EPA ADDENDUM TO THE STAFF REPORT

Application for approval to import EDN for release

APP202804
October 2019
## Table of Contents

1. **Background** ................................................................................................................................. 3
2. **Additional information** .................................................................................................................. 4
3. **Assessment of changes to the risk assessment** ........................................................................... 5
4. **Controls** ........................................................................................................................................ 9
5. **Overall evaluation and recommendation** .................................................................................... 9

**Appendix 1: Documents received since the 20 August 2018** ......................................................... 10
1. Background

The substance

1.1. Lučební Závody Draslovka a.s. Kolín (“Draslovka”) have applied to import EDN, a compressed gas containing the active ingredient ethanedinitrile at a concentration of 1000 g/kg, at a minimum purity of 95%.

1.2. The active ingredient is new to New Zealand. The applicant seeks to have EDN approved for use as a fumigant for insect pests, nematodes and fungi in timber logs for export, with an intended application rate of 150 g/m$^3$ of EDN and a treatment period of 24 hours.

1.3. The active substance, ethanedinitrile, is approved in Australia and South Korea\(^1\) as a fumigant. Ethanedinitrile fumigation is an officially recognised treatment option for timber and logs imported into Malaysia.

1.4. Ethanedinitrile toxicity is believed to be mediated through its hydrolytic breakdown to the cyanide ion (CN\(^-\)) (also called cyanide). Exposure to high concentrations can be fatal.

The submission process

1.5. The application to import EDN was formally received on 17 July 2017, and was opened for submission on 27 February 2018 and was closed on 19 April 2018. 43 submissions were received.

1.6. A hearing was held in Wellington, New Zealand on 21 August 2018 for EDN. On 20 August 2018 further information was received from the applicant. As a result, a Direction and Minute (Direction and Minute Number 2) was issued on 23 August 2018 by the Decision-Making Committee (DMC), directing two rounds of expert conferencing to be held to resolve areas of disagreement highlighted by the new information. These sessions were held on 12 October 2018 and 15 October 2018 and covered the Tolerable Exposure Limits (TELs) and Air concentration dispersion modelling, respectively.

1.7. After the initial submission period, where 43 submissions were received, three further opportunities have occurred to allow parties to comment on the additional information concerning the two rounds of expert conferencing on TELs and air concentration dispersion modelling, and to provide comments on the request by the DMC for further information (Direction and Minute Number 6). The timeline for the application is available on the EPA website under ‘EDN application timeline’.

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\(^1\) See Appendix 1: South Korean registration certificate
1.8. The first two opportunities for submitters to provide written comments occurred after the joint expert statements were made available on the EPA website, along with the new information from the applicant and STIMBR that was provided to the DMC on 19 and 20 August 2018 respectively. Submitters were to provide a written comment within 10 working days of the documents being made available on the EPA website (as outlined in the Direction & Minute 2).

1.9. The third opportunity for submitters to provide written feedback occurred after the DMC issued a Direction and Minute (Direction and Minute Number 6) on 28 January 2019, for further information. Direction and Minute 6 received nine responses, including one from the applicant and one from Worksafe.

1.10. All additional, publically available, information that has been received since 20 August 2018 is outlined in Appendix 1.

1.11. As additional information has been provided by the applicant, Worksafe and various public submitters since 20 August 2018, the EPA has prepared an update on what impact, if any, the further information had on the views outlined in the EPA Staff Report (dated 27 February 2018) and the EPA Science Memorandum (dated July 2018).

2. Additional information

2.1. The EPA has reviewed the additional information that has been provided since August 2018, as set out in Appendix 1. It covers the following areas:

- New information relating to a change in application rate of EDN;
- New information on log stack sizes;
- New information on buffer zones;
- New information on EDN monitoring using different equipment;
- Joint expert statements on TELs and air concentration dispersion modelling;
- Comments from submitters regarding the joint expert conferencing on TELs and air concentration dispersion modelling;
- Comments from the applicant, Worksafe and submitters regarding the request for further information (Direction and Minutes Number 6);
- New information regarding wood odour from EDN fumigated logs;
- An Occupation Health Hygienist report on worker exposure;
- New EDN efficacy data.
3. Assessment of changes to the risk assessment

3.1. A quantitative risk assessment has previously been performed and outlined in the EPA Staff Report, dated July 2018, and risks were identified in relation to EDN.

3.2. The EPA have considered the risks identified in the Staff Report and how they may be affected by any additional information submitted by the applicant, Worksafe and other various submitters since August 2018.

General information

Application rates

3.3. The applicant initially requested an application rate of EDN at 150 g/m³. Fumigation would cover a 24-hour period.

3.4. In the additional information submitted to the EPA since August 2018, the applicant has suggested a change in application rate.

3.5. In a submission made by STIMBR, dated 8 March 2019, in response to the Direction and Minutes (Direction and Minute 6) issued on 28 January 2019, the applicant has confirmed that they are now requesting a maximum rate of 120 g/m³ instead of the 150 g/m³ initially requested. Draslovka are currently collecting data using the application rate of 120 g/m³.

3.6. Without additional modelling the EPA are unable to fully assess the risk of a change in application rate.

Log pile sizes

3.7. The log pile sizes in the initial application were 750 m³. However, in a report ‘Review of an Assessment of Ethanedinitrile for Log Fumigation’ (dated April 2018), Dr Bruce Graham adjusted his modelling to account for log stacks of up to 1500 m³ based on a methyl bromide review he carried out for ERMA New Zealand in 2009.

3.8. In the additional information submitted to the EPA, Draslovka have suggested in their response to Dr Graham’s report (dated 20 August 2018), the average log stack sizes in New Zealand

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2 See Draslovka’s response to the DMC’s 28 January Direction and Minute 6 requesting more information in appendix 1.

Zealand, according to industry data, should be approximately 1000 m³, with a loading factor of 58% (the load factor is the proportion of ‘air space’ under the tarpaulin, taken up by logs).

3.9. It was suggested by Dr Graham and Mr Hlinka in the Joint Expert Statement for air concentration dispersion that further modelling may be required if the DMC wish to consider the effects of changes to any of the input data that may affect the air dispersion modelling, such as log pile size, EDN height release under the tarpaulin and the EDN load factor.

3.10. Without additional modelling the EPA are unable to fully assess the risk of a change in log stack sizes or higher loading factor for EDN

Ship hold and container fumigation

3.11. Draslovka did not include EDN fumigation in ship holds and containers in their original application but note that this is important to the timber and log industry.

3.12. In a submission from STIMBR (dated 8 March 2019), they have proposed that the modelling of ship holds can be provided on request and consider there to be no additional risks that have not already been reviewed in this application.

3.13. However, no new data have been submitted on EDN use in ship holds and containers, therefore, these types of use patterns have not been evaluated.

Review of monitoring data

3.14. In a submission received from STIMBR, it was suggested that the EPA could review monitoring data at the end of the first year of commercial use of EDN in New Zealand in order to revisit the controls (eg around buffer zones and EDN concentration).

3.15. Any change to controls would require a reassessment, in the event of an approval being granted. Alternatively, a control could be included that prohibits use without specified actions occurring. However, this has not been offered as a control by the applicant, and noting the current limitation on the ability to monitor EDN, this is not considered a viable control at this point in time.

Human health risk assessment

Worker exposure risk assessment

Monitoring of EDN levels

3.16. In the initial EPA Staff Report it is stated that the applicant had proposed using an electrochemical gas analyser to monitor EDN levels. This instrument can measure levels of

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4 A report was received from STIMBR, dated 22 November 2018, in response to the expert conferencing held in October 2018.
EDN between 1 to 50 ppm, however, no suitable instruments were identified that could monitor exposure of EDN below 1 ppm in the air.

3.17. It was also noted that current devices used to monitor methyl bromide were not suitable for monitoring EDN.

3.18. Personal Protective Equipment (PPE), particularly Respiratory Protective Equipment (RPE), was recommended for anyone working less than 10 metres to a single log stack being fumigated or 20 metres to multiple log stacks.

3.19. Additional information has been submitted since August 2018 regarding the monitoring of EDN levels.

3.20. From the final Occupational Hygienist Report, dated 14 June 2019, it indicates that there are limitations on the equipment used to accurately measure EDN exposures, in a timely manner, in a commercial setting. The GC instrument mentioned in the report has a time delay of three minutes, the MSA Ultima XA gas detector can give false positives and often needs to be finely tuned, and the Gasmet instrument, while observed to be quite reliable, has some delay and is not commercially viable. However, the report finds that all results suggest exposure to EDN would not be expected to exceed the short term exposure limits (STEL) under normal conditions.

3.21. Accordingly, it is noted that monitoring of compliance with controls may still be problematic. The EPA notes that this may be impacted by any requirements set by WorkSafe.

Buffer zones

3.22. From the initial EPA Staff Report, a proposed buffer zone of 20 m was proposed for workers within the fumigation facility.

3.23. As no new information has been submitted on buffer zones since August 2018, they remain the same at 20 m for workers.

Bystander risk assessment

Tolerable exposure limit

3.24. The initial EPA Staff Report stated short-term exposure was evaluated as being between 10 minutes to 8 hours, any exposure exceeding this time would be considered long-term exposure to people residing near the fumigation facility.

3.25. The risks to bystanders from the short-term exposure was considered negligible as modelled values were less than the Acute Exposure Guidelines (AEGL) values of 2.5 ppm for a 10 minutes exposure and 1.0 ppm for an 8 hour exposure.

3.26. For long-term exposure, a tolerable exposure limit (TEL) of 0.034 ppm was calculated as a 24-hour average.
3.27. Modelled exposures for multiple log piles were above the TEL of 0.034 ppm and therefore unacceptable for any bystanders or the general public.

3.28. In order to bring exposure levels of EDN below the TEL, a control was proposed that would require a maximum measurement of no more than 700 ppm of EDN under the tarpaulin before it could be removed from the log stack pile.

3.29. From the additional information submitted since August 2018, Draslovka had said EPA’s proposed TEL of 0.034 ppm was overly conservative (correspondence received on 20 August 2018).

3.30. In the joint statement on TEL, issued on 12 October 2018, in response the DMC’s Directions and Minutes (Direction and Minute 2), dated 23 August 2018 and 14 September 2018, expert conferencing (conducted by Dr Adam Jonas from Draslovka and Dr James Deyo from the NZ EPA) concluded with Dr Jonas accepting Dr James Deyo’s approach to calculating a TEL, and the TEL value. Accordingly, there is no change to the proposed TEL of 0.034 ppm.

3.31. The concentration of EDN under the tarpaulin also remains unchanged at less than or equal to 700 ppm prior to the removal of the tarpaulin from a fumigated log pile.

Buffer zones

3.33. In the initial EPA Staff Report, a buffer zone of 120 m was proposed for bystanders and the general public. This buffer zone is only appropriate if the concentration of EDN remains at less than or equal to 700 ppm under the tarpaulin prior to removal.

3.34. As no new information has been submitted to the EPA since August 2018, the proposed buffer zone of 120 m remains unchanged.

Environmental Risk Assessment

3.35. In the initial EPA Staff Report, the EPA assessment found that exposure to EDN is unlikely for aquatic species based on the use pattern. However, a control outlining favourable atmospheric conditions was set to mitigate any risk of movement of EDN into water.

3.36. Risks to earthworms, soil organisms and non-target plants were considered likely to be negligible.

3.37. Risks to non-target invertebrates, such as bees, was considered to be negligible as they are unlikely to be found in the surrounding areas of the port were EDN ventilation would occur.

3.38. Risks to birds may occur after removal of the tarpaulin, or if there are any leaks during fumigation. While the EPA did not expect most bird species to be present around the ports where fumigations would to take place, sea birds may be most at risk. A control stating that
fumigations must be undertaken at locations where water bird colonies are not known to exist was proposed to mitigate risks to birds.

3.39. No additional information or new modelling has been submitted to the EPA since August 2018 that would change the environmental risk assessment in its current form in the EPA Staff Advice.

4. Controls

4.1. Without additional modelling the EPA are unable to fully assess whether the proposed controls, as outlined in the EPA Staff Advice, will require alteration due to the additional information submitted since August 2018, should an approval be granted. The exception to this is the maximum application rate change from 150 g of substance/m³ to 120 g of substance/m³. The EPA have not received a revised application form stating the change in application rates.

4.2. Accordingly, the current draft controls are set out in the EPA Science Memorandum dated July 2018.

5. Overall evaluation and recommendation

5.1. The additional information, submitted since August 2018, supplied by the applicant, Worksafe and various submitters, has not provided any new modelling data to be assessed by the EPA. As such, the EPA have not changed the current advice as outlined in the EPA Staff report and Science Memorandum.

5.2. In the event of new modelling being provided to the EPA, findings of EPA Staff Report and Science Memorandum could have the potential to be impacted by the new data.

5.3. There is still uncertainty on the risks associated with this substance. However, the benefits of the substance are likely to outweigh the risks of the substance, even with the uncertainty around the risks. Furthermore, there is insufficient information to be assured that WorkSafe and the EPA will be able to set the requirements and controls that will best mitigate the risks and potential risks of the substance.

5.4. Accordingly, it was not considered necessary to update either the EPA Staff report or Science memorandum at this stage.
Appendix 1: Documents received since the 20 August 2018

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<tr>
<th>Date received</th>
<th>Document</th>
<th>Link</th>
<th>Commentary</th>
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This report outlines some key issues, in the Applicant’s view, from the document provided by Dr Bruce Graham.

Draslovka consider a loading factor of 37% as assessed by Dr Graham is overly cautious and that an average loading factor of 58% is more appropriate.

Draslovka say Dr Graham has overestimated rates of exposure to EDN after ventilation due to an overestimation the log stack sizes. Dr Graham suggests buffer zones of 50 m for workers and 120 m for the general public to which Draslovka have said is unnecessary – Draslovka says 20 m should be sufficient for both workers and the public (although further in the report they say 10 m should be sufficient for workers).

Dr Graham quoted an EDN fumigation study which showed there was around about a 10% loss of EDN through permeation through the covering material over a 24 hour period. Draslovka agrees there is a 10% permeation but also states that because the levels of EDN under the tarpaulin decrease over the fumigation time, there will be a decrease in quantity lost into the atmosphere. Draslovka goes onto say that the study Dr Graham was quoting did not conduct the test using logs under a tarpaulin.

Draslovka discuss monitoring leakage detection of EDN at less than 50 ppm. They have said the detector, MSA Ultima XA should be used as a hazard warning device. If the monitor detects a “failure” then workers
need to move to an area of lower concentration to check for malfunction or actual “failure”. It has a response time of 12 seconds, therefore, according to Draslovka is should not take longer than 20 seconds to determine whether EDN concentration exceeds 50 ppm.

Draslovka have also said they have tested the Riken FI-8000™ instrument that can measure between 0.4 g/m³ and 300 g/m³. Draslovka have stated that this instrument can be used outdoors in all weather conditions. This instrument will allow measurement of EDN concentration under the tarpaulin before its removal.

Draslovka have said the EPA’s proposed Tolerable Exposure Limits (TEL) of 0.034 ppm is overly conservative. They note that the most common safety exposure levels is 10 ppm over an 8 hour period. They also note that sensitivities to cyanide is well documented, eg rats and rhesus monkeys are more sensitive than humans, therefore studies based off these species will give conservative estimates.

With regard to filters and respirators for workers, Draslovka agree all respiratory protective equipment have their issues, responding to Worksafe’s comments about the use of SCBA apparatus. The use of SCBA requires certification and training for use. Draslovka also regard the A2B2 filter as a good option for long-term protection for workers.

Draslovka do not consider scrubbing and recapture of EDN necessary. They go onto say it increases costs and may increase the risk of exposure to humans and the environment from the effluent it would produce. The APVMA in Australia does require scrubbing for log fumigation.

Draslovka did not include fumigation in ship holds and containers in their original application but note that this is important to the timber and log industry. They intend to include this method in future.
Draslovka suggest average stack sizes in New Zealand, according to industry data, should be around 1000 m³ with a loading factor of 58%.

**Air Concentration Dispersion Modeling Assessment of Ethanedinitrile (EDN) Concentrations in Tauranga Port, New Zealand**

This report covers the air dispersion modelling system, AERMOD, using meteorological data from Port of Tauranga (New Zealand), to determine airborne concentrations of EDN at the 95th percentile.

STIMBR provided new information in relation to wood odour

Trial workers and log logistics reported a smell following EDN fumigations during containment field trials in Tokoroa in April 2016. It was suggested that the smell may have been low levels of ammonia.

STIMBR commissioned Plant and Food Research (PFR) to develop a protocol to identify which compounds are present in treated wood after log fumigations with EDN and to determine the potential compounds causing wood odour following EDN fumigations.

PFR conducted a preliminary trial on *Pinus radiata* logs with EDN. After 24 hour fumigation period, residues of EDN, HCN and monoterpenes (α- and β-pinene) were confirmed. The trial showed:

- High sorption (98%) of EDN in the logs during fumigation with an average concentration of 3.4 gm⁻³ at the end of the fumigation period.
- Low HCN levels at the end of the fumigation period at 1.06 gm⁻³. The average increase in concentration was 0.32 gm⁻³.
- Ammonia was not identified in headspace above EDN-treated logs.
- No measurable change in levels of seven terpenes/monoterpenes occurred between fumigated and non-fumigated logs.

- CO₂ was present due to respiration of logs in a closed space.

A definitive answer on the possible compounds causing the post-fumigation smell associated with EDN fumigated logs could not be provided.

Studies conducted by Draslovka using both EDN and HCN showed no other reports of a post-fumigation smell at either the end of treatment or several hours after ventilation.

The report also provides an explanation on the breakdown of EDN and discusses the characteristic odours of EDN and HCN and their differing odour thresholds (10 ppm and 0.58 to 5 ppm, respectively).

It was concluded that it was difficult to determine the compounds contributing towards the odour of *P. radiata* logs after fumigation. The reported odour is unlikely to be EDN or HCN due to their distinctive smell and taking the toxicity of EDN into consideration, it was considered unlikely that the odour would be harmful.

**12/10/18**

**Joint expert statement TEL**


**Expert Conferencing Joint Report to the Decision-Making Committee**

The report is a signed joint witness statement from Dr Adam Jonas (Draslovka) and Dr James Deyo (EPA) in response to the Decision-Making Committee’s Directions and Minutes dated 23 August 2018 and 14 September 2018 regarding the Tolerable Exposure Limit (TEL).

While there were some disputed areas and agree facts, ultimately Dr Jonas accepts Dr Deyo’s approach to calculating a TEL and the TEL value (0.034 ppm as a 24 hour average).
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<tr>
<th>Date</th>
<th>Description</th>
<th>Document</th>
<th>Details</th>
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<tbody>
<tr>
<td>15/10/18</td>
<td>Joint expert statement Modelling</td>
<td>Joint-Expert-Statement-Air-Concentration-Dispersion-Modelling.pdf</td>
<td>The report is a signed joint witness statement from Dr Bruce Graham and Dennis Hlinka in response to the Decision-Making Committee’s Directions and Minutes dated 23 August 2018 and 14 September 2018 regarding Air Concentration Dispersion Modelling. Both experts agreed on a number of the parameters discussed, the issues where both experts could not fully comment on, both agreed that additional modelling was required for those issues.</td>
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<tr>
<td>2/11/18</td>
<td>Dr B Graham (EPA) Advice provided after expert conferencing</td>
<td>Graham-EDN-advice-after-expert-conferencing-2018-11-02.pdf</td>
<td>Response to expert conferencing on EDN Air concentration dispersion modelling The response summarises a range of changes that would need to be made if additional modelling assessments are carried out based on discussions from the expert conferencing. It suggests that modelling results should be assessed against the appropriate TEL value or 50% of the TEL, and notes that some recommendations for additional modelling are based entirely on the consultants' opinion. It was concluded that if no additional modelling were to be undertaken then conclusions from the report provided to the EPA in April 2018 would remain unchanged.</td>
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<tr>
<td>22/11/18</td>
<td>BOPRC Comments on expert conferencing</td>
<td>COMMENT-Bay-of-Plenty-Regional-Council.pdf</td>
<td>Comments on the expert conferencing from Bay of Plenty Regional Council Bay of Plenty Regional Council (BOPRC) made four points responding to the new information provided. It was noted that there were a number of areas where the experts disagreed and that further modelling should be conducted to address this.</td>
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The comments raised that “CFD [Computational fluid dynamics] modelling” should also be looked at as micro meteorological events could occur at the Port of Tauranga.

BOPRC support the establishment of a maximum concentration of EDN (700 ppm to begin with) under the tarpaulin prior to ventilation of the log stack.

BOPRC supports the buffer zones of 20 m for workers and 120 m for the general public if proven to be acceptable.

BOPRC would like to know what monitoring will be used (e.g. instrumentation and methodology) in order to verify compliance and boundary limits.

<table>
<thead>
<tr>
<th>Date</th>
<th>STIMBR Comments on expert conferencing</th>
<th>STIMBR submission following the expert conferencing, 22 November 2018</th>
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<tbody>
<tr>
<td>22/11/18</td>
<td></td>
<td>This submission focuses on two areas: 1). The TEL determined by the EPA; 2). Dispersion modelling.</td>
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<td>STIMBR would like to emphasise that the TEL is extremely conservative and would like the DMC to take this into account when developing controls and buffer zones.</td>
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<td>For dispersion modelling, STIMBR suggests a maximum application rate of 150 g/m³ and an end of fumigation concentration of 375 ppm.</td>
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<td>STIMBR would like the EPA to review the monitoring data at the end of the first year of commercial use of EDN in New Zealand in order to revisit the controls (e.g. around buffer zones and EDN concentration).</td>
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<td>STIMBR has suggested that log stacks should be a maximum of 6 m in height and 1000 m³ in total volume.</td>
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<td>STIMBR has also stated that modelling for ship holds can be provided and wishes for the EPA to approve the use of EDN in ship holds as they</td>
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### Comments on expert conferencing

**Tauranga Moana Fumigation Action Group (TMFAG)**

TMFAG continues to believe that the application for EDN should be declined and request:

- More comprehensive studies to be carried out on human health and environmental effects, as well as looking into the potential for the substance to act as a bacteria mutagen;
- That the EPA implements a more appropriate approach to national regulation that TMFAG say is lacking for methyl bromide;
- Approval be conditional on the development of an offsite fumigation facility and that scrubbing of logs following fumigation should be implemented.

On TELs, TMFAG say that due to a lack of knowledge, little confidence is given to the TEL recommended by the EPA, and in the event of an approval, exposure limits should be set significantly higher than what is currently suggested.

On air dispersion modelling, TMFAG say expert conferencing show the information was limited in order for the EPA to make an informed decision.

TMFAG would also like to see exposure limits set for instantaneous and short time exposure (e.g. 10 minutes) if approval is given.

### Log stack data

**Genera**

Genera provided log stack data showing average log stack sizes.

The information supported the volume used in the air dispersion modelling submitted by the Applicant on 20 August 2018 (1000 m3).
Draslovka’s response to the DMC’s 28 January Direction and Minute requesting more information

The response notes that Draslovka is currently collecting data from efficacy trials in the Waikato, with a fumigation rate of 120 g/m³, in order to confirm whether the rate of treatment is effective against target insect species. The data from these trials should produce information regarding:

- EDN levels under the tarpaulin throughout the fumigation process;
- EDN levels in the area where workers undertaking fumigation and ventilation tasks are present; and
- EDN in the atmosphere at set distances away from the fumigated log stacks.

The response states that Draslovka has hired an occupational hygienist to review worker exposure calculation data.

Draslovka can offer international data but has reservations about the variations with the studies.

Draslovka will be undertaking worker exposure trials in the USA, pending sign-off from the US EPA.

Email from WorkSafe provides their response to the DMC

Worksafe will proceed with developing safe work instruments based on the information that has been provided. They note that further information on workplace exposure and the relevant HSWA controls will be considered in a separate statutory process to consulting on a safe work instrument.
Draslovka wishes to know whether the DMC would like any of the information described. They wish to avoid any delays in progressing this application.

Draslovka is willing to undertake comprehensive trials in New Zealand to address any issues the DMC have raised as long as these issues are clearly identified. A comprehensive trial would be a costly undertaking for Draslovka and would likely take a considerable amount of time.

Draslovka have submitted a timeline with anticipated completion dates for studies that are to be made available to the DMC for consideration.

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<tr>
<th>Aubade Global Resources</th>
<th>Submission from Satinder Singh, Aubade Global Resources Limited:</th>
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<tbody>
<tr>
<td>Response to Direction &amp; Minute 6</td>
<td>Aubade acknowledges the different organisations and local and overseas stakeholders involved and the resulting delay in decision. They noted that the Forest Export Industry is becoming frustrated and anxious as a result of on-going delay. The submission urges the DMC to provide a decision when all information is available so the industry can prepare for October 2020.</td>
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<tr>
<th>BOPRC</th>
<th>Submission from Bay of Plenty Regional Council regarding additional information provided:</th>
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<tr>
<td>Response to Direction &amp; Minute 6</td>
<td>1. DMC intended to view fumigation process at Port of Tauranga however, there was no opportunity to do so. Port of Tauranga can provide footage to the EPA and DMC as this could be useful as viewing fumigation on site.</td>
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<td>2. It is stated that time taken to remove a tarpaulin is typically 10 to 15 minutes. Regional council staff have observed (via video) tarpaulin removal taking 8 minutes per stack when multiple stacks are uncovered.</td>
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<p>| Application for approval to import EDN for release (APP202804) | |</p>
<table>
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<tr>
<th>Matariki Forests</th>
<th>Submission from Matariki Forests managed by Rayonier NZ Limited:</th>
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<tr>
<td>Response to Direction &amp; Minute 6</td>
<td>The submission from Matariki Forests (MF) states that without an alternative fumigant to methyl bromide before October 2020, this will result in the loss of the log export market. Negative financial impact on MF will cause an adverse effect on forestry in NZ. The submitter acknowledges that EDN is the best fumigant replacement to MB [methyl bromide] with 100% kill rates of NZ pine insects and less than 1% chemical remaining after 24 hours.</td>
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<th>Nordiko</th>
<th>Submission from Nordiko:</th>
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<tr>
<td>Response to Direction &amp; Minute 6</td>
<td>The submission recognises that Draslovka and Worksafe would be responding to additional field work based on the Directions and Minutes from the DMC. The submitter had comments in relation to field measurement and reporting of results in regards to EDN fumigation of log stacks:</td>
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1. Ensuring an independent assessment organisation is involved in the data collection and reporting process;
2. A demonstration of EDN recapture equipment on some of the log stacks being fumigated is included as there are concerns in regards to the efficiency and other aspects of recapture, and that evaluating recapture would be beneficial as one of the controls under consideration. |

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<th>Port Blakely</th>
<th>Submission from Port Blakely:</th>
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<tr>
<td>Response to Direction &amp; Minute 6</td>
<td>Port Blakely exports to China, Korea and India with &gt;80% of exports requiring fumigation.</td>
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They have acknowledged that other alternatives to methyl bromide such as debarking or joule heating technology are not available or practicable. Therefore, EDN is the best alternative to methyl bromide.

Port Blakely wishes to encourage DMC to provide a decision soon so the industry can prepare for October 2020 as the consequence of no replacement for methyl bromide as this would be significant to their business and the forestry industry.

Submission from Quarantine Scientific Ltd:

The submission acknowledges that EDN research provided to the EPA by Plant and Food Research (PFR) which included toxicity to target insects, penetration characteristics, exposure measurements and air quality sampling in the field is supported by Draslovka and STIMBR. The results of the studies suggest that EDN is a suitable replacement for methyl bromide and can be safely used for phytosanitary treatment of logs in NZ.

The submitter stated that it is now 20 months since the application was submitted in July 2017 and no decision has yet been made. The submission requests that the DMC makes a decision in a timely manner to approve EDN in order to replace methyl bromide by October 2020. Furthermore, it recognised that EPA approval does not mean that EDN can be used immediately as it requires other regulatory bodies to consent to the use of EDN.

Submission by STIMBR:

The submission acknowledges the need for the DMC to request further information. STIMBR has been working with Draslovka to provide commercial scale confirmatory tests to assist the DMC and Worksafe in
<table>
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<tr>
<th>21/04/19</th>
<th>Applicant Abstract of Russian timber study</th>
<th>EDN timber study from Russia</th>
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<tr>
<td></td>
<td>New_information_Russian-EDN-timber-study.pdf</td>
<td>This abstract was provided as part of the EDN registration process in Russia conducted by the Noborossiysk branch of the Russian fumigation group, Moscow at Apcharovsk, Krasodar Krai in December 2018. The study used 2.5 kg of EDN product at a dose rate of 50 g/m³ during 8 hour treatment period on Oak and Pine wood. A treatment tarpaulin used had a 15 m buffer zone. Atmospheric EDN concentration during application, treatment and ventilation periods was measured at 5, 15, 100 and 200 m of the treatment tarp using MSA Ultima XA safety detector. EDN concentrations inside the tarpaulin were also measured.</td>
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<tr>
<td>Applicant</td>
<td>Article on using EDN on bark beetle in Czech forests</td>
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<td>New_information_First_Trial_Results_EDN - Used_for_Forest_Protection_in_the_Czech_Republic_2017.pdf</td>
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</table>

EDN concentration inside the tarpaulin declined to 8 g/m³ after 8 hours of the fumigation period with the remaining concentrations ventilated into the atmosphere. The results showed EDN concentration was not detectable at 5, 15, 100 and 200 m from the tarpaulin from upwind and downwind directions. It was concluded that a 15 m buffer zone would be considered safe to protect bystanders and non-target organisms.

<table>
<thead>
<tr>
<th>Applicant</th>
<th>Summary of presentation “Commercial Fumigations of Wood in Czech forests – first experiences”</th>
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</table>

Article on using EDN to fumigate against bark beetle in forests in the Czech Republic

This article presents experiments on log fumigation on the bark beetle using EDN and another fumigant, BLUEFUME (stabilised hydrogen cyanide).

The article states EDN is best suited for log fumigation (based on chemical properties and commercial testing).

Using a wood pile of 80 m³ and a loading factor of 62%, tests were conducted exposing EDN to the wood pile for 7 hours and 45 minutes, with EDN concentration monitored throughout.

A total of 6.5 kg, with the initial dose of 50 g/m³ of EDN was applied at two entry points of the pile, at around 60 cm above the ground

EDN concentration decreased over time during treatment, depicted in the two charts within the article.

The article concludes by stating EDN shows 100% efficacy against all present bark beetle species.

<table>
<thead>
<tr>
<th>Applicant</th>
<th>Summary of presentation “Commercial Fumigations of Wood in Czech forests – first experiences” MBAO conference, Orlando, Nov 2018</th>
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<td>This summary discusses the two studies for EDN that were presented at the MBAO conference.</td>
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</table>

October 2019
The first was an efficacy study using EDN on a number of bark beetle insects, while the other was conducted to determine EDN and HCN concentration in the log stack.

In the efficacy study, logs were placed under a tarpaulin.

The treatment volume was 86 m³ (this was incorrectly presented to the conference as 150 m³).

The loading factor was 62% (i.e. around 53 m³ of wood in 86 m³ volume), with a fumigation dose of 50 g/m³ over a 10 hour period. A total of 4.3 kg of EDN was applied.

EDN concentration declined over the 10 hour treatment period, with the average concentration at 2.2 g/m³ at the end of treatment (measured at three sections under the tarpaulin – the highest level being 2.5 g/m³ after 10 hours).

A 100% control of the bark beetles in the treated logs.

In the second study, 2 m Norway spruce logs were fumigated, with a total treatment volume of 1496 m³.

The loading factor was 64%, with a fumigation dose of 50 g/m³ over 10 hours. The total amount of EDN applied was 75 kg, taking approximately 20 minutes.

A number of instruments were used to measure EDN and HCN during fumigation and ventilation, including a GC instrument (Shimadzu GC-17A), MSA Ultima XA 6 detectors - for EDN detection - and GasAlert 4 detectors - for HCN detection - (measured 10 m from tarpaulin during fumigation and 20 m from tarpaulin during ventilation in all four directions), Gasmet DX4040 (measured 20 m downwind from tarpaulin during ventilation) and LumaSense INNOVA 1412i (measured 10 m downwind from the centre of the log pile).
The results found that EDN concentration declined over the 10 hour treatment period (one hour before ventilation it measured at the top and bottom of the stack at 3.8 g/m³ and 4.1 g/m³, respectively). HCN concentration remained constant during the fumigation process.

The monitoring equipment found:
- no EDN or HCN 1.5 hours after ventilation;
- no EDN or HCN 10 m from log stack during fumigation;
- immediately after ventilation, LumaSense measured a maximum EDN concentration of 88 ppm for the first 20 minutes, 16 ppm between 20 to 40 minutes and 3 ppm between 40 to 60 minutes.
- Immediately after ventilation, Gasmet measured 0 ppm during the three sampling periods, 0 to 20 minutes, 20 to 40 minutes and 40 to 60 minutes.
- MSA and GasAlert measured 0 ppm at the three sampling periods, 0 to 20 minutes, 20 to 40 minutes and 40 to 60 minutes.

Article on using EDN to eradicate *Bursaphelenchus xylophilus* in South Korean forest

This article from Byung-Ho Lee, et al, provides preliminary data on the EDN laboratory fumigation trials on pine logs for the eradication of the nematode *Bursaphelenchus xylophilus* and its vector insect *Monochamus alternatus*, in two pine log moisture content ranges (from 15.6% to 24.9% and 30.9% and 35.6%), at three different temperatures, 5 ± 1°C, 12 ± 1°C and 20 ± 1°C.

The article also provides worker exposure data from trials on pine logs covered with PVC tarpaulin, using a threshold limited value (TLV) of 10 ppm as the baseline. The 10 ppm limit is considered the maximum level
where adverse effects should not be caused with ongoing exposure. These trials are conducted.

Laboratory fumigation trials: 8 L glass desiccators acted as the fumigation chambers.

For the fumigation of *B. xylophilus*, three pinewood samples, each infested with about 150–210 individuals, were placed into individual unsealed desiccators and left overnight at 5 ± 1°C and 70% relative humidity prior to treatment the following morning.

For the fumigation of *M. alternatus* 10 glass jars were used, containing one larva (plus a little sawdust as a food source) were placed into individual unsealed desiccators, to avoid cannibalism, and left overnight at 5 ± 1°C, 12 ± 1°C or 20 ± 1°C, and 70% relative humidity prior to treatment the following morning.

EDN was then injected into the covered desiccators and stirred for 10 minutes. Concentrations of EDN ranged from 4 – 40 g/m³, with different doses used in replicates.

Fumigation of *B. xylophilus* involved two replicates for each of the two moisture content ranges, with the lower moisture content receiving eight and six different doses, respectively, while the higher moisture content replicates received seven different doses each. The fumigations were performed under a temperature of 5 ± 1°C.

Fumigations of *M. alternatus* involved three replicates at each temperature, each receiving eight different doses of fumigant.

Sample were fumigated for six hours and aerated for 24 hours following fumigation. EDN concentrations were measured at 0.1, 0.5, 1, 2, 3, 4, 5 and 6 hour mark. For both species, mortality rates were evaluated 72 hours later.
For *B. xylophilus*, at 5 ± 1°C, shows EDN is more effective at lower moisture conditions. It was stated that there was a large degree of variation in the data and a higher moisture content appears to be favourable for the abundance of nematodes. As fumigation of *B. xylophilus* was only carried out at 5 ± 1°C, further research would need to be carried out.

For *M. alternatus*, EDN was most effective at higher temperatures but values were not significantly different when compared to the lowest temperature, although large variation in data between 5 ± 1°C and 20 ± 1°C was observed.

Pine log fumigation trials covered with PVC tarpaulin: These trials looked at the same two species as the laboratory trials, *B. xylophilus* and *M. alternatus*, as well as worker exposure.

These trials were conducted in three different temperatures, 21–33°C, 6–12°C and −1–3°C and were not replicated. These trials also looked at the same two species, *B. xylophilus* and *M. alternatus*.

The fumigation chamber sizes varied, with 107 m³ used for temperature range 21–33°C, 50 m³ for 6–12°C and 108 m³ used for −1–3°C.

A loading factor (volume of logs over total volume x 100) of 46% was used for trials at the temperature ranges of 21–33°C and 6–12°C, while 30% was used for −1–3°C.

Fumigation dose rates at 21–33°C were 100 g/m³, at 6–12°C they were 120 g/m³ and at −1–3°C they were 150 g/m³.

High doses of EDN were used due to the higher moisture content of the logs.
Application for approval to import EDN for release (APP202804)

During the trial period, gas samples were taken from inside the fumigation chamber at 0.5, 1, 2, 4, 8, 16 and 24 hours. After 24 hours the tarpaulin was opened and logs were aerated for 24 hours.

The average wind speed at the lowest temperature (3 ± 1°C) was 3–5 m/s, at mid-temperature (10 ± 4°C) it was 2–3 m/s and at the highest temperature (23 ± 4°C) it was 3–5 m/s.

Higher than expected cumulative Ct (the concentration x time (g h/m³)) products of EDN were observed: 398.6 g h/m³ at 21–33°C, 547.2 g h/m³ at 6–12°C and 595.9 g h/m³ at −1–3°C after 24 hours of exposure.

Mortality rates were evaluated 72 hours after ventilation. The trials achieved a 100% mortality rate.

The article suggests the amount of EDN is more important than time when fumigating to eradicate target organisms.

For worker exposure, air samples were collected downwind for the tarpaulin at 5, 10 and 20 m at a height of 1.8 m.

At 23 ± 4°C (high temperature trial site), with a wind speed of 3-5 m/s, the fumigation chamber, opened at the edge of the tarpaulin, saw EDN fall under the TLV 1 hour (at 5 m) and 0.5 hours (at 10 m) after aeration.

At 10 ± 4°C (mid-temperature trial site), with a wind speed of 2-3 m/s, and at 3 ± 1°C (low temperature site), with a wind speed of 3-5 m/s, the fully opened fumigation chambers saw EDN levels fall under the TLV at 1 hour (at 5 m) and 0.4 hours (at 10 m).

Measurements taken 20 m downwind from the fumigation chambers opened at the edge or opened fully for aeration were never above the TLV level.
The article concludes stating EDN should be pursued as an alternative to methyl bromide in Korea, with expense and hazards associated with its use needing to be taken into consideration.

Summary presentation for EDN trial in South Korea

These slides provide commercial application data on mortality rates of the target pests, Reticulitermes speratus (Japanese termite), Cryptalus fulvus (Yellow minute bark beetle), Monochamus alternatus (Japanese pine sawyer) and Bursaphelenchus xylophilus (Pine wilt nematode) for New Zealand pine, after a 24 hour fumigation.

Data was gathered from three trials and each trial was broken into two sub-trials where two sets of pests were targeted, R. speratus (Japanese termite) and C. fulvus (Yellow minute bark beetle) were targeted together and M. alternatus (Japanese pine sawyer) and B. xylophilus (Pine wilt nematode) were targeted together.

The data also showed worker exposure using a threshold limited value (TLV) of 10 ppm as the baseline, looking at both "edge open" ventilation and "full open" ventilation. Measurement data displayed the concentration of EDN taken from inside the fumigation chamber, and at 5 m, 10 m and 20 m downwind from the PVC tent.

Data was gathered from the three trials, using three temperatures (20 ± 7˚C, 10 ± 4˚C and 1 ± 5 ˚C). At each trial, the fumigation chamber varied in size from 107 m³, 50 m³ for temperatures 20 ± 7˚C and 10 ± 4˚C, respectively, and 108 m³ and 98 m³ for 1 ± 5˚C.

The trial at 20 ± 7˚C had a loading factor of 46%, the trial at 10 ± 4˚C had a loading factor of 45% and the trial at 1 ± 5˚C had two loading factors of 46% and 30% at each sub-trial.
The dose rates of EDN vary between the three temperatures, with 30 mg/L and 100 mg/L used at 20 ± 7°C, 40 mg/L and 120 mg/L used at 10 ± 4°C and 40 mg/L and 150 mg/L used at 1 ± 5 °C.

The data shows 100% mortality rate at each trial.

At the 20 ± 7°C trial sites, with a wind speed of 3-4 m/s, edge open ventilation saw EDN fall under the TLV six (6) hours after ventilation. Full open ventilation saw EDN fall under the TLV one (1) hour after ventilation.

At the 10 ± 4°C trial sites, with a wind speed of 2-4 m/s, edge open ventilation saw EDN fall under the TLV two (2) hours after ventilation. Full open ventilation saw EDN fall under the TLV one (1) hour after ventilation.

At the 1 ± 5 °C trial sites, with a wind speed of 3-4 m/s, edge open ventilation saw EDN fall under the TLV two (2) hours after ventilation. Full open ventilation saw EDN fall under the TLV one (1) hour after ventilation.

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**Applicant**

South Korean registration certificate


South Korean registration certificate

This is a registration certificate from the Rural Development Administration in South Korea for EDN (trade name STERIGAS), from registrant FarmHannong Co., Ltd.

They have listed the target crop as timber (pine) and the target pest as pine weevil and white ant.

The dilution rate of EDN is 50 g/m³.

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**Applicant**

PFR slides from presentation

[New_information_PFR_Update_Completed_EDN_Laboratory_Efficacy_Research.pdf](New_information_PFR_Update_Completed_EDN_Laboratory_Efficacy_Research.pdf)

Plant and Food Research (PFR) slides on EDN laboratory efficacy research
These slides come from the New Zealand Institute for Plant & Food Research Limited (Plant and Food Research) for ‘Developing EDN science-based fumigation schedules’.

Their EDN research programme uses the lessons learnt from their MB (methyl bromide?) programme. These lessons were broken down in to three phases.

Phase 1: Find the most tolerant species life stage (using three different species); examine sorption and desorption (using Radiata pine planks).

For the most tolerant species life stage, Plant and Food subjected the three species to EDN at two different temperatures. They found eggs were most susceptible at both temperature to EDN.

They also found EDN is highly toxic to all life stage of at least one of the species Arhopalus ferus. The most tolerant species was Hylastes ater at the pupal stage.

For the sorption/desorption using Radiata pine, tests were conducted using 28 L fumigation chambers, with both wet and dry planks, and had an EDN loading factor of 11% and 14% at a dose rate of 20 g/m³ and 50 g/m³. The end grain of the planks was also sealed and unsealed. Tests were conducted at 15˚C for 10 hours, with four replicates per factor.

Plant and Food found that the loading factor is more important for EDN sorption than moisture content end-grain sealing and dose (these had minimal effects).

Phase 2: using the most tolerant insect (H. ater) for testing.

Testing was conducted at three temperatures, 5˚C, 10˚C or 20˚C, over a 24 hour period.
Eight EDN concentrations were conducted at each temperature with three reps per temperature, with three infested logs per concentration/temperature.

Plant and Food found EDN efficacy was significantly affected by temperature. Mortality rates were higher at 5°C or 10°C and lower at 20°C.

The effectiveness of EDN decreased when volume of fumigated space and logs increased, particularly at 10°C.

Phase 3: Large scale confirmatory tests: as yet there is no information available.

<table>
<thead>
<tr>
<th>Applicant</th>
<th>Draft of efficacy data</th>
<th>15/05/19</th>
<th>Applicant</th>
<th>A further draft of efficacy data</th>
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<tbody>
<tr>
<td>Overview</td>
<td>Overview of EDN experimental Data from International Studies</td>
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<td>Overview of EDN experimental data from international studies</td>
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Global analysis of International EDN studies where reviewed to compare data sets against EDN research conducted in New Zealand.

The reports referred to in the discussion paper were conducted in different countries, using different tree species, targeting different pests and conducted by different researchers using different experimental designs. This meant tests varied quite significantly. However, there were some over-arching trends that did emerge.

- EDN was effective against all targeted pests;
The concentration of EDN decreases over time under tarpaulin (or sheet) in all tests by the end of fumigation;

Only small amounts of EDN is released into the atmosphere when venting occurs;

EDN does not "pool" of linger in fumigation areas during the ventilation process.

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<th>Date</th>
<th>Description</th>
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<tr>
<td>20/05/19</td>
<td>Applicant Draft Occupation Health Hygienist report</td>
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<tr>
<td>14/06/19</td>
<td>Applicant Final Occupation Health Hygienist report</td>
<td>[Summary of 'Final Occupation Health Hygienist report']</td>
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Derek Miller, a certified occupational hygienist, was asked to write a report on potential worker exposure to EDN during key fumigation tasks. Worker exposure data was obtained from eight (out of nine) fumigations, from four confirmatory tests.

The four confirmatory tests were as follows:

- The first test (test 1) had fumigations using 120 g/m³ EDN over a 24 hour period, with three replicates. No environmental data was collected from the first replicate of this test.
- For the second test (test 2), fumigations used 120g/m³ of EDN for either a 16 hour or 20 hour period.
- The third test (test 3) had fumigations using 80g/m³ or 100g/m³ of EDN over a 20 hour period.
- Finally, the fourth test (test 4) saw two more replications of fumigations at 100g/m³ over a 20 hour period.

Further information: Environmental and Worker Exposure data - June 2019.pdf
Air samples were taken to monitor EDN concentrations during the fumigation of log stacks, from the injection of EDN into the log stack, through to the fumigation and ventilation processes. EDN was monitored via air samples at 5 m and 20 m from the fumigated log stacks, on all four sides. Samples were analysed using a GC instrument (it requires a 3 min processing time so the amount of data that can be collected at any given time could be limited). The GC could only detected concentrations more than or equal to 1.0 ppm.

Gas samples were taken at 1 m, 5 m and 20 m from the log stacks but because of the time between each sample, worker exposure EDN could not be calculated accurately.

EDN was monitored on confirmatory tests 1, 2 and 3 using a handheld MSA Ultima XA gas detector, with a detection range of 1 ppm to 50 ppm, with a response time of 10 seconds.

If the MSA detector is exposed to a high level of EDN it may produce false positives until fresh air has passed over it. It can also detect higher readings if more than one chemical is present.

Personnel who were working in the immediate area during the fumigation process had MSA detectors placed or held at “breathing height” (considered to be 15-20 cm from the worker’s nose). False positive readings were more likely with MSA detectors than the GC. As a result, for test 4, a Gasmet detector was used.

Gasmet DX4030 was used to detect any EDN present in the air (recorded as cyanogen). Gasmet is not able to provide instantaneous readings of EDN present. Environmental measurements were made 10 m downwind from the log stack. It was concluded that Gasmet was useful in an experimental setting but is not a commercially viable option for monitoring EDN.
Data was collected for worker exposure from around the log stack, from the beginning of the fumigation process up until 5 hours after the removal of the tarpaulin from the log stack. Initial trials collected data from all four sides of the log stack, while later trials did not record any data upwind of the log stacks.

Overall, measurements were taken at various distances from outside of the log stack: 1 m (checking for leaks and for 2 hours after the removal of the tarpaulin); 5 and 10 m (these distances had more of a focus on them as it was found trials at 20 m showed levels of EDN at zero); 20 m (this is the proposed buffer zone distance for workers without needing any PPE for EDN).

Using the Gasmet, measurements were also taken from 1 m from the log stack several hours after ventilation in test 4 to assess acceptable re-entry levels for unprotected workers.

Some leakage was detected at low levels during three of the treatments at either 5 m or 20 m, likely due to minor tears in the tarpaulin. These levels quickly dissipated and tears were repaired.

During ventilation, EDN was detected downwind for the log stack but it quickly dissipated and the proposed WES of 5 ppm was not exceeded at 20 m, however, one sample did exceed 3 ppm at 20 m (WorkSafe has nominated a WES of 3 ppm and a ceiling WES of 5 ppm).

Small pockets of EDN do seem to get trapped in log stack but they quickly dissipate once tarpaulin is removed.

Using the MSA monitor saw the detector being overloaded on two occasions (≥ 50 ppm), these may have been false positives.

On two occasions the driver of the forklift who had to remove the tarpaulins from the long stacks was downwind from these stacks, not the
usual position for a worker carrying out this task. This exposed the driver to some level of EDN.

The report finds that all results suggest exposure to EDN would not be expected to exceed the short term exposure limits (STEL) under normal conditions. The STEL is the acceptable average exposure over a short period of time, usually 15 minutes, as long as the time-weighted average is not exceeded.

From the report: ‘Efficacy of ethanedinitrile (EDN) as a fumigant for export logs’

The tests conducted were to demonstrate efficacy of EDN at different concentrations and fumigation times. These were called Confirmatory test No. 1, with three replications of fumigations using EDN at 120 g/m³ for 24 hours, Confirmatory test No. 2 with fumigations using EDN at 120 g/m³ for either 16 hours or 20 hours, Confirmatory test No. 3 with fumigations using EDN at either 80 g/m³ or 100 g/m³ at 20 hours and Confirmatory test No. 4, two replications for fumigations using EDN at 100 g/m³ for 20 hours – produced to provide three replicate data sets of fumigation at 100 g/m³ for 20 hours.

*Hylastes ater* was the species used for these tests as this was considered the most EDN-tolerant species at their pupal stage.

Loading factors for the log stacks was approximately 58-59% - these were calculated by multiplying the log weight (tonnes) by a factor of 1.7 m³, then dividing the weight of logs by the product and multiplying that answer by 100.

Wind speed (including wind gusts) averaged between 0.45 to 20.5 km/h. Mortality rates were typically 100%, however, in test No. 4, mortality rates fell between 98% and 100%.
EDN concentrations under the tarpaulin were concluded to have decreased relatively rapidly over time, with the sorption percentage consistent during most tests. The report states that less than 1% of the applied concentration remained at the end of fumigation. Therefore, no scrubbing was needed.

Fumigation at 100 g/m³ for 20 hours was found to be appropriate, while fumigation at 120 g/m³ for 24 hours would be excessive.

The report goes on to say that the proposal to use EDN at 150 g/m³ for 24 hours is again excessive and a 100% mortality rate for *H. ater* is still achievable at 100 g/m³ for 20 hours.

Stefan Browning (Tauranga Moana Fumigation Action Group and Soil & Health Association National Council) comments on new information


Stefan has attached a power point presentation entitled ‘*EDN + H2O = HCN – EDN log fumigations…Are they as safe as is being claimed?’”

Stefan discusses in his email two points: that liquid phase hydrogen cyanide appears to have been overlooked in the information gathered from the applicant and Genera and the concern over the log stack trials.

For the liquid phase hydrogen, he says there has not been any testing done on moisture under the tarpaulin or covers of fumigated log stacks, within the logs themselves or on any surface water adjacent to the log stacks. This could have the potential for contaminated runoff. He also notes that fumigations do not cease in wet weather conditions.

Stefan wonders if the EDN application is also effectively a hydrogen cyanide application and thinks that an assessment of hydrogen cyanide
as a fumigant for logs would be appropriate before any possible approval of EDN.

For the log stack trials Stefan discusses concerns over the unexpected release of EDN during the trials through tears in the tarpaulins, requiring repairs. This shows the risk of fumigation under tarpaulin or similar covers and shows the need for wider buffer zones.

Stefan is also concerned about the removal of tarpaulins after fumigation. In the report ‘Efficacy of ethanedinitrile (EDN) as a fumigant for export logs’ it states that tarpaulin was removed in one-fourth increments (the report states it takes around 15-30 mins), whereas, Tauranga Moana Fumigation Action Group has witnessed tarpaulins being removed by Genera staff and they that they are not removed as slowly as the report would suggest with removal completed in 1-1.5 mins.

Finally, the email from Stefan discusses how STIMBR blocked or were not willing to coordinate trials for methyl bromide recapture.

Additionally, from the powerpoint presentation, there were claims that EDN concentrations has been underestimated as the log volume values calculated are lower than actual log volumes in commercial log stacks.
Application for approval to import EDN for release (APP202804)