Memorandum

To:	Tipene Wilson, Dr Ngaire Philips, Dr Derek Belton
Copy to:	Gayle Holmes, Miriam Robertson, Milana Blakemore
From:	Lee Bailey (application lead), Ben Deeble
Date:	28 August 2020
Subject:	Reassessment of methyl bromide: addendum to Staff Report

Purpose

1. During the hearing for the reassessment of methyl bromide (application APP203660), the EPA agreed to provide an update to their recommended buffer zones based on the amount of methyl bromide used to fumigate logs bound for India, as well as China.
2. As noted in the Decision-making Committee's (DMC's) Direction and Minute WGT022, the DMC asked the EPA to provide a summary of the existing modelling information so as to provide this update.
3. The purpose of this memo is to report on those updated buffer zones, including how they were derived.
4. In addition, the EPA has taken this opportunity to highlight a transcription error relating to the hazard classifications that made its way through to our presentation at the hearing.

Updated buffer zones

Information requested

5. During the hearing for the reassessment of methyl bromide some submitters indicated that they thought that the buffer zones for ship holds should be based on the amount of methyl bromide mandated by the phytosanitary requirements of India, rather than those for China.
6. Further submitters requested that there be more differentiation between the uses of methyl bromide when the buffer zones are set, including for smaller log stacks, sheeted shipping containers, and fresh produce.
7. The DMC requested that the updated buffer zones be provided based on the 99.9th percentiles, rather than the 100th percentiles used in the EPA Staff Report.

Derivation for log stacks and ship holds

8. The EPA used the various isopleth plots (that is, plots showing equal air concentration levels, similar to contour plots for elevation) provided in several available air dispersion modelling reports to identify the extent of the area at which the air concentration would be above the one-hour tolerable exposure level (1-hour TEL).
9. The EPA then used geographical mapping tools to estimate the distance until the 1-hour TEL would no longer be breached according to the models.

10. Where a recapture rate was not available in a report considered suitable for use, the EPA has extrapolated between those rates that were available. This is considered reasonable because, in deterministic modelling, there is a linear relationship between the amount of methyl bromide released and the distance travelled.

11. Where modelling was not reported at the 99.9th percentile, the EPA has continued to use the 100th percentile result to update the buffer zones.

Derivation for smaller fumigations

12. The EPA Staff Report did not propose that the buffer zones for containers were updated. This was because the evidence provided all related to the fumigation of logs in stacks under sheets and in ship holds.

13. The Ministry for Primary Industries presentation showed images of different fumigation scenarios not related to the mass export of logs. They requested that these be considered further when differentiating any new buffer zones as a result of the reassessment.

14. The EPA acknowledges that there is little difference in the volume in a shipping container to that of a single shipping container covered in a sheet for biosecurity fumigation purposes.

15. Although images presented at the hearing included a small covered stack of specialised logs, the application form indicated that these are also done inside containers. For this reason, a dedicated sub-use is not included for this fumigation type. It will be up to the operator to decide which fumigation method is best and to use the appropriate buffer zone accordingly.

16. For the purposes of this update, the fumigation container required for fresh produce was considered to be similar to a large shipping container. An operator will still need to ensure that they meet the requirements in the Health and Safety at Work (Hazardous Substances) Regulation 14.39.

Updated distances

17. Table 1 below shows the updated buffer zones as described above.

18. The charts used to extrapolate between the different recapture percentages are presented in the Appendix.

19. Buffer zones are defined in the Hazardous Properties Controls Notice as the downwind distance to a sensitive receptor. As noted in the EPA Staff Report, in this case a sensitive area is considered to be a place where non-port-related bystanders might be present, including but not limited to those in occupied residential and commercial/industrial properties, public open space, and marae and other Māori facilities.

Table 1: Updated buffer zones

Use		Minimum buffer zone (m)				
Main	Details	No recapture	30% recapture	50% recapture	60% recapture	80% recapture
Containers	Total volume less than 77 m^2 in any 60-minute period	10	10	10	10	10
	Total volume of 77 m^2 or more in any 60-minute period	25	25	25	25	25
	Single shipping container under sheet	25	25	25	25	25
	Dedicated fresh produce fumigation enclosure	25	25	25	25	25
Log stacks under sheets	When methyl bromide used ≤40 g/m^3	300	220	160	140	100
	When methyl bromide used >40 - ≤72 g/m^3	500	380	300	250	100
	When methyl bromide used >72 g/m3	625	530	460	410	100
Ship holds	When methyl bromide used ≤40 g/m^3	1200	1000	850	775	540
	When methyl bromide used >40 - ≤72 g/m^3	1650	1400	1225	1150	540
	When methyl bromide used >72 g/m3	1900	1700	1600	1500	540

Blue shading: as 2010 reassessment decision, with expanded sub-uses
Yellow shading: At 99.9th percentile in Golder report (no differentiation between rates in report)
Orange shading: At 100th percentile in Todoroski Air Sciences (TAS) report
Red shading: Extrapolated from distances extracted from TAS report

Correction

20. One submitter, Dr Melanie Miller, noted a transcription error between the Science Memo and Staff Report, which also made its way into the EPA's presentation at the hearing.

21. The classifications for acute toxicity via the oral and inhalation routes were inadvertently switched.

22. For clarity, the correct information is provided in Table 2. All the remaining proposed classifications are as detailed in Table 3 of the Staff Report.

Table 1 Corrected classifications

Hazard	Existing classification	Applicant's proposed new classification	EPA's proposed new classification
Acute toxicity (oral)	6.1C	6.1C	6.1C
Acute toxicity (inhalation)	6.1B	6.1B	6.1C