

16 December 2019

Genera Limited  
C/- Beca  
PO Box 903  
TAURANGA 3140

Attention: Keith Frentz

Via email - keith.frentz@beca.com

Dear Keith

**Resource Consent Application RM19-0663: Genera Limited – Request for Further Information (s92 RMA)**

Following an initial review of the application, it is considered that it is able to be accepted for processing under section 88 of the RMA. However, we request the further information as outlined below, in order to better understand the nature of the application and the potential effects of it. For completeness, the Bay of Plenty Regional Council has engaged the services of Jennifer Barclay of ASG and Kevin Rolfe of Kevin Rolfe Consulting Limited to assist in the assessments of the modelling and air quality assessments.

1. FUMIGANTS

The application is seeking authorisation for the discharge of a number of fumigants (Methyl Bromide, Phosphine, EDN, VaporMate (Ethyl Formate), Pestigas (a natural Pyrethrim) and synthetic Pyrethroids, including other phytosanitary fumigants authorised by the EPA. However, the AEE does not provide a comprehensive assessment of the proposed application and potential effects associated with the use of these fumigants (other than Methyl Bromide).

- a) **As a result, please provide a comprehensive assessment of the proposed methodology for the use of Phosphine, EDN, VaporMate (Ethyl Formate), Pestigas (a natural Pyrethrim) and synthetic Pyrethroids that are being sought as part of this resource consent application. Such an assessment should include information on the methodology employed for fumigation activities using each of the proposed contaminants, including the need for recapture and ventilation following fumigation, concentrations at the time of ventilation, fumigation methodologies including what type (and specification) of meters that will be used to monitor the proposed fumigants and methods for managing the rate of discharge. Additionally, please provide a complete assessment of potential effects associated with the same.**
- b) **The AEE states, at section 7.3.9, that the application for the discharge of Phosphine is a 'precautionary one', and only needed if there is an accidental discharge while a ship is docked. This section does not, however, quantify the effects of such a discharge. Additionally, and for clarity, please confirm that 'ordinarily' the discharge of Phosphine from the venting of ships will not take**

**place within the Bay of Plenty Region and therefore does not require resource consent by the Regional Council.**

- c) **The application makes reference to the Worksafe document ‘Workplace Exposure Standards and Biological Exposure Indices (November 2018)’ with regard to the use of Phosphine. However it is unclear if the proposed use of Phosphine is to be consistent with this document. Please clarify.**

I note that the application states that the methodology for the use of fumigants that are yet to be authorised by the EPA or Worksafe will be finalised following the appropriate authorisations and will be administered in accordance with the requirements of these organisations. Whilst this approach may be appropriate in general terms, it is noted that the proposed fumigation sites at the Port of Tauranga have specific characteristics that are unique to this location and as a result, the general conditions applied in the EPA or Worksafe authorisations may not be appropriate in all cases. Therefore, the requested assessment of effects should provide consideration of the application of the fumigant specifically at the Port of Tauranga.

## 2. CONTAINER FUMIGATIONS

The resource consent application is seeking the discharge of substances associated with the fumigation of containers with Methyl Bromide. It is noted that the fumigations are proposed to be undertaken at the Sulphur Point wharfs, however the area that these activities are to be undertaken in is not shown on the map in figures 3-4 (page 13).

- a) **Please provide an updated map to show the extent of the container fumigation area.**

Additionally, section 7.3.7 of the application identifies that 100% of container fumigations are subject to effective recapture and therefore the potential effects from them are considered to be no more than minor. However, the proposed definition of effective recapture in the application means that the ventilation of the containers following fumigation will result in the discharge of methyl bromide to air (albeit a limited volume).

- b) **Please provide further information quantifying the concentration of the discharge and if the volume of Methyl Bromide remaining at the time of ventilation varies depending on the material being fumigated. The response should provide a comprehensive assessment of environmental effects resulting from the ventilation of containers and the physical extent of the discharge.**

## 3. EFFECTIVE RECAPTURE

The application identifies that fumigations will be subject to effective recapture. However, it does not identify the methodology for certifying that the recapture of Methyl Bromide under the sheets has achieved the requirements to meet the definition of effective recapture. Put another way, it is unclear if monitoring of the concentration of Methyl Bromide under the sheets is the means proposed to certify that the recapture process is complete.

- a) **Please clarify the methodology for certifying that the effective recapture of Methyl Bromide has been completed to enable venting. Please note that such methodology should be provided for all fumigation activities, including container, log row and break bulk activities.**
- b) **If the methodology includes the monitoring of concentration levels under the sheets, please provide information on the concentration level proposed to be indicative of recapture being completed (including the justification for this concentration).**

On page 21 of the application, is it stated that 'Nessie' can recapture Methyl Bromide from three log stacks at a time. However, there is little quantitative data of the effectiveness of these recapture events.

- c) **Please provide information on the level of efficiency of the recapture proposed by 'Nessie' and the duration that this recapture is based on?**

The application indicates that there are two forms of recapture, carbon and a liquid scrubber. However, there is no information on the disposal process associated with the recaptured Methyl Bromide (or any other proposed fumigant) or the recapture material used. Additionally, the application is not clear on the location, volumes and procedures associated with the storage of fumigants and the destruction of recovered fumigants and by-products, including if other resource consents are required.

- d) **Please provide further information identifying procedures associated with the storage of fumigants, and the method of disposal for used/recovered fumigants and their associated by-products. Additionally, please clarify if additional resource consents are required for these activities.**

The application notes that currently the technology to recapture Methyl Bromide from ship holds is not adequate.

- e) **Please provide clarification on if Genera is currently in the process of developing recapture technology associated with the fumigation of ship holds. If this is the case, what recapture efficiency is likely to be achieved and is it anticipated that the recapture of fumigants from ship holds will form part of this resource consent in the future, in what timeframe?**

#### 4. DISCHARGE DATA

It appears that the historical discharge data provided in the application and relied upon in the modelling are averages of the WES and TEL data. It is understood that accepted practice (in guidance by the EPA) is that full data sets are to be used for this purpose, rather than averages.

- a) **Please provide the full 'raw' data set for the historical monitoring undertaken (such as hourly emission records) and update the model using the same. Additionally, figures 5-1 and 5-2 depict monthly averages of TVOCs rather than a record of real time or hourly readings. Please update the figures to reflect the EPA guidance.**
- b) **Please provide all canister Methyl Bromide sampling results that Genera holds, in conjunction with information on associated fumigation activities, locations, meteorological data and PID data, for the previous five year period or timeframe relied upon in the modelling.**
- c) **Please provide any raw data from the PIDs that fumigation staff wear during fumigation operations for the previous 12 month period or timeframe relied upon in the modelling.**

#### 5. CULTURAL EFFECTS

The application notes at section 7.5 that an Assessment of Cultural Effects will be completed and provided to BOPRC 'in due course'.

- a) **Please provide the Cultural Effects Assessment.**

#### 6. MONITORING

Section 4.3.2 of the application references a monitoring protocol associated with the recapture of Methyl Bromide within the headspace of log stacks. The application states that this monitoring report is attached as Appendix E of the application. However, the report is not attached as Appendix E.

- a) **Please provide the report of the monitoring prepared for Genera for the BOPRC and referenced in section 4.3.2 as being in Appendix E.**

Additionally, it is understood from the application and monitoring data provided that the active monitoring undertaken during ventilation activities can vary in effectiveness, given the fluctuating weather conditions experienced at the Port environment. Further, this active monitoring is identified as a significant mitigation tool for maintaining safe worker exposure distances. In light of that, it is unclear in the application if the 8-hour WES provides appropriate protection to worker health.

- b) **Please provide an assessment of the appropriateness of the 8-hour WES in monitoring the protection of worker health. Additionally, the assessment should provide further modelling to determine probabilistic exposure distances for each fumigant proposed for use on the Port.**

## 7. LIMITS/ESR ASSESSMENT

The ESR report provides a comprehensive assessment of the general toxicology associated with the use of Methyl Bromide as a fumigant. However, it is considered that it doesn't adequately provide for the development of air quality criteria that can be used for the air dispersion modelling to determine the extent of effects on the environment and people. Further, in this instance, the discharge of fumigants is proposed to be undertaken for a number of short-term duration events or varying sizes, concentrations and locations. As a result, it is considered that the key matter of consideration is the acute exposure, up to a maximum of 24-hour averaging times, of people (both workers on the port and people exposed beyond the port boundary (in particular the vulnerable such as infants and the elderly)).

- a) **Please review the air quality criteria contained in the ESR assessment, to provide specific consideration for the short term nature of the fumigation activities and the unique characteristics of the Port of Tauranga site. Currently, it is considered that the ESR assessment draws some general conclusions with regard to exposure limits. However given the nature of the exposure, being intermittent short term high exposures, it is considered that further analysis is required to identify the appropriate exposure limits that are applicable in this instance for each of the different fumigants. Such an approach may be the identification of 24-hour, 60-minute and 10-minute exposure limits, although the analysis will require specific assessment of the criteria considered to be appropriate. This analysis is required for each of the fumigants proposed to be used. It is noted that the atmospheric dispersion modelling will require updating to reflect these values.**

It is unclear why the application has identified Phosphine as having a 15-minute Short Term Exposure Limit and Methyl Bromide (and the other proposed fumigants) do not, especially given the very high concentration releases of Methyl Bromide at ventilation from both ship holds and log piles.

- b) **Please clarify if the application is seeking to impose a STEL on all fumigants. Additionally, please clarify the formula for determining the STEL in each instance and if the formula includes the use of models based on a distance**

approach. Note that the analysis required by a) above may address this matter.

## 8. OPERATIONS

The application is unclear on the scale and frequency of log row fumigations.

- a) **Please provide a definition for 'fumigation area' and 'fumigation event' that are referred to in the application documents.**
- b) **What are the maximum number and size of log rows proposed to be fumigated over 1 hour and 24 hour periods?**
- c) **What is the maximum number of log rows that are proposed to be fumigated within a 'fumigation event'?**
- d) **What is the maximum amount of MB used in a single log row fumigation?**

The Proposal relies on the management of fumigation events subject to weather conditions, including wind speed and temperature inversion conditions. However, it is unclear how these conditions are monitored, and appropriate actions taken in practice.

- e) **Please provide further information to outline the procedures that are in place, or proposed, to determine whether the wind speed limit for covering logs or the restrictions on ventilation when temperature inversion conditions are present. This information should include monitoring equipment proposed to be used to provide up to date weather conditions.**

The application identifies that fumigations can occur within sheds. However, there is little information on what fumigation activities are undertaken within sheds, how frequently these events occur, what volumes of fumigant are used (it is assumed that it is Methyl Bromide) and if recapture procedures are used.

- f) **Please provide information on the methodology for undertaking shed fumigations, including the frequency, type of fumigant used, volumes and use of recapture technology.**

The application provides reference in the Fumigation Management Plan to an Emergency Management Plan (in Appendix 4) that addresses emergency procedures associated with the accidental release of fumigants into the environment. The appendix is not provided.

- g) **Please provide the appendices to the Fumigation Management Plan, including the Emergency Response Plan. Additionally, please clarify if regular exercises or meetings are held between Genera and emergency authorities, if so, please provide records of the same.**

## 9. MODELLING

Table 5 states that an assumption of the model is the discharge of 450 kg/hour of Methyl Bromide.

- a) **Please clarify if this volume represents the discharged mass or the original introduced mass of MB prior to absorption.**
- b) **Please confirm the size (dimensions) of a single typical log pile and a maximum log pile proposed to be fumigated. Additionally, please update the**

**model to reflect these dimensions, the location and number of log piles fumigated at one time and the amount of fumigant used as a consequence.**

- c) Are log piles ever fumigated in the evening? i.e., after work hours? Are there any different modelling results from undertaking fumigations at different times of the day or night? Please clarify and provide.**
- d) Please clarify what a dosage of 450 kg/hr means in so far as a single typical log pile prior to absorption and at ventilation?**
- e) How many log piles were typically fumigated to meet the criteria of 450kg/hr dosage?**
- f) Does Genera only ventilate those same logs that it fumigated at 450kg/hr, i.e., is this a one:one relationship of dosage to ventilation?**
- g) Why was Methyl Bromide usage capped at a maximum of 450 kg/hr?**

Additionally, the modelling assumptions and calculations do not clearly identify the parameters of a log row and as a consequence there is uncertainty regarding the accuracy of the modelling conclusions provided. For example, the model appears to assume that fumigations will use 450kg/hr of Methyl Bromide for an entire location. However, a location can consist of 3 log piles or 23 log piles. As the emissions are additive, the outcome of the discharge can vary considerably depending on the scale of fumigation actually occurring and consequently from the effects that would be experienced on the ground. As a result, the initial review indicates that such an approach generates an underestimation of emission rates.

The application identifies that the emission rate at a single location is capped at a Methyl Bromide usage of 450kg/hr, which for a medium size log pile at an application rate of 80 g/m<sup>3</sup> is approximately 5-6 log piles. It is understood that in reality there have been many ventilation events with many more log piles than the 5-6 log piles modelled. Golder limited the amount of Methyl Bromide that can be released in an hour, in order to maintain the total amount of Methyl Bromide that can be released for longer periods, i.e., a day or year. Because Methyl Bromide fumigations don't happen continuously the long time period of Methyl Bromide use is not an issue, but the short term usage is. It is understood that in reality, tarpaulins can be removed two at a time, or within a few minutes, and sometimes ten minutes. This means that multiple log piles can be ventilated within the first 30 minutes, i.e. more so than what has been modelled here. To displace hour 1 venting to hour 2 is to significantly reduce the actual emission rate, and therefore peak concentration.

- h) Please amend the model to reflect the short term discharge of contaminants from the venting of multiple sources within the first hour, as is the current operational practice.**

The modelling indicated that only 35% of the initial dose into the ship holds was available for release at the time of venting. This number was based on one sample conducted on the 19<sup>th</sup> of May 2019. The time the sample was taken after ventilation was not identified. However, it is noted that the assumption of Methyl Bromide available for discharge at the time of venting log piles was 47% and the literature supports a figure in the order of 50%.

- i) Please update the model to reflect a discharge rate that is in-line with the accepted literature and that for log piles. Alternatively, please provide additional justification for the figure that has been modelled.**



The ventilation rate of a ship hold has been assumed to release its headspace within the first two hours of ventilation, and the initial release rate was evenly distributed for the first two hours, (i.e., 17% release for each hour). It is recognised that ship hold ventilation will largely be a function of the wind speed, wind direction and atmospheric stability. It is noted however that for some conditions, it is anticipated that 80% or even 90% will be drawn off within the first hour, not 50% in the first hour and 50% in the second hour. This assumption will reduce the predicted peak concentration and consequently the modelling results.

- j) **Please update the model to reflect the anticipated draw down and discharge for the first hour, based on a range of weather conditions experienced at the Port of Tauranga site.**

In addition to the above, the review has identified that further detail of the model and model assumptions is required, in order to form an understanding of the accuracy of the modelled information.

- k) **Please provide the CALPUFF hourly variable emission file, all model control files and the full model methodology.**

Analysis of the latest modelling results showed that the 1-hour maximum TEL of 1 ppm and 24-hour TEL of 0.333 ppm for log piles and ship holds alone as well as the combined effect of logs and ship holds extended beyond the Port boundary. The 99.9<sup>th</sup> percentile 1 hour value was below the TEL for both the log piles and ship holds alone, and when they were combined. Golders produced contour plots of both the 1-hour maximum and the 99.9<sup>th</sup> percentile, but the AEE only showed the 1-hour 99.9<sup>th</sup> percentile plot in the report. In this instance, it is considered that the 1-hour maximum results are relevant because;

- The 99.9<sup>th</sup> highest ground level concentrations at the Port boundary are below the monitored data at the Port boundary. Therefore in this application the 99.9<sup>th</sup> percentile are not better reported as the maximum.
- The 1-hour maximum ground level concentrations are more in agreement with the monitoring data, and are slightly more conservative. The ten minute monitors recorded several incidents where the peak TVOC at the Port boundary was 0.6 – 4.29 ppm.
- Because of the lack of a short term 10-15 minute exposure limit means that the 1-hour TEL provides more protection both on Port and at the Port boundary than the 99.9<sup>th</sup> percentile.
- The combined combination of meteorological conditions and discharge circumstance are not 'exceedingly rare' (as per ESR). Any meteorological hour with flow from the West, NorthWest or SouthWest, i.e., toward the eastern Port Boundary which occurs for 46% of time for winds < 5 m/s has the potential to cause an exceedance of the TEL at the Port boundary, which is just a couple of hundred metres away. Other meteorological variables such as mixing height are not that important due to the very near field effects

- l) **Please update the analysis to reflect both the 99.9<sup>th</sup> percentile discharge as well as the 1-hour maximum discharge values.**

## STORAGE AND DISPOSAL OF FUMIGANTS

The application is not clear on the location, volumes and procedures associated with the storage of fumigants and the destruction of recovered fumigants and by-products, including if other resource consents are required.

- a) **Please provide further information identifying procedures associated with the**

**storage of fumigants, and the method of disposal for used/recovered fumigants and their associated by-products. Additionally, please clarify if additional resource consents are required for these activities.**

#### ASSESSMENT OF ALTERNATIVES

The application has provided a brief assessment of alternatives in reference to section 105 and the fourth schedule of the RMA. However, there does not appear to be a robust analysis of all alternatives available, such as (but not limited to):

- An alternative to fumigation, such as the debarking of all logs;
- The substitution of fumigants;
- Developments in Recapture technology including Recapture and Destruct and Recapture and Reuse; and
- The undertaking of vessel fumigations (or fumigations that are unable to have effective recapture applied) at an alternative location that is further separated from sensitive activities such as residential areas and sports facilities, such as a different port.

- a) Please provide a comprehensive assessment of alternatives to the discharge proposed in order to identify the best practicable option as it relates to this application.**

#### OTHER INFORMATION

- a) Paragraph 7.3.10 of the AEE states that the Applicant is currently authorised to use fumigants such as VaporMate in its operations and proposes its use in the future. It is unclear if there is currently an authorisation for the use of VaporMate and as such if it forms part of the 'consented environment' as is implied in the AEE. Please clarify. If vapormate (or pestigas and synthetic pyrethroids) have been used in the past, please provide dates of fumigation activities and quantities of each fumigant used.**
- b) Resource consent 62719 authorises fumigation activities at the Port of Tauranga and Genera's Maru Street site. The current application does not appear to seek authorisation for fumigation activities at Maru Street. Please confirm that this is the case.**
- c) Section 2.3.1 of the AEE references Methyl Bromide being a naturally produced gas that generates 1-2 billion kgs/yr. Please cite the original source of this figure and if there are local sources that contribute to concentrations near the Port of Tauranga.**
- d) Please provide any monitoring data from metres placed in any of the business offices located on the Port?**
- e) Please provide information/PID measurements on methyl bromide exposure for Genera staff or Port workers for intervals shorter than 8 hours?**
- f) What Methyl Bromide concentration do the staff personal Methyl Bromide monitors 'alarm' at?**

Once we have received all information necessary to assess the effects of your proposal on the receiving environment, we will continue processing your application.

Please feel free to contact me regarding the requirements of this letter, on 027 455 33 55 or david@enspire.co.nz.

**When and how should I respond?**



In accordance with section 92A(1) of the Resource Management Act 1991 (RMA) you must respond to this request by **28 January 2020**. You may either:

- provide the required information,
- write to us stating that you will supply the required information, but require a longer period in which to do so, or
- write to us stating that you refuse to provide the required information.

### **What happens if I do not respond or refuse to provide the information?**

If you do not respond by **28 January 2020** or respond indicating your refusal to provide the requested information, then under section 92B(2) of the RMA we must continue to process your application, but your application is likely to be notified (incurring extra costs) and/or declined. If we decline your application, you have the right of appeal (s120 RMA) to the Environment Court.

Yours faithfully



David Greaves  
**Enspire**

**for General Manager Regulatory and Customer Service**