MONTREAL PROTOCOL

ON SUBSTANCES THAT DEPLETE

THE OZONE LAYER

UNEP

REPORT OF THE

TECHNOLOGY AND ECONOMIC ASSESSMENT PANEL

QUARANTINE AND PRESHIPMENT TASKFORCE – FINAL REPORT

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Report of the
UNEP Technology and Economic Assessment Panel
Quarantine and Preshipment Taskforce - Final Report

October 2009

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Common Acronyms

1,3-D	1,3-dichloropropene
A5	Article 5 Party
CUE	Critical Use Exemption
CUN	Critical Use Nomination
EC	European Community
EPPO	European Plant Protection Organisation
IPPC	International Plant Protection Convention
ISPM	International Standard Phytosanitary Measure
MB	Methyl Bromide
MBTOC	Methyl Bromide Technical Options Committee
MITC	Methylsiocyanate
MOP	Meeting of the Parties
NPPO	National Plant Protection Organisation
OEWG	Open Ended Working Group
Pic	Chloropicrin
QPS	Quarantine and Pre-shipment
SF	Sulfuryl fluoride
TEAP	Technology and Economic Assessment Panel
USA, US	United States of America

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The opinions expressed in this report are those of the Panel and Committee and do not necessarily reflect the views of any sponsoring or supporting organisation.

1. Executive Summary

Decision XX/6 requested TEAP to review all relevant, currently available information on the use of methyl bromide for QPS applications and related emissions; to assess trends in the major uses, available alternatives, other mitigation options and barriers to the adoption of alternatives; and to determine any additional information or action that may be required to meet those objectives.

TEAP set up a revitalised Quarantine and Preshipment Task Force (QPSTF) made up of 10 experts, 4 from A5 and 6 from non A5 countries, to respond to aspects of Decision XX/6 directed to TEAP.

Between 1999 and 2007 reported production of MB for QPS remained approximately constant on an annual basis and roughly at the same level as reported consumption. Cumulative total reported production and consumption between 2002 and 2007 was 69,265 and 69,882 tonnes respectively, but fluctuations exceeded 1,000 tonnes on a yearly basis, possibly reflecting stock changes.

Reported global consumption for QPS has averaged nearly 11,000 metric tonnes a year since 1995, with some variation from year to year, with minimum consumption of less than 8000 tonnes in 1998, with peaks in 1999, 2003 and 2006 at 12,425, 12,286 and 12,207 tonnes respectively.

Non-A5 Parties accounted for approximately 62% and 46% of reported global consumption in 2006 and 2007, respectively. Six non-A5 Parties reported consumption of >100 tonnes QPS methyl bromide in 2007, with two Parties accounting for 82% of total non-A5 consumption. USA reports a wide annual variation in QPS consumption, peaking at 5,089 metric tonnes for 2006 and reduced to 2,930 tonnes in 2007. QPS consumption in A5 countries has increased since 2000, particularly in the Asian region, while in non-A5 countries it has declined. In 2007, eleven A5 countries reported consumption at or above 100 metric tonnes for QPS purposes. Together, this accounted for 5,100 tonnes or about 87% of total A5 consumption in that year. A5 consumption amounted to 38% of total global consumption in 2006 and 54% in 2007.

For the 2007 estimated QPS usage of 8,486 tonnes, QPSTF estimated that 65% of this related to phytosanitary (Quarantine) requirements associated with international trade, covered by the IPPC; 14% for Preshipment uses; 20% for within-country Quarantine uses, including treatment for producing propagation materials; and <1% for other Quarantine uses, particularly control of human health and animal disease vectors, internationally or domestically.

Most QPS treatments, by volume, for international trade are carried out at point of export to meet requirements of the importing country.

While there remain some data gaps and uncertainties, information supplied by the Parties has allowed QPSTF to make estimates of use for more than 83% of total reported QPS consumption. Five major categories of use accounted for 70% of total global 2007 consumption. These main categories represent about 84 % of the uses for which detailed information is available (i.e. excluding unidentified uses). These are for fumigation against plant pests of: fresh fruit and vegetables (8% of identified uses); grain, including rice (12%); soil for preplant fumigation in situ (14%); whole logs (21%); and wood and wood packaging material (15%). Over all categories of QPS fumigation it is estimated that around 79% of applied methyl bromide is emitted, in absence of recapture and destruction processes and with standard industrial practice.

There is a discrepancy of about 1,300 tonnes for non-A5 Parties for 2007 between total consumption as represented by methyl bromide actually used, estimated by 'bottom-up' analysis, and total consumption reported as per Article 7 data. A discrepancy of similar magnitude is apparent yearly over the period 2003-2007. This discrepancy results mainly from differences between reported QPS methyl bromide consumption by the US under Article 7 and estimates of its annual actual use as a fumigant. At this time the fate of this surplus is unidentified, but could include accumulation of QPS-labelled stocks of methyl bromide.

The proportions treated with QPS methyl bromide represent a small fraction of these commodity groups traded internationally, though a high proportion or all of the trade in these groups between particular countries may be treated at present and be important economically.

In response to Decision XX/6(7) that called for TEAP list categories of use it has identified that have been classified as QPS use by some Parties but not by others, the following large volume methyl bromide fumigation treatments were identified: a) export coffee (Vietnam); b) export rice and cassava chips (Thailand, Vietnam); and c) soil for production of high health propagation material (USA). The Parties have provided rationale as to why these situations quality to be treated as QPS uses, given as annexes to this report. Target pests for QPS treatments vary from country to country and with the particular trade or situation. The target pests for Quarantine and for Preshipment are distinct.

The NPPOs of importing countries maintain extensive lists of regulated (Quarantine) pests, specific to the requirements of that country. Some of these pests are specifically targeted by methyl bromide fumigation at this time in particular countries and with origin of the cargo and risk that it might carry Quarantine pests taken into account.

While there may be very many different pest species of Quarantine significance for particular trades, there are some key pests that are at present commonly managed with methyl bromide fumigation. These include pinewood nematode, longicorn beetles and other wood pests for trade in logs and wooden materials, khapra beetle in grain and similar commodities, tephritid fruit flies in some fresh fruit and various pathogenic nematodes and fungi in soils.

Development of methyl bromide alternatives for Quarantine applications on commodities continues to be a difficult process, exacerbated by the multitude of commodities being treated, the diverse situations where treatments are applied, a constantly changing trade and regulatory landscape, requirements for bilateral agreement on QPS measures, requirement for very high levels of proven effectiveness, often for several different target species, lack of patent coverage or other commercial protection for some potential alternatives, and the low price and plentiful supply of methyl bromide for QPS purposes. Regulations favouring methyl bromide treatment or prescribing methyl bromide alone are a major barrier to adoption of alternatives as often there is little incentive for the regulation to be changed. A key barrier to development of alternatives for soil treatment for growing plants of certified high health status is the rigorous testing required to prove and certify an alternative effective.

With regard to Quarantine treatments associated with international trade, the IPPC has an agreed policy that alternatives to methyl bromide should be used wherever technically and economically feasible, advice mirroring that in Decision VII/5(c). Under the IPPC, there is a Technical Panel on Phytosanitary Treatments that has promulgated a standard for treatments to be assessed against and is assessing alternatives and approving where sufficient data is available.

There are technically effective alternatives in use approved and in use for at least some of the major categories of current Quarantine uses on commodities. Heat treatments are available for treatment of sawn timber and wood packing material, fumigation with phosphine or sulfuryl fluoride – MITC are available for particular trades with whole logs, and there are a number of alternative options in use for various perishables in international trade.

For Preshipment treatments, the objective of treatments is to produce goods that are 'pest-free', to some standard level. While in practice the target species are typically cosmopolitan insect pests (beetles, moths and psocids) associated with quality losses in storage, treatments are also expected to eliminate the other living insect species that may contaminate commodities, even when they do not pose a direct threat to the quality of the commodity.

For Preshipment treatment of grains, there are several alternative fumigants, which are available or near market, that can match the effectiveness and speed of action of methyl bromide. Where logistically possible, several alternative strategies are available that can deliver 'pest-free' grain at point of export. In-transit fumigation with phosphine may also be an option. Several soil treatment techniques and soilless systems can deliver propagation material produced to high plant health status.

In many of these cases, where the alternatives are not already approved and agreed, there are various regulatory and other barriers to be overcome, before the alternatives can be applied.

The QPSTF identified a number of instances of QPS methyl bromide treatments where there are no technically effective alternatives at this time. Examples include: treatment of some export fruit that are hosts of codling moth, postentry treatment of a number of import consignments, e.g. cut flower imports, at risk of infestation with Quarantine pests, treatment of grains and associated materials against risk of presence of khapra beetle, some export trades in undebarked, whole logs, and treatment of wood packaging material where heat treatment is not feasible.

Methyl bromide emissions from fumigations can be minimised through adoption of best practice, both directly through best use of the fumigant and indirectly by minimising the need to retreat after treatment failures. Methyl bromide can also be conserved to some extent. In a commercial installation in China treating logs, residual gas from one fumigation chamber is transferred to a new fumigation. The concentration is then topped up to specification using new methyl bromide, with a saving of methyl bromide of about 30% use.

There are several commercially available processes for recapture of residual methyl bromide. Present installations known to QPSTF have individual capacities of less than 50kg of fumigant, but higher capacity units are being currently being installed. All commercially available recapture units are based on absorption onto active carbon, but subsequent treatment of the loaded carbon differs. Efficiencies of recapture are strongly dependent on good fumigation practice that minimises leakage during the exposure to the fumigant. Some specifications for QPS fumigations include a minimum residual concentration or % retention at the end of the exposure. Examples vary from 21 to 60% retention, setting a limit on easily available fumigant for recapture. Taking into account losses in practice during fumigations, including sorption losses and leakage, it is estimated that 30-70% of initial dosage is available for recapture, with good practice, depending the load treated and other conditions. Commercially available recapture system also offers the ability to release recaptured methyl bromide for reuse, with a saving in practice of about 30% of methyl bromide use. Costs of recapture are highly situation-dependent, but may typically add 50-100% to the cost of a fumigation.

Methyl bromide, as a highly toxic gas, is subject to numerous restrictions and regulations that affect its use as QPS fumigant treatment.

Some Parties have discontinued use of QPS methyl bromide or have announced they intend to do so in the near future. The Russian Federation discontinued use of QPS methyl bromide with legislation that also terminated use of non-QPS material. Both the EC and Brazil have signalled they will discontinue QPS methyl bromide use soon.

Industrial and environmental regulations relating to methyl bromide fumigations vary widely between countries. In some, its use severely restricted and may require recapture in some regions. National phytosanitary regulations specify set dosages for particular applications. There are relatively few cases (by total volume used) where methyl bromide is the sole treatment specified, though local circumstances may make it the only feasible option. This is particularly so for postentry quarantine.

Illustrative examples of regulations affecting methyl bromide as a QPS fumigant are given in the report.

In general, there is sufficient data available to provide a reliable picture of major uses of QPS methyl bromide and the many regulations that encourage or restrict QPS methyl bromide use are accessible, if not fully catalogued. Alternatives for many of the uses are known, though often not tested and certified to a level acceptable to regulatory authorities.

In the light of the information available on categories of use of methyl bromide for QPS purposes, alternatives available and key pests, the QPSTF was able to make preliminary estimates of uses and amounts that could possibly be replaced with alternatives. Most, perhaps 80%, of QPS methyl bromide in the world is technically replaceable according to the scenario presented, although achieving this level of replacement is constrained by many difficulties, including resolution of some regulatory constraints on the available and potential alternatives.

2 Introduction

2.1 Mandate and scope of the final report

Following Decision XX/6 on Actions by Parties to reduce methyl bromide use and emissions for quarantine and pre-shipment purposes, TEAP set up a revitalised Quarantine and Pre-shipment Task Force (QPSTF), to report to the Parties on those parts of Decision XX/6 that requested TEAP's response. TEAP, in consultation with the International Plant Protection Convention (IPPC) secretariat, reviewed all relevant, currently available information on the use of MB for Quarantine and Pre-shipment (QPS) applications and related emissions, to assess trends in the major uses, available alternatives, other mitigation options and barriers to the adoption of alternatives, and determine what additional information or action may be required to meet those objectives to further protect the stratospheric ozone layer.

In particular, the assessment is required to consider:

- Volumes of MB used for QPS, by major uses and target pests;
- Technical and economic availability of alternatives for the main MB uses, by volume, and of MB recovery, containment and recycling;
- QPS applications for which no alternatives are available and an assessment of why alternatives are not technically or economically feasible or cannot be adopted;
- Illustrative examples of regulations that directly affect the use of MB for QPS treatment;
- Barriers preventing the adoption of alternatives to MB;
- Opportunities for reducing MB use or emissions for QPS, including technologies for recapture and destruction of methyl bromide from QPS applications.

Decision XX/6 also requested TEAP to address its paragraphs 5 and 7 in an interim report presented to the twenty-ninth meeting of the Open-Ended Working Group. The interim report provided this response and also described work in progress and preliminary findings related to the remaining tasks under Decision XX/6. These remaining tasks are addressed in the present Report, which is submitted to the 21st Meeting of the Parties per the mandate of the Decision. The full text of Decision XX/6 is included for convenience in Annex 1 at the end of this report.

2.1.1. Fulfilment of Decision XX/6 – Process

In response to Para. 4 of Decision XX/6, TEAP assembled a streamlined and revitalised QPS task force (QPSTF) under the coordination of two co-chairs, one from an A5 and one from a non-A5 Party. The task force is presently composed of ten members including the co-chairs, six from non-A5 Parties and four from developing (A5) Parties, with broad regional representation. Names and details of QPSTF members can be found in Annex 5.

QPSTF work was generally conducted though conference calls and electronic communication. A private website for posting documents was created with the help of the Ozone Secretariat to help progress work. Communication was established with the IPPC in response to the Decision mandate. Cooperation of the Parties, either directly or via the regional UNEP Compliance Assistance Programmes (CAP) was sought through the Ozone Secretariat. Responses and valuable information has been received directly from twenty-six Parties, and permission to use data from surveys, previously considered confidential, was obtained.

The QPSTF further conducted extensive reviews of published literature, conference proceedings, QPS regulations from different countries, consultation with experts and others, to access relevant information to the best extent possible.

Draft reports were circulated to the MBTOC-Soils and MBTOC-QSC subcommittees as well as TEAP for discussion, review and input.

A face to face meeting of the full QPSTF was held at IPPC quarters in Rome, Italy from 7 to 9 September 2009 in order to finalise the report to be presented during the 21st MOP according to mandate.

In keeping with Decision XX/6, the QPSTF has considered categories of use and options for adopting alternatives to methyl bromide for QPS uses in relation to IPPC rules and measures. In particular reference has been made to the IPPC recommendation "For the replacement or reduction of MB as a phytosanitary measure" (IPPC, 2008).

2.1.2. Layout and structure of the report

The report is structured to fully comply with tasks assigned to the QPSTF as per Decision XX/6:

- *Chapter 2* - Provides an introduction to the QPS exemption and background information of uses of MB for QPS purposes, Decisions the Parties have taken concerning QPS and others.
- *Chapter 3* - Gives an overview of production and consumption of methyl bromide for QPS uses, both at the global and the regionas A5/non-A5 levels. It compares production and consumption trends over several years.
- *Chapter 4* - Analyses reported consumption per category of use by volume. It further present volumes of unallocated uses, that is, volumes for which a specific use has not been clearly identified.
- *Chapter 5* - Presents uses of MB found by QPSTF to be considered as QPS by some Parties but not others, in response to para 7 of Decision XX/6. The rationale submitted by such Parties is included as Annex 3.
- *Chapter 6* – Gives an overview of alternatives to MB for the main categories of QPS use, identified as follows:
    - Fresh fruit and vegetables
    - Grain including rice

- Soil in situ
- Whole logs
- Wood and wooden packaging material

It further includes a section analysing barriers to adoption of alternatives and describes those uses and instances for which no alternatives have been identified.

- *Chapter 7* – Discusses opportunities for emission reduction and recovery of MB. It gives an estimate of quantities of QPS methyl bromide emissions available for recapture and destruction; presents technologies for MB recovery, containment and recycling for commodity treatments; and discusses options for MB emission reduction in soil fumigation.
- *Chapter 8* – Deals with regulations and other measures that directly affect the use of MB for QPS uses. It provides examples of regulations that mandate MB use and regulations that provide alternative treatments, per geographic region. Reference is further made to regulations relating to use of MB as a toxic substance at ground level and IPPC standards that relate to methyl bromide.
- *Chapter 9* – Analyses information gaps with respect to the mandate of Decision XX/6 and proposes ways in which such information could be obtained.

At the end of the report five Annexes are included as follows:

- Annex 1 – Presents the full text of Decision XX/6.
- Annex 2 – Contains examples of alternative non-MB quarantine treatments that have been approved by quarantine authorities for the following groups of products: Fresh fruit and vegetables; cut flowers and ornamentals; and propagative plant materials for planting, including plants, bulbs and cuttings.
- Annex 3 – Includes responses by Parties to listing under Decision XX/6(7) – categories of MB use that are considered to be QPS by some Parties but not others.
- Annex 4 – Includes further detailed information on QPS regulations which impact the use of methyl bromide.
- Annex 5 – Provides a listing of QPSTF members together with an individual declaration of interest.

2.1.3. Origin and original intent of the QPS exemption

At the 1992 Meeting of the Parties in Copenhagen that established methyl bromide as a controlled Ozone Depleting Substance, Article 2H of the Protocol specifically excluded QPS from control measures when it stated, *inter alia*:

'The calculated levels of consumption and production …shall not include the amounts used by the Party for quarantine and pre-shipment applications'

This was the first time that QPS was mentioned in the Protocol documentation. It is notable that in the report of this Meeting of the Parties there was no attempt to define 'quarantine' or 'pre-shipment' (UNEP/Ozl.Pro.4/15), but rather to defer this task to a later meeting.

At the time that Article 2H was documented in Copenhagen in 1992, the Parties understood that there were no alternatives to MB for a diverse range of treatments carried out with MB for QPS. The Parties recognised that although QPS consumption was about 10% of global MB consumption at the time, this volume was nevertheless very significant in allowing inter- and intra-country trade in commodities treated with MB *in the absence of site-specific alternatives*.

Unless site specific alternatives to MB were available for QPS that were tested and approved in both A 5 and non-A 5 countries, there was a strong likelihood of disruption to international trade if the exemption for QPS were not available. For some A 5 and non-A 5 that rely on export receipts for MB-treated commodities as a significant proportion of their income from specific commodities, the exemption was considered very important as it specifically avoided '…new non-tariff barriers to trade…' (Decision VI/11) that could be introduced if such an exemption were not in place.

Biological invasions by new pest species into a country of region can have serious adverse effects economically and on natural resources (e.g. recreational values, extinction of indigenous species). An objective of the Quarantine treatments of the QPS exemption is to prevent establishment of these new pest species in areas hitherto free of them. The combined economic costs of new pests may be significant, with implications for environmental policy and resource management; yet full economic impact assessments are rare at a national scale. A Canadian study (Colautti *et al*. 2004) characterised and projected economic costs associated with new pest species in Canada, through a combination of case-studies and an empirical model derived from 21 identified effects of 16 new pest species. Despite a lack of data, characterised costs associated with ten species in Canadian fisheries, agriculture and forestry were estimated to cost $ CDN 187 million per year.

These costs were dwarfed by the 'invisible tax' projected for sixteen new pest species found in Canada, which was estimated at between $ CDN 13.3 and 34.5 billion per year. One study reported that 79 exotic species in the USA had caused approximately $US 97 billion in damages during the period 1906–1991 (OTA 1993). Another study in the USA (Pimental *et al.* 2000) estimated the non indigenous species caused some $US 137 billion damage per year.

The eradication of a newly discovered pest is generally difficult, often highly controversial, and frequently requires substantial resources costing millions of dollars and commitment of those in charge of an operation and the many stakeholders (e.g., Myers and Hosking, 2002; Simberloff, 2002, 2003). However, as Brockerhoff *et al*. (unpublished) found there are ample examples of successful eradication campaigns. These include several recent successful eradication campaigns against tree-defoliating Lepidoptera in New Zealand (at a cost of $NZ 94 million) and North America (e.g., Myers and Hosking, 2002; Suckling *et al*., 2007a). A number of other pest insects and diseases have been successfully eradicated, including the screw-worm fly (*Cochliomyia hominivorax*) in the USA (Myers *et al*., 1998), Central America (Galvin and Wyss, 1996), and North Africa (Gillman, 1992), the Mediterranean fruit fly (*Ceratitis capitata*) in Mexico, parts of Central America, Chile, Australia and California (Hendrichs *et al*., 2002), and the red imported fire ant (*Solenopsis invicta*) in New Zealand (Sarty, 2007).

Countries involved in trade have relied on effective quarantine measures to prevent the incursion of new pest species. Along with other pest control methods, methyl bromide has been a key tool for this for over 70 years.

2.1.4. Decisions relating to QPS use of methyl bromide

Since 1992, there have been various Decisions taken by the Parties to the Montreal Protocol related to this QPS exemption. These have concerned definitions and clarification of definitions, and have also requested TEAP to conduct closer evaluations of MB uses for QPS purposes and their possible alternatives or opportunities for reducing emissions. TEAP has responded to these Decisions through its MBTOC as well as appointing special task forces.

Table 2-1 below lists decisions relating to QPS uses of MB and summarises the main issues comprised by each:

Table 2-1. Summary of decisions relating to QPS uses of MB

Decision No.	**Decision title**	**Summary**
VI/11(c)	Clarification of «quarantine» and «pre-shipment» applications for control of methyl bromide	Gives definitions of quarantine and pre-shipment. Urges non-A5 Parties to refrain from MB use and use non ozone-depleting technologies whenever possible. Where MB is used Parties are urged to minimise eemmissions and use containment and recovery and recycling methodologies ot the extent possible
VII/5	Definition of «quarantine» and «pre-shipment» applications	Provides definitions for QPS. In applying them, all countries are urged to refrain from the use of MB and to use non-ozone depleting technologies when possible. Where MB is used, Parties are urged to minimise emissions and use MB through containment and recovery and recycling methodologies to the extent possible
XI/12	Definition of pre-shipment applications	Defines a maximum time period of 21 days prior to export for application of treatments to qualify as 'Pre-shipment'

Decision No.	Decision title	Summary
XI/13	Quarantine and pre-shipment	Requests that the 2003 TEAP Report evaluate the technical and economic feasibility of alternatives that can replace MB for QPS uses; and to estimate the volume of MB that would be replaced by the implementation of such alternatives, reported by commodity and/or application. Requests Parties to review their national regulations with a view to removing the requirement for the use of MB for QPS where alternatives exist. Urges Parties to implement procedures to monitor the uses of MB by commodity and quantity for QPS uses. Encourages the use of recycling and recovery technologies for those uses with no feasible alternatives
XVI/10	Reporting of information relating to quarantine and pre-shipment uses of methyl bromide	Requests TEAP to establish a QPS Task Force to prepare the report under Dec XI/13; requests Parties to submit information on QPS uses of MB if not already done so. Requires TF to report on the data submitted by Parties in response to the April 2004 methyl bromide QPS for the 25th OEWG. Data to be presented in a written report in a format aggregated by commodity and application so as to provide a global use pattern overview, and to include available information on potential alternatives for those uses identified by the Parties' submitted data
XVII/9	Critical-use exemptions for methyl bromide for 2006 and 2007	To request the QPSTF to evaluate whether soil fumigation with MB to control quarantine pests on living plant material can in practice control pests to applicable quarantine standards, and to evaluate the long-term effectiveness of pest control several months after fumigation for this purpose, and to provide a report in time for the 26th meeting of the OEWG.
XX/6	Actions by Parties to reduce methyl bromide use for quarantine and pre-shipment purposes and related emissions	Requests the QPSTF, in consultation with the IPPC secretariat, to review all relevant, currently available information on the use of MB for QPS applications and related emissions; to assess trends in the major uses; available alternatives; other mitigation options and barriers to the adoption of alternatives; and to determine what additional information or action may be required to meet those objectives.

Source: Montreal Protocol Handbook

2.1.5. Quarantine and Pre-shipment - definitions

The scope of the QPS exemption set out in Article 2H para. 6 has been clarified in Decisions VII/5 and XI/12 of the Protocol relating to the terms 'Quarantine' and 'Pre-shipment'. TEAP (2002) provided some discussion and examples of cases that might or might not fall within the QPS exemption. There is also discussion of the scope of the exemption from control under the Protocol for QPS uses of methyl bromide in TEAP (1999) and the UNEP/IPPC (2008) publication 'Methyl Bromide: Quarantine and Preshipment Uses'.

Differences in interpretation of the scope and application of the QPS exemption by individual Parties has led to some differences in the uses that were reported as QPS in the data accessed by the QPSTF.

Specifically, the Seventh Meeting of the Parties decided in Decision VII/5 that:

a) *"Quarantine applications", with respect to methyl bromide, are treatments to prevent the introduction, establishment and/or spread of quarantine pests (including diseases), or to ensure their official control, where:*
   i. *Official control is that performed by, or authorised by, a national plant, animal or environmental protection or health authority;*
   ii. *Quarantine pests are pests of potential importance to the areas endangered thereby and not yet present there, or present but not widely distributed and being officially controlled*

b) *"Pre-shipment applications" are those treatments applied directly preceding and in relation to export, to meet the phytosanitary or sanitary requirements of the importing country or existing phytosanitary or sanitary requirements of the exporting country;*

The definition of 'Pre-shipment' is unique to the Montreal Protocol. It is given and elaborated in Decisions VII/5 and XI/12. The Eleventh Meeting of the Parties decided in Decision XI/12 that pre-shipment applications are *"those non-quarantine applications applied within 21 days prior to export to meet the official requirements of the importing country or existing official requirements of the exporting country"*.

As per decision VII/5, official requirements are those, which are "performed by, or authorised by a national plant, animal, environmental, health or stored product authority".

The International Plant Protection Convention, Codex Alimentarius Commission (Food Standards) and the International Office of Epizootics (Animal Standards) all fall under the mantle of the principles of the Sanitary and Phytosanitary Agreement (SPS) which itself is under the World Trade Organisation. The main SPS principle is that no Member should be prevented from adopting or enforcing measures necessary to protect human, animal or plant life or health. The Agreement applies to all sanitary and phytosanitary measures that may, directly or indirectly, affect international trade. However, 'Members shall ensure that any sanitary or phytosanitary measure is applied only to the extent necessary to protect human, animal or plant life or health, is based on scientific principles and is not maintained without sufficient scientific evidence, except as provided for in paragraph 7 of Article 5.' (Article 2.2). Members may introduce or maintain sanitary or phytosanitary measures which result in a higher level of sanitary or phytosanitary protection than would be achieved by measures based on the relevant international standards, guidelines or recommendations, if there is a scientific justification. Members shall accept the sanitary or phytosanitary measures of other Members as equivalent, even if these measures differ from their own or from those used by other Members trading in the same product, if the exporting Member objectively demonstrates to the importing Member that its measures achieve the importing Member's appropriate level of sanitary or phytosanitary protection. Another important principle of the SPS agreement is "To harmonize sanitary and phytosanitary measures on as wide a basis as possible, Members shall base their sanitary or phytosanitary measures on international standards, guidelines or recommendations, where they exist, except as otherwise provided for in this Agreement ..." (Article 3,1). The SPS agreement also requires parties to base their phytosanitary measures on risk assessment, taking into account scientific evidence and the risk assessment techniques developed by the relevant international organizations (Article 5,1). The SPS agreement does not talk about quarantine pests but defines what sanitary or phytosanitary measures are.

Sanitary or phytosanitary measure — Any measure applied:

a) to protect animal or plant life or health within the territory of the Member from risks arising from the entry, establishment or spread of pests, diseases, disease-carrying organisms or disease-causing organisms;

b) to protect human or animal life or health within the territory of the Member from risks arising from additives, contaminants, toxins or disease-causing organisms in foods, beverages or feedstuffs;

c) to protect human life or health within the territory of the Member from risks arising from diseases carried by animals, plants or products thereof, or from the entry, establishment or spread of pests; or

d) to prevent or limit other damage within the territory of the Member from the entry, establishment or spread of pests.

In the International Plant Protection Convention, the following definitions apply:

> *"Quarantine pest" - a pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled;*
>
> *"Regulated non-quarantine pest" - a non-quarantine pest whose presence in plants for planting affects the intended use of those plants with an economically unacceptable impact and which is therefore regulated within the territory of the importing contracting party.*

The QPSTF notes that '*not yet present there*' is referring to exotic pests, rather than an endemic pest. Exotic pests may be long established in defined regions of a country, but still subject to quarantine measures for regions where they are not established or host material moving between regions.

The definition of a quarantine pest under the Montreal Protocol differs from that under the IPPC by one word, 'economic': the Montreal Protocol refers to *"pests of potential importance"* while the Convention definition refers to "*pests of potential economic importance"*. However, under the IPPC, it has been clarified in a supplement to ISPM No. 5 that 'economic' includes the effect of changes (e.g. in biodiversity, ecosystems, managed resources or natural resources) on human welfare.

The IPPC deals with pests of plants, and not of livestock, which would have potential economic impact, again including environmental considerations. The scope of the IPPC covers international measures for the protection of cultivated plants in agriculture (including horticulture and forestry), uncultivated/unmanaged plants, wild flora, habitats and ecosystems. IPPC measuresare not directly concerned with domestic phytosanitary and quarantine measures, excepting where they impact international measures.

The IPPC definition of a quarantine pest relates to official control, which means the active enforcement of mandatory phytosanitary regulations and the application of mandatory phytosanitary procedures with the objective of eradication or containment of quarantine pests or for the management of regulated non-quarantine pests. The latter are specifically pests of propagation material and seeds for planting, and do not include pests that affect quality in storage.

The Montreal Protocol's definition covers environmental and other pests that might endanger a region without direct quantifiable economic loss. An interpretation of Decision VII/7 is that the use of methyl bromide as a quarantine treatment may only be for pests that are officially recognised as quarantine pests and must be officially authorised by a competent authority. The IPPC definition of a quarantine pest relates to official control, which means established, authorised or performed by a national plant protection organisation. Under the Montreal Protocol definitions, 'competent authorities' include not only national plant protection organisations, but also national animal or environmental protection authorities or national official health authorities. An interpretation is that commercial and contractual arrangements to supply fumigated or pest-free commodity do not qualify a treatment as 'quarantine' nor 'pre-shipment'.

QPS treatments under the Montreal Protocol relate not only to official phytosanitary treatments, but may also apply to 'sanitary' treatments, e.g., against human or animal pathogens and vectors (e.g. mosquitoes), covered by International Agreements (IAs, multilateral agreements) such as the World Animal Health Organisation (OIE) and World Health Organization (WHO).

Pre-shipment treatments target non-quarantine pests that may be present in both the exporting and importing country. These pests are usually ones that affect storage or end-use quality of the exported commodities, and are outside the direct scope of the IPPC. However, the model Phytosanitary certificate from Guidelines for Phytosanitary Certificates provided in ISPM 12 contains the following clause: "They are deemed to be practically free from other pests.* (optional)". This relates to Preshipment uses where a certification is needed to meet commodity shipping requirements.

3. Production and Consumption

3.1 Introduction

Production and consumption of methyl bromide, an ozone-depleting substance, for quarantine and pre-shipment uses is exempted from control under Article 2H, para. 6 of the Montreal Protocol. Parties have been required to report their production and consumption for QPS purposes (Beijing Amendment, Art. 1, para. O).

Paragraph 1 of Decision XX/6 urge those Parties that have not yet done so to report data on the use of MB for QPS applications, (as required under paragraph 3 of Article 7, by April 2009) and to report such data in accordance with existing Protocol requirements and decisions annually thereafter. Paragraph 2 requests the Ozone Secretariat:

> (a) To update the definition of pre-shipment in paragraph 5.6 of the Instructions/Guidelines for data reporting to reflect decision XI/12;
>
> (b) To post on its website, production and consumption data reported by the Parties under paragraph 3 of Article 7 for methyl bromide used for quarantine and pre-shipment applications;

Parties have been encouraged to use alternatives to methyl bromide for QPS purposes where technically and economically feasible (Decisions VI/11(c), VII/5, XI/13, XVI/11 in part). The CPM policy for its members on methyl bromide also requests that alternatives to methyl bromide for Quarantine uses be used where possible (IPPC 2008)

Nevertheless, consumption of methyl bromide for QPS purposes continues to be substantial. TEAP (2004) estimated QPS use of MB to be about 28% of global methyl bromide consumption in 2002, equivalent to 11,245 tonnes. In 2006, MBTOC (2007) reported that although production of MB for QPS purposes (Ozone Secretariat data) had been approximately constant over the period 1999-2004 at around 10,500 metric tonnes per annum, it showed an increase of about 30% in 2005 to 13,815 tonnes. The increase came at a time when ‘controlled’ uses of methyl bromide had decreased rapidly as a result of progress with phasing out of MB in both A 5 and non-A 5 countries.

In 2007, the most recent year for which the Ozone Secretariat has complete data as at September 2009, reported global production of MB for QPS uses was 12,984 metric tonnes, after a lower reported production in 2006 of 10,275 metric tonnes. Global production of MB for non-exempt uses, has been falling rapidly in response to the phaseout activities for methyl bromide for both A 5 and non-A5 Parties and in 2007, at 12,875 metric tonnes, this fell below that for QPS for the first time. Production for QPS is expected to exceed that for non-exempt uses substantially in 2008, with the continued downward trend in non-exempt uses.

On average, about 80% of the methyl bromide applied in QPS uses is estimated to be emitted (see Chapter 8) and thus presents a risk to the ozone layer. An exception is when recapture systems are fitted and emissions are reduced substantially. At this time, only a small fraction of total applied methyl bromide is recaptured. This is probably less than 1% of applied methyl bromide, but the exact quantity recaptured and reused or destroyed is not known.

Uses of methyl bromide for QPS are diverse, but there is a well-established set of specific uses. TEAP and its MBTOC have reported on this issue in several reports (TEAP, 1999, 2003, 2006; MBTOC 1998, 2002, 2007). They noted that individual tonnages for methyl bromide uses for quarantine and pre-shipment treatment of particular commodities were not available at that time on a comprehensive and worldwide basis, though specific surveys or datasets were available for a number of countries. Following Decision XI/13, all EC Member States are required to use logbooks recording QPS uses and quantities. However, in many countries, records of QPS usage by application have not been routinely kept or not easily accessed. In 2004 a survey of QPS uses by individual Parties was carried out in response to Decision XI/13(4). This survey provided data on uses for close to 50% of reported global consumption. Decision XI/13(6) urged Parties to implement procedures to monitor the QPS uses of methyl bromide by commodity and quantity, but these may not have been in place by the time the survey was conducted, limiting the availability of the information requested. Decision XVI/10(4) requested Parties that had not already submitted data to provide best available data on QPS uses and associated quantities to the 2005 TEAP Quarantine and Pre-shipment Task Force before 31 March 2005. Both Decisions requested information from the Parties on what alternatives were available to the individual Party for particular QPS applications, and specifically for the five largest consuming applications. Responses by Parties to the 2004 survey and subsequent information provided under Decision XVI/10(2) covered about 65% of the total reported annual consumption for QPS during the 2002-2004 period. Responses from Parties indicate wide variation in the kinds of data collected by individual Parties and the precision with which they can report to the Protocol commodity by commodity use.

Decision XX/6 urged those Parties that have not yet done so to report data to the Ozone Secretariat on the use of methyl bromide for quarantine and pre-shipment applications by April 2009 and to report such data annually thereafter in accordance with existing Protocol requirements and decisions. It further encourages Parties, in accordance with the recommendations (IPPC 2008) of the third meeting of the Commission on Phytosanitary Measures under the International Plant Protection Convention, to put in place a national strategy involving actions to help reduce the use of methyl bromide for phytosanitary measures and/or reduce emissions of methyl bromide and make such strategies available to other Parties through the Ozone Secretariat.

3.1.1. Sources of information – Volumes of MB used for QPS

National statistics on the production, import and export of MB intended for QPS have been submitted to the Ozone Secretariat by a number of Parties in their annual reports under Article 7 of the Protocol. The ‘Data Access Centre’ on the Ozone Secretariat’s website contains the data on MB production for QPS, and QPS consumption. The available data lies in the period from 1986 to 2007, although there are many gaps in the earlier years. Reporting of methyl bromide production and consumption for QPS purposes was not specifically required under the Articles of the Montreal Protocol until the Beijing Amendment was adopted in 1999. The Beijing Amendment inserted into Article 7(3) a requirement for Parties to report the annual amount of MB used for QPS (Beijing Amendment, Art. 1, para. O). This

Amendment entered into force in 2002 or 90 days following a Party's ratification date. Some Parties have not ratified this Amendment at the present time.

A number of Parties submitted QPS data to the Ozone Secretariat for the years before the Beijing Amendment came into force as a result of several Decisions. In 1997, Decision IX/28(6) revised the official formats for reporting Article 7 data and stipulated that, when reporting on QPS, Parties should report the amount 'consumed' (imports, production, exports) rather than actual 'use'. Decision X/11(4) reminded Parties of the need to report on the volumes of MB consumed for QPS as set out in Decision IX/28. Most recently, in 2008, Decision XX/6(1) urged Parties that have not yet reported QPS data under Article 7 to do so by April 2009, and annually thereafter.

3.1.2. Overview of QPS production and consumption

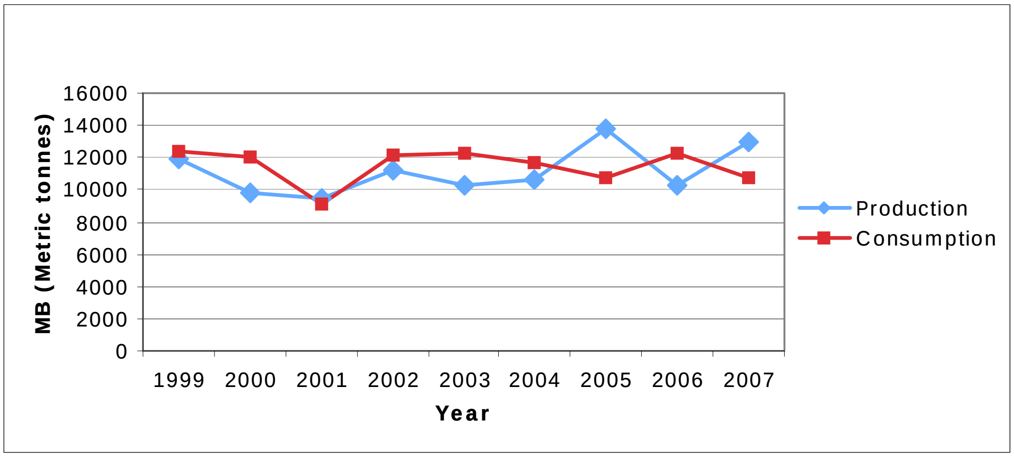
Data has been submitted by 7 Parties that produced MB for QPS in the period 1991-2007. Table 2 indicates the recent years for which the data and totals are complete and incomplete, and the number of data gaps in each year. The Data Access Centre indicates gaps in significant areas in the period 1991-1998, and as a result the total volume of QPS according to the reported data set is substantially under reported. However, the data on MB production for QPS is complete for the years 1999 and 2002-2007. After 1999, the data is absent for one Party (China) and only for the years 2000 and 2001. The QPSTF has estimated this missing data values by assuming a linear trend between 1999 and 2002 reported values.

3.1.3. Comparison of global production and consumption

As seen in Fig. 3-1 below, between 1999 and 2007 reported and estimated production of MB for exempted QPS uses has been roughly at the same level as reported consumption. Data prior to 1999 for reported consumption by country is incomplete and thus the comparison can only be made for totals subsequent to 1999. Differences between production and consumption between 2002 and 2007 exceeded 1000 tonnes on a yearly basis, possibly reflecting stock changes. The aggregate values over this period were closely similar (production, 69,265 tonnes; consumption, 69,882 tonnes).

The close similarity between global production and consumption provides a good check on the validity of these measures. However, it does not necessarily indicate a balance between production and actual use, where 'use' is the actual release of the methyl bromide into a fumigation system. As per Ozone Secretariat guidelines, 'QPS consumption' is taken to mean QPS Production plus QPS Imports minus QPS Exports. 'Consumption' may thus be different to 'use'. Differences between the two data sets may arise from several factors, notably changes in inventory during the year of reporting. Drawdown of stocks of material gives a lower calculated consumption compared with reported use, while stockpiling leads to higher calculated consumption compared with reported use.

Fig. 3-1. Global production of MB for QPS uses compared to global consumption



Source: Ozone Secretariat Data, September 2009, with QPSTF estimates for data gaps

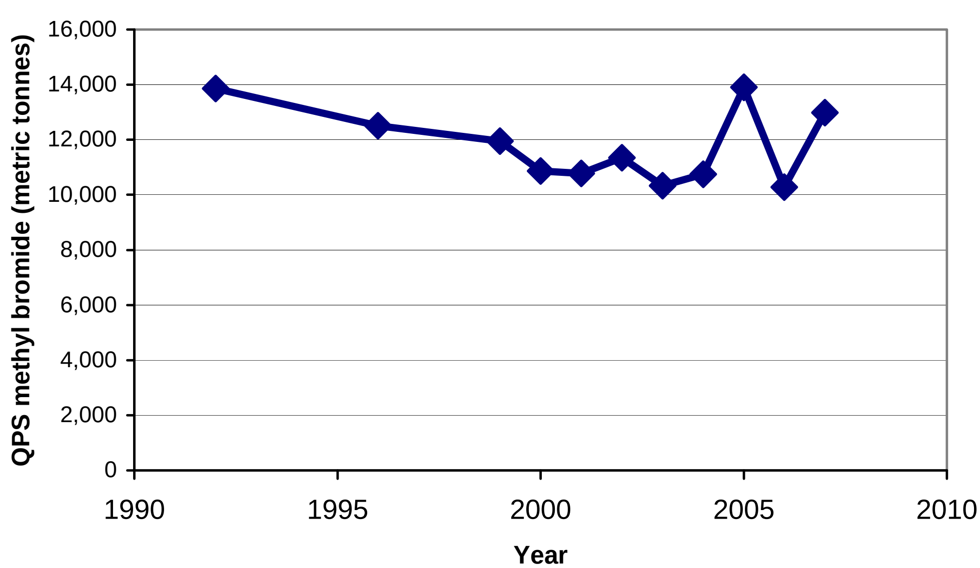
3.2. Production

3.2.1. Global Production for QPS Purposes

Production data, both in aggregate and for individual Parties, helps to provide some validation of the accuracy of reported consumption data. Data on production and consumption by individual Parties has not previously been available publicly, but was released under Decision XX/6(2)

Global production for QPS showed a steady decline from 1992 till 1999 but then was relatively stable at approximately 10,500 metric tonnes from 2000 to 2004. Since 2004, there have been substantial fluctuations in total reported production for QPS, with values of 13,815, 10,275 and 12,984 tonnes for 2005, 2006 and 2007 respectively (Fig. 3-2).

Fig. 3-2. Estimated global production of methyl bromide for QPS uses 1991 – 2007



Source: MBTOC (1994, 1998) estimates; Ozone Secretariat data, September 2009

Table 3-1. MB production for QPS, available data for 1997-2007

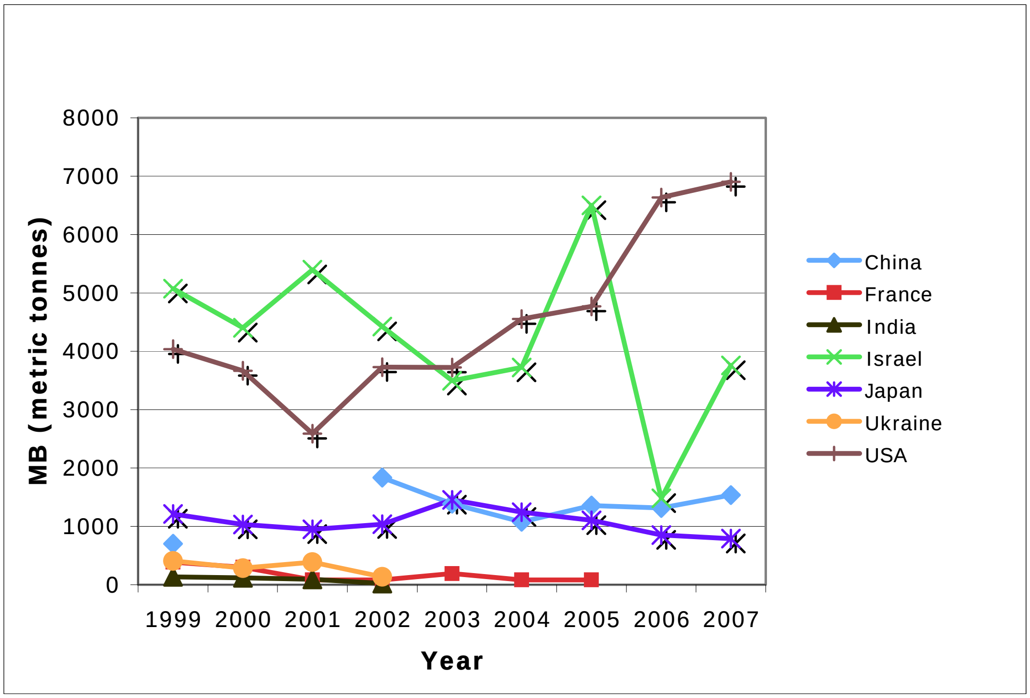
Year	Reported MB production (tonnes)	Number of Parties not reporting
1997	7784	1
1998	8118	1
1999	11950	0
2000	9793	1
2001	9496	1
2002	11269	0
2003	10246	0
2004	10660	0
2005	13815	0
2006	10275	0
2007	12984	0

Source: Ozone Secretariat Data Access Centre, September 2009. Data rounded to the nearest whole tonne.

3.2.2. Production by Party

Seven Parties to the Montreal Protocol have reported production of methyl bromide for QPS uses over the period 1999-2007: five non-A 5 Parties - France, Israel, Japan, Ukraine and the United States; and two A 5 countries – China and India. Fig. 3-3 below shows great variation in production levels for some Parties. The fluctuations in total global methyl bromide production for QPS are reflected by those in production reported from Israel. Reasons for this fluctuation have not been identified at this stage. Inventory changes are a possibility.

Fig 3-3. Production of methyl bromide for QPS uses by Party, 1999 – 2007



Source: Ozone Secretariat Data, September 2009

3.3. Consumption

3.3.1. Global MB consumption for QPS uses

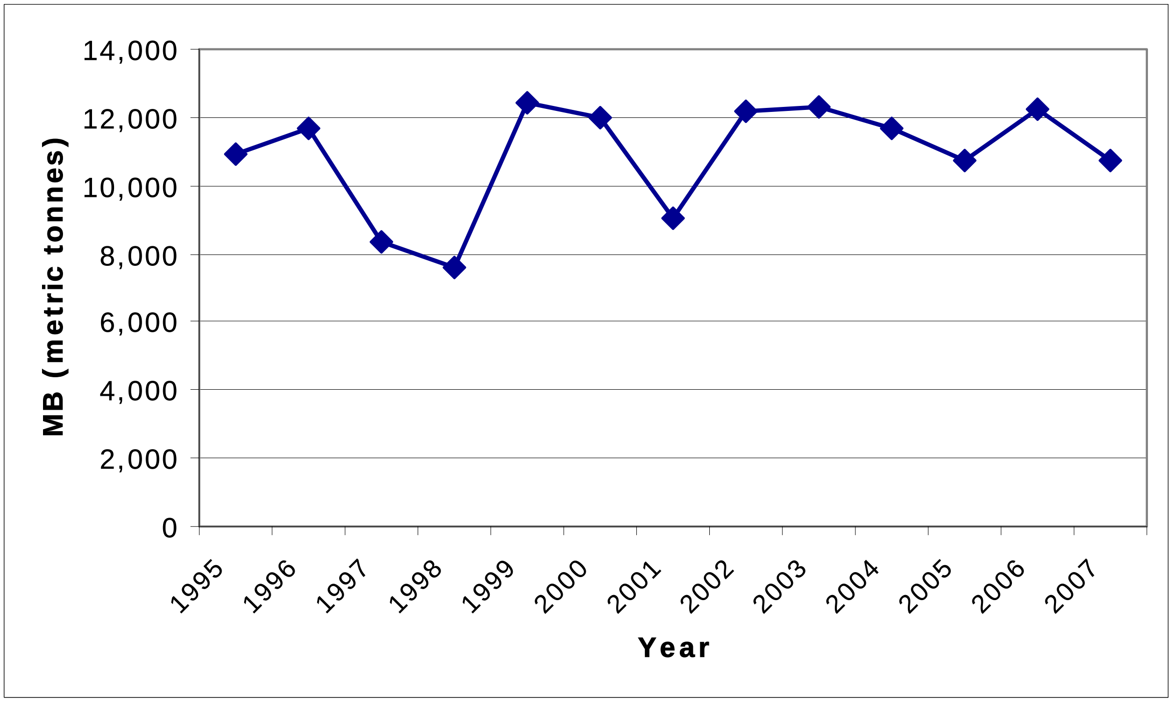
In the period 1991-2007 QPS consumption data have been submitted to the Ozone Secretariat for some years by 41 non-A5 Parties and 67 A5 Parties, giving a total of 108 Parties. QPS consumption figures are available for as early as 1986 for some Parties but not for others. Because information gaps make it difficult or impossible to conduct a comprehensive analysis, the QPSTF considered it best to assess data from 1999 onwards for consumption when data for most Parties were available.

Among the 15 non-A5 Parties (counting the EC-27 as one Party), 9 Parties have submitted data points for at least 9 years continuously in the period 1999-2007, allowing longer term trends to be analysed. Data for 1999-2007 is available for the major QPS users i.e. Parties that have consumed more than 100 tonnes in any year since 2002. The available data for non-A5 Parties since 1999 is sufficient for QPSTF to make estimates of the totals using the Ozone Secretariat data alone.

Among the A5 Parties, 28 have submitted data points for at least 9 years, while 34 Parties have reported data for at least 4 of the last 5 years (2003-2007). Thirteen A5 Parties have reported QPS consumption >100 tonnes in any year since 2002. In most cases, these large MB-users have reported data since 2002 or much earlier.

Global consumption for QPS has averaged nearly 11,000 metric tonnes a year since 1995, with minimum consumption of less than 8,000 tonnes in 1998, with maxima in 1999, 2003 and 2006 at 12,425, 12,286 and 12,207 tonnes respectively, as seen in Fig. 3-4 below.

Figure 3-4. Reported global consumption of methyl bromide for QPS uses, 1995-2007



Source: Ozone Secretariat Data, 2009

Control measures under the Montreal Protocol typically apply differently to A 5 and non-A 5 members, though the QPS exemption applies to both groups. In the discussion below, data for these two groups is presented separately, following this precedent.

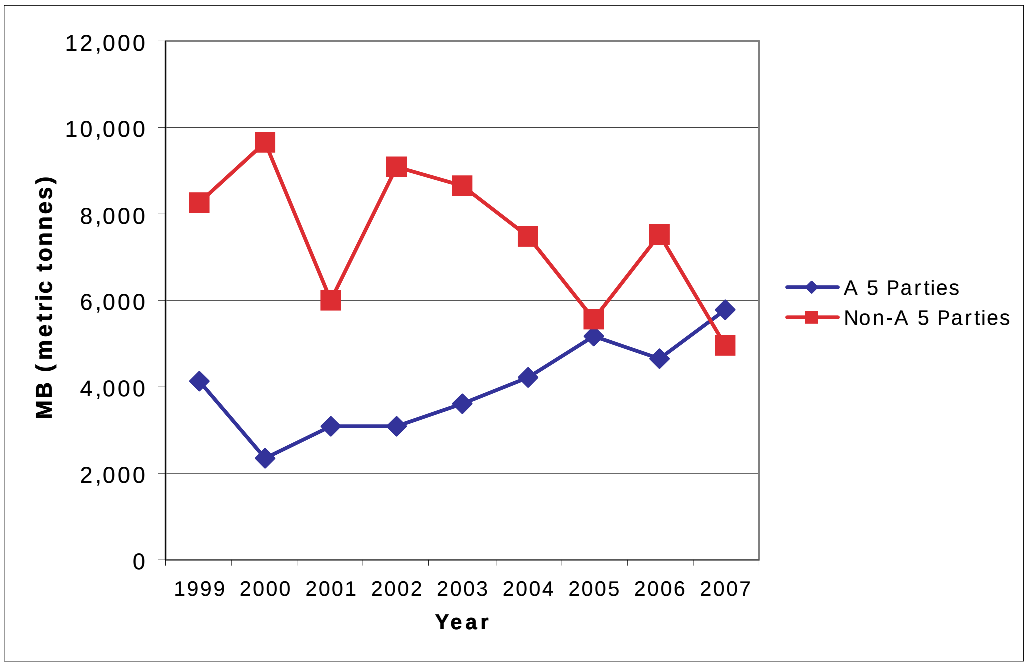
It is important to note that QPS treatments associated with international trade (about 85% of total use in 2007, Table 3-4) usually involve consumption in one (exporting) country to meet the requirements of another (importing) country. This is in contrast to the situation with most other ODS where consumption usually occurs within the country. A similar situation may be the use of an ODS in a manufactured good to meet requirements of an importing country. As a result, the reported quantity of methyl bromide consumed for QPS purposes by a particular Party may not reflect the actual consumption of methyl bromide for its own needs and requirements. No distinction is made below between methyl bromide consumed or used for a Party's own needs and that consumed or used to meet requirements of other Parties. This problem is elaborated further below, particularly with regard to A5 Party consumption (see Section 3.3.3)

Figure 3-5 shows the reported QPS consumption in A5 Parties and non-A5 Parties from 1999 to 2007. When consumption is considered in the light of regional groupings of A5 and non-A5 countries, the following trends are evident:

- In 2007 reported consumption for QPS in A5 countries exceeded that in non-A5 for the first time.

- Total consumption of MB for QPS uses peaked in non-A 5 Parties in 2000 with a reported consumption of 9,646 metric tonnes. In 2006 consumption was reported at 7,536 tonnes, reducing to 4,949 tonnes in 2007.
- In contrast, reported consumption for QPS uses in A 5 countries has grown approximately linearly since 2000, from 3,990 tonnes to 5,803 tonnes in 2007. Evolution of reported consumption for A5 and non-A5 Parties is illustrated in Figure 3-5 below.

Fig. 3-5. Total reported consumption by Article 5 and non-Article 5 Parties over the period 1999 – 2007



Source: Ozone Secretariat Data, September 2009

3.3.2. Consumption in non-Article 5 Parties

Consumption and use of methyl bromide for QPS purposes for treatment of commodities in trade can occur in either the importing or exporting country. Often the exporting country is an A5 Party. There is a trend for the National Plant Protection Organisations (NPPOs) of many countries, supported at IPPC level, to encourage specified quarantine treatments to be carried out at point of export, not at import. This is designed to ensure only consignments free of quarantine pests are brought within the country's borders, giving improved border security and ecosystem protection and allowing procedures such as a 'systems approach' to be used. A result of this process is to move the methyl bromide consumption or use in these instances from the importing country's QPS methyl bromide account to that of the exporting one except where alternative treatments are approved and available, allowing the country to use other options. This contrasts with the consumption of methyl bromide for controlled (non-QPS) uses, fumigation of soils, commodities and structures, where most of the methyl bromide consumption and use occurs in the country requiring the fumigation. An exception occurs with *in situ* soil treatments classified as QPS where the resulting plants are used within the same country. Detailed global statistics are not available for how much QPS fumigation occurs in originating country and how much in importing (destination) country.

It may be speculated that the reasons for the increases in QPS consumption in A5 countries with corresponding decrease in non-A5 countries results from a combination of the trend towards increased treatment at country of origin prior to shipment, much increased trade from A5 countries that are at risk of infestation by quarantine pests and requiring QPS fumigation, and concurrent adoption of non-methyl bromide alternatives in non-A5 countries. As examples, it was estimated (US response to Decision XVI/10) that of the 498 tonnes used for commodity fumigation in the US in 2004, 252 tonnes (52%) was used on exports to meet the quarantine requirements of the importing country. In New Zealand at least 84% of the methyl bromide was used in 2007 on export commodities to meet the quarantine requirements of the importing country. This use of MB is directly related to the trends in trade of logs and lumber. Increased MB treatments for pallets and packaging (following ISPM 15) are also likely to have occurred in some exporting countries. There has been decreased on-shore (post entry) fumigation in Australia following introduction of the AFAS (Australian Fumigation Accreditation Scheme) in several Asian countries, replacing treatments formerly carried out in Australia. The scheme (AFAS 2009) is designed to ensure a high standard of quarantine fumigation is carried out in countries exporting to Australia so that overseas fumigations can be recognised by Australian quarantine authorities, avoiding the need for treatment or retreatment at point of entry into Australia.

Nine non-A5 Parties reported consumption of MB for QPS purposes in 2006 and 2007. Together, they accounted for approximately 62% and 46% of total global consumption in 2006 and 2007 respectively. Two Parties, Japan and the USA, represent 82% of total non-A5 consumption in 2007. The USA reports a wide variation in QPS consumption, peaking at 5,089 metric tonnes for 2006. There is no obvious trend in reported consumption for Japan since 2004. Both are major destinations for commodities shipped from A5 countries with stringent quarantine requirements to safeguard the environment, human and animal health and agriculture and both have had major incursions of exotic organisms that have caused severe economic and environmental damage. All other Parties reflect a downward trend in MB consumption for QPS purposes. Details on such consumption may be found in Table 3-2 and Fig. 3-5 below.

Table 3-2. Large volume* consumers of MB for QPS uses in non-Article 5 regions (metric tonnes).

Party	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Australia	352	352	425	517	475	415	441	390	360	359	294
European Community	910	782	1328	2855	790	800	758	880	474	342	194
Israel	853	986	225	319	337	437	501	416	331	227	210
Japan	2175	1620	1450	1637	1408	1525	2845	1277	1166	1105	1107
New Zealand	56	96	60	58	51	100	140	205	126	215	170
Russian Federation		209	223	250	117	214	117	157	113	148	33
Ukraine	315	315	409	257	-356 [b]	-24[b]					
United States			4038	3663	3079	4127	3722	4116	2931	5089	2930

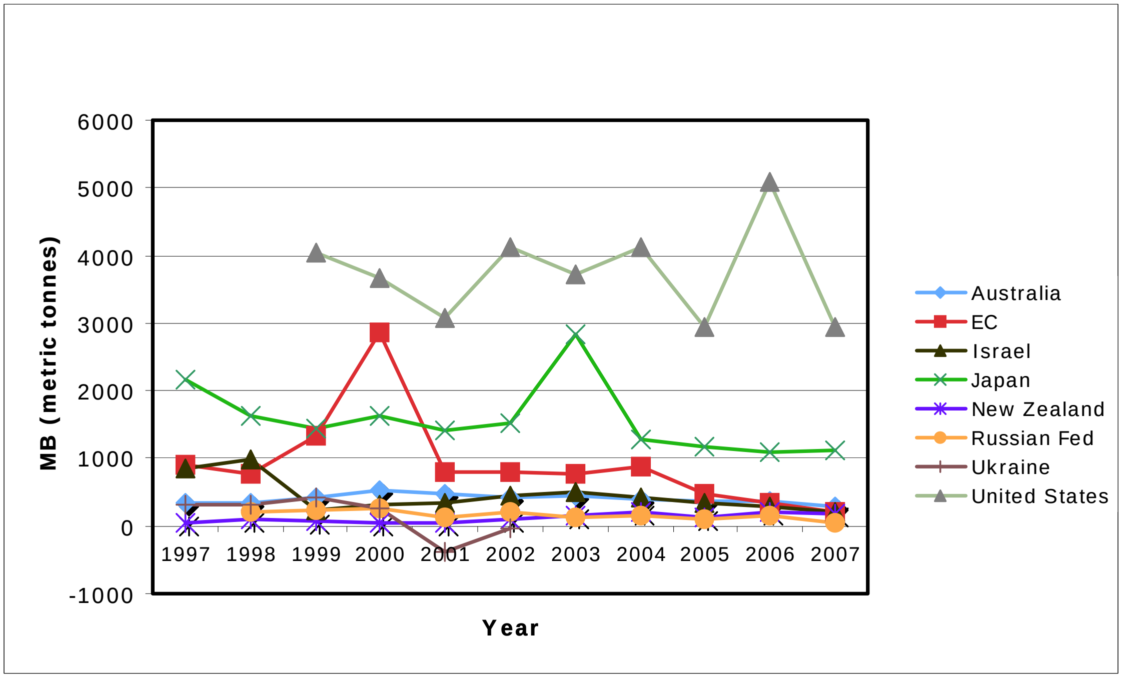
* Large volume users have reported QPS consumption of >100 tonnes a year in 2006 or 2007. Unusually large consumption reported by Russia for 2002 (1,600 metric tonnes) was identified as erroneous by the Party and corrected to 214t. This correction was made after the QPSTF interim report was published. Source: Ozone Secretariat data, September, 2009

An analysis of regional consumption for non A5 Parties indicates the following trends as illustrated by Fig 3-6 below:

- The EC, Japan and Israel show a general downward trend although there were was increased consumption in the EC in 2000 when reported consumption reached 2,855 metric tonnes, and in 2003 for Asia (Japan and Israel) with 3,357 tonnes.

Reported consumption in North America (USA and Canada) has ranged from approximately 2,900 to 5,100 tonnes. Although lower in 2007 than in 1999, consumption showed a sharp increase in 2006 when the United States reported 5,089 metric tonnes consumed for QPS purposes.

Fig 3-6. Reported MB consumption for QPS purposes in non-A5 Parties in various regions



Source: Ozone Secretariat data, September 2009

3.3.3. Consumption in Article 5 Parties

Analysis of QPS consumption data reported in 2006 and 2007 by A5 Parties (Ozone Secretariat data) indicates that forty-three countries reported consumption in 2006 and 39 in 2007. In response to Decision XX/6(1), five Parties reported that they did not use methyl bromide for QPS in 2007. The Ozone Secretariat website further records 97 additional Parties that report no QPS usage of MB in 2007. In aggregate, A5 consumption amounted to 38% of total global consumption in 2006 and 54% in 2007. Consumption trends for A5 Parties can be summarised as follows:

- In 2006, ten A5 Parties reported consumption of MB for QPS purposes that was larger than 100 metric tonnes. Aggregate consumption for this group of Parties was 84% of the total reported consumption for this group in 2006.
- The remaining 26% was composed of three medium volume users consuming between 50 and 100 tonnes (accounting to 6% of total A5 use for that year), eleven small volume users (between 5 and 50 tonnes) and nineteen low volume consumers (LVC) with usage below 5 metric tonnes.
- In 2007, eleven countries reported usage at or above 100 metric tonnes for QPS purposes. Together, this accounted for 5100 tonnes or about 87% of total A5 consumption in that year.
- The remaining 23% was composed of four medium users (between 50 and 100 metric tonnes of MB) summing 5% of the total A5 consumption for the year, ten small users (between 5 and 20 tonnes) and fourteen LVC.

The largest volume consumers of MB for QPS purposes (consumption at or above 100 tonnes for 2006 and/or 2007) appear in Table 3-3 below. Several countries in different world regions show a sustained increase in consumption. Preliminary discussion on particular categories of use and key pests were included in the interim report and are addressed in detail in this report.

Table 3-3. Large volume* A 5 consumers of MB for QPS (metric tonnes).

Party	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Brazil							52	107		223	167
China		67	889	223	121	1118	1291	725	1519	1029	1855
Egypt						200	54	89	160	150	138
India	182	207	210	308	295	114		389	301	330	361
Indonesia	169	147	210		189	252	252	252	337	211	250
Malaysia	46	61	93			168	156	171	252	285	300
Mexico	1252	1106	312	359	715	155	96	135	240	239	260
Republic of Korea	950	390	884	350	516	543	377	536	425	288	381
Singapore	40	37	231	109	35	35	52	46	85	98	153
Thailand	259	253	458	146	208		375	620	455	539	558
Vietnam	70	330	380	250	325		336	530	599	656	677

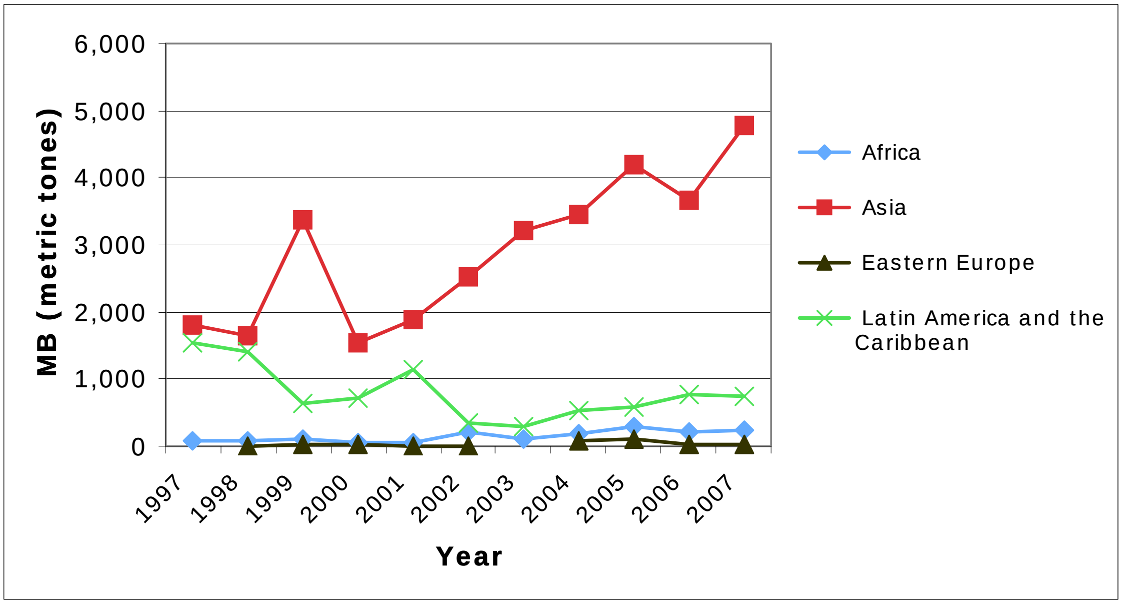
Source: Ozone Secretariat Data, September 2009, rounded to the nearest tonne

*Large volume users have a reported QPS consumption of >100 tonnes a year in 2006 or 2007

An analysis of methyl bromide consumption for QPS uses per region reveals that largest consumers are located in Asia as seen in Fig. 3-7 below. Further, that QPS consumption in that part of the world is increasing. Since 2000 the annual linear rate of increase has been about 430 tonnes per year. This was also found in a recent survey of QPS uses conducted through CAP for Region of Asia and Pacific (ROAP), where total estimated QPS consumption for the Asia/ Pacific (including Taiwan, PRC and Pacific Islands) in 2005 was estimated to be about 34% of the global QPS production for that same year (UNEP/ ROAP, 2008).

To a lesser extent, an upward tendency with respect to consumption of MB for QPS uses is also observed in Latin American countries since 2002, following a decline to a low point then.

Fig. 3-7. Regional QPS consumption in Article 5 Parties 1997 – 2007 (metric tonnes).



Source: Ozone Secretariat Data, September 2009

3.3.4. Proportions of QPS use covered by IAs and domestic regulations

Based on data supplied by the Parties relating to QPS consumption for individual uses, with QPSTF input, it is possible to give an approximate breakdown of QPS consumption into various overall categories of use (Table 3-4). This analysis identifies approximate quantities of use lying outside plant quarantine measures relating to international trade, and allocates the balance of use to the latter category. This breakdown distinguishes Quarantine treatments against quarantine (regulated) pests, and Preshipment treatments to ensure 'pest-free' status of commodities, as defined in Decision VII/5 and XI/12.

Table 3-4. Estimated QPS global methyl bromide consumption for 2007 by overall category of use.

	Approximate % fraction of 2007 QPS use	Corresponding tonnage used (mt)	Official agency or International Agreement	Examples of category
Quarantine – international trade, phytosanitary measures	65%	5486	IPPC	Fumigation of export logs against regulated pests
Quarantine – international trade, measures against Animal and human disease vectors and misc. other uses	1%	100	National quarantine agencies	Fumigation of import used tyres against mosquitoes and other disease vectors
Quarantine – intracountry trade, including some soil treatments	14%	1200	National and regional regulatory agencies	Fumigation of fresh fruit or soils to meet intra country quarantine regulations
Preshipment – international trade	20%	1700	National (import or export) trading regulations relating to product quality (pest-free status)	Fumigation of some export grains.
Totals	100%	8486		
Unidentified or surplus of consumption over quantity used		2128		
Total reported consumption		10614	Article 7 reporting by the Parties	

3.4. Summary: Production and consumption

3.4.1. Trends by region

Non-A5 Parties accounted for approximately 62% and 46% of reported global consumption in 2006 and 2007 respectively. Two Parties, Japan and the USA, represent 82% of total non-A5 consumption in 2007. USA reports a wide annual variation in annual QPS consumption, ranging from 2,930 to 5,089 metric tonnes over the period 1999 - 2007. A5 consumption amounted to 38% of total global consumption in 2006 and 54% in 2007. Large volume consumers are located in Asia and QPS consumption in that region is increasing. To a lesser extent, an upward tendency with respect to consumption of MB for QPS uses is also observed in Latin American countries since 2002.

Reported consumption for QPS uses in A 5 countries has grown approximately linearly since 2000, while that in non-A5 countries has declined at approximately the same rate. Reasons for the increases QPS consumption in A 5 countries with corresponding decrease in non-A5 countries may result from a combination of the trend towards increased treatment at country of origin prior to shipment, increased trade from A5 countries that are at risk of infestation by quarantine pests and requiring QPS fumigation and concurrent adoption of alternatives in non-A5 countries.

3.4.2. Trends globally

Between 1999 and 2007 reported production of MB for exempted QPS uses has been approximate constant on an annual basis and roughly at the same level as reported consumption. Total reported production and consumption between 2002 and 2007 was 69,265 and 69,882 tonnes respectively, but fluctuations exceeded 1,000 tonnes on a yearly basis, possibly reflecting stock changes.

4. REPORTED USES

4.1. Introduction and mandate

Paragraph 4 (a) of Decision XX/6 requests TEAP, in consultation with the IPPC secretariat, "*to review all relevant, currently available information on the use of methyl bromide for quarantine and pre-shipment applications and related emissions, to assess trends in the major uses*… and, in particular, item (a) requires:

> *(a) A description of the majority of the volumes of methyl bromide used for quarantine and pre-shipment applications, by the major uses and target pests.*

4.1.1. Target pests for QPS treatments

Target pests for QPS treatments vary from country to country. The procedures for handling the issue of defining the target pests also differ. The target pests for Quarantine and for Preshipment are distinct, as discussed below.

For Preshipment treatments required by official authorities, the objective of treatments is to produce goods that are 'pest-free', to some standard level, often specified indirectly by a standard sampling regimen. While in practice the target species are typically the almost cosmopolitan insect pests (beetles, moths and psocids) associated with quality losses in storage, treatments are also expected to eliminate the other living insect species that may contaminate commodities during harvesting, storage and handling, even when they do not pose a direct threat to the quality of the commodity.

For Quarantine treatments, the National Plant Protection Organisations (NPPOs) of particular Parties publish master lists of regulated pests, being recognised quarantine pest species. These can be found through the IPPC portal (IPPC 2009). Only some of these pests are controlled by methyl bromide as the treatment of choice or exclusive approved treatment. Some quarantine authorities have regulations for species not found in their country that require quarantine action if the species is known to be a pest that would cause damage or vector diseases in their country or if there is evidence to suggest a risk of such damage. Likewise species that would substantially endanger human or animal health or comfort, especially by spreading exotic disease, would likewise be considered a quarantine species. Species of quarantine concern to one country will not necessarily be of concern to another country: the pest might attack a crop not grown in the country, climatic conditions in the country might not be favourable to establishment of the species or the country might already have the species in their country. Nonetheless, there are certain groups of organisms that are responsible for most quarantine action in the world currently involving methyl bromide treatment.

Table 4-1 shows the main target pests of quarantine significance in the major classes of methyl bromide use, by volume, for plant Quarantine purposes. Examples of key pests of quarantine significance were provided to QPSTF by several Parties. Examples, supplied by the Parties, are given in Annex 4. Additionally, specific quarantine pests associated with these major methyl bromide uses are discussed in the section on alternatives foir specific applications (Section 4-2).

Table 4-1. Main target pests of plant quarantine significance in the major classes of MB use for QPS purposes

Treated commodity or situation	**Main target quarantine pests**
Whole logs, not debarked	Various species of bark beetles, wood borers, Sirex spp., pinewood nematodes.
Solid wood packaging	See Table 6-4
Grain and similar foodstuffs	*Trogoderma* spp., particularly *T. granarium*; *Prostephanus truncatus*; *Sitophilus granarius*; cotton boll worm, various snails.
Fresh fruit and vegetables	Numerous species of Tephritidae (fruit flies), thrips, aphids, scale insects and other sucking bugs, various Lepidoptera and Coleoptera, various mites.
Soil for crop production, including propagation material	Exotic nematodes such as the Potato Cyst Nematode (*Globodera pallida)*,Golden nematode (*Globodera rostochiensis),* pinewood nematode (*Bursaphelenchus xylophilus),* exotic weeds, including *Orobanche* spp.

Key quarantine pests that are sometimes controlled in international trade with methyl bromide that lie outside the scope of the IPPC include various mosquito species (human and animal disease vectors, nuisance species), tramp ant species including red imported fire ant (*Solenopsis invicta*) (animal and ecological health, invasive species), rodents (disease vectors), snakes (invasive species), and cockroaches (human health disease vectors).

4.1.2. Examples of key pest listings

In response to Decision XX/6 QPSTF received examples of key quarantine pests which are included as illustration of the complex nature of this issue in sections below.

4.1.2.1. Key pests - Canada

Canada submitted detailed information in response to Decision XX/6 including an update on uses of MB for QPS purposes for the period of 2003 - 2008. The most relevant information with reference to key pests is presented below in Table 4-2.

Table 4-2. Main categories of use and key pests controlled with MB for QPS purposes in Canada

Commodity group	**Pest treated**	**Reason for treatment**	**Import/ Export destination**	**Legislative basis for QPS treatment.**
Fresh fruit and fresh vegetables	*Otiorhynchus corruptor*	Live specimens intercepted on imported grapes	Canada from Europe	D95-08
Grain and cereals for consumption including rice	*Ditylenchus dipsaci*	When tested and found infested / legume shipments done in Singapore or at destination in India	India	Bi-lateral agreement; FPQIR India
Dried foodstuffs	Cydia sp	Infested chestnuts	Canada from Asia	AIRS for HS 080240
Nursery stock	*Grapholitha molesta*		Domestic	
Wooden packaging materials, other packaging materials including cardboard, pallets and dunnage	Anobiidae, Bostrichidae, Buprestidae, Cerambycidae, Curculionidae, Isoptera, Lyctidae, Oddemeridae, Scolytidae, Siricidae, Nematodes, e.g *Anoplophora* spp., *Ips typographus, Hylastes ater, Monochamus* sp, *Tomicus piniperda, Agrilus planipennis, Callipogon relictus, Tetropium castaneum, T. fuscum, Trichoferus campestris, Monochamus alternatus, Lymantria dispar* Asian biotype, *L. monacha, L. mathura, Sirex noctilio, Brenneria salicis, Xanthomonas populi, Phytophthora* spp., *P. ramorum, Ophiostoma ulmi, O. novo-ulmi, Zeuzera pyrina* and others	Live wood inhabiting pests detected at time of inspection.	Canada from various origins	(5) D98-08 and (17) ISPM 15
Wood (including round sawn, sawn wood, chips	Visible pests		China (2005), Cuba,	FPQIRs

Commodity group	Pest treated	Reason for treatment	Import/ Export destination	Legislative basis for QPS treatment.
Whole logs (with or without bark	Visible pests	Conifer logs shipped to authorized port for fumigation upon arrival; hardwood logs per FPQIR or per specific import permits	China, Taiwan, India, Saint Pierre and Miquelon	Bi-lateral agreement with China and FQPIRs
Equipment (including used agricultural machinery & vehicles); and empty shipping containers)	*Acedes pallescentella*, *Alphitobius diaperinus*, *Ahasversus advena* ;*Cadra cautella*, *Carpophilus sp* *Cryptolestes ferrugineus*, *Cryptolestes sp*, *Ephestiodes sp*,, *Haptoncus sp*, , *Oryzaephilus mercator*, *Sitophilus oryzae*, *Sitophilus larvae*, *Stegobium paniceum*, *Tenbroides mauritanicus, Tribolium castaneum* , *T. larvae*, *Tribolium spp*., *Typaea stercorea*	infested empty ship holds		Plant Protection Regulation s.58 and s 59. (Ship Inspection Program)
	Callidiellum rufipenne	infested ship holds and dunnage	Canada from Japan (2004 ship holds)	D98-08 and (7) D02-12
Christmas trees, Pinus sp (for pine shoot beetle) and other spp for export	*Tomicus piniperda*	facilitate domestic movement within Canada and for export since it is a quarantine pest for both Canada and the USA	internal in Canada and USA, Jamica	FPQIR

Source: Agriculture Canada, 2009

4.1.2.2. Key pests - Mexico

In turn, Mexico has submitted detailed information on key pests that are presently controlled with MB to meet quarantine and pre-shipment requirements. This information has been summarised in Table 4-3 below.

Table 4-3. Key pests controlled with MB in Mexico (QPS)

Use category	*Key pests controlled*
QUARANTINE	
Wood packaging materials	*Hylurgus ligniperda, Hylastes ater,Xyleborus* sp., *Xylosandrus* sp. *Sinoxylon sp. ,Heterobostrychus* sp. *Ophiostoma* sp.
Plant products and sub-products (inc dried flowers and foliage, tobacco, etc). Dried foodstuffs	*Trogoderma granarium, Cydia splendana, Cydia splendana, Curculio carya, Curculio elephas*
Grain, mostly red beans	*Acanthoscelides argillaceus, Alternaria brassicicola, Bean pod mottle vírus, Bruchidius atrolineatus, Bruchidius incarnatus, Callosobruchus analis, C. Phaseoli, C. rhodesianus, Cercospora kikuchii, Purple speck, Colletotrichum truncatum, Cowpea severe mosaic virus, Choanephora cucurbitarum, Diaporthe phaseolorum, Erysiphe pisi DC var. pisi, Gibberella avenacea,* *Matsumuraeses phaseol, Pea early browning virus, Peanut mottle virus, Phoma exigua var. Diversispora, Phomopsis longicolla, Pleospora herbarum, Pseudomonas viridiflava, Tomato black ring virus, Trogoderma granarium.*
Fresh fruits and vegetables	*Ceratitis capitata*, *Cydia molesta, Conotrachelus nenuphar*, *Maconellicoccus hirsutus*, *Dinoderus spp* (except *D. minutus), Heterobostrychus brunneus, Lyctoxylon japonum, Trogoxylon parallelopipedum, Coptotermes formosanus*
Basket weaving materials (reeds, rattan, grasses)	*Anastrepha ludens, Anastrepha* spp.
PRE-SHIPMENT	
Fresh fruit	*Cydia molesta, Archips argyrospilus, Argyrotaenia ciurana, Bondia comodona, Choristoneura rosaseana, Grapholita prunivora, Amyelois transitella, Platynota stultana, Spectrobates ceratoniae, Alsophila pometaria, Amorbia cuneana, Cydia latiferreana, Grapholita packardi, Hypera postica, Orthosia hibisci* *Paleacrita vernata, Panonychus ulmi, Sparganothis sulfureana,* *Xylomyges curiales, Discestra trifolii, Rhagoletis pomonella, Conotrachelus nenuphar*, Fruit flies (Tephritidae)

Source: Mexican Ozone Unit, SEMARNAT

4.1.2.3. Key pests - Japan

Insect pests are most often detected as eggs or immature larval stages during quarantine inspection, when it is difficult to identify the particular species present. For this reason, identification is frequently limited to the family and/or genus level as is evident in Table 4-4. To solve this problem, the Japanese Plant Quarantine Station has undertaken the development of identification techniques based on DNA analysis (Misumi *et al.*, 2009; MAFF, 2009).

Table 4-4. Frequency of major insect pests detected in vegetables in Japan during import quarantine inspections

Category	Family, Genus or Species	Broccoli	Asparagus	Cabbage	Okra	Pumpkin
Thripidae		1,677	3,948	106	609	134
	Thirips sp.	64	2,921	68	101	9
	Frankliniella sp.	820	942	45		6
	Scirtothrips sp.		60			
	Apterothrips sp.		18			
Aphididae		1,213	463	105	22	4
	Myzus persicae	617	153	80		1
	Aulacorthum solani	13		1		
	Macrosiphum euphorbiae	5				
Lepidoptera		63	190	20	55	145
	Noctuidae	29	961	10	384	26
	Spodoptera sp.	5	381			9
	Helicoverpa sp.		545	1	265	2
	Earias sp.				77	
	Plutella xylostella	676		303		
Pseudococcidae				1	406	17
	Phenacoccus sp.				178	
Agromyzidae		106		5		51
Tetranychidae					9	36
	Tetranychus sp.					24
	Tetranychus urticae					38
	Tetranychus turkestani					18
	Tetranychus hydrangeae					6
	Tetranychus pacificus					7
Total number detected in six categories		5,288	10,582	745	2,106	533
Total number of detected insect overall		6,412	10,997	849	2,595	611
Occupancy rate (%, 6 categories/grand total)		82.5	96.2	87.8	81.2	87.2

Note: Figures are extracted from Plant Quarantine Statistics 2002 and 2003, Japan. Non-quarantine insect pests are included in this table.

4.1.2.4 Key pests - EC

The EC has published lists of the pest species that are classified as quarantine pests (harmful organisms) by the EC in Council Directive 2000/29/EC on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community, OJ L 169, 10.7.2000, as updated and amended. The EC Directive also identifies the required quarantine treatments and measures for each specific commodity and pest combination. The EC does not specifically require MB as a quarantine treatment, and lists MB as an approved treatment for only two specific commodities (see section 8.3.3.6 below).

As a result of reports submitted by Member States to the European Commission, analysis of the data submitted for 2007 showed that the MB was used to meet quarantine and/or pre-shipment requirements for specific pests. It was not always clear from these reports if all treated pests were quarantine or non-quarantine in their nature.

Some examples of reported key pests and uses of MB in the EC (Greece) in 2007 were:

- Greece fumigated cotton with MB to control *Anthonomus grandis* (boll weevil) on cotton exports to Egypt. The boll weevil is a quarantine pest regulated by the Egyptian phytosanitary authorities.
- Greece reported national legislation requiring treatment of figs and raisins with MB to control non-quarantine pests such as *Ephestia cautella, Plodia interpunctella, Tinea granella, Oryzaephilus mercator and O. surinamensis*. This is a pre-shipment treatment to control economically important pests of stored foods found for example in North America and Australia, where Greek exports arrive.
- Greece also reported treating dried foodstuffs exported to Australia and Singapore with MB to control *Trogoderma granarium* and *Ephestia* spp. *Ephestia* is generally regarded as a non-quarantine pest.

The main uses of MB for QPS in the EC in 2007 were reported as follows: wooden pallets (78%), cotton (9%), processed wood (5%), dried food (1%), fresh fruit and vegetables (0.4%), cut flowers (0.2%), equipment (0.2%), and other goods at small percentages (Touchdown, 2009). The main export destinations for fumigated goods in 2007 were Australia, USA, China, Canada, New Zealand, India and South Africa, mainly for ISPM 15 treatments. The consumption of MB for QPS has fallen substantially since the year 2000. The EC is scheduled to ban all QPS uses of MB in the EC from 18 March 2010 (see Chapter 8).

4.2. Major QPS uses and volumes of methyl bromide

At various stages since 1994, TEAP and MBTOC have carried out surveys and/or contacted national experts in order to compile information about major QPS uses, and to estimate methyl bromide volumes used in some cases (e.g. MBTOC 1995, 1998, 2003, 2007).

While there remain some data gaps and uncertainties, QPSTF has been able to make estimates of the volumes of uses covering more than 83% of total reported QPS use, with 70% of total global 2007 reported consumption resulting from 5 major categories of use.

In keeping with Decision XX/6, the QPSTF followed the same categories of use for QPS as those used by the IPPC, with some additions and modifications. These were as used in Annex 6 of 3CPM – *Recommendation for the replacement or reduction of the use of methyl bromide as a phytosanitary measure* (IPPC, 2008) and are given in Table 4-5. The additional categories marked with an asterisk in Table 4-5 were added to cover areas not covered by the IPPC.

Table 4-5. Main categories of MB use for QPS purposes

Category	**Uses**
Commodities	Bulbs, corms, tubers and rhizomes (intended for planting)
	Cut flowers and branches (including foliage)
	Fresh fruit and vegetables
	Grain, cereals and oil seeds for consumption including rice (not intended for planting)
	Dried foodstuffs (including herbs, dried fruit, coffee, cocoa)
	Nursery stock (plants intended for planting other than seed), and associated soil and other growing media
	Seeds (intended for planting)
	Soil and other growing media as a commodity, including soil exports and soil associated with living material such as nursery stock*
	Wood packaging materials
	Wood (including sawn wood and wood chips)
	Whole logs (with or without bark)
	Hay, straw, thatch grass, dried animal fodder (other than grains and cereals listed above)
	Cotton and other fibre crops and products
	Tree nuts (e.g. almonds, walnuts, hazelnuts)
Structures and equipment	Buildings with quarantine pests (including elevators, dwellings, factories, storage facilities)
	Equipment (including used machinery and vehicles) and empty shipping containers and reused packaging
Soil as agricultural land*	Preplant and disinfestation fumigation of agricultural land in situ*
Miscellaneous small volume uses	Personal effects, furniture, air* and watercraft*, artifacts, hides, fur and skins

Source: IPPC (2008) list of categories; *Not on IPPC (2008) list

Designation of a particular use as QPS is dependent on interpretation of the definitions of QPS set out in Decisions of the Parties. In the analysis below, uses for QPS were as reported by the individual Party. This includes cases where the category of use was listed in the QPSTF interim report (TEAP 2009) as as one which was classified as quarantine and pre-shipment use by some Parties but not by others (see Chapter 5).

4.2.1. Use by quantity

A general analysis on categories of use by volume was conducted, on the basis of information received from Parties in response to Decision XX/6 supplemented by data from previous surveys of QPS uses (TEAP 2006, UNEP/ROAP 2008). Data received were most complete for 2007 and so 2007 was taken as the year for the analysis. Where data was not available for that year, the most recent year for which detailed information was used as an estimate for 2007, without adjustment. All data used were for 2004 or later.

Total consumption reported by A5 Parties to the QPSTF in response to Decision XX/6 and consumption identified from other sources as explained, amounted to approximately 5,262 metric tonnes of methyl bromide. Total consumption reported by A5 Parties to the Ozone Secretariat for 2007 as per Article 7 was 5,803 tonnes. Brazil confirmed a reported use of 167 tonnes but did not provide a breakdown of uses. This leaves 541 tonnes for which uses have not been allocated. However, over 95% of this figure corresponds to two Parties – India (reported 2007 QPS consumption of 360.5 tonnes), and Singapore (153 tonnes).

For non-A5 Parties, total consumption reported to the QPSTF or identified from other sources amounted to 3,667 metric tonnes, whilst total consumption reported as per Article 7 data for 2007 was 4,950 tonnes.

Israel recently reported a consumption of 210 tonnes for 2007, providing a breakdown of uses for 16.5 tonnes, which is the amount used by Israel only. The remaining amount of 195 tonnes is consumed by the Palestinian Authority and no specific description of uses is available.

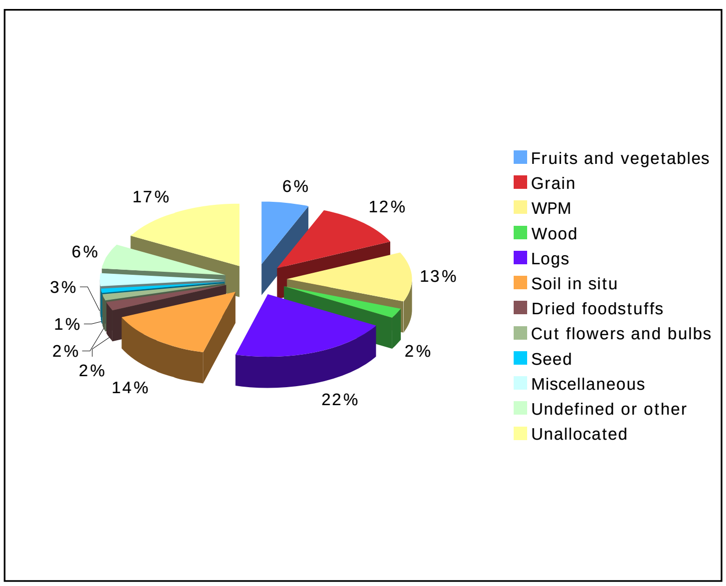
There is an estimated difference for 2007 between reported consumption and estimated use of 1,283 tonnes for the US. The US has submitted a breakdown of QPS uses for an estimated 1,969 metric tonnes in 2005, in response to Decision XVI/10. Total consumption reported for that year (Article 7) was 2,931 tonnes. Data gathering for the US is ongoing, but there is an indication that the quantity of QPS accounted for by use has been much lower than reported consumption over the last 5 years. On the basis of a constant usage of 1,969 tonnes per year for QPS purposes for the years 2003 - 2007, a surplus of reported consumption over use of about 8,943 tonnes is indicated. At this time the fate of this surplus is unidentified, but could include accumulation of QPS-labelled stocks of methyl bromide.

Table 4-6 and Fig. 4-1 below present QPS use categories at the global level by volume estimated for 2007.

Table 4-6. Volumes (metric tonnes) and percentage of MB used for QPS by category in Article 5, non-Article 5 countries, and globally.

Use category	**A 5 Parties**		**Non- A 5 Parties**		**Global**	
	Tonnes	%	Tonnes	%	Tonnes	%
Fruit and vegetables	355	6%	291	6%	646	8%
Grain	948	16%	325	7%	1272	12%
Wood Packaging Material	1122	19%	270	6%	1385	13%
Wood	160	3%	84	2%	244	2%
Logs	1432	25%	804	17%	2236	21%
Soil in situ	42	1%	1489	30%	1531	14%
Dried Foodstuffs	215	4%	5	<1%	220	2%
Cut Flowers and bulbs	168	3%	7	<1%	175	1%
Equipment	82	1%	8	<1%	<1%	<1%
Seeds	116	2%	10	<1%	126	1%
Miscellaneous	133	2%	131	3%	263	2%
Undefined or Other	489	8%	195	3%	684	6%
Total - identified uses	**5262**	**91%**	**3667**	**70%**	**8486**	**83%**
Total – as per A7 data	**5803**	**100%**	**4950**	**100%**	**10614**	**100%**
Difference – unidentified or unallocated	541	9%	1283	30%	1824	17%

Fig 4-1. Global consumption of MB for QPS uses



4.3. Summary: Reported uses

While there remain some data gaps and uncertainties, the QPSTF has been able to make estimates of the quantities of methyl bromide used for QPS purposes of uses covering more than 83% of total reported QPS consumption, with 70% of total global consumption resulting from 5 major categories of use. These main categories represent about 84 % of the uses for which detailed information is available. These are for fumigation of: fresh fruit and vegetables (8% of identified uses); grain, including rice (12%); soil for preplant fumigation in situ (14%); whole logs (21%); and wood and wood packaging material (15%). All of these categories have approved non-methyl bromide alternatives in at least some applications, but technical availability of alternatives is strongly dependent on the local situation where the treatment is carried out.

5. Uses listed in response to Decision XX/6(7)

5.1 Decision XX/6(7) requirements

Paragraph 7 of Decision XX/6 requested TEAP to list MB use categories that have been classified as QPS by some Parties but not by others, and submit them to the 29OEWG.

Three categories of use were submitted to 29 OEWG and the Parties with these uses submitted a response to the Ozone Secretariat detailing why the individual Parties considered the use to fall under the QPS exemption.

5.2. Listing in TEAP/QPSTF interim report

TEAP/QPSTF in its interim report (TEAP, 2009) was able to identify three specific categories of use that are considered to fall under the QPS exemption by some Parties, but other Parties would apparently not consider them to be QPS under the same technical conditions. All these examples have consumption or use at greater than 50 tonnes a year of methyl bromide. These categories may, or may not, include some methyl bromide applications against pests of quarantine concern.

QPSTF notes that the importing country controls whether a particular commodity/situation requires a quarantine treatment, not the exporting country. Quarantine designation is completely situational and often bilateral. Preshipment uses can be applied either to meet import or export country's official requirements, and may also be under bilateral agreement.

In response to dceision XX6(7) the TEAP/QPSTF report of May 2009 (TEAP, 2009) listed the following three categories that are classified as QPS by some Parties but not by others:

1. Treatment of export coffee for QPS, as reported by Vietnam (UNEP/ ROAP, 2008).
2. QPS treatment of export rice and cassava chips from Thailand and Vietnam (UNEP/ ROAP, 2008).
3. Fumigation of soil used to produce propagation material in the United States (i.e. strawberry runners, sod or turfgrass, forest nursery seedlings, ornamental nursery material for propagation purposes), when such material needs to be moved across administrative boundaries within the country (e.g. across State borders).

Although pre-plant soil fumigation for the production of strawberry runners was listed by Chile as a QPS use after the interim report was published and reported to the OEWG, Chile recently informed the Ozone Secretariat that after careful analysis with their quarantine authorities they do not consider this use to fall under the definition of QPS. Thus, Chile has now been excluded from this section.

5.3. Summary - Responses to listing under Decision XX/6(7)

Official responses to listing of methyl bromide uses under Decision XX/6(7) were received by the Ozone Secretariat from Thailand, USA, Vietnam and Chile. These are provided in Annex 3 to this report. A brief summary of the rationale sent by these Parties (except Chile, who did notconsidered the initial reported use to be QPS) follows below. The QPSTF has not provided a technical analysis of the Parties' responses as this was not requested by Decision XX/6.

5.3.1. Treatment of commodities

Thailand considers the treatment of exported rice and cassava chips with MB as a pre-shipment treatment required to meet official phytosanitary requirements of the exporting country (Thailand) for these products. Rice and cassava exported from Thailand must be pest-free under the official Thai Rice Quality Standard and the Tapioca Standard respectively.

Vietnam states that coffee, rice and casava chips are often treated so as to be pest-free at time of export under a legal disposition officially regulated by the exporting country (Vietnam) in Article 23, 24 of the Plant Quarantine Regulation (enacted by Decree 92/CP of November 27th 1993), and Article 25 of Decree 02/2007/ND-CP on Plant Quarantine (05/01/2007); and thus the treatments with methyl bromide are in accordance with the concept “Pre-shipment application” in Decision VII/5 and XI/12 of the Montreal Protocol.

5.3.2. Pre-plant fumigation of soil

The United States reports that, in October 1998, their law regulating methyl bromide was amended to create an exemption for production and import of MB for QPS applications. U.S. EPA issued an interim final regulation for the QPS exemption in July 19, 2001. US EPA moved forward with finalising the regulation during 2001 and published the final regulation on January 2, 2003. In both the interim final and the final regulation US EPA made reference to the guidance from TEAP and MBTOC regarding uses considered to be QPS, such as “treatment of land prior to export of crop” . The full response given by the US can be found in Annex 3 at the end of the report.

The US classifies methyl bromide treatment of soil for production of certified high plant health propagation material, such as for strawberry runners, sod or turf, forest seedlings, ornamentals, as a quarantine measure where the plants are destined to cross an administrative boundary.

6. ALTERNATIVES TO METHYL BROMIDE FOR QPS USES

6.1. Introduction and mandate

Paragraph 4(b) of Decision XX/6 requests the QPSTF to evaluate

"….The technical and economic availability of alternative substances and technologies for the main methyl bromide uses, by volume, and of technologies for methyl bromide recovery, containment and recycling…"

Previous MBTOC and TEAP reports have provided details of existing alternatives for various QPS uses (e.g. MBTOC 1995, 1998, 2002, 2007; TEAP 1999, 2006). The 2002 MBTOC Assessment (MBTOC 2002) provided detailed discussion of alternatives to QPS methyl bromide use on commodities in specific circumstances. A comprehensive discussion on alternatives was included in the 2006 MBTOC Assessment Report (MBTOC, 2007). A detailed report on QPS and alternatives is given in TEAP (2003), produced in response to Decision XI/13(4).

MBTOC (2002) recognised thirteen different categories of alternative treatment, such as heat, cold and irradiation that are approved by regulatory agencies as QPS treatments in one or more countries against specific quarantine (regulated) pests for disinfestation of particular perishable and durable commodities. The MBAIS database (AQIS 2009a) provides a listing of references to methyl bromide alternatives for QPS and other uses.

Existing alternatives to MB for QPS treatment of perishable and durable commodities are based on (1) pre-harvest practices and inspection procedures; (2) non-chemical (physical) treatments; and (3) chemical treatments.

Many quarantine treatments are 'post-entry'. This is where a treatment is required either if inspection finds a quarantine organism in the shipment at the port of entry or quarantine or other treatments have been insufficient to adequately manage the risk of importing quarantine pests in sufficient numbers to be a quarantine threat. Many countries prohibit imports of particular cargoes where the risk of carrying quarantine pests is unacceptable and there is no system or treatment available to manage this risk to an adequate level. In effect, this avoids the need for post-entry quarantine measures, including methyl bromide fumigation.

Typically, treatment options are more restricted practically for post-entry quarantine treatments than for treatment before shipment. In many post-entry situations, methyl bromide fumigation is the only technically and economically available and approved process to meet quarantine standards to allow importation. There is usually limited infrastructure to apply alternatives to methyl bromide available at import ports and ports often lack alternative treatment facilities at present. The cargos are often containerized and removal from the container is uneconomic. Methyl bromide fumigation may be ordered before the commodity can be released for distribution. Rejection or destruction of the cargo remains the default option if the treatment is not carried out.

MBTOC (2002) noted more than 300 individual alternatives approved for quarantine treatment of perishables and more than 70 approved as QPS treatments for durable commodities. These examples are often specific to a particular commodity and export trade and are drawn from several categories of alternatives (such as cold, heat, pest-free zones, systems approach, physical removal of pests, controlled atmospheres, pesticides, alternative fumigants, debarking, irradiation and combination treatments (MBTOC 2002; 2007)).

National Plant Protection Organisations may publish listings of approved treatments for imports, with specifications varying according to phytosanitary requirements of receiving countries and pest risk. In many cases, methyl bromide fumigation may be specified as a quarantine treatment, but often there are also approved alternative treatments or processes given.

Examples of manuals of approved quarantine treatments for international trade include:

USA - APHIS PPQ manuals –
http://www.aphis.usda.gov/import_export/plants/manuals/index.shtml

Australia – AQIS Import Conditions database
http://www.aqis.gov.au/icon32/asp/ex_querycontent.asp

New Zealand - Approved Biosecurity Treatments for Risk Goods Directed for Treatment - http://www.biosecurity.govt.nz/files/regs/stds/bnz-std-abtrt.pdf

Japan - Theory and Practice of Plant Quarantine Treatments (revised edition 2002) (JFTA 2002)

Some NPPOs also keep listings of treatments required to meet the quarantine and preshipment requirements of importing countries (e.g. PHYTO (AQIS 2009)). These can include both methyl bromide and approved alternatives.

A listing of alternatives for various Quarantine uses was given in the IPPC recommendation (IPPC 2008) to its contacting Parties on preferential use of alternatives in place of MB, together with considerations affect the choice of a phytosanitary measure to replace methyl bromide use. The listing is reproduced in Table 6-1.

Table 6-1. Examples of potential phytosanitary treatments to consider to replace or reduce methyl bromide

List of articles fumigated	Examples of potential phytosanitary treatments to consider to replace
Commodities	
Bulbs, corms, tubers and rhizomes (intended for planting)	Hot water, pre-plant quarantine soil sterilization (steam or chemical), pesticide dip, or a combination of these treatments
Cut flowers and branches (including foliage)	Controlled atmosphere (CO_2, N_2) + combination treatment, hot water, irradiation, phosphine, phosphine/carbon dioxide mixture, pyrethroids + carbon dioxide, ethyl formate + carbon dioxide
Fresh fruit and vegetables	Cold treatment, high-temperature forced air, hot water, irradiation, quick freeze, vapour heat treatment, chemical dip, phosphine, combination of treatments
Grain, cereals and oil seeds for consumption including rice (not intended for planting)	Heat treatment, irradiation, ethyl formate, carbonyl sulphide, phosphine, phosphine + carbon dioxide, controlled atmosphere (CO_2, N_2)
Dried foodstuffs (including herbs, dried fruit, coffee, cocoa)	Heat treatment, carbon dioxide under high pressure, irradiation, ethyl formate, ethylene oxide, phosphine, phosphine + carbon dioxide, controlled atmosphere (CO_2, N_2), sulfuryl fluoride, propylene oxide
Nursery stock (plants intended for planting other than seed), and associated soil and other growing media	Hot water, soil sterilization (steam or chemical e.g. methyl isothiocyanate (MITC) fumigants), pesticides dip, phosphine, combination of any of these treatments
Seeds (intended for planting)	Hot water, pesticide dip or dusting, phosphine, combination treatments
Wood packaging materials[7]	Heat treatment (contained in Annex 1 of ISPM No. 15). Further alternative treatments may be added in the future.
Wood (including round wood, sawn wood, wood chips)	Heat treatment, kiln-drying, removal of bark, microwave, irradiation, MITC/sulfuryl fluoride mixture, methyl iodide, chemical impregnation or immersion, phosphine, sulfuryl fluoride
Whole logs (with or without bark)	Heat treatment, irradiation, removal of bark, phosphine, sulfuryl fluoride
Hay, straw, thatch grass, dried animal fodder (other than grains and cereals listed above)	Heat treatment, irradiation, high pressure + phosphine, phosphine, sulfuryl Fluoride
Cotton and other fibre crops and products	Heat treatment, compression, irradiation, phosphine, sulfuryl fluoride
Tree nuts (almonds, walnuts, hazelnuts etc.)	Carbon dioxide under high pressure, controlled atmosphere (CO_2, N_2), heat treatment, irradiation, ethylene oxide, ethyl formate, phosphine, phosphine + carbon dioxide, propylene oxide, sulfuryl fluoride
List of articles fumigated	**Examples of potential phytosanitary treatments to consider to replace**
Structures and equipment	
Buildings with quarantine pests (including elevators, dwellings, factories, storage facilities)	Controlled atmosphere (CO_2, N_2), heat treatment, pesticide spray or fogging, phosphine, sulfuryl fluoride
Equipment (including used agricultural machinery and vehicles), empty shipping containers and reused packaging	Controlled atmosphere (CO_2, N_2), heat treatment, steam, hot water, pesticide spray or fogging, phosphine, sulfuryl fluoride
Other items	
Personal effects, furniture, crafts, artefacts, hides, fur and skins	Controlled atmosphere (CO_2, N_2), heat treatment, irradiation, ethylene oxide, pesticide spray or fogging, phosphine, sulfuryl fluoride

6.1.1 International standards for QPS treatments

Some international standards produced by the IPPC (ISPMs) relate directly or indirectly to phytosanitary (quarantine) processes that either use methyl bromide at present or avoid the need for QPS methyl bromide treatments.

The main ISPM that deals specifically with a major volume use of methyl bromide is ISPM 15, as revised (IPPC 2009b). The standard deals with the disinfestation of wood packaging material in international trade as a quarantine measure against various pests of wood and forests. The standard contains specifications for both heat treatment and methyl bromide fumigation. The standard recognises that methyl bromide is an ozone-depleting substance (p.5 of Appendix 4). It states *"In the absence of alternative treatments being available for certain situations or to all countries, or the availability of other appropriate packaging materials, methyl bromide treatment is included in this standard."* (IPPC 2006, 2009). The recently revised ISPM 15 standard also encourages national quarantine authorities to promote the use of an approved MB alternative: *'NPPOs are encouraged to promote the use of alternative treatments approved in this standard'* (CPM-4 report, April 2009, p.11 of Appendix 4)

Other ISPM standards (www.ippc.int) relevant to methyl bromide treatments and alternatives are:

- ISPM No. 02 (2007) Framework for pest risk analysis
- ISPM No. 10 (1999) Requirements for the establishment of pest free places of production and pest free production sites
- ISPM No. 11 (2004) Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms
- ISPM No. 14 (2002) The use of integrated measures in a systems approach for pest risk management
- ISPM No. 16 (2002) Regulated non-quarantine pests: concept and application
- ISPM No. 18 (2003) Guidelines for the use of irradiation as a phytosanitary measure
- ISPM No. 21 (2004) Pest risk analysis for regulated non quarantine pests
- ISPM No. 22 (2005) Requirements for the establishment of areas of low pest prevalence
- ISPM No. 24 (2005) Guidelines for the determination and recognition of equivalence of phytosanitary measures
- ISPM No. 26 (2006) Establishment of pest free areas for fruit flies (Tephritidae)
- ISPM No. 28 (2009) Phytosanitary treatments for regulated pests
- ISPM No. 29 (2007) Recognition of pest free areas and areas of low pest prevalence
- ISPM No. 30 (2008) Establishment of areas of low pest prevalence for fruit flies (Tephritidae)

6.2. Alternatives for the main methyl bromide uses

Globally, the main categories of use of methyl bromide for QPS by volume (>300 tonnes a year) identified from data presented in Section 4.3 are:

- Fresh fruit and vegetables
- Grain including rice
- Soil, in situ, for production of propagation material
- Whole logs
- Wood and wooden packaging material

These main categories represent about 85 % of the uses in 2007 for which detailed estimates are available at this time (i.e. excluding unidentified uses) and 70% of total reported consumption.

All of these categories have approved non-methyl bromide alternatives in at least some applications. Specific alternatives may not be available for a particular trade or situation because of the risk or presence of particular quarantine pests, lack of approval by the importing NPPO, or lack of registration or commercial supply of the particular treatment.

6.2.1. Fresh fruit and vegetables

This is a complex category comprising a large and diverse group of products. Very large volumes of perishable products are traded internationally each year (FAO 2009). The statistics on international trade and MB usage indicate that the vast majority of perishable products are traded without MB fumigation. The principal perishable commodities that tend to use MB for quarantine treatments are apples and pears, berry fruit, citrus, cucurbits, grapes, root crops, stone fruit, subtropical and tropical fruit, and some vegetables, as well as cut flowers, ornamentals and others (MBTOC, 2007 p.299). Quarantine treatments or procedures are considered essential in the cases where countries and commodities are hosts to specific pests that have quarantine significance to a specific importing country and are not found in the importing country and the commodity being traded presents an unacceptable risk of the pest being introduced into the importing country.

Various alternative methods to MB have been developed in recent decades, in some cases to address product quality problems. The typical MB dosages used required for successful QPS fumigation result in some perishables showing significant loss of marketability and quality (MBTOC 2007 p.299-300), such as reduced shelf-life. This acts as an incentive for the development and use of alternatives to QPS methyl bromide treatment. As described in previous MBTOC and TEAP reports (TEAP 1999, MBTOC 1994, 1998, 2002, 2007) there is a wide variety of non-MB treatments and procedures available, applied individually or in combination, which may be able to meet quarantine requirements depending on the pest in question, country of origin and quarantine security requirements of the importing country. However before quarantine treatments can be used, alternatives have to be approved case by case for specific commodities, pests and countries, as explained in other sections of this report. For a discussion on barriers and limitations, refer Section 6.5.

MBTOC (2002) recorded more than 300 alternative quarantine treatments for perishable commodities that had been approved by a National Plant Protection Organisation (national quarantine authorities) (MBTOC 2007, p.300) for some particular quarantine situation. This current study has identified many and diverse approved treatments. It provides examples of alternative quarantine treatments and procedures that have been approved by national quarantine authorities for the list of of fresh fruit and vegetables listed in Table 6-1 and Annex 2. Approved alternatives include cold treatments, various types of heat treatments, heat + controlled atmospheres, pesticide dips or sprays, wax coating, pest removal (e.g. by brushing), alternative fumigants, irradiation, crop production in areas free from quarantine pests, the systems approach, and inspection procedures. Examples for particular perishable commodities are summarised in Table 6-1 and given in more detail in Annex 2. Technical descriptions of these alternatives can be found in previous MBTOC reports (e.g. MBTOC 2002, pp.273-318; MBTOC 2007, pp.306-315). For most of the commodities listed in Table 6-2, two or more different types of alternatives have been approved by various quarantine authorities for specific quarantine situations. Cold, heat and irradiation treatments appear to be applicable to the widest range of commodities at present.

There is a wide variety of pests of quarantine significance, varying according to origin and country of destination. These include tephritid fruit flies, mealybugs, thrips, aphids, mites and other groups shown in Table 6-3.

In many cases, the approved treatments apply to a particular situation, i.e. a particular commodity with particular pest(s) from a particular country or region and a particular quarantine concern of the importing country (MBTOC, 2007), as illustrated in Annex 2. Each approved treatment may be applicable to just one or several species of fruit fly, for example. However, in some cases an approved treatment covers many species, such as 'external feeders' and 'insects', as shown in Table 6-3.

Alternatives for perishables (e.g. fresh fruits, vegetables, cut flowers) can be grouped by process into three classes:

- Pre-harvest practices, including systems approaches
- Non-chemical treatments
- Chemical treatments, including fumigation

Non-chemical treatments kill pests by exposure to changes in temperature and/or atmospheric conditions, or high energy processes such as irradiation and microwaves, or physical removal using air or water jets. Often a combination of these is required to kill particular quarantine pests or pest complexes because they can tolerate a single treatment.

Although a number of treatments have been approved, actual use of these treatments is not well documented (MBTOC 2007, p.300). The QPSTF did not collect statistics on the specific commercial adoption and use of QPS alternatives on particular categories of fruit and vegetables. Some of the approved treatments listed in Table 6-2 may not be used at all in commercial practice, while others are used to a significant extent. For example, the non MB the systems approach required for Hass avocado exported from Mexico (Michoacán region only) to the USA appears to be well used, according to FAO statistics (http://faostat.fao.org). Mexico exported a total of about 310,260 tonnes of avocado in 2007 (value $US 620 million), and much of this was imported by the USA, indicating that this quarantine procedure is used for a significant volume of product. An APHIS document also reported on the efficacy of the Mexico/Michoacán avocado procedure in commercial practice (which does not use MB), stating that "*In 6 years of experience, the surveys, inspections, and fruit cuttings have not detected the presence of any insect pests in the importation of Mexican Hass avocados*" (APHIS 2004, p.8).

Alternative treatments for perishable products may be carried out in the country of origin, or in-transit in some cases, or in the importing country as outlined below. However, although for reasons of practicality (see below), fumigation with MB may at present be the only available treatment in lieu of destruction or rejection of the consignment if infestation by quarantine pests is detected at the port of entry.

Treatments in the country of origin: Some of the approved alternative methods, notably systems approaches, pest free areas and pre-export inspection requirements, can only be carried out in the country of origin. For some important quarantine pest species such as fruit flies and codling moth, some importing countries require that infestible perishable commodities undergo a mandatory treatment or procedure prior to export. Exporters sometimes prefer to carry out quarantine treatments in the country of origin for economic reasons. The cost of materials and labour for quarantine treatments can be lower in the exporting country, particularly if the destination country is a non-A5 country with higher labour costs or high charges for port demurrage. . Quarantine MB fumigations in the Philippines, for example, were reported to be $US 20–80 if carried out prior to export compared with $1,500–2,000 if carried out in destination countries (MLF 2004, prices in 2004). In many cases fixed facilities are needed for carrying out treatments (e.g. heat, cold, controlled atmospheres) and it can be cheaper for the exporters to locate and operate the facilities in the country of origin than in the importing country, i.e. it is more efficient to treat all the commodity at the point of origin than to treat the commodity after it has been dispersed to several different ports. Taiwan, for example, has 4 vapour heat treatment facilities and pack houses which have been approved by the Australian quarantine authorities for mangoes exported to Australia, while the Philippines has 5 registered treatment facilities for mango (AQIS 2009). For certain treatments such as MB and heat, there is a product quality cost, however, for treating perishables before transit because the earlier treatment significantly cuts shelf life of the treated commodity compared to treatment after transit. On the other hand, cold treatments and controlled atmospheres can improve the shelf-life and quality of perishable commodities (such as flowers and fruit) if carried out prior to export.

For perishable products, pest control based on pre-harvest practices, as part of the systems approach as described in ISPM No. 14, must include cultural techniques leading to pest reduction, they must have an agreement on the area of any pest-free zones, and be subject to inspection in order to receive certification. In these cases, regulatory approval depends on a number of factors including knowledge of the pest-host biology, evidence of commodity resistance to the pest, trapping and field treatment results, monitoring of pests and diseases, and careful documentation.

In-transit treatment: In some cases the approved alternative treatments (e.g. cold, controlled atmospheres) are allowed to be carried out while commodities are being transported to their destination in a truck, shipping container or ship hold that has the relevant equipment. The quarantine authorities in the USA, for example, have approved the equipment installations in a number of ships and in hundreds of shipping containers for in-transit cold treatments (CPHST 2009b, 2009c). For example, citrus shipped from Spain to the US treated by cold treatment in transit.

Treatments on arrival in the importing country: When products arrive in an importing country and are found to need a quarantine treatment, MB tends to be the prevalent treatment in a number of countries, due to logistic issues such as a lack of rapid pest identification facilities and lack of alternative treatment facilities at ports of entry. Quarantine authorities in the USA, for example, have approved a total of about 116 quarantine treatment facilities for imported products in 28 states (primarily for MB fumigation). This total includes 7 heat treatment facilities[1] located in 5 states, and 8 cold treatment facilities located in 1 state only (APHIS 2008 ab). So in many US states, only MB and phosphine facilities appear to be available at present for carrying out quarantine treatments on imported perishable products (APHIS 2008ab).

For the existing approved treatments, there exist a number of barriers to actual use, outlined in section 6.5. The development of further approved treatments has tended to be a slow process for perishables.

[1] Some of these heat facilities are small and may not be suitable for perishable products. These 7 heat facilities are intended for imported products only. This number does not include the heat facilities approved for ISPM-15 treatments in the USA.

Table 6-2. Examples of alternative non-MB quarantine treatments approved by some national quarantine authorities for fresh fruit and vegetables (listed by commodity) for specific quarantine situations involving particular importing and exporting countries

Perishable commodities	Examples of alternative quarantine treatments or procedures						
	Cold	Heat	Chemical	Irradiation	Pest free areas	Inspection	Systems approach
Fruit (many types)			CHM		PFA		
Vegetables, many types			CHM		PFA		
Apple	CT	CAT			PFA	INS	SYS
Apricot	CT				PFA	INS	
Avocado	CT				PFA, SA	INS	SYS
Blueberry	CT		CHM			INS	
Breadfruit			SWB				
Cape gooseberry	CT						
Carambola	CT			IRR			
Cherimoya			SWW				
Cherry	CT	CAT					SYS
Citrus	CT	HTF			PFA		
Clementine	CT	VHT					
Durian, other large fruits			SWB				
Eggplant		VHT		IRR			
Ethrog	CT						
Garlic					PFA		
Grape	CT		FUM				SYS
Grapefruit	CT	VHT			PFA	INS	
Guava				IRR			
Horseradish roots		HWT					
Kiwi fruit	CT						
Kumquat	CT	HTF					
Lemon	CT	HTF					
Lime		HWT,	SWW				

Perishable commodities	Examples of alternative quarantine treatments or procedures						
	Cold	Heat	Chemical	Irradiation	Pest free areas	Inspection	Systems approach
		HTF					
Litchi (lychee)	CT	HTF, VHT		IRR			
Longan	CT	HWT		IRR		INS	
Loquat	CT						
Mandarin	CT						
Mango	CT	HWT, VHT		IRR	PFA		
Nectarine	CT	CAT					
Orange	CT	HTF, VHT					
Ortanique	CT						
Papaya		HTF, VHT					
Passion fruit			SWW				
Peach	CT	CAT			PFA	INS	SYS
Pear	CT					INS	SYS
Pepper (bell)		VHT			PFA	INS	
Persimmon	CT						
Pineapple		VHT		IRR			
Plum, Plumcot	CT						SYS
Pomegranate	CT				PFA	INS	
Rambutan		HTF, VHT		IRR			
Squash		VHT					
Tangerine	CT	HTF					
Tomato		VHT					
Zucchini		VHT					

Source: Extracted from Table 1 of Annex 2 below.

Key to table:

CAT Forced moist air or vapour warm air with controlled atmosphere treatment, e.g. 1% oxygen, 15% CO_2.
CHM Chemical dip or spray, e.g. specified fungicide, acaricide or nematicide, other than MB.
CT Cold treatment
FUM Fumigant other than MB, e.g. phosphine, sulfuryl fluoride.
HTF High temperature forced air treatment
HWT Hot or warm water treatment
INS Inspection
IRR Irradiation
PFA Approved pest-free production area
SA Systems Approach comprising measures such as pest free areas, trapping, field sanitation, registered packhouses, screened storage etc.
SWB Soapy water + brushing
SWW Soapy water + wax
VHT Vapour heat treatment

Table 6-3. Examples of alternative non-MB quarantine treatments used alone or in combination approved by national quarantine authorities for fresh fruit and vegetables (listed by pest group) for specific quarantine situations involving particular exporting and importing countries

Categories of pests controlled by approved treatments	*Examples of alternative quarantine treatments or procedures*						
	Cold	Heat	Chemical	Irradiation	Pest free area	Inspection	Systems approach
External feeders, surface pests		HWT	SWB			INS	
Fruit borers	CT					INS	
Fruit flies	CT	CAT, HTF, HWT, VHT		IRR	PFA	INS	SYS
Fruit moths (a)	CT	CAT			PFA	INS	SYS
Fungi (b)			CHM		PFA	INS	
Insects			FUM	IRR		INS	
Mealybugs	CT	HWT			PFA	INS	
Mites (c)			SWW, CHM			INS	SYS
Nematodes		HWT			PFA	INS	
Spiders			CHM			INS	
Weevils	CT	VHT			PFA	INS	
Unspecified quarantine pests	CT	VHT, HTF	CHM		PFA	INS	

Source: Compiled from Table 1 of Annex 2 below.
(a) Including codling moth, false codling moth, light brown apple moth. (b) Including citrus black spot, fruit rusts. (c) Including spider mites, false spider mite.

6.2.1.1. Alternatives under development

Fresh fruit and vegetables comprise a difficult category for development of quarantine treatments in order to avoid or minimise chemical injury, quality deterioration or phytotoxicity often occur. Adverse effects vary according to the country or area of production, the varieties involved and other factors. Additionally, some types of perishable commodities are directly consumed without processing or cooking and therefore, tests such as residue analysis to ensure food safety are strictly required. Mortality tests and chemical injury tests are presently being conducted or planned in Japan; chemical injury tests mainly consider methyl iodide, phosphine and sulfuryl fluoride. In particular, methyl iodide is expected to exhibit toxic properties that are similar to those of methyl bromide given that their chemical composition is almost equivalent. Phosphine fumigation at 1.5 g m^{-3} for 24h at >15°C is registered as a quarantine treatment for Japanese pear. Mortality tests for fresh fruits are in progress to evaluate control of leaf miners, spider mites and mealybugs with a mixture of ethyl formate + carbon dioxide.

Until recently phosphine, generated from aluminium phosphide preparations, was not used for perishable commodities because ammonia contaminants released from the formulation that damaged some perishable goods (Horn and Horn 2004). However, experts in Chile have developed treatments of pure phosphine at low temperature (i.e. cold-storage temperature, or 1.5 - 15 ºC) which have been found to control key fruit pests, such as mealybugs, *Pseudococcus* spp; apple moth, *Cydia pomonella*; eulia, *Proeulia spp*; fruit tree weevil, *Naupactus xanthographus*; mediterranean fruit fly, *Ceratitis capitata*; fruit fly, *Rhagoletis* spp, *Bractocera* spp, *Anastrepha* spp; and *Thrips* spp., without causing damage to the fruit (Horn and Horn 2004). This pure phosphine treatment has been adopted commercially as a MB alternative for quarantine (and non-quarantine) pests for fruit exports from Chile to Mexico, Iran and other countries. New Zealand has recently registered pure phosphine as a postharvest pesticide for kiwifruit (for armoured scales and mealy bugs) and studies are underway to gain approval for quarantine use (Horn 2009). USDA researchers recently tested pure phosphine at cold temperatures as a MB alternative, and found there was no damage to artichokes, white-flesh peaches, and white-flesh nectarines (USDA 2008, p.9). USDA researchers also demonstrated that pure phosphine is effective in controlling western flower thrips without causing damage to commodities such as strawberries, lettuce, broccoli and asparagus (USDA 2008, p.9).

6.2.2. Grain, including rice

Methyl bromide fumigation continues to be used for preshipment treatment of cereal grains (or prior to export) where logistical constraints at point of export or importing country specifications preclude the use of phosphine, the principal accepted fumigant alternative or methyl bromide treatment is specified by regulation, and or for treatments against certain specific regulated quarantine pests. Methyl bromide fumigation may be the treatment of choice or the only approved and available treatment for the situations where a quarantine treatment is required, though it is acknowledged that it may not be ideal for this purpose when it causes some damage to the commodity.

There are different alternative treatments of choice for grains to meet appropriate QPS standards, depending on whether the treatment is officially required by national authorities for normal and widespread insects that attack or are associated with grain in storage and transport (i.e. pre-shipment), or they are for control and elimination of specific regulated quarantine pests.

Export cereal grains, such as rice and wheat, are prone to infestation by a number of cosmopolitan grain pests that cause damage when in storage and are unacceptable to modern market standards. Most of the MB fumigations that target these pests are non-QPS treatments, falling outside the Protocol's definition of QPS. However, these pests are also the main target of the preshipment treatments that are officially required by official regulations of some exporting countries or by official requirements of some importing countries. Export cereal grains, similar products and associated packaging from some locations may also be subject to quarantine treatments against specific insect pests, notably khapra beetle (*Trogoderma granarium*), or contaminants such as specific snails (e.g.. *Cochlicella* spp.) or seed-borne diseases such as karnal bunt (*Tilletia indica*).

6.2.2.1. Alternatives for pre-shipment

There are well known, standard processes for protection and disinfestation of stored grain in storage and transport, capable of delivering grain, either bagged or in bulk, to an export point in a 'pest-free' condition without recourse to methyl bromide fumigation (e.g. see MBTOC 2007). The choice of alternative is dependent on the commodity or structure to be treated, the situation in which the treatment is required, the accepted level of efficacy and the cost and the time available for treatment. Some alternatives (e.g. some fumigants, heat treatment) may be implemented as 'stand alone' treatments to replace methyl bromide in certain situations. Others may be used in combination to achieve an acceptable level of control.

Preshipment treatments in general are aimed at a lower standard of pest control than quarantine. While Quarantine treatments lead to a commodity free of regulated quarantine pests, Preshipment only requires the consignment to be "practically free" of pests. This lower level of security gives some wider choice of alternatives, with reduced requirements for efficacy testing.

These processes, theoretically, can avoid the need for any further treatment against infestation at the export port. In practice, consignments may be brought to the export point in infested condition. Also, particularly in humid, tropical situations, there is often a high invasion pressure from pests at the export point. As a result, an insecticidal process, usually fumigation, must be used to ensure the grain meets the exporter's or importer's official regulations for lack of infestation.

Alternatives to methyl bromide fumigation for preshipment of cereal grains, including rice, vary with situation, particularly the required speed of action. In some export situations, there is sufficient capacity at the port, to allow slower acting alternative treatments to be used easily, with treatment times of 7 days or more for full effectiveness. Phosphine fumigation is in widespread use for this purpose, for both bagged and bulk consignments. Controlled atmosphere technologies have some usage at present (e.g. Clamp and Moore 2000), but have potential for much more widespread adoption. Dichlorvos treatment, where permitted, also will give pest-free grain to inspection standards.

In many export situations, a high throughput is required, where there is limited space at the port for treatments and as demurrage costs on waiting vessels is high. Typical turnaround times for methyl bromide for a shipment can be 24-48 hours, a time that has to be accommodated in the organisation of the export consignment under preshipment treatment.

More rapid treatments would be welcomed in many export situations, as these would minimise delays handling the export consignment with associated costs and grain handling limitations. At this time there are no agreed, widely available and approved preshipment treatments that will match the treatment speeds of large consignments that can be achieved with MB fumigation, though there are several in advanced stages of commercialisation and the regulatory approval process. The fumigants sulfuryl fluoride, cyanogen and carbonyl sulphide, and synergised ethyl formate all have potential to give similar treatment times and throughputs to methyl bromide (MBTOC 2007). Sulfuryl fluoride fumigation is restricted by availability and registration of the fumigant to only a few countries at this time, but now is in routine use as an alternative to methyl bromide for preshipment treatment of grain (e.g. in Australia).

Irradiation has been used as a preshipment disinfestation of grain (Zakladnoi *et al*. 1982) and heat treatments have been demonstrated at moderate rates of throughput (150 tonnes per hour (Thorpe *et al*. 1984)). Both systems require very substantial infrastructure if they are to match treatment speeds provided by fumigants, including methyl bromide.

Some importing countries may specify fumigation at point of export as a pre-shipment treatment, with indications as to what treatments are acceptable. Typically where methyl bromide is specified as one treatment, phosphine fumigation may be specified as an alternative. However, several countries specify use of methyl bromide as the only acceptable QPS treatment of imported grain from specified exporters, even though well-conducted phosphine fumigation may be expected to deliver the same technical outcome as methyl bromide treatment.

Treatment of bulk or bagged grain in ships with phosphine after loading may potentially replace some current preshipment uses of MB. However, this may be interpreted as falling outside ‘preshipment’ and may not meet regulatory requirements of some expoeters and importers who require grain to be practically pest-free before loading. Phosphine treatments may be conducted at the dockside, in lighters or barges prior to loading a ship, or in the ship after loading and before sailing. In suitable ships, in-transit phosphine treatment gives an effective post-export treatment.

International Maritime organisation (IMO) recommendations on safe use of pesticides in ships and shipping containers describe the safe use of both phosphine and methyl bromide at port and in-transit (IMO 2008 ab).

The International Maritime Organisation (IMO 1996) specifically recommends that cargoes should not be fumigated in ships with MB prior to sailing due to the risks resulting from the difficulty in ventilating the cargo effectively. As an alternative to methyl bromide, for safety and efficacy reasons, in-transit treatment with phosphine is restricted to specially-designed bulk carriers, tanker-type vessels and other ships where the holds are gastight or can be made so (Semple and Kirenga, 1997). In addition, equipment must be installed to circulate the phosphine through the cargo mass (Watson *et al.,* 1999). The circulation equipment ensures that the gas penetrates throughout the load and can be aired from the load prior to unloading.

In-transit treatment of bulk grain is in widespread use, potentially avoiding the need for methyl bromide treatment prior to shipment where import and export regulations permit.

6.2.2. 2. Alternatives for Quarantine treatments

Many countries have strict quarantine regulations on grain and other durables originating from countries where khapra beetle occurs. Typically, only methyl bromide treatment is specified against this notorious pest, using double normal dosages for stored product disinfestation often with extended exposure period. For instance, cereal products from khapra beetle areas for import into Australia require 80g m^{-3} for 48 hours at 21°C with an end point concentration at 48 hours of 20g m^{-3} (ICON 2009).

The USDA PPQ Treatment Manual (USDA 2009) contains many treatment schedules specific to khapra beetle. Schedule T307-a refers to various treatment schedules for commodities and transport vehicles found infested with khapra beetle for post-entry quarantine treatment. Heat treatment at a high temperature and prolonged exposure (7 minutes at 65.5°C) is given as the only approved alternative and only to be used when specifically authorised.

Heat treatment appears to be a good alternative treatment against khapra beetle, with potential as a quarantine measure. Despite its tolerance to quite high temperatures at around 41°C, it is quite susceptible to higher temperatures, more so than some common storage pests such as *Rhyzoperta dominica*. There is a surprising quantity of data available to substantiate this. Much of it is antique, but of good quality.For instance, Husain (1923) studied heat disinfestation of wheat from khapra larvae.

Pupae of *T. granarium* are the most heat tolerant stage, requiring 16 hours at 50°C or 2 hours at 55°C for '100%' kill, while other stages are eliminated in less than 2 hours (Mookherjee *et al*., 1968). *R. dominica* requires in excess of 24 hours for complete kill at 50°C, 5 hours at 51°C and 10 minutes at 55°C. Battu *et al*. (1975) found LT_{95} for diapausing and non-diapausing larvae to be 7.4 and 3.0 hours respectively at 50°C. Lindgren *et al.* (1955) noted a slight dependence of time to complete kill an ambient relative humidity with treatment at high humidities taking slightly longer. At 55°, 75% r.h., 95% mortality was obtained after 8 and 15 minutes with 4th instar larvae and pupae respectively. Wright *et al*. (2007) investigated heat treatment of *Trogoderma variabile,* showing it to have similar response to heat as *T. granarium*.

T. granarium is usually quite susceptible to phosphine (e.g. Hole *et al*. 1976). Phosphine fumigation at one time appeared to be a potential alternative to methyl bromide against this pest, but it is probably no longer so, with the development of high levels of phosphine resistance in the Indian subcontinent.

Tests to quarantine standards with alternative fumigants, such as sulfuryl fluoride, would be result in a reduction in the use of methyl bromide..

Some winter wheat fields in Texas were infected with Karnal bunt disease, *Tilletia indica*, in 2001. When infected grain was harvested and transferred to storage bins, the bins and grain handling equipment became infected. MB fumigation of emptied contaminated storage bins requires a high dosage (240 g m^{-3}) for 96 hours to meet quarantine standards. Steam heating to a point of runoff in bins also is an effective alternative to MB providing surface temperatures reach 77°C (Dowdy, 2002). Microwave technology has recently been reported as effective in controlling *Tilletia indica* teliospores (karnal bunt of wheat) in 10 seconds compared to 96 hours using MB (Ingemanson, 1997).

Alternative treatments to methyl bromide are needed for various snails of quarantine significance (e.g. *Achitina fulica, Cernuella spp., Theba pisana*). Methyl bromide fumigation is usually the only approved quarantine measure for these pests when associated with grain shipments. Other processes, including HCN and CO_2 fumigations, may be more effective (e.g. Cassells et al. 1994), but are not approved.

6.2.2. 3. Alternatives under development

Japan imports about 30 million tonnes of grain (including for example wheat, maize and soybean). The quantities of MB used for grains in Japan are larger than for any other category except whole logs (PPS, 2007). Phosphine (PH_3) fumigation using aluminum phosphide tablets has been introduced as part of the plant quarantine treatment schedule in Japan (MAFF, 1971). This is not however adopted for controlling *Sitophilus* species because the pupal stage of *Sitophilus granarius* (a regulated quarantine pest for Japan) could not be killed completely at the dosage rates and fumigation conditions used in commercial quarantine fumigation (Mori and Kawamoto, 1966). On the other hand, sulfuryl fluoride has higher efficacy against pupal stages of several stored product insects, although the egg stage is the most tolerant (Furuki *et al.* 2005; Bell *et al*. 2003). Fumigating with a mixture of PH_3 and SF gas kills all stages of *Sitophilus* species, using the good properties of both fumigants. Tests with mixtures of phosphine and sulfuryl fluoride (PH_3 + SF) in progress in Japan.

6.2.3. Alternatives for Preplant soil use – propagation materials

The use of methyl bromide for soils falls under 3 categories, as can be seen from Parties' responses to Decision XX/6;

1) treatment of soil or substrate as a commodity

2) treatment of soil to eradicate quarantine pests

3) treatment of soils in situ as a preplant fumigation

6.2.3.1 Treatment of soil as a commodity

Soil or substrates as commodity treatments may be treated with MB to ensure pests are controlled on export to another country. Other commodities when shipped between countries may be required to be essentially free of soil or treated with MB to ensure any residual soil on the commodity is fumigated, eg, flower bulbs. For example, this use is reported by Malaysia, with a usage of 5.05 tonnes for 2007 in this category. Used equipment with soil attached may be fumigated with methyl bromide against Quarantine pests, where steam treatment is unsuitable. Several Pacific Island countries import bulk soil and aggregate that is fumigated against pests, weeds and diseases at export. The quantity of use of MB for this use is small, estimated at less than 100 t annually.

6.2.3.2 Treatment of soil in situ to eradicate an exotic Quarantine Pest.

Several cases exist worldwide where an exotic pest has invaded a restricted region with a country and is under official control. The control of these pests often specifies MB fumigation or an alternative that achieves further spread of the pest to other regions. MB as a soil treatment is often the fumigant of choice. For instance, the potato cyst nematode *Globodera pallida* is a quarantine pest in the United States with occurrence limited to the state of Idaho. Regulations 301.86 to 301.89 impose restrictions on the movement of materials from the state and designate quarantined areas within the state (Federal Register Vol 73 No. 177, Sept 11, 2008; USDA 2007). An eradication program presently covers a total of eight fields comprising approximately 445 ha, which are fumigated with MB once a year usually in the spring. In both 2007 and 2008, 217 tonnes were used for this purpose. The fumigation is followed by a Telone/chloropricrin fumigation 6 months later (Vick, 2009, pers. comm.; USDA 2007). The programme is expected to take several years to complete.

In a similar quarantine situation, 4.5 tonnes of MB was used to eradicate golden nematode (*Globodera rostochiensis*) from an infested area in New York state in 2008.

These examples of treatment of soil in situ against a quarantine pest for purposes of eradication of that pest are similar to that in other countries, ie. Australia. Methyl bromide was used prior to 2006 as a treatment of soil to control and eliminate branched broomrape (*Orobanche* sp), an exotic quarantine pest (parasitic plant) of limited distribution within Australia. This use of MB has since been discontinued as the pest was not effectively controlled and other products are now used to limit further spread.

6.2.3.3 Preplant fumigation of soils for nusery plants and turf

Preplant fumigation of soils with methyl bromide to produce plants for propagation or turf is distinct from treatments of soil to eliminate recognised quarantine pests either in soil transported as a substrate or treated in situ. The key difference is that preplant soil use is often applied many months prior to harvest of the plants and treatment is used to minimise spread of common endemic pests. In contrast, treatment of soil or substrate that is either imported or exported as a commodity (to grow plants in) is sometimes fumigated with MB as a quarantine measure to ensure freedom from a pest not found in the region to which it is exported (see section 6.2.3.1. above).

A very large amount of research and experience has been devoted to the development and adaptation of alternatives to methyl bromide for pre-plant soil fumigation (MBTOC, 2007, TEAP, 2008; 2009). A statistical analysis undertaken by MBTOC for expert assistance with CUNs was conducted to evaluate alternatives to MB for preplant fumigation (Porter *et al,* 2006). It mainly concentrated on production of strawberry fruit and tomatoes. Analyses from strawberry fruit trials showed that a large number of alternatives used alone or in various combinations had mean estimated yields which were within 5% of the estimated yield of the standard MB treatment (MB/Pic 67:33). Of these, a number of alternatives led to results that were comparable to MB/Pic. These included chloropicrin alone, 1,3-dichloropropene (1,3-D) + chloropicrin, 1,3-D/Pic + metham sodium and methyl iodide + chloropicrin, which was registered in the majority of US states in 2008 (excluding California) and which is undergoing review for registration in several countries. As shown below, these alternatives being adopted as effective alternatives for nursery uses in many non A5 countries (MBTOC, 2007; TEAP, 2008; 2009) that once used MB for nursery uses. Alternatively, substrates using soilless mixes are proving very effective in replacing MB for many nursery uses.

Presently, there is widespread adoption of these and other alternatives in many countries, showing equal effectiveness to methyl bromide (MBTOC, 2007; TEAP, 2008; 2009).

Table 6-4 gives the range of plant types that are grown as propagation material with the aid of methyl bromide in the US (2004 data).

Table 6-4. Production of various types of propagation material in the US with associated methyl bromide usage (2004 data)

Propagative material – source	Tonnes of MB used in US (2004
Bulb growers	261
California deciduous nurseries	127
California rose nurseries	136
Forest nurseries	174
Strawberry nurseries	463
Turfgrass (sod)	266
Western raspberry nurseries	25
Misc.	24
Total	**1476**

Source: US Response to Decision XVI/10, rounded to nearest tonne.

The production of propagation materials is subject to high health standards and often certification requirements, which are readily achieved with methyl bromide, applied to production beds. In the case of strawberry runners for example, MB is used to meet the certification standards for strawberry runner stock. The certification typically specifies a low tolerance of particular pests and diseases. Since a single strawberry runner grown in year one can expand to several million runners over three generations in soil, the detrimental impacts of pests in an early generation of the multiplication process is of particular importance. The same is true for stock plants used for producing cuttings of many ornamental plants.

In spite of these requirements, there are several measures accepted as alternatives to methyl bromide for production of propagative material. Methyl iodide and 1,3-D either alone or in combination with chloropicrin, are proving extremely effective in several countries and for several US nursery sectors (e.g. Kabir *et al.,* 2005). A recent version of NIPM Item #7 "Approved treatment and handling procedures to ensure against nematode pest infestation" lists 1,3-D and methyl iodide aside from methyl bromide, as alternative treatments to achieve certification requirements related to nematode control (CDFA, 2009), although methyl iodide is not currently registered in California.

Studies have shown that plants grown in soils treated with MB fumigation carry pathogens which are known to occur in the regions to which they are exported (De Cal, *et al.,* 2004; 2005). Often, the levels of pathogens are lower than the surrounding levels in soils at the site where they are grown, due to the presence of established endemic pathogens.

6.2.3.1. Alternatives for strawberry runners

1,3-D/Pic and Pic alone have totally replaced the use of MB in the Spanish strawberry runner industry (García-Méndez *et al.,* 2008; López-Medina *et al.,* 2007; De Cal *et al*, 2004). Strawberry production from transplants fumigated with MB alternatives was evaluated in Spain (López-Medina *et al.,* 2007); results indicated that treatment with 1,3-D alone or 1,3-D/Pic are efficient alternatives to MB for high elevation strawberry nurseries. These alternative fumigants are registered and available in regions producing strawberry runners in the US.

Preplant soil treatments with MI/Pic, Pic followed by dazomet and 1,3-D/Pic followed by dazomet were shown to be potential alternatives to MB for strawberry runner production in California (Kabir *et al.,* 2005). MI/Pic is now being adopted by ths strawberry runner industry in the SE United States (USA 2009 CUN for strawberry runners). Nursery yields and subsequent fruit yields in California were found to be similar to those obtained with MB when treated with MI/Pic, or 1,3-D followed by dazomet and chloropicrin followed by dazomet, although economic considerations influenced adoption (Fennimore *et al.,* 2008)

6.2.3.2. Alternatives for forest nurseries

Research on forest nurseries reports chloropicrin alone in combination with herbicides - when weeds pose problems - or 1,3D/Pic - when there are nematodes present - as effective alternatives for MB used as a QPS treatment (South 2008). Methyl iodide has been found to provide control of pathogens and weeds that is not significantly different to that achieved with MB (Enebak, 2006).; chloropicrin alone (South, 2007; 2008);1,3-D/Pic (South, 2008) , 1,3-D /Pic/metham sodium (South, 2008); metham sodium + Pic (Cram *et al.,* 2007); and dazomet (Muckennfuss *et al*. 2005; Enebak *et al*., 2006). Pic and metham when used in conjunction with barrier films (LPBF) may provide an effective technical alternative. Enebak (2007) found that with LPBF, use rates of MB can be significantly reduced

6.2.3.3. Alternatives for other kinds of propagation materials

Further successful trials have been reported on rose nurseries Hanson *et al.* (2008; 2009). MI/Pic, 1,3-D and 1,3-D/ Pic with high density polyethylene (HDPE) plus 1,3-D/Pic with VIF appear to provide weed control similar to MB in perennial tree nurseries (Shrestha, *et al*., 2008, Schneider *et al*., 2009).

6.2.3.4. Non-chemical alternatives

An alternate approach to chemical soil treatments is the production of nursery stock in bags or containers of different types, using soilless substrates (MBTOC, 2007). Substrates are becoming increasingly adopted as they avoid the need for methyl bromide in many countries (Stoddard *et al.,* 2008; Walter *et al.,* 2008). Strawberry plug plants were found to be a viable alternative to soil fumigation, as long as specific requirements associated to this technology are met (Durner *et al,* 2002; Sances, 2005). Maintaining good hygiene levels for plug plants is essential to their further expansion. Contamination can produce outbreaks of diseases, especially some airborne diseases which can proliferate under the controlled conditions of plug production.

Production systems where this approach is economically feasible and allows for the production of high quality products have been identified. In Japan for example, a simple, economically feasible system using trays filled with substrate is proving particularly useful for the production of strawberry runners. Various materials are used as substrates (e.g. rock wool, peat moss, rice hulls, coconuts husk and bark) and can be reused after sterilising with solar heat treatment or hot water (Nishi and Tateya, 2006).

Steam is in wide use for treating used substrates recycled for use for the production of propagation materials in Europe (EC Management Strategy, 2008) as well as in other countries around the world, including developing countries producing propagation materials which are subjected to certification requirements. Runia *et al* published a review of the various combinations of chemical and cultural practices used in northern Europe for the control of nematodes and the major diseases attacking strawberry runners.

6.2.3.5. Alternatives under development

DMDS + chloropicrin produced promising results in the forest nursery sector, although the former is not registered (Weiland *et al.*, 2008; Quicke *et al.*, 2007, 2008). Methyl iodide is gaining more widespread acceptance with new registration pending in several countries (TEAP, 2009).

6.2.4. Whole logs

Logs, timber and wooden materials (e.g. sawn timber, wooden packaging materials) are notorious for their ability to carry a variety of pests of quarantine significance. Some of these pests potentially attack forests and amenity trees (standing timber), while others can attack timber in furniture, buildings and other structures. Targets of methyl bromide fumigation may be insects that infest green and dry wood (Table 6-5), nematodes (particularly pinewood nematode, *Bursaphelenchus xylophilus*) and some fungal pests of wood, notably oak wilt fungus (*Ceratocystis fagacearum*). Fumigations may also be carried out to eliminate hitchhiker pests of quarantine significance, including pest insects and snails.

Some wood inhabiting fungi that need to be controlled, usually for quarantine purposes, are: *Antroida carbonica, Ceratocystis fagacearum, Gloeophyllum sepiarium, Lentinus lepideus, Lenzites sepiaria, L. trabea, Postia placenta* and *Serpula lacrimans.*

Table 6-5. Groups of wood insects containing species of quarantine importance that are targets of methyl bromide fumigation. Modified from ISPM15 (IPPC 2006)

Pest family	Common name
Anobiidae	Wood borers, woodworms
Bostrichidae	Powder-post beetles
Buprestidae	Jewel beetles
Cerambycidae	Longicorn beetles
Curculionidae	Weevils
Isoptera	Termites, white ants
Lyctidae	Powder-post beetles
Oedemeridae	False blister beetles
Scolytidae	Bark beetles
Siricidae	Wood wasps

6.2.4.2. Alternatives for logs

Methyl bromide is the most widely used fumigant for logs and the largest single commodity treated in the world but does have some limitations i.e. limited penetration, particularly across the grain and into wet timber. Most arthropods associated with timber are quite susceptible to methyl bromide but much higher dosages are required to have mortality effect on fungi (e.g. see Rhatigan *et al.*1998). Green logs are problematic to treat due to the high moisture content (80%), presence of bark (very adsorbent), size and large volumes.

Treatments of logs may need to be rapid, such as at point of export or import, to avoid charges and congestion at ports associated with occupying restricted port area for the treatment. Where quarantine treatments can be applied outside port areas, such as prior to export or in-transit, slower systems can be used. Many pests of quarantine significance, which attack green wood, do not reinfest dry and debarked wood.

There is active research in progress to develop alternatives for logs but gaining the required efficacy data is very difficult as laboratory rearing has not yet been achieved to the numbers required, most insects are seasonal, the commodity is large and variable.

Phosphine in transit on those parts of the shipment carried under deck is the only commercially used alternative currently for under bark pests. China has approved a specific treatment schedule for sulfuryl fluoride on logs for fumigation in Germany and other countries prior to export.

Methyl iodide (MI)/CO_2 and the methyl isothocyanate (MITC)/sulfuryl fluoride mixtures have been registered in Japan but not yet used commercially. Cyanogen shows promise but is yet to be registered or used commercially.

Research on alternatives for logs evaluating the efficacy of MI and MITC/SF/ mixtures have been completed in Japan and both treatments are under the process of inclusion under the relevant regulations. However, instructions or procedures for conducting gas measurements and safety devices to protect fumigators from gas exposure still need further work.

As logs are a high volume, comparatively low value and are shipped long distances the trade is very price sensitive to changes in freight costs, exchange rates and treatment costs. What may be an economic treatment for fruit may not be economic for logs. Non fumigant methods such as heat, microwaves and irradiation are normally cost prohibitive for logs.

Specific QPS alternatives for logs are discussed below, followed by discussion of some processes under development.

6.2.4.2. Reduction in Fumigation rate

Treatment specifications for logs have not been harmonised worldwide and schedules vary with country of import and target pest. Korea may require 25 g m^{-3} for 24hrs at 12-15^oC (Yu *et al*. 1984), China 120 g m^{-3} for 16hrs at 5-15C and Malaysia requires 128 g m^{-3} for a 24 hour exposure period at the higher temperature of 21^oC. Significant savings of methyl bromide could be achieved by standardising the fumigation rate. Thus New Zealand's use could be reduced by 53 tonnes per annum by reducing the fumigation rate from 120 to 80 g m^{-3} , as data show that this can be done without compromising efficacy and if permitted by the importing countries..

A new ISPM is being drafted for the international movement of wood. This will include two categories of treatments, firstly those already in use in bilateral trades and with efficacies against specific pests. The second category will be for classes of wood (round wood, sawn wood and mechanically processed wood) and will be based on the draft criteria for future ISPM No.15 treatment submissions and used the same decision-tree approach. A call for treatments for wood moving in international trade could go out late in 2009.

6.2.4.3. Alternatives for logs - fumigants

***Phosphine*.** New Zealand has pioneered the use of phosphine for the in-transit fumigation of forest produce destined for China but currently can only be used for the logs shipped below deck in the holds, approximately 2/3rds of a shipment. It is now in routine use as a QPS measure, replacing MB use. One of the major disadvantages of phosphine when compared to methyl bromide is the long exposure time (up to 10 days) required, but this is overcome by applying the phosphine in transit. Considerable efficacy data has been developed in support of this methyl bromide alternative (Frontline Biosecurity 2003, Crop & Food 2004, Hosking and Goss 2005, Zhang 2003, Zhang and van Epenhuijsen 2005). However, efficacy data for the wood wasp, *Sirex noctilio,* a quarantine pest of concern for India, has yet to be obtained to the level required for approval for trade with India.

The current dosage specification is for at least 200 ppm phosphine (v/v, 0.28 g m^{-3}) to be maintained for 10 days. Due to sorption of the gas by the logs (Zhang 2004) top-up of phosphine is required 5 days into the voyage to prevent the concentration falling below 200ppm. In transit tests have shown an even gas distribution throughout the loaded ship holds. High concentrations of CO_2 also occur within the ship holds during the fumigation period that may assist action of the fumigant. The current dosage specification is based on Australian experience with stored grain pests (insects) and is likely to be significantly higher than required where no insect resistance is involved (Frontline Biosecurity 2005).

Phosphine is typically produced in the reaction of aluminium or magnesium phosphide with water. There are some formulations of phosphine available in cylinders as technical grade, pure compressed gas or diluted with CO_2. The gas is highly toxic to insects (see section 6.2.2) and has remarkable penetration ability (Spiers 2003). Because of the relationship between respiration and efficacy, the egg and pupal stages of insects are generally more tolerant than larval and adult stages. Phosphine is generally ineffective against fungi infesting timber (Zhang, pers. com.).

Phosphine has long been used for the treatment of grain insects (see Section 6.2.2) but repeated treatment of grain silos and poorly conducted fumigations has led to high levels of phosphine resistance in stored grain pests in some countries (Zettler 1997, Collinson 1999). Such resistance is not an issue for one way commodities such as forest produce and extrapolation of data on dosage requirements from grain insects may be misleading for forest produce.

Research in China and Japan has demonstrated that phosphine killed 10 species of forest insects of quarantine concern including cerambycids, scolytids and platypodids. Oogita *et al.* (1997) fumigated the cerambycids (*Semanotus japonica, S. japonicus*, *Callidiellum rufipenne*, *Monochamus alternatus*, the scolytids (*Phloeosinus perlatus, Cryphalus fulvus* and *Xyleborus pfeili*) and the platypodids (*Platypus quercivorus* and *P. calamus*)) with phosphine at concentrations of 1.0 and 2.0 g m^{-3} for 24 and 48 hours at 15°C and 25°C. *S. japonica* and *P. perlatus* eggs were killed at 2.0 g m^{-3} for 24 hours at 15°C, but larvae and pupae of all species were not killed at 2.0 g m^{-3} for 48 hours at 15°C. At 2.0 g m^{-3} for 48 hours at 25°C, all stages of *C. fulvus* and *X. pfeili*, except larvae of *C. fulvus*, were killed. The work concluded that more than 48hrs was required.

In New Zealand two phosphine log fumigation trials were completed in 2009 (Wang W. *et al.,* unpublished), using sea containers loaded with commercial export logs and field collected insect-infested logs. The initial dosage of aluminium phosphide in the treatment container was equivalent to 2 g m^{-3} phosphine gas. Phosphine concentration was maintained at over 200 ppm during the 10-day fumigation period with one to three additional applications of aluminium phosphide pellets.

Penetration of the phosphine into export logs at an average moisture content of 59% and 79% respectively to a depth of 80mm achieved an average exposure of 183 ppm.hr and 265 ppm.hr in the two trials.

A total of 680 insects extracted from infested logs in the treatment chambers were dead after phosphine fumigation and the mortality rate was 100%. All the 561 insects extracted from the controls were alive. Insects included Cerambycidae; *Arhopalus ferus* (Mulsant) larvae, *Prionopolus reticularis* (White) larvae, Ichneumonidae; Rhyssines larvae (*Sirex noctilio* parasite) and Scolytidae; *Pachycotes pergrinus* (Chapuis) adults, *Hylastes ater* (Paykull) adults, *Hylastes* eggs, *Hylurgus ligniperda* (Fabricus) larvae, *Hylurgus* adults, and *Hexatricha pulverulenta* (Westwood) larvae.

This confirms the laboratory trials carried out by Zhang (2004b) that included four replicates of 94-102 eggs of *A. ferus* were successfully killed at 200ppm for 10 days and in another later trial a further four replicates of 100-253 *A. ferus eggs* were killed at a mean ppm of 260 over seven days.

Fumigation of logs using *phosphine* is effective in controlling bark beetles, wood-wasps, longhorn beetles and platypodids at a dosage of 1.2 g m^{-3} for 72h at 15 ºC or more. The length of time required to complete treatments restricts its commercial acceptability.

The "Florani" experiment showed that phosphine could be successfully used as an in-transit fumigant for eliminating the pinewood nematode from pine chips (Leesch *et al*. 1989; Dwinell 2001b).

Sulfuryl fluoride. While sulfuryl fluoride has similar properties and exposure requirements at some temperatures to methyl bromide, with significantly better in penetration of wood (Scheffrahn and Thoms 1993), it is not so effective at lower temperatures and requires significantly higher dosages to compensate. Most treatments of logs occur in temperate climates that have temperatures less than 25°C for much of the year which would make the treatment uneconomic in comparison with methyl bromide treatment. The recommended minimum temperature is 15°C. Sulfuryl fluoride has a large global warming potential (Papadimitriou *at al*. 2008).

Sulfuryl fluoride has long been used for termite control in the USA where it is marketed under the trade name Vikane. The fumigant has been shown to be effective against adult bark and timber insects. However, its efficacy against eggs drops sharply below 21°C requiring increased application rates (USDA 1991a). Dwinnel (2001) recommends a treatment schedule for 24 h sulfuryl fluoride fumigation of unseasoned pine for control of pinewood nematode (*Bursaphelenchus xylophilus*).of 3000 g h m^{-3} at 15°C down to 1000 g h m^{-3} at 35°C or greater. It does not appear effective against the pinewood nematode (Soma *et al.* 2001) either at 40 g m^{-3} for 24hrs or 20 g m^{-3} for 48hrs at 15°C. Its performance against the wide range of fungi of quarantine significance is unclear, though sulfuryl fluoride has successfully killed oak wilt fungus in 72 hrs at rates similar to methyl bromide (Carpenter *et al.* 2000; Tubajika 2006). Also at 30 g m^{-3} all eight wood fungi tested failed to grow after re-isolation, Zhang and van Epenhuijsen (2005).

Methyl isothocyanate/ sulfuryl fluoride mixture. The mixed gas of MITC and SF was registered in Japan in 2004 for logs infested with forest insect pests. MITC does have high sorption characteristics and an odour (UNEP 2001). MITC used in mixture with CO2 is effective against wood borers, bark beetles, and ambrosia beetles at 40-60 g m^{-3} for 24hrs at 15°C (Naito *et al.,* 1998). It has been found to be particularly effective against pinewood nematode (Soma *et al*., 2001).

Soma *et al.* (2004) using the fumigant mixture of SF and MITC (sulfuryl fluoride 30%, MITC 30% and carbon dioxide 40%, w/w) that all stages of three kinds of forest insect species, alnus ambrosia beetle (*Xyleborus germanus*), ambrosia beetle (*Xyleborus pfeili*) and pine bark beetle (*Cryphalus fulvus*) and adult stage of smaller Japanese cedar longicorn (*Callidiellum rufipenne*) were killed 100% at the dosages of SF15 g m^{-3} + MITC 15 g m^{-3} and of SF 21 g m^{-3} + MITC 21 g m^{-3} at temperature range with 18.3-21.2°C although achieving of complete kill for each of species tested were difficult when they had been fumigated with single gas of SF or MITC. These four species were considered less tolerant to mixture fumigant than pinewood nematode (*B. xylophilius*) and large scale mortality test using pine wood nematode provided complete kill of 97,400, 59,500 and 22,700 individuals with SF 27 g m^{-3} + MITC 27 g m^{-3} at 10°C, SF 21 g m^{-3} + MITC 21 g m^{-3} at 15°C and SF 15 g m^{-3} + MITC 15 g m^{-3} at 25°C, respectively (Soma *et al*., 2006).

The sulfuryl fluoride/methyl isothiocyanate mixture was recently registered as an agrochemical in Japan.

Methyl iodide. In Japan, the developments of alternative chemicals to methyl bromide for imported logs has been carried out by research institute on plant protection of MAFF (Ministry of Agriculture, Forestry and Fisheries, 2009), manufactures and other bodies concerned MB use because MB use for logs is the largest in total MB use in plant quarantine.

Complete mortality of the pinewood nematode and the longhorn beetles, *Monochamus alternatus* and *Arhopalus rusticus,* were attained at 84 g m^{-3} at 10 °C, 60 g m^{-3} at 15 °C, 64 g m^{-3} at 20 °C, 48 g m^{-3} at 25 °C respectively using methyl iodide 50% and carbon dioxide 50% (Kawakami *et. al* 2004). This mixture is now registered in Japan for timber treatment. The limited amount of research that has been undertaken suggests it is no better than methyl bromide in controlling pathogens in wood and may in fact be inferior (Schmidt and Amburgey 1997).

Nine kinds of insect pest species for logs, smaller Japanese cedar longicorn (*Callidiellum rufipenne*), Japanese pine sawyer (*Monochamus alternatus*), cryptomeria bark borer (*Semanotus japonicus*), pine bark beetle (*Cryphalus fulvus*), Iarch ips (*Ips cembrae*), ambrosia beetle (*Xyleborus pfeili)*, alnus ambrosia beetle (*Xylosandrus germanus*), yellow-spotted pine weevil (*Pissodes nitidus*), pine weevil (*Shirahoshizo rufescens*) were fumigated with methyl iodide and found the egg stages were more susceptible. Besides, larval and pupal stages showed similar susceptibilities. All tested species except for smaller Japanese cedar longicorn (*C. rufipenne*) were killed completely with the fumigation of methyl iodide 50 g m^{-3} for 24 hours at 15°C (Naito *et al*., 2003). Mortality tests for pine wood nematode

(*Bursaphelenchus xylophilus*) which indicated almost equal tolerance to methyl iodide with above mentioned nine species provided more than 99% of mortality for nematode that were fumigated with methyl iodide 30 g m^{-3} at 15^{o}C and 100% mortality was obtained at the test with 40 g m^{-3} of dosage (Soma *et al*., 2005). Subsequently, large scale mortality test for pine wood nematode was examined at three different temperatures and 10,800, 33,500 and 22, 400 individuals were killed completely at 10^{o}C with 60 g m^{-3}, 15^{o}C with 40-50 g m^{-3} and 25^{o}C with 30 g m^{-3}, respectively (Soma *et al*., 2005). Therefore, 87,800 nematodes in total were completely killed by lower dosages than the nominated standards of plant quarantine. It is expected to be adopted as a quarantine treatment in the near future.

Methyl iodide has successfully killed oak wilt fungus at rates similar to methyl bromide (Tubajika, 2006). This material was recently registered as an agrochemical in Japan.

Cyanogen. Cyanogen, sometimes referred to as ethanedinitrile, has been investigated as a replacement for methyl bromide. Registration is currently being sought in Australia. Ren *et al*. (2006) found direct exposure of Asian longhorned beetle larvae at 21 ^{o}C required a *ct*-product of 56.6 g h m^{-3} over 6 hours to give 99.5% mortality, equivalent to an exposure of 9.4 g m^{-3} over 6 hours. At a low temperature of 4.4 ^{o}C, an exposure to 94 g m^{-3} over 3 hours was required for 99.5% mortality. Trials reported by Dowsett *et al*. (2004) showed cyanogen to be more effective than methyl bromide on a *ct*-product basis against all life stages of two species of timber beetles and one species of termite. At 50 g m^{-3} and at 4.1^{o}C for 1 day cyanogen caused >96.5% mortality of the pinewood nematode *Bursapelenchus xylophilus* and the nematode *Steinernema carpocapsae*, a beneficial, was killed at 40 g m^{-3} and 20C after a 5 hour exposure.

Full scale trials using cyanogen on stacks of sawn timber have been carried out in Malaysia under MLF-funded demonstration trials for methyl bromide alternatives (UNDP - MAL/99/G68/A/2G/99). Cyanogen penetrates wood quite rapidly both across and along the grain, in contrast to methyl bromide that travels along the grain but poorly across the grain (Ren *et al*. 1997). Unlike methyl bromide, it appears to penetrate high moisture content timber well. More data is needed on this. It appears to have considerable potential as a methyl bromide alternative for logs (Wright *et al*. 2002).

6.2.4.4. Alternatives – non fumigants

Heat treatment. Heat treatment has been accepted as a quarantine treatment for logs and timber to be shipped to the USA and many other countries for many years (e.g. USDA 1996). The general specification has been to reach a core temperature of 71°C for 60 minutes. Kiln drying of timber to a moisture content of less than 20% using temperatures over 70°C is often a commercial requirement but also has long been accepted as a quarantine treatment by most importing countries. Currently 56°C for 30mins core temperature is sufficient for wood packaging.

Heat treatment of unprocessed logs is an approved risk mitigation measure for importation into the USA (Morrell 1995) but because of the energy required and the bulk of the commodity, it is rarely an economic alternative to fumigation. Steam heat is a more effective quarantine measure than dry heat (USDA 1994, Dwinell 2001).

Hot water and steam treatment has long been used for risk mitigation for hardwood veneer logs imported into New Zealand. Such logs are invariably attacked by pinhole borers (Scolytidae and Platypodidae) before shipment. Moist heat treatment is an integral part of log conditioning prior to peeling but has the additional benefit of eliminating quarantine risk.

A considerable volume of literature addresses thermal mortality of insects and has been reviewed by Hosking (2002a). Jamieson et al (2003) provides a good general summary of the literature on heat mortality of insects and fungi. A better summary of heat treatment applications for forestry produce is that of Dwinell (2001).

This literature suggests few if any insects and their close relatives can survive even short exposure (less than 24h) to temperatures above 50°C, but some fungi are more tolerant. Direct exposure trials of gypsy moth eggs (Hosking 2001) found 100% mortality for the lowest temperature (55°C) and shortest exposure time (5minutes) tested. Fungi have been shown to be more variable in temperature mortality threshold and the required exposure time, some requiring exposures up to 6 hours at 57°C (Morrell 1995) while others are killed at 60°C for 10 minutes (Ridley and Crabtree 2001). Heat treatment by steam has been shown to eradicate all tested fungi when 66°C is held at the centre of wood for 1.25 hour (Miric and Willeitner 1990, Newbill and Morrell 1991), but Dwinell (2002) reported that neither the APHIS-approved MB treatment for timber nor heat treatment up to 81°C killed all saprophytic fungal pathogens in imported hardwood pallets. Many fungal pathogens are also very tolerant of methyl bromide (e.g. see Rhatigan *et al.* 1998)

Irradiation. Gamma irradiation has been suggested as a treatment for wood and wood products (Reichmuth, 2002), and is currently approved for logs into Australia at a rate of 10 kGray (1.0 Mrad). However, its practical application must overcome a number of hurdles, not the least being the construction of large irradiators to handle logs and bulk wood products. The technology is also limited by poor penetration into freshly cut logs, potential damage and degradation of wood products such as fibre board and paper, variation in effect on different insect groups, and very high dosages required to eliminate fungi (Morrell 1995).

Irradiation to eradicate the pine wood nematode (*Bursaphelenchus xylophilus*) in pine chips has been investigated. Pine wood nematode-infested wood chips were exposed (for periods from 1 h to 2 weeks) to gamma ray doses up to 12 kGy. Lethal doses lay in the range above 6 to 9 kGy, which was considered too high to make irradiation an economically attractive means of decontaminating commercial wood chips. Forintek Canada Corp. researchers reported that a similar dosage of 7 kGy was required to kill pine wood nematodes in aqueous solution, which supports the contention that a higher dosage is necessary to eliminate the pine wood nematode in vivo than in vitro. Recent studies on irradiation effects on other nematodes confirmed the relative high dosages required to cause mortality (i.e. a dose of 7.5 kGy was required to kill all J2 larvae of *Meloidogyne javanica*). The use of irradiation for decontaminating logs in export trade does not appear to be economically feasible at this time, but be useful in managing pests on high-value forest products that cannot normally be heat-treated or fumigated.

Water soaking or immersion provides a process for control of pests on imported logs. Immersion of some logs destined for plywood manufacture is a useful process as it improves the quality of the products. The storage of logs in water or under water spray has long been accepted as an effective treatment for terrestrial insects and fungi with salt water immersion for 30 days being an approved treatment for logs into Japan but contamination of waterways with bark is an issue. The upper surface of the logs above the water level is sprayed with an insecticide mixture such as dichlorvos as part of the pest management strategy (Reichmuth 2002).

The potential for use of water soaking for quarantine treatment of imported logs is limited by the large area of water required and the undesirable side effects of ponding large volumes of logs, making its application on a large scale unlikely.

Debarking. Bark removal has long been a key strategy in reducing contamination of logs and reducing the risk that logs and sawn timber carry insects and fungi of quarantine concern. While debarking removes surface contamination and also bark and cambium, areas particularly prone to pest attack; it does not affect insects and fungi already in the wood (USDA, 1992). Many countries require debarking of all imported logs. Because of the high cost, and the requirement by customers in major Asian markets that bark remain on logs, its application as a quarantine treatment is limited and frequently only carried out on high value logs.

Microwave treatment. This is essentially a heat treatment using electromagnetic energy in the 10 – 30,000 MHz range. The relationship between field intensity, exposure time and mortality of individual insect species is not well understood, but has been shown to include considerable variability (Ria *et al.* 1972, Ikediala *et al.* 1999).

Forest produce poses special problems in the use of microwaves for disinfestation both in the wide variation in moisture content and the variety of target insects. However, recent research by Fleming *et al.* (2003) has shown microwave irradiation to be highly effective against Asian longhorned beetle in both green and dry wood packaging up to 100 x 100 x 100 mm. Microwave irradiation has also been shown to be effective against termites (Lewis *et al.* 2000). It seems unlikely however that microwave irradiation has application in the treatment of logs in the quantities exported, and even scaling up the technology to deal with quarantine risk wood packaging poses some serious challenges.

6.2.4.5. Trends in Log Trade

It is recognized that unmanufactured wood, especially in raw log form, is a particularly high-risk pathway for movement of forest insects and pathogens into new environments and treatment is usually required either preshipment or on arrival. The main approved treatment is methyl bromide with a small volume in trade using phosphine. The increasing world trade in logs and unmanufactured wood articles to fast growing economies such as China and India has amplified the consumption of methyl bromide in this sector.

From 1999 to 2007 the imports of logs into China grew by 230%. While the bulk of the logs going into China are from Russia via the land border and do not require treatment, a significant proportion is shipped by sea and requires treatment, as do those logs shipped from other countries. India has experienced a 92% increase over the same period and is likely to continue to grow. These increases have been offset slightly by a decrease in the log trade to both Japan (down 46%) and S.Korea (down 14%) over the same period. The nett effect however has been a 56% increase in imports over the eight year period, with increased need for quarantine treatment of some kind.

Fig 6-1. Trends in log trade in Asia 1999 – 2007

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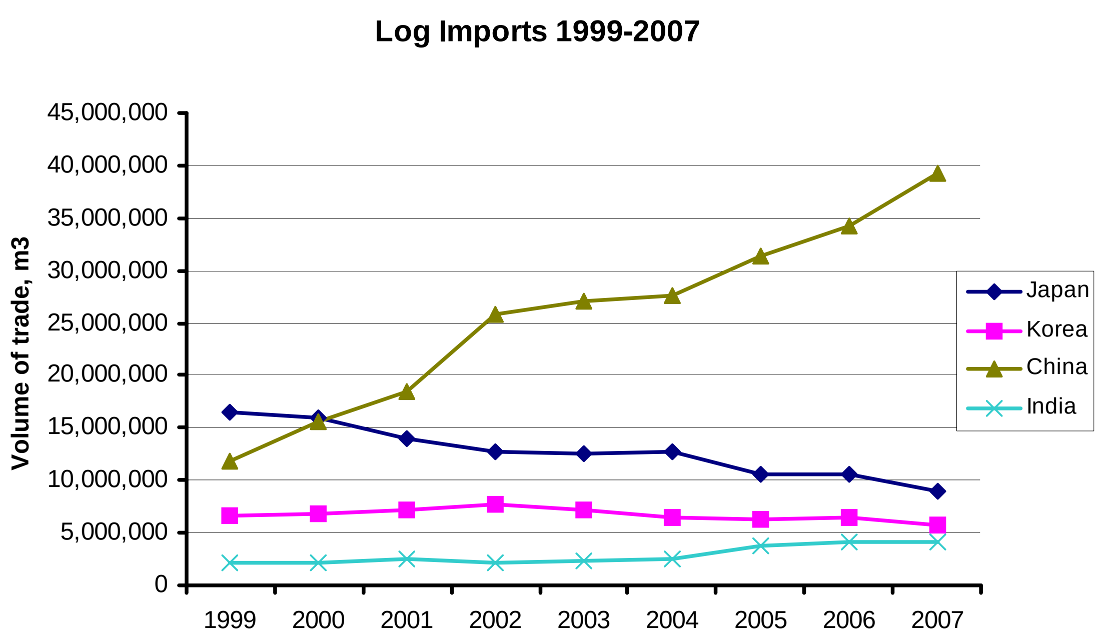

6.2.5. Wood and wood packaging material

6.2.5.1. Heat treatment

The only alternative treatment to methyl bromide treatment accepted internationally under ISPM 15 for treatment of wood packaging materials (WPM) is heat treatment, including kiln drying. A temperature of at least 56°C, core temperature, must be maintained for at least 30 minutes (IPPC, 2006). The 2009 version of the ISPM 15 standard (IPPC 2009) specifically encourages use of heat where feasible in preference to methyl bromide. There is substantial use of the heat treatment in many countries to meet ISPM 15. In general, heat treatment requires a higher level of infrastructure compared with methyl bromide fumigation.

There are some trends to comply with the ISPM 15 standard entirely with heat treatments and without using methyl bromide. The EC has published a manual of options and alternatives to achieve the objectives of ISPM 15 without using MB (Vermeulen and Kool, 2006). Also, in this manual, two possible alternatives to MB, controlled atmosphere and sulfuryl fluoride are discussed.

A variety of facilities are in use to achieve the specified heat dosage for ISPM 15. They include timber kilns (present in many countries), hot water dipping (e.g. Bangladesh (Kabir, 2005)), modified freight containers or similar enclosures with either hot water heating (China) or electrical or gas heating (Australia, Jamaica). Heat has been used in many A5 countries for many years (e.g. Morocco, Costa Rica, Colombia, Ecuador) and is made easier due to the fact that it can be integrated with kiln drying. CFIA (2007) describes procedures for measuring and achieving ISPM15 heat conditions with both green and dried wood. The AQIS standard for heat treatment (AQIS 2009) gives procedures for measuring heat dosages to meet ISPM 15 and for treatment of other commodities too.

6.2.5.2 Chemical alternatives

In cases where WPM has to be treated together with heat vulnerable cargoes or goods to meet ISPM 15, there is no chemical option at present other than MB treatment[2], but alternative chemicals are being evaluated. The 2009 revision of ISPM 15 (IPPC 2009) did not recognise any alternative to methyl bromide except heat, but several potential alternatives to heat and methyl bromide are under continued testing. The Technical Panel on Phytosanitary Measures (TPPT), the panel that advises the CPM on technical evaluations on alternatives, reports that several potential alternatives have been submitted to the IPPC and are under evaluation. These are given in Table 6-6 were submitted to IPPC and have been evaluated in accordance with the IPPC process. The evaluation panels have requested additional efficacy data for all these potential alternatives. It seems that species of *Agrilus planipennis* (Emerald Ash Borer), *Anoplophora glabripennis* (Asian longhorned beetle, ALB) and *Bursaphelenchus xylophilus* (Pinewood nematode, PWN) are key pests that at least need to be controlled to a very high level of quarantine security by any alternative.

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[2] ISPM 15 requires the wood packing material to be treated to the required standard before it is stamped. However, on some occasions, it appears that stamping occurs prior to treatment. This gives potential to expose heat sensitive articles to the treatment.

Table 6-6. List of potential treatments for ISPM-15 under IPPC evaluation

Sulfuryl fluoride
Sulfuryl fluoride and MITC mixture
Hydrogen cyanide
Microwave irradiation
Phosphine
Methyl iodide

Of the alternatives for ISPM 15 being considered, the data submitted for sulfuryl fluoride are sufficient to support Probit-9 efficacy for SF fumigation against *Anoplophora glabripennis* in wood packaging material, but not for pinewood nematode. The TPPT has sufficient information to support the 99.99683% (Probit-9) efficacy of a methyl iodide schedule against PWN with but not for Anoplophora. Phosphine data submitted are not yet sufficient to demosntrate efficacy against either of the two key pests.

A new ISPM is being drafted for the international movement of wood that will include two categories of treatments, firstly those already in use in bilateral trades and with efficacies against specific pests. The second category will be for classes of wood (round wood, sawn wood and mechanically processed wood) and will be based on the draft criteria for future ISPM No.15 treatment submissions and used the same decision-tree approach. A call for treatments for wood moving in international trade could go out late in 2009.

6.2.5.3 Not in-kind alternatives for WPM

Not-in-kind alternatives exist for wood pallets and other wooden packaging materials. These avoid the need for MB fumigation or heat treatment. Plastic pallets (often made from recycled plastic and reusable) are commercially available and are used by many companies in the EC, the US[3] and many other regions of the world. Cardboard pallets can be suitable for loads of about 3,000 kg, for example, and are available commercially in Australia, the EC, Kenya, New Zealand, the US and others[4]. Plastic, cardboard, plywood and particle board can also be used, instead of wood packing materials, for boxes, containers and staves which prevent goods moving within packed shipping containers. These materials are exempt from the requirements for MB or heat treatments under the ISPM 15 standard, which refers only to solid wood packaging materials. The ISPM 15 standard excludes non-wood packaging (plastic, cardboard) and specifically excludes plywood, particle board, oriented strand board and similar processed wood that has been subjected to glue or pressure during processing (IPPC 2009, Appendix 4, section 2.1). As a side benefit, a reduction in the volume of new timber used for wood pallets would bring benefits to countries where forest resources are

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[3] Examples of plastic pallets can be found at www.USplasticpallets.com, www.cabka.com, www.plasticpallet.eu, www.goplasticpallets.com, www.rwrpaletten.be, www.craemer.de, www.permapallets.nl, www.palletower.com, www.plastibac.eu.

[4] Examples of cardboard pallets can be found at www.cardboardpalletcompany.com.au, www.tripla.com, http://www.jmpholdings.com.au/palletscorrugated.html, www.farusa.dk, www.doubleEco.co.nz.

under pressure. Kenya, for example, is estimated to use about 250,000 to 300,000 wood pallets per annum for tea exports alone. This volume of pallets comprises about 5,500-6,600 tonnes of cut timber, which requires the felling or importation of about 8,330 - 10,000 tonnes of raw timber per annum (Rodwell, 2007). This demand for timber causes problems in Kenya where the tree cover is rapidly dwindling due to other pressures such as the need for firewood (Rodwell, 2007).

6.2.6. Alternatives under development

The requirement for mortality data showing a high level of effectiveness for wide range of pests is a major barrier to development and approval of additional alternative treatments for ISPM 15. Details of current requirements for submission of potential alternatives are given in ISPM 28. Criteria for future ISPM 15 treatment submissions are being considered by the TPPT.

Some NPPOs recognise other treatments for wood packaging materials and similar products where ISPM is not applied. These treatments may be post entry or prior to export. Australia, for instance, accepts off-shore treatments of timber packaging and dunnage not treated in accordance with ISPM 15 must at specified dosages of several alternatives, including fumigation with sulfuryl fluoride, or ethylene oxide or treatment with heat, gamma irradiation or some timber preservatives (ICON 2009)

Evaluation and use of alternatives was reported by the EC in 2007 as follows (Touchdown, 2009):

- Heat treatments were used in their territories for the disinfestation of pallets and packaging materials (Bulgaria, France, Germany, Greece, Hungary, Ireland, the Netherlands, Poland, Slovenia, Spain). Heat treatment facilities were registered in Portugal and the UK;
- Research was underway on sulfuryl fluoride (SF) to control a range of pests infesting wood (France, Germany, Greece, Ireland, Portugal and Spain). The Netherlands registered SF in 2007 and Greece in 2009.
- Hungary researched hydrogen cyanide (HCN) for the control of wood boring insects. There was collaboration between Hungary and a company in the Czech Republic that was the owner of the HCN formulation. There was interest in obtaining IPPC accreditation for the use of HCN, perhaps as one of the alternatives listed under ISPM 15.

6. 3. Uses where no alternatives have been identified

6.3.1. Introduction and mandate

Paragraph 4 (c) requires the Task force to discuss *"Quarantine and pre-shipment applications for which no alternatives are available to date and an assessment of why alternatives are not technically or economically feasible or cannot be adopted"*

6.3.2. Uses without alternatives

Given existing gaps of information, lack of research on effectiveness of some alternatives and regulatory constraints affecting their implementation in some situations, it is presently difficult to clearly identify QPS uses of methyl bromide where no alternatives exist. In some cases, although alternatives exist they may not be available for a particular situation or country. Nevertheless, in the light of information available, the QPSTF was able to identify some areas where implemetation of alternatives seems particularly complicated or difficult.

For perishable commodities, the QPSTF noted there were currently no approved alternatives for certain economically important exports (the list is not all inclusive):

- Apple, pear and stonefruit that are hosts to codling moth, for example
- Nectarines from USA, codling moth
- Nectarine from New Zealand, codling moth
- Apples from New Zealand, codling moth
- Apples from France, MED fly and codling moth
- Apples from Australia (Tasmania), codling moth
- Cherries from Chile, codling moth
- For certain pests on berryfruit;
- For grapes infested with, for example mites, exported to some countries (although Chile has developed a systems approach allowing export to the USA);
- Some root crops exported by countries if soil was present or pests of concern were detected on arrival.
- Post entry quarantine treatment of cut flowers and some other perishables as an alternative to destruction or rejection of the cargo.

Similarly, there are certain current QPS uses of methyl bromide on durables for which QPSTF did not identify any existing alternatives. These were disinfestion of (not an exhaustive list):

- Seed-borne nematodes from alfalfa and some other seeds for planting.
- Treatments against khapra beetle or risk thereof in grain and packaged goods at risk of carrying the pest. Moderate heat not approved. Phosphine not approved, and possibly unwise in view of the phosphine resistance picture with this pest.
- Treatments against snails, particularly white snails such as *Theba pisana* in grain. MB does not work well but is only available treatment.
- Treatment of whole logs at risk of carrying both insect quarantine (regulated) pests and Bursaphelencus nematodes.
- Treatment of oak logs and oak products at risk of carrying oak wilt fungus
- Treatment of wood packaging material to ISPM 15 requirements, where heat treatment is not feasible (however, as decsribed above there are not in kind options available).
- Treatment of large bulks of soil as a commodity, where steaming cannot be used for disinfestation against quarantine fungi and weed seeds.

For preplant soil uses of methyl bromide classified as QPS, there are alternatives that are effective for almost all instances, but lack of regulation of a key alternative, methyl iodide and future concerns over regulation of a number of other fumigant alternatives may limit future options.

In areas where methyl iodide is not registered, MB is the key fumigant required to eradicate quarantine and regulated non quarantine pests and pathogens such as potato cyst nematode and golden nematode.

Feasible alternative options are a)inspection programmes prior to shipment, b) total prohibition of a particular trade or c) processing products prior to export (e.g. exporting cut dried timber rather than raw, whole logs) in order to avoid because of excessive risk of carrying quarantine pests sufficient to permit establishment in the importing country. For some commodities, methyl bromide fumigation may be the only approved treatment at present to allow the trade (eg export of apples to Japan from Tasmania).

6.3.3. Country examples

6.3.3.1. EC

EC Member States (Touchdown, 2009) reported that alternatives were not available in 2007 for the following QPS uses:

- In Spain and Portugal to control pests on chestnuts to maintain access to the international markets for high quality nuts;
- In France for the disinfestation of *Ditylenchus dipsaci* nematode in alfalfa seeds;
- In Greece for the economically-feasible and logistically-acceptable disinfestation of dried figs and raisins;
- In the Netherlands for the disinfestation of cut-flowers for export to Japan, as so far research on ozone, ozone/water and low-oxygen environments had not been successful;
- In Poland for the control of wood pests such as *Monochamus* sp. and *Bursaphelenchus xylophilus*, as the long exposure time under low-oxygen conditions exceeded logistical requirements; and
- In Spain for the treatment of imported cattle hides and some wood products.

Spain and Portugal reported that the use of steam for the disinfestation of chestnuts was an alternative, but they were seeking a better alternative that was less costly and preserved the quality of the chestnuts.

6.3.3.2. Japan

Although alternatives for logs and wood packaging materials are now in use in Japan, there is a lack of alternatives approved and available for treating fresh fruits and vegetables. In addition, high concern over food safety, particularly regarding imported vegetables plus chemical injury resulting from treatment with certain chemicals make methyl bromide the treatment of choice.

The top five products treated with methyl bromide by plant quarantine authorities upon entry to Japan are listed in Table 6-5 below. Broccoli and asparagus accounted for about 40% of the fumigations performed on vegetables in 2005 (8,513 fumigations in total).

Table 6-5. The five vegetables most frequently fumigated with MB in Japan in 2005

	Product	No. of MB fumigations[1)]	Ratio to all fumigations (%)[2)]
1	Broccoli	2,463	28.9
2	Asparagus	956	11.2
3	Cabbage	631	7.4
4	Okra	413	4.9
5	Squash	350	4.1

1) Source: Plant Quarantine Statistics 2005, Japan.

2) The total number of MB fumigations for vegetables was 8,513.

Reasons for fumigation and frequency of the main species detected on import quarantine inspection on these vegetables are shown in Table 4-4. These are mainly species in the Thripidae, Aphididae, Lepidoptera, Pseudococcidae, Agromyzidae and Tetranychidae families, which together account for 80-90% of treated pests. It should be noted that during quarantine inspections, both quarantine and non-quarantine insect pests are detected, and that the number of pests now classified as non-quarantine by Japanese authorities is increasing year by year. For example, the diamondback moth, *Plutella xylostella* found on broccoli and cabbage, is now listed in non-quarantine pest group (Misumi *et al.,* 2009; MAFF, 2009).

It is thus essential to improve identification techniques that allow for quick distinction between quarantine and non-quarantine insect pests upon entry into Japan. Insect pests are most often detected as eggs or immature larval stages during quarantine inspection, when it is difficult to identify the particular species present. For this reason, identification is frequently limited to the family and/or genus level as is evident in Table 4-4. To solve this problem, the Japanese Plant Quarantine Station has undertaken the development of identification techniques based on DNA analysis (Misumi *et al.,* 2009; MAFF, 2009).

6.4. Barriers to adoption of MB alternatives

6.4.1. Mandate and overview

Decision XX/6 (4d,e) requests QPSTF to provide:

> *(d) Illustrative examples of regulations or other relevant measures that directly affect the use of methyl bromide for quarantine and pre-shipment treatment (including information requested in decision X/11);*
>
> *(e) Other barriers preventing the adoption of alternatives to methyl bromide;*

Past MBTOC and TEAP reports have reported on some of the barriers to adoption of MB alternatives and emission mitigation options (e.g. MBTOC 1998, 2002, 2007; TEAP 1999, 2000, 2006, 2007). For some countries such information has been published in papers about QPS issues produced by national phytosanitary authorities and national experts.

Development of new methyl bromide alternatives for QPS applications, particularly for the Quarantine component, continues to be a difficult and complex process, exacerbated by the multitude of commodities being treated, the diverse situations where treatments need to be applied, the high demonstrated efficacy against the regulated pests required of the process, the low price of methyl bromide and the relatively small market for alternatives for many specific usesand a constantly changing trade and regulatory landscape.

A variety of technologies are potentially suitable as replacements for some commodities and some circumstances. In many cases, uncertainty about phytotoxic effects and effectiveness against the target pests constrain use of alternatives. There may be considerable cost, effort and time associated with the registrations and approvals that are required for many quarantine uses.

A major barrier to adoption of alternatives are the many regulations, domestic and international that specify or favour methyl bromide use. This is discussed below (Section 6.4.6) with discussion of illustrative regulations as required under Decision XX/6(4,d) is made more fully in Chapter 8.

6.4.2. Lack of or difficulty in obtaining efficacy data

The required standard of efficacy for quarantine uses is extremely high because the consequences of exotic pests surviving treatments can be catastrophic to regions where the new pest becomes established. As compared to normal pest control and pre-shipment treatments, quarantine treatments seek to absolutely prevent entry of any pest individuals into a country and as such must be as close to 100% effective as possible. A common quarantine standard is probit 9, which states that 99.9968% of pests in the shipment must be killed or made reproductively sterile by the treatment—an extremely difficult target to reach. Proof that an alternative treatment reaches this specification is a costly and onerous task, often required for particular combinations of commodity and pest.

Research and statistical analysis required to prove the efficacy of an alternative are rigorous, lengthy and expensive. As a general rule, such processes must be conducted on the specific pest under quarantine. Very often research will have to be conducted in the exporting country which is where the pest in question exists, since its quarantine character does not allow for study in the importing country. In the absence of controls on MB use for QPS uses, there is little incentive – and sometimes difficulty in securing funding - to develop such data where there is an alternative treatment that could allow entrance of the products in question into the importing country.

A key barrier to development of alternatives for preplant soil treatment for plants of certified high health status is the rigorous testing required to prove an alternative effective. Often MB is accepted as the effective standard as historically it has been used to achieve plants of high health status and thus may only require visual assessment for symptoms of diseases and pests or even no testing to validate its performance. Preplant soil treatments to achieve high plant health status generally do not achieve the same levels of pest and disease control as international quarantine treatments and often work to a level of disease tolerance e.g. 1% of plants affected with a particular pests.

6.4.3. Shelf life issues and economics

Methyl bromide for QPS purposes continues to be in plentiful and unrestricted supply, as expected under the exemption from phaseout under Article 2H para 6. The cost of methyl bromide gas to end users is a relatively small component of the total cost of a QPS treatment. Compliance costs associated with the handling and use of a highly toxic gas to exacting occupational, environmental and effectiveness standards, increases the overall cost of conducting QPS methyl bromide treatments. Nevertheless the methyl bromide treatment costs present a competitive barrier to the development and adoption of any new alternative processes.

Cost of methyl bromide to the end user and the fumigator, has remained relatively stable over the last 5 years, with price approximately in the range $US 4-16 per kilo in many developed and developing countries. In some countries, the price of methyl bromide has fallen recently, possibly as a result of new suppliers entering the market. For instance, in Australia, methyl bromide for QPS purposes is now approximately $US 6.50 per kilo, down from about $US 8.00 in 2002. Price for 'Q-gas' in the US is about $US 15.00 per kilo at this time, with substantial discount available to large volume users.

The advantage that methyl bromide enjoys arises in part because methyl bromide based systems do not include the costs of the damage to the ozone layer and ultimately to human health. The extent of such costs is however not known. In addition, other QPS systems also have unaccounted costs to the environment and human health. Sulfuryl fluoride and heat for example, also carry environmental impacts. Again, the extent of these costs is not known.

In the absence of regulatory or economic incentives to adopt alternatives and assuming methyl bromideis in most cases the lowest cost effective system at present, an alternative would not be voluntarily adopted unless it performed as well or better at the same market cost. Technically feasible alternatives will have limited market acceptance if they are more costly – and in the world of bulk commodities, it is difficult to entice end buyers to pay a higher price for goods treated with alternatives.

If however the goal is to replace methyl bromide with alternatives (since protection against high risk pests is also a primary goal) while also protecting the ozone layer and market forces have not resulted in development and adoption of alternatives, then alternative actions such as the following may be considered to encourage further steps. The following list shows some diverse examples of activities that different Parties have chosen to undertake, leading to reductions or expected reductions of methyl bromide use for QPS:

- Publically (government) subsidized or direct research into alternatives e.g. Japan, USA, Australia, EC, China and Argentina.

- Subsidies to encourage use of non-MB systems, e.g. the first alternative treatment facility at a major port in the Netherlands, initially received a government subsidy as seed funding (this led to further commercial adoption without subsidies).

- Taxes on the use of MB systems. e.g. Czech Republic and several other countries have applied taxes on the imports of MB (and other ODS) for many years; this encouraged the uptake of alternatives.

- Prior approval for each MB fumigation taking account of the availability of an alternative treatment, e.g. in the 1980s the Netherlands introduced a prior approval system for each MB fumigation – the use of MB was not authorised in situations where alternatives could be used.

- Obligatory use of recapture/destruction equipment, e.g. in 2007 Belgium required the capture of 80% of available gas from MB fumigations.

- Cap or freeze on the quantity of MB permitted for QPS, e.g. the EC placed a freeze on QPS consumption from the year 2001 onwards (Regulation (EC) no 2037/2000).

- National prohibitions or bans on QPS uses of MB, e.g. Denmark (Statutory Order 974, 1995), Sweden (Pesticides Ordinance 1998:947), Finland (CSD 262/98, 1999); the EC has recently de-registered MB as a pesticide because MB failed to meet the safety/health criteria, and a ban on MB use is due be implemented by 18 March 2010.

- Prohibitions or voluntary restrictions on specific QPS uses, e.g. Canada and Taiwan have discontinued the use of MB for ISPM 15, using alternatives only (TEAP 2008 p.113).

- Unilaterally or multilaterally banning all or specific uses of MB for QPS.

Some parties already implement variations of the first option. A ban on MB use for QPS has now been adopted in some Parties (e.g. Denmark (Statutory Order 974, 1995), Sweden (Pesticides Ordinance 1998:947), Finland (CSD 262/98, 1999)) and may soon be adopted at the regional level e.g. in 2010 in the EC, and announced for 2015 in Brazil. The Russian Federation no longer allows use of methyl bromide, including for QPS, though there are pressures to reverse this ban (communication to MBTOC, 29th OEWG).

A large number of Parties (e.g. 97 A5 Parties) have reported no use of MB for QPS altogether as discussed in Section 3.3 above.

In some cases methyl bromide alternatives are in use, even though their market prices are higher. This has occurred for diverse reasons – such as health or safety concerns about methyl bromide, idiosyncratic circumstances or because the users anticipate that methyl bromide will be banned or taxed and they expect their early adoption will soon result in higher profits.

In many cases, MB is an established and traditional practice, not subjected to the rigorous and expensive efficacy testing that might be required of a new entrant in the market. It is also often the case that MB alternatives are more practical when applied at the point of origin, thus relocating the quarantine barrier off-shore. More options may be available at that location including strategies to ensure product health during the production process. Factors of scale may also be relevant in this respect: large quantities of products at the point of origin may allow for more cost efficient treatment, for example by justifying installation of irradiation facilities, cold or heat treatment facilities, and others, which would not be feasible at points of entry.

However, treatment with MB often affects product quality negatively, which mainly translates into a reduced shelf life. This makes some exporters reluctant to apply treatments before export. Finally, most alternatives are more expensive than fumigation with MB at the port of entry which further deters from their development and adoption.

6.4.4. Post-entry quarantine measures

Given that activity normally taken place at ports, it is frequently considered impractical to establish treatment facilities such as for irradiation or other similar measures for treating goods infested with quarantine pests due to space or environment restrictions. Further, treatments are generally performed by private contractors not government authorities, which meansthere has to be sufficient through-put on a continuing basis to justify the costs of facilities as well as the training and maintaining of staff to operate them. Even if treatments are available in the area, quarantine officers will often not allow the product to be moved from the port for treatment due to risks of pest dissemination. In view of this, if pests are discovered at the port of entry, it is important to have access to a wide spectrum treatment which is fast and portable, generally fumigation. Presently, four fumigants are widely available for use: methyl bromide, phosphine and, to a lesser extent, sulfuryl fluoride and HCN. For a variety of reasons including tradition, efficacy, registration, occupational health and safety issues and speed of action, methyl bromide frequently is the leading available fumigant for use at many ports at present.

Decision on the actual treatment to be applied is made by the importing country. According to the particular case, it may even be decided that no treatment is necessary.

6.4.5. Barriers to adoption of QPS alternatives in uses in Article 5 countries

For many A 5 countries, MB treatment of imported commodities such as wheat, rice, maize, and beans for QPS purposes, is performed either by the exporting country or during transit, with inspection on arrival. In many cases, the methyl bromide treatments will be ‘pre-shipment’, not against regulated ‘quarantine’ pests. When the commodity is found to be infested on arrival, the risk of quarantine pests being present is assessed, and it may be either treated such as by fumigation in situ, processed or completely rejected. Presently, phosphine and MB are the only fumigants that are widely available for use for post entry disinfestation, with methyl bromide usually preferred or required by plant quarantine authorities because of its traditional reputation for effectiveness, speed of action and, recently, activity against phosphine-resistant strains of pest.

Although phosphine is widely used, continuous use of this product may lead to insect resistance unless appropriate precautions are taken. MB treatment is also often achieved in a shorter time than when phosphine is used, though some formulations of phosphine are more efficient and treatment time can be reduced with combined treatments (MBTOC, 2007). Improper treatment with methyl bromide alternatives may lead to insufficient control and destruction of exported consignments upon arrival at port of entry, or may lead to additional use of methyl bromide

Other proven alternatives such as irradiation, heat, cold, inert gases, are not always fully available A5 countries due to factors such as cost, logistics, equipment needs and others. Appropriate technology transfer is also necessary.

ISPM 15 identifies heat and MB as feasible alternatives for QPS treatment of wooden packaging materials. Heat treatment facilities for ISPM treatments have been set up in Bangladesh, China, India (41 facilities), Jamaica, Malaysia (30 facilities), the Philippines, Singapore, Taiwan, Thailand, Turkey, Vietnam and other A5 countries (TEAP, 2008, p.113; Batchelor and Miller, 2008; ECO2, 2009 pers comm.). Taiwan, for example, has discontinued the use of MB to meet ISPM 15 and uses heat treatments (TEAP, 2008, p.113). Heat has been used in many A5 countries for many years (i.e. Morocco, Costa Rica, Colombia, Ecuador) and is made easier due to the fact that it can be integrated with kiln drying. However, some A5 countries face constraints such as high fuel costs, funds and technology to implement this technique appropriately. A project is underway in Fiji aimed at the development of a solar assisted system to treat pallets following the requirements of ISPM 15 (TEAP, 2008 p. 113)

Interception of a quarantine pest associated to cut flower consignments can lead to its destruction by the importing country, or fumigation with MB, which significantly reduces vase life. Several A5 exporters of cut flowers thus work on preinspection before shipping and on taking appropriate measures during production to avoid presence of quarantine pests or pathogens (Rojas, pers comm, 2009). Trials on the control of cut flower pests with irradiation are also under way in some cut flower exporting countries, for example Colombia (Lee, pers comm, 2009). Some countries like Kenya, however, report that Japan and US authorities are very strict with quarantine pests on Kenyan cut flowers exported to these countries. To meet this requirement, Kenya is considering establishing a MB fumigation chamber for fumigation of the cut flower and other fresh produce for export to these markets.

A variety of technologies are potentially suitable as replacements for some commodities and some circumstances. In many cases, uncertainty about phytotoxic effects and effectiveness against the target pests constrain use of alternatives. There may be considerable cost, effort and time associated with the registrations and approvals that are required for many quarantine uses.

Changing quarantine regulations and bilateral quarantine agreements are the responsibility of governmental agencies but, in many countries, pesticide registrations are initiated by the private sector. In the past, pesticide companies have been reluctant to invest money to register and market pesticides for small markets represented by many of these quarantine uses, or where patent protection is lacking. Alternatives that do not require registration such as heat, cold and inert gases may be more easily adapted in cases where their use is appropriate to the tolerance of the commodity, the situation and where they show sufficient efficacy. However, these treatments still require bilateral quarantine agreement or regulation in the importing country before use will be allowed.

Pre-shipment uses on the other hand, are usually for widely distributed pests that are already found in the importing country. Consequently, the efficacy standard does not need to be as severe as in the case of quarantine and research requirements to establish efficacy can be less rigorous as well. It would appear that there are fewer obstacles to adopting alternatives for pre-shipment methyl bromide uses than for quarantine uses.

The WTO SPS Agreement relating to quarantine measures gives countries the right to adopt phytosanitary measures necessary for the protection of human, animal or plant life or health' provided that the measures are applied only to the extent necessary to protect such health, based on scientific principles and risk assessment, not applied in a discrimatory manner, and complying with various other provisos. Members may adopt phytosanitary measures that give a higher level of protection than the adopted international standards if there is scientific justification or as a result of risk assessments that take account of scientific evidence and other factors. . Since many factors influence the adoption of a particular level of security, some countries will have low requirements that many different treatments might satisfy, whilst other countries require a very high level of rigour achieved with few or even no treatments. Countries are required to apply such phytosanitary measures consistently across all their trading partners and even within their own territory and that of other Members (Article 2,3) when the same internal quarantine situation prevails. Additionally, parties to the WTO agree to recognize and accept treatments which have been shown to provide sufficient efficacy to meet the required level of quarantine security. As a general rule, countries may also choose to apply any available treatment that is approved.

Other barriers to adoption of alternatives have been summarised by the EC in its Report on QPS Applications (Touchdown, 2009) and include;

- Importing countries specifications mandating the use of MB
- Alternative is uneconomical, logically impractical or unregistered
- The technical expertise to assess a pest risk is not available

6.4.6. Regulatory issues

Countries have regulations that list requirements allowing for a commodity to be imported into their boundaries, including quarantine treatment requirements. In some cases, the only treatment that is listed as acceptable is MB, indicating that there are no available data to prove the efficacy of alternatives at a level which is consistent with the country's quarantine security requirements.

Regulations prescribing MB treatment alone are a major barrier to adoption of alternatives as often there is little incentive for the regulation to be changed. Also, often the data have not been generated to prove effective control of all pests with an alternative to a standard similar to MB and Parties are unwilling to approve the alternative in the absence of this information.

Constraints to adoption of alternatives for treating soil where crops will be grown with MB are mainly regulatory – that is, alternatives not being registered at the location where treatment occurs or being highly restricted[5] by regulations (for example, alternatives not being registered, such as methyl iodide; large buffer zones; township caps in California, USA). Certification regulations sometimes do not recognise other treatments different to MB to achieve the high plant health status required, although developments in this respect are beginning to occur (for example, NIPM Item #7 "Approved treatment and handling procedures to ensure against nematode pest infestation" lists 1,3-D and methyl iodid aside from MB, as alternative treatments to achieve certification requirements related to nematode control (CDFA, 2009)).

The registration of a new chemical or extension of the label are often a very onerous and expensive tasks, which can take years to resolve and require considerable data on safety and efficacy. For many countries the potential volume of use is too small or cannot guarantee the intellectual property rights to justify registration.

6.5 Summary: Alternatives to methyl bromide

6.5.1. Areas where there are alternatives

All of the categories appearing in the sections above have approved non-methyl bromide alternatives in at least some applications. Specific alternatives may not be available for a particular trade or situation because of the risk or presence of particular quarantine pests, lack of approval by the importing NPPO, or lack of registration or commercial supply of the particular treatment.

Table 6-7 below lists cases of approved alternative quarantine treatments for perishables and durable commodities.

[5] These observations should not be taken as criticisms of the validity of the registration process.

Table 6-7. Number of known cases where countries have approved an alternative QPS technique for perishable or durable commodities (or groups of similar commodities)

Alternative procedure or technique	Identified cases where a country has approved an alternative quarantine treatment for perishable commodities	Identified cases where a country has approved an alternative QPS treatment for durable commodities
Bifluorides	-	1
Carboxide	-	1
Cold	> 240[1]	1
Combination treatment	8	1
Controlled atmospheres	1	23
Debarking	-	1
Ethyl formate	-	1
Heat	24	33
Hydrogen cyanide	-	3
Inspection on arrival	1	-
Irradiation	Many possible	1
MITC	-	1
Modified atmospheres	0	0
Pest-free zones or periods	7	-
Pesticides, aerosols, fumigants	7	-
Phosphine	-	Many
Physical removal of pests	3	-
Pre-shipment inspection	5	5
Systems Approach	4	-
Total identified to date	>> 303	>> 70

[1]9 schedules for 55 countries

Source: MBTOC, 2002

7. OPPORTUNITIES FOR EMISSION REDUCTION AND RECOVERY

7.1. Introduction and mandate

Paragraph 6 of Decision XX/6 reads:

"To request the Technology and Economic Assessment Panel to present a final report highlighting areas where sufficient information indicates opportunities for reductions in methyl bromide use or emissions for quarantine and pre-shipment purposes, including a list of available methyl bromide recapture technologies for consideration by the Parties and, where there is insufficient information, a final proposal for further data gathering for the consideration of the Twenty-First Meeting of the Parties;…"

In the absence of effective containment and recapture or reuse technologies, most methyl bromide applied to a QPS fumigation is subsequently released or lost by leakage to the atmosphere. The fraction of applied methyl bromide that is lost from a specific fumigation depends on the quantity of the applied methyl bromide that reacts with various components in the commodity and associated materials and structures. This reaction leads to non-volatile bromine ion residues. Estimates of the fraction emitted from particular categories of fumigation, including for QPS purposes, can be found in MBTOC (2006) and previous Assessments.

There are a variety of measures that can be taken to reduce the relative or absolute fraction of the applied methyl bromide emitted in a particular QPS application. These are discussed below. The various emission reduction techniques can affect the proportion of initially applied methyl bromide that is subsequently available for recapture and potentially, reuse.

At this time, recapture technologies are commercially available for QPS and other treatments using methyl bromide on commodities and structures, but not for soil treatment in situ. There are a variety of emission mitigation measures that can be applied to QPS and other methyl bromide fumigations for soils in situ.

7.2. Quantities of QPS methyl bromide emissions available for recapture and destruction

The total quantity of methyl bromide emitted from a fumigation, during dosing, by leakage during the exposure, by venting at the end of the exposure and by subsequent airing off of sorbed methyl bromide, provides an upper limit to the quantity of methyl bromide available for recapture. The remaining fraction of the initial applied gas is converted to non-volatile bromide ion residues.

Different commodities vary widely in their ability to sorb methyl bromide and to react with methyl bromide. In the QPS commodity treatment sector, fresh fruit and vegetables treated in gastight fumigation chambers at short exposure times absorb little methyl bromide and over 95% of applied dosage may be available for recapture. High protein, milled commodities such as oilseed expeller cake may absorb more than 80% of applied dosage over a 24 hour exposure, leaving less that 20% of dosage available for recapture. Temperature and load factor also influences methyl bromide available for recapture in the absence of significant leakage.

Some treatment schedules for QPS treatments of commodities specify a minimum retention of concentration of methyl bromide at the end of the exposure period. While this is usually specified to ensure an adequate exposure (*ct*-product) is achieved for effectiveness against the target QPS pests, this does give an indication of the likely potential emissions from the processes at the end of the treatment, in the absence of any recapture or destruction process.

Table 7-1 gives examples of minimum retention of methyl bromide specified by some QPS-related standards. These schedules approximately define the minimum quantity of methyl bromide readily available for recapture or destruction under the schedule.

There is some uncertainty as to the actual residual quantity present after fumigation, as the measurements relate only to concentration. In normal fumigation practice, it is usually assumed that the methyl bromide is present at the measured concentration throughout the fumigation enclosure and the product of enclosure volume and concentration indicates the quantity present. However this does not take into account either the exclusion volume of the fumigated materials nor the quantity of gas that may be sorbed, unchanged, on these materials.

Table 7-1. Examples of standard QPS methyl bromide treatment schedules that specify end point concentrations.

Treatment schedule or standard	Exposure period	Minimum % of initial specified dosage rate
AQIS (2008a) Methyl Bromide Fumigation Standard	2 h	60%
ISPM 15 (2009) for Solid Wood Packing Material	24 h	50%
MAFF (1951) standard for imported logs	24h	31%
AQIS (2008a) Methyl Bromide Fumigation Standard	24 h	30%
T404-d treatment (70-79F) against wood borers and khapra beetle (USDA 2009)	24h	30%
MAFF (1951) standard for imported logs	48h	25%
MAFF (1951) standard for imported logs	72h	21%

Estimates of total methyl bromide emitted from fumigations under standard industrial practice differ from those based on residual concentration data. Total emissions include losses during initial application and leakage during the exposure, in addition to quantities vented from the fumigation at the end of the exposure and subsequent airing off of residual sorbed gas.

Table 7-2 gives calculations of total emissions from various categories of QPS treatment, including soils treatments, for the year 2007. Annual methyl bromide emissions are likely to have been similar in magnitude over the previous 5 years, since annual consumption has remained approximately constant over these years. The overall actual annual emission rate is dependent on the rate of accumulation or use of any stocks in each year.

Table 7-2. Estimates of emissions from various commodities fumigated with methyl bromide

Fumigated material or situation	**MB used (2007, tonnes)[b]**	**Estimated % MB emitted, with standard industrial practice[c]**	**Estimated MB emitted (tonnes)**
Grains, nuts and dried fruit	1618	51 – 70	825 – 1132
Timber and wood packaging	3865	88	3401
Fresh fruit and vegetables and other perishables	821	85 – 95	698-780
Other commodities and unidentified use	651	80 – 95	521-618
Soils, in situ	1531	40 – 92	612-1409
Totals and weighted[a] estimates	8486	71 – 86	6057-7341
Discrepancy (total reported consumption, less use, Table 4-6)	1824	71 – 86	

a estimates weighted by tonnage
b data from Table 4-6, this report
c based on estimates from Table 9.1 of MBTOC (1998)

Table 7-2 shows that emissions from QPS treatments are likely to be in the range 71 – 86% , mean estimate 79%, of applied methyl bromide, in absence of recapture and destruction processes and with standard industrial practice. Assuming that recapture from soil fumigation is not technically and commercially feasible at this time, the estimated total methyl bromide available for recapture in 2007 from QPS commodity fumigations is 5,445 – 5,932 tonnes, being about 67% of estimated 2007 annual QPS use of 8,486 tonnes and a mean of 82% of QPS methyl bromide applied to commodities.

7.3 Emission reduction processes and technologies

7.3.1. Emission reduction through improved and best practice.

7.3.1.1. Reducing Volumes of Methyl Bromide Use as a Phytosanitary Measure

The IPPC recommendation “Replacement or reduction of the use of methyl bromide as a phytosanitary measure” (IPPC 2008) states the reduction of methyl bromide emissions can be achieved through the use of reduced dosages of methyl bromide as a phytosanitary measure or decreased treatment frequency. In addition, existing methyl bromide use should be analysed carefully to determine if the treatment is appropriate and necessary.

The following approaches may, where appropriate, be pursued to reduce the use of methyl bromide as a phytosanitary measure (IPPC 2008):

- inspection-based fumigation instead of mandatory fumigation (i.e. to detect and identify the quarantine pest of concern)
- avoidance of unjustified re-fumigation with methyl bromide (i.e. re-fumigation should be used only when a quarantine pest situation is evident)
- improvement of treatment facilities as appropriate to maximize efficiency of fumigation, thus reducing replenishment or re-fumigation requirements
- increasing exposure time with a view to reducing dosage, where technically feasible
- compliance with phytosanitary requirements for exporting commodities
- avoidance of application in situations where efficacy is doubtful or marginal
- reassessment of doses and exposure times in order to reduce them
- use of optimal temperatures when fumigating
- use of appropriately sized treatment facilities
- evaluation of pest risk and treatment efficacy (through a pest risk analysis) to determine if a more appropriate dose or alternative treatment is possible.

7.3.1.2 Application of best practice

Several quarantine authorities (NPPOs) have codes of practice or similar documents that detail best practice in use of methyl bromide for QPS treatment of commodities. These include sections in the USDA PPQ manual (USDA 2009, USA), AQIS Methyl Bromide Fumigation Standard (AQIS 2009a, Australia) and Theory and Practice of Plant Quarantine Treatments (JFTA 2002, Japan). The FAO web-based document 'Guide to Fumigation under Gas-Proof Sheets' (FAO 2009) also provides instruction on use of methyl bromide for QPS treatments. Use of best practice for QPS treatment of commodities minimises emission losses (leakage) prior to venting at the end of treatment, while maximising effectiveness of a particular dosage of methyl bromide.

Treatment of commodities for QPS purposes under best practice is typically carried out in well sealed enclosures designed to retain the fumigant gas at effective levels throughout the exposure time of the treatment. The level of sealing should be such as to minimise unintentional fumigant loss, caused by atmospheric forces such as wind and temperature changes (e.g. van Someren Graver and Banks, 2008). There are a range of standards set for sealing of enclosures (freight containers, fumigation chambers, sheeted stacks, silo bins, sheds etc.) for fumigation with methyl bromide. These standards vary with circumstances and country regulations or codes of practice. They are typically based either on a pressure test or a gas retention test, with pressure half life of 10 seconds to 5 minutes and gas retentions exceeding 70% of initial dosage at the end of a 24h exposure in an empty fumigation enclosure, with circulation fans running, if applicable.

A fumigation enclosure used with methyl bromide must be well sealed in order to minimise gas loss for both industrial safety and efficacy reasons. In practice, methyl bromide treatments of commodities, for both QPS and other purposes, are often carried out in poorly sealed enclosure with substantial rates of gas loss. To compensate for this loss, some NPPOs and other authorities (e.g. AQIS 2009, USDA 2009) allow 'top up', a process of adding additional methyl bromide during the course of a fumigation to maintain effective gas concentrations. This top up process may give a good treatment from QPS point of view, but leads to increased methyl bromide use and emissions compared with adoption of better sealing. This is under conditions where gas loss occurs from leakage, not reaction and sorption on the commodity and packaging.

Application of audited best practice for QPS fumigations in several countries that trade with Australia under the AFAS scheme has saved (avoided use of) substantial quantities of methyl bromide. It is estimated that AFAS countries (India, Indonesia, Malaysia and Thailand) have collectively reduced methyl bromide usage by 153 tonnes from 2004 to 2008 (Fox 2008, Cox 2008) This saving was achieved largely through avoiding repeated methyl fumigations after failures in the initial treatments were detected.

7.3.2. Gas transfer systems.

Some saving in methyl bromide usage can be obtained from transferring the residual methyl bromide gas in a fumigation to another undosed fumigation enclosure loaded with material to be treated.

As an example, two large fumigation systems located at the Taicang port in Jiangsu province and the Putian port in Fujian province have been constructed in China for methyl bromide fumigation of imported timber. They each have an annual treatment capacity of 1.5 million m^3. Automatic control and monitoring systems were incorporated into these two facilities. These include dosage, recirculation, concentration monitoring, and gas transfer between tanks. After each fumigation cycle, half of the gas residue in one tank can be transferred through the recirculation fan and pipe system to any other tank in the system. After one and half years in operation, more than 2.5 million m^3 of imported timber have been treated at these two facilities and MB usage for the purpose has been reduced by more than 60 tonnes of methyl bromide.

7.3.3 Prolonged exposures

In theory, extending the exposure period or contact time that methyl bromide has with a reactive fumigated commodity allows more of the added fumigant to decompose to non-volatile residues, thus reducing methyl bromide emissions. Prolonged exposures at a particular dosage may also result in greater *ct*-products, giving scope for dosage reduction and, consequently, reduced emissions.

Prolonged exposures combined with barrier films are in use with soil fumigations as a means of extending fumigation periods and reducing dosage requirements, and incidentally, emissions. Prolonged exposures, as a means of reducing emissions tends to be unsuitable in practice for commodity treatments. Many commodities, particularly perishables, are damaged by prolonged exposure to methyl bromide. In port situations, where QPS commodity fumigations are typically carried out, a rapid rate of treatment is required for logistic reasons.

7.4. Technologies for MB recovery, containment and recycling from commodity treatments

7.4.1. Recapture of methyl bromide from QPS commodity treatments

Methyl bromide QPS treatments of commodities, carried out under best practice, are well suited to the application of recapture systems for minimising emissions of methyl bromide. Good sealing of the fumigation enclosure is a prerequisite for efficient recapture of methyl bromide as it minimises leakage from the enclosure during the exposure to the gas.

There are many different possible systems with potential to destroy methyl bromide gas vented from fumigations or recapture methyl bromide for reclamation and recycling or for destruction. All these systems should be capable of handling methyl bromide gas concentrations in the range of about 10 – 100 g m^{-3}, typical of gas concentration remaining after a fumigation exposure period is complete, with high recapture or destruction efficiency.

MBTOC (2002, 2007) summarised approaches to methyl bromide recapture and destruction, with details of several commercial installations.

TEAP (2007) summarised responses from Parties to Decision XVII/11 that read in part:

"To encourage Parties who have deployed in the past, currently deploy or plan to deploy technologies to recapture/recycle/destroy or reduce methyl bromide emissions from fixed facilities or sea container fumigation applications to submit to the Technology and Economic Assessment Panel details of efficacy, including destruction and removal efficiency (DRE), logistical issues and the economic feasibility of such fumigations, by 1 April 2006".

Commercially available systems for recapture of methyl bromide, known to QPSTF at this time are detailed in Table 7-3, together with destruction efficiencies as obtained under Decision XVII/11.

Table 7-3. Available systems for recapture of MB

Supplier	System	Unit or module capacity	Installations	Disposal of sorbed methyl bromide	URL
Desclean, Belgium	Absorption on activated charcoal, with cooling	Carbon loadings of up to 1: 3 by weight, typically for fumigated freight containers	Transportable system – Belgium	Incineration or thermal desorption and reuse	www.desclean.be
Nordiko, Australia	Absorption on activated charcoal, ambient temperature	Typical carbon loadings of 1:5 by weight. Installations for permanent fumigation chambers, freight containers and fumigations under sheets	Australia, Malaysia, Belgium, China, New Zealand etc	Reaction with sodium thiosulphate solution or landfill	www.nordiko.com.au
TIGG, USA	Absorption on activated charcoal, ambient temperature	Fitted to large fumigation chambers	Houston and Watsonville, USA	Incineration off-site in specialised facility, with recovery of bromine component	www.tigg.com

All operational commercial recovery units known to QPSTF, given in Table 7-3, are based on recapture of methyl bromide on activated carbon. Subsequent treatment of the carbon loaded with methyl bromide varies with supplier and situation. Most systems have chosen to operate with a destruction component for the recaptured methyl bromide, but potentially the methyl bromide absorbed on the carbon can be released for reuse by heating the carbon to typically 130-170°C. The Desclean system operates by initially cooling the carbon absorption bed to increase absorption capacity, followed by a heating phase to release sorbed gas for further use. It is claimed (E. Williame, pers. comm.) that the process leads to about 30% to 70% reduction in new methyl bromide use, depending on the situation of the fumigated enclosure (e.g. freight container) and what load is treated These estimates are consistant with expected residual concentrations from good practice fumigations, such as those indicated in Table 7-1. A model for absorption on a carbon bed at ambient tremperature, followed by higher temperature desorption, is given in Joyce and Bielski (2008).

An example of a commercial installation of a carbon-based recapture system is in operation at Nelson, New Zealand. This port has a substantial trade in export timber that require QPS fumigation with methyl bromide. The installation commenced operation recently (summer 2009) and was required to meet recently modified local air quality standards. The Nelson air quality standards, unique to this port, require capture to 5ppm v/v for containers, and for bulk timber fumigations, reduction until emissions in the ventilation system do not exceed 2.2 g/sec in all flues combined.

The company uses two of the standard sized Nordiko units for shipping containers either on their own or in series. Each filter contains 70 kg of carbon and single filters are used or two filters in series, depending on their degree of saturation. The original idea was to build a single large unit to handle the larger export timber fumigations but the two container sized units have been utilised by breaking down the stack sizes to smaller multiple stacks, anarrangement which ironically probably uses more MB.

The typical volume of under-tarp fumigation of export timber was 200 m^3, with a recapture time for timber stacks of 2-4 hours for 48 or 56 g m^{-3}(according to temperature) for the under-tarp QPS fumigations against the wood pest, *Arhopalus tristis*. The total volume of under-tarpaulin fumigation over four months was approximately 15,000 m^3 with an input of around 780 kg of MB. With an expected 5% leakage and high sorption into timber frequently only 40% of the gas input is available for capture. Approximately 3.5 tonnes of absorption carbon were used.

The carbon-based recapture/destruction systems in Table 14 have similar Destruction and Removal Efficiencies (DREs), >95%, to the destruction processes for the only dilute source so far approved by the Parties and added to the list of Approved Destruction Processes (TEAP 2006). These are the municipal waste incineration and rotary kiln incineration processes for dilute CFCs sources obtained from foams (Annex II, Report of 15MOP).

The DRE values are based on the assumption that the destruction system used, thiosulphate washing or incineration, is 100% efficient and that there are no inadvertent losses during the destruction process. Measurements in support of this assumption have not been supplied. None of the submissions described any toxic byproducts arising from the destruction processes.

Subject to the constraints on good housekeeping and emissions set out in Annex III and IV of the Report of 15MOP, appropriately amended to take into account the special chemical and use features of methyl bromide, Parties may wish to consider adding carbon-based recapture/ destruction systems (thiosulphate washing or incineration) to the list of Approved Destruction Processes. A stipulation that the processes must achieve a DRE of >95% would be consistent with restrictions on Approved Destruction Processes for dilute ODS sources from foams.

7.4.2 Economics of recapture, reuse and destruction technologies.

At this time, recapture technologies generally have *not* been fitted to methyl bromide fumigations in response to the need to restrict emissions of Ozone-Depleting Substances. This is despite Decisions VII/5 and XI/13, both which urge in part fitting of recapture equipment where technically and economically feasible. Some local regulations restrict quantities of methyl bromide that are released from fumigations. Others provide stringent limits on the maximum concentrations of methyl bromide that can occur in the workspace and environment around a fumigation. These regulations and requirements are related to local air quality and the need to restrict emitted methyl bromide to very low levels. It is these regulations associated with local health and safety considerations that have mainly driven the installation and use of recapture equipment.

Fitting recapture equipment increases the overall cost of carrying out QPS and other methyl bromide fumigations. The actual cost increase per fumigation is highly dependent on situation and throughput. To a first approximation, it appears that fitting and operation of recapture equipment typically doubles the cost of a fumigation with methyl bromide.

In a presentation to MBTOC-QSC (E. Willaume, pers. com.), it was stated that the Desclean recapture/reuse system would cost an extra Euro 34 per container fumigation, with a present cost of methyl bromide fumigation without recapture of about Euro 150. This is for treatment of 1000 containers a year over 3 years – a high and sustained rate of treatment.

For an installation on export log fumigations in Nelson, New Zealand, recapture has doubled the cost of fumigation per m^3 of timber. Exact costs in practice have not yet been determined as the problem of disposal of the loaded carbon has not yet been fully solved. As the major fumigations in Nelson are seasonal, the equipment is on long term lease and the equipment cannot be used elsewhere, the costs have to be carried and loaded onto the fumigations. Some exporters have already switched export ports to ones not requiring recapture to avoid the extra costs.

Regeneration or disposal of the carbon that is loaded with recaptured methyl bromide is a significal component of the recapture process. Recovery and reuse of the methyl bromide is an attractive option, avoiding these costs. The sorbed methyl bromide can be released by various forms of heating of the loaded carbon bed to temperatures of 100-180°C, with appropriate temperatures depending on the desorption isotherms for the particular carbons used and degree of recovery needed. The Desclean system (Desclean 2009) can effectively recover recaptured methyl bromide for reuse.

The quantity of methyl bromide that is potentially and in practice available for reuse depends on local design of the fumigation system and the commodity treated. Specifications for efficiency of recapture for certification by Belgian authorities for recapture units require the unit to be able to recapture at least 80% of methyl bromide remaining in the free space from a dosed empty enclosure. In practice, because of sorption and other losses, recapture efficiencies are often substantially less than this (see Table 7-1), limiting the quantity of methyl bromide available for reuse. Thus for new fumigations, it is necessary to top up any dosing from recaptured gas with newly produced methyl bromide.

The cost of newly produced methyl bromide is small (see Section 6.4.3) compared with cost of recaptured gas. Thus, in absence of other considerations, the cost savings for using recovered methyl bromide do not, on their own, justify its use compared with recovery and destruction systems.

There is continued debate in some jurisdictions on the registration status of recaptured methyl bromide for reuse.

7.4.3. Recapture systems under development.

An Indian manufacturer of methyl bromide, Intech Pharma Pvt Ltd, is currently developing a scrubbing and destruction system for methyl bromide released from fumigations (IPPL 2009).

Commercial installations of methyl bromide recapture equipment are typically limited in size to absorption capacities of less than 50 kg methyl bromide. An installation capable of absorbing 484 kg per fumigation is to be installed at Stockton, California, USA, on a fumigation facility processing imported grapes from Chile. The unit is based on a carbon bed absorber with regeneration with a thiosulphate wash (Joyce P. pers. comm., BACT 2009).

In New Zealand, most QPS methyl bromide is used for large capacity fumigation of export logs. Feasibility of a capture system with the appropriate capacity, possibly 500kg methyl bromide, is being investigated.

Studies are in progress in China (Wang Yuejin, QPSTF member) on selection of different types of activated carbon and modification of the characteristics of the activated carbon to reduce the sorption energy of methyl bromide on the carbon for easy recovery. The results show that a much lower temperature of 110°C was needed for complete recovery of methyl bromide from a new type of activated carbon, compared with cocoanut based activated carbon of up to 170°C. Lower recovery temperatures have several advantages, particularly decreased losses from hydrolytic decomposition of sorbed methyl bromide.

7.5. Methyl bromide emission reduction in soil fumigation

Methyl bromide emissions to the atmosphere from soil fumigation come from any of three major sources (MBTOC 2002; 2007):

i) MB emitted through plastic sheets during fumigation;
ii) MB lost from edges during fumigation; and
iii) MB emerging from soil after lifting the sheets after fumigation.

It has been estimated that emission ranged from is 40-92% from the standard polyethylene (PE) sheeting and 35 - 87% for low permeability barrier films (LPBF) (MBTOC, 2002; 2007) Fluxes of MB through LPBF tarps are very low, but loss can occur after lifting the tarp. This is very dependent on the duration of tarping and the soil type and conditions (Yates, 2005; Fraser *et al.*, 2006; Ou *et al, 2007;* MBTOC, 2007). Experimentally, very low emissions can be obtained (e.g. 6%, Yates, 2005). The total emitted is unlikely to be 100% of that applied because of breakdown of applied MB in the soil (MBTOC 2002; 2007). Degradation is due to reaction with soil organic matter and some mineral constituents as well as other reaction pathways such as hydrolysis (De Heer *et al.* 1983).

Emission volume release and release rate to the atmosphere during soil fumigation depend on a large number of key factors. Of these, the type of surface covering and condition; period of time that a surface covering is present; soil conditions during fumigation; MB injection depth and rate; and whether the soil is strip or broadacre fumigated are considered to have the greatest effect on emissions.

7.5.1. Barrier films

Studies under field conditions in a number of regions and countries, together with the large-scale adoption of barrier films in Europe, and more recently the USA, support the use of these films as a means to reduce MB dosage rates and emissions (López-Aranda *et al.,* 2000; Hamil, *et al.,* 2004; Gilreath and Santos, 2005; Hanson *et al*., 2009). Controlled studies have also shown substantial reductions in MB emissions (Wang, 1997; Yates, 2005; Fraser *et al.,* 2006). The State of California in the US, however, has a regulation which prevents implementation of VIF (California Code of Regulations Title 3 Section 6450(e)). It was implemented because of concerns over possible worker exposure due to altered flux rates of MB when the film is removed or when seedlings are planted.

Barrier films consists of either 1) multi-layer laminates with outer layers of low density polyethylene and a barrier layer of polyamide or ethylene vinyl alcohol, or 2) a mixture of these materials, often called an "alloy" or 3) two layer, metallised polyethylene films.

Barrier films reduce MB emissions from soil fumigation by keeping the MB in the soil to allow for degradation (Yates *et al.* 1998) when:

- The entire field is covered with VIF film;
- All film strip over-laps are well glued and sealed;
- The VIF film edges are sealed (buried under soil);
- The MB is injected deeply in the soil;
- The film is kept on the field, completely sealed, for 10 to 20 days; and
- The soil temperature, moisture and organic matter content are optimal - medium temperatures, moist soil, and high organic matter.

Barrier films are less effective at reducing MB emissions from soil fumigation (Rice *et al.,* 1996; Thomas, 1998; Wang *et al.,* 1999) when:

- Only part of the field is covered with VIF;
- Any of the film strip over-laps become unglued or are otherwise unsealed;
- Any of the film edges anywhere around the field become unsealed;
- The film seal is broken before 10 to 20 days have passed; and
- Soil temperature, moisture, organic matter are in any way sub-optimal (hot, soil dry or very wet with little organic matter).

Studies have shown that, with traditionally laid plastic films, most unreacted MB either passed through the films or was emitted from the edges of the film (Yates, 2005). In general fumigation films remain in place for 5 to 7 days and with standard films this ensures maximum effectiveness of the applied dose. With barrier films, even though lower doses of MB are used, longer periods of tarping may be required to ensure complete degradation of MB dosage applied and to effectively reduce MB emissions and avoid off gassing.

7.5.2. Increased chloropicrin content with decreased MB

One key strategy to reduce MB dosage and therefore relative emissions has been the adoption of MB:Pic formulations with lower concentrations of MB (e.g. MB:Pic 50:50, 30:70 or less). MB/Pic formulations with lower concentrations of MB (e.g. MB/Pic 50:50, 45:55 or less) are considered to be equally effective in controlling soilborne pathogens as formulations containing higher quantities of MB (e.g. 98:2, 67:33) (e. g. Porter *et al*., 1997; Melgarejo *et al*., 2001; López-Aranda *et al*., 2003; Santos *et al*., 2007; Hamill *et al*., 2004; Carey and Godbehere, 2004; Gilreath and Santos, 2005; Hanson *et al.*, 2006; Hanson *et al,* 2009). Where such formulations are registered or otherwise permitted, they can be used for pre-plant soil fumigation with excellent results. Their use can be achieved with similar application machinery that allows co-injection of MB and Pic or by use of premixed formulations. Consistent performance has been demonstrated with both barrier and non-barrier films. This includes rates as low as 75 kg/ha (7.5 g/m2) in 250 kg/ha of 30:70 or 33:67 mixtures or 100 kg/ha (10 g/m2) of MB in 250 kg/ha of 50:50 MB/Pic mixtures in conjunction with barrier films as these have shown similar effectiveness to higher rates of MB in 67:33 MB /Pic and 335 to 800 kg/ha (33.5 to 80 g/m2) of MB 98% with standard polyethylene.

Irrespective of what surface barrier is used to contain MB during soil fumigation, there are a number of key factors which affect emissions of MB during soil fumigation. Recent reports (Yates, 2005; 2006) have shown that manipulation of many other factors can reduce emissions of applied MB, but the extent to which these factors are practiced by industry is unreported.

They concluded that emissions can be reduced by improving containment of the methyl bromide gas and by increasing degradation time, however natural soil degradation is insufficient to reduce fumigant emissions to the atmosphere. Methods to improve containment included barrier films as discussed above, but also improvements in cultural factors of the cropping system including soil management, e.g. strip verses broadacre treatment, increased containment time, addition of sulphur containing fertilizers, increasing organic matter, soil water content, soil compaction and surface sealing with water (MBTOC, 2007).

8. REGULATIONS AND MEASURES AFFECTING QPS

8.1. Introduction and mandate

As per Paragraph 4(d) of Decision XX/6, QPSTF is required to provide *"Illustrative examples of regulations or other relevant measures that directly affect the use of methyl bromide for quarantine and pre-shipment treatment (including information requested in decision X/11"*

In response to the Decision, the QPS Task Force has collected information on examples of regulations which cover the handling and use of methyl bromide as a product and regulations which influence the use for QPS purposes. Owing to the complicated nature of the regulations, the Task Force has summarised the key issues only in this report and provided a table of some examples from major QPS using regions worldwide.

As mentioned previously, use of MB for QPS for commodity treatments is mostly associated with international trade where regulations are usually imposed by the importing country on the exporting country. MB is used in response to either inspection and/or need for a phytosanitary certificate which either requires the use of MB or requires the commodity to be free from quarantine pests and MB may be used. The driving force for what treatments are required, allowed or not allowed are those of the importing country. Under IPPC and Montreal Protocol definitions, quarantine regulations concern control of a quarantine pest, not of endemic pests. In the case of bilateral trade and quarantine use, the importing country may allow the treatment to be conducted in the importing country, but often the treatment must be conducted in the exporting country. In many cases, QPS use of MB is covered by a number of national and local regulations which often need to be considered in conjunction with one another.

In some instances, internal regulations are imposed by national or state jurisdictions to use MB for movement of commodities across state or county borders. These relate to movement of quarantine pests which are known not to occur within the state or county (see Table 8-1). Under an interpretation of the Montreal Protocol definitions, the use of QPS MB appears to be being used for maintainence of plant health against endemic pests.

During the review of regulations, MBTOC encountered very few which mandated or specified MB use only. However, there are many regulations that require plants to be free of insect and other pests, with MB as the fumigant of choice. Regulations prescribing MB treatment alone are a major barrier to adoption of alternatives as often there is little incentive for the regulation to be changed. Also, often the data has not been generated to prove effective control of all pests with an alternative to a standard similar to MB and Parties are unwilling to adopt the alternative in the face of possible increased risk.

Information on regulations that require the use of MB is available in phytosanitary treatment manuals and treatment schedules that can be found in the official national phytosanitary authorities' (NPPOs) websites, and related publications.

8.2. Phytosanitary standards of IPPC and recommendations on use of MB

IPPC Phytosanitary standards have approved the use of methyl bromide for specific phytosanitary treatments, provided that practical measures are taken to control or reduce its emission during use. The non-availability of commercially available cost-effective alternatives to methyl bromide does also influence IPPC standards to continue to approve use of methyl bromide where necessary. The recent IPPC Recommendation on the 'Replacement or Reduction of the Use of Methyl Bromide as a Phytosanitary Measure' has encouraged parties to put in place a strategy that will help them to reduce the use of MB and/or reduce emissions (IPPC, 2008, p.4-5). In addition, the latest ISPM 15 standard encourages NPPOs to promote the use of the alternative (heat) treatments approved in the standard (IPPC, 2009b).

Constraints to adoption of alternatives for treating soil where crops will be grown with MB are mainly regulatory – i.e. alternatives not being registered or highly restrictive.

The QPSTF compiled illustrative information for several key countries and regions in the section and table below (Table 8-1). Within the table is a list of website addresses which cover the regulations in more detail. To collect information, members of the QPSTF either approached the State or National Regulatory Authority or sought out information from websites/reports of illustrative examples of regulations/legislation for import and export in a country/region under different categories. They include those which;

1) Specifiy (require) the use of MB only,
2) Specify freedom from pests but do not specify MB
3) Regulations where MB is listed as an option (not specified), and alternatives are also listed for a range of imported and exported commodities, or
4) Other general regulations not included above.

In summary the review showed that very few regulations actually specifically require the sole use of MB (Table 8-1). However, MB is used as the treatment of choice because it has been proven historically to provide the necessary level of control of quarantine pests and diseases. In most instances, QPS treatment was found to fall in category (2) where treatment is required to provide 'nil tolerance' to a pest or to allow for a certain pest or disease tolerance level which restricts risk of disease when the commodity is transferred to another region (e.g. for nursery stock). These regulations often did not either specify or mandate MB, however it was used as it was known to have been effective.

The QPSTF notes that regulations on the use of MB under the QPS exemption are dramatically influenced by a country's interpretation of a 'quarantine pest' (see Section 4.2). A quarantine pest for one country may not be consistent with a quarantine pest for another country and therefore the requirement for MB use or that of an alternative varies widely. A pest recognised as a 'quarantine pest' by one country and not by another can occur for a number of reasons including:

i) The pest is not considered a quarantine pest as the pest occurs in that country,

ii) The pest can't survive in the country or if it did survive then it could not cause harm,

iii) The host for the crop is not present in the country, etc. In summary, in these cases a non quarantine pest does not present a high risk to the importing country or region.

As mentioned above, regulations may vary in their requirement to use MB. The required dosage rate may differ too. Short timelines to treat and inspect the commodity influence the selection of the treatment used. MB is often used as the only practical treatment to achieve nil tolerance (often Probit 9 or 3 surviving pests in 100,000) to a pest whereas in others the commodity (or soil) is expected to be practically free of pests and diseases or at specified tolerance level determined using inspection to achieve certification (1% tolerance, etc.) (see Table 8-1).

Certain countries strictly adhere to the need to endorse a a phytosanitary certificate that the consignment has been treated with MB only when it has been prescribed by a National Plant Protection Organization or for preshipment when an importing country has published official phytosanitary requirements prescribing its use. While a phytosanitary certificate is an official government to government document, there is use of the certificate under contractural requirements to certify pest-free status of consignments or show they have been subjected to specified treatments, including sometimes, methyl bromide fumigation (B. Larsen, pers. comm.) .

8.3. Regulations covering use, handling and application of methyl bromide

As a highly toxic gas, methyl bromide is subject to many industrial, environmental and operational controls that affect its use as a fumigant for QPS purposes. These are additional to those that arise because of its ozone depleting potential. Their complexity and severity restrict how methyl bromide can be used. This is sometimes to the point where methyl cannot be used practically.

The recent decision in the EC not to reregister methyl bromide either as a biocide or agricultural chemical, including for QPS purposes, was largely in response to its toxic properties and hazards to workers, bystanders and the environment when used as a fumigant.

In countries where methyl bromide is used for QPS purposes, restrictions on its use may include:

- Restrictions on transport and storage of methyl bromide as a dangerous good.
- Regulations on who may buy, sell, handle and supply methyl bromide.
- Regulations on who may apply methyl bromide, with standards of good practice in its use as a fumigant. Applicators (fumigators) may need to be trained and licenced to use the material.
- Regulations on quantities of methyl bromide that may be emitted after a fumigation and their maximum emission rate and on when a fumigation can be declared finished.
- Regulations on maximum permissible concentrations of methyl bromide in the workspace and in the environment around a fumigation.
- Regulations on handling goods that have been fumigated and precautions to ensure persons entering areas or transport that has been fumigated are not exposed to undue concentrations of methyl bromide.

- Regulations on maximum residue limits in commodities, foodstuffs, resulting from methyl bromide fumigations.

The following illustrative example describes some regulations in California, USA, covering use of methyl bromide fumigant as an example of the more stringent general regulations covering methyl bromide use.

8.3.1. An example of MB regulation from Califormia, USA

In California, use is controlled by a combination of federal labelling, state regulations and county permit conditions. Federal requirements for use, such as dosage rates, protective equipment and buffer zones are primarily on the labels. Certification requirements and tolerances are found in the Code of Federal Regulations (CFR).

As MB is a poisonous gas, emissions in the air are regulated with respect to bystander safety. California's regulatory target concentrations are 210 ppb for bystander exposure (24 hour TWA) and 510 ppb for worker exposure (8 hour TWA). Federal target regulatory numbers, as published in the recent Reregistration Eligibility Document (RED) are 0.33 ppm for acute inhalation for non-occupational or residential bystanders (24-hour time weighted average) and 1 ppm for workers (8 hour TWA).

Methyl bromide is a federally 'Restricted Use Pesticide' and may only be used by or under the supervision of a Certified Applicator. US states have their own programs for certifying applicators but must meet federal standards. In California, commercial applicators are certified through a testing and licensing process. Grower-applicators, called Private Applicators, are issued certificates by the County Agricultural Commissioners, but must also take and pass an examination. Both Private and Commercial Applicators must obtain a required number of Continuing Education hours to maintain their certification status.

Buffer zones are an important tool for mitigating fumigant risks in California. For soil QPS uses, buffer zones range from about 15 to 800m depending on the quantity of methyl bromide applied and size of the area treated. The establishment of buffer zones is referenced in California regulations, but the buffer zone look up tables are found in guidance to County Agricultural Commissioners, who actually issue the methyl bromide permits and enforce them. No one may use methyl bromide without a permit. Most California nurseries that use methyl bromide for production of high plant health status propagation material break their fields up into small blocks so they can obtain manageable buffer zones. In many cases, this results in multiple application events for relatively small acreages. California regulations on methyl bromide use also require fumigation site plans, personal protective equipment, neighbour notification, field posting, specific application equipment, specific tarps and many items.

The US Environmental Protection Agency (EPA) is in the process of requiring changes for all methyl bromide use labels to comply with the recent RED. The RED only applies to soil fumigation and non-food structural fumigation. Federal requirements for buffer zones are still not final. The buffer zones proposed for methyl bromide soil uses in the last version of the RED were considerably greater than California's buffer zones for soil fumigation, but EPA is considering some recent studies. The buffer zones will be required on 2011 labels.

There are many other new requirements as a result of the RED. Certain requirements must be met in 2010 and other requirements, notably the buffer zones, will be required to be incorporated in labels starting in 2011. The new label requirements include:

For 2010, new good agricultural practices, rate reductions, use site limitations, new handler protections, applicator training, extended worker reentry restrictions, training information for workers, fumigant management plans, first responder and community outreach, tarp cutting and removal restrictions.

For 2011, restrictions on applications near sensitive areas, buffer zones around all occupied sites, buffer posting, and buffer overlap prohibitions, emergency preparedness

California commodity fumigation requirements, like soil fumigation, are a mix of label, regulation and permit conditions. Federal requirements are on the label approved for QPS methyl bromide (Q-gas) for commodity fumigation (e.g. Cardinal Products 2009). Commodity fumigation exposure is limited by restricting a person's access to, or time spent in areas near enclosures being fumigated or aerated. There are 2 types of buffer zones, a treatment zone and an aeration zone. The size of the zones depend on a number of factors including type of structure (tarp, chamber, etc.), space fumigated and methyl bromide quantity used, exhaust stack height and exhaust velocity. Buffer zones in the DPR guidance documents go from a minimum of about 9m to a maximum of about 330m and aeration zones from a minimum of 3.3m to a maximum of 545m. There are also requirements on the label for testing chambers and numerous other restrictions..

Tolerances are established for inorganic bromide in foodstuffsresulting from fumigation with methyl bromide. These range from 5 ppm for pears, apples and quince to 200 ppm for almonds, walnuts and most other nut crops. Typical tolerances for most fruits and vegetables are 20 to 50 ppm. There are no tolerances for pre-plant soil use as it is considered a non-food use in the US.

8.4. Regulations or other relevant measures that directly affect the use of methyl bromide for QPS in specific regions

8.4.1. IPPC standards that relate to Methyl Bromide

IPPC standards that relate to the use of MB for QPS purposes and possible alternatives are as follows:

- Systems Approach:
  ISPM No. 14 - (2002) -*The use of integrated measures in a systems approach for pest risk management*
- Pest Free Areas and Areas of Low Pest Prevalence:
  ISPM No. 4 – (1995) *Requirements for the establishment of pest free area*
  ISPM No. 22 (2005) *Requirements for the establishment of areas of low pest prevalence*
  ISPM No. 26 (2006) – *Establishemnt of pestfree areas for fruit flies (Tephritidae)*
  ISPM No. 29 (2007) *Recognition of pest-free areas and areas of low pest prevalence*

ISPM No.30 (2008) - *Establishment of areas of low pest prevalence for fruit flies (Tephritidae)*

- Export Certification System
  ISPM No. 7(1997) – *export Certification system*
- Pest Free Places and Sites of Production
  ISPM No. 10 (1999) *Requirements for the establishment of pest free places of production and pest free production sites*
- Irradiation as a Phytosanitary Measure
  ISPM No. 18 (2003) - *Guidelines for the use of irradiation as a phytosanitary measure*
- Phytosanitary treatments
  ISPM No. 28 (2007) *Phytosanitary treatments for regulated pests*
- Wood Packaging materials
  ISPM 15 (2002) with modifications (2006) and (2009) - *Guidelines for regulating wood packaging material in international trade.*

8.4.2. Examples ofRegulations affecting MB use for QPS purposes at the regional level

8.4.2.1. Africa

Kenya

KEPHIS (Kenya Phant Health Inspection Service) is the authorised body in Kenya that issues import permits for plants and plant products shipped into Kenya. Prior to the release of the imported plants and plant products to their consignees, KEPHIS ensures that the imported plants and/or plant products are free from foreign pests and diseases. Plants or plant products that are either infested or infected with a pest or disease are either fumigated or treated to free them of any infestation and/or infection. In cases where treatment or fumigation will not provide satisfactory results, the plants or plant products are either destroyed or re-shipped back to the exporter. In this case, the exporter meets the cost of re-shipment.

8.4.2.2. Australia/ New Zealand

Australia

Imports and exports of methyl bromide are controlled in Australia under the Commonwealth’s *Ozone Protection Act 1989*. Administered by the Department of Environment, Heritage, Water and the Arts, regulations under the Act require controlled substances licences to be held by anyone importing methyl bromide, whether it is intended for soil fumigation or quarantine and preshipment applications.

In 2000, a review of the impact, appropriateness, effectiveness and efficiency of the Commonwealth’s ozone protection legislation, including the *Ozone Protection Act 1989*, indicated that the legislation has made a strong positive contribution to the Australian community by preventing a substantial depletion of the ozone layer of the stratosphere and supporting both national and international resolve to address ozone-related issues. A high net benefit of the legislation can be attributed to Australia’s particular susceptibility to the damaging effects of ozone depletion and to the consequent gains which emerge from a pro-active approach to environmental regulation.

As a member of the World Trade Organisation, Australia has certain rights and obligations to impose quarantine regulations which are based on a transparent sanitary and phytosanitary (SPS) decision making system. This system is based on sound and objective science. As such, Australia has adopted conservative policies based on either the use of international standards or a scientific risk analysis (import risk analysis, IRA) that comply with World Trade Organisation rules. Whilst methyl bromide has been important in the past, future IRAs may consider other treatments which can be used in replace of methyl bromide without exposing Australian industries and environment to increased biosecurity risk. It is also clearly acknowledged that IRAs should not be used to protect Australian exports from imports, and that striving for zero risk is unrealistic. A risk analysis must:

- Identify the pests whose entry, establishment or spread within a territory are to be prevented, as well as the associated potential biological and economic consequences.
- Evaluate the likelihood of this occurring.
- Evaluate the likelihood in accordance with SPS measures that might be applied.

To date, for many pest/commodity situations methyl bromide has been relied on as the main method to minimise import pest risk. Over the last decade however, international research efforts have increased understanding of the efficacy of alternatives for commodity disinfestation and Australia is in a much better position to adopt some of these alternatives for some QPS situations.

The largest QPS use by volume on exports is for export grains, particularly wheat, and export hay. These are treated to meet a 'pest-free' status required by the NPPO of the importing country (e.g. India, http://www.aqis.gov.au/phyto/asp/ex_restriction.asp?ID=61009&Index=0&RecordCount=1) and Australia's Preshipment requirements under the Export (Plant and Plant Products) Control Orders 2005 as amended, available at:

http://www.comlaw.gov.au/comlaw/Legislation/LegislativeInstrumentCompilation1.nsf/0/AEF5D5318D7E91F9CA25737F001515C9?OpenDocument.

New Zealand

As an island nation, New Zealand is largely free of many of the pests and diseases found in other countries. The biosecurity system based on the Biosecurity Act 1993 protects New Zealand's economic, environmental, human health and socio-cultural values. These values are threatened by a very large number of organisms that affect animal health, plant health, and terrestrial, freshwater and marine environments. New Zealand's economy is largely based on the export of primary produce so the protection of the current phytosanitary status is very important from an economic and trade point of view.

The Ministry of Agriculture and Forestry Biosecurity New Zealand's unwanted organism register currently lists over 15,000 organisms in twelve categories. These organisms would impact on New Zealand's values in different ways and with differing severity. Similarly, the likelihood of their entry and establishment varies, and is related to how well interventions are delivering effective risk management at the border and in post-border settings. Some 612 import health standards describe the conditions for import of goods that may harbour unwanted organisms and many of these require treatment either prior to export from the exporting country or on arrival. Methyl bromide is a commonly used treatment.

The unwanted organisms register is available at: http://www.biosecurity.govt.nz/pests/registers/uor

The import health standard register is available at: http://www.biosecurity.govt.nz/ihs/search

From 1996, no new organism is allowed to be imported into New Zealand without being assessed for risk under the Hazardous Substances and New Organisms Act 1996 this legislation controls the importation of new organisms which are assessed by the Environmental Risk Management Authority.

New Zealand is a large exporter of primary produce and the volume of methyl bromide used is affected by the phytosanitary conditions imposed by importing countries and the fluctuating (usually upwards) levels of trade. For instance in 2001 China mandated the fumigation of all logs with methyl bromide at the point of export. The volume of logs exported to China has doubled during the period 2001 to 2009 with the corresponding increase in MB used. In 2005 India also put in place the requirement for logs to be fumigated at point of origin. The volume of logs traded to India has more than doubled over the last five years to 521,235 cubic metres for the year ending March 2009.

While two thirds of the logs shipped to China in the hold of the ship have been able to be fumigated with an alternative, phosphine, in recent years and saved over 1,400 tonnes of MeBr, the fumigation of logs still uses over 70% of MB consumed in New Zealand. The use of phosphine is not yet allowed on the log trade to India.

While about the same quantities of logs are exported to Korea and Japan, these are fumigated on arrival. Total forest produce exported constituted 8.3% of New Zealand's exports in 2008.

The other factor affecting the amount of MB used is the fumigation rate specified by the importing country for export product which is sometimes different for the same commodity going to different countries. As an example, New Zealand pine logs being fumigated at the same temperature require a fumigation rate for China of 120g m^{-3} and for India it is 64 g m^{-3}, nearly 50% less for the same commodity.

All timber (including heat treated) exported to Australia during the summer is required to be fumigated with methyl bromide prior to export due to the burnt pine beetle (*Arhopalus tristus*).

Another illustration of trade change affecting the amount of MB being used is the importation of scrap metal from the Pacific Islands into New Zealand for recycling. The container loads of scrap are recognised as a high biosecurity risk for being contaminated with a wide range of pests including giant African snail which requires a high rate of MB to treat. Heat treatment is recognised as an option but all attempts so far have been uneconomic and impractical. With the increase in value of scrap metal the trade has increased from virtually nothing to consuming some 5 tonnes of MB per year.

Table 8-2.:Examples of methyl bromide mandated use for imported goods into New Zealand

Country	**Commodity**	
Methyl bromide treatment in an exporting country required		
China	Garlic	
Tonga	Watermelon	
Australia	Strawberries, Watermelon	
Requires methyl bromide treatment in NZ		
All countries	Used tyres and used car parts	
All countries	Scrap metal and used batteries	
All countries	Various on detection of live quarantine pests to be treated as listed in the MAF Standard, Approved Biosecurity Treatments	
Requires methyl bromide treatment in NZ or off shore		
All countries	Bamboo, cane, rattan	Heat is an option but rarely used

Use of methyl bromidev on imports is a minor part of New Zealand's QPS MB consumption. 85% of this use is on exported product prior to shipment to meet the importing countries requirements.

8.4.2.3. Asia

In China, QPS regulations are controlled by the AQSIQ (General Administration for Quality Supervision, Inspection and Quarantine), however there is no regulation that mandates the use of MB.

Regulations governing Preshipment of rice and other dry foodstuffs from Vietnam and Thailand are given in the country responses to Decision XX/6(7) in Annex 3.

8.4.2.4. North America

Canada and Mexico both submitted lists of regulations related to QPS methyl bromide use. These are included in Annex 4

8.4.2.5. South America

Argentina

In Argentina, QPS regulations are controlled by SENASA.

The phytosanitary programs that use MB in Argentina are:

1) National Program for control and eradication of fruit flies. SENASA regulates the entrance of fruit fly hosts into areas under official control and eradication programs within Argentina. Senasa lists the fruit fly hosts, regulates and supervises Quarantine Treatment Center facilities, approves the Operation Manual for MB fumigations, and regulates the phytosanitary treatments that have to be applied to *Ceratitis capitata* and/or *Anastrepha fraterculus* hosts.

2) Certification program of quarantine treatments for fruit flies on blueberries for export. SENASA together with APHIS – USDA regulates facilities and operational procedures for blueberries MB fumigation for the US market.

3) National Programme for prevention and eradication of the boll weevil. SENASA regulates the movement of cotton from infested to free areas within Argentina.

4) Treatment Centres for wood packaging material, in accordance with ISPM 15.

8.3.2.6. European Community

In the EC, there are only two uses where MB is specified, and one of them (wooden packaging material) has heat as an alternative. Oak logs with bark attached from the US imported into Europe only have at this stage MB as the approved reatment. For the rest of the plant and plant products, there is a range of approved treatments that, when used, will permit entry.

Council Directive 2000/29/EC[6] describes the protective measures that are required to be implemented by 27 Member States to reduce the risk of organisms harmful to plants and plant products being introduced into and spread within the European Community (EC)[2].

In Directive 2000/29/EC, there are relatively few species that are categorised as harmful organisms. Many are fruit flies which are particularly damaging to fruit production and are treated with processes other than MB.

In general terms, the Directive 2000/29/EC recognises that:

1. Plant protection is very important as production yields are reduced and costs increased through the accidental introduction of harmful organisms. A total

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[6] OJ L 169, 10.7.2000, p. 1 - 147

ban on all imports would give a high level of protection, but in reality this is not practical as trade in plants and plant products is needed for the health and well-being of society;

2. Inspection of every imported product is impossible. Therefore, the Directive bans the import of plants, plant products and other objects that are associated with well defined harmful organisms damaging to plants and plant products in the EC. The plants, plant products and other objects can be exempt the ban if the exporter applies an approved treatment or procedure to reduce the risk of the accidental introduction of these harmful organisms;
3. To be effective against harmful organisms, all Member States should correctly apply the requirements of the Community's plant health regime as there are no internal borders and harmful organisms can easily be moved /transported from one Member State to another;
4. There is a need to facilitate the movement of well defined plants and plant products between Member States using a "plant passport[7]" instead of a phytosanitary certificate;
5. Member States with borders on the edge of the EC have points of entry with a strong plant-health inspection infrastructure, which is supported financially with a contribution from the General Budget of the EC for equipment and facilities to carry out inspections, and a fee for inspections payable by the importer or their representative;
6. Within the EC there are special areas called Protected Zones where harmful organisms within the EC are not endemic or not established despite favourable conditions for them to do so, and would damage the food and other crops grown in these Zones if they were to establish; and
7. The European Commission, as a type of federal agency, has a special responsibility to ensure that that the plant health (phytosanitary) authorities within each Member State perform to the standards required and to apply penalties when this is not proven to be the case.

Directive 2000/29/EC has three Annexes:

Annex 1: Harmful organisms that are banned from the EC

Annex 2: Harmful organisms whose introduction into and spread within certain Protected Zones is banned when present on certain oplants or plant products

Annex 3: Harmful organisms that are subject to Special Requirements in the EC.

See Annex 4 of this report for further information on the above.

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[7] An official label prepared by the responsible official body in the Member State showing that the plants or plant products comply with the plant health standards and special requirements of this Directive. The responsible body is an official plant protection organisation(s) of a Member State, or any State Authority established at a national level or under the supervision of a national authority at regional level.

Harmful organisms

Annex 1 of Directive 2000/29/EC provides some illustrative examples of harmful organisms whose introduction into, and spread within, all Member States in the EC is banned. Some of these may be treated with methyl bromide fumigation. The harmful organisms are categorised according to 1) Insects, mites and nematodes at all stages of development 2) Bacteria 3) Fungi 4) Viruses and virus-like organisms 5) Parasitic plants. Member States are required to put in place treatments and procedures that mitigate against the introduction and spread of harmful organisms that are: 1) Not known to occur in any part of the Community and relevant for the whole Community; 2) Known to occur within the Community but are not endemic or established throughout the Community; and 3) Present in the Community but prohibited from Protected Zones in the Community. These treatments and procedures have been agreed by Member States in Directive 2000/29/EC.

In Directive 2000/29/EC, there are relatively few species that are categorised as harmful organisms. Many are fruit flies which are particularly damaging to fruit production and are treated with processes other than MB.

Protected zones

Annex 2 of Directive 2000/29/EC shows the plants and plant products that are prohibited from entering specifically-designated protected zones when listed harmful organisms are detected alone or for certain plants and plant products. These protected zones are regularly and officially verified as pest- and disease-free areas.

Treatments to reduce risk of entry of harmful organisms

Annex 3 of Directive 2000/29/EC provides illustrative examples of specific requirements, which are equivalent to “treatments” or “procedures”, which allow the entry into the EC of plants, plant products and other objects that are banned from entry. The EC requirements for quarantine measures differ from many other regions because the EC typically provides a choice of two or three different treatment options for each plant or plant product, beginning with inspection which sometimes may be all that is required, or sometimes a requirement for a treatment such as heat or fumigation. Examples of these treatments that avoid the need for MB treatment include:

- Heat treatments or kiln drying for wood of certain species, to the ISPM 15 standard of a minimum of 56°C core temperature for at least 30 minutes, and a mark ‘HT’ placed on wood or any wrapping;
- Fumigation of certain species of wood to a specification approved by the Standing Committee on Plant Health;
- Chemical impregnation of certain species of wood in accordance with the procedures approved by the Standing Committee on Plant Health;
- An official statement accompanying certain consignments of wood that it is bark-free as this reduces the risk of certain harmful organisms;
- Official statement that certain species of wood originate from areas that are known to be free of harmful organisms;

Annex 4 of this report summarises the range of treatments found in the Directive that allow the plant or plant product to be imported into the EC.

Quarantine treatment with methyl bromide

When fumigation is specified in Directive 2000/29/EC as an option, the fumigant itself is generally not specified. This means that the EC does not specify that plants or plant products are required to be fumigated with methyl bromide. To be accepted by the EC, however, the fumigation treatment must be carried out to the specified requirements that have been approved by the EC Standing Committee on Plant Health.

Directive 2000/29/EC specifies the use of methyl bromide in only two cases[8]: 1) Treatment of oak logs (*Quercus* L.) with bark attached that are exported from the United States of America to Europe; and 2) Treatment of wood-packaging material. Methyl bromide fumigation for oak logs with bark attached and for wood packaging material *is not required* under specific conditions when alternative treatments or procedures are used.

Oak logs exported from the United States

Ceratocystis fagacearum (Bretz) Hunt (the cause of oak wilt) is a harmful organism associated with oak logs with bark attached that originate from the United States of America. Fig. 8-1 shows the foliar symptoms of oak wilt and the short term and long term impact on the oak trees.

Figure 8-11. Foliar symptoms of *Ceratocystis fagacearum (the cause of oak wilt)* in the United States (EPPO)

Prior to export to the EC, the oak logs with bark attached must be fumigated with methyl bromide, or proven to belong to the white oak group of the *Quercus* L. species. The logs are always exported with bark as the bark protects the trunk allowing the manufacture of high quality oak veneer in Europe. There are specific conditions applied to the phytosanitary requirements which if not fulfilled result in rejection of the oak log consignment.

When treated with methyl bromide, each consignment must be fumigated at 240 g m^{-3} for 72h at a log temperature of $\geq 5°C$[9]. Each batch of fumigated logs must be numbered on the base of each log; the fumigation must be carried out by trained personnel under the supervision of the competent authority; the concentration must be topped up to the initial dose after 24h; and the phytosanitary certificate that accompanies the batch of logs must describe the treatment, the log numbers and other information.

The logs must enter through one of 34 designated ports in Europe that have appropriate handling and inspection facilities for receiving fumigated oak logs with bark attached. Apart from documentation and inspection checks on arrival, core samples from a random selection of logs are subjected to a "fumigation/colour-reaction" test. The logs are considered to have been adequately fumigated if the red coloration of the testing solution[10] disappears after the

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[8] Personal Communication 28 August 2009. Mr Marc Vereecke, Chair of the Standing Committee on Plant Health from 1989 to 2007.

[9] OJ L 114, 4.5.2005, p 14. Commission Decision of 29 April 2005 providing for a derogation from certain provisions of Directive 2000/29/EC as regards oak (*Quercus* L.) logs with bark attached, originating in the United States of America.

[10] 1% solution of 2,3,5-triphenyl-2H-tetrazolium chloride (TTC) made with distilled water.

core samples have been soaked for three days in this solution. If the inspections do not show that the consignment fully complies with the specified conditions, the whole consignment must be rejected and removed from the EC.

Once imported to Europe, the fumigated oak logs with bark attached must be wet-stored in places approved by the competent authority; they must be kept in continuous wet storage starting at the time of the flushing of the local or neighbouring oak stands (derogation is possible) and the neighbouring stands must be regularly inspected for freedom from *Ceratocystis fagacearum* (Bretz) Hunt. The Commission must be informed if the disease is detected in the neighbouring oak stands.

The oak logs are exempt methyl bromide fumigation if they pass an identification test[11] proving that they are belong to the white oak species; they are shipped in consignments that consist only of white oak logs; they are exported no earlier than 15 October and reach the place of storage no later than 30 April; they are kept in wet storage; and the oak logs do not enter a port in the EC south of 45° latitude[12], or pass through areas south of this latitude. In addition, MB fumigation is not reqired by the EC if the oak wood meets one of the following conditions: (a) all round surfaces are removed, or (b) bark-free and dried to <20% moisture, or (c) bark-free and treated with hot-air or hot water treatment, or (d) sawn and kiln-dried to <20% moisture (Council Directive 2000/29/EC as amended, Annex IV, Part A, Section 1,3).

Wood packaging material

The other product for which methyl bromide is an approved treatment is wood packaging material, covered in the Directive 2000/29/EC under Annex IV, Part A, Section I and wood used to wedge or support non-wood cargo also listed in Annex IV, Part A, Section I. In both cases, there is a requirement that these types of wood on entry in the EC should be have been subjected to an approved treatment as specified in Annex I to the FAO ISPM No 15 (as modified in 2009), which lists methyl bromide or heat treatment as approved treatments.

If a methyl bromide treatment is used, the wood packaging material must be fumigated at 24 to 64 g m^{-3}, depending on the temperatures in excess of 10°C and other treatment conditions[13]. The wood packaging material is exempt from methyl bromide fumigation if the core temperature is maintained using a heat treatment which keeps the wood packaging material at a minimum core temperature of 56°C for at least 30 minutes and other treatment conditions are met. In addition, pallets constructed entirely of plastic, cardboard or various other materials are exempt from the need for MB or heat treatment, providing users with an alternative.

Termination of the use of methyl bromide for QPS in the European Community

The use of methyl bromide for QPS treatments carried out in the EC will no longer be permitted after 18 March 2010, according to a new regulation in the EC on "*Substances that Deplete the Ozone Layer*" which was adopted by the European Parliament and European

[11] Samples of logs turn from reddish brown to grey-blue when a 10% solution of sodium nitrite is applied to heartwood

[12] Logs can enter Marseille which is below 45° latitude, providing they are moved immediately to areas above this latitude. The southern Member States of Cyprus, Greece, Italy, Malta, Portugal and Spain do not exempt white oak logs.

[13] FAO. 2009. International Standards for Phytosanitary Measures. Revision of ISPM No. 15 - Regulation of Wood Packaging Material In International Trade.

Council[14] prior to 31 July 2009. This is because methyl bromide will not be available as a plant protection product in the EC after 18 March 2010 because, in the light of current scientific and technical knowledge, it was not eligible to be included in Annex I of Directive 91/414/EC[15]. To be eligible for inclusion in Annex 1 and therefore available for use in the EC, evidence must be submitted that demonstrates that (a) a plant protection product's *residues* do not have any harmful effects on human or animal health or on groundwater or any unacceptable influence on the environment; and (b) a plant protection product's *use* does not have any harmful effects on human or animal health or any an acceptable influence on the environment. Methyl bromide did not comply with these requirements and therefore it was excluded from Annex I of Directive 91/414/EC[16]. Additionally, methyl bromide was also not authorised as a biocidal product under Directive 98/8/EC[12] for the treatments that do not involve plant products such as the disinfestation of shipping containers.

The legislation will reduce the amount of methyl bromide that can be used in the EC from 45 ODP-tonnes in the period 1 January to 18 March 2010, and thereafter to zero ODP-tonnes. This is down from a previous cap of 607 ODP-tonnes per year. The amount that can be imported is also limited to 21% of the average quantity imported and placed on the market annually from 2005 to 2008. During this period, methyl bromide may only be used on sites approved by the competent authority of the Member State and, if economically and technically feasible, at least 80% of the methyl bromide released from the consignment must be recovered.

The legislation in the EC that terminates the use of methyl bromide in the EC for all uses including QPS is applicable only to the use of methyl bromide in the EC and does not apply to its use in countries outside the EC.

The termination of the use of methyl bromide in the EC is not expected to increase the use of methyl bromide for QPS in countries exporting to the EC. This is because methyl bromide is specified for use on only two plant or plant products, which are oak logs from the United States of America and wood packaging materials from all countries. In both cases, exporters are exempt fumigation with methyl bromide if other treatments or procedures are used instead. Furthermore, both oak logs and wooden packaging material must be treated using methyl bromide or other options prior to being export to the EC. As Directive 2000/29/EC does not require treatment in the EC, the ban on the use of methyl bromide in the EC after 18 March 2010 does not impact its use for these two products outside of the EC where treatments with methyl bromide (when it is used in place of other options) normally take place.

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14 Regulation of the European Parliament and of the Council on "Substances that deplete the ozone layer (recast)". 7 July 2009. PE-CONS 3622/09. To be published in October 2009 and in force in the European Community after publication.

15 Council Directive 91/414/EEC. 15 July 1991. Concerning the placing of plant protection products on the market. OJ L 230, 19.8.1991, p. 1. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:01991L0414-20090501:EN:NOT

16 OJ L 258, 26.9.2008, p. 68.

8.4. Impact of regulations on methyl bromide use

8.4.1. Illustrative examples of QPS uses which specify (mandate) the use of MB only.

There are many and diverse QPS situations for which methyl bromide is specified as the sole approved treatment. The illustrative, given below contains examples of some of the main uses within a number of countries across different continents:

- quarantine use for a regulated quarantine pest such as fruit fly as in several countries;
- quarantine use on imports for specific nursery stock as a commodity (eg. Australia)
- preshipment use for export of wheat to India (e.g. Australia)
- quarantine use for grapes to New Zealand and cherries to USA exported from Australia
- quarantine use on wood and wood products imported into many countries, eg. India, New Zealand, South Korea,
- quarantine use on cherry, walnut, pomegranate shipped imported into South Korea from USA
- quarantine use on chestnut exported from Korea to USA
- quarantine use on imported garlic and used tyres into New Zealand
- quarantine use on oak logs, with bark attached, imported into EC from the USA.

Several countries have no mandated quarantine or preshipment use solely for methyl bromide, yet it is still used for specific uses in several countries , e.g. in China, Kenya.

8.4.2. Illustrative Examples of QPS Uses which require pest-free or nil tolerance of pests, but do not specify MB exclusively.

Many QPS situations arise where a treatment is not specified but methyl bromide can be used to achieve pest-free status. These include:

- Nursery stock and kiwifruit imported into New Zealand.
- Import of cereals and pulses, and bananas into South Korea. Phosphine and Hydrogen cyanide can be used respectively.
- Cut flowers imported into New Zealand. After inspection, MB may be used if required.
- Exported kiwifruit to Korea and generally for household effects from New Zealand.

8.4.3. Illustrative examples of QPS uses where MB is used but alternatives are available.

Many QPS treatments have non-MB treatments available and approved, though methyl bromide may be the treatment of choice. These include:

- Fruit flies on a wide range of commodities for the internal markets in Argentina. Cold treatment is available.
- Solid wood packaging exported from many countries under ISPM15. Heat treatment can be used.

- Nursery material transferred between countiesand states within in USA. 1,3-Dichloropropene and methyl iodide available under certain regulations.
- Wheat exported from India. Aluminium phosphide can also be used to some markets.
- General treatment of Agricultural Products when pests found. A range of treatments can be used, although often MB chosen due to quick time for treatment.

Table 8-1. Examples of import/export regulations (and internet sites) covering use of fumigation with MB and alternatives for the key commodities exported from/to different countries and preplant soil uses considered QPS.

Examples of Key categories: 1. General non specific regulations; 2. Whole logs; 3. Solid Wood Packaging; 4. Grain and Rice exports; 5. Strawberry and other nursery soils uses; 6. Fresh grape imports; 7. Khapra Beetle; 8. Fruit flies

ARGENTINA – Fruit flies

Country	**Commodity or pest (Select others if relevant)**	**List (and website address) or copy the national regulations covering Import and Export of specific commodities and soil uses of MB under QPS**	**Quantity of MB used (if known in tonnes)**	**Does policy require MB specifically for this use? (Please provide actual wording)**	**Are alternatives allowed under the policy?**	**Comments**
A. Regulations which require the use of MB (ie MB is only product specified in regulation)						
Internal market	Avocado Prickly pear Pepino dulce Cucumber?	Resol. SENASA 601/2001 http://www.senasa.gov.ar/seccion.php?in=1078&titulo=Año%202001	2007 – 38.2 t 2008 - 31.375 t	Yes	No	To commercialize in fruit fly free regions or under eradication programs for regulated quarantine pest
Export	Blueberries	http://www.senasa.gov.ar/Archivos/File/File1937-protoc_export.pdf	2007 – 3.8 t 2008 – 6.125 t	Yes	No	For USA
C. Regulations where MB is used (not required), and alternatives are available						
Internal market	Grapefruit, tangerines, orange, tangelo mineola, kumquat, sweet lime cider, Kiwi, Sweet pepper Quince, Grape	Resol. SENASA 601/2001 http://www.senasa.gov.ar/seccion.php?in=1078&titulo=Año%202001	Included in figures given in A. internal market	No	Cold treatment	To commercialize in fruit fly free regions or under eradication programs

Country	Commodity or pest (Select others if relevant)	List (and website address) or copy the national regulations covering Import and Export of specific commodities and soil uses of MB under QPS	Quantity of MB used (if known in tonnes)	Does policy require MB specifically for this use? (Please provide actual wording)	Are alternatives allowed under the policy?	Comments
Import	Wood packaging	Resol. SENASA 19/2002 www.senasa.gov.ar	Unknown	No	Phosphine	
Export	Wood packaging	Resol. SENASA 626/03 www.senasa.gov.ar	Unknown	No	Heat treatment	Almost negligible (included in fresh fruit fumigations, because they are performed in the same facilities)
D. Other regulations						
Internal market	Cotton	Resol. SENASA 169/2005 http://www.senasa.gov.ar/contenido.php?to=n&in=1030&ino=1030&io=1659	Unknown	No	Phosphine	

Australia:

QPS Category	Commodity or pest	Please provide text and/ or URL of actual national regulations covering uses of MB for Import and Export of specific commodities and soil under QPS	Quantity of MB used (if known)	Does policy require MB specifically for this use?	Are alternatives allowed under the policy?	Comments
A. Regulations which require the use of MB (i.e. MB is only product specified in regulation)						
Import	Nursery stock eg. Prunus	http://www.aqis.gov.au/icon32/asp/ex_casecontent.asp?intNodeId=8784796&intCommodityId=4081&Types=none&WhichQuery=Go+to+full+text&intSearch=1&LogSessionID=0	32g/m³ x 2-3 hours @ 21°C depending on product and temp.	Yes, however some alternatives are allowed for prunus species which are susceptible to MB.	MB has been shown to be detrimental to some plants and these may receive an insecticidal dip or hot water treatment in place of MB. All other plants must be fumigated with MB.	Nursery stock is treated to destroy arthropod pests as soon as practical after arrival. Most plants are fumigated with MB
Export	**Grain** Wheat, barley (India)	http://www.aqis.gov.au/icon32/asp/ex_querycontent.asp		Yes		Depends on other countries import requirements.
Preshipment	Fresh grapes New Zealand	http://www.aqis.gov.au/icon32/asp/ex_casecontent.asp?intNodeId=8764667&intCommodityId=6292&Types=none&WhichQuery=Go+to+full+text&intSearch=1&LogSessionID=0	32g/m³ x 3 hrs @ 21°C	Yes, mandatory fumigation with MB		Fumigation may be undertaken pre-shipment or on arrival in Australia
Preshipment	Fresh cherries USA	http://www.aqis.gov.au/icon32/asp/ex_casecontent.asp?intNodeId=8772167&intCommodityId=6267&Types=none&WhichQuery=Go+to+full+text&intSearch=1&LogSessionID=0	32g/m³ x 3 hrs @ 21°C	Yes, mandatory fumigation with MB		Fumigation details must be included in the Phytosanitary certificate

B. General regulations which require nil tolerance of pests, pest freedom etc. but do not require MB.						
Import	Nursery stock	http://www.biosecurity.govt.nz/files/ihs/155-02-06.pdf		No - MB treatment OR Hot water treatment OR Chemical treatment		New Zealand MAF standards
Import	Kiwi fruit	http://netprod.aqis.gov.au/icon32/asp/ex_casecontent.asp?intNodeId=8770410&intCommodityId=13924&Types=All&WhichQuery=Go+to+Public+Text		No		If live insects detected, the entomologist must be consulted and consignment must be treated, where appropriate, by an AQIS approved method.
C. Regulations where MB is used (not required), and alternatives are available						
Import	Timber	http://www.aqis.gov.au/icon32/asp/ex_casecontent.asp?intNodeId=8849077&intCommodityId=17670&Types=none&WhichQuery=Go+to+full+text&intSearch=1&LogSessionID=0		Mandatory treatment either prior to shipment (ISPM15 stamped) or on arrival in Australia.	If not ISPM stamped a number of alternatives to MB can be used; a) sulphuryl fluoride b) heat treatment c) gamma irradiation d) permanent timber preservative treatment	Timber packaging and dunnage not treated in accordance with ISPM 15 must be treated as shown in previous column.
Export	Wheat (Kenya)	http://www.aqis.gov.au/icon32/asp/ex_querycontent.asp		No, phosphine possible as well as MB		
D. Other Regulations						
Preshipment	Fresh grape imports		$48 g/m^3$ x 2 hrs @ 21°C	Mandatory Fumigation Treatment for Grapes from California, USA	Table grapes must be fumigated prior to pre-clearance inspection in the US with MB	

India:

Country	Commodity or pest	List (and website address) or copy the national regulations covering Import and Export of specific commodities and soil uses of MB under QPS	Quantity of MB used (if known)	Does policy require MB specifically for this use?	Are alternatives allowed under the policy?	Comments
A. Regulations which require the use of MB (ie MB is only product specified in regulation)						
Import	Wood and wood products	Plant quarantine (regulation of import into India) order, 2003 Schedule - VI http://www.plantquarantineindia.org/law.htm http://www.agriculture-industry-india.com/india-agro-statistics/import-agricultural-products.html	N/A	Fumigation with MB at 48g /m^3 for 24 hrs. at 21^{o}C and above or equivalent or any other treatment approved by a PlantProtection Adviser to the Government of India. The treatment should be endorsed on a Phytosanitary Certificate issued at the country of origin or before export.		Import quantity in 1999-2000 are in the website of the India agro industry. Wood and wood products should be a big user commodity but no quantity data exists only costs

C. Regulations where MB is used (not required), and alternatives are available						
Export	Wheat	Revised Guidelines for import of Wheat for consumption/ processing (effective upto 31st December, 2006) http://www.plantquarantineindia.org/wheat_import.htm	N/A	(v) The wheat consignment would be required to be fumigated with MB @32 g/m^3 at 21°C and above for 24 hours under Normal Atmospheric Pressure and the treatment endorsed on the Phytosanitary Certificate	OR the wheat consignment would be required to be fumigated with Aluminium Phosphide @ 40g/1000 cu ft for a period of at least 21 days prior to arrival into India provided the ship hold has provision for post re-circulation of phosphine gas during the period of transit.	

Kenya:

Country	Commodity or pest	Please provide text and/ or URL of actual national regulations covering uses of MB for Import and Export of specific commodities and soil under QPS	Quantity of MB used (if known)	Does policy require MB specifically for this use?	Are alternatives allowed under the policy?	Comments
A. Regulations which require the use of MB (i.e. MB is only product specified in regulation)						
Import		No regulation, which require the use of MB for treatment or fumigation of imported plant or plant products into Kenya, exists.				
Export						
B. General regulations which require nil tolerance of pests, pest freedom etc. but do not require MB.						
Import		The international protocol is followed to lists pests that require nil tolerance when imported into the country. However, there is no regulation *per se* that exists in Kenya and which specifically requiress the use of MB to treat or fumigate imported plants and plant products that are known to be hosts to these pests with nil tolerance. Instead, other technologies other than MB are used.				
C. Regulations where MB is used (not required), and alternatives are available						
Export	**Cut flowers**	USA require that the cultivation fields for cut flowers production exported by Kenya to be fumigated with MB. Although the Kenya regulations do not subscribe to this requirement, the cut flowers grown in Kenya and destined for export to USA are treated with MB to meet the requirement. Effective alternatives to MB for cut flower production are currently available.				
D. Other Regulations						
Import	i) **Fumigation of imported grains** Under the World Food Programme, Kenya imports hundreds of tonnes of grains (mainly maize and rice) as food aid. No MB is used to fumigate the imported grains. Phosphine, including other alternative treatments, is used.					
Export	ii) **Heat treatments of the wooden pallets for packing** ISPM 15 recommends heat treatment or use of MB for the wooden pallets used for packing. In Kenya heat treatment of wooden packing materials is mainly used. The wooden pallets are subject to 60^0 C for 60 minutes. A credited and specialized company carries out the heat					

	treatments of the wooden pallets. iii) **Pre-plant Soil treatment with MB** The Pest Control Products Board is the authorised body in Kenya that issues imports permits to allow the importation of MB to Kenya for pre-plant soil fumigation of cut flower production fields. During the 2009 period to the date (August 2009), no MB has been imported to Kenya for use as a pre-plant soil fumigant. This is in response to farmer's awareness that with effect from January 1, 2010, no MB shall be imported to Kenya for soil fumigation. vi) **Emission reduction of MB used for QPS** Under a bilateral assistance to Kenya, USA may be considering to install a MB fumigation chamber at the Jomo Kenyatta International Airport. The MB fumigation chamber will be set up on experimental basis to assess its effectiveness in reducing the emission of MB used for fumigation of cut flowers for export to USA.

South Korea:

Country	Commodity or pest	List (and website address) or copy the national regulations covering Import and Export of specific commodities and soil uses of MB under QPS	Quantity of MB used (if known)	Does policy require MB specifically for this use?	Are alternatives allowed under the policy?	Comments
A. Regulations which require the use of MB (ie MB is only product specified in regulation)						
Import	Whole logs and Fresh fruit and vegetables	Treatment Act of NPQS (No 2009-7)	800MT/year (approximately)	Only MB is listed for fumigant for wood (whole logs, except WPMs, and sawn timber) and most of fresh fruit and vegetable	HCN can be used for some fresh fruit and vegetable as well as MB such as orange and banana etc.	
Import	Cherry, walnut, pomegranate	Lifting Act for importing cherry, walnut, orange, pomegranate, pine wood from USA to Korea by MAF: No. 2009-97	N/A	From USA to Korea should be fumigated with MB		
Export	General	Treatment Act of NPQS (No 2009-7)	50MT/year (approximately)	Same as above	Same as above	
Export	Chestnut, apple	Exporting Act of mandarin, persimmon, grape, apple, chestnut pear form Korea to USA by NPQS: No. 2009-14	N/A	From Korea to USA should be fumigated with MB		

B. General regulations which require nil tolerance of pests, pest freedom etc. but do not require MB.						
Import	Cereals and pulse	Treatment Act of NPQS (No 2009-7)	N/A		Dry product(grain etc) can be fumigated for disinfecting pests with PH3 as well as MB	WPMs can be disinfected with heat as well as MB It will be possible when another fumigant is listed in Treatment Act
Import	**Banana**	Treatment Act of NPQS (No 2009-7)	N/A		HCN can be used to some of fresh fruit and vegetable as well as MB such as orange and banana etc.	
Export		Treatment Act of NPQS (No 2009-7)	-		Same as upper layer	
C. Regulations where MB is used (not required), and alternatives are available						
Import		Treatment Act of NPQS (No 2009-7)	N/A		PH3, HCN, Heat(vapour, dry) besides MB for disinfecting	
Export		Treatment Act of NPQS (No 2009-7)	N/A		Same with upper layer	

New Zealand:

Country	Commodity or pest	List (and website address) or copy the national regulations covering Import and Export of specific commodities and soil uses of MB under QPS	Quantity of MB used (if known)	Does policy require MB specifically for this use?	Are alternatives allowed under the policy?	Comments
A. Regulations which require the use of MB (ie MB is only product specified in regulation)						
Import	Garlic	http://www.biosecurity.govt.nz/files/ihs/garlic-prc.pdf	Unknown	An MB fumigation must be used as a phytosanitary measure for Delia antiqua, Liriomyza huidobrensis and Liriomyza trifolii which may be associated with garlic bulbs or the above-ground edible parts of the garlic plant.	No	
Import	Used Tyres	http://www.biosecurity.govt.nz/imports/non-organic/standards/bmg-std-tyres.htm	Unknown	All used tyres (not on rims) must be fumigated with MB on arrival by a MAF approved operator.	No	Fumigated for mosquitoes and Gypsy moth
Export Australia	Sawn Timber	http://www.aqis.gov.au/icon32/asp/ex_casecontent.asp?intNodeId=8206506&intCommodityId=7524&Types=none&WhichQuery=Go+to+full+text&intSearch=1&LogSessionID=0	19 t	Containerised or break bulk timber consignments from BPL affected ports require one of the following treatments prior to shipment. For details of affected NZ ports during the BPL flight season refer to the BPL season ICON Alert. a) MB fumigation at 48g/m³ for 12 hrs at a minimum temperature of 15°C; or b) MB fumigation at 56g/m³ for 12 hrs at a minimum temperature of 10°C; or c) Insecticidal Pestigas, Permigas or Pybuthrin 33, applied at a dosage rate of 50g/100m³ for panel products and timber mouldings only.	None for timber	Burnt Pine Longhorn (BPL) flight season is November to April.

Country	Commodity or pest	List (and website address) or copy the national regulations covering Import and Export of specific commodities and soil uses of MB under QPS	Quantity of MB used (if known)	Does policy require MB specifically for this use?	Are alternatives allowed under the policy?	Comments
Export India	Logs	http://www.biosecurity.govt.nz/exports/forests/standards/india.htm#logs	Approximately 75 t/yr	MB at 48 g/m^3 at >21^{o}C for 24 hours. 56 g/m^{3}at 16-20^{o}C for 24 hrs. 64 g/m^3 at 11-15^{o}C for 24 hrs. 72 g/m^{3}at 10-11^{o}C for 24 hrs.	Nil	
Export China	Logs	http://www.biosecurity.govt.nz/exports/forests/standards/china.htm#logs	Approximately 190 t/year	MB fumigation rates are: If entire logs and ambient temperatures are above 15^{O}C throughout fumigation, 80g/m^3 for at least 16 hrs. If entire logs and ambient temperatures are between 5 and 15^{o}C throughout fumigation, 120 g/m^3 for at least 16 hrs. Or: In-hold fumigation with Phosphine. Initial fumigation must be at a rate of at least 2 g/m^3. After 5 days a further top up of 1.5 g/m^3 is required. Treatment must maintain an in hold gas concentration of at least 200 ppm. for 10 days. Or Logs are debarked	Yes, phosphine only for below deck cargo	Debarking is very expensive and not a reliable ”treatment” and phosphine requires 10days treatment time which is not suitable for cargo on the deck of the ship
B. General regulations which require nil tolerance of pests, pest freedom etc. but do not require MB.						
Import	Cut flowers	http://www.biosecurity.govt.nz/files/ihs/appendix1.pdf	unknown	No – requirement is: This is to certify that the cut flowers/foliage described herein have been inspected and/or tested according to appropriate official procedures and are		Frequently fumigated with methyl bromide on detection of quarantine pests

Country	Commodity or pest	List (and website address) or copy the national regulations covering Import and Export of specific commodities and soil uses of MB under QPS	Quantity of MB used (if known)	Does policy require MB specifically for this use?	Are alternatives allowed under the policy?	Comments
				considered to be free from the quarantine pests specified by New Zealand MAF and to conform with the current phytosanitary requirements of New Zealand MAF, including those for regulated non-quarantine pests.		
Export	Kiwifruit	http://www.biosecurity.govt.nz/files/regs/stds/icprs/korea-republic-of.pdf	unknown	Phytosanitary certificate required	Yes, cold and phosphine	Was being fumigated with MB until recently
Export	Household effects	http://www.biosecurity.govt.nz/border/inspection-services/152-08-01s.htm	unknown	Any risk goods that do not comply with an existing import health standard are to be seized. The owner of the goods is to be advised that the goods cannot be given biosecurity clearance. The owners is to be asked if they wish to have the goods: re-shipped (at their own expense); treated (at their own expense) as directed by the inspector; or destroyed under the direction of the inspector. There shall be no compensation for goods that must be destroyed.		Frequently people moving between countries fumigate as a precaution to prevent any hold ups with their goods and to get rid of household pests such as cockroaches

C. Regulations where MB is used (not required), and alternatives are available						
Import	Bamboo	http://www.biosecurity.govt.nz/imports/forests/standards/non-viable-forest-produce/bamboo-rattan.htm	unknown	Fumigation of filleted or otherwise separated layers with methyl bromide at the rates and temperatures indicated in the table below, for more than 24 continuous hours. Or Heat treatment for more than 4 hours at a minimum continuous core temperature of 70°C.	Heat	Normally fumigated due to lack of availability, cost, possibility of damage and logistics of heat.
Export	ISPM 15 Wood Packaging	https://www.ippc.int/servlet/BinaryDownloaderServlet/133703_ISPM_15_Revised_2009.doc?filename=1240489124097_ISPM_15_Revised_2009_E.doc&refID=133703	unknown	The treatments described in Annex 1 are considered to be significantly effective against most pests of living trees associated with wood packaging material used in international trade. Wood packaging material must be heated in accordance with a specific time–temperature schedule that achieves a minimum temperature of 56 °C for a minimum duration of 30 continuous minutes throughout the entire profile of the wood (including at its core). The wood packaging material must be fumigated with methyl bromide in accordance with a schedule that achieves the minimum concentration-time product[5] (CT) over 24 hours at the temperature and final residual concentration specified in Table 1.	Heat	Frequently fumigated due to lack of availability, cost, possibility of damage to packaged commodity and logistics of heat.

Philippines:

Country	Commodity or pest	List (and website address) or copy the national regulations covering Import and Export of specific commodities and soil uses of MB under QPS	Quantity of MB used (if known)	Does policy require MB specifically for this use?	Are alternatives allowed under the policy?	Comments
A. Regulations which require the use of MB (ie MB is only product specified in regulation)						
Export	**BPI Quarantine Administrative Order No.1 series of 2008 *"Guidelines for the Implementation of the Australian Fumigation Accreditation Scheme (AFAS) in the Philippines"***					
B. General regulations which require nil tolerance of pests, pest freedom etc. but do not require MB.						
Import	**Presidential Decree 1433 or *Plant Quarantine Law of 1978***					
Export	**BPI Quarantine Administrative Order No. 1 series of 1981 *"Implementing Rules and Regulations of PD 1433"***					
C. Regulations where MB is used (not required), and alternatives are available						
Import	Regulated Wood Packaging Material made of unprocessed raw wood	BPI Quarantine Administrative Order No.1 series of 2004 *"Guidelines for Regulating Wood Packaging Material Involved in International Trade"* BPI Q. AO no.3 series of 2005 *"Amendment to BPI Q AO 1 s.2004"* BPI Q AO no. 1 series of 2006 *"Amendment to BPI Q AO 1 s.2004"*		Section 3.2 Approved treatments for regulated wood packaging materials are methyl bromide fumigation and heat treatment	Heat Treatment	

Country	Commodity or pest	List (and website address) or copy the national regulations covering Import and Export of specific commodities and soil uses of MB under QPS	Quantity of MB used (if known)	Does policy require MB specifically for this use?	Are alternatives allowed under the policy?	Comments
Import	Agricultural Products	BPI Q. AO No.1 series of 2004 Amendments: BPI QAO no.3 s. 2005 BPI Q AO no.1 s. 2006 Presidential Decree 1433 BPI Q Ao. No.1 series of 1981		Rule II. Importation of plants, plant products and other materials found infected/infested with plant pests shall be subjected to a prescribed commodity treatment, or destroyed or returned to the country of origin Rule V. Phytosanitary Certificate can be issued for commodities for export after inspection and administering of commodity treatment (if the importing country requires)	Yes, any treatment which can eliminate the pests of concern	

USA:

Country	Commodity or pest	National regulations covering uses of MB for Import and Export of specific commodities and soil under QPS	Quantity of MB used (if known)	Does policy require MB specifically for this use?	Are alternatives allowed under the policy?	Comments
A. Regulations which require the use of MB (ie MB is only product specified in regulation)						
Export (Several)	Cherries	http://www.aphis.usda.gov/import_export/index.shtml				Heat treatment or a systems approach could be used, although not currently approved by any receiving U.S. export cherries
C. Regulations where MB is used (not required), and alternatives are available						
Export	Soft Wood Packaging Material	http://www.aphis.usda.gov/import_export/index.shtml http://www.aphis.usda.gov/import_export/plants/plant_exports/wpm/wpm_methyl_bromide.shtml The National Wood Pallet and Container Association (NWPCA) in coordination with APHIS and the wood packaging industry has developed an official program in order for the NWPCA to implement a quality control program for the official labeling of WPM fumigated with Methyl Bromide in compliance with the ISPM15 standard. The Methyl Bromide (MB) Fumigation Program is structured much the same as the Heat Treatment (HT) program. The NWPCA administers the fumigation program. Inspection agencies enrolled with the National Wood Pallet and Container Association monitor the fumigation with methyl bromide and treatment marking of WPM in conformance with ISPM15. The agency quality mark may only be applied on WPM treated by fumigators certified in the program		No, MB and Heat	Yes, heat	The IPPC standard calls for most WPM to be either heat treated or fumigated with methyl bromide in accordance with the guidelines and marked with an approved international mark certifying that treatment. The final rule, which became effective on September 16, 2005, affects all persons using wood packaging material in connection with importing goods into the United States. Click on the above link to learn about the import requirements for WPM.

Export (between countries and States.	Strawberry runners	http://fpms.ucdavis.edu/Strawberry/CDFAStrawRegs.html The use of MB is covered by a number of certification standards and regulations depending on region. The certification requirements (e.g., CDFA, 2003; TDA, 1999; NCDA, 1985, TEAP 1999, Clean Air Act 2003, NIPM Item #3,Federal Register Vol 68) (see Appendix XX?). Regulations do not require MB, require freedom from 'quarantine pests'. Certification is supported by approved uses for products which could be MB or a number of alternatives depending on the region. Pest tolerances are generally determined by visual inspection and certification based on a tolerance level for most diseases. California regulations (e.g., CDFA, 2003—NIPM #3) for nursery standards (reg. 3060.2-a) include: "All nursery stock shall be kept 'commercially' clean with respect to established pests of general distribution. Commercially clean shall mean that pests are under effective control, are present only to a light degree, and that only a few of the plants in any lot or block of nursery stock or onthe premises show any infestation or infection, and of these none show more than a few individuals of any insect, animal or weed pests, or more than a few individual infestations of any plant disease." Further, 'At least two visual inspections shall be made of each planting prior to harvest and in addition plants shall be inspected at digging time. Inspection for the detection of harmful nematode pests may be made using laboratory methods and	>400 tonnes	No. MB generally not specified but historically used to achieve plants significantly free of pests and diseases. 1,3-D/Pic accepted for nematodes except fine textured soils. MI recently approved for use in California, but not yet registered	Recent results have indicated that iodomethane /chloropicrin , 1,3-D/chloropicrin followed by dazomet, chloropicrin followed by dazomet, and MB/chloropicrin all provided comparable weed control with similar hand-weeding costs	**Nematode certification Section 3055.1 NIPM** "Free of nematodes" means free of nematodes consistent with the capacity of the approved treatment and approved laboratory methods prescribed in this article respectively to yield nursery stock free of nematodes or to detect low level nursery stock nematode infestations. It does not mean complete freedom and nematodes may be present consistent with the limitations inherent to the prescribed approved treatment and approved laboratory methods.

		is required for approval as foundation stock or as registered stock'. TENNESSEE (TDA, 1999) "No strawberry plants shall be sold, offered, stored, or held for sale, or transported within or into the State of Tennessee unless they shall have been certified as being **essentially free of insect pests and plant diseases** by the Director of Entomology and Plant Pathology of the Tennessee Department of Agriculture or by a legally constituted agency designated for such purpose in other states, territories, or counties." "Soil in Foundation planting sites shall be **fumigated or otherwise sterilized using materials and methods prescribed or accepted by the Director of Entomology and Plant Pathology of the Tennessee Department of Agriculture."** NORTH CAROLINA (NCDA, 1985) 02 NCAC 48A .1207 NURSERY INSPECTION AND RECORD-KEEPING (a) A plant inspection certificate shall be issued after the nursery has been inspected by an inspector of the North Carolina Department of Agriculture, **found apparently free of injurious plant pests**, less than one acre in size and the proper fee paid. An inspection shall be conducted at least once annually prior to September 30 of each year., and the proper fee paid. An inspection shall be conducted at least once every three years Authority G.S. 106-65.45; 106-65.46				

9. STATUS OF INFORMATION

9.1. Introduction and mandate

Paragraph 6 of the Decision requests QPSTF to highlight in its final report …"*areas where sufficient information indicates opportunities for reductions in methyl bromide use or emissions for quarantine and pre-shipment purposes, including a list of available methyl bromide recapture technologies for consideration by the Parties and, where there is insufficient information, a final proposal for further data gathering for the consideration of the Twenty-First Meeting of the Parties"*

9.2. Opportunities for the Parties to consider

9.2.1. Areas where sufficient information indicates opportunities for reduction

In the light of the information available on categories of use of methyl bromide for QPS purposes, alternatives available and key pests, the QPSTF was able to make preliminary estimates of uses and amounts that could possibly be replaced with alternatives. These are technically feasible alternatives that allow for replacement of methyl bromide whilst still complying with official QPS requirements in place to ensure border security. It should be stated however, that such estimates do not include an economic assessment nor have they taken into account the availability of such alternatives for major users. Regulatory barriers, which have been shown to restrict adoption of alternatives for controlled uses, have not been analysed. In consequence, the figures presented below provide a general basis and do not presently allow for the suggestion a time frame within which such replacement could occur.

Opportunities for adoption of alternatives and for replacement of methyl bromide used for QPS purposes should include: adoption of best practice, wider adoption of recapture and deployment of alternatives in preference to methyl bromide use, where these have been found to be acceptable (for example, preferring heat over methyl bromide for ISPM 15).

Table 9-1 below presents a feasible scenario of technically feasible alternatives, within the limitations described above. Based on use information as presented in Table 4-6 the QPSTF estimates a preliminary replaceable estimate of more than 6,300 tonnes out of a total of 7,534 tonnes used. Almost 80% of QPS methyl bromide in the world is technically replaceable according to the following scenario.

Table 9-1. QPS methyl bromide – feasible scenario for technically replaceable use in the world.

QPS category	Principal alternative technologies	Tonnage, 2007 use (Table 4-6 data)	Estimated Replaceable fraction
Logs	Alternative fumigants	2236	Most
Sawn timber and wood packaging material (ISPM 15)	Heat treatment, alternative fumigants	1629	Almost all
Grains and similar foodstuffs	Alternative fumigants and controlled atmospheres	1492	Almost all
Soils, in situ	Alternative soil fumigants	1531	Almost all
Fruit and vegetables	Systems approach, heat and cold treatments, alternative fumigants	646	About half

1) There are many limitations for estimation (see paragraphs 9.2.1.)

2) quarantine activities against regulated pests not replaced (grain, soil)

3) assumes alternative fumigants accepted (logs)

As stated above, however, the estimated replacement would need accompanying efforts directed at calculating full feasibility of adoption of alternatives. Assisting the IPPC secretariat to promulgate and Parties to implement the IPPC recommendations to replace and reduce methyl bromide would ensure the progress took place. This might include support for change through some funding mechanism for A5 countries to demonstrate alternatives and to transition to alternatives. A5 countries often need expertise, technology transfer and trialling of particular alternatives, for their specific circumstances.

In essence, the following could be considered:

- Assistance to Article 5 Parties for technology transfer on alternatives to QPS uses and on emission control;
- Investment in recycling and recovery technology, as a transitional step
- Reviewing the necessity of MB treatments required by Article 5 Parties for products exported to non-Article 5 Parties.

9.2.2. Information gaps

The quantities of methyl bromide consumed for QPS and the approximate quantities applied for major uses are well defined for 2005 to 2007 years. A number of illustrative examples have been presented on regulations affecting methyl bromide, including for QPS purposes, and on alternatives for at least the 5 major use categories. Some issues remain that would provide a still better picture of QPS methyl bromide, its uses and alternatives. The following data gaps need filling:

- Elucidation of the fate of the methyl bromide indicated by the difference between the annual consumption and use.
- A fuller list of pests where methyl bromide is considered at present the only feasible control option
- An evaluation of possibilities for standardisation of regulations
- An economic analyses of alternatives (or impact of inadequate disinfestation)
- An analysis of regulatory issues restricting adoption of methyl bromide alternatives for QPS uses
- Consideration of reporting on stocks for QPS and feedstocks under the Accounting Framework process to determine accurately banks of methyl bromide

9.2.3. How this information could be obtained

Information could be obtained:

- Parties which have unidentified uses to conduct surveys and provide a report on these uses by the 30th OEWG
- During the survey above, Parties may wish to provide more detailed and precise information on:
  - use per category
  - defined lists of quarantine pests and regulated non quarantine pests
  - an accurate list of specific uses that require MB and a category of why the use is required i.e. technical, regulatory or economic.
- Regulations are a major factor affecting use of MB and alternatives for QPS. It is suggested that a committee in conjunction with IPPC could be set up to review the differences in regulations and make suggestions on areas where standardisation of regulations would positively impact on ODS reduction without creating further biological, technical or economic risk.
- Many of the solutions for QPS are similar to those already achieved by Parties that have phased out methyl bromide or have reduced use of methyl bromide through the critical use process. A review of a suggested list by Parties could identify the feasibility or barriers to their use.

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11. ANNEXES

Annex 1 – Decision XX/6

XX/6: Actions by Parties to reduce methyl bromide use for quarantine and pre-shipment purposes and related emissions

Recognizing that methyl bromide use for quarantine and pre-shipment purposes is an important remaining use of an ozone-depleting substance that is not controlled pursuant to paragraph 6 of Article 2H of the Montreal Protocol and that the 2006 assessment report of the Scientific Assessment Panel indicated that “emissions associated with continued or expanded exemptions, QPS … may also delay recovery [of the ozone layer]”,

Recalling that Article 7 of the Montreal Protocol requires Parties to report on the annual amount of methyl bromide used for quarantine and pre-shipment applications and that decision XI/13 urges Parties to implement procedures to monitor the uses of methyl bromide by commodity and quantity for quarantine and pre-shipment,

Recalling decision VII/5 urging Parties to refrain from using methyl bromide and to use non-ozone depleting technologies wherever possible and decision XI/13 encouraging Parties to use recovery and recycling technologies where technically and economically feasible until alternatives are available,

Reaffirming the importance of managing and, when economically and technically feasible, replacing quarantine and pre-shipment applications of methyl bromide, as stated in the preamble to decision XVII/15,

Stressing that methyl bromide is a potent ozone-depleting substance and that it and many of its alternatives are hazardous substances that have caused serious human health impacts, notably on workers in ports and warehouses in some Parties,

Recognizing that many Parties have relied on methyl bromide for trade and the conservation of biodiversity and will continue to do so until alternatives become available and accepted for all quarantine and pre-shipment uses,

Acknowledging the efforts made by Parties to phase out or reduce the use and emissions of methyl bromide for quarantine and pre-shipment purposes whether through adoption of alternatives or the use of recapture technologies,

Acknowledging with appreciation the joint efforts of the Ozone Secretariat and the International Plant Protection Convention in reviewing alternatives to methyl bromide for phytosanitary purposes, particularly under ISPM-15, and the Convention’s recommendation encouraging Parties to develop and implement strategies to replace and/or reduce methyl bromide use for phytosanitary applications,

Mindful that the use of methyl bromide for quarantine and pre-shipment purposes is still increasing in some regions of the world,

Recognizing current data gaps and the need for better information to monitor and analyse trends in quarantine and pre-shipment use and further to identify opportunities for reducing global amounts of methyl bromide required for quarantine and pre-shipment applications under the Montreal Protocol,

1. To urge those Parties that have not yet done so to report data on the use of methyl bromide for quarantine and pre-shipment applications, as required under paragraph 3 of Article 7, by April 2009 and to report such data in accordance with existing Protocol requirements and decisions annually thereafter;

2. To request the Ozone Secretariat:

   a) To update the definition of pre-shipment in paragraph 5.6 of the Instructions/Guidelines for data reporting to reflect decision XI/12;

b) To post on its website, production and consumption data reported by the Parties under paragraph 3 of Article 7 for methyl bromide used for quarantine and pre-shipment applications;

3. To request the Implementation Committee to consider the reporting of methyl bromide used for quarantine and pre-shipment applications under paragraph 3 of Article 7, in accordance with the Non-Compliance Procedure of the Montreal Protocol;

4. To request the Technology and Economic Assessment Panel, in consultation with the International Plant Protection Convention secretariat, to review all relevant, currently available information on the use of methyl bromide for quarantine and pre-shipment applications and related emissions, to assess trends in the major uses, available alternatives and other mitigation options, and barriers to the adoption of alternatives or determine what additional information or action may be required to meet those objectives; the assessment should consider:

a) A description of the majority of the volumes of methyl bromide used for quarantine and pre-shipment applications, by the major uses and target pests;

b) The technical and economic availability of alternative substances and technologies for the main methyl bromide uses, by volume, and of technologies for methyl bromide recovery, containment and recycling;

c) Quarantine and pre-shipment applications for which no alternatives are available to date and an assessment of why alternatives are not technically or economically feasible or cannot be adopted;

d) Illustrative examples of regulations or other relevant measures that directly affect the use of methyl bromide for quarantine and pre-shipment treatment (including information requested in decision X/11);

e) Other barriers preventing the adoption of alternatives to methyl bromide;

f) Projects demonstrating technically and economically feasible alternatives, including technologies for recapture and destruction of methyl bromide for quarantine and preshipment applications;

5. To request the Technology and Economic Assessment Panel to present a draf report based on the analysis of the available information to the Open-ended Working Group at its twenty-ninth meeting, indicating areas where the information is not sufficient, explaining, where appropriate, why the data were inadequate and presenting a practical proposal for how best to gather the information required for a satisfactory analysis;

6. To request the Technology and Economic Assessment Panel to present a final report highlighting areas where sufficient information indicates opportunities for reductions in methyl bromide use or emissions for quarantine and pre-shipment purposes, including a list of available methyl bromide recapture technologies for consideration by the Parties and, where there is insufficient information, a final proposal for further data gathering for the consideration of the Twenty-First Meeting of the Parties;

7. To request the Technology and Economic Assessment Panel, in accordance with its terms of reference, to list categories of use it has identified that have been classified as quarantine and pre-shipment use by some Parties but not by others by the twenty-ninth meeting of the Open-ended Working Group and that those Parties are requested to provide the information on the rationale for doing so to the Technology and Economic Assessment Panel in time for inclusion in its final report to the Twenty-First Meeting of the Parties

8. To request the Ozone Secretariat, in cooperation with the Technology and Economic Assessment Panel, the International Plant Protection Convention secretariat and other relevant bodies, to organize in the margins of the Twenty-First Meeting of the Parties a workshop to discuss the report of the assessment referred to in paragraph 4 of the present decision and other relevant inputs with a view to determining possible further actions;

9. To request the Ozone Secretariat to strengthen cooperation and coordination with the International Plant Protection Convention secretariat in accordance with decisions XVII/15 and XVIII/14;

10. To encourage Parties in accordance with the recommendations of the third meeting of the Commission on Phytosanitary Measures under the International Plant Protection Convention to put in place a national strategy that describes actions that will help them to reduce the use of methyl bromide for phytosanitary measures and/or

reduce emissions of methyl bromide and make such strategies available to other Parties through the Ozone Secretariat, where possible before the Twenty-First Meeting of the Parties; the strategy may include the following areas for action:

a) Replacing methyl bromide use;

b) Reducing methyl bromide use;

c) Physically reducing methyl bromide emissions;

d) Accurately recording methyl bromide use for phytosanitary measures.

Annex 2: Examples of non-MB quarantine treatments approved by national quarantine authorities for perishable products

Annex 2 contains examples of alternative non-MB quarantine treatments that have been approved by quarantine authorities for the following groups of products:

Table 1: Fresh fruit and vegetables
Table 2: Cut flowers and ornamentals
Table 3: Propagative plant materials for planting, including plants, bulbs and cuttings
References for information sources

Key to tables:

CAT	Forced moist air or vapour warm air with controlled atmosphere treatment (usually 1% oxygen, 15% carbon dioxide or nitrogen).
CHM	Chemical dip or spray, e.g. specified fungicide, acaricide or nematicide, other than methyl bromide.
CT	Cold treatment
HT	Heat treatment
HTF	High temperature forced air treatment
HWT	Warm or hot water treatment
INS	Inspection
IRR	Irradiation
PFA	Approved pest-free production area
PFP	Pest free period, a specified season during which commodities can be imported without treatment
PH3	Phosphine
PR	removal of pests
SWB	Soapy water + brushing
SWW	Soapy water + wax
SYS	Systems approach comprising measures such as pest free areas, trapping, field sanitation, registered packhouses, screened storage etc.
VHT	Vapour heat treatment
WWT	warm water treatment

Annex 2. Table 1: Examples of non-MB quarantine treatments approved by quarantine authorities for fresh fruit and vegetables

In most cases, inspection is also permitted as an alternative option to the treatments listed below.

Commodity	Non-MB treatment or procedure							Country of origin	Importing country	Quarantine pest species	
	Cold	Heat	Chemical	Irradia-tion	Pest free	Inspec-tion	Systems approach			No.	Controlled pest types
Apple					PFA	INS		Australia	India	5	Fruit flies, mealybug, apple moth
Apple	CT					INS		Australia	India	5	Fruit flies, mealybug, apple moth
Apple	CT							Various	USA	> 5	Fruit flies
Apple	CT					INS		South Africa	USA	1	False codling moth
Apple		CAT						Various	USA	2	Codling moth, fruit moth
Apple						INS*		New Zealand	USA	>4	Apple moth, others
Apple							SYS	Chile	Mexico	>1	Cydia molesta, and others
Apricot					PFA	INS		New Zealand	Australia		Not specified
Apricot	CT							Various	USA	> 6	Fruit flies, false codling moth
Avocado	CT							Various	USA	2	Fruit flies
Avocado							SYS	Mexico	USA	>1	Fruit flies
Avocado (Hass)					PFA, SA	INS		Mexico (from approved areas in Michoacán only)	USA (except US territories)	>6	Fruit flies, weevils, seed moth,
Avocado (Hass)							SYS	Argentina	Chile	>1	Fruit flies
Blueberry			CHM			INS		New Zealand	Australia	1	Blueberry rust
Blueberry	CT							Various	USA	> 4	Fruit flies
Breadfruit			SWB					Various	USA	Many	External feeders
Cape gooseberry	CT							Colombia, others	USA	2	Fruit flies
Carambola	CT							Belize, Grenada, Taiwan, others	USA	> 5	Fruit flies, fruit borer
Carambola				IRR				Mexico	USA	several	Fruit flies
Cherimoya			SWW					Chile	USA	1	Spider mite
Cherry							SYS	Australia, New Zealand, USA	Japan	1	Codling moth
Cherry							SYS	Chile	Mexico	>1	Cydia molesta, and others
Cherry	CT							Argentina, Chile, Mexico, others	USA	> 5	Fruit flies
Cherry (sweet)		CAT						Not specified	USA	2	Codling moth, fruit fly
Citrus	CT							South Africa, others	USA	2	Fruit flies, false codling moth
Citrus					PFA			South Africa	USA	1	Citrus black spot
Citrus		HTF						Mexico, infested areas of USA	USA	> 2	Fruit flies
Citrus		HTF						Hawaii	USA	3	Fruit flies
Clementine	CT							Spain, others	USA	> 5	Fruit flies

Commodity	Non-MB treatment or procedure							Country of origin	Importing country	Quarantine pest species	
	Cold	Heat	Chemical	Irradia-tion	Pest free	Inspec-tion	Systems approach			No.	Controlled pest types
Clementine		VHT						Mexico	USA	> 4	Fruit flies, others
Durian, other large fruits			SWB					Various	USA	Many	External feeders
Eggplant		VHT						Various	USA	3	Fruit flies
Eggplant				IRR				Ghana	USA	several	Fruit flies, insects
Ethrog	CT							Various	USA	3	Fruit flies
Fruit (many types)					PFA			Argentina, Australia, Belize, Brazil, Chile, Ecuador, Guatemala, Mexico, Peru	USA		Fruit flies
Fruit (many types)			CHM						NZ		spiders
Fruit (specific types)				IRR				Hawaii	USA	several	Fruit flies, insects
Garlic					PFA			Italy, Spain	USA		Not specified
Grape			checking					Chile (except Arica Province)	USA		Chilean spider mite
Grape							SYS	Chile	Costa Rica	1	Chilean spider mite
Grape	CT							South Africa, others	USA	> 5	Fruit flies, false codling moth
Grapefruit	CT							Israel, Spain	Australia	1	Fruit flies
Grapefruit					PFA	INS		USA	Australia		Fruit flies
Grapefruit	CT							Belize, Israel, Morocco, others	USA	> 5	Fruit flies
Grapefruit		VHT						Mexico	USA	> 2	Fruit flies
Guava				IRR				Mexico	USA	several	Fruit flies, insects
Horseradish roots		HWT						Not specified	USA	2	Golden nematodes
Kiwi fruit	CT							Argentina, France, Zimbabwe, others	USA	> 5	Fruit flies
Kumquat	CT							Not specified	USA	2	Fruit flies, false codling moth
Kumquat		HTF						Infested areas of USA	USA	> 2	Fruit flies
Lemon	CT							Various	USA	3	Fruit flies, false codling moth
Lemon		HTF						Mexico, infested areas of USA	USA	>2	Fruit flies
Lemon		HTF						Hawaii	USA	3	Fruit flies
Lime		WWT						Various	USA	Many	Surface pests, mealybugs
Lime			SWW					Chile	USA	1	Spider mite
Lime		HTF						Mexico, infested areas of USA	USA	>2	Fruit flies
Lime		HTF						Hawaii	USA	3	Fruit flies
Litchi (lychee)	CT							China, Israel, Taiwan, others	USA	6	Fruit flies, fruit borer
Litchi		HTF						Hawaii	USA	2	Fruit flies
Litchi		VHT						Hawaii	USA	2	Fruit flies
Litchi		HWT						Hawaii	USA	2	Fruit flies

Commodity	Non-MB treatment or procedure							Country of origin	Importing country	Quarantine pest species	
	Cold	Heat	Chemical	Irradia-tion	Pest free	Inspec-tion	Systems approach			No.	Controlled pest types
Litchi				IRR				Thailand	USA	several	Fruit flies, insects
Longan	CT					INS		China, Taiwan, others	USA	4	Fruit flies, fruit borer
Longan				IRR				Thailand	USA	several	Fruit flies, insects
Longan		HWT						Hawaii	USA	2	Fruit flies
Loquat	CT							Chile, Israel, others	USA	2	Fruit flies
Mandarin	CT							Israel	Australia	1	Fruit flies
Mandarin	CT							Peru, others	USA	> 3	Fruit flies
Mango	CT				PFA			Haiti	Australia	2	Mango weevils
Mango		VHT			PFA			Philippines	Australia	> 2	Mango weevils
Mango		VHT						Taiwan	Australia		Quarantine pests
Mango					PFA			Mexico	Australia		Fruit flies
Mango		WWT						Mexico	Australia		Fruit flies
Mango		WWT						Central America	USA	> 3	Fruit flies
Mango		HTF						Mexico	USA	3	Fruit flies
Mango (Manilla variety)		VHT						Mexico	USA	> 2	Fruit flies
Mango				IRR				Mexico	USA	several	Fruit flies
Mango				IRR				India	USA	several	Fruit flies, insects
Mango		VHT						Philippines (Gulmaras Island)	USA	3	Fruit flies
Mango		VHT						Taiwan	USA	2	Fruit flies
Mango				IRR				Thailand	USA	several	Fruit flies, insects
Nectarine	CT							Argentina, Israel, Mexico, South Africa, others	USA	> 5	Fruit flies, false codling moth
Nectarine		CAT						Not specified	USA	2	Codling moth, fruit moth
Orange	CT							Israel	Australia	1	Fruit flies
Orange	CT							Costa Rica, Israel, Spain, others	USA	> 6	Fruit flies, false codling moth
Orange		HTF						Mexico	USA	> 3	Fruit flies, others
Orange		VHT						Mexico	USA	> 3	Fruit flies, others
Orange		HTF						Infested areas of USA	USA	> 2	Fruit flies
Orange		HTF						Hawaii	USA	3	Fruit flies
Ortanique	CT							Spain, others	USA	2	Fruit flies
Papaya		VHT						Various	USA	3	Fruit flies
Papaya		HTF						Belize, Chile, Hawaii	USA	3	Fruit flies
Passion fruit			SWW					Chile	USA	1	Spider mite
Peach	CT							Argentina, Israel, Mexico,	USA	> 5	Fruit flies, false codling moth

Commodity	Non-MB treatment or procedure							Country of origin	Importing country	Quarantine pest species	
	Cold	Heat	Chemical	Irradia-tion	Pest free	Inspec -tion	Systems approach			No.	Controlled pest types
								Morocco, others			
Peach					PFA	INS		Mexico	USA	many	Fruit flies
Peach		CAT						Not specified	USA	2	Codling moth, fruit moth
Pear	CT							Chile, France, South Africa, others	USA	> 5	Fruit flies
Pear						INS*		New Zealand	USA	>4	Apple moth, others
Pear							SYS	Chile	Mexico	>1	Cydia molesta, and others
Pepper (bell)					PFA	INS		Europe, Korea, USA	Australia		Fruit flies
Pepper (bell)		VHT						Various	USA	3	Fruit flies
Persimmon	CT							Chile, Israel, Jordan, others	USA	3	Fruit flies
Pineapple		VHT						Various	USA	3	Fruit flies
Pineapple				IRR				Thailand	USA	several	Fruit flies, insects
Pitaya (Yellow)		VHT						Colombia	USA	2	Fruit flies
Plum, Plumcot	CT							Argentina, Israel, Mexico, South Africa, others	USA	> 5	Fruit flies, false codling moth
Plum, Peach							SYS	Chile	Mexico	>1	Cydia molesta, and others
Pomegranate	CT							Greece, Israel, others	USA	> 4	Fruit flies
Pomegranate					PFA	INS		Mexico	USA	several	Fruit flies
Pummelo	CT							Israel, others	USA	2	Fruit flies
Quince	CT							Argentina, Chile, others	USA	> 4	Fruit flies
Rambutan				IRR				Thailand	USA	several	Fruit flies, insects
Rambutan		VHT						Hawaii	USA	2	Fruit flies
Rambutan		HTF						Hawaii	USA	2	Fruit flies
Sand pear	CT							Chile, others	USA	3	Fruit flies, fruit borer
Squash		VHT						Various	USA	3	Fruit flies
Squash					PFA			China	Japan	1	Melon fly
Tangelo	CT							Not specified	USA	> 3	Fruit flies
Tangerine	CT							Israel	Australia	1	Fruit flies
Tangerine	CT							Ecuador, Israel, Mexico, others	USA	> 6	Fruit flies, false codling moth
Tangerine		HTF						Mexico, infested areas of USA	USA	> 2	Fruit flies
Tangerine		HTF						Hawaii	USA	3	Fruit flies
Tomato		VHT						Various	USA	3	Fruit flies
Vegetables, many types					PFA			Argentina, Australia, Belize, Brazil, Chile, Ecuador, Guatemala, Mexico, Peru	USA		Fruit flies
Vegetables, many types			CHM						NZ		spiders

Commodity	Non-MB treatment or procedure							Country of origin	Importing country	Quarantine pest species	
	Cold	Heat	Chemical	Irradia-tion	Pest free	Inspec-tion	Systems approach			No.	Controlled pest types
Vegetables (specific)				IRR				Hawaii	USA	several	Fruit flies, insects
Ya pear	CT							China	USA		Not stated
Zapote (white)	CT							Not specified	USA	1	Fruit flies
Zucchini		VHT						Various	USA	3	Fruit flies

Compiled from: APHIS 2009bcd; APHIS 2009e section 5-2, 5-6; AQIS 2008; AQIS 2009; BNZ 2008; CPHST 2009.
* Fruit are treated with water washers in approved packhouses and inspected by USDA inspectors in New Zealand before shipment.

Annex 2. Table 2: Examples of non-MB quarantine treatments approved by quarantine authorities for cut flowers and ornamentals

Commodity	Non-MB treatment or procedure								Country of origin	Importing country	Quarantine pests	
	Cold	Heat	Chemical	Irradia-tion	Pest removal	Pest free	Inspec-tion	Systems approach			No.	type
Allium		HWT								USA	2	Ditylenchus nematodes
Amaryllis		HWT								USA	2	Ditylenchus nematodes
Aster						PFA	INS			USA	1	*Puccinia horiana* rust
Azelea			CHM		PR					USA	several	*Chrysomyxa* spp.
Azaleodendron			CHM							USA	several	Chrysomyxa spp.
Azaleodendron			CHM		PR					USA	several	*Chrysomyxa* spp.
Bromeliad			CHM		PR					USA	several	*Phyllosticta bromeliae, Uredo* spp.
Broomcorn		ST								USA	several	corn borers, ticks, others
Camellia			CHM		PR					USA	2	Bulb nematodes
Christmas tree						PFA	INS		Canada	USA	2	Pine shoot beetle, gypsy moth
Christmas tree			CHM		PR					USA	1	*Phoma chrysanthemi*
Christmas tree						PFP	INS			USA	1	Pine moth
Chrysanthemum						PFA	INS			USA	many	Actionable pests
Chrysanthemum			CHM		PR					USA	1	*Phoma chrysanthemi*
Cut flowers			CHM							NZ		Snails
Cut flowers			CHM							NZ		Ants, aphids, earwigs, mites, moths, psocids, thrips
Cut flowers			CHM							NZ		Insects
Cut flowers							INS		Chile	USA	many	Actionable pests
Cut flowers							INS		Jamaica	USA	many	Actionable pests
Cut flowers							INS		Australia, Ireland, UK, others	USA	1	Apple moth
Cut flowers						PFA	INS		New Zealand	USA	1	Apple moth
Cut flowers							INS		Canada	USA	many	Actionable pests
Cut flowers without fruit or pods							INS		All other countries	USA	many	Actionable pests
Dried flowers, dried foliage		HT								NZ		Insects
Ferns							INS			USA	many	Actionable pests
Foliage			CHM							NZ		Snails
Foliage			CHM							NZ		Ants, aphids, earwigs, mites, moths, psocids, thrips
Foliage			CHM							NZ		Insects

Commodity	Non-MB treatment or procedure								Country of origin	Importing country	Quarantine pests	
	Cold	Heat	Chemical	Irradia-tion	Pest remova l	Pest free	Inspec-tion	Systems approach			No.	type
Gentian			CHM		PR					USA	several	*Phyllosticta bromeliae*, *Uredo* spp.
Gentiana			CHM		PR					USA		*Septoria gentianae*
Gladiolus							INS		Colombia, Mexico, other countries	USA	1	Gladiolus rust
Grasses (many)							INS		Canada	USA	many	Actionable pests
Orchid							INS			USA	many	Actionable pests
Orchid			CHM		PR					USA	many	Actionable pests
Orchid					PR					USA	several	*Ascochyta* spp.
Orchid			CHM		PR					USA	several	*Cercospora* spp.
Pine decorative materials						PFP				USA	1	Pine moth
Protea							INS			USA	1	Apple moth
Rhododendron			CHM							USA	several	*Chrysomyxa* spp.
Rhododendron			CHM		PR					USA	several	*Chrysomyxa* spp.
Rice straw novelties		HT								USA	several	Rice diseases
Sugarcane		ST								USA	several	Not stated
Sugarcane		HT								USA	several	Not stated

Compiled from: APHIS 2009ac; APHIS 2009e section 5-3 and 5-6; BNZ 2008; CPHST 2009.

Annex 2. Table 3: Examples of non-MB quarantine treatments approved by quarantine authorities for propagative plant material (cuttings and plants for planting)

Commodity	Non-MB treatment or procedure								Country of origin	Importing country	Quarantine pests	
	Cold	Heat	Chemical	Irradiation	Pest removal	Pest free	Inspection	Systems approach			No.	type
Aquatic plants		HWT								USA	many	Snails
Amaryllis		WWT								USA	1	Ditylenchus nematodes
Banana roots		HWT								USA	many	External feeders
Banana roots					PR		INS			USA	many	External feeders
Begonia		WWT								USA	1	Foliar nematodes
Bromeliads			CHM		PR					USA	all	Actionable pests
Bromeliads		HWT*			PR					USA	many	Actionable pests
Bromeliads					PR		INS			USA	many	Actionable pests
Bulbs, various		WWT								USA	several	Ditylenchus nematodes
Bulbs, various		HWT								USA	several	Globodera nematodes
Bulbs, various		HWT								USA	several	Meloidogyne nematodes
Bulbs, various		WWT								USA	1	*Aphelenchoides* foliar nematode
Bulbs*, root divisions, corms, tubers and rhizomes			CHM							NZ		Insects
Bulbs#, root divisions, corms, tubers and rhizomes		WWT	CHM							NZ		Nematodes
Bulbs#, root divisions, corms, tubers and rhizomes			CHM							NZ		Mites
Bulbs#, root divisions, corms, tubers and rhizomes		WWT								NZ		Mites
Cacti and other succulents					PR		INS			USA	many	Borers, soft scales
Calla rhizomes		HWT								USA	several	Meloidogyne nematodes
Christmas trees, pine decorative materials						PFP				USA	1	Moth
Chrysanthemum cuttings			CHM		PR					USA	many	External feeders
Chrysanthemum cuttings		HWT								USA	many	Leafminers, aphids, mites, others
Chrysanthemum		WWT								USA	several	Meloidogyne, Pratylenchus

Commodity	Non-MB treatment or procedure								Country of origin	Importing country	Quarantine pests	
	Cold	Heat	Chemical	Irradiation	Pest removal	Pest free	Inspection	Systems approach			No.	type
												nematodes
Citrus seed		HWT	CHM							USA	1	Citrus canker
Cotton seed			PH3							USA	many	External feeders
Crocus		WWT								USA	2	Nematodes
Gladiolus		WWT								USA	1	Ditylenchus nematode
Greenhouse-grown plants							INS			USA	Many	Borers, soft scales
Herbaceous plants, herbaceous cuttings							INS			USA	many	Borers, soft scales
Hosta	CT	WWT								USA	1	Foliar nematode
Hyacinth bulbs		WWT								USA	2	Ditylenchus nematodes
Iris bulbs and rhizomes		HWT								USA	2	Ditylenchus nematodes
Lily bulbs		WWT								USA	1	*Aphelenchoides* foliar nematode
Narcissus bulbs		HWT								USA	1	Mite
Narcissus bulbs		HWT								USA	1	Ditylenchus nematodes
Nursery stock: whole plants, cuttings, etc.			CHM							NZ	many	Insects
Nursery stock: whole plants, cuttings, etc.			CHM							NZ		Spiders
Orchids, plants, cuttings		HWT*			PR					USA	many	Actionable pests
Orchids, plants, cuttings					PR		INS			USA	many	Actionable pests
Orchids, plants, cuttings					PR					USA		Galls
Orchids, plants, cuttings		HWT								USA	> 3	Leaf miner, others
Orchids, plants, cuttings			CHM		PR					USA	many	Actionable pests
Pods and seeds of Kenaf, Hibiscus, Okra			PH3							USA	many	Internal feeders
Polyanthes tubers		WWT								USA	1	Ditylenchus nematodes
Potato tubers		WWT								USA	2	Globodera nematodes
Propagative plant			CHM							USA	several	Snails

Commodity	Non-MB treatment or procedure								Country of origin	Importing country	Quarantine pests	
	Cold	Heat	Chemical	Irradiation	Pest removal	Pest free	Inspection	Systems approach			No.	type
materials												
Propagative plant materials					PR		INS			USA	several	Snails
Propagative plant materials			CHM		PR					USA	all	Actionable pests
Propagative plant materials		HWT			PR					USA	all	Actionable pests excluding scale insects
Propagative plant materials					PR		INS			USA	all	Actionable pests excluding scale insects
Rose		HWT								USA		Meloidogyne nematodes
Seeds for sowing			PH3									Insects except Trogoderma
Seeds with pulp					PR					USA	many	Fruit flies, others
Strawberry		HWT								USA	several	Pratylenchus surface diseases
Strawberry		HWT								USA	1	*Aphelenchoides* nematodes
Woody plant cuttings (greenwood)							INS			USA	many	Borers, soft scales

Compiled from: APHIS 2009e, sections 5-3 and 5-6; BNZ 2008.
Dormant bulbs.
* Hot water dip is not effective against all insects (APHIS 2009e, p.5-3-20).

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Annex 3 . Responses by Parties to listing under Decision XX/6(7)

Full responses, exactly as received from the Parties, are included at the end of the report.

i. Thailand

Rice exports: The rice milling process does not exclude all pests; it is common to store the grain for a period of time before export occurs, during which infestation can become widespread. Because the pests involved are often of quarantine character, fumigation with either MB or phosphine is used to treat rice before export and thus meet standard and official requirements for phytisanitary certification. Treatment is essential to ensure that the exported rice is pest-free and meets the Thai Rice Quality Standard.

Cassava Chips: Farmers normally harvest tapioca roots each year, then cut, dry and store it in open warehouses until a purchase order is received. To ensure that quality as specified in the Tapoioca Standard is met, and a phytosanitary certificate issued, fumigation with MB is necessary as infestation can occur during storage.

Thailand considers the treatment of exported rice and cassava chips with MB as a pre-shipment treatment required to meet official phytosanitary requirements for these products. The country highlights its accreditation scheme included in the Biennial Program of the National MB Phaseout Plan (NMBPP) through which a phytosanitary certification can be issued to accredited manufacturers without treatment. This is used for commodities with low risk of pest infestation. They are also searching for alternatives for pre-shipment applications of MB. Thailand has further set up a Management Information System (MIS) to facilitate import monitoring and control of MB usage.

ii. United States

After referring to Paragraph 7 of Decision XX/6 and Montreal Protocol definitions of Quarantine and Preshipment, the United States provided the following rationale:

TEAP Assessments of Montreal Protocol Definitions of Quarantine and Pre-shipment

The TEAP, and its subsidiary bodies the MBTOC and the QPS Task Force, have assessed the Montreal Protocol definitions of “quarantine” and “preshipment” and provided guidance to the Parties in many reports. TEAP reports in 1998, 1999, 2002, and 2006 compared the Montreal Protocol definitions of “quarantine” and “preshipment” to definitions under the International Plant Protection Convention (IPPC).

The TEAP, MBTOC and QPSTF have suggested that Parties may wish to consider aligning the language in Decision VII/5 with definitions under the IPPC. The Parties to the Montreal Protocol have not taken any action to change the definitions of “quarantine applications” and “preshipment applications” agreed in Decision VII/5 to more closely align with the IPPC definitions.

Many TEAP reports have provided detailed assessments of the Montreal Protocol language in Decision VII/5 that defines “quarantine applications” and “preshipment applications.”

In 1999, the TEAP conducted a particularly detailed analysis of the Montreal Protocol language in Decision VII/5. The following are excerpts from the 1999 TEAP Progress Report giving guidance to Parties on how the definitions of QPS in Decision VII/5 might be used to implement the exemption

Page 24, MBTOC Report, 1999

> **"3.2.4 Scope of QPS**
>
> "There has been considerable discussion on the scope of the QPS exemption which is summarized here. For quarantine treatments, the Parties decided to:
>
> - Include quarantine treatments for commodities moved interstate or region within the one territory."

Page 27, MBTOC Report, 1999

> "**3.3 Examples that May Assist in Categorizing 'Quarantine' and 'Pre-shipment'**
>
> "**3.3.1 Uses considered by MBTOC to be QPS**

A. *" <u>Official treatment of a commodity transported within a country</u> (underline added) where there is potential for transfer of a quarantine pest into an area declared free of that pest, or when the pest is under official containment. (Examples from the report cited)*

B. " *<u>MB treatment of land prior to export of crop</u> (underline added)*

- ***Example:*** Fumigation of land prior to planting strawberry runners for export.
- ***Reasoning:*** This is covered by the QPS exemption as the treatment was carried out for official phytosanitary reasons (pers. Comm.. Dr Frank Westerlund, MBTOC) against soil pathogens that could be carried by the exported strawberry runners."

4. Diagram Representing Uses Considered by MBTOC to be QPS

A diagram included in the 1999 TEAP Progress Report shows examples that MBTOC considers to be QPS from. The overlapping ovals in the diagram show that "uses considered by MBTOC to be QPS" can overlap and therefore a single use can be classified as QPS in two different ways, such as treatment for intra-country movement to meet quarantine requirements, and treatment to meet quarantine requirements for propagation nursery plants.

The MBTOC examples from the 1999 Progress Report and the diagram mentioned provided guidance to the USA when interpreting Decision VII/5 in the development of the national regulations. The examples provided in the 1999 TEAP Progress Report and specific uses considered by MBTOC to be QPS (example A and B below) helped in the USA in classifying uses of methyl bromide to be QPS.

5. Examples of USA Official Control for Treatment of Propagation Material

The USA is a federal constitutional republic comprising fifty States and a federal district. Within this Federal political system each of the fifty States has jurisdiction for defining its own laws and regulations for governing its territory. This includes creating State quarantine requirements.

The national government of the USA has quarantine laws and regulations that govern the movement of commodities into and out of the nation, as well as across State borders. Some USA national quarantine restrictions even define quarantine restrictions for movement of goods into and out of specific counties (sub-regions within a State) when a program is established *to prevent the introduction, establishment and/or spread of quarantine pests (including diseases)*. An example of a county-level or state-level quarantine program would be the control of fire ants, golden nematodes, or asian citrus psyllid. The regulatory list of quarantine treatments and quarantine pests for various plants, bulbs, corms, tubers, rhizomes and roots (propagation material for nursery stock) published by the US Animal, Plant Health Inspection Service (APHIS) is included in Annex IV.

Each of the fifty States has quarantine regulations and restrictions to protect its territory from the introduction of quarantine pests. The economic activity in each State is different. Many States rely heavily on official controls to ensure high plant health for imported nursery stock propagation material. Some States rely heavily on preventing quarantine pests (i.e., and net importing State) while other States have significant economic activity in producing nursery stock (propagation material) that is principally exported and must meet quarantine requirements of importing foreign nations or of other States within the USA. For example, the States in the northwestern United States have an important and very active forestry industry. To protect their forest resources and the economic importance of their forest industry, northwestern States depend on healthy forest tree seedlings for reforestation programs. The quarantine restrictions regarding tree seedlings in northwestern States, and other States around the country, are established "*to prevent the introduction, establishment and/or spread of quarantine pests (including diseases), or to ensure their official control," (quote from Decision VII/5).*

As examples, this document shows below excerpts from State or national quarantine regulations (official controls). The list contained in Annex V is not exhaustive and is only illustrative.

Example – Oregon State – Department of Agriculture regulation

Weed-Free Tree Seedling Nurseries (OAR-603-052-1205)

(1) Nursery-grown tree seedlings for commercial forest production can spread noxious weeds if they become contaminated with weed seeds. In order to prevent the spread of noxious weeds, it is necessary to keep them out of the seedling production fields at nurseries that grow conifer and hardwood seedlings for commercial forest plantings. Noxious weeds found in seedling nurseries include, but are not limited to, yellow nutsedge, thistles, St. Johnswort, creeping

yellow cress and quackgrass. OAR-603-052-1200 has a complete list of noxious weeds quarantined in Oregon.

(2) To prevent the establishment and spread of noxious weeds via tree seedlings used for commercial forest plantings, seedling production fields must be kept noxious weed-free.

(3) Currently the preferred method of treatment of seedling production fields, though not the only acceptable treatment, is fumigation with methyl bromide prior to seeding or transplanting of seedlings. This rule is intended as a bridge to ensure effective noxious weed control until technically viable and economically feasible alternative controls and methods can be developed and tested. Active testing of alternatives is underway but has not yet proven operationally successful. This section (3) of this rule may be repealed on December 31, 2013 unless a thorough review as to its importance results in a finding that it is still necessary.

Example – South Carolina – Code of Laws Title 46 - Agriculture

Chapter 33: Shipment and Sale of Trees, Plants and Shrubs

Inspection of out-of-state shipments into State. (Section 46-33-10)

Every person engaged in the nursery business at a place without this State who ships trees or plants into this State shall have them examined by the State Crop Pest Commission, and no such shipment shall be made until and unless such plants have been inspected by the Commission and shall have had placed thereon a tag prepared by the Commission, showing that such trees or plants have been duly inspected and are free from disease.

Phytosanitary certificate or permit; fumigation using methyl bromide (Section 46-33-85) A phytosanitary certificate or a permit may be issued by an inspector for intrastate and interstate shipments of conifer and hardwood seedlings to verify that they are apparently free of pests and diseases. To ensure pest and disease-free plant material, the preferred method of treatment is fumigation using methyl bromide in seedling plant beds prior to seedling.

Example – United States -- Animal and Plant Health Inspection Service (APHIS)

Federal Domestic Quarantine Order: Citrus Greening Disease (CG) and Asian Citrus Psyllid (ACP)

The Administrator of the Animal and Plant Health Inspection Service (APHIS) has determined that it is necessary, in order to prevent the destructive and harmful dissemination of citrus greening disease (CG) and/or asian citrus psyllid (ACP), to establish restriction on the interstate movement of CG host material from quarantined areas in the States of Florida and Louisiana and ACP host material from quarantined areas in the States of Alabama, California, Florida, Georgia, Hawaii, Louisiana, Mississippi, South Carolina, and Texas, as well as the Commonwealth of Puerto Rico and the Territory of Guam.

6. USA Legal Background in Establishing the QPS Exemption

The Parties to the Montreal Protocol agreed on a QPS exemption in 1997 and also agreed on the definitions for QPS in 1997. However, the USA did not have legal authority for creating a QPS exemption for methyl bromide production and import until October 1998.

In October 1998, the United States law was amended to create an exemption for production and import of methyl bromide for quarantine and preshipment applications. The amendment was made to the Section 604(d)(5) of the Clean Air Act. Annex VI contains a copy of the language added to amend the Clean Air Act law.

The development of regulation to enact the law was a particularly lengthy process and involved multiple consultations with environmental groups, industry representatives, and U.S. government agencies. Initial work on the regulations by US EPA began in early 1999. The interim final regulation was published July 2001. During the development of the quarantine and preshipment regulations, US EPA considered carefully the many decisions of the Parties to the Montreal Protocol. In developing the domestic regulations, US EPA also considered the assessments by the MBTOC and the TEAP.

7. U.S. EPA regulation – Methyl Bromide QPS exemption

U.S. EPA issued an interim final regulation for the QPS exemption in July 19, 2001. US EPA moved forward with finalizing the regulation during 2001 and published the final regulation on January 2, 2003. In both the interim final and the final regulation US EPA made reference to the guidance from TEAP and MBTOC regarding uses considered to be QPS, such as "treatment of land prior to export of crop" (i.e., for propagation material like strawberry runners).

Below are excerpts from US EPA's final regulation published January 2, 2003. The full explanatory text for the interim final regulation published July 19, 2001, and the explanatory text for the final regulation published January 2, 2003, are attached in Annex VII.

"The provisions of the Vienna Convention on the Law of Treaties (VCLT), 8 International Legal Materials 679 (1969), that concern treaty interpretation generally reflect customary international law. Paragraph 1 of Article 31 of the Vienna Convention on the Law of Treaties provides that a treaty "shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose."

"… the definition of quarantine applications is qualified by the scope of the exemption as stated in the Clean Air Act (US law). As passed by Congress, the Clean Air Act (CAA) specifically applies the quarantine and preshipment exemption to quantities of methyl bromide used to 'fumigate commodities entering or leaving the United States or any State (or political subdivision thereof)…' (CAA section 504(d)(5)). This language makes clear Congress's intent to apply the exemption only where there is the transport of goods from one distinct locality to another, and thus to prevent the potential for the geographic spread of pests. As a result, today's action adds the following sentence to the definition of quarantine applications: 'This definition excludes treatments of commodities not entering or leaving the United States or any State (or political subdivision thereof).'"

"With today's final action, [US] EPA is defining quarantine applications …as follows:"

"*Quarantine applications*, with respect to [methyl bromide], are treatments to prevent the introduction, establishment and/or spread of quarantine pests (including diseases), or to ensure their official control, where: (i) Official control is that performed by, or authorized by, a national (including state tribal or local) plant, animal or environmental protection or health authority; (ii) quarantine pests are pests of potential importance to the areas endangered thereby and not yet present there, or present but not widely distributed and being officially controlled. This definition excludes treatments of commodities not entering or leaving the United States or any State (or political subdivision thereof)."

"As specified in the above definition, a quarantine application of methyl bromide must be 'performed by, or authorized by, a national (including state, tribal or local) plant, animal or environmental protection, or health authority.' In addition, as delineated in the above definition, quarantine applications must be directed at quarantine pests."

8. Conclusion

The USA implements the provisions of the Montreal Protocol in accordance with the definitions of "quarantine applications" and "preshipment applications" in Decisions VII/5 and XI/12 as agreed by the Parties to the Montreal Protocol. The above information describes how the USA implements the national regulatory program to ensure QPS uses of methyl bromide are protective of agriculture consistent foreign-, national- and State-level official controls established by the appropriate plant, animal or environmental protection or health authority."

Annexes included with this rationale can be found at the end of this report.

**iii.	Vietnam**

The official response provided by Vietnam to the Ozone Secretariat states that coffee, rice and casava chips are the major commodities exported by the country; these are harvested seasonally and then stored until commercial contracts for exporting them come by. As a result, they may become infested with pests during storage and not meet phytosanitary requirements of the importing countries. Accordingly, commodities may be refused by importer, destroyed or re-shipped, leading economic losses for exporters.

To ensure freedom from regulated pests, these commodities are often treated with MB at the request of the importing country or to comply with a pest-free status agreed within contracts between importers and exporters. This is a legal disposition regulated by the exporting country (Vietnam) in Article 23, 24 of the Plant Quarantine Regulation (enacted by Decree 92/CP of November 27th 1993), and Article 25 of Decree 02/2007/ND-CP on Plant Quarantine (05/01/2007); it is also in accordance withthe concept "Pre-shipment application" in Decision VII/5 and XI/12 of the Montreal Protocol. In such cases Vietnam thus considers MB treatment of rice, coffee and cassava chips as a preshipment application to meet official phytosanitary requirements for these products.

Vietnam also highlighted its efforts to implement a MB phase out plan. One of activities carried out in this respect is a Policy Review aimed at reviewing the country's legal document system, to find the limitations and constraints for the control and management of MB use. Vietnam further reconfirmed its commitment to the Montreal Protocol and its efforts to devise efficient means to monitor, manage, import and use of MB effectively. In the draft version of its Plant Protection and Quarantine Law, Vietnam will focus on the integration and harmonization of Phytosanytary requirements and obligations to which it is committed, including the Montreal Protocol

iv Chile

Although initially reporting classification of preplant soil fumigation for the production of strawberry runners as QPS, Chile later sent a clarification, where such use is not considered to fall within quarantine and is thus included under their controlled uses.

Annex 4 – Further information on regulations impacting methyl bromide use for QPS purposes

1. Canada

Country	Commodity or pest	List (and URL) of national regulations covering Import and Export of commodities (eg. regulation under a specified Act)	National regulations covering MB use for QPS (Name and URL)	Comments
Canada		2. *Policy on the Issuance of Phytosanitary certificate* http://www.inspection.gc.ca/english/plaveg/protect/dir/d-99-06e.shtml 3.	**1. Implementation Policy for the Quarantine and Pre-shipment (QPS)Treatment Applications of the fumigant Methyl Bromide in Canada, May 2008** **Exports** 'Methyl bromide quarantine treatments on exports from Canada shall only be conducted and may only be certified on phytosanitary certificates when the treatment is officially required by and has been prescribed by the National Plant Protection Organization (NPPO) of the importing country in their PQIR or other official documents. Preshipment export treatments may only be considered as exempted from phase-out controls of the *Montreal Protocol* when the **importing** country has published official phytosanitary requirements which prescribe the methyl bromide treatment. The only **existing** (ie. dating from 1995) Canadian required export pre-shipment methyl bromide treatments which may be authorized by an Inspector for application in Canada are in empty ship holds in vessels designated to carry Canadian grain and grain products which are regulated under the *Canada Grains Act*. However, every effort should be made to use an alternate fumigant in most circumstances. Methyl bromide should be considered for use only when there are extenuating circumstances such as where there is imminent danger of a quarantine or very	Any QPS methyl bromide treatment required by the NPPO of the importing country as a condition for entry must be verified by the inspection staff in accordance with relevant official standards, policies or standard operational procedures. Details on the treatment are to be entered on the Phytosanitary Certificate unless the FPQIR specifically requests an additional declaration to be made. Any treatments required for import or domestic purposes must be supervised or verified effective by inspection staff in accordance with relevant official inspection policies and procedures. Every QPS MB treatment application must have a tracking report prepared. Any QPS methyl bromide treatment required by the NPPO of the importing country as a condition for entry must be verified by the inspection staff in accordance with relevant official standards, policies or standard operational procedures. Details on the treatment are to be entered on the Phytosanitary Certificate in the space provided for treatment, unless the FPQIR specifically

Country	Commodity or pest	List (and URL) of national regulations covering Import and Export of commodities (eg. regulation under a specified Act)	National regulations covering MB use for QPS (Name and URL)	Comments
			uncommon storage pest for Canada escaping from the ship holds'. **Imports** 'On arrival methyl bromide quarantine treatments on imports into Canada may only be authorized by a Plant Protection Inspector duly designated under the *Canadian Food Inspection Agency Act*. Such treatment orders must be documented (section 17 & 18, *Plant Protection Regulations*, *Treatment or Processing of a Thing or Place*). Generally such treatment orders will be promulgated as enforcement actions to address non-compliance with Canada's PQIR or due to the detection of, or because of reasonable suspicions for the actual presence of a quarantine pest at the time of arrival of things in Canada. On-arrival methyl bromide treatments shall not be undertaken as a routine precaution for normal importing. Any necessary precautions must have been taken at origins before despatch of things to Canada (section 38, *Plant Protection Regulations*, *Treatment or Processing*). **Domestic** QPS methyl bromide treatments shall only be undertaken in order to comply with requirements specified in Movement Certificates or with other official phytosanitary.	requests an additional declaration to be made. Any treatments required for import or domestic purposes must be supervised or verified effective by inspection staff in accordance with relevant official inspection policies and procedures.

2. EC

Table 1 of Annex 4: Options in Directive 2000/29/EC for treatments to reduce the risk of harmful organisms entering and spreading in the European Community ?which would be MB treated in other jurisdictions?

Plant or plant product / Treatment	Artificially dwarfed plants	Cut flowers	Fruit	Grain	Plants	Plants for planting	Seeds	Trees and shrubs	Tubers	Vegetables	Wood	Wood packaging material
Inspection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Area freedom			✓	✓	✓	✓	✓		✓		✓	
No symptoms			✓	✓	✓	✓	✓	✓				
Appropriate treatment	✓	✓				✓	✓	✓				
Country freedom		✓	✓		✓					✓		
Heat treatment (air or water)						✓	✓				✓	✓
Production field freedom			✓			✓	✓		✓			
Fumigation						✓	✓				✓	✓
Laboratory culture and/or testing of genetic line or samples						✓	✓		✓			
Monthly or 2-monthly field inspections	✓				✓	✓						
Area freedom and vicinity					✓	✓						
Bark free											✓	✓
Production cycle freedom			✓			✓						
Random sampling	✓								✓			
Soil freedom			✓			✓						
Acid extraction							✓					
Chemical fungicide treatment			✓									
Chemical pressure impregnation											✓	
Cold treatment			✓									
Field treatment					✓							
Free from flowers, fruit and plant debris								✓				
Grown in plant nursery								✓				
Kiln drying to < 20% moisture											✓	
Less than one preceding seed harvest before crop							✓					
Natural seed resistance							✓					
Packed at registered facilities			✓									
Potted on shelves at least 50 cm from the ground	✓											
Produced in glasshouse or isolated cage						✓						
Removal of infested plants + test remainder	✓											
Shake and wash roots + new medium	✓											
Squared to remove rounded surface											✓	

Annex 1 of Annex 4: Harmful organisms that are banned from the European Community.

	CATEGORY	SUB- CATEGORY	HARMFUL ORGANISM	ILLUSTRATIVE EXAMPLES	TOTAL NUMBER OF SPECIES IN THIS SUB-CATEGORY
1	**Annex 1 / Part A:** **Harmful organisms whose introduction into, and spread within, all Member States is banned**	**Harmful organisms not known to occur in any part of the Community and relevant for the entire Community**	Insects, mites and nematodes, at all stages of their development	*Bemisia tabaci* Genn. (non-European populations) vector of viruses; Tephritidae (non-European) such as *Anastrepha fraterculus* (Wiedemann), *A. ludens* (Loew), A. *obliqua* Macquart *A. suspensa* (Loew); *Rhagoletis cingulata* (Loew), *R. completa* Cresson, *R. fausta* (Osten-Sacken), *R. indifferens* Curran, *R. mendax* Curran, *R. pomonella* Walsh, *R. ribicola* Doane, *R. suavis* *Xiphinema californicum* Lamberti and Bleve-Zacheo	58 species in total, including 23 species of fruit flies
2			Bacteria	Only example: *Xylella fastidiosa* (Well and Raju)	1 species
3			Fungi	*Ceratocystis fagacearum* (Bretz) Hunt; *Gymnosporangium* spp. (non-European); *Monilinia fructicola* (Winter) Honey	17 species
4			Viruses and virus-like organisms	Tobacco ringspot virus, Andean potato latent virus, Peach phony rickettsia	32 species
5			Parasitic plants	Only example: *Arceuthobium* spp. (Small mistletoe, non-European)	1 species
6	**Annex 1 / Part A:** **Harmful organisms whose introduction into, and spread within, all Member States is banned**	**Harmful organisms known to occur in the Community and relevant for the entire Community**	Insects, mites and nematodes, at all stages of their development	*Globodera pallida* (Stone) Behrens; *Meloidogyne chitwoodi* Golden *et al*. (all populations); *Spodoptera littoralis* (Boisduval)	8 species
7			Bacteria	*Clavibacter michiganensis* (Smith) Davis *et al*. ssp. *sepedonicus* (Spieckermann and Kotthoff) Davis *et al*.; *Pseudomonas solanacearum* (Smith) Smith	2 species
8			Fungi	*Melampsora medusae* Thüme; *Synchytrium endobioticum* (Schilbersky) Percival	2 species
9			Viruses and virus-like organisms	Apple proliferation mycoplasm; Apricot chlorotic leafroll mycoplasm; Pear decline mycoplasm	3 species
11			Viruses and virus-like organisms	Tomato spotted wilt virus (SE, FI)	2 species

	CATEGORY	SUB- CATEGORY	HARMFUL ORGANISM	ILLUSTRATIVE EXAMPLES	TOTAL NUMBER OF SPECIES IN THIS SUB-CATEGORY
12	***ANNEX II /* Part A** **Harmful organisms whose introduction into, and spread within, all Member States shall be banned if they are present on certain plants or plant products**	**Harmful organisms not known to occur in the Community and relevant for the entire community**	Insects, mites and nematodes, at all stages of their development	*Aculops fuchsiae* Keifer on plants of *Fuchsia* L., intended for planting, other than seeds; *Carposina niponensis* Walsingham on plants of *Cydonia* Mill., *Malus* Mill., *Prunus* L. and *Pyrus* L., other than seeds, originating in non-European countries	32 species
13			Bacteria	*Erwinia stewartii* (Smith) Dye on seeds of *Zea mais* L.	5 species
14			Fungi	*Alternaria alternata* (Fr.) Keissler (non-European pathogenic isolates) on plants of *Cydonia* Mill., *Malus* Mill. and *Pyrus* L. intended for planting, other than seeds, originating in non-European countries	16 species
15			Viruses and virus-like organisms	Citrus mosaic virus on Plants of *Citrus* L., *Fortunella* Swingle, *Poncirus* Raf., and their hybrids, other than fruit and seeds	15 species
16	***ANNEX II /* Part A** **Harmful organisms whose introduction into, and spread within, all Member States shall be banned if they are present on certain plants or plant products**	**Harmful organisms known to occur in the Community and relevant for the entire Community**	Insects, mites and nematodes, at all stages of their development	*Daktulosphaira vitifoliae* (Fitch) on plants of *Vitis* L., other than fruit and seeds	9 species
17			Bacteria	*Erwinia amylovora* (Burr.) Winsl. *et al*. on plants of *Amelanchier* Med., *Chaenomeles* Lindl., *Cotoneaster* Ehrh., *Crataegus* L., *Cydonia* Mill., *Eriobotrya* Lindl., *Malus* Mill., *Mespilus* L., *Photinia davidiana* (Dcne.) Cardot, *Pyracantha* Roem., *Pyrus* L. and *Sorbus* L., intended for planting, other than seeds	11 species
18			Fungi	*Phytophthora fragariae* Hickmann var. *fragariae* on plants of *Fragaria* L., intended for planting, other than seeds	12 species
19			Viruses and virus-like organisms	Raspberry ringspot virus on plants of *Fragaria* L. and *Rubus* L., intended for planting, other than seeds	16 species
20	***ANNEX III /* PART A** **Plants, plant products and other objects the introduction of which shall be prohibited in all Member States**			Isolated bark of *Quercus* L., other than *Quercus suber* L. from North American countries; Plants of *Vitis* L., other than fruits from third countries other than Switzerland; Plants of *Cydonia* Mill., *Malus* Mill., *Prunus* L. and *Pyrus* L. and their hybrids, and *Fragaria* L., intended for planting, other than seeds from non-European countries, other than Mediterranean countries, Australia, New Zealand, Canada, the continental states of the USA	19 categories (2 are shown here)

Annex 2 of Annex 4: Harmful organisms whose introduction into and spread within certain Protected Zones is banned when present on certain plants or plant products

	CATEGORY	SUB-CATEGORY	HARMFUL ORGANISM	ILLUSTRATIVE EXAMPLES	PROTECTED ZONE(S) / ILLUSTRATIVE EXAMPLES
1	**Annex I / Part B:** **Harmful organisms whose introduction into, and whose spread within, certain Protected Zones shall be banned**		Insects, mites and nematodes, at all stages of their development	*Bemisia tabaci* (Genn.) European populations *Daktulosphaira vitifoliae* (Fitch*)* *Liriomyza bryoniae* (Kaltenbach)	*IE, PT, UK, SE, FI* *CY* *IE and UK* 5 species in total
2	***ANNEX II /* Part B** **Harmful organisms whose introduction into, and whose spread within certain Protected Zones shall be banned if they are present on certain plants or plant products**		Insects, mites and nematodes, at all stages of their development	*1)* *Anthonomus grandis* (Boh.) on seeds and fruits (bolls) of *Gossypium* spp. and unginned cotton; 2) *Ips amitinus* Eichhof on plants of *Abies* Mill., *Larix* Mill., *Picea* A. Dietr. and *Pinus* L., over 3 m in height, other than fruit and seeds, wood of conifers (*Coniferales*) with bark, isolated bark of conifers	In the Protected Zones of : 1) EL, ES (Andalucia, Catalonia, Extremadura, Murcia, Valencia) 2) EL, FR (Corsica), IE, UK
3			Bacteria	*Curtobacterium flaccumfaciens* pv. *Flaccumfaciens* (Hedges) Collins and Jones on seeds of *Phaseolus vulgaris* L. and Dolichos Jacq	In the Protected Zones of EL, ES, PT
4			Fungi	*Glomerella gossypii* Edgerton on Seeds and fruits (bolls) of *Gossypium* spp.	In the Protected Zone of EL
5			Viruses and virus-like organisms	Grapevine flavescence dorée MLO in plants of *Vitis* L., other than fruit and seeds	In the Protected Zones of CZ, FR (Champagne-Ardenne, Lorraine and Alsace), IT (Basilicata)
6	***ANNEX III /* PART B** **Plants, plant products and other**			Plants and live pollen for pollination of: Cotoneaster Ehrh. and *Photinia*	ES, EE, FR (Corsica), IE, IT (Abruzzo, Apúlia, Basilicata, Calabria, Campania, Emilia- Romagna (the provinces of Parma and Piacenza),

	CATEGORY	SUB-CATEGORY	HARMFUL ORGANISM	ILLUSTRATIVE EXAMPLES	PROTECTED ZONE(S) / ILLUSTRATIVE EXAMPLES
	objects the introduction of which shall be prohibited in certain Protected Zones			*davidiana* (Dcne.) Cardot, other than fruit and seeds, originating in third countries other than those recognised as being free from *Erwinia amylovora*, or in which pest free areas have been established in relation to *Erwinia amylovora*	Friuli-Venezia Giulia, Lazio, Liguria, Lombardy (except the province of Mantua), Marche, Molise, Piedmont, Sardinia, Sicily, Tuscany, Umbria, Valle d'Aosta, Veneto (except the province of Rovigo, the communes Castelbaldo, Barbona, Piacenza d'Adige, Vescovana, S. Urbano, Boara Pisani, Masi in the province of Padova and the area situated to the south of highway A4 in the province of Verona)), LV, LT, AT (Burgenland, Carinthia, Lower Austria, Tirol (administrative district Lienz), Styria and Vienna), PT, SI (except the regions Gorenjska, Koroška, Notranjska and Maribor), SK (except the communes of Blahová, Horné Mýto and Okoč (Dunajská Streda County), Hronovce and Hronské Kľačany (Levice County), Veľké Ripňany (Topoľčany County), Málinec (Poltár County), Hrhov (Rožňava County), Kazimír, Luhyňa, Malý Horeš, Svätuše and Zatín (Trebišov County)), FI, UK (Northern Ireland, Isle of Man and Channel Islands).

AT = Austria; CZ = Czech Rep.; EE = Estonia; EL = Greece; ES = Spain; FI = Finland; FR = France; IE = Rep. of Ireland; IT = Italy; LV = Latvia; PT = Portugal, SI = Slovenia; SK = Slovakia; UK = United Kingdom.

Annex 3 of Annex 4: Harmful organisms that are subject to Special Requirements in the European Community

CATEGORY	SUB-CATEGORY	PLANTS, PLANT PRODUCTS AND OTHER OBJECTS	ILLUSTRATIVE EXAMPLES OF SPECIAL REQUIREMENTS
***ANNEX IV /* PART A** **Special requirements which must be laid down by all Member States for the introduction and movement of plants, plant products and other objects into and within all Member States**	**Section I**: Plants, plant products and other objects originating outside the Community	Whether or not listed among the CN codes in Annex V, Part B, wood of conifers (Coniferales), except that of *Thuja* L.(cedar), other than in the form of: — Chips, particles, sawdust, shavings, wood waste and scrap obtained in whole or part from these conifers, — Wood packaging material, in the form of packing cases, boxes, crates, drums and similar packaging, pallets, box pallets and other load boards, pallet collars, actually in use in the transport of objects of all kinds, — Wood used to wedge or support non-wood cargo, — Wood of *Libocedrus decurrens* Torr. where there is evidence that the wood has been processed or manufactured for pencils using heat treatment to achieve a minimum temperature of 82 °C for a seven to eight-day period, but including that which has not kept its natural round surface, originating in Canada, China, Japan, the Republic of Korea, Mexico, Taiwan and the USA, where *Bursaphelenchus xylophilus* (Steiner et Bührer) Nickle *et al*. is known to occur.	Official statement that the wood has undergone an appropriate: (a) Heat treatment to achieve a minimum core temperature of 56 °C for at least 30 minutes. There shall be evidence thereof by a mark 'HT' put on the wood or on any wrapping in accordance with current usage, and on the certificates referred to in Article 13.1.(ii), or (b) Fumigation to a specification approved in accordance with the procedure laid down in Article 18.2. There shall be evidence thereof by indicating on the certificates referred to in Article 13.1.(ii), the active ingredient, the minimum wood temperature, the rate (g/m3) and the exposure time (h), or (c) Chemical pressure impregnation with a product approved in accordance with the procedure laid down in Article 18.2. There shall be evidence thereof by indicating on the certificates referred to in Article 13.1. (ii), the active ingredient, the pressure (psi or kPa) and the concentration (%).
		As above but for wood of *Thuja* L.	Official statement that the wood: (d) is bark-free; or (e) Has undergone kiln-drying to below 20 % moisture content, expressed as a percentage of dry matter, achieved through an appropriate time/temperature schedule. There shall be evidence thereof by a mark 'kiln dried' or 'K.D.' or another internationally recognised mark, put on the wood or on any wrapping in accordance with current usage; or (a), (b) or (c) above
		Conifer (Coniferales) wood from Russia, Kazakhstan and Turkey, other than in the form of i. Chips, particles, sawdust, shavings, wood waste and scrap obtained in whole or part from the conifers, ii. Wood packaging material in the form of packing cases, boxes, crates, drums and similar packings, pallets, box pallets and other boards, pallet collars, actually in use in the transport of objects of all kinds. iii. Wood used to wedge or support non-wood cargo	Official statement that the wood: (f) Originates in areas known to be free from: — *Scolytidae* spp. (non-European) — *Monochamus* spp. (non-European) — *Pissodes* spp. (non-European) The area shall be mentioned on the certificates referred to in Article 13.1.(ii), under the rubric 'place of origin,' or (g) is bark-free and free from grub holes, caused by the genus *Monochamus* spp. (non-European), defined for this purpose as those which are larger than 3 mm across, or a), b), c), d) or e) above

CATEGORY	SUB-CATEGORY	PLANTS, PLANT PRODUCTS AND OTHER OBJECTS	ILLUSTRATIVE EXAMPLES OF SPECIAL REQUIREMENTS
		Wood of *Quercus* L., other than in the form of: — Chips, particles, sawdust, shavings, wood waste and scrap, — Casks, barrels, vats, tubs and other coopers' products and parts thereof, of wood, including staves where there is documented evidence that the wood has been produced or manufactured using heat treatment to achieve a minimum temperature of 176 °C for 20 minutes but including wood which has not kept its natural round surface, originating in the USA.	Official statement that the wood : a) is squared so as to remove the rounded surface or b) is bark-free and the water content is less than 20% expressed as a percentage of the dry matter or c) is bark-free and has been disinfected by an approved hot-air or hot-warm treatment or d) if sawn, with or without residual bark attached, has undergone kiln-drying to below 20 % moisture content, expressed as a percentage of dry matter , achieved through an approved time/temperature schedule. There must be evidence thereof by a mark "Kiln-dried" or " KD" or another internationally recognised mark, put on the wood or on any wrapping in accordance with current usage.
		Conifer wood from Russia, Kazakhstan and Turkey	Official statement that the wood: (f) Originates in areas known to be free from: — *Monochamus* spp. (non-European) — *Pissodes* spp. (non-European) — *Scolytidae* spp. (non-European) The area shall be mentioned on the certificates referred to in Article 13.1.(ii), under the rubric 'place of origin,' or (g) is bark-free and free from grub holes, caused by the genus *Monochamus* spp. (non-European), defined for this purpose as those which are larger than 3 mm across, or a), b), c), d) or e) above
		Wood of *Quercus* L. (oak)	Wood of *Quercus* L., other than in the form of: — Chips, particles, sawdust, shavings, wood waste and scrap, — Casks, barrels, vats, tubs and other coopers' products and parts thereof, of wood, including staves where there is documented evidence that the wood has been produced or manufactured using heat treatment to achieve a minimum temperature of 176 °C for 20 minutes but including wood which has not kept its natural round surface, originating in the USA.
		Plants of *Quercus* L., other than fruit and seeds, originating in the USA	Without prejudice to the provisions applicable to the plants listed in Annex III(A)(2), official statement that the plants originate in areas known to be free from *Ceratocystis fagacearum* (Bretz) Hunt.
		Plants of *Ulmus* L. (elm), intended for planting, other than seeds, originating in North American countries	Official statement that no symptoms of Elm phlöem necrosis mycoplasm have been observed at the place of production or in its immediate vicinity since the beginning of the last complete cycle of vegetation.
		From 15 February to 30 September, fruit of *Prunus* L. (cherry), originating in non-European countries	Official statement: — The fruit originate in a country known to be free from *Monilinia fructicola* (Winter) Honey; or

CATEGORY	SUB-CATEGORY	PLANTS, PLANT PRODUCTS AND OTHER OBJECTS	ILLUSTRATIVE EXAMPLES OF SPECIAL REQUIREMENTS
			— The fruit originate in an area recognised as being free from *Monilinia fructicola* (Winter) Honey, in accordance with the procedure referred to in Article 18(2); or — The fruit have been subjected to appropriate inspection and treatment procedures prior to harvest and/or export to ensure freedom from *Monilinia* spp.
		Soil and growing medium, attached to or associated with plants, consisting in whole or in part of soil or solid organic substances such as parts of plants, humus including peat or bark or consisting in part of any solid inorganic substance, intended to sustain the vitality of the plants, originating in: Turkey, Belarus, Georgia, Moldova, Russia, and Ukraine; and non-European countries, other than Algeria, Egypt, Israel, Libya, Morocco, Tunisia	Official statement that: (a) The growing medium, at the time of planting, was: — Either free from soil, and organic matter; or — Found free from insects and harmful nematodes and subjected to appropriate examination or heat treatment or fumigation to ensure that it was free from other harmful organisms; or — subjected to appropriate heat treatment or fumigation to ensure freedom from harmful organisms, and (b) Since planting: — Either appropriate measures have been taken to ensure that the growing medium has been maintained free from harmful organisms, or — Within two weeks prior to dispatch, the plants were shaken free from the medium leaving the minimum amount necessary to sustain vitality during transport, and, if replanted, the growing medium used for that purpose meets the requirements laid down in (a).
	Section II Plants, plant products and other objects originating in the Community	Plants of *Populus* L. (poplar), intended for planting, other than seeds	Official statement that no symptoms of *Melampsora medusae* Thümen have been observed at the place of production or in its immediate vicinity since the beginning of the last complete cycle of vegetation.
		Plants of *Vitis* L. (grape), other than fruit and seeds	Official statement that no symptoms of Grapevine Flavescence dorée MLO and *Xylophilus ampelinus* (Panagopoulos) Willems *et al*. have been observed on the mother-stock plants at the place of production since the beginning of the last two complete cycles of vegetation.
		Plants with roots, planted or intended for planting, grown in the open air	There shall be evidence that the place of production is known to be free from *Clavibacter michiganensis* ssp. *sepedonicus* (Spieckermann and Kotthoff) Davis *et al., Globodera pallida* (Stone) Behrens, *Globodera rostochiensis* (Wollenweber) Behrens and *Synchytrium endobioticum* (Schilbersky) Percival.
***ANNEX IV /* PART A** **Special requirements which shall be laid down by all member states for the introduction and**	Protected zones in EL, IE, UK	Wood of conifers (*Coniferales*)	(a) The wood shall be stripped of its bark; or (b) Official statement that the wood originates in areas known to be free from *Ips duplicatus* Sahlbergh; or (c) There shall be evidence by a mark ‘Kiln-dried’, ‘KD’ or another internationally recognised mark, put on the wood or on its packaging in accordance with current

CATEGORY	SUB-CATEGORY	PLANTS, PLANT PRODUCTS AND OTHER OBJECTS	ILLUSTRATIVE EXAMPLES OF SPECIAL REQUIREMENTS
movement of plants, plant products and other objects into and within certain protected zones			commercial usage, that it has undergone kiln-drying to below 20 % moisture content, expressed as a percentage of dry matter, at time of manufacture, achieved through an appropriate time/temperature schedule.
		Fruit of *Vitis* L. in the Protected Zones of CY	The fruit shall be free from leaves and an official statement that the fruit: (a) Originate in an area known to be free from *Daktulosphaira vitifoliae* (Fitch); or (b) Have been grown at a place of production which has been found free from *Daktulosphaira vitifoliae* (Fitch) on official inspections carried out during the last two complete cycles of vegetation; or (c) Have been subject to fumigation or other appropriate treatment against *Daktulosphaira vitifoliae* (Fitch).
ANNEX V **Plants, plant products and other objects which must be subject to a plant health inspection** **PART A** **Plants, plant products and other objects originating in the Community**	**Plants, plant products and other objects, originating in the Community, which are potential carriers of harmful organisms of relevance for the entire Community**	Plants, intended for planting, other than seeds, of *Amelanchier* Med., *Chaenomeles* Lindl. (quince), *Cotoneaster* Ehrh., *Crataegus* L. (hawthorn), *Cydonia* Mill. (quince), *Eriobotrya* Lindl. (loquat), *Malus* Mill.(apple), *Mespilus* L. (medlar), *Photinia davidiana* (Dcne.) Cardot, *Prunus* L. (cherry, plum), other than *Prunus laurocerasus* L. and *Prunus lusitanica* L., *Pyracantha* Roe., *Pyrus* L. and *Sorbus* L. (ash)	(a) Inspection at the place of production before being moved within the community*;* (b) Must be accompanied by a plant passport
	Plants, plant products and other objects, originating in the Community, which are potential carriers of harmful organisms of relevance for certain Protected Zones	Plants, other than fruit and seeds, of *Amelanchier* Med., *Chaenomeles* Lindl., *Cotoneaster* Ehrh., *Crataegus* L., *Cydonia* Mill. (quince), *Eriobotrya* Lindl., *Eucalyptus* L'Herit., *Malus* Mill., *Mespilus* L., *Photinia davidiana* (Dcne.) Cardot, *Pyracantha* Roem., *Pyrus* L. (pear), *Sorbus* L. and *Vitis* L.	(a) Inspection at the place of production , before being moved within the community (b) Must be accompanied by a plant passport valid for the appropriate Zone when introduced into or moved within that Zone
PART B **Plants, plant products and other objects originating in territories, other than those territories outside of the Community**	**Plants, plant products and other objects, not originating in the Community, which are potential carriers of harmful organisms of relevance for the entire Community**	Fruit of: — *Citrus* L., *Fortunella* Swingle, *Poncirus* Raf., and their hybrids, *Momordica* L. and *Solanum melongena* L. — *Annona* L. (custard apple), *Cydonia* Mill., *Diospyros* L., *Malus* Mill., *Mangifera* L. (mango), *Passiflora* L. (passion fruit), *Prunus* L., *Psidium* L. (guava), *Pyrus* L., *Ribes* L. (currant), *Syzygium* Gaertn. (clove tree), and *Vaccinium* L. (blueberry, cranberry), originating in non-European countries.	Before being permitted to enter the Community: (a) Inspection in the country of origin or the consignor country,
	Plants, plant products and other objects, not originating in the Community, which are potential carriers	Soil from beet and unsterilised waste from beet(*Beta vulgaris* L.); Live pollen for pollination of *Amelanchier* Med., *Chaenomeles* Lindl., *Cotoneaster* Ehrh., *Crataegus* L., *Cydonia* Mill.,	Before being permitted to enter the Community: (a) Inspection in the country of origin or the consignor country, (b) Must be accompanied by a plant passport valid for the

CATEGORY	SUB-CATEGORY	PLANTS, PLANT PRODUCTS AND OTHER OBJECTS	ILLUSTRATIVE EXAMPLES OF SPECIAL REQUIREMENTS
	of harmful organisms of relevance for certain Protected Zones	*Eriobotrya* Lindl., *Malus* Mill., *Mespilus* L., *Photinia davidiana* (Dcne.) Cardot, *Pyracantha* Roem., *Pyrus* L. and *Sorbus* L.	appropriate Zone when introduced into or moved within that Zone

Annex 5 – Task Force membership

Co-chairs

Dr Jonathan Banks

Consultant
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Pialligo
Canberra ACT
AUSTRALIA
Dr. Jonathan Banks, Cochair of TEAP's QPS Task Force, is a private consultant. He was a member of the 1992 Methyl Bromide Assessment and from 1993 to 1998 and 2001 to 2005 cochaired the Methyl Bromide TOC. He worked as a Research Scientist with the Australian Commonwealth Scientific and Industrial Research Organization (CSIRO) from1972 to 1999 on grain storage technologies, including use of improved use of fumigants. He is coinventor of carbonyl sulfide, an alternative fumigant to methyl bromide in some applications. Patent rights have been assigned to his employer, CSIRO. Dr Banks has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs. He has stock in Brambles Ltd, a company that *inter alia* leases wooden pallets for freight. The pallets may or may not be treated with methyl bromide or alternatives. His spouse is co-owner of their commercial organic apple orchard. She has no financial interests relating to ozone-depleting substances. He has served on some national committees concerned with ODS and their control, and within the last 4 years has received contracts from UNEP, and other institutions and public companies related to methyl bromide alternatives and grain storage technology--including training in fumigation (methyl bromide and alternatives) and fumigation technology and recapture systems for methyl bromide.

Ms. Marta Pizano **Article 5 co-chair**

Consultant
Bogotá
COLOMBIA

Ms. Marta Pizano, Cochair of TEAP's QPS Task Force is a consultant on methyl bromide alternatives and has actively promoted them among growers in many countries. She is a regular consultant for the Montreal Protocol Multilateral Fund (MLF) and its implementing agencies. In this capacity, she has contributed to MB phase-out programs for controlled uses in nearly twenty Article 5 countries around the world, assisting growers with the adoption of sustainable alternatives and the implementation of IPM programs. She is a frequent speaker at national and international methyl bromide conferences and has authored numerous articles and publications on alternatives to this fumigant. She has been a member of MBTOC since 1998 and a co-chair since 2005. Neither Ms Pizano nor her husband or their children own stock or have proprietary interest in companies producing ODS or their alternatives or substitutes.

Members of record

Dr. Tom Batchelor

Touchdown Consulting
La Hulpe, Brussels
Belgium

Dr Tom Batchelor is Director of Touchdown Consulting Brussels, which undertakes work on ozone layer and climate protection. For 12 years he was a scientist in New Zealand developing quarantine treatments. He worked for the European Commission from 1999 to 2006 where he was responsible for EU national and international leadership on policies to further protect the ozone layer. He was a member of the MBTOC from 1992 - 2003, Co-Chair of MBTOC and a member of the TEAP. His spouse is a co-Director of Touchdown Consulting Brussels. Both Directors have no financial interests relating to ozone-depleting substances or their alternatives. In the last three years, Touchdown Consulting Brussels has provided advice to UNEP, GEF, European Commission, CABI, private companies and Implementing Agencies on alternatives to ozone-depleting substances.

Mr. Kenneth Glassey

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Mr. Kenneth Logan Glassey is a Senior Biosecurity Adviser at the Ministry of Agriculture and Forestry (MAF). Ken Glassey is a full time adviser on Phytosanitary Treatments and Treatment Operators at the Ministry of Agriculture and Forestry Head Office, Wellington, New Zealand. MAF has an interest in the topics of the Montreal Protocol because quarantine and preshipment treatments uses a significant amount of methyl bromide (170.2 tonnes in 2007). Current responsibilities cover researching, developing and reviewing New Zealand's import standards including operational standards such as treatments for imported commodities. This also involves monitoring quality and adequacy, initiating remedial action as necessary, and the provision of advice on the practical application and implications of such standards. Mr Glassey has been involved in QPS inspection and treatments for 20 years with particular expertise with forest produce, and worked in forest management for 11 years prior to that. Mr Glassey has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult for organizations seeking to phaseout ODSs. He does not work as a consultant to implementing agencies on matters related to the Montreal Protocol. Mr Glassey's partner living in same home does not work for or consults for any organization which has an interest in the topics of the Montreal Protocol. She has no proprietary interest alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult for organizations seeking to phaseout ODSs.

Mr Takashi Misumi

Ministry of Agriculture, Forestry and Fisheries MAFF, Japan
1-16-10 Shin-yamashita, maka-ku
Yokohama, 231-0801
JAPAN

Mr. Takashi Misumi, member of MBTOC since 2005 is a senior researcher at the Yokohama Plant Protection Station (YPPS). Mr. Misumi is a full time Researcher at the Quarantine Disinfestation Technology Section, Research Division of YPPS. He has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult for organizations seeking to phaseout ODSs. Neither his spouse nor their children work for organizations with has an interest in the topics of the Montreal Protocol.

Dr David M Okioga **Article 5 member**

Coordinator, Kenya Ozone Office, National Environment Management Office
Ministry of the Environment and National Resources
PO Box 67839
Nairobi
KENYA

Dr. David Okioga is a founding member of MBTOC, joining in 1992. He was MBTOC co-chair between 1997 and 2002. Dr Okioga was the Director, National Plant Quarantine Services of Kenya for sixteen years. He also served as the Coordinator in Agricultural Botany under the Kenya Agricultural Research Institute, Secretary to the Ministry of Agriculture on Plant Breeder's Rights, Member of the National Agricultural Research Centre, National Horticultural Research Centre, National Potato Research Centre, and the National Committee for the National Genebank. Dr. Okioga has undertaken a number of contracts from the African Unity (then Organization of the African Unity), FAO and UNEP. Some of these consultancies were related to crop protection, where methyl bromide was considered as the chemical of choice for soil fumigation, whereas others were on strengthening the Montreal Protocol policies on ODS phase out in the African region (including methyl bromide). In 1995, Dr. Okioga was appointed Coordinator, of the National Ozone Unit (NOU) of Kenya by the Ministry of Environment and Natural Resources, Kenya, in consultation with UNDP, a post that he still holds at present. Dr.

Okioga's main responsibility is strengthening the government of Kenya in meeting the requirements of the Montreal Protocol and in phasing out of ODS in the country.Dr. Okioga has no proprietary interests in alternatives for ODS and does not consult for companies seeking to phase out ODS.

Dr. Ian Porter

Consultant
Victoria, AUSTRALIA
Dr Ian Porter is the Principal Research scientist in Plant Pathology with the Victorian Department of Primary Industries (DPI) but presently conducts MBTOC work on leave from his organisation. DPI has an interest in developing sustainable control measures for plant pathogens and biosecurity. He is a member of a number of National Committees regulating ODS, has led the Australian research program on methyl bromide alternatives for soils and has 28 years experience in researching sustainable methods for soil disinfestation of plant pathogens with over 200 research publications. He has been a member of MBTOC since 1997, Soils sub committee chair since 2001 and MBTOC Co-chair since 2005. Neither, Dr. Ian Porter, his wife or children have any proprietary interest in alternatives or substitutes to ODSs, nor own stock in companies producing ODS or alternatives or substitutes to ODSs. Dr Porter is presently assisting National research agencies in Australia develop national priorities for IPM and soil health. He has conducted projects for UNEP and UNIDO in developing programmes to assist China, Mexico and CEIT countries to replace methyl bromide.

Dr Ken Vick

Department of Agriculture
Agricultural Research Service/ Office of National Programs
5601 Sunnyside Ave
Beltsville MD 20705 – 5139
UNITED STATES

Dr. Kenneth W. Vick is Senior National Program Leader for methyl bromide alternatives research at the Agricultural Research Service (ARS), United States Department of Agriculture (USDA). As Senior National Program Leader he co- leads the over $22/ million/year ARS research program to develop alternatives to the use of methyl bromide for soil and post-harvest (including QPS) applications. ARS has an interest in the topics of the Montreal Protocol because as the primary research arm of the USDA it was assigned lead responsibility for developing methyl bromide alternatives and because it is deemed to be of high priority by the United States Government. Since 1991 he has led ARS' program for developing and testing commodity phytosanitary treatments and exotic pest exclusion and eradication technologies. . He has been a MBTOC member since 1993. He is the ARS liaison to the USDA Animal and Health Inspection Service (APHIS) for plant quarantine Issues and has helped develop numerous bilateral phytosanitary agreements since 1991. Dr Vick has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult for any organization. His spouse, a MBTOC co-chair, consults for governments, NGOs and companies that have an interest in the phase out of methyl bromide because they are Parties to the Protocol or because they are investigating or developing food irradiation a methyl bromide alternative for some commodities and in some quarantine situation. She has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does consult for organizations seeking to phaseout ODSs.

Mr Eduardo Willink **Article 5 member**

Estación Experimental Agroindustrial Obispo Colombrés
William Cross 3150, Las Talitas,
4101 Tucumán
ARGENTINA

Mr Eduardo Willink is Director of Special Disciplines and Head of the Agricultural Zoology Department of the EstaciÛn Experimental Agroindustrial Obispo ColombrÈs Tucum·n, Argentina. He is a full time researcher in entomology who leads a team of researchers working on quarantine treatments, systems approach and pest host status, and is a member of the Technical Panel on Phytosanitary Treatments within IPPC, FAO. The organization has an interest in the topics of the Montreal Protocol because its mission is to resolve regional agro industrial problems with the least impact on the environment. Mr Willink has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consulting for organizations seeking to phaseout ODSs. Neither his spouse or dependant children work for or consult for organizations with an interest in the topics of the Montreal Protocol, nor do they have any proprietary interest in alternatives or substitutes to ODSs, own stock in companies producing ODS or their alternatives or substitutes or consult for organizations seeking to phaseout ODSs.

Mr. Wang Yuejin **Article 5 member**

Institute of Inspection Technology and Equipment,
Chinese Academy of Inspection and Quarantine.Blg.241, Huixinli, Chaoyang District,
Beijing 100029, People's Repulic of China

Mr. Wang Yuejin is a chief research Scientist of Chinese academy of Inspection and Quarantine (CAIQ) and the deputy director general of the institute of Inspection Technology and Equipment. In the institute there is a laboratory specified for quarantine treatment and invasive pest eradication. He is also a leader of several national research programs for quarantine treatment and invasive pest eradication, which involve the development of alternatives to methyl bromide and their relative equipments and facilities applicable in quarantine treatment. He was ever a member of MBTOC from 1996 to 2000 and now he is a member of the Technical Panel on Phytosanitary Treatments within IPPC. CAIQ has an interest in the topics of the Montreal Protocol because one of its mission is to provide technical support for decision - making for the relevant government departments, such as AQSIQ, the government administrative for entry-exit animal and plant quarantine; the

Ministry of Environment Protection and the Ministry of Agriculture. Mr. Wang Yuejin, his wife and his child have not any proprietary interest in alternatives to ODSs or stock in the correlative companies.

Full Responses by Parties to listing under Decision XX/6(7)

No. AC 0913 /๑๗๙๔

Office of Agricultural Regulation
Department of Agriculture
Jatujak, Bangkok 10900

๙ September B.E. 2552 (2009)

Dear Mr. Gonzalez,

Subject: Paragraph 7 of Decision XX/6 of the 20th Meeting of the Parties to the Montreal Protocol

We would like to refer to information provided by the Quarantine and Pre-shipment Task Force (QPSTF) of the Technology and Economic Assessment Panel (TEAP) that fumigation of export rice and cassava chips has been classified as quarantine and pre-shipment use in Thailand, but not by others. In response to your letter dated August 19, 2009, Thailand has been requested by TEAP to provide rationale for such classification to the Ozone Secretariat not later than September 7, 2009 in order for the QPSTF to consider the information and include in its final report for consideration by the twenty-first Meeting of the Parties in November 2009.

Pursuant to above request, Thailand would like to clarify our rationale for such classification as follows:

(1) <u>Export of Rice</u>: Rice is the major economic commodity of Thailand. The process in milling rice can sort off the pests at a certain level and thus some pests still remain in the product. However, common practice in Thailand is that the product is not immediately exported, but it has to be stored for a certain period until exporting to importing countries takes place. This practice can bring about the chance for the stored milled rice to encounter infestation of stored product pests. Given that these are quarantine-concerned pests in a number of destinations; either methyl bromide or phosphine is used to treat the rice prior to export in order to meet standard and official requirements of phytosanitary certification for rice. As Thailand's rice is considered premium product, treatment with fumigants is essential to ensure that exported product is pest-free and meets the quality in accordance with Thai Rice Standard.

(2) <u>Export of Cassava Chips</u>: Please be informed that the farmers normally harvest tapioca root in the yearly basis. The tapioca root is then cut, dried, and stored in open warehouses. The tapioca chip has been kept in the open warehouse until exporters of cassava chips obtain purchasing order from their customers. Having been kept in the warehouse unattended, there are a lot of stored product insects in the tapioca chips. In order to ensure that exported tapioca chips meet the quality in accordance with the Tapioca Standard, treatment with methyl bromide is needed for disinfestations of all these pests prior to issuing phytosanitary certification.

According to Decision XI/12, pre-shipment is defined as "Treatments to be within 21 days of export either to meet the official phytosanitary or sanitary requirements of the exporting country or to meet the official phytosanitary or sanitary requirements of the importing country." In this context, Thailand considered the treatment of exported rice and cassava chips with methyl bromide as pre-shipment as it is required to meet official phytosanitary requirement for these products. We however are not in the position to comment on other countries that did not report the treatment as pre-shipment as it depends on each country's requirements and its product standard

We also would like to highlight an accreditation scheme indicated in our 2008-2009 Biennial Program of the National Methyl Bromide Phaseout Plan (NMBPP). The Department of Agriculture has already implemented the accreditation scheme in which phytosanitary certification can be issued to exported products manufactured by accredited manufacturer without the need for treatment. This is to reduce the use of methyl bromide for treatment of commodities that have low-risk to pest infestation. In addition, we are also in the process of categorizing exported commodities that have low risk to pest infestation and may not be needed for treatment (according to ISPM#32). With this classification, the usage of methyl bromide for these exported commodities would be reduced. In the meantime, we are in the process of searching alternatives to methyl bromide for pre-shipment applications. These actions by Thailand can well demonstrate Thailand's commitment to eliminate the use of methyl bromide.

Finally, the Department of Agriculture has set up the operation of Management Information System (MIS) as part of the NMBPP activities to facilitate the Department of Agriculture and our Plant Quarantine Stations throughout Thailand control and monitor import and use of all methyl bromide in Thailand. The functional of MIS would enable Thailand to control and monitor the use methyl bromide effectively.

Should you require any further clarifications pertaining to the above, please don't hesitate to contact us.

Yours sincerely,

(Mr.Wichar Thitiprasert)
Director of
Office of Agricultural Regulation

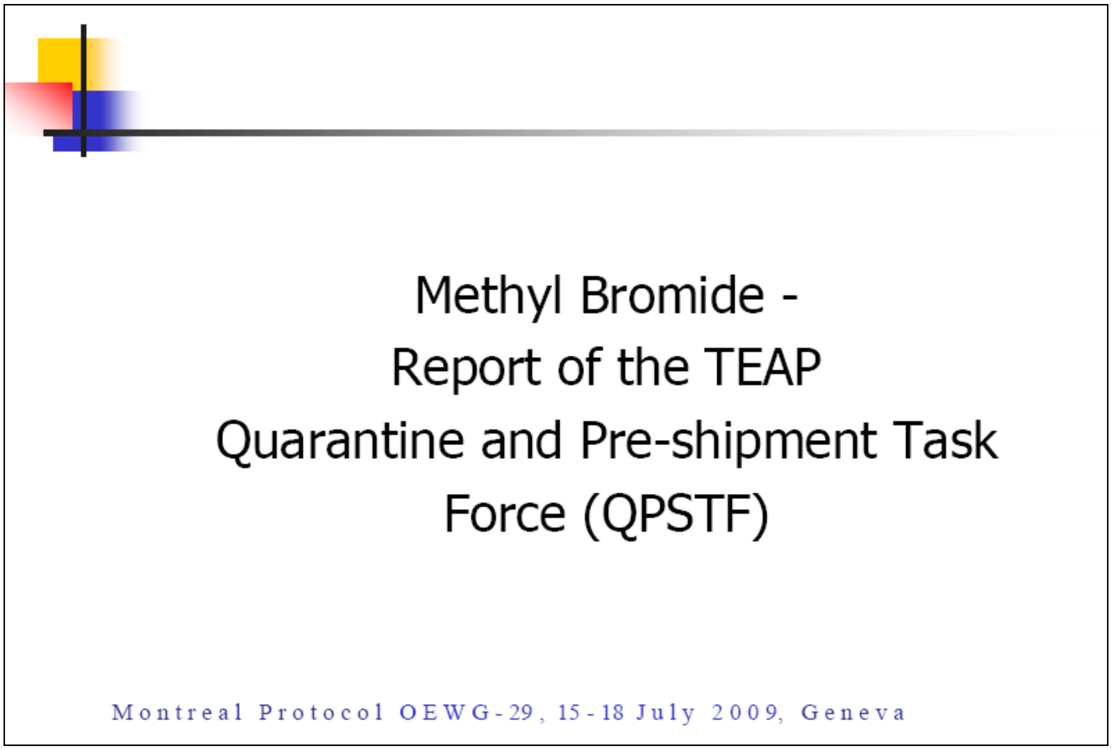
Tel: +66 (0) 2 940 6828
Fax: +66 (0) 2 940 6958

To: Mr. Marco Gonzalez
Executive Secretary
Ozone Secretariat
P.O. Box 30552-00100
Nairobi, KENYA

cc: Ms. Somying Kunanopparat
Director
Treaties and International Strategies Bureau
Department of Industrial Works
Bangkok 10400, THAILAND

United States of America

Annex I. - Presentation of the QPSTF at 29th OEWG



Decision XX/6 - Interim report

For the 29th OEWG, TEAP was specifically requested :

- *To list categories of use it has identified that have been classified as quarantine and pre-shipment use by some Parties but not by others* (Para. 7)

- *To present a draft report based on the analysis of the available information .., indicating areas where the information is not sufficient* ..(Para. 5)

Decision XX/6 – Final report

Decision XX/6, in part, requested TEAP to consider:

- Volumes of MB used for QPS, by major uses, target pests;
- Technical and economic availability of alternatives for the main MB uses, by volume;
- Technical and economic availability of MB recovery, containment and recycling;
- QPS applications for which no alternatives are available;
- Examples of regulations that directly affect use of MB for QPS treatment and barriers to adoption of alternatives;
- Opportunities to reduce MB use or emissions for QPS.

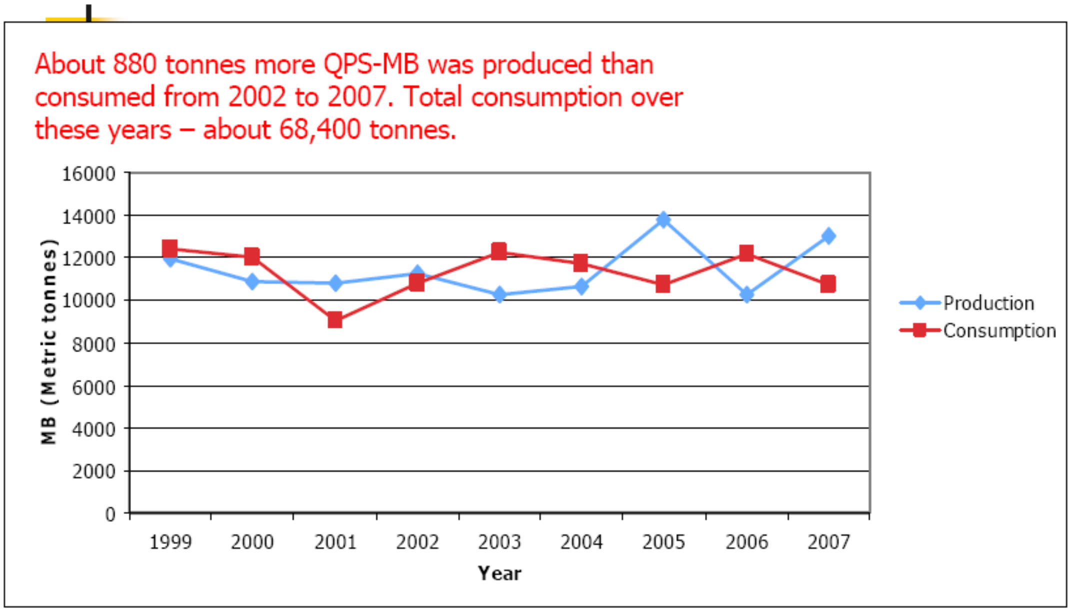
QPSTF Membership

- Cochairs:
  Jonathan Banks (Australia) - Marta Pizano (Colombia)

- Members:

Tom Batchelor (EC)	Ian Porter (Australia)
Ken Glassey (NZ)	Ken Vick (USA)
Takashi Misumi (Japan)	Wang Yuejin (China)
David Okioga (Kenya)	Eduardo Willink (Argentina)

Global production vs. global consumption of MB for QPS uses 1999 - 2007



QPS analysis - main findings

- Global production and consumption for QPS was approximately constant at 10,500 tonnes per year in 2004-2007
- Consumption in Non-A5 Parties dropped from nearly 10,000 tonnes (in 2000) to 5,000 tonnes (in 2007). Two Parties accounted for 82% of consumption
- Consumption in A5 countries increased from 2,360 tonnes (in 2000) to nearly 6,000 tonnes in 2007. Increase mainly in Asia region
- A5 consumption was 24% of total global consumption in 2000 and 54% in 2007

How MB was used for reported QPS consumption

- Uses have been identified for 77% of 2007 total reported QPS consumption. Uses of 2558 tonnes unidentified
- At least 68% of total consumption (88% of identified uses) results from 5 main categories of use:
  - Whole logs 21%
  - Soil (field) fumigation 14%
  - Wood and wood packaging material 13%
  - Grain, including rice 12%
  - Fresh fruit and vegetables 8%
- All of these have at least some instances where alternatives are not registered, or not technically or economically available for QPS

Decision XX/6 - Paragraph 7

The QPSTF identified several treatments as categories of use that were classified as QPS by some Parties but not by others:

- Fumigation of export coffee (Vietnam);
- Fumigation of export rice and cassava chips (Thailand, Vietnam)
- Fumigation of soil (fields) for the production of propagation material (USA, Chile)

Decision XX/6 asks these Parties to provide the rationale for these QPS uses (see TEAP guidance in Report)

Definitions of 'Quarantine' and 'Pre-Shipment'

- Decisions VII/5 and XI/12 relate to the definitions of the terms 'Quarantine' and 'Pre-Shipment'
- An interpretation of these terms is that they refer specifically to *official* requirements, such as set by National Plant Protection Organizations, and not to contractual or other unofficial requirements
- Some methyl bromide fumigations of export coffee, rice and cassava chips may be for contractual, not official reasons

Parties that consider soil (field) fumigation for production of propagation material of high plant health status to be QPS or not

Use category	Parties that classify use as QPS	Parties that do not classify use as QPS
Bulb propagation	USA	Australia, EC
Deciduous nurseries	USA	EC, Israel, NZ
Rose nurseries	USA	Australia
Forest nurseries	USA	EC
Strawberry nurseries	USA, Chile	Argentina, Australia, Canada, EC, Lebanon, NZ
Raspberry nurseries	USA	EC
Turfgrass (sod)	USA	Australia

Methyl bromide recapture

- There are at least four suppliers of commercial recapture equipment
- All commercial equipment relies on a capture stage on activated carbon, subsequent treatment differs
- All present installations are small scale capturing less than 50kg at a time or per unit. Larger installations under consideration. Most QPS uses suit recapture
- No *approved* destruction process, sensu Dec.XV/9
- Losses from leakage and reaction reduce overall efficiency of capture on carbon to 30 – 90% of applied quantity. Efficiency situation dependent

Alternatives for QPS uses

- Development of alternatives for Quarantine uses is a difficult process; many commodities, diverse application situations, requirements for agreement between trading partners and very high levels of proven effectiveness
- Pre-shipment, with less stringent requirements, has more opportunities for alternatives
- Regulations prescribing MB promote its use even when an alternative is available

Alternatives - general

Use	Alternatives
Wood packing material	Heat, SF
Logs	Heat, phosphine, MI, SF+MITC
Grain, including rice	Phosphine, CA, SF
Soil (field) treatment, for propagative material	Various non-MB soil fumigants, production in soilless media
Fruit and vegetables	Many processes

Not all alternatives are applicable in all situations as they may be constrained by regulations, economics or proof of efficacy to a quarantine standard. Final report will discuss these limitations

Your help please !

Decision XX/6 - Paragraph 5

- Additional quantitative data on consumption for major uses is required from Parties to permit improved QPSTF assessment of usage trends
- There is a discrepancy of about 1,300 tonnes for non-A5 Parties for 2007 between total consumption estimated by 'bottom-up' analysis and total consumption reported under Article 7 data
- A discrepancy of similar magnitude is apparent in the annual figures for 2003-2007. Further clarification is being sought on this portion of QPS usage

Annex II. – Decisions of the Parties to the Montreal Protocol on Quarantine and Pre-Shipment

Decision VI/11: Clarification of “quarantine” and “pre-shipment” applications for control of methyl bromide

The *Sixth Meeting of the Parties* decided in *Dec. VI/11:*

1. Recognizing the need for non-Article 5 Parties to have, before 1 January 1995, common definitions of “quarantine” and “pre-shipment” applications for methyl bromide, for purposes of implementing Article 2H of the Montreal Protocol, and that non-Article 5 Parties have agreed on the following:
    a. Quarantine applications, with respect to methyl bromide, are applications to prevent the introduction, establishment and/or spread of quarantine pests (including diseases), or to ensure their official control, where:
        i. Official control is that performed by, or authorized by a national plant, animal or environmental protection, or health authority;
        ii. Quarantine pests are pests of potential importance to the areas endangered thereby and not yet present there, or present but not widely distributed and being officially controlled;
    b. Pre-shipment applications are those treatments applied directly preceding and in relation to export, to meet the phytosanitary or sanitary requirements of the importing country or existing phytosanitary or sanitary requirements of the exporting country;
    c. In applying these definitions, non-Article 5 countries are urged to refrain from use of methyl bromide and to use non-ozone-depleting technologies wherever possible. Where methyl bromide is used, Parties are urged to minimize emissions and use of methyl bromide through containment and recovery and recycling methodologies to the extent possible;
2. Acknowledging that Article 5 Parties have agreed to identify the following:
    a. That definitions relating to pre-shipment applications affect Article 5 countries and that new non-tariff barriers to trade should be avoided;
    b. That the Article 5 countries still need to have more consultations and further approaches to the quarantine and pre-shipment application definitions related to methyl bromide;
    c. That the Food and Agriculture Organization of the United Nations should play a fundamental role in the establishment of common definitions concerning quarantine and pre-shipment applications related to methyl bromide use;
    d. That it is anticipated that the use of methyl bromide by Article 5 countries may increase in the forthcoming years;
    e. That adequate resources from the Multilateral Fund for the Implementation of the Montreal Protocol and other sources are needed to facilitate the transfer of non-ozone-depleting technologies for quarantine and pre-shipment applications related to methyl bromide to the Article 5 countries;

3. Further recognizing that containment, recovery and recycling methodologies relating to methyl bromide should be given a wider application among all Parties;
4. To request the Open-ended working group of the Parties at its eleventh and twelfth meetings
    a. To further study the most suitable definition for “quarantine” and “pre-shipment” applications relating to methyl bromide use, taking into consideration:
        i. The Methyl Bromide Technical Options Committee report;
        ii. The Methyl Bromide Scientific Assessment Report;
        iii. The FAO guidelines on Pests Risk Analysis; and
        iv. The development of lists of injurious pests;
    b. To consider jointly the definitions issues along with the methyl bromide issues contained in decision VI/13;
    c. To provide the necessary elements to be included for a decision of the Seventh Meeting of the Parties to the Montreal Protocol on all the above issues.

Decision VII/5: Definition of “quarantine” and “pre-shipment applications”

The *Seventh Meeting of the Parties* decided in *Dec. VII/5* that:

a. “Quarantine applications”, with respect to methyl bromide, are treatments to prevent the introduction, establishment and/or spread of quarantine pests (including diseases), or to ensure their official control, where:
    i. Official control is that performed by, or authorized by, a national plant, animal or environmental protection or health authority;
    ii. Quarantine pests are pests of potential importance to the areas endangered thereby and not yet present there, or present but not widely distributed and being officially controlled;
b. “Pre-shipment applications” are those treatments applied directly preceding and in relation to export, to meet the phytosanitary or sanitary requirements of the importing country or existing phytosanitary or sanitary requirements of the exporting country;
c. In applying these definitions, all countries are urged to refrain from use of methyl bromide and to use non-ozone-depleting technologies wherever possible. Where methyl bromide is used, Parties are urged to minimize emissions and use of methyl bromide through containment and recovery and recycling methodologies to the extent possible.

Decision X/11: Quarantine and pre-shipment exemption

The *Tenth Meeting of the Parties* decided in *Dec. X/11:*

Noting the Technology and Economic Assessment Panel’s findings that over 18 per cent of methyl-bromide use is estimated to have been excluded from control under the quarantine and pre-shipment exemption, and that this use is increasing in some regions according to official data,

Noting also that the operation of the exemption criteria might lead to unnecessary use of methyl bromide;

1. To request the Technology and Economic Assessment Panel, as part of its ongoing work:
    a. To assess the volumes and uses of methyl bromide under the quarantine and pre-shipment exemption, including the trend in use since the 1991 base year;
    b. To report on the existing and potential availability of alternative substances and technologies, identifying those applications where alternative treatments do not currently exist, and also on the availability and economic viability of recovery, containment and recycling technologies;
    c. To report on the operation of quarantine and pre-shipment exemptions as set out in decision VII/5, including the scope of the pre-shipment definition;
    d. To report on existing and potential options that individual Parties might consider to reduce the use and emissions of methyl bromide from its application under the quarantine and pre-shipment exemption and to elaborate further on their recommendations in previous reports, and taking into account the special circumstances of Parties operating under paragraph 1 of Article 5 of the Protocol;
    e. To review and report on the amendment by the International Plant Protection Convention (IPPC) to its quarantine and non-quarantine pests definitions, and the FAO/IPPC structure relative to the use of pesticides for regulated non-quarantine pests, to help determine whether clarification of the definitions of quarantine and pre-shipment, taking into account these FAO/IPPC usages, would help encourage consistency in the quarantine and pre-shipment definitions;
    f. To submit its findings to the Open-ended Working Group of the Parties to the Montreal Protocol at its first meeting in 1999;
2. To request the Open-ended Working Group, in the light of the report of the Technology and Economic Assessment Panel, to make any appropriate recommendations for consideration by the Eleventh Meeting of the Parties;
3. To request the Parties to submit to the Secretariat by 31 December 1999 a list of regulations that mandate the use of methyl bromide for quarantine and pre-shipment treatments;
4. To remind the Parties of the need to report on the volumes of methyl bromide consumed under the quarantine and pre-shipment exemption as set out in decision IX/28.

Decision XI/12: Definition of pre-shipment applications of methyl bromide

The *Eleventh Meeting of the Parties* decided in *Dec. XI/12* that pre-shipment applications are those non-quarantine applications applied within 21 days prior to export to meet the official requirements of the importing country or existing official requirements of the exporting country. Official requirements are those which are performed by, or authorized by, a national plant, animal, environmental, health or stored product authority.

Decision XI/13: Quarantine and pre-shipment

The *Eleventh Meeting of the Parties* decided in *Dec. XI/13:*

1. To note that, while the reliability of the survey data was noted by the Technology and Economic Assessment Panel to be insufficient to draw firm conclusions, the Panel's April 1999 report estimates that over 22 per cent of the methyl bromide use is excluded

from control under the quarantine and pre-shipment exemption, and that this use is increasing in some countries;

2. To note that the Science Assessment Panel revised the ODP of methyl bromide to 0.4 in its 1998 report;
3. To note that, under an amendment adopted by the Eleventh Meeting of the Parties, each Party shall provide the Secretariat with statistical data on the annual amount of the controlled substance listed in Annex E used for quarantine and pre-shipment applications.
4. To request that the 2003 report of the Technology and Economic Assessment Panel:
    a. Evaluate the technical and economic feasibility of alternative treatments and procedures that can replace methyl bromide for quarantine and pre-shipment;
    b. Estimate the volume of methyl bromide that would be replaced by the implementation of technically and economically feasible alternatives for quarantine and pre-shipment, reported by commodity and/or application;
5. To request the Parties to review their national plant, animal, environmental, health and stored product regulations with a view to removing the requirement for the use of methyl bromide for quarantine and pre-shipment where technically and economically feasible alternatives exist;
6. To urge the Parties to implement procedures (using a form shown in the Panel's April 1999 report, if necessary) to monitor the uses of methyl bromide by commodity and quantity for quarantine and pre-shipment uses in order:
    a. To target the efficient use of resources for undertaking research to develop and implement technically and economically feasible alternatives;
    b. To encourage early identification of technically and economically feasible alternatives to methyl bromide for quarantine and pre-shipment where such alternatives exist;
7. To encourage the use of methyl bromide recovery and recycling technology (where technically and economically feasible) to reduce emissions of methyl bromide, until alternatives to methyl bromide for quarantine and pre-shipment uses are available.

Decision XVI/10: Reporting of information relating to quarantine and pre-shipment uses of methyl bromide

The *Sixteenth Meeting of the Parties* decided in *Dec. XVI/10:*

Recalling the tasks assigned to the Technology and Economic Assessment Panel under decision XI/13 paragraphs 4 (a) and (b) regarding quarantine and pre-shipment uses of methyl bromide,

Recognizing that in order to complete both of these tasks, the Panel will require better data on the nature of each Party's quarantine and pre-shipment uses and on the availability in each Party of technically and economically feasible alternatives to methyl bromide for these uses,

Noting the advice of some Parties that they would require additional time in order to provide useful and robust data to inform the Panel's work on this issue, particularly on the availability of technically and economically feasible alternatives in their jurisdictions, *Desiring* that the Technology and Economic Assessment Panel's implementation of decision XI/13, paragraph 4, should nevertheless take place in as timely and reasonable a manner as possible,

Noting with appreciation that some Parties have already submitted partial data to inform the Panel's work on this issue,

Noting that, given the nature of quarantine and pre-shipment applications, quarantine and pre-shipment uses of methyl bromide and its alternatives can vary considerably from year to year,

Noting that the introduction of standard 15 of the International Standards for Phytosanitary Measures, of March 2002, of the International Plant Protection Convention of the Food and Agriculture Organization of the United Nations, may create a growing demand for the quarantine and pre-shipment uses of methyl bromide, despite the availability of heat treatment as a non-methyl bromide option in the standard;

Noting the current workload of the Methyl Bromide Technical Options Committee and its request at the twenty-fourth meeting of the Open-ended Working Group for additional expertise in some quarantine and pre-shipment applications,

Noting that quarantine and pre-shipment treatments, according to decisions VII/5 and XI/12, are authorized or performed by national plant, animal, health or stored product authorities,

1. To request the Panel to establish a task force, with the assistance of the Parties in identifying suitably qualified members, to prepare the report requested by the Parties under decision XI/13 paragraph 4;
2. To request Parties that have not yet submitted data to the Panel on this issue to provide best available data to the task force before 31 March 2005, identifying as available all known uses of methyl bromide for quarantine and pre-shipment, by commodity and application;
3. In responding to the request under paragraph 2, to request the Parties to use best available data for the year 2002 or data considered by the Party to be representative of a calendar year period;
4. To request the task force to report the data submitted by the Parties under paragraphs 2 and 3, or previously submitted by other Parties in response to the 14 April 2004 methyl bromide quarantine and pre-shipment survey, by 31 May 2005, for the information of the Open-ended Working Group at its twenty-fifth session;
5. Also to request the task force, in reporting pursuant to paragraph 4, to present the data in a written report in a format aggregated by commodity and application so as to provide a global use pattern overview, and to include available information on potential alternatives for those uses identified by the Parties' submitted data;
6. To request the Parties to provide information to the task force, as available and based on best available data, on the availability and technical and economic feasibility of applying in their national circumstances the alternatives identified in paragraph 5, focusing in particular on the Parties' own uses, for the calendar year period reported under paragraphs 2 and 3, by 30 November 2005, constituting either:

    a. More than 10 per cent of their own total annual methyl bromide consumption for quarantine and pre-shipment consumption; or
    b. In the absence of uses over 10 per cent, which constitute their five highest volume uses; or
    c. Where data is available to the Party, all their known uses;
7. To request the Panel, on the basis of information contained in paragraph 6, to report to the Parties in accordance with decision XI/13, paragraph 4, by 31 May 2006.

Decision XVI/11: Coordination among United Nations bodies on quarantine and pre-shipment uses

The *Sixteenth Meeting of the Parties* decided in *Dec. XVI/11:*

Bearing in mind that, under standard 15 of the International Standards for Phytosanitary Measures, of March 2002, of the International Plant Protection Convention of the Food and Agriculture Organization of the United Nations, guidelines were issued regulating wood packaging materials in international trade, which approved heat treatments and fumigation by methyl bromide for wood packaging to reduce the risk of the introduction and/or spread of quarantine pest associated with wood packaging used in trade,

Understanding that these guidelines are intended to address quarantine and pre-shipment applications,

Considering that coordination among United Nations bodies is essential for the attainment of their common goals,

Taking into account that the Technology and Economic Assessment Panel is conducting assessments on methyl bromide alternatives on quarantine and pre-shipment uses,

1. To request the Ozone Secretariat to make contact with the Secretariat of the International Plant Protection Convention of the Food and Agriculture Organization of the United Nations, stressing the commitment by Parties to the Montreal Protocol to the reduction of methyl bromide with specific reference to standard 15 of the International Standard for Phytosanitary Measures, and to exchange information with a view to encouraging alternatives to methyl bromide treatment of wood packaging material stipulated by that organization as a phytosanitary measure;
2. To request the Ozone Secretariat to report thereon to the Seventeenth Meeting of the Parties;
3. To urge the Parties to consider, in the context of standard 15 of the International Standards for Phytosanitary Measures, the use, as a priority and to the greatest possible extent, when economically feasible and when the country concerned has the required facilities of alternatives such as heat treatment or alternative packaging materials, instead of methyl bromide fumigation;
4. To encourage the importing Parties to consider accepting wood packaging treated with alternative methods to methyl bromide, in accordance with standard 15.

Decision XVII/15: Coordination between the Ozone Secretariat and the Secretariat of the International Plant Protection Convention

The *Seventeenth Meeting of the Parties* decided in *Dec. XVII/15:*

Recalling decision XVI/11, on coordination among United Nations bodies on quarantine and pre-shipment uses,

Acknowledging the efforts made by the Ozone Secretariat to make contact and maintain coordination with the Secretariat of the International Plant Protection Convention regarding reduction in the use of methyl bromide, with specific reference to standard 15 of the International Standards for Phytosanitary Measures,

Bearing in mind that the Interim Commission on Phytosanitary Measures of the International Plant Protection Convention agreed to submit to the Standards Committee for expedited review proposals for amending the March 2002 standard 15, so as to increase the duration of exposure to methyl bromide during fumigation and increase the minimum required gas concentrations at various stages of the fumigation to ensure its efficacy, which are expected to be considered for adoption by the Interim Commission on Phytosanitary Measures in 2006,

Stressing the importance of managing and, when economically and technically feasible, replacing quarantine and pre-shipment applications of methyl bromide,

Taking into account the risk to the ozone layer of increasing methyl bromide emissions through quarantine and pre-shipment applications,

1. To request the Ozone Secretariat to further liaise with the secretariat of the International Plant Protection Convention regarding the application of standard 15 of the International Standards for Phytosanitary Measures;
2. To request the Technology and Economic Assessment Panel to provide any information collected by the Quarantine and Pre-shipment Task Force pursuant to decision XVI/10 to the relevant bodies of the International Plant Protection Convention.

Annex III. – Excerpts from TEAP Reports

UNEP
APRIL 1999 REPORT OF THE TECHNOLOGY AND ECONOMIC ASSESSMENT PANEL

Parties with regard to the use of measures applied to protect human, animal or plant life or health, including procedures to test, diagnose, isolate, control or eradicate diseases and pests. This Agreement encourages Parties to base their national SPS measures on relevant international standards, guidelines and recommendations. Risk assessment provides the basis for measures applied in the absence of international standards.

In assessing pest risks, WTO Members are required to take into account available scientific evidence; relevant processes and production methods; relevant inspection, sampling and testing methods; prevalence of specific diseases and pests; existence of disease/pest free areas or areas of low pest prevalence; relevant ecological and environmental conditions; and quarantine or other treatment.

1.7.3 IPPC

The Secretariat of the International Plant Protection Convention (IPPC), in co-operation with regional organisations operating within the framework of the IPPC, is responsible for developing international standards, guidelines and recommendations for plant health. The IPPC is recognised by the SPS Agreement as the organisation under which international standards for phytosanitary measures are established. In practice, the IPPC focuses primarily on quarantine issues.

This international agreement is most relevant to quarantine treatments as defined by the Protocol as the IPPC promulgates guidelines for the implementation of measures for quarantine pests and regulated non-quarantine pests (see Glossary, Appendix 1). However, non-regulated pests do not fall within the scope of the application of phytosanitary measures under the IPPC as they are not classified as injurious to plant health. Non-regulated pests are often the target of pre-shipment MB treatments, as defined under the Protocol, as they are detrimental to the *quality* of the product in which they are found.

1.8 QPS Definitions

1.8.1 Quarantine

The Protocol defines 'quarantine' applications as follows:

> *'Quarantine applications' with respect to methyl bromide, are treatments to prevent the introduction, establishment and/or spread of quarantine pests (including diseases) or to ensure their official control, where:*

i) Official control is that performed by, or authorised by, a national plant, animal or environmental protection or health authority;

ii) Quarantine pests are pests of potential importance to the areas endangered thereby and not yet present there, or present but not widely distributed and being officially controlled.

The Protocol definition of a quarantine pest was based on that from the 1994 FAO Glossary of Terms, with one change. The Glossary refers to pests of potential economic importance, whereas the Protocol excludes the term '*economic*'. The definition agreed under the Protocol is deemed by the Parties to be *explicitly* broader than that of the IPPC as it encompasses not only the activities covered by IPPC (plant health) but also covers human and animal health and wider environmental considerations. The IPPC considers that environmental concerns related to plant health, while not specifically stated, are *implicit* in their definition.

The IPPC focuses on securing common and effective action to prevent the spread and introduction of damaging pests of plants and plant products. The Protocol has a broader definition as it also includes 'health authorities'. From a human health perspective, the jurisdiction of health authorities includes preventing the spread of disease from rodents which are found in ships, aircraft and other vehicles; and controlling particular micro-organisms such as bacteria or other disease-carrying organisms which are harmful or even fatal to humans and that may be prevalent in an imported food product.

The Protocol uses the term 'phytosanitary' to refer generally to 'officially-authorised pest control treatments applied to plants and plant products'. A recent revision of the IPPC resulted in expansion (from a 'quarantine' perspective) of the term 'phytosanitary' (previously just 'quarantine pests') to include 'regulated non-quarantine pests' which are associated with plants for planting (propagative material).

1.8.2 Pre-shipment

'Pre-shipment', as intended by the Parties, appears to have no parallel in other international treaties or conventions. Pre-shipment applications are:

Those treatments applied directly preceding and in relation to export, to meet the phytosanitary or sanitary requirements of the importing country or existing phytosanitary or sanitary requirements of the exporting country.

IPPC adopted a definition which narrowed (from a pre-shipment perspective) 'phytosanitary measures' to those related to 'quarantine pests' and 'regulated non-quarantine pests which affect plants for planting'. This definition specifically excluded non-quarantine, stored product pests from within the scope of 'phytosanitary measures' under the Convention. Such pests are often the target of pre-shipment MB treatments as defined under the Protocol as they are detrimental to the quality of the product in which they are found. 'Pre-shipment' therefore aims at using official authorised treatments to control 'quality' pests. Note that 'official' is not specifically part of the definition of 'pre-shipment'. TEAP (1998), however, provided interim explanatory notes to assist the Parties consider pre-shipment treatments as those '...'phytosanitary or sanitary' officially authorised but non-quarantine treatments, fulfilling official requirements of the importing or exporting country at time of export...and not intended to cover informal or purely contractual or commercial arrangements not required under official regulations'. The Protocol's application of the term 'phytosanitary' to cover non-quarantine measures therefore differs from the new IPPC definition of this term.

Clarification of the Protocol usage of terms and the degree to which this is aligned with the IPPC and/or SPS will help regulatory and other border control agencies to better understand both agreements and facilitate a more consistent reporting under the Protocol. For effective implementation with Regulatory Agency staff undertaking 'border patrol' on import-export commodity inspection activities, it would be helpful to explain and provide guidance on deviations from the IPPC.

avoided '...new non-tariff barriers to trade...' (Decision VI/11) that could be introduced if such an exemption were not in place.

3.2.4 Scope of QPS

There has been considerable discussion on the scope of the QPS exemption which is summarised here. For quarantine treatments, Parties decided to:

- Base the exemption on a narrow FAO 1994 definition of a quarantine pest, but to delete 'economic' from '...economic importance...' in the definition as there were more than just 'economic' reasons when considering 'importance';

- Restrict the exemption under quarantine to treatments carried out by government plant, health, animal, or environmental authorities; and

- Include quarantine treatments for commodities moved interstate or region within the one territory.

Unlike 'quarantine', in 1994 there was neither a definition for 'pre-shipment' under the FAO or elsewhere. Currently, the concept of 'pre-shipment' remains peculiar to the Protocol. The Parties saw the need to introduce and define the term 'pre-shipment' to:

- Allow an exemption for MB applied prior to export for *non-quarantine* pests infesting commodities or associated structures and transport vehicles that stored or conveyed these commodities;

- Exempt treatments to those applied 'directly preceding' export, thus excluding multiple, routine, MB treatments from the exemption;

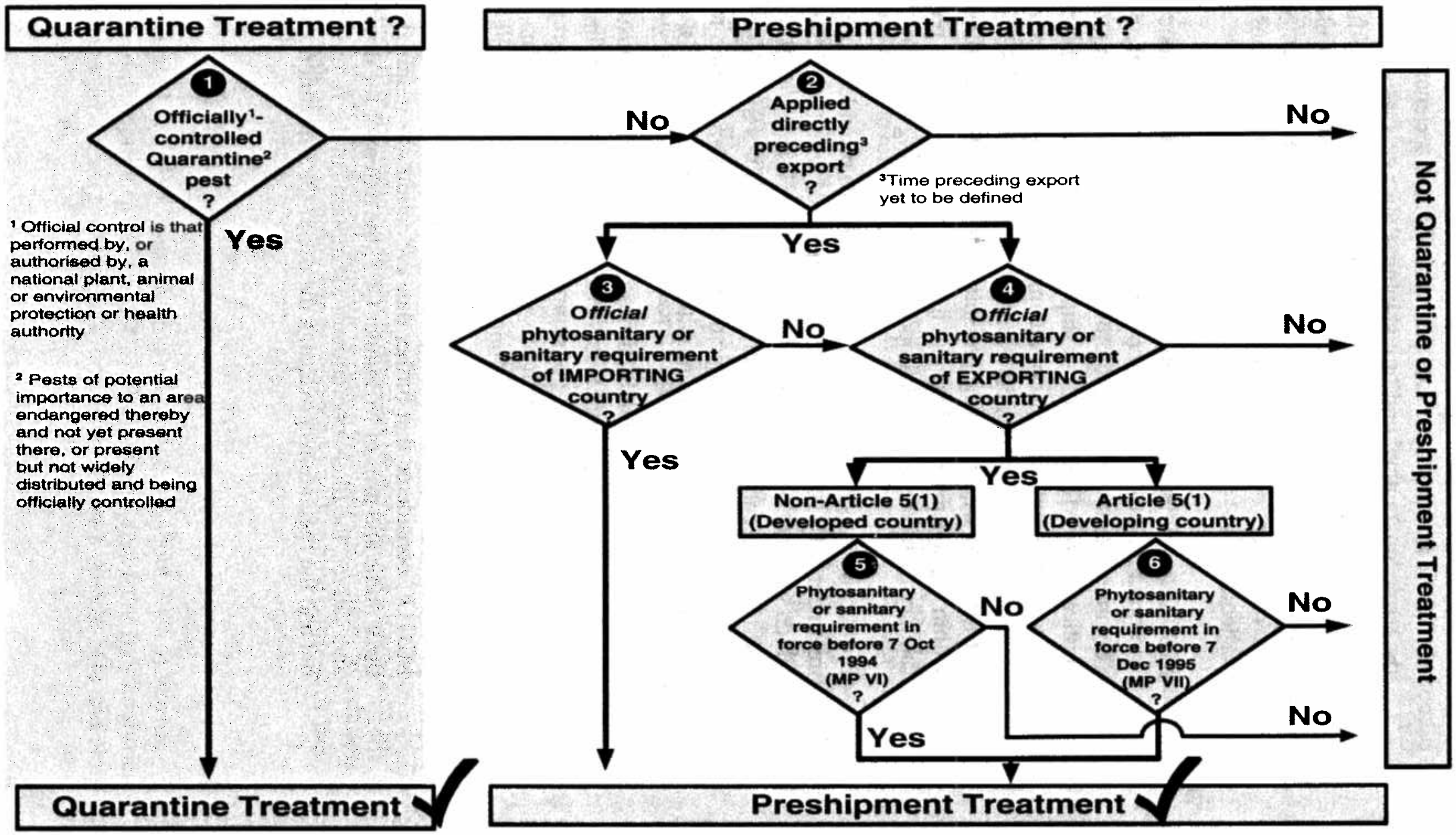
- Exclude treatments authorised by commercial or contractual purposes, and

- Require that the regulation specifying MB treatment must have been in place at the time of the Decision in order to avoid subsequent legislation that might allow exemptions to be generated without the consent of the Parties.

3.2.5 MBTOC comments

MBTOC stated that QPS consumption accounted for about 22% of world-wide MB consumption (MBTOC 1998). Preliminary data from four countries indicated that MB used for QPS was increasing for both Article 5(1) and Non-Article 5(1) Parties.

Figure 3.1: QPS Logic Diagram to assist in deciding whether a treatment should be categorised as a 'quarantine' treatment, 'pre-shipment' treatment or neither.



3.3 Examples that May Assist in Categorising 'Quarantine' and 'Pre-shipment'

This section provides examples of MB treatments considered by MBTOC to be Q, PS and non-QPS.

3.3.1 Uses considered by MBTOC to be QPS

3.3.1.1 Official quarantine treatment in country of origin

A MB treatment required by officials in an importing country against a quarantine pest known to infest a particular commodity.

- ***Example:*** Treatment of packed commodities subject to infestation such as rice, spices and expeller cake or materials packed in straw and wooden crates from a country known to have khapra beetle as an established pest.
- ***Reasoning:*** This is covered by the QPS exemption. It is a quarantine treatment because khapra beetle is an officially recognised quarantine pest in a number of countries. Typically MB is specified for its control.
- ***Example:*** MB treatment in the USA of oak logs to control oak wilt fungus. The logs are destined for Europe.
- ***Reasoning:*** This is covered by the QPS exemption because oak wilt fungus is a declared object of quarantine in the European Union.

3.3.1.2 Official quarantine treatment on arrival

Official treatment of imported consignment where a pest, declared as an object of quarantine, is detected.

- ***Example:*** MB treatment of grapefruit from Florida found to be infested with Caribbean fruit fly on arrival in Japan.
- ***Reasoning:*** This is covered by the QPS exemption. It is a quarantine treatment because Caribbean fruit fly is not present in Japan and MB is specified as a control measure.

Official treatment of a commodity transported within a country where there is potential for transfer of a quarantine pest into an area declared free of that pest, or when the pest is under official containment.

- ***Example:*** MB treatment of rice shipped into Western Australia as a precaution against *Trogoderma variabile*, a pest established in the rice growing area of New South Wales, Australia.

- ***Reasoning:*** This is covered by the QPS exemption. It is a quarantine treatment because the pest is under official containment in Western Australia and is a declared object of State quarantine (although known to be present in a restricted area of Western Australia) and under official control.

3.3.1.3 Eradication of a quarantine pest from an area

MB may be required to control or possibly eradicate quarantine pests in limited and well-defined geographical areas. Pests may be recently established or under long term control.

Treatment of an established quarantine pest with a view to its control and eventual eradication from a country.

- ***Example:*** MB treatment of dry wood termites in houses and in other structures in Southern Queensland.
- ***Reasoning:*** This can be categorised under QPS as a quarantine treatment because dry wood termites are quarantine pests established in a few small regions of Australia and subject to official control. Treatment of quarantine pests established in a limited area is an example of a 'post-entry' quarantine treatment.

3.3.1.4 Official pre-shipment treatment in country of origin in relation to exports

Treatment of a cargo prior to shipment to meet an importing country's official phytosanitary requirements.

- ***Example:*** MB treatment of wheat shipments destined for Kenya. The treatments against cosmopolitan grain pests are carried out in the seven day period prior to export.
- ***Reasoning:*** This is categorised under QPS as a pre-shipment application because treatment with MB is an official phytosanitary requirement of the Kenyan Government for wheat imported into Kenya. Although Kenyan authorities recognise phosphine as an alternative to MB for this application, the existence of an alternative does not invalidate the exemption.

Treatment of a cargo preceding export to meet a country's export regulatory requirements which were in force before 7 October 1994 (for non-Article 5(1) countries) or before 7 December 1995 (for Article 5(1) countries).

- ***Example:*** MB fumigation of wheat at the point of export (seaboard terminal) within a few days prior to shipment from Australia to meet officially required 'nil' tolerance levels for insect infestation in export grain.

- ***Reasoning:*** This can be categorised under QPS as a pre-shipment treatment as it was applied at the time of export to meet the official requirements of the Grain, Plant and Plant Protection Orders under the Export Control Act (1982) which were in force at the time of Decision VII/5.

Treatment of an empty ship prior to loading to meet exporting country's regulatory requirements.

- ***Example:*** MB fumigation of empty ships' holds in ships due to load grain for export at a port in Canada, carried out under the direction of the inspection authorities, because cosmopolitan grain pests were intercepted on the ship.
- ***Reasoning:*** This would be categorised under QPS as a pre-shipment treatment as it was carried out in relation to exports to comply with the export requirements of the exporting country's legislation in force at the time of Decision VII/5.

In-transit fumigation of freight containers loaded on a train and subsequently exported by ship.

- ***Example:*** To meet official phytosanitary requirements, MB fumigation of milled rice in bags in freight containers at the rice mill some distance from a port. Subsequent transfer to port and export by ship within 14 days of treatment.
- ***Reasoning:*** This would be categorised under QPS as a pre-shipment treatment as it was carried out directly prior to export to meet official phytosanitary requirements.

3.3.1.5 Treatment of land prior to export of crop

MB treatment of land prior to planting a crop destined for export.

- ***Example:*** Fumigation of land prior to planting strawberry runners for export.
- ***Reasoning:*** This is covered by the QPS exemption as the treatment was for carried out for official phytosanitary reasons (pers. comm. Dr Frank Westerlund, MBTOC) against soil pathogens that could be carried by the exported strawberry runners.

Note: This was the only example identified by MBTOC for treatment of land, and is therefore a very unusual case. An example of QPS for export fruit, distinct from runner production, is discussed in 4.3.2.5.

8. QPS Comparison of Definitions

8.1 Quarantine

8.1.1 Montreal Protocol definition

Decision VI/11 defined the term 'quarantine' which reads as follows:

(a) *'Quarantine applications' with respect to methyl bromide, are treatments to prevent the introduction, establishment and/or spread of quarantine pests (including diseases) or to ensure their official control, where:*

i) *Official control is that performed by, or authorised by, a national plant, animal or environmental protection or health authority;*

ii) *Quarantine pests are pests of potential importance to the areas endangered thereby and not yet present there, or present but not widely distributed and being officially controlled;*

8.1.2 Comparison with the International Plant Protection Convention Definition

MBTOC notes that although there are general similarities between the IPPC definition of quarantine and that adopted by the Parties to the Protocol, there are some significant differences that may affect implementation by some quarantine authorities.

The Protocol definition of a quarantine pest was based on the 1994 FAO Glossary of Terms with one change. The Glossary refers to pests of potential economic importance, whereas the Protocol excludes the term *'economic'*.

The definition agreed under the Protocol is deemed by the Parties to be *explicitly* broader than that of the IPPC as it encompasses not only the activities covered by IPPC (plant health) but also covers human and animal health and wider environmental considerations. Hence the word 'economic' was omitted from the Protocol definition, and the definition also included reference to authorities other than national plant health authorities. MBTOC noted that the IPPC considers that environmental concerns related to plant health, while not specifically stated, are *implicit* in the IPPC definition.

The Protocol uses the term 'phytosanitary' to refer generally to treatments applied to plants and plant products. The IPPC has previously limited the term in a technical sense to only quarantine pests. However, the recent revision of the IPPC resulted in minor expansion of the term to include also 'regulated non-quarantine pests' which are those pests (e.g., plant-feeding mites) associated with plants for planting (propagative material). This was done to provide clarity to the legitimate application of phytosanitary measures (regulatory requirements) in the category of 'other injurious pests'. Pests that are neither 'quarantine' nor 'regulated non-quarantine' now fall outside the application of the term phytosanitary under the IPPC. The result is that the IPPC has moved somewhat closer to the Protocol usage of the term, but the Agreements continue to be inconsistent with respect to treatments for those pests that are not eligible for phytosanitary measures in a technical sense. Clarification of the Protocol usage of terms and the degree to which this is aligned with the IPPC and/or SPS will help regulatory and other agencies to better understand both agreements and facilitate a more consistent reporting under the Protocol.

The IPPC focuses on securing common and effective action to prevent the spread and introduction of damaging pests of plants and plant products. The Protocol definition is necessarily broader as it includes 'health authorities'. From a human health perspective, the jurisdiction of health authorities includes preventing the spread of disease from rodents which are found in ships, aircraft and other vehicles; and controlling particular micro-organisms such as bacteria or other disease-causing organisms which are harmful or even fatal to humans and that may be prevalent in an imported food product.

8.1.3 Implications of inconsistent interpretation

MBTOC noted that there is some inconsistency in the interpretation of the term 'quarantine' amongst Parties. This may lead to anomalies in reporting of consumption of MB under the quarantine part of the QPS exemption.

The term 'quarantine' may have different connotations to MB users and officials in some countries. For example, in some cases treatments regarded locally as quarantine are applied to kill non-quarantine pests, such as species of insects (eg. cosmopolitan grain pests) already present in the country. Detection by inspection authorities of pests or other living organisms in an incoming shipment may be sufficient to result in authorisation of a treatment regarded locally as 'quarantine'. This may be based on long established practice, though not consistent with the use and interpretation of current IPPC definitions. The definition adopted by the Protocol of 'quarantine' conforms to the international concept of plant quarantine agreed under the IPPC where the pest for which treatment is authorised must be a declared object of quarantine. MBTOC suggests that the Parties consider recommending adherence to the IPPC definition and not local definitions of quarantine.

In the latest IPPC language, 'quarantine' applications continue to be limited to 'regulated quarantine pests' and exclude applications for 'unregulated pests'. However, within the category of pests previously known under the IPPC as other 'injurious pests' clarification has been provided to distinguish 'regulated non-quarantine pests' from other pests. This is significant in that the application of official phytosanitary measures under the IPPC is limited to regulated pests, i.e., 'quarantine pests' and 'regulated non-quarantine pests'.

The definition in Decision VII/5 is silent on quarantine application in intra-country trade. However, at the time of drafting the definition of QPS, it was not intended to exclude official intra-country quarantine treatments from exemption, although the text of Decision VII/5 could be interpreted to restrict exempt quarantine treatments to those conducted or authorised by national, not state authorities.

MBTOC notes that inconsistency in the interpretation of the term 'quarantine' may lead to mis-classification of some officially required treatments which are not applied to quarantine pests and would be more appropriately categorised as pre-shipment treatments.

MBTOC notes that little has changed with respect to 'quarantine' between the IPPC and Protocol. However, further IPPC clarification of terms and their application through the establishment of standards and agreement on new terms or changes to existing terms can significantly affect harmonisation with the Protocol interpretation and application. For instance, IPPC definitions being developed for 'official control, widespread and/or limited distribution' will provide substantial additional clarity to the definition for quarantine pests, and by implication, could lead to changes in QPS.

8.1.4 Options for the Parties to consider

There are two main mechanisms that may be considered in order to provide clarification to Parties for consistent interpretation of 'quarantine', and to harmonise with IPPC to the extent that is necessary and appropriate:

a) Amend the Protocol definition of 'quarantine'. The disadvantage of this approach is that further amendments may be required in the future to keep abreast of IPPC changes, and a definition is not likely to provide sufficient explanation for consistent application of 'quarantine' to the Parties.

b) Provide an Explanatory Note (with legal support) and a mechanism for updating the Note by, for example a TEAP review, that harmonises the Protocol use of 'quarantine' with the relevant and appropriate changes as they arise in the IPPC definition; and Parties can be provided with guidance to enable consistent interpretation by all Parties.

Parties may therefore wish to consider these options:

- Exclude one or more of the different authorities which are referred to in the Protocol definition to narrow the scope of the exemption;
- Retain the current Protocol definition and thus the broad scope of the exemption;
- Insert the term 'economic' in the definition to harmonise the definition of quarantine pest with that of the IPPC;
- Full harmonisation with the IPPC terminology; and
- Request specific guidance on interpretation under the Protocol that differ from the IPPC (partial harmony in specified areas).

8.2 Pre-shipment

8.2.1 Montreal Protocol Definition

The Montreal Protocol defines pre-shipment applications as '...those treatments applied directly preceding and in relation to export, to meet the phytosanitary or sanitary requirements of the importing country or existing phytosanitary or sanitary requirements of the exporting country.'

MBTOC is not aware of any other international definition of 'pre-shipment' with the same intent as that provided in the Protocol. There is, however, a WTO agreement on 'pre-shipment inspection' but this relates to specific activities on the '...quality, quantity, price...customs classification...' of goods to be exported and not to the 'pre-shipment' treatment as described in the Protocol.

8.2.2 Chronology

When MB was first added as a controlled substance under the Montreal Protocol in 1992, Parties allowed a blanket exemption for QPS use, although the terms were left undefined.

Subsequently, the Parties defined QPS and discussed the scope of the terms during their 6th meeting in 1994. As part of the discussion, Parties examined existing relevant international definitions and, given that there appeared to be definition for pre-shipment, the Parties looked to the FAO glossary and their own domestic procedures for guidance. The Food and Agricultural Organisation (FAO) glossary included a definition of 'phytosanitary measures' which was synonymous with 'quarantine', i.e. 'Any legislation, regulation or official procedure having the purpose to prevent the introduction and/or spread of quarantine pests'. However, for many years, officials issued phytosanitary certificates which covered both quarantine and other injurious pests. At the time, other injurious pests were broadly interpreted to be those which affected quality pursuant to national regulations or standards.

In response to this practice, the decision of the Parties at the 6th meeting was to limit the definition of pre-shipment applications to treatments carried out immediately prior to export to meet phytosanitary requirements of importing countries or the existing phytosanitary requirements of exporting countries. Initially, these provisions related to non-Article 5(1) countries only. Between 1994 and 1995, at the request of the Meeting of the Parties, TEAP reviewed the definitions in line with current practices and guidelines. Based on TEAP's findings, the Parties decided at the 7th meeting not to alter the definition but rather to extend it to cover Article 5(1) Parties.

At about the same time in 1995, the SPS agreement came into force and the Parties to the IPPC began the process of revising its Convention to clarify the application of 'phytosanitary measures'. Members debated whether to include or exclude non-quarantine stored product pests from the scope of 'phytosanitary measures', where they involved injury to quality of products, not strictly to health of plants.

In 1997, the Parties to the IPPC adopted a definition which narrowed 'phytosanitary measures' to those related to 'quarantine pests' and 'regulated non-quarantine pests which affected plants for planting' (propagative material). This definition specifically excluded non-quarantine, stored product pests from within the scope of 'phytosanitary measures' under the Convention. Examples of cosmopolitan and thus, in most situations, non-quarantine stored product pests usually include Indian meal moth and *Sitophilus* grain weevils. These pests are damaging to stored grain, and yet under the IPPC narrow definition of phytosanitary measures, are specifically excluded. The Protocol, therefore, appears to have defined 'pre-shipment' as those treatments applied to control 'quality' pests. While the revised definition of 'phytosanitary measures' that was adopted by IPPC Members in 1997 has yet to be ratified, ratification is likely.

Also in 1997, TEAP suggested that one option for Parties might be the removal of the quarantine and pre-shipment exemptions. The Parties did not make a decision on this suggestion. In their 1998 report, TEAP recognised inconsistencies in the interpretation of the terms quarantine and pre-shipment by Parties and provided interim explanatory notes to assist the Parties:

(3) "The definition of 'pre-shipment application' is restricted by the terms 'phytosanitary or sanitary' to officially authorised but non-quarantine treatments, fulfilling official requirements of the importing or exporting country at time of export. It was not intended to cover informal or purely contractual or commercial arrangements not required under official regulations."

and

(5) 'The intention of the definition of 'pre-shipment applications' was to limit exemptions to those treatments carried out at the time of export under official requirements, either of the importing country or regulations in force in exporting countries at the time of the Decision (December 1995). This excludes arrangements which are contractual only."

In recognition of the on-going inconsistencies in interpretation, and to assist the Parties in the correct interpretation of QPS, Section 3.3 of this report contains a QPS Logic Diagram and examples of QPS treatments.

8.2.3 Current Issues

As a result of inconsistent interpretation of the term 'pre-shipment', some Parties may be over or under estimating their controlled consumption of MB.

As a result of the divergence between the Protocol and IPPC interpretations of the term 'phytosanitary', the Protocol permits pre-shipment treatments for unregulated pests whereas under the IPPC definition, treatments should only be applied to regulated pests. Regulated pests are 'quarantine pests', and 'non-quarantine pests that affect plants for planting'.

The primary issues are (1) whether the Parties to the Protocol wish to align QPS with the IPPC (or alternatively with the SPS) in the use of the term 'phytosanitary', and (2) whether the Parties wish to associate with IPPC Article VI (2) concerning the scope of the application of phytosanitary measures. In either case, deviations from the IPPC should have supporting rationale and will require explicit guidance to Parties if implementation by Regulatory Agency border control staff is to be effective.

8.2.4 Options on pre-shipment that Parties may wish to consider

There are several options which the Parties may wish to consider when reviewing the pre-shipment exemption. Regardless of which option is taken up, Parties may need to ensure that domestic regulatory agencies are able to interpret the protocol definitions consistently. The options are described briefly below:

Option 1: Remove pre-shipment exemption before phase out

This would mean that current pre-shipment uses would fall under the control schedule adopted by the Parties for all non-exempted MB uses. The use itself would continue until phase out.

Implications

1.1 Current pre-shipment uses would no longer be exempt after the phaseout, except where they meet Critical Use Criteria. Consumption of MB for current pre-shipment uses such as disinfestation of grain, cocoa, dried fruit and nuts and treatment of empty shipholds would need to be allocated to current consumption volumes per country.

1.2 The incentive to develop and adopt alternatives for pre-shipment uses would increase.

1.3 Exemptions would not be allowed under the critical use and possibly the emergency use procedures until after phaseout.

1.4 The individual baseline volume for each Party might need to be increased to accommodate pre-shipment uses, if the Parties considered this necessary.

1.5 Pre-shipment treatments would need to compete with other controlled uses as the supply of MB diminishes as a result of interim reductions leading to phaseout.

1.6 Some national legislation or regulations requiring the use of MB ie., legislation which falls outside of ozone-depleting substances, would need to be amended.

Option 2: Remove pre-shipment exemption after phase out

This would mean that current pre-shipment uses would remain in place until scheduled date for phaseout.

Implications

As for 1.1, 1.2 and 1.5 above, but in addition:

2.1 Exemptions would be allowed under either critical use or emergency use after phaseout.

Option 3: Place a cap on pre-shipment consumption.

3.1 The baseline would need to be agreed by the Parties.

Parties could consider capping QPS MB consumption based on baseline consumption for an agreed number of years. This has been agreed in a Common Position for a new EC Regulation by the European Union.

Implications

Current pre-shipment consumption would continue at baseline level.

Option 4: Leave exemption in place, but interpret 'phytosanitary' following the IPPC definition that includes only those uses which apply to 'regulated non-quarantine pests (that affecting plants for planting)'

This would mean that the current definitions would remain, with the addition of the IPPC definition for 'phytosanitary measures'.

Implications

As for 1.2, 1.4, 1.5, 1.6 and 2.1 above, but in addition:

4.1 All other current pre-shipment uses to control pests that *do not* affect plants for planting would no longer be exempt. This would exclude almost all current exemptions, notably disinfestation of grain, cocoa, dried fruit and nuts and treatment of empty shipholds.

Option 5: Leave exemption in place with current definitions, but interpret 'phytosanitary' in the SPS definition to include all uses related to injurious pests.

This would mean that the current definition would remain, with the addition of the SPS definition for 'phytosanitary measures'.

Implications

5.1 Would include all injurious pests that apply to plants, animals and human health.

5.2 May broaden the interpretation of the current definition to include all treatments applied directly preceding export, whether in response to official or contractual requirements alike, thereby increasing consumption under the exemption.

Option 6: Change existing definition or add an Explanatory Note

One option would be to replace 'phytosanitary and sanitary' with the word 'official'; and 'within 14 days of export' and add 'stored product authority'. The definition would then read:

'Pre-shipment applications are those applied *within 14 days* directly preceding and in relation to export to meet the *official* requirements of the importing country or existing *official* requirements of the exporting country. *Official* requirements are those which are performed by, or authorised by, a national plant, animal, environmental, health or *stored product authority*.'

Implications

6.1 No change to existing Protocol interpretation of pre-shipment, ie., it allows the 1994 interpretation to remain, consistent with 1998 TEAP explanatory notes 3 & 5 above.

6.2 Greater clarity for Parties.

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- Australian Quarantine and Inspection Service (AQIS) (http://www.affa.gov.au);
- Major changes to AQIS import conditions (ICON database) for AQIS (http://www.aqis.gov.au/icon32/asp/ex_alertscontent.asp)
- United States Department of Agriculture (USDA) Animal and Plant Health and Inspection Service (APHIS) (http://www.aphis.usda.gov/ppq)
- Food quality and safety (http://www.fao.org/es/ESN/index_en.stm)
- Codex Alimentarius (http://www.codexalimentarius.net/)
- Animal Health OIE (http://www.oie.int/)
- FAO Animal Health (http://apps3.fao.org/vs/index.htm)
- North American Plant Protection Organisation (http://www.nappo.org)
- New Zealand Ministry of Agriculture Biosecurity Authority (http://202.78.129.207/biosecurity)
- APHIS Part 319: Foreign Quarantine Notices that shows conditions under which products can be imported into the USA (http://www.access.gpo.gov/nara/cfr/waisidx_01/7cfr319_01.html)

The equivalent European document to the "USDA-APHIS Treatment Manual" is contained within legislation (EC) 2000/29 and (EC) 2000/36 that contains the special requirements that must be implemented by all Member States to control pests and pathogens on plants, plant products and other objects that move into and within the Member States (Anon 2000a).

The IPPC in December 2002 will consider opportunities to minimise the use of MB and ways to avoid disruption to trade in the event of further restrictions being placed on the use of this fumigant (Dr Stephen Ogden, Director Market Access Solutionz, *pers. comm.*, November 2002). This follows technical consultations among Regional Plant Protection Organisations on the prospects of reduced access to MB for quarantine fumigation (Anon 2001c). The Interim Commission of the IPPC has adopted 17 International Standards for Phytosanitary Measures which endeavour to harmonise international phytosanitary practices e.g., risk analysis and risk management and non-compliance feedback. The implementation of practices consistent with these standards should result in a reduction of the QPS applications of MB. Some Parties have already capped the amount of MB that can be used for QPS purposes e.g., the European Regulation EC2037/00 that has been implemented in 15 countries. Other Parties may consider similar restrictions on the use of MB for QPS uses, though the timeframe for implementation of this restriction is unknown.

7.3 Definitions of Quarantine and Pre-shipment

In general, MB used in quarantine treatments targets quarantine pests, which are carefully defined by regulatory authorities. The treatment is officially authorised by the competent authority and not a commercial organisation and can be carried out before shipment or on arrival. In contrast, pre-shipment treatments are always carried out within 21 days of shipment and target non-quarantine pests. Pre-shipment treatments must also be authorised by the relevant authority and not a commercial organisation. The Montreal Protocol definitions of Q and PS together with an explanation of their derivations and intent follow in the following sections.

7.3.1 Definition of quarantine

Decision VII/5 of the Montreal Protocol in 1995 defined a *quarantine application* as a treatment applied to prevent the introduction, establishment and/or spread of a quarantine pest (including disease), or to ensure its official control. A *quarantine pest* is defined as a pest of potential importance to the area endangered and not yet present there, or present but not widely distributed and being officially controlled. *Official control* is that performed by, or authorised by, a national plant, animal, environmental protection or health authority.

The use of MB in a quarantine treatment can only be for pests that are officially recognised as quarantine pests. The Protocol definition of 'quarantine' is broader than the use of this term in other international plant protection conventions and treaties. However, this was regarded by the Parties as appropriate as MB is currently being used for some pest control practices such as rat control where there is a risk to human health. Human health aspects are not specifically considered in the definition of plant quarantine in other treaties and conventions.

There has been considerable discussion by the Parties on the scope of the QPS exemption. For quarantine treatments, the Parties decided to:

- Base the exemption on a narrow FAO 1994 definition of a quarantine pest, but to delete 'economic' from '...economic importance...' in the definition as there were more than just 'economic' reasons when considering 'importance';
- Restrict the exemption under quarantine to treatments carried out by government plant, health, animal, or environmental authorities; and
- Include quarantine treatments for commodities moved interstate or region within the one country.

The WTO Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement) defines the basic rights and obligations of Parties with regard to the use of measures applied to protect human, animal or plant life or health, including procedures to test, diagnose, isolate, control or eradicate diseases and pests. This Agreement encourages Parties to base their national SPS measures on relevant international standards, guidelines and recommendations. Risk assessment provides the basis for measures applied in the absence of international standards.

In assessing pest risks, WTO Members are required to take into account available scientific evidence; relevant processes and production methods; relevant inspection, sampling and testing methods; prevalence of specific diseases and pests; existence of disease/pest free areas or areas of low pest prevalence; relevant ecological and environmental conditions; and quarantine or other treatment.

The Secretariat of the Food and Agricultural Organisation (FAO, IPPC), in co-operation with regional organisations operating within the framework of the IPPC, is responsible for developing international standards, guidelines and recommendations

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treatment at 0°C (± 0.5°C) followed by MB *fumigation* at a low rate of 12 g m^{-3} for 2 hours at 15°C for control of fifth instar diapause larvae of peach fruit moth potentially infesting apples for export to the USA was more effective than MB fumigation alone (Kawakami *et al.*, 1994). A combination of *vapour heat* followed by *cold storage* is used to kill oriental fruit flies on litchi imported by Japan from Taiwan (Anon, 1980) and China (Anon, 1994a).

Inspection combined with a heat treatment is an accepted treatment for litchi exported from Hawaii to the mainland USA. Litchis must be thoroughly examined in the pack house and found free of *Cryptophlebia* spp. and other plant pests. Fruit must be submerged at least four inches below the surface of the water that must be kept at 45.5°C and above for 20 minutes (USDA, 2007). Hydro-cooling subsequently is recommended after treatment to avoid fruit damage.

The rarity of approved combination treatments compared with single treatment applications is probably due to extensive technical documentation required to demonstrate treatment efficacy for regulatory agencies.

9.4.6. Alternatives for soils for production of certified propagation material

Methyl bromide is used in several countries for some treatments of soil on which propagation material is grown. The treatments are for the production of certified high health stock, such as strawberry runners, tree seedlings and nursery material. In nearly all non-Article 5 countries in 2006 that applied for an exemption from phaseout for methyl bromide for this purpose, the consumption was permitted under a Critical Use Exemption, on the basis that there are currently no technically and economically feasible alternatives for the use, following Decision IX/6. These countries determined that it is appropriate to use the CUN process for methyl bromide to be used for production of strawberry runners and some other propagation stock. In one country, USA, a proportion of the methyl bromide used for production of propagation material is allocated to QPS use.

Target pests for this QPS use include a range of pest nematodes and pathogenic fungi. These pests and diseases, if allowed to remain unchecked, may have severe effects on the productivity and growth of the propagation material when it is grown out. Government and industry certification schemes for propagation material aim to reduce the level of pathogen or disease tolerance to a very low level (often < 1%). This has a major influence on reduction of disease when the propagation material is planted out in production fields. Plants show either no disease or very low levels of disease. Fruiting strawberry plants from runners from untreated soils typically produce 70% or less fruit compared with runners produced on land fumigated with methyl bromide.

Three key points to consider in these cases are:

1. Does MB reduce pathogen levels or eradicate pathogens (especially notifiable quarantine pests) to a reasonable depth in soil after treatment and does this prevent disease?
2. Can MB fumigation treatments 4 to 6 months before harvest of propagative material guarantee disease free status of plant material?

ANNEX IV. – U.S. Quarantine Regulations for "Plants for Planting"

United States Department of Agriculture (USDA)
Animal and Plant Health Inspection Service (APHIS)

Title 7 – Agriculture
Part 305.2 – Treatments

(n) ***Plants, bulbs, corms, tubers, rhizomes, and roots***. The treatment schedules for which administration instructions are not provided are in §305.6 for methyl bromide (MB) fumigation, §305.10 for combination (COM), and §305**.**42(c) for miscellaneous (Misc.).

Plant material	Pest	Treatment schedule
Anchusa, Astilbe, Clematis, Dicentra, Gardenia, Helleborus, Hibiscus, Kniphofia, Primula	Lesion nematodes (*Pratylenchus* spp.)	T553–2: Hot water dip at 118 °F for 30 minutes.
Acalypha	*Pratylenchus* spp	T570–1: Hot water dip at 110 °F for 50 minutes.
Aconitum	*Aphelenchoides fragariae* spp	T570–2: Hot water dip at 110 °F for 50 minutes.
Allium, *Amaryllis*, and bulbs	Bulb nematodes: *Ditylenchus dipsaci, D. destructor*	T552–1: Presoak bulbs in water at 75 °F for 2 hours, then at 110–111 °F for 4 hours.
Amaryllis	*Ditylenchus destructor*	T565–1: Hot water dip at 110 °F for 4 hours immediately after digging.
Aquatic plants	Snails of the families: Ampullariidae, Bulinidae, Lymnaeidae, Planorbidae, Viviparidae	T201–q: Hot water treatment at 112 °F for 10 minutes. (*Elodea, Danes,* and *Cabomba caroliniana* plants not tolerant to this treatment.)
Armoracea (horseradish roots), bulbs (not specifically provided for)	*Globodera rostochiensis* and *G. pallida*	T553–3: Hot water dip at 118 °F for 30 minutes.
Astilbe, Bletilla hyacinthina, Cimicifuga, *Epimedium pinnatum, Hosta, Paeonia*	*Aphelenchoides besseyi*	T564–1: Presoak in water at 68 °F for 1 hour followed by hot water soak at 110 °F for 1 hour. Then dip in cold water and let dry.
Astilbe roots	*Brachyrhinus* larvae	MB T202–b.
Azalea	*Chrysomyxa* spp	T501–1: Remove infested parts and treat all plants of same species in shipment with 4–4–50

		Bordeaux dip or spray.
Azalea hybrid	*Chrysomyxa* spp	T501–2: Remove infested parts and treat all plants of same species in shipment with 4–4–50 Bordeaux dip or spray; or T505–1–1: Treat with mancozeb or other approved fungicide of equal effectiveness according to the label.
Banana roots	External feeders	T202–c: Pretreatment at 110 °F for 30 minutes. Then, hot water dip at 120 °F for 60 minutes.
Begonia	*Aphelenchoides fragariae*	T559–1: Dip in hot water at 118 °F for 5 minutes.
Bletilla hyacinthina	*Aphelenchoides fragariae*	T553–4: Dip in hot water at 118 °F for 30 minutes.
Bromeliads	External feeders	MB T201–e–1.
	Internal feeders such as borers and miners	MB T201–e–2.
	Phyllosticta bromeliae Uredo spp	T507–1: Remove infested leaves and treat all plants of same species in shipment with Captan following label directions.
Cacti and other succulents	External feeders (other than soft scales) infesting collected dormant and nondormant plant material	MB T201–f–1.
	Borers and soft scales	MB T201–f–2.
Calla (rhizomes)	*Meloidogyne* spp	T556–1: Dip in hot water at 122 °F for 30 minutes.
Camellia (light infestation)	*Cylindrosporium camelliae*	*Light infestation:* T509–1–1: Remove infested leaves and dip or spray plant with 4–4–50 Bordeaux. Dry quickly and thoroughly. *Heavy infestation:* An inspector will refuse entry.
Christmas tree	*Phoma chrysanthemi*	T501–5: Remove infested parts and treat all plants of same species in shipment with 4–4–50

		Bordeaux dip or spray.
Chrysanthemum	*Phoma chrysanthemi*	T501–4: Remove infested parts and treat all plants of same species in shipment with 4–4–50 Bordeaux dip or spray.
Chrysanthemum rooted and unrooted cuttings	Aphids	MB T201–g–1.
	External feeders	COM T201–g–2.
	Leafminers, aphids, mites, etc. (*Chrysanthemum* spp. from Dominican Republic and Colombia when infested with Agromyzid leafminers requires no treatment unless destined to Florida.)	T201–g–3: Dip in hot water at 110–111 °F for 20 minutes.
Chrysanthemum (not including Pyrethrum)	*Meloidogyne* spp. and *Pratylenchus* spp	T557–1: Dip in hot water at 118 °F for 25 minutes.
Commodities infested with	Slugs of the families Agriolimacidae, Arionidae, Limacidae, Milacidae, Philomycidae, Veronicellidae, including the following genera: *Agriolimax, Arion, Colosius, Deroceras, Diplosolenodese, Leidyula, Limax, Meghimatium, Milax, Pallifera, Pseudoveronicella, Sarasinula, Semperula, Vaginulus, Veronicella*	MB T201–l.
Convallaria	*Globodera rostochiensis* and *G. pallida*	T551–1: Keep the pips frozen until time for treatment. Then thaw enough to separate bundles just before treatment begins. Without preliminary warmup, immerse in hot water at 118 °F for 30 minutes.
Crocus	*Aphelenchoides subtenuis, Ditylenchus destructor*	T565–2: Hot water at 110 °F for 4 hours immediately after digging.
Cycads (except *Dioon edule*)	External feeders	MB T201–h–1.
Deciduous woody plants (dormant)	External feeders	MB T201–a–1.
	Gypsy moth egg masses	MB T313–a or MB

		T313–b.
	Mealybugs	MB T305–c.
Deciduous woody plants (dormant), root cuttings, scion wood cuttings, and nonfoliated citrus whitefly host: *Acer, Berberis, Fraxinus, Philadelphus, Rosa, Spiraea, Syringa*	Borers, Citrus whitefly hosts	MB T201–a–2 or MB T201–k–1.
Dioon edule	External feeders	MB T201–h–2.
Dieffenbachia, Dracaena, Philodendron (plants and cuttings)	External feeders	MB T201–i–1.
	Internal feeders	MB T201–i–2.
Evergreens (*Azalea, Berberis, Camellia, Cedrus, Cupressus, Ilex, Juniperus, Photinia, Podocarpus, Thuja*, and *Taxus*)	External feeders	MB T201–b–1.
Exceptions:		
Araucaria	External feeders	MB T201–c–1.
Azalea indica	External feeders	MB T201–c–2.
Cycads	External feeders	MB T201–l.
Hosts	*Dialeurodes citri*	MB T201–k–1.
Daphne	External feeders	MB T201–c–1.
Lavandula	External feeders	Misc. T201–p–1.
Osmanthus americanus	External feeders	COM T201–p–2.
Pinus (Canada to certain States)		MB T201–j.
Peanuts	Gypsy moth egg masses	MB T313–a.
Foliated host plants of *Dialeurodes citri* , excluding *Osmanthus americanus*	*Dialeurodes citri*	MB T201–k–1.
Fragaria (strawberry)	*Aphelenchoides fragariae*	T569–1: Hot water at 121 °F for 7 minutes.
	Pratylenchus spp.	T558–1: Dip in hot water at 127 °F for 2 minutes.
Garlic (see §319.37–6(c))	*Brachycerus* spp. and *Dyspessa ulula*	MB T202–j.
Gentiana	*Septoria gentianae*	T507–2: Remove infested leaves and treat all plants of same species in shipment with Captan following label directions.
Gladiolus	*Taeniothrips simplex*	MB T202–e–1 or MB 202–e–2.
	Ditylenchus destructor	T565–3: Hot water at 110 °F for 4 hours immediately after digging.

Greenhouse-grown plants, herbaceous plants and cuttings, greenwood cuttings of woody plants	External feeders, leafminers, thrips	MB T201–c–1.
	Borers and soft scales	MB T201–c–2.
Exceptions :		
Bromeliads	External feeders	MB T201–e–3–1.
Cacti and other succulents	External feeders	MB T201–j.
Chrysanthemum	External feeders	MB T201–g–1.
Cycads	External feeders	MB T201–1.
Cyclamen	Mites	MB T201–a–2.
Dieffenbachia , *Dracaena* , and *Philodendron*	External feeders	MB T201–i–1.
Kalanchoe synsepala	Quarantine pests, excluding scale insects	Misc. T201–p–1.
Lavandula	Quarantine pests	COM T201–p–2.
Orchids	*Dialeurodes citri*	MB T201–k–2.
Osmanthus americanus	Quarantine pests	Misc. T201–p–1.
Pelargonium	Quarantine pests	Misc. T201–p–1.
Sedum adolphi	Quarantine pests	Misc. T201–p–1.
Plants infested with	*Succinea horticola*	T201–o–1: Use a high-pressure water spray on the foliage to flush snails from the plants. The run-off drain must be screened to catch snails before drainage into the sewer system.
Plants infested with	*Veronicella* or other slugs	MB T201–1.
Horseradish roots from the countries of Armenia, Azerbaijan, Belarus, Bosnia, Herzegovina, Croatia, Czech Republic, Estonia, Georgia, Germany, Hungary, Italy, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Poland, Russia, Serbia and Montenegro, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan	External feeders	MB T202–f.
Host plants of *Aleurocanthus woglumi*	*Aleurocanthus woglumi*	MB T201–n.
Host plants of *Omalonyx unguis* and *Succinea*	*Omalonyx unguis* and *Succinea* spp. (snails)	T201–o–1: Use a high-pressure water spray on the foliage to flush snails from the plants. The run-off drain must be screened to catch snails before drainage into the sewer system; or T201–

		o–2: Dip plants with solution prepared by adding 3 level tablespoons of 25 percent Malathion wettable powder and 6 level teaspoons of 50 percent carbaryl wettable powder per gallon of water with a sticker-spreader formulation.
Humulus	*Heterodera humuli*	T553–5: Hot water at 118 °F for 30 minutes.
Hyacinthus (bulbs), *Iris* (bulbs and rhizomes), *Tigridia*	*Ditylenchus dipsaci* and *D. destructor*	T554–1–1: Presoak in water at 70–80 °F for 2.5 hours followed by hot water immersion at 110–111 °F for 1 hour; or T554–1–2: Hot water immersion at 110–111 °F for 3 hours with no presoaking.
Lilium (bulbs)	*Aphelenchoides fragariae*	T566–3: Completely submerge in hot water at 102 °F.
Lily bulbs packed in subsoil	Internal feeders	MB T202–g.
Lycoris	*Taeniothrips eucharii*	MB T202–h.
Muscari, *Ornithogalum*, *Polianthes* (tuberose)	*Ditylenchus dipsaci*	T567–1: Dip in hot water at 113 °F for 4 hours.
Narcissus	*Steneotarsonemus laticeps*	MB T202–i–1; or MB T202–i–2; or T202–i–3: Hot water at 110–111 °F for 1 hour after bulbs reach 110 °F pulp temperature. Apply hot water within 1 month after normal harvest as injury to flower bud may occur.
	Ditylenchus dipsaci	T555–1: Presoak in water at 70–80 °F for 2 hours; then at 110–111 °F until all bulbs reach that temperature and hold for 4 hours.
Nonfoliated host plants of *Dialeurodes citri*, excluding *Osmanthus americanus*	*Dialeurodes citri*	MB T201–k–2.

Orchids	*Ascochyta* spp	T513–1: Defoliate if leaf-borne only; inspector will refuse entry if pseudo-bulbs infested.
	Cercospora spp	T501–3: Remove infested parts and treat all plants of same species in shipment with 4–4–50 Bordeaux dip or spray.
	Hemileia spp., *Leptosphaeria* spp., *Mycosphaerella* spp., *Ophiodothella orchidearum, Phomopsis orchidophilia, Phyllachora* spp., *Phyllosticta* spp., *Sphenospora* spp., *Sphaerodothis* spp., *Uredo* spp. (except *U. scabies*)	*Light infestation:* T509–2–1: Remove infested leaves and treat plant with 4–4–50 Bordeaux dip or spray. Dry quickly and thoroughly. *Heavy infestation:* An inspector will refuse entry.
Orchids, plants and cuttings (see MB T305–c for mealybugs)	External feeders (other than soft scales)	MB T201–d–1.
Orchids, plants and cuttings	External feeders (other than soft scales) infesting greenhouse grown plant material	MB T201-d-2.
	Borers, cattleya fly, *Mordellistena* spp., soft scales, *Vinsonia* spp	MB T201–d–3.
	Cecidomyid galls	T201–d–4:Excise all galls.
	Leaf miner, *Eurytoma* spp. infesting Rhynchostylis	T201–d–5: Hot water dip at 118 °F for 1/2 hour followed by a cool water bath.
Orchids to Florida	Rusts	T508–1: An inspector will refuse entry of all infested plants and all other plants of the same species or variety in the shipment. Other orchid species in the shipment that may have become contaminated must be treated with Captan. Repackage treated orchids in clean shipping containers.
Oryza (paddy rice)	*Aphelenchoides fragariae*	T559–2: Dip in hot water at 132.8 °F for 15

		minutes.
Pineapple slips	Various	MB T201–e–3–1 or MB T201–e–3–2.
Pines (*Pinus* spp.) from Canada and destined to California, Idaho, Oregon, or Utah. Precautionary treatment for pine trees and twigs and branches of all *Pinus* spp., except that Christmas trees and other pine decorative materials are exempt from treatment from November 1–December 31	*Rhyacionia buoliana*	MB T201–j.
Plant cuttings:		
Scion wood	External feeders	MB T201–m–1.
Greenwood cuttings of woody plants and herbaceous plant cuttings	External feeders	MB T201–m–2.
Root cuttings	External feeders	MB T201–m– or MB T201–m–4.
Exceptions to plant cuttings:		
Avocado	External feeders	COM T201–p–1.
Chrysanthemum	External feeders	MB T201–g–1.
Dieffenbachia	External feeders	MB T201–i–1.
Dracaena	External feeders	MB T201–i–2.
Lavandula	External feeders	COM T201–p–1.
Orchids	External feeders	MB T201–k–2.
Philodendron	External feeders	MB T201–i–1.
Plant material not tolerant to fumigation	Actionable pests	COM T201–p–1.
Rhododendron	*Chrysomyxa* spp.	T501–6: Remove infested parts and treat all plants of same species in shipment with 4–4–50 Bordeaux dip or spray; or T505–2–1: Treat with mancozeb or other approved fungicide of equal effectiveness according to the label instructions.
Rosa (except multiflora)	*Meloidogyne* spp.	T560–1: Dip in hot water at 123 °F for 10 minutes.
Selaginella	External feeders	MB T202–a–1 or MB T202–a–2.
	Internal feeders	MB T202–a–3.
Senecio (Lingularis)	*Aphelenchoides fragariae*	T568–1: Treat with hot water at 110 °F for 1 hour.

Scilla	*Ditylenchus dipsaci*	T565–4: Hot water at 110 °F for 4 hours immediately after digging.
Solanum (potato tubers)	*Globodera rostochiensis*, *G. pallida*	T565–5: Hot water at 110 °F for 4 hours immediately after digging.
Various plant commodities	*Meloidogyne* spp.	T553–1: Hot water at 118 °F for 30 minutes.
Yams and sweet potatoes		MB T202–d.

Annex V. – Examples of Official Controls for Quarantine Pests by the National Government and State Governments

The following National-level and State-level official controls of plant pests, and the exaples of quarantine programs, quarantine provisions and treatment controls for these pest problems are illustrative of the way the National-level and State-level controls sometimes overlap and sometimes are independent. The list of below is also illustrative of the official controls of quarantine pests that are related to propagation material (nursery stock) for a variety of agricultural commodities. The list of quarantine pests are illustrative and do not represent the full extent of quarantine controls at the National- or State-level.

1. Golden Nematode Quarantine
    a. National-level Official Control – USDA / APHIS
        i. USDA / APHIS homepage on Golden Nematode, including risk assessment, regulations, regulated articles, quarantine map, etc. http://www.aphis.usda.gov/plant_health/plant_pest_info/nematode/index.shtml
        ii. USDA / APHIS quarantine regulations for golden nematode regulated articles
        iii. USDA / APHIS Golden Nematode Quarantine Program Manual http://www.aphis.usda.gov/import_export/plants/manuals/domestic/downloads/gnpm.pdf

2. Nematode Quarantine Programs
    a. State-level Official Control
        i. California (example)

    Many nematology related state [quarantine] programs are still in operation to date, including the External Quarantine Burrowing Nematode and Reniform Nematode program, the Nursery Nematode Control program, Nursery Stock Certification program, Seed Garlic and Strawberry Phytosanitary Certification program, and the Quarantine Phytosanitary Certification program for export trade California grown commodities. Many of these programs have increased volumetrically over the decade largely due to increased human populations and migration to California. As a result there have been increases in quantities, quality and types of plant quarantine shipments with their associated parasites entering California, as well as increased demands for clean nursery stock and other plant commodities for local, national and international commerce.

3. Pine Shoot Beetle
    a. National-level Official Control – USDA / APHIS
        i. USDA / APHIS homepage on Pine Shoot Beetle, including risk assessment, regulations, management guides, etc. http://www.aphis.usda.gov/plant_health/plant_pest_info/psb/index.shtml

    ii. USDA / APHIS quarantine regulations for pine shoot beetle http://www.aphis.usda.gov/plant_health/plant_pest_info/psb/downloads/psbcfr09.txt (see below)
  b. State-level Official Control
    i. Vermont (example) http://www.vermontagriculture.com/ARMES/plantindustry/documents/PineShootBeetleQuarantine.pdf
    ii. Pennsylvania (example) http://www.pabulletin.com/secure/data/vol32/32-35/1522.html

USDA / APHIS Quarantine Regulation on Pine Shoot Beetle

[Code of Federal Regulations] [Title 7, Volume 5] [Revised as of January 1, 2009] [CITE: 7CFR301] [Page 43-52]

TITLE 7--AGRICULTURE

CHAPTER III--ANIMAL AND PLANT HEALTH INSPECTION SERVICE, DEPARTMENT OF AGRICULTURE

PART 301_DOMESTIC QUARANTINE NOTICES--Table of Contents

Subpart_Pine Shoot Beetle

Source: 57 FR 54496, Nov. 19, 1992, unless otherwise noted.

Sec. 301.50 Restrictions on interstate movement of regulated articles.

Regulated articles may be moved interstate from any quarantined area only in accordance with this subpart.\1\

\1\ Any properly identified inspector is authorized to stop and inspect persons and means of conveyance; and to seize, quarantine, treat, apply other remedial measures to, destroy, or otherwise dispose of regulated articles as provided in sections 414, 421, and 434 of the Plant Protection Act (7 U.S.C. 7714, 7731, and 7754).

Sec. 301.50-1 Definitions.

Administrator. The Administrator, Animal and Plant Health Inspection Service, or any individual authorized to act for the Administrator.

Animal and Plant Health Inspection Service (APHIS). The Animal and Plant Health Inspection Service of the United States Department of Agriculture.

Certificate. A document in which an inspector, or person operating under a compliance agreement, affirms that a specified regulated article is free of pine shoot beetle and may be moved interstate to any destination.

Compliance agreement. A written agreement between APHIS and a person engaged in growing, handling, or moving regulated articles, in which the person agrees to comply with the provisions of this subpart.

Infestation. The presence of the pine shoot beetle or the existence of circumstances that make it reasonable to believe that the pine shoot beetle is present.

Inspector. Any employee of the Animal and Plant Health Inspection Service, or other individual, authorized by the Administrator to enforce this subpart.

Interstate. From any State into or through any other State.

Limited permit (permit). A document in which an inspector, or person operating under a compliance agreement, affirms that the regulated article identified on the document is eligible for interstate movement in accordance with Sec. 301.50-5(b) of this subpart only to a specified destination and only in accordance with specified conditions.

Moved (Move, Movement). Shipped, offered for shipment, received for transportation, transported, carried, or allowed to be moved, shipped, transported, or carried.

Person. Any association, company, corporation, firm, individual, joint stock company, partnership, society, or other entity.

Pine bark products. Pieces of pine bark including bark chips, bark nuggets, bark mulch and bark compost.

Pine nursery stock. All Pinus spp. woody plants, shrubs, and rooted trees, including dug (balled and burlaped) Christmas trees, and ornamental pine, such as bonsai.

Pine shoot beetle. The insect known as pine shoot beetle, Tomicus piniperda (Linnaeus), in any stage of development.

Quarantined area. Any State, or any portion of a State, listed in Sec. 301.50-3(c) of this subpart or otherwise designated as a quarantined area in accordance with Sec. 301.50-3(b) of this subpart.

Regulated article. Any article listed in Sec. 301.50-2 (a) or (b) of this subpart or otherwise designated as a regulated article in accordance with Sec. 301.50-2(c) of this subpart.

State. The District of Columbia, Puerto Rico, the Northern Mariana Islands, or any State, territory, or possession of the United States.

Sec. 301.50-2 Regulated articles.

The following are regulated articles:

(a) Pine products (Pinus spp.), as follows: Bark products; Christmas trees; logs with bark attached; lumber with bark attached; nursery stock; raw pine materials for pine wreaths and garlands; and stumps.

(b) Any article, product, or means of conveyance not covered by paragraph (a) of this section, that presents a risk of spread of the pine shoot beetle and that an inspector notifies the person in possession of it is subject to the restrictions of this subpart.

Sec. 301.50-3 Quarantined areas.

(a) Except as otherwise provided in paragraph (b) of this section, the Administrator will list as a quarantined area, in paragraph (c) of this section, each State, or each portion of a State, in which the pine shoot beetle has been found by an inspector, in which the Administrator has reason to believe that the pine shoot beetle is present, or that the Administrator considers necessary to regulate because of its inseparability for quarantine enforcement purposes from localities in which the pine shoot beetle has been found. Less than an entire State will be designated as a quarantined area only if the Administrator determines that:

(1) The State has adopted and is enforcing a quarantine and regulations that impose restrictions on the intrastate movement of the regulated articles that are equivalent to those imposed by this subpart on the interstate movement of these articles; and

(2) The designation of less than the entire State as a regulated area will otherwise be adequate to prevent the artificial interstate spread of the pine shoot beetle.

(b) The Administrator or an inspector may temporarily designate any nonquarantined area in a State as a quarantined area in accordance with the criteria specified in paragraph (a) of this section. The Administrator will give a copy of this regulation along with a written notice of this temporary designation to the owner or person in possession of the nonquarantined area; thereafter, the interstate movement of any regulated article from an area temporarily designated as a quarantined area is subject to this subpart.
As soon as practicable, this area will be added to the list in paragraph
(c) of this section, or the designation will be terminated by the Administrator or an inspector. The owner or person in possession of an area for which designation is terminated will be given notice of the termination as soon as practicable.

(c) The areas described below are designated as quarantined areas:

Connecticut

The entire State.

Illinois

Boone County. The entire county.
Bureau County. The entire county.
Carroll County. The entire county.
Champaign County. The entire county.
Christian County. The entire county.
Clark County. The entire county.
Coles County. The entire county.
Cook County. The entire county.
De Kalb County. The entire county.
De Witt County. The entire county.
Douglas County. The entire county.
Du Page County. The entire county.
Edgar County. The entire county.
Ford County. The entire county.
Grundy County. The entire county.
Henry County. The entire county.
Iroquois County. The entire county.
Jo Daviess County. The entire county.
Kane County. The entire county.
Kankakee County. The entire county.
Kendall County. The entire county.
La Salle County. The entire county.

Lake County. The entire county.
Lee County. The entire county.
Livingston County. The entire county.
Macon County. The entire county.
Marshall County. The entire county.
Mason County. The entire county.
McHenry County. The entire county.
McLean County. The entire county.
Moultrie County. The entire county.
Ogle County. The entire county.
Peoria County. The entire county.
Piatt County. The entire county.
Putnam County. The entire county.
Shelby County. The entire county.
Stark County. The entire county.
Stephenson County. The entire county.
Tazewell County. The entire county.
Vermilion County. The entire county.
Whiteside County. The entire county.
Will County. The entire county.
Winnebago County. The entire county.
Woodford County. The entire county.

Indiana

Adams County. The entire county.
Allen County. The entire county.
Bartholomew County. The entire county.
Benton County. The entire county.
Blackford County. The entire county.
Boone County. The entire county.
Brown County. The entire county.
Carroll County. The entire county.
Cass County. The entire county.
Clinton County. The entire county.
Dearborn County. The entire county.
Decatur County. The entire county.
De Kalb County. The entire county.
Delaware County. The entire county.
Elkhart County. The entire county.
Fayette County. The entire county.
Fountain County. The entire county.
Franklin County. The entire county.
Fulton County. The entire county.
Grant County. The entire county.
Hamilton County. The entire county.
Hancock County. The entire county.

Hendricks County. The entire county.
Henry County. The entire county.
Howard County. The entire county.
Huntington County. The entire county.
Jasper County. The entire county.
Jay County. The entire county.
Jennings County. The entire county.
Johnson County. The entire county.
Kosciusko County. The entire county.
Lagrange County. The entire county.
Lake County. The entire county.
La Porte County. The entire county.
Madison County. The entire county.
Marion County. The entire county.
Marshall County. The entire county.
Miami County. The entire county.
Monroe County. The entire county.
Montgomery County. The entire county.
Morgan County. The entire county.
Newton County. The entire county.
Noble County. The entire county.
Owen County. The entire county.
Park County. The entire county.
Porter County. The entire county.
Pulaski County. The entire county.
Putnam County. The entire county.
Randolph County. The entire county.
Ripley County. The entire county.
Rush County. The entire county.
Shelby County. The entire county.
St. Joseph County. The entire county.
Starke County. The entire county.
Steuben County. The entire county.
Tippecanoe County. The entire county.
Tipton County. The entire county.
Union County. The entire county.
Vermillion County. The entire county.
Vigo County. The entire county.
Wabash County. The entire county.
Warren County. The entire county.
Wayne County. The entire county.
Wells County. The entire county.
White County. The entire county.
Whitley County. The entire county.

Iowa

The entire State.

Maine

Franklin County. The entire county.
Oxford County. The entire county.

Maryland

Allegany County. The entire county.
Frederick County. The entire county.
Garrett County. The entire county.
Montgomery County. The entire county.
Washington County. The entire county.

Massachusetts

The entire State.

Michigan

The entire State.

Minnesota

The entire State.

New Hampshire

The entire State.

New Jersey

Bergen County. The entire county.
Cumberland County. The entire county.
Hunterdon County. The entire county.
Morris County. The entire county.
Passaic County. The entire county.
Somerset County. The entire county.
Sussex County. The entire county.
Warren County. The entire county.

New York

Albany County. The entire county.
Allegany County. The entire county.
Broome County. The entire county.
Cattaraugus County. The entire county.
Cayuga County. The entire county.
Chautauqua County. The entire county.
Chemung County. The entire county.
Chenango County. The entire county.
Clinton County. The entire county.
Columbia County. The entire county.

Cortland County. The entire county.
Delaware County. The entire county.
Erie County. The entire county.
Essex County. The entire county.
Franklin County. The entire county.
Fulton County. The entire county.
Genesee County. The entire county.
Greene County. The entire county.
Hamilton County. The entire county.
Herkimer County. The entire county.
Jefferson County. The entire county.
Lewis County. The entire county.
Livingston County. The entire county.
Madison County. The entire county.
Monroe County. The entire county.
Montgomery County. The entire county.
Niagara County. The entire county.
Oneida County. The entire county.
Onondaga County. The entire county.
Ontario County. The entire county.
Orange County. The entire county.
Orleans County. The entire county.
Oswego County. The entire county.
Otsego County. The entire county.
Rensselaer County. The entire county.
St. Lawrence County. The entire county.
Saratoga County. The entire county.
Schenectady County. The entire county.
Schoharie County. The entire county.
Schuyler County. The entire county.
Seneca County. The entire county.
Steuben County. The entire county.
Sullivan County. The entire county.
Tioga County. The entire county.
Tompkins County. The entire county.
Ulster County. The entire county.
Warren County. The entire county.
Washington County. The entire county.
Wayne County. The entire county.
Wyoming County. The entire county.
Yates County. The entire county.

Ohio

Allen County. The entire county.
Ashland County. The entire county.
Ashtabula County. The entire county.

Athens County. The entire county.
Auglaize County. The entire county.
Belmont County. The entire county.
Butler County. The entire county.
Carroll County. The entire county.
Champaign County. The entire county.
Clark County. The entire county.
Columbiana County. The entire county.
Coshocton County. The entire county.
Crawford County. The entire county.
Cuyahoga County. The entire county.
Darke County. The entire county.
Defiance County. The entire county.
Delaware County. The entire county.
Erie County. The entire county.
Fairfield County. The entire county.
Franklin County. The entire county.
Fulton County. The entire county.
Gallia County. The entire county.
Geauga County. The entire county.
Greene County. The entire county.
Guernsey County. The entire county.
Hamilton County. The entire county.
Hancock County. The entire county.
Hardin County. The entire county.
Harrison County. The entire county.
Henry County. The entire county.
Highland County. The entire county.
Hocking County. The entire county.
Holmes County. The entire county.
Huron County. The entire county.
Jackson County. The entire county.
Jefferson County. The entire county.
Knox County. The entire county.
Lake County. The entire county.
Lawrence County. The entire county.
Licking County. The entire county.
Logan County. The entire county.
Lorain County. The entire county.
Lucas County. The entire county.
Madison County. The entire county.
Mahoning County. The entire county.
Marion County. The entire county.
Medina County. The entire county.
Meigs County. The entire county.
Mercer County. The entire county.

Miami County. The entire county.
Monroe County. The entire county.
Montgomery County. The entire county.
Morgan County. The entire county.
Morrow County. The entire county.
Muskingum County. The entire county.
Noble County. The entire county.
Ottawa County. The entire county.
Paulding County. The entire county.
Perry County. The entire county.
Pickaway County. The entire county.
Pike County. The entire county.
Portage County. The entire county.
Preble County. The entire county.
Putnam County. The entire county.
Richland County. The entire county.
Ross County. The entire county.
Sandusky County. The entire county.
Scioto County. The entire county.
Seneca County. The entire county.
Shelby County. The entire county.
Stark County. The entire county.
Summit County. The entire county.
Trumbull County. The entire county.
Tuscarawas County. The entire county.
Union County. The entire county.
Van Wert County. The entire county.
Vinton County. The entire county.
Warren County. The entire county.
Washington County. The entire county.
Wayne County. The entire county.
Williams County. The entire county.
Wood County. The entire county.
Wyandot County. The entire county.

Pennsylvania

The entire State.

Rhode Island

The entire State

Vermont

The entire State.

Virginia

Clarke County. The entire county.

West Virginia

The entire state.

Wisconsin

The entire State.

Sec. 301.50-4 Conditions governing the interstate movement of regulated articles from quarantined areas.

Any regulated article may be moved interstate from a quarantined area \2\ only if moved under the following conditions:

\2\ Requirements under all other applicable Federal domestic plant quarantines and regulations must also be met.

(a) With a certificate or limited permit issued and attached in accordance with Sec. Sec. 301.50-5 and 301.50-8 of this subpart;

(b) Without a certificate or limited permit, if:

(1)(i) The regulated article originates outside any quarantined area and is moved through the quarantined area without stopping (except for dropoff loads, refueling, or traffic conditions, such as traffic lights or stop signs) during October, November, or December, or when ambient air temperature is below 10 [deg]C (50 [deg]F); or

(ii) The regulated article originates outside any quarantined area and, during the period of January through September, is moved through the quarantined area at a temperature higher than 10 [deg]C (50 [deg]F), if the article is shipped in an enclosed vehicle or completely covered (such as with plastic, canvas, or other closely woven cloth) so as to prevent access by the pine shoot beetle; and

(2) The point of origin of the regulated article is indicted on the waybill.

(c) With a limited permit issued by the Administrator if the regulated article is moved:

(1) By the United States Department of Agriculture for experimental or scientific purposes;

(2) Under conditions, specified on the permit, which the Administrator has found to be adequate to prevent the spread of the pine shoot beetle; and

(3) With a tag or label, bearing the number of the permit issued for the regulated article, attached to the outside of the container of the regulated article or attached to the regulated article itself, if the regulated article is not in a container.

Sec. 301.50-5 Issuance and cancellation of certificates and limited permits.

(a) A certificate will be issued by an inspector \3\ for the interstate movement of a regulated article if the inspector determines that:

\3\ Services of an inspector may be requested by contacting the local offices of Plant Protection and Quarantine, which are listed in telephone directories. The addresses and telephone numbers of local offices may also be obtained from the Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Domestic and Emergency Operations, 4700 River Road Unit 134, Riverdale, Maryland 20737-1236.
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(1)(i) The regulated article has been treated under the direction of an inspector in accordance with Sec. 301.50-10 of this subpart, or, if pine bark products, produced according to the requirements of the management method in Sec. 301.50-10(d) of this subpart; or

(ii) Based on inspection of the premises of origin, if the regulated article is a greenhouse-grown pine (such as bonsai), that the greenhouse is free from the pine shoot beetle and is screened to prevent entry of the pine shoot beetle; or

(iii) Based on inspection of the regulated article, if the regulated article is a pine seedling or a pine transplant and is no greater than 36 inches high with a bole diameter at soil level of 1 inch or less, that it is free from the pine shoot beetle; or

(iv) Based on inspection by an inspector (branch tip-by-branch tip) of pine nursery stock, that it is free from the pine shoot beetle; or

(v) If the regulated article is a pine log with bark attached or pine lumber with bark attached or a pine stump, that its source tree has been felled during the period of July 1 through October 31 or if the regulated article is pine bark products produced from a tree felled and debarked during the period of July 1 through October 31; and

(2)(i) The regulated article will be moved through the quarantined area during October, November, or December, or when the ambient air temperature is below 10 [deg]C (50 [deg]F); or

(ii) The regulated article will be moved through the quarantined area during the period of January through September, if the ambient air temperature is 10 [deg]C (50 [deg]F) or higher, in an enclosed vehicle or completely enclosed by a covering adequate to prevent access by the pine shoot beetle; or

(iii) The pine log with pine bark attached, pine lumber with bark attached, or pine stump from a tree felled during the period of July 1 through October 31, or the pine bark products produced from a tree felled and debarked during the period of July 1 through October 31, will be shipped interstate from the quarantined area during the period of July 1 through October 31 of the same year in which the source tree was felled; and

(3) The regulated article is to be moved in compliance with any additional conditions deemed necessary under section 414 of the Plant Protection Act (7 U.S.C. 7714) \4\ to prevent the spread of the pine shoot beetle; and
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\4\ An inspector may hold, seize, quarantine, treat, apply other remedial measures to, destroy, or otherwise dispose of plants, plant pests, or other articles in accordance with sections 414, 421, and 434 of the Plant Protection Act (7 U.S.C. 7714, 7731, and 7754).
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(4) The regulated article is eligible for unrestricted movement under all other Federal domestic plant quarantines and regulations applicable to the regulated articles.

(b) An inspector \5\ will issue a limited permit for the interstate movement of a regulated article if the inspector determines that:

\5\ See footnote 3 to Sec. 301.50-5(a).

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(1)(i) The regulated article is to be moved interstate to a specified destination for specified handling, processing, or utilization (the destination and other conditions to be listed in the limited permit), and this interstate movement will not result in the spread of the pine shoot beetle. If the regulated article is part of a shipment of pine Christmas trees, the inspector will make a pest-risk determination on the basis of an inspection conducted in accordance with Sec. 301.50-5(c) of this paragraph; or

(ii) The regulated article is to be moved interstate from a quarantined area to a quarantined area and will transit any non-quarantined area in an enclosed vehicle or completely enclosed by a covering adequate to prevent access by the pine shoot beetle; and

(2) The regulated article is to be moved in compliance with any additional conditions deemed necessary under section 414 of the Plant Protection Act (7 U.S.C. 7714) to prevent the spread of the pine shoot beetle; and

(3) The regulated article is eligible for interstate movement under all other Federal domestic plant quarantines and regulations applicable to the regulated article.

(c) The number of pine Christmas trees randomly selected for inspection is determined by the size and type of shipment, in accordance with the following tables. If a shipment mixes painted and natural trees, the inspection procedure for painted trees will apply.

Table 1--Painted (Color-Enhanced) Pine Christmas Trees \1\

No. of trees in shipment	No. of trees to sample	No. of trees in shipment	No. of trees to sample
1-72..........................	All	701-800.............	120
73-100........................	73	801-900.............	121
101-200.......................	96	901-1,000...........	122
201-300.......................	106	1,001-2,000..........	126
301-400.......................	111	2,001-3,000..........	127
401-500.......................	115	3,001-5,000..........	128
501-600.......................	117	5,001-10,000.........	129
601-700.......................	119	10,001 or more.......	130

\1\ If a pine shoot beetle is detected in any one of the trees being sampled, the entire shipment must be rejected. If no pine shoot beetle is detected in any of the trees sampled, the shipment will be allowed to move with a limited permit. The limited permit must state, ``All trees that remain unsold as of December 25 must be destroyed by burning or chipping, or must be fumigated, prior to January 1."

Table 2--Natural (Unpainted) Christmas Trees \1\

No. of trees in shipment	No. of trees to sample	No. of trees in shipment	No. of trees to sample
1-57...........................	All	501-600.............	80
58-100.........................	58	601-700.............	81
101-200........................	69	701-1,000...........	82
201-300........................	75	1,001-3,000..........	84
301-400........................	77	3,001-10,000.........	85
401-500........................	79	10,001 or more.......	86

\1\ If a pine shoot beetle is detected in any one of the trees being sampled, the entire shipment must be rejected. If no pine shoot beetle is detected in any of the trees sampled, the shipment will be allowed to move with a limited permit. The limited permit must state, ``All trees that remain unsold as of December 25 must be destroyed by burning or chipping, or must be fumigated, prior to January 1."

(d) Certificates and limited permits for use for interstate movement of regulated articles may be issued by an inspector or person operating under a compliance agreement. A person operating under a compliance agreement may issue a certificate for the interstate movement of a regulated article if an inspector has determined that the regulated article is otherwise eligible for a certificate in accordance with paragraph (a) of this section. A person operating under a compliance agreement may issue a limited permit for interstate movement of a regulated article when an inspector has determined that the regulated article is eligible for a limited permit in accordance with paragraph (b) of this section.

(e) Any certificate or limited permit that has been issued may be withdrawn by an inspector orally, or in writing, if he or she determines that the holder of the certificate or limited permit has not complied with all conditions under this subpart for the use of the certificate or limited permit. If the withdrawal is oral, the withdrawal and the reasons for the withdrawal shall be confirmed in writing as promptly as circumstances allow. Any person whose certificate or limited permit has been withdrawn may appeal the decision in writing to the Administrator within 10 days after receiving the written notification of the withdrawal. The appeal must state all of the facts and reasons upon which the person relies to show that the certificate or limited permit was wrongfully withdrawn. As promptly as circumstances allow, the Administrator will grant or deny the appeal, in writing, stating the reasons for the decision. A hearing will be held to resolve any conflict as to any material fact. Rules of practice concerning such a hearing will be adopted by the Administrator.

Sec. 301.50-6 Compliance agreements and cancellation.

(a) Any person engaged in growing, handling, or moving regulated articles may enter into a compliance agreement when an inspector determines that the person understands this subpart.\6\

\6\ Compliance agreement forms are available without charge from the Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Domestic and Emergency Operations, 4700 River Road Unit 134, Riverdale, Maryland 20737-1236.

(b) Any compliance agreement may be canceled orally or in writing by an inspector whenever the inspector finds that the person who has entered into the compliance agreement has failed to comply with this subpart. If the cancellation is oral, the cancellation and the reasons for the cancellation shall be confirmed in writing as promptly as circumstances allow. Any person whose compliance agreement has been canceled may appeal the decision, in writing, within 10 days after receiving written notification of the cancellation. The appeal must state all of the facts and reasons upon which the person relies to show that the compliance agreement was wrongfully canceled. As promptly as circumstances allow, the Administrator will grant or deny the appeal, in writing, stating the reasons for the decision. A hearing will be held to resolve any conflict as to any material fact. Rules of practice concerning such a hearing will be adopted by the Administrator.

Sec. 301.50-7 Assembly and inspection of regulated articles.

(a) Any person (other than a person authorized to issue certificates or limited permits under Sec. 301.50-5(c)), who desires to move a regulated article interstate accompanied by a certificate or limited permit must notify an inspector,\7\ at least 48 hours in advance of the desired interstate movement.

\7\ See footnote 3 to Sec. 301.50-5(a).

(b) The regulated article must be assembled at the place and in the manner the inspector designates as necessary to comply with this subpart.

Sec. 301.50-8 Attachment and disposition of certificates and limited permits.

(a) A certificate or limited permit required for the interstate movement of a regulated article must be attached, at all times during the interstate movement, to the outside of the container containing the regulated article, or to the regulated article itself, if not in a container. The requirements of this section may also be met by attaching the certificate or limited permit to the consignee's copy of the waybill, provided the regulated article is sufficiently described on the certificate or limited permit and on the waybill to identify the regulated article.

(b) The certificate or limited permit for the interstate movement of a regulated article must be furnished by the carrier to the consignee at the destination of the regulated article.

Sec. 301.50-9 Costs and charges.

The services of the inspector during normal business hours (8 a.m. to 4:30 p.m., Monday through Friday, except holidays) will be furnished without cost. The user will be responsible for all costs and charges arising from inspection and other services provided outside of normal business hours.

Sec. 301.50-10 Treatments and management method.

(a) Fumigation is authorized for use on pine logs with bark attached, pine lumber with bark attached, pine bark products, and pine stumps, as follows: Logs, lumber, and stumps may be treated with methyl bromide at normal atmospheric pressure with 48 g/m\3\ (3 lb/1000 ft\3\) for 16 hours at 21 [deg]C (70 [deg]F) or above, or 80 g/m\3\ (5 lb/1000 ft\3\) for 16 hours at 4.5 - 20.5 [deg]C (40 - 69 [deg]F.).

(b) Cold treatment is authorized for cut pine Christmas trees, pine nursery stock, and raw pine materials for pine wreaths and garlands as follows: The regulated articles must be loaded into a refrigeration unit and held at -20.6 [deg]C (-5 [deg]F) for one hour; the period before the refrigeration unit reaches the specified temperature is not part of the treatment period.

(c) Any one of these fumigation treatments is authorized for use on cut pine Christmas trees and raw pine materials for pine wreaths and garlands. Cut pine Christmas trees and raw pine materials for pine wreaths and garlands may be treated with methyl bromide at normal atmospheric pressure as follows:

Temperature	Dosage: pounds per 1000 feet \3\	Exposure: hours	Concentration readings: ounces per 1000 feet \3\			
			2.0 hr	3.0 hr	3.5 hr	4.0 hr
40-49 [deg]F................................	4.0	4.0	57	--	--	48
50-59 [deg]F................................	4.0	3.5	57	--	48	--
50-59 [deg]F................................	3.5	4.0	50	--	--	42
60 [deg]F+..................................	4.0	3.0	57	48	--	--
60 [deg]F+..................................	3.0	4.0	43	--	--	36

Note: APHIS assumes no responsibility for damage to cut pine Christmas trees due to possible phytotoxic effects of these treatments. Trees should be cut at least 14 days before treatment to reduce the possibility of phytotoxic effects.

(d) Management method for pine bark products. The following procedures are authorized for use with pine bark products derived from white pine (Pinus strobus), Scotch pine (P. sylvestris), red pine (P. resinosa), and jack pine (P. banksiana) trees. Pine bark products will only be considered to have been produced in accordance with this management method if the following procedures are followed:

(1) For pine bark products produced from trees felled during the period November 1 through March 31:

(i) The trees must be harvested at a height of 4 inches or more above the duff line; and

(ii) The trees must have been mechanically debarked with a ring debarker or a Rosser head debarker; and

(iii) For Scotch pine, red pine, and jack pine, the bark must either be ground into pieces of 1 inch or less in diameter or composted in accordance with the procedure in paragraph (d)(3) of this section.

(2) For pine bark products produced from trees felled during the period April 1 through June 30:

(i) The trees must have been mechanically debarked with a ring debarker or a Rosser head debarker; and

(ii) The bark must either be ground into pieces of 1 inch or less in size or composted in accordance with the procedure in paragraph (d)(3) of this section.

(3) Composting for pine bark products for the management method in this paragraph (d) must be performed as follows:

(i) The pile of pine bark to be composted must be at least 200 cubic yards in size; and

(ii) The compost pile must remain undisturbed until the interior temperature of the pile reaches 120 [deg]F (49 [deg]C) and remains at or over that temperature for 4 consecutive days; and

(iii) After the 4-day period is completed, the outer layer of the compost pile must be removed to a depth of 3 feet; and

(iv) A second compost pile must be started using the cover material previously removed as a core. Core material must be removed from the first pile and used to cover the second compost pile to a depth of 3 feet; and

(v) The second compost pile must remain undisturbed until the interior temperature of the pile reaches 120 [deg]F (49 [deg]C) and remains at or over that temperature for 4 consecutive days. After this 4-day period, the composting procedure is complete.

(vi) Previously composted material generated using this procedure may be used as cover material for subsequent compost piles. A compost pile that uses previously composted material must remain undisturbed until the interior temperature of the pile reaches 120 [deg]F (49 [deg]C) and remains at or over that temperature for 4 consecutive days.
After this 4-day period, the composting procedure is complete.

Vermont Agency of Agriculture, Food & Markets
Quarantine #4 - Pine Shoot Beetle

Section I: Statement of Concerns

Whereas, the Vermont Department of Agriculture, Food & Markets and the Vermont Department of Forests, Parks & Recreation having found that an exotic pest, known as the pine shoot beetle, Tomicus piniperda (L.), which is an introduced pest of pine trees, has been detected in this state and has a very limited distribution at this time; and

Whereas, a federal quarantine, 7 CFR, Ch. 111, Part 301.50, calls for the establishment of a parallel internal state quarantine; and

Whereas, it has been determined to be in the best interest of affected industries to regulate the movement of the pine shoot beetle at the county level:

Therefore, the State of Vermont is hereby establishing this interior plant quarantine regulation by the authority of 6 V.S.A., Chapter 84, Pest Survey, Detection and Management.

Section II: Definitions

"Certificate" means a document in which an inspector, or person operating under a compliance agreement, affirms that a specified regulated article is free of pine shoot beetle and may be moved interstate to any destination.

"Commissioner" means the Commissioner of Agriculture, Food & Markets and the Commissioner of Forests, Parks & Recreation.

"Compliance Agreement" means a written agreement between VDAF&M and a person engaged in growing, handling, or moving regulated articles, in which the person agrees to comply with the provisions of this quarantine.

"Evidence of Infestation" means the presence of a clean pine shoot beetle gallery, and/or the pine shoot beetle.

"Infestation" means the presence of the pine shoot beetle.

"Inspector" means any employee of the Animal and Plant Health Inspection Service, Vermont Department of Agriculture, Food & Markets, or Vermont Department of Forests, Parks & Recreation, authorized to enforce this quarantine.

"Interstate" means from any state into or through any other state.

"Limited Permit" means a document which an inspector, or person operating under a compliance agreement, affirms that the regulated article identified on the document is eligible for intrastate and/or interstate movement in accordance with this quarantine to a specified destination and only in accordance with specified conditions.

"Pine Nursery Stock" means all Pinus spp. woody plants, shrubs, and rooted trees, and ornamental pine, such as bonsai.

"Pine Shoot Beetle" means the insect known as pine shoot beetle, Tomicus piniperda (Linnaeus), in any stage of development.

"Processed Pine Product" means any pine product without bark, wreaths, roping, or any other commodity designated as such by the commissioner.

"Quarantined Area" means any state, or any portion of a state, listed in 7 CFR, Ch. 111, Part 301.50, or any Vermont town listed in Section IV of this quarantine regulation.

"Receiving Facility" means any mill, incinerator, or other facility that receives a regulated article.

"Regulated Article" means any article listed under Section III of this quarantine regulation.

"State" means the District of Columbia, Puerto Rico, the Northern Mariana Islands, or any state, territory, or possession of the United States.

Section III: Regulated Articles

(A) The pine shoot beetle, Tomicus piniperda (L.), in any living stage of development.

(B) Entire plants or parts thereof of the genus Pinus spp., including, but not limited to, Christmas trees, nursery stock and brush, unless specified under Section VI: Exemptions of this regulation.

(C) Logs and lumber of Pinus spp., with bark attached.

(D) Any other article, product or means of conveyance, when it is determined by the Commissioner, that it presents the risk of spread of pine shoot beetle, Tomicus piniperda (L.)

Section IV: Quarantined Areas

(A) Within this section, the Commissioner shall list any county, town or other political subdivision in which the pine shoot beetle has been found by an inspector, in which the commissioner has reason to believe the pine shoot beetle is present, or that the commissioner considers necessary to regulate because of its inseparability for quarantine enforcement purposes from localities in which the pine shoot beetle has been found.

(1) Essex County
(2) Orleans County
(3) Caledonia County
(4) Any other county meeting USDA / APHIS criteria for regulated status in accordance with 7 CFR, Ch. 111, Part 301.50.

Section V: Conditions of Movement of Regulated Articles

(A) Movement Within Quarantined Areas: Movement of the regulated article from and through any quarantined area to any destination within a quarantined area is allowed.

(B) Movement Out of a Quarantined Area: Movement of the regulated article from any quarantined area to any destination outside the quarantined area is prohibited, except under the following conditions:

(1) Pine Christmas Trees & Brush: Movement of Christmas trees and brush during October, November and December is allowed under a limited permit, certificate, or compliance agreement if:

(a) Visual inspection of the trees or brush in a shipment or the plantation does not detect the presence of the pine shoot beetle. The number of trees selected for inspection is randomly determined by the size and type of shipment, in accordance with 7 CFR, Ch. 111, Part 301.50.; or

(b) The Christmas tree plantation is under, and adhering to the conditions of, a Compliance Agreement. The Compliance Agreement shall be in accordance with the conditions outlined under the 1999 Pine Shoot Beetle Compliance Management Program as cooperatively developed by the National Plant Board and USDA / APHIS / PPQ.; or,

(c) The shipment of Christmas trees or brush is treated using one of the fumigation methods as outlined in accordance with 7 CFR, Ch. 111, Part 301.50.

(2) Pine Logs and Lumber with Bark Attached: Movement of pine logs or lumber with bark attached out of the quarantine area is prohibited, except under the following conditions:
(a) If the shipment is taking place from July 1st through October 31st, and the source of the pine was felled during the same period, then the shipment may move unrestricted.

(b) If the shipment is taking place from November 1st through March 30th, then movement is allowed under the following conditions:

(b1) The shipment has been treated at the point of origin under the supervision of an inspector with the approved method of fumigation as outlined in accordance with 7 CFR, Ch. 111, Part 301, and issued a certificate attesting to such; or

(b2) The shipment will be moved under a limited permit to a receiving facility that is operating under, and meeting the standards set forth in, a compliance agreement approved by the Commissioner. The compliance agreement will specify the conditions for handling, processing, and/or utilization of the pine bark which will prevent the spread of the pine shoot beetle.

(c) If the shipment is taking place from April 1st through June 30th, then movement is allowed under the following conditions:

(c1) The shipment has been treated at the point of origin under the supervision of an inspector with the approved method of fumigation as outlined in accordance with 7 CFR, Ch. 111, Part 301.50, and issued a certificate attesting to such.

(c2) The shipment will be moved under a limited permit to a receiving facility that is operating under, and meeting the standards set forth in, a compliance agreement approved by the Commissioner. The compliance agreement will specify the conditions for handling, processing, and/or utilization of the pine bark which will prevent the spread of the pine shoot beetle.

(3) Pine Bark and Pine Mulch: Movement of pine bark and pine mulch out of the quarantine area is prohibited, except under the following conditions:

(a) If the shipment is taking place from July 1st through October 31st, and the source of the pine was felled during the same period, then the shipment may move unrestricted after the issuance of a certificate by an inspector attesting to such.

(b) If the shipment is taking place from November 1st through March 30th, then movement is allowed under the following conditions:

(b1) The shipment has been treated at the point of origin under the supervision of an inspector with the approved method of fumigation as outlined in accordance with 7 CFR, Ch. 111, Part 301.50, and issued a certificate attesting to such.; or

(b2) The pine bark or pine mulch shipment will be meeting the standards set forth in a compliance agreement approved by the Commissioner. The compliance agreement will specify the conditions for handling and processing of the pine bark which will prevent the spread of the pine shoot beetle.

(c) If the shipment is taking place from April1st through June 30th, then movement is allowed under the following conditions:

(c1) The shipment has been treated at the point of origin under the supervision of an inspector with the approved method of fumigation as outlined in accordance with 7 CFR, Ch. 111, Part 301.50, and issued a certificate attesting to such.; or

(c2) The pine bark or pine mulch shipment will be meeting the standards set forth in a compliance agreement approved by the Commissioner. The compliance agreement will specify the conditions for handling and processing of the pine bark which will prevent the spread of the pine shoot beetle.

(4) Pine Nursery Stock: Movement of pine nursery stock is allowed under a certificate, or compliance agreement if:

(a) A visual inspection of 100% of the trees in a shipment is conducted. Evidence of infestation in any one tree will result in the rejection of that tree; or

(b) The pine tree nursery is under, and adhering to the conditions of, a compliance agreement. The compliance agreement shall be in accordance with the conditions outlined under the 1999 Pine Shoot Beetle Compliance Management Program as cooperatively developed by the National Plant Board and USDA / APHIS / PPQ.

(C) Transiting Quarantined Areas: Movement of the regulated article from an area outside the quarantined area to any destination outside the quarantined area, that transits through the quarantined area is allowed under the following
conditions.

(1)The point of origin must be indicated on the waybill, invoice, or shipping document that accompanies the shipment, and;

(2)The shipment must move through the quarantined areas without stopping except for drop-off loads, refueling, or traffic conditions such as traffic lights or stop signs.

(D) Transiting Non-Quarantined Areas: Movement of the regulated article from a quarantined area to any destination inside another quarantined area, that transits through a non-quarantined area is prohibited, except under the following conditions.

(1)The point of origin must be indicated on the waybill, invoice, or shipping document that accompanies the shipment, and;

(2)The shipment must move through the quarantined areas without stopping except for drop-off loads, refueling, or traffic conditions such as traffic lights or stop signs.

Section VI: Exemptions

(A) The commodities listed below present negligible risk to the artificial movement of pine shoot beetle and therefore are determined to be exempt from the requirements of this regulation.
Processed Pine Products.
Pine seedlings less than 36 inches tall with a trunk diameter of 1 inch or less at the soil line.

4. State-level Plant Protection Regulations – Including Quarantine Official Controls
    a. Wisconsin (example)

WISCONSIN

SUMMARY OF PLANT PROTECTION REGULATIONS
Updated June 2008

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The information as provided is for informational purposes only and should not be interpreted as complete, nor considered legally binding. Coordination with both your state and the destination state plant regulatory agency listed above may be necessary to stay current on revised regulations and requirements.

NURSERY STOCK DEFINITION

Nursery Stock means plants and plant parts that can be propagated or grown, excluding seeds, sod, cranberry cuttings, annuals and evergreen trees grown for eventual harvest and sale as Christmas trees.

GENERAL SHIPPING REQUIREMENTS

Each bundle package or container of nursery stock shipped into Wisconsin must be accompanied by a certificate tag, label, or stamp issued by the appropriate regulatory agency of the state of origin, certifying that the nursery stock to which it is attached has been appropriately inspected and found to be apparently pest free.

NOXIOUS WEEDS

NOXIOUS WEEDS UNDER LOCAL AUTHORITY:

Cirsium arvense ....Canadian thistle
Euphorbia esula ....leafy spurge
Convolvulus arvensis ....field bindweed

NUISANCE WEEDS UNDER STATE OR LOCAL AUTHORITY:

Lythrum salicaria...purple loosestrife
Rosa multiflora..multiflora rose

QUARANTINES OR ADDITIONAL REQUIREMENTS

GINSENG CERTIFICATION PROGRAM

PLANT: American Ginseng (*Panax quinquefolius*)

STATES REGULATED: All

REQUIREMENTS: All ginseng to be exported shall have its weight verified prior to the issuance of an export permit. This weight must accurately correspond to the weight of purchases from collectors and growers set out in records required to be submitted to the Department. Ginseng dealers shall not receive, purchase or hold ginseng that has not been certified under Wisconsin law or laws or rules of other states. No person may act as a grower or dealer unless he or she is registered with the Department.

GYPSY MOTH QUARANTINE

PEST: Gypsy Moth, *Lymantria dispar*

STATES REGULATED: Infested states, counties or areas designated in the USDA-APHIS Quarantine under 7 CFR 301.45-2a.

MATERIALS REGULATED: The gypsy moth in any living stage; trees, woody shrubs, cut Christmas trees, logs, pulpwood, slabwood, firewood, wood chips and outdoor household items or any other regulated article that originates from a gypsy moth regulated area designated by the USDA under 7 CFR 301.45-2a.

RESTRICTIONS: All regulated articles from quarantined areas are prohibited except items that are inspected and certified by a pest control official in the state or province of origin, provided that the items are accompanied by a written certificate issued by the pest control official who inspected those items. The certificate shall identify the date of inspection and the items inspected. In the certificate, the pest control official shall certify at least one of the following:

(a) That the inspected items originate from non-infested premises and have not been exposed to gypsy moth infestation.
(b) That the inspected items were found, at the time of inspection, to be free of gypsy moth infestation.
(c) That the inspected items have been effectively treated to destroy the gypsy moth. The certificate shall specify the method and date of treatment.
Note: Effective treatment methods include the methods described in the "Gypsy Moth Program Manual" published by the United States department of agriculture, animal and plant health inspection service (USDA-APHIS). A copy of the manual may be inspected at the department, or may be obtained from USDA-APHIS.
(d) That the inspected items are produced, processed, stored, handled or used under conditions, described in the certificate, that effectively preclude the transmission of any gypsy moth infestation.

SPECIAL NOTE: This state quarantine may be superseded by Federal gypsy moth quarantine.

COMMON PINE SHOOT BEETLE QUARANTINE

PEST: Common Pine Shoot Beetle, *Tomicus piniperda*

STATES REGULATED: Infested counties in Illinois, Indiana, Michigan, New York, Ohio, and Pennsylvania or other regulated areas designated by USDA under 7 CFR 301.50-3.

MATERIALS REGULATED: The pine shoot beetle in any living stage; live or cut plants of *Pinus* spp.; timber or logs of *Pinus* spp., *Picea* spp., or *Abies* spp., with bark attached; ornamental foliage from *Pinus* spp., *Picea* spp., or *Abies* spp.; and any other regulated article that originates from a pine shoot beetle regulated area designated by the USDA under 7 CFR 301.50-3.

RESTRICTIONS: All regulated articles from quarantined areas are prohibited except items that are inspected and certified by a pest control official in the state or province of origin, provided that the items are accompanied by a written certificate issued by the pest control official who inspected those items. The certificate shall identify the date of inspection and the items inspected. In the certificate, the pest control official shall certify at least one of the following:

(a) That the pine shoot beetle is not present on the inspected items.
(b) The inspected items have been effectively treated to destroy the pine shoot beetle. The certificate shall specify the method and date of treatment.
Note: Effective treatment methods include the methods described in the "Pine Shoot Beetle Program Manual" published by the United States department of agriculture, animal and plant health inspection service (USDA-APHIS). A copy of the manual may be inspected at the department, or may be obtained from USDA-APHIS.

SPECIAL NOTE: This state quarantine may be superseded by Federal pine shoot beetle quarantine.

POTATO LATE BLIGHT

PEST: Potato Late Blight (*Phytophthora infestans*)

MATERIALS REGULATED: Potato cull piles and volunteers.

RESTRICTIONS: A person who owns or controls land on which potato cull piles are located shall dispose of those cull piles by May 20 of each year. Whenever volunteer potato plants appear on land, the person who owns or controls hat land shall immediately remove or kill those volunteer potato plants.

POTATO ROT NEMATODE

PEST: Potato Rot Nematode (*Ditylenchus destructor*)

MATERIALS REGULATED: Soil and plant materials containing potato rot nematode.

RESTRICTIONS: The Department shall declare as infested any field or parcel of land on which potatoes that are infected with potato rot nematode have been grown. No potatoes grown on an infested field may be sold or moved without Department approval. No person may plant potatoes on any infested field without giving prior notice to the Department.

HONEYBEE IMPORT CONTROLS

PESTS: Africanized bees, Varroa mite, American foulbrood

MATERIALS REGULATAED: Live honeybees and used beekeeping equipment.

RESTRICTIONS: No person may ship live honeybees or used beekeeping equipment into Wisconsin without:

(1) reporting the import shipment to the Department in writing;
(2) a pest control official certifying that the honeybees are European if they originate in a parish or county designated by USDA as having undesirable honeybees;
(3) a pest control official certifying that the honeybees and used beekeeping equipment are apparently free from Varroa mite and American foulbrood infestations.

JAPANESE BEETLE IMPORT CONTROL rules were rescinded in 2002. Wisconsin will comply with the National JB Harmonization Plan.

HEMLOCK WOOLLY ADELGID QUARANTINE

PEST: Hemlock Woolly Adelgid (*Adelges tsugae*)

MATERIALS REGULATED: Hemlock seedlings, nursery stock, logs and bark.

STATES REGULATED: Those states and counties listed by the USDA Forest Service as being infested with hemlock woolly adelgid.

RESTRICTIONS: All regulated articles from quarantined areas are prohibited except items that are inspected and certified by a pest control official in the state or province of origin, provided that the items are accompanied by a written certificate issued by the pest control official who inspected those items. The certificate shall identify the date of inspection and the items inspected. In the certificate, the pest control official shall certify at least one of the following:

(a) That the items originate from non-infested premises and have not been exposed to hemlock woolly adelgid.
(b) That the items were found, at the time of inspection, to be free of hemlock woolly adelgid.
(c) That the items have been effectively treated to destroy hemlock woolly adelgid.
(d) That the items are produced, processed, stored, handled or used under conditions, described in the phytosanitary certificate, that effectively preclude the transmission of hemlock woolly adelgid.

Items may be imported into the state if a there is a written agreement between the department and the importer. The agreement shall specify import terms and conditions including the following

(a) The name and address of the importer and import recipient.
(b) The proposed source and destination of each import shipment.
(c) The proposed import dates or time period.
(d) The items to be imported in each proposed shipment.
(e) The proposed size and frequency of import shipments.
(f) The proposed method of import.
(g) Required import conditions that will, in the department's opinion, effectively prevent the spread of hemlock woolly adelgid.
(h) Provisions authorizing the department to cancel the agreement at any time, with or without cause or prior notice.

EMERALD ASH BORER; IMPORT CONTROLS AND QUARANTINE

PEST: Emerald Ash Borer (*Agrilus planipennis*)

MATERIALS REGULATED: The emerald ash borer in any living stage, ash trees, ash limbs, branches and roots, ash logs, slabs, or untreated lumber with bark attached, cut firewood of all non-coniferous species, ash chips and ash bark fragments larger than one inch in diameter.

STATES REGULATED: Infested states, counties or areas designated in the USDA-APHIS quarantine under 7 CFR 301.53-3c.

RESTRICTIONS: All regulated articles from quarantined areas are prohibited except items that are inspected and certified by a pest control official in the state or province of origin, provided that the items are accompanied by a written certificate issued by the pest control official who inspected those items. The certificate shall identify the date of inspection and the items inspected. In the certificate, the pest control official shall certify at least one of the following:

a) That the items originate from non-infested premises and have not been exposed to emerald ash borer.
b) That the items were found, at the time of inspection, to be free of emerald ash borer.
c) That the items have been effectively treated to destroy emerald ash borer.
d) That the items are produced, processed, stored, handled or used under conditions, described in the certificate, that effectively preclude the transmission of emerald ash borer.

ASIAN LONGHORNED BEETLE; IMPORTS CONTROLS AND QUARANTINE

PEST: Asian Longhorned Beetle, *Anoplophora glabripennis*

STATES REGULATED: Infested states, counties or areas designated in the USDA-APHIS quarantine under 7 CFR 301.51-3c.

MATERIALS REGULATED: The Asian longhorned beetle in any living stage, cut firewood of all non-coniferous species and any of the following genera: *Acer, Aesculus, Albizia, Betula, Celtis, Fraxinus, Platanus, Populus, Salix, Sorbus, and Ulmus.*

RESTRICTIONS: All regulated articles from quarantined areas are prohibited except items that are inspected and certified by a pest control official in the state or province of origin, provided that the items are accompanied by a written certificate issued by the pest control official who inspected those items. The certificate shall identify the date of inspection and the items inspected. In the certificate, the pest control official shall certify at least one of the following:

a) That the items originate from non-infested premises and have not been exposed to Asian longhorned beetle.
b) That the items were found, at the time of inspection, to be free of Asian longhorned beetle.
c) That the items have been effectively treated to destroy Asian longhorned beetle.
d) That the items are produced, processed, stored, handled or used under conditions, described in the certificate, that effectively preclude the transmission of Asian longhorned beetle.

PHYTOPHTHORA RAMORUM; IMPORT CONTROLS AND QUARANTINE

PEST: *Phytophthora ramorum*

STATES REGULATED: Infested states, counties or areas designated in the USDA-APHIS quarantine under 7 CFR 301.92-3a.

MATERIALS REGULATED: Nursery stock, soil or potted media, all cultures and live material of *Phytophthora ramorum*, unprocessed wood, and unprocessed wood and plant products including bark chips, firewood, logs, lumber, mulch, wreaths, garlands and greenery of the following genera: *Abies, Acer, Asiantum,Aesculus, Arbutus, Arctostaphylos, Calluna, Calycanthus, Camellia, Castanea, Clintonia, Corylus, Drimys, Dryopteris, Fagus, Frasinus, Griselinia, Hamamelis, Heteromeles, Kalmia, Laurus, Leucothoe, Lithocarpus, Lonicera, Maianthemum, Magnolia, Michelia, Nothofagus, Osmorhiza, Parrotia, Pieris, Photinia, Pittosporum, Pseudotsuga, Pyracantha, Quercus, Rhamnus, Rhododendron, Rhus, Rosa, Rubus, Salix, Sequoia, Syringa, Taxus, Toxicodendron, Torreya, Trientalis, Umbellularia, Vaccinium, Vancouveria, Viburnum.*

RESTRICTIONS: All regulated articles from quarantined areas are prohibited except items that are inspected and certified by a pest control official in the state or province of origin, provided that the items are accompanied by a written certificate issued by the pest control official who inspected those items. The certificate shall identify the date of inspection and the items inspected. In the certificate, the pest control official shall certify at least one of the following:

e) That the items originate from non-infested premises and have not been exposed to *Phytophthora ramorum*.
f) That the items were found, at the time of inspection, to be free of *Phytophthora ramorum*.
g) That the items have been effectively treated to destroy *Phytophthora ramorum*.
h) That the items are produced, processed, stored, handled or used under conditions, described in the certificate, that effectively preclude the transmission of *Phytophthora ramorum.*

TREATED FIREWOOD FROM CERTIFIED SOURCES

PLANT PRODUCT: Firewood

MATERIALS REGULATED: Firewood going onto state owned land.

RESTRICTIONS: Per the Department of Natural Resource's regulations, no person can move firewood onto state land that originates from greater than 50 miles from the state land unless it is certified by the Wisconsin Department of Agriculture, Trade and Consumer Protection. This certification applies to persons who regularly sells or distributes firewood in this state and whose primary business location is in Wisconsin.

5. Citrus Greening Disease (CG) and Asian Citrus Psyllid (ACP)
    a. National-level Official Control – USDA / APHIS
        i. http://www.aphis.usda.gov/plant_health/plant_pest_info/citrus_greening/downloads/pdf_files/spro/DA-2009-36.pdf
        ii. New Pest Response Guidelines - Citrus Greening Disease
            1. http://www.aphis.usda.gov/plant_health/plant_pest_info/citrus_greening/downloads/pdf_files/cg-nprg.pdf

6. European Corn Borer
    a. State-level Official Control
        i. Eight western States and two southern States (listed below)

European Corn Borer Certification

Eight western (Arizona, California, Idaho, Nevada, New Mexico, Oregon, Utah, Washington) and two southern states (Florida, Texas) have established exterior quarantines against European corn borer *(Ostrinia nubilalis)* and its hosts. These hosts include corn, broom corn, sorghum and sudan grass all parts thereof (including shelled grain and stalks, ears, cobs and all other parts, fragments or debris of said plants). For shipment of corn and sorghum grain into these states, the grain must either be fumigated or passed through a ½ inch screen to remove debris large enough to harbor European corn borer larvae.

A certificate issued by any authorized representative of the state of origin must accompany each shipment. The certificate attests that the grain in the particular shipment has been passed through a ½ inch mesh screen or less prior to loading for shipment. It also certifies that the shipping container (ie. railcar, truck, etc.) was cleaned prior to loading and it is believed that no danger of infestation by the European corn borer exists in the acceptance of the shipment.

Because the Department of Agriculture does not have the personnel to inspect every load to be shipped out, the Department enters into compliance agreements with shippers. The agreements are for a one-year period ending December 31st each year. New compliance agreements applications are sent to the shippers each December.

Holders of valid compliance agreements are audited periodically by the Department to ensure that they are fulfilling compliance agreement requirements, that European corn borer certificates are being properly completed and utilized, and that ½" screening equipment is available for screening and is in functional condition. Certificate usage is also documented.
Compliance agreement holders are not authorized to certify for fumigation treatments. Only Department personnel are allowed to certify the application of methyl bromide and other types of fumigation treatments.

Excerpt from Utah Rule R68-10. Quaratine Pertaining to the European Corn Borer.

G. Certification is required on certain vegetable and ornamental plants and plant products produced in or shipped from an infested area. Except as provided in paragraph h. below, beans in the pod, beets, celery, peppers (fruits), endive, Swiss chard, and rhubarb (cut or plants with roots); cut flowers and entire plants of aster, chrysanthemum, calendula, cosmos, hollyhock, marigold, zinnia, Japanese hop, dahlia (except tubers without stems), and gladiolus (except corms without stems) produced in or shipped from the infested area will be admitted into the State of Utah, provided each lot or shipment is officially certified by a duly authorized official of the state where produced, evidencing that such plants, products, or cut flowers have been inspected or that the greenhouse or growing grounds where same were produced were inspected and no European Corn Borer was found, or that such plants, products, or cut flowers have been fumigated by a method and in a manner prescribed by the Utah Department of Agriculture and Food and setting forth the date of fumigation, dosage schedule, and kind of fumigant used. No restrictions are placed by this quarantine on the entry into Utah of such vegetable and ornamental plants and plant products produced in and shipped from any non-infested state.

7. Panicle Rice Mite
    a. National-level Official Control – USDA / APHIS
    http://ag.arizona.edu/crops/pesticides/docs/FO_PRM_Puerto_Rico_20080711.pdf

Annex VI. – Clean Air Act – Amendment Language on Quarantine and Preshipment

(Public Law No. 105-277, October 21, 1998)

Sec. 764. (a) Section 604 of the Clean Air Act is amended by inserting at the end the following:

``(h) Methyl Bromide.--Notwithstanding subsection (d) and section 604(b), the Administrator (of the U.S. Environmental Agency) shall not terminate production of methyl bromide prior to January 1, 2005. The Administrator shall promulgate rules for reductions in, and terminate the production, importation, and consumption of, methyl bromide under a schedule that is in accordance with, but not more stringent than, the phaseout schedule of the Montreal Protocol Treaty as in effect on the date of the enactment of this subsection."

(b) Section 604(d) of the Clean Air Act is amended by inserting at the end the following:

``(5) **Sanitation and food protection.--To the extent consistent with the Montreal Protocol's quarantine and preshipment provisions, the Administrator shall exempt the production, importation, and consumption of methyl bromide to fumigate commodities entering or leaving the United States or any State (or political subdivision thereof) for purposes of compliance with Animal and Plant Health Inspection Service requirements or with any international, Federal, State, or local sanitation or food protection standard.**

``(6) Critical uses.--To the extent consistent with the Montreal Protocol, the Administrator, after notice and opportunity for public comment, and after consultation with other departments or institutions of the Federal Government have regulatory authority related to methyl bromide, including the Secretary of Agriculture, may exempt the production, importation, and consumption of methyl bromide for critical uses."

(c) Section 604(e) of the Clean Air Act is amended by inserting at the end the following:

``(3) Methyl bromide.--Notwithstanding the phaseout and termination of production of methyl bromide pursuant to section 604(h), the Administrator may, consistent with the Montreal Protocol, authorize the production of limited quantities of methyl bromide, solely for use in developing countries that are Parties to the Copenhagen Amendments to the Montreal Protocol.".

Annex VI. – US EPA Regulations on Quarantine and Preshipment

1. Interim Final Rule, July 19, 2001

2. Final Rule, January 2, 2003

Federal Register

Thursday,

July 19, 2001

Part III

Environmental Protection Agency

40 CFR Part 82

Protection of Stratospheric Ozone: Process for Exempting Quarantine and Preshipment Applications of Methyl Bromide; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 82

[FRL–7014–5]

RIN 2060–A142

Protection of Stratospheric Ozone: Process for Exempting Quarantine and Preshipment Applications of Methyl Bromide

AGENCY: Environmental Protection Agency (EPA).

ACTION: Interim final rule.

SUMMARY: With this rulemaking, EPA is taking interim final action to amend the accelerated phaseout regulations that govern the production, import, export, transformation and destruction of substances that deplete the ozone layer under the authority of Title VI of the Clean Air Act Amendments of 1990 (CAA or the Act). Today's amendments incorporate an exemption permitted under the Montreal Protocol on Substances that Deplete the Ozone Layer (Protocol) and required by recent changes in Title VI of the CAA. Specifically, EPA is creating a temporary exemption, through December 31, 2002, from the consumption and production phaseout for quantities of Class I, Group VI controlled substances (methyl bromide) that are used for quarantine and preshipment. Following public comment, EPA intends to issue a final action to extend this exemption beyond December 31, 2002. EPA is also actively pursuing a separate notice and comment rulemaking, with stakeholder involvement, to establish methyl bromide exemptions for critical uses and emergency uses beyond the phaseout of production and import on January 1, 2005.

DATES: This rule is effective July 19, 2001 and the additions to 40 CFR Part 82 will remain in effect through December 31, 2002. The provisions and requirements established in today's rule apply to the entire 2001 and 2002 calendar years (control periods). EPA will consider all written comments received by October 12, 2001 to determine whether any changes are necessary prior to issuing a final action to extend this exemption beyond December 31, 2002.

ADDRESSES: Should you have comments that are directly related to this rulemaking please submit them in duplicate (two copies) to: Air Docket No. A–2000–24, U.S. Environmental Protection Agency, Mail Code 6102, 1200 Pennsylvania Ave., NW., Washington, DC, 20460. In addition, should you have comments that are separately related to a different issue than those raised by this rulemaking you may send them directly to U.S. Environmental Protection Agency, Global Programs Division (6205J), 1200 Pennsylvania Ave., NW., Washington, DC 20460.

Materials relevant to this rulemaking are contained in Docket No. A–2000–24. The Docket is located in room M–1500, First Floor, Waterside Mall at 401 M Street, SW., Washington, DC 20460. The materials may be inspected from 8:30 am until 5:30 pm Monday through Friday. A reasonable fee may be charged by EPA for copying docket materials.

FOR FURTHER INFORMATION CONTACT: Tom Land, U.S. Environmental Protection Agency, Global Programs Division (6205J), 1200 Pennsylvania Ave., NW., Washington, DC, 20460, 202–564–9185.

SUPPLEMENTARY INFORMATION: EPA is taking this action as an interim final rule without prior proposal and public comment because EPA finds that the good cause exemption from the notice-and-comment rulemaking requirement of the Administrative Procedure Act (APA), 5 U.S.C. 551 *et seq.*, applies here. Section 307(d) of the Clean Air Act (CAA) states that in the case of any rule to which section 307(d) applies, notice of proposed rulemaking must be published in the **Federal Register** (CAA307(d)(3)). The promulgation or revision of regulations under title VI of the CAA is generally subject to section 307(d). However, section 307(d) does not apply to any rule referred to in subparagraphs (A) or (B) of section 553(b) of the APA. Section 553(b)(B) of the APA, 5 U.S.C. 553(b)(B), provides that, when an agency for good cause finds that notice and comment public procedures are impracticable, unnecessary or contrary to the public interest, the agency may issue a rule without providing notice and an opportunity for public comment.

EPA has determined that there is good cause for making today's rule an interim final rule without prior proposal and opportunity for comment because we view these revisions as protecting commodity trade from the adverse impacts of quarantine pest infestations, as well as protecting the supply of imported fruits and vegetables available to the general public. Without the creation of the exemption by this rule, quantities of methyl bromide used for quarantine and preshipment would be counted against the production and consumption allowances already limited by prior rulemaking (65 FR 70795), which for 2001 constitute 50% of the baseline. Having to compete for non-exempt methyl bromide, without today's exemption, fumigators at U.S. ports might not be able to meet U.S. requirements to treat imported commodities (under the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) requirements). This could jeopardize the supplies of these commodities for U.S. consumers because in the absence of required treatments ships would be turned away. Alternatively, the absence of today's exemption could increase the risk of an outbreak of a quarantine pest within the United States because shipments are typically unloaded onto the docks in preparation for fumigation with methyl bromide. Unloading containers at the docks could occur prior to a realization that methyl bromide is unavailable at the port and thereby jeopardize U.S. commodities with a quarantine pest infestation. If an infestation of a quarantine pest occurs, the amount of methyl bromide used could greatly increase. For example, when the port of Houston was infested with the Mediterranean snail, a fumigator who typically uses 40,000–50,000 pounds a year, used 21,000 pounds in 7½ weeks to treat this outbreak of a quarantine pest. In addition, exporters might not be able to ship U.S. commodities overseas because they would not be able to meet foreign import requirements without today's exemption. Thus, notice and public procedure are impracticable and contrary to the public interest. EPA finds that this constitutes good cause under 5 U.S.C. 553(b)(B). Nonetheless, EPA is providing 90 days for submission of public comments following today's action. EPA will consider all written comments submitted in the allotted time period to determine if any change is warranted prior to taking final action that would extend this exemption beyond December 31, 2002. The phaseout program operates in control periods that correspond to calendar years. EPA believes that the exemption should correspond to whole control periods, i.e., entire calendar years. EPA does not believe it will be possible to take final action before the end of the 2001 control period. Because the Agency is providing a 90-day comment period and wants to ensure there is sufficient time to carefully review comments and consider other approaches, and to simplify the administrative implementation for affected entities, today's exemption is effective through December 31, 2002.

Section 553(d) of the APA generally provides that rules may not take effect earlier than 30 days after they are published in the **Federal Register**. However, APA section 553(d) excepts from this provision any action that grants or recognizes an exemption or relieves a restriction. Since today's action grants an exemption from the phaseout of production and import of methyl bromide, EPA is making this action effective immediately to ensure the availability of methyl bromide for quarantine and preshipment through December 31, 2002.

EPA emphasizes that this rule is intended only to address the basic implementation of the methyl bromide quarantine and preshipment exemptions according to the definitions agreed upon by the Montreal Protocol Parties. Any deviations from the Protocol Parties' definitions are constrained by the Protocol and the Clean Air Act, and therefore are not addressed in today's rulemaking.

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Entities potentially regulated by this action are those associated with methyl bromide that is used for quarantine and preshipment applications. In addition, this action potentially regulates entities importing and exporting methyl bromide. Potentially regulated categories and entities include:

Category	Examples of regulated entities
Industry	Producers, Importers and Exporters of methyl bromide. Distributors of methyl bromide used for quarantine and preshipment. Applicators of methyl bromide used for quarantine and preshipment. Commodity Owners or Shippers of Goods that request the quarantine or preshipment application of methyl bromide in accordance with treatments, official controls or requirements.

Table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your facility, company, business, organization, etc. is regulated by this action, you should carefully examine the regulations promulgated at 40 CFR 82, Subpart A. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding FOR FURTHER INFORMATION CONTACT section.

I. What Is the Background of the Phaseout Regulations for Ozone-Depleting Substances?

The current regulatory requirements of the Stratospheric Ozone Protection Program that limit production and consumption of ozone-depleting substances were promulgated by the Environmental Protection Agency (EPA or the Agency) in the **Federal Register** on December 20, 1994 (59 FR 65478), May 10, 1995 (60 FR 24970), August 4, 1998 (63 FR 41625), and October 5, 1998 (63 FR 53290). The regulatory program was originally published in the **Federal Register** on August 12, 1988 (53 FR 30566), in response to the 1987 signing of the Montreal Protocol on Substances that Deplete the Ozone Layer (Protocol).[1] The U.S. was one of the original signatories to the 1987 Montreal Protocol and the U.S. ratified the Protocol on April 21, 1988. Congress then enacted, and President Bush signed into law, the Clean Air Act Amendments of 1990 (CAA or the Act) that included Title VI on Stratospheric Ozone Protection.

Today's action amends the existing EPA regulations published under Title VI of the CAA that govern the production and consumption of ozone-depleting substances. Today's action establishes an exemption from the methyl bromide production and import reduction and phaseout schedule for quantities to be used for quarantine and preshipment applications. Today's amendments are intended to implement requirements of the Protocol and the CAA, including amendments to Title VI as created by Section 764 of the 1999 Omnibus Consolidated and Emergency Supplemental Appropriations Act (Pub. L. 105–277, October 21, 1998) (Section 604(d)(5) of the Clean Air Act).

The requirements contained in the final rules published in the **Federal Register** on December 20, 1994 and May 10, 1995 establish an Allowance Program. The Allowance Program and its history are described in the notice of proposed rulemaking (NPRM) published in the **Federal Register** on November 10, 1994 (59 FR 56276). The control and the phaseout of production and consumption of ozone-depleting substances, as required under the Protocol and CAA, are accomplished through the Allowance Program.

In developing the Allowance Program, EPA collected information on the amounts of ozone-depleting substances produced, imported, exported, transformed and destroyed within the United States for specific baseline years

[1] Several revisions to the original 1988 rule were issued on the following dates: February 9, 1989 (54 FR 6376), April 3, 1989 (54 FR 13502), July 5, 1989 (54 FR 28062), July 12, 1989 (54 FR 29337), February 13, 1990 (55 FR 5005), June 15, 1990 (55 FR 24490) and June 22, 1990 (55 FR 25812) July 30, 1992 (57 FR 33754), December 10, 1993 (58 FR 65018).

for specific chemicals. This information was used to establish the U.S. production and consumption ceilings for these chemicals. The data were also used to assign company-specific production and import rights to companies that were in most cases producing or importing during the specific year of data collection. For methyl bromide, 1991 was the baseline year used to establish the ceiling and assign company-specific production and import rights. Production or import rights are called ''allowances.'' Production allowances and consumption allowances continue to exist for only one specific class I controlled ozone-depleting substance—methyl bromide. All other production or consumption of class I controlled substances is prohibited under the Protocol and the CAA, save for a few narrow exemptions. For methyl bromide the remaining schedule for the phaseout of production and consumption allowances is as follows: 50 percent reduction of baseline beginning January 29, 2001, 70 percent reduction of baseline beginning January 1, 2003, and a 100 percent reduction of baseline beginning January 1, 2005, with narrow exemptions for critical uses and emergencies, as well as for quarantine and preshipment uses.

In the context of the regulatory program, the use of the term consumption may be misleading. Consumption does not mean the ''use'' of a controlled substance, but rather is defined as the formula: Consumption = production + imports − exports, of controlled substances (Article 1 of the Protocol and Section 601 of the CAA). Class I controlled substances that were produced or imported through the expenditure of allowances prior to their phaseout date can continue to be used by industry and the public after that specific chemical's phaseout under these regulations, unless otherwise precluded under separate regulations.

The specific names and chemical formulas for the controlled ozone-depleting substances in Groups of class I controlled substances are in Appendix A and Appendix F in Subpart A of 40 CFR Part 82. The specific names and chemical formulas for the class II controlled ozone-depleting substances are in Appendix B and Appendix F in Subpart A.

II. What Is Methyl Bromide?

Methyl bromide is used in the United States and throughout the world as a fumigant to control a variety of pests in many different situations. Methyl bromide is an odorless, colorless, toxic gas. Methyl bromide is a broad spectrum pesticide, which is used as a fumigant to control a variety of pests, such as insects, weeds, rodents, pathogens, and nematodes. Additional characteristics and details about the uses of methyl bromide can be found in the proposed rule published in the **Federal Register** on March 18, 1993 (58 FR 15014) and the final rule published in the **Federal Register** on December 10, 1993 (58 FR 65018). Information on methyl bromide can be found at the following sites of the World Wide Web: *www.epa.gov/ozone/mbr/mbrqu.html* and *www.teap.org* or by contacting the Stratospheric Ozone Protection Hotline at 1–800–296–1996.

III. What Are Examples of Quarantine and Preshipment Uses of Methyl Bromide?

An example of a quarantine use of methyl bromide is the fumigation of commodities such as rice and spices that are subject to infestation by a specific and officially recognized quarantine pest, such as the khapra beetle (Trogoderma granarium Everts). The purpose of quarantine fumigation is to prevent the introduction of specific quarantine pest(s) into a defined geographical area, such as an importing country. An example of a preshipment use of methyl bromide is the application to wheat because of official phytosanitary requirements at the shipment destination. In 1998, the Methyl Bromide Technical Options Committee (MBTOC), a sub-group under the independent advisory body of the Technical and Economic Assessment Panel (TEAP) to the Montreal Protocol, published an assessment that gives further details about uses of methyl bromide and possible alternatives and substitutes for controlling pests.

IV. What Is the Legal Authority for Exempting Production and Consumption of Methyl Bromide for Quarantine and Preshipment Applications?

In Article 2H of the Montreal Protocol, which establishes the phaseout schedule for methyl bromide for developed countries, paragraph 6 states that, ''[t]he calculated levels of consumption and production under this Article shall not include the amounts used by the Party for quarantine and pre-shipment applications.'' EPA notes that paragraph 6, of Article 2H indicates that the exemption is to exclude from the U.S.'s calculation of methyl bromide consumption and production the amounts used by the U.S. for quarantine and preshipment applications. In addition, Article 7 of the Protocol was recently amended regarding methyl bromide and now requires each Party to report on, ''the annual amount used for quarantine and preshipment applications.'' Beyond the critical uses allowed in Article 2H, Paragraph 5, quarantine and preshipment uses are the only exemptions explicitly allowed for under the Montreal Protocol.

The recent amendments to Title VI of the Clean Air Act regarding methyl bromide include a new provision on ''Sanitation and Food Protection,'' which is related to the Protocol exemption for quarantine and preshipment. This new Section 604(d)(5) of Title VI of the CAA, on Sanitation and Food Protection, was added by Section 764(b) of the 1999 Omnibus Consolidated and Emergency Supplemental Appropriations Act (Public Law 105–277). This new Section 604(d)(5) says, ''To the extent consistent with the Montreal Protocol's quarantine and preshipment provisions, the Administrator shall exempt the production, importation, and consumption of methyl bromide to fumigate commodities entering or leaving the United States or any State (or political subdivision thereof) for purposes of compliance with Animal and Plant Health Inspection Service requirements or with any international, Federal, State or local sanitation or food protection standard.'' Prior to Congressional passage of Section 604(d)(5), the CAA did not provide authority for creating such an exemption to the methyl bromide phaseout schedule. Therefore, by today's interim final regulation, EPA is implementing the express language provided in Article 2H, paragraph 6, of the Protocol under the authority provided by section 604(d)(5) of the CAA. EPA is also acting in a manner consistent with, and to fulfill the obligations of, section 614(b) of the CAA. Section 614(b) of the CAA states that, ''[t]his title as added by the Clean Air Act Amendments of 1990 shall be construed, interpreted, and applied as a supplement to the terms and conditions of the Montreal Protocol, as provided in Article 2, paragraph 11 thereof, and shall not be construed, interpreted, or applied to abrogate the responsibilities or obligations of the United States to implement fully the provisions of the Montreal Protocol. In the case of conflict between any provision of this title and any provision of the Montreal Protocol, the more stringent provision shall govern.''

At a July 1999 meeting with the Methyl Bromide Industry Panel, EPA received a legal memorandum from their counsel regarding the definition of quarantine and preshipment and the recent amendment adding Section

604(d)(5) to the Clean Air Act. The argument made in the Methyl Bromide Industry Panel's legal memorandum is that the introductory phrase (''to the extent consistent with the Montreal Protocol's quarantine and pre-shipment provisions'') in Section 604(d)(5) of the Clean Air Act does not require EPA to make its regulations consistent with the ''preshipment'' and ''quarantine'' definitions in Decision VII/5 and Decision XI/12 of the Parties to the Protocol. The issue raised by the Methyl Bromide Industry Panel's legal memorandum is whether the reference to the ''Montreal Protocol's quarantine and preshipment provisions,'' in Section 604(d)(5) refers only to the single provision found in Article 2H, paragraph 6 of the Protocol (which provides that the ''calculated levels of consumption and production under this Article shall not include the amounts used by the Party for quarantine and preshipment applications'') or also refers to Decision VI/11, Decision VII/5, Decision XI/12, and Decision XI/13 of the Parties. The Methyl Bromide Industry Panel's legal memorandum also notes that Section 602 of the CAA defines the Montreal Protocol as, The Montreal Protocol on Substances that Deplete the Ozone Layer and its amendments and adjustments without specific reference to Decisions by the Parties to the Protocol.

The provisions of the Vienna Convention on the Law of Treaties (VCLT), 8 International Legal Materials 679 (1969), that concern treaty interpretation generally reflect customary international law. Article 31 of the VCLT sets forth the general rule of treaty interpretation. Paragraph 1 of Article 31 provides that a treaty ''shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose.'' Paragraph 3 of Article 31 of the VCLT states, ''[t]here shall be taken into account, together with any context: * * * (a) any subsequent agreement between the parties regarding the interpretation of the treaty or the application of its provisions.'' Decisions VI/11, VII/5, XI/12 and XI/13 constitute subsequent consensus agreements among the Parties to the Montreal Protocol (including the United States) regarding the interpretation and application of the quarantine and preshipment provision of Article 2H. Therefore, it is appropriate for EPA, when determining what is consistent with the ''Montreal Protocol's quarantine and preshipment provisions,'' to take into account Decisions VI/11, VII/5, XI/12, and XI/13.

Furthermore, in amending the CAA, Congress specifically cited the plural ''quarantine and preshipment provisions.'' If Congress intended for this phrase to be limited to the single provision in the Protocol referencing quarantine and preshipment in Article 2H, and not the subsequent Decisions between the Parties regarding interpretation or application of the treaty, Congress would have presumably directed the Agency to be consistent with the singular provision.

Precedents within the current regulations (40 CFR Part 82) demonstrate that the United States has routinely considered Decisions that clarify and interpret obligations under the Montreal Protocol to be authoritative and that such Decisions of the Parties are currently implemented through regulations under the CAA. For example, the United States' current regulatory definition of a ''controlled substance'' is based on a Decision by the Parties (Decision IV/12) that clarifies Article 1, paragraph 4 of the Protocol.

In another example, the current process in the United States for implementing the Protocol's essential-use exemption relies on Decisions by the Parties for the specific definition of what is an ''essential use.'' In the process of preparing the United States' annual nomination, the U.S. relies on Decision IV/25 to evaluate applications that are submitted by U.S. entities who are requesting an essential-use exemption. In addition, the U.S. government considers whether the information that will be provided in the national nomination is in accordance with Decision VIII/10, as well as whether it is in accordance with the conditions to be applied in providing an exemption under Decision VI/9, Decision VII/28, and Decision VIII/9. Consideration of these Decisions by the U.S. government is important because the U.S. nomination is reviewed by the Protocol's TEAP, who then makes recommendations to the Parties based on the Decisions. The essential-use exemptions nominated by the U.S. government are ultimately considered and authorized by the Parties in the context of these Decisions. The control measures in Article 2 of the Protocol allow for essential-use exemptions (for the production and consumption of controlled substances beyond phaseout dates). However, the Parties' interpretation of the phrase ''essential use'' and their agreements regarding the application of this exemption appear in Decisions.

Finally, EPA is in the process of developing regulations that would implement Decision IX/7 of the Parties by allowing an exemption for ''emergency methyl bromide use.'' Decision IX/7 reflects an agreement among the Parties to the Protocol regarding the interpretation and application of the critical-use exemption provided for in Article 2H(5) of the Protocol. Decision IX/7 directs the Ozone Secretariat and the TEAP to ''evaluate the [emergency] use according to the ''critical methyl bromide use'' criteria and present this information to the next meeting of the Parties for review * * *''

The examples above illustrate how U.S. regulations incorporate Decisions by the Parties to the Protocol. Other precedents for incorporating Decisions by the Protocol Parties into current U.S. regulations can be found in 40 CFR Part 82, Subpart A.

V. What Is the Definition of Quarantine and Preshipment Applications?

In today's action, EPA is defining quarantine and preshipment applications as agreed by the Parties to the Montreal Protocol. The Parties to the Protocol agreed to the following definition of ''quarantine applications'' in Decision VII/5: ''quarantine applications, with respect to methyl bromide, are treatments to prevent the introduction, establishment and/or spread of quarantine pests (including diseases), or to ensure their official control, where: (i) Official control is that performed by, or authorized by, a national plant, animal or environmental protection or health authority; (ii) quarantine pests are pests of potential importance to the areas endangered thereby and not yet present there, or present but not widely distributed and being officially controlled.''

The Parties to the Protocol first agreed to the following definition for preshipment applications of methyl bromide in Decisions VI/11 and VII/5: ''preshipment applications are those treatments applied directly preceding and in relation to export, to meet the phytosanitary or sanitary requirements of the importing country or existing phytosanitary or sanitary requirements of the exporting country.'' At the 11th Meeting of the Parties in December 1999, the Parties further clarified the intent of the term preshipment, by agreeing to the following definition in Decision XI/12: ''* * * preshipment applications are those non-quarantine applications within 21 days prior to export to meet the official requirements of the importing country or existing official requirements of the exporting country. Official requirements are those which are performed by, or authorized by, a national plant, animal, environmental, health or stored product authority.''

With today's action, EPA is defining quarantine applications and preshipment applications, for implementing the exemption to the methyl bromide production and consumption phaseout schedule mandated by the new section 604(d)(5) of the CAA and in a manner consistent with section 614(b) of the CAA, as follows:

Quarantine applications, with respect to class I, Group VI controlled substances, are treatments to prevent the introduction, establishment and/or spread of quarantine pests (including diseases), or to ensure their official control, where: (i) Official control is that performed by, or authorized by, a national plant, animal or environmental protection or health authority; (ii) quarantine pests are pests of potential importance to the areas endangered thereby and not yet present there, or present but not widely distributed and being officially controlled.

Preshipment applications, with respect to class I, Group VI controlled substances, are those non-quarantine applications within 21 days prior to export to meet the official requirements of the importing country or existing official requirements of the exporting country. Official requirements are those which are performed by, or authorized by, a national plant, animal, environmental, health or stored product authority.

As specified in the above definitions, which mirror exactly those specified by the Protocol, a quarantine application of methyl bromide must be ''performed by, or authorized by, a national plant, animal or environmental protection, or health authority.'' In addition, as delineated in the above definition, quarantine applications must be directed at quarantine pests. Today's definition of preshipment applications is limited to applications ''to meet the official requirements of the importing country or existing official requirements of the exporting country.'' The definition of preshipment applications specifies that the phrase ''official requirements'' means ''those which are performed by, or authorized by, a national plant, animal, environmental, health, or stored product authority.''

A. Are There Clarifications Regarding Trade Within the U.S.?

The Technical and Economic Assessment Panel (TEAP) provided the Parties to the Protocol with analyses and clarifications of the definition of ''quarantine applications,'' recommending that Decision VII/5 be interpreted to include officially required treatments for intra-country trade within the territory of the Party. Therefore, for purposes of today's regulation, ''quarantine applications'' include inter-state and inter-county treatments required to control quarantine pests. This is consistent with the Montreal Protocol and reconciles the language with Section 604(d)(5) of the CAA on Sanitation and Food Protection, which refers to international, Federal, state and local requirements. In recognizing official state, county, tribal, and local quarantine requirements, EPA interprets the definition of quarantine applications such that intra-country quarantine treatments required by state, county, tribal, and local plant, animal, environmental, or health government authorities constitute official control.

In contrast to the definition of quarantine applications, which accommodates intra-country trade, the Protocol definition of preshipment applications is specific to trade between countries because of the phrase ''applications within 21 days prior to export.'' Therefore, for purposes of today's regulation, the exemption for preshipment applications is limited to the movement of goods from the U.S. to another country, and does not include movement of goods within the U.S.

B. Are There Additional Qualifiers Associated With the Definition of Preshipment Applications?

In 1998, the TEAP provided interim explanatory notes to assist the Parties in the consistent implementation of the exemption for preshipment applications, highlighting that preshipment applications are ''* * * not intended to cover informal or purely contractual or commercial arrangements not required under official regulations.'' (April 1998 TEAP Report, page 145). The definition of ''preshipment applications'' focuses on applications ''to meet the official requirements of the importing country or existing official requirements of the exporting country.'' The definition of preshipment applications specifies that the phrase ''official requirements'' means ''those which are performed by, or authorized by, a national plant, animal, environmental, health, or stored product authority.''

The definition of preshipment applications in Decision XI/12 contains the phrase ''existing official requirements of the exporting country,'' (emphasis added), which implies the need to establish a cutoff date when a preshipment requirement is existing. With today's action, however, for the interim period through December 31, 2002, EPA will interpret the word ''existing'' to mean simply that the preshipment requirement must be in existence at the time of the specific treatment. It is important to note that the exporting country referred to in the phrase is the United States.

EPA is seeking comments on ways to interpret the term ''existing'' in the preshipment applications definition for development of the final version of this regulation. Options for interpreting the term ''existing official requirements'' might be to exempt official preshipment requirements of the exporting country that were: (1) In effect prior to the date the Parties to the Protocol adopted Decision XI/12, which was December 3, 1999, (2) in effect at the time this interim final rule is published in the **Federal Register**, (3) in place at the time the final rule on the quarantine and preshipment exemption is published in the **Federal Register**, (4) existing at the time of the methyl bromide application (since it would be an ''existing'' requirement of the exporting country upon going into effect). EPA seeks comments on these possible interpretations of the phrase ''existing official requirements of the exporting country.''

For the interim period through December 31, 2002, EPA will also interpret the phrase ''to meet the * * * official requirements of the exporting country'' as exempting methyl bromide used to fumigate a commodity when it is to meet a United States food sanitation requirement and the fumigation occurs within 21 days prior to export from the United States. For example, today's action considers methyl bromide used to meet food sanitation requirements of the U.S. government (such as requirements for food in interstate commerce under the Federal Food Drug and Cosmetic Act, as monitored by the Food and Drug Administration) to be exempt under the definition of preshipment applications for the interim period through December 31, 2002, when the methyl bromide is applied within the 21 days prior to export to a foreign country. EPA is seeking comments on this interpretation of the definition of ''preshipment applications.''

It should be noted that if an importing country were to establish a new official requirement for the preshipment application of methyl bromide, nothing in this rule would prevent a U.S. exporter from using methyl bromide to meet the new requirement of the importing country.

C. Are There Additional Qualifiers Associated With the Definition of Quarantine Applications?

With today's action, EPA is establishing that for the interim period through December 31, 2002, the exemption for quarantine applications will apply when methyl bromide is among a list of treatments or official control options for quarantine pests or if methyl bromide is required for an emergency U.S. quarantine application. Under Section 3, Section 18, and Section 24a of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), EPA is notified of emergency quarantine applications of methyl bromide in accordance with specific requirements published under FIFRA. In addition, for the interim period (through December 31, 2002), methyl bromide will be exempted for quarantine applications on U.S. commodities for export when the foreign country simply has a broad performance-based quarantine requirement. In other words, today's action exempts methyl bromide in situations when the foreign country's regulations require a certification that U.S. commodities be exported free of quarantine pests. EPA understands that both USDA/APHIS and State agencies issue ''phytosanitary certificates'' that accompany U.S. commodities exported to foreign countries. These phytosanitary certificates are often required by importing foreign countries to ensure that U.S. exports are free of quarantine pests. To the extent that methyl bromide is used by a U.S. exporter to meet a foreign quarantine requirement, then the phytosanitary certificates (PPQ Form 577, PPQ Form 578, and PPQ Form 579) issued by USDA/APHIS or an authorized State agency will be an additional means for EPA to cross-check quarantine applications of methyl bromide under today's exemption. However, EPA is not exempting methyl bromide used for non-quarantine applications, even if the U.S. exporter must obtain a phytosanitary certificate for the export of the commodity. Today's exemption applies to the use of methyl bromide to meet a foreign quarantine requirement when a phytosanitary certificate is issued for a U.S. exported commodity. If PPQ Forms or other types of certificates are issued for commodities meeting state or local quarantine requirements then methyl bromide used in these cases is considered exempt under today's action.

To assist in development of the final version of this regulation, EPA is seeking comments on the variety of ways of interpreting the methyl bromide exemption for quarantine applications. One approach would be to limit the exemption to cases when regulations list methyl bromide as the unique treatment or control for specific quarantine pests.

A second approach would be to apply the exemption in cases when methyl bromide is among a list of treatment or control options for quarantine pests. Presumably, currently existing quarantine regulations that include methyl bromide among a list of treatment or control options indicate that other treatments or controls on the list can be used to address the quarantine pest(s).

A third approach would be to apply the exemption in cases when methyl bromide is required for an emergency quarantine application.

A fourth approach would be to apply the exemption to quarantine applications when there is a broad performance-based quarantine requirement. This would be a situation when the regulations require that a commodity be exported/imported free of quarantine pests. The Agency understands that many importing countries have quarantine regulations which broadly require commodities to be free of quarantine pests without specifying the types of treatments or controls. EPA seeks comment on these various ways of interpreting the exemption for quarantine applications.

Combinations of the above approaches for applying the exemption for quarantine applications, including combinations where the exemption is applied differently depending on whether a commodity is being imported into, moved within, or exported from the U.S., are possible as demonstrated by the conditions established with today's action for the interim period through December 31, 2002 (first paragraph in V.C. above). Today's action exempts methyl bromide for imports when methyl bromide is among a list of treatments or official control options for quarantine pests or if methyl bromide is required for an emergency U.S. quarantine application, and exempts methyl bromide for exported U.S. commodities when the foreign country simply has a broad performance-based quarantine requirement. Another possible combination of the above approaches would be to institute the exemption for treatments of commodities being imported into the U.S., or moved within U.S., when the quarantine regulations uniquely list methyl bromide as the treatment/control option, while at the same time exempting methyl bromide for the export of U.S. commodities when the foreign quarantine requirement lists methyl bromide among a list of treatment/control options. In this latter example for exports, the exemption might apply only in cases when a phytosanitary certificate is issued for a U.S. commodity to meet the foreign quarantine requirement and methyl bromide is among the list of treatment/control options. EPA is seeking comments on the approaches above and possible combinations of these as demonstrated by the conditions established with today's action for the interim period through December 31, 2002.

The Agency intends to consider prior Decisions by the Parties to the Protocol, such as paragraph (c) of Decision VII/5 which states, ''[i]n applying these definitions, all countries are urged to refrain from use of methyl bromide and to use non-ozone-depleting technologies wherever possible.'' Further, the Parties to the Protocol agreed in Decision XI/13, ''to request the Parties to review their national plant, animal, environmental, health and stored product regulations with a view to removing the requirement for use of methyl bromide for quarantine and preshipment where technically and economically feasible alternatives exist.'' The need to have incentives for people to switch to non-ozone-depleting methods for controlling quarantine pests will also be included in development of the final version of this regulation and EPA is seeking comments on this issue.

EPA is interested in comments addressing the effect of each of these potential approaches on methyl bromide use. EPA recognizes that the price of methyl bromide will play a key role in determining uses, especially where alternatives are available. Basic economic principles of supply and demand suggest that the price of methyl bromide is likely to increase during the phaseout period as supply is constrained. A question remains as to whether this increase will also be seen in the price of quantities of methyl bromide exempted for quarantine and preshipment applications, or whether the exempted methyl bromide for quarantine and preshipment applications will be priced differently than non-exempt quantities. We are interested in comments that address the merits of relying on a potential price increase for methyl bromide exempted for quarantine and preshipment applications—at least over the initial phaseout period—as a way of governing its use for these purposes.

D. How Do the Definitions of Quarantine and Preshipment Aplications Apply to Food Sanitation?

With today's action, for the interim period through December 31, 2002, the exemption of methyl bromide for quarantine applications will not apply to preventative treatments to meet food sanitation standards. Please note that if the methyl bromide use were to occur within 21 days prior to export to another country it would be exempted under the definition of ''preshipment applications'' if it was to meet the official requirements of the importing country or existing official requirements of the exporting country (see discussion in Part V.B. above).

Some U.S. industries have stated that not having methyl bromide for the preventative treatment of their commodities against non-quarantine pests could jeopardize their ability to bring the commodity to market because they would not be able to meet food sanitation standards. EPA is aware that alternative treatments may be technically and economically available for many industries currently using methyl bromide to maintain food sanitation or meet food sanitation standards.

For those industries facing food sanitation challenges, production of methyl bromide will continue until the 2005 phaseout, albeit in limited quantities. For the period beyond the 2005 phaseout, these industries, as well as others, will be able to apply for a ''critical-use'' exemption for continued production and/or import of methyl bromide. Consistent with the Protocol, Parties can apply for a critical-use exemption beyond the 2005 phaseout for specific uses where there are no technically and economically feasible alternatives. Although the critical-use exemption is not available until after 2005, EPA has initiated a separate process with stakeholder input to develop a critical-use exemption. In 2002, a separate **Federal Register** notice will be published asking for people to submit specific information to substantiate requests for a critical-use exemption. However, at this time no decisions have yet been made regarding what uses will be exempted as ''critical.''

EPA understands that certain industries often use methyl bromide as a prophylactic treatment for periodic quality control fumigations associated with food sanitation. Stored commodities, such as dried fruits, nuts, and cocoa beans, as well as grain mills and pasta manufacturing facilities are often fumigated periodically with methyl bromide to prevent populations of pests, such as insects and rodents, from increasing to a point where they would adversely affect food quality. Fumigations with methyl bromide of stored commodities, or food-processing facilities, as preventative measures to maintain food sanitation are directed at controlling populations of pests that are generally endemic to the U.S. and are not designed or intended to ''prevent the introduction, establishment and/or spread of quarantine pests.'' Congress directed EPA to create an exemption, ''consistent with the Montreal Protocol's quarantine and preshipment provisions.'' The quarantine definition from Decision VII/5 of the Protocol stresses that exempt applications of methyl bromide are ''to prevent the introduction, establishment and/or spread of quarantine pests (including diseases).'' This focus on ''quarantine pests'' seems to be the core of the definition and establishes the limit on exempted quarantine applications.

The definition of preshipment applications from Decision XI/12 includes a time constraint of ''21 days prior to export,'' which establishes the limit on the exempted preshipment uses. Thus, the periodic prophylactic fumigation of a commodity, or, the prophylactic fumigation of a food-processing facility which is not to meet quarantine requirements and which is outside of the 21 days prior to export would not be exempt under the Protocol's definition of quarantine applications or preshipment applications.

The Agency is seeking comments on the prophylactic uses of methyl bromide to meet food sanitation standards. The Agency intends to use this information to assist in development of the critical-use exemption process as discussed above.

E. How Do These Definitions Apply to ''Propagative Material'?

The use of methyl bromide to fumigate the soil for growing propagative material, such as strawberry propagative rhizomes, differs from many quarantine applications of methyl bromide. In the specific example of quarantine treatment of strawberry propagative material that was brought to EPA's attention, Japanese regulations require that the underground portions of the imported propagative rhizomes (of the strawberry planting stock) be certified to have been grown in soil that is free of quarantine pests. To meet this Japanese quarantine requirement, and other similar quarantine requirements, U.S. nurseries fumigate the soil with methyl bromide to raise strawberry propagative material. Methyl bromide is used to fumigate the soil before each transplanting (a number of times over 3–5 years) because Japanese requirements dictate that soil in which the strawberry propagative rhizomes are grown be free of quarantine pests. EPA is unaware of how much methyl bromide is used in the growing of strawberry propagative material in the U.S. to meet this or other foreign or domestic quarantine requirements and seeks comments on this specific quarantine application. In addition, the Agency is seeking similar information on other types of plants for planting for which methyl bromide is used as a pre-plant treatment (soil treatment) to ensure propagative materials meet quarantine requirements.

With today's action, for the interim period through December 31, 2002, the exemption for quarantine applications applies to methyl bromide used for growing propagative material, such as strawberry rhizomes, if the methyl bromide is being used to grow propagative material to meet official quarantine requirements of the destination to which it will be shipped. To ensure that the use of methyl bromide for propagative material is consistent with the Protocol's quarantine provisions, applicators availing themselves of the exemption during the interim period must maintain records of each methyl bromide application. These records must certify that the methyl bromide treatments are being undertaken to meet quarantine requirements of the intended destination country for the specific propagative material.

Monitoring methyl bromide used for propagative materials will be a large challenge. The propagative materials may be grown in close proximity to crops that do not qualify for the quarantine and preshipment exemption. EPA believes that it may be difficult to ensure that farmers growing propagative material in a small nursery in the corner of their acreage were meeting the requirements associated with the quarantine exemption—that the methyl bromide purchased under the exemption for the nursery was only used for the propagative material—and growers were not using the methyl bromide for fumigation of their larger acreage where the actual crop was being grown (*i.e.,* strawberry fruit versus propagative material). Monitoring for such an abuse of the exempted methyl bromide may be difficult because both uses would be soil fumigations on the same farm—in adjoining fields.

Another difficulty in compliance monitoring may be caused by the 3–5 year time horizon for growing strawberry propagative materials. The growing cycle for strawberry propagative materials necessitates soil fumigation with methyl bromide several times over a 3–5 year period to protect the specific germplasm (genetic material) that is desired by the Japanese, or others, as well as to allow the grower to certify that the underground portions of the propagative plants are free of quarantine pests. A system is needed to document and ensure the validity of claims by farmers that they are using exempted methyl bromide over the 3–5 years to grow strawberry seedlings for export to meet Japanese or other quarantine requirements. However, EPA recognizes that some farmers will legitimately justify using exempted methyl bromide to meet Japanese or other quarantine requirements for strawberry seedlings, yet due to economic or market conditions these farmers will not send the seedlings to Japan or another destination that has a relevant quarantine requirement. To address this compliance monitoring challenge, the Agency is seeking comments on establishing a recordkeeping requirement for quarantine applications that involve the use of methyl bromide in soil fumigation for the growth of propagative material. EPA is also seeking comments on whether the U.S. growers of propagative materials, in general, should be required to report periodically on methyl bromide used to meet quarantine requirements.

The use of exempted methyl bromide to grow propagative material that the grower planned to ship to a destination with a propagative material quarantine requirement, but which the grower ultimately shipped to a destination without such a requirement, may raise compliance issues for the United States' obligations under the Protocol. EPA is seeking comments on the necessity of, and the nature of, possible compensatory measures. If methyl bromide is used to grow propagative material with the intention of meeting a quarantine requirement of a particular importing country or domestic location, but in the end is sent instead to a destination without a quarantine requirement for the propagative material, the use of the methyl bromide is not exempt under the Protocol. Rather, the quantity used would count against the United States' cap for domestic methyl bromide consumption (currently limited to 50% of baseline for 2001). The U.S. could exceed its control obligations under the Protocol if all U.S. production and consumption allowances for methyl bromide were expended in a particular control period (calendar year) and some methyl bromide in the same control period was mistakenly exempted for quarantine applications when, in fact, the propagative material was sent to a place without quarantine requirements. EPA is seeking comments on several possible options for rectifying this potential situation of non-compliance.

Under the first approach, a person who uses exempted methyl bromide to meet a propagative material quarantine requirement, and who ultimately changes the material's destination to one without a quarantine requirement, would be required to buy an equivalent amount of production allowances for any ozone-depleting substance, on an ozone-depleting potential (ODP) basis, and retire those allowances. In other words, the allowances could not be expended for new production in accordance with Subpart A of 40 CFR Part 82. For example, if a person used 1,000 kilograms of exempted methyl bromide on strawberry propagative material to meet the quarantine requirement of the intended destination but delivered the propagative material to a destination without a quarantine requirement, that person would be required to purchase the ODP equivalent of 1,000 kilograms of methyl bromide production allowances to compensate for the United States' exceeding the methyl bromide production cap.

A second approach would be for the person to destroy an amount of ozone-depleting substances that is equivalent on an ODP basis. Thus, the person would be required to purchase and destroy quantities of existing stocks of ozone-depleting substances, rather than being required to purchase and retire allowances, as in the first approach.

A third approach would require the person to purchase, and store, a quantity of non-exempt methyl bromide equivalent to the quantity of exempt methyl bromide used in the growing of propagative material. This stored (banked) quantity of non-exempt methyl bromide would be insurance against the need to compensate for the United States' specific methyl bromide compliance obligations of zero production after the phaseout, or in the case when all production and consumption allowances had been expended for the particular control period prior to the phaseout. If, in this third option, the propagative material was in fact sent to a destination with a quarantine requirement for that particular propagative material, the person could then sell or use the quantity of non-exempt methyl bromide that was being stored as ''insurance''. However, if the propagative material was ultimately sent to a destination without a quarantine requirement and compensatory measures were needed to ensure the United States meets its compliance obligations under the Protocol, the person holding the stored quantity of non-exempt methyl bromide would be required to pay for its destruction. This option addresses issues of the long time horizon between methyl bromide use and the shipment of the propagative material, as well as the United States' specific methyl bromide compliance obligations under the Protocol both before and after the phaseout.

EPA is seeking comments regarding compliance and enforcement issues related to soil uses of methyl bromide for propagative material to meet quarantine requirements, in general, as well as the specific approaches described above. In addition, the Agency is seeking information on existing certification programs and recordkeeping requirements associated with the pre-plant soil use of methyl bromide for growing propagative material to meet quarantine requirements. EPA is seeking comments on the possible recordkeeping and reporting aspects of the specific approaches described above for rectifying possible non-compliance. Resolving these compliance monitoring and enforcement issues will be important not only to ensure U.S. compliance with obligations under the Protocol but also to maintain a level playing field for all growers in each particular commodity market.

F. How Do These Definitions Apply to In-Transit Applications?

With today's action, for the interim period through December 31, 2002, quantities of methyl bromide used to control quarantine pests on commodities in-transit to the U.S. or traveling within the U.S. are exempt when the use is to meet a quarantine, official control requirement that lists methyl bromide (see discussion in Part V.C. above). Quantities of methyl bromide used to control quarantine pests on commodities that are in-transit from the U.S. to another country, to meet the importing country's quarantine requirements, are also exempt. However, for the interim period, the in-transit application of methyl bromide after a shipment leaves the United States is not an exempt preshipment application because the application would not occur ''within 21 days prior to export'' from the United States (emphasis added). As above, it should be noted that for purposes of today's regulation, the word ''export'' is interpreted to mean the departure of a commodity from the United States or another foreign country.

EPA is seeking comments on the extent of the practice of fumigating commodities for non-quarantine purposes while in-transit.

VI. What Is the Process for Exempting Methyl Bromide for Use in Quarantine and Preshipment Applications?

With this action, EPA is establishing a process to exempt methyl bromide used for quarantine and preshipment applications from the Allowance Program's control measures that phase out production and consumption of methyl bromide (described in Part I. Background above). Today's action exempts quantities of methyl bromide used for quarantine and preshipment applications from the production and consumption reduction steps through December 31, 2002. The final version of this rule will address the exemption for quantities of methyl bromide used for quarantine and preshipment applications for the period that includes the remaining reduction steps and the eventual phaseout of production and consumption under the Montreal Protocol and Clean Air Act.

EPA is creating a flexible process for exempting production and consumption of methyl bromide for quarantine and preshipment applications that is responsive to demands arising when commodities need to be protected from infestations by quarantine pests and when commodities need to be protected immediately prior to shipment in accordance with official requirements. Today's action includes a certification and reporting procedure under authority of the Clean Air Act (CAA) that exempts production and consumption of methyl bromide for quarantine and preshipment applications from the reduction steps through December 31, 2002.

A. Are Producer and Importer Quarterly Reports and Recordkeeping Changing?

Producers and importers must distinguish between quantities of methyl bromide produced or imported for quarantine and preshipment applications and quantities produced or imported for other categories, such as transformation, when submitting quarterly reports that are otherwise currently required under § 82.13. As with quantities for transformation, the quantities of methyl bromide produced or imported for quarantine and preshipment applications are exempt, and are not counted against a company's production allowances and consumption allowances. In other words, the quantity reported specifically for quarantine and preshipment applications by the producer or importer will not be counted when determining the production allowances and consumption allowances expended during the quarter. The production allowances and consumption allowances held by each U.S. company at the beginning of the year, in accordance with § 82.5, § 82.6 and § 82.7, establish the U.S. limit on the amount of production and consumption of methyl bromide for all non-exempted uses in accordance with obligations under the Montreal Protocol. The relationship between each company's baseline production allowances and baseline consumption allowances and the reduction steps in these allowances is in accordance with the control measures under the Montreal Protocol and the Clean Air Act as described in Part I of today's rule and in the direct final rule published in the **Federal Register** on November 28, 2000 (65 FR 70795).

Methyl bromide produced or imported and specifically designated for quarantine and preshipment applications will not be counted as net production or net import for the purposes of the Allowance Program. Net production or net import represents the number of production allowances and consumption allowances expended by a company. Currently, producers and importers provide information on the gross quantity of methyl bromide produced or imported in a quarter. In the same quarterly report, producers and importers indicate the quantity specifically designated for transformation and the quantity specifically designated for destruction which are exempt from the reduction steps and phaseout. These quantities for transformation and for destruction are subtracted from the gross quantity in order to calculate a company's net production or net import. With today's action, producers and importers must also provide information on the quantity of methyl bromide designated solely for quarantine and preshipment applications. This quantity of methyl bromide solely for quarantine and preshipment applications is exempt and producers and importers should also subtract it from the gross quantity in order to calculate net production or net import. Finally, domestic purchasers (distributors or customers) must provide producers and importers with certifications of the quantities being purchased that are designated solely for quarantine and preshipment applications (discussion of requirements for foreign purchasers appears below in Part VI.D). Certifications from distributors will attest that the material will be sold only for quarantine and preshipment applications, and certifications from applicators purchasing directly from a producer or importer will attest that the material will be used only for quarantine and preshipment applications.

In developing today's regulation, EPA initially considered a system of refunding allowances to producers and importers based on amounts of methyl bromide certified as having been purchased solely for quarantine and preshipment applications reported to the Agency by distributors. However, EPA decided a process of refunding allowances would be time-consuming and would likely impede the commercial availability of methyl bromide. EPA also believes a process of refunding allowances to producers and importers based on certification of purchases solely for quarantine and preshipment applications would be more burdensome to implement for both the industry and the Agency. With this action, EPA is simply exempting through December 31, 2002, methyl bromide production and import for quarantine and preshipment applications from the requirement to expend allowances, as is currently done for methyl bromide for transformation or destruction.

In developing today's action, EPA also considered another option for exempting methyl bromide for quarantine and preshipment applications. EPA considered a procedure that would allow the Agency to follow specific quantities of quarantine or preshipment methyl bromide through the chain of commerce (similar to a RCRA hazardous waste manifest) but rejected this option as being overly burdensome with little additional benefit. The option of a manifest system to track quarantine and preshipment quantities through the market would have relied on methyl bromide's regulation under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). As a FIFRA regulated substance, cylinders of methyl bromide are marked with unique registration numbers and labels that prescribe the use of the substance. Although EPA is not tracking cylinders by registration number through the chain of commerce, the Agency is still working with industry on a possible change to the FIFRA label (see Part VI.E below) which would reflect requirements of this rulemaking under CAA authority. If the

FIFRA label on methyl bromide is changed in the future to create a unique product solely for quarantine and preshipment applications, in accordance with the provisions of the Protocol and CAA, then EPA believes identifying material that is exempt because it is designated explicitly for quarantine and preshipment applications will be facilitated.

B. Are Methyl Bromide Applicators Required To Report?

Today's action includes a certification requirement for purchases of methyl bromide by applicators. Applicators must submit a certification to the seller of the methyl bromide when they want to purchase a specific quantity of methyl bromide explicitly for quarantine and preshipment applications. The applicator will certify that the quantity purchased will be used solely for quarantine and preshipment applications. The applicator must send the certification to the company selling the methyl bromide before the seller ships the cylinders of methyl bromide (*i.e.,* certification before shipment).

With today's action, for the interim period through December 31, 2002, the distributor must send a Quarantine and Preshipment Certification Form to any person who places an order for a quantity of methyl bromide that is explicitly and solely for quarantine and preshipment applications as defined in today's action. The applicator, upon receiving the form, must check the box indicating that the particular quantity being ordered is solely for quarantine and preshipment applications as defined on the form (the definition above in Part V) and will neither be sold nor used for any other purpose. The applicator must sign the form certifying, under penalty of law, that the quantity of methyl bromide purchased will be used solely for quarantine and preshipment applications in accordance with the definitions. The applicator must return the completed and signed form to the distributor. The distributor retains the certification form in order to compile data that they will submit to EPA on the quantity of methyl bromide purchased under the exemption for quarantine and preshipment applications. The certification form ensures that quantities of methyl bromide produced or imported under the exemption for quarantine and preshipment applications are used only in accordance with the strict requirements of the exemption. It is important to note that the applicator will also be able to purchase non-exempt methyl bromide until the phaseout date for methyl bromide.

Today's interim rule does not require the distributor to send a Certification Form for every methyl bromide purchase '' instead, distributors are only required to send a Certification Form when an applicator wants to purchase a quantity solely for quarantine and preshipment applications. However, the distributor of methyl bromide may want to send the Certification Form to customers (applicators) for every methyl bromide quantity before the actual purchase and shipment of the material. Doing so would allow the distributor and the applicator to distinctly track the quantities of exempt and non-exempt methyl bromide. To assist in developing the final rule, EPA is seeking comments on the merits and burdens associated this type of shipment-by-shipment certification method as compared to the approach outlined in today's rule. EPA is also interested in comments addressing the implications of a FIFRA label for exempt quantitites of methyl bromide (as discussed in Part VI.E. below).

For quarantine applications, the applicator must collect documentation citing the regulatory requirement or other official requirement that justifies the use of methyl bromide. Acceptable documentation for a quarantine application includes the forms provided directly to the applicator by an official from a national plant, animal, environmental protection or health authority requesting the treatment of commodities to control quarantine pests. In the absence of official documentation from a plant, animal, environmental protection or health authority, the commodity owner, shipper or their agent must provide a letter to the methyl bromide applicator requesting the use of methyl bromide that explicitly cites the regulation requiring a quarantine treatment or quarantine official control. Likewise, the applicator must collect documentation citing the official requirement calling for a preshipment application. The commodity owner, shipper or their agent must provide a letter to the methyl bromide applicator requesting the use of methyl bromide that explicitly cites the official requirement for a preshipment application. The letter that the commodity owner, shipper or their agent presents to the applicator must include the following statement: ''I certify knowledge of the requirements associated with the exempted quarantine and preshipment applications published in 40 CFR part 82, including the requirement that this letter cite the treatments or official controls for quarantine applications or the official requirements for preshipment requirements.'' Both the commodity owner, shipper or their agent and the applicator must maintain this letter for three years in accordance with current recordkeeping requirements in 40 CFR part 82, subpart A. Neither the applicator nor the commodity owner, shipper or their agent are required to submit the letter to EPA. EPA is seeking comments on these procedures, for purposes of developing the final rule.

C. Are Distributors Required To Report?

With today's action, for the interim period through December 31, 2002, EPA is requiring that a person who distributes methyl bromide to applicators (the distributor) compile all the information from applicator certifications (as described in Part VI.B, above) on an annual basis and submit the summary data to EPA. If certifications were signed by applicators at the time the specific quantity of methyl bromide was ordered, in accordance with the procedures described above in VI.B. but the signature of the certification was before date of today's publication, then the distributor can consider those quantities exempt and should include them in the annual report to EPA. In other words, if certifications were signed contemporaneously with an order for a quantity of methyl bromide solely for quarantine and preshipment applications, the distributor should include this quantity in their annual report to EPA, as long as the certifications were signed within the 2001 or 2002 control periods (calendar years).

In development of the final version of this regulation, EPA is seeking comments on whether annual, bi-annual or quarterly reporting of this information would be easier to manage for the distributors of methyl bromide. Companies responsible for reporting on other ozone-depleting substances have clearly expressed their preference for quarterly reporting because it reduces the burden of an end-of-year crunch to compile twelve months of data. Regardless of the reporting periodicity, the distributor must compile all certifications received during the period to obtain the total quantity that purchasers certified to be for quarantine and preshipment applications. The collection of information on the quantity of methyl bromide sold and certified for quarantine and preshipment applications is needed so that the U.S. can respond to a recent amendment to the Protocol. The amendment, to which the Parties agreed at their Eleventh Meeting in Beijing in 1999, adds a provision to Article 7 (Reporting of Data), requiring Parties to submit information on the amounts of methyl bromide used for quarantine and preshipment applications. Reporting by the distributors will allow a comparison between the quantities of methyl bromide sold and certified for quarantine and preshipment applications with the amount of methyl bromide produced and imported for quarantine and preshipment applications, as reported in the producers'/importers' report as described in Part VI.A above.

D. What About Reporting of Methyl Bromide Exported for Quarantine and Preshipment Applications?

EPA considered many options for collecting information on the quantity of methyl bromide produced in the U.S. and then exported for quarantine and preshipment applications. With today's action, producers and others that export methyl bromide must report the total quantity of methyl bromide explicitly exported to individual foreign countries for quarantine and preshipment applications on a quarterly basis. Currently, producers and exporters distinguish other exempted quantities of methyl bromide explicitly exported for transformation or destruction. For each export of methyl bromide for quarantine and preshipment applications, as for exports for transformation or destruction, the exporter must obtain a certification from the foreign person (entity) importing the methyl bromide stating that the material will be used only for quarantine and preshipment applications. These certifications must be submitted with the quarterly reports. These certifications will then be shared with the appropriate foreign government officials in the importing country and the compiled data will be shared with UNEP advisory bodies to the Protocol. Certifications must accompany the reporting on quantities exported for quarantine and preshipment applications because of a concern that the U.S., as one of the largest worldwide producers of methyl bromide, could potentially contribute to the creation of a loophole for non-exempt uses of methyl bromide around the globe. EPA feels it will be important to closely monitor and track production of methyl bromide that is exported for quarantine and preshipment applications because these uses are exempt from Protocol control measures.

EPA considered linking periodic reporting on the quantity of methyl bromide exported for quarantine and preshipment applications with a system for refunding allowances. EPA also considered the option of establishing a ceiling on the export of exempted methyl bromide for quarantine and preshipment applications according to historical export levels. EPA considered this option because the U.S. is one of the largest global producers of methyl bromide and EPA is concerned that exempted production of methyl bromide for quarantine and preshipment exports might become a loophole if those exempted quantities were to be used by other Parties for non-quarantine or non-preshipment applications. At this time, EPA has no indication that abuse of the quarantine and preshipment exemption will occur, but the Agency will monitor the situation closely. For development of the final version of the rule, EPA is seeking comments on today's recordkeeping and reporting requirements and other variations for monitoring quantities of methyl bromide produced in the U.S. and exported for quarantine and preshipment applications.

E. Will There Be a FIFRA Pesticide Label Change?

In parallel with today's action, EPA's Office of Pesticide Programs is working with the Methyl Bromide Industry Panel to develop a registration and label change for methyl bromide products under authority of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). The proposed registration/label change under FIFRA would create unique methyl bromide products solely and specifically for quarantine and preshipment applications. A registration/label change would designate individual cylinders of methyl bromide specifically for quarantine and preshipment applications and it would be illegal to use the material in these cylinders for other uses. Under an approved registration/label change there would be unique registration numbers for the new labels that would accompany each cylinder through the chain of commerce from producers or importers to the end-user (the applicator). As currently required under FIFRA, establishments would report total quantities of methyl bromide under this new quarantine and preshipment registration/label to EPA's Office of Pesticide Programs on an annual basis. Following a change in the FIFRA authorized registration/label, as well as today's final action, it will be possible for the Agency to reconcile the total quantity of methyl bromide certified to be solely for quarantine and preshipment applications under procedures described Part VI.B and VI.C above, the total quantity of methyl bromide produced or imported for quarantine and preshipment applications under today's Part VI.A above, and the annual FIFRA establishment reports on methyl bromide, which reference specific products by registration number.

VII. What Are Other Considerations and Situations on Which EPA Is Seeking Comment?

EPA is seeking comments on the following paragraphs that describe possible variations on the exemption that have not been incorporated into today's action and therefore are not effective during the interim period (through December 31, 2002). To assist in developing the final version of the regulation, EPA is seeking comments regarding the items described below. In addition, EPA will consider comments and questions regarding aspects of today's action that are effective for the interim period. If a person has a question about whether a certain aspect of today's interim action applies to their situation, EPA is encouraging the submission of written questions accompanied by a detailed description of how methyl bromide relates to the person's particular enterprise. The Agency will consider questions about whether aspects of today's interim action apply in the context of EPA's regular process for issuing written determinations.

A. What Are Considerations on Which the Agency Is Seeking Comment Regarding Definitions Under the International Plant Protection Convention (IPPC)?

Under the International Standards for Phytosanitary Measures (ISPMs) adopted by members of the International Plant Protection Convention (IPPC) on April 22, 2001, the definition of "official control" is different than the definition that was agreed to by the Parties to the Montreal Protocol. The IPPC definition of the phrase "official control" is, "the active enforcement of mandatory phytosanitary regulations and the application of mandatory phytosanitary procedures with the objective of eradication or containment of quarantine pests or the management of regulated non-quarantine pests." The IPPC glossary of phytosanitary terms defines "official" as "established, authorized or performed by a National Plant Protection Organization (NPPO)." In the United States, the NPPO is the USDA Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ) Program.

Further, under the ISPMs adopted by the IPPC, the phrase ''regulated non-quarantine pests'' is defined as, ''a non-quarantine pest whose presence in plants for planting affects the intended use of those plants with an economically unacceptable impact and which is therefore regulated within the territory of the importing contacting party.'' Because the IPPC definition of ''regulated non-quarantine pest'' refers to ''plants for planting,'' the phytosanitary measure is limited to propagative materials, such as strawberry seedlings. Although the IPPC's definition of ''official control'' includes regulated non-quarantine pests, it should be noted that the Montreal Protocol does not include these regulated non-quarantine pests. In 1998, the TEAP explicitly laid out the differences between the IPPC's and the Montreal Protocol's definitions of ''official control'' for consideration by the Parties. The Parties rejected making any changes to the Protocol's definition of ''official control'' even when presented with the IPPC language. EPA is seeking comments on possible changes to EPA's interpretation of the phrase ''official control'' as used in today's exemption, for purposes of the final rule.

B. What Are considerations on Which the Agency Is Seeking Comment Regarding Prophylactic Fumigation of U.S. Exports When the Fumigation Is Not Mandated by Import Regulations?

U.S. businesses sometimes use methyl bromide against non-quarantine pests for a commodity that is being exported because it is known that the importing country will treat with methyl bromide at the port of entry if the detected level of these non-quarantine pests during port-of-entry inspection exceeds that country's standards. Some U.S. exporters give their commodities a prophylactic treatment in the U.S. to prevent a much more damaging treatment in the receiving country that could occur if non-quarantine pests were found; possibly reducing the quality of the commodity. In cases where an official foreign Party requirement is specific to quarantine pests, or there is a general performance-based quarantine requirement, the use of methyl bromide under the exemption for quarantine applications would be appropriate. In addition, fumigation with methyl bromide to meet U.S. government non-quarantine pest requirements within 21 days prior to export of the commodity would also be exempt under the definition of preshipment applications. However, EPA is seeking comments that would clarify the scope of the prophylactic use of methyl bromide described in this section, where the official foreign Party requirement is *not* specific to quarantine pests.

C. What Are Considerations on Which the Agency Is Seeking Comment Regarding the Exclusion of Specific Quarantine and Preshipment Applications From the Exemption at Some Future Time?

The Parties to the Protocol in Decision XI/13 request Parties to ''review their national plant, animal, environmental, health and stored product regulations with a view to removing the requirement for the use of methyl bromide for quarantine and preshipment where technically and economically feasible alternatives exist.'' The reason for a review process would be to limit the production and import of methyl bromide to only those cases where no other ''technologically and economically feasible alternatives exist.'' Through time, it is likely that the use of methyl bromide will be less and less necessary for quarantine and preshipment applications. When technically and economically feasible alternatives to methyl bromide are available, a process could be devised that would allow the U.S. to limit the use of this ozone-depleting substance while taking into account the need to protect international trade. In the years beyond the methyl bromide production and consumption phaseout, there will continue to be an exemption for quarantine and preshipment applications but there may no longer be price pressures for moving away from these quarantine and preshipment uses of methyl bromide. Therefore, the Parties to the Protocol emphasize the importance of reviewing quarantine and preshipment applications and identifying when technically and economically feasible alternatives exist, and removing these applications from the exemption.

One option for implementing a review process would be to establish a procedure for excluding specific quarantine and preshipment applications from the exemption when EPA determines by notice and comment rulemaking that alternatives are in significant international use for the specific applications. Such a process would allow U.S. users of methyl bromide for quarantine and preshipment applications to make the case that although alternative(s) are in significant international use, the specific circumstances of their U.S. applications are unique (e.g., the alternatives are not feasible or commercially available in the U.S.) and continue to warrant the use of methyl bromide.

Other options for implementing a review process include: (1) Immediately prior to the 2005 methyl bromide phaseout, reviewing and listing all quarantine and preshipment applications that would be exempt beyond the phaseout through notice and comment rulemaking asking for justifications for continued use, (2) eliminating the exemption for quarantine and preshipment applications after the phaseout and asking users to apply for critical-use exemptions where no technically or economically feasible alternatives exist, and (3) conducting periodic reviews (i.e., 3 or 5 years) for listing through notice and comment rulemaking the specific quarantine and preshipment applications that would be exempt because there were no technically or economically feasible alternatives. EPA seeks comments on these and any other potential processes for reviewing the exemption for quarantine and preshipment applications, where technically and economically feasible alternatives exist.

As an alternative to a formal review process, EPA might rely on market prices to guide methyl bromide use. The effectiveness of this price mechanism is to some extent dependent on the behavior of methyl bromide prices over the phasedown period, and particularly on whether a separate market evolves for the pure grade of methyl bromide needed for quarantine and preshipment uses. Basic economic supply and demand principles suggest that the price of methyl bromide is likely to increase during the phaseout period, thereby providing incentives for the development and use of alternatives. Following the phaseout period after January 1, 2005, we expect the price of methyl bromide exempted for quarantine and preshipment applications (and other exemptions that may be established in the future) to likely be determined by the cost of manufacturing those quantities and not by further decreases in supply. We are interested in comments on this view. We are especially interested in comments addressing: (1) The likely behavior of the price of exempt and non-exempt quantities of methyl bromide during the phaseout; (2) the likely behavior of the price of exempt methyl bromide after the phaseout, (3) the impact on these prices of establishing a FIFRA label explicitly for the methyl bromide exempt for quarantine and preshipment applications, (4) the possible impact of other Federal actions that would influence pricing of methyl bromide, and (5) the value of a price mechanism in assuring that methyl bromide is directed toward those uses where there are no alternatives and/or where it provides the greatest value.

D. What Are Considerations on Which the Agency Is Seeking Comment Regarding National Security Fumigations?

EPA is seeking comments on the possible need for methyl bromide to meet special national security quarantine requirements. The Agency understands that it might be necessary to treat military or other U.S. government property with methyl bromide for import to eliminate possible contamination with biological weapons. EPA is seeking comments on whether a national security quarantine situation could arise that would require a specific exemption. In considering this question, commenters should be aware that prior to the phaseout date some methyl bromide will still be produced without use restrictions, and after the phaseout date, methyl bromide would be available under the emergency use exemption consistent with Decision IX/7 as agreed by the Parties to the Protocol.

VIII. What Are the Steps To Conform the U.S. Methyl Bromide Phaseout Schedule and Exemptions to the Montreal Protocol and the Amended Clean Air Act?

During stakeholder meetings, and in the proposal and final rules that established the 25 percent reduction in methyl bromide baseline allowances beginning in 1999 (64 FR 9290, 64 FR 29240), EPA described its intention to follow with separate rulemakings that would include the additional phaseout steps for methyl bromide and establish additional exemptions in accordance with the Protocol and the CAA. The rule establishing the remaining reduction and phaseout schedule for methyl bromide was published November 28, 2000 (65 FR 70795). The reduction and phaseout schedule is listed above at the end of Part I.

After the phaseout on January 1, 2005, critical-use exemptions are permitted under the Montreal Protocol and the Clean Air Act when nominated by the United States and approved by the Parties. In addition, an emergency use exemption of no more than 20 metric tonnes is available after the phaseout on January 1, 2005. EPA, in consultation with the U.S. Department of Agriculture, is in the process of developing a rulemaking to establish the emergency-use and critical-use exemptions. In 2001, EPA initiated stakeholder meetings to develop rulemaking that will establish the process for an emergency use exemption and the process for critical-use exemptions, which will be designed to ensure the U.S. meets its obligations under the Montreal Protocol consistent with statutory requirements in the Clean Air Act. In 2002, a separate **Federal Register** notice will be published asking for people to submit specific information to substantiate requests for a critical-use exemption. However, at this time no decisions have yet been made regarding what uses will be exempted as ''critical.'' Sometime in advance of 2005, EPA will establish a process for an emergecny use exemption through notice and comment rulemaking.

IX. Administrative Requirements

A. Unfunded Mandates Reform Act

Because the agency has made a ''good cause'' finding that this action is not subject to notice-and-comment requirements under the Administrative Procedure Act or any other statute as explained in the Supplementary Information section of this rulemaking, it is not subject to section 202 and 205 of the Unfunded Mandates Reform Act of 1995 (UMRA) (Public Law 104–4).

B. Regulatory Flexibility Act (RFA), as Amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), 5 U.S.C. 601 et seq.

Because the agency has made a ''good cause'' finding that this action is not subject to notice-and-comment requirements under the Administrative Procedure Act or any other statute as explained in the **SUPPLEMENTARY INFORMATION** section of this rulemaking, it is not subject to the regulatory flexibility provisions of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*)

C. Executive Order 12866

Under Executive Order 12866 (58 FR 51735, October 4, 1993), the Agency must determine whether this regulatory action is ''significant'' and therefore subject to OMB review and the requirements of the Executive Order. The Order defines a ''significant'' regulatory action as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, OMB has notified EPA that it considers this a ''significant regulatory action'' within the meaning of the Executive Order. EPA has submitted this action to OMB for review. Changes made in response to OMB suggestions or recommendations on the original rule submitted to them will be documented in the public record.

D. Applicability of E.O. 13045—Children's Health Protection

Executive Order 13045: ''Protection of Children from Environmental Health Risks and Safety Risks'' (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is determined to be ''economically significant'' as defined under E.O. 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

EPA interprets E.O. 13045 as applying only to those regulatory actions that are based on health or safety risks, such that the analysis required under section 5–501 of the Order has the potential to influence the regulation. This is not such a rule, and therefore E.O. 13045 does not apply.

E. Paperwork Reduction Act

The Office of Management and Budget (OMB) has approved the information collection requirements contained in this rule for six (6) months under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* and the emergency approval provisions of 5 CFR 1320.13. The OMB control number is 2060–0170.

Today's action also serves as the first notice of a request for comment on an extension of today's approval. EPA will follow this action with a second notice in the **Federal Register** regarding today's information collection. EPA is soliciting comments on specific aspects of the information collection as described below. Comments are requested on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques. Send comments on the ICR to the Director, Collection Strategies Division; U.S. Environmental Protection Agency (2822); 1200 Pennsylvania Ave., NW., Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th St., NW., Washington, DC 20503, marked ''Attention: Desk Officer for EPA.'' Include the ICR number in any correspondence. Comments must be submitted on or before September 17, 2001. Copies of material supporting this ICR notice are available free of charge from the Stratospheric Ozone Protection Hotline at 1–800–296–1996 between the hours of 10 am and 4 pm Eastern Standard Time or may be received electronically by sending an e-mail to land.tom@epa.gov. For further information contact, Tom Land, U.S. Environmental Protection Agency, Global Programs Division (6205J), 1200 Pennsylvania Ave., NW., Washington, DC 20460, telephone (202)–564–9185, or facsimile (202)–565–2155.

The EPA would like to solicit comments to: (i) Evaluate whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information will have practical utility; (ii) evaluate the accuracy of the agency's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used; (iii) enhance the quality, utility, and clarity of the information to be collected; and (iv) minimize the burden of the collection of information on those who are to respond, including through the use of appropriate automated electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses.

The Office of Management and Budget (OMB) previously approved the information collection requirements contained in the final rule promulgated on August 4, 1998, and assigned OMB control number 2060–0170 (EPA ICR No. 1432.18).

In relation to the expected benefits of today's exemption from the phaseout schedule for methyl bromide, this action is adding additional reporting and recordkeeping requirements. This action increases the information collection burden under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* This action adds reporting by distributors of methyl bromide regarding the total quantity sold that is certified to be solely for quarantine and preshipment applications. This action also requires applicators of methyl bromide to certify that specified quantities purchased will be used solely for quarantine and preshipment applications. Producers and importers of methyl bromide must include additional information in existing quarterly reports. In addition, producers that export and third-party exporters must submit additional information regarding quantities of methyl bromide exported for quarantine and preshipment applications. Today's action also includes recordkeeping requirements associated with the reporting listed above and an additional recordkeeping requirement for commodity owners or shippers who must formally request methyl bromide use citing the treatment, official control or official requirement for the quarantine and preshipment application.

The information collection under this action is designed to implement the exemption in paragraph 5 under article 2H of the Montreal Protocol for quantities of methyl bromide used for quarantine and preshipment applications as well as the exemption under 604(d)(5) of the CAA. The information collection under this rule is authorized under sections 603(b) and 603(d) of the Clean Air Act Amendments of 1990 (CAA). This information collection is conducted to meet U.S. obligations under Article 7, Reporting Requirements, of the Montreal Protocol on Substances that Deplete the Ozone Layer (Protocol); and to carry out the requirements of Title VI of the CAA, including sections 603 and 614.

The reporting requirements included in this rule are intended to:

(1) Allow exempted production and import for a specific exemption and the consequent tracking of that production and import;

(2) Respond to industry comments on the functioning of the program to streamline reporting and eliminate administrative inefficiencies;

(3) Satisfy U.S. obligations under the international treaty, The Montreal Protocol on Substances that Deplete the Ozone Layer (Protocol), to report data under Article 7;

(4) Fulfill statutory obligations under Section 603(b) of Title VI of the Clean Air Act Amendments of 1990 (CAA) for reporting and monitoring;

(5) Provide information to report to Congress on the production, use and consumption of class I controlled substances as statutorily required in Section 603(d) of Title VI of the CAA.

EPA informs respondents that they may assert claims of business confidentiality for any of the information they submit. Information claimed confidential will be treated in accordance with the procedures for handling information claimed as confidential under 40 CFR Part 2, Subpart B, and will be disclosed only to the extent, and by means of the procedures, set forth in that subpart. If no claim of confidentiality is asserted when the information is received by EPA, it may be made available to the public without further notice to the respondents (40 CFR 2.203).

The information collection requirements for this action have an estimated reporting burden averaging 1.38 hours per response. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed and completing the collection of information.

The estimate includes the time needed to comply with EPA's reporting requirements, as well as that used for the completion of the reports.

Collection activity	No. of respondents	Responses/ respondent	Total responses	Hours per response	Total hours
Producers and Importers Report	4	4	16	1	16
Exporters Report	2	4	8	8	64
Applicator Certification	15	6	90	0.5	45
Distributor Report	15	1	15	16	240
Commodity Owner, Shipper or Agent Recordkeeping	500	10	500	1	500

Collection activity	No. of respondents	Responses/ respondent	Total responses	Hours per response	Total hours
Total Burden Hrs					865

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An Agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR part 9 and 48 CFR chapter 15.

F. Executive Order 13132 (Federalism):

Executive Order 13132, entitled ''Federalism'' (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' is defined in the Executive Order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

Under Section 6 of Executive Order 13132, EPA may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or EPA consults with State and local officials early in the process of developing the regulation. EPA also may not issue a regulation that has federalism implications and that preempts State law, unless the Agency consults with State and local officials early in the process of developing the regulation.

This rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. This rule does not in any way restrict States from continuing to operate their plant, animal, environmental, health or stored product protection programs associated with quarantine and preshipment applications. Thus, the requirements of section 6 of the Executive Order do not apply to this rule.

G. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

On January 1, 2001, EO 13084 was superseded by EO 13175. However, this rule was developed during the period when EO 13084 was still in force, and so tribal considerations were addressed under EO 13084. Under Executive Order 13084, EPA may not issue a regulation that is not required by statute, that significantly or uniquely affects the communities of Indian tribal governments, and that imposes substantial direct compliance costs on those communities, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by the tribal governments, or EPA consults with those governments. If EPA complies by consulting, Executive Order 13084 requires EPA to provide the Office of Management and Budget, in a separately identified section of the preamble to the rule, a description of the extent of EPA's prior consultation with representatives of affected tribal governments, a summary of the nature of their concerns, and a statement supporting the need to issue the regulation. In addition, Executive Order 13084 requires EPA to develop an effective process permitting elected officials and other representatives of Indian tribal governments ''to provide meaningful and timely input in the development of regulatory policies or matters that significantly or uniquely affect their communities.''

Today's rule does not significantly or uniquely affect the communities of Indian tribal governments. The rule does not impose any enforceable duties on communities of Indian tribal governments. Accordingly, the requirements of section 3(b) of Executive Order 13084 do not apply to this rule.

H. The National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (''NTTAA''), Public Law 104–113, § 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards. This rulemaking does not involve technical standards. Therefore, EPA did not consider the use of any voluntary consensus standards.

I. Executive Order 13211 (Energy Effects)

This rule is not a ''significant energy action'' as defined in Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355 (May 22, 2001)) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. Further, we have concluded that this rule is not likely to have any adverse energy effects.

X. Congressional Review

A. Submission to Congress and the Comptroller General

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This rule is not a ''major rule'' as defined by 5 U.S.C. 804(2). This rule will be effective July 19, 2001.

List of Subjects in 40 CFR Part 82

Environmental protection, Administrative practice and procedure, Air pollution control, Chemicals, Exports, Imports, Methyl Bromide, Quarantine, Preshipment, Ozone layer.

Dated: July 11, 2001.

Christine Todd Whitman,

Administrator.

For reasons set out in the preamble, title 40 chapter I of the Code of Federal Regulations is amended as follows:

PART 82—PROTECTION OF STRATOSPHERIC OZONE

1. The authority citation for subpart 82 continues to read as follows:

Authority: 42 U.S.C. 7414, 7601, 7671–7671q.

Subpart A—Production and Consumption Controls

2. Section 82.3 is amended by adding new definitions in alphabetical order for the terms, ''Applicator'', ''Commodity owner, shipper or their agent'', ''Distributor of methyl bromide'', ''Preshipment applications'', and ''Quarantine applications''.

§ 82.3 Definitions.

As used in this subpart, the term:

Applicator means the person who applies methyl bromide.

* * * * *

Commodity owner, shipper or their agent means the person requesting that an applicator use methyl bromide for quarantine or preshipment applications.

* * * * *

Distributor of methyl bromide means the person directly selling a class I, Group VI controlled substance to an applicator.

* * * * *

Preshipment applications, with respect to class I, Group VI controlled substances, are those non-quarantine applications applied within 21 days prior to export to meet the official requirements of the importing country or existing official requirements of the exporting country. Official requirements are those which are performed by, or authorized by, a national plant, animal, environmental, health or stored product authority.

* * * * *

Quarantine applications, with respect to class I, Group VI controlled substances, are treatments to prevent the introduction, establishment and/or spread of quarantine pests (including diseases), or to ensure their official control, where:

(1) Official control is that performed by, or authorized by, a national plant, animal or environmental protection or health authority;

(2) Quarantine pests are pests of potential importance to the areas endangered thereby and not yet present there, or present but not widely distributed and being officially controlled.

* * * * *

3. Section 82.4 is amended by redesignating paragraph (a) as (a)(1) and republishing the text, adding paragraph (a)(2), redesignating paragraph (c) as (c)(1) and republishing the text, adding paragraph (c)(2), redesignating paragraph (k) as (k)(1) and republishing the text, and adding paragraph (k)(2) as follows:

§ 82.4 Prohibitions.

(a)(1) Prior to January 1, 1996, for all Groups of class I controlled substances, and prior to January 1, 2005, for class I, Group VI controlled substances, no person may produce, at any time in any control period, (except that are transformed or destroyed domestically or by a person of another Party) in excess of the amount of unexpended production allowances or unexpended Article 5 allowances for that substance held by that person under the authority of this subpart at that time for that control period. Every kilogram of excess production constitutes a separate violation of this subpart.

(2) From January 1, 2001 through December 31, 2002, production of class I, Group VI controlled substances is not subject to the prohibitions in paragraph (a)(1) of this section if it is solely for quarantine or preshipment applications as defined in this Subpart.

* * * * *

(c)(1) Prior to January 1, 1996, for all Groups of class I controlled substances, and prior to January 1, 2005, for class I, Group VI controlled substances, no person may produce or (except for transhipments, heels or used controlled substances) import, at any time in any control period, (except for controlled substances that are transformed or destroyed) in excess of the amount of unexpended consumption allowances held by that person under the authority of this subpart at that time for that control period. Every kilogram of excess production or importation (other than transhipments, heels or used controlled substances) constitutes a separate violation of this subpart.

(2) From January 1, 2001 through December 31, 2002, production and import of class I, Group VI controlled substances is not subject to the prohibitions in paragraph (c)(1) of this section if it is solely for quarantine or preshipment applications as defined in this Subpart.

* * * * *

(k)(1) Prior to January 1, 1996, for all Groups of class I controlled substances, and prior to January 1, 2005, for class I, Group VI controlled substances, a person may not use production allowances to produce a quantity of a class I controlled substance unless that person holds under the authority of this subpart at the same time consumption allowances sufficient to cover that quantity of class I controlled substances nor may a person use consumption allowances to produce a quantity of class I controlled substances unless the person holds under authority of this subpart at the same time production allowances sufficient to cover that quantity of class I controlled substances. However, prior to January 1, 1996, for all class I controlled substances, and prior to January 1, 2005, for class I, Group VI controlled substances, only consumption allowances are required to import, with the exception of transhipments, heels, used controlled substances. Effective January 1, 1996, for all Groups of class I controlled substances, except Group VI, only essential-use allowances or exemptions are required to import class I controlled substances, with the exception of transhipments, heels and used controlled substances.

(2) Notwithstanding paragraph (k)(1) of this section, from January 1, 2001 through December 31, 2002, for class I, Group VI controlled substances, consumption allowances are not required to import quantities solely for quarantine or preshipment applications as defined in this Subpart.

* * * * *

4. Section 82.13 is amended by:

a. Adding paragraphs (f)(2)(xvii) through (f)(2)(xix), and (f)(3)(xiii) through (f)(3)(xv),

b. Adding paragraphs (g)(1)(xvii) through (g)(1)(xix), and (g)(4)(xv) through (g)(4)(xvii),

c. Revising paragraph (h),

(d). Adding paragraphs (aa), (bb), and (cc).

The revisions and additions read as follows:

§ 82.13 Recordkeeping and reporting requirements.

* * * * *

(f) * * *

(2) * * *

(xvii) For class I, Group VI controlled substances, dated records of the quantity of controlled substances produced for quarantine and preshipment applications and quantity sold for quarantine and preshipment applications;

(xviii) Written certifications that quantities of class I, Group VI controlled substances produced solely for quarantine and preshipment applications were purchased by distributors or applicators to be used only for quarantine and preshipment applications in accordance with the definitions in this Subpart; and

(xix) Written verifications from a U.S. purchaser that class I, Group VI controlled substances produced solely for quarantine and preshipment applications, if exported, will be exported solely for quarantine and preshipment applications upon receipt of a certification in accordance with the definitions of this Subpart and requirements in paragraph (h) of this section.

(3) * * *

(xiii) The amount of class I, Group VI controlled substances sold or transferred during the quarter to a person other than the producer solely for quarantine and preshipment applications;

(xiv) A list of the quantities of class I, Group VI controlled substance produced by the producer and exported by the producer and/or by other U.S. companies, to a Party to the Protocol that will be used solely for quarantine and preshipment applications and therefore were not produced expending production or consumption allowances; and

(xv) For quarantine and preshipment applications of class I, Group VI controlled substances in the United States or by a person of another Party, one copy of a certification that the material will be used only for quarantine and preshipment applications in accordance with the definitions in this Subpart from each recipient of the material and a list of additional quantities shipped to that same person for the quarter.

* * * * *

(g) * * *

(1) * * *

(xvii) For class I, Group VI controlled substances, dated records of the quantity of controlled substances imported for quarantine and preshipment applications and quantity sold for quarantine and preshipment applications;

(xviii) Written certifications that quantities of class I, Group VI controlled substances imported solely for quarantine and preshipment applications were purchased by distributors or applicators to be used only for quarantine and preshipment applications in accordance with the definitions in this Subpart; and

(xix) Written verifications from a U.S. purchaser that class I, Group VI controlled substances imported solely for quarantine and preshipment applications, if exported, will be exported solely for quarantine and preshipment applications upon receipt of a certification in accordance with the definitions of this Subpart and requirements in paragraph (h) of this section.

* * * * *

(4) * * *

(xv) The amount of class I, Group VI controlled substance sold or transferred during the quarter to a person other than the importer solely for quarantine and preshipment applications;

(xvi) A list of the quantities of class I, Group VI controlled substance exported by the importer and or by other U.S. companies, to a Party to the Protocol that will be used solely for quarantine and preshipment applications and therefore were not imported expending consumption allowances; and

(xvii) For quarantine and preshipment applications of class I, Group VI controlled substances in the United States or by a person of another Party, one copy of a certification that the material will be used only for quarantine and preshipment applications in accordance with the definitions in this Subpart from each recipient of the material and a list of additional quantities shipped to that same person for the quarter.

(h) *Reporting Requirements—Exporters.*

(1) For any exports of class I controlled substances (except Group VI) not reported under § 82.10 of this subpart (additional consumption allowances), or under paragraph (f)(3) of this section (reporting for producers of controlled substances), the exporter who exported a class I controlled substance (except Group VI) must submit to the Administrator the following information within 45 days after the end of the control period in which the unreported exports left the United States:

(i) The names and addresses of the exporter and the recipient of the exports;

(ii) The exporter's Employee Identification Number;

(iii) The type and quantity of each controlled substance exported and what percentage, if any, of the controlled substance is used, recycled or reclaimed;

(iv) The date on which, and the port from which, the controlled substances were exported from the United States or its territories;

(v) The country to which the controlled substances were exported;

(vi) The amount exported to each Article 5 country;

(vii) The commodity code of the controlled substance shipped; and

(viii) The invoice or sales agreement containing language similar to the Internal Revenue Service Certificate that the purchaser or recipient of imported controlled substances intends to transform those substances, or destruction verifications (as in paragraph(k) of this section) showing that the purchaser or recipient intends to destroy the controlled substances.

(2) For any exports of class I, Group VI controlled substances not reported under § 82.10 of this subpart (additional consumption allowances), or under paragraph (f)(3) of this section (reporting for producers of controlled substances), the exporter who exported a class I, Group VI controlled substance must submit to the Administrator the following information within 45 days after the end of each quarter in which the unreported exports left the United States:

(i) The names and addresses of the exporter and the recipient of the exports;

(ii) The exporter's Employee Identification Number;

(iii) The type and quantity of each controlled substance exported and what percentage, if any, of the controlled substance is used, recycled or reclaimed;

(iv) The date on which, and the port from which, the controlled substances were exported from the United States or its territories;

(v) The country to which the controlled substances were exported;

(vi) The amount exported to each Article 5 country;

(vii) The commodity code of the controlled substance shipped; and

(viii) The invoice or sales agreement containing language similar to the Internal Revenue Service Certificate that the purchaser or recipient of imported controlled substances intends to transform those substances, the destruction verifications (as in paragraph (k) of this section) showing that the purchaser or recipient intends to destroy the controlled substances, or the certification that the purchaser or recipient and the eventual applicator will only use the material for quarantine and preshipment applications in accordance with the definitions in this Subpart.

* * * * *

(aa) Every distributor of methyl bromide (class I, Group VI controlled substances) who purchases or receives a quantity produced or imported solely for quarantine or preshipment applications under the exemptions in this Subpart must comply with recordkeeping and reporting requirements specified in this paragraph (aa) of this section.

(1) Every distributor of methyl bromide must certify to the producer or importer that quantities received that were produced or imported solely for quarantine and preshipment applications under the exemptions in this Subpart will be used only for quarantine applications or preshipment applications in accordance with the definitions in this Subpart.

(2) Every distributor of a quantity of methyl bromide that was produced or imported solely for quarantine or preshipment applications under the exemptions in this Subpart must receive from an applicator a certification of the quantity of class I, Group VI controlled substances ordered, prior to delivery of the quantity, stating that the quantity will be used solely for quarantine or preshipment applications in accordance with definitions in this Subpart.

(3) Every distributor of methyl bromide who receives a certification from an applicator that the quantity ordered and delivered will be used solely for quarantine and preshipment applications in accordance with definitions in this Subpart must maintain the certifications as records for 3 years.

(4) Every distributor of methyl bromide who receives a certification from an applicator that the quantity ordered and delivered will be used solely for quarantine and preshipment applications in accordance with definitions in this Subpart must report to the Administrator within 45 days after the end of the control period, the total quantity delivered for which certifications were received that stated the class I, Group VI controlled substance would be used solely for quarantine and preshipment applications in accordance with definitions in this Subpart.

(bb) Every applicator of class I, Group VI controlled substances who purchases or receives a quantity produced or imported solely for quarantine and preshipment applications under the exemptions in this Subpart must comply with recordkeeping and reporting requirements specified in this paragraph (bb) of this section.

(1) Recordkeeping—Applicators. Every applicator of class I, Group VI controlled substances produced or imported solely for quarantine and preshipment applications under the exemptions of this Subpart must maintain, for every application, a document from the commodity owner, shipper or their agent requesting the use of class I, Group VI controlled substances citing the regulatory requirement that justifies its use in accordance with definitions in this Subpart. These documents shall be retained for 3 years.

(2) Reporting—Applicators. Every applicator of class I, Group VI controlled substances who purchases or receives a quantity of class I, Group VI controlled substance that was produced or imported solely for quarantine and preshipment applications under the exemptions in this Subpart shall provide the distributor of the methyl bromide, prior to shipment of the class I, Group VI controlled substance, with a certification that the quantity of controlled substances will be used only for quarantine and preshipment applications as defined in this Subpart.

(cc) Every commodity owner, shipper or their agent requesting an applicator to use a quantity of class I, Group VI controlled substance that was produced or imported solely for quarantine and preshipment applications under the exemptions of this Subpart must maintain a record for 3 years, for each request, certifying knowledge of the requirements associated with the exemption for quarantine and preshipment applications in this Subpart and citing the regulatory requirement that justifies the use of the class I, Group VI controlled substance in accordance with definitions in this Subpart.

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Federal Register

Thursday,

January 2, 2003

Part VI

Environmental Protection Agency

40 CFR Part 82

Protection of Stratospheric Ozone: Process for Exempting Quarantine and Preshipment Applications of Methyl Bromide; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 82

[FRL–7434–1]

Protection of Stratospheric Ozone: Process for Exempting Quarantine and Preshipment Applications of Methyl Bromide

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: With this rulemaking, EPA is taking final action to amend the accelerated phaseout regulations that govern the production, import, export, transformation and destruction of substances that deplete the ozone layer under the authority of Title VI of the Clean Air Act Amendments of 1990 (CAA or the Act). Today's amendments incorporate an exemption permitted under the Montreal Protocol on Substances that Deplete the Ozone Layer (Protocol) and required by changes in Title VI of the CAA. Specifically, EPA is creating an exemption from the consumption and production phaseout for quantities of Class I, Group VI controlled substances (methyl bromide) that are used for quarantine and preshipment.

DATES: This rule is effective January 1, 2003.

ADDRESSES: Materials relevant to this rulemaking are contained in Docket No. A–2000–24. The Docket is located at EPA West, 1301 Constitution Avenue NW., Room B108, Mail Code 6102T, Washington, DC 20460, Phone: (202)–566–1742, Fax: (202)–566–1741. The materials may be inspected from 8:30 a.m. until 4:30 p.m. Monday through Friday. A reasonable fee may be charged by EPA for copying docket materials.

FOR FURTHER INFORMATION CONTACT: Kate Choban, U.S. Environmental Protection Agency, Global Programs Division (6205J), 1200 Pennsylvania Ave., NW., Washington, DC, 20460, 202–564–3524.

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Entities potentially regulated by this action are those associated with methyl bromide that is used for quarantine and preshipment applications. In addition, this action potentially regulates entities importing and exporting methyl bromide. Potentially regulated categories and entities include:

Category	Examples of regulated entities
Industry	Producers, Importers and Exporters of methyl bromide. Distributors of methyl bromide used for quarantine and preshipment. Applicators of methyl bromide used for quarantine and preshipment. Commodity Owners or Shippers of Goods that request the quarantine or preshipment application of methyl bromide in accordance with official controls or requirements.

The above table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your facility, company, business, organization, etc. is regulated by this action, you should carefully examine the regulations promulgated at 40 CFR part 82, subpart A. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION 000000CONTACT** section.

I. What Is the Background of the Phaseout Regulations for Ozone-Depleting Substances?

The current regulatory requirements of the Stratospheric Ozone Protection Program that limit production and consumption of ozone-depleting substances were promulgated by the Environmental Protection Agency (EPA or the Agency) in the **Federal Register** on December 20, 1994 (59 FR 65478), May 10, 1995 (60 FR 24970), August 4, 1998 (63 FR 41625), and October 5, 1998 (63 FR 53290). The regulatory program was originally published in the **Federal Register** on August 12, 1988 (53 FR 30566), in response to the 1987 signing of the Montreal Protocol on Substances that Deplete the Ozone Layer (Protocol).[1] The U.S. was one of the original signatories to the 1987 Montreal Protocol and the U.S. ratified the Protocol on April 21, 1988. Congress then enacted, and President Bush signed into law, the Clean Air Act Amendments of 1990 (CAA or the Act) that included Title VI on Stratospheric Ozone Protection.

Today's action amends the existing EPA regulations published under Title VI of the CAA that govern the production and consumption of ozone-depleting substances. Today's action establishes an exemption from the methyl bromide production and import reduction and phaseout schedule for quantities to be used for quarantine and preshipment applications. Today's amendments are intended to implement requirements of the Protocol and the CAA, including amendments to Title VI as created by Section 764 of the 1999 Omnibus Consolidated and Emergency

[1] Several revisions to the original 1988 rule were issued on the following February 9, 1989 (54 FR 6376), April 3, 1989 (54 FR 13502), July 5, 1989 (54 FR 28062), July 12, 1989 (54 FR 29337), February 13, 1990 (55 FR 5005), June 15, 1990 (55 FR 24490) and June 22, 1990 (55 FR 25812) July 30, 1992 (57 FR 33754), December 10, 1993 (58 FR 65018).

Supplemental Appropriations Act (Public Law 105–277, October 21, 1998) (section 604(d)(5) of the Clean Air Act).

The requirements contained in the final rules published in the **Federal Register** on December 20, 1994 and May 10, 1995 establish an Allowance Program. The Allowance Program and its history are described in the notice of proposed rulemaking (NPRM) published in the **Federal Register** on November 10, 1994 (59 FR 56276). The control and the phaseout of production and consumption of ozone-depleting substances, as required under the Protocol and CAA, are accomplished through the Allowance Program.

In developing the Allowance Program, EPA collected information on the amounts of ozone-depleting substances produced, imported, exported, transformed and destroyed within the United States for specific baseline years for specific chemicals. This information was used to establish the U.S. production and consumption ceilings for these chemicals. The data were also used to assign company-specific production and import rights to companies that were in most cases producing or importing during the specific year of data collection. For methyl bromide, 1991 was the baseline year used to establish the ceiling and assign company-specific production and import rights. Production or import rights are called ''allowances.'' Production allowances and consumption allowances continue to exist for only one specific class I controlled ozone-depleting substance—methyl bromide. All other production or consumption of class I controlled substances is prohibited under the Protocol and the CAA, save for a few exemptions. For methyl bromide, the remaining schedule for the phaseout of production and consumption allowances is as follows: 50 percent reduction of baseline beginning January 29, 2001, 70 percent reduction of baseline beginning January 1, 2003, and a 100 percent reduction of baseline beginning January 1, 2005, with narrow exemptions for critical uses and emergencies, as well as for quarantine and preshipment uses.

In the context of the regulatory program, the use of the term consumption may be misleading. Consumption does not mean the ''use'' of a controlled substance, but rather is defined as the formula: consumption = production + imports—exports, of controlled substances (Article 1 of the Protocol and section 601 of the CAA). Class I controlled substances that were produced or imported through the expenditure of allowances prior to their phaseout date can continue to be used by industry and the public after that specific chemical's phaseout under these regulations, unless otherwise precluded under separate regulations.

The specific names and chemical formulas for the controlled ozone-depleting substances in Groups of class I controlled substances are in appendix A and appendix F in subpart A of 40 CFR part 82. The specific names and chemical formulas for the class II controlled ozone-depleting substances are in appendix B and appendix F in subpart A.

II. What Is the Background for Today's Action?

EPA published an interim final rule in the **Federal Register** on July 19, 2001 (66 FR 37752) to provide methyl bromide users in the United States with an exemption to the phaseout of methyl bromide for quarantine and preshipment applications. The interim final rule solicited public comment on a number of issues related to EPA's implementation of the Quarantine and Preshipment Exemption. Today's action responds to public comment and finalizes the specifications for the exemption.

III. What Is Methyl Bromide?

Methyl bromide is an odorless, colorless, toxic gas, which is used as a broad-spectrum pesticide. Methyl bromide is used in the United States and throughout the world as a fumigant to control a variety of pests, such as insects, weeds, rodents, pathogens, and nematodes. Additional characteristics and details about the uses of methyl bromide can be found in the proposed rule published in the **Federal Register** on March 18, 1993 (58 FR 15014) and the final rule published in the **Federal Register** on December 10, 1993 (58 FR 65018). Information on methyl bromide can be found at the following sites of the World Wide Web: *http://www.epa.gov/ozone/mbr/* and *http://www.teap.org* or by contacting the Stratospheric Ozone Protection Hotline at 1–800–296–1996.

IV. What Are Examples of Quarantine and Preshipment Uses of Methyl Bromide?

An example of a quarantine application of methyl bromide is the fumigation of a commodity, such as rice and spices, which are subject to infestation by a specific and officially recognized quarantine pest, such as the khapra beetle (Trogoderma granarium Everts) when the fumigation is conducted before transport of the commodity to meet official quarantine requirements (see discussion in part VI below). The purpose of quarantine fumigation is to prevent the introduction of specific quarantine pest(s) into a defined geographical area, such as an importing country. An example of a preshipment use of methyl bromide is the application to wheat immediately before shipment (see discussion in part VI below) because of official phytosanitary requirements of the destination country.

In 1998, the Methyl Bromide Technical Options Committee (MBTOC), a sub-group under the independent advisory body of the Technical and Economic Assessment Panel (TEAP) to the Montreal Protocol, published an assessment that gives further details about uses of methyl bromide and possible alternatives and substitutes for controlling pests. The MBTOC and TEAP assessments can be found on the web at *http://www.teap.org/html/methyl_bromide_reports.html* and *http://www.teap.org/*.

V. What Is the Legal Authority for Exempting the Production and Import of Methyl Bromide for Use in Quarantine and Preshipment Applications?

In Article 2H of the Montreal Protocol, which establishes the phaseout schedule for methyl bromide for developed countries, paragraph 6 states that, ''[t]he calculated levels of consumption and production under this Article shall not include the amounts used by the Party for quarantine and pre-shipment applications.'' EPA notes that paragraph 6, of Article 2H indicates that the exemption is to exclude from the U.S.'s calculation of methyl bromide consumption and production the amounts used by the U.S. for quarantine and preshipment applications. In addition, Article 7 requires each Party to report on, ''the annual amount used for quarantine and preshipment applications.'' Beyond the critical uses allowed in Article 2H, Paragraph 5, quarantine and preshipment uses are the only exemptions explicitly allowed for under the Montreal Protocol.

In 1998 Congress added several provisions to the Clean Air Act regarding methyl bromide including a provision title ''Sanitation and Food Protection,'' which is related to the Protocol exemption for quarantine and preshipment. This provision, which was codified as section 604(d)(5) of the CAA, was added by section 764(b) of the 1999 Omnibus Consolidated and Emergency Supplemental Appropriations Act (Public Law 105–277). Section 604(d)(5) says, ''To the extent consistent with the Montreal Protocol's quarantine and preshipment provisions, the Administrator shall exempt the production, importation, and consumption of methyl bromide to fumigate commodities entering or leaving the United States or any State (or political subdivision thereof) for purposes of compliance with Animal and Plant Health Inspection Service requirements or with any international, Federal, State or local sanitation or food protection standard.'' Prior to Congressional passage of section 604(d)(5), the CAA did not provide authority for creating such an exemption to the methyl bromide phaseout schedule. In today's final regulation, EPA is implementing the express language provided in Article 2H, paragraph 6, of the Protocol under the authority provided by section 604(d)(5) of the CAA. EPA is also acting in a manner consistent with, and to fulfill the obligations of, section 614(b) of the CAA. Section 614(b) of the CAA states that, ''[t]his title as added by the Clean Air Act Amendments of 1990 shall be construed, interpreted, and applied as a supplement to the terms and conditions of the Montreal protocol, as provided in Article 2, paragraph 11 thereof, and shall not be construed, interpreted, or applied to abrogate the responsibilities or obligations of the United States to implement fully the provisions of the Montreal Protocol. In the case of a conflict between any provision of this title and any provision of the Montreal Protocol, the more stringent provision shall govern.''

EPA's interim final rule related to the process for exempting quarantine and preshipment applications of methyl bromide, published in the **Federal Register** on July 19, 2001 (66 FR 37752), defined quarantine and preshipment applications as agreed by the Parties to the Montreal Protocol in Decisions VII/5 and XI/12, respectively. EPA received ten comments regarding our decision to adhere to the language of the Parties' Decisions. All commenters stated that Decisions of the Parties do not have the same force of law as the Protocol itself, its amendments, or adjustments adopted by the Parties and, as such, EPA is not bound to their language. The comments submitted to EPA in response to the interim final rule echo a legal memorandum submitted to EPA by the legal counsel of the Methyl Bromide Industry Panel at a July 1999 meeting. A more detailed discussion of the arguments made in this memorandum can be found in the interim final rule published in the **Federal Register** on July 19, 2001 (66 FR 37752).

EPA responded directly to the legal memorandum submitted by the Methyl Bromide Industry Panel in the interim final rule. EPA has reconsidered the issue as it was raised by the comments submitted in response to the interim final rule and has concluded that its approach reflects widely accepted principles of customary international law. The provisions of the Vienna Convention on the Law of Treaties (VCLT), 8 International Legal Materials 679 (1969), that concern treaty interpretation generally reflect customary international law. Paragraph 1 of Article 31 of the VCLT provides that a treaty ''shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose.'' Paragraph 3 of Article 31 of the VCLT states, ''[t]here shall be taken into account, together with any context: * * * (a) any subsequent agreement between the parties regarding the interpretation of the treaty or the application of its provisions.'' Decisions VI/11, VII/5, XI/12 and XI/13 constitute subsequent consensus agreements among the Parties to the Montreal Protocol (including the United States) regarding the interpretation and application of the quarantine and preshipment provision of Article 2H. Therefore it is appropriate for EPA, when determining what is consistent with the ''Montreal Protocol's quarantine and preshipment provisions,'' to take into account the Decisions of the Parties.

Furthermore, in amending the CAA, Congress specifically cited the plural ''quarantine and preshipment provisions.'' If Congress intended for this phrase to be limited to the single provision in the Protocol referencing quarantine and preshipment in Article 2H, and not the subsequent Decisions between the Parties regarding interpretation or application of the treaty, Congress would have presumably directed the Agency to be consistent with the singular provision.

Precedents within the current regulations (40 CFR part 82) demonstrate that the United States has routinely considered Decisions that clarify and interpret obligations under the Montreal Protocol to be authoritative and that such Decisions of the Parties are currently implemented through regulations under the CAA. Examples of such regulatory implementation of Decisions of the Parties include the current U.S. definitions of ''controlled substance'' (based on Decision IV/12) and ''essential use''. Additional examples of how U.S. regulations incorporate Decisions by the Parties to the Protocol can be found in the preamble of the interim final rule published in the **Federal Register** on July 19, 2001 (66 FR 37752) and in 40 CFR part 82, subpart A.

VI. What Are the Definitions of Quarantine and Preshipment Applications?

In today's final action, EPA is defining quarantine applications and preshipment applications, as agreed by the Parties to the Montreal Protocol. The Parties to the Protocol agreed to the following definition of ''quarantine applications'' in Decision VII/5: ''quarantine applications, with respect to methyl bromide, are treatments to prevent the introduction, establishment and/or spread of quarantine pests (including diseases), or to ensure their official control, where: (i) Official control is that performed by, or authorized by, a national plant, animal, or environmental protection or health authority; (ii) quarantine pests are pests of potential importance to the areas endangered thereby and not yet present there, or present by not widely distributed and being officially controlled.''

The Parties to the Protocol first agreed to the following definition for preshipment applications of methyl bromide in Decision VI/11 and VII/5: ''preshipment applications are those treatments applied directly preceding and in relation to export, to meet the phytosanitary or sanitary requirements of the importing country or existing phytosanitary or sanitary requirements of the exporting country.'' At the 11th Meeting of the Parties in December 1999, the Parties further clarified the intent of the term preshipment by agreeing to the following definition in Decision XI/12: ''* * * preshipment applications are those non-quarantine applications within 21 days prior to export to meet the official requirements of the importing country or the existing official requirements of the exporting country. Official requirements are those which are performed by, or authorized by, a national plant, animal, environmental, health or stored product authority.''

EPA adopted the above definition of preshipment applications in the interim final rule and received nine related comments. All of the commenters raised the concern that the 21-day limitation on treatments to qualify as a preshipment application is unduly restrictive and arbitrary. One commenter stated that the time restriction is unrelated to the purpose of the preshipment exemption and that so long as a treatment is done to meet the official non-quarantine requirements of the importing or exporting country it ought to qualify as a preshipment application.

EPA believes that the incorporation of a time restriction within the definition of preshipment application is necessary to meet the purpose of this exemption as intended by the Parties to the Montreal Protocol. The preshipment exemption applies to treatments of commodities near the time of export to meet the official non-quarantine requirements of the exporting or importing country. Eliminating the time requirement would invite misuse of the exemption. With no established time window, the argument could be made that a pre-plant soil application of methyl bromide qualifies as a preshipment application because the crop being cultivated would eventually be exported from U.S. soil. By imposing a time restriction, Decision XI/12 of the Parties demonstrates that their intent was not to imbue the preshipment exemption with a lifecycle-wide scope. The 21-day restriction was agreed upon by the Parties (based on the advice of global experts) as a reasonable time limitation for the preshipment exemption. EPA has received no comment indicating that another time limitation would be better justified and meet the intent of the Parties in implementing the preshipment exemption.

In addition to the above, the definition of quarantine applications is qualified by the scope of the exemption as stated in the CAA. As passed by Congress, the CAA specifically applies the quarantine and preshipment exemption to quantities of methyl bromide used to ''fumigate commodities entering or leaving the United States or any State (or political subdivision thereof)* * *''(CAA section 504(d)(5)). This language makes clear Congress's intent to apply the exemption only where there is the transport of goods from one distinct locality to another, and thus to prevent the potential for the geographic spread of pests. As a result, today's action adds the following sentence to the definition of quarantine applications: ''This definition excludes treatments of commodities not entering or leaving the United States or any State (or political subdivision thereof).'' Section III.D. further discusses the uses of methyl bromide that are excluded from today's exemption for quarantine applications.

With today's final action, EPA is defining quarantine applications and preshipment applications as follows:

Quarantine applications, with respect to class I, Group VI controlled substances, are treatments to prevent the introduction, establishment and/or spread of quarantine pests (including diseases), or to ensure their official control, where: (i) Official control is that performed by, or authorized by, a national (including state, tribal or local) plant, animal or environmental protection or health authority; (ii) quarantine pests are pests of potential importance to the areas endangered thereby and not yet present there, or present but not widely distributed and being officially controlled. This definition excludes treatments of commodities not entering or leaving the United States or any State (or political subdivision thereof).

Preshipment applications, with respect to class I, Group VI controlled substances, are those non-quarantine applications within 21 days prior to export to meet the official requirements of the importing country or existing official requirements of the exporting country. Official requirements are those which are performed by, or authorized by, a national plant, animal, environmental, health or stored product authority.

As specified in the above definitions, a quarantine application of methyl bromide must be ''performed by, or authorized by, a national (including state, tribal or local) plant, animal or environmental protection, or health authority.'' In addition, as delineated in the above definition, quarantine applications must be directed at quarantine pests. Today's definition of preshipment applications is limited to applications ''to meet the official requirements of the importing country or existing official requirements of the exporting country.'' The definition of preshipment applications specifies that the phrase ''official requirements'' means ''those which are preformed by, or authorized by, a national plant, animal, environmental, health or stored product authority.''

A. Are There Clarifications Regarding Trade Within the U.S.?

The interim final rule interpreted ''quarantine applications'' as including interstate and inter-county treatments required to control quarantine pests. This interpretation is consistent with the Technical and Economic Assessment Panel's (TEAP) recommendation that the Parties of the Protocol interpret Decision VII/5 to include officially required treatments for intra-country trade within the territory of the Party and reconciles the language of the Montreal Protocol with section 604(d)(5) of the CAA on Sanitation and Food Protection, which refers to international, Federal, state and local requirements.

In recognizing official state, county, tribal, and local quarantine requirements, EPA's final rulemaking interprets the definition of quarantine applications such that an intra-country quarantine treatment required by state, county, tribal, or local plant, animal, environmental, or health government authorities constitutes an official control. Today's action adds parenthetically that ''national'' is meant to include state, tribal or local authorities for purposes of the definition of quarantine applications.

In contrast to the definition of quarantine applications, which accommodates intra-country trade, the Protocol definition of preshipment applications is specific to trade between countries because of the phrase ''applications within 21 days prior to export.'' This distinction was noted in the interim final rule and EPA received no comment. Therefore, for the purposes of today's final action, the exemption for preshipment applications remains limited to the movement of goods from the U.S. to another country, and does not include movement of goods within the U.S.

B. Are There Additional Qualifiers Associated With the Definition of Preshipment Applications?

The interim final rule noted, in agreement with the 1998 TEAP interim explanatory notes for the Parties, the focus within the definition of ''preshipment applications'' on applications to meet ''official requirements'' and not ''informal or purely contractual or commercial arrangements not required under official regulations'' (April 1998 TEAP Report, page 145). EPA is continuing to stress the importance of this limitation in the scope of the preshipment exemption. The definition of preshipment applications specifies that the phrase ''official requirements'' means, ''those which are performed by, or authorized by, a national plant, animal, environmental, health, or stored product authority.''

The interim final rule's definition of preshipment applications further qualifies the term ''official requirements'' as it relates to exporting countries to include only ''existing official requirements''. EPA interpreted this phrase to imply the need to establish a cutoff date. EPA asked for comment on four possible interpretations for the term ''existing official requirements of the exporting country''. The options listed were to exempt applications pursuant to official preshipment requirements of the exporting country that were: (1) In effect prior to the date the Parties to the Protocol adopted Decision XI/12, which was December 3, 1999, (2) in effect at the time the interim final rule was published in the **Federal Register**, which was July 19, 2001, (3) in place at the time this final rule on the quarantine and preshipment exemption is published in the **Federal Register**, or (4) existing at the time of the methyl bromide application (since it would be an ''existing'' requirement of the exporting country upon going into effect).

EPA received eight comments related to the interpretation of ''existing official requirements.'' All commenters supported the fourth option, which is to exempt applications pursuant to official preshipment requirements of the exporting country that exist at the time of the methyl bromide application. Commenters noted that this interpretation recognizes the possibility of future outbreaks of new pests requiring official action. EPA notes the value to such flexibility within the rule and believes that this interpretation is consistent with the intended purpose of the exemption.

It should be noted that the qualifier ''existing'', as used within the preshipment application definition, applies only to the official requirement of the exporting country (the U.S.) and not to the preshipment requirements of importing countries. Thus, if an importing country were to establish a new official requirement for the preshipment application of methyl bromide, nothing in this rule would prevent a U.S. exporter from using methyl bromide to meet the new requirement of the importing country.

C. Are There Additional Qualifiers Associated With the Definition of Quarantine Applications?

With today's final action EPA is establishing the following parameters for the quarantine exemption. For commodities imported to, exported from, and transported within the U.S., the exemption for quarantine applications will apply when: (1) Methyl bromide is identified within quarantine regulations as the unique treatment option for specific quarantine pests; (2) methyl bromide is identified within quarantine regulations as one among a list of treatment options for specific quarantine pests; and (3) methyl bromide is required for an emergency quarantine application. Under section 3, section 18, and section 24a of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), EPA is notified of emergency quarantine applications of methyl bromide in accordance with specific requirements published under FIFRA. In addition to the above, for commodities being exported from the U.S. to a foreign nation, the exemption applies to quarantine applications when there is a broad performance-based quarantine requirement. In other words, the exemption applies when an importing country has quarantine regulations which broadly require U.S. exported commodities to be free of quarantine pests without specifying the types of treatments.

The above follows EPA's decision in the interim final rule. The Agency received 12 comments on the scope of the quarantine exemption. Every commenter said that the broadest possible option should be implemented by the Agency. EPA believes that the scope of the exemption described above is the broadest interpretation that it can reasonably adopt for each given type of commodity. For example, for imports, USDA/APHIS requirements are explicit regarding treatment options acceptable for the control of specific crop/pest combinations. EPA considered limiting the scope of the quarantine exemption to only those instances where APHIS lists methyl bromide as the only acceptable treatment option for a given pest. However, as many commenters noted, variations in climate, etc. can affect the level of efficacy of treatment options in different regions. Thus, EPA chose to adopt a broader definition of the quarantine exemption which applies to quantities of methyl bromide used to meet quarantine requirements where fumigation with methyl bromide is the listed, or one of the listed, treatment options.

While EPA believes that such an interpretation is sufficiently broad for the purposes of imported and domestically traded commodities given the applicable U.S. regulations, the Agency recognizes that some foreign countries lack such specificity within their quarantine regulations for imported commodities. EPA chose to create even greater flexibility within the quarantine exemption in order to accommodate the broad, performance-based quarantine requirements of these foreign trade partners.

D. How Does the Exemption for Quarantine Applications Apply to Commodities Issued ''Phytosanitary Certificates''?

Today's final action exempts methyl bromide in situations when a foreign country's regulations require a certification that U.S. commodities be exported free of quarantine pests. EPA understands that both USDA/APHIS and State agencies issue ''phytosanitary certificates'' that accompany U.S. commodities exported to foreign countries. These phytosanitary certificates are often required by importing foreign countries to ensure that U.S. exports are free of quarantine pests. To the extent that methyl bromide is used by a U.S. exporter to meet a foreign quarantine requirement, the phytosanitary certificates (PPQ Form 577, PPQ Form 578, and PPQ Form 579) issued by USDA/APHIS or an authorized State agency will be an additional means for EPA to cross-check quarantine applications of methyl bromide under today's exemption.

As was noted in the interim final rule, and for this final action, EPA is not exempting methyl bromide used for non-quarantine applications, even if the foreign country requires the U.S. exporter to obtain a phytosanitary certificate. Today's exemption applies to the use of methyl bromide to meet an official foreign quarantine requirement. If PPQ Forms or other types of certificates are issued for commodities meeting state or local quarantine requirements then methyl bromide used in these cases is considered exempt under today's action, provided that methyl bromide is one of the listed treatment options.

E. How Do the Definitions of Preshipment and Quarantine Applications Apply to Food Sanitation?

The language of the Clean Air Act related to the quarantine and preshipment exemption explicitly limits the exemption to quantities of methyl bromide used ''to fumigate commodities *entering or leaving* the United States or any State (or political division thereof) for purposes of compliance with Animal and Plant Health Inspection Service requirements * * *'' (emphasis added). By applying the quarantine and preshipment exemption only to quantities of methyl bromide used to fumigate commodities being transported from one geographical location to another, Congress imposed limitations on how the definitions of preshipment and quarantine applications apply to food sanitation.

As defined in today's action, preshipment applications are those non-quarantine applications within 21 days prior to export to meet the official requirements of the importing country or existing official requirements of the exporting country. Official requirements are those which are performed by, or authorized by, a national plant, animal, environmental, health or stored product authority. Methyl bromide used any time within 21 days prior to export of a commodity to meet ''official requirements'' related to food sanitation would qualify under the preshipment exemption. Any treatment performed outside of this 21 day window, by definition, does not qualify for the preshipment exemption.

The exemption of methyl bromide for quarantine applications, as defined by the interim final action, did not apply to preventative treatments to meet food sanitation standards. EPA received 4 comments about the interaction between food sanitation standards and the quarantine exemption. All commenters asserted that preventative treatments of commodities with methyl bromide to meet food sanitation requirements should qualify as ''quarantine applications'' because ''such standards are geared to preventing the dissemination of pests, although admittedly for human health and food sanitation purposes.''

EPA's final action is bound by the limitations imposed on the quarantine exemption by the definitions and determination of scope agreed upon by the Parties to the Montreal Protocol and adopted by Congress in the Clean Air Act. EPA understands that certain industries often use methyl bromide as a prophylactic treatment for periodic quality control fumigations associated with food sanitation. Stored commodities, such as dried fruits, nuts, and cocoa beans, as well as grain mills and pasta manufacturing facilities are often fumigated periodically with methyl bromide to prevent populations of pests, such as insects and rodents, from increasing to a point where they would adversely affect food quality. Such *in situ* population control measures do not qualify as quarantine applications since they are not performed on ''commodities entering or leaving the United States or any state (or political subdivision thereof) * * *''

Additionally, food sanitation requirements that are directed at controlling population levels of pests endemic to the region would not qualify under the definition of ''quarantine applications''. The quarantine definition, as established in today's final action, stresses that exempt applications of methyl bromide are ''to prevent the introduction, establishment and/or spread of quarantine pests (including diseases).'' Quarantine pests are defined as ''pests of potential importance to the areas endangered thereby and not yet present there, or present but not widely distributed and being officially controlled.'' Endemic pests are not quarantine pests.

The above limitations were noted in the interim final version of this rule. Likewise, the Agency noted in that publication its interest in comments related to prophylactic uses of methyl bromide to meet food sanitation standards in order to use this information in the Agency's development of the Critical Use Exemption to the phaseout of methyl bromide. Please see the discussion below (Section VIIIA) related to the Critical Use Exemption.

F. How Do These Definitions Apply to ''Propagative Material''?

The use of methyl bromide to fumigate the soil for growing propagative material, such as strawberry rhizomes, differs from many quarantine applications of methyl bromide. The Agency sought comment on the use of methyl bromide for propagative materials and received a variety of information on relevant quarantine regulations, planting and fumigating practices, and propagative materials (other than strawberry rhizomes) that use methyl bromide to meet quarantine requirements.

With today's final action, the exemption for quarantine applications applies to methyl bromide used for growing propagative material if the methyl bromide is being used to grow propagative material to meet official quarantine requirements of the destination to which the propagative material will be transported. Although the interim final rule only cited strawberry rhizomes in the discussion of the exemption for propagative material, with today's action EPA wishes to clarify that the exemption also covers other propagative material, including tree seedlings, when the methyl bromide is used to meet an official quarantine requirement of the destination to which the propagative material will be transported.

EPA notes the following qualifiers in the application of the quarantine exemption to methyl bromide used to grow propagative material (also referred to as ''plants for planting''). First, as noted above (see discussion in part VI.C.), the Clean Air Act language specifies that the scope of the quarantine exemption is limited to use of methyl bromide for fumigation of goods for transport from one distinct locality to another. Thus, the exemption for propagative materials only applies for use with ''plants for planting'' that are to be transported (complete with rootstock) from one distinct locality to another. Second, today's action only exempts the use of methyl bromide for pre-plant fumigation of soil to meet official quarantine requirements specifying that the underground portions of the propagative material are to be free from quarantine pests. The purpose of such regulations is ensuring that quarantine pests are not spread to the region where the regulated rootstock will be replanted. This exemption does not apply to pre-plant soil treatment for commodities transported without their attached rootstock, or commodities transported for any purpose other than for replant.

Finally, with this action, EPA is only exempting quantities of methyl bromide used to grow propagative material to meet official quarantine requirements of the destination to which such material will be transported. If the material is transported to a destination that has no applicable official quarantine requirements, then the methyl bromide used does not qualify for this exemption. This is true even in an instance where a farmer legitimately justified using exempted methyl bromide to meet a quarantine requirement for propagative materials, yet due to economic or market conditions the farmer does not send the seedlings to the planned destination, and instead sends the seedlings to a region without relevant quarantine requirements. EPA recognizes that many of the propagative materials for which this exemption applies are planted far in advance of their trade and transplant and that farmers face some difficulty in accurately predicting their commodities' ultimate destination. The Agency reminds methyl bromide users that non-exempted quantities will be available until the January 1, 2005 phaseout date and that the Critical Use Exemption will become available after the phaseout (see discussion in part VIII.A. below).

The use of exempted methyl bromide to grow propagative material that the grower planned to ship to a destination with a propagative material quarantine requirement, but which the grower ultimately shipped to a destination without such a requirement, may raise compliance issues for the United States under the Protocol. Such quantities of methyl bromide would count against the U.S. cap for domestic methyl bromide consumption. The U.S. could exceed its control obligations under the Protocol if all U.S. production and consumption allowances for methyl bromide were expended in a particular control period (calendar year) and some methyl bromide in the same control period was mistakenly exempted for quarantine applications when, in fact, the propagative material was sent to a place without quarantine requirements. With this action, EPA is implementing the following options for rectifying such discrepancies. The methyl bromide user found to be incorrectly using exempt quantities of methyl bromide for propagative uses as described above may choose either of the following options to rectify their actions. First, a methyl bromide user in the above situation may choose to buy an equivalent amount of production allowances for any ozone-depleting substance, on an ozone-depleting potential (ODP) weighted basis, and retire those allowances, thus rendering them unable to be expended for new production in accordance with subpart A of 40 CFR part 82. Alternatively, a person who uses exempted methyl bromide to meet a propagative material quarantine requirement, and who ultimately changes the material's destination to one without a quarantine requirement, can choose to destroy an amount of any ozone-depleting substance that is equivalent on an ODP-weighted basis to the amount of methyl bromide used. This approach differs from the first option, in that it requires the person to physically destroy an existing quantity of an ozone-depleting chemical rather than reduce the overall quantity produced in the future.

Those users of methyl bromide required to perform one of the compensatory measures described above to rectify a non-compliance situation must submit to EPA a letter of certification detailing the following information: (1) The quantity of exempt methyl bromide used on propagative materials that were shipped to a destination lacking a quarantine requirement; (2) the compensatory option chosen (see discussion above); (3) the ozone-depleting substance destroyed or the type of production allowance obtained; and (4) the quantity of ozone-depleting substance destroyed or production allowances retired. See the section above entitled **FOR FURTHER INFORMATION CONTACT** for submittal information.

Monitoring and compliance issues are a concern associated with the use of methyl bromide for pre-plant propagative material uses. EPA expressed a concern in the interim final rule about situations where propagative materials are grown in proximity to crops that do not qualify for quarantine and preshipment exemption. EPA believed that it would be difficult to ensure that exempted quantities of methyl bromide were being properly used. However, the Agency received input from 3 commenters that state that propagative material is rarely, if ever, grown in proximity to other crops, which alleviates the Agency's concern. The Agency will continue to monitor this possibility.

G. How Do These Definitions Apply to In-Transit Applications?

EPA understands that some users of methyl bromide may be testing and/or using ''on-ship'' fumigation of commodities while they are ''in-transit.'' With today's final action, EPA is interpreting the definition of quarantine application to apply to these quantities of methyl bromide used ''in-transit'' when the use is to meet an official U.S. quarantine requirement and is in accordance with other U.S. regulations for commodities being imported into the U.S., (see discussion in part VI.C. above for more information on what is considered an official quarantine requirement for an imported commodity) or for commodities moving from one location to another within the U.S. However, today's action does not exempt quantities of methyl bromide used outside of U.S. jurisdiction on U.S. exported commodities to meet the importing country's official quarantine requirements while the commodities are ''in-transit.'' Today's action, likewise, does not exempt quantities of methyl bromide used on U.S. exported commodities when they are being transshipped through a foreign country en route to the destination importing country. Finally, today's action does not exempt quantities of methyl bromide used to meet an importing country's requirements when a commodity is simply being transshipped through the U.S. from the exporting foreign country en route to the importing foreign country.

It should be noted that use of methyl bromide after a shipment leaves the Unites States is not an exempt preshipment application because the application did not occur ''within 21 days prior to export'' from the U.S., where the word ''export'' is interpreted to mean the departure of a commodity from the Unites States.

VII. What Is the Process for Exempting Methyl Bromide for Use in Quarantine and Preshipment Applications?

With this action, EPA is establishing a process to exempt methyl bromide used for quarantine and preshipment applications from the Allowance Program's control measures that phase out production and consumption of methyl bromide (described in Part I. Background above). Today's action exempts quantities of methyl bromide used for quarantine and preshipment applications from the production and consumption reduction steps between now and 2005, as well as beyond the final phaseout of production and consumption under the Montreal Protocol and Clean Air Act on January 1, 2005.

EPA is creating a recordkeeping and reporting process that is flexible enough to respond to demands arising when commodities need to be protected from infestations by quarantine pests and when commodities need to be treated immediately prior to shipment in accordance with official requirements. Such flexibility needs to be balanced with the U.S. Government's reporting requirements under the Montreal Protocol. Today's action includes a certification and reporting procedure under authority of the Clean Air Act (CAA) for exempted production and consumption of methyl bromide for quarantine and preshipment applications.

A. What Recordkeeping and Reporting Must Producers and Importers Perform?

Until the January 1, 2005 phaseout date for methyl bromide, U.S. companies will continue to hold production and consumption allowances, calculated as a percentage of their baseline production and consumption. After January 1, 2005, there will not be production allowances and consumption allowances for methyl bromide. The relationship between each company's baseline production allowance and baseline consumption allowances and the reduction steps in these allowances is in accordance with the control measures under the Montreal Protocol and the Clean Air Act as described in part I of today's rule and in the direct final rule published in the **Federal Register** on November 28, 2000 (65 FR 70795).

Because quarantine and preshipment applications are exempted from the phaseout, the total quantities of methyl bromide produced and imported that are specifically designated for quarantine and preshipment will not be counted as net production or net import for the purposes of the Allowance Program. In order for EPA to ensure that qualifying quarantine and preshipment quantities of methyl bromide are being properly exempted from companies' total allowed production/import, the Agency must have a record of those exempted quantities.

Currently, § 82.13 requires producers and importers to submit quarterly reports to EPA with information on the gross quantity of methyl bromide produced or imported in that quarter. In that same report, producers and importers indicate the quantity specifically designated for transformation and for destruction and, thus, exempted from the reduction steps and phaseout of methyl bromide. EPA subtracts these quantities for transformation and for destruction from the gross quantity reported to obtain the company's net production or import. The interim final rule required producers and importers to include the quantities of methyl bromide specifically designated for quarantine and preshipment applications on these same quarterly reports. Quantities of methyl bromide used for quarantine and preshipment applications are also subtracted from the gross quantity of production or import because of their exempted status and, thus, are not counted against a company's production and consumption allowances.

In addition to the reporting requirements outlined above, the interim final rule established the following recordkeeping requirements for producers and importers. Domestic purchasers (distributors or customers) must provide producers and importers with certifications that a designated quantity is being purchased solely for quarantine and preshipment applications (discussion of requirements for foreign purchasers appears below in part VII.D.) Certifications from distributors will attest that the material will be sold only for quarantine and preshipment applications, and certifications from applicators purchasing directly from a producer or importer will attest that the material will be used only for quarantine and preshipment applications.

While EPA received no comments on the specific recordkeeping and reporting procedures described in the interim final rule, several commenters submitted general feedback. All comments on this topic focused on the burden of recordkeeping and reporting and suggested that the creation of a FIFRA label specific to quarantine and preshipment would help to ease that burden. EPA recognizes the potential utility of a quarantine and preshipment specific FIFRA label (see full discussion below in part VII.E.). However, until such a label can be established, EPA must rely on another means of obtaining the information it needs to meet the U.S.'s reporting obligations under the Montreal Protocol and to ensure domestic compliance with the phasedown and phaseout schedule for production and import. The requirements created by the interim final rule were discussed with many industry representatives and represent one of the least burdensome options available. Thus, with this final action EPA is continuing the recordkeeping and reporting requirements for producers and importers established by the interim final rule and described in the above text.

B. Are Methyl Bromide Applicators Required To Report?

Today's action includes a certification requirement for purchases of methyl bromide by applicators. Applicators must submit a certification to the seller of the methyl bromide when they want to purchase a specific quantity of methyl bromide explicitly for quarantine and preshipment applications. The applicator will certify that the quantity purchased will be used solely for quarantine and preshipment applications. The applicator must send the certification to the company selling the methyl bromide before the seller ships the cylinders of methyl bromide (*i.e.*, certification before shipment).

The applicator can obtain the certification form at EPA's Web site at *http://www.epa.gov/ozone/mbr* or from their methyl bromide distributor. The applicator must check the box indicating that the particular quantity being ordered is solely for quarantine and preshipment applications as defined on the form (see the definition above in Part VI) and will neither be sold nor used for any other purpose. The applicator must sign the form certifying, under penalty of law, that the quantity of methyl bromide purchased will be used solely for quarantine and preshipment applications in accordance with the definitions. The applicator must return the completed and signed form to the distributor. The distributor retains the certification form in order to compile data that they will submit to EPA on the quantity of methyl bromide sold under the exemption for quarantine and preshipment applications. The certification form ensures that quantities of methyl bromide produced or imported under the exemption for quarantine and preshipment applications are used only in accordance with the strict requirements of the exemption. It is important to note that the applicator will also be able to purchase non-exempt methyl bromide until the phaseout date for methyl bromide.

For quarantine applications, the applicator must collect documentation citing the regulatory requirement or other official requirement that justifies the use of exempted methyl bromide. Acceptable documentation for a quarantine application includes the forms provided directly to the applicator by an official from a national plant, animal, environmental protection or health authority (*e.g.* USDA/APHIS) requesting the treatment of commodities to control quarantine pests. In the absence of official documentation from a plant, animal, environmental protection or health authority, the commodity owner, shipper or their agent must provide a letter to the methyl bromide applicator requesting the use of methyl bromide that explicitly cites the regulation requiring a quarantine treatment or quarantine official control. Likewise, the applicator must collect documentation citing the official requirement calling for a preshipment application. The commodity owner, shipper or their agent must provide a letter to the methyl bromide applicator requesting the use of methyl bromide that explicitly cites the official requirement for a preshipment application. The letter that the commodity owner, shipper or their agent presents to the applicator must include the following statement: ''I certify knowledge of the requirements associated with the exempted quarantine and preshipment applications published in 40 CFR part 82, including the requirement that this letter cite the treatments or official controls for quarantine applications or the official requirements for preshipment requirements.'' Both the commodity owner, shipper or their agent and the applicator must maintain this letter for three years in accordance with current recordkeeping requirements in 40 CFR part 82, subpart A. Neither the applicator nor the commodity owner, shipper or their agents are required to submit the letter to EPA.

The requirements established by today's final action exactly match the requirements of the interim final rule. EPA received one comment related to these reporting requirements. The commenter raised the concern that requiring distributors to send and recover Certification Forms prior to every sale could cause supply delays and backlog of commodities needing fumigation at ports. EPA does not believe that the above requirements will cause such a backlog if efficiently managed. While the above protocol explicitly requires that distributors must receive completed Certification Forms prior to distributing the order of methyl bromide, there is flexibility regarding when distributors must provide the blank forms to their customers. In fact, a distributor may send a blank Certification Form to every applicator with instructions to make many copies of the blank form, so each applicator is ready to place immediate, ''rush'' orders for methyl bromide for quarantine and preshipment applications. However, in situations when an applicator needs to have methyl bromide on-hand to fumigate a shipment hours after it arrives, EPA understands applicators strive to anticipate these busy seasons and accordingly place large orders well in advance. Under today's exemption, when an applicator places a large order in anticipation of future needs for methyl bromide for quarantine and preshipment applications, the applicator can and must submit the Certification Form for the quantity that will be stored to be used solely for quarantine and preshipment applications in the future.

C. Are Distributors Required To Report?

With today's action, EPA is requiring that a person who distributes methyl bromide to applicators (the distributor) compile all the information from applicator certifications (as described in part VII.B above) on a quarterly basis and submit the summary data to EPA. In administering other parts of the stratospheric ozone protection program over the past decade, regulated companies have often expressed an appreciation for the submission of smaller, quarterly reports, rather than one large, end-of-year report. EPA also believes that regular, quarterly tracking by distributors will increase the accuracy of reporting. Since EPA received no comments objecting to the submission of quarterly reports, we are requiring distributors to submit quarterly reports that summarize the total quantity of methyl bromide sold over a quarter to applicators who submitted certifications described in part VII.B above.

The collection of information on the quantity of methyl bromide sold and certified for quarantine and preshipment applications is needed so that the U.S. can respond to a recent amendment to the Protocol. The amendment, to which the Parties agreed at their Eleventh Meeting in Beijing in 1999, adds a provision to Article 7 (Reporting of Data), requiring Parties to submit information on the amounts of methyl bromide used for quarantine and preshipment applications. Reporting by the distributors will allow a comparison between the quantities of methyl bromide sold and certified for quarantine and preshipment applications with the amount of methyl bromide produced and imported for quarantine and preshipment applications, as reported in the producers'/importers' report as described in part VII.A above.

D. What About Methyl Bromide Exported for Quarantine and Preshipment Applications?

With today's action, producers and others that export methyl bromide must report the total quantity of methyl bromide explicitly exported to individual foreign countries for quarantine and preshipment applications on a quarterly basis. Under § 82.13, producers and exporters already distinguish other exempted quantities of methyl bromide explicitly exported for transformation or destruction. For each export of methyl bromide for quarantine and preshipment applications, as for exports for transformation or destruction, the exporter must obtain a certification from the foreign person (entity) importing the methyl bromide stating that the material will be used only for quarantine and preshipment applications. These certifications must be submitted with the quarterly reports. These certifications will then be shared with the appropriate foreign government officials in the importing country and the compiled data will be shared with UNEP advisory bodies to the Protocol. Certifications must accompany the reporting on quantities exported for quarantine and preshipment applications because of a concern that the U.S., as one of the largest worldwide producers of methyl bromide, could potentially contribute to the creation of a loophole for non-exempt uses of methyl bromide around the globe. EPA feels it will be important to closely monitor and track production of methyl bromide that is exported for quarantine and preshipment applications because these uses are exempt from Protocol control measures.

The above requirements are consistent with those created by the interim final rule. EPA received no comments related to this issue.

E. Will There Be a FIFRA Pesticide Label Change?

The interim final rule introduced the possibility of EPA's Office of Pesticide Programs developing, under the authority of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), a unique label for methyl bromide specifically designated for quarantine and preshipment use. The Agency received five comments in support of such an action. Commenters advocated that EPA replace the record keeping and reporting requirements established by the interim rule (and continued with today's action) with such a label in order to reduce the burden on users associated with the Quarantine and Preshipment Exemption.

EPA recognizes the potential burden reduction that creating a new QPS-specific FIFRA label could offer, however, the Agency also remains cognizant of the need to retain access to the information it needs to meet the U.S. government's own international reporting requirements as established by the Montreal Protocol. Thus, after the Office of Pesticide Programs finishes the process of making changes that create a new QPS-specific FIFRA label for methyl bromide, the Office of Air and Radiation will consider ways to simplify today's recordkeeping and reporting requirements but likely retain some of these requirements to ensure the accurate submission of data in accordance with U.S. obligations under the Montreal Protocol.

A registration/label change would designate individual cylinders of methyl bromide specifically for quarantine and preshipment applications and it would be illegal to use the material in these cylinders for other uses. Under an approved registration/label change there would be unique registration numbers for the new labels that would accompany each cylinder through the chain of commerce from producers or importers to the end-user (the applicator). As currently required under FIFRA, establishments would report total quantities of methyl bromide under this new quarantine and preshipment registration/label to EPA's Office of Pesticide Programs on an annual basis. Following a change in the FIFRA authorized registration/label, it would be possible for the Agency to reconcile the total quantity of methyl bromide certified to be solely for quarantine and preshipment applications under procedures described in parts VII.B and VII.C above, the total quantity of methyl bromide produced or imported for quarantine and preshipment applications under today's part VII.A above, and the annual FIFRA establishment reports on methyl bromide, which reference specific products by registration number.

EPA's Office of Pesticide Programs is continuing to work with the Methyl Bromide Industry Panel to develop a registration and label change for methyl bromide products. EPA reserves the ability to reevaluate the record keeping and reporting requirements established in today's action if and when such a label is created.

VIII. What Were Other Considerations and Situations on Which EPA Sought or Received Comment?

In the interim final rule, EPA sought comment on a number of possible variations on the exemption that were not incorporated into the interim rule as it was published. The Agency received comment on some of these items, as well as on other topics for which comment was not expressly sought.

EPA recognizes that additional questions may arise regarding aspects of today's final action. If a person has a question about whether a certain aspect of today's final action applies to their situation, EPA is encouraging the submissions of written questions accompanied by a detailed description of how methyl bromide relates to the person's particular enterprise. The Agency will consider questions about whether aspects of today's final action apply in the context of EPA's regular process for issuing written determinations.

A. Methyl Bromide Is the Only Feasible Treatment Option

EPA received 31 comments in response to the interim final rule that addressed the lack of feasible alternatives available for specific uses of methyl bromide and the economic impact of the phaseout on sectors of the agricultural industry. In response to such comments, EPA notes that there is no ''critical need'' requirement associated with the Quarantine and Preshipment Exemption at this juncture. The exemption applies only to uses of methyl bromide that qualify as a quarantine or preshipment application, as defined by this final action, regardless of the availability of alternatives.

The Montreal Protocol and the CAA created two distinct exemptions to the methyl bromide phaseout: (1) The Quarantine and Preshipment Exemption, and (2) the Critical Use Exemption. The Critical Use Exemption was created by the Parties to the Protocol to address the possibility that substitutes and alternatives may not be available for all methyl bromide uses by the January 1, 2005 phaseout date. The term ''critical use'' is defined, in part, by the lack of technically or economically feasible alternatives. For more information about the Critical Use Exemption please consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section or visit *http://www.epa.gov/ozone/mbr/cueqa.html.*

B. Has the Agency Considered Definitions Under the International Plant Protection Convention (IPPC)?

Under the International Standards for Phytosanitary Measures (ISPMs) adopted by members of the International Plant Protection Convention (IPPC) on April 22, 2001, the definition of ''official control'' is different than the definition that was agreed to by the Parties to the Montreal Protocol and adopted by EPA in the interim final rule. The IPPC definition of the phrase ''official control'' is, ''the active enforcement of mandatory phytosanitary regulations and the applications of mandatory phytosanitary procedures with the objective of eradication or containment of quarantine pests or the management of regulated non-quarantine pests.'' The IPPC glossary of phytosanitary terms defines ''official'' as ''established, authorized or performed by a National plant protection Organization (NPPO).'' In the United States, the NPPO is the USDA Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ) Program.

Further, under the ISPMs adopted by the IPPC, the phrase ''regulated non-quarantine pests'' is defined as, ''a non-quarantine pest whose presence in plants for planting affects the intended use of those plants with an economically unacceptable impact and which is therefore regulated within the territory of the importing contacting party.''

EPA sought comment in the interim final rule on this IPPC definition of ''official control'' and received 3 comments. All commenters stated that EPA ought to adopt the IPPC definition because it is broader than that adopted in the interim final rule.

In this final action, EPA is adopting the definition of ''official control'' found in the interim final rule and agreed upon by the Parties to the Montreal Protocol. The IPPC definition is broader, insofar as includes within its scope not only regulated quarantine pests but also regulated ''non-quarantine pests'', an addition not found in EPA's definition. However, IPPC defines the phrase ''non-quarantine pests'' as being applicable only to ''plants for planting''. [With this final action, EPA explicitly applies the quarantine exemption to use of methyl bromide for growing propagative material if it is being used to meet official quarantine requirements of the destination to which the propagative materials are being transported. However, the IPPC's definition is much narrower than the Protocol's, because the word ''official'' under the IPPC is limited only to national plant protection organization, and the Protocol's quarantine definition refers to ''plant, animal or environmental protection or health authority'' and the preshipment definition refers to ''national plant, animal, environmental, health or stored product authority''.

Additionally, in 1998, the TEAP explicitly laid out the differences between the IPPC's and the Montreal Protocol's definitions of ''official control'' for consideration by the Parties. The Parties rejected making any changes to the Protocol's definition of ''official control'' even when presented with the IPPC language (See discussion in section IV above). The Agency is acting in conformity with customary international law by adhering to the decision of the Parties on this matter.

C. What Action Is the Agency Taking Regarding Prophylactic Fumigation of U.S. Exports When the Fumigation Is Not Mandated by Import Regulations?

U.S. businesses sometimes use methyl bromide against non-quarantine pests for a commodity that is being exported because it is known that the importing country will treat with methyl bromide at the port of entry if the detected level of these non-quarantine pests during port-of-entry inspection exceeds that country's standards. Some U.S. exporters give their commodities a prophylactic treatment in the U.S. to prevent a much more damaging treatment in the receiving country that could occur if non-quarantine pests were found, possibly reducing the quality of the commodity. In cases where an official foreign Party requirement is specific to quarantine pests, or there is a general performance-based quarantine requirement, the use of methyl bromide under the exemption for quarantine applications would be appropriate. In addition, fumigation with methyl bromide to meet U.S. government or foreign non-quarantine requirements 21 days prior to export of the commodity would also be exempt under the definition of preshipment applications. The Agency reminds methyl bromide users that non-exempted quantities will be available until the January 1, 2005 phaseout date and that the Critical Use Exemption will become available after the phaseout (see section VII.A. above).

D. What Action is the Agency Taking Regarding the Exclusion of Specific Quarantine and Preshipment Applications From the Exemption at Some Future Time?

The Parties to the Protocol in Decision XI/13 request Parties to ''review their national plant, animal, environmental, health an stored product regulations with a view to removing the requirement for the use of methyl bromide for quarantine and preshipment where technically and economically feasible alternatives exist.'' The reason for a review process would be to limit the production and import of methyl bromide to only those cases where no other ''technologically and economically feasible alternatives exist.'' Through time, it is likely that the use of methyl bromide will be less and less necessary for quarantine and preshipment applications. When technically and economically feasible alternatives to methyl bromide are available, a process will be devised that will allow the U.S. to limit the use of this ozone-depleting substance while taking into account the need to protect international trade. In the years beyond the methyl bromide production and consumption phaseout, there will continue to be an exemption for quarantine and preshipment applications but there may no longer be price pressures for moving away from these quarantine and preshipment applications of methyl bromide. Therefore, the Parties to the Protocol emphasize the importance of reviewing quarantine and preshipment applications and identifying when technically and economically feasible alternatives exist, and removing these applications from the exemption.

EPA offered several options for implementing such a review process in the interim final rule. The Agency received 5 comments related to this issue. All commenters asserted that the option to eliminate the Quarantine and Preshipment Exemption after the phaseout and ask users to apply for critical-use exemptions where no technically or economically feasible alternatives exist offered by EPA in the interim final rule was contrary to the provisions of the Montreal Protocol and could not be pursued without an amendment to the agreement. Given the request by the Parties for a future contraction of the Quarantine and Preshipment Exemption, EPA does not agree that the Protocol prohibits such a course of action. However, the Agency agrees that this option may impose the burden of completing a Critical Use Exemption Application on users where it may not be necessary. Thus, with this action, EPA sets forth its intent to meet the Parties' request for a domestic review process for quarantine and preshipment applications of methyl bromide by establishing a procedure for excluding specific quarantine and preshipment applications from the exemption when EPA determines by notice and comment rulemaking that alternatives are in significant international use for the specific applications. In undertaking the process of notice and comment rulemaking, EPA will consult with USDA/APHIS regarding alternatives that are efficacious for quarantine and preshipment and are in significant international use for specific quarantine and preshipment applications. Such a notice and comment rulemaking process will allow U.S. users of methyl bromide for quarantine and preshipment applications to make the case that although alternative(s) are in significant international use, the specific circumstances of their U.S. applications are unique (*e.g.*, the alternatives are not feasible or commercially available in the U.S.) and continue to warrant the use of methyl bromide.

EPA considered relying on market prices to guide methyl bromide use as an alternative to the formal review process described above. However, the Agency was unable to gather adequate information to determine whether the price of methyl bromide would be sufficiently likely to provide an incentive for the development and use of alternatives. Without adequate economic analysis, the Agency is unable to rely on market forces to meet the U.S.'s international commitment.

IX. What Are the Steps To Conform the U.S. Methyl Bromide Phaseout Schedule and Exemptions to the Montreal Protocol and Amended Clean Air Act?

During stakeholder meetings, and in the proposed and final rules that established the 25 percent reduction in methyl bromide baseline allowances beginning in 1999 (64 FR 9290, 64 FR 29240), EPA described its intention to follow with separate rulemakings that would include the additional phaseout steps for methyl bromide and establish additional exemptions in accordance with the Protocol and the CAA. The rule establishing the remaining reduction and phaseout schedule for methyl bromide was published November 28, 2000 (65 FR 70795). The reduction and phaseout schedule is listed above at the end of part I.

After the phaseout on January 1, 2005, critical-use exemptions are permitted under the Montreal Protocol and the Clean Air Act when nominated by the United States and approved by the Parties. In addition, an emergency use exemption of no more than 20 metric tonnes is available after the phaseout on January 1, 2005. In 2001, EPA initiated stakeholder meetings to develop a process for an emergency use exemption and for critical use exemptions, which is designed to ensure that the U.S. meets its obligations under the Montreal Protocol consistent with statutory requirements in the Clean Air Act. On May 10, 2002 EPA published a **Federal Register** document (67 FR 31798) asking for people to submit Critical Use Exemption Applications. At this time no final decision has been published regarding what uses will be exempted as ''critical.'' Sometime in advance of 2005, EPA will establish a process for an emergency use exemption through notice and comment rulemaking.

X. Administrative Requirements

A. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with ''Federal mandates'' that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with the applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective of least burdensome alternatives if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

EPA has determined that this rule does not contain a Federal mandate that may result in expenditures of $100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. The rule imposes no enforceable duty on any

State, local, or tribal government. The recordkeeping and reporting requirements are the only mandates imposed on those members of the private sector that choose to take advantage of the exemption to the methyl bromide phaseout established by this rulemaking, which EPA calculated to be under $100 million per year. Thus, today's rule is not subject to the requirements of sections 202 and 205 of the UMRA. EPA has also determined that this rule contains no requirements that might significantly or uniquely affect small governments. Thus, today's rule is not subject to the requirements of section 203 of the UMRA.

B. Regulatory Flexibility Analysis

EPA has determined that it is not necessary to prepare a regulatory flexibility analysis in connection with this final rule. EPA has also determined that this rule will not have a significant economic impact on a substantial number of small entities. For purposes of assessing the impacts of today's rule on small entities, small entity is defined as: (1) A small business that is identified by the North American Industry Classification System code (NAICS) in the Table below; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

Type of enterprise	NAICS Code	Size standard (number of employees)	Size standard (millions of dollars)
Pesticide and Other Agricultural Chemical Manufacturing	32532	500	
Support Activities for Agriculture and Forestry	115		$6.0
Exterminating and Pest Control Services	56171		$6.0

After considering the economic impacts of today's final rule on small entities, EPA has concluded that this action will not have a significant economic impact on a substantial number of small entities. We have determined that although some small percentage of distributors may be small entities and many of the applicators are too, that all entities regulated by today's action receive a benefit through the exemption, which allows them to continue to obtain quantities of methyl bromide outside of the reduction schedule and phaseout controls. We estimate that these benefits are equal to approximately 7 to 10% of the U.S. baseline of methyl bromide, annually, or about 1,787 to 2,552 metric tonnes, which at current prices for methyl bromide of approximately $3.00/pound would be equal to an estimated annual benefit of $12 to $17 million. The costs of this exemption arise from the limited recordkeeping and reporting requirements which are estimated to be less than $53 thousand per year for the entire industry that uses methyl bromide for quarantine and preshipment applications.

Although this final rule will not have a significant economic impact on a substantial number of small entities, EPA nonetheless has tried to reduce the impact of this rule on small entities. EPA held several stakeholder meetings to explore options for establishing a reasonable record keeping and reporting system that would allow the Agency to monitor and collect information for the U.S. reporting obligations to the Montreal Protocol. One option considered would have asked for certifications from applicators to be submitted to producers or importers prior to exempted production or import. This and other options were not only administratively too burdensome, but would also be too disruptive of normal commerce. In today's action, for each level in the methyl bromide market chain, the Agency chose the least burdensome method for collecting the minimum amount of information that would allow the U.S. to accurately fulfill its Protocol reporting requirements.

C. Executive Order 12866

Under Executive Order 12866, (58 FR 51735 (October 4, 1993)), the Agency must determine whether this regulatory action is ''significant'' and therefore subject to OMB review and the requirements of the Executive Order. The Order defines ''significant regulatory action'' as one that is likely to result in a rule that may: (1) Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) raise novel legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, OMB has notified EPA that it considers this a ''significant regulatory action'' within the meaning of the Executive Order. EPA has submitted this action to OMB for review. Changes made in response to OMB suggestions or recommendations on the original rule submitted to them will be documented in the public record.

D. Applicability of Executive Order 13045 (Children's Health Protection)

Executive Order 13045: ''Protection of Children from Environmental Health Risks and Safety Risks'' (62 FR 19885 (April 23, 1997)) applies to any rule that: (1) Is determined to be ''economically significant'' as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

EPA interprets Executive Order 13045 as applying only to those regulatory actions that are based on health or safety risks, such that the analysis required under section 5–501 of the Order has the potential to influence the regulation. This rule is not subject to Executive Order 13045 because it implements a specific exemption set forth by Congress in section 604(d)(5) of the Clean Air Act.

E. Paperwork Reduction Act

The Office of Management and Budget (OMB) has approved the information collection requirements contained in this rule for three years under the provisions of the Paperwork Reduction

Act, 44 U.S.C. 3501 *et seq.* The OMB control number is 2060–0170.

In relation to the expected benefits of today's exemption from the phaseout schedule for methyl bromide, this action is maintaining the additional reporting and record keeping requirements required in the interim final rule. This action requires reporting by distributors of methyl bromide regarding the total quantity sold that is certified to be solely for quarantine and preshipment applications. This action also requires applicators of methyl bromide to certify that specified quantities purchased will be used solely for quarantine and preshipment applications. Producers and importers of methyl bromide must include additional information in existing quarterly reports. As in the interim final rule, producers that export and third-party exporters must submit additional information regarding quantities of methyl bromide exported for quarantine and preshipment applications. Today's action also maintains the record keeping requirements of the interim final rule associated with the reporting listed above and for commodity owners or shippers who must formally request methyl bromide use citing the official control or official requirement for the quarantine and preshipment application.

EPA is making the reporting forms associated with this rule available electronically, as a first step. In addition, EPA is working to make it possible for people to complete the forms electronically with special guidance on a ''file naming protocol.'' EPA wants to create this ''file naming protocol'' so forms completed electronically by producers and importers can be saved with similar nomenclature for transmission to EPA by email. For example, the company, Acme Ltd., might complete the third-quarter importer's report electronically and save the document with the name 3Q_ImpR_Acme and send it, by email, to EPA. The Agency believes guidance on a ''file naming protocol'' will ease the process for electronically filing, searching and identifying forms for both the Agency and companies, and be especially helpful if a question arises about information in a specific form. EPA will strive to have forms available that can be completed electronically by the regulatory deadline for submission of the first-quarter reports (30 days after the end of the quarter in 2003), and will make every effort to have them available no later than for submission of second-quarter reports. Concurrent with the process for making it possible to electronically complete forms for submission by email, EPA is pursuing technical and logistical questions about creating a secure Web-based system for direct electronic reporting of data. If EPA deems that it is feasible and efficient to create a secure Web-based database for direct electronic reporting, then EPA will work to bring such a system online by 2004.

The information collection under this action is designed to implement the exemption in paragraph 6 under article 2H of the Montreal Protocol for quantities of methyl bromide used for quarantine and preshipment applications as well as the exemption under 604(d)(5) of the CAA. The information collection under this rule is authorized under section 603(b) and 603(d) of the CAA. This information collection is conducted to meet U.S. obligations under Article 7, Reporting Requirements, of the Montreal Protocol on Substances that Deplete the Ozone Layer (Protocol); and to carry out the requirements of Title VI of the CAA, including sections 603 and 614. The reporting requirements included in this rule are intended to: (1) Allow exempted production and import for a specific exemption and the consequent tracking of that production and import; (2) respond to industry comments on the functioning of the program to streamline reporting and eliminate administrative inefficiencies; (3) satisfy U.S. obligations under the international treaty, The Montreal Protocol on Substances that Deplete the Ozone Layer (Protocol), to report data under Article 7; (4) fulfill statutory obligations under Section 603(b) of Title VI of the Clean Air Act Amendments of 1990 for reporting and monitoring; and (5) provide information to report to Congress on the production, use and consumption of class I controlled substances as statutorily required in section 603(d) of Title VI of the CAA.

EPA informs respondents that they may assert claims of business confidentiality for any of the information they submit. Information claimed confidential will be treated in accordance with the procedures for handling information claimed as confidential under 40 CFR part 2, Subpart B, and will be disclosed only to the extent, and by means of the procedures, set forth in that subpart. If no claim of confidentiality is asserted when EPA receives the information it may be made available to the public without further notice to the respondents (40 CFR 2.203).

The information collection requirements for this action have an estimated reporting burden averaging 1.38 hours per response. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed and completing the collection of information. The estimate includes the time needed to comply with EPA's reporting requirements, as well as that used for the completion of reports.

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; and transmit or otherwise disclose the information.

An Agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR part 9 and 48 CFR chapter 15.

Collection activity	No. of respondents	Responses/ respondent	Total responses	Hours per response	Total hours
Producers & Importers Report	4	4	16	1	16
Exporters Report	2	4	8	8	64
Applicator Certification	15	6	90	0.5	45
Distributor Report	15	4	60	4	240
Commodity Owner, Shipper or Agent Record keeping	500	10	500	1	500
Total burden hrs					865

F. Executive Order 13132 (Federalism)

Executive Order 13132, entitled ''Federalism'' (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' is defined in the Executive Order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

This rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national governmental and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. This rule does not in any way restrict States from continuing to operate their plant, animal, environmental, health or stored product protection programs associated with quarantine and preshipment applications. Thus, Executive Order 13132 does not apply to this rule.

G. Executive Order 13175 (Consultation and Coordination With Indian Tribal Governments)

Executive Order 13175, entitled ''Consultation and Coordination with Indian Tribal Governments'' (65 FR 67249 (November 9, 2000)), requires EPA to develop an accountable process to ensure ''meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.'' This final rule does not have tribal implications, as specified in Executive Order 13175. There is no enforceable mandate imposed on tribal governments within this regulation. Thus, Executive Order 13175 does not apply to this rule.

H. The National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104–113, section 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (*e.g.* materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards. This rulemaking does not involve technical standards. Therefore, EPA did not consider the use of any voluntary consensus standards.

I. Executive Order 13211 (Energy Effects)

This rule is not a ''significant energy action'' as defined in Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355, May 22, 2001) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. Further, we have concluded that this rule is not likely to have any adverse energy effects.

XI. Congressional Review

A. Submission to Congress and the Comptroller General

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating that rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This rule is not a major rule as defined by 5 U.S.C. 804(2). This rule will be effective January 1, 2003.

List of Subjects in 40 CFR Part 82

Environmental protection, Administrative practice and procedure, Air pollution control, Chemicals, Exports, Imports, Reporting and recordkeeping requirements.

Dated: December 23, 2002.

Christine Todd Whitman,

Administrator.

For reasons set out in the preamble, title 40 chapter I of the Code of Federal Regulations is amended as follows:

PART 82—PROTECTION OF STRATOSPHERIC OZONE

1. The authority citation for subpart 82 continues to read as follows:

Authority: 42 U.S.C. 7414, 7601, 7671–7671q.

Subpart A—Production and Consumption Controls

2. Section 82.3 is amended by adding new definitions in alphabetical order for the terms, ''Applicator,'' ''Commodity Owner, Shipper or their Agent,'' ''Distributor of methyl bromide,'' ''Preshipment applications,'' and ''Quarantine applications.''

§ 82.3 Definitions.

As used in this subpart, the term:

Applicator means the person who applies methyl bromide.

* * * * *

Commodity Owner, Shipper or their Agent means the person requesting that an applicator use methyl bromide for quarantine or preshipment applications.

* * * * *

Distributor of methyl bromide means the person directly selling a class I, Group VI controlled substance to an applicator.

* * * * *

Preshipment applications, with respect to class I, Group VI controlled substances, are those non-quarantine applications applied within 21 days prior to export to meet the official requirements of the importing country or existing official requirements of the exporting country. Official requirements are those which are performed by, or authorized by, a national plant, animal, environmental, health or stored product authority.

* * * * *

Quarantine applications, with respect to class I, Group VI controlled substances, are treatments to prevent the introduction, establishment and/or spread of quarantine pests (including diseases), or to ensure their official control, where: (1) Official control is that performed by, or authorized by, a national (including state, tribal or local) plant, animal or environmental protection or health authority; (2) quarantine pests are pests of potential importance to the areas endangered thereby and not yet present there, or present but not widely distributed and being officially controlled. This definition excludes treatments of commodities not entering or leaving the United States or any State (or political subdivision thereof).

* * * * *

3. Section 82.4 is amended by redesignating paragraphs (a) as (a)(1) and republishing the text, adding (a)(2), redesignating paragraphs (c) as (c)(1) and republishing the text, adding (c)(2),

redesignating (k) as (k)(1) and republishing the text, and adding (k)(2) as follows:

§ 82.4 Prohibitions.

(a)(1) Prior to January 1, 1996, for all Groups of class I controlled substances, and prior to January 1, 2005, for class I, Group VI controlled substances, no person may produce, at any time in any control period, (except that are transformed or destroyed domestically or by a person of another Party) in excess of the amount of unexpended production allowances or unexpended Article 5 allowances for that substance held by that person under the authority of this subpart at that time for that control period. Every kilogram of excess production constitutes a separate violation of this subpart.

(2) Effective January 1, 2003, production of class I, Group VI controlled substances is not subject to the prohibitions in paragraph (a)(1) of this section if it is solely for quarantine or preshipment applications as defined in this subpart.

* * * * *

(c)(1) Prior to January 1, 1996, for all Groups of class I controlled substances, and prior to January 1, 2005, for class I, Group VI controlled substances, no person may produce or (except for transhipments, heels or used controlled substances) import, at any time in any control period, (except for controlled substances that are transformed or destroyed) in excess of the amount of unexpended consumption allowances held by that person under the authority of this subpart at that time for that control period. Every kilogram of excess production or importation (other than transhipments, heels or used controlled substances) constitutes a separate violation of this subpart.

(2) Effective January 1, 2003, production and import of class I, Group VI controlled substances is not subject to the prohibitions in paragraph(c)(1) of this section if it is solely for quarantine or preshipment applications as defined in this subpart.

* * * * *

(k)(1) Prior to January 1, 1996, for all Groups of class I controlled substances, and prior to January 1, 2005, for class I, Group VI controlled substances, a person may not use production allowances to produce a quantity of a class I controlled substance unless that person holds under the authority of this subpart at the same time consumption allowances sufficient to cover that quantity of class I controlled substances nor may a person use consumption allowances to produce a quantity of class I controlled substances unless the person holds under authority of this subpart at the same time production allowances sufficient to cover that quantity of class I controlled substances. However, prior to January 1, 1996, for all class I controlled substances, and prior to January 1, 2005, for class I, Group VI controlled substances, only consumption allowances are required to import, with the exception of transhipments, heels, and used controlled substances. Effective January 1, 1996, for all Groups of class I controlled substances, except Group VI, only essential-use allowances or exemptions are required to import class I controlled substances, with the exception of transhipments, heels and used controlled substances.

(2) Notwithstanding paragraph (k)(1) of this section, effective January 1, 2003, for class I, Group VI controlled substances, consumption allowances are not required to import quantities solely for quarantine or preshipment applications as defined in this subpart.

* * * * *

4. Section 82.13 is amended by:

a. Adding paragraphs (f)(2)(xvii) through (f)(2)(xix), and (f)(3)(xiii) through (f)(3)(xv),

b. Adding paragraphs (g)(1)(xvii) through (g)(1)(xix), and (g)(4)(xv) through (g)(4)(xvii),

c. Revising paragraph (h),

d. Adding paragraphs (aa), (bb), and (cc).

The revisions and additions read as follows:

§ 82.13 Recordkeeping and reporting requirements.

* * * * *

(f) * * *

(2) * * *

(xvii) For class I, Group VI controlled substances, dated records of the quantity of controlled substances produced for quarantine and preshipment applications and quantity sold for quarantine and preshipment applications;

(xviii) Written certifications that quantities of class I, Group VI controlled substances produced solely for quarantine and preshipment applications were purchased by distributors or applicators to be used only for quarantine and preshipment applications in accordance with the definitions in this subpart; and

(xix) Written verifications from a U.S. purchaser that class I, Group VI controlled substances produced solely for quarantine and preshipment applications, if exported, will be exported solely for quarantine and preshipment applications upon receipt of a certification in accordance with the definitions of this subpart and requirements in paragraph (h) of this section.

(3) * * *

(xiii) The amount of class I, Group VI controlled substances sold or transferred during the quarter to a person other than the producer solely for quarantine and preshipment applications;

(xiv) A list of the quantities of class I, Group VI controlled substances produced by the producer and exported by the producer and/or by other U.S. companies, to a Party to the Protocol that will be used solely for quarantine and preshipment applications and therefore were not produced expending production or consumption allowances; and

(xv) For quarantine and preshipment applications of class I, Group VI controlled substances in the United States or by a person of another Party, one copy of a certification that the material will be used only for quarantine and preshipment applications in accordance with the definitions in this subpart from each recipient of the material and a list of additional quantities shipped to that same person for the quarter.

* * * * *

(g) * * *

(1) * * *

(xvii) For class I, Group VI controlled substances, dated records of the quantity of controlled substances imported for quarantine and preshipment applications and quantity sold for quarantine and preshipment applications;

(xviii) Written certifications that quantities of class I, Group VI controlled substances imported solely for quarantine and preshipment applications were purchased by distributors or applicators to be used only for quarantine and preshipment applications in accordance with the definitions in this subpart; and

(xix) Written verifications from a U.S. purchaser that class I, Group VI controlled substances imported solely for quarantine and preshipment applications, if exported, will be exported solely for quarantine and preshipment applications upon receipt of a certification in accordance with the definitions of this Subpart and requirements in paragraph (h) of this section.

* * * * *

(4) * * *

(xv) The amount of class I, Group VI controlled substance sold or transferred during the quarter to a person other than the importer solely for quarantine and preshipment applications;

(xvi) A list of the quantities of class I, Group VI controlled substances exported by the importer and or by other U.S. companies, to a Party to the Protocol that will be used solely for quarantine and preshipment applications and therefore were not imported expending consumption allowances; and

(xvii) For quarantine and preshipment applications of class I, Group VI controlled substances in the United States or by a person of another Party, one copy of a certification that the material will be used only for quarantine and preshipment applications in accordance with the definitions in this subpart from each recipient of the material and a list of additional quantities shipped to that same person for the quarter.

(h) Reporting Requirements—Exporters.

(1) For any exports of class I controlled substances (except Group VI) not reported under § 82.10 of this subpart (additional consumption allowances), or under paragraph (f)(3) of this section (reporting for producers of controlled substances), the exporter who exported a class I controlled substance (except Group VI) must submit to the Administrator the following information within 45 days after the end of the control period in which the unreported exports left the United States:

(i) The names and addresses of the exporter and the recipient of the exports;

(ii) The exporter's Employee Identification Number;

(iii) The type and quantity of each controlled substance exported and what percentage, if any, of the controlled substance is used, recycled or reclaimed;

(iv) The date on which, and the port from which, the controlled substances were exported from the United States or its territories;

(v) The country to which the controlled substances were exported;

(vi) The amount exported to each Article 5 country;

(vii) The commodity code of the controlled substance shipped; and

(viii) The invoice or sales agreement containing language similar to the Internal Revenue Service Certificate that the purchaser or recipient of imported controlled substances intends to transform those substances, or destruction verifications (as in paragraph(k) of this section) showing that the purchaser or recipient intends to destroy the controlled substances.

(2) For any exports of class I, Group VI controlled substances not reported under § 82.10 of this subpart (additional consumption allowances), or under paragraph (f)(3) of this section (reporting for producers of controlled substances), the exporter who exported a class I, Group VI controlled substance must submit to the Administrator the following information within 45 days after the end of each quarter in which the unreported exports left the United States:

(i) The names and addresses of the exporter and the recipient of the exports;

(ii) The exporter's Employee Identification Number;

(iii) The type and quantity of each controlled substance exported and what percentage, if any, of the controlled substance is used, recycled or reclaimed;

(iv) The date on which, and the port from which, the controlled substances were exported from the United States or its territories;

(v) The country to which the controlled substances were exported;

(vi) The amount exported to each Article 5 country;

(vii) The commodity code of the controlled substance shipped; and

(viii) The invoice or sales agreement containing language similar to the Internal Revenue Service Certificate that the purchaser or recipient of imported controlled substances intends to transform those substances, the destruction verifications (as in paragraph (k) of this section) showing that the purchaser or recipient intends to destroy the controlled substances, or the certification that the purchaser or recipient and the eventual applicator will only use the material for quarantine and preshipment applications in accordance with the definitions in this subpart.

* * * * *

(aa) Every distributor of methyl bromide (class I, Group VI controlled substances) who purchases or receives a quantity produced or imported solely for quarantine or preshipment applications under the exemptions in this subpart must comply with recordkeeping and reporting requirements specified in this paragraph (aa) of this section.

(1) Every distributor of methyl bromide must certify to the producer or importer that quantities received that were produced or imported solely for quarantine and preshipment applications under the exemptions in this subpart will be used only for quarantine applications or preshipment applications in accordance with the definitions in this subpart.

(2) Every distributor of a quantity of methyl bromide that was produced or imported solely for quarantine or preshipment applications under the exemptions in this subpart must receive from an applicator a certification of the quantity of class I, Group VI controlled substances ordered, prior to delivery of the quantity, stating that the quantity will be used solely for quarantine or preshipment applications in accordance with definitions in this subpart.

(3) Every distributor of methyl bromide who receives a certification from an applicator that the quantity ordered and delivered will be used solely for quarantine and preshipment applications in accordance with definitions in this subpart must maintain the certifications as records for 3 years.

(4) Every distributor of methyl bromide who receives a certification from an applicator that the quantity ordered and delivered will be used solely for quarantine and preshipment applications in accordance with definitions in this subpart must report to the Administrator within 45 days after the end of each quarter, the total quantity delivered for which certifications were received that stated the class I, Group VI controlled substance would be used solely for quarantine and preshipment applications in accordance with definitions in this Subpart.

(bb) Every applicator of class I, Group VI controlled substances who purchases or receives a quantity produced or imported solely for quarantine and preshipment applications under the exemptions in this subpart must comply with recordkeeping and reporting requirements specified in this paragraph (bb) of this section.

(1) Recordkeeping—Applicators. Every applicator of class I, Group VI controlled substances produced or imported solely for quarantine and preshipment applications under the exemptions of this subpart must maintain, for every application, a document from the commodity owner, shipper or their agent requesting the use of class I, Group VI controlled substances citing the regulatory requirement that justifies its use in accordance with definitions in this subpart. These documents shall be retained for 3 years.

(2) Reporting—Applicators. Every applicator of class I, Group VI controlled substances who purchases or receives a quantity of class I, Group VI controlled substance that was produced or imported solely for quarantine and preshipment applications under the exemptions in this subpart shall provide the distributor of the methyl bromide, prior to shipment of the class I, Group

VI controlled substance, with a certification that the quantity of controlled substances will be used only for quarantine and preshipment applications as defined in this subpart.

(cc) Every commodity owner, shipper or their agent requesting an applicator to use a quantity of class I, Group VI controlled substance that was produced or imported solely for quarantine and preshipment applications under the exemptions of this subpart must maintain a record for 3 years, for each request, certifying knowledge of the requirements associated with the exemption for quarantine and preshipment applications in this subpart and citing the regulatory requirement that justifies the use of the class I, Group VI controlled substance in accordance with definitions in this subpart. The record must include the following statement: ''I certify knowledge of the requirements associated with the exempted quarantine and preshipment applications published in 40 CFR part 82, including the requirement that this letter cite the treatments or official controls for quarantine applications or the official requirements for preshipment requirements.''

[FR Doc. 02–32986 Filed 12–31–02; 8:45 am]

BILLING CODE 6560–50–P

MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT
PLANT PROTECTION DEPARTMENT

Add: 149 Ho Dac Di street, DongDa, Hanoi, Vietnam
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To: Dr. Marco Gonzalez,
Executive Secratary,
The Ozone Secretariat

Sub: Vietnam Response, Decision XX/6 (7)

Dear Sir,

I write to refer to information provided by the QPSTF of the TEAP that fumigation of export coffee, rice and cassava chips for export has been classified as QPS in Vietnam, but not by others mentioned in you letter on 19 August, 2009, for the QPSTF to consider the information and include in its final report for consideration by the 21st meeting of the Parties in November 2009, in response to request set out in Decision XX/6(7).

Vietnam would like to clarify our rationale for such classification as follows:

Coffee, rice and cassava chips are major export commodities of Vietnam. Normally, these commodities are harvested seasonally and stored until exporters are able to export the commodities according to commercial contracts. As a result, there may be an extended period of storage after harvest. During the period of storage these commodities possibly are infested with pests. Some of these pests may be of concern to the importing country and will cause the consignment not to meet with phytosanitary requirements in such importing countries. Accordingly, commodities may be refused importation, destroyed or re-shipped, leading economic loss for the exporters.

Therefore, aiming to ensure that the consignment is free of regulated pests, MB treatments are often applied at the request of the importing country or under conditions of pest-free status in terms of contract between importers and exporters. This is to ensure pest free export products and meets quality standards of Vietnam's Products.

Article 23, 24 of Plant Quarantine Regulation (enacted by the Government Decree 92/CP November 27th 1993), Article 25 of the Government Decree 02/2007/ND-CP on Plant Quarantine (05 January 2007) endorses treatments by exporters under commercial contract or by the commodity owners as an official action to protect the pest-free reputation of Vietnam's exports, in accordance with the concept "Pre-shipment application" in Decision VII/5 and XI/12 of the Montreal Protocol:

'Pre-shipment applications' are those non-quarantine applications applied within 21 days prior to export to meet the official requirements of the importing country or existing official requirements of the exporting country. Official requirements are those

which are performed by, or authorized by, a national plant, animal, environmental, health or stored product authority;"

Thus, in these cases, MB treatments on export rice, coffee and cassava chips are considered as a preshipment application to meet official phytosanitary requirements of the exporting country for these mentioned products. However, we will not comment on the phytosanitary requirements of the importing countries. There are differences in regulations and quality standards from each country, and these may or may not include official phytosanitary requirements that imports be fumigated before arrival in those countries.

We also would like to highlight that Vietnam has made substantial efforts in implementing its MB phase out plan (MBPP).

One of activities carried out by MBPP project that being implemented by PPD is Policy Review. This aims to review the legal document system of Vietnam, find the limitations and constraints in control and management of MB use. Meanwhile, we also refer to international regulations that Vietnam is participating in or being a signatory, including the Montreal Protocol. This may involve adaptation and adjustment in the future.

Furthermore, other activities of the project also focus on looking for alternatives of MB which can apply widely in Vietnam, and to disseminate, recommend and raise awareness for MB users about the regulations as well as in the necessity for elimination of MB. Beside those activities, PPD also is developing MIS in order to monitor, manage imports and use of MB effectively.

In the draft version of Plant Protection and Quarantine Law, Vietnam is going to focus on integration and harmonization of phytosanitary requirements and obligations commitments, including the Montreal Protocol.

We hope that the above explanation can satisfy the requirements of the Ozone Secrectariat. If you need any further information, please do not hesitate to contact us.

Thank you for your kind attention.

Yours sincerely.

Hoang Trung, PhD.
Deputy Director General
Date: 15 September 2009

GOBIERNO DE CHILE
COMISION NACIONAL
DEL MEDIO AMBIENTE

Carta D.E. Nº. 093415 /

ANT. Oz.Sec/Paragraph 7 of Decision XX/6/Chile. 19 de Agosto de 2009.

MAT.: Remite informe de consumo de Bromuro de Metilo QPS, de Chile.

SANTIAGO, 02 OCT. 2009

Señor
Marco González
Secretario Ejecutivo
Secretaría del Protocolo de Montreal
Presente

De mi consideración:

Me dirijo a Usted en virtud del párrafo 7 de la Decisión XX/6 referida al uso de Bromuro de Metilo clasificado como "Cuarentena y Pre-embarque (QPS)".

Al respecto, tengo a bien remitir a usted la carta del Servicio Agrícola y Ganadero, dependiente del Ministerio de Agricultura, que especifica los usos de Bromuro de Metilo en Chile, clasificados como QPS.

Asimismo, quisiéramos rectificar lo mencionado en la información remitida al MBTOC el pasado mes de mayo de 2009, en cuanto a que el uso de Bromuro de Metilo en la fumigación de suelos para la exportación de plantas de frutilla, no corresponde a una clasificación QPS.

Por tal motivo, adjunto a usted la nueva carta del Servicio Agrícola y Ganadero (ORD. 10559, del 28 de Septiembre de 2009), con la rectificación mencionada.

Sin otro particular, saluda cordialmente a usted,

HANS WILLUMSEN ALENDE
JEFE DEPARTAMENTO CONTROL DE LA CONTAMINACIÓN
COMISIÓN NACIONAL DEL MEDIO AMBIENTE

CP
CPC/jra

CC./ Sra. Marta Pizano, Co-Presidenta MBTOC
Sr. Jonathan Banks, Co-Presidente MBTOC
DIMA Ministerio de Relaciones Exteriores
Archivo Depto. Relaciones Internacionales
Archivo Depto. Control de la Contaminación
Archivo Unidad Ozono, Depto. Control de la Contaminación

Ref. Ozono: Secretaria Protocolo /MBTOC

CHILE
POTENCIA ALIMENTARIA Y FORESTAL

GOBIERNO DE CHILE
MINISTERIO DE AGRICULTURA
SAG

División Protección Agrícola y Forestal
Subdepartamento de Exportaciones
Agrícolas y Forestales

5532

OFICINA DE PARTES
29 SET. 2009
RECIBIDO
CONAMA

ORD. : 10559 /
ANT. :
MAT. : Información sobre uso de Bromuro de metilo.

19918

2 8 SEP 2009

DE : JEFA DIVISIÓN PROTECCIÓN AGRÍCOLA y FORESTAL

A : JEFE DEPARTAMENTO CONTROL DE LA CONTAMINACIÓN COMISIÓN NACIONAL DEL MEDIO AMBIENTE

1. En relación a nuestro ORD. N° 4824, de fecha 18 de mayo de 2009, mediante el cual señalamos los motivos por los cuales se utiliza el bromuro de metilo en Chile, me permito señalar a Ud., que ese listado se confeccionó de acuerdo a los ítems que se especificaron en la encuesta que respondió nuestro Servicio el año 2005.

2. No obstante lo anterior, me permito informar a Ud., que concordamos en que las alternativas señaladas referente a la fumigación de suelos para la producción de plantas de frutilla de exportación, no cae dentro de las definiciones que el Protocolo de Montreal tiene establecida como uso de cuarentena o pre-embarque.

3. Adjunto a la presente, se remite tabla con los usos de cuarentena reconocidos por el SAG.

Saluda atentamente a Ud.,

SERVICIO AGRICOLA Y GANADERO
JEFA DIVISION PROTECCION AGRICOLA Y FORESTAL
S.A.G.

GRISEL MONJE VILDÓSOLA
INGENIERO AGRÓNOMO
JEFA DIVISIÓN PROTECCIÓN AGRÍCOLA y FORESTAL

RAR/RAM
N° 910
Distribución:
- Departamento Control de la Contaminación, CONAMA
- División Protección Agrícola
- Archivos

USO del Bromuro de Metilo con fines de Pre-embarque o Cuarentena

Pestes Tratadas	**Razón del Tratamiento**	**Base Legal**	**País de destino del producto tratado**
Pestes forestales	Fumigación de Materiales de Embalaje	NIMF 15 / FAO	Todos
Brevipalpus chilensis	Fumigación de Uva y Kiwi	Portaria N° 129, del 15 de abril de 1997, Brasil	Brasil
Brevipalpus chilensis	Fumigación de Uva	Planes de Trabajo	Perú, Costa Rica
Brevipalpus chilensis, Pseudococcus longispinus, Cydia molesta	Fumigación de Uva, Kiwi, Carozo, Manzana y Pera	Planes de Trabajo	México
Brevipalpus chilensis	Fumigación de Uva, Kiwi, Limón	Requerimiento del país importador, Manual Treatment, USDA/APHIS/PPQ	USA
Insectos de alimentación superficial	Fumigación de Ciruela, Damasco, Durazno, Nectarin, Espárrago, Arándano Frambuesa, Mora	Requerimiento del país importador, Manual Treatment, USDA/APHIS/PPQ	USA
Tuta absoluta, Rhagoletis tomatis	Fumigación de tomate	Requerimiento del país importador, Manual Treatment, USDA/APHIS/PPQ	USA
Cydia molesta	Nectarines, Ciruelas, Duraznos, Membrillos y Damascos	Directiva 95-08 (D-95-08): “Requerimientos Generales para la Importación de Fruta Fresca de Clima	Canadá