

MINIMUM REQUIREMENTS FOR FUMIGATION OPERATIONS AT NORTHPORT



Fumigation Requirements at Northport



Log yard at Northport

Executive Summary

Northport Limited as the owner of the Northport facility is committed to ensuring any operation within the Port is safe and meets all required legislative standards and controls.

To support this, Northport Limited has produced a number of documents specifying general minimum requirements and standards that apply at the Northport facility. This document focuses on fumigation operations. All fumigation operations must meet the minimum standards described within this document. The Northport Ltd requirements are in addition to any statutory requirements under the HSNO Act, the HSWA Act, HSWA Regulations and Safe Work Instruments, EPA Notices and the EPA approval for Methyl Bromide dated 11 August 2021. Additional safety controls may also be required due to the specific hazardous substances being brought onto the facility. Northport documents specifying the general facility health and safety requirements and hazardous substance storage and cargo handling requirements should also be read in conjunction with this document.

Document Revision History

Revision number	Revision Date	Author	Reviewed By	Revision type	Pages Reviewed
issue 1	January 2014	N Dobbs	J Moore	First issue	All
issue 2	July 2015	D Finchett	J Moore	Minor Update	Exec Summary & PSC Terminology
issue 3	February 2023	R Maassen/D Finchett	Management Team	Update to reflect EPA changes from Aug 2021	All

CONTENTS

1.	PART ONE Introduction	6
1.1.	Purpose	6
1.2.	Associated References	6
1.2.1	Consented Activity	6
1.2.2	Compliance with Statute & Guidance	6
1.3.	Conditions for Conduct of Fumigations at Northport	7
1.4.	Overview of Biosecurity & Fumigation	7
1.5.	Background	8
1.6.	Reassessment of Methyl Bromide - Decision dated 11 August 2021	9
1.7.	Methyl Bromide Recapture	10
1.7.1	Recapture Performance Criteria	10
1.7.2	Minimum Buffer Zones Linked to Recapture Performance	10
1.8.	Designated Log Row Fumigation Area	11
1.9.	Recapture Technology	12
1.9.1	Carbon Regeneration Technology	13
2.	PART TWO Operational Requirements	14
2.1.	Port Worker Hazard Awareness	14
2.2.	Training & Certification	14
2.3.	Respiratory Protective Equipment - RPE	14
2.4.	Exposure & Health Monitoring	14
2.5.	Emergency Response Plans - ERP's	14
2.6.	Port User and Bystander Risk Minimisation	15
2.6.1	Restricted Access	15
2.6.2	Temporary Traffic Management & Safe Working Zones	15
2.6.3	Posting of Fumigation Warning Signage	16
2.6.4	Ventilation & Air Quality Monitoring	16
2.7.	Incident Notification	17
2.8.	Fumigation Under Sheets	17
2.9.	Fumigation of Shipping Containers	18
2.10.	Under Deck Phosphine Treatment	18
2.11.	Fumigant Storage	20
2.11.1	Transportation	21
2.11.2	Hazardous Substance Disposal	21
Appendix 1:	Resource Consent - Discharge Contaminants to Air from Fumigation Activities	22
Appendix 2:	Methyl Bromide Health & Safety Information	23
Appendix 3:	Aluminium Phosphide Health & Safety Information	25
Appendix 4:	Emergency Actions	Back Inside Cover

Annual Average Recapture Performance The average reduction of Methyl Bromide per fumigation event for which recapture technology is used, for a calendar year.

Codes of Practice - COP Detailed guidance documents developed in partnership with industry and other agencies. They may become “approved” by a relevant regulatory authority to assist in compliance with legal requirements.

Biological Exposure Index - BEI An index chemical or biomarker that appears in biological fluid or expired air, following exposure to a workplace chemical, and which serves as a warning of exposure.

Buffer Zone An area extending outward in all directions from the perimeter of each enclosed space being fumigated to the relevant distance, outside of which the Tolerable Exposure Level (TEL) must not be exceeded.

Buffer Zone Period In relation to the application of Methyl Bromide, the period starting when Methyl Bromide is first applied to an enclosed space and ending when the specified recording of data is no longer required.

Certified Handler A person, certified by a Worksafe NZ registered Compliance Officer, as having met the training, experience and qualifications required under the Hazardous Substances Regulations 2017, to safely handle a specified hazardous substance.

Controlled Substances License Holder Is a person, who inclusive of being certified to handle a specified hazardous substance, is also licensed by Worksafe NZ to use and possess that substance, subject to meeting fit and proper person checks.

Discharge The release of a fumigant into open air.

Dosed To Concentration Applying a fumigant until the required concentration is achieved rather than determining the amount to apply based on the empty volume of the enclosed space.

Enclosed Space A container, a ship’s hold, or the space under a sheet.

Environmental Protection Authority - EPA Crown agency responsible for the protection of the public and the environment and approval of applications to import or manufacture pesticides, dangerous goods, household chemicals and other hazardous substances in New Zealand.

Event Recapture Proportion The percentage of fumigation events for which appropriate recapture technology must be used, at each location for a calendar year.

Exceedance When the monitored concentrations of a fumigant in air at a specific location averaged over the relevant time period exceeds the relevant TEL or WES level.

Fumigation Area A place within a workplace where fumigation is, or is intended to be, carried out.

Fumigation Cell A sealed chamber, including a shipping container, used exclusively for fumigation.

Fumigation Event The fumigation of one enclosed space.

Fumigation Under Sheets Fumigation carried out under tarpaulins.

Fumigation Warning Signage Signs that must be erected at every point of access to the fumigation area, the risk area and at every point of entry to the buffer zone.

Health & Safety at Work Act 2015 - HSWA The main purpose of HSWA is to provide for a balanced framework to secure the Health and Safety of workers and workplaces by protecting workers and other persons against harm to their health, safety and welfare by eliminating or minimising risks arising from work.

Hazardous Substances and New Organisms Act 1996 - HSNO The purpose of the HSNO Act is to protect the environment, and the health and safety of people and communities by preventing or managing the adverse effects of hazardous substances and new organisms.

General Risk & Workplace Management Regulations 2016 - GRWM Regs Persons conducting a business or undertaking (PCBU’s) have duties to ensure, so far as is reasonably practicable, that the workplace is without risks to the health and safety of any person.

Hazardous Substances Regulations 2017 - HSR The Health and Safety at Work (Hazardous Substances) Regulations 2017 set out the rules for work-related activities involving hazardous substances.

Industrial Hygiene Is a multi-disciplinary science which draws on aspects of toxicology, chemistry, physics, physiology and engineering in controlling workplace hazards that can cause harm.

Lower & Upper Explosive Limits - LEL & UEL A volume of a gas or vapour in air, which given an available ignition source, can produce a fire or explosion. Levels below or above the LEL/UEL concentrations respectively are unable to burn in air.

Major Hazard Facilities Regulations 2016 - MHF Regs Mandate specific duties relating to process safety that apply to designated MHFs and outline requirements for potential MHFs.

Minimum Recapture The minimum reduction of Methyl Bromide from the amount of Methyl Bromide in the enclosed space that must be achieved for a fumigation event.

NZ Ministry for Primary Industries - MPI Is a Crown agency that provides policy and regulatory advice, market access and trade services, and manages NZ systems of biosecurity, food safety, forestry, fisheries management, and animal welfare.

Monitored Safety Zone Cordoned off exclusion zone (overseen by a certified handler) placed around the fumigation area during ventilation, where entry is not permitted other than by trained personnel with appropriate PPE, and at the perimeter of which active air quality monitoring is conducted to ensure that occupational bystanders outside the MSZ will not be exposed to concentrations exceeding the Workplace Exposure Standards.

Notification of Intended Fumigation Notification of intention to fumigate required under the HSR and associated Safe Work Instruments.

Northport The commercial port facility at Marsden Point, New Zealand.

Northport Limited - NPL Owner and operator of the Northport facility, also referred to as the Company.

Non-Occupational Bystander Any person that is not employed to work at Northport where fumigation is occurring or is likely to occur (e.g.: general public outside Port).

Occupational Bystander Any person that is undertaking work at Northport where fumigation is occurring or likely to occur.

Person Conducting a Business or Undertaking - PCBU Has the meaning defined in section 17 of the Health and Safety at Work Act 2015.

Port User A Company operating at the Northport facility.

Port User Rules Are the “Port User Company Operating Rules” issued by Northport Ltd.

Recapture Technology A system that extracts and captures Methyl Bromide in order to mitigate emissions from fumigation enclosures.

Regeneration Technology A system where Methyl Bromide is desorbed from a capture medium (typically activated carbon) and is destroyed by chemical absorption process so that the capture medium may be re-used multiple times.

Respiratory Protective Equipment - RPE Air purifying or supplied air respirators that must be worn by exposed workers when airborne contaminants exceed permissible limits (WES).

Risk Area A fumigation area or any other area that, in the opinion of a Certified Handler, a fumigant may enter and exceed WES levels if released.

Safety Data Sheet - SDS Specific information (as specified by the EPA’s Notice) that the manufacturer, seller or importer of the substance, must make available to purchasers and users of a substance.

Safe Work Instrument - SWI The purpose of a safe work instrument is to define terms, prescribe matters, or make other provision in relation to any activity or thing, including listing standards, control of substances, and competency requirements.

Tolerable Exposure Limit - TEL Limits of concentration of a toxic substance in air that cannot be exceeded to protect the public.

1-Hour Exposure Level The average exposure level for each 60-minute time period from the start of ventilation until the end of the buffer zone period.

24-Hour Exposure Level The average exposure level for each 24-hour time period from the start of ventilation until the end of the buffer zone period.

Annual Exposure Level The total of 24-hour exposure levels recorded over a calendar year and averaged over 365 days.

Ventilate The release of a gas, such as Methyl Bromide, into the atmosphere and ventilation has a corresponding meaning.

Workplace Exposure Standard - WES Are values that refer to the airborne concentration of substances at which it is believed that nearly all workers can be repeatedly exposed day after day without coming to harm.

Short Term Exposure Limit - (WES-STEL) The airborne concentration of a particular substance calculated as a time-weighted average over 15 minutes.

Time Weighted Average - (WES-TWA) The level at which workers must be protected from the effects of long-term exposure (over 8 hours).

Worksafe NZ New Zealand’s primary workplace Health & Safety Regulator.

1.1. PURPOSE

The purpose of this booklet is to specify minimum requirements for fumigation activities to ensure the safety of all who work or enter the port area and protect the health and well-being of the public and surrounding local community. It is not intended to replace or provide definitive guidance in fulfilling statutory duties prescribed elsewhere.

Other fumigants are mentioned; however, this booklet is principally focused on Methyl Bromide and all references to buffer zones and recapture performance apply to Methyl Bromide only.

1.2. ASSOCIATED REFERENCES

1.2.1 CONSENTED ACTIVITY

Hazardous Substances Storage and Discharge to Air Consents (Appendix 1) were applied for and granted to Northport Ltd (NPL) by the Whangarei District and Northland Regional Councils respectively. NPL's choice to be the applicant and hold these consents demonstrates the company's commitment to ensuring all fumigation activity at the Northport facility is undertaken in a safe and compliant manner.

1.2.2 COMPLIANCE WITH STATUTE AND GUIDANCE

The conditions and procedures for conduct of fumigations in the Northport Facility contained within this booklet are in addition but not limited to the provisions under the below listed legislative or guidance instruments.

- Hazardous Substances and New Organisms Act 1996
- Resource Management Act 1991
- Biosecurity Act 1993
- Health & Safety at Work Act 2015
- Health & Safety at Work (General Risk and Workplace Management) Regulations 2016
- Health & Safety at Work (Major Hazard Facilities) Regulations 2017
- Worksafe Gazetted Safe Work Instruments (SWI)
- NZ Workplace Exposure Standards
- Worksafe Good Practice Guides (GPG)
- NZ Environmental Protection Authority Notices
- NZ Environmental Protection Authority HSNO approval HSR001635.
- NZ Ministry for Primary Industries - Approved Biosecurity Treatments
- International Maritime Organisation (IMO) Guidance
- International Cargo Cooperative Biosecurity Arrangement Guide to Performing QPS Fumigations with Methyl Bromide
- Good Practice Guide for Ambient Air Monitoring (SKM) 13 December 2012
- Other Industry Codes of Practice Relating to Fumigation
- Territorial Authority Consents for Hazardous Substance Storage and Discharge to Air
- Australian/New Zealand Standards Relating to Flammable and Toxic Substances
- Australian/New Zealand Standards Relating to Respiratory Protective Equipment
- NZ Land Transport Dangerous Goods Rule 2005

1.3. CONDITIONS FOR CONDUCT OF FUMIGATIONS AT NORTHPORT

- * Each Port User undertaking fumigation must provide NPL with detailed risk assessments and health and safety procedures (including emergency response plans) relating to all proposed fumigation operations at Northport. These procedures shall be provided to the NPL Health and Safety Manager prior to any such fumigation operation commencing.
- * Notification of intention to fumigate at the Northport facility must be made to the parties as prescribed in the Hazardous Substances Regulations and the EPA's reassessment dated 11 August 2021.
- * Plant and equipment used in relation with any fumigation activities must be designed and used in accordance with Health and Safety legislation, Land Transport Rules, recognised safe work practice and any appropriate New Zealand standards that may apply. This includes activities relating to the use of recapture and carbon regeneration plant and equipment, respiratory protective equipment, hazardous substance storage facilities, forklift trucks and associated attachments, water tankers, tarp trailers etc.
- * Annual reporting of fumigant use must be made to the parties as prescribed in the EPA's reassessment dated 11 August 2021.

To ensure fumigation operations are conducted in accordance with these requirements, NPL will audit and conduct monitoring of fumigation activities within the Northport facility. Fumigation companies must provide appropriate support to these activities.

1.4. OVERVIEW OF BIOSECURITY AND FUMIGATION

Imported risk goods have the potential to introduce pests and unwanted organisms into New Zealand. The Biosecurity Act 1993 prescribes requirements for the exclusion, eradication and effective managing of pests and unwanted organisms in New Zealand. Unwanted pests/organisms have the potential to cause harm to natural and physical resources and human health in New Zealand. The Ministry for Primary Industries (MPI) is responsible for enforcing the provisions of the Biosecurity Act 1993.

Similarly, exporters must ensure they meet an Importing Countries Phytosanitary Requirements (ICPR's) based on legislation, regulation, and any clarification received from that country. MPI's role is to help log, timber and other exporters meet the requirements of overseas markets.

The process of fumigation of forestry export cargoes is primarily to protect overseas countries from three potentially harmful NZ forest beetles, hylastes and hylurgus bark beetles, and burnt pine beetle (*Arhopalus ferus*).

Based on the needs of export countries the fumigant selected for log and wood fumigation is currently either Methyl Bromide gas or Phosphine gas (generated from Aluminium Phosphide or from cylinders) i.e. Methyl Bromide is a biosecurity tool, permitted for use in quarantine and pre-shipment fumigation of logs and timber exports. Fumigation with Methyl Bromide was the main treatment option for above-deck log exports to China and was the only approved option for log exports to India.

Total log exports were worth \$3.61 billion in the year to June 2021, according to the Ministry for Primary Industries. In 2018, 22% of all exported logs were treated with Methyl Bromide, the remainder were treated with Phosphine (under deck for China), debarked, or treated on arrival.

1.5. BACKGROUND

In 2010 the EPA's predecessor, the Environmental Risk Management Authority (ERMA), conducted an extensive reassessment of the use of Methyl Bromide and in October 2010 released its decision in which a 10-year deadline for industry to effectively achieve full recapture of Methyl Bromide was decreed.

However, in 2019 a timber industry group Stakeholders in Methyl Bromide Reduction (STIMBR) applied to the EPA for a reassessment of Methyl Bromide on the basis that full recapture was unachievable with current technology.

Public consultation began in mid-2019, and a hearing was held in August 2020. Given that the 2010 recapture definition was unachievable, the Decision-making Committee amended the controls associated with recapture so that any risks associated with the use of Methyl Bromide were negligible, while the benefits of use were retained.

The reassessment decision set a significantly higher recapture performance requirement than requested by the applicant, as the Committee considered that industry must be encouraged to invest in strategies to reduce Methyl Bromide emissions.

Other treatments to meet importing country requirements are available, such as debarking logs for China. In May 2022, the EPA also approved an alternative fumigant called Ethanedinitrile (EDN), however at the time of issue of this document, importing countries are yet to approve the use of EDN as a phytosanitary treatment. Safe Work Instruments developed by Worksafe NZ have been gazetted.

This booklet may be reissued to cover operations using EDN should this treatment be introduced at Northport.



1.6. REASSESSMENT OF METHYL BROMIDE - EPA DECISION DATED 11 AUGUST 2021

The EPA's Decision-making Committee revised the controls for using Methyl Bromide.

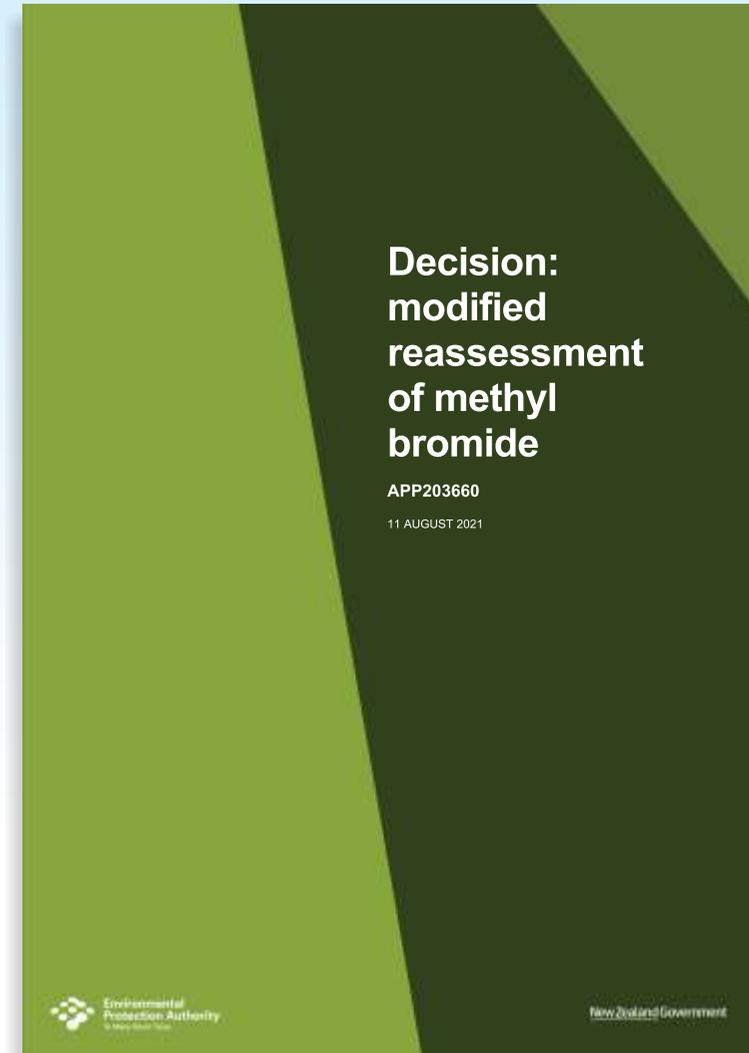
Document reference APP203660 dated 11 August 2021.

The reassessment decision considers protecting human health and the environment from the risks of ongoing Methyl Bromide use. It also acknowledged concerns from Māori and the wider public regarding the health and environmental effects of Methyl Bromide, as well as NZ's international obligations under the Montreal Protocol on Substances that Deplete the Ozone Layer.

The reassessment focused on recapture requirements, and a comprehensive suite of controls to mitigate the risks of Methyl Bromide use:

- ▶ From 1 January 2023, fumigation of ship's holds is prohibited.
- ▶ From 1 January 2022, larger buffer zones to prevent the public from being in the vicinity while the gas is being used. Where appropriate, local councils and affected parties, including neighbouring marae and other community facilities, must be notified in advance of fumigation happening.
- ▶ Stepped increases (see 1.7.1) will apply to the recapture of Methyl Bromide from containers and covered log stacks, starting from 1 January 2022.
- ▶ To further help reduce the volume of Methyl Bromide used, the decision also requires 50% of fumigation events to be 'dosed to concentration' by 1 January 2024.
- ▶ Ventilation of any fumigation event may only occur when wind speed is at least 2 m/s.
- ▶ The decision also introduces much stricter accountability, data recording and reporting measures. Operators using Methyl Bromide will be required to provide annual reports to the EPA about their activities in greater detail than before, to ensure actions are being taken to reduce Methyl Bromide emissions.

This information is additional to the existing requirements administered by WorkSafe NZ.



1.7. METHYL BROMIDE RECAPTURE

1.7.1 Recapture Performance Criteria

Table A. Performance criteria of recapture technology for every Methyl Bromide Fumigation event in containers.

Table B. Performance criteria of recapture technology for Methyl Bromide fumigations under sheets.

Start Date	Minimum Recapture (%)
1 January 2023	80%
1 January 2027	90%
1 January 2031	99%

Start Date	Event Recapture Proportion %	Minimum Recapture %	Annual Average Recapture Performance %
1 January 2022	50	30	55
1 January 2023	75	40	60
1 January 2025	100	50	65
1 January 2027	100	60	75
1 January 2029	100	70	85
1 January 2031	100	80	95
1 January 2033	100	90	99
1 January 2035	100	99	99

1.7.2 Minimum Buffer Zones Linked to Recapture Performance

Table C. Minimum buffer zones for Methyl Bromide fumigation under sheets

Minimum Recapture %	Minimum Buffer Zone: dose rate ≤ 40 g/m ³ (m)	Minimum Buffer Zone: 40 g/m ³ < dose rate ≤ 72 g/m ³ (m)	Minimum Buffer Zone: 72 g/m ³ < dose rate ≤ 120 g/m ³ (m)
No Recapture	210	515	700
30	155	380	520
40	135	335	455
50	120	290	395
60	100	245	335
70	80	200	270
80	65	155	210
90	50	110	150
99	50	70	95

1.8. DESIGNATED LOG ROW FUMIGATION AREA

Prior to the EPA's 2021 decision, the minimum initial buffer distance for Methyl Bromide fumigations was 50m. In effect, this meant that fumigation of log rows under sheets was feasible in the majority of the Northport log storage area.

Following the August 2021 reassessment decision and the more stringent buffer zone distances, a defined and centralised fumigation area was designated. This has resulted in NPL allocating an area of approximately 12,000m² (See image below) based on a minimum buffer zone of 150m.

Significant Methyl Bromide recapture performance consistent with Table C will have to be delivered within this newly defined log row fumigation area.

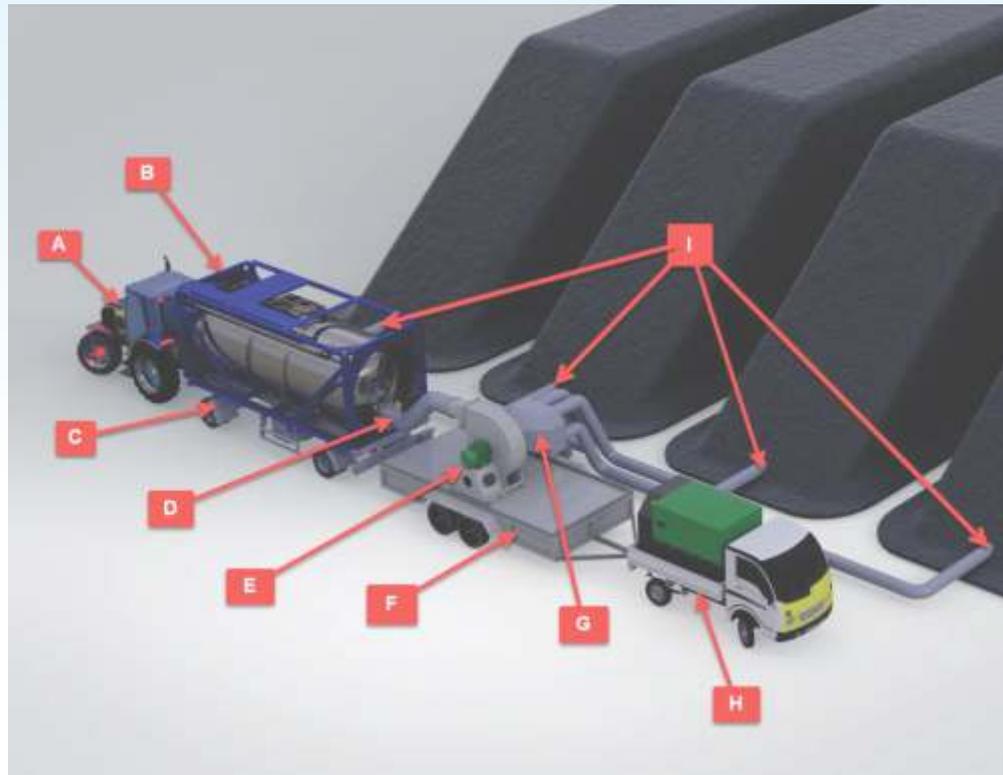


1.9. RECAPTURE TECHNOLOGY

Recapture of Methyl Bromide from log rows under sheets and containers is not a new development. Since the ERMA decision of 2010, carbon and liquid scrubber prototypes have been developed and operated by Genera Ltd and other fumigation companies.

The challenge of meeting the proportion of recapture (Tables A & B) required and to lessen the buffer zone (Table C) has seen Genera Ltd produce new recapture units, with the scale and efficiency to meet the new performance criteria as per the diagram below.

MB RECAPTURE USING ACTIVATED CARBON IN A 20' ISO-TANK



- A: Tractor for towing ISO-Tank trailer
- B: Modified ISO-Tank containing activated carbon
- C: 20' container trailer
- D: ISO-Tank airflow inlet ducting
- E: Large blower unit
- F: Tandem trailer (towed by generator truck)
- G: Large manifold (for recapture from up to 4 log stacks)
- H: Small truck with diesel generator
- I: Ducting and valves from log stacks

NOTES:

- Single pass operation with fresh air introduced from the far end of the stack
- Exhaust from ISO-Tank monitored for MB breakthrough (carbon saturation)
- Individual stack MB concentrations monitored to determine recapture %

1.9.1 CARBON REGENERATION TECHNOLOGY

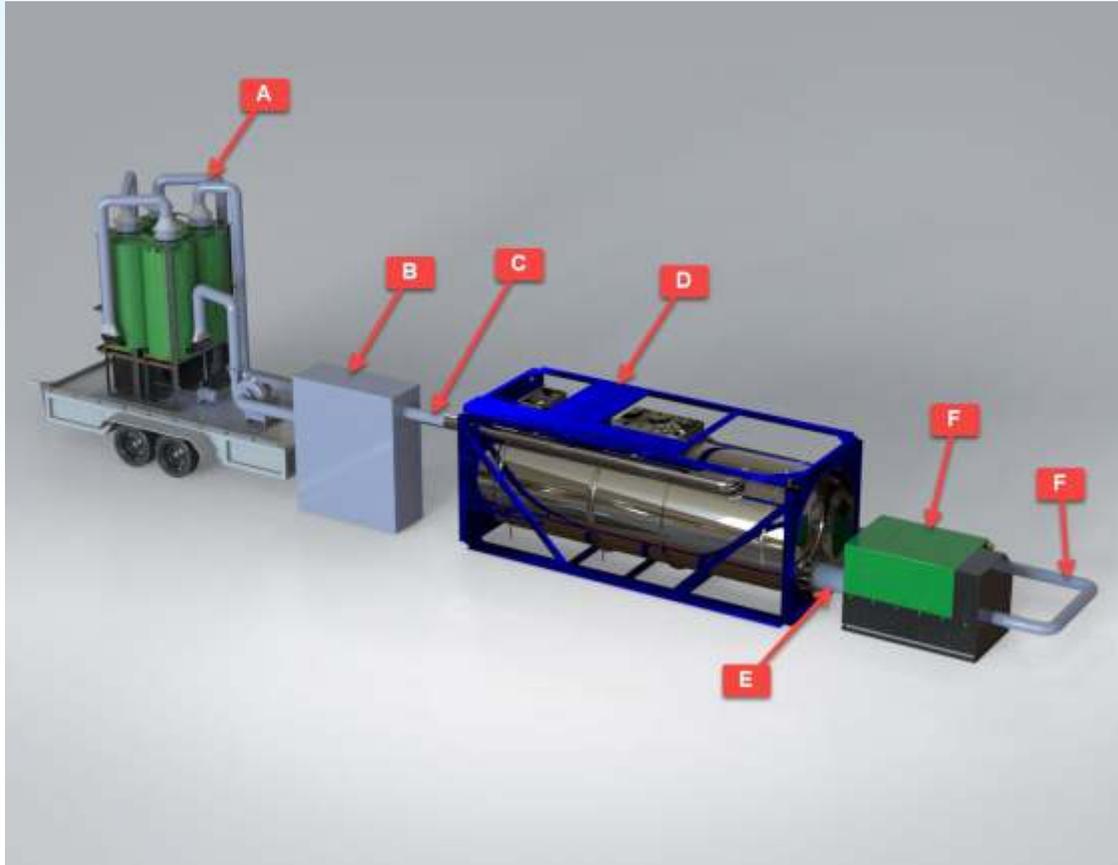
Brief synopsis from Genera Ltd.

Under a recapture system using bulk activated carbon, it isn't economically or environmentally viable to simply replace and dispose of the saturated waste carbon. To overcome this issue, thermal desorption is a technology of physical separation based on heating the contaminated absorbent (carbon) to mobilise water and organic compounds. Once mobilised through heating, the compounds are cooled and then passed through a liquid scrubbing system, which removes or 'scrubs' the contaminants from the gas and transfers them into the liquid.

Once fully used, the liquid can be disposed of through approved treatment routes.

This technology will enable the carbon to be regenerated and reused multiple times.

MB DESORPTION FROM ACTIVATED CARBON IN A 20' ISO-TANK



- A: Scrubber unit
- B: Cooling unit for airstream from ISO-Tank exhaust
- C: MB airstream from ISO-Tank exhaust to scrubber unit
- D: Modified ISO-Tank containing activated carbon (with captured MB)
- E: Heated airstream to ISO-Tank inlet
- F: Air heating and blower unit
- G: Return airstream from liquid scrubber

NOTES:

- Multi-pass operation cycled until no MB detected from scrubber outlet
- Exhaust from ISO-Tank cooled prior to entering liquid scrubber
- Process time varies; indicatively 24-48 hours

2. OPERATIONAL REQUIREMENTS

These apply to all fumigation activities undertaken at the Northport facility including logs or timber under sheets and in containers and are mainly focused on Methyl Bromide fumigation hence references to buffer zones, ventilation and air quality monitoring apply to Methyl Bromide only.

2.1. PORT WORKER HAZARD AWARENESS

Port Users must ensure that all workers entering the Port Facility have a current Northport safety induction and are fully informed, trained and supervised with respect to all hazards they may encounter at the Northport Facility including those associated with fumigation activities.

2.2. TRAINING & CERTIFICATION

Fumigation workers on the Port Facility must be further trained and supervised in accordance with duties imposed under the General Risk and Workplace Management Regulations 2016 (GRWM) and the Hazardous Substances Regulations 2017 (HSR).

2.3. RESPIRATORY PROTECTIVE EQUIPMENT - RPE

Fumigation workers on the Port Facility must be equipped with appropriately selected RPE and workers must be trained in its correct use and maintenance. The fumigating Port User must have a programme of fit testing, cleaning, replacement and maintenance of RPE.

2.4. EXPOSURE & HEALTH MONITORING

- Through applying appropriate Industrial Hygiene methodology, fumigating Port Users are to ensure that potential workplace exposures have been appropriately determined so that levels of exposure are known, and appropriate risk minimisation is in effect.
- Where a valid Biological Exposure Index and/or health assessment exists, subject to worker consent, fumigating Port Users are to ensure that regular biological sampling and health assessment is performed to recognised Industrial Hygiene Standards.

2.5. EMERGENCY RESPONSE PLANS - ERP's

The fumigation Port User shall prepare Emergency Response Plans that must identify foreseeable emergencies and provide information on the Port User's preparedness for such events, how effects will be reduced and remedied and how communication and coordination with Northport, FENZ, other Port Users and affected neighbours will occur. This will include providing Northport's Port Services Centre (PSC) with the appropriate Safety Data Sheets.

2.6. PORT USER AND OCCUPATIONAL BYSTANDER RISK MINIMISATION

2.6.1 RESTRICTED ACCESS

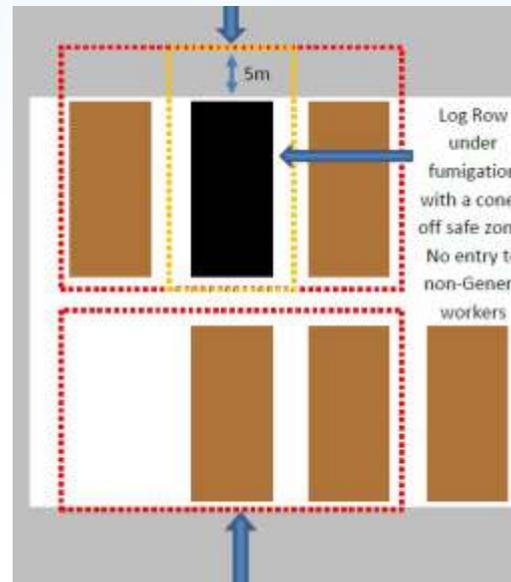
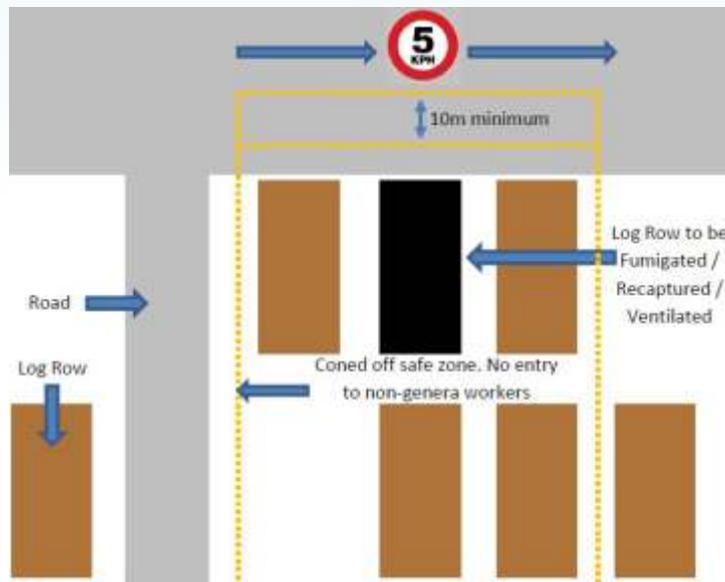
- **Risk Area** - No person (other than the trained and protected personnel of the fumigation Port User) is permitted inside the coned off risk area around the fumigation enclosure, except with the permission of and if accompanied by the Certified Handler in charge of the fumigation.

Note: This includes operators of mobile plant and vehicles.

- **Monitored Safety Zone During Ventilation** - this area is restricted to the trained and protected personnel of the fumigation Port User.

2.6.2 TEMPORARY TRAFFIC MANAGEMENT AND SAFE WORKING ZONES

- It is the fumigation Port User's responsibility to ensure information has been provided to relevant Port Users and Northport to advise the fumigation location, access restrictions and changes to traffic management associated with the fumigation operation.
- Where Port Users have a duty to jointly manage overlapping Health & Safety risks, shared procedures must be formulated, agreed, and followed by the respective parties.
- Fumigation ground crew working on roadways within Northport shall establish plans for temporary traffic management and cordon off safe working zones.
 - Note:** No materials handling or mobile plant operation shall occur within 2 log rows or 20m of an active ground crew operation or a cordoned safe working zone.
- There must be a gap of at least 2.0m between each log row to be fumigated to ensure:
 - The safety of the fumigators and others needing access between the rows
 - That sheets can be adequately secured to contain and prevent an uncontrolled release of fumigant
 - There is enough room to safely position a ladder if required
- No fire hydrants or other manholes to be covered or obstructed by fumigation related equipment



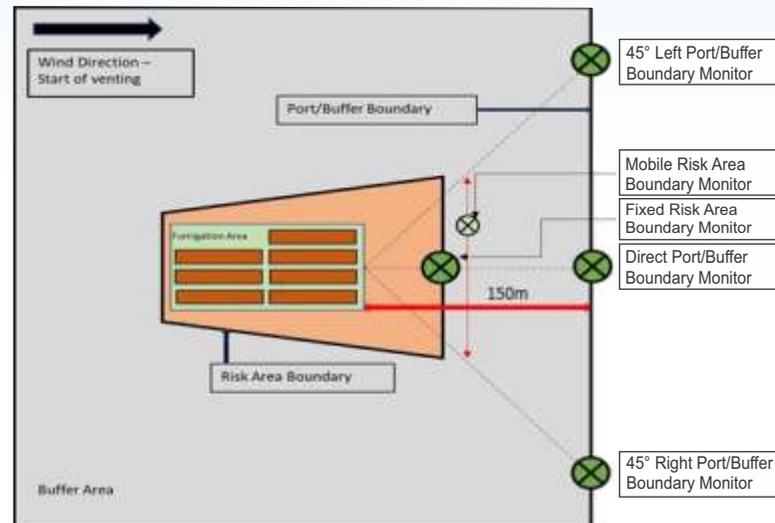
2.6.3 POSTING OF FUMIGATION WARNING SIGNAGE

- Signage must comply with the requirements of the HSR and associated SWI.
- Prior to applying a fumigant, the Certified Handler must ensure that specific warning signage is posted, and able to be clearly read from an appropriate distance (10m)
- The Certified Handler must ensure warning signs are posted at every point of access to the place within the workplace where fumigation will be carried out, at the perimeter of the risk area, around the perimeter of the buffer zone at every point of entry to the buffer zone that:
 - can be readily understood and seen by any person approaching;
 - states that fumigation is being carried out;
 - identifies the fumigant being used and states that it is toxic to humans;
 - describes the general type of hazards associated with the fumigant;
 - if the fumigant is flammable, describes the precautions necessary to prevent the unintended ignition of the fumigant;
 - identify the PCBU with management or control of the fumigation and provide sufficient information to enable the PCBU to be contacted at any time during the fumigation;
 - state the day on which the fumigation is to start;
 - be illuminated during the hours of darkness.
- If the fumigation is carried out in a room or compartment within a building or other enclosed space, be positioned at each entrance to the room or compartment including ships access to cross decks from the accommodation.



2.6.4 VENTILATION & AIR QUALITY MONITORING

- Fumigators are to have in place a monitoring protocol that describes their ambient air monitoring methods, including the election of monitoring locations at the boundary of buffer zones.
- All air monitoring shall be undertaken with equipment specified, and calibrated, for the fumigant being used. The Fumigation Port User must ensure that all those who use monitoring equipment are fully trained in its correct use.
- As far as practicable, venting of gas shall be done at times when there are fewer Port Users at the facility.
- The Certified Handler shall ensure that no other Port User enters the monitored safety zone during venting until it is deemed safe to do so.
- Once the row has been fully vented and levels are consistently below the WES, it will be marked as “available” and the release from fumigator control communicated in writing to the relevant marshalling company.



2.7. INCIDENT NOTIFICATION

- The fumigation Port User must notify NPL of any unintentional discharges of any fumigant within the Port. They are to advise the estimated quantity released, the location, the potential risk to bystanders or the environment, the actions taken to stop the discharge and any corrective and/or preventive actions recommended. A written report into the release is to be provided to the NPL H&S Manager within 5 days of the release.
- The fumigation Port User must notify NPL of any complaint or non-compliance warning received from any member of the community or from any enforcement or monitoring agency.
- Any emergency or Health & Safety incident (including near misses) that involves any part of fumigation operations must be reported to the NPL H&S manager immediately and details recorded into Northport's incident reporting system.
- The fumigation Port User shall notify NPL of any TEL_{air} exceedance at the buffer zone boundary.

2.8. FUMIGATION UNDER SHEETS

- Sheets for fumigation of break bulk logs or timber and containers, must be impervious to the fumigant being used, made of durable material and of sufficient length and width to ensure a minimum of 500 mm extends out from the base of the enclosure on all sides.
- Retention of fumigant reduces with sheet use; sheets must be carefully monitored to ensure their condition is good enough to reliably retain the fumigant. A programme of repair and replacement of sheets must be in place.
- The Fumigation Technician must ensure that the enclosed space is monitored for a sufficient period after the application of the fumigant to ensure that there is no significant leakage of fumigant.
- Application of fumigant (gassing) under sheets, should not take place if strong wind is forecast. Caution must be taken when covering with sheets in strong winds and must not proceed when winds reach 25knots. Irrespective of the 25knot cut-off, it is the responsibility of the Fumigation Port User to ensure all safety risks are considered during strong wind.
- Potential for sheets to loosen or water snakes to float may necessitate water bag tucking and other weighting down precautions, when strong winds or heavy rain is forecast.
- There must be a suitably trained and experienced representative of the fumigation company present at all times when fumigation under sheets is being undertaken. They must conduct regular checks on the fumigation(s) being undertaken and frequency must be increased during storm events.



2.9. FUMIGATION OF SHIPPING CONTAINERS

- A cordon must be in place around the risk area of containers or sheeted enclosures under fumigation and warning signage posted.
- Before preparing for fumigation, the Fumigator must inspect the container for any visible holes, damage or poor door seal condition that would make it unsuitable.
- Sealing of vents and doors must be undertaken using durable impervious tape.
- Where the container has been deemed unsuitable or significant gas leakage is detected during fumigation, it may be necessary to enclose under gas-proof sheet.
- The Fumigation Technician must ensure that the container or enclosure is gas monitored for a sufficient period after the application of the fumigant to ensure that there is no significant leakage of fumigant.
- If un-sealed, to prevent entry during fumigation the Fumigator must “lock out” the container using a personal master lock.

2.10. UNDER DECK PHOSPHINE TREATMENT

Ship's cargo space fumigation with Phosphine is an approved phytosanitary treatment for export wood product commodities to China.

Unlike Methyl Bromide, Phosphine is not an ozone depleting gas.

Currently at Northport and other NZ Ports, Aluminium Phosphide is initially applied to the cargo holds of loaded vessels bound for China prior to departure. Aluminium Phosphide is a dark grey crystalline solid specially formulated to slowly generate phosphine gas when it meets atmospheric moisture. It is commercially available in tablet and blanket forms, which are packaged in sealed containers.

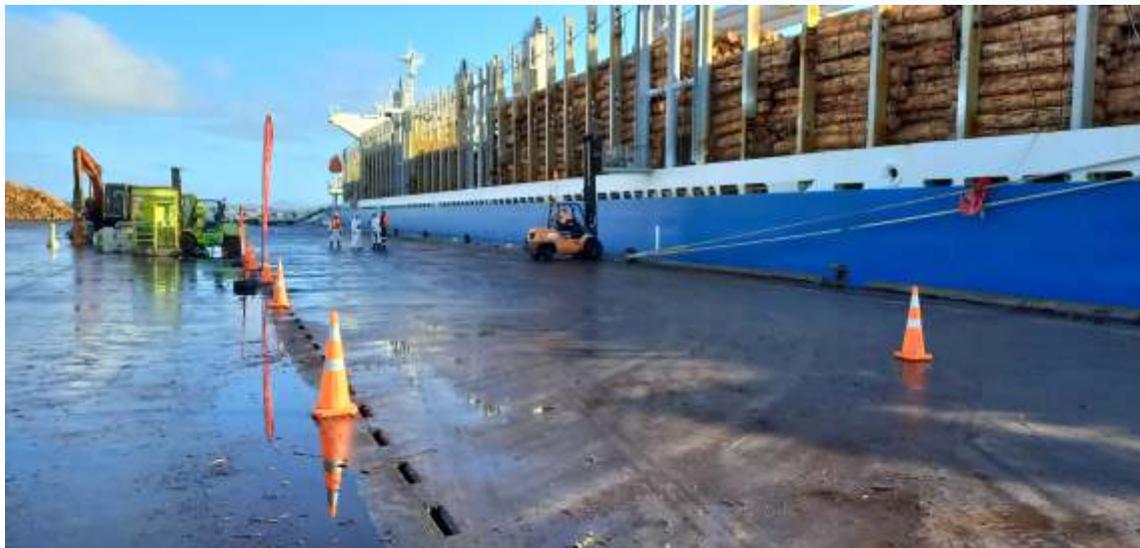


Phosphine is a slow acting fumigant and current phytosanitary standards require treatment for 10 days at a minimum concentration of 200ppm. To maintain this level, additional Aluminium Phosphide product is loaded aboard the vessel and a “top up” application is performed on day 5 of passage, this will be performed by either trained crew or the fumigation company's worker known as an In Transit Technician (ITT) who makes passage to China with the vessel. Final ventilation of the holds occurs during passage in international waters.

- A thorough pre-inspection of the vessel is to be performed by a competent fumigator consistent with IMFO CoP recommendation part 7, to assess the cargo spaces suitability for fumigation and identify any hold or hatch configurations that may cause dispensed product to cluster or poorly distribute over the cargo.
- The Fumigation Port User must ensure their work poses no risk to other activities being undertaken in the area, including in the water or under the wharf.
- The Fumigation Port User shall also ensure that the local agent and master of the ship undergoing fumigation, receives documentation consistent with IMFO CoP recommendation Part 8 to provide a Voyage Safety Plan fully informing them of the method of fumigation and how to minimise risk of exposure.
- A Phosphine initial treatment must occur at a time when fumigators will not be exposed to shipboard activities (stevedoring, lashing and crane operations) and the vessel crew will not be unwittingly exposed to potential gas leakage.
- At the completion of the fumigation and prior to the ship's departure, the Fumigator accompanied by an ITT or ship's crew will conduct leak checks, when satisfied there are no excessive leaks or any relevant leaks have been appropriately managed, the fumigator in charge will sign off the leak check form with the Master or CO of the vessel.

Trials with cylindered high purity Phosphine (tradename VAPORPH3OS) were conducted at the Northport Facility in 2019. This is applied to ships holds from the berth using specialised air blending equipment. Following extensive trials (predominantly at Port of Tauranga), the treatment became MPI approved.

This booklet may be reissued if and when cylindered phosphine treatment is employed as an alternative to Aluminium Phosphide at Northport.



2.11. FUMIGANT STORAGE

By virtue of their pesticidal purpose and physicochemical makeup, fumigants are generally acutely toxic to humans and the environment and are often highly flammable. The storage and handling requirements for toxics and flammables are contained within the HSR. The following requirements shall be adhered to by Port Users requiring to store and use fumigants on NPL land.

- Specific consent and approval to store and use fumigants at Northport is required by NPL as part of the Port User application process.
- Where volumes stored, or the substance classifications exceed the stated thresholds and trigger requirement for Transit Depot or Hazardous Substances Location, evidence of Worksafe notification or Location Compliance Certificate must be supplied to NPL inclusive of updated copies on expiry and renewal.
- Any storage facility for flammable fumigants must be designed to be intrinsically safe.

In addition, if quantities and classes stored trigger Major Hazard Facility designation, NPL will require a copy of the Worksafe designation and assurance that the requirements of the MHF Regs are being fulfilled.

- Each location is to be clearly identified as a Hazardous Storage Area with access to that area restricted to authorised Port Users only.
- Details relating to the following aspects of compliance with the HSR and LCC requirements of are to be maintained by any Port User holding fumigants within the Port:
 - The facility and storage structures meet required design standards and will display HAZCHEM signage as listed in regulation 2.6 (5) (a-d) of the HSR.
 - There is an inventory of hazardous substances
 - Tracking systems are in place and up to date
 - Substances are secure
 - Workers are trained and appropriately certified and licensed
 - Current Safety Data sheets are readily available for all listed substances
 - There are detailed site plans which are to scale and indicate appropriate controlled zones, hazardous zones and locations of emergency equipment
 - Detailed emergency plans are present within the location
 - A copy of the current LCC is displayed within the location
 - HAZCHEM signage that complies with the HS Regs is displayed
 - Segregation and separation requirements for incompatible substances is being met
 - Fire suppression equipment (extinguishers and hose reels) are of the correct type and standard and are within expiry/test date
 - Spill clean-up equipment and absorbent products are appropriate and sufficient
 - Appropriate first aid and emergency equipment is available
- Emergency response plans must be readily available to NPL which must -
 - Detail responses to foreseeable emergencies that may arise from the storage and use of hazardous substances or any related safety assessments
 - List the names, roles, and contact details of emergency response team members
 - Identify the contact details of Port Users, neighbours and relevant emergency response agencies and stakeholders
 - Provide evidence when drills have occurred (minimum once per year).

2.11.1 TRANSPORTATION

During transportation within the Port, vehicles or trailers carrying fumigants are subject to the Land Transport Rule Dangerous Goods 2005, fumigation product and packaging must be firmly secured, and appropriate placards displayed.

2.11.2 HAZARDOUS SUBSTANCE DISPOSAL

- NPL must be consulted prior to a Port User engaging in any onsite hazardous substance disposal activity.
- Where Port Users undertake hazardous substances disposal within the Port Facility, this must be undertaken in accordance with; NZ Ministry for the Environment's regulations for Product Stewardship, the EPA's Consolidated Hazardous Substances Disposal Notice 2017 and bylaws or rules of the Relevant Territorial Authorities.



Aluminium Phosphide Storage Container



Methyl Bromide Storage Shed



Methyl Bromide Storage Shed



Gassing Trailer Placards

Resource Consent

FILE: 5055
(37)
New

Document Date: 15.09.2020

Pursuant to the Resource Management Act 1991, the Northland Regional Council (hereinafter called "the council") does hereby grant a Resource Consent to:

NORTHPORT LIMITED, PO BOX 44, RUAKAKA 0151

To undertake the following activity associated with port operations at Ralph Trimmer Drive, Marsden Point, at or about location co-ordinates 1734193E 6033293N:

Note: All location co-ordinates in this document refer to Geodetic Datum 2000, New Zealand Transverse Mercator Projection.

AUT.005055.37.01 Discharge contaminants to air from fumigation activities.

Subject to the following conditions:

- 1 This consent only authorises the discharge of contaminants to air from fumigation activities within the areas identified on the **attached** plan identified as Northland Regional Council Plan Number **4970**.
- 2 The activities authorised by this consent shall be undertaken in accordance with the most recent version of the Northport document entitled "**MINIMUM REQUIREMENTS FOR FUMIGATION OPERATIONS AT NORTHPORT**". If changes are made to this document, then a copy of the amended document shall be provided to the council's Compliance Manager within two weeks of the document becoming operative.
- 3 The Consent Holder shall notify the council's Compliance Manager in writing of any proposed change(s) to fumigation activities that would alter the nature or scale of discharges to air from fumigation, including:
 - (a) Adoption of new methods to undertake fumigation, including recapture technology; or
 - (b) Adoption of new fumigants,
 at least one month prior to the proposed change(s) occurring.

Advice Note: *If the proposed alteration may result in adverse effects that are greater than those authorised by this consent, or the change is outside the scope of what was applied for, then either a change to the conditions of this consent under Section 127 of the Resource Management Act, or a new consent would need to be obtained.*
- 4 The Consent Holder shall maintain records of any complaints relating to the discharge to air received by the Consent Holder, as detailed below:
 - (a) The name and address of the complainant;
 - (b) The date and time the complaint was received;

- (c) The nature of the complaint;
- (d) The duration of the event that gave rise to the complaint;
- (e) The location giving rise to the complaint;
- (f) The weather conditions prevailing at that time;
- (g) Any events in the management and operation of any processes that may have resulted in the increased discharge to air of fumigants; and
- (h) Any actions taken by the Consent Holder, where possible, to minimise the effects as a result of the complaint.

The Consent Holder shall notify the council's assigned monitoring officer as soon as is reasonably practicable of any complaint received. Records of the above shall be sent to the council's assigned monitoring officer upon request.

- 5 The Consent Holder shall, on becoming aware of any discharge associated with the Consent Holder's operations that is not authorised by this consent:
 - (a) Immediately take such action, or execute such work as may be necessary, to stop and/or contain such escape; and
 - (b) Immediately notify the council by telephone of an escape of contaminant; and
 - (c) Take all reasonable steps to remedy or mitigate any adverse effects on the environment resulting from the escape; and
 - (d) Report to the council's Compliance Manager in writing within one week on the cause of the escape of the contaminant and the steps taken or being taken to effectively control or prevent such escape.

For telephone notification, during the council's opening hours the council's assigned monitoring officer for this consent shall be contacted. If that person cannot be spoken to directly, or it is outside of the council's opening hours, then the Environmental Hotline shall be contacted.

Advice Note: *The Environmental Hotline is a 24 hour, seven day a week, service that is free to call on 0800 504 639.*

- 6 This consent shall not lapse until its expiry.
- 7 The council may in accordance with Section 128 of the Resource Management Act 1991, serve notice on the Consent Holder of its intention to review the conditions of the consent during the month of September for any one or more of the following purposes:
 - (a) To deal with any adverse effects on the environment that may arise from the exercise of the consent and which it is appropriate to deal with at a later stage;
 - (b) To require the adoption of the best practicable option to remove or reduce any adverse effect on the environment.

The Consent Holder shall meet the reasonable costs of any such review

EXPIRY DATE: 30 SEPTEMBER 2040

This consent is granted this Fifteenth day of September 2020 under delegated authority from the council by:


Stuart Savill
Consents Manager

DESCRIPTION

Methyl Bromide is a colourless gas at room temperature and standard pressure with a boiling point of 4°C. It is heavier than air (3.27 times) and is odourless except at very high concentrations when it can have a musty or fruity, chloroform-like smell.

Methyl Bromide is commercially available as a cylindered compressed liquified gas at a concentration of 1000 g/kg.

EPA CLASSIFICATIONS

Classifications	Hazard Statements
Flammable Gas2	H221: Flammable Gas
Acute Oral Toxicity 3	H301: Toxic if swallowed
Acute Inhalation Toxicity 3	H330: Fatal if inhaled (Respiratory tract irritation at lower levels)
Skin Corrosive 1C	H314: Causes severe skin burns and eye damage
Serious Eye Damage 1	H318: Causes severe eye damage
Reproductive Toxicity 2	H361: Suspected of damaging fertility or the unborn child
Germ Cell Mutagenicity 1	H341: Suspected of causing genetic defects
Specific Target Organ Toxicity (SPOT). Repeated Exposure 1	H372 Causes damage to organs through prolonged or repeated exposure
Aquatic Acute 1	H400: Very toxic to aquatic life
Aquatic Chronic 1	H410: Very toxic to aquatic life with long lasting effects

Workplace Exposure Standard – WES

Workplace exposure standards (WES) are values detailed (in italicised headings below) that refer to the airborne concentration of Methyl Bromide at which it is believed that nearly all workers can be repeatedly exposed day after day without coming to harm. Above these levels, a PCBU is lawfully required to eliminate or minimise the risk of harm.

Time Weighted Average – WES/TWA

This is the average airborne concentration of methyl Bromide when calculated over a normal eight-hour working day. The 2022 revised time weighted average for worker exposure to Methyl Bromide is 1ppm (part per million/air).

Short Term Exposure Limit – WES/STEL

This is the airborne concentration of Methyl Bromide calculated as a time-weighted average over 15 minutes. The 2022 revised short-term exposure limit for Methyl Bromide is 2 ppm (parts per million/air).

Skin Notation – (skin)

In addition, Methyl Bromide carries a skin notation i.e. it is a substance that is capable of being significantly absorbed into the body through contact with the skin.

Tolerable Exposure Limit - TELair

The Tolerable Exposure Limit (TELair) has been set by the EPA under regulation and refers to the limit of airborne concentration of Methyl Bromide (as tabled below) that cannot be exceeded outside the buffer zone.

	Parts Per million - ppm	milligrams per metre cubed - mg/m3
Chronic TELair (annual average):	0.0013	0.005
TELair (24 hour):	0.333	1.3
TELair (1 hour):	1	3.9

Symptoms of Acute Exposure (inhalation)

Cough, sore throat, dizziness, headache, abdominal pain, vomiting, weakness, shortness of breath, confusion, hallucinations, loss of speech, incoordination, convulsions, pulmonary oedema.

Note: Poisoning from Methyl Bromide can be delayed for up to 48 hours, if symptoms develop, seek medical attention immediately.

Contact With Skin

Methyl Bromide can cause severe irritation and corrosive skin injury with blisters resembling second degree burns. Severe injury may occur if high concentrations of gas or liquid is trapped in gloves, boots or other clothing. When liquid Methyl Bromide is spilled on the skin, it evaporates rapidly producing a cool or burning sensation.

Note: Methyl Bromide can be absorbed through the skin and produce the same symptoms described for inhalation.

Chronic Exposure

Chronic exposure to Methyl Bromide is characterised by lethargy, muscular pains; visual, speech and sensory disturbances and mental confusion. More severe effects include tremors, hallucinations, fainting spells and seizures due to permanent brain damage.

Immediate First Aid Steps - See back page

DESCRIPTION

Aluminium Phosphide is a dark grey crystalline solid specially formulated to slowly generate Phosphine gas when it meets atmospheric moisture. It is commercially available in tablet and blanket forms, which are packaged in sealed containers.

EPA CLASSIFICATIONS

Classifications	Hazard Statements
Water Reactive Flammable Gas 1	H260: In contact with water releases flammable gas which may ignite spontaneously
Acute Toxicity 1	H330: Fatal if inhaled
Eye Irritation 2	H319: Causes serious eye irritation
Specific Target Organ Toxicity Repeated Exposure 1	H372: Causes damage to organs through prolonged or repeated exposure
Aquatic Acute 1	H400: Very toxic to aquatic life
Aquatic Chronic 1	H410: Very toxic to aquatic life with long lasting effects

Workplace Exposure Standard – WES

Workplace exposure standards (WES) are values detailed (in italicised headings below) that refer to the airborne concentration of Phosphine at which it is believed that nearly all workers can be repeatedly exposed day after day without coming to harm. Above these levels, a PCBU is lawfully required to eliminate or minimise the risk of harm.

Time Weighted Average – WES/TWA

This is the average airborne concentration of Phosphine when calculated over a normal eight-hour working day. The time weighted average for worker exposure to Phosphine is 0.3 ppm (part per million/air).

Short Term Exposure Limit – WES/STEL

This is the airborne concentration of Phosphine calculated as a time-weighted average over 15 minutes. The short-term exposure limit for Phosphine is 1 ppm (parts per million/air).

Tolerable Exposure Limit - TELair

The Tolerable Exposure Limit (TELair) has been set by the EPA under regulation and refers to the limit of airborne concentration of Phosphine (as tabled below) that cannot be exceeded outside the buffer zone to protect the public.

	Parts Per million - ppm	milligrams per metre cubed - mg/m3
Chronic TELair:	0.0002	0.0003
Ceiling Level:	0.0072	0.01

Symptoms of Acute Exposure (inhalation or ingestion)

Headache, dizziness, nausea, diarrhoea, chest pain, shortness of breath, irregular heartbeat, convulsions unconsciousness.

Chronic Exposure

The substance may cause effects on the central nervous system, cardiovascular system, heart, gastrointestinal tract, liver and kidneys. Non-specific complaints like gastrointestinal disorders, headache, nausea etc. may occur.

Immediate First Aid Steps - see back cover

Methyl Bromide Gas, Phosphine Gas, or Phosphine Dust Inhaled

1. Remove victim to fresh air.
2. Keep victim at rest in half upright or sitting position.
3. Contact Port Services Centre on 09 432 5018 (24/7) and request an ambulance. Or call 111 and notify PSC immediately.
4. If patient becomes unconscious or unresponsive, perform CPR.

Note: Due to risk of first aid responder exposure during expired air resuscitation (mouth to mouth), personal protective equipment such as a big valve mask, oxygen supply or performing compressions only is recommended.

Contact with skin & clothing

1. Remove all contaminated clothing.
2. Wash the affected area with soap and water.
3. Seek medical attention if pain, reddening of the skin or blistering occurs.
4. Monitor for symptoms of acute exposure.

Eye Contact

1. Holding the eyelids apart, flush eyes immediately with saline solution or water for at least 15 minutes.
2. Seek immediate medical attention.

Phosphine Tablets or Dust Swallowed

1. Drink or administer one or two glasses of water to rinse mouth thoroughly but do NOT induce vomiting. Do not give anything by mouth if victim is unconscious or not alert.
2. Contact Port Services Centre on 09 432 5018 (24/7) and request an ambulance. Or call 111 and notify PSC immediately.
3. If patient becomes unconscious or unresponsive, perform CPR.

Contact with Skin & Clothing

1. Brush or shake material off clothes in a well-ventilated area.
2. Allow clothes to aerate in a ventilated area prior to laundering.
3. Do not leave contaminated clothing in occupied and/or confined areas such as automobiles, vans, motel rooms, etc.
4. Flush affected areas of skin with cold water for at least 15 minutes.
5. Seek immediate medical attention.

Unintentional Release

If there is an unintentional release of fumigant into the air, take the following steps immediately.

1. Move immediately upwind.
2. Notify Northport Port Services Centre on 09 432 5018 (24/7) and the Fumigator immediately.
3. Stay out of the area, especially directly down wind.