Before a Decision-Making Committee
Of the Environmental Protection Authority

APP203660

Under	the Hazardous Substances and New Organisms Act 1996
In the matter of	the modified reassessment of methyl bromide
By	**Stakeholders in Methyl Bromide Reduction Inc** Applicant

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STATEMENT OF EVIDENCE OF DONALD ROBERT HAMMOND

27 JULY 2020

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INTRODUCTION

1. My full name is Donald Robert Hammond.

Introduction and background

2. I am the chair of the applicant, Stakeholders in Methyl Bromide Reduction Inc (**STIMBR**), and have held that position since 2015. I have a long-standing interest and involvement in New Zealand's forestry industry, having worked as a Registered Forestry Consultant for 18 years prior to 2015.

3. I hold a Bachelor of Forestry Science (with Honours) from Canterbury University, a Diploma In Business Studies from Massey University, and a Certificte for Governance Development from Massey University. I am a NZ Institute of Forestry Registered Forestry Consultant, a member of NZ Forest Owners Association, a member of NZ Farm Forestry Association and a member of the NZ Institute of Directors. I have in the past been a Council Member for the NZ Institute of Forestry, a member of that organisation's Registration Board and the Editor of the NZIF Forerstry Handbook.

Scope of Evidence

4. This statement will cover:

   (a) An introduction to STIMBR and its objectives;

   (b) A general description of New Zealand's use of methyl bromide as a fumigant for phytosanitary purposes;

   (c) STIMBR's research into methyl bromide recapture technology and alternative treatments to methyl bromide; and

   (d) The consequences for the log export industry if the current recapture obligation remains in force without adjustment.

Code of Conduct

5. Some of my evidence is based on my expertise in the forest industry and the domestic and export log markets that I have gained from my experience as a forestry consultant and as STIMBR's chair.

6. I understand this reassessment is to be determined by a Decision-making Committee of the Environmental Protection Authority. However, I have read the Code of Conduct for expert witnesses in the Environment Court Practice Note 2014 and I have complied with it when preparing this evidence. Other than when I state that I am relying on the advice of another person, this evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

EXECUTIVE SUMMARY

7. Methyl bromide is used in New Zealand as a fumigant, mostly as a phytosanitary treatment for forest products that are exported to China and India. It is applied to forest products in ship holds, in log stacks under tarpaulins, and (for small quantities of wood product or logs) in shipping containers. The use of methyl bromide has increased in the last ten years due to increased export volumes and an increased level of export to India where methyl bromide fumigation is mandatory for logs. Some methyl bromide use is currently subject to recapture technology at the completion of fumigation, which is able to recapture 30–80% of methyl bromide remaining in the headspace for large scale fumigations.

8. Since 2010, STIMBR has undertaken considerable research into methyl bromide recapture technologies and alternative treatments. This has been in accordance with STIMBR's objective of reducing the use and emission of methyl bromide by transitioning to alternatives to enable continued market access. Despite this ongoing research, no system has been discovered or developed (either in New Zealand or globally) that will replace the use of methyl bromide entirely or allow methyl bromide to be used for log stack and ship hold fumigations in a manner that complies with the recapture standard set in 2010.

9. If the recapture standard set in 2010 comes into force (requiring recapture to 5ppm), then the log export industry will need to stop using methyl bromide for log stack and ship hold fumigations. This would cause a significant decrease in the value to New Zealand's economy of log exports to China and India. That economic impact would be avoided if an achievable recapture control is set and adequate lead time is allowed to build the necessary recapture infrastructure.

STIMBR and its objectives

10. STIMBR is an incorporated society established in November 2008, formed by stakeholders in the horticulture, forestry and log export industries.

11. STIMBR's objectives are to lead, promote, support and co-ordinate initiatives to reduce emissions, and where possible the use, of methyl bromide. STIMBR is driven by an appreciation that methyl bromide is an ozone-depleting substance that has the potential, if improperly used, to adversely affect people's health and the environment. STIMBR is firmly committed to initiatives for the use of methyl bromide to be reduced and, where practical, replaced with safer alternative phytosanitary treatments. STIMBR also recognises that a reduction in the use of methyl bromide and/or a shift to alternative treatments can and should occur in a manner that will continue or enhance market access for New Zealand forest products. The shift away from methyl bromide should not require sacrificing the significant economic benefit provided by industries that are currently dependent on methyl bromide for market access.

12. STIMBR's members include every major forestry owner, log exporter, and fumigator in New Zealand, in addition to wood processors and manufacturers, horticultural product importers and exporters, methyl bromide importers, the ports from which log exports occur, research bodies, and the Plant Market Access Council.

13. The Ministry for Primary Industries (**MPI**) and occasionally other government agencies are invited to attend meetings. Close contact is maintained with MPI.

OVERVIEW OF NEW ZEALAND'S USE OF METHYL BROMIDE

14. Methyl bromide is a fumigant that kills a wide range of pests, including soil-borne fungi, nematodes, weeds, insects, mites and rodents. It is imported as a liquid, under pressure, in metal cylinders, and released as a fumigant through an evaporator or vaporiser that converts it to gas. In New Zealand its most prevalent use — around 95% — is for the pre-shipment fumigation of logs (particularly) and some other forest products and horticulture exports. The balance — around 5% — is used to fumigate imports, to protect New Zealand from incoming pests and disease. Such uses are sometimes collectively referred to as "Quarantine and Pre-Shipment" or "QPS". Pursuant to

international agreements, QPS uses of methyl bromide continue to be permitted, but STIMBR has taken the view that there is a need to continue working towards reducing, recapturing or replacing methyl bromide.

Pre-shipment fumigation requirements for forest products

15. Most (around 76%) of New Zealand's log exports (by value) in the year ended June 2018 were sent to China. About 10% were exported to South Korea, and 7% to India. The proportion going to China has increased since 2010 from 59% to the current 76% and the total volume exported has also increased as noted below. India is a potentially growing market in volume terms.

16. In the period from 2010 to 2018 the total volume of New Zealand log exports rose from 10 million m^3, having a value of NZ$1.2 billion, to over 20 million m^3, generating close to NZ$3.4 billion.

17. Importing countries (New Zealand included) are able to prescribe phytosanitary requirements on products. If the exporting country wishes to change these requirements then that would generally be negotiated based on robust scientific evidence of the efficacy of any proposed treatment or change to existing treatments. The requirements are negotiated on a country to country basis often taking many years to reach agreement. It is important to note that phytosanitary treatments are a requirement of the importing country, not the exporting country.

18. The agreed importing country phytosanitary requirements for exporting New Zealand logs are set out in schedules published by MPI.

19. The fumigation requirements for exports to China are for logs to be either:

    (a) Treated with methyl bromide at a rate of 80g/m^3 (ie 80 mg of methyl bromide needs to be applied for every cubic metre of material to be fumigated) for at least 16 hours at log and ambient temperatures above 15°C; or

    (b) Treated with methyl bromide at a rate of 120g/m^3 for at least 16 hours at log and ambient temperatures between 5 to 15°C; or

    (c) Treated with phosphine in the hold of the ship at a rate of at least 2g/m^3 with a top up of 1.5g/m^3 after 5 days and concentrations of at least 200ppm maintained for 10 days within sealed holds.

As phosphine performs differently to other fumigants — requiring time to act — it is used as an in-hold in-transit treatment. Phosphine treatment cannot be applied to log stacks carried as top stow on the deck of a ship.

20. There is also some allowance for log exports to China to be debarked, but this is only a small proportion of logs. This is a risk reduction measure, not a recognised phytosanitary treatment. If pest incursions are detected in debarked logs upon arrival, then the shipment is required to be fumigated with methyl bromide at the Chinese port at the exporter's cost. The industry may not able to rely on debarking on a large scale because the risk of frequent interceptions may result in it no longer being allowed. Currently New Zealand does not have sufficient debarking capacity to address the total volume of logs.

21. For exports to India, which have significant potential for growth, there is a requirement to fumigate all logs (whether transported in holds, or above deck) with methyl bromide for at least 24 hours at rates of 48 to 72 g/m^3 (again, these rates refer to the amount of methyl bromide required per volume of material to be fumigated). The precise rate depends on the temperature during fumigation. India does not accept phosphine as a phytosanitary treatment, or debarking as a risk reduction measure.

22. South Korea does not currently require fumigation before export but does require treatment with methyl bromide upon arrival.

23. As a consequence of the Indian and Chinese pre-shipment fumigation requirements, around 31% of log exports by value in 2018 were treated with methyl bromide. The volume treated with methyl bromide in 2018 was about 6.6 million m^3 with a value of NZ$1.1 billion. [1]

24. The rest of log exports were treated with phosphine in ship holds (for China), were debarked (again for China only) or were exported to countries that do not have a pre-shipment fumigation requirement.

25. Phosphine is considerably cheaper than any other phytosanitary treatment, and its use avoids the industry having to use a far greater amount of methyl

[1] PINZ Management Ltd "Impact of the loss of methyl bromide as a phytosanitary treatment for forest products (22 March 2019) (provided to the EPA with STIMBR's response to the request for further information on 28 June 2019).

bromide. In the absence of phosphine, it would take around 2,500 tonnes per year of methyl bromide to fumigate our log exports, compared with our current use of around 660 tonnes per year. The use of phosphine for New Zealand log exports commenced in 2001 on an experimental basis and has increased in recent years from around 73 tonnes in 2010 to around 253 tonnes in 2019, due to an increase in export volumes to China.

Pre-shipment fumigation procedures for forest products

26. By its nature, fumigation has to occur within an enclosed space, by injecting methyl bromide into the space and sealing it for the required fumigation period. Three types of enclosures are used for fumigating logs with methyl bromide: (1) logs stowed in ship holds, typically holding about 23,500JAS of logs depending on the type of ship, (2) logs in stacks on the wharf covered with gas-impermeable tarpaulins, under which up to 1,000m^3 of logs can be fumigated; and (3) in shipping containers for smaller volumes (the largest shipping containers can hold up to around 26 m^3 of logs).

27. Of New Zealand's total log exports about 25% (5.3 million m^3 of logs) are fumigated with methyl bromide under tarpaulins, and about 6% (1.28 million m^3 of logs) are fumigated in ship holds. The prevalence of fumigation under tarpaulins despite the large capacity of ship holds compared to log stacks, is due to most ship holds (i.e. those going to our largest export partner, China) being able to be fumigated with phosphine which is both cheaper and makes loading the ship quicker.

Pre-shipment fumigation of fresh produce

28. Since 2010, there has been a shift away from the use of methyl bromide for the pre-shipment treatment of fresh horticulture produce exports. Alternative chemical treatments (such as ethyl formate for kiwifruit) and physical treatments (such as heat treatment) are being utilised and STIMBR has finiancially supported some of the research that has led to this change.

29. However, there are still some pest-commodity combinations that do not have an alternative phytosanitary treatment, and which are dependent on continued use of methyl bromide. For example, capsicums exported to Australia are required by that country to be fumigated for the tomato potato psyllid. Additionally, there is a significant cost involved in proving to

the satisfaction of trading partners that a proposed alternative treatment is effective, and for some smaller export sectors (for example the flower industry) these costs can be prohibitive. The continuing export uses of methyl bromide for horticultural produce are a fairly small proportion of methyl bromide consumption in New Zealand. Further detail on these uses is provided in MPI's report to the DMC "Information on the biosecurity use of methyl bromide in New Zealand" dated July 2019.

Use of methyl bromide for quarantine

30. Methyl bromide fumigations are also used for quarantine purposes for some imports into New Zealand such as wooden materials (eg bamboo from China), and some fresh produce and other commodities (such as copra and scrap metal from Pacific Islands). These fumigations are required by Biosecurity New Zealand, and again carried out by fumigation service providers. This is a relatively small proportion (around 5%) of methyl bromide use in New Zealand. These quarantine fumigations are generally carried out under tarpaulins or in shipping containers. Further detail on these uses is provided in MPI's July 2019 report.

Methyl bromide use over time since 2010

31. There has been a significant increase in the use of methyl bromide since the ERMA's 2010 reassessment. Annual consumption of methyl bromide has increased from around 400 tonnes in 2010 to around 600 tonnes in 2016, and 660 tonnes in 2018. This increase has primarily been due to increased exports of logs (which in turn is due to an increased volume of forestry attaining harvest age). The increase in use patterns was one of reasons for the EPA deciding in April 2018 that there were grounds for reassessment of methyl bromide.

Use of recapture technology since 2010

32. The log export industry has gone some way towards implementing recapture technology on an industrial scale since 2010. I understand that Genera uses its recapture technology to recapture methyl bromide for all fumigation types at Ports of Nelson, Centre Port Wellington, Ports of Auckland, and for container fumigations at the Port of Tauranga. It is also currently using technology to recapture methyl bromide for more than 80% of log stack

fumigations at the Port of Tauranga. Genera is required by its resource consent to increase the proportion of fumigations at Tauranga that are subject to recapture, eventually to 100% of all fumigations.

STIMBR'S ROLE

33. As I have noted above, STIMBR was established in 2008 for the purposes of reducing the emission and use of methyl bromide by investigating alternatives. In the last decade it has undertaken significant research into alternatives to methyl bromide and into methyl bromide recapture technologies, as a response to the 2010 reassessment.

34. Some submitters to this reassessment have expressed the view that STIMBR and the log export industry have not done enough in the last 10 years, since the 2010 reassessment, to ensure that the log export industry can comply with the recapture obligation.[2]

35. I very strongly disagree with this view. STIMBR has expended vast time and resources over the past 10 years pursuing efforts on multiple fronts to address the recapture obligation, as I will explain in this statement. It has investigated alternative fumigant phytosanitary treatments to methyl bromide, notably EDN. It has commissioned research into a lower methyl bromide treatment dose. And it has investigated all known methyl bromide recapture and destruction technologies to assess whether they could be efficacious for large scale log stack and ship hold fumigations.

36. After the 2010 reassessment, there was a general expectation that a feasible alternative treatment or recapture technology was either available somewhere or would become available. 10 years seemed to be ample time to undertake the necessary research and development to find an efficacious alternative treatment and/or recapture technology. Regrettably, the presumption that there was enough time for research and commercial development of a solution has proven to be ill-founded. Despite STIMBR's sustained efforts, no solution has been identified that is commercially feasible

[2] For example: Tauranga Moana Fumigation Action Group asserts that "it is not obvious that any recent and concerted efforts are being made to develop technology to meet the EPA recapture requirement"; Ms Deborah Crowe opines that "They simply did not undertake the steps necessary nor priotirise [meeting the recapture deadline] enough"; Mr Peter Beech suggests that "It looks to me as if the industry has done nothing about using the 10 yrs to develop the recapturing technology, they have waited for the clock to run down and have reapplied for another reassessment."

for large scale log stack and ship hold fumigations and that does not ultimately result in the release of methyl bromide at some future date from the waste products of the recapture system.

37. STIMBR's comprehensive research programme, which commenced in January 2010, was designed to:

    (a) Minimise methyl bromide emissions to the atmosphere;

    (b) Future-proof forest product and other exports;

    (c) Minimise the phytosanitary risks associated with the export of forest products; and

    (d) Provide importers and MPI with alternative tools to protect New Zealand from quarantine pests on imported products.

38. STIMBR has invested over $30 million in this research programme over the last decade. This research is funded from a mix of industry, Government and other sources. The primary source of STIMBR's research funding is from the export log and forest product industry by way of a voluntary levy on methyl bromide and phosphine use. Since 2011 over $13 million has been contributed to STIMBR by forest product exporters through this voluntary levy mechanism. The balance of STIMBR's funding is derived from Government (MPI, Ministry for Business, Employment and Innovation, Ministry for Foreign Affairs and Trade), Crown Research Institutes, the Agricultural and Marketing Research and Development Trust, Draslovska, and other contributors.

39. The research and development that STIMBR has co-ordinated, supported and funded is the only concerted effort of this sort being led and undertaken by industry anywhere in the world. Other countries have not needed to undertake such extensive research, because either: their export sectors are not dependent on the use of methyl bromide; or their regulatory schemes do not impose recapture obligations for the use of methyl bromide.

40. In addition to the $30 million research programme undertaken by STIMBR over the last decade, other New Zealand entities have separately invested over $14 million into their own research programmes. These include research by Genera into the recapture technologies it has developed; and work by the horticulture sector (mostly New Zealand Apples & Pears Inc and Zespri) into alternative treatments for produce exports.

41. I will now list some examples of the work that STIMBR has undertaken in response to the 2010 reassessement. This list is by no means exhaustive, but gives an indication of the breadth and depth of STIMBR's efforts:

(a) STIMBR undertook four years of intensive insect trapping (over 1 million insects were caught, counted and identified) across the country, for informing research into periods when insects are not active (or are less active), such that fumigation may not be required.

(b) In order to provide live specimen insects for research purposes, STIMBR initiated and managed a programme to develop laboratory methods to mass-produce three forest insect species associated with pine logs. These three species constitute over 99% of the insects caught in trapping networks. This was a world first and remains a world-leading and very sucessful programme, which has enabled insects of the three species to be produced on demand in large numbers and at every stage of the life cycle. Being able to use large number of insects in the efficacy tests ensures robust results with a high degree of statistical confidence.

(c) STIMBR recently completed research and commercial scale confirmatory tests that show methyl bromide rates can be reduced to 40 g/m^3 and retain efficacy against forest insects (current application rates are between 48 and 120 g/m^3 depending on where the export is going and the temperature). This alone could reduce methyl bromide use by around 235 tonnes per annum (if the reduced rate is accepted by trading partners).

(d) STIMBR has funded comprehensive research, separate from that undertaken by Genera, seeking possible means of destroying or recapturing/recycling methyl bromide following fumigation using novel approaches.

(e) STIMBR has procured independent reviews of every known technology that has been promoted for the recapture/destruction of methyl bromide, and has offered to fund commercial scale validation trials for any technology that meet essential criteria.

(f) STIMBR procured a comprehensive review of the alternative treatments available globally in 2014, which was the first review of its

kind in the world. This review identified that there were few alternatives (physical, ecological or environmental) that could be used in place of methyl bromide. Ethanedinitrile (EDN) was identified in that study as a possible candidate for use as an alternative to methyl bromide.

(g) STIMBR developed toxicity and efficacy data in the laboratory and has subsequently confirmed commercial scale efficacy data for EDN, supporting its use as a suitable alternative fumigant to methyl bromide.

(h) STIMBR proved the concept that Joule heating can be used as a phytosanitary treatment for logs i.e. running an electrical current through logs to produce heat, raising the temperature within the log to a prescribed level to kill pests. The programme continues to research the scale and efficacy of this treatment method before advancing to the development of a pilot-scale treatment facility.

42. Much of the scientific research that STIMBR has undertaken will be described in more detail in the evidence to be given by Dr Jack Armstrong.

43. Since 2010, STIMBR has continuously maintained a watching brief for prospective methyl bromide recapture and destruction technologies that may be suitable for use in New Zealand for large scale log fumigation. In order to facilitate the search for suitable technologies, STIMBR will fund independent validation testing of any promising technology, as set out in its "Assessment Criteria for Considering Support for MBRDT Validation Tests", established in 2015. The Assessment Criteria requests that technology suppliers provide details of their recapture technology to STIMBR to establish whether the technology is scientifically sound, commercially viable, and able to be used in port situations for large-scale fumigations. The Assessment Criteria are applied in a uniform, careful and critical manner to ensure that STIMBR directs its limited resources towards technologies with established efficay data that might be feasible for commercial use.

44. If the Assessment Criteria are met and STIMBR funds validation testing, then STIMBR's requires that the results will be published in a format that is agreed between it and the technology supplier. The purpose of this requirement is to ensure that the data is presented in a comprehensive and scientifically

robust format, so that anyone relying on the report has an accurate picture of the efficacy of the technology.

45. Two applicants have applied for STIMBR to fund validation testing of their technologies, both of which were approved. These applications came from Genera in relation to its liquid scrubber technology, and Bletchley Ltd (also known as Envirofume). Genera's technologies have developed into the system that is now being used for large scale fumigations at the Port of Tauranga, which is able to recapture 30–80% of methyl bromide remaining in the headspace, depending on the conditions. On the other hand, the results of Bletchley's validation testing demonstrated it was not effective at destroying methyl bromide, and that technology has not been developed further for application on large scale fumigations.

46. STIMBR has over the years negotiated with Nordiko, a recapture technology supplier, in relation to proposed validation testing of its recapture technology. However, the validation testing did not proceed because Nordiko would not agree to the requirement for the results to be published in a form mutually agreed by the parties. This was unacceptable because of STIMBR's concerns about the data being presented in a selective and misleading format. Additionally, Nordiko did not and has not provided efficacy data on the results of its own testing, which is a requirement of the Assessment Criteria.

47. Stepping back, there are a few important conclusions that STIMBR has reached based on the results of its research programme to date.

48. First, despite STIMBR's ongoing and world-leading research (as well as the research undertaken by other entities), no one has been able to discover or develop a commercially scaleable system that will either replace the use of methyl bromide entirely, or allow continued methyl bromide use in a manner that complies with the recapture standard set by the EPA in 2010 (ie a reduction of the residual methyl bromide to 5ppm before venting).

49. This leads to the inescapable conclusion that there is presently no technology that can achieve the 5ppm level required by the recapture control. The highest performing recapture technology that could potentially be implemented on tarpaulin fumigations has the potential to recapture 30%–80% of the methyl bromide remaining in the headspace. That falls some orders of magnitude short of the 5ppm standard.

50. Secondly, recapture from ship holds presents additional difficulties. Genera have two recapture technologies under development. But at the present time, it has not been confirmed that Genera's technology or a similar technology can be effectively scaled up to achieve effective recapture levels (in the region of 30%–80%) for ship hold fumigations. Scaling up to scrub ship holds is extremely challenging. Some of the challenges relate to the size of a hold, effectively a sealed steel bin stacked full with logs in different configurations often with one block at right angles to the next with no means of being able draw an air stream from the bottom of the hold to the top.

51. The difficulties of fumigating ship holds cannot be avoided by substituting tarpaulin fumigations. Aside from the fact that the best performing recapture technology only has the potential to recapture 30%–80% of the methyl bromide for large scale tarpaulin (log stack) fumigations, it would be logistically impossible to to rely solely on tarpaulin fumigations. Approximately 67% of the commodity sent to India is transported in ship holds. There is no efficient way to achieve fumigation of this volume out of the hold, and then load the hold and embark within the required time limits. Those time limits, set by MPI in accordance with trading partner requirements, require logs to be loaded on the vessel within 48 hours of the fumigation being vented to prevent reinfestation by insects after the fumigation as there is no residual effect.

52. Thirdly, an additional challenge for imposing recapture technology is that logs are a high volume low value commodity. This makes them more vulnerable to increased costs associated with adding recapture technology to the fumigation process. The current price for pruned (i.e. top quality) logs is about NZ$180 / tonne. Compare this with apples averaging NZ$2000 / tonne, fresh and processed vegetables $1270 / tonne; and other horticulture produce NZ$5860 / tonne. The average export price for 1000 litres of wine is currently NZ$6670. While the annual costs of production are higher for the horticulture crops and grapes, the per tonne price of logs is to be spread over a production cycle spanning about 28 years.

53. Fourthly, while there are some options that might reduce methyl bromide use, these are unable to immediately resolve the difficulty presented by the recapture deadline.

54. As I have noted above, one possibility is that methyl bromide treatment doses for log exports could be reduced. Confirmatory tests have shown methyl bromide rates can be reduced to 40g/m^3, which would reduce the use of methyl bromide by some 235 tonnes per year (provided that trading partners agree to the reduced rate). However, MPI is yet to gain agreement from China and India allowing the schedule rate to be adjusted. There is no certainty that the lower rate will be accepted and approved for use. Gaining acceptance of a lower treatment rate will not remove the need to recapture. At best it may help decrease some of the technical challenges associated with the recapture processes, but it will not make recapture to 5ppm achievable for large scale fumigations.

55. The other way that the industry may be able to make significant reductions in the use and emissions of methyl bromide would be by substituting EDN for methyl bromide. STIMBR has supported Draslovska's application to the EPA for approval for the import and use of EDN as an alternative. If EDN is approved with feasible EPA and WorkSafe controls for log stacks under tarpulins and for ship holds, then EDN will have the potential to replace methyl bromide use as a phytosanitary treatment for logs. There will be an incentive for the industry to shift from methyl bromide to EDN, assuming that EDN use does not have a recapture requirement. Furthermore the forest industry is committed to move to less environmentally harmful alternatives such as EDN.

CONSEQUENCES FOR THE LOG EXPORT INDUSTRY IF THE CURRENT RECAPTURE CONTROL REMAINS IN FORCE

56. As matters currently stand, if the recapture control comes into force in its current form, requiring recapture to 5ppm, then the industry will need to stop using methyl bromide for all log stack and ship hold fumigations. As I have explained, the present recapture control and standard is not achievable for log stacks and ship holds.

57. The consequence of stopping methyl bromide fumigations are likely to be significant:

    (a) New Zealand would cease exporting logs to India, where methyl bromide is the sole approved phytosanitary treatment. Phosphine (as a phytosanitary measure) and debarking (as a risk reduction measure) are not accepted alternatives.

(b) New Zealand's ability to export logs to China would be restricted to exporting logs that are fumigated with phosphine in the ship hold, or debarked. There is limited ability to rely on debarking, as it is not an accepted phytosanitary measure. Phosphine use on shore is not practical therefore logs could not be sent as top stow, which would add significantly to shipping costs. To export the same volume of logs to China as are currently exported, a 50% increase in the number of ship movements per year would be required. This poses logistical and cost challenges.

(c) The increased shipping costs would result in decreased returns on log exports to forest owners.

(d) It would not be a feasible option for logs that would otherwise have been fumigated with methyl bromide to be diverted to domestic markets. The domestic market is supplied largely with pruned and S or A grade logs coming from the lower trunk while the lesser grade logs from the upper trunk are exported. Domestic consumption has been reasonably constant for the last two decades at around 13 million m^3 per year. At the same time, export volumes have trebled from around 7 million m^3 per year to around 21 million m^3 per year, and now account for around 60% of total production. If some of that volume of of export-bound logs was unable to be exported, then the domestic market would not be able to absorb the significant increase in supply. In the absence of a market to sell forest products, many forest owners would defer harvesting those trees, which would further decrease their incomes and lead to a downscaling of forestry operations.

(e) Employment in the regions is likely to be adversely affected by a downscaling of forestry operations (in addition to the employment and economic effects that are already being experienced as a result of the Covid-19 pandemic and disruptions to international trade).

58. The economic consequences of the log export industry ceasing the use of methyl bromide fumigations are described in more detail in the evidence to be given by Kieran Murray.

59. An additional consequence may arise if the DMC decides to retain the current recapture control and in addition decides that the recapture deadline should be brought forward to 28 October 2020 (the date set by

ERMA in 2010) rather than 28 April 2021 (the date directed by the DMC in July 2020 in response to STIMBR'S waiver application). Exporters are now supplying forest products in reliance on the 28 April 2021 deadline, and are entering into letters of credit arrangement with payments falling due between 28 October 2020 and 28 April 2021. If the recapture deadline is brought forward, then payment under those letters of credit would fall due at a time when the exporter is unable to continue to supply log products, and there will be a risk of payments not being honoured in relation to forest products that have already been exported.

60. The consequences that I have described will be able to be avoided if the DMC decides in this reassessment to:

(a) First, set a recapture control that can feasibly be achieved for log stack fumigations using currently available recapture technology.

(b) Secondly, allow sufficient lead time before any recapture control comes into force for the industry to build the necessary recapture equipment to apply recapture to log stack fumigations. This lead time is necessary because it is not commercially feasible for the fumigation providers (primarily Genera) to commit capital expenditure to the construction of the necessary equipment in the absence of certainty about the requirements of any amended recapture control.

(c) Thirdly, allow a further 10 years before recapture technology is required to be applied to ship hold fumigations. Within 10 years, the likely outcome is that the industry will have implemented an alternative treatment (such as EDN, if approval can be obtained from the EPA, regional councils and trading partners with workable conditions). It also is possible that Genera's current recapture technology may become sufficiently advanced in ten years time to enable recapture from ship hold fumigation, although this still cannot be guaranteed.

DONALD ROBERT HAMMOND
27 July 2020