CTO DECISION DOCUMENT – Equivalence for non-compliant consignment

- **A CTO direction is required to fulfil MPIs reporting requirements - section 27(3) of the Biosecurity Act.**
- **The direction should not be attached to the PDF version of the permit; but must be retained in ECMS for reporting purposes**

Decision document and CTO direction to be signed by (highlight):			
Director (PFE)	Group Manager (PIE)	**Team Manager** (not currently delegated)	**Senior Adviser** (not currently delegated)

Under what authority is the decision being made (highlight):		
Appointed Chief Technical Officer – Peter Thomson	**Appointed Deputy Chief Technical Officer** – Stephen Butcher	**Delegated CTO authority** (no delegations are currently approved)
Section of the Act the decision is being made under:	**27(1)(d)(iii)** - a chief technical officer has issued guidelines, or given directions, on measures, different from those in the standard, that may be applied to manage effectively risks of the kind arising from the non-compliance	
The Biosecurity Act can be viewed on the website:http://www.legislation.govt.nz/act/public/1993/0095/latest/DLM314623.html Delegations under the Biosecurity Act can be searched on the following website:http://kotahi.maf.govt.nz/do/policies/view/article/1169/delegations-and-authorisations - CTO delegations can be searched under the heading 'Biosecurity (Chief Technical Officer)'		

Author:	Ken Glassey	**Team:**	PIE
Subject:	**CTOPlants: 2015 2050038**	**Due date:**	17/2/15

The unique CTO decision number can be found under the tab 'CTO27(1)(d)(iii)decisions' in the spreadsheet: http://fcs.maf.govt.nz/webtop/drl/objectId/090101b380d69fea

Review steps	**Name**	**Team**	**Date**
Peer review	Catherine Duthie	Risk	17/2/15
Consultation with other MPI groups	Francine Timmins	Legal	
	Veronica Hall	Legal	17/2/15
External			
Review and Team Manager sign out	Paul Hallett	B&E	
Group Manager sign out	Paul Hallett	B&E	
Director sign out			

ECMS link to Word version of this Decision Document:

2015 CTO Decision Document Equivalent Treatment Option.doc
http://fcs/webtop/drl/objectId/090101b380db81e4
FCS Folder Location: http://fcs/webtop/drl/objectId/0b0101b38007ad87

Insert other relevant documents here, this may include:

20141223 Recommendation document emergency measures change to Vehicle.all.pdf
http://fcs/webtop/drl/objectId/090101b380d9c745

FCS Folder Location: http://fcs/webtop/drl/objectId/0b0101b38007ad87

Insert copy of Decision Document here once signed (i.e. link in ECMS or PDF attachment)

CTO DECISION DOCUMENT

CTO Plants:

ISSUE

A CTO decision is required under section 27(1)(d)(iii) of the Biosecurity Act 1993, to direct that measures, different from those required by the import health standard (IHS) for Vehicles, Machinery and Tyres **(Vehicle – all)** may be applied to effectively manage the risks posed by non-compliant vehicles and machinery sourced from the USA.

This is a generic CTO decision, the outcome of which may apply to multiple imports of vehicles and machinery sourced from the USA.

BACKGROUND

Vehicles and machinery are eligible for import under the **IHS Vehicle –all**; specifically vehicles and machinery must meet the requirements of sections 4.3. To comply with the requirements of the IHS, the following measures must be met:

All new and used vehicles and machinery imported via sea freight must be:

Treated with:

a. heat (60 °C / 20min in the coldest location on the vehicle); or
b. methyl bromide (48gm/24hrs/10-15°C or 40gm/24hr/16-21°C or 32gm/24hr/21°C+)

and

c. break bulk cargo must be treated no more than 48hours prior to shipment;
d. containerised cargo must be treated either prior to shipment, or within 24 hours on arrival at the port of discharge.

Or

Managed through an MPI - approved system

On arrival in New Zealand these consignments did not comply with the IHS requirement sections 4.3

Halyomorpha halys, or brown marmorated stink bug (BMSB), is a temperate/subtropical species of stink bug native to China, Japan, Korea and Taiwan and has recently become invasive in the USA and causing significant economic losses. H. halys is not present in New Zealand and if it establishes will cause considerable economic loss and be a significant public nuisance in its aggregation phase.

The pathways that pose the highest likelihood of entry into New Zealand and exposure are containers (and items within), and vehicles and machinery.

In response to two separate interceptions of large numbers of aggregated live BMSB from two different ships discharging new vehicles from the USA at the Auckland port in December 2014, the vehicle IHS was urgently updated to include treatment of all vehicles from the USA.

There were 70 individuals in one consignment and 40 in the second consignment off one vehicle. The cargo was inspected on the vessel before discharge, again on the wharf and the aggregated BMSB were not detected. The bugs were only found when flushed out during the heat treatment process. It is concluded that visual inspection is ineffective at detecting BMSB.

The first shipment detected with an aggregated BMSB population consisted of live flying bugs inside the vehicle which posed difficulty with containment and treatment. The second shipment with 117 vehicles and machinery to be treated posed more logistical issues to contain the risk. It is recommended that the best method of containing the biosecurity risk of BMSB is to require a pre-shipment treatment at the port of loading within a narrow time-frame to prevent re-infestation.

During November and December 2014 there were six more instances of break bulk cargo (new truck, new car, new and used boats) with both live and dead bugs found on or in the cargo on a single ship.

At the two main ports (Baltimore and Savannah) for shipping break bulk vehicles and machinery there is no current heat treatment facilities and it is expected to take some months to build a facility. There is also a lack of methyl bromide due to the quota system for Quarantine and Preshipment use, for instance the fumigation facility is fully utilised treating timber for export. Exporters also have concerns over the detrimental effect of methyl bromide on the new vehicle components and have requested that New Zealand allow the use of sulfuryl fluoride as allowed for exports to Australia.

Sulfuryl fluoride for the treatment of vehicles

Sulfuryl fluoride (SO2F2, SF, Vikane®, ProFume® Gas Fumigant), is manufactured by Dow AgroSciences and registered globally for use as a structural/facility and stored product fumigant. SF is approved for both non-food and food uses to control insect pests in grain mills and storage facilities; in commodities like dried fruits, tree nuts and cocoa; in structural fumigation to disinfect buildings, monuments and churches. SF has been produced for fumigant use by Dow AgroSciences since 1961.

In the United States, Vikane (product registration #62719-004) has been registered for insect control in residential and non-residential structures since 1961. ProFume (product registration #62719-376) has been registered for food uses since 2004. Approved SF uses includes structures such as food handling establishments (e.g. pet food facilities, bakeries, food production facilities, mills, warehouses), stationary transportation vehicles (railcars, shipping containers, trucks, etc., excluding aircraft and passenger railcars), temporary and permanent fumigation chambers, and storage structures.

ProFume Gas Fumigant (Registration #59952) has been registered for use in Australia since November 2007. Approved uses include homes and other structures for drywood termites as well as fumigating food processing structures such as flour mills. ProFume is permitted for the commodity fumigation of dried fruit and nuts, whole grains and seeds and baled hay for animal feed use.

The current Australian Profume label lists all life stages of stored product pests including;

- Indian meal moth (Plodia interpunctella),
- Mediterranean flour moth (Ephestia kuehniella),
- Confused flour beetle (Tribolium confusum),
- Rust red flour beetle (Tribolium castaneum),
- Warehouse beetle (Trogoderma variabile),
- Saw-toothed grain beetle (Oryzaephilus surinamensis),
- Dried fruit moth (Ephestia cautella),
- Drugstore beetle (Stegobium paniceum),
- Tobacco beetle (Lasioderma serricorne),
- Hide beetle (Dermestes maculatus),
- Grain weevil (Sitophilius granarius),
- Rice weevil (Sitophilius oryzae),
- Rust red grain beetle (Cryptolestes ferrugineus) and
- Lesser grain borer (Rhyzopertha dominica)

The label includes insects such as borers, bedbugs, cockroaches, clothes moths, carpet beetles and drywood termites. Dwellings (including mobile homes) buildings, construction materials, timber and logs, furnishings (household effects), shipping containers (including those containing pallets, machinery and non-food items), and vehicles (including cars, buses, surface ships, rail cars and recreational vehicles but excluding aircraft).

Comparison of sulfuryl fluoride and methyl bromide at 15oC for 24 hours
An MPI operational research project (Brash et al (2007)) covered the first evaluation of sulfuryl fluoride (SF) as a potential alternative fumigant for methyl bromide (MB) for control of quarantine pests on vehicles and equipment imported into New Zealand. The evaluation followed an earlier literature review that recommended this fumigant for further testing. SF was considered promising because it is already registered in some countries.
Brash tested the efficacy of SF for control of 15 species of arthropods, gastropods, nematodes and fungi, including two life stages of four insects, comparing three rates of SF with a standard MB treatment. SF was just as effective as MB for control of all but the adult mites. A high rate of SF was required for control of burnt pine longhorn beetle eggs. SF was effective for control of brown garden snail but not for the egg stage of root knot nematodes.
Exposure tests using higher rates than needed to kill the pests were carried out on 20 car components, all considered sensitive to fumigants, and a network interface card, simulating a car computer. We found that no components were affected by these high rates of fumigant.
The report recommended SF as a broad-spectrum biocide which could be used as an alternative to MB for disinfestation of imported used vehicles and equipment.

Table 1

Family	Species		Life stage	Controlled by SF 30g/m3	Controlled by MB at 48g/m3
Coleoptera	Australian carpet beetle	Anthrenocerus australis	Larvae	Y	Y
Coleoptera	Burnt pine longhorn	Arhopalus tristis	Eggs	Y	Y
			Adults	Y	Y
Coleoptera	Hide beetle	Dermestes haemorrhoidalis	Adults Larvae	Y Y	Y Y

Tortricidae	Light brown apple moth	Epiphyas postvittana	Eggs Pupae	Y Y	Y
Formicidae	White footed house ant	Technomyrmex albipes	Adults Pupae	Y Y	Y Y
Pisauridae	Nurseryweb spider	Dolomedes minor	Spiderlings	Y	Y
Acaridae	Mould mite	Tyrophagus putrescentiae	Adults	N	Y
Helicidae	Brown garden spider	Helix aspersa	Aestivating adults	Y	Y

100% control* = all specimens killed using both fumigants (MB and SF at lowest rate).
SF also showed that it is unlikely to damage sensitive car parts.
A low rate of 30 g SF/m3 gave complete control of nine of 11 species/life stages tested.

Control of Cimex lectularius (Hemiptera: Cimicidae), the common bed bug

Millar and Fisher fumigated (at label rates) a large apartment block with SF and completely killed all adult stages of bed bugs.

Phillips et al (2014) found that at 25°C, a target dosage of 103.7 g-h/m3 resulted in 100% mortality of adults and late-instar nymphs. Nymphs emerged and survived from two of 439 eggs treated with SF dosages that were 6-7 g-h/m3 less than the target dosage. No nymphs emerged from eggs fumigated with dosages greater than 97.9 g-h/m3 in the validation study. Therefore, the threshold dosage for complete egg mortality (97.9 g-h/m3) was used, rather than the LED99 (lethal effect dose), to calculate the monitored field dosage rate of 148.2 g-h/m3 (= 1.5 x 97.9 g-h/m3) for control of all life stages of bed bugs at 25°C. Based on these results, at 15°C, 1.5x the threshold dosage for complete egg control (189.7 g-h/m3) was used to calculate a target dosage of 285 g-h/m3 for the confirmatory trial, which resulted in 100% mortality of adults, late-instar nymphs, and eggs.

Control of BMSB, initial trials

Initial trials at U.C. Davis by Dr. Spencer Walsh being carried out in February 2015, and observed by MPI advisers, found that 8g/m3 for 18 hours at 10°C (144g.h/m3) successfully controlled adult stages of BMSB. The work is ongoing and will take some time to produce the complete set of data.

Post treatment time

During the overwintering period BMSB generally remain inactive unless temperatures increase. BMSB do not fly at night at temperatures below an average of 21°C (T. Leskey pers. comm. 2015). Daytime temperatures of a sustained average of 15°C are sufficient for activity (Toyama et al. 2006). A post treatment period of 72 hours is considered to pose little risk of re-contamination during winter conditions at US ports. However, it is recommended that separation of a minimum of 100m between treated and untreated goods, or treated goods and potential infestation sources such as vegetation, is maintained.

Conclusion

The Australian SF fumigation rate is 32g/m3@21-25°C for 24 hours (768g-h/m3), 40g/m3@16-20°C for 24 hours or 960g-h/m3 which is well in excess of the 285g-h/m3 recommended by Phillips to control all life stages

of bed bugs. The Brash report used 30g/m3 at 15C for 24 hours or 720g.h/m3 for control of adult life stage of nine species.

It is recommended that the Australian SF fumigation rates with the 72 hour post treatment time period are adopted as they are in excess of known efficacy rates for similar insects and can be further refined (highly likely to be able to be reduced) when the research currently being carried out at Davis is completed.

ASSESSMENT OF RISK
Treatment with Sulfuryl fluoride, prior to export is equivalent to the requirement in sections 4.3 in the IHS **Vehicle –all** and will effectively manage the risks identified in the IHS:

LEGAL
A CTO decision is required, under section 27(1)(d)(iii) of the Biosecurity Act, to approve certain measures, different from those set out in the current IHS that may be applied to manage the risks set out in the IHS to enable biosecurity clearance.

DECISION
That treatment with Sulfuryl fluoride 32g/m3@21-25°C for 24 hours, 40g/m3@16-20°C for 24 hours prior to export, is equivalent to the requirement to fumigate with methyl bromide or heat treatment under section 4.3 in the IHS **Vehicle –all** and will effectively manage the risks identified in the IHS.

RECOMMENDATION
It is recommended that you accept the proposal described below.

That the following measure, different to that specified in section 4.3 of the import health standard **Vehicle – all,** may be used to effectively manage risks of the kind arising from non-compliant consignments of vehicles and machinery sourced from the USA:

Treatment with sulfuryl fluoride 32g/m3@21-25°C for 24 hours, 40g/m3@16-20°C for 24 hours, 72 hours prior to export.

AGREE / ~~DISAGREE~~

Ken Glassey
Senior Adviser Biosecurity and Environment
Acting pursuant to delegated Chief Technical Officer Authority

Date: 18/2/15

CTO Direction to MPI Inspector
Biosecurity clearance of non-compliant consignment/s

CTO direction code for recording in Quantum: CTO Plants: 2015 xxxx

Pursuant to section 27(1)(d)(iii) of the Biosecurity Act 1993 I, Paul Hallett give the following directions for consignments of vehicles and machinery sourced from the USA, to be given biosecurity clearance in accordance with the following measures, different from those required by section 4.3 fumigation with methyl bromide or heat treatment in the import health standard (IHS) **Vehicle.all**:

Treatment with sulfuryl fluoride 32g/m3@21-25°C for 24 hours, 40g/m3@16-20°C for 24 hours within 72 hours of shipment.

All other relevant sections of the IHS **Vehicle.all** for vehicles and machinery sourced from the USA must be complied with.

This direction takes effect from the date of signing, and may apply to multiple consignments of vehicles and machinery sourced from the USA which are not compliant with the measures required by section 4.3 in the import health standard (IHS) Vehicle.all This CTO direction is valid until, no more than 2 years after issuance at which stage it must be reviewed, unless it is amended or revoked.

Paul Hallett
Deputy Chief Technical Officer

Plant, Food & Environment Directorate
Date: 18/2/2015