

# **Application for the Reassessment of a Hazardous Substance under Section 63 of the Hazardous Substances and New Organisms Act 1996**

**Name of substance: methyl bromide**

**Application Number: HRC08002**

**Applicant:  
Chief Executive ERMA New Zealand**

## **EXECUTIVE SUMMARY**

# EXECUTIVE SUMMARY

## In brief

Since the Environmental Risk Management Authority decided in July 2008 that there were grounds to reassess methyl bromide, ERMA New Zealand staff (the Agency) have researched and evaluated information from many sources in New Zealand and overseas about the fumigant and its use.

These findings are presented in this document, which recommends the re-approval of the use in the medium term of methyl bromide for quarantine and pre-shipment (QPS) purposes only, with tighter controls. The proposals for the continued safe use of methyl bromide are set out in full in this reassessment application and are based on the Agency's evaluation of the risks, costs and benefits of the use of the substance.

**This is only a preliminary recommendation by staff of the Agency. A final decision will be made by members of the Authority itself, after consideration of public submissions and evidence provided at public hearings.** If the risks and costs of using methyl bromide outweigh the benefits, after taking account of all safety precautions that can be imposed and the likely effects of the substance being unavailable, the Authority may not re-approve the use of the substance.

Submissions are now sought on the Agency's evaluation and proposals. Submissions close on **18 December 2009**.

## The application

This application is made by the Chief Executive of ERMA New Zealand for the reassessment under the Hazardous Substances and New Organisms Act 1996 of the fumigant methyl bromide and of products containing methyl bromide. Following a submission and hearing process, the Environmental Risk Management Authority will make a decision on the future use of methyl bromide in New Zealand. The Authority's decision will be based on whether or not the positive effects (benefits) of using methyl bromide outweigh the negative effects (risks and costs) of its availability – after taking account of all safety precautions that might be imposed and the likely effects of the substance being unavailable.

If the benefits outweigh the risks and costs, the Authority may approve the continued importation, manufacture of methyl bromide in New Zealand for some or all of its current uses (possibly with stricter controls or with further restrictions on use). If the benefits do not outweigh the risks or costs then the Authority may decide to prohibit it outright.

To assist in preparing this application, the Agency has obtained information from a variety of regulatory, industry and community sources both in New Zealand and overseas. These individuals and organisations are identified in **Appendix A** of the application.

## The international context

Methyl bromide is an odourless, colourless, heavier than air gas, used internationally as a broad-spectrum fumigant. It has proved to be an highly effective means of treating timber, agricultural produce, buildings, vessels and containers to eradicate a wide range of pests (including soil-borne fungi, nematodes, weeds, insects, mites and rodents) because of its good penetrating and toxic properties and rapid action.

Methyl bromide was recognised as an ozone-depleting substance under the Montreal Protocol in 1987 and control measures for the chemical were included in 1992. The Protocol was an international response, based on a scientific consensus, to concerns that continued use of such substances would threaten the integrity of the ozone layer which in the long term would allow greater amounts of ultra violet (UV) radiation to reach the Earth's surface and cause harm to the environment, humans and other life forms.

New Zealand, which ratified the Protocol in 1987, was required to phase out the production and consumption of methyl bromide except for quarantine and pre-shipment (QPS) uses and other "critical use" purposes by 1 January 2005.

The direct ozone-depleting effects of methyl bromide on human health or the environment are not evaluated in this reassessment as they are adequately addressed under the Montreal Protocol and through the Ozone Layer Protection Act 1996.

Thus, this reassessment addresses the two categories of methyl bromide use in New Zealand which are exempted from phase-out under the control measures under the Protocol, namely:

- critical uses (for which a Critical Use Exemption (CUE) is required); and
- use for QPS purposes.

In addition, this reassessment considers alternative methods of treatment (chemical and physical) and potential recovery and recycling methodologies in order that methyl bromide emissions may be minimised in accordance with Protocol requirements.

Overseas regulatory agencies in Australia, Canada, Europe and the United States are also looking at the future use of methyl bromide. In 2007, the Australian Pesticides and Veterinary Medicines Authority (APVMA) recommended that QPS and CUE uses should continue. However, the European Parliament has banned the use of methyl bromide within the EU from 18 March 2010. Further information on overseas regulation of the substance is set out in **Appendix B**.

## Current New Zealand uses of methyl bromide

The most prevalent current use of methyl bromide in New Zealand is the QPS fumigation of logs and other goods in order to:

- ensure that imported goods meet New Zealand's border biosecurity requirements (quarantine use); or
- enable New Zealand exporters to meet the importing requirements of other countries (pre-shipment use).

The primary QPS uses of methyl bromide are fumigation of:

- logs in ships' holds;
- logs onshore;
- stacks of cut timber;
- shipping containers containing imported goods; and
- commodities at transitional facilities and quarantine treatment centres.

The export log/sawn timber industry is the largest user by sector (nearly 80 percent of the methyl bromide used in 2007). The key trading partners which require fumigation of logs are China, Japan, Korea, Malaysia and India (although Japan and Korea currently fumigate upon arrival). New Zealand log exports to China are increasing rapidly at present, up from 1.2 million cubic metres in 2007, to 1.4 million cubic metres in 2008 and heading towards 3– 4 million cubic metres in 2009.

In the past, a critical use of methyl bromide in New Zealand was as a soil fumigant for strawberry and strawberry runner growing. This CUE exemption expired on 31 December 2007. However, growers who imported methyl bromide prior to 31 December 2007 are still legally able to use it to fumigate strawberry beds until their stocks are exhausted. It is estimated that the current stocks might last through the 2010 growing season.

Further information on the use of methyl bromide in New Zealand is set out in **Appendices B and C**.

## Risks, costs and benefits of use in New Zealand

In its assessment of the risks, costs and benefits of QPS use of methyl bromide, the Agency considered three scenarios:

Scenario	Scope	Comment
Scenario 1 – baseline	The continued use of methyl bromide for approximately the next ten years.	QPS use continues but other uses (soil) are phased out as existing stocks are used up.
Scenario 2 – phase out	Phase out of all uses of methyl bromide over a period of five years.	An appropriate phase out period for QPS use allowed.
Scenario 3 – immediate ban	An immediate total ban on the manufacture, importation and use of methyl bromide for any purpose.	All importation and use prohibited immediately.

The assessment is in respect of QPS use only and assumes that the existing controls, whether under the HSNO Act or other legislation, are in place. The application of additional controls and restrictions on the current QPS use of methyl bromide is treated as a modification of the baseline scenario rather than being treated as separate scenarios.

## ***Assessment of human health risks and benefits***

An assessment of risks and benefits to human health has been undertaken for:

- operators (i.e. workers directly involved in the application or venting of the gas); and
- bystanders (i.e. other workers in the vicinity of the fumigation as well as non-workers beyond the site boundary).

The human health risk assessment concludes that, with controls in place, the risks to operators are **low** with potential for acute adverse effects on the health of operators only if controls are not adhered to. The Agency notes that these risks to individuals are partly voluntary and partly involuntary and may have long term and irreversible outcomes. Therefore, the Agency proposes adopting a cautious approach and has made recommendations relating to the use of personal protective equipment (PPE) including respiratory protective equipment (RPE).

For occupational and non-occupational bystanders, the Agency concludes that, with controls in place, the risks to health are **negligible** if additional controls (specifically monitoring requirements) are introduced to provide assurance that the risks can be managed safely.

The bystander risk assessment is based on monitoring data made available to the Agency. The Agency considers that for most situations, measurements of gas concentrations give an objective measure of the gas concentration for a particular operation, provided the monitoring equipment is performing to specification and the monitoring devices are located appropriately.

The destruction of vermin in foodstuffs and the elimination of some forestry pests, such as red fire ants, are beneficial to human health. However, these benefits are common to other fumigants and the Agency has not identified any significant beneficial effects on human health from the use of methyl bromide.

Given the lack of direct benefits to human health, the adverse effects outweigh the positive effects.

## ***Assessment of environmental risks and benefits***

The environmental risk assessment of the use of methyl bromide in New Zealand concludes that, with controls in place:

- the direct risks to the environment will be **negligible**. The Agency considers that normal use of methyl bromide as a fumigant for QPS use will not result in direct exposure of beneficial plants, terrestrial or aquatic organisms; and
- the adverse effects of methyl bromide on the environment as an ozone-depleting substance are **potentially significant**. However, under the baseline scenario of continued use over the medium term (approximately ten years) the additional effect on the ozone layer of current levels of methyl bromide use in New Zealand is not considered to be significant.

In terms of the continued use of methyl bromide over a five to ten years timeframe, the Agency considers that the positive effects on the environment would exceed the adverse

effects. There are biosecurity benefits to the New Zealand environment and ecosystems from continued use of methyl bromide to avoid the introduction of damaging pests.

The Agency considers that, if there were an immediate ban on the use of methyl bromide, the adverse effects on the New Zealand environment would exceed the benefits because of the potential for damaging pests to be introduced into New Zealand.

### ***Relationship of Māori to the environment***

The Agency considers the overall level of risk from continued QPS use of methyl bromide on the relationship of iwi/Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu, valued flora and fauna and other taonga to be ***negligible***. This assessment is based on the assumption that the substance is handled, stored, transported, used, and disposed of, in accordance with the controls proposed in this application, and any other controls required by other legislation.

The Agency considers there to be a ***medium*** benefit from methyl bromide on the relationship of Māori to the environment and in their ongoing ability to develop economically.

Accordingly, the Agency considers that the positive effects for iwi/Māori of the continued availability of methyl bromide exceed the adverse effects.

### ***Assessment of risks and benefits to society and communities***

The risk assessment of the QPS use of methyl bromide in New Zealand concludes that, with controls in place, none of the identified adverse effects on society and community are significant. The Agency is of the view that specific local community concerns about the use of methyl bromide in particular regions can be mitigated. Improved communication between communities and port authorities regarding the use of the substance and the controls on its use, and through RMA processes, where appropriate, would assist in this mitigation.

### ***Assessment of risks and benefits to the market economy***

There are benefits to the New Zealand market economy from use of methyl bromide and risks associated with its sudden unavailability. The assessment of risks and benefits to the market economy under the three proposed scenarios concludes that:

- the adverse effects of continued use of methyl bromide for the medium term (approximately ten years) would not be significantly different to the adverse effects associated with a five year phase out; and
- the benefits of retaining methyl bromide for the medium term exceed the benefits associated with allowing continued importation and manufacture for only five years; and
- an immediate ban on use of methyl bromide would have significant adverse effects on the market economy and no benefits.

## ***Overall evaluation of risks, costs and benefits***

The Agency’s overall evaluation of the effects of using methyl bromide under Scenarios 1 and 2 and the likely effects of it being immediately unavailable (Scenario 3) are summarised in the following table:

	<b>Assessment of adverse effects</b>	<b>Assessment of positive effects</b>	<b>Overall evaluation</b>
<b>Scenario 1</b> <b>Baseline scenario</b> <b>(approximately ten years continued use)</b>	Human health (operators) – <b>low</b> Market economy – <b>low-negligible</b>	Market economy – <b>medium</b> Māori interests - <b>medium</b>	Positive effects outweigh adverse effects
<b>Scenario 2</b> <b>Phase out use over five years</b>	Human health (operators) – <b>low</b> Market economy – <b>low-negligible</b>	Māori interests - <b>medium</b> Market economy – <b>low</b>	Positive effects outweigh adverse effects
<b>Marginal difference for Scenario 2 over Scenario 1</b>	nil	Reduced benefit	
<b>Scenario 3</b> <b>Immediate total ban</b>	Market economy – <b>medium</b> Environment (biosecurity) – <b>potentially significant</b> Māori interests - <b>potentially significant</b>	Negligible	Adverse effects outweigh positive effects
<b>Marginal difference for Scenario 3 over Scenario 1</b>	Increased adverse effects	Reduced benefit	

For use of methyl bromide for QPS purposes, the Agency’s preferred scenario is the baseline (Scenario 1). While the net benefit is positive for both Scenario 2 and Scenario 1, there are greater benefits for Scenario 1, and therefore greater net benefit for Scenario 1 over Scenario 2.

While use of recapture technology could further reduce potential exposure to people and the environment, the risk assessment does not indicate that recapture needs to be imposed as a control in order to manage those risks. The Agency considers that further research into the logistics and cost-effectiveness of recapture technology (particularly large scale recapture) needs to be carried out before it can be imposed as a mandatory requirement in New Zealand.

There is currently no single alternative fumigant or method of treatment to replace methyl bromide for all intended uses or overseas markets. Thus the introduction of alternatives depends on further research into their efficacy and subsequent acceptance of them by trading partners. Accordingly, the Agency considers that it will be several years before any alternative treatments will have any effect on the amount of methyl bromide being used. However, acceptance of phosphine by India and the acceptance of reduced methyl bromide fumigation rates by China could see a significant reduction in the amount of methyl bromide

used. The amount of reduction cannot be estimated because of the volatile nature of the demand from China for logs.

Therefore, the Agency considers that an immediate ban on use of methyl bromide would have potentially significant adverse effects on the market economy, possible adverse effects on the natural environment through the introduction of pests (not assessed), and no benefits.

## Preliminary recommendations

**The recommendations set out below are the Agency's preliminary recommendations only.** They are not a final decision on the future use of methyl bromide in New Zealand, which will only be made after the Environmental Risk Management Authority has considered all information put before it, including that received from public submissions, together with any evidence provided at public hearings, and any other information it may require.

### *Revocation of approvals for non-QPS use*

The Agency recommends that the two HSNO approvals (HSR001637 and HSR001638) for importation of methyl bromide for non-QPS purposes should be revoked with immediate effect from the date of the Authority's decision on this reassessment. This will give formal effect to the prohibition already in place under the Montreal Protocol on further importation of these substances for non-QPS purposes.

The Agency notes in respect of these substances, that existing New Zealand stocks are permitted to be used up under the Montreal Protocol and that it is anticipated that these stocks will be used up by sometime in 2010. The Agency recommends that the Authority should also issue a direction, by notice in the Gazette, under section 66 of the Act, prohibiting further use of the substances for non-QPS use and requiring disposal at the owners' expense by **31 December 2010**. The timing of this prohibition coming into effect may alter depending on information received, by way of submissions, from the relevant users on current levels of stock held and likely use up dates.

### *Changes to controls for QPS approval*

For use of methyl bromide for QPS purposes, for the reasons stated above, the Agency's preferred scenario is the baseline scenario (Scenario 1). The Agency therefore recommends that the current QPS approval (HSR001635) should be re-approved with the following **additional controls** and **recommendations** to ensure that the substance is used in a safe manner for people, communities and the environment:

1. The Agency proposes the adoption of the following **tolerable exposure limits** (TELs):

<b>TEL (chronic)</b>	<b>TEL(acute) - 24 hour average</b>	<b>TEL (acute) - 1 hour</b>
0.005 mg/m <sup>3</sup>	1.3 mg/m <sup>3</sup>	3.9 mg/m <sup>3</sup>
1.3 ppb	333 ppb	1000 ppb
0.0013 ppm	0.333 ppm	1 ppm

2. The Agency proposes that the following minimum **buffer zones** (the downwind distance between the ventilation release location and any non-occupational bystander) be observed when ventilation occurs:

<b>Situation</b>	<b>Buffer zone</b>
Ship's hold (greater than 1000 kg methyl bromide used)	100m
Ship's hold (less than 1000 kg)	50m
Logs/timber under covers outdoors and indoors (without recapture technology)	50m
Shipping containers	25m

**Note 1:** Non-occupational bystanders include not just those persons living in nearby residential properties but also those who may be temporarily present in a location, for example, walking on footpaths.

**Note 2:** The buffer zone distance used should be recorded for all fumigations using the site evaluation form in Appendix A of the proposed STIMBR monitoring protocol (see **Appendix P**). This information should be kept by those conducting the fumigation and should be available to be provided upon request to appropriate regulatory agencies. It also should be noted that these buffer zones apply only if there are potential non-occupational bystanders in the downwind direction.

3. The Agency proposes that appropriate air quality **monitoring** be required for all types of fumigation to assess the potential exposures of non-occupational bystanders to ensure that exposures are below the recommended acute and chronic TELs. Monitoring of shipping container, outdoor tarpaulin enclosure and ship hold fumigations should adhere to the eventual final version of the STIMBR Methyl Bromide – Ambient Air Monitoring Protocol (see **Appendix P**). Monitoring devices must be located appropriately at a downwind position where the non-occupational bystander might be exposed and measurements made when detectable concentrations of methyl bromide are likely to be present. The Agency notes that:
  - for sites with complicated geography and weather conditions, the Protocol recommends that specialist help should be obtained in selecting appropriate monitoring sites;
  - monitoring needs to be maintained until methyl bromide gas is no longer detectable; and
  - the results of such monitoring should be kept by those conducting the fumigation and should be available upon request to appropriate regulatory agencies.
4. The Agency **recommends** that the identified best practice in relation to respiratory protective equipment (RPE) requirements for methyl bromide fumigation operations be adopted.
5. Finally, if the Authority decides to re-approve the QPS approval (HSR001635), the Agency proposes the following **classification** changes:
  - change from 6.3A (skin irritancy) to 8.2C (skin corrosive);
  - change from 6.4A (eye irritancy) to 8.3A (eye corrosive); and
  - change from 9.2A (very ecotoxic in soil) to 9.2D (slightly harmful in soil).

## Submissions

Submissions are now invited on this reassessment, including the appropriateness or workability of the above proposals and recommendations. In particular, further information on the following points would be welcome:

- current levels of stock held for non-QPS uses and likely use up dates;
- the adverse effects on New Zealand export trade, the New Zealand agricultural sector and natural ecosystems from the unavailability of methyl bromide;
- the benefits to specific sectors from continued use of methyl bromide;
- ways in which the social effects might be reduced or mitigated;
- whether or not there is further evidence that exposure to methyl bromide is associated with, or causes, motor neurone disease;
- whether or not methyl bromide is a useful tool to iwi/Māori and why that might (or might not) be the case;
- whether iwi/Māori continue to consider there to be the potential for adverse effects posed to native species and to the health and wellbeing of iwi/Māori (if so, what are they and what measures might be implemented to address them);
- whether iwi/Māori consider that controls utilising rāhui should be imposed;
- whether iwi/Māori consider that there should be better communication between users of methyl bromide and local iwi/Māori and, if so, what form should that communication take;
- progress in evaluating alternative methods of treatment;
- quality assurance methods that may reduce or eliminate the need for fumigation in certain industry sectors (for example, forestry); and
- whether different sized buffer zones or alternative controls could provide an adequate level of protection for non-occupational bystanders.

Submissions on this application must be made within a 30 working day period. Electronic responses using the form on our web site are encouraged. Please return your submission, whether electronic or by post, fax or email to:

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All submissions must be received by **5 pm, Friday, 18 December 2009**.

Submissions must state the reasons for making the submission and state whether the submitter wishes to be heard at a public hearing. The submission may also state any decision sought.