following:

- (a) Genetic (genes conferring resistance);
- (b) Biological (type and frequency of reproduction); and
- (c) Type and frequency of agrichemical used and the quality of the application technique.

Agrichemical resistance is an increasing worldwide and New Zealand problem. For example, development of glyphosate-resistant annual ryegrass and resistance of internal parasites to common drenches have become important concerns for primary producers in New Zealand and have raised awareness of the need to avoid practices which lead to development of resistance by target organisms to agrichemical products. The key aspects of resistance avoidance are listed in Table D1 for animals and plants. Product labels provide critical advice where the risk of development of resistance exists or has been shown for a particular product and target combination. Always follow label recommendations.

**Table D1 – Key aspects of resistance avoidance**

Animal health	Plant health
Seek expert guidance. Become informed on the population dynamics of the major parasites. Work to a plan.	Aim to reduce selection pressure with pesticides by using a range of control measures, rather than a single approach.

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<p>Know the resistance status of the flock (herd) and farm. Keep records of anthelmintics used (see section 5) and have faecal egg counts and larval cultures carried out on a regular basis (both for monitoring and for drench testing).</p>	<p>Keep good records of pesticide use (see section 5), and recognise the different modes of action of the products used.</p>
<p>Ask to see appropriate records for all stock brought on to the farm.</p>	<p>Use products from different modes of action (as noted on labels) as far as possible, for example, on rotation, or limited to parts of the season, as appropriate.</p>
<p>Use anthelmintics at the optimum (that is, label) rate. Lower doses may select for resistance, and accentuate the risk of not achieving satisfactory control. Similarly there is no point in increasing the dose, as the extra cost will not be returned in improved control. The drench dose should be set for the heaviest animal in the mob. Weigh a number of animals to get this information. Dose the appropriate classes only (such as only calves &gt;4 months for products containing MLs) and follow the dosing interval where specified.</p>	<p>Consult and follow specific resistance management guidelines where available, especially for insects and diseases with known cases of resistance. Pay particular attention and adhere to label recommendations on number of applications per year of products of the same class or mode of action.</p>
<p>Calibrate application equipment frequently, and follow application guidelines. Drench only when required. Treatment should be dictated by the plan and by good management, not the calendar. As a general rule, treat only those animals that require it. Calibrate equipment frequently, and follow use guidelines to ensure correct dose of anthelmintic.</p>	<p>Calibrate application equipment frequently, and follow application guidelines.</p>
<p>Drench only those classes of livestock that will gain benefit. Generally, only lambs and calves in their first year are at risk and require protection. While mature stock will acquire immunity, usually tolerating a worm burden without loss of performance, treatment may still be needed to prevent pasture larval contamination and cross-infection of stock. Knowing the parasite burdens and resistance status of the flock (herd) will help with making the decisions about what stock should be drenched.</p>	<p>Use correct label rates. Lower doses may contribute to poor control and select for resistance, although poor control is not always the result of resistance.</p>
<p>Have a worm management plan – include refugia and quarantine for new stock.</p>	<p>Treat only the minimum part of the pest populations, for example, by identifying the location of outbreaks on the property, rather than the whole property.</p>

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<p>Take into account the interaction of the worm burden in the flock (herd) and on the pasture. A pre-lambing or early lactation treatment of the ewes can prevent the build-up of worm eggs on the pasture that typically follows lambing.</p>	<p>Monitor the levels of pests and diseases, and use treatment thresholds where available (note that thresholds are increasingly available for many pests and diseases).</p>
<p>Plan grazing management so that young stock are not exposed to contaminated pasture. Using recognised strategies for both parasite burden and resistance management, for example, the Wormwise website.</p>	<p>Remove plant residues from the crop to reduce pest and disease inoculum, and use other cultural controls as far as possible.</p>
<p>For more information, contact a veterinarian or Wormwise.</p>	<p>For more information, contact the New Zealand Committee on Pesticide Resistance (NZCPR).</p>

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****APPENDIX E – PRODUCT DATA AND INFORMATION**

(Informative)

**E1 Introduction**

Product data and information on registered and/or approved agrichemicals is available and essential for their safe, responsible, and effective use. This is because the uses on the label have been assessed for safety, efficacy, and residues (if applicable). The product label is the first source of information and must be read and understood, but space limits the information that can be included. This appendix provides details on the sources of information available to agrichemical users. Users should ensure that all product data used is prepared for New Zealand use and that only New Zealand websites of manufacturers and distributors are used for obtaining documents such as labels and SDSs.

**E2 Product labels****E2.1 Legislation**

The product label conveys information that is needed to achieve safe, responsible, and effective use in accordance with regulatory requirements. Under the ACVM Act, there are some items that must appear on the product label of registered agrichemicals, and the emphasis is on the regulatory conditions of the product's approval and registration. Using the agrichemical in a manner not consistent with the product guidance (particularly the label and often referred to off-label use) is at the risk of the user. See Appendix D for further details on off-label use.

NOTE – Where conditions are applied to the ACVM registration of an agrichemical product that defines, directs, or restricts its use, it is a requirement for the user of that product to comply with those conditions.

Labels for products exempt from ACVM registration (see A1.6) must also comply with the requirements of the ACVM Regulations. Users should follow the use instructions provided with any exempt agrichemical. If the user is considering using the exempt agrichemical for any other purpose, the user must comply with the general specifications set out in Appendix D.

**E2.2 Label contents**

Certain information on the label of an end-use product is determined by requirements under the HSWA, HSNO Act and ACVM Act, that is, regulatory conditions. Other information is provided by the registrant and provides guidance on the safe and effective use of the product. The regulatory statements that must be included on the label are to be distinguishable from those of the registrant.

The label of the contained substance should provide information for the user relating to the following:

- (a) Product information such as trade name, active ingredient(s), formulation, mode of action, net contents;
- (b) Risks associated with the use of the product and safety precautions such as PPE;
- (c) Claims and directions for use, including dilution rates for different uses;
- (d) Storage, transport, and disposal requirements;
- (e) Emergency management advice; and
- (f) Other information (such as contact details of manufacturer/distributor, ACVM and/or HSNO registration numbers, date of manufacture, batch numbers).

The text and pictures must be clear, in English, and readily understandable. The label must be durable for the lifetime of the product.

The label content relevant to the ACVM Act is approved by MPI. There is no formal label approval process under the HSNO Act or HSWA. The responsibility is with the supplier to identify the relevant controls imposed.

**E3 Safety data sheets (SDSs)****E3.1 Use of SDSs**

An SDS is a detailed document that contains information about the properties of a product or substance. Its primary purpose is to provide users of agrichemicals with information about a product's chemical and physical properties and the nature of any hazards (physical, human, and environmental), along with methods of prevention and control of any adverse effects. The SDS also includes contact details for the manufacturer/distributor and emergency services.

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SDSs are also used by specialist personnel such as Fire and Emergency NZ, medical personnel, and environmental clean-up teams to assist in the management of health, environmental, or physical emergencies.

NOTE – It is a legal requirement for the PIC to obtain a copy of the SDS for each hazardous substance in their workplace. However, where workers travel between workplaces, the SDS may be kept at the PIC's principal place of business if workers can immediately access the key information from the SDS or a condensed version in an emergency.

**E3.2 Specific requirements**

The Hazardous Substances (Safety Data Sheets) Notice 2017 (EPA Safety Data Sheets Notice) sets out specific requirements for the content of an SDS for a specific hazardous substance. Information is provided in the following 16 sections:

- (a) Identification, including product name;
- (b) Hazard(s) identification;
- (c) Composition and information on ingredients;
- (d) First aid measures;
- (e) Firefighting measures;
- (f) Spillage, accidental release measures;
- (g) Handling and storage;
- (h) Exposure controls and personal protection;
- (i) Physical and chemical properties;
- (j) Stability and reactivity;
- (k) Toxicological information;
- (l) Ecological information;
- (m) Disposal considerations;
- (n) Transport information;
- (o) Regulatory information, including, if applicable:
  - (i) HSNO approval number
  - (ii) ACVM registration number; and
- (p) Other information.

**E4 Product safety card (PSC)**

A PSC is a simplified and more 'user-friendly' version of the SDS. The detail in an SDS may in some cases far exceed the information routinely required to safely manage and transport the product, including using it in the workplace. Furthermore, vital safety information spread throughout an SDS can be difficult to quickly access and interpret in an emergency situation. In situations where an SDS may not be appropriate or convenient, the PSC offers an alternative means of presenting key product information to help with product management or in the workplace.

NOTE – A HazNote™ is a type of PSC.

Some PSCs are also designed to be used as the mandatory consignment documentation, for example, dangerous goods declaration (DGD) for transport, and emergency response information (ERI).

**E5 Government databases****E5.1 EPA database of approved hazardous substances with controls**

The EPA database includes all approved hazardous substances and associated controls from HSNO Regulations (for substances approved prior to 1 December 2017 only), EPA notices, the Hazardous Substances Regulations and any safe work instrument (SWIs). The EPA database includes all hazardous substances, not just agrichemicals. Each substance has an HSNO approval number.

The EPA database provides the definitive set of controls for a product. In the event of any discrepancy in product controls between sources of product information, the user should refer to the EPA database. For example, labels may not be up to date with any recent changes in requirements.

The EPA also has a publicly available database of all documentation associated with product approvals, including submissions and decisions.

**E5.2 ACVM register**



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The ACVM register lists information about all products registered pursuant to the ACVM Act for use in New Zealand. The register includes approved label context. The ACVM register includes agrichemicals that are not hazardous substances.

Every agrichemical used in New Zealand must be on the ACVM register unless otherwise permitted as set out in Appendix D.

### **E5.3 MPI databases**

A database of MRLs can be found in the NZ Food Safety section of the MPI website. Products approved for use in the dairy industry can also be found on the MPI website.

MPI also manages the Plant Pest Information Network, a national database for the collection, management, and dissemination of plant pest surveillance information.

## **E6 Other sources of product information**

Other sources of information on agrichemicals include the following:

- (a) Plant protection products:
  - (i) Industry technical information such as spray programmes
  - (ii) Novachem, the New Zealand Agrichemical Manual, is regularly revised to include summary label information for agrichemicals approved for use in New Zealand
  - (iii) Technical information produced by agrichemical manufacturers and distributors providing more details on product use and efficacy. This may be available publicly on websites or only through field representatives of the rural retailer
  - (iv) Pest plant information provided by Weedbusters, regional councils, and other groups
  - (v) Agricultural and horticultural consultants;
- (b) Veterinary medicines:
  - (i) General guides, for example, IVS Manual (New Zealand Index of Veterinarian Specialities Annual)
  - (ii) Suppliers of veterinary medicines
  - (iii) Veterinarians; and
- (c) Detergents and sanitisers:
  - (i) Consultants
  - (ii) Technical data from suppliers
  - (iii) Risk management programme under NZCP1.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****APPENDIX F – COMPETENCY AND TRAINING**

(Normative)

**F1 General**

Users and suppliers shall be appropriately trained and/or qualified to carry out their duties and responsibilities.

The person in charge (PIC) shall ensure that every worker using, handling, manufacturing, or storing agrichemicals is provided with the following:

- (a) Information on the properties and risks of the agrichemicals, including their impact on human health, food safety, and the environment, and how to manage them;
- (b) Information on where hazardous substances are present or likely to be present;
- (c) Training and instruction on:
  - (i) How to manage the risks associated with the products used
  - (ii) Procedures for safe storage, handling, and use
  - (iii) How to use PPE correctly
  - (iv) How to manage an emergency; and
- (d) An appropriate period of practical experience under direct supervision in the workplace.

Records of training, formal or informal, should be kept for the duration of a worker's employment.

**F2 Specific regulatory requirements****F2.1 General**

Specific regulatory requirements for training and certification are generally determined by the hazard class of the product being used. Table F1 sets out the default requirements for the hazard classes relevant to agrichemicals.

**Table F1 – Certification and competency requirements**

<b>Hazard class</b>	<b>GHS class</b>	<b>Competency requirements</b>	<b>Source of requirements</b>
6.1A	Acute toxicity oral category 1 Acute toxicity dermal category 1 Acute toxicity inhalation category 1	Certified handler	Hazardous Substances Regulations
6.1B	Acute toxicity oral category 2 Acute toxicity dermal category 2 Acute toxicity inhalation category 2	Certified handler	Hazardous Substances Regulations
6.1C	Acute toxicity oral category 3 Acute toxicity dermal category 3 Acute toxicity inhalation category 3	Competent person	EPA Hazardous Property Controls Notice
6.7A	Carcinogenicity category 1	Competent person	EPA Hazardous Property Controls Notice
8.2A	Skin corrosion category 1A	Competent person	EPA Hazardous Property Controls Notice
9.1A	Hazardous to the aquatic environment category acute 1	Qualified person/contractor	EPA Hazardous Property Controls Notice

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	Hazardous to the aquatic environment category chronic 1		
9.2A, 9.3A, 9.4A	Hazardous to the terrestrial environment and listed in Table 1A of Schedule 9; or whose HSNO product approval requires this control	Qualified person/contractor	EPA Hazardous Property Controls Notice

**F2.2 Certified handler**

Under the Hazardous Substances Regulations, some classes of hazardous substances, including products with very high human toxicity (HSNO classes 6.1A and 6.1B) have controls that include the requirement for the product to be under the control of a certified handler. Table F1 indicates the hazard classes that shall be under the control of a certified handler.

A certified handler compliance certificate requires the candidate to have knowledge of the HSWA legislation and to be able to demonstrate competency in the safe handling of hazardous substances (such as agrichemicals). Compliance certificates are issued by compliance certifiers, who are authorised by WorkSafe.

A person without a certified handler certificate can handle products with very high human toxicity if the certified handler:

- (a) Is present at the workplace where the substance is being handled;
- (b) Has provided specific guidance in respect of how to handle the product for this task; and
- (c) Is available at all times to provide assistance.

NOTE – Other agrichemicals may also require a certified handler. This control will be recorded in the relevant SWI and will form part of the EPA product approval. While not included in the scope of this standard, many fumigants and VTAs with hazard classifications not listed in Table F1 will require certified handler certification and in some cases also a controlled substance licence (CSL). Note also that a former poisons licence issued under Pesticides (Vertebrate Pest Control) Regulations 1983 is not the equivalent to a CSL.

**F2.3 Competent person**

Under the EPA Hazardous Property Controls Notice, some classes of hazardous substances have requirements for the person using the substance to be a competent person and for the substance to only be used in the workplace.

WorkSafe also requires a competent person to be responsible for tracked products.

A competent person is someone who has had appropriate training and instruction in the management of hazardous substances (see F1). A Growsafe Standard certificate is acceptable evidence of competency for agrichemicals, as is a certified handler compliance certificate.

NOTE – Other agrichemicals can also require a competent person. This control will be recorded in the relevant SWI and will form part of the EPA product approval.

**F2.4 Qualified person**

Products with high ecotoxicity shall be applied by a ‘qualified person’ or under the direct or indirect supervision of a ‘qualified person’ as appropriate based on the skills and experience of the applicator and the nature of the task as set out in Table F2. The specific requirements for a person other than a contractor are set out in the EPA Hazardous Property Controls Notice (but are subject to updates).

NOTE – See 1.3 for definition of ‘high ecotoxicity’.

**Table F2 – Qualifications required for ground-based application of products with high ecotoxicity by a person other than a contractor**

Application method	Examples	Growsafe certification	Alternative
Motorised application equipment – not handheld	Boom or air-blast sprayer	Growsafe Standard	u/s 21563 and one of: u/s 23620; u/s 27216; u/s 23617; u/s 6239; u/s 6236; u/s 6242
Motorised application equipment – handheld	Gun-spraying	Growsafe Standard	u/s 21563 and one of:

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with tank capacity of more than 30 L	Mist-blower		u/s 27216; u/s 6237; u/s 6238
Motorised application equipment – handheld within 30 m of water or a sensitive habitat	Motorised knapsack Gun-spraying near water or sensitive habitat	Growsafe Standard	u/s 21563 and one of: u/s 27216; u/s 6237; u/s 6238
All application into water	Spraying aquatic weeds	Growsafe Standard and u/s 6240	u/s 21563 and u/s 6240

NOTE –

- (1) u/s = unit standard
- (2) For non-motorised application equipment (for example, a knapsack) or motorised handheld equipment with a tank capacity of 30 L or less, there is no requirement under the EPA Hazardous Property Controls Notice for specific certification.

**F2.5 Qualified contractor**

If applied by a contractor, products with high ecotoxicity shall be applied by a 'qualified contractor' or under the direct or indirect supervision of a 'qualified contractor' as set out in Table F3. The specific requirements for a contractor are set out in the EPA Hazardous Property Controls Notice (but are subject to updates).

**Table F3 – Qualifications required for ground-based application of products with high ecotoxicity by a contractor**

Application method	Examples	Growsafe certification	Alternative
Motorised application equipment – not handheld	Boom or air-blast sprayer	Growsafe Registered Chemical Applicator (RCA) with relevant strand	n/a
Motorised application equipment – handheld with tank capacity of more than 30 L	Gun-spraying Mist-blower	Growsafe Registered Chemical Applicator (RCA) with relevant strand; or Growsafe Standard and one of: u/s 27216; u/s 6237; u/s 6238	National Certificate in Agrichemical Application with relevant strand; or u/s 21563 and one of: u/s 27216; u/s 6237; u/s 6238
Motorised application equipment – handheld within 30 m of water or a sensitive habitat	Motorised knapsack Gun-spraying near water or sensitive habitat	Growsafe Registered Chemical Applicator (RCA) with relevant strand; or Growsafe Standard, with one of: u/s 27216; u/s 6237; u/s 6238	National Certificate in Agrichemical Application with relevant strand; or u/s 21563 with one of: u/s 27216; u/s 6237; u/s 6238
All application into water	Spraying aquatic weeds	Growsafe Registered Chemical Applicator (RCA) with aquatic strand	n/a

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All other ground-based application	Non-motorised Motorised handheld with capacity 30 L or less and not near water or sensitive habitat	Growsafe Standard	u/s 21563 and u/s 27215
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**F2.6 Qualified loader**

For a person mixing or loading agrichemicals with high ecotoxicity but not doing the application, there is a requirement under the EPA Hazardous Property Controls Notice (but this is subject to updates) to be a 'qualified loader', or under the direct or indirect supervision of a 'qualified loader'. A person who holds a Growsafe Standard, Advanced or RCA certificate is considered a qualified loader, as is someone who holds a current Pilot Chemical Rating or has gained a National Certificate in Agrichemical Application or u/s 21563.

**F3 Recommended training and certification****F3.1 General**

A number of training programmes on agrichemical use are available. A training programme that meets the requirements of this standard shall do the following:

- Have content based on this standard and any subsequent regulatory updates;
- Include relevant content from the applicable regional plan;
- Have a procedure for regular review of the training programme and training providers by a suitably qualified or experienced third party to ensure ongoing quality and relevance of the training;
- Have a procedure to moderate the assessment process to ensure that it adequately addresses matters covered in the course and ensures robust assessment practices; and
- Certify competency on the content covered for a maximum period of 5 years and then require a review of competency through a refresher programme.

There are a range of Growsafe® courses offered by the New Zealand Agrichemical Education Trust that satisfy the requirements of this standard. Other training courses may also meet these requirements.

NOTE – Certified handler certification requirements are set by WorkSafe. Growsafe or other training programmes may provide supporting evidence of competency but are not sufficient in themselves.

**F3.2 Suppliers**

The requirements of this standard for suppliers can be met by the completion of the Growsafe Supplier certificate or equivalent. This certificate is designed specifically for suppliers, including importers, wholesalers, and retailers of agrichemicals.

NOTE – If handling products with very high human toxicity, certified handler certification will also be required.

**F3.3 Users of plant protection products***F3.3.1 Ground application (farmers/growers/land managers)*

The training requirements for safe, responsible, and effective use of agrichemicals according to this standard can be met by completion of a Growsafe Standard certificate or equivalent. It is recommended that at least one person at each workplace hold this level of certification. More advanced training in the management of agrichemical use can be met by completion of the Growsafe Advanced certificate, which is awarded for specific sectors.

NOTE – If using products with very high human toxicity, certified handler certification will also be required.

Those operating under supervision (direct or indirect depending on the level of experience of the worker and complexity of the task) should hold a minimum of the Growsafe Basic certificate or equivalent training.

PICs who do not apply agrichemicals themselves are required to understand their responsibilities and to ensure that employees or contractors are managing agrichemicals correctly. A Growsafe Theory certificate or equivalent is recommended for those in this situation.

*F3.3.2 Ground application (contractors and/or public places)*

The requirements of this standard for ground application by contractors and those applying agrichemicals in a public place can be met by the completion of the Growsafe Registered Chemical

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Applicator certificate. This is attained by first completing the New Zealand Certificate in Agrichemical Application and not less than 200 hours of work experience.

Those operating under supervision should hold a minimum of Growsafe Standard or Growsafe Basic (or equivalent) depending on the risks associated with the activity as set out in Table F4. See 1.3 for definitions of direct and indirect supervision.

**Table F4 – Recommended minimum certification levels for spray contractors and those spraying in public places**

Activity	Direct supervision from RCA	Indirect supervision from RCA
Aquatic application	Growsafe® Basic	Growsafe® Standard
Motorised application, for example, boom, air-blast	Growsafe® Basic	Growsafe® Standard
Motorised downward handheld application, for example, gun spraying	Growsafe® Basic	Growsafe® Basic*
Handheld application, for example, knapsack	Growsafe® Basic	Growsafe® Basic*

\* These applicators should be working under direct supervision from holders of a Growsafe Standard, especially if inexperienced.

NOTE – If using products with very high human toxicity, certified handler certification will also be required.

Those applying agrichemicals in places accessible to the public, for example, schools and golf courses, should meet the requirements applicable to those spraying in public places. Where the applicator is not a contractor, the Growsafe Advanced certificate (endorsed for the relevant sector) is a suitable alternative to the Registered Chemical Applicator certificate.

#### *F3.3.3 Helicopter and fixed wing application*

Under the Civil Aviation Rules (Civil Aviation Act 1990), the application of agrichemicals by aircraft requires the pilot to hold a Pilot Chemical Rating, which is issued by the Civil Aviation Authority (CAA).

The initial Chemical Rating has a life of 5 years. For renewal, the holder is required to attend an approved refresher training event or provide other evidence acceptable to the CAA that knowledge and competency are being maintained.

Groundcrew supporting aerial agrichemical application should hold a Growsafe Groundcrew certificate or equivalent.

NOTE – If using products with very high human toxicity, certified handler certification will also be required.

#### *F3.3.4 UAV application*

Under the Civil Aviation Rules, the application of agrichemicals by UAV requires the applicator to be certified under Part 102 and have an endorsement (privilege) for agriculture, which is issued by the CAA.

### **F3.4 Veterinary medicines**

#### *F3.4.1 Unrestricted veterinary medicines*

The basic principles of safe, responsible, and effective use of veterinary medicines are covered in most agrichemical or animal health training courses.

#### *F3.4.2 Restricted veterinary medicines*

A person is authorised to prescribe restricted veterinary medicines (RVMs) if they are a veterinarian recognised under section 44G of the ACVM Act or are specified as the authorising person in an MPI-approved operating plan for that RVM. Veterinarians registered with the Veterinary Council of New Zealand and holding a current annual practising certificate meet the legal requirements for administering, prescribing, and dispensing RVMs. People administering RVMs under the authorisation of veterinarians, for example, farmers, should have experience and training in the administration of veterinary medicines, or be operating under supervision.

### **F3.5 Dairy detergents**

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The basic principles of safe, responsible, and effective use of dairy detergents are covered in most agrichemical or milk harvesting courses.

#### **F3.6 Other products**

Specialised training and certification are required for the use of some agrichemicals (for example, fumigants, controlled VTAs). Users should check with their supplier or industry association.

#### **F4 Accreditation**

Growsafe accreditation for agrichemical use is available to companies or businesses that complete a number of requirements. These include the following:

- (a) All personnel involved in agrichemical use holding the appropriate Growsafe certificate;
- (b) The completion of an independent audit of facilities and procedures related to the use of agrichemicals; and
- (c) Satisfying any findings that may arise from the audit.

Growsafe accreditation can be renewed by satisfying any findings arising from a further audit. Audits must be carried out by an auditor approved by the New Zealand Agrichemical Education Trust.

#### **F5 Other requirements**

##### **F5.1 Controlled substance licence (CSL)**

Both the HSWA and the ACVM Act require some acutely toxic substances to be under the control of a person holding a CSL for their use. Generally, agrichemicals as defined in this standard do not require a CSL but fumigants and VTAs often do.

##### **F5.2 Transport Act**

If maximum transport quantity thresholds are breached, there are requirements under the Dangerous Goods Rule for training and certification (see section 3).

##### **F5.3 Regional plans**

Regional plans may have specific requirements for training or certification. These requirements may be dependent on type of spray application, for example, handheld or otherwise, or on location, for example, public places or not.

NOTE – As regional plans vary by region, regional plan requirements will not be found on the label. Check the regional plan applicable to the location of the planned spraying.

##### **F5.4 Market or export requirements**

Some marketers or exporters of primary produce require all steps in their produce supply chain to be serviced by competent people. For agrichemical use, relevant Growsafe certificates (as set out in F3) held by users, contractors, and suppliers will satisfy these requirements.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****APPENDIX G – LAND TRANSPORT OF AGRICHEMICALS**

(Informative)

**G1 Agrichemicals as dangerous goods and as hazardous substances****G1.1 Agrichemicals as dangerous goods**

Dangerous goods are those substances and articles classified as dangerous for transport by the United Nations Committee of Experts on the Transport of Dangerous Goods. The United Nations list of dangerous goods and classification criteria are set out in the United Nations Recommendations on the Transport of Dangerous Goods, Model Regulations (UNRTDG), also known as the UN Orange Book. In New Zealand, the term 'dangerous goods' is defined in the Land Transport Rule: Dangerous Goods 2005 (Dangerous Goods Rule).

The Dangerous Goods Rule sets out the legal requirements for the transport of dangerous goods on land in New Zealand. Technical information to comply with the Dangerous Goods Rule is provided in NZS 5433. Some parts of that standard are incorporated by reference in the Dangerous Goods Rule.

The Dangerous Goods Rule aligns closely with the regulatory framework for hazardous substances under the HSWA and the HSNO Act. In general terms, compliance with the Dangerous Goods Rule will mean compliance with other relevant legislation during transport on land. However, there are some differences relating to classification and controls:

- (a) The HSNO Act applies to the entire life cycle of products with hazardous properties (for example, manufacture, storage, use, and disposal);
- (b) The HSWA applies to manufacture, storage, transport, use, and disposal of all agrichemicals;
- (c) The Dangerous Goods Rule applies to the transport life cycle – consignment, packaging, loading, transport, and unloading only – for dangerous goods.

The classification system under the HSNO Act is different to transport classification. HSNO controls apply to some products that are not classified as dangerous for transport, and conversely some goods that are classified as dangerous for transport (for example, class 6.2 infectious substances and class 7 radioactive materials) are not controlled under HSNO.

**G1.2 Agrichemicals as hazardous substances**

Hazardous substances are those substances that are specified in the EPA Hazard Classification Notice. The thresholds are based on the Globally Harmonized System of Classification and Labelling of Chemicals (GHS). The GHS uses the same basic classes of hazard as the UNRTDG, but divides hazards into more subclasses and includes categories with lower degrees of hazard than the transport system.

**G1.3 UN number and proper shipping name**

Substances and articles that are dangerous goods for transport have been allocated a four-digit United Nations (UN) number and a 'proper shipping name' (under the UNRTDG). The proper shipping name is the name that most accurately describes the substance. Some dangerous goods are not listed specifically by name, but are allocated a UN number and a generic proper shipping name based on the properties of the substance, for example, UN 2902, PESTICIDE, LIQUID, TOXIC, N.O.S. An agrichemical that has a UN number on the product label is classified as dangerous goods for transport.

NOTE – N.O.S. means 'not otherwise specified'.

**G1.4 Packing group**

Dangerous goods of class or division 3, 4 (except self-reactive substances in division 4.1), 5.1, 6.1, 8, and 9 are assigned to one of three packing groups according to the degree of hazard for transport:

- (a) Packing group I (PG I) is high danger;
- (b) Packing group II (PG II) is medium danger; and
- (c) Packing group III (PG III) is low danger.

In general terms, packing group numbers are similar to, but not exactly the same as, the hazard categories in the HSNO and GHS classification systems (Table G1). For example, UN class 6.1A and B (toxic substances), packing group I and II have a similar degree of danger as GHS class acute toxicity, category 1 and 2 respectively.



**DRAFT ONLY****COMMITTEE IN CONFIDENCE****Table G1 – Relationships between LD<sub>50</sub> toxicity, hazard classification, and packing group**

LD <sub>50</sub> oral liquids (mg/kg body weight)	<5	5–50	50–300	300–500	500–2000	2000–5000
GHS acute toxicity	Category 1	Category 2	Category 3	Category 4		Category 5
HSNO class 6.1	A	B	C	D		E
UN class 6.1 packing group (UNRTDG)	I	II	III		n/a	

NOTE – LD<sub>50</sub> is a measure of acute toxicity – the lethal dose required to kill 50% of a sample population.

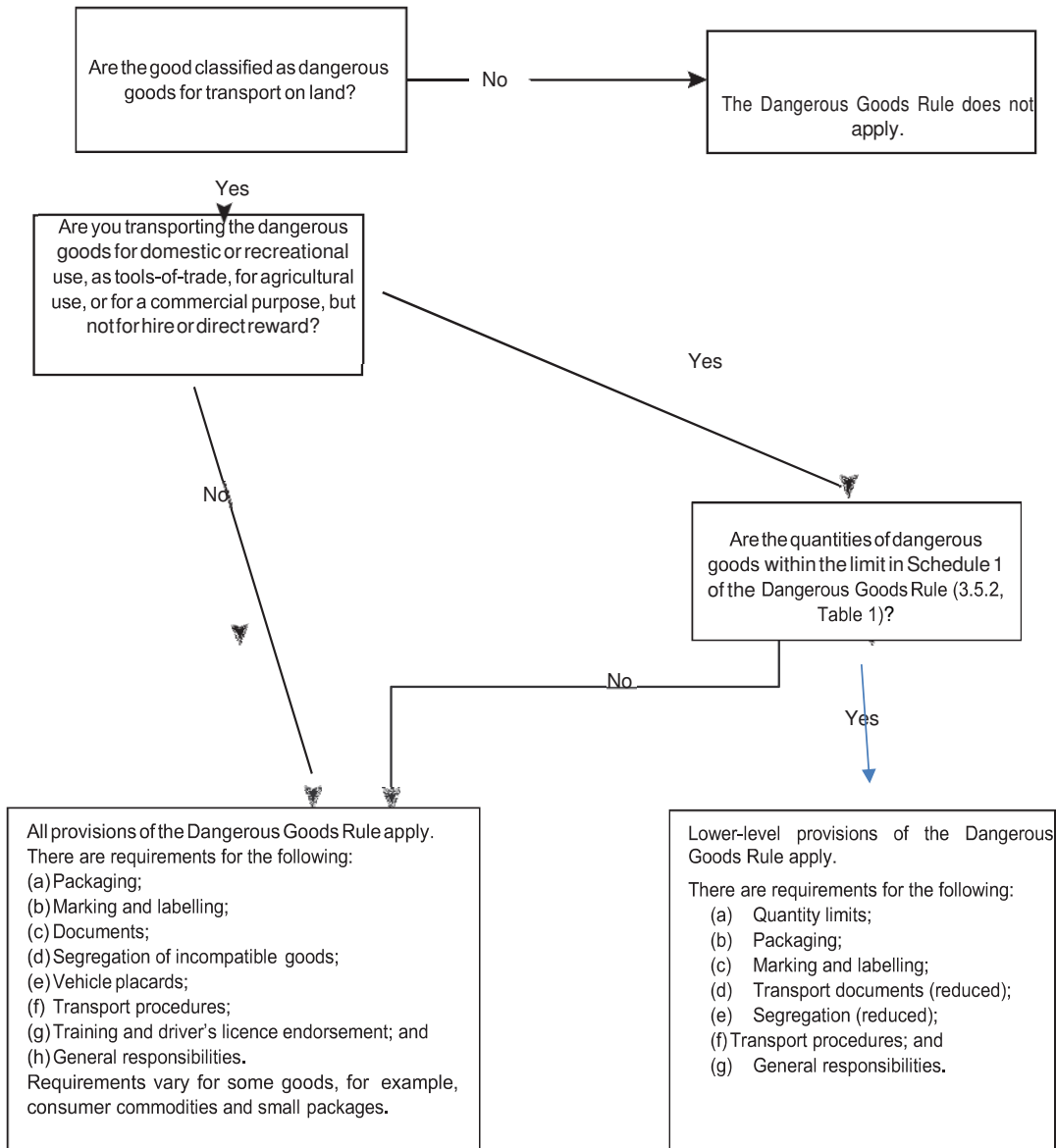
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**G2 Agrichemical transport requirements**

The Dangerous Goods Rule applies to everyone involved in transport of dangerous goods, but the requirements vary according to the nature, quantity, and use of the goods. To assist in determining agrichemical transport requirements when agrichemicals are dangerous goods, see Figure G1.

**Figure G1 – Flow chart for the determination of agrichemical transport requirements when agrichemicals are dangerous goods**



**DRAFT ONLY****COMMITTEE IN CONFIDENCE****G3 Segregation**

The segregation requirements that apply when dangerous goods are transported are set out in Table G2. See also 3.4.4, 3.5.6, and 3.6.6.

**Table G2 – Segregation of dangerous goods**

<b>Class or division and name of dangerous goods</b>	<b>Must not be loaded in the same freight container or on the same vehicle with these classes of dangerous goods</b>	<b>Must not be loaded in the same freight container; and Must be separated horizontally by at least 3 m unless all but one are packed in separate freight containers</b>
3 Flammable liquids	1, 2.1, 2.3, 4.2, 5.1, 5.2, 7	4.3
5.1 Oxidising substances	1, 2.1, 3, 4.2, 4.3, 5.2, 6.2, 8	4.1, 6.1, 7
5.2 Organic peroxides	1, 2.1, 2.3, 3, 4.1, 4.2, 4.3, 5.1, 6.2, 7, 8	2.2, 6.1
6.1 Toxic substances	1, food items, note 1	5.1, 5.2
8 Corrosives	1, 5.1, 5.2, 7, food items, note 1, note 2	4.3
9 Miscellaneous dangerous substances and articles	1	–

NOTE –

- (1) Cyanides (class 6.1) must not be loaded in the same freight container or on the same vehicle with acids (class 8).
- (2) Strong acids must not be loaded in the same freight container or on the same vehicle with strong alkalis.
- (3) For storage segregation see K8.
- (4) Table G1 includes classifications that cover most agrichemicals that are dangerous goods. Refer to NZS 5433 for full details of segregation of dangerous goods during transport.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****APPENDIX H – EMERGENCY MANAGEMENT**

(Normative)

**H1 Scope**

This appendix deals with emergency preparedness in relation to the hazards from spillage or fire where agrichemicals are involved. Both these events can occur at any time, but the most hazardous situation is either in storage areas where large amounts of different agrichemicals may be held or in transport accidents.

The appendix addresses what needs to be considered in an emergency response plan. Specific information on managing spillage, fire, and transport emergencies is also provided. See Appendix Q for how to respond when an individual is exposed to toxic products, for example, poisoning or chemical burns.

Refer to the Hazardous Substances Regulations for full details of the HSWA requirements for emergency management of hazardous substances and the EPA Hazardous Property Controls Notice for emergency management requirements for ecotoxic substances.

**H2 Emergency response plan****H2.1 General requirement**

All PICs shall prepare an emergency response plan for their workplace. This plan shall include the following:

- (a) Emergency procedures, including:
  - (i) How to respond effectively to an emergency
  - (ii) Evacuation procedures
  - (iii) Procedures for notifying emergency services
  - (iv) First aid procedures
  - (v) Communication between people at the workplace;
- (b) An inventory of hazardous substances at the workplace, including copies of the SDSs for each product stored;
- (c) Procedures for testing the emergency plan; and
- (d) How to ensure workers are aware of and able to implement the emergency plan, for example, training and information.

The emergency response plan shall provide the appropriate response for all reasonably foreseeable emergencies that may arise, such as the following:

- (e) Spillage on person or place;
- (f) Fire;
- (g) Transport accidents involving agrichemicals;
- (h) Poisoning (see Appendix Q); and
- (i) All other natural disasters (earthquake, flooding).

**H2.2 More detailed emergency response plans for large quantities of hazardous products**

Where significant quantities of hazardous products are stored, more specific requirements are set under the Hazardous Substances Regulations and the EPA Hazardous Property Controls Notice for the emergency response plan. Table H1 shows the amount of hazardous substance for the various hazard classes that triggers the requirement for a more detailed emergency response plan. Only hazard classes relevant to agrichemicals have been included.

**Table H1 – Quantity thresholds for more detailed emergency response plan**

<b>GHS classification</b>	<b>HSNO hazard classification (old)</b>	<b>Quantity threshold beyond which a more detailed emergency response plan is required</b>
Flammable liquid category 1	3.1A	100 L (exclusions apply – see note 2)
Flammable liquid category 2	3.1B	1000 L
Flammable liquid category 3 or 4	3.1C, 3.1D	10 000 L
Oxidising solid category 1	5.1.1A	50 kg
Oxidising solid category 2	5.1.1B	500 kg

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Oxidising solid category 3	5.1.1C	5000 kg
Oxidising liquid category 1	5.1.1A	50 L
Oxidising liquid category 2	5.1.1B	500 L
Oxidising liquid category 3	5.1.1C	5000 L
Acute toxicity (oral, dermal, or inhalation) category 1, 2, or 3	6.1A, 6.1B, 6.1C	100 kg or L
Acute toxicity (oral, dermal, or inhalation) category 4	6.1D	1000 kg or L
Respiratory or skin sensitisation	6.5A, 6.5B	1000 kg or L
Germ cell mutagenicity category 1	6.6A	10 000 kg or L
Carcinogenicity category 1	6.7A	1000 kg or L
Carcinogenicity category 2	6.7B	10 000 kg or L
Reproductive toxicity category 1	6.8A	10 000 kg or L
Specific target organ toxicity (single or repeated exposure) category 1	6.9A	10 000 kg or L
Skin corrosion/irritation category 1B	8.2B	1000 kg or L
Skin corrosion/irritation category 1C	8.2C	10 000 kg or L
Serious eye damage/eye irritation category 1	8.3A	10 000 kg or L
Hazardous to the aquatic environment (acute or chronic) category 1	9.1A	100 kg or L
Hazardous to the aquatic environment (acute or chronic) category 2 or 3	9.1B, 9.1C	1000 kg or L (exclusions apply – see note 2)
Hazardous to the aquatic environment (acute or chronic) category 4	9.1D	10 000 kg or L

NOTE –

- (1) Only classes relevant to agrichemicals included; refer to Hazardous Substances Regulations for all classes.
- (2) Threshold for petrol, aviation gasoline, racing gasoline, kerosene is 1000 L.

For workplaces with hazardous substances in excess of the thresholds in Table H1, the emergency response plan for each type of reasonably foreseeable emergency event shall include the following:

- (a) A description of actions to be taken to:
  - (i) Assess the situation. The plan shall provide details of how and when to implement emergency responses. For example, when is evacuation required?
  - (ii) Keep people safe, including warning people at the workplace and nearby that the emergency has occurred and advising those people on what do, for example, evacuation procedures
  - (iii) Contact emergency services such as Fire and Emergency NZ
  - (iv) Help or treat any injured person
  - (v) Manage the situation to ensure that adverse effects are restricted to the area initially affected, reduced in severity as soon as practicable, and eliminated if reasonably possible
  - (vi) Re-establish controls such as security of hazardous substances;

NOTE – The evacuation procedures should cover the type of alarm and its means of evacuation, assembly areas to enable emergency services to quickly determine if all of the occupant's personnel have been evacuated, and a means by which the emergency services can identify members of the warden structure for the premises.

- (b) Identification of the person with responsibility for the actions above:
  - (i) How to contact each person – for example, a list of names and telephone or pager numbers (including at work and after hours) of personnel within the occupier's organisation who can provide specialist advice or assistance in an emergency
  - (ii) What skills or training they are required to have

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- (c) A copy of the inventory listing the product names, quantities, hazard classes, and UN numbers of the hazardous substances being stored and their location within the premises and including copies of the SDSs for all of the hazardous substances on the site; and
- (d) A site plan, which should include:
  - (i) Location of all hazardous substances
  - (ii) Location of emergency equipment such as fire extinguishers and first aid kit
  - (iii) The direction of north and prevailing wind
  - (iv) The boundaries of the premises and the names of adjacent streets
  - (v) The location and identification of all buildings and external stores at the site
  - (vi) Vehicular entry points, and vehicular access within the site
  - (vii) Locations of the emergency assembly areas
  - (viii) Details of signage used and location
  - (ix) The main electrical switchboard
  - (x) Location of nearest water supply such as tanks or hydrants.

**H2.3 Testing the emergency response plan**

The emergency response plan needs to be kept up to date. The equipment, material, and people specified in the plan shall be available. The people specified by the plan shall be able to reach the site in the time specified and be able to perform the duties and provide the advice required within a specified time.

The procedures in the plan shall be tested, and amended if necessary:

- (a) Within three months of a change to persons, procedures, or actions; and
- (b) At least every 12 months.

The results of each test shall be documented and retained for 2 years. Testing of the emergency response plan should cover the range of emergency situations identified.

**H2.4 Availability of the plan**

Keep a copy of the emergency response plan in a waterproof place where it can be easily located by emergency services. The plan may be in a locker attached to the outside of the store or a cupboard in a nearby building. Bear in mind that fumes or fire may prevent access to the plan if it is left inside the store.

The plan shall be available to every person specified in it and the appropriate emergency service. Consideration should be given to sharing the emergency response plan with neighbours.

**H2.5 Review by Fire and Emergency NZ**

Fire and Emergency NZ may review an emergency response plan and recommend changes. The PIC shall, as far as is reasonably practicable, amend their emergency response plan to implement these recommendations.

**H3 Emergency planning – spills****H3.1 General**

Spills of concentrate can occur at the store, at the loading area, during transport, and while mixing or decanting. Spills of dilute spray mix can occur due to equipment failure or during transport. Spills can range from a dribble down the side of a container to a forklift fork going through an intermediate bulk container (IBC) during unloading. In all cases, containment to the site is a basic requirement to be addressed in an emergency response plan.

**H3.2 Spill preparedness**

Effective control can only be achieved if the spill containment materials are immediately to hand and are well labelled so that no time is lost locating materials and equipment.

Spillage, particularly at supplier site, most often occurs in the paved loading and unloading area of store yards in very close proximity to storm water grates. These storm water intakes shall be clearly marked and protected with shut-off valves or the immediate availability of mats, sandbags, or portable dykes and absorbent materials.

Labelled, fit-for-purpose spill kits shall be prominently available near agrichemical storage areas (indoor and outdoor). Spill kits are also recommended for high-use loading areas. See J10.1 for suggested contents of an agrichemical spill kit.

Approved spill-recovery drums appropriately labelled shall be made available in supplier stores. These enable damaged or leaking drums to become immediately safe when deposited in the outer recovery drum.

**H3.3 Management of spills**

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The response to a spill depends on the size, location, and nature of the spill. Table H2 provides guidance for users, summarising the main factors determining the risk associated with an agrichemical spill. Major spills are likely to require notification of emergency services or local authorities. Minor spills may be able to be managed appropriately by the user.

NOTE – The information in Table H2 is generic and users should give precedence to any product-specific guidance provided on the label or SDS.

**Table H2 – Spill hazard guidance chart**

Factor	Minor	Major
Toxicity	Low human toxicity	High human toxicity
Ecotoxicity	Low ecotoxicity	High ecotoxicity
Formulation/physical hazard class	Inert granule	Vapour, flammable, corrosive
Quantity of product	< 1 L	> 1 L
Quantity of spray mix	< 50 L	> 50 L
Surface	Impervious	Absorbent, movement away from surface
Containment	Contained and captured	Movement away from spill site, for example, drains/leaching
Likelihood of contact by people	Trained person wearing PPE	Children, general public nearby
Likelihood of spill reaching sensitive areas (proximity and movement)	Away from water bodies	Near water bodies, above water bodies

Actions in the event of a spillage include the following:

- (a) Assess the scope of emergency:
    - (i) Is the spill major or minor?
    - (ii) Are fumes or gas present, is a chemical reaction underway?
    - (iii) Can I or other immediately available staff cope, or should emergency services be called?
    - (iv) Identify the products and type of hazard involved at a safe distance before getting physically involved. Until the agrichemical is identified, it shall be treated as the most hazardous known to be on the site;
  - (b) Keep people safe:
    - (i) Keep yourself safe
    - (ii) Evacuate people from the area
    - (iii) Prevent non-essential people from entering the area
    - (iv) If the spill involves flammable substances, extinguish all ignition sources (cigarettes, engines, heaters) and move away from the spill before using a mobile phone;
  - (c) Raise the alarm:
    - (i) Depending on the best assessment of the scope of the emergency, either call emergency responses on 111 or relevant emergency 24-hour number, or raise local alarm for minor issues without delay
    - (ii) Always advise others of your plans before attempting any human rescue or salvage;
- NOTE – The regional council should be notified as soon as practicable where it is likely that agrichemicals could enter surface water or soil water or be discharged unsafely into the air.
- (d) Attend to any human casualties. Give first aid if necessary. Follow the instructions of the label, PSC, or SDS;
  - (e) Manage the spill if it is safe to do so:
    - (i) Control the spill. The flow of any liquid being spilled should be controlled as soon as possible regardless of the source, volume, or location (for example, move or turn a leaking drum into a position where leaking stops). Wear suitable PPE
    - (ii) Contain the spill. Spilled agrichemical should not be allowed entry into any body of water, including storm water drains. Prevent the spread of the spillage with improvised bunds made from commercial absorbent socks, dry absorbent, sand, or soil. Spread absorbent material on and around the spilled substance. Control of spills requires immediate availability of containment materials. Wear suitable

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PPE and work upwind, minimising any physical contact with the agrichemical. Beware of fumes and interaction with other agrichemicals. If leaks/spills are due to leaking spray equipment, if possible, move the equipment to a safe place where leakage can be contained

- (iii) Clean up
  - (A) Liquid spills – Pump into a safe container or absorb with appropriate materials. Shovel or sweep up all contaminated sorbent into a leak-proof container awaiting disposal. Use suitable absorbent materials (for example, dry earth or clay, lime, proprietary booms) to contain any liquid. Do not use dispersants or emulsifiers
  - (B) Powder spills – Sweep up and place in a safe container. Alternatively, use a vacuum cleaner and ensure that the dustbag is safely handled and disposed of
  - (C) If the spill needs to be neutralised, get a qualified contractor or contact Fire and Emergency NZ or the regional council. Use appropriate chemicals to neutralise or decontaminate
  - (D) Keep the contaminated area as small as possible. A hose shall not be used to hose down the spilt chemical;

NOTE – For a major spill, evacuate area, erect barricades, and wait for Fire and Emergency NZ personnel. Make safety response information available to the emergency services on their arrival.

- (f) Re-establish controls:
  - (i) With the spill safely contained and absorbed awaiting treatment or collection and any personnel safety issues under control, review the safety information (SDS/PSC) for confirmation of actions taken and next steps
  - (ii) Consider whether professionals need to deal with the absorbed spill. Contact the manufacturing company for advice and/or the regional council for confirmation on disposal procedures
  - (iii) Review SDS recommendations for site decontamination substances and procedure
  - (iv) All exposed/contaminated salvage personnel involved in the recovery and clean-up shall remove their protective clothing and wash thoroughly (see Appendix R)
  - (v) Any materials used to deal with the spill emergency should be replaced; and
- (g) Review – The PIC should review why the spill occurred and develop procedures to prevent a recurrence.

NOTE – Spill response advice may be available from the regional council.

## **H4 Emergency planning – fire**

### **H4.1 Fire preparedness**

All workplaces shall provide at least one 30B-rated fire extinguisher outside or close to the agrichemical store and ensure it is in working condition. Additional fire extinguishers will be required when quantities of hazardous substances exceed the threshold levels. (See Table J4.)

Where fire alarms are installed, they shall be clearly marked and their operation known to all employees. Pre-planned fire drills simulating an actual fire shall be held so that staff and emergency services can familiarise themselves with the agreed procedures.

### **H4.2 Emergency actions – fire**

In the event of a fire involving agrichemicals, carry out the following actions:

- (a) Assess the situation:
  - (i) How big is the fire?
  - (ii) Are there flammable items nearby?
  - (iii) Can I or other immediately available staff cope, or should emergency services be called?
  - (iv) Identify the products and type of hazard involved at a safe distance before getting physically involved. Until the agrichemical is identified, it shall be treated as the most hazardous known to be on the site;
- (b) Keep people safe:
  - (i) The premises or property shall be evacuated
  - (ii) If significant smoke is being generated, all people and animals in the vicinity, especially downwind, shall be evacuated;
- (c) Raise the alarm:
  - (i) Let other people know there's a fire
  - (ii) Fire and Emergency NZ shall be contacted
  - (iii) Attend to any human casualties



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- (iv) Any person exposed to fumes, smoke, or splashing and any person showing signs of having been affected such as illness, dizziness, or headaches shall be treated by medical professionals immediately;
- (d) Manage the fire if it is safe to do so:
- (i) Fire should be fought with water fog, foam, or dry agent. If only water is available, it shall be used as a fine spray or fog. Water jets from high-pressure hoses break containers and can make a chemical fire worse
  - (ii) Firefighting water and spilt agrichemical shall be contained throughout the firefighting operation
  - (iii) If dangers arise from exploding containers or there is emission of noxious fumes, consider withdrawing and allowing the fire to burn out under the supervision of Fire and Emergency NZ personnel
  - (iv) Firefighters shall be made aware of the hazards on the premises. The inventory and associated site plan will meet this requirement
  - (v) If a serious fire warrants firefighting with large volumes of water and run-off containment is threatened, the regional council shall be informed
  - (vi) Additional secondary containment or dykes shall be built to contain the run-off;
- (e) Re-establish controls:
- (i) WorkSafe shall be advised (see Appendix P regarding notifiable events)
  - (ii) Clean-up procedures shall only commence once Fire and Emergency NZ, WorkSafe and regional council clearance has been given
  - (iii) Controls such as security of hazardous substances shall be re-established as soon as practicable; and
- (f) Review – The PIC should review why the fire occurred and develop procedures to prevent a recurrence.

NOTE –

- (1) In the event of a fire in any agrichemical storage building, it is essential that Fire and Emergency NZ be notified by dialling 111. Once Fire and Emergency NZ has been notified, and it is considered safe, the fire can be attacked with any suitable firefighting equipment available.
- (2) When notifying emergency services, use a RAPID (Rural Address Property Identification) number where one exists, to help the services accurately locate the emergency site if it is in a rural area.

**H4.3 HAZCHEM code**

The HAZCHEM code provides immediate action details for the initial emergency management of a fire or spill involving agrichemicals. The code consists of a number followed by a letter, as set out in Table H3 and Table H4. In some cases, there is a second letter, 'E'. The number indicates the most suitable medium for firefighting. The first letter provides information as to the most suitable protective clothing, whether the chemical can be reactive, and whether the chemical needs to be contained or diluted. The letter 'E' requires the evacuation of the hazard area to be considered.

**Table H3 – HAZCHEM numbers**

Number	Firefighting response
1	Jets/coarse spray
2	Fog/fine spray
3	Foam
4	Dry agent

**Table H4 – HAZCHEM letters**

Letter	Risk of violent reaction or explosion	Protection requirements for fire response	Appropriate measures
P	V	FULL	Dilute
R			
S	V	BA	
T			Contain
W	V	FULL	
X			
Y	V	BA	
Z			

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Letter	Additional considerations
E	Public safety hazard – consider evacuation

NOTE –

- (1) FOG – In the absence of fog equipment a fine spray mist may be used.
- (2) DRY AGENT – Water must not come into contact with the substance at risk.
- (3) V – Can be violently or even explosively reactive.
- (4) FULL – Full-body protective clothing with breathing apparatus.
- (5) BA – Breathing apparatus plus protective gloves.
- (6) DILUTE – May be washed to drain with large quantities of water. However, due care must be taken to avoid pollution of water bodies.
- (7) CONTAIN – Prevent spillage from entering water bodies, by any available means.
- (8) CONSIDER EVACUATION – This is the first priority. In case of doubt, evacuate the immediate vicinity and request police assistance.

## **H5 Emergency planning – transport**

### **H5.1 Emergency preparedness – transport incident**

#### *H5.1.1 Information*

The consignor shall provide emergency response information (ERI) for all sales of dangerous goods. Drivers shall carry ERI when carrying agrichemicals that are dangerous goods on the road. This provides the key information required in dealing with transport emergencies.

The primary source of ERI is the SDS for the product. A PSC will also provide emergency information. Another source of ERI is the SNZ HB 76. This booklet-size guide provides emergency information once the user has correctly identified the UN number or proper shipping name.

Responsible Care operates a 24-hour emergency response service specifically designed to help manage transport emergencies involving dangerous goods. The number is 0800 CHEMCALL (0800 243 622).

#### *H5.1.2 Emergency response plan*

The emergency response plan shall be made in consultation between the prime contractor and the consignor for whom they are transporting dangerous goods. The emergency response plan shall be written down and all people involved – particularly drivers – shall be aware of what they have to do in an emergency.

More specifically, emergency response plans for transport should include the following procedures and actions:

- (a) For packaged goods:
  - (i) Arrange for any special supplies or equipment, including PPE, to be immediately available at the scene of an emergency, or within a reasonable time
  - (ii) Give technical advice on the properties and hazards of the products dispatched
  - (iii) Have an agreed plan of operations and communications with the prime contractor for the actions both will take in an emergency; and
- (b) For bulk loads:
  - (i) Maintain a continuous telephone service while the goods are on the vehicle
  - (ii) Ensure that whoever answers the phone knows what to do, that is, the person is technically trained and understands the properties and hazards of the products and is capable of giving advice for them;

or

- (iii) Ensure the person who answers the telephone is able to contact a technically competent person quickly and that this person has the means of going to the scene quickly if required to do so
- (iv) Consider whether neutralising chemicals are needed in case of a spill and ensure that they can get a supply of the chemicals at short notice
- (v) Consider the equipment required for the transfer of goods from a disabled tanker and the source of supply of such equipment
- (vi) Consider what safety equipment, including PPE, is necessary for handling a spill and how such equipment will be available for any staff who may have to visit the scene of an emergency.

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The prime contractor shall make arrangements for special equipment needed for recovery of the vehicle to be available at the scene of an emergency within a reasonable period of time.

### **H5.2 Emergency actions – transport incident**

In an emergency involving a breakdown or where a spill of hazardous substances has occurred, the driver shall not put themselves or the public at risk. The driver has the following responsibilities:

- (a) Assess the nature of the emergency;
- (b) Keep people safe; and
- (c) Raise the alarm.

The driver shall carry out the following duties:

- (a) Where no spill has occurred:
  - (i) Move the vehicle to a safe position clear of traffic (if possible)
  - (ii) If the vehicle cannot be moved to a safe position, turn on hazard warning lights and put out emergency warning triangles
  - (iii) If the vehicle is blocking the road, contact the police to control traffic until the vehicle is recovered
  - (iv) Contact the prime contractor, or cause them to be contacted as soon as practical, to enable them to either lead or provide support to emergency services to manage the situation, including making arrangements so that the vehicle can be recovered; and
- (b) Where a spill of hazardous substances has occurred:
  - (i) Do a preliminary assessment of the situation
  - (ii) Warn persons in the area who may be at risk
  - (iii) If the vehicle cannot be moved to a safe position clear of traffic, put out emergency warning triangles
  - (iv) Contact the nearest police or fire brigade informing them of the situation (or cause them to be informed) and the proper shipping name and UN number of the substance which is leaking
  - (v) Put on whatever safety gear has been provided suitable for the hazardous substance and take whatever actions are required by the ERI, which is sometimes attached to or part of the dangerous goods declaration (DGD)

NOTE – Drivers must on no account put themselves at risk.

- (vi) Give the police and fire and emergency services such assistance and information as they may require, for example, copies of the DGD/ERI
- (vii) Inform the prime contractor (or cause them to be informed) as soon as practical.

Once aware of the event, the prime contractor, together with the consignor, shall do the following:

- (c) Manage the situation (if there is spilt product, see guidance set out for spill management in H3.3, including advising the local authority, that is, the regional or district council, and the property owner of the spillage);
- (d) Re-establish controls; and
- (e) Undertake a review of the event and the response.

## **H6 Emergency planning – floods**

### **H6.1 Flood preparedness**

To prevent adverse effects arising from flooding, ensure that the agrichemical store is not located in a flood-prone area and is away from potential water courses generated by flooding. Be aware also of the impact of floating debris during flooding.

Additional measures include keeping wettable powders on the top shelves of the store, and ensuring the agrichemical store is locked and securely attached to its base.

### **H6.2 Emergency actions – flood**

If warning is provided of flooding, the following actions should be considered:

- (a) Sandbagging around agrichemical store; and
- (b) Moving product to a temporary store that is unlikely to be affected.

At all times, consider your own safety. Do not go into flood areas alone.

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## **APPENDIX J – GENERAL STORAGE REQUIREMENTS**

(Normative)

### **J1 Scope**

Safe and secure storage of agrichemicals is essential:

- (a) To ensure compliance with the regulatory requirements; and
- (b) To protect people, animals, and the environment.

Requirements for agrichemical stores are largely determined by the type and quantity of products stored. However, another consideration in determining controls is whether containers are open or closed (that is, are sealed and have never been opened).

NOTE – See Appendix L for guidance on mixing sites.

The scope of this appendix is limited to packaged agrichemicals. Many workplaces have other hazardous substances on-site such as fuel, paint, fumigants, VTAs, and ammunition. These are not covered in this appendix except as they directly relate to the storage of agrichemicals.

Suppliers shall comply with the relevant requirements set out in this appendix but additional obligations may apply due to the quantity and range of hazardous substances stored. General requirements for the storage of mixed classes of dangerous goods are set out in AS/NZS 3833 and there are additional specific requirements in the Hazardous Substances Regulations. In addition, any local authority resource consent to operate a store will impose specific conditions needing to be adopted for a particular site. Suppliers should seek expert advice when establishing a storage facility or rearranging the floor plan for product storage.

NOTE – AS/NZS 3833 does not apply to agrichemicals supplied in bulk containers. 'Bulk' refers to liquid or gaseous substances contained in receptacles of a capacity greater than 250 L. Surface containers of over 60 L and up to 450 L are considered as non-bulk under the Hazardous Substances Regulations.

Always seek expert advice before building storage facilities for agrichemicals where circumstances differ from those covered by this standard.

### **J2 Risk management**

#### **J2.1 Inventory**

All workplaces storing hazardous substances shall have an inventory. An inventory can be completed on paper, in an electronic document or spreadsheet, or in an online application such as WorkSafe's hazardous substances calculator. For each hazardous substance, the inventory shall include the following:

- (a) Full trade name of the product (or chemical name);
- (b) UN number;
- (c) Maximum likely quantity at the workplace;
- (d) Location of the substance; and
- (e) Any specific storage and segregation requirements.

It is also useful to record the following:

- (f) Hazard classes of the product;
- (g) HSNO approval number; and
- (h) Any specific use requirements.

NOTE – The maximum likely quantity may vary during the year. It is recommended that the high point of the year be used to determine maximum risk and therefore actions required to manage that risk.

A current safety data sheet (SDS) for each product shall be included with the inventory. The completed inventory can then be used to calculate total quantities by hazard class to enable assessment against the thresholds for controls set out in the Hazardous Substances Regulations and summarised in this appendix.

NOTE – WorkSafe's online hazardous substances calculator will provide a list of the controls arising given a list of hazardous substances and quantities of each.

#### **J2.2 Emergency management planning**

All agrichemical storage areas require some emergency planning. The extent of the plan depends on the quantities and type of agrichemicals held in the store. See Appendix H for full details of emergency management requirements.

Management of major and minor spills, fire, and transport emergencies is also covered in Appendix H.

### **J3 Location**

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Regardless of whether the agrichemical store is a stand-alone facility, attached to an existing building, or an outdoor store, storage areas shall be located:

- (a) Away from obvious hazards such as incinerators, welding gear, and areas where fuel or other flammable materials are stored. Keep the surrounding area clear of combustible vegetation and refuse by at least 3 m;
- (b) Protected from strong winds, and away from any area that has a flood risk;
- (c) At least 15 m away from public places, protected places, and areas of possible pollution risk. These include dwellings, livestock buildings, packhouses, fodder, feeds, crops;
- (d) At least 20 m from any water body, well, or bore and other environmentally sensitive areas; and
- (e) At least 20 m from farm dairies and 45 m from water source on dairy farms.

If the store is inside another building, it shall be on the ground floor. All the requirements above shall be met, with the exception of (c). In this situation, quantities of flammable, acutely toxic, and corrosive substances shall be managed so the thresholds for separation distances set under the Hazardous Substances Regulations are not exceeded and/or fireproofing of the store will be required. Storage in metal cabinets in accordance with J4.2 complies with these thresholds.

NOTE –

- (1) Some local authorities have more stringent setbacks for the location of agrichemical storage sheds, such as distances from water bodies and bores.
- (2) Setbacks for on-farm storage of fuel are different.
- (3) For stores with over 10 000 kg or L of flammable or 1000 kg or L of high acute toxicity, greater separation distances may be required. Refer to the Hazardous Substances Regulations.

**J3.2 Suppliers***J3.2.1 General*

Manufacturer and retailer location requirements will be different, but the first need is to meet the local authority requirements for resource consent to operate a hazardous substances store in particular zones in industrial, light industrial, or rural categories of the district plan for the particular operation (for example, manufacture, distributor, transit store, or retail). Proximity to sensitive environmental areas and sensitive land uses such as schools, hospitals, or residential areas will influence the suitability of the site. A resource consent may be required.

Hazardous substances shall be stored away from protected and public places such as dwellings and public roads. There are a number of exemptions to the standard separation distances for retail suppliers:

*J3.2.2 Toxic and corrosive substances*

Reduced separation distances from protected places apply for retail storage of toxic and corrosive substances. Separation from public places is not required if the conditions set out in J8.3 are met.

GHS classification	HSNO class	Separation distances from protected places
Acutely toxic category A	6.1A	10 m (50–1000 kg)
Acutely toxic category B and C	6.1B and C	Nil if in closed containers
Skin corrosive category A and B	8.2A and B	Nil if in closed containers

*J3.2.3 Flammable liquids*

There shall be a minimum of 3 m physical distance kept between the store and the title boundary or protected places unless strict fire-resistance ratings are met for the building. A supplier storing more than 2000 L of flammable substances shall keep isolation distances to title boundaries in accordance with the resource consent as well as HSWA regulations.

Outside storage of flammable liquids, for example, in the yard, requires different separation distances if the containers are larger than 60 L:

Quantity stored outside	Separation distance to protected place
Up to 250 L	3 m

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1000 L	6 m
10 000 L	15 m

NOTE – Separation distances are calculated by linear extrapolation if in between quantity thresholds.

## **J4 Construction**

### **J4.1 General**

Construction of an agrichemical store shall take account of the maximum volume of hazardous substances likely to be stored at any one time. The inventory will provide this information.

Construct the store soundly, in compliance with any resource consent, local by-laws and regional and district plans. Important store features include the following:

- (a) A fully bunded impervious floor or drip trays which will readily contain any spilled product. See J10;
- (b) Walls and roof made of fire-resistant materials which are also compatible with the products to be stored (see Table J1 for requirements for flammable storage);
- (c) Moisture control. The store must be dry at all times to prevent spoilage;
- (d) Temperature control:
  - (i) Store products out of direct sunlight and away from any heat source
  - (ii) Ensure products do not freeze as this might damage the integrity of the container;
- (e) Good ventilation:
  - (i) Flammable substances shall be provided with enough ventilation to control the flammable vapour concentrations and to maintain oxygen levels
  - (ii) Adequate ventilation shall also be provided when toxic products are stored
  - (iii) Vents located in the upper and lower walls as well as the roof should provide natural ventilation, although vents may compromise fire resistance rating. Vents shall not be below the level of any bunding
  - (iv) If an extractor fan is used where flammable products are stored, it must be intrinsically safe;
- (f) Good lighting. If electrical lighting is required, it must be suitable for use in a hazardous area;
- (g) Ability to prevent unauthorised access, for example, lock;
- (h) Convenient access, with forklift access for larger stores. This will lessen the likelihood of spills and facilitate any emergency operation;
- (i) Shelving shall be fit for purpose:
  - (i) Racking and storage shelving shall be securely fastened to the floor or support beams to minimise spillage in the event of an earthquake
  - (ii) Shelving shall be resistant to the products being stored, in case of spills
  - (iii) Unless purposefully designed to act as spill trays, shelves should be constructed so they prevent pooling of liquid;
- (j) Water supply nearby for handwashing; and
- (k) If a hazardous substance location (see Table J7), the store shall also have:
  - (i) A safety shower
  - (ii) Eye-washing facilities
  - (iii) Two means of access if more than 25 m<sup>2</sup> in size.

**Table J1 – Construction requirements for storage of flammable products**

<b>Quantities and class of flammable liquids</b>	<b>Construction requirements</b>
No flammable substances or only category 4 flammable liquids (HSNO class 3.1D)	No specific construction requirements apply but fire-resistant materials are recommended.
Up to 60 L of flammable liquid category 1 or 2 or up to 250 L of flammable liquid category 3	Fire-resistant materials shall be used for all parts of the buildings within 6 m of the flammable substances.
> 60 L of flammable liquid category 1 or 2 and/or > 250 L of flammable liquid category 3	The walls, ceiling, and door(s) of the store shall be constructed to specific fire-resistance rating requirements. Refer to the Hazardous Substances Regulations for details.

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NOTE – Refer to the Hazardous Substances Regulations for full requirements for fire resistance rating of stores based on whether they are stand-alone or inside another building and the quantities/classes of flammable products stored.

#### **J4.2 Metal cabinets**

For small quantities of agrichemicals (less than 250 kg or L), a metal cabinet within an existing building may be suitable. In addition to a maximum total quantity of 250 kg or L of agrichemicals, the following additional restrictions apply to particular classes of hazardous substances that can be stored in a metal cabinet:

- (a) Toxic substances – Not more than 25 kg or L of acute toxicity category 1 (HSNO class 6.1A) and not more than 50 kg or L of acute toxicity category 2 (HSNO class 6.1B);
- (b) Corrosive substances – Not more than 50 kg or L of Skin corrosion category 1A (HSNO class 8.2A) and not more than 250 kg or L of Skin corrosion category 1B (HSNO class 8.2B); and
- (c) Flammable liquids – Each container is a maximum of 20 L.

NOTE – Quantity sum ratio applies (see J11.2), that is, total quantity of all toxic and corrosive substances must be considered against thresholds, not individual hazard classes.

Cabinets shall be designed for the storage of hazardous substances and meet the appropriate New Zealand or international standard (refer to Hazardous Substances Regulations).

As with any storage facility, products that are incompatible or may react dangerously shall not be stored in the same cabinet (see Table J3). Oxidising substances and organic peroxides shall be stored in a separate cabinet from toxic, corrosive, and/or flammable products.

Appropriate signage (see J6) shall be displayed on the exterior of the cabinet and the cabinets shall be kept locked.

The cabinet shall be located so that it is:

- (d) Not on a fire exit route;
- (e) Near a source of water for handwashing;
- (f) At least 5 m away from any other cabinet storing hazardous substances; and
- (g) At least 6 m from any ignition sources if flammable or oxidising substances stored.

#### **J4.3 Outside storage areas**

Outside storage is not generally recommended but is sometimes suitable for storage of large containers such as intermediate bulk containers (IBCs) of low-toxicity products where forklift access to the agrichemical store is not available. The area should be secured, either with fencing or with padlocks on the containers themselves. Consideration should also be given to protection of the products from extreme temperatures.

NOTE – If quantities stored are above the threshold for secondary containment (see Table J5), it is unlikely outdoor storage will be suitable unless there is a bespoke storm water drainage system.

#### **J5 Security and restricted access**

All storage areas shall be secured to prevent access by children, unauthorised persons, pets, livestock, and vermin.

If substances are held in the store that must be under the control of a certified handler, then access to these products shall be restricted to certified handlers only, unless the certified handler is present in the store, has provided guidance, and is available to assist if required. This may require a locked cabinet within the main agrichemical store.

If substances are held in the store that must be under the control of a person holding a controlled substance licence (CSL), the substances shall only be held on-site if the CSL is current and covers the specific agrichemical. Access to the controlled substances shall be restricted to the holder of the CSL only. This may require a locked cabinet within the main agrichemical store.

#### **J6 Signage and information**

All agrichemical storage areas shall at a minimum have 'No Smoking' and orange 'HAZCHEM Agrichemicals' signage secured to the agrichemical storage building in such a way as to be clearly visible from all normal lines of approach.

Where the aggregate quantity of any one hazardous substance classification exceeds the amount specified in Table J2, signage that meets the requirements of clauses 2.5–2.10 of the Hazardous Substances Regulations shall be provided.

- (a) This signage shall:

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- (i) Advise that the location contains hazardous substances, that is, 'HAZCHEM'
  - (ii) Describe the hazardous property and nature of the hazard(s) of the substance and/or display hazard pictograms
  - (iii) Describe the precautions needed to safely manage the substance
  - (iv) Give contacts for emergency response personnel
  - (v) Describe the immediate actions to take in the event of an emergency, for example, ring 111;
- (b) Signage shall be:
- (i) Easily understood
  - (ii) Easily read from 10 m distance, under varying conditions (for example, rain or low light)
  - (iii) Resistant to sunlight and require little maintenance
  - (iv) Be maintained or replaced when required; and
- (c) Signage shall be situated so it is clearly visible to people entering a place where hazardous substances are located:
- (i) For standalone stores – On the outside of the building where the hazardous substances are stored
  - (ii) For stores or cabinets within a building – Outside the room/cabinet within the building where the agrichemicals are stored
  - (iii) For outdoor storage areas – Immediately next to that area
  - (iv) For farm dairies containing dairy detergents and sanitisers – At the primary vehicular or pedestrian entrance to the building (signage is not required at entries that are only used by animals)
  - (v) At every vehicular and pedestrian entry to the land if the property has multiple hazardous substance storage locations.

**Table J2 – Threshold levels for hazard-specific signage**

GHS classification	HSNO class	Amount (trigger level) for hazard-specific signage
Flammable liquid category 1	3.1A	50 kg or L (see note 2 exemptions apply)
Flammable liquid category 2	3.1B	250 kg or L
Flammable liquid category 3	3.1C	1000 kg or L
Flammable liquid category 4	3.1D	10 000 kg or L
Oxidising liquid or solid category 1	5.1.1A	50 kg or L
Oxidising liquid or solid category 2	5.1.1B	500 kg or L
Oxidising liquid or solid category 3	5.1.1C	1000 kg or L
Corrosive to metals category 1	8.1A	1000 kg or L
Acute toxicity category 1	6.1A	50 kg or L
Acute toxicity category 2	6.1B	250 kg or L
Acute toxicity category 3	6.1C	1000 kg or L
Acute toxicity category 4	6.1D	10 000 kg or L
Skin corrosion category 1A	8.2A	50 kg or L
Skin corrosion category 1B	8.2B	250 kg or L
Skin corrosion category 1C	8.2C	1000kg or L
Serious eye damage category 1	8.3A	1000 kg or L
Hazardous to the aquatic environment category 1	9.1A	100 kg or L
Hazardous to the aquatic environment category 2	9.1B	1000 kg or L
Hazardous to the aquatic environment category 3	9.1C	



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Hazardous to the aquatic environment category 4	9.1D	10 000 kg or L
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NOTE –

- (1) Only classes relevant to agrichemicals included.
- (2) Threshold for petrol, aviation gasoline, racing gasoline is 250 L.

In addition, any other notices or warnings required by other regulatory authorities shall be displayed. This includes the requirements of the HSWA and the HSNO Act.

**J7 Safety equipment**

A suitable first aid kit shall be available (see Appendix Q). This should be kept away from the agrichemicals to prevent contamination. If products with high human toxicity are stored, a source of clean water shall be available nearby for washing hands, rinsing, and clean-up.

Personal protective clothing appropriate for the products in the store shall be provided. At a minimum, include suitable gloves, overalls, and eye protection (goggles or face shields). This PPE and first aid equipment should be stored in a separate, clean storage area nearby or an airtight cabinet or container.

Always read the product information before handling a product to find out what specific protective equipment is needed.

If quantities of product exceed those for the establishment of a hazardous substances location (see J11), the following facilities shall be provided:

- (a) Safety shower;
- (b) Eye-wash facilities; and
- (c) Water for handwashing.

**J8 Segregation of incompatible products****J8.1 General**

Products that are incompatible (see Table J3) shall be stored away from each other. Products shall also be segregated from products they may react dangerously with (refer to the SDS for product-specific information).

**Table J3 – Incompatible products**

Hazard class	Incompatible substances and materials
Flammable liquids (HSNO class 3.1)	All substances with a physical hazard classification (HSNO classes 1–5) except: - Other flammable liquids (HSNO class 3.1) - Corrosive to metals (HSNO class 8.1)
Oxidising substances (HSNO class 5.1)	All substances with a physical hazard classification except: - Other oxidising substances (HSNO class 5.1) Acute toxicity category 1, 2, 3 (HSNO class 6.1A, 6.1B, 6.1C) All corrosives (HSNO class 8) Any organic matter or substance that contains carbon
Acute toxicity category 1, 2, 3 (HSNO class 6.1A, 6.1B, 6.1C)	All explosives (HSNO class 1) All oxidising substances and organic peroxides (HSNO class 5)
All toxic cyanides	All explosives (HSNO class 1) All oxidising substances and organic peroxides (HSNO class 5) All corrosive acids (HSNO class 8.2)
Corrosive acids (HSNO class 8.2A and 8.2B)	All explosives (HSNO class 1) All oxidising substances and organic peroxides (class 5) All toxic cyanides

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	All corrosive alkalis (HSNO class 8.2)
Corrosive alkali (HSNO class 8.2A and 8.2B)	All explosives (HSNO class 1) All oxidising substances and organic peroxides (HSNO class 5) All corrosive acids (HSNO class 8.2)
Hazardous to the aquatic environment (HSNO class 9.1)	All explosives (HSNO class 1) All oxidising substances and organic peroxides (class 5)

NOTE – Excludes explosives, flammable gases, and self-reactive substances. If these products are stored, there are additional incompatibilities.

### J8.2 Users

Flammable liquids and products with aquatic toxicity should be stored at least 3 m from incompatible products.

Toxic and corrosive products shall be stored 5 m from incompatible products unless:

- Both products are powders, in which case the distance may be reduced to 3 m; or
- The products are stored in separately bunded areas (or suitable cabinets).

For quantities of oxidising substances up to 1000 kg or L, the segregation distance from incompatible products shall be:

- Category 1 (HSNO class 5.1.1.A) – 5 m; and
- Category 2 (HSNO class 5.1.1.B) – 3 m.

NOTE – For quantities over 1000 kg or L, refer to the Hazardous Substances Regulations.

### J8.3 Suppliers

Within a retail store storage areas accessible to the public shall meet the following conditions:

- A maximum of 20 L of flammable liquid category A is stored;
- All containers remain closed;
- Flammable liquids category B and C are segregated from:
  - Flammable gases (HSNO class 2) by 1.5 m
  - Aerosols > 200 L by 1.5 m
  - Oxidising substances (HSNO class 5) by 3 m;
- Stores comply with the general requirements for retail storage of AS/NZS 3833:2007; and
- Maximum of 8000 L of product is stored, in maximum container sizes of:
  - 5 L for category B
  - 20 L for category C.

NOTE – Refer to Hazardous Substances Regulations for full details of allowances for retail stores.

## J9 Managing the risk of fire

### J9.1 Storage precautions

In addition to ensuring flammable and oxidising substance are segregated from incompatible substances (see J8) and the agrichemical store is constructed of suitable materials (see J4.1), the risk of ignition must be managed.

Storage of any quantity of category 1, 2, or 3 flammable liquids (HSNO class 3.1A, 3.1B, or 3.1C) requires special precautions. A hazardous area shall be defined as 5 m around the storage area and marked on the site plan. Potential sources of ignition shall not be present within 15 m of the store if more than 30 L of category 1 or 2 flammable liquids (HSNO class 3.1A or 3.1B) are stored, or within 6 m if more than 30 L of category 3 flammable liquids (HSNO class 3.1C) are present. The PIC shall do the following:

- Designate the store and its surroundings as a 'no smoking area';
- Ensure there is no potential source of sparks such as machinery, vehicles, or mobile phones. A flameproof or spark arrestor supplied vehicle shall be used in stores where flammables are present;
- Ensure any electric lighting, ventilation, or other equipment is intrinsically safe and well-maintained; and
- Maintain the temperature of store at least 20% below the flashpoint of the products stored.

NOTE – Refer to section 9 of the product's SDS for its flashpoint.

All oxidising substances shall be kept away from ignition sources. Where quantities of oxidising substances exceed those set out in Table J7, specific requirements apply:

- Unopened containers shall be stored at least 5 m from any potential ignition source. Where containers are open, they shall be stored at least 8 m from any ignition source; and

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(f) The temperature in the store shall be at least 15°C below the substance's decomposition temperature.

**J9.2 Fire protection systems**

Fire protection and response systems shall be so designed that the emergency response equipment is appropriate for the type, class, and quantities of agrichemicals stored.

The fire protection system in a store used to contain agrichemicals shall provide firefighting equipment suitable for the materials stored and with enough capacity to do the following:

- (a) Quickly control and extinguish any fire that may occur; and
- (b) Provide fire protection to prevent agrichemicals from being affected by any nearby fire.

**J9.3 Fire extinguishers**

At least one 30B-rated fire extinguisher shall be provided outside the store. If quantities exceed those in Table J4, then additional fire extinguishers shall be provided. Fire extinguishers should be regularly maintained and tested.

**Table J4 – Number of fire extinguishers required for flammable products**

GHS classification	HSNO class	Quantity threshold	Number of fire extinguishers required
Flammable liquid category 1	3.1A	50 L	1
		200 L	2
Flammable liquid category 2	3.1B	250 L	2
Flammable liquid category 3 or 4	3.1C or 3.1D	500 L	2
Oxidising substance category 1	5.1.1A	5 L or 5 kg	1
		25 L or 25 kg	2
Oxidising substance category 2	5.1.1B	200 L or 200 kg	1
		500 L or 500 kg	2
Oxidising substance category 3	5.1.1C	500 L or 500 kg	2

Locate the appropriate number of fire extinguishers no further than 30 m from where the agrichemical is located and ensure they are visible and readily accessible, for example, not inside locked building. These location points shall be near normal staff working areas and along exit routes and shall be well identified with signage located above eye level.

**J9.4 Smoke detection devices**

Users shall install smoke alarms in agrichemical stores located within a building where people are regularly present if flammable liquids are opened for measuring or decanting and stored once opened.

Suppliers should consider a monitored alarm system in conjunction with their security system. Regular checks shall be made on effectiveness.

**J10 Spill control****J10.1 Spill kits**

A spill kit suitable for the products stored shall be readily available. For corrosive products, chemicals for neutralising or decontaminating spills shall also be available.

Contents of a spill kit should include the following:

- (a) Suitable PPE;
- (b) Absorbent material (not sawdust);
- (c) Spill containment equipment such as grate covers and absorbent socks;
- (d) Broom and shovel;
- (e) Plastic bag or container for contaminated material; and
- (f) Emergency procedures information (see Appendix H).

**J10.2 Secondary containment**

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Secondary containment may be required depending on the substance and the amount stored at any one time. The Hazardous Substances Regulations and EPA Hazardous Property Controls Notice require that secondary containment be provided when the quantities of pooling substances exceed certain levels. See Table J5.

**Table J5 – Threshold quantities for secondary containment**

GHS classification	HSNO class	Quantity
Flammable liquid category 1	3.1A (see note 2)	100 L
Flammable liquid category 2	3.1B	1000 L
Flammable liquid category 3 or 4	3.1C, 3.1D	10 000 L
Oxidising liquid category 1	5.1.1A	50 L
Oxidising liquid category 2	5.1.1B	500 L
Oxidising liquid category 3	5.1.1C	5000L
Acute toxicity (oral, dermal, or inhalation) category 1, 2, or 3	6.1A, 6.1B, 6.1C	100 L
Acute toxicity (oral, dermal, or inhalation) category 4	6.1D	1000 L
Respiratory sensitisation category 1	6.5A	
Contact sensitisation category 1	6.5B	
Carcinogenicity category 1	6.7A	
Germ cell mutagenicity category 1	6.6A	10 000 L
Carcinogenicity category 2	6.7B	
Reproductive toxicity category 1	6.8A	
Specific target organ toxicity (single or repeated exposure) category 1	6.9A	
Skin corrosion category 1A	8.2A	100 L
Skin corrosion category 1B	8.2B	1000 L
Skin corrosion category 1C	8.2C	10 000 L
Serious eye damage category 1	8.3A	
Hazardous to the aquatic environment category 1 (acute or chronic)	9.1A	100 L
Hazardous to the aquatic environment category 2 or 3 (acute or chronic)	9.1B, 9.1C	1000 L
Hazardous to the aquatic environment category 4 (acute or chronic)	9.1D	10 000 L

NOTE –

- (1) Only classes relevant to agrichemicals included; refer to Hazardous Substances Regulations for all classes.
- (2) The threshold for petrol, aviation gasoline, racing gasoline, and kerosene is 1000 L.

If secondary containment is required, the PIC shall ensure that any part of the storage facility where a hazardous substance spill may occur is serviced by a secondary containment system. The perimeter of all storage areas shall be properly bunded. This secondary containment shall adequately contain spillage from packages stored in an outdoor yard or a building, and also in specific chemical or dangerous goods storage areas.

The system shall be constructed from impervious materials resistant to the hazardous substances used or stored on the site. The secondary containment system or bunding provided in a store used to contain agrichemicals shall provide enough containment capacity for the volume of materials stored and should also allow for firefighting waters. Table J6 sets out the capacity requirements for secondary containment.

**Table J6 – Secondary containment capacity requirements**

Container size	Hazard classification	Total volume stored	Containment capacity needed
Up to 60 L each		< 5000 L	50% of the total volume stored

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	Physical hazard grouping (HSNO classes 2–5)	≥ 5000 L	2500 L or 25% of total volume stored, whichever is greater
	Health hazard grouping (HSNO classes 6–8)	< 20 000 L	25% of the total volume stored
		≥ 20 000 L	5000 L or 5% of total volume stored, whichever is greater
Over 60 L and up to 450 L	Physical hazard grouping (HSNO classes 2–5)	< 5000 L	100% of the total volume stored
		≥ 5000 L	5000 L or 50% of total volume stored, whichever is greater
	Health hazard grouping (HSNO classes 6–8)	< 20 000 L	25% of the total volume stored or 110% of largest container stored
		≥ 20,000 L	5000 L or 5% of total volume stored, whichever is greater
Over 450 L	Physical hazard or health hazard grouping (HSNO classes 2–8)	< 5000 L	100% of the total volume stored
		≥ 5000 L	5000 L or 50% of total volume stored, whichever is greater

NOTE –

- (1) Where there are containers of different size categories, the containment volume required is the sum of the volumes for each category.
- (2) An area 10 m x 10 m with a kerb 100 mm high has a capacity of 10 000 L (1 m<sup>3</sup> = 1000 L).

**J10.3 Segregation systems for spills**

Where incompatible substances are stored in the same facility, the secondary containment shall ensure that incompatible substances remain segregated in the event of spills and leaks. For example, there may need to be separately bunded floor areas.

The building layout and segregation system used shall ensure that any spilt flammable or oxidising substances are contained in such a manner that they cannot be ignited. A metal storage cabinet is one way of achieving this.

The building layout and segregation system used shall also prevent people from being exposed to spilt toxic or corrosive substances when they are contained.

Suppliers will need to consider public access issues if these spilt substances are to be retained within the confines of the retail access areas. Similarly, public exposure issues shall be taken into account when devising containment systems for outdoor drum storage areas.

**J10.4 Storm water protection**

The spill management system shall be able to prevent discharge of any contaminated storm water into any wastewater network, unless permitted by the local authority. If the storm water drainage system is connected to the local storm water system, then:

- (a) There shall be a means of quickly blocking off the site drainage system in the event of a spillage; and
- (b) There shall be a procedure for removing spillage and any diluent.

Storm water intakes shall be clearly marked with yellow paint. They are often located in the middle of paved areas and shall be either protected with cut-off valves or able to be blocked off with mats, socks, or sandbags. These spill-control mechanisms shall be clearly labelled and located adjacent to the storm water grates needing protection.

**J11 Location compliance certificate****J11.1 Threshold quantities**

Where significant quantities of hazardous goods are stored, additional controls apply. If quantities stored exceed the quantities set out in Table J7, then the site is deemed to be a hazardous substance location unless the substances are present for less than 24 hours (or less than 2 hours for tracked substances).

Hazardous substance locations shall be notified to WorkSafe at least 30 days prior to commissioning and shall gain a location compliance certificate (LCC) from a WorkSafe authorised compliance certifier. Compliance with all the requirements for safe storage of hazardous substances is a prerequisite for the LCC, as well as a site

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plan being available, and staff having been trained. Quantities being stored shall not exceed those stated on the LCC.

**Table J7 – Quantities of hazardous substances that activate hazardous substance location requirements, including a location compliance certificate**

GHS classification	HSNO class	Quantity beyond which LCC is required
Flammable gases categories 1A and 1B	2.1.1A and B	100 kg (or 100 m <sup>3</sup> if a gas)
Aerosols category 1	2.1.2A	3000 L (aggregate water capacity)
Flammable liquid category 1	3.1A	20 L (open or closed containers) 50 L for petrol (exception)
Flammable liquid category 2	3.1B	100 L in containers greater than 5 L (closed) 250 L in containers up to and including 5 L (closed) 50 L (open)
Flammable liquid category 3	3.1C	500 L in containers greater than 5 L (closed) 1500 L in containers up to and including 5 L (closed) 250 L (open)
Oxidising substances category 1	5.1.1A	50 kg or 50 L (closed) 5 kg or 5 L (open)
Oxidising substances category 2	5.1.1B	500 kg or 500 L (closed) 50 kg or 50 L (open)
Oxidising substances category 3	5.1.1C	1000 kg or 1000 L (closed) 100 kg or 100 L (open)
Acute toxicity (oral, dermal, inhalation) category 1	6.1A	50 kg or 50 L 100 kg or 100 L (farms > 4 ha)
Acute toxicity (oral, dermal, inhalation) category 2	6.1B	250 kg or 250 L 500 kg or 500 L (farms > 4 ha)
Acute toxicity (oral, dermal, inhalation) category 3	6.1C	1 000 kg or 1 000 L 3 500 kg or 3 500 L (farms > 4 ha)
Skin corrosion/irritation category 1A	8.2A	50 kg or 50 L 500 kg or 500 L (farms > 4 ha)
Skin corrosion/irritation category 1B	8.2B	250 kg or 250 L 3500 kg or 3500 L (farms > 4 ha)
<p>NOTE –</p> <p>(1) Quantity sum ratio applies to calculation of thresholds.</p> <p>(2) Closed containers are those that have never been opened. Containers that have been opened and then the lid replaced are considered to be open.</p> <p>(3) These requirements also apply to transit depots.</p> <p>(4) Only hazard classes relevant to agrichemicals included. A full list of hazard classes is given in the Hazardous Substances Regulations.</p>		

### J11.2 Quantity sum ratio

To determine whether a threshold quantity is exceeded, the ratios of quantity stored to quantity threshold are summed. If the sum is greater than 1, the threshold is exceeded. For the purposes of this calculation, all substances in the same subclass are added, for example, all categories for flammable liquids. Also, classes 6 and 8 are combined (unless incompatible and stored in different locations).

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For example, on a small site (that is, not a farm greater than 4 ha) holding:

20 L of acute toxicity category 1 (HSNO class 6.1A)

200 L of skin corrosion category 1 (HSNO class 8.2B)

Ratio =  $20/50 + 200/250 = 0.4 + 0.8 = 1.2$

Ratio > 1 therefore a hazardous substance location must be established.

## **J12 Management of the store (users)**

### **J12.1 Receipt of products**

A checklist:

- (a) Establish a drop-off point for agrichemicals (other than dairy detergents and sanitisers) at a location away from the farm dairy;
- (b) Check every single container received into the store to ensure the correct product has been delivered and that the entire label is intact;
- (c) Check that an SDS has been supplied with the first delivery of a product. Subsequent deliveries of the same product may not come with this information;
- (d) Do not accept leaking containers. Isolate and return them to the supplier in a secure container (preferably by having the supplier arrange collection);
- (e) When a container is received into the store, check the date of manufacture on the label or record the date it is received on the container, using a waterproof pen; and
- (f) Make sure that vaccines have valid expiry dates on products just received.

### **J12.2 Storage of products**

The following is a checklist for good storage:

- (a) Use the oldest products first ('first in/first out');
- (b) Store products so the container labels can be read;
- (c) Keep the store tidy and free of rubbish at all times;
- (d) Clean up any spill immediately and safely;
- (e) Do not store liquid products above powders, granules, or dry formulations to avoid possible leakage contaminating product below;
- (f) Store large liquid containers on or near floor level;
- (g) Store corrosives below eye level;
- (h) Do not overload shelves; and
- (i) Provide easy uncluttered access from the storage facility to the mixing site to minimise the possibility of spillage or contamination.

### **J12.3 Segregation**

For safety reasons, it is important to segregate incompatible products (see J8 for general requirements). Refer to the product's SDS for details on segregation requirements and record this information on the inventory.

Depending on the nature of the operation, a number of different types of agrichemicals may need to be stored at a workplace. Ideally, plant protection products should be stored in a separate store from veterinary medicines, and dairy detergents separately again. Where this is not possible, for example, in small workplaces, separate areas of the store should be designated for different product types:

- (a) Plant protection products:
  - (i) Store herbicides as far away as possible from insecticides and fungicides. Pay particular attention to phenoxy or hormone herbicide such as 2,4-D
  - (ii) Keep powder, liquid, and aerosol formulations separate
  - (iii) Foliar fertilisers which can be applied with plant protection products may also be stored with them, preferably in a separately identified part of the store
  - (iv) Dips may also be stored with plant protection products
  - (v) Biologicals may need to be stored separately under specific conditions to ensure they remain active
  - (vi) Unopened (sealed) dairy detergents may be stored with plant protection products if necessary;
- (b) Veterinary medicines:
  - (i) Store drenches, vaccines, and the equipment used to administer them as far away as possible from dips and plant protection products if they cannot be kept in separate stores
  - (ii) Refrigeration may need to be provided for vaccines and other heat-sensitive products (check product labels);
- (c) Dairy detergents and sanitisers:

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- (i) Acids and alkalis can be kept in the same store but must be separated to avoid potential reaction (see J8 for segregation of incompatibles);
- (d) Do not keep in the same store as any of the above:
  - (i) Fumigants – store in their own area so they cannot come into contact with any other products
  - (ii) Animal or human food (cross-contamination risk)
  - (iii) Explosives such as ammunition (explosion or fire risk)
  - (iv) Solid fertilisers (risk of cross-contamination and, with ammonium or potassium nitrate fertilisers, explosion)
  - (v) Fuels or lubricants (explosion or fire risk)
  - (vi) Pool chemicals (explosion or fire risk)
  - (vii) Seeds (cross-contamination risk);
- (e) Store oxidising agents (such as chloride of lime) in their own areas, away from any toxic substances, flammable products, or acids. Pay particular attention to the integrity of the packaging. There shall be no leakage of oxidising agents;
- (f) Within groups, intersperse non-flammable products among flammable products. A metal cabinet for flammable substances is preferable.

**J12.4 Stacking of products**

Stack products as follows:

- (a) Place cartons and paper bags on pallets or shelves, away from exterior walls (concrete floors and exterior walls may sweat);
- (b) Do not stack drums (20 L and above) more than two tiers high. Ensure stacks are stable and lower containers are not damaged by weight of upper layer;
- (c) Do not stack liquid products above powders, granules, or dry formulations to avoid possible leakage contaminating product below; and
- (d) Store large liquid containers on or near floor level (20 L–60 L drums).

**J12.5 Container care**

Care for containers as follows:

- (a) When not in use, containers shall be securely closed and stored upright;
- (b) Keep containers clean;
- (c) Keep labels legible;
- (d) Keep all products in their original containers unless they are damaged – in which case they should be decanted into a suitable properly labelled container, preferably an empty container of the same product;

NOTE – Minimum labelling requirements are the name of product, hazard pictogram, and hazard statement for the substance (full labels required if over 40 L).

- (e) Do not store products in unlabelled containers or containers unsuitable for the purpose; and
- (f) Never put an agrichemical into a container that would normally contain food or drink, even during use or measurement.

**J12.6 Equipment**

Provide the following equipment:

- (a) A suitable table or bench for the measuring and mixing of products;
- (b) A scoop, scales, calibrated jugs, and buckets appropriate for measuring out the products in the store;
- (c) These must be kept specifically for use in the store; do not use household items for this purpose. Drenches should not be measured out using the equipment used for plant protection products. Use separate, clearly labelled equipment;
- (d) A broom, spade, and supply of chemical absorbent material (do not use sawdust) to contain and absorb spills (see J10.1); and
- (e) A large empty open-topped drum for temporary storage of contaminated material and leaking containers.

All equipment kept or used within the store shall be compatible with the products stored.

**J12.7 Empty containers**

It is bad practice to reuse any container for any purpose other than to hold the same product. Empty containers should be cleaned and recycled. Special care should be taken where containers are used to contain flammable products, especially gases. See section 6 and Appendix M for disposal requirements.

**J12.8 Signs and information**

Use safety signs and posters within the store to warn and remind staff and others of hazards and safe-use guidelines. This includes prominently displayed emergency response information (ERI) (for example, local



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doctor or hospital address and phone numbers). Ensure that everyone who uses the store understands the meaning of the signs and messages.

Laminated copies of PSCs or standard operating procedures are useful.

NOTE – Check product labels for any additional requirements.

### **J13 Management of the store (suppliers)**

#### **J13.1 Packaging**

Before any dangerous goods or hazardous substances are moved anywhere into storage, the supplier shall ensure that the product is packed in the right quality packaging. The manufacturer should have matched the current formulation to the appropriate UN-approved packaging for transport hazards (DGs). For hazardous substances, the approved packaging is as laid out in the EPA Packaging Notice.

If the hazardous substance is not packed in the correct quality packaging, subsequent storage, human, and environmental safety will be compromised. This applies to both inner and outer packaging, irrespective of package size, and when repackaging or breaking down the product into smaller units. The store operator shall seek solutions from the manufacturer for the deficient packaging before storing the product.

#### **J13.2 Stacking of product**

Block storage of bulky product should be discouraged in favour of racking. Where product must be stored in blocks on the ground, the following guidelines are recommended:

- (a) Limit blocks to a width of 2 pallets, a maximum height of 4 pallets, and a length of 8 pallets (for example, paper and plastic sacks);
- (a) Include an inspection aisle of at least 0.5 m between blocks and a 1 m gap along the wall;
- (b) Placard the blocks of bulk hazardous substances with appropriate labels, and hazard signage;
- (c) 20 L steel drums shall be stacked no more than 2 high per pallet and a maximum of 4 pallets high;
- (d) 20 L plastic drums shall be stacked no more than 2 high per pallet and a maximum of 2 pallets high; and
- (e) To assist air circulation, a clear space of 1 m shall be maintained between the topmost products and the roof.

#### **J13.3 Segregation**

Once approved packaging has been confirmed, the store operator can plan and organise an effective segregation policy based upon the following principles:

- (a) Product segregation minimises the risk of fire and consequential environmental damage that is possible by mixed storage arrangements. See Table J3 for incompatible products and segregation distances and J8.3 for retail-specific rules;
- (b) See J9 for the storage of flammable and oxidising products. If only a small proportion of flammable liquids and/or oxidising substances are present, they should be isolated. It may be more cost-effective to remove them from the mixed class store and store them according to the relevant class standard than to upgrade the whole of the store to meet the more stringent requirements for these substances;
- (c) Restrict the retail presence of flammable and oxidising substances. The balance of flammable and oxidising product stock not required for retail presence shall be stored out of the retail area;
- (d) Non-dangerous goods or low-hazard products (provided they are non-combustible) can be used to provide a barrier between incompatible classes. Effective separation and segregation can also be achieved by using blocks of ecotoxic substances as barriers between incompatible classes provided the packaging is approved;
- (e) Separate secondary containment, such as bunding or metal cabinets, should be used to ensure incompatible substances do not mix in the event of spillage;
- (f) Utilise suitable metal cabinets to store away from each other highly hazardous substances such as gaseous fumigants, aluminium phosphide, cyanides, and phosphorous paste as well as flammable and oxidising substances;
- (g) Smelly toxic substances shall be provided with sufficient ventilation. These include the granular formulations of organophosphate insecticides;
- (h) Segregate all agrichemicals by their product types – such as insecticides, herbicides, fungicides, – to avoid any possibility of cross-contamination. Also keep solids and liquids segregated;
- (i) Subsidiary risk is just as important. Substances that have a subsidiary risk shall be segregated by both primary and subsidiary risk;
- (j) Animal feedstuffs and any human food item or empty containers shall be stored away from all dangerous goods and hazardous substances;
- (k) Store class 5 material away from incompatible materials such as wood (for example, pallets) – use suitable steel structures instead; and

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- (l) Observe regulatory conditions specific to veterinary medicines., such as the need to secure restricted veterinary medicines (RVMs) and to refrigerate some products (for example, some vaccines). Ensure that refrigeration maintains the product at the correct temperature, for example, by placing a thermometer in the refrigerator to record the temperature. Consult the authorising veterinarian if there is a temperature excursion, for example, the product freezes or the refrigerator fails.

**J13.4 Forklift trucks**

Suppliers shall arrange for all forklift drivers to have current certificates from WorkSafe approved trainers. Procedures for each store should be developed for the safe operation of forklifts. This procedure should include 'Forklift Operating' signage at each entrance both inside and outside the store where forklifts operate. Provision shall be made for a fire extinguisher and securement of keys when parked.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****APPENDIX K – APPLICATION AND CALIBRATION**

(Informative)

**K1 General**

This appendix addresses specific regulatory requirements to ensure that the equipment used in applying toxic, corrosive, or ecotoxic (HSNO class 6, 8, or 9) agrichemicals dispenses or applies the substance, without leakage, at a rate and in a manner for which the equipment is designed. The quality and accuracy of application also has a significant impact on product efficacy and pest management.

**K2 Nozzles and droplet size for plant protection products****K2.1 Introduction**

Product labels for agrichemicals normally have advice on the dose and volume rates to use, whereas information on the nature of the spray equipment to use is often missing or unclear. Spraying devices used to apply agrichemicals employ a range of nozzle types to break the spray mixture into droplets. The size of the droplets produced significantly affects target deposition, coverage, and off-target losses. Systems for nozzle classification have been developed to describe droplet size ranges so the user can select the appropriate nozzle and pressure for the application.

Droplet spectra for nozzles are described by the British Crop Protection Council (BCPC) spray quality specifications, which are in accordance with the American Society of Agricultural and Biological Engineers (ASABE) standard S-572. The technical basis uses analysis of droplet size spectra (measured using laser analysers) compared to a set of reference nozzles. This information can be used on product labels, for example, 'apply as a medium spray', and in some instances is a requirement of the product's HSNO approval.

The classification of sprays and nozzles serves two main functions:

- To define the spray quality most appropriate to the product, pest, and target that can be communicated on the product label; and
- To avoid the use of sprays likely to lead to adverse environmental effects.

NOTE – Manufacturers and suppliers provide useful information on nozzles and application equipment and should refer spray quality to pressure by nozzle.

**K2.2 Spray categories**

The classification of spray quality uses seven simple terms to describe spray categories based on the range of droplet size produced. Table K1 lists spray quality categories in relation to expected droplet size range. Droplet size is measured in microns ( $\mu\text{m}$ ) using laser techniques.

**Table K1 – Spray quality and range of volume median diameter (approximate)**

Spray quality category (abbreviation)	Volume median diameter (VMD)
Very fine (VF)	50 to 150 $\mu\text{m}$
Fine (F)	150 to 235 $\mu\text{m}$
Medium (M)	235 to 330 $\mu\text{m}$
Coarse (C)	330 to 405 $\mu\text{m}$
Very coarse (VC)	405 to 500 $\mu\text{m}$
Extra coarse (XC)	500 to 665 $\mu\text{m}$
Ultra coarse (UC)	> 665 $\mu\text{m}$

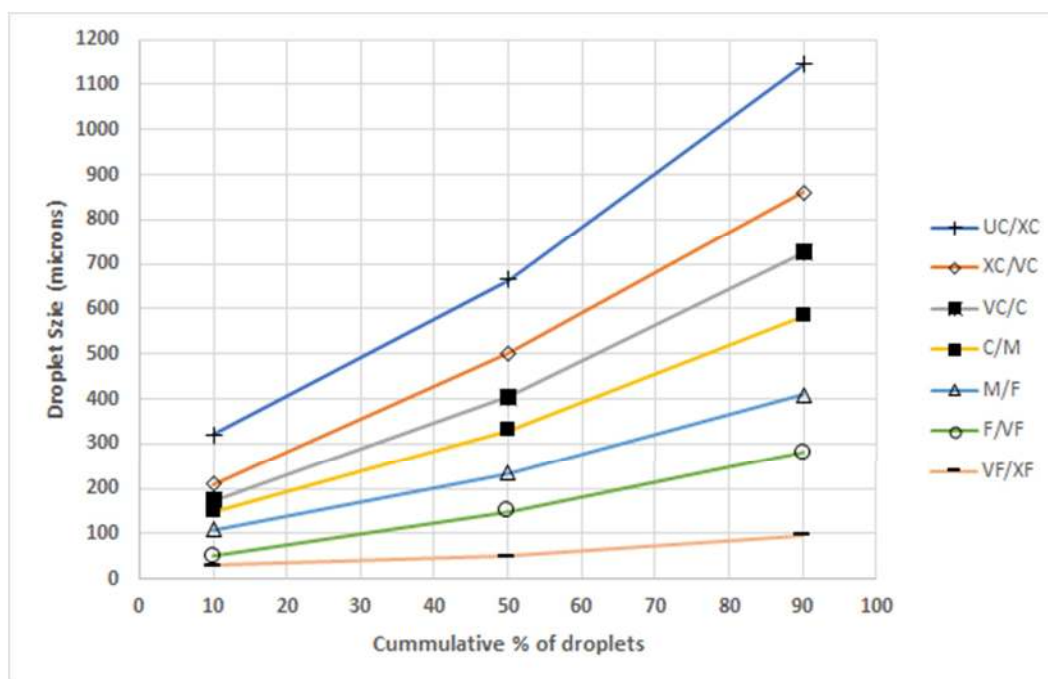
NOTE – The VMD refers to the midpoint droplet size (median), where half of the volume of spray is in droplets smaller, and half of the volume is in droplets larger than the median.

Each spray quality nozzle output covers a range of droplet size. For example, 'medium' ranges from 100 to 530  $\mu\text{m}$ . Figure K1 shows the range of droplet sizes for each spray quality. The lines in Figure K1 show the boundary between spray quality categories. Individual nozzles produce a range of droplet sizes represented by a line in K1 at a particular pressure. Variation in spray pressure will vary droplet size (VMD) and may change the spray category of spray quality produced.

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Figure K1 – Reference spray droplet size range by spray quality category. Reproduced from *Spray nozzle classification by droplet spectra ASABE s572.2*. Placeholder – needs finalising



The 'medium' category relates to the spray produced by nozzles used in current general arable spraying, which usually means volume rates of 150–300 L/ha at pressures of 2 to 3 bar (200–300 kPa).

The scheme allows direct comparison between different types and sizes of nozzle used at different pressures. Any category may therefore contain a mixture of flat fan, hollow cone, and other types of nozzle which, when operated at different pressures, produce similar spray spectra.

Rotary, through-valve, and air shear nozzles cannot be directly compared with hydraulic reference nozzles as these nozzles normally produce a narrow droplet size spectrum. The volume median diameter (VMD) could be used for comparison. Air shear sprayers use very high velocity air (>90m/s) to break a low-volume spray liquid stream into fine or very fine spray droplets. Through-valve nozzles produce a relatively narrow spectrum of large droplets (1200 to 1500 microns).

The system uses reference nozzles to define the threshold between the categories, using the BCPC nozzle code. This allows particular nozzles to be specified without using manufacturer's individual codes or terminology.

### K2.3 Droplet size, spray coverage, and drift risk

The droplet size produced by agrichemical application equipment may range from fog to rain drops. Small droplets should achieve finer distribution and greater coverage in comparison to large droplets, especially at low water volumes. However, small droplets are more prone to drift off target. Larger droplets fall more quickly, are more likely to penetrate canopies, and are less prone to drift but are less likely to achieve uniform coverage as compared with small droplets unless greater water volumes are used. Finer to medium spray quality is recommended for efficacy of contact applications. Medium to coarser spray quality can be used for systemic applications while reducing drift risk. When determining what spray quality to use, a balance must be struck between, on the one hand, using the finest spray quality possible to maximise spray coverage on the target and effectiveness of the product, minimise application volume rate, and improve sprayer efficiency and, on the other hand, managing (minimising) the risk of drift to adjacent sensitive areas.

NOTE – Where spray quality is specified in the regulatory conditions for a product, that spray quality shall be used.

### K2.4 Nozzle types

A large range of nozzle types are available. They vary by the pattern they produce (fan or cone shape), the angle of the pattern produced, and the way the spray mixture is broken up and emitted as droplets. This ranges from a conventional, simple single orifice, most likely producing finer spray quality; to a pre-orifice reducing

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pressure at the orifice and producing larger droplets; to utilising a venturi to mix air into droplets, further increasing droplet size and eliminating fine, 'driftable' droplets.

It is possible to cover most of the spray quality range from fine to extremely coarse by using different types of nozzles while delivering the same flow rate. These systems for droplet production are described as drift reduction technologies (DRTs). This term may also be applied to application equipment. The reference system is based on the 03 flat fan nozzle specified in the BCPC droplet size classification scheme at 3 bar pressure and at a spray height of 50 cm above the target surface. Drift from this system is defined as 100% and the benchmark for drift control levels from other nozzles. For example, compared to conventional nozzles, drift may be reduced by 50% for pre-orifice type nozzles and by 80% to 95% for air induction (AI or venturi) nozzles. In this way DRTs can be consistently compared from country to country even though they will have different measurement systems.

### **K3 Calibration of application equipment for plant protection products**

#### **K3.1 Introduction**

Accurate calibration of equipment is necessary to achieve the application of active ingredient at the recommended or desired rate. The principles of calibration are the same irrespective of the type of product and equipment used. Examples of calibration exercises, from a simple sprayer (knapsack) through to a more complex sprayer (orchard air-blast), follow the explanation of general principles. For complex sprayers (for example, orchard air-blast), properly qualified consultants should be used to calibrate and check the sprayer.

NOTE – Properly qualified consultants include persons who hold a Growsafe Registered Calibrator certificate or have demonstrated competency in equipment calibration.

#### **K3.2 General principles**

##### *K3.2.1 Calibration formula*

The calibration formula, Formula A, describes the relationship between the three key factors:

- (a) Width (m);
- (b) Forward speed (km/h); and
- (c) Volume rate (L/min).

#### **FORMULA A**

$$AR = \frac{600 \times V}{S \times W}$$

Where:

- AR = desired application rate (L/ha), total volume (product + diluent)
- V = total flow of sprayer, or flow per nozzle if only one nozzle (L/min)
- S = forward speed (kilometres per hour)
- W = width of application (metres)

##### *K3.2.2 Width (W) of application in metres (m)*

This may be sprayed width, row width (knapsack, boom), bout width, or track spacing (distance between successive passes). Note that the swath width refers to the lateral spray distribution on the target surface and may be wider than the sprayed width or track spacing.

##### *K3.2.3 Forward speed (S) in kilometres per hour (km/h)*

Forward speed is determined by recording the time taken to travel a known distance. Note that speeds given by the manufacturer for each gear at stated revolutions may not reflect the true speed because of tyre size variation and wheel slip. Speed tests should be done in conditions as similar as possible to anticipated spraying conditions, that is, sprayer tank half full, similar ground contour and surface.

Speed measurement requires a tape measure, two markers, and a stop watch. To calculate speed:

- (a) Measure a convenient distance (10, 20, 50, 100 m);
- (b) Select appropriate speed (walking speed or gear and throttle setting); and
- (c) Record the time it takes to travel the measured distance.

Use FORMULA B to determine forward speed S:

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****FORMULA B**

$$S \text{ (km/h)} = \frac{\text{Distance (m)} \times 3.6}{\text{Time (s)}}$$

Where:

$$\begin{aligned} \text{Distance} &= \text{distance travelled (metres)} \\ \text{Time} &= \text{time required to travel above distance (seconds)} \end{aligned}$$

Speed monitors can be fitted to vehicle-mounted equipment to indicate forward speed. Their accuracy should be checked periodically. Global positioning systems (GPSs) can also be used to measure forward speed.

**K3.2.4 Volume rate (V) in L/min (L/min)**

Once forward speed and width are set, the final adjustment to application rate is usually made by altering volume rate (sprayer discharge or output). Usually the calibration procedure starts with a desired application rate (L/ha), consistent with product label recommendations, the nature of the target, the need to obtain good coverage, and equipment capability. Use Formula C to calculate the volume rate required to achieve the desired application rate:

**FORMULA C**

$$V \text{ (L/min)} = \frac{\text{AR (L/ha)} \times W \text{ (m)} \times S \text{ (km/h)}}{600}$$

Where:

$$V \text{ (volume rate)} = \text{output of application equipment in L/minute.}$$

The volume or output rate can be measured by:

- Collection method – Collect output in a calibrated measuring vessel for a given time (30–120 seconds). Smaller volume rates may require longer collection time. Weight-based measurement systems are preferred;
- Top-up method – Fill sprayer tank to a marked level, spray for a given time, accurately measure the amount of diluent required to refill sprayer to original level; or
- Flow monitor – Some flow monitors display nozzle flow rate (accuracy of flow monitors should be checked regularly).

For large changes in volume rate, for example, from 150 to 300 L/ha, nozzles may have to be changed. For smaller changes, pressure may be altered. Increasing pressure increases volume rate.

**K3.2.5 Calibration checks**

Calibration should be checked:

- After every 100 hours' spraying; more often where abrasive products (wetable powders) are used; less often where emulsifiable concentrates (ECs) are used; and
- After replacement of nozzles, vehicle, tyres, or pressure gauge.

Check the calibration by measuring volume rate. Always keep a running total of volume of product, litres of diluent used and area covered. This indicates any changes in forward speed.

**K3.2.6 Adding product to the tank**

Application rate (L/ha), product rate (L or kg/ha), area to spray, and tank size determine how much product to add to the sprayer tank for mixing and loading. The tank should not be empty when the product is added. Fill the tank with half the volume needed then load the product or products to begin mixing the product with the diluent, usually water. Top the tank to the target volume.

Use Formula D to determine how much product to add to the tank:

**FORMULA D**

$$\text{Volume of product to add to tank} = \frac{\text{Product rate/ha} \times \text{water volume in tank}}{\text{Application rate (AR)}}$$

**DRAFT ONLY****COMMITTEE IN CONFIDENCE***K3.2.7 Automated systems for area-based spraying (ground and aerial)*

Modern spraying equipment may have a range of automated systems to control volume (flow) rate in relation to vehicle speed and position. For example, sprayer rate controllers will automatically adjust operating pressure to maintain a pre-selected application rate (L/ha) in relation to the forward speed (increase forward speed, increase pressure). Applicators should ensure they operate over a range of speed suitable for nozzles to remain within their specified and safe operating range in relation to spray quality category.

In addition to sprayer controllers, simple GPS systems can guide steering, and map sprayer movements. In more sophisticated systems, flow rate data from the sprayer is combined with GPS data to record where spray was applied. The most advanced GPS systems work with maps of the target application area to control sprayer output to not only avoid overlaps or gaps in application but also register and avoid sensitive areas and vary application rate (L/ha) in relation to location within the target application area where a prescription is used to reflect pest or weed density. This is known as variable rate application. Some sophisticated systems have developed to the extent that flow rate is adjusted to maintain the volume application rate along the length of a spray boom during a turn.

Even though sprayer controllers automate the calibration process, always keep a record of the gear (speed), throttle and pressure settings, and application rate (L/ha) achieved for future reference in case the controller malfunctions.

**K3.3 Handheld application equipment***K3.3.1 Knapsack sprayer*

For knapsacks and handguns when agrichemical rates are based on volume of water only, use the recommended application rate based on water volume, for example, '10 ml of agrichemical per 10 L of water'.

NOTE – With residual herbicides, it is important to apply the required dose rate per hectare evenly over the soil surface, so these should be applied through accurately calibrated fixed boom equipment. Where a single nozzle is used for spot spraying, use a fan-jet nozzle, preferably an 'even spray' fan-jet nozzle, which gives a uniform spray distribution across the entire swath width. Compare product used with area covered during spot spraying. This should be similar to the product rate for area-based calibration on the label (L or kg/ha).

Calculate as follows:

- (a) Width (W) – Determine application rate (AR) (L/ha), and product rate (L or kg/ha) from the product label. Hold the spray wand at a constant height above the ground, crop, animal, or weed and measure the band width (in metres) of the fan jet nozzle being used. For example, this might be 0.8 m when the nozzle is 50 cm above the ground. For a fixed boom, measure the distance between nozzles, for example, 0.5 m (50 cm), and multiply by the number of nozzles, for example, 3 x 0.5 = 1.5 m.
- (b) Speed (S) – Determine spraying (walking) speed. Measure and mark a convenient distance (for example, 10 m). Record the time taken to walk this distance while spraying (for example, 13 seconds). Use a stopwatch or a watch with a second hand. This is easier with two people. Usual walking speed range is 1.5–4 km/h.

Calculate the speed using Formula B:

**FORMULA B**

$$S \text{ (km/h)} = \frac{\text{Distance (m)} \times 3.6}{\text{Time (s)}}$$

For example:

$$S \text{ (km/h)} = \frac{10 \text{ m distance} \times 3.6}{\text{Time taken (13 seconds)}} = 2.77 \text{ km/h}$$

- (c) Volume rate (V) – Generally, nozzle flows range from 0.5 to 3 L/min at 1–3 bar pressure (check spray quality, K2). Use the 'collection' or 'top-up' method to measure the output of the nozzle as described previously. Fitting a pressure regulator and a pressure gauge to the spray wand to monitor system pressure helps maintain consistent flow.

Operate the knapsack for 1 minute and record L of output.

$$\text{Output} = \text{L used in 1 minute} = \text{L/min}$$



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$$= 1.5 \text{ L collected in graduated jug}$$

$$= 1.5 \text{ L/min.}$$

Where more than one nozzle is fitted, and all nozzles are the same, measure the output from one nozzle and multiply by the number of nozzles to give the sprayer output. Note that individual nozzle outputs should be checked regularly by collecting the spray from each nozzle in a given time and comparing the amount. A nozzle that varies by more than + 5% from the average of all nozzles should be replaced.

Use Formula A to determine application rate (AR).

**FORMULA A**

$$\text{AR} = \frac{600 \times V}{S \times W}$$

For example:

$$\text{AR (L/ha)} = \frac{600 \times 1.5 \text{ L/min}}{2.77 \text{ km/h} \times 0.8 \text{ m}} = 406 \text{ L/ha}$$

Some recommendations are given as ml/10 m<sup>2</sup>. The volume in millilitres per 10 square metres (for example, an area 2 m x 5 m) is equivalent to volume application rate (L per hectare), that is, 400 L/ha = 400 ml/10 m<sup>2</sup>.

Increasing swath width, reducing system pressure, and walking faster all reduce the application rate if required. Repeat the calibration if changes are made.

Use Formula D to determine how much product to add to the tank load. For example:

$$\begin{aligned} \text{Application rate} &= 400 \text{ L/ha} \\ \text{Product rate} &= 2 \text{ L/ha} \\ \text{Tank size} &= 15 \text{ L} \end{aligned}$$

**FORMULA D**

$$\text{Amount of product to add to tank} = \frac{\text{Product rate/ha} \times \text{total volume in the tank}}{\text{Application rate}}$$

For example:

$$\begin{aligned} &= \frac{2 \text{ L/ha} \times 15 \text{ L}}{400 \text{ L/ha}} \\ &= 0.075 \text{ L (75 ml) of product per tank} \end{aligned}$$

**K3.3.2 Handgun spraying**

Handgun sprayers are normally used to spray to run-off (for example, brush weed control), but the calibration procedure is the same. Fit the desired nozzle tip.

Calculate as follows:

- Width and speed (W and S) – Record the time it takes to spray a measured area (say 20 m x 2 m strip). Aim to achieve good coverage using the lowest amount of water and smallest droplets practical. Change nozzle or adjust pressure if necessary.
- Volume (V) – Measure volume rate or output of handgun (collection or top-up method).

$$\text{Volume applied} = \frac{\text{Time taken (sec)} \times \text{output (L/min)}}{60}$$



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$$\begin{aligned}
 &= \frac{86 \text{ sec} \times 3.5 \text{ L/min}}{60} \\
 &= 5 \text{ L} \\
 \text{Application rate (AR)} &= \frac{\text{Volume applied} \times 10\,000 \text{ m}^2 (= 1 \text{ ha})}{\text{Area sprayed}} \\
 &= \frac{5 \text{ L} \times 10\,000}{40 \text{ m}^2} \\
 &= 1250 \text{ L/ha}
 \end{aligned}$$

Practical tip:

Quick calibrations to establish an application rate of 1000 L/ha (a common target application rate):

- Measure the time taken to deliver 1 L into a calibrated jug or cylinder (say 15 seconds); and
- Practise covering 10 m<sup>2</sup> (say a 10 m x 1 m strip) in this time (15 seconds). This gives 1 L per 10 m<sup>2</sup> = 1000 L per hectare.

### K3.3.3 Motorised mist blower

These sprayers consist of a small motor, centrifugal fan and flexible discharge hose, and a small tank (usually about 10 L). The fan produces a high-velocity airstream, and some of this air is used to pressurise the spray tank. Spray is formed by the liquid being metered into the fan discharge tube, where the high-speed air breaks it into droplets.

The calibration procedure is essentially the same as any other sprayer, with measurement of nozzle output, travel speed, spray width, and application rate required. Measuring output is difficult because of the blowing action surrounding the nozzle, so use the top-up method to measure nozzle flow. Calibration may be carried out in a similar fashion to the handgun sprayer. Use the top-up method to measure nozzle flow. Agrichemical rates are usually based on volume of water, for example, 10 ml of agrichemical per 10 L of water. Because of the very fine spray produced, it may be difficult to be precise about sprayed width, and the motorised mist blower is therefore not a precise application device.

## K3.4 Vehicle-mounted area-based spraying

### K3.4.1 Boom spray

Check the sprayer for leaks and see that the pressure regulator and gauge works correctly. Calculate the nozzle volume (flow) rate:

- Width (W) – Measure the distance between nozzles on a boom (usually 0.5 m);
- Speed (S) – Select appropriate gear and throttle setting. Use Formula B to check speed over a distance of 100 m, likely to be 4 to 18 km/hr. Example uses 7.2 km/hr; and
- Decide on application rate – Read the label, for example, 250 L/ha.

Use Formula C to determine the nozzle volume (flow) rate.

### FORMULA C

$$\begin{aligned}
 \text{V (L/min) per nozzle} &= \frac{250 \text{ L/ha} \times 0.5 \text{ m} \times 7.2 \text{ km/h}}{600} \\
 &= 1.5 \text{ L/min}
 \end{aligned}$$

Use a spray nozzle chart to find the correct nozzle size for the nozzle spacing on the boom and desired spray quality. Operate the sprayer within the recommended pressure range for the nozzle. Note that the pressure affects spray quality (see K2). Check nozzle flow by measuring output from each nozzle for 1 minute. Replace nozzles where flow varies by more than + 5% of the average. Adjust boom height.

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To determine the sprayer volume (flow) rate or output, use Formula C again but change the width (W). Multiply the number of nozzles by the distance between nozzles to find spray width (W), for example, 12 nozzles x 0.5 m = 6 m.

$$\begin{aligned} \text{V (L/min) for the spray boom} &= \frac{250 \text{ L/ha} \times 6 \text{ m} \times 7.2 \text{ km/h}}{600} \\ &= 18 \text{ L/min} \end{aligned}$$

Use the top-up method or calibrated flow meter to measure sprayer output; adjust pressure to achieve required sprayer (boom) volume rate.

Work out correct amount of agrichemical to add to the tank, for example, for 0.5 L/ha product rate and a 500 L tank, using Formula D:

**FORMULA D**

$$\begin{aligned} \text{Volume of product to} &= \frac{\text{Product rate/ha} \times \text{water volume in tank}}{\text{Application rate (AR)}} \\ \text{add to tank} & \\ \\ \text{For example:} &= \frac{0.5 \text{ L/ha} \times 500 \text{ L}}{250 \text{ L/ha}} \\ &= 1 \text{ L product per tank} \end{aligned}$$

NOTE – Total volume includes the chemical; add the required chemical and make up the volume to 500 L.

**K3.4.2 Weed booms**

Spraying herbicide on to a strip under trees and vines is a common practice. Calibration procedure is the same as for a boom sprayer except that the sprayed width is less (usually about 1 m).

Calculate as follows:

- Width (W) – Desired width, for example, 0.9 m;
- Speed (S) – Determine forward speed over a distance of 100 m (see K3.2.3); and
- After deciding on the application rate (250 L/ha), determine the required total nozzle output using Formula C to calculate volume (flow) rate (V):

For example:

$$\begin{aligned} \text{Volume (L/min)} &= \frac{\text{AR} \times \text{W} \times \text{S}}{600} \\ &= \frac{250 \text{ L/ha} \times 0.9 \text{ m} \times 5 \text{ km/h}}{600} \\ &= 1.875 \text{ L/min} \end{aligned}$$

You may choose to deliver this total flow through one or two nozzles. Achieving even coverage is critical to good practice as uneven application can lead to poor control and development of weeds which become resistant to agrichemicals. Check the pattern produced by the nozzles. This may require two runs for overlapped systems. The easiest way to do this is to spray on to dry concrete and watch the sprayed strip dry. It should dry evenly. For a more accurate check use a patterator.

**K3.4.3 Controlled droplet application equipment**

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Controlled droplet application (CDA) equipment differs from conventional spray application equipment only in that the range of droplet sizes produced by the nozzle(s) is narrower. The area-based calibration procedure is therefore the same for CDA (boom), CDA (orchard), and CDA (knapsack), that is, for the three factors the following apply:

- (a) Spray width (W);
- (b) Forward speed (could be walking speed) (S); and
- (c) Nozzle flow rate (output) (V).

Use Formula A:

**FORMULA A**

$$AR \text{ (L/ha)} = \frac{600 \times V \text{ (L/min)}}{W \text{ (m)} \times S \text{ (km/h)}}$$

**K3.4.4 Other handheld equipment**

Accurate calibration is also necessary for other specialist agrichemical application equipment such as foggers, weedameters, lawnboys, and forestry spot guns. Refer to the manufacturer's instructions for the calibration procedure. The relationship between width (or volume), speed, and volume rate remain the same. Other equipment can be calibrated using those principles and the calibration Formula A.

Agrichemical rates for use in wiping equipment are based on water volume, for example, 1 part agrichemical to 2 parts clean water. The wiping surface should always be damp with product during application. The chemical mix should not drip from the wiping surface.

**K3.5 Vehicle-mounted standing row crop sprayers****K3.5.1 General**

Agrichemical labels for tree and vine crops such as apples and grapes recommend a concentration in terms L/100 L for an application to point of run-off. The sprayer for standing crops is required to pass between rows of crops which range from about 1 m tall (blueberries) to more than 8 m tall (avocados). They also vary in row spacing and density so present markedly different spray targets.

**K3.5.2 Application rate (AR)**

Traditionally spray volumes and agrichemical rates have been expressed on a 'per hectare' basis which fails to account for the variations in spray targets and new growing techniques. Best practice is to determine the dilute volume which is the 'point of first run-off' from measurements of the spray target. The point of run-off (without wetting agents) tends to occur when spray droplets on the outer canopy are beginning to coalesce and drip. At this point the inner canopy should be covered but not wet to point of dripping. Use a measurement system which accounts for the key factors of canopy height, row spacing, and density. An approach which accounts for changes in row spacing and crop height is use of 'L per 100 m row per metre of canopy height'. The point of first run-off for most standing row crops is in the range of 20 to 30 L/100 m row length/metre canopy height for a two-sided sprayer. Use the lower figure for sparse or 'open' canopies and the higher figure for the densest canopies. Refer to the accepted industry guideline for the crop. For example, the point of run-off for a 3 m high apple canopy can be calculated as follows:

$$\begin{aligned} \text{L per 100 m row} &= \text{L per 100 m row per metre canopy height} \times \text{canopy height (m)} \\ &= 22 \text{ L/100 m/m} \times 3 \text{ m} \\ &= 66 \text{ L/100 m row} \end{aligned}$$

While modern sprayer controllers can be programmed to deliver a L/100 m row volume rate, most applicators will rely on a per hectare rate (L/ha) delivery or simply speed and pressure settings. Conversion from L/100 m row to L/ha can be calculated as follows:

$$\text{L per hectare} = \text{L per 100 m row per metre canopy height} \times 100 \times \text{row spacing (m)}$$

For a 4 m row spacing example:

$$\text{L per hectare} = 66 \text{ L/100 m/m} \times 100 \times 4 \text{ m row spacing}$$

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= 1650 L/ha

Work out the correct amount of agrichemical to add to the tank using Formula D.

**K3.5.3 Forward speed and air assistance****K3.5.3.1 General**

Most sprayers for standing crops project the spray mixture to the target by a combination of nozzle pressure (hydraulic nozzles) and air assistance. The applicator should aim to displace the still air in the canopy with spray-laden air to achieve optimum air assistance. This requires a balance of a number of variables such as fan speed and pitch (air volume and air velocity), distance to canopy, crop maturity, and canopy pruning. Forward speed has a major impact on how the spray-laden air interacts with the crop. Maximum forward speeds are determined by the pump and air output. For effective spraying this may be as low as 3.5 km/hr in a large crop like avocados and up to 12 km/hr in some situations for dwarf apple trees or grapes, especially early in the season before all leaves have emerged. As there is a wide range of sprayer types, tractors, and canopy dimensions there will be compromises and only general guidance is given here. Consult an equipment calibration specialist, trusted industry source, and/or grower manuals for assistance if necessary.

**K3.5.3.2 Forward speed**

Choose a suitable engine and power take off (PTO) operating rpm and select a gear to suit the target crop. Determine forward speed (K3.2.3). A typical forward speed might be 5 km/h.

For a forward speed of 5 km/hr the desired sprayer volume rate (output) can be determined using Formula C.

For example:

$$\begin{aligned} \text{Sprayer volume rate (L/min)} &= \frac{1650 \text{ L/ha} \times 4 \text{ m} \times 5 \text{ km/h}}{600} \\ &= 55 \text{ L/min} \end{aligned}$$

Decide on the proportion of spray to be delivered to each part of tree or vine. Select nozzle tips (orifice discs) and cores or cone jet nozzles to achieve this, using the nozzle flow chart. Consult an equipment calibration specialist or equipment supplier to assist if necessary.

Operate the sprayer at the selected pressure (approximately 6–20 bar) and measure the nozzle flow rate (collect nozzle flow for 1 minute).

Measure total discharge from sprayer using the top-up method or a calibrated flow meter. Spray with both sides open for 30 to 120 seconds. Adjust pressure to achieve desired sprayer output.

Adjust the nozzle angles to achieve best coverage with the sprayer stationary in the crop, fan in gear, and operating at calibrated pressure.

**K3.5.3.3 Air assistance**

Ensure air volume and speed are matched to canopy size and density to achieve the most efficient spray deposition without overspray or drift. It is important air is directed at the canopy for effective spray deposition. If air is poorly directed, especially over the height of the canopy, spray loss to ground or aerial drift is likely. To check this, ask an assistant to drive down a row at the designated speed. Adjust the air output so that the spray-laden air puffs out about a metre in any gaps between vines or trees on the upwind side of the sprayer to ensure adequate spray coverage. Spray should be seen about 1 m above trees where spray is directed up to the tops of trees and about 0.2 m above lower-growing vine crops like grapes. Spray should not be seen to be pushed past the next target row. For larger and more dense trees spray should not necessarily push through the entire canopy width but should consistently push beyond the trunks.

Spray coverage can be confirmed using water-sensitive papers, fluorescent dye, or kaolin clay.

Note that variations in target crop can be matched by varying forward speed, pressure, and nozzle selection, for example, utilising swing over nozzles and turning nozzles off.

**K3.5.4 Dilute and concentrate (low volume) spraying****K3.5.4.1 General**

Dilute and concentrate spraying describe applications based on spray concentration. Where the product rate on labels is recommended per 100 L of diluent (water) eg mls, grams, L or kg/100 L, Formula E can be used to calculate the quantity of product to add to a sprayer tank.

**FORMULA E**

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$$\text{Volume of product to add to tank} = \frac{\text{Product rate}/100 \text{ L} \times \text{Water volume in tank}}{100}$$

**K3.5.4.2 Dilute spraying**

For dilute spraying the concentration on the label is used. For example, a fungicide applied to apples requires 110 g of product per 100 L of water and the sprayer tank holds 2000 L. Use Formula E to work out the amount of product to add to the tank.

$$\begin{aligned} \text{Volume of product to add to tank} &= \frac{\text{Product rate}/100 \text{ L} \times \text{Water volume in tank}}{100} \\ &= \frac{110 \text{ g} \times 2000 \text{ L}}{100} \\ &= 2200 \text{ g (2.2 kg) product per tank} \end{aligned}$$

NOTE –

- (1) Total volume includes the product, that is, add the required product, and make up the volume to 2000 L.
- (2) Users should adhere to label recommendations where a minimum product rate per hectare is also listed.

**K3.5.4.3 Concentrate (low volume) spraying**

Concentrate spraying is the practice of increasing the concentration of the spray mix, decreasing the application volume rate, and decreasing droplet size. The product rate per hectare stays the same but the volume of water used is less per hectare.

Using 2- to 5-fold increases in concentration is common. However, for applications at more than a 5-fold increase in concentration, spray coverage can be compromised and pest control reduced, so care is needed. Increases in concentration are often described as a multiplication, for example, 2X concentrate describes 2-fold increase (doubling) of the concentration of the spray mixture and halving the volume application rate, for example, from 2000 L/ha down to 1000 L/ha.

Once the appropriate dilute spray volume has been determined (for example, 1650 L/ha for the apple example above) the new application rate can be calculated. For example, at 3X concentrate, the product rate will be 3 x 110, that is, 330 g/100 L, and the application rate will be 3-fold less (that is, 1650/3 = 550 L/ha).

In practice on the sprayer reducing AR from 1650 L/ha to 550 L/ha could be achieved by changing nozzles (most conveniently using swing over nozzle bodies), increasing forward speed, and adjusting operating pressure. Matching air assistance and forward speed to achieve adequate spray coverage on the target canopy is key to successful concentrate spraying. Once those changes have been made and the sprayer output (volume rate) has been checked, then the amount of product to add to the tank can be calculated using Formula E.

**FORMULA E**

$$\text{Volume of product to add to tank} = \frac{\text{Product rate}/100 \text{ L} \times \text{Water volume in tank}}{100}$$

For 3X concentrate example:

$$\begin{aligned} \text{Volume of product to add to tank} &= \frac{330 \text{ g}/100 \text{ L} \times 2000 \text{ L (tank size)}}{100} \\ &= 6600 \text{ g (6.6 kg) product per tank} \end{aligned}$$

**K3.6 New technologies**

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New technology such as AI nozzles has made a big impact on spray application practices in New Zealand by reducing spray drift risk. Technology is also advancing for spray equipment to improve spray deposition and reduce drift risk. These include sensor systems, tunnel and recycle sprayers, and pulse width modulation (PWM) nozzle control.

- Sensor systems – Detecting the presence or absence of tree or vine canopy or even weeds, these systems automatically adjust spray outputs accordingly. These systems can save 30% of product over a season.
- Tunnel and recycle sprayers – These systems involve shields that hang on either side of the vine row to capture at least some of the overspray. The shields protect spray from ambient wind, improving deposition and reducing drift. Recycling sprayers reduce losses to the ground by capturing excess spray in collection trays at the base of each shield and pumping it back into the tank for re-application.
- PWM – In this system the flow from each nozzle is controlled by a solenoid (switch). The solenoid pulses to start and stop flow very quickly which stabilises spray quality over a wide range of application volumes.

### K3.7 Aircraft-mounted equipment

The calibration procedure for agrichemical application equipment mounted on fixed wing or rotary wing aircraft is very similar to that used for boom sprayers except that sprayed width or track spacing needs to be assessed and calculated rather than determined by calculation only. That is because the width of lateral spray distribution on the target surface or 'swath width' is likely to be wider than the sprayed width or track spacing.

The sprayed width (W), or 'track spacing', for successive passes of an aircraft should be based on achieving even spray distribution and coverage. To establish 'effective sprayed width', spray water at normal speed, height, and flow rate centrally over a line of water-sensitive papers placed at 1 m intervals across approximately twice the expected sprayed width, or spray a dye/water mix over a smooth white surface of approximately twice the spray width. A string system may also be used to assess lateral distribution of spray deposits across the spray width. Sprayed width or track spacing can be calculated from these results, usually by computer analysis so that the coefficient of variation (CV) across the swath is minimised.

Calculate as follows:

Establish true ground speed with the aid of two people on the ground, as follows:

- Measure a distance of 500 m, place a marker person at each end, one at the start with a flag, the other at the finish with a stopwatch;
- Fly the 500 m distance at normal spraying speed and height; and
- The first marker drops a flag as the aircraft passes overhead. At the same time the second starts a stopwatch. The stopwatch should be stopped when the aircraft passes over the second marker. Use Formula B to calculate ground speed S.

For example:

$$\begin{aligned}
 S \text{ (km/h)} &= \frac{\text{Distance (500 m)} \times 3.6}{12 \text{ seconds (time to fly 500 m)}} \\
 &= \frac{500 \times 3.6}{12} \\
 &= 150 \text{ km/h}
 \end{aligned}$$

NOTE – Airspeed (S) is normally measured in knots. To convert knots to km/h, multiply by 1.852, for example, km/h = 80 knots x 1.852 = 148 km/h.

GPS or laser speed detector may also be used to determine true ground speed.

Volume rate (V). Decide on a volume application rate (AR) based on the product to use and required target coverage, for example, 40 L/ha for herbicide application.

Use Formula C to calculate the required total volume (flow) rate from all nozzles. For example, with track spacing = 12m:

$$\begin{aligned}
 \text{Boom volume} &= \frac{40 \text{ L/ha} \times 12 \text{ m} \times 150 \text{ km/h}}{600} \\
 \text{(flow) rate} &= 120 \text{ L/min}
 \end{aligned}$$

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Divide the required total flow rate by the number of nozzles on the boom to find required nozzle volume (flow) rate.

For example:

$$\text{Nozzle volume (flow) rate} = \frac{120 \text{ L/min}}{40 \text{ nozzles}} = 3 \text{ L/min/nozzle}$$

Select nozzle type to achieve this using the manufacturer's nozzle flow chart.

Check individual nozzle flows where possible and replace nozzles which vary by more than + 5% from average nozzle flow rate.

Adjust pressure to achieve nozzle flow rate of 3 L/min using collection method to measure nozzle flow (where possible). As a final system check, or where a windmill pump is used to deliver spray to the boom, use the 'top-up' method to measure total nozzle flow (volume rate). Fill the spray tank to an identified level, spray for 30 seconds and accurately measure, preferably by weight or calibrated flow meter, the amount of water required to refill the tank to the original level.

For example:

$$\text{Volume rate (L / min)} = \frac{\text{L used (73) in 30 sec}}{146 \text{ L/min}}$$

The actual application rate based on 146 L/min instead of 120 L/min can be found by applying Formula A.

$$\text{AR (L/ha)} = \frac{600 \times 146}{150 \times 12} = 49 \text{ L/ha}$$

Use the actual application rate (49 L/ha) and desired product rate (3 L/ha) in Formula D to work out how much product to add to a 550 L tank.

For example:

$$\begin{aligned} \text{Amount of product to add} &= \frac{\text{Product rate/ha (3 L/ha) x total volume in tank (550 L)}}{\text{Application rate (49 L/ha)}} \\ &= 33.7 \text{ L} \end{aligned}$$

NOTE – Total volume includes the product, that is, add the required 33.7 L of product to a partly full tank, and make the volume up to 550 L.

Once these basic calculations have been carried out to establish operational parameters, on-board GPSs coupled with flow monitoring can be used to adjust application volume rate on the job. The system reports area covered and volume used in real time so the applicator can make fine adjustments to speed to compensate for real-time factors such as wind. Always keep a running total of volume of product, litres of diluent used, and area covered to check calibration.

NOTE – Accuracy of flow monitors should be checked periodically for both loading aircraft and on-board aircraft.

## **K4 Application equipment for registered veterinary medicines**

### **K4.1 Introduction**

It is important to administer veterinary medicines accurately at the required dosage to avoid excessive chemical residues in animal products from overdosing, or repeat treatments and resistance to agrichemicals where under-dosing occurs. Calibration of equipment is required for safe and responsible use of veterinary medicines. Read the product label and observe prescribed withholding periods (WHPs).

### **K4.2 Application of anthelmintics by drenching or pour-on**



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Application or dose rate is determined by animal live weight, for example, 20 ml per 100 kg live weight. Read the label to decide on the dose rate.

For most efficient use of anthelmintics, dosage should be adjusted to the live weight of individual animals. Where the average live weight of a group of animals is known, and adjusting each individual dosage is not practicable, then choose the dose rate on the basis of the heaviest animals in the group. It may be necessary to split the mob or herd into weight ranges if there is a risk of overdosing lighter animals (especially for products that have low margins of safety such as levamisole and abamectin in young stock). (Refer to the label.)

Calibrate the dosing device as follows:

- (a) Set required dose on the device, for example, 20 ml;
- (b) Carefully add 10 doses of the product intended for use to an accurately calibrated jug or measuring cylinder;
- (c) Divide the amount collected by 10 to establish the actual dose delivered, for example, 190 ml/10 = 19 ml per dose; and
- (d) Adjust dosing device and retest to attain correct dose rate.

Ensure that the device fully recharges with product after each delivery. Clean the dosing device after use to maintain accuracy. Check the calibration of the device is consistent with the amount of use, that is, whenever a product or dose rate is changed or after a period of use (for example, 100 lambs).

### **K4.3 Calibration of dipping baths, sumps, and supply tanks (ectoparasiticides)**

#### *K4.3.1 Application rates*

The recommended application rate of ectoparasiticides (dips) is based on water volume, for example, 500 ml of agrichemical per 1000 L of water, so the volume of dip wash tanks must therefore be known. Maintaining the application rate is central to achieving good control of ectoparasites.

Sheep should be 'clean and empty' before dipping to avoid contamination of the dip wash. This may require dagging or crutching and penning overnight.

NOTE – Applying the correct dose to every animal in the correct manner should be the major concern. Throughput, or number of animals treated per hour, is of secondary concern.

#### *K4.3.2 Calibration*

All dipping baths, sumps, and supply tanks need to be calibrated accurately to achieve dip wash of the required concentration.

For simple square or round shapes, the dimensions can be easily measured and volumes calculated. For irregularly shaped baths, fill a 200 L drum repeatedly and empty it into the dipping bath, counting the number of drum fills required to fill the dipping bath. This number x 200 equals the working volume in litres. Although this is laborious, it is a very accurate method if done conscientiously. Alternatively, a flow meter may be used if available. If a pump with a constant flow is available, measure the time it takes to fill a 200 L drum. Then measure the time taken to fill the dipping bath using the same pump and flow rate.

For example:

$$\begin{array}{rcccl} \text{Volume of dipping} & & \text{Time to fill dipping bath} & & \\ \text{bath} & = & \frac{\quad}{\text{Time to fill a 200 L drum}} & \times 200 & = \quad \dots\dots \text{ L} \\ & & \frac{37.5 \text{ minutes}}{2.5 \text{ minutes}} & \times 200 & = \quad 3000 \text{ L} \end{array}$$

Mark the volume of wash in the bath at various levels (200 or 500 L steps as convenient) on two dipsticks. One stick should be in use during dipping and the other stored as a spare.

#### *K4.3.3 Replenishment*

During dipping, sheep retain some of the dip wash in their fleece, reducing wash volume. Chemical is also 'stripped' out of the dip wash, reducing wash strength. Therefore, replenishment of dip wash is required continuously or periodically, consistent with use. Replenishment is usually carried out with the added dip wash concentration the same as the initial concentration, unless the ectoparasiticide is particularly susceptible to stripping, in which case replenishment concentration may be higher than initial concentration. Refer to label recommendations.

#### *K4.3.4 Dipping out*



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Towards the end of the day some farmers add chemical only to the dip wash without adding water (reinforcement) to extend the use of the dip wash. This practice is not recommended, as there is a real risk of not achieving adequate control on tail end sheep that puts the whole flock at risk. The risk of lost production and income and the potential animal welfare implications outweigh the savings in chemicals. If this practice is used, follow the manufacturer's instructions.

**K4.3.5 Dip wash replacement**

No more than one sheep per 2 L of dip wash initially prepared should be dipped. Clean out the sump/dip bath at each dip wash replacement. The quality of the dip wash for the first sheep should equal the quality of the dip wash for the last sheep. Follow label recommendations where they are given.

For example, dip bath capacity = 3000 L. Replace dip wash after 1500 sheep have been through; or, for a constant replenishment shower, empty and clean out a 500 L sump after every 250 sheep.

**K4.3.6 Bacteriostat**

Use a bacteriostat if keeping unused dip wash overnight. Unless the label recommends otherwise, used wash should be discarded at the end of each day's dipping.

**K4.3.7 Mixing**

With both shower and plunge dips, pre-mix the dip in a bucket and use a paddle to ensure it is evenly distributed. In large plunge dips (10 000 L or more) use 20 to 30 'stirrer' sheep to swim through the bath initially, and re-dip these sheep later.

**K4.4 Saturation methods (ectoparasiticides)****K4.4.1 Plunge dip**

Sheep are totally immersed in a plunge dip so fleeces become fully saturated with dip wash. Plunge dips are made in various shapes and sizes, for example, long swim, ring, or pot dips, with varying capacities (for example, 3000–13 000 L).

Prepare the initial dip wash at the recommended concentration as stated on the label of the dip concentrate container after determining the capacity of the dipping bath.

For example:

Plunge dip bath capacity	=	6000 L
Required concentration	=	500 ml (0.5 L) dip concentrate/1000 L

To determine the quantity of dip concentrate to add to the dip bath for the initial charge, find the dip/water ratio and multiply by dip bath volume.

For example:

$$\begin{aligned} \text{Volume to add to plunge dip bath} &= \frac{\text{Product rate/1000 L x water volume in tank}}{1000 \text{ L}} \\ &= \frac{0.5 \text{ L} \times 6000 \text{ L}}{1000 \text{ L}} \\ &= 3 \text{ L dip concentrate for the initial charge} \end{aligned}$$

Plunge dip design and sheep flow need to allow a swim time in excess of 30 seconds and for sheep to be fully immersed twice (swim length of 12 m or keep sheep in the dip wash). Sheep should be forced to swim as this aids penetration of the dip wash into the fleece.

The methods of plunge dip replenishment are:

- Standard replenishment. With fresh dip regularly check the level in the dip bath and replenish it before it falls by a fifth of the capacity (determine volume remaining with sheep removed). Use a calibrated dipstick for this.

For example, for a plunge bath capacity of 6000 L: replenish when volume drops by 1200 L (6000 divided by 5).

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For example, where the label recommendation for standard replenishment is 500 ml/1000 L added, fill dip bath with:

$$\begin{aligned} \text{Dip concentrate required} &= \frac{\text{Product rate/1000 L x water volume in tank}}{1000 \text{ L}} \\ &= \frac{0.5 \text{ L x 1200 L}}{1000 \text{ L}} \\ &= 0.6 \text{ L (600 ml) dip concentrate in 1200 L water} \end{aligned}$$

(b) Constant replenishment. Fresh wash is continuously supplied to the dip bath and replaces the wash removed by sheep. Flow should always be running from the supply tank to the dip bath.

To mix the required concentration in the supply tank(s):

For example, for a supply tank capacity of 2000 L: replenishment concentration is 500 ml/1000 L:

$$\begin{aligned} \text{Dip concentrate required} &= \frac{\text{Product rate/1000 L x water volume in tank}}{1000 \text{ L}} \\ &= \frac{0.5 \text{ L x 2000 L}}{1000 \text{ L}} \\ &= 1 \text{ L dip concentrate in 1000 L water} \end{aligned}$$

#### *K4.4.2 Shower dip*

Each animal is exposed to 30–50 L of dip wash at low pressure (1–1.5 bar) from rotating nozzles overhead and fixed nozzles underneath in an enclosed pen. Nozzle booms should rotate at eight revolutions per minute. Top nozzles should remain on throughout the whole showering period; bottom nozzles may be on for only half this period. Ensure all nozzles remain open during the operation.

Fit a pressure gauge that the operator can see, for example, on the dip wash delivery pipe close to the nozzles. Once the volume rates are set and known, ensure that the system pressure remains constant. Constant pressure indicates constant delivery of dip wash.

Operate the shower, check for leaks, blocked nozzles, and adequate operation of pump (slipping belts, clean filters) and pressure gauge.

After determining the capacity of the sump and the supply tank (500–4000 L), prepare the initial charge of dip wash as described for a plunge dip (see K4.4.1).

$$\text{Sump capacity} = 2000 \text{ L}$$

For example:

$$\text{Required concentration} = 1 \text{ L dip concentrate/1000 L}$$

$$\begin{aligned} \text{Dip concentrate for initial charge} &= \text{Dip/water ratio x water volume} \\ &= 1 \text{ L for 1000 L} \\ &= 2 \text{ L dip concentrate for 2000 L} \end{aligned}$$

Load sheep into the unit at about the density they would be in a woolshed at night (they should be just able to mill around).

The methods of shower dip replenishment are:

(a) Standard replenishment as for plunge dip.

For a sump capacity of 1500 L replenish when the level drops by 300 L (1500 divided by 5).

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The concentration of the dip wash should be as recommended by the manufacturer for replenishment of shower dips. A label recommendation for replenishment is 1000 ml/1000 L.

For example:

$$\begin{aligned} \text{Dip concentrate required} &= \text{Dip/water ratio} \times \text{water volume} \\ &= 1 \text{ L per } 1000 \text{ L} \times 300 \text{ L} \\ &= 0.3 \text{ L (300 ml) dip concentrate for } 300 \text{ L} \\ &\quad \text{water.} \end{aligned}$$

(b) Constant replenishment as for plunge dip.

$$\text{Supply tank capacity} = 800 \text{ L}$$

For example:

$$\text{Replenishment concentration} = 1000 \text{ ml/1000 L}$$

$$\begin{aligned} \text{Dip concentrate required} &= \text{Dip/water ratio} \times \text{water volume} \\ &= 1000 \text{ ml per } 1000 \text{ L} \times 800 \text{ L} \\ &= 800 \text{ ml concentrate.} \end{aligned}$$

#### *K4.4.3 Assessment*

Examine sheep 1 minute after dipping to assess penetration of dip wash into the fleece in hard to wet sites. This can be checked using an 'indelible' pencil, or a water-activated pen. If the fleece is not saturated to skin level, then the time sheep are in contact with the dip wash should be increased.

### **K4.5 Non-saturation methods (ectoparasiticides)**

#### *K4.5.1 Jetting*

These methods may not give the protection achievable with saturation dipping. They are most effective when used for sheep 'off the shears' for short-term control of lice, keds, and blowflies. Pressure is generally higher than for shower systems (2–8 bar). High flow rates are needed because of the brief exposure time.

Dilution rates depend on output of the spray system, which can range from 18 to 300 L/min, and the rate of sheep throughput, so it is important to achieve appropriate dilution as per the product label.

Pressure gauges visible to the applicator should be fitted to the system.

There are many non-saturation methods of applying ectoparasiticides. In all cases, refer to the label recommendations and the equipment manufacturer's instructions for more detail. Guidelines for some methods are:

- (a) Jetting – This involves the application of relatively high concentrations at high pressure (5 bar) and low volume (5 L/min) of dip wash to flystrike areas of the animal (along the midline of the back in three sweeps to the hind legs, and to the crutch and genital areas);
- (b) Hand jetting – A 3–6 nozzle gun is combed through the fleece. Flow rates range from 5 to 10 L/min. Dip wash should be applied at a rate of 2 to 5 L per animal at sufficient pressure to achieve saturation to skin level; and
- (c) Automatic jetting races – These are similar to shower dips but operate at higher pressure and flow rates (4 bar, 140 L/min) as sheep spend less time in contact with the dip wash. Apply 2–8 L dip wash per head.

#### *K4.5.2 Pour-on backline treatments*

Use the specific applicator recommended by the product manufacturer. Choose a dose rate on the basis of the heaviest animals in the group. Read the label. Apply the product from the poll to the tail evenly across each side of the midline. Check the calibration of guns in the same manner as for an anthelmintic dosing device.

### **K4.6 Application by injection**

#### **K4.6.1 General**

A careful injection technique is required to prevent personal injury by accidental self-injection and prevent damage to and subsequent downgrading of carcasses, pelts, or hides. The following apply:

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- (a) Adequate restraint of animals is required, for example, in races or head crushes, to allow injection at the recommended site and by the recommended route, and to prevent personal injury;
- (b) Take care in light-conditioned animals, especially small ruminants, because there is a higher risk of inadvertently injecting into a joint, bone, or other non-target structure;
- (c) Some products are very irritating or toxic to humans. Use specialised safety injection equipment when directed by the authorising veterinarian or manufacturer;
- (d) The recommended site of injection in food-producing animals is virtually always high on the neck, in an area which is readily trimmed at slaughter. However, injection in this area, particularly with cattle, increases the risk to the operator, so some compromise might be needed by using less favoured alternative sites – seek advice from the supplier;
- (e) Injection of vaccines, antibiotics, and other pharmaceuticals is either by the subcutaneous (under the skin) or the intramuscular (into the muscle) route; and
- (f) Regardless of the site or route of injection, always inject in an area of skin which is clean and dry.

**K4.6.2 Vaccination**

Most vaccines are administered by subcutaneous injection, usually in the anterior third (upper part) of the neck. Needles must be clean and sharp. Syringes and vaccination guns must be reliable and accurate, and must be regularly cleaned and sterilised:

- (a) Preparation – Before use, sterilise vaccinators and needles (for example, for some equipment, boiling in water for 10 minutes will achieve this). For some products, once the seals on needle packs are broken, the needles should be stored in methylated spirits before use. Check label or supplier for product-specific recommendations on needle hygiene; and
- (b) Vaccination technique (subcutaneous) – Ensure that the vaccinator is functioning properly and set to the correct dose (read the label). If unsure, get advice from a veterinarian on proper injection technique and suitable injection sites.

**K5 Application equipment for fumigants**

These products have specific requirements for use relating to notification, calibration, application, and buffer zones, which are listed in Part 14 of the Hazardous Substances Regulations and tend only to be available through specialised contractors.

For products directly available to users for soil fumigation the universal calibration formula (Formula A) can be used for adherence to label recommendations.

For products directly available to users for fumigating spaces like grain silos and bulk food products, labels prescribe a rate per cubic metre of space occupied or per kg of bulk food product to be treated.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****APPENDIX L – HANDLING, MIXING, AND CLEAN-UP**

(Informative)

**L1 Introduction**

Before opening any agrichemical container, read the mixing instructions on the label.

Great care is required when opening agrichemical containers containing concentrates, decanting or adding concentrates into measuring equipment or spray tanks, and mixing. Concentrates have a greater potential toxicity than diluted spray mixture, so wear the correct protective equipment. Protection against splashes on the skin and in the eyes, and inhalation of fumes or dust, is essential.

**L2 Mixing sites**

Vulnerability of groundwater to contamination is a key factor to consider in choosing mixing sites for agrichemicals (see N2 and N4). The following are important features of any mixing site:

- (a) Sufficient isolation from plants and animals to prevent damage from vapour or dust;
- (b) Good ventilation and lighting;
- (c) Uncluttered and free from interference;
- (d) Precautions are in place to prevent contamination of any drain, well, or water body occurring. In addition:
  - (i) Permanent and semi-permanent mixing sites should be situated at the distances set out in J3.1 (user) for storage
  - (ii) For temporary mixing sites, if any water is drawn from a fresh water source, sufficient one-way valves (backflow preventers) shall be fitted to ensure there is no contamination from that source by back siphoning. Additional precautions, such as maintaining a suitable distance from the waterbody, or temporary bunding, may also be used;
- (e) Well supplied with clean water for mixing and washing; and
- (f) Ability to contain a spill immediately using a suitable emergency clean-up kit to hand (for example, a supply of a suitable absorbent material such as vermiculite):
  - (i) Ideally, the site should have an impervious surface and secondary containment to avoid soil contamination. Designated mixing, loading, and washing facilities should be able to capture and contain spills with a roof to prevent rainfall overwhelming the sump
  - (ii) For a semi-permanent site, establish a mixing and loading site on an area of grass reinforced with a grid or gravel. Do not remove topsoil when installing grid; a thin layer of gravel may be placed above the topsoil to improve surface stability. This approach is not recommended for heavy clay soils due to compaction risks. Periodic movement of the area selected is advised
  - (iii) If working from a temporary mixing site, have a shovel on hand to form emergency bunding with soil to contain a spill.

All areas used for decanting substances shall have floors that are capable of containing any spill or diverting it to a suitable secondary containment system.

NOTE – Check relevant district and regional plans for any specific mixing site requirements.

**L3 Mixing procedures****L3.1 General**

The following are basic points for mixing agrichemicals:

- (a) Wear the appropriate PPE (see Appendix R) and do not eat, drink, smoke, or touch your eyes or skin;
- (b) Seek calm conditions, or in low wind ensure your back is to the prevailing wind while mixing and loading;
- (c) Avoid distractions, work on a sturdy platform on level ground;
- (d) Open paper containers with a sharp knife or scissors – don't tear open;
- (e) Only open and mix the amount of chemical required for each job;
- (f) When pouring from a container, avoid pouring at eye level, and be careful of splashes, spills, or dust. (Use protective glasses);
- (g) Use a calibrated measuring jug, set the jug on a flat surface, and check measurement at eye level;
- (h) Prevent accidental spillage by immediately replacing lids and bungs on partly used containers;
- (i) Shake any suspended formulations well before dispensing the required amount;
- (j) Invert large containers to ensure adequate mixing where containers are too large to shake effectively;
- (k) Attend to any spillages immediately (see H3). Remove contaminated clothing and wash thoroughly. Provide first aid if required (see Appendix Q);

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- (l) Use closed transfer systems if available to reduce exposure to the pesticide during loading and mixing. In these systems, the product is transferred directly from a container into the mixing tank and sprayer tank; and
- (m) Keep accurate records of prepared and used agrichemicals. See section 5 for details.

**L3.2 Mixing plant protection products for spray application**

When adding the measured amounts of agrichemicals to a spray tank:

- (a) Check the label for special procedures, including compatibility if combining products;
- (b) Ensure water is of acceptable quality (see L5);
- (c) Fill the tank with about half the volume of water required;
- (d) Start tank agitation;
- (e) Add any insoluble materials – wettable powders, granules, then suspensions;
- (f) Add soluble materials;
- (g) Add emulsions;
- (h) Add any adjuvants or oils;
- (i) Top up tank to required level with water; and
- (j) Add any chemicals that cause foaming when the tank is nearly full.

NOTE – If there is no label guidance on compatibility of agrichemicals to be mixed, see L4.

**L3.3 Preparing dairy detergents and sanitisers for use**

Detergents and sanitisers include substances that may be strongly acid or strongly alkaline. Basic safety precautions include the following:

- (a) Use closed containers when carrying corrosive products in quantities greater than what is required for immediate use;
- (b) Avoid inhalation of fumes and splashes on the skin and in the eyes;
- (c) Do not pour liquids above your head (for example, into a milk vat);
- (d) When mixing:
  - (i) Add products to water not water to product
  - (ii) Dissolve caustics (acid or alkali) in a small amount of cold water prior to use in hot water
  - (iii) Do not mix chlorinated products with acid and do not allow these chemicals to mix in a common drain;
- (e) Do not pour concentrated alkaline or acid material on metal; and
- (f) Many detergents and sanitisers will make concrete or other hard surfaces slippery.

**L3.4 Preparation of veterinary medicines for use**

Restricted medicines shall be used in accordance with veterinary authorisation. For unrestricted veterinary medicines (UVMs):

- (a) Ensure drench guns, vaccination guns, and bolus applicators are working correctly. Periodic disassembly, cleaning, and lubrication (according to the manufacturer's recommendations) should be undertaken; and
- (b) Check dosing systems using reticulated water for livestock are clean and maintained to deliver accurate dosing.

**L4 Chemical compatibility**

Mixing different chemicals in the spray tank before application may cause problems, including endangering the safety of the user, due to incompatibility of the chemicals. Users should:

- (a) Comply with the manufacturer's recommendations regarding the mixing of two or more agrichemicals, for simultaneous use or application. Information is provided on product SDSs and charts describing agrichemical compatibility are also available;
- (b) Use mixtures of two or more agrichemicals immediately after mixing, and do not store mixtures for later use;
- (c) Keep any mixtures of agrichemicals simple. Mixtures not approved by the manufacturer can void the manufacturer's warranty. The absence of label information advising incompatibility should not be taken as meaning the agrichemical is compatible with other ingredients in a mixture. In the absence of other information, tests should be performed to check physical and biological compatibility; and
- (d) Undertake field tests for compatibility. The mixing of incompatible agrichemicals may result in undesirable changes to the physical and chemical properties of the components of the mix. This could result in excessive crop damage, ineffective pest control, blockages in application equipment, or an increased hazard to the user, as well as monetary loss.

If unsure about physical compatibility, the mixture can be tested as follows:

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- (e) Make up a 250 ml sample of the agrichemical mixture as intended for use, according to the manufacturer's instructions;
- (f) Place the sample in a clear glass bottle;
- (g) Invert the bottle 100 times;
- (h) Let the bottle stand for half an hour and then examine to see if any changes have taken place; and
- (i) Check for physical changes or the inability to get the chemicals back into solution or suspension. These indicate that the components are incompatible (for example, colour changes, heat/gas generation).

## NOTE –

- (1) Various brands of the same agrichemical may react differently because of different additives in their formulation.
- (2) Any mixture of agrichemicals not approved by the manufacturer voids the manufacturer's warranty. If in doubt, check with the manufacturer or supplier. The product of chemical mixtures may be potentially more hazardous than the components.

**L5 Water quality**

The cleanliness and chemical composition of the water used in a spray mix can influence the effectiveness of applied agrichemical. The three key water quality indicators related to agrichemical performance are listed below. In all cases check with the agrichemical supplier for advice on water quality testing and acceptable range water quality results, particularly water hardness and pH:

- (a) Cleanliness/turbidity – Water may contain suspended solids such as clay. Chemicals such as glyphosate and diquat are sensitive to this, as they are readily adsorbed to soil particles. Use the cleanest water possible for spray applications;
- (b) Hard water – Caused by positively charged minerals, including calcium, magnesium, sodium, and iron. These cations bind to some herbicides such as glyphosate and 2-4D amine, reducing their performance. Hardness is expressed in ppm or mg/L of calcium carbonate equivalent (CaCO<sub>3</sub>). Values above 300 mg/L are described as very hard. If the electrical conductivity of the water used for spraying is above 500 µS/cm, then a hardness test should be carried out. Electrical conductivity can be assessed with a handheld meter, and tests for hardness are available from analytical testing laboratories; and
- (c) pH – A complex parameter, as it is related to agrichemical's solubility, tolerance of hard water, and degradation characteristics:
  - (i) Most products perform best in slightly acidic conditions, that is, pH 5.5 to 7. Problems may arise if the water source is alkaline (from water bores or water stored in concrete tanks). Few plant protection products work best in alkaline conditions
  - (ii) Copper is an exception to (i) as phytotoxic effects (foliage/fruit damage) may occur when spray mixtures are acidic (less than pH 6.5, depending on copper formulation)
  - (iii) Some products may require a specific pH to dissolve properly
  - (iv) Label directions are important, sometimes calling for specific adjuvants. Some plant protection products, particularly insecticides, can break down rapidly in higher pH water
  - (v) The pH of mixtures in the spray tank can be changed by adding an acid or alkaline to the spray tank (after half filling with water). However, this must be done precisely, using calculated amounts depending on the pH change required. It is best to get specialist advice on this from the agrichemical supplier/manufacturer.

NOTE – Do not use salt or brackish water for mixing with plant protection products. Avoid taking water from estuaries, coastal lakes, and tidal rivers.

**L6 Equipment cleaning and decontamination****L6.1 Cleaning**

Cleaning means rinsing thoroughly (usually with water) to remove or dilute any remaining agrichemical.

All application equipment should be cleaned regularly – at least at the completion of each day's work. Application equipment, including protective equipment, should not be stored unless it has been cleaned. The easiest way to reduce the hazards from contaminated equipment is to dilute agrichemicals with large volumes of water, being careful to dispose of the washings in a manner consistent with the requirements of this standard (see Appendix M).

On completion of application, there may be a considerable quantity of mix left in pumping equipment and hoses, particularly with aircraft. Sufficient clean water should be pumped through to flush this residue out of the application equipment, to ensure that any spillage of chemical on to the loading area during dismantling of the equipment is minimised. Contaminated washings should be disposed of by approved methods (see Appendix M).

**L6.2 Sprayer design and operation**

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Ensure the sprayer tank can be pumped out completely at the end of spraying. Once the tank is empty, place a small volume (about 5% of capacity) of clean water in the tank to flush the system out through the nozzles on to the application area, for example, the headland or a waste area, ensuring that the maximum label application rate is not exceeded. This will avoid having to dispose of waste unused spray mix.

If the sprayer cannot be emptied with the sprayer pump, then modifications should be made to facilitate that. For example, fill cavities with fibreglass or other chemical resistant and impervious material.

Where a spray operation cannot be completed due to weather or equipment failure, store unused spray mix until conditions permit application. Check with manufacturer or supplier whether the product will still be suitable for use after such storage. Additional product or adjuvant may be needed if degradation has occurred.

### L6.3 Decontamination

Decontamination is a specific procedure to remove or neutralise any remaining agrichemical.

Decontamination should be considered whenever a change of agrichemical mix occurs. Decontamination should preferably be carried out on a concrete pad that is correctly drained and enables proper disposal of chemical waste. If decontamination has to be carried out in the field, a safe area should be selected which cannot be grazed by stock and cannot contaminate water bodies, groundwater, other crop sites, or residential areas. Triple rinsing with 10% of tank volume is recommended. The second rinse should have the cleaner added to it. This will achieve reliable decontamination.

Many agrichemicals are subject to degradation in the presence of an alkaline (most common) or acid medium. Decontamination requirements vary with chemical types. The recommendations in Table L1 are presented as general guidelines. If in doubt, or if further information is required, manufacturers should be consulted.

### L6.4 Decontamination for equipment maintenance

Vehicles used for spraying will require servicing from time to time. Owners and operators should ensure their vehicles are thoroughly cleaned internally and externally of agrichemical product prior to servicing. Tanks especially should be drained or only contain clean water. The range of products used through the sprayer and their associated hazards should be communicated to the service technicians. Particular attention to hazard risk should occur where breakdowns interrupt a spraying operation. These hazards should be assessed and mitigated. Service technicians must wear and use appropriate PPE when repairing contaminated equipment.

**Table L1 – Decontamination agents and use rates for application equipment**

Product used <sup>(1)</sup>	Quantity of agent per 100 L of water	Instruction
Phenoxy herbicides, salt, or amine formulations (for example, 2,4-D dicamba, MCPA) <sup>(2)</sup>	1 L household ammonia or 500 g alkaline detergent	Thoroughly agitate, flush small amount through systems, and let remainder stand in sprayer overnight. Flush and rinse. <sup>(4)</sup>
	or 500 g washing soda	Same as above except let stand for at least 2 hours.
	or 1 kg trisodium phosphate	Same as above except let stand for at least 2 hours.
	or 250 g fine activated charcoal and 250 g powder detergent <sup>(3)</sup> flush through sprayer	Agitate, operate sprayer for 2 minutes, let remainder stand for 10 minutes, then rinse.
Phenoxy herbicides, ester formulations (for example, 2,4-D esters, MCPA) <sup>(2)</sup>	500 g washing soda + 4 L kerosene + 125 g powder detergent <sup>(3)</sup>	Rinse inside of tank and flush small amount through system. Let stand at least 2 hours. Flush and rinse.



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Sulphonyl ureas (for example, chlorsulfuron, methyl, metsulfuron, tribenuron)	1 L chlorine bleach (3% sodium hypochlorite) per 100 L water	Flush through with agitation, drain, and repeat. Rinse with clean water.
Other herbicides (for example, atrazine, glyphosate, simazine)	125 g powder detergent <sup>(3)</sup>	Rinse with clean water before and after using soap or other detergent.
Insecticides <sup>(5)</sup> and/or fungicides	125 g powder detergent <sup>(3)</sup>	Agitate, flush, and rinse.
<p>NOTE –</p> <p>(1) Some proprietary products are available for decontamination, for example, Agpro De-Tox, Kleenup granular, Tank and Equipment Cleaner, and Pro-Kleen granular.</p> <p>(2) Caution. Since only a trace of some herbicides such as 2,4-D, sulphonyl ureas or picloram can damage plants, it may be risky to use an insecticide or fungicide in a sprayer that has been used to spray such herbicides. Separate sprayers are good insurance against plant damage.</p> <p>(3) Liquid detergent or surfactant may be substituted for powder detergent. Mix at a rate to make a sudsy solution.</p> <p>(4) Do not mix the concentrate ammonia with detergents, washing soda, or trisodium phosphate.</p> <p>(5) Organophosphate and carbamate insecticides may be detoxified by adding household 880 aqueous ammonia (for example, Cloudy Ammonia) to the cleaning solution (1 L per 100 L or 100 ml per 10 L).</p>		

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****APPENDIX M – DISPOSAL OF AGRICHEMICALS AND CONTAINERS**

(Normative)

**M1 Introduction**

Check the warning and precaution section of the product label for information on safe disposal regimes for the agrichemical and container. In the absence of specific label instructions, the following procedures provide guidance. Disposal of agrichemicals and their empty containers is controlled by the EPA Disposal Notice. There may also be local authority requirements under the RMA relating to the disposal of both agrichemicals and containers.

**M2 Disposal of unwanted agrichemicals**

Users should consider the following options, in the order listed, for the disposal of unwanted or obsolete concentrates:

- (a) Alternate uses – All users should investigate other legal uses of agrichemical concentrates. Checking the label claims and the HSNO approval for the product can help identify alternate uses. Unexpired, unused, or unwanted dairy detergent or sanitiser should be transferred to other dairy farmers for use;
- (b) Return to the manufacturer – If the agrichemical container is unopened, users should investigate the feasibility of returning the agrichemical to the reseller or manufacturer. Farmers with unwanted veterinary medicines should investigate the feasibility of returning unused or part used products to the reseller (unprescribed medicines) or the veterinarian responsible for prescribing them;
- (c) Agrecovery – As part of the industry stewardship programme, Agrecovery offers a collection service for unwanted agrichemicals. Chemical collection is user pays or may be funded by local or central government. Check with Agrecovery for more details, including the process for booking in for collection on farm or at regular chemical recovery events;
- (d) Local authority collections – Some local authorities operate unwanted agrichemical collections. Check with the local authority to see if this is an option;
- (e) Commercial waste disposal – Where none of the above options is available, then disposal through a recognised, specialist hazardous materials disposal company will ensure safe disposal. Always ask if the company is licensed to handle the particular unwanted material;
- (f) Landfills – Landfill disposal may be an option for some low toxicity, low hazard agrichemicals. Check with the local authority regarding options available with local landfills; and
- (g) Follow label instructions when dealing with expired dairy detergents and sanitisers. Undiluted product should not directly enter the dairy farm effluent system.

NOTE – Discharging the diluted agrichemical into the environment is not an acceptable option for disposal of unwanted agrichemical concentrate.

Where a substance is required to be tracked under the Hazardous Substances Regulations, the user shall record information on the identity of the substance, the total amount disposed of, the manner and date of disposal and location of the disposal site, and the name of the person undertaking the disposal.

**M3 Disposal of surplus spray mix****M3.1 General**

In all cases best practice is to prepare only sufficient spray mixture for the job on hand. Accurate planning, measurement, and calibration will assist with this. However, sometimes it may not be possible to finish a spray application due to changes in weather conditions or other circumstances.

**M3.2 Apply to target area**

If there is surplus spray mix left over from a job, the preferred disposal method is to spray the mixture on to the intended target.

When spraying on to the target area, remember the need to avoid exceeding:

- (a) Any maximum residue levels (MRLs) set for the crop being sprayed; and
- (b) Any maximum application rates recommended on the label or set as part of the HSNO product approval.

**M3.3 Store and use later**

If it is not possible to dispose of surplus spray on the target area, for example, if a mechanical breakdown or weather halts the spraying operation, the surplus spray mixture must be managed in a way that does not harm people, animals, or the environment. One method is to transfer the surplus to a suitable clean container or holding tank (check compatibility) until the mixture can be applied to the target area, or other suitable waste areas where the mixture is applied at a rate not greater than that recommended on the product label.

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Any such containers or tanks shall be properly labelled so that the contents can be identified and marked with hazard statements if applicable. The date of storage and the dilution rate shall also be recorded. This information is important where the contents are to be reused. The characteristics and effectiveness of some agrichemicals can change quite rapidly (for example, overnight) once diluted for application. Check with your supplier for advice on how to treat stored diluted product.

**M3.4 Spraying on to waste ground**

Small amounts of surplus spray mixture can be disposed of on to waste ground provided that:

- (a) The effective application rate, in litres per hectare, is no greater than the recommended application rate given on the product label and any other label conditions such as buffer zones or application frequency are adhered to;
- (b) No run-off occurs and no spray mixture enters any surface water, including streams or ponds;
- (c) No spray mixture enters groundwater, field drains, septic tanks, or sewerage systems; and
- (d) Any withholding periods (WHPs) for livestock re-entry are observed.

NOTE –

- (1) As a guide, 50 L or less of diluted spray mix is a small quantity.
- (3) Waste ground is an area which is not used for the production of any food crop or stock feed, and has no intrinsic environmental value.

**M4 Disposal of washings****M4.1 General**

Spray equipment should be rinsed internally and externally after use (see Appendix L). Both internal and external washings should be collected and either treated or disposed of safely.

Even when the sprayer tank is empty, the application equipment may still contain up to 10 L or more of spray mixture. This shall be diluted with rinse water and disposed of. A triple rinse with a cleaner for decontamination may be necessary when changing the product to be applied through the sprayer. This will create a greater volume of washings to dispose of. Boom ends may contain spray mix and should also be flushed. The use of boom end taps can facilitate this. Fitting boom end nozzles can avoid this.

Hosing down or water-blasting the outside of the sprayer creates external washings. These are likely to contain agrichemical product.

**M4.2 Spray internal washings on to target area**

The diluted contents of the sprayer may be sprayed on to the target area provided that the conditions set out in M3.2 are met. Some sprayers are fitted with a tank rinsing system designed to allow this for convenience as spraying is finished at the target area.

**M4.3 Spray internal washings on to waste ground**

Small amounts of diluted surplus spray mixture produced while rinsing and cleaning the sprayer can be disposed of on to waste ground provided that the conditions set out in M3.4 are met.

**M.4.4 Treatment systems***M4.4.1 General*

As an alternative to disposal on to waste ground, or where larger amounts are to be disposed of, specially designed evaporation pits or biodegradation beds can be constructed. The purpose of the treatment system is to render the washings non-hazardous.

NOTE – No discharge to surface or groundwater is permitted from such a system (unless the discharge can be shown to meet quality standards set by the local authority concerned and any HSNO disposal requirements are satisfied). Local authorities should be consulted for further advice.

*M4.4.2 Evaporation pits*

Sprayer rinsate is collected in a small shallow pond and allowed to evaporate naturally. The pond should have a roof to keep rainwater out. Design should allow for good airflow across the pond surface. RemDry™ is an example of a commercialised mobile sprayer rinsate collection and treatment system based on evaporation.

*M4.4.3 Biodegradation*

Biodegradation systems utilise the process of microbial degradation of agrichemicals which occurs in the soil (see N2.4.2). These systems are known as biobeds and have been widely adopted in Europe and the UK to deal with spills and sprayer washings. They are accepted as a place where it is safe to dump dilute agrichemical waste. They typically consist of a mixture of 50% straw, 25% peat-free compost, and 25% soil (biomix) that is placed in a lined pit measuring about 1m deep, 3m wide, and 6m long.

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NOTE – The sizing of the system should relate to the rinsing methods used and the volumes of contaminated water (sprayer rinsate) to be treated.

The biobed is covered with turf, usually couch grass (*Agropyron repens*) which has been found to tolerate dilute herbicide washings (fungicide and insecticide washings are not expected to be harmful to the turf).

Liquids enter the biomix within a biobed from a banded sprayer filling area either by gravity drain or pump, where they undergo bioremediation and are then drained from the biobed. Excess water that leaches to the bottom must be removed and cycled back to the top of the biobed. This liquid, with minimal pesticide residues, can also be used for land irrigation or reused, for example, for subsequent sprayer washing. The biomix allows any pesticides within the liquid to cling or lock on to organic matter, particularly on to the straw. Some chemicals do this very rapidly. The bacteria within the soil and within the mix then slowly work to break down the pesticide residues, with the compost assisting a stabilised moisture content within the mix.

The Phytobac® is a commercialised biobed-based system available in the EU. The Phytobac system enables contaminants, typically originating from the filling, cleaning, and washing of spray equipment, to be retained and degraded by microbial means, that is, bioremediation. Phytobac is a sealed container of waterproof concrete, metal, or plastic walls. The container is filled with a biomix of 70% topsoil and 30% chopped straw. The topsoil should be from conventionally cropped fields as this encourages the growth of the necessary microbial strains. The straw gives the biomix the required degree of porosity and serves as an energy source for the microorganisms.

#### *M4.4.4 Biofilter system*

The Biofilter is essentially a mini-biobed made from four intermediate bulk containers (IBCs) (1000 L pods), some plumbing, and biobed materials. In areas where high water tables may be a problem, an above ground biofilter system may be a better option. This is a well suited system for undercover spray fill areas and smaller operations where less than 15 000 L is being passed through the system each year. Advantages are:

- (a) Current fill areas can be adapted;
- (b) It can be built above ground;
- (c) The biomix is easy to refresh once exhausted;
- (d) It has a relatively small footprint; and
- (e) It is cheaper and easier to install than a biobed.

For details on building a Biofilter search for 'how to build a Biofilter to treat pesticide washings'.

## **M5 Disposal of contaminated absorbent material**

Small quantities of absorbent material arising from spill clean-up can be treated in a similar way to how spray washings are treated in a biofilter (M4.4.4). The key requirement of a treatment system for contaminated absorbent material is to render the material non-hazardous.

A simpler, smaller-scale alternative to the biofilter can be made in a large container, for example, an IBC, which is 2/3 full of biobed material along with activated charcoal. Construction and operation should maintain an environment to support a microbial population, that is, moist with airflow across the top. A layer of drainage gravel in the base of the IBC, separated from biomix with a geocloth, is recommended. Direct application of concentrate would not be suitable.

Keep a record of product additions and dates. If water accumulates in the base of the IBC, either:

- (a) Drain and reapply to top of the biomix; or
- (b) Test the water for the product(s) known to have been added and:
  - (i) Use for irrigation if non-hazardous
  - (ii) Dispose of safely if still hazardous.

## **M6 Stock dip effluent disposal methods**

The user has the responsibility to ensure that dip baths, including footbath solutions, and any ancillary equipment are sited well away from any drains, watercourses, wells, or bores which might become contaminated. Resource consents may be required under district or regional plans for the discharge of stock dip effluents. Guidelines for the disposal of spent (stripped) dip wash and footbath solution include the following:

- (a) Storage of dip wash and footbath solution in a holding tank pending disposal by a specialist contractor; or
- (b) Spreading on to suitable land, at low application rates within any environmental exposure limit (EEL) restrictions:
  - (i) As a guide, not more than 5000 L of spent dip should be applied per hectare

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- (ii) The land needs to be capable of absorbing the volume of liquid to be discharged without run-off risk to wildlife, ground, or surface waters. A minimum distance to water bodies of 50 m for any discharge is recommended
- (iii) Land used for disposal shall not be producing food crops or stock feed at the time of disposal
- (iv) Do not let stock on to land that has been used as a disposal site for at least 28 days following disposal.

## **M7 Disposal of empty agrichemical containers**

### **M7.1 Recycle**

The vast majority of agrichemical containers are able to be recycled. Where recycling is possible, containers shall be recycled. In all cases the container must be clean of any agrichemical residue before it may be accepted for recycling.

NOTE – Agrecovery runs a nationwide recycling scheme. The scheme is funded by participating levy paying product manufacturers. Recycling of their products is free. Refer to the Agrecovery website for further details such as collection points, rinsing requirements.

Triple rinsing shall be used to make the empty containers non-hazardous. Triple rinsing of glass, metal, plastic, and even some heavy paper containers effectively removes most remaining product in the container.

To triple rinse:

- (a) Ensure you are wearing appropriate protective equipment for the product;
- (b) Drain the empty container for 30 seconds;
- (c) Fill the container with water to about 30% of capacity, replace the lid, and shake the container so that all interior surfaces are rinsed;
- (d) Remove the cap and add the rinse liquid to the spray tank or dip wash. For drenches and ready-to-use sheep dips, if permitted under the HSNO product approval, spread or spray the rinsate on to waste ground or pasture from which all livestock have been excluded. In each case allow the container to drain for 30 seconds; and
- (e) Repeat steps (c) and (d) twice more, facing the container in a different direction each time to shake.

Drenchers and ready to use dips should also use this rinsing process to remove remaining product and make packaging non-hazardous.

### **M7.2 Reuse**

A small number of containers such as IBCs can be returned to the supplier for reuse. Containers should be clean and dry before taking to the rural retailer for refilling.

### **M7.3 Disposal**

#### *M7.3.1 General*

Where recycling or reuse is not possible, the agrichemical container or packaging shall be disposed of.

The package or container shall be rendered incapable of containing any substance, and shall be disposed of in a manner that is consistent with the disposal of the agrichemical it contained and which takes into account the material the package is manufactured from. Plastic shall not be burnt.

#### *M7.3.2 Public landfill disposal*

Triple rinse any containers to be disposed of in a landfill to make the empty containers non-hazardous. Remove lids or bungs from the containers and chop holes in any containers to prevent reuse. Containers shall also be squashed to reduce the volume in landfills.

NOTE – Some landfills may not accept containers for disposal. Contact the landfill operator for confirmation.

#### *M7.3.3 Private landfill disposal*

If none of the preceding disposal means is available, containers may be disposed of in a private landfill provided that landfill has resource consent from the relevant local authority, or is permitted by a local authority. Triple rinse any containers to be disposed of in a landfill to make the empty containers non-hazardous. Ensure lids and bungs are removed and holes are chopped in containers to prevent reuse, squash, and ensure they are buried. Containers shall be buried in a location where groundwater will not percolate through the material.

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## **APPENDIX N – ENVIRONMENTAL MANAGEMENT**

(Informative)

### **N1 Introduction**

Agrichemical movement away from the target application area (or the point where the chemical is introduced to the environment, for example, from spillage) will be in either water, soil, or air. Movement of agrichemicals away from the target area is an environmental hazard.

Consult the relevant regional council for advice. Local government rules and requirements must be followed with respect to the use of agrichemicals. These rules and requirements are based on the RMA, HSWA, and HSNO Act and associated regulations and notices. Approval or consent may be required when agrichemicals are used where they may enter water. Users are required to notify the respective regional council in the event of any accidental spillage or unintended introduction of agrichemical into the environment.

This Appendix concentrates on movement in water with some comments on effects on non-target organisms. Movement of agrichemical in air (spray drift) is covered in Appendix B.

### **N2 Fate processes**

#### **N2.1 General**

Once an agrichemical is introduced into the environment, whether through application, through disposal, or due to a spill, many processes determine the ultimate fate of that chemical. Not all agrichemicals undergo the same fate processes. The chemico-physical properties of the active ingredients in the agrichemicals determine, together with soil and environmental factors, which fate processes dominate once the agrichemicals are in the environment.

Fate processes can be separated into three major types:

- (a) Adsorption, which binds agrichemicals;
- (b) Transfer processes, which move agrichemicals; and
- (c) Degradation processes, which break agrichemicals down.

#### **N2.2 Adsorption**

The adsorption process binds agrichemicals to soil particles, often because of the attraction between chemical and soil particles.

Many soil factors influence agrichemical adsorption. Soils high in organic matter or clay are more adsorptive than coarse, sandy soils. Soil moisture also influences adsorption. Wet soils tend to adsorb less than do dry soils because water molecules compete with the chemical for the binding sites on soil particles.

Chemical adsorption can lead to reduced pest control capability. For example, target weeds will be missed if a herbicide binds tightly to soil particles and cannot be taken up by roots. Some product labels recommend higher application rates when the chemical is applied to adsorptive soils.

Plant injury can result when a product used for one crop is later released from the soil particles in sufficient quantities to harm a subsequent sensitive crop. 'Carry-over', as the persistence of agrichemicals in the soil is often called, can also lead to the presence of illegal residues on subsequent food or feed crops.

Adsorption is particularly important because it determines whether other processes can affect the movement of agrichemicals.

#### **N2.3 Transfer processes**

##### *N2.3.1 General*

Transfer is sometimes an essential process for pest control. For example, for certain pre-emergent herbicides to be effective, they must be able to move within the soil to reach the germinating weed seeds. Too much movement, however, can move a chemical away from the target pest. This can lead to reduced pest control, injury of non-target species, including humans, and surface water and groundwater contamination.

The five ways that agrichemicals can be transferred are through volatilisation, run-off, leaching (preferential flow), absorption, and crop/animal removal and are as follows:

##### *N2.3.2 Volatilisation*

The volatility of the agrichemical is an important factor. Volatilisation is the conversion of a solid or liquid into a gas. Once volatilised, a chemical can move in air currents away from the treated surface (Appendix B). Concentration and vapour pressure are important factors in determining whether a product will volatilise; the higher the concentration, the higher the vapour pressure, and hence the volatility is higher.

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Environmental factors that tend to increase volatilisation include high temperature, low relative humidity, and air movement. An agrichemical that is tightly adsorbed to soil particles is less likely to volatilise; soil conditions such as texture, organic matter content, and moisture can influence volatilisation.

Volatilisation may result in reduced control of the target pest because less product remains at the target site. Vapour drift is the movement of chemical vapours or gases in the atmosphere. Labels of volatile agrichemicals may suggest incorporating the product into the soil by tillage or irrigation during or shortly after application. This helps to reduce volatilisation by reducing the amount of exposed product on the surface of the soil. Products at risk of volatilisation are increasingly being replaced by products with less volatile formulations.

Some agrichemicals can escape from soils as gases. Some can be drawn from the soil and enter the atmosphere with evaporating water or revolatilise after deposition on the target. Agrichemical particles in the atmosphere can come back to earth in rain, snow, or dust fall. They then can leach into groundwater or be carried by runoff into surface water. Airborne transport of agrichemicals is a major route for their widespread dispersion in the environment so extreme care is needed particularly if using volatile herbicides. Follow product labels where they suggest avoiding use in relation to forecast air temperature and humidity to reduce the risk of revolatilisation after application.

NOTE – Regulatory conditions may include restrictions on use of volatile products under certain weather conditions.

### *N2.3.3 Vapour pressure*

Vapour pressure is the pressure exerted by a saturated vapour above its own liquid in a closed container. Vapour pressures reported on SDSs are in millimetres of mercury (mmHg) at 20°C (68°F), unless stated otherwise. Table N1 outlines how to interpret the levels of volatility from vapour pressure reported on the SDS.

**Table N1 – Volatility rating from vapour pressure at 20 to 30°C (room temperature) US data\***

Level of volatility	Vapour pressure measurement
Non-volatile	Less than $1 \times 10^{-7}$ mmHg (0.0000001 millimetres of mercury)
Slightly volatile	$10^{-7}$ to $10^{-4}$ mmHg (0.0000001 to 0.0001 mmHg)
Volatile	$10^{-4}$ to $10^{-2}$ mmHg (0.0001 to 0.01 mmHg)
Highly volatile	Greater than 0.01 mmHg

NOTE –

- (1) SDSs may provide volatility data in mPa. 1 mPa (milliPascal) = 0.001 Pa =  $7.5 \times 10^{-6}$  mmHg (Torr) or 1 mmHg = 133 000 mPa.
- (2) Vapour pressure of a substance at 38°C (100°F) will always be higher than the vapour pressure of the substance at 20°C (68°F).
- (3) Vapour pressures reported on SDSs in mmHg are usually very low pressures; 760 mmHg is equivalent to 14.7 pounds per square inch.
- (4) The lower the boiling point of a substance, the higher its vapour pressure.
- (5) When quality control tests are performed on products, the test temperature is usually 38°C (100°F), and the vapour pressure is expressed as pounds per square inch (psig or psia).

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### *N2.3.4 Run-off*

Run-off is the movement of water over a sloping surface. Run-off occurs when water is applied to the soil at a faster rate than it can enter the soil. This can occur in the situation of heavy rainfall or high irrigation intensities, or if water is applied to a hydrophobic (water-repellent) soil surface. Run-off water can carry traces of agrichemicals in the water itself or bound to eroding soil particles.

The presence of vegetation or crop stubble tends to slow the movement of run-off water. Certain physical and chemical properties of an agrichemical, such as how quickly plants absorb it, or how tightly it is bound to plant tissue or soil, are also important.

Herbicide run-off can directly injure non-target plants. Insecticide- and nematicide-contaminated run-off which drains into water bodies, streams, and lakes can be particularly harmful to aquatic organisms. Run-off into surface waters can cause injury to crops, livestock, or humans if the contaminated water is used downstream. Run-off water can also lead to groundwater contamination. In most landscapes, surface and groundwater are connected and interact with each other, for example, through outflow of surface water through the stream bed.

Agrichemical run-off can be reduced in the following ways:

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- (a) By monitoring weather conditions (for example, avoid agrichemical application when heavy rain is predicted);
- (b) By carefully applying irrigation water (for example, avoid high irrigation intensities and duration, monitor soil water content before irrigating);
- (c) By using a spray mix additive to enhance product retention on foliage; and
- (d) By incorporating the chemical into the soil.

*N2.3.5 Leaching*

Leaching is the movement of a chemical through the soil as opposed to movement over the surface and depends on the way water flows through the soil. Water may flow uniformly through the soil matrix, or it may concentrate in preferential pathways (cracks, macropores, and fissures). This latter process is called preferential flow and is an important process for agrichemical transport through a wide range of soils, including both clays and intermediate soils. The remainder of water in the soil is effectively immobile and held in the soil matrix.

Leaching depends, in part, on the chemical and physical properties of a product. A product held strongly to soil particles by adsorption is less likely to leach. However, soil particles can move together with adsorbed agrichemicals into deeper soil layers. Known as colloid transport, this process depends on the mobility and character of colloids. The persistence of an agrichemical also influences the likelihood of leaching. For example, an agrichemical that is rapidly broken down by a degradation process is less likely to leach because it remains in the soil only a short time.

Other factors that can influence leaching include soil texture and organic carbon content, in part, because of their effect on chemical adsorption. Soil permeability (that is, how readily water moves through the soil) is also important. The more permeable a soil, the greater the potential for leaching; a sandy or gravelly soil is much more permeable than a clay soil.

Leaching of agrichemicals can be affected by the following:

- (a) The method and rate of application;
- (b) The use of conservation farming systems that modify soil conditions; and
- (c) The amount and timing of water a treated area receives after an application. Typically, the closer the time of application to a heavy or sustained rainfall, the greater the likelihood some leaching will occur.

Careful product selection is important because products that are not readily adsorbed or rapidly degraded, and are highly water-soluble, are the most likely to leach. Labels must be read carefully and the application instructions followed. The label may also contain statements that advise against the use of the product when certain soil, geological, or climatic conditions are present.

*N2.3.6 Absorption*

Absorption or uptake is the movement of an agrichemical into plants and/or animals. Absorption by target and non-target organisms is influenced by environmental conditions, by the chemical and physical properties of the product and the soil, and by the physiology of the target plant or animal.

Once absorbed by plants and animals, agrichemicals either break down (metabolise), are excreted (in the case of animals), or remain in the plant or animal until the tissues decay or are processed.

Most food commodities are subject to washing and/or processing which removes most of the remaining residue. Some transfer of residue or breakdown products can occur when crops or animals are moved from the treatment site or by the movement of material such as lawn clippings or soil.

**N2.4 Degradation processes***N2.4.1 General*

Degradation, or the breakdown of agrichemicals, is usually beneficial. The reactions that destroy these products change most residues in the environment to lower toxicity compounds. Degradation, however, can be detrimental when an agrichemical is destroyed before the target pest has been controlled. The relevant types of degradation processes include microbial, chemical, and photodegradation.

*N2.4.2 Microbial degradation*

Microbial degradation is the breakdown of agrichemicals by fungi, bacteria, and other microorganisms that use them as a food source. Most microbial degradation of agrichemicals occurs in the soil. Soil conditions such as moisture, temperature, aeration, pH, and the amount and nature of organic matter affect the rate of microbial growth and activity. In the case of animal health products, most microbial degradation occurs in the animal itself.

*N2.4.3 Chemical degradation*



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Chemical degradation is the breakdown by processes that do not involve living organisms. Temperature, moisture, pH, and adsorption, in addition to the chemical and physical properties of the product constituents, determine which chemical reactions take place and how quickly they occur.

Hydrolysis, a common degradation reaction, is a breakdown process where the product reacts with water. Many organophosphate and carbamate insecticides are particularly susceptible to hydrolysis under alkaline conditions. Some can be broken down within hours if mixed with water that is alkaline.

A product label may warn against mixing one agrichemical with other agrichemicals or using water with specific characteristics (see Appendix L). Observing these precautions can help prevent product degradation and potential incompatibility problems and phytotoxicity. In some situations, buffers or other additives may be available to modify spray mix conditions and prevent, or at least reduce, degradation. Emptying the spray tank between applications can reduce agrichemical degradation and possible corrosion of spray equipment.

#### *N2.4.4 Photodegradation*

Photodegradation is the breakdown of chemicals by light, particularly the ultraviolet component of sunlight. Photodegradation can destroy chemicals on the surface of foliage, animals, soil, and even in the air.

Factors that influence photodegradation include the intensity of the sunlight, properties of the application site, the application method, and properties of the particular chemical. Losses from photodegradation can be reduced by incorporating the product into the soil during or immediately after application or by administering to animals orally or by injection.

Photodegradation can be beneficial in breaking down unwanted chemical residues on food or feed crops before harvest.

### **N3 Surface water contamination**

There are many ways in which surface water (for example, streams or ponds) can be contaminated by agrichemicals, including direct flow from storage or mixing areas, indirect flow as sediment with adsorbed chemical, and wash-off from the target crop by unexpected rainfall.

NOTE – Direct contamination of water bodies can occur from spray drift or off-target application. See Appendix B.

Run-off water contaminated by agrichemicals can pose risks to health, water supplies, aquatic environments, and irrigated crops. Prevention must be the aim, and the measures listed for prevention of groundwater contamination (see N4) also apply to surface water contamination. Provision of riparian vegetation or buffer zones between the crop and surface water will reduce contamination risks.

Only agrichemicals that have been approved for use on to or into water can be used to control aquatic weeds in drains, rivers, or other water bodies. Check label conditions for details.

### **N4 Groundwater contamination**

#### **N4.1 General**

Contamination of groundwater by agrichemicals is serious because once it has occurred it is virtually impossible or very expensive to reverse. Therefore, prevention is critical, and the following practices can help reduce the possibility of contamination. The processes described help determine whether chemicals reach groundwater or are degraded beforehand.

#### **N4.2 Practise integrated pest management**

Agrichemical applications should be carefully timed and combined with other non-chemical pest management practices where this is possible. Pests should be accurately identified and agrichemical applications made only when necessary, using the lowest labelled amount needed for adequate pest control. Minimising chemical use reduces the potential for environmental problems.

NOTE – See Appendix D for further information on IPM and resistance management.

#### **N4.3 Prevent spills**

Users shall take precautions to minimise the likelihood of spills occurring. See L3 on how to reduce the risks of spills during mixing.

If a spill does occur, it shall, where practical, be contained and cleaned up immediately. See H3 for advice on managing spills. In the event of repeated spills in the same area, the capacity of the soil to adsorb or degrade the chemical can be exceeded, which may increase the likelihood of water contamination as well as leading to the contaminated soil itself being unproductive or even hazardous.

#### **N4.4 Select products carefully**

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Products that are not readily adsorbed to soil particles, highly water-soluble, and relatively stable have the greatest potential to reach ground and surface waters. Read labels carefully for information and restrictions on application rates, timing, and placement. All of these factors can influence the potential for leaching and run-off. Also note water protection guidelines on the label.

**N4.5 Vulnerability of the area**

Users should routinely determine the susceptibility of their soil to leaching and run-off. A number of factors can affect agrichemical movement, including soil texture, organic matter, permeability and moisture content, slope of the land, and the presence of vegetation. The closeness to surface water, the depth of the water table, and the permeability of the layers between the soil surface and the groundwater should all be considered when assessing the vulnerability of an area.

When mixing, applying, storing, or disposing (including clean-up) of agrichemicals, always consider the proximity to water bodies. These include springs, streams, dams, wetlands, and other surface waters, bores and groundwater recharge areas, and sinkholes. By either establishing a vegetation zone or leaving an untreated border, a buffer zone can be provided between a use or handling site and a sensitive area. Buffer zones, and other protective controls, may be specified in the HSNO approval for the product.

**N4.6 Location and condition of bores**

Bores should be properly capped and sealed to prevent groundwater contamination. Grade the area to keep surface run-off away from the bore. If chemicals are spilled near bores they can move directly and rapidly into groundwater. Properly close all abandoned bores and never dispose of waste in unused bores.

NOTE – See J3.1 for guidance on distance of agrichemical stores from bores and other water bodies.

**N4.7 Measure accurately**

Carefully calculate how much product is needed to treat the specific site with the equipment being used and measure the quantity accurately. Careful calculations help eliminate disposal problems associated with excess spray mix, or use of concentrations which are higher than recommended.

**N4.8 Sprayer operation**

Calibrate equipment carefully and often, to ensure that the proper amount of chemical is applied or administered. Check the equipment for leaks and malfunctions to minimise the potential for accidents or spills.

NOTE – See Appendix K for information on calibration and equipment maintenance.

**N4.9 Mix and load carefully**

Handle agrichemicals carefully to avoid spills. Mix and load on a concrete surface to avoid saturating the soil with agrichemicals. Fill the spray tank as far from the water source as possible. Increase the length of the water hose or fill the tank in the field using an alternative water source. Never leave a spray unit unattended while filling.

Decanting of product shall take place on an impervious surface that is able to contain any spill.

**N4.10 Prevent back-siphoning**

Use sufficient anti-backflow devices (check-valves) to prevent the product getting into the water body. When siphoning water directly from a dam or stream, at least one one-way valve shall be used. Properly constructed bores should have check-valves fitted to prevent back-siphoning; check-valves can be added to an existing system.

**N4.11 Weather and irrigation**

If heavy or sustained rain is forecast, delay the application to avoid run-off and leaching. The depth of irrigation water applied should be carefully controlled to minimise the potential for leaching and run-off.

**N4.12 Store agrichemicals safely**

Minimise the stock of agrichemicals by buying only what is needed for a season or a specific spray job. The storage area should be located away from all water bodies. An impervious floor facilitates clean-up in the event of a spill or leak. Inspect containers regularly for leaks and corrosion. Bulk storage tanks should be inspected frequently and placed on a bunded impervious surface to prevent any chemical movement beyond the storage area in the event of a spill or leak.

NOTE – See Appendix J for details of regulatory requirements for storage of agrichemicals.

**N4.13 Dispose of waste carefully**

Follow all label instructions when disposing of agrichemicals and containers. Triple rinse containers that have been holding liquid concentrates as soon as they are empty and pour the rinse material into the spray tank.

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Excess spray mix and washings from equipment cleaning can be sprayed on another site or crop authorised by the label. Minimise impact of sprayer washings by ensuring the sprayer tank can be pumped out completely at the end of spraying.

NOTE – See Appendix M for more details.

## **N5 Effects on non-target organisms**

### **N5.1 General**

Environmental hazards include the use of agrichemicals that may affect non-target organisms, that is, desirable plants, bees and other beneficial insects, fish, and other wildlife. Refer to the product's label conditions for any restrictions on use and any directions to minimise or avoid these effects.

### **N5.2 Plants**

Herbicides are the primary cause of non-target plant injury. Herbicides cause damage to non-target organisms by way of drift, run-off, or leaching from treated areas as well as from mixing, disposal, and storage sites.

A chemical that injures plants is described as phytotoxic. The symptoms of herbicide phytotoxicity are frequently difficult to diagnose. Symptoms often do not appear for several days or sometimes weeks and, even then, are often confused with pest damage, nutritional deficiencies, virus disease symptoms, inappropriate cultural practices, or adverse weather conditions. Sometimes no symptoms develop, but instead a crop may be rendered unsaleable due to illegal residue levels.

Accurate diagnosis of herbicide injury is aided by having access to the following: good application records, weather data, knowledge of how the herbicide acts (mode of action), fresh plant specimens, and knowledge of the planting area and its proximity to other potential sources of pollution.

Minimising off-target application (for example, spray drift, run-off), preventing spills, and careful use of residual herbicides will reduce the chances of unintended plant injury or death.

### **N5.3 Bees and other invertebrate pollinators**

Invertebrate pollinators such as bees must be protected from substances that are toxic to them (EPA Hazardous Property Controls Notice). In addition to the possibility of pollinator mortality, potential effects of agrichemicals on pollinators include confusion and reduced flight. By taking the following precautions, users can reduce the chances of bee poisoning or movement of chemicals into the food chain through pollen transport:

- (a) Do not apply products that are toxic to bees and in a form to which bees are likely to be exposed when bees are foraging or when plants are in flower and likely to be visited by bees or other invertebrate pollinators. This includes shade or shelter trees and weeds within the application area. Mow cover crops and weeds to remove the flowers prior to spraying;
- (b) Select the product which is least harmful to foraging bees, which will involve a consideration of both degree of toxicity and formulation hazards:
  - (i) Check product labels for information specific to bee toxicity
  - (ii) Select the safest formulation. Wettable powders are usually more hazardous to bees than either emulsifiable concentrates (ECs) or water-soluble formulations. Granular insecticide formulations are generally the least hazardous to bees. The hazard increases, however, when insecticides are micro-encapsulated, as the minute capsules can be carried back to the hive in much the same manner as pollen;
- (c) Minimise drift during application;
- (d) Time the application carefully. Evening applications are less hazardous than early morning. Both are safer than midday applications;
- (e) Do not spray near hives. Bees may need to be moved or covered before using insecticides near colonies; and
- (f) Cooperate with beekeepers. Fostering cooperation among beekeepers, growers, and agrichemical users can reduce bee poisoning.

The best way to avoid injury to beneficial insects and microorganisms is by careful and correct use of agrichemicals. Target-specific products should be used where possible and applied only when necessary as part of a total pest management programme.

### **N5.4 Soil ecosystems**

Adsorption and binding of chemicals to soil particles may increase risks to soil fauna (for example, earthworms) and microorganisms from the toxic effects of agrichemicals. Key factors in minimising these risks include selecting agrichemicals that are target-specific and using agrichemicals where the products of biodegradation are benign. Some agrichemicals such as copper, DDT, or dieldrin can persist in the soil for years; other

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agrichemicals can break down into compounds that are more toxic or persistent than the original agrichemical. Read and follow product label conditions and recommendations.

Timing of application, accurate equipment calibration, and the form of the agrichemical are important tools to avoid soil contamination.

**N5.5 Fish and other wildlife**

Fish and other wildlife, including birds, often mistake granules or pellets for food. Pets, birds, and other wildlife can be killed when granules or pellets are left unattended or improperly placed. Granules are usually dyed green to reduce the attractiveness to birds.

The following practices can minimise any effects upon wildlife from the use of agrichemicals:

- (a) Use agrichemicals only when necessary. Select the least toxic and least persistent product available;
- (b) Observe the label conditions and recommendations relating to environmental precautions;
- (c) Treat only the areas needed and wherever practical avoid aquatic areas. Leave a buffer zone between water bodies (such as rivers, lakes, dams, and water troughs) and the treated area where appropriate (see B7 for advice about buffer zones);
- (d) Avoid spraying trees overhanging streams or dams;
- (e) Exercise caution when placing pellets or granules. Users must be aware of their legal responsibilities when using agrichemicals. Very strict laws have been enacted to protect wildlife, especially endangered species.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****APPENDIX P – ADVERSE EVENTS**

(Normative)

**P1 Scope**

This appendix provides a definition of an adverse event and details how adverse events should be reported and managed. Users of agrichemicals shall take steps to avoid, remedy, and mitigate any adverse effects caused by the use of agrichemicals.

Following the requirements of this standard should help prevent adverse events occurring. However, accidents and mistakes do occur, and an agrichemical user should know what to do in that event.

NOTE – The requirements for managing spray drift events are set out in a separate section, see P4.

**P2 Definition of adverse event****P2.1 General**

An adverse event is any unfavourable or unintended event that occurs after the use of an agrichemical regardless of whether it was used as per the label or not (either deliberately or unintentionally). This includes unintended or unfavourable effects on the following:

- (a) Target crop/plant and animals;
- (b) Non-target plants or animals;
- (c) The surrounding environment, including sensitive areas; and
- (d) Human health.

NOTE – For further details on ACVM-related adverse events, including regulatory definitions and obligations, see the MPI website.

**P2.2 Plant protection products**

Unfavourable outcomes from the use of plant protection products may include the following:

- (a) Reduction in product efficacy;
- (b) Phytotoxicity;
- (c) Human health issues;
- (d) Damage to non-target plants or property (for spray drift, see P4);
- (e) Environmental consequences, for example, bee, bird, or fish deaths;
- (f) Residues in food crops that do not comply with maximum residue levels (MRLs) (on-label or off-label use);
- (g) Issues which affect quality assurance schemes.

Adverse effects may occur despite following label guidance. For example, there may be unknown incompatibility between agrichemical products or spraying issues resulting from poor-quality product sedimentation despite adequate stirring.

Adverse events may also result from not following regulatory conditions and label guidance:

- (h) Incorrect rate and timing;
- (i) Used on a crop not specified on the label, that is, off-label use;
- (j) WHP was not followed;
- (k) Inappropriate use or lack of use of PPE;
- (l) Insufficient agitation of spray mix;
- (m) Poor-quality water;
- (n) Incompatible products mixed;
- (o) Wrong product used on a crop;
- (p) Contamination from a previous product in tank; or
- (q) Poor coverage due to incorrect sprayer set-up.

Other adverse events may occur due to events such as spillage, incorrect use or failure of PPE, or equipment failure.

**P2.3 Veterinary medicines**

Unfavourable outcomes from the use of veterinary medicines may include the following:

- (a) A product exhibiting unintended reactivity with other products or compounds;
- (b) A product not being as efficacious as claimed on the label, that is, suspected lack of expected efficacy;
- (c) Residue that is not compliant with the applicable MRLs (on-label or off-label use); or
- (d) Side effects for human or animal health and safety (ensuring animal welfare is a legal obligation for all animal owners).

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Adverse effects may occur despite following label guidance. For example, there may be unknown side effects of a product. A negative outcome may arise due to causes other than being directly attributable to use of a product, for example, the shape or structure of a product or applicator.

Adverse events may also result from not following label guidance:

- (e) An incorrect dose administered;
- (f) The incorrect product for the animal species or target disease administered; or
- (g) Product administered via the incorrect route, for example, oral dosing of pour-on.

Other adverse events may occur due to events such as incorrect use or failure of PPE, or accidental self-injection.

**P2.4 Dairy detergents and sanitisers**

Unfavourable outcomes from the use of dairy detergents and sanitisers may include the following:

- (a) Explosive reactions between incompatible products;
- (b) Generation of toxic gases from combining reactive products;
- (c) Unacceptable residue levels;
- (d) Unacceptable contamination of milk product (milk downgrades); or
- (e) Adverse effects on the environment.

Adverse events may occur despite following label guidance. For example, the product may not work as effectively as expected.

Adverse events may also result from not following label guidance:

- (f) An incorrect quantity of product use;
- (g) The incorrect product used; or
- (h) Incorrect cleaning procedures.

Other adverse events may occur due to events such as incorrect use or failure of PPE, splashes, or product spillage.

**P3 Adverse event reporting****P3.1 General**

The requirement to formally report an adverse event depends on the nature and seriousness of the event. Even when there is no requirement to report an event, a record of the event should be made so that the event can be reviewed and procedures updated to reduce the risk of future adverse events of the same or similar nature. Where an adverse event occurs as a result of application by a contractor, the contractor shall inform the client.

Reporting of adverse events arising from incorrect use of a product may encourage a product registrant to make changes to a product or its guidance to reduce the likelihood of future adverse events.

**P3.2 Reporting to ACVM**

Users should notify either the product's registrant or ACVM if an adverse event occurs as a result of both on or off-label use. Registrants must advise ACVM about any adverse events reported to them.

Further information along with the form to fill out in the advent of an adverse event can be found on ACVM's website.

**P3.3 Reporting to WorkSafe**

Notifiable events shall be reported to WorkSafe. These include the following:

- (a) Death or serious injury or illness requiring a person to be admitted to hospital for immediate treatment;
- (b) Any injury or illness that requires (or would usually require) medical treatment within 48 hours of exposure to a substance (for example, burns or inhalation of toxic chemicals); and
- (c) Any unplanned or uncontrolled incident that puts people at serious risk (for example, fire, explosion, major spill), whether or not people were actually harmed.

**P3.4 Reporting to other authorities**

Other relevant organisations may need to be informed of the adverse event:

- (a) Local authorities – For major spills or any spill involving sensitive areas especially water bodies (see Table H2);
- (b) Civil Aviation Authority (CAA) – If the incident involves aerial application;
- (c) EPA – If notification of an adverse event is specifically required in a product approval; and
- (d) EPA – For incidents involving bee poisoning.

In the event of spray drift/damage, see P4.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****P4 Spray drift adverse events****P4.1 The law**

The RMA gives the responsibility to local authorities for the control of the discharge of contaminants into the air. Regional councils have prepared regional plans which outline how air quality is to be managed in their region and specify requirements for the users of agrichemicals. Many regions also address water or soil quality, and may also have rules for agrichemical users.

**P4.2 Who to contact**

Spray drift and/or spray damage should be reported in the first instance to the regional council. Most regional councils have a 24-hour pollution hotline. They will either investigate the complaint or forward it to the agency that will deal with it. In some circumstances more than one agency may be responsible for investigating an incident.

The various entities to contact include the following:

- (a) Ministry of Health (MOH); if there are public health concerns, contact the public health services department via your DHB;
- (b) WorkSafe if it is a notifiable event, that is, there is a serious risk to the health of people;
- (c) EPA for environmental incidents arising from workplace use of agrichemicals;
- (d) CAA for spray drift incidents involving aerial applications; and
- (e) MPI for spray drift incidents where there is a potential food safety or residue issue.

**P4.3 Immediate actions***P4.3.1 General*

Report any spray drift damage to the local authorities. Spray drift damage, whether it is plant damage or health-related, can be very serious. The chances of such incidents being resolved satisfactorily will be greatly increased if some basic requirements are met.

*P4.3.2 Complainant*

The following immediate actions are to be taken:

- (a) Minimise the harm by reducing contact with the chemical, for example, take shelter, close windows, and stay indoors until spraying has finished. Seek professional advice on reducing exposure to residual chemical. Consider decontamination of exposed surfaces such as outdoor furniture, rinsing product off susceptible plants, and disconnecting downpipes if rainwater collected for home use;
- (b) Record and verify events accurately, for example, date of event, photographs of the damage and of the suspected source, time of day, weather conditions (particularly wind direction and wind speed at the site), nature and location of suspected damage (including maps showing the affected areas and the suspected source), the agrichemical involved (if known), odour detected, and witnesses of the event. Keep copies of what has been reported;
- (c) Seek information from the applicator on the agrichemical being sprayed, including the trade name and active ingredient;
- (d) Notify authorities (see P4.2);
- (e) Take samples of exposed plants as soon as possible, noting when and where the samples were taken. Get advice on where and how to take samples and how to store them – some should be frozen, others kept cool. (Refer to MPI as the regulatory authority or testing laboratories themselves);
- (f) Other samples may be required, for example, water collected from a roof;
- (g) Seek advice from authorities prior to consuming any exposed fruit and vegetables; and
- (h) Check with supply chain partners and quality assurance bodies such as organic certifiers before harvesting or selling any exposed produce.

*P4.3.3 Applicator, contractor, or PIC*

The following immediate actions are to be taken:

- (a) Respond to any complaints where your spraying activities may have been involved, and actively participate in dealing with the event (including advising the complainant of the recommended actions outlined above);
- (b) Ensure that the records of your spraying activities are complete, accurate and up-to-date (see 5.2.6.1). Records should include measures taken to avoid adverse events, especially spray drift;
- (c) Where possible, verify the actions and procedures taken at the time of the spraying that may have caused the suspected damage;
- (d) Notify regulatory agencies if required; and
- (e) Do not admit liability. Seek specialist advice if necessary and consult your insurance company.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****APPENDIX Q – AGRICHEMICAL POISONING AND FIRST AID**

(Informative)

**Q1 Agrichemical poisoning****Q1.1 Acute and chronic poisoning**

Agrichemicals with human health toxicity classification (HSNO class 6) have the potential to cause harm, including poisoning, to people's health. Agrichemicals can enter the human body and cause poisoning via four routes:

- (a) Oral (through the mouth);
- (b) Dermal (through the skin and eyes);
- (c) Inhalation (breathed in); and
- (d) Injection (for example, when treating animals).

There are two main types of poisoning:

- (e) Acute poisoning – When a single, sometimes large dose is received quickly, due to an unexpected event, for example, a burst spray hose; and
- (f) Chronic poisoning – Resulting from a series of smaller doses over a longer period of time.

For suspected severe acute poisoning, follow the label instructions for first aid, or the general guidelines provided below, and seek immediate medical assistance. Symptoms of poisoning vary according to the chemical group, the duration and degree (severity) of exposure, and the sensitivity of the individual. Interpretation of symptoms is a matter for the medical professionals.

If chronic poisoning is suspected, seek the advice of a medical professional, and provide as much information as possible on the names and details of chemicals suspected.

**Q1.2 Symptoms of poisoning**

The symptoms of agrichemical poisoning can range from mild to severe. Common symptoms are listed below, but this is not a full list. Seek medical advice if there are any concerns. Seek immediate medical assistance if severe symptoms are observed.

Typical symptoms of mild poisoning include the following:

- (a) Headache;
- (b) Dizziness;
- (c) Fatigue;
- (d) Nausea;
- (e) Muscle weakness; and
- (f) Thirst or loss of appetite.

The following are more severe symptoms:

- (a) Dilated pupils or blurred vision;
- (b) Drooling;
- (c) Vomiting/diarrhoea;
- (d) Loss of muscle control;
- (e) Difficulty breathing; and
- (f) Loss of consciousness.

**Q1.3 Acute poisoning response**

Where acute agrichemical poisoning is suspected, these are the key considerations:

- (a) Keep yourself safe – rushing in to assist could endanger your own health:
  - (i) Discuss with emergency personnel whether it will be safe to help the patient
  - (ii) Put on appropriate PPE;
- (b) Seek assistance:
  - (i) For urgent medical assistance dial 111 and ask for ambulance
  - (ii) Alert others in the workplace (or friends/family if delayed symptoms appear outside work hours)
  - (iii) In non-urgent situations, the National Poisons Centre, 0800 POISON (764 766), can provide information and advice
  - (iv) Local medical services can also provide assistance;
- (c) Identify the agrichemical(s) involved:
  - (i) Full product name and the HSNO approval number



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- (ii) Approximate quantity of product that patient was exposed to;
- (d) Prevent further exposure to the agrichemical
  - (i) Remove the patient from the contamination source if it is safe to do so
  - (ii) Remove contaminated clothing from the patient, taking care not to contaminate yourself and in consultation with emergency personnel;
- (e) Provide first aid:
  - (i) Follow advice of emergency services
  - (ii) Check patients for ABC (airway, breathing, circulation)
  - (iii) Administer first aid such as advised by emergency personnel, taking care not to contaminate yourself; and
- (f) Monitor symptoms even in cases of mild poisoning:
  - (i) Patients should not be left alone
  - (ii) Call emergency services if any deterioration in symptoms, especially trouble breathing, loss of consciousness, or severe pain.

NOTE – The HSNO or EPA approval number can be found on the label, the PSC, and section 15 of the SDS.

## **Q2 First aid**

### **Q2.1 General**

Immediate first aid advice is provided on the agrichemical container label and also on the PSC and section 4 of the SDS. Follow the information provided and seek medical assistance.

The following procedures may be followed where product information is not immediately available or is insufficient or where there is no immediate access to medical advice. Procedures are based around the possible contamination sources.

### **Q2.2 Inhaled chemicals**

Where inhaled chemicals are suspected, this is the recommended procedure:

- (a) Follow general guidelines in Q1.3, including ensuring your own safety and seeking assistance;
- (b) Move the patient into fresh air;
- (c) Loosen tight clothing and check ABC (airway, breathing, circulation), avoiding self-contamination; and
- (d) Keep the patient warm and comfortable.

### **Q2.3 Skin contamination**

Where skin contamination is suspected, this is the recommended procedure:

- (a) Follow general guidelines in Q1.3, including ensuring your own safety and seeking assistance;
- (b) Loosen tight clothing, remove contaminated clothing and check ABC (airway, breathing, circulation), avoiding self-contamination;
- (c) Wash contaminated skin thoroughly, ideally with plenty of tepid water and soap. (If dry product, brush off before washing.) Avoid getting the contaminant on your own skin. Continue washing skin with water for at least 20 minutes. Do not scrub;
- (d) Treat chemical burns as you generally would a thermal burn; and
- (e) Keep the patient warm and comfortable.

### **Q2.4 Eye contamination**

In the event of eye contamination, carry out the following:

- (a) Follow general guidelines in Q1.3, including ensuring your own safety and seeking assistance;
- (b) Remove contaminated clothing and check ABC (airway, breathing, circulation), avoiding self-contamination;
- (c) Flush the eyes with clean water for at least 15 minutes, keeping eyes open. The patient's eyes will naturally blink during flushing. It may be necessary to hold the eyelids open;
- (d) Do not attempt to remove contact lenses prior to initial irrigation with water. However, remove lenses promptly, with clean fingers, and continue irrigation;
- (e) Do not use any eyedrops;
- (f) Keep patient warm and comfortable; and
- (g) Always seek specialist medical attention for any eye injury (take the SDS for the product).

### **Q2.5 Swallowed chemicals**

In the event of chemicals being swallowed, carry out the following:

- (a) Follow general guidelines in Q1.3, including ensuring your own safety and seeking assistance;

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- (b) Remove any contaminated clothing and check ABC (airway, breathing, circulation), avoiding self-contamination;
- (c) If the patient is conscious and able to drink, give a small amount of fluid to drink;
- (d) Do not administer chemical antidotes unless instructed to do so by a medical professional;
- (e) Do not induce vomiting unless instructed to do so by a medical professional; and
- (f) Keep patient warm and comfortable.

**Q2.6 Accidental vaccination**

If this occurs, call 0800 POISON (764 766) and consult a doctor at the first opportunity. Remember to have available information on what the vaccine was (check the label or packing slip). In addition to the risk from the agrichemical injected, contamination from a dirty needle is highly likely.

**Q2.7 First aid kit**

It is a regulatory requirement to provide a suitable first aid kit for the workplace. The minimum first aid items to be provided include the following:

- (a) Triangular bandages;
- (b) Roller bandages;
- (c) Sterile dressings;
- (d) Adhesive wound dressing strips;
- (e) Paraffin gauze;
- (f) Sterile eye pads;
- (g) An eye-bath and/or container for pouring water over eyes;
- (h) Receptacle for soiled dressings;
- (i) Antiseptic liquid;
- (j) Antiseptic cream;
- (k) Safety pins;
- (l) Scissors;
- (m) Splinter forceps;
- (n) Accident register and pen/pencil;
- (o) First aid booklet;
- (p) Card listing local emergency numbers;
- (q) Adhesion plaster; and
- (r) Disposable gloves.

NOTE – All the above items should be stored in a sealed container, the contents of which should be inspected regularly for replacement of used or damaged items.

**Q2.8 Additional items**

Where agrichemicals are handled, the following additional items are recommended:

- (a) Clean water;
- (b) Pure soap;
- (c) Clean blanket;
- (d) Clean clothing;
- (e) Barrier cream; and
- (f) Resuscitation/CPR face shield with mouthpiece for mouth-to-mouth.

NOTE – Ensure water stored for first aid use is regularly replaced to ensure it is clean.

PPE suitable for the chemicals used at the workplace shall be available for use in emergency situations.

A chemical safety shower, eye-wash facilities and water for handwashing should be provided at the chemical mixing site.

NOTE – These facilities shall be provided where highly toxic or corrosive products are stored.

**Q3 Health monitoring****Q3.1 Cholinesterase testing***Q3.1.1 General*

Users working regularly with organophosphates or carbamates should have periodic cholinesterase tests. Liver function testing is also recommended. These tests can be used to measure the effect of exposure. Consult a doctor to arrange these tests.

*Q3.1.2 Baseline red cell cholinesterase tests*

Users of organophosphate products should have baseline red cell cholinesterase levels done at a time when they are not exposed to organophosphate or carbamate agrichemicals. Everyone has their own personal

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baseline level of red cell cholinesterase and users will need to know their own level. Without a baseline, users have no way of knowing whether or not their red cell cholinesterase has been impacted.

Ideally, there should be no contact with organophosphates for 60 days prior to having the baseline red cell cholinesterase measured.

Carbamate products cause rapidly reversible inhibition of cholinesterase, so users need only avoid contact with these substances for a few days before having baseline red cell cholinesterase tests done.

**Q3.1.3 Monitoring red cell cholinesterase**

Once the baseline red cell cholinesterase value is known, a monitoring programme should be implemented:

- (a) If users are involved in a regular spraying programme, monitoring levels should be done once a month;
- (b) If the spraying programme is irregular or infrequent, there should be a monitoring test after each use of the organophosphate or carbamate sprays or when the spraying is completed.

NOTE – Regular monitoring is no substitute for the selection and use of appropriate protective equipment.

If at any time, users believe that agrichemicals have affected their health, a test should be performed as soon as possible after exposure. The result, when compared to previous values or the baseline values, will indicate whether excessive exposure to organophosphates or carbamates occurred. Medical advice, including advice on the future use of organophosphate or carbamate products, should be followed.

**Q3.2 Other health monitoring**

A health monitoring plan for workers using agrichemicals should be prepared and should reflect the health risks identified for the workplace. For example, regular lung function testing may be appropriate if products with respiratory sensitisation hazards are used, or hearing tests if motorised equipment used. Where respiratory protection is required to be worn, a minimum of lung function testing should be carried out. Health monitoring is usually done by a health service provider such as an occupational health nurse with experience in agrichemical use.

**Q4 Safety precautions**

Safety plans and procedures shall be reviewed and, if necessary, revised to minimise the risk of poisoning in the future.

NOTE – If an employee is seriously harmed, as defined in the HSWA, the event should be notified to WorkSafe. Notifiable events include serious eye injury, serious burn, or any injury requiring hospital admission or medical treatment within 48 hours.

**Q5 Emergency response numbers**

For urgent advice and assistance, ring emergency services on 111. Ask for ambulance in the first instance. They will advise Fire and Emergency NZ if their services are also required, for example, for decontamination.

The National Poisons Centre operates a 24 hour, 7 day service in Dunedin. For assistance and information phone 0800 POISON (0800 764 766), email [poisons@otago.ac.nz](mailto:poisons@otago.ac.nz), or visit [www.toxinz.com](http://www.toxinz.com).

The New Zealand Chemical Industry Council's Emergency Response Service can also be used: 0800 CHEMCALL (0800 243 622).

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## **APPENDIX R – PERSONAL PROTECTIVE EQUIPMENT**

(Normative)

### **R1 Introduction**

#### **R1.1 General**

This appendix provides details of how personal protective equipment (PPE) should be used and maintained. Users of agrichemicals shall wear suitable PPE to avoid exposure to the hazards posed by agrichemicals. Information on recommended PPE can be found on product information such as the label or SDS. Users shall wear at least the PPE recommended on the product information. This appendix is designed to help the user to interpret this product information and to provide users with a framework for making good decisions on PPE based on the risks involved. The person in charge (PIC) can also seek advice from a technical expert if required, for example, an occupational hygienist with experience in agrichemicals.

#### **R1.2 Hierarchy of controls**

A hierarchy of controls shall be used for risk mitigation. The hierarchy starts with the most effective controls, such as elimination of the risk by not using agrichemicals, and moves down through those less effective, such as substitution of one product with another less hazardous product or engineering controls, such as enclosed tractor cabs.

NOTE – See 2.2 for an overview of risk management when using agrichemicals, including the HSWA hierarchy of controls.

PPE is the least effective strategy, as it requires the PPE to be properly fitting at all times it is used, supervision of workers, and monitoring to ensure the provision of correct PPE, and there is a risk that PPE can fail during use. PPE must be stored and cleaned correctly, so that clean PPE is used, fitted correctly, and worn throughout exposure. Also, only the person wearing appropriate PPE is protected; PPE provides no protection for bystanders.

#### **R1.3 Regulatory requirements**

If it is determined that risks cannot be adequately controlled without the need for PPE, a number of specific requirements relate to the provision and use of PPE:

- (a) The PIC shall ensure that all workers (and any other people in the workplace) are provided with PPE and shall ensure, as far as is reasonably practicable, that they use the clothing and other personal equipment which provides protection against hazards, including hazardous agrichemicals;
- (b) The PIC shall ensure the PPE is suitable for the hazards faced by the worker; ensure the PPE is a suitable size and fit and is properly maintained, and repair or replace the PPE where this is not the case;
- (c) Workers may choose to provide their own PPE. However, the PIC shall confirm its suitability;
- (d) The PIC shall provide information, training, and instructions in the use, storage, and maintenance of PPE to workers; and
- (e) Workers shall wear or use the PPE in accordance with any reasonable instructions of the PIC, shall not intentionally damage equipment, and shall inform the PIC of any damage or maintenance required.

#### **R1.4 PPE cleaning and maintenance**

PPE shall be maintained regularly. PPE should be checked prior to each use, especially gloves and respirators (see R5.7.3).

PPE shall be cleaned after every use. Waterproof PPE should be rinsed before removal and before touching other surfaces.

PPE shall be stored so that it is not subject to contamination or damage during storage. Storage outside the agrichemical shed is recommended.

### **R2 Assessment of risk factors**

Selecting the most appropriate PPE for any task requires careful consideration of a number of factors which determine the degree of exposure to the hazards posed by agrichemicals. These should be considered where the product information does not provide sufficient specific guidance on PPE for the planned use.

Applicators need to have an appreciation of the level of risk that their specific activity presents to them and others. Some activities can represent higher risks than others. Applicators should assess their activities using Table R1 as a guide and seek expert advice if required.

In general, more effective protective wear is needed as exposure increases or there is greater individual risk or personal susceptibility to the hazard.

NOTE – Over-specifying PPE can increase body burden without improving protection.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****Table R1 – Risk factors for PPE selection – guidance chart**

Factor	Lower	Higher	Reference
Toxicity	Low human toxicity	High human toxicity	R3.1.1
Formulation	Granules	Dust Vapour	R3.1.2
Concentration of spray mix	Standard dilution	Ultra low volume (ULV) spraying or no dilution, for example, paste	R3.1.3
Application site	Open air	Enclosed spaces, for example, greenhouse or silo	R3.2.1
Ambient temperature	Cool	Hot > 30 °C	R3.2.3
State of container	Closed/sealed	Open/used	R3.3.2
Mixing process	Auto-dispensing, for example, closed transfer systems; automatic dosing of concentrate to delivery	Open container mixing	R3.3.3
Activity – maintenance	Nozzle change	Pump maintenance, calibration	R3.3.4
Activity – spray application	Spraying	Mixing	R3.3
Duration of exposure	1 hour	8 hours per day	R3.4.1
Frequency of exposure	A few times per year	Daily	R3.4.1
Volume/time – dosage	Low volume, for example, knapsack	High volume, for example, orchard air-blast	R3.4.2
Spray quality	Coarse	Fine, for example, fogging or misting	R3.4.2
Height of release	Below knees	Above head	R3.4.2
Direction of release	Downwards	Upwards	R3.4.2
Post-application exposure	No re-entry	Walking through after spraying – waist-height crop	R3.4.4
Individual sensitivity	No known sensitivities	Known sensitivity to specific products	R3.5
Engineering controls	Vehicle cab	No cab	R6

NOTE – This table sets out general guidance – each workplace will have specific factors that affect the risk of the applicator's exposure to agrichemicals.

### **R3 Management of risk factors**

#### **R3.1 Product**

##### *R3.1.1 Toxicity*

Toxicity is the most important factor determining PPE requirements. Read the label of the product to determine PPE requirements for the product being used. The product's SDS will provide details of the toxic effects and how it might enter the body.

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Mixtures may be more hazardous than components. Where more than one agrichemical is being mixed or applied, always wear the PPE applicable to the most hazardous product. If you are unsure of the potential risk to yourself or the compatibility of the products you intend to mix, then contact the manufacturer or supplier for advice.

**R3.1.2 Formulation**

The physical form of a product is another important factor determining PPE requirements. Dry, granule-type formulation (dustless) products pose lower risks of dermal or inhalation absorption. The inhalation risk is higher with dusts, powders, and liquid formulations (mist or spray), and the risk is highest with fumigant gases.

**R3.1.3 Concentration**

The agrichemical product is the most hazardous compared with diluted product in the spray mix. For example, standard dilution may recommend 1 L of product be applied with 100 L of water. However, some application techniques such as ultra low volume (ULV) spraying or applying paste to a cut stump may not require any dilution of product, so the hazard is not reduced by dilution.

**R3.2 Environment****R3.2.1 Site/environment**

In general, the risk of spray inhalation increases with applications within an enclosed space such as a greenhouse or grain silo compared with open-air application. The use of a respiratory protective device (RPD) should be considered in an enclosed space.

**R3.2.2 Wind speed and direction**

Wind speed and direction interacts with the height and direction of release by the sprayer to affect droplet dispersion. PPE should be chosen to mitigate the risk that agrichemicals may be airborne and air movement may cause them to come into contact with the applicator.

**R3.2.3 Temperature and humidity**

The potential for thermophysiological effects (heat stress) when wearing PPE shall be considered. Temperature, humidity, and the type of clothing or PPE worn during application will affect the comfort and exposure risk of the wearer.

Users of PPE may experience heat stress and be at risk from heat-related illness when wearing protective apparel with low heat dissipation, in particular, respirators, face masks, chemical resistant suits, or overalls. These conditions may arise in hot, humid environments such as in greenhouses or in summer while applying agrichemicals with non-vehicle-mounted equipment. There is a risk the wearer may faint or suffer dehydration – with potentially serious effects.

Where exposed perspiring skin is in contact with PPE the risk of dermal absorption will be increased compared with where the skin remains cool and dry. Considerations include the following:

- (a) PPE should provide protection and be comfortable to wear;
- (b) Avoid using products and techniques whose application requires the use of PPE that is uncomfortable to wear;
- (c) Schedule work early and late in the day to avoid the hottest times of the day; and
- (d) Select a level of PPE appropriate for the task, according to minimum PPE requirements on the label (that is, not overprotecting the body).

**R3.3 Activity****R3.3.1 General**

Some activities are higher risk than others. Spray application technique is covered separately in R3.4.

**R3.3.2 Storage and handling**

Once the container has been opened, suitable chemical resistant gloves should always be worn to handle the container. Most containers are unclean on the outside once opened.

NOTE – Nitrile gloves are resistant to most commonly used agrichemicals. However, read the product safety information to ensure this type of gloves provides appropriate protection for the product being used.

**R3.3.4 Mixing and measuring**

The highest agrichemical hazard risk occurs during measuring, mixing, and loading of undiluted product. Handlers and applicators of agrichemicals shall avoid contact with skin and eyes of undiluted chemicals. Also avoid inhalation of dust or vapours.

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The product information will provide guidance on the PPE to be worn during mixing. Unless a higher level of protection is specified by the label or SDS, **the following** are minimum PPE requirements for mixing agrichemicals:

- (a) Cotton overalls;
- (b) Suitable chemical resistant gloves (at least long enough to cover the wrist);
- (c) Face shield, safety goggles or glasses; and
- (d) Waterproof footwear (not leather work boots).

Some products will also require use of a respirator due to their toxicity and/or formulation. Waterproof aprons should be worn where there is a risk that product may be spilt on cotton overalls.

Sprayers with mixing and transfer systems at or below waist height are likely to pose less risk than those where product must be lifted above the waist to be loaded into the spray tank. Engineering solutions such as closed transfer systems are ideal and preferable to the use of PPE.

NOTE – Use separate gloves for mixing plant protection products to those used for mixing dairy detergents and sanitisers.

#### *R3.3.5 Equipment maintenance, cleaning, and decontamination*

A waterproof apron is a useful addition to PPE when cleaning down equipment.

Gloves should be worn when checking or changing nozzles and full PPE appropriate to the product worn for more complex maintenance tasks such as pump and plumbing maintenance, sprayer flow tests, and calibration.

#### *R3.3.6 Clean-up and disposal*

Empty containers should be considered hazardous until they have been triple rinsed (see section 6 and Appendix M) and should be handled wearing the PPE appropriate for the product.

### **R3.4 Application**

#### *R3.4.1 Duration and frequency*

PPE is the least effective strategy (R1.2) for mitigating the risk of exposure to agrichemicals. Where the duration of application is extended and the frequency of application is increased, other controls should be sought such as engineering controls which might include closed transfer systems and/or vehicle cabs or administration controls such as hiring a specialised contractor.

Where there is long duration of exposure, the quality of PPE is critical. A higher level of PPE such as chemical resistant boots, chemical resistant coveralls, and an RPD should be considered. Key aspects are:

- (a) Penetration

Penetration is the movement of a chemical and/or microorganisms through porous materials, seams, pinholes, or other imperfections in a protective garment. Penetration rates are seldom available because they depend on garment design, methods used for manufacturing, and the way the garment is worn with other items of PPE.

- (b) Permeation

Permeation is the rate at which chemicals pass through the material and is classified in terms of breakthrough time. Permeation rates are generally available for most protective clothing materials and this information is usually obtainable from suppliers of the protective clothing and/or equipment. Permeation rates through clothing material from different or the same supplier can be compared only if the method used for testing is comparable. The effect of mixtures of substances on the permeation rate needs to be considered. So, too, does the relevance of a permeation rate (based on continuous contact between a chemical and a material sample) to a work situation.

#### *R3.4.2 Glove selection*

Most agrichemicals are handled at some stage by the user, so hand protection is critical to avoid skin contact with the product. Chemical resistant gloves are most suited to handling agrichemicals.

- (a) Glove material – Formulation is an important consideration in glove choice. Water-based (aqueous) formulations and dry formulations require a lower level of glove protection (rubber or latex) compared with organic solvent-based formulations such as emulsifiable concentrates (ECs). The solvents in the EC formulation can make the active ingredient travel through rubber and latex relatively quickly, meaning chemical resistant gloves are required.

European Standard (EN 374-1:2016) provides three levels of chemical resistance: Type A (high resistance), Type B (medium resistance), and Type C (lowest resistance). To be given a chemical resistance rating, a glove must pass air leak, water leak, and permeation tests. Whether the glove is rated Type A, B, or C is determined by the number of chemicals it can resist for a set period of time. For example,

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Type A gloves will resist at least 6 chemicals from a list of 18 standard defined chemicals for at least 30 minutes.

For agrichemical products available in New Zealand, nitrile gloves meet this standard (Type A) and are the minimum recommended. Mixing, measuring, and loading usually take less than 30 minutes and gloves are washed afterwards, so 30 minutes' breakthrough time will generally be appropriate.

One particular group of users facing a higher risk are those who load sprayers as their sole role. In this case, protection worn should be similar to that required for manufacturing, commercial blending, and packaging. Special attention should be given to breakthrough times for PPE and rinsing PPE during loading.

- (b) **Glove length** – Some tasks require longer (elbow length) rather than shorter (covering the wrist) gloves. For example, some products, usually a wettable powder, supplied in a large plastic bag may require the user to reach down into the bag. Elbow-length gloves would be required to protect the user from contact with the product whereas shorter gloves may not provide sufficient protection. In all situations, gloves should at least cover the end of the sleeve of cotton overalls so that all the skin on the arm is protected.
- (c) **Glove strength and longevity** – How gloves are used is a factor in glove selection. For example, disposable chemical resistant nitrile gloves may be suitable for some tasks, filling a knapsack with product from a previously opened container, for example. Other tasks such as loosening the cap on a new container of product may require gloves with more strength and less susceptibility to tearing. Users also need to assess glove condition over time, as all gloves have a limited life. A glove replacement policy should be developed reflecting how gloves are used along with frequency and duration of use. As a minimum, gloves should be stored out of sunlight. Gloves should be discarded and replaced annually or if there is any indication of degradation (holes or tears) or chemical breakthrough. Some users wear double gloves and barrier cream to provide added protection.

#### *R3.4.3 Equipment type and use*

During spraying, inhalation and dermal contact are the main routes of chemical entry to the body. Different parts of the body absorb chemicals at different rates – groin > forehead/scalp > hand > arms, legs, torso. All skin should be covered during agrichemical use. A hat is recommended where the scalp is exposed to agrichemicals.

Gloves and boots shall normally be worn inside the sleeves and legs respectively of PPE. However, gloves should be worn outside the sleeves when working above shoulder height. When spraying upwards, wear the spray suit outside gloves and boots. Try to remain upwind of spray so spray drift is away from the user.

Avoid inhalation of spray mist:

- (a) Wear an RPD if the label guidance recommends one;
- (b) Avoid spraying into the wind;
- (c) Fine droplets will increase the chances of spray moving into the user's breathing zone; and
- (d) Spray directed down towards the ground is less likely to enter the user's breathing zone than spray directed upwards.

A combination of the nature of application and the equipment used will determine the risk of personal exposure to agrichemicals. For example, fungicides and insecticides may be applied with either a knapsack or an air-blast sprayer depending on the size of the task (dormant roses in the backyard versus pipfuit in bloom in a commercial orchard). While the same products with same hazard class and spray quality may be applied, the risks to the applicator are significantly different. Where the release point is low, spray is directed downwards with the knapsack, and 15 L of spray mix will be used in the backyard, minimum PPE listed on the label will be sufficient. However, where the release point is high and upward with the air-blast sprayer and 8000 L of spray mix will be used, additional PPE will be required, such as a category 3 tractor cab (Table R2) or an RPD.

The physical nature of the work may also impact on risk. For example, spot spraying with herbicide for forestry establishment in hill country on a warm day could result in heat stress, especially if an impervious suit is worn. Choosing low-toxicity products and less laborious application equipment could reduce the level of PPE required and reduce risk to the applicator.

#### *R3.4.4 Post-application*

The interval between spraying and re-entry to the target area (crop) is specified on the label. If it is necessary to re-enter the target area before the re-entry time has elapsed then appropriate PPE shall be worn. For example, where it is necessary to walk through waist-high bulky sprayed crops then waterproof clothing shall also be worn and chemical resistant suits should be considered.

### **R3.5 Other factors**



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Exposure to agrichemicals may not be the only hazard during application. Application equipment may present simultaneous hazards such as noise, heat, and ultraviolet light. Additional PPE such as a sun hat and ear protection may also be required during application. There may also be situations where the choice of footwear has to reflect other risks, such as grip.

A level of PPE may protect most but not all individuals, as some are more sensitive and may develop symptoms such as a rash. Where this condition is known, hypersensitive individuals should inform the PIC of their PPE requirements so that the hierarchy of controls can be appropriately applied.

The PIC can also seek advice from a technical expert if required, for example, an occupational hygienist with experience in managing the health risks associated with agrichemical use.

NOTE – See Q3 for advice on health monitoring.

**R4 Selection of PPE****R4.1 Ease and effectiveness of decontamination**

Decontamination of clothing and equipment after use can be difficult. Residues may accumulate on the surface of garments or within the materials without visible evidence. Instructions for cleaning may be provided by the supplier of the clothing/equipment or the agrichemical, but these usually do not take into account the many variables affecting the garment:

- (a) Physical form(s) of chemical(s);
- (b) Concentration of the chemical(s);
- (c) Solubility of chemicals in water; and
- (d) Type of material from which garment is made:
  - (i) Absorbent materials such as cotton and cotton/polyester (common in overalls) can be washed in hot soapy water (but not with household washing). Heavily contaminated PPE should be rinsed prior to washing
  - (ii) Water resistant materials shall be hosed down and scrubbed (but residues may remain in the material matrix, and consideration needs to be given to the flow of contaminated water)
  - (iii) Disposable-type garments require consideration as to safe disposal after use
  - (iv) Clothing worn under permeable protective garments/equipment shall be removed and cleaned when spraying is completed. Wash separately from other clothing, as a precaution.

**R4.2 Secondary risks**

Note that chemical resistant suits are made of polypropylene and present a higher fire risk than cotton overalls, potentially swapping one risk for another. Take care to keep away from hot surfaces when wearing chemical resistant suits.

**R4.3 Added protection**

For added protection always carry at least 20 L of water, soap, and paper towelling with the spray outfit for washing hands, face, and other areas of exposed skin, and especially the eyes. Wash thoroughly with soap and water after mixing chemicals and before eating, drinking, or smoking or after work. Barrier cream may be used on the hands but is not a protection against chemical penetration and should only be used to provide added protection for a gloved hand.

Keep cuts and abrasions covered with a waterproof dressing. Change the dressing for a porous one after work.

**R5 Respiratory protection and filter replacement****R5.1 Introduction**

No person should be exposed to potentially harmful atmospheres. The PIC shall ensure that all workers are trained in the safe use of protective equipment. A respirator shall be worn for applicator protection where the product label or SDS indicates it is required.

The correct use and care of RPDs is important for all users. This section summarises the important factors relating to selection and use of RPDs, and filter replacement.

NOTE – For more detailed information refer to AS/NZS 1715.

**R5.2 Classification of respiratory hazards**

Respirators for agrichemical use are designed to protect against one or more of the following types of air contaminants:

- (a) Particles of dust;
- (b) Fine droplets, that is, mist;
- (c) Gases or vapours;

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(d) Lack of oxygen.

**R5.3 Selection of respirators<sup>3</sup>**

There are four main factors to consider when selecting the correct respirator for the job:

- (a) Contaminant-related factors, such as:
  - (i) The nature, toxicity, physical form, and concentration of the contaminant
  - (ii) The consequences of failure of the respirator on life or health
  - (iii) The adequacy of warning of the contaminant, for example, odour;
- (b) Task-related factors, including:
  - (i) Whether the respirator is for regular use or occasional use (for example, emergencies)
  - (ii) The activity and mobility of the wearer, and the effect on breathing rate
  - (iii) The need for clear vision and communication
  - (iv) The type of application equipment being used
  - (v) The conditions at the time of agrichemical use
  - (vi) Limitations of RPE;
- (c) Applicator-related factors, including:
  - (i) Medical fitness and health status, for example, epilepsy, asthma, pregnancy
  - (ii) The comfort level when wearing the respirator
  - (iii) The length of time which a respirator must be worn
  - (iv) The importance of good facial fit or seal
  - (v) Facial hair (beard, moustache, stubble)
  - (vi) Other PPE that needs to be used with the respirator such as face shielding protection, glasses, hearing protection
  - (vii) Other factors, for example, chewing gum and some prescription glasses can interfere with the fit or seal;
- (d) RPD maintenance requirements, such as:
  - (i) Cleaning
  - (ii) Availability of spare parts
  - (iii) Disposal and/or recycling.

Proper fitting of a respirator is very important to ensure that it can function properly. If in doubt about which respirator to use, get expert advice from equipment suppliers, or a technical expert.

Selection of the appropriate RPD is mainly a function of the contaminant, the task, and the wearer, with different types of respirators offering different levels of protection.

**R5.4 Respirator types**

There are three major types of respirators used by agrichemical applicators – either air purifying, powered air purifying, or supplied air.

- (a) Air purifying respirators (non-powered, half or full mask). A full mask/facepiece will provide additional protection for the face and eyes. These respirators rely on the user's breathing to draw air through a purifying filter, known as 'negative pressure'. The filter can be of three types:
  - (i) Particulate filter for dusts, mists, and fumes. Class P1 low efficiency, class P2 medium efficiency, and class P3 high efficiency. A class P3 filter provides maximum protection, in a full face mask
  - (ii) Gas filters for gases and vapours. The size of the filter, or its adsorption capacity, determines the length of time that it can be used. Class 1 low capacity, class 2 medium, and class 3 high
  - (iii) Most commonly a combination of a particulate filter and a gas filter is used.

Care is needed in selecting appropriate filter(s). Always follow label recommendations. If unsure, clarify with the product supplier or manufacturer. Over-specifying is not recommended as this will increase body burden without improving protection. For example, where a P1 dust filter is recommended in relation to expected particle size, wearing a P2 filter will offer no more protection but breathing will be harder.

- (b) Air purifying respirators (powered, full mask, or hood). A battery-operated motor unit can be fitted to draw air through a filter, that is, positive pressure. These systems are known as powered air purifying respirators (PAPRs).

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<sup>3</sup> Only select RPDs which conform with the requirements of AS/NZS 1716.

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- (c) Supplied air respirators. These are fed from a clean air supply outside the contaminated area, that is, 'positive pressure', from either:
- (i) Self-contained breathing apparatus (SCBA), which uses a clean air supply carried by the wearer, and comprise either:
    - (A) A full face piece which covers the whole face and has either single or double filters fitted; or
    - (B) A helmet or hood which covers the head and is usually supplied with air from an external source such as a blower/fan unit drawing air through a filter system;
  - (ii) Air hose or air line – An external source of air is supplied by an air hose (from atmosphere) or air line from compressed gas, usually to a full face mask, hood, or helmet system. Air quality must meet the requirements of AS/NZS 1715.

**R5.5 Filter selection**

The appropriate protection for each agrichemical can be assessed according to its physical state or formulation. The type of work and application equipment being used are also important factors. The type of protection required could be influenced by combined hazards and these are generally stated on the label. The following guidelines may be helpful:

- (a) Most sprayed agrichemicals consist of wettable powders, dusts, and other formulations which form mists. A particulate filter suitable for toxic dusts and mists is the most appropriate filter for these products;
- (b) For those products which present the greatest risk by the release of harmful vapour, or highly toxic substances, a combination filter consisting of a particulate filter fitted over a gas filter may be the best option. This option may also be appropriate with other types of chemicals;
- (c) Particulate filters act as a barrier to the droplets and solid particles in the spray, permitting clean air to pass;
- (d) For those sprays and chemicals which contain organic solvents as a carrier liquid, or contain other products with a high vapour pressure (that is, strong smelling or volatile), gas filters are required. Use gas filters for organic vapour (brown sticker on filter) as these contain a bed of charcoal or other agent that adsorbs or reacts with the chemical, retaining the gas or vapour and allowing clean air to pass. Gas filters shall be replaced as the sorbent material becomes saturated. The following points should be considered with gas filters:
  - (i) Manufacturers and suppliers of respirators can provide information and advice about suitable filters. Different gas filters may be required for different groups of chemicals. Only use filters that are appropriate for use against the specific product
  - (ii) Some chemicals have poor warning properties, that is, they have very little odour. Protection from these products may involve the use of supplied air devices
  - (iii) Do not use air purifying respirators in enclosed places such as silos or pits, where there could be a deficiency of air
  - (iv) Since air purifying respirators only provide protection for the inhalation of contaminants, additional protective equipment may be necessary to protect the eyes from irritation and the skin from absorption of the chemical.

**R5.6 Service life of gas/vapour filters***R5.6.1 Factors influencing service life*

The service life of a gas filter, that is, how long it is going to continue to provide protection, depends on factors such as the following:

- (a) Physical properties of the agrichemical;
- (b) The type of solvent or carrier in which the chemical is delivered;
- (c) The airborne concentrations of the agrichemical;
- (d) Conditions of use, that is, type of spray system;
- (e) Capacity and efficiency of the filter;
- (f) Worker breathing rates (that is, light or heavy work); and
- (g) Humidity, temperature, and how well the respirator fits.

The most important of these are the physical properties and concentration of contaminant, the airflow rate, and humidity. The working conditions and the type of equipment used may also be significant. Issues such as winter versus summer application, sitting on a tractor or walking, and hand spraying versus air-blast equipment, need to be assessed. In general, a heavy concentration of contaminant and heavy breathing rates shorten the life of a filter.

*R5.6.2 Developing a filter replacement policy*

The complicated relationship between the factors listed above makes it very difficult to develop specific rules for filter replacement. However, a policy for filter replacement shall be established, based on each application,

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with an allowance for safety. Manufacturers and suppliers of respirators can provide information and advice about the service life of filters. Important factors to consider in establishing this policy include the following:

- (a) Particulate filters – The breathing resistance of the filter increases with use as the filter gradually becomes choked to a point where it causes the wearer discomfort. When that happens, the filter shall be replaced. Frequent replacement may give longer gas filter life when they are used in combination;
- (b) Gas filters – Detecting when the contamination breaks through the filter (the breakthrough time) is critical in estimating filter service life. At this point the wearer may detect odour or taste during a test using a benign organic vapour such as a freshly cut onion or orange. While this is a useful guide it should not be relied on as the basis of determining filter life as taste or smell is subjective, varies from person to person, and can be affected by health status.

NOTE – Caution: some agrichemicals have no odour or taste to allow their detection.

A filter replacement policy shall include the following:

- (c) Filters are to be dated when the packaging is opened;
- (d) All gas filters shall be discarded no longer than six months after opening, regardless of duration or frequency of use;
- (e) A schedule shall be established for filter checking/replacement at an easy to recall interval such as the beginning of each week, or before each specific task. The detection of breakthrough by taste or smell at any time means the filter shall be replaced immediately;
- (f) Storage and maintenance – To prevent the filter accumulating contaminants while not in use, store all gas filters in a sealed (airtight) container, away from stored chemicals. For maximum efficiency and safety, it is essential that respirators are properly maintained and cleaned in accordance with the manufacturer's instructions;
- (g) Individual respirators shall be supplied, or if a respirator might be shared, it shall be sanitised according to manufacturer's instructions between users; and
- (h) Follow the manufacturer's guidance on the replacement and storage of filters.

NOTE – Obtain expert advice if there is any doubt or concern about the correct use of respirators. As a guide, filter cartridges have an approximate life of 4 to 12 hours of continuous use.

### **R5.7 Half and full face respirator fitting and testing**

#### *R5.7.1 General*

Proper fitting of respirators is essential to avoid exposure to potentially harmful atmospheres. Respirators incorporating half or full facepieces (masks) rely on close fitting to achieve a seal and prevent inward leakage of contaminants. Such RPD shall not be used by workers who are not clean shaven about the cheeks, neck, and jaw or where there is any chance of hair coming between the facepiece and the skin. Long hair may impair the function of valves and position of head harness. Follow the manufacturer's fitting instructions which come with the RPD.

#### *R5.7.2 Fit tests*

For regular users of products with high human toxicity via inhalation (including HSNO classes 6.1A, 6.1B, and 6.1C), respirators should be assigned to a worker at purchase and fit tested annually by a specialist or after any change in face shape. A quantitative fit test is highly recommended to ensure that you have chosen the correct size and are able to get a secure fit. Companies that offer quantitative fit testing are easily found by an internet search using the words 'respiratory fit testing'.

For intermittent users (several times per year) of RPDs or where a quantitative fit test is not practicable, a qualitative fit test shall be carried out. A qualitative fit test is best carried out by a certified fit test administrator who will also provide guidance and instruction in the use of the RPD.

Users should get retested if they gain or lose a lot of weight, or do anything that may change the shape of their face. The PIC is responsible for protecting workers and should determine what level of testing is required for an individual situation. Where a respirator is transferred from one worker to another, the respirator should be thoroughly cleaned (see R5.8), the filter(s) shall be replaced, the respirator shall be fitted, and fit tests or checks shall be done as appropriate.

#### *R5.7.3 Fit checks*

For users who handle an agrichemical product requiring a respirator, positive and negative pressure fit checks shall be carried out each time a respirator is used.

- (a) Negative pressure fit check

Place palms over filter opening(s) on the respirator. Inhale gently and check that the face piece collapses slightly and no air leaks between the face and the respirator.

**DRAFT ONLY****COMMITTEE IN CONFIDENCE****(b) Positive pressure fit check**

Place palms over exhalation valve opening(s) and exhale gently into the face piece. Pressure should be felt in the face piece which should bulge slightly with no air leaking between the face and the face piece.

**(c) Actions if fit check fails**

If air leakage is detected, reposition the respirator and readjust tension on straps to eliminate the leakage. If the respirator still fails a negative or positive pressure check, it shall be repaired or replaced prior to using.

**R5.8 Procedures for cleaning and disinfecting RPDs**

Manufacturers will provide instructions on how to clean and maintain a specific make and model of RPD. However, the following is the standard method to clean and disinfect an RPD:<sup>4</sup>

- (a) Remove filters from facepiece where applicable;
- (b) Disassemble facepieces according to manufacturer's instructions;
- (c) Replace or repair any defective parts;
- (d) Wash components in warm (40 °C maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt;
- (e) Rinse components thoroughly in clean, warm, preferably running water. Drain and allow to dry;
- (f) When the cleaner used does not contain a disinfecting agent, and disinfection is required, respirator components should be immersed for about 2 minutes in one of the following:
  - (i) Hypochlorite solution (50 ppm of chlorine) made by adding approximately 2 ml of laundry bleach to 1 L of warm water
  - (ii) Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 ml of tincture of iodine (6–8 g ammonium and/or potassium iodide/100 ml of 40% alcohol (v/v) to 1 L of warm water
  - (iii) Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer;
- (g) After disinfection, rinse components thoroughly in clean water, drain, and allow to air dry; and
- (h) Reassemble the facepiece in accordance with manufacturer's instructions.

**R6 Vehicle cabs****R6.1 General hygiene**

Vehicle cabs can offer good protection from hazardous agrichemicals during application as long as good hygiene is practised to avoid cross-contamination:

- (a) If a respirator, goggles, or face shield and/or PVC apron have been used by the applicator for measuring, mixing, and loading, then these should be washed and removed prior to entering the cab;
- (b) Gloves may be removed after washing, either outside the cab or once inside the cab. If they are removed outside the cab, make sure the any railing and door handles are washed or wiped down before entry to the cab. If they are removed inside the cab, place them in a separate container from other cab contents before touching anything else inside the cab.

As a general rule – keep dirty clothing and equipment out of the spraying vehicle. Fit a small storage box outside the cab with separate clean and dirty sections.

Ensure the user has access to gloves for cleaning nozzles or otherwise touching the outside of the sprayer adjusting the sprayer. Always carry at least 20 L of water, soap, and paper towels for washing out in the field.

**R6.2 Cab filtration**

Whenever spraying from a vehicle, use one with a fitted cab. If possible, also use suitably filtered cab ventilation rather than opening the windows. Cabs rely on positive air pressure to prevent dust, spray mist, or vapour entering the cab. Keep air filters and air conditioning systems well maintained to maintain positive air pressure in the cab.

There are a range of air filters and air purifying units that protect drivers of vehicles involved in spraying. The filters, usually activated carbon type, replace existing filters in air conditioning units and are available as aftermarket parts. Air filtration can also be provided by a complete airflow system that can be fixed to a window or cab.

**R6.3 European standards**


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<sup>4</sup> Modified from AS/NZS 1715:2009 Appendix C.

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European standards provide a useful benchmark for the protection provided by vehicle cabs. They apply to agricultural equipment in the EU to protect the applicator from hazardous substances when applying plant protection products and liquid fertilisers. Table R2 lists the four categories of filtration.

**Table R2 – Categories of cab filtration (EU standard EN 15695-1:2009)**

Category	Level of protection
1	No defined level of protection against hazardous substances
2	Protection against dust
3	Protection against dust and aerosols (spray mist)
4	Protection against dust, aerosols, and vapour

Wheeled and tracked tractors manufactured in the EU offering protection against hazardous substances must be fitted with cab filtration of level 2, 3, or 4 complying with the requirements set out in the standard EN 15695-1:2009. For example, for a vehicle providing protection against aerosols of plant protection products (spray mist) the cab filtration shall be category 3.

A large range of tractors, and other vehicles, may be used for spraying and will all differ in the level of protection provided to the applicator against agrichemical hazards. The PIC should check with the vehicle supplier as to the protection (cab filtration) level offered by the vehicle used for application and ensure protection is adequate for the expected hazard exposure.

## Recommended changes to draft standard

<b>To:</b> Standards New Zealand PO Box 1473 Wellington 6140  <b>Email:</b> SNZPublicComments@mbie.govt.nz	<b>From:</b> Gary Bedford Director – Environment Quality Taranaki Regional Council Private Bag 713 Stratford	
	Closing date for comment  <b>1 February 2021</b>	Date of your comments
<b>DZ 8409      Committee:</b> P8409 Management of Agrichemicals  <b>Title:</b> <i>Management of agrichemicals</i>		

**Comment is preferred in electronic format following the layout below. Electronic drafts are available from Standards New Zealand website at <http://www.standards.govt.nz>.**

The following form is for comments to be submitted electronically. Please email your comments to SNZPublicComments@mbie.govt.nz

### General comment

Type your general comments in the box. The comment box will automatically expand to accommodate comments of any length.

Subject to the specific submission points below, Taranaki Regional Council (“the Council”) supports SNZ’s intent in reviewing and updating the above standard.
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### Specific comment

Insert the number of the clause, paragraph or figure. Do not preface the number with words (that is, '1' not 'clause 1'). If there is no clause number, use the section heading (such as Preface). Insert the page, paragraph, and line number as appropriate. Use a new row for each comment.

The rows will automatically expand to accommodate comments of any length. Remove unused rows, or insert additional rows as required. To insert extra rows at the end of the table, go to the last cell and press the TAB key.

Clause/ Para/ Figure/ Table No.	Page No.	Recommended changes and reason <i>Exact wording of recommended changes should be given</i>
1.1.3	10	<p>The exclusion of fumigants and VTA's from the standard is made clear in cl 1.1.3. The further guidance on sources of relevant information in clauses 5.5 and 5.6 is also good.</p> <p>However, because the link between clause 1.1.3 and clauses 5.5 and 5.6 is not obvious, users may be left unclear about where to look for information on fumigants and VTAs. It would be helpful to either:</p> <ul style="list-style-type: none"> <li>• At 1.1.3, clearly point Standard users to clauses 5.5 and 5.6; or</li> <li>• incorporate the guidance that is currently contained in clauses 5.5 and 5.6 into the exclusion of fumigants and VTA's in clause 1.1.3.</li> </ul> <p><i>Recommended change: Provide greater clarity as to where Standard users can get guidance on the use of fumigants and VTAs.</i></p>
1.3	11-26	<p>This standard uses a number of defined terms that also appear in other key agrichemical management instruments, including the Hazardous Substances and New Organisms Act ("HSNO") and the Resource Management Act ("RMA").</p> <p>At times, the use of the defined terms in the Standard aligns with either the specific definition or what has become the accepted usage of that term under the other instrument. At other times, those uses differ.</p> <p>Given the significance of instruments such as HSNO and RMA and the implications of any variation in usage of terms, it would be helpful to Standard users to know whether the term aligns or varies from that other source.</p> <p>The comments in the Standard about the source of definitions of "environment", "environmental exposure limit" and "fertiliser" are all good examples of the change that the Council is suggesting should be made universally within the Standard.</p> <p><i>Recommended change:</i></p> <ul style="list-style-type: none"> <li>• <i>Indicate at the start of clause 1.3 that, for terms that are also defined in other key management instruments:</i> <ul style="list-style-type: none"> <li>○ <i>for all such definitions, that other key management instrument will be referenced;</i></li> <li>○ <i>and add a further notation saying either that:</i> <ul style="list-style-type: none"> <li>○ <i>the definition is the same as in that other key management instrument;</i> or</li> <li>○ <i>the definition varies from that other key management instrument.</i></li> </ul> </li> </ul> </li> <li>• <i>Include a notation as required in each definition.</i></li> </ul>
1.3	11-26	<p>The structure of the definitions for "amenity area", "sensitive areas" and "public places" and the resulting use of those terms could create some confusion for Standard users.</p>



Clause/ Para/ Figure/ Table No.	Page No.	<b>Recommended changes and reason</b> <i>Exact wording of recommended changes should be given</i>
		<p>As written, the term “sensitive areas” appears to be an umbrella definition for the other two terms. However, while the definition can support this intention, the use of the terms is sometimes inconsistent with it.</p> <p>The contention that “sensitive areas” is the omnibus definition is further supported by clause B4, which includes both amenity areas and public places as examples of sensitive areas.</p> <p>Similarly, in the majority of times that the terms “amenity area” and “public places” are used in the Standard, they are used as a combined description. The only exception relates to approximately 6 uses of “public places” that relate primarily to signage. (Note that three of those total instances actually refer to sites that would be classed amenity areas.)</p> <p>It is at least arguable that having the three levels of definition adds nothing to the clarity and comprehensiveness of the Standard. In fact, a simple rationalisation of the definitions under a more comprehensive definition of “sensitive areas” could improve that level of clarity.</p> <p>In making this submission, Council would offer the definition of “public amenity areas” contained in the Regional Air Quality Plan for Taranaki as a possible approach for SNZ to take.</p> <p><i>Recommended change:</i></p> <ol style="list-style-type: none"> <li>1. <i>Review the definition of “sensitive areas” against the list contained in clause B4 of the Standard and definitions contained in various legislative instruments (most especially in reg 2 and reg 13.1 of the Health and Safety at Work (Hazardous Substances) Regulation 2017) - looking to build a comprehensive definition.</i></li> <li>2. <i>Review all references to “amenity areas” and “public places” within the Standard against this new definition and replace accordingly, noting those “sensitive areas” usages where some level of recognition of public access is required</i></li> <li>3. <i>Delete the definitions of “amenity areas” and “public places” from the Standard.</i></li> </ol>
1.3	11-26	<p>The definition of “sensitive areas” talks of the “area” having a “risk of suffering an adverse effect”. However, most of the examples given in B4 are places where the user, rather than the area, would suffer the effect.</p> <p>For example, it is hard to think of how a road could be affected – but very easy to think of how road users could be affected.</p> <p><i>Recommended change: Review the definition of “sensitive areas” and clarify that, for built environments, it is the user, rather than the construction, which is at risk of suffering an effect.</i></p>
1.3	25	<p>The definition of “toxic” is incomplete as it does not indicate the breadth of organisms that may be impacted.</p> <p><i>Recommended change: Add “to any or all of plants, animals, fish and humans”.</i></p>
1.5.2	28	<p>The section on Criminal Liability correctly notes that criminal proceedings are possible under the RMA.</p> <p>However, the second paragraph, incorrectly omits to mention that the RMA also has strict liability provisions.</p> <p><i>Recommended change: Amend the third sentence in paragraph two to read “under the HSWA and the RMA”.</i></p>

Clause/ Para/ Figure/ Table No.	Page No.	Recommended changes and reason <i>Exact wording of recommended changes should be given</i>
2.5.3	32	<p>This clause lists the documentation required to be kept by certain classes of agrichemical users.</p> <p>Under the RMA, “use” includes disposal and decontamination activities. Currently the documentation list in this clause of the Standard does not encompass documents that relate to disposal and decontamination.</p> <p><i>Recommended change: Amend the list of documentation in cl 2.5.3 to include documentation relating to disposal of agrichemicals and decontamination of agrichemical related sites.</i></p>
5.2.5.1 and 5.2.5.2	47	<p>Refer also to the earlier submission on consistency of use of the terms “amenity areas”, “sensitive areas” and “public places”.</p> <p>These clauses are an example of inconsistency of use – as planning only relates specifically to “sensitive areas”, but users are required to install signage for application on “public places” and “amenity areas” (but not “sensitive areas”). This usage of the terms is confusing and possibly creates unintended gaps in coverage.</p> <p><i>Recommended change: Review and clarify the comprehensiveness of areas covered by the use of these terms at all places in the Standard and amend accordingly.</i></p>
5.2.5.2	47	<p>The signage provisions do not require signs to be installed for agrichemical application on public roads. The Council believes that this formulation of the clause creates a significant gap.</p> <p><i>Recommended change: Additional to the changes recommended in the above submission point, also amend the clause to read “For public places, public roads and amenity areas”.</i></p>
Appendix B B4	71	<p>The examples of sensitive areas include in (d) places where people congregate.</p> <p>People can also be impacted if they are passing through an area where agrichemicals are being applied. The list of examples should be amended accordingly to reflect this fact.</p> <p><i>Recommended change: Amend (d) to read “where people congregate or are able to freely access”.</i></p>
Appendix B B4	71	<p>Rail corridors are, in some urban areas especially, areas that are accessed by the public – often despite attempts to restrict access. In its own Air Quality plan, Council has included specific agrichemical application provisions for rail corridors that mirror those for public roads.</p> <p><i>Recommended change: If it has not already done so, SNZ should consult with KiwiRail on whether rail corridors should be included in the list of examples in B4.</i></p>

<b>Clause/ Para/ Figure/ Table No.</b>	<b>Page No.</b>	<b>Recommended changes and reason</b> <i>Exact wording of recommended changes should be given</i>
Appendix C	76 to 79	<p>The Council supports the concept of spray plans as an effective tool in identifying the risks associated with agrichemical application.</p> <p>However the Council notes that, while there are extensive details on the requirements for contents of a spray plan and on how to notify, there are no requirements for that plan to be subsequently followed by the PIC, applicator or contractor applying the agrichemical.</p> <p>We also note that, while some clauses in the Standard do require consideration of the plan (eg., during an on-site risk assessment), none appear require compliance with the spray plan during application.</p> <p><i>Recommended change: Add a requirement to either Appendix C or to clause 5 requiring the terms of spray plans to be adhered to during the application of agrichemicals.</i></p>
Appendix C Clause C4.3	78-79	<p>Refer also to the earlier submission on consistency of use of the terms “amenity areas”, “sensitive areas” and “public places”.</p> <p>The provisions for application in public places should be clarified and/or extended to also include “amenity areas” – as the risk to the public are the same in each of the those location types.</p> <p><i>Recommended change: Re-label C4.3 as “Application in public places and amenity areas” and amend the terms of clauses 4.3.1 and 4.3.2 to provide for appropriate controls in those areas.</i></p>
Appendix P Clause P4.2	160	<p>Clause P4.1 correctly identifies that Regional Councils have a role in managing the effects of agrichemical application by way of regional plans. However despite acknowledging Regional Councils’ role, they are omitted from the list of entities to contact in clause P4.2.</p> <p><i>Recommended change: Add “(f) The local Regional Council for spray drift incidents, discharge/spillage of agrichemicals or any other issue that may be covered under a regional plan rule or resource consent condition”</i></p>
Appendix P Clause P4.3.1	160	<p>PIC’s, applicators and contractors should also be required to report any complaints received to the appropriate local authority. This reporting is an important requirement in managing the effects of the agrichemical use, determining if any form of enforcement activity may be required or enabling timely investigation of frivolous complaints.</p> <p><i>Recommended change: Amend the first sentence of clause P4.3.1 to read “Report any spray drift damage or complaint received to the local authorities.”</i></p>
Appendix P Clause P4.3.3	160	<p>The Council generally supports the requirement to notify regulatory agencies under clause 4.3.3(d). However, the wording that is currently used provides limited guidance and/or instruction to users as to when that notification is required. The Council believes that the current wording allows too much discretion and interpretation for users, which could see incidents being un-reported.</p> <p><i>Recommended change: Amend clause P4.3.3(d) to read “Notify regulatory agencies as required under any resource consent, regional or district plan, application licence, Act or regulation;”</i></p>
General	N/A	<p>The Standard uses “local authority” to apply to both regional councils and territorial authorities. It also defines “regional authority” and “territorial authority”.</p> <p>The Council supports the distinction between regional and territorial authorities, given their different jurisdictions.</p>

Clause/ Para/ Figure/ Table No.	Page No.	<b>Recommended changes and reason</b> <i>Exact wording of recommended changes should be given</i>
		<p>However, despite defining the specific terms, the Standard only uses “local authority” (save once instance of “territorial authority”).</p> <p>Council submits that, as these terms are defined, they should be used in preference to the general “local authority”. Doing so would provide greater clarity to Standard users.</p> <p><i>Recommended change: Replace all references to “local authority” in the Standard with a specific reference to either “regional authority” or “territorial authority” as appropriate for the provision and the respective jurisdictions.</i></p> <p><i>Delete the definition of “local authority” as not being required once the above change is made.</i></p>



**Date:** 2 February 2021

**Subject:** **2021 State of the Environment Report for Taranaki**

**Approved by:** G K Bedford, Director - Environment Quality  
S J Ruru, Chief Executive

**Document:** 2681577

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### **Purpose**

1. The purpose of this memorandum is to present for Members' information, a project update for the preparation of the Council's next State of the Environment Report (SOER). The SOER is an omnibus collation of appropriate and up to date data and information primarily about the about the physical environment of Taranaki and the effects of human activities and interventions.

### **Executive summary**

2. The Council is to prepare and release its next SOER in June through to December 2021 following previous reports in 2014, 2009, 2003 and 1996.
3. Since preparing our last report in 2014 there have been developments in our capabilities to manage and report on our state of the environment monitoring data. There have also been changes in thinking within the Council (and within other councils), based on experiences with state of the environment reporting generally, as to how best to present data, report key messages and connect effectively with chosen audiences, while at the same time keeping the process cost-effective and manageable.
4. The outcome is that the next SOER will be available in primarily a digital format with enhanced online features in comparison to the online version of the 2014 report. The SOER will no longer be reported as an omnibus style report, but rather will be developed as a series of modules to be released over a six-month schedule. These modules will be reviewed and updated on a regular basis after they are released resulting in continuously revolving state of the environment reporting rather than reporting at approximately five-yearly intervals.
5. Work on the SOER design and delivery is now underway. Much of the data analysis, writing and editing of individual chapters will take place over the next few months and we expect all modules to be drafted by the end of the 2021 calendar year.

## Recommendations

That the Taranaki Regional Council:

- a) receives the memorandum 2021 State of the Environment report for Taranaki.
- b) approves the revised approach to the delivery of the SOER with the schedule for delivery of all online modules to be completed by December 2021.

## Background

6. The Council has prepared four SOERs to date: 1996 (The Taranaki Region), 2003 (Our place, our future), 2008 (Taranaki: where we stand), and 2014 (Taranaki as one - Taranaki Tāngata Tū Tahī). Each of these has been built on a 'pressure-state-response' framework. They are published on a 5-7 year cycle.
7. The relevant sections of the Resource Management Act require monitoring and the gathering of information by the Council as follows:-
  - 7.1. 35 (1): such information as is necessary to carry out effectively its functions...
  - 7.2. 35 (2) (a): the state of the whole or any part of the environment of its region to the extent that is appropriate to enable the council to effectively carry out its functions
  - 7.3. 35 (2) (b): the efficiency and effectiveness of policies, rules, or other methods in its policy statement or its plan
  - 7.4. 35 (2A): Every council must at intervals of not more than 5 years compile and make available to the public a review of the results of its monitoring under subsection (2)(b)
  - 7.5. 35 (3) every council shall keep at its principal office information relevant to...current issues relating to the environment.
  - 7.6. 35 (5) Information kept under 35(3) shall include...any other information gathered under subsections 35(1) and 35 (2).
8. So in summary, a compiled and publicly released SOER is used to provide information on the state of the whole or parts of the environment of the region [35(2)(a)] as per the obligation of 35(5). There is no statutory obligation to use the mechanism of a stand-alone and all-embracing SOER to do so, nor a stipulation about how often ( in respect of environmental data *per se*), nor specification as to particular subject matters; only that whatever mechanism is used shall deliver information relevant to current issues and about the state of the regional environment, gathered to the extent that is appropriate.
9. It should however now be noted, that *the National Policy Statement for Freshwater Management 2020* has explicit requirements for reporting a comprehensive suite of monitoring data in respect of freshwater. Data for a range of measures, attributes and values must be published annually, while an ecosystem health score card and an assessment of state, pressures, attainment of target states, and changes in freshwater systems must be published every five years.
10. While the RMA did not previously specifically require the preparation of a report on quantitative measures of the state of the region's environment, the Council has chosen to prepare such a report every five years. The last report was prepared in 2014 (following earlier reports in 2009, 2003 and 1996). The next report was programmed for release in the 2020/2021 year.

11. Monitoring the state of the environment is clearly important because it tells the Council and the wider community how successful or otherwise we have been as a community in promoting the sustainable management purpose of the RMA.
12. The purpose of the SOER is to provide high quality environmental information that is accessible and understandable to the Taranaki community at large. It will help answer questions such as is the quality of our environment improving or deteriorating? Where and by how much? Have our policies and programmes been effective? What changes if any are required? What adjustments are required in the future in order to meet expectations?
13. Much of the information contained in the report will be drawn from comprehensive state of the environment monitoring programmes established by the Council in the mid-1990s. These have now been running for sufficient lengths of time to enable robust statistical testing of trends in the data.
14. The Council's 2020/21 Annual plan required the following:
  - 14.1. "Prepare and publish the five-yearly state of the environment report. The next report is due in 2020."
15. During 2020, the Council faced significant changes including Covid-19 restrictions, changes of senior leadership and the implementation of the Essential Freshwater Package by MfE. Because of these changes and the opportunity to scope the digitally-based delivery of the SOER, this timeframe was not achievable.

## Discussion

16. Since preparing our last report there have been developments in our capabilities to manage and report on our state of the environment monitoring data. There have also been changes in thinking within the Council (and within other councils), based on experiences with state of the environment reporting generally, as to how best to present data, report key messages and connect effectively with chosen audiences, while at the same time keeping the process cost-effective and manageable.
17. The outcome is that the next 2021 SOER will primarily be available in a digital format. While the previous report was available on-line, the 2021 report will advance on some of the previous features for example with the use of interactive graphics – to allow viewers to select periods of interest, locations, specific datasets etc. There will also be greater level of linkage to other areas of the website (e.g. live hydrological and environmental quality data and on-line technical reports) and opportunity for community members to engage with the Council on the content.
18. The approach will involve the iterative/staged production of modules (each module will cover a specific domain as did chapters of the previous SOER) and the Council will move to a programmed ongoing refresh of these modules to ensure that the information remains relatively current. Therefore, there will not be a compendium style report released on a single date every 5 to 7 years, but rather a series of modules each on its own release and review schedule, which we will aim to review within a 24 month cycle. Printable downloads of the digital modules will be available although these are likely to be in a summarised format as compared to what is available online. Single page report cards for each module will also be available for download, in a style based on our current annual freshwater quality report cards.
19. The 2014 style of reporting will be applied to the 2021 digital SOER. In addition, the modules will be organised in such a way that these each cover one or more of the themes

that were applied in each of the 2014 SOER chapters. The report will also follow the 'Pressure, State, Response' model adopted in earlier reports.

20. The report will contain information from other regions, nationally or internationally to enable comparisons with the Taranaki situation for the particular topic being reported on. How we compare with other places or jurisdictions provides a sense of how well we are doing relative to our peers and is something that is important to most people.
21. Again as with previous reports, good use will be made of case studies. This will be an opportunity to showcase and celebrate community actions and success which in turn will motivate and inspire others.
22. The draft schedule is set out in the table below:

Milestone (Key Deliverable)	Estimated Completion Date
Project Start Date	01/07/2020
MyTRC and potential inclusion of SoER discovery phase	15/11/2020
Refine project scope and plan	04/12/2020
Complete draft communications plan	24/12/2020
Memo to P&P committee for commencement and approach to the digital SoER	02/02/2021
Complete communications base design work (incl. style and templates)	01/03/2021
Complete digital platform base set-up and the Taranaki Overview (Module Zero)	01/04/2021
Complete the development of an overall data delivery plan	01/04/2021
Complete Module One (Air Quality) publication	01/06/2021
Complete Module Two (Coast) publication	01/08/2021
Complete Module Three (Waste & Natural Hazards) publication	01/09/2021
Complete Module Four (Land) publication	01/10/2021
Complete Module Five (Biodiversity) publication	01/11/2021
Complete Module Six (Heritage and Place) publication	01/12/2021
Complete Module Seven (Freshwater) publication	31/12/2021
Review and redevelop Project Plan for Phase 2	31/03/2022
Project End Date	31/03/2022



### **Financial considerations—LTP/Annual Plan**

23. This memorandum and the associated recommendations are consistent with the Council's adopted Long-Term Plan and estimates. Any financial information included in this memorandum has been prepared in accordance with generally accepted accounting practice.

### **Policy considerations**

24. This memorandum and the associated recommendations are consistent with the policy documents and positions adopted by this Council under various legislative frameworks including, but not restricted to, the *Local Government Act 2002*, the *Resource Management Act 1991* and the *Local Government Official Information and Meetings Act 1987*.

### **Iwi considerations**

25. This memorandum and the associated recommendations are consistent with the Council's policy for the development of Māori capacity to contribute to decision-making processes (schedule 10 of the *Local Government Act 2002*) as outlined in the adopted long-term plan and/or annual plan. Similarly, iwi involvement in adopted work programmes has been recognised in the preparation of this memorandum.

### **Community considerations**

26. This memorandum and the associated recommendations have considered the views of the community, interested and affected parties and those views have been recognised in the preparation of this memorandum.

### **Legal considerations**

27. This memorandum and the associated recommendations comply with the appropriate statutory requirements imposed upon the Council.



**Date** 2 February 2021

**Subject:** **Submissions on the proposal to amend the Regional Pest Management Plan**

**Approved by:** A D McLay, Director - Resource Management  
S J Ruru, Chief Executive

**Document:** 2635811

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### **Purpose**

1. The purpose of this memorandum is to:
  - update Members on the public consultation process on the proposal to amend the *Pest Management Plan for Taranaki* (the Proposal) to declare mustelids as pests, including recommend changes to the Proposal as a result of submissions; and
  - set out the process from here for adopting the Proposal.

### **Executive summary**

2. On 7 November 2020, the Taranaki Regional Council (the Council) publicly notified the proposal to amend the *Pest Management Plan for Taranaki*.
3. The *Pest Management Plan for Taranaki* sets out the regulatory framework for the management of pest animals and pest plants in the Taranaki region.
4. The Proposal is part of a partial review of the Pest Plan. The Proposal seeks to declare mustelids (ferrets, stoats and weasels) as 'pests' in the Taranaki region and for rules to apply. The Proposal does not otherwise amend the RPMP, except for minor consequential changes necessary to update the Plan to recognise the outcomes of this review.
5. Pursuant to section 73 of the *Biosecurity Act 1993* (the BSA), the Council publicly notified the proposal and invited feedback and submissions on the partial review.
6. The Council received eight submissions on the proposal. Submitters included individuals, two district councils, Forest and Bird, Federated Farmers, and two iwi authorities. Three submitters have so far indicated they wish to speak at a hearing.
7. In brief, most submissions were generally supportive of the Council declaring mustelids to be pests and the application of rules to control mustelids in Taranaki.
8. Council officers have completed an Officers Report for each of the eight submissions, which is attached for your information.

9. It is suggested a hearing of submission be held by Council at the Ordinary meeting of 23 February 2021 to consider submissions. Three submitters have indicated they wish to speak at a hearing.
10. Following the hearing, Council will make its decisions on the reliefs sought in the submissions, including any changes to the current Pest Management Plan. Submitters have 15 working days to appeal to the Environment Court against the Council's decisions.

## Recommendations

That the Taranaki Regional Council:

- a) receives this memorandum titled *Submissions on the proposal to amend the Regional Pest Management Plan*
- b) adopts the recommendations contained within the attached *Officers Report*, subject to any amendments agreed to by Council
- c) agrees to hear submissions at the Ordinary meeting of 23 February 2021.

## Background

11. Biosecurity is the prevention or management of risks from the thousands of pests and other harmful organisms that affect our economy, environment and wellbeing. Biosecurity and pest management is vital to New Zealand's environmental and economic well-being.
12. The BSA provides regional councils with a leadership role and powers to manage harmful species classified as pests or unwanted organisms. Under the BSA, the Council is required to have in place a pest management plan for its region if it wishes to undertake pest management. A pest management plan specifies what organisms are declared to be 'pests' and sets out the rules in relation to those 'pests'.
13. The *Pest Management Plan for Taranaki* was adopted by Council and became operative on 20 February 2018 following a comprehensive public process under the BSA. The Plan sets out management programmes to ensure the sustained control of 17 'pest' animal and plant species and empowers the Council to exercise the relevant enforcement and funding provisions available under the BSA. It is an offence under the BSA not to comply with the Plan's requirements.
14. Members may recall that at the time of the 2018 review Council considered declaring mustelids to be a pest but the decision was deferred to 'trial' the *Towards Predator-free Taranaki* programme, first as part of a voluntary approach to ensure its effectiveness. Since 2018, Council has been successfully implementing the *Towards Predator-free Taranaki* programme. Rurally, there is 42,000 hectares covered by predator control with a 90% reduction in mustelid populations following the predator control and is successfully kept at very low levels.
15. Two years on, the Council was determined to undertake a partial review of the *Regional Pest Management Plan*. Council believes amendment is required to the operative Plan to protect the sustainability of and public investment in *Towards Predator-free Taranaki*. Proposed amendments will introduce predator control rules to support maintenance of the *Towards Predator-free Taranaki* programme.
16. The proposal to amend the *Regional Pest Management Plan* seeks to declare mustelids (weasels, stoats and ferrets) to be 'pests' and to include a new programme for their

sustained control. The new programme will empower the Council to exercise the relevant advisory, service delivery, regulatory and funding powers available under the BSA to deliver mustelid control in defined parts of Taranaki. A copy of the Proposal for inclusion of mustelids Regional Pest Management Plan can be found [here](#).

17. Mustelids are opportunistic non-indigenous predators that have been implicated in the decline and even extinction of native bird species. They have been a prime target in the roll-out of *Towards Predator-Free Taranaki*, the multi-year programme to boost populations of native plants, birds and reptiles by removing introduced threats. Formally including mustelids in the *Pest Management Plan* would help to lock in and expand these gains.
18. The Council would identify 'Predator Control Areas' where land occupiers in a locality agree to participate in the programme. This is similar to its approach under the long-running and successful Self-Help Possum Control Programme. In each of the Predator Control Areas, the Council would undertake initial predator control targeting mustelids. After initial predator control work has been undertaken, occupiers within the area will be required to control and maintain mustelid numbers at the reduced levels.

### **Submission process**

19. On 13 October 2020, a memorandum to seek approval to publicly notify the proposed amendments to the *Pest Management Plan* was accepted by Council members.
20. Under section 73 of the BSA, the Council invited submissions on the proposal to amend the *Pest Management Plan*.
21. The proposal was also put in to the Taranaki Daily Newspaper on 7 November and the Taranaki Regional Council website had been updated to include a section on the proposed changes and submission process. Key interested parties were also individually notified, including New Plymouth District Council, South Taranaki District Council, Stratford District Council, Federated Farmers, the Taranaki Mouna project, the Department of Conservation, Ministry for Primary Industries, and all iwi authorities.
22. Submissions could be made through the completion of an online submission form on the Council website, via email or by posting a hard copy to the Council. Council officers were also available over the submission period to answer questions or to provide clarification on matters of concern.
23. The submission period concluded at 4pm on Friday 4 December 2020. Technical difficulties resulted in some of the notification emails not getting through to intended recipients. These parties were individually contacted and received an extension of time (until 24 December) to make a submission.

### **Submissions**

24. Eight submissions were received on the proposal to amend the *Pest Management Plan*, these were from:
  - South Taranaki District Council
  - Te Korowai o Ngāruahine Trust
  - Neil and Lloma Hibell
  - Forest and Bird
  - Anne Collins

- Federated Farmers
  - Te Kotahitanga o Te Atiawa
  - New Plymouth District Council
25. In brief, the submissions were generally supportive in identifying mustelids as pests in the *Pest Management Plan* and for the application of rules to control mustelids in Taranaki.
26. Each of the submissions received have been reviewed by officers and submission points summarised in the attached *Officers' Report*. Officer recommendations in relation to individual submission points are also presented in the report for Council's consideration. Recommendations have been provided on the issues made in the attached *Officers' Report*. The full set of submissions is appended to the *Officers Report*.
27. Key issues or themes raised in submissions are as follows:
- general support for declaring mustelids to be a pest in the Taranaki region
  - seek further information or minor additional amendments to the Plan in relation to monitoring
  - recognition of the role of iwi as kaitiaki
  - seek feral cats also to be declared as pests
  - amendment to the mustelid control rule to make it less onerous to land occupiers.
28. Recommended changes to the Proposal to be duly incorporated into the Pest Management Plan are relatively minor and are identified in the officers response to submission points (where relevant) identified in the *Officers Report*. It is recommended that mustelids be declared a pest in the Taranaki region and to include a new programme in the current Pest Plan for their sustained control.
29. In relation to the reliefs sought by submitters a number of minor and inconsequential changes are recommended by officers. The most significant change recommended by officers is to amend the proposed rule to control mustelids to make costs and obligations imposed on participating land occupiers less onerous.
30. Officers have reviewed the rule and believe Council can reduce the proposed trapping requirements from **ten times** per calendar year to **eight times** in accordance with a submitter's request to be less onerous on the land occupier and still achieve the biodiversity outcomes sought. Accordingly, officers recommend amending the proposed rule to read:
- "...A land occupier within a Predator Control Area must maintain ferrets, stoats, and weasels numbers present on their land by:*
- (a) servicing permanent mustelid traps a minimum of **eight** times per calendar year and record trap catch information in the TrapNZ database; and*
- (b) servicing any activated 'remote sensor mustelid trap' within 30 days of activation.*
- Note: 'Servicing' means the removal of dead animals, inspection of trap to make sure it is functioning properly, grass/obstacles removed from around the trap entrance and trap rebaited with fresh bait."*
31. Three submitters have so far indicated that they wish to have their submissions heard. The submitters wishing to be heard are Te Korowai o Ngāruahine Trust, Forest and Bird, and Te Kotahitanga o Te Atiawa.

**Next steps**

- 32. A hearing of submissions is recommended to be held by Council at the Ordinary meeting of **23 February 2021** to consider submissions. Three submitters have indicated they wish to speak at a hearing.
- 33. Following the hearing, Council will make its decisions on the reliefs sought in the submissions, including any changes to the current Pest Management Plan.
- 34. The Council will then prepare a written report on its decisions, publicly notify the report, and send a copy to every submitter.
- 35. Submitters have 15 working days to appeal to the Environment Court against the Council’s decisions. With the strong and practical relationships in place, the Council has not been previously appealed on biosecurity matters.
- 36. The process to date and the steps remaining are summarised in the table below.

13 October 2020	Policy & Planning Committee agrees to publically notify the Proposal for public submissions
7 November 2020	Proposal to amend the RPMP publically notified
4 December 2020	Deadline for public submissions (note 24 December extension for some parties)
December 2020 to February 2021	Summarise submissions and prepare draft Officers’ Report
February 2021	Policy and Planning Committee receives submissions and an Officers’ Report and recommends changes to current Pest Plan for Council’s consideration
February – March 2021	Council holds hearing of submissions and makes decisions Submitters have 15 working days to appeal to the Environment Court.

**Decision-making considerations**

- 37. Part 6 (Planning, decision-making and accountability) of the *Local Government Act 2002* has been considered and documented in the preparation of this agenda item. The recommendations made in this item comply with the decision-making obligations of the *Act*.

**Financial considerations—LTP/Annual Plan**

- 38. This memorandum and the associated recommendations are consistent with the Council’s adopted Long-Term Plan and estimates. Any financial information included in this memorandum has been prepared in accordance with generally accepted accounting practice.

### **Policy considerations**

39. This memorandum and the associated recommendations are consistent with the policy documents and positions adopted by this Council under various legislative frameworks including, but not restricted to, the *Local Government Act 2002*, the *Resource Management Act 1991* and the *Local Government Official Information and Meetings Act 1987*.

### **Iwi considerations**

40. This memorandum and the associated recommendations are consistent with the Council's policy for the development of Māori capacity to contribute to decision-making processes (schedule 10 of the *Local Government Act 2002*) as outlined in the adopted long-term plan and/or annual plan. Similarly, iwi involvement in adopted work programmes has been recognised in the preparation of this memorandum.
41. Iwi authorities were consulted prior to public notification of the proposal and subsequently as part of the public process. No feedback prior to public notification was made.
42. Through the public process, Ngāruahine and Te Atiawa made submissions on the proposal. However, it is noted that the aims and intent of the proposal are consistent and give effect to many of the aspirations set out in iwi management plans relating to biodiversity.

### **Legal considerations**

43. This memorandum and the associated recommendations comply with the appropriate statutory requirements imposed upon the Council.

### **Appendices/Attachments**

Document 2640115: Officers report on the proposal to amend the RPMP

# Officers report

## Proposal to amend the Regional Pest Management Plan

Publication date: February 2021

Document: #2640115





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## Officers summary

This report summarised points made in submissions to the proposal to amend the *Pest Management Plan for Taranaki (2018)* to include a mustelid pest programme, including officers' recommendations and responses to the points made.

Requests to amend the proposal are either accepted or declined by Taranaki Regional Council (Council) officers with an explanation on the reasons for the response. Changes to the proposal are tracked in red with additions being underlined and deletions showing ~~striketrough~~.

Submissions were being received by the Taranaki Regional Council between the 7<sup>th</sup> of November 2020 until the 4<sup>th</sup> of December 2020 ( and 24 December for some given technical issues).

Please refer to Appendix 1 of this report for a full copy of the submissions.

### Submission 1: South Taranaki District Council

Submitters requests		Officers' recommendations and response
<b>General comments</b>		
<b>1.</b>	<b>Support</b>	<b>Accept</b>
	The submitter supports the Council's focus on bringing mustelids into the Pest Management Plan noting the benefits of the proposed programme on improving indigenous biodiversity outcomes across Taranaki.	Officers note the submitter's support for the proposed amendments.
<b>2.</b>	<b>Support</b>	<b>Accept</b>
	The submitter supports the approach to identify 'Predator Control Areas' where land occupiers in a locality agree to participate in the programme. The submitter suggests this is a sensible approach and has been shown to be successful with the Possum Self-Help Programme.	Officers note the submitter's support for the proposed amendments.

Submission 2: Te Korowai o Ngāruahine Trust

Submitters requests		Officers' recommendations and response
<b>Section 4 Organisms declared as pests</b>		
<b>3.</b>	<b>Support</b>	<b>Accept</b>
	The submitter supports the Council's decision to include mustelids as a target pest species in the Pest Management Plan. The submitter states that this is a sensible approach, building upon the outstanding work in possum control and the protection of indigenous biodiversity.	Officers note the submitter's support for the proposed amendments.
<b>Toxins</b>		
<b>4.</b>	<b>Amend</b>	<b>No change required</b>
	The submitter is concerned that there will be an increased use of toxic and ecotoxic substances into the environment to control mustelids, particularly in proximity to statutory acknowledgement areas.  The submitter seeks that: <ul style="list-style-type: none"> <li>- there is no increase in the current amount of toxic and ecotoxic substances used to control animal and plant pest species; and</li> <li>- where toxic and ecotoxic substances must be used, that there are buffer zones of 200 metres for any waterways or Ngāruahine statutory areas.</li> </ul>	Officers note the submitter's concerns regarding increased use of toxins but notes that both initial and ongoing mustelid control are based upon a (non-toxic trap) network.  Officers further note that there is no specific mustelid toxins suitable for the programme area that would necessitate buffer distances.
<b>Iwi participation</b>		
<b>5.</b>	<b>Amend</b>	<b>No change required</b>
	The submitter seeks that Ngāruahine iwi and hapū members participating in current and future pest control and management to support their role as kaitiaki. In particular, the submitter seeks that: <ul style="list-style-type: none"> <li>- pest control favour manual, non-chemical methods</li> <li>- pest control involve collaboration with mana whenua and a genuine expression of kaitiakitanga; and</li> <li>- any monitoring or management of aquatic or terrestrial indigenous biodiversity involves collaboration with mana whenua in recognition of the partnership principle of the Treaty of Waitangi.</li> </ul>	Officers note that the Council welcome iwi involvement in mustelid control and can advise members on the appropriate training and qualifications required to undertake this work.  As noted above, officers further note that the mustelid programme utilises traps for both initial and ongoing control. Also, as part of any operation, Council will endeavour to involve and collaborate with mana whenua in accordance with the Council's statutory responsibilities and in recognition of their kaitiaki role and the partnership principles of the Treaty of Waitangi.

Submission 3: Neil and Lloma Hibell

Submitters requests		Officers' recommendations and response
<b>General comments</b>		
<b>6.</b>	<b>Oppose</b>	<b>Decline</b>
	<p>The submitter is opposed to regulatory requirements for mustelid control.</p> <p>The submitter considers that the Council is expecting too much from landowners. The submitter notes that they agreed to join the mustelid scheme on a (voluntary) basis with the expectation that they would not need to manage traps on their farm. The submitter is concerned that in addition to proposed requirements to undertake additional predator control work on their farms, farmers are already doing extra work in fencing, planting waterways and possum control.</p>	<p>Officers recommend declining the relief sought.</p> <p>Officers note the submitter's opposition to regulatory requirements for mustelid control. Council acknowledges the additional compliance costs (in time and in money) imposed on farmers and other land occupiers. Hence, the partnership approach whereby the Council funds the initial control and provides consider support for the land occupier's efforts.</p> <p>Of note, officers and contractors work individually with land occupiers to ensure they are fully aware of the regulatory requirements and that traps are positioned with ease of ongoing control front of mind. Council notes that so far over 90% of farmers approached have agreed to be part of this programme. For the reasons outlined in the proposal, officers do not believe a non-regulatory approach will achieve effective sustainable mustelid control and recommend declining the relief.</p>

Submission 4: Forest and Bird

Submitters requests		Officers' recommendations and response
<b>Section 4 and Rule 3</b>		
<b>7.</b>	<b>Support</b>	<b>Accept</b>
	<p>The submitter supports the identification of mustelids as a pest and the application of rules to control mustelids on Taranaki. The submitter considers the proposal to be in line with the Council's vision of being predator free.</p>	<p>Officers note the submitter's support for declaring mustelids to be pests.</p>

8.	Amend	Decline
	<p>The submitter seeks amendment to the proposal to include provisions to control feral and stray cat populations. In particular, the submitter seeks that cats be declared as pests and that the Council amend the Proposed Plan by:</p> <ul style="list-style-type: none"> <li>- amending Section 4 to declare and identify <b>unowned cats</b> as pests in Table 1 of the Pest Management Plan;</li> <li>- including a new section setting out a sustained control programme for cats which includes rules for land occupiers within a Predator Control Area to control cats;</li> <li>- including a new section identifying high risk catchments for Māui dolphin as a priority for site led cat control; and</li> <li>- amend section 9.1 to incorporate a cat monitoring programmes in the Pest Management Plan.</li> </ul> <p>The submitter suggested that cats need to be controlled in order to prevent the spread of toxoplasmosis a disease which poses a serious threat to the Hector's and Māui dolphins.</p> <p>The submitter also noted that Taranaki has an extremely high number of unowned cats across the region especially in the Mangamingi area where cats are often dumped. Cats are responsible for 33% of bird, mammal and reptile extinctions recorded on islands by the International Union for Conservation of Nature and feral cats are also implicated in the spread of bovine tuberculosis, with the potential to infect cattle.</p>	<p>Officers recommend declining the relief.</p> <p>Officers note that the Government funding that enabled the Taranaki Predator-free programme to commence is for mustelids only. The current trapping infrastructure targets mustelids and is not suitable for the trapping of feral and stray cats</p> <p>Council fully understand the impacts that feral cats have within Taranaki. Hence the preparation and implementation of the <i>Taranaki Regional Council Biosecurity Strategy</i> (2018) whereby the Council, amongst other things, targets feral and stray cats as part of a site-led approach, e.g. Key Native Ecosystems.</p> <p>Officers further note that the Council also assist land occupiers and others to undertake feral cat control through the provision of traps.</p>

Submission 5: Anne Collins

Submitters requests		Officers' recommendations and response
General comments		
9.	<p><b>Support</b></p> <p>The submitter supports the Council's proposal to include mustelids into the Pest Management Plan.</p>	<p><b>Accept</b></p> <p>Officers note the submitter's support for declaring mustelids to be pests.</p>

Section 4 and Rule 3	
<p><b>10. Amend</b></p> <p>The submitter is seeking amendment to include the control of feral cats in the Pest Management Plan.</p> <p>The submitter is concerned about the negative impact feral cats are having on native fauna and considers the inclusion of cats as apex predators is necessary if the Council is to be serious about this problem.</p> <p>The submitter notes that:</p> <ul style="list-style-type: none"> <li>- feral cats have a major impact on native birds, bats, lizards and insects such as weta. Cats are also capable of travelling long distances including one tracked to cover almost 6 km;</li> <li>- cats are known carriers and transmitters of infectious diseases including Bovine TB, and <i>Toxoplasmosis gondii</i> (<i>T. gondii</i>). Kittens and unwell cats are the worst spreaders of these diseases. <i>T. gondii</i> can enter the waterways and eventually reach the sea where they can infect our marine mammals such as Māui and Hector's dolphins; and</li> </ul> <p>The submitter notes that responsible cat ownership is the aim of every conservation organisation. The submitter further notes that New Plymouth District Council has a limit of five cats per household, Whanganui has three. South Taranaki District Council and Stratford District Council have no limits on the number of cats that may be kept. This encourages careless breeding, no micro chipping and the subsequent dumping of unwanted cats and kittens. Those that survive further contribute to the feral cat population.</p>	<p><b>Decline</b></p> <p>Officers recommend declining the relief.</p> <p>Officers note the submitter's concern. However, it is noted that the Government funding that enabled the Taranaki Predator-free programme to commence is for mustelids only. The current trapping infrastructure targets mustelids and is not suitable for the trapping of feral and stray cats</p> <p>Council fully understand the impacts that feral cats have within Taranaki. Hence the preparation and implementation of the <i>Taranaki Regional Council Biosecurity Strategy</i> (2018) whereby the Council, amongst other things, targets feral and stray cats as part of a site-led approach, e.g. Key Native Ecosystems.</p> <p>Officers further note that the Council also assist land occupiers and others to undertake feral cat control through the provision of traps and would support any district council bylaw that sought to reduce or limit the number of domestic cats allowed per household.</p>

Submission 6: Federated Farmers

Submitters requests		Officers' recommendations and response
<b>General comments</b>		
<b>11.</b>	<b>Support</b> The submitter noted that it was good to see a detailed cost benefit analysis in the proposal.	<b>No change required</b> Officers note the submitter's comments. No further action required.
<b>12.</b>	<b>Other</b> The submitter has asked for formal guidance regarding who is responsible for maintaining and servicing the traps. Due to farms being subject to lease or contract milking or share-milking arrangements, certainty and clarity is required on who has responsibilities.  The submitter would also like to see ongoing emphasis on catchment level programmes and encourage Council to continue supporting various funding mechanisms of pest control at either a catchment level and/or individual farm level, such as the Key Native Ecosystems programme.  In addition, the submitter would encourage Council to support on-going discussion with community groups e.g. Wild for Taranaki, regarding the use of community volunteers to check trap lines in catchments or on individual properties.	<b>Accept</b> The submitter raises a number of technical and operational queries relating to the implementation of the mustelid programme.  Officers note that the term occupier comes from the Biosecurity Act 1993, it refers to the owner, occupier or person in charge of the property. Officers will work with the submitter to produce appropriate guidance.  Officers further note that the requested emphasis on catchment level programmes and supporting individuals and community groups to undertake pest control, including the checking of traps, is consistent with the Council's approach set out in the proposal plus the <i>Taranaki Regional Council Biosecurity Strategy</i> .
<b>Section 4 [Organisms declared as pests]</b>		
<b>13.</b>	<b>Support</b> The submitter supports the inclusion of mustelids in section 4 as organisms declared as pests and the identification of ferrets, stoats, and weasels as pests in Table 1.  The submitter notes that mustelids can have a negative impact on primary production due to their ability to carry parasites and toxoplasmosis.	<b>Accept</b> Officers note the submitter's support.

Section 6.6A [Predators (ferret, stoat and weasel)]		
<b>14.</b>	<b>Support</b>	<b>Accept</b>
	<p>The submitter broadly agrees with the proposed objective set out in 6.6A of sustainably controlling mustelid numbers within a specified Predator Control Area, and elsewhere to avoid or minimise adverse effects on indigenous biodiversity values in the Taranaki region.</p> <p>The submitter offers on-going support to Council’s extension programme as the principal method by which Council will achieve this objective.</p> <p>The submitter acknowledges the success of the Self-help Possum Control Programme and expects it will be as effective in controlling mustelids. Given predator control areas are only established when most of the community agree to work with Council in order to control mustelids, the submitter agrees there must be a legal ‘failsafe’ to ensure these efforts are not in vain.</p>	<p>Officers note and appreciate the submitter’s offer of ongoing support.</p>
Section 6.6A [Measuring what the objectives are achieving]		
<b>15.</b>	<b>Support</b>	<b>Accept</b>
	<p>The submitter supports the establishment and mapping of Predator Control Areas (clause (ba)) and robust modelling of mustelid population densities and trends over time (clause (bb)) to determine the effectiveness of the programme.</p>	<p>The submitters support for proposed clauses (ba) and (bb) are noted.</p>
Rule 3 [General Rule for Predator Control Areas]		
<b>16.</b>	<b>Amend</b>	<b>Accept</b>
	<p>The submitter seeks amendment to Rule 3 of the Pest Management Plan to read:</p> <p><i>“...A land occupier within a Predator Control Area must maintain ferrets, stoats, and weasels numbers present on their land by:</i></p> <p><i>(a) servicing permanent mustelid traps a minimum of <del>ten</del> eight times per calendar year and record trap catch information in the TrapNZ database; and</i></p> <p><i>(b) servicing any activated ‘remote sensor mustelid trap’ within 30 days of activation.</i></p>	<p>Council acknowledges the additional work for farmers that the new rules will require. Accordingly, Council officers and contractors will work individually with land occupiers to ensure that traps are positioned to ensure ongoing control is as easy and practicable as possible for the farmers.</p> <p>Officers note that Council has investigated, as part of the development of the proposal, rules and associated compliance monitoring techniques, including the technical feasibility of adopting a rule similar to the possum trap-catch system. Unfortunately, there is no equivalent robust compliance monitoring technique for mustelids (similar in kind to the trap-catch) at a farm scale. Council will continue to</p>



<p><i>Note: 'Servicing' means the removal of dead animals, inspection of trap to make sure it is functioning properly, grass/obstacles removed from around the trap entrance and trap rebaited with fresh bait.</i></p> <p>OR</p> <p>Delete proposed rule 3 and with new rule as below: <i>"...A land occupier within a Predator Control Area must control mustelids present on their land by regularly servicing permanent mustelid traps and recording trap catch information as practicable in accordance with Council advice."</i></p> <p>The submitter is supportive of the logic behind the inclusion of the proposed Plan rule 3, but caution that its effectiveness will depend on its enforceability and on-going monitoring.</p> <p>The submitter notes that the general rule in support of the self-help possum control programme (6.6.3.1) requires landowners to maintain possum numbers present on their land to below a 10% residual trap catch. This allows the landowner to focus on the objective without enforcing a potentially onerous servicing requirement. As mustelid population densities and trends become clearer over time, the submitter would like to see the inclusion of a residual trap catch requirement (or similar) in the mustelid rule so the focus shifts from how often farmers service their traps to an agreed outcome.</p> <p>In the absence of such a measure, the submitter is concerned that the proposed requirement for land occupiers to service traps 10 times per calendar year is unnecessarily onerous and places an additional burden on farmers that are already putting in good work through the possum control program. The submitter states that the requirement to service traps a minimum of 10 times per calendar year would be impractical due to busy periods like calving and mating. For these reasons the submitter asks that the proposed rule is amended to reduce or omit the prescriptive trap servicing requirement</p>	<p>reassess new monitoring systems and will revisit the rule should alternative robust farm-scale monitoring be developed.</p> <p>Mustelid control is most successful when traps are permanently set due to mustelids large home ranges, however increased captures often occur from November to March, officers determined that a minimum of ten checks should not be too onerous and will achieve the best level of control.</p> <p>Notwithstanding the above, officers have reviewed the rule's trapping requirement and believe Council can reduce the requirement in accordance with the submitter's request to be less onerous on the land occupier and still achieve the biodiversity outcomes sought. Accordingly, officers recommend amending Rule 3 of the Pest Management Plan to read:</p> <p><i>"...A land occupier within a Predator Control Area must maintain ferrets, stoats, and weasels numbers present on their land by:</i> <i>(a) servicing permanent mustelid traps a minimum of <del>ten</del> eight times per calendar year and record trap catch information in the TrapNZ database; and</i> <i>(b) servicing any activated 'remote sensor mustelid trap' within 30 days of activation.</i></p> <p><i>Note: 'Servicing' means the removal of dead animals, inspection of trap to make sure it is functioning properly, grass/obstacles removed from around the trap entrance and trap rebaited with fresh bait.</i></p>
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Good Neighbour Rule	
<p><b>17. Amend</b></p> <p>The submitter understands the reasoning in Council’s cost benefit analysis and their obligations for considering a good neighbour rule under the Biosecurity Act 1993 and the <i>National Policy Direction on Pest Management 2015</i>. However, the submitter would like further information on its viability.</p> <p>The submitter appreciate Council’s view that the 200ha dispersal range of mustelids would necessitate a 2km buffer and have the potential to impose significant costs on landowners that are not within a predator control area. Notwithstanding this the submitter views the good neighbour rule as a key step to addressing the ongoing issue of Crown land being non-rateable and not required to directly contribute to regional pest management. The submitter acknowledges that the Department of Conservation undertakes significant pest management in the region, e.g. the Mounga project. However, consideration to the good neighbour rule is often necessary as it is accepted that pest management generally is not effective unless all landowners (including Crown) consistently manage the spread of pests. Council’s own analysis of “who should pay?” in section 3.5 of the partial review document lists the Department of Conservation as a “major” beneficiary of the proposed predator control while private landowners, including dairy, sheep and beef farmers are listed only as “minor” beneficiaries.</p>	<p><b>Decline</b></p> <p>Officers note the submitter’s concerns regarding potential externality impacts arising from Crown land.</p> <p>Officers note that as part of the development of the proposal, Council considered the development and inclusion of a Good Neighbour rule. However, the dispersal range of mustelids meant that a 2 kilometre buffer would have been required and it was believed the compliance costs imposed would have been disproportionate to the benefits anticipated. Officers are satisfied that given the ongoing commitment by Taranaki Mounga Project and the Department of Conservation to managing mustelids on Crown land a Good Neighbour rule is not necessary at this time. However, these assumptions will be tested in the future (see comments below) as part of any Plan review.</p>
<p><b>18. Amend</b></p> <p>As Predator Free Taranaki is rolled out and its uptake grows throughout the region, the submitter seeks that the Council re-consider the imposition of a good neighbour rule to ensure Crown agencies participant in the programme to the same extent as land owners.</p> <p>The submitter considers the rationale behind inclusion of a rule to ensure land occupiers play their part to be reasonable. Likewise, they expect such a rule should apply to Crown and conservation land. The submitter notes that the negotiated understanding around potential boundary pests between the Council and Crown agencies are of little comfort to our members as they have no means to enforce it and requires the Regional Council to be pro-active, incur costs and navigate a political minefield with the Crown.</p>	<p><b>Accept</b></p> <p>Officers note that, in accordance with the <i>Biosecurity Act</i>, the Council is required to review efficiency and effectiveness of the Pest Management Plan after five years (i.e. 2023) and undertake a full statutory review after 10 years (i.e. 2028). At that time there will be an opportunity to review the merits of the Good Neighbour rule.</p>

Submission 7: Te Atiawa

Submitters requests		Officers' recommendations and response
<b>Rule 3 [General Rule for Predator Control Areas]</b>		
<b>19.</b>	<b>Support</b>	<b>Accept</b>
	The submitter states that trapping mustelids can minimise the number of pests having a positive impact on the overall number of taonga species. The submitter states that this would return mauri to the whenua, wai and tangata. The submitter notes that the trapping of mustelids relates to the Te Atiawa Iwi Management Plan which states that weeds and pests generate adverse effects on the survival of native biodiversity.	Officers note the submitter's comments and support for the protection of taonga species and native biodiversity.
<b>Section 4 [Organisms declared as pests]</b>		
<b>20.</b>	<b>Support</b>	<b>Accept</b>
	The submitter supports the addition of mustelids in the proposed Plan as it aligns with the provisions of the Te Atiawa Iwi Management Plan, specifically the Te Tai Tāne Tokorangi chapter of the Plan which outlines the protection and restoration of native biodiversity encouraging weed and pest management.	Officers note the submitter's support for the proposed amendments to include mustelids in the Pest Management Plan and the programme's alignment with the Te Atiawa Iwi Management Plan.
<b>General comments</b>		
<b>21.</b>	<b>Clarification</b>	<b>No change required</b>

Notwithstanding the submitter's general support for the proposed amendments to the Pest Management Plan, the submitter is seeking clarification with regard to the Council's consideration of the consequential effects mustelid management and control will have on rabbit populations given rabbits are the main diets of ferrets.

Clarification is further sought by the submitter as to why the partial review is limited to mustelids only as the *Taranaki Regional Council Biosecurity Strategy* in addition to possums and mustelids, identifies rabbits, goats, feral cats and rats as pest animals which are threatening Taranaki biodiversity as well.

Officers note that mustelid control will not consequentially increase rabbit populations. Research conducted by Manaaki Whenua has confirmed that the biggest driver of rabbit populations is climatic, i.e. warm dry winters often see a rise in rabbit populations. Further information on this research can be found [here](#). However, of note Council, as part of the *Towards Predator Free Taranaki* research programme, has been analysing mustelid stomach content (to confirm assumptions) which has found bird and rodents present with no samples so far identifying rabbits. Officers are confident that the programme will not increase rabbit numbers.

Officers also note that proposals to include other pest animal species and impose rules and obligations on people were considered as part of the full review of the Pest Management Plan completed in 2018. This review is deliberately confined to mustelids in response to changing policy circumstances.

Government funding that enabled the Taranaki Predator-free programme to commence is limited to mustelids only. The current trapping infrastructure targets mustelids and is not suitable for the trapping of other pests such as rabbits, goats and cats.

Officers note that the Council does however target other harmful species. Through the preparation and implementation of the *Taranaki Regional Council Biosecurity Strategy* (2018) the Council has a range of non-regulatory programmes targeting other harmful species such as feral cats, deer, goats, pigs, rats, rabbits and hares. This Strategy and the Council's non regulatory programmes continue to be considered the most effective and appropriate form of intervention for the aforementioned harmful animals.

Although rats are not targeted in the Proposal they are controlled as a 'by-kill' during the initial predator control work for mustelids. Officers further note that the Council also provides assistance to land occupiers and others to undertake feral cat control through the provision of traps.

1.4 [Consultation overview]	
<p><b>22. General comments</b></p> <p>The submitter notes that Section 2.4 of the Pest Management Plan states:</p> <p><i>“...the Taranaki Regional Council, seek to provide for the protection of the relationship between Māori as tangata whenua and their ancestral lands, their waters, sites, wāhi tapu, and taonga and for the protection of those aspects from the adverse effects of pests, through the Plan. Māori involvement in biosecurity is an important part of exercising kaitiakitanga over their mana whenua. The Local Government Act (LGA) requires the Taranaki Regional Council to recognise and respect the Crown’s responsibilities under the Tiriti o Waitangi – Treaty of Waitangi. It also requires councils to maintain and improve opportunities for Māori to contribute to decision-making processes. This includes considering ways to help Māori to contribute. These responsibilities and requirements were met while preparing this Plan and will continue after it takes effect”.</i></p>	<p><b>No change required</b></p> <p>The submitter’s comments are noted and is in the context of questioning the Council’s consultation and engagement processes with tangata whenua as part of this review. The Council’s response to this matter is addressed in submission point 23 below [Consultation overview].</p>
1.4 [Consultation overview]	
<p><b>23. Other</b></p> <p>The submitter notes that section 72(1)(c) of the <i>Biosecurity Act</i> requires consultation with tangata whenua. The submitter therefore notes their concern that tangata whenua have been restricted in the participation of submitting on the partial review and this does not constitute kaitiakitanga.</p> <p>The submitter suggests that sending one email <u>is not</u> sufficient, effective and meaningful consultation as one email does not maintain and improve opportunities for ngā hapū o Te Atiawa and Te Kotahitanga o Te Atiawa to contribute to this decision-making process.</p>	<p><b>No relief necessary</b></p> <p>The submitter contends that pre-notification consultation with iwi authorities is confined to one email and does not constitute recognition of [sic] kaitiakitanga.</p> <p>Officers do not agree with the contention that pre-notification consultation with iwi authorities is confined to one email to iwi authorities and notes that no feedback was received.</p> <p>Officers note that key elements of this proposal were first discussed and confined during the development of Council’s <i>Biosecurity Strategy</i> and during the initial application for Government funding for which all eight iwi (including Te Atiawa) provided letters of support for.</p> <p>Officers have subsequently regularly met with key Te Atiawa staff, including the previous Chief Executive, informally over the past 2- 3 years to update the Iwi and the Predator-free programme’s implementation within their Rohe. During these meetings, the need to incorporate a rule within the Pest Management Plan was</p>

		<p>discussed (and supported) to ensure the community's investment in controlling mustelids could be protected.</p> <p>Prior and in addition to public notification of the Proposal, Council directly contacted iwi authorities (through email) with an outline of the key components of the proposal and invited comment or an opportunity for further discussion if there was interest. The email sent to iwi included a detailed PDF discussion document which invited iwi to work together with the council and for the council to hear the views of tangata whenua. At that time, no feedback was received from the submitter or indication that further discussion was sought.</p> <p>Of note the aforementioned engagement, was in addition to consultation requirements set out in the <i>Biosecurity Act</i> and the formal public consultation and submission process on the Proposal. It is also in addition to update information and decision making considerations forwarded to the Council's Policy and Planning Committee, which includes iwi representatives tasked as a conduit for the exchange of information and the sharing of tangata whenua views at the Council's decision making committees.</p> <p>Notwithstanding the above, the Council is committed and investigating a range of measures to better recognise kaitiakitanga across its functions. This remains a work in progress but one that the Council is committed to.</p>
24.	<p><b>Other</b></p> <p>The submitter further states that only tangata whenua have the expertise to advise on the acceptability of effects on themselves and their cultural, natural and physical resources and it is important to Te Atiawa iwi that taonga species are protected through pest management and control.</p>	<p><b>No relief necessary</b></p> <p>The submitter's comments are noted. The proposal should contribute to the better protection of taonga species. No action required.</p>

General comments (how impacts on Māori are monitored)		
25.	Other	No change required
	<p>The submitter seeks clarification as to how the results of pest management and control and the impacts on Māori culture and traditions are to be monitored, in addition to the effectiveness of the Pest Management Plan in this regard.</p> <p>The submitter notes that Section 9.4 of the Pest Management Plan states “...<i>The provisions of this Plan do not replace other legislation or regulations relating to the use of toxins, impacts on Māori culture and traditions, and public health and safety</i>”. However, only tangata whenua have the expertise to advise on impacts on Māori culture and traditions.</p>	<p>Officers note that, in accordance with the <i>Biosecurity Act</i>, the Council is required to review efficiency and effectiveness of the Pest Management Plan after five years (i.e. 2023) and undertake a full statutory review after 10 years (i.e. 2028).</p> <p>At that time there will be an opportunity to review the effectiveness of pest management and control with the presumption that the protection of biodiversity will contribute to the protection of tangata whenua values, including taonga species. This will also include consideration of the results of baseline and trend biodiversity monitoring over the life of the Pest Management Plan, including bird counts.</p> <p>Officers agree with the submitter that only tangata whenua have the expertise to advise on the impacts of the Plan on Māori culture and traditions. Officers note that the proposed changes to the Plan do not represent a change in the Council’s pest management <i>modus operandi</i>. The Council only expects positive impacts arising from the implementation of the Plan. However, the Council would expect it to be advised by tangata whenua if unforeseen or unintended adverse impacts were to occur from the implementation of the Plan on Māori culture and traditions.</p>

Submission 8: New Plymouth District Council

Submitters requests		Officers’ recommendations and response
Section 6.6A [Proposed programme]		
26.	Support	Accept
	<p>The submitter supports the proposal to incorporate a sustained control management programme for ferrets, stoats, and weasels into the proposed Plan. The submitter states that New Plymouth District Council have been trapping mustelids in their reserves through the ‘restore New Plymouth Reserves’ programme, which involves several volunteers.</p>	<p>Officers note the submitter’s support for the proposed amendments to include a sustained control management programme for ferrets, stoats and weasels.</p>

Section 3.2 [Impact evaluation]		
27.	<b>Support</b> The submitter supports the Council’s review of the iwi environmental management plans prepared by the Taranaki iwi and the recognition of the impact that introduced predators, such as mustelids, have on indigenous biodiversity values and taonga species.	<b>Accept</b> Officers note the submitter’s support.
Section 6.6A [Proposed programme]		
28.	<b>Amend</b> The submitter suggests that the ‘Predator Control Areas’ be mapped and included in the Pest Management Plan by way of an appendix or appendices.	<b>Accept in kind</b> Officers recommend an alternative relief. This would involve mapping and appending <u>indicative</u> Predator Control Areas over the life of the Plan. More detailed GIS property maps identifying individual and aggregated properties where the mustelid rules apply will reside outside the Plan on the GIS and document management systems.  Indicative maps are considered appropriate given that the over the life of the Plan new areas will be incrementally included into the programme subject to (yet to occur) consultation with land occupiers as part of the long term planning processes and in terms of their collective acceptance of rules in their locality to control mustelids.
Section 6.6A [Towards Predator Free Taranaki]		
29.	<b>Amend</b> The submitter notes that the fourth paragraph of Section 6.6A refers to “ <i>targeting mustelids and rats.</i> ” The submitter questions whether the wording should include reference to rats as the remainder of the proposal does not refer to rats.	<b>Accept in kind</b> Officers note that rats are an important by-kill of mustelid control. However, for the purposes of certainty and clarity recommend amending paragraph 4 of Towards Predator Free Taranaki (Section 6.6A) to read: <i>“... the Council will undergo <u>initial predator</u> control work within the Predator Control Area targeting mustelids (and rats <u>as a by-kill</u>).”</i>
Section 6.6A [Explanation of rule]		
30.	<b>Amend</b> The submitter identifies a typographical error whereby the ‘Explanation of the rule’ refers to rules 3 and 4 (when it should only refer to Rule 3). The submitter recommends amendment to the actual rules and rule references so that they align.	<b>Accept</b> Officers agree (reference to Rule 4 will be deleted).



Section 9.1 [Measuring what the objectives are achieving]		
<b>31.</b>	<b>Amend</b>	<b>Accept</b>
	The submitter notes that item (c) in Section 9.1 of the Pest Management Plan refers to possum control in Egmont National Park and seeks that mustelids also be monitored.	Officers agree and recommend amending 9.1(c) of the Pest Management Plan to read: <i>“(c) developing agreed collaborative monitoring, reporting and management programmes addressing possum <u>and mustelid</u> control within and <del>around Egmont National Park</del> <u>Te Papakura o Taranaki</u>.”</i>
Section 3.2, 3.3 and 3.4		
<b>32.</b>	<b>Amend</b>	<b>No change required</b>
	The submitter has recognised minor typos in sections 3.2, 3.3 and 3.4 of the proposal and has asked that these be amended as appropriate.	The submitter’s comments are noted.  No details are provided of the minor typos for which correction is sought. However, officers note that sections 3.2, 3.3 and 3.4 of the Proposal relate to the cost benefit analysis (and not amendments to be incorporated into the operative Plan) and have served their purpose in terms of informing this Plan review.
Section 3.5 [Who should pay?]		
<b>33.</b>	<b>Amend</b>	<b>No change required</b>
	The submitter notes that the <i>“Land occupiers with infestations are the principal exacerbators of the problem”</i> , the submitter suggests that this working could be amended to read: <i>“Land occupiers who are not managing infestations on their property are the principal exacerbators of the problem.”</i>	The submitter’s comments are noted.  Officers note that section 3.5 of the Proposal relates to the cost benefit analysis (and not amendments to be incorporated into the operative Plan) and have served their purpose in terms of informing this Plan review. However, officers agree with the views expressed and will be incorporating similar statements into future cost benefit analyses.

## Set of submissions

Submissions on the proposal to amend the Regional Pest Management Plan

### Submission 1 South Taranaki District Council

**Submissions and the identity of submitters are public information and will be published on the Council's website and made available for others to publish.**

I understand

**Name**

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**Do you wish to speak to your submission at a hearing?**

No

**Enter your feedback in the textbox below or upload a file at the bottom of the page.**

The South Taranaki District Council (STDC) thanks the TRC for the opportunity to comment on the partial review of the Pest Management Plan for Taranaki.

We support TRC's focus on bringing mustelids into the Pest Management Plan, as this will have direct impacts on improving indigenous biodiversity outcomes across Taranaki. The approach to identify 'Predator Control Areas' where land occupiers in a locality agree to participate in the programme is a sensible one, and this approach has been shown to be successful with the Possum Self-Help programme.

There is already a large ground-swell of conservation and biodiversity protection work being undertaken by our communities in Taranaki, and this change to the Pest Management Plan will help to augment and support the implementation of that work.

However, it is essential that TRC continue to support and enable landowners to carry out this work, so that best-practice pest-control techniques are carried out as standard across the region

## Submission 2 Te Korowai o Ngāruahine Trust



Dion Luke  
Te Korowai o Ngāruahine Trust  
147 Hight Street, Te Hāwera

27<sup>th</sup> November 2020

Chief Executive  
Taranaki Regional Council  
Private Bag 713  
Stratford 4352

Tēnā koutou e te kaunihera. This submission is made on behalf of Te Korowai o Ngāruahine Trust and supports the proposed amendment to the Pest Management Plan for Taranaki with some additional inclusions.

Te Korowai o Ngāruahine Trust is the post treaty settlement governance entity for the Iwi Ngāruahine. It is the role of the Trust to represent the interests and concerns of Iwi members on social, cultural and environmental issues. On behalf of Te Korowai o Ngāruahine Trust, we would like to support the inclusion of mustelids as a target pest species in the Pest Management Plan for Taranaki. We believe this is a sensible approach which builds upon the regional councils outstanding work on possum control throughout the region and protection of indigenous biodiversity. However, we believe the following issues should be addressed by the proposed amendment.

1. We are concerned that there will be an increased introduction of toxic and ecotoxic substances into the environment particularly in proximity to the statutory areas identified in Schedule 1 of the Ngāruahine Claims Settlement Act 2016 (<http://www.legislation.govt.nz/act/public/2016/0093/latest/whole.html>).
2. We would like to see Ngāruahine Iwi and hapū members participating in current and future pest control and management to supports their role as kaitiaki within the rohe of Ngāruahine.

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[www.ngaruahine.iwi.nz](http://www.ngaruahine.iwi.nz)

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To this end we suggest that the Council accept the proposed amendment with further provisions that:

- there is no increase in the current amount of toxic and ecotoxic substances used to control animal and plant pest species;
- where toxic and ecotoxic substances must be used, there are buffer zones of 200 metres for any waterways or Ngāruahine statutory areas;
- animal and plant pest species controls favour manual, non-chemical methods which involve collaboration with mana whenua and a genuine expression of kaitiakitanga;
- any monitoring or management of aquatic or terrestrial indigenous biodiversity involves collaboration with mana whenua in recognition of the partnership principle of the Treaty of Waitangi.

Thank you for considering our submission, and I look forward to the opportunity to speak to it.

Ngā manaakitanga o te wā



Dion Luke (MPlan, B Env & Soc, UGDipNat Res)  
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### Submission 3 Neil and Lloma Hibell

**Submissions and the identity of submitters are public information and will be published on the Council's website and made available for others to publish.**

I understand

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**Do you wish to speak to your submission at a hearing?**

No

**Enter your feedback in the textbox below or upload a file at the bottom of the page.**

When we joined the scheme we said we would not be prepared to look after the traps as we do not live on the farm and we do not expect our sharemilker to have an extra job added to his contract, We agreed to the scheme because we were told that the Council was employing contractors to monitor the traps. The farmers have had so much extra work ie fencing waterways and planting them and possum control we think the Council is expecting too much of landowners to add more work to their already busy schedule.

Submission 4 Forest and Bird

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**Forest & Bird**  
TE REO O TE TAIAO | *Giving Nature a Voice*

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4 December 2020

**Submission on partial review of the Pest Management Plan for Taranaki**

To: Chief Executive  
Taranaki Regional Council  
Private Bag 713  
Stratford 4352

Submitted online.

From: North & South Taranaki Branch  
Royal Forest and Bird Protection Society (Forest & Bird)  
P.O. Box 631  
Wellington 6011

Attn: Amelia Geary – Regional Conservation Manager  
[a.geary@forestandbird.org.nz](mailto:a.geary@forestandbird.org.nz) or 022 039 9363

**Introduction**

1. Forest & Bird is New Zealand's largest independent conservation organisation. Our mission is to protect New Zealand's unique flora and fauna and its habitat.
2. We congratulate Taranaki Regional Council (TRC) on this partial review of the Regional Pest Management Plan (RPMP) and attempts to bring TRC in line with its vision for predator-free Taranaki. Forest & Bird supports the identification of mustelids as a pest and the application of rules to control mustelids in Taranaki. We, however, suggest this plan review is too narrow in scope and, in accordance with 100D(2)(b) of the Biosecurity Act, cats have been overlooked. Our submission relates to the proposed inclusion of mustelids and our requested inclusion of cats in Taranaki's RPMP.
3. We would like to speak in support of our submission.



## SUBMISSION

### Forest & Bird supports inclusion of a sustained control programme for mustelids.

4. Although habitat loss and modification remains a threat to native biodiversity, a more equally serious threat is from invasive introduced species. Mustelids pose a significant threat to our remaining natural ecosystems, habitats and threatened native species. They can also have considerable negative impact on primary production. Mustelids are implicated in the extinction of some indigenous bird species and as the major cause of decline of many others<sup>1</sup>. Ferrets are also a threat to agriculture, particularly through their role as a vector of bovine tuberculosis<sup>2</sup>.
5. Forest & Bird supports TRC's proposal that mustelids be added to the RPMP in order to:
  - minimise the actual or potential adverse or unintended effects associated with mustelids; and
  - maximise the effectiveness of individual pest management actions for mustelids by way of a regionally coordinated approach.

It is appropriate that the RPMP be amended to declare mustelids to be 'pests' and empower TRC to exercise the relevant advisory, service delivery, regulatory and funding powers available under the Act to deliver mustelid control in defined parts of Taranaki.

6. **Relief sought:** Allow changes to the RPMP to enable a sustained control programme for mustelids. Specifically, the amendment to Section 4 that declares and identifies ferrets, stoats, and weasels as a pest in Table 1 of the RPMP; the new section 6.6A setting out a sustained control programme for mustelids which includes rules for land occupiers within a Predator Control Area to control mustelids; the amended section 9.1 to incorporate mustelid monitoring programmes in the RPMP; and an amended glossary to introduce a definition for a new term in the RPMP – 'Predator Control Area'.

### Forest & Bird seeks the inclusion of a sustained control programme for unowned cats.

7. In light of the Biosecurity Act's direction in s100D regarding reasons for reviews, Forest & Bird suggests the scope of this partial review is too narrow. Section 100D(2) states:

The Minister or council may review the whole or part of a plan if the Minister or council has reason to believe—

  - (a) that the plan or part is failing to achieve its objectives; or
  - (b) that relevant circumstances have changed since the plan or part commenced.
8. Inclusion of mustelids pertains to the recent adoption of the Towards Predator-Free Taranaki programme, a commendable operation which Forest & Bird endorses wholeheartedly. However, as per s100D(2)(b) of the Act, relevant circumstances have changed since the plan commenced regarding the need to control cats in an effort to prevent the spread of toxoplasmosis. The recent review of the Hector's and Māui Dolphin Threat Management Plan identified toxoplasmosis as a serious threat to the dolphins and that there is a need to address this threat.

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<sup>1</sup> King, CM (Ed) 2005. The Handbook of New Zealand Mammals. Oxford University Press.

<sup>2</sup> Byrom, AE, Caley, P, Paterson, BM & Nugent, G, 2015. Feral ferrets (*Mustela furo*) as hosts and sentinels of tuberculosis in New Zealand, New Zealand Veterinary Journal, 63:  
<https://doi.org/10.1080/00480169.2014.981311>



9. Cats are the only known definitive host for *Toxoplasma gondii*, the parasite that causes toxoplasmosis.<sup>3</sup> Toxoplasmosis is spread through cat faeces. A recent review of toxoplasmosis and its implications for wildlife, published this week in the journal *Pacific Conservation Biology*, surmised that the large population of owned and unowned cats, coupled with high rates of *T. gondii* seroprevalence, indicates that there is likely to be substantial loading of *T. gondii* oocysts in the New Zealand environment.<sup>4</sup> Oocysts can remain infective in soil and fresh water for at least one year, and in seawater for up to two years. Contamination of fresh water by cat faeces is the source of entry for *T. gondii* oocysts into the marine environment as rain water and runoff transport the oocysts to the sea through streams, rivers and stormwater drains.<sup>5</sup>
10. Hector's and Māui dolphins' range includes Taranaki coastal waters, which are entirely within the West Coast North Island Marine Mammal Sanctuary.<sup>6</sup> The sanctuary's offshore boundary extends from mean high water springs to the 12 nm territorial sea limit. Recent research has shown that New Zealand river currents, even from small catchments, run up to 100 kilometres out to sea.<sup>7</sup> *Every single catchment in Taranaki drains into the West Coast North Island Marine Mammal Sanctuary.* Toxoplasmosis has been recorded as the primary cause of death in Hector's and Māui dolphins.<sup>8</sup> Taranaki Regional Council has direct responsibility for preventing the spread of toxoplasmosis from the land to the sea, to help prevent the extirpation of these species within its rohe.
11. Domestic cats in New Zealand fall into three categories: 'owned' (pet) and 'unowned' (feral and stray). Forest & Bird considers unowned cats to be any cat which is not microchipped and registered on the New Zealand Companion Animal Register <https://www.animalregister.co.nz/> and is free-living, unsocialised and has limited or no relationship with or dependence on humans. Taranaki has extremely high numbers of unowned cats across the region. They have been described as reaching 'plague proportions' by locals in East Taranaki.<sup>9</sup>
12. Forest & Bird South Taranaki traps cats at Mangamingi as part of its conservation programme to protect kiwi. Our job is to keep the kiwi safe. Cats are by far the biggest threat, far greater than ferrets and stoats. Without the support of surrounding farmers trapping, we would be in a hopeless situation and unable to protect our kiwi population. A local farmer trapped a feral cat recently that weighed 10 kilos. Last year we caught a feral female with 6 kittens. A local lady started intensive cat trapping in 2003 – in that year she caught 170 cats. This year she has caught

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<sup>3</sup> Roberts, JO, Jones, HFE, Roe, WD (2020) The effects of *Toxoplasma gondii* on New Zealand wildlife: implications for conservation and management. *Pacific Conservation Biology*. Published online 1 December 2020. <https://doi.org/10.1071/PC20051>

<sup>4</sup> Roberts, JO, Jones, HFE, Roe, WD (2020) The effects of *Toxoplasma gondii* on New Zealand wildlife: implications for conservation and management. *Pacific Conservation Biology*. Published online 1 December 2020. <https://doi.org/10.1071/PC20051>

<sup>5</sup> Roberts, JO, Jones, HFE, Roe, WD (2020) The effects of *Toxoplasma gondii* on New Zealand wildlife: implications for conservation and management. *Pacific Conservation Biology*. Published online 1 December 2020. <https://doi.org/10.1071/PC20051>

<sup>6</sup> <https://www.doc.govt.nz/globalassets/documents/conservation/marine-and-coastal/marine-protected-areas/mms-westcoast-northisland-map.pdf>

<sup>7</sup> Jhugroo K, O'Callaghan J, Stevens CL, Macdonald HS, Elliott F and Hadfield MG (2020) Spatial structure of low salinity submesoscale features and their interactions with a coastal current. *Front. Mar. Sci.* 7:557360. <https://www.frontiersin.org/articles/10.3389/fmars.2020.557360/full>

<sup>8</sup> Roberts, JO, Webber, DN, Roe, WD, Edwards, CTT, Doonan, IJ (2019). Spatial risk assessment of threats to Hector's and Māui dolphins (*Cephalorhynchus hectori*). New Zealand Aquatic Environment and Biodiversity Report No. 214. <https://www.fisheries.govt.nz/dmsdocument/35007/direct>

<sup>9</sup> <https://www.rnz.co.nz/news/national/311897/feral-cats-reaching-%27plague-proportions%27>



66, and has consistently been between these numbers every year. Rotokare and Forest & Bird have caught 112 so far this year. In past years, we have seldom caught fewer than 50 in a year. Cats are a huge problem in the Mangamingi area. The Mangamingi Saddle, Oru Road, Lake Rotorangi boat ramp and Wingrove Road are popular dump sites for unwanted cats. They just keep coming.

13. The impact of cats on biodiversity is well documented and is greatest on endemic fauna that have evolved in regions free of mammals, such as islands, and in Australia and New Zealand.<sup>10,11</sup> Cats are responsible for 33% of bird, mammal, and reptile extinctions recorded on islands by the International Union for Conservation of Nature.<sup>12</sup> One feral cat killed 102 endangered native short tail bats in a week on the southern slopes of Mt Ruapehu.<sup>13</sup> One domestic cat in Wellington has decimated a breeding colony of banded dotterels for two seasons in a row.<sup>14</sup> It doesn't take much to extrapolate the damage being wrought across Taranaki in the absence of systematic cat control.
14. In addition to effects on threatened species and biodiversity, cats have serious impacts on the agricultural sector. Feral cats are implicated in the spread of bovine tuberculosis, with the potential to infect cattle.<sup>15</sup> The parasites and toxoplasmosis that cats carry cause abortions in sheep and illness in humans. Recent research in Australia demonstrated that diseases transmitted by cats cost the Australian economy more than A\$6 billion annually through their impact on human health and livestock production.<sup>16</sup> While such research is yet to be conducted here, the farming community in New Zealand already incurs significant cost vaccinating ewes against toxoplasmosis in order to prevent lamb loss.<sup>17</sup> With a total New Zealand cat population estimated at between 1.3 and 1.9 million individuals<sup>18</sup> it is clear that if left uncontrolled, cats will be having a similar impact on New Zealand's economy.

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<sup>10</sup> Medina FM, Bonnaud E, Vidal E, Tershy BR, Zavaleta ES, Donlan CJ, Keitt BS, Le Corre M, Horwath SV, Nogales M, 2011. A global review of the impacts of invasive cats on island endangered vertebrates. *Global Change Biology* 17: 3503–3510, <https://doi.org/10.1111/j.1365-2486.2011.02464.x>

<sup>11</sup> Doherty TS, Dickman CR, Johnson CN, Legge SM, Richie EG, Woinarski JCZ, 2017. Impacts and management of feral cats *Felis catus* in Australia. *Mammal Review* 47: 83–97, <https://doi.org/10.1111/mam.12080>

<sup>12</sup> Pyšek P, Blackburn TM, García-Berthou E, Perglová I, Rabitsch W, 2017. Displacement and local extinction of native and endemic species, Pages 157–175 in Vilá M, Hulme PE eds. *Impacts of Biological Invasions on Ecosystem Services*. Springer.

<sup>13</sup> <https://www.doc.govt.nz/news/media-releases/2010/cat-nabbed-raiding-the-mothership/>

<sup>14</sup> <https://www.stuff.co.nz/environment/118927562/prowling-cat-decimates-banded-dotterel-colony-for-second-breeding-season>

<sup>15</sup> Coleman JD, Cooke MM, 2001. *Mycobacterium bovis* infection in wildlife in New Zealand. *Tuberculosis*. 81: 3, pp 191-202. <https://doi.org/10.1054/tube.2001.0291>

<sup>16</sup> Legge S, Taggart PL, Dickman CR, Read JL, Woinarski JCZ. (2020). Cat-dependent diseases cost Australia AU\$6 billion per year through impacts on human health and livestock production. *Wildlife Research* 47, 731-746. <https://doi.org/10.1071/WR20089>

<sup>17</sup> Tompkins, D.M. 2014. Potential of Feral Cat Control to Reduce the Incidence of Toxoplasmosis on Sheep Farms. Report Addendum. Landcare Research. Report prepared for Hawkes Bay Regional Council.

<sup>18</sup> Roberts, JO, Jones, HFE, Roe, WD (2020) The effects of *Toxoplasma gondii* on New Zealand wildlife: implications for conservation and management. *Pacific Conservation Biology*. Published online 1 December 2020. <https://doi.org/10.1071/PC20051>

15. **Relief sought:** further amend the RPMP to include a sustained control programme for unowned cats *across the entire Taranaki region*, with site-led control focussing on catchments that present particular risk to Māui dolphin. Specifically:

- amend Section 4 to declares and identify unowned cats as a pest in Table 1 of the RPMP;
- include a new section setting out a sustained control programme for cats which includes rules for land occupiers within a Predator Control Area to control cats;
- include a new section identifying high risk catchments for Māui dolphin as a priority for site-led cat control; and
- amend section 9.1 to incorporate a cat monitoring programmes in the RPMP;

**Submission ends.**

## Submission 5 Anne Collins

**Submissions and the identity of submitters are public information and will be published on the Council's website and made available for others to publish.**

I understand

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**Do you wish to speak to your submission at a hearing?**

No

**Enter your feedback in the textbox below or upload a file at the bottom of the page.**

**Submission on partial review of the Pest Management Plan for Taranaki Anne Collins**

1. I support the Taranaki Regional Council (TRC), in it's proposal to include mustelids into its pest management rule book, the Regional Pest Management Plan for Taranaki.  
I urge the Council to include the control of feral cats in this plan. This makes sense because if we are to be serious about protecting our native fauna by removing predators, then the inclusion of cats as apex predators is required.
2. All cats are natural hunters including domestic cats. Domestic cats are important as much loved companion animals, and are hugely popular. My submission does not seek to remove these. Feral cats have a major impact on native birds, insects, bats, lizards and insects such as weta. Cats are capable of travelling long distances including one tracked to cover almost 6 Km, as has been documented.  
<https://www.doc.govt.nz/nature/pests-and-threats/animal-pests/feral-cats/>  
<https://www.nzherald.co.nz/lifestyle/cat-tracking-study-an-eye-opener-for-owners/2Y53ECMIPCUQMPNU5V2ZZ4XEAM/>
3. Cats are known carriers and transmitters of infectious diseases. These include Bovine TB, and importantly for our native animals, Toxoplasmosis gondii (T. gondii). Kittens and unwell cats are the worst spreaders of this disease by T. gondii oocysts (eggs) in their faeces. Other animals become infected by ingesting these. The eggs enter the waterways and eventually reach the sea where they can infect our marine mammals. In particular, Maui and Hector's dolphins are at risk.
4. Responsible cat ownership is the aim of every conservation organisation, but this is definitely a wish list. Currently, New Plymouth District Council has a limit of five cats per household, Whanganui has three. South Taranaki District Council and Stratford District Council have no

limits on the number of cats that may be kept. This encourages careless breeding, no micro chipping and the subsequent dumping of unwanted cats and kittens. Those that survive further contribute to the feral cat population.

“While possums are the priority for Predator Free Hawke's Bay's efforts on the Mahia Peninsula, feral cats will also be in their sights along with stoats and rats.”

“Really it's about responsible cat ownership - making sure they are de-sexed if they are not going to be bred from, and micro-chipping.

In February this year a new bylaw was introduced in Wellington requiring all domestic cats over the age of 12 weeks to be microchipped and registered with the NZ Companion Animal Register.”

<https://www.nzherald.co.nz/hawkes-bay-today/news/feral-and-stray-cat-control-a-complex-issue/IF2FKFJZZGHWA5OAUXCXRGPBIE/>

## Submission 6 Federated farmers

To: **Taranaki Regional Council**

Submission on: **Partial Review of the Regional Pest Management Plan for Taranaki**

Date: 4 December 2020

Submission by: Federated Farmers Taranaki

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### 1. General comments

We appreciate the opportunity to submit on Taranaki Regional Council's Partial Review of the Pest Management Plan. This submission is representative of member views and their first-hand experience with pest management. The publication of the proposed changes recognises that much of the good work done around pest management happens outside of a regulatory environment and that this is often the most appropriate form of management. Federated Farmers (FFNZ) has long been an advocate for robust cost benefit analysis as the foundation for good decision making, both at local and central government levels. It is therefore good to see a detailed cost benefit analysis of the proposed changes.

As the proposed control of mustelids will largely happen on farming properties, we encourage Council to consider some of the practical issues for farmers.

Farms are often subject to lease or contract milking or share-milking arrangements that complicate the question of who is responsible or available for maintaining and servicing traps. We would like Council to provide formal guidance on this to ensure there is no 'grey area' for farmers who may wish to control predators but are unsure of their responsibilities.

Dairy farming is a seasonally intensive activity requiring a heavy workload in the calving and mating periods (usually June through to the end of November). During this period trap servicing is unlikely to be carried out on many properties and the servicing requirements of any proposed rule should reflect this.

While acknowledging the need for a rule to formalise predator control efforts on a landholder basis, FFNZ would like to see an on-going emphasis on catchment level programs. We encourage Council to continue supporting various funding mechanisms of pest control at either a catchment level and/or individual farm level, such as the KNE programme. In addition, we



would encourage Council to support on-going discussion with community groups e.g. Wild for Taranaki, regarding the use of community volunteers to check trap lines in catchments or on individual properties. We envisage that some large farming properties will have significant numbers of traps and owner or farm staff capacity to keep these regularly checked will be challenging.

FFNZ would like to engage further with Council on this as part of this review.

## **2. Summary**

- FFNZ encourages Council to be mindful of practical farming issues
- FFNZ supports the inclusion of mustelids in section 4 as organisms declared as pests
- FFNZ agrees with the objective set out in section 6A
- Retain the proposed performance measures for pest management in the Taranaki Region
- Amend or delete and replace proposed rule 3
- FFNZ supports Council's approach to the good neighbour rule in the initiation phase of towards Predator Free Taranaki ('the program') but would like to see the good neighbour rule implemented as the programme becomes more popular

## **3. Specific Comments**

### **3.1 Inclusion of Mustelids as Pests**

We support the inclusion of mustelids in section 4 as organisms declared as pests and the identification of ferrets, stoats, and weasels as pests in Table 1. Mustelids can have a negative impact on primary production as they carry parasites and toxoplasmosis, which can cause illness in humans and livestock. Ferrets are also a vector (carrier) of bovine tuberculosis.

### **3.2 Objective**

Federated Farmers agrees broadly with the objective set out in 6A. That is - we agree with the objective of sustainably controlling mustelid numbers within a specified Predator Control Area, and elsewhere to avoid or minimise adverse effects on indigenous biodiversity values in the Taranaki region. FFNZ also offer our on-going support to Council's extension program as the principle method by which Council will achieve this objective. Council's self-help Possum control program was established in 1992 and was extended to include mustelids in 2018. The programme requires Council take a lead on predator control where 75% of land occupiers, covering at least 75% of the land area targeted indicate or have indicated, that they wish to be included in the program. FFNZ acknowledge the success of this program in controlling possums and expect it will be as effective in controlling mustelids. The inclusion of a rule in the RPMP to deal with mustelids is intended to encourage the participation of the few landowners that refuse to undertake predator control ('exacerbators' as defined by Council). Given predator control areas are only established when most of the community agree to work with Council in order to control mustelids, we agree there must be a legal failsafe to ensure these efforts are not in vain. FFNZ are supportive of the logic behind the inclusion of the proposed Plan rule 3, but caution that its effectiveness will depend on its enforceability and on-going monitoring.

### 3.3 Measuring what the Objective is Achieving

Proposed measures:

(ba) annually mapping the implementation of the Towards Predator Free Taranaki programme, including establishment of Predator Control Areas;

(bb) monitoring mustelid population densities and trends, over time, in areas included in the Predator Control Areas;

FFNZ support the establishment and mapping of Predator Control Areas and robust modelling of mustelid population densities and trends over time to determine the effectiveness of the program.

### 3.4 Proposed Plan Rule 3: General Rule for Predator Control Areas

A land occupier within a Predator Control Area must maintain ferrets, stoats, and weasels numbers present on their land by:

(a) servicing permanent mustelid traps a minimum of ten times per calendar year and record trap catch information in the TrapNZ database; and

(b) servicing any activated 'remote sensor mustelid trap' within 30 days of activation.

Note:

'Servicing' means the removal of dead animals, inspection of trap to make sure it is functioning properly, grass/obstacles removed from around the trap entrance and trap rebaited with fresh bait.

'Remote sensor mustelid traps' refers to kill traps fitted with remote sensor technology capable of sending trap catch information to the user wirelessly.

### 3.5 Reason for submission on Proposed Rule 3

The effectiveness of the rule will be based on Council's ability a) to enforce it, and b) to monitor its impact. In the view of FFNZ an effective predator control rule will focus on outcomes rather than process. We note that the general rule in support of the self-help possum control program (6.6.3.1) requires landowners to maintain possum numbers present on their land to below a 10% residual trap catch. This allows the landowner to focus on the objective without enforcing a potentially onerous servicing requirement. We also understand that mustelid populations are difficult to track and establishing a residual catch number may be impractical in the short term. As mustelid population densities and trends become clearer over time, we would like to see the inclusion of a residual trap catch requirement (or similar) in the mustelid rule so the focus shifts from how often farmers service their traps to an agreed outcome. From a practical standpoint landowner are more likely to integrate mustelid trap servicing with routine possum trap/bait station servicing, with this in mind FFNZ would (in time) like the mustelid control rule more closely aligned to the possum control rule.

Our concern with the rule as drafted is that the requirement to service traps 10 times per calendar year may needlessly place an additional burden on farmers that are already putting in good work through the possum control program and thus create some pushback from farmers. Additionally, the seasonal intensity of dairy farming is likely to make the requirement to service traps a minimum of 10 times per calendar year impractical due to busy periods like calving and mating. FFNZ asks that the proposed rule is amended to reduce or omit the prescriptive trap servicing requirement. Farmers will be more likely to embrace and sustain their participation in the program if they have ownership over servicing requirements and can make the logistics of pest control work for their own property and their farming business. For ease of reading our suggested amendments are shown with ~~strikeout~~ for deletions and underlining for additional wording.



### 3.6 Relief Sought

**Amend Rule 3 as below:**

*A land occupier within a Predator Control Area must maintain ferrets, stoats, and weasels numbers present on their land by:*

- (a) servicing permanent mustelid traps a minimum of ~~ten~~ eight times per calendar year and record trap catch information in the TrapNZ database; and*
- (b) servicing any activated 'remote sensor mustelid trap' within 30 days of activation.*

**Note:**

*'Servicing' means the removal of dead animals, inspection of trap to make sure it is functioning properly, grass/obstacles removed from around the trap entrance and trap rebaited with fresh bait.*

**Or**

**Delete proposed rule 3 and with new rule as below:**

*A land occupier within a Predator Control Area must control mustelids present on their land by regularly servicing permanent mustelid traps and recording trap catch information as practicable in accordance with Council advice."*

### 3.7 Good Neighbour Rule

Federated Farmers understands the reasoning in council's cost benefit analysis and their obligations for considering a good neighbour rule under the Biosecurity Act 1993 and the National Policy Direction on Pest Management 2015. That is not to say we favour exclusion of the good neighbour rule from Mustelid control but would like further information on its viability. We appreciate Council's view that the 200ha dispersal range of Mustelids would necessitate a 2km buffer and have the potential to impose significant costs on landowners that are not within a predator control area.

Notwithstanding this FFNZ views the good neighbour rule as a key step to addressing the ongoing issue of Crown land being non-rateable and not required to directly contribute to regional pest management. While we acknowledge that DoC does undertake significant pest management in the region, e.g. the Mounga project, we consider the good neighbour rule is often necessary as it is accepted that pest management generally is not effective unless all landowners (including Crown) consistently manage the spread of pests. Council's own analysis of "who should pay?" in section 3.5 of the partial review document lists the Department of Conservation as a "major" beneficiary of the proposed predator control while private landowners, including dairy, sheep and beef farmers are listed only as "minor" beneficiaries. FFNZ considers the rationale behind inclusion of a rule to ensure landowners play their part to be reasonable. Likewise, we expect such a rule should apply to Crown and Conservation land. The negotiated understanding around potential boundary pests between the Regional Council and Crown agencies are of little comfort to our members as they have no means to enforce it and requires the Regional Council to be pro-active, incur costs and navigate a political minefield with the crown agencies it needs to co-operate with.

Given the general predator control rule is only applied to Predator Control Areas and as Predator Free Taranaki is still being initiated Federated Farmers understands why Council is not seeking to impose a good neighbour rule at present. As Predator Free Taranaki is rolled out and it's uptake grows throughout the region Federated Farmers would like Council to re-consider the imposition of a good neighbour rule to ensure Crown agencies participant in the programme to the same extent as land owners.



**4. Federated Farmers thanks the Taranaki Regional Council for considering our feedback.**

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*About Federated Farmers*

Federated Farmers is a not-for-profit primary sector policy and advocacy organisation that represents the majority of farming businesses in New Zealand. Federated Farmers has a long and proud history of representing the interests of New Zealand's farmers.

The Federation aims to add value to its members' farming businesses. Our key strategic outcomes include the need for New Zealand to provide an economic and social environment within which:

- Our members may operate their business in a fair and flexible commercial environment;
- Our members' families and their staff have access to services essential to the needs of the rural community; and
- Our members adopt responsible management and environmental practices.

-end-

Submission 7 Te Kotahitanga o Te Atiawa



23 December 2020

Taranaki Regional Council  
Private Bag 713  
Stratford 4352

By email: [chris.spurdle@trc.govt.nz](mailto:chris.spurdle@trc.govt.nz)  
[info@trc.govt.nz](mailto:info@trc.govt.nz)

Attention: Steve Ruru

Tēnā koe Steve

**SUBMISSION BY NGĀ HAPŪ O TE ATIAWA AND TE KOTAHITANGA O TE ATIAWA TRUST TO THE REGIONAL PEST MANAGEMENT PLAN FOR TARANAKI PARTIAL REVIEW**

1. On behalf of ngā hapū o Te Atiawa and Te Kotahitanga o Te Atiawa Trust (Te Kotahitanga), we appreciate the opportunity to provide a submission to the Taranaki Regional Council's partial review of the Regional Pest Management Plan for Taranaki (RPMP).
2. Te Atiawa Iwi are tangata whenua over the lands, waters, sites, taonga species, wāhi tapu/wāhi taonga, urupā, sites and areas of significance to Māori and other taonga within our Te Atiawa rohe. The Te Atiawa rohe extends from Te Rau o Te Huia along the coast to the Herekawe Stream, inland to Tahuna-a-Tūtawa, east to Whakangerengere, northeast to Taramoukou, north back to Te Rau o Te Huia and offshore out to 200 nautical miles. The Te Atiawa Iwi rohe falls wholly within the jurisdiction of the Taranaki Regional Council.
3. Te Atiawa has strong historical, cultural, traditional and spiritual connections within this rohe, our environment is a part of who we are. In return, we as kaitiaki, have the inherent responsibility of ensuring the mauri of these environmental and cultural resources is protected and enhanced for future generations.
4. Today our Te Atiawa hapū from north to south of the rohe are:
  - Ngāti Rahiri
  - Otaraua
  - Manukorihi
  - Pukerangiōra
  - Puketapu
  - Ngāti Tawhirikura
  - Ngāti Tuparikino

- Ngāti Te Whiti.
5. Te Kotahitanga is the mandated voice and representative entity for the collective interests of Te Atiawa Iwi. Te Kotahitanga was established on 31 March 2014 as the post-settlement governance entity by a Deed of Trust. Following this the Te Atiawa Deed of Settlement was signed on 9 August 2014 and the Te Atiawa Claims Settlement Act (2016) enacted on 5 December 2016. Te Kotahitanga has a responsibility to ensure that the interests of Te Atiawa are safe-guarded. This includes considering the extent to which proposed policy may impact on the historical, traditional, cultural and spiritual interests of Te Atiawa within its rohe and under the Te Atiawa Claims Settlement Act 2016.
  6. Te Atiawa has rights and interests including, but not limited to:
    - Rights and interests arising under the Te Atiawa Claims Settlement Act (2016);
    - Rights and interests arising under the Te Atiawa Iwi Environmental Management Plan – *Tai Whenua, Tai Tangata, Tai Ao*; and
    - Rights and interests
      - according to tikanga and customary law;
      - arising from the common law (including the common law relating to aboriginal title and customary law); and
      - under Te Tiriti o Waitangi and its principles.
  7. Te Atiawa seek to ensure that these rights and interests are recognised in proposed policy and there is alignment with the outcomes of Te Atiawa's key iwi documents:
    - a. Te Atiawa Iwi Claims Settlement Act 2016;
    - b. Te Atiawa Deed of Settlement; and
    - c. *Tai Whenua, Tai Tangata, Tai Ao*.
  8. *Tai Whenua, Tai Tangata, Tai Ao* sets the position of Te Atiawa Iwi on resource management matters. It is an expression of rangatiratanga and kaitiakitanga from ngā uri o Te Atiawa over the environmental and cultural resources within our Te Atiawa rohe.
  9. The Taranaki Regional Council (TRC) has undertaken a partial review of the Regional Pest Management Plan for Taranaki (RPMP) by way of amending it to identify and declare mustelids as a pest species and incorporate an additional programme relating to the sustained control of mustelids. The proposed amendments to the RPMP include the introduction of a sustained control programme for mustelids and the introduction of a definition for a new term, 'Predator Control Area'.
  10. Mustelids and other pests predate on native biodiversity, especially taonga species. The loss of native biodiversity and taonga species is identified under Issue TTTT2 of the Te Atiawa iwi environmental management plan *Tai Whenua, Tai Tangata, Tai Ao* because of the effects these introduced species can have on Te Atiawa values and the health of our whenua, wai and tangata.



11. Trapping mustelids as mentioned in the Proposal<sup>1</sup> can minimise the number of pests, having a positive effect on the overall numbers of taonga species ultimately returning mauri to the whenua, wai and tangata. Issue TTTT4 of *Tai Whenua, Tai Tangata, Tai Ao* states '*The introduction of weeds and pests can generate adverse effects on the survival of our native biodiversity*'.
12. As previously mentioned, the addition of mustelids as a pest to the RPMP aligns with the provisions of *Tai Whenua, Tai Tangata, Tai Ao*, specifically in the Te Tai Tāne Tokorangi (TTTT) chapter of the Plan (Attachment 1). This section outlines the protection and restoration of native biodiversity encouraging weed and pest management.
13. Notwithstanding our general support for the proposed amendments to the RPMP, we trust the Taranaki Regional Council have considered the consequential effects mustelid management and control will have on rabbit populations given rabbits are the main diets of ferrets<sup>2</sup>. Clarification is sought in this regard.
14. Further to the above, clarification is sought as to why the partial review is limited to mustelids only. The Taranaki Regional Council Biosecurity Strategy 2018-2038 in addition to possums and mustelids, identifies rabbits, goats, feral cats and rats as pest animals threatening Taranaki biodiversity as well.
15. Section 2.4 of the RPMP for Taranaki states '*..the Taranaki Regional Council, seek to provide for the protection of the relationship between Māori as tangata whenua and their ancestral lands, their waters, sites, wāhi tapu, and taonga and for the protection of those aspects from the adverse effects of pests, through the Plan*'. It is noted that section 72 of the Biosecurity Act 1993 requires consultation with tangata whenua (section 72(1)(c)). Pre-notification consultation with iwi authorities involved one email being sent from the Taranaki Regional Council to those iwi authorities<sup>3</sup>, noting no feedback was received (page 2 of the Proposal<sup>4</sup>).
16. Further to the above section 2.4 of the RPMP for Taranaki goes on to state '*Māori involvement in biosecurity is an important part of exercising kaitiakitanga over their mana whenua.. The Local Government Act (LGA) requires the Taranaki Regional Council to recognise and respect the Crown's responsibilities under the Tiriti o Waitangi – Treaty of Waitangi. It also requires councils to maintain and improve opportunities for Māori to contribute to decision-making processes. This includes considering ways to help Māori to contribute. These*

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<sup>1</sup> Taranaki Regional Council (2020). *Proposal for inclusion of Mustelids, Regional Pest Management Plan for Taranaki*.

<sup>2</sup> Department of Conservation (2020). *Ferrets*, accessed 10 December 2020, <<https://www.doc.govt.nz/nature/pests-and-threats/animal-pests/ferrets/>>

<sup>3</sup> See Attachment 2

<sup>4</sup> Taranaki Regional Council (2020). *Proposal for inclusion of Mustelids, Regional Pest Management Plan for Taranaki*.

*responsibilities and requirements were met while preparing this Plan and will continue after it takes effect.*

17. Only tangata whenua have the expertise to advise on the acceptability of effects on themselves and their cultural, natural and physical resources. Pest management and control is important to protecting our taonga species; however, restricting the participation of tangata whenua to submitting on the partial review of the RPMP for Taranaki does not constitute kaitiakitanga. It is concerning that the Taranaki Regional Council continue to maintain that sending one email is sufficient, effective and meaningful consultation. One email does not maintain and improve opportunities for ngā hapū o Te Atiawa and Te Kotahitanga o Te Atiawa to contribute to this decision-making process.
18. Section 9.4 of the RPMP for Taranaki states '*The provisions of this Plan do not replace other legislation or regulations relating to the use of toxins, impacts on Māori culture and traditions, and public health and safety*'. Clarification is sought as to how the results of pest management and control and the impacts on Māori culture and traditions are monitored, in addition to the effectiveness of the RPMP in this regard; noting only tangata whenua have the expertise to advise on these impacts.
19. Though ngā hapū o Te Atiawa and Te Kotahitanga o Te Atiawa are generally supportive of the proposed amendments, we seek clarification to the points above.
20. Ngā hapū o Te Atiawa and Te Kotahitanga o Te Atiawa wish to be heard in support of this submission.
21. If you have any questions, please contact the undersigned at the following:  
Postal address: PO Box 1097, Taranaki Mail Centre, New Plymouth 4340  
Email address: [sarah@teatiawa.iwi.nz](mailto:sarah@teatiawa.iwi.nz)  
Phone number: (06) 758 4685

Nāku me ngā mihi  
Ngā hapū o Te Atiawa and Te Kotahitanga o Te Atiawa Trust

*p.p. S. Mako*

Liana Poutu  
Te Kotahitanga o Te Atiawa Pouwhakarae/ Chairperson



**Attachment 1: 6.6 Te Tai Tāne Tokorangi chapter, *Tai Whenua, Tai Tangata, Tai Ao***

**6.6 TE TAI O TĀNE TOKORANGI - FLORA AND FAUNA**

Tokorangi is the act of propping up the sky. Tāne Mahuta, the son of Ranginui and Papatūānuku, broke the embrace of his parents by lifting the sky and giving rise to many children each becoming the ātua of respective domains of the environment. Tāne became the ātua of the forests and birds.

Prior to European settlement, Taranaki was covered in dense native forest, shrubland and small wetland areas which held an abundance of native fauna. However, due to Taranaki's low-lying terrain much of the land was cleared for settlement. Today, remnants of native forest remain scattered around the region, with the largest concentration confined to Taranaki Maunga. The protection and enhancement of native biodiversity and mahinga kai underpins many matters which we as kaitiaki seek to address.

This section addresses matters in our Te Atiawa rohe relating to Tokorangi and covers issues such mahinga kai, native biodiversity, restoration of native species, and weed and pest management. This section should be read in conjunction with Section 6.1.

**WHAKARĀPOTO NGĀ TAKE - SUMMARY OF ISSUES**

The Te Tai o Tāne Tokorangi issues within the rohe of Te Atiawa are summarised below:

TE TAI O TĀNE TOKORANGI	
<b>Ngā Take - Issues</b>	
<b>Issue Te Tai o Tāne Tokorangi (TTTT)1:</b> Mahinga kai	The loss of mahinga kai areas and species as a result of habitat loss, discharges, abstractions, diversion of waterways, barriers to fish passage and introduction of exotic species is impacting on Te Atiawa values, and our health and wellbeing.
<b>Issue TTTT2:</b> Native biodiversity	The loss of native biodiversity and taonga species is affecting Te Atiawa values and the health of our land, water and people.
<b>Issue TTTT3:</b> Restoration of native biodiversity	Due to the loss of native biodiversity there is a need for species restoration initiatives.
<b>Issue TTTT4:</b> Weed and pest management	The introduction of weeds and pest can generate adverse effects on the survival of our native biodiversity.
<b>Issue TTTT5:</b> Pest management with toxins	There are concerns about the use of toxins as a method of pest control, and the impacts it can generate on our ancestral lands, waters and species.

**NGĀ PAETAĒ - GENERAL OBJECTIVES**

**Gen. Ob. Te Tai o Tāne Tokorangi (TTTT)1.1**  
Protect and enhance indigenous biodiversity and taonga species within our Te Atiawa rohe.

**Gen. Ob. TTTT1.2**  
Acknowledge and provide opportunities for practical exercise of kaitiakitanga by Te Atiawa.

for the relationship of Te Atiawa with indigenous biodiversity and taonga species with particular regard to customary use in management and decision making.

**Gen. Pol. TTTT1.2**  
Require that central government agencies and regional and district councils recognise that only Te Atiawa can identify the impact of activities on our relationship with indigenous biodiversity and taonga species within our Te Atiawa rohe.

**NGĀ KAUPAPA - GENERAL POLICIES**

**Gen. Pol. Tāne Mahuta (TTTT)1.1**  
Require that central government agencies and regional and district councils recognise and provide

**Gen. Pol. TTTT1.3**  
Require that central government agencies and regional and district councils engage with Te Kotahitanga and Ngā Hapū o Te Atiawa as affected

parties on any application made under the Resource Management Act 1991 and Conservation Act 1987 which affect indigenous biodiversity and taonga species.

**Gen. Pol. TTTT1.4**

Require that central government agencies and regional and district councils take into consideration the incremental and cumulative effects of activities such as discharges, abstractions, diversion of waterways, barriers to fish passage and introducing exotic species on mahinga kai when developing planning documents, and assessing resource consents.

**Gen. Pol. TTTT1.5**

Support Te Atiawa in the development and use of mātauranga Māori monitoring techniques of indigenous biodiversity and taonga species within our Te Atiawa rohe.

**MAHINGA KAI**

**Te Take - Issue**

**Issue TTTT1:** The loss of mahinga kai areas and species as a result of habitat loss, discharges, abstractions, diversion of waterways, barriers to fish passage and introduction of exotic species is impacting on Te Atiawa values, and our health and wellbeing.

The objectives and policies to address this issue within the rohe of Te Atiawa are:

**Ngā Paetae - Objectives**

**Ob. TTTT1.1**

Improving the health of our waters, freshwater, coastal and marine, will support mahinga kai, and the health and wellbeing of our people.

**Ngā Kaupapa - Policies**

**Pol. TTTT1.1**

Require restoration of mahinga kai areas and species, and preserve the tikanga associated with these resources, by:

- a) integrating mahinga kai objectives into planning documents;
- b) developing and implementing restoration projects;
- c) conducting wānanga to teach our future kaitiaki about our mahinga kai traditions; and

d) identify and support options for restoring populations of mahinga kai species.

**Pol. TTTT1.2**

Require that central government agencies and regional and district councils plans include provisions to protect, enhance and extend existing mahinga kai habitats such as reef structures, estuaries, remnant wetlands, waipuna, riparian margins and native forest.

**Pol. TTTT1.3**

Encourage that landowners protect remnant areas of indigenous biodiversity to connect species and habitats.

**NATIVE BIODIVERSITY**

**Te Take - Issue**

**Issue TTTT2:** The loss of native biodiversity and taonga species is affecting Te Atiawa values and the health of our land, water and people.

The objectives and policies to address this issue within the rohe of Te Atiawa are:

**Ngā Paetae - Objectives**

**Ob. TTTT2.1**

Support General Objectives which provide for Te Tai o Tāne Tokorangi, Te Tai Awhi-Nuku, Te Tai o Maru and Te Tai o Tangaroa.

**Ngā Kaupapa - Policies**

**Pol. TTTT2.1**

Require acknowledgement of Te Tiriti o Waitangi as the basis for the relationship between the regional and district councils all other relevant authorities and Te Atiawa with regard to managing native biodiversity.

**Pol. TTTT2.2**

Require the Department of Conservation, regional and district councils and all other relevant authorities, work with Te Atiawa to protect, enhance and restore native biodiversity.

**Pol. TTTT2.3**

Require that the intellectual property rights of indigenous biodiversity remains in the possession of Te Atiawa.

**Pol. TTTT2.4**

Require the Department of Conservation, regional and district councils and other relevant authorities recognise and provide for Te Atiawa cultural values when identifying areas with significant indigenous biodiversity value.

**Pol. TTTT2.5**

Promote the principle of Ki Uta Ki Tai (from mountain to sea) as a culturally appropriate approach to establishing corridors of native biodiversity in the region.

**RESTORATION OF NATIVE BIODIVERSITY**

**Te Take** - Issue

**Issue TTTT3:** Due to the loss of native biodiversity there is a need for species restoration initiatives.

The objectives and policies to address this issue within the rohe of Te Atiawa are:

**Ngā Paetae** - Objectives

**Ob. TTTT3.1**

Protect and enhance natural landscapes and native species and therefore enhance the mauri of the land and these species.

**Ngā Kaupapa** - Policies

**Pol. TTTT3.1**

Require the Department of Conservation and the regional council to take into account Te Atiawa mahinga kai objectives when planning restoration projects.

**Pol. TTTT3.2**

Require that when planning restoration projects the flora and fauna is appropriate to that area.

Practise note: It is anticipated that the implementation of this policy will require techniques such as ecosourcing.

**Pol. TTTT3.3**

Require recognition of Te Atiawa's cultural, spiritual and traditional association with native species when planning restoration projects.

**Pol. TTTT3.4**

Require engagement with Te Atiawa when planning native bird restorations projects to translocate and release species in our Te Atiawa rohe or transfer species from our Te Atiawa rohe to other rohe.

**WEED AND PEST MANAGEMENT**

**Te Take** - Issue

**Issue TTTT4:** The introduction of weeds and pest can generate adverse effects on the survival of our native biodiversity.

The objectives and policies to address this issue within the rohe of Te Atiawa are:

**Ngā Paetae** - Objectives

**Ob. TTTT4.1**

Eradicate introduced weeds and pests that are causing adverse effects to protect and enhance our native biodiversity whilst avoiding adverse effects on the environment and species.

**Ngā Kaupapa** - Policies

**Pol. TTTT4.1**

Require the protection, maintenance and restoration of indigenous species as a key focus of weed and pest management.

**Pol. TTTT4.2**

Require the use of natural solutions including trapping possums; establishment of riparian margins for shading aquatic weed) over the use of hazardous substances, where feasible.

**Pol. TTTT4.3**

Require timing and techniques that avoid or reduce the impact of pest control operations on indigenous biodiversity and other cultural values.

**Pol. TTTT4.4**

Require that central government agencies and regional and district councils weed management programmes avoid effects on indigenous biodiversity, and wāhi tapu/wāhi taonga, urupā and sites of significance to Māori. This may include but is not limited to:

- a) avoiding areas identified by Te Atiawa and utilising alternative methods in these areas; and
- b) timing operations in accordance with Te Atiawa



advice.

### **PEST CONTROL WITH TOXINS**

#### **Te Take** - Issue

**Issue TTTT5:** There are concerns about the use of toxins as a method of pest control, and the impacts it can generate on our ancestral lands, waters and species.

The objectives and policies to address this issue within the rohe of Te Atiawa are:

#### **Ngā Paetae** - Objectives

##### **Ob. TTTT5.1**

Support General Objectives which provide for Te Tai o Tāne Tokorangi, Te Tai Awhi-Nuku, Te Tai o Maru and Te Tai o Tangaroa.

#### **Ngā Kaupapa** - Policies

##### **Pol. TTTT5.1**

Te Atiawa may support the use of toxins if the following can be determined:

- a) the timing and design of operations reflect local conditions;
- b) toxins will be used in conjunction with other methods such as shooting or trapping, to maximise success;
- c) non target impacts are identified, including those identified by Te Atiawa;
- d) Te Atiawa are engaged early and are involved in setting priorities and designing operations, including monitoring; and
- e) there is an actual environmental or cultural benefit for the use of toxins.

##### **Pol. TTTT5.2**

Support an investigation into the effects of and alternatives to using toxins.

##### **Pol. TTTT5.3**

Avoid the use of toxins in areas which could be managed by shooting or trapping pests.

##### **Pol. TTTT5.4**

Encourage the use of incentives for people to trap or shoot pests in accessible areas.

## Attachment 2: Email from Taranaki Regional Council to iwi authorities

**From:** Joe Mack  
**Sent:** Tuesday, 8 September 2020 4:40 PM  
**To:** 'paulsilich2@gmail.com' <paulsilich2@gmail.com>; 'office@ngatimutunga.iwi.nz' <office@ngatimutunga.iwi.nz>; 'tari@teatiawa.iwi.nz' <tari@teatiawa.iwi.nz>; 'holden.hohaia@xtra.co.nz' <holden.hohaia@xtra.co.nz>; 'whare@taranaki.iwi.nz' <whare@taranaki.iwi.nz>; 'info@ngaruahine.iwi.nz' <info@ngaruahine.iwi.nz>; Haimona Maruera (haimona.maruera@ruanui.co.nz) <haimona.maruera@ruanui.co.nz>; 'tumu.whakarae@rauru.iwi.nz' <tumu.whakarae@rauru.iwi.nz>; 'bella@maniapoto.co.nz' <bella@maniapoto.co.nz>  
**Cc:** Steve Ellis <Steve.Ellis@trc.govt.nz>; Chris Spurdle <chris.spurdle@trc.govt.nz>; Sam Tamarapa <Sam.Tamarapa@trc.govt.nz>  
**Subject:** To the Chief Executive: Mustelid rule discussion - Pest Management Plan for Taranaki

Tēnā kouto

Following approval by Taranaki Regional Council to commence a partial review of the Pest Management Plan for Taranaki, officers are seeking your views on the merits or otherwise of including mustelids (stoats, ferrets, weasels) in the Plan and having a rule requiring land occupiers to control them. This feedback will inform the preparation of a proposal prior to public notification and a formal submission process.

We have drafted the attached document for your information and to aid early discussion, Please feel free to contact our Policy Manager Chris Spurdle [chris.spurdle@trc.govt.nz](mailto:chris.spurdle@trc.govt.nz) with any questions or comments at your convenience.

Nāku noa nā

**Steve Ellis**

Environment Services Manager

### Taranaki Regional Council

47 Cloten Road | Private Bag 713 | Stratford 4352, New Zealand

M 027 471 3741 | P 06 765 7127 | F 06 765 5097 | [www.trc.govt.nz](http://www.trc.govt.nz)   

Working with people | caring for Taranaki



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forward**

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## Submission 8 New Plymouth District Council



When replying please quote: 8437756

10 December 2020

The Chief Executive  
Taranaki Regional Council  
Private Bag 713  
STRATFORD

Dear Sir

### **PROPOSAL FOR INCLUSION OF MUSTELIDS IN THE REGIONAL PEST MANAGEMENT PLAN FOR TARANAKI**

New Plymouth District Council (NPDC) thanks the Taranaki Regional Council (TRC) for the opportunity to submit on the proposal to declare mustelids to be pests in the Taranaki region and to amend the Regional Pest Management Plan for Taranaki (RPMP) accordingly.

NPDC supports the proposal to incorporate a sustained control management programme for ferrets, stoats, and weasels into the RPMP. NPDC has been trapping mustelids in our reserves through our 'Restore New Plymouth Reserves' programme, which involves several volunteers. A total of 37 mustelids have been trapped since October 2019.

We make the following general comments on the proposed amended sections of the Plan:

#### **General Comments**

We support your review of the iwi environmental management plans prepared by Te Atiawa, Taranaki Tūturū, Ngā Ruanui and Ngāa Rauru and your recognition of the impact that introduced predators, such as mustelids, have on indigenous biodiversity values and taonga species. We agree that these issues are a concern for tangata whenua and that trapping methods are preferred over the use of hazardous substances where feasible.

We note that the mustelid control programme will take place in certain 'Predator Control Areas'. If these areas have already been identified, we suggest that they be mapped and included in the RPMP by way of an appendix or appendices.

Liardet Street, Private Bag 2025, New Plymouth 4340, New Zealand  
P 06-759 6060 | F 06-759 6072 | E enquiries@npdc.govt.nz

**Specific Comments**

Section	Subsection	Issue	Comments
2.3: The new proposed programme to be inserted into section 6 of the RPMP, page 5	6.6A, 'Towards Predator Free Taranaki'	Fourth paragraph refers to "targeting mustelids and rats."	Question whether the wording should include reference to rats, as they are not part of the proposal.
2.3: The new proposed programme to be inserted into section 6 of the RPMP, page 7	6.6A, 'Explanation of rule'	Last line: "Contravention of rules 3 and 4 ..." yet only rule 3 is included on the facing page.	Amend actual rules and rule reference so that they align.
2.4: An amended section 9.1 [Measuring what the objectives are achieving], page 8	6.6A, 'Measuring what the objectives are achieving] (c)	Item (c) refers to possum control in Egmont National Park.	Should mustelids also be included?
3: 'Cost benefit analysis for sustained control programme for mustelids', page 11	3.2, 3.3 and 3.4	There are minor typos in this sub-section.	Amend as appropriate if not already corrected.
3.5 'Who should pay?', page 14		Second paragraph: "Land occupiers with infestations are the principal exacerbators of the problem."	Suggest this wording could be amended as follows: "Land occupiers who are <u>not managing</u> infestations <u>on their property</u> are the principal exacerbators of the problem."

Once again, we thank you for the opportunity to make comments on your proposal to include a sustained control programme for mustelids in the RPMP, and we wish you well in your endeavours.

Yours faithfully

Nāku noa, nā



Juliet Johnson  
DISTRICT PLANNING LEAD





### **Whakatata te hau**

#### ***Karakia to open and close meetings***

Whakatata te hau ki te uru	Cease the winds from the west
Whakatata te hau ki tonga	Cease the winds from the south
Kia mākinakina ki uta	Let the breeze blow over the land
Kia mātaratara ki tai	Let the breeze blow over the ocean
Kia hī ake ana te atakura	Let the red-tipped dawn come with a sharpened air
He tio, he huka, he hauhu	A touch of frost, a promise of glorious day
Tūturu o whiti whakamaui kia tina.	Let there be certainty
Tina!	Secure it!
Hui ē! Tāiki ē!	Draw together! Affirm!

### **Nau mai e ngā hua**

#### ***Karakia for kai***

Nau mai e ngā hua	Welcome the gifts of food
o te wao	from the sacred forests
o te ngakina	from the cultivated gardens
o te wai tai	from the sea
o te wai Māori	from the fresh waters
Nā Tāne	The food of Tāne
Nā Rongo	of Rongo
Nā Tangaroa	of Tangaroa
Nā Maru	of Maru
Ko Ranginui e tū iho nei	I acknowledge Ranginui above and
Ko Papatūānuku e takoto ake nei	Papatūānuku below
Tūturu o whiti whakamaui kia tina	Let there be certainty
Tina!	Secure it!
Hui e! Taiki e!	Draw together! Affirm!