

# **METHYL BROMIDE CRITICAL USE RENOMINATION FOR POST-HARVEST USE TREATMENT OF DRY, CURED PORK PRODUCTS**

## **EXECUTIVE SUMMARY**

The dried cured pork product industry currently has no viable chemical alternative available. Although its IPM measures may have reduced the number of times fumigation is needed, IPM has not eliminated the need for fumigation. Currently there are no alternatives to methyl bromide for this industry: phosphine does not control mites (a major pest) and heat would alter the product. Sulfuryl fluoride received federal registration and is now being tested for efficacy against the mites and other pests of cured meat products, but results are not yet available. At the time of this nomination there are no registered alternatives for use on hams in the U.S. that provide the same level of pest control as methyl bromide. Therefore, methyl bromide remains critical to this industry.

# METHYL BROMIDE CRITICAL USE RENOMINATION NOMINATION FOR STRUCTURES, COMMODITIES OR OBJECTS

## NOMINATING PARTY:

The United States of America

## NAME

USA CUN10 POST HARVEST -- DRY, CURED PORK PRODUCTS

## BRIEF DESCRIPTIVE TITLE OF NOMINATION:

Methyl Bromide Critical Use Nomination for Post Harvest Use on Dry Cured Pork Products (Submitted in 2008 for 2010 Use Season)

## STRUCTURE, COMMODITY OR OBJECT TREATED:

This sector is for the production of cured meat products, such as country hams. These are produced primarily in the southern U.S. This sector has no viable alternatives available. Heat would destroy the product and phosphine does not control mites on the curing hams. Sulfuryl fluoride was registered nationally in mid-July 2005 for use on this commodity and is currently being tested to determine its efficacy on the primary pests, especially mites.

## QUANTITY OF METHYL BROMIDE REQUESTED IN EACH YEAR OF NOMINATION:

TABLE COVER SHEET: QUANTITY OF METHYL BROMIDE REQUESTED IN EACH YEAR OF NOMINATION

YEAR	NOMINATION AMOUNT (KILOGRAMS)
2010	4.465

## SUMMARY OF ANY SIGNIFICANT CHANGES SINCE SUBMISSION OF PREVIOUS NOMINATIONS:

The amount of this nomination has reduced greatly due to improved data on the usage and need of methyl bromide in the United States for this sector.

## REASON OR REASONS WHY ALTERNATIVES TO METHYL BROMIDE ARE NOT TECHNICALLY AND ECONOMICALLY FEASIBLE:

It is common for producers of cured pork products to experience pest pressure from insects such as the ham skipper, the red legged ham beetle, dermestid beetles, and mites. These pests infest and feed on meat, especially deep inside the meat along the bone, as it cures and ages. Environmental conditions (temperature and humidity) in and around the facility strongly influence the level of pest pressure. Under favorable ambient conditions, such as those seen in silo curing, pest pressure increases and a regular fumigation schedule is recommended. In the U.S., the Food and Drug Administration (FDA) regulates the maximum levels of live or dead insects or insect parts that may be present in stored food products. Food commodities that

exceed maximum limits allowed are considered adulterated by FDA and thus unfit for human consumption.

Currently there are no viable alternatives to methyl bromide for the dried meat industry: phosphine does not control mites (a major pest) and heat would alter the product. Sulfuryl fluoride received federal registration and is now being tested for efficacy against the mites and other pests of cured meat products, but results are not yet available. At the time of this nomination there are no registered alternatives for use on hams in the U.S. that provide the same level of pest control as methyl bromide.

This industry is cooperating with university researchers to find technically and economically feasible alternatives to methyl bromide. In the meantime, several companies have modified their buildings to make them more gas-tight. Some companies are eliminating grass, trees, and shrubs from their buildings and replacing it with gravel, as suggested by researchers last year. Many use pheromone traps; however, these traps only used for monitoring purposes at this time (Arthur and Phillips, 2003).

This industry currently has no viable chemical alternative available. Although its IPM measures may have reduced the number of times fumigation is needed, it has not eliminated the need for fumigation. Therefore, methyl bromide remains critical to this industry.

*(Details on this page are requested under Decision Ex. I/4(7), for posting on the Ozone Secretariat website under Decision Ex. I/4(8))*

*This form is to be used by holders of single-year exemptions to reapply for a subsequent year's exemption (for example, a Party holding a single-year exemption for 2005 and/or 2006 seeking further exemptions for 2007). It does not replace the format for requesting a critical-use exemption for the first time.*

*In assessing nominations submitted in this format, TEAP and MBTOC will also refer to the original nomination on which the Party's first-year exemption was approved, as well as any supplementary information provided by the Party in relation to that original nomination. As this earlier information is retained by MBTOC, a Party need not re-submit that earlier information.*

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Following the requirements of Decision IX/6 paragraph (a)(1) [*insert name of Party*] has determined that the specific use detailed in this Critical Use Nomination is critical because the lack of availability of methyl bromide for this use would result in a significant market disruption. X Yes  No

\_\_\_\_\_  
 Signature Name Date  
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**LIST OF DOCUMENTS SENT TO THE OZONE SECRETARIAT IN OFFICIAL NOMINATION PACKAGE:**

<b>1. PAPER DOCUMENTS:</b>	<b>No. of pages</b>	<b>Date sent to Ozone Secretariat</b>
<b>Title of paper documents and appendices</b>		
USA CUN10 Post Harvest Dry, Cured Pork Products		
<b>2. ELECTRONIC COPIES OF ALL PAPER DOCUMENTS:</b>	<b>No. of kilobytes</b>	<b>Date sent to Ozone Secretariat</b>
<b>*Title of each electronic file (for naming convention see notes above)</b>		
USA CUN10 Post Harvest Dry, Cured Pork Products		

\* Identical to paper documents

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## Part A: SUMMARY INFORMATION

### 1. NOMINATING PARTY AND NAME:

The United States of America  
USA CUN10 POST HARVEST DRY, CURED PORK PRODUCTS

### 2. DESCRIPTIVE TITLE OF NOMINATION:

Methyl Bromide Critical Use Nomination for Post Harvest Use on Dry, Cured Pork Products  
(Submitted in 2008 for 2010 Use Season)

### 3. YEAR FOR WHICH EXEMPTION SOUGHT: 2010

**TABLE A.1: QUANTITY OF METHYL BROMIDE REQUESTED IN EACH YEAR OF NOMINATION**

YEAR	NOMINATION AMOUNT (METRIC TONNES)
2010	4.465

### 4. SUMMARY OF ANY SIGNIFICANT CHANGES SINCE SUBMISSION OF PREVIOUS NOMINATIONS (e.g. changes to requested exemption quantities, successful trialling or commercialisation of alternatives, etc.)

The amount of this nomination has reduced greatly due to improved data on the usage and need of methyl bromide in the United States for this sector.

Currently there are no viable alternatives to methyl bromide for the dried meat industry: phosphine does not control mites (a major pest) and heat would alter the product. Sulfuryl fluoride received federal registration and is now being tested for efficacy against the mites and other pests of cured meat products, but results are not yet available. At the time of this nomination there are no registered alternatives for use on hams in the U.S. that provide the same level of pest control as methyl bromide.

This industry is cooperating with university researchers to find technically and economically feasible alternatives to methyl bromide. In the meantime, this industry is using IPM techniques to manage their pest populations. All use sanitation to keep their curing facilities clean. Several companies have modified their buildings to make them more gas-tight. Some companies are eliminating grass, trees, and shrubs from their buildings and replacing it with gravel, as suggested by researchers last year. Many use pheromone traps; however, these traps only used for monitoring purposes at this time (Arthur and Phillips, 2003).

This industry currently has no viable chemical alternative available. Although its IPM measures may have reduced the number of times fumigation is needed in some facilities, it has not eliminated the need for fumigation. Therefore, methyl bromide remains critical to this industry.

## Part B: TRANSITION PLANS

*Provision of a National Management Strategy for Phase-out of Methyl Bromide is a requirement under Decision Ex. I/4(3) for nominations after 2005. The time schedule for this Plan is different than for CUNs. Parties may wish to submit Section 21 separately to the nomination.*

### **5. DESCRIBE MANAGEMENT STRATEGIES THAT ARE IN PLACE OR PROPOSED TO ELIMINATE THE USE OF METHYL BROMIDE FOR THE NOMINATED CRITICAL USE, INCLUDING:**

1. Measures to avoid any increase in methyl bromide consumption except for unforeseen circumstances;
2. Measures to encourage the use of alternatives through the use of expedited procedures, where possible, to develop, register and deploy technically and economically feasible alternatives;
3. Provision of information on the potential market penetration of newly deployed alternatives and alternatives which may be used in the near future, to bring forward the time when it is estimated that methyl bromide consumption for the nominated use can be reduced and/or ultimately eliminated;
4. Promotion of the implementation of measures which ensure that any emissions of methyl bromide are minimised;
5. Actions to show how the management strategy will be implemented to promote the phase-out of uses of methyl bromide as soon as technically and economically feasible alternatives are available, in particular describing the steps which the Party is taking in regard to subparagraph (b) (iii) of paragraph 1 of Decision IX/6 in respect of research programmes in non-Article 5 Parties and the adoption of alternatives by Article 5 Parties.

The U.S. has previously submitted the National Management Strategy in accordance with Decision IX/6.

## Part C: TRANSITION ACTIONS

*Responses should be consistent with information set out in the applicant's previously-approved nominations regarding their transition plans, and provide an update of progress in the implementation of those plans.*

*In developing recommendations on exemption nominations submitted in 2003 and 2004, the Technology and Economic Assessment Panel in some cases recommended that a Party should explore the use of particular alternatives not identified in a nomination's transition plans. Where the Party has subsequently taken steps to explore use of those alternatives, information should also be provided in this section on those steps taken.*

*Questions 5 - 9 should be completed where applicable to the nomination. Where a question is not applicable to the nomination, write "N/A".*

### **6. TRIALS OF ALTERNATIVES**

*Where available, attach copies of trial reports. Where possible, trials should be comparative, showing performance of alternative(s) against a methyl bromide-based standard*

#### **(i) DESCRIPTION AND IMPLEMENTATION STATUS:**

In the spring of 2007 a proposal was submitted to USDA CSREES Integrated Research, Education, and Extension Competitive Grants Program- Methyl Bromide Transitions by several meat scientists and an entomologist. This proposal was recently funded for the next three years.

There are several objectives to this multiple year research program: First is to determine the effectiveness of chemical controls (sulfuryl fluoride, phosphine, and methyl bromide) against all life stages of both mold mites (*Tyrophagus putrescentiae*) and red legged ham beetles (*Necrobia rufipes*). Second objective is to determine the effectiveness of carbon dioxide and ozone against all life stages of both mold mites and red legged ham beetles. The third objective is to test the effects of sulfuryl fluoride, phosphine and methyl bromide on the quality and safety of the dry cured hams. The fourth objective is to conduct an economic analysis of the alternatives demonstrated to be technically viable alternatives for methyl bromide in this industry.

The research will be initially conducted under laboratory conditions. The treatments that are effective under laboratory settings will then be tested in industrial and commercial conditions. In addition to dry cured ham products, some of the biological studies will also be conducted on cheese, as the pests and conditions are the same.

To date there have been no efficacy studies to address the potential of alternatives, such as sulfuryl fluoride, to control critical pests under commercial conditions.

**(ii) OUTCOMES OF TRIALS:** *(Include any available data on outcomes from trials that are still underway. Where applicable, complete the table included at [Appendix I](#) identifying comparative disease ratings and yields with the use of methyl bromide formulations and alternatives. )*

From the 2006 MBO conference in Orlando, Florida, the scientists presented the results of their survey from early 2006. Sixty-five percent of the plants that were surveyed report using methyl bromide as a fumigant to control mite (*T. putrescentiae*) and/or red legged beetle (*N. rufipes*) infestations in their hams. Methyl bromide usage was 67, 60, and 67 % for plants in North Carolina, Kentucky, and Virginia, respectively. (Rentfrow, et al. 2006)

It was also reported that fumigation occurs from 1 to 5 times per year when methyl bromide is used by a plant. The survey also tried to determine the differences between the seven plants that had no problems with those facilities that did report problems. The primary result was that the longer the hams were aged the more problems with mites and/or beetles were reported. However, the long aging time is necessary for a high quality product. Some of the recommendations that resulted from the survey include cleaning and sanitizing the aging room as much as possible. It is also recommended to have an area devoid of grass, trees, and shrubs around the ham house; in fact it is better if that area is gravel. (Rentfrow, et al. 2006)

The researchers at the 2007 MBO, in San Diego, CA., presented information regarding the fumigation of slices of ham with sulfur dioxide. This initial investigation was to provide information regarding the effect of sulfur dioxide fumigation on the quality and safety of dry cured ham. The initial results indicate a linear relationship between the fumigation concentration and fluoride residue concentration in the ham. Significant differences existed ( $p < 0.05$ ) among all treatments with mean values of 0.1, 12.4, 24.9, and 35.4 ppm for 0, 12, 24, and 36 g/L of sulfur dioxide, respectively. This signifies that the 24 g/L and 36 g/L treatments may not be usable since 20 ppm is the legal limit for fluoride in hams. However, the surface area would be much smaller in commercial applications since whole hams would be fumigated and not ham slices. Therefore, further trials need to be performed to determine the exact levels that could be utilized under real world conditions. However, it is evident that the dry cured hams will absorb fluoride from sulfur dioxide fumigation. (Schilling, et al. 2007)

**(iii) IMPACT ON CRITICAL USE NOMINATION/REQUIRED QUANTITIES:** *(For example, provide advice on any reductions to the required quantity resulting from successful results of trials.)*

The critical use nominated for this sector is based on information provided by both fumigation companies that service this sector and by the registrants of methyl bromide. This sector has made some modifications to buildings and their surroundings in order to reduce pest pressures thereby reducing some methyl bromide fumigations. However, at this time, research has not found any way to reduce methyl bromide applications when pests have infested facilities. There is no known viable alternative for dry cured meat products; therefore, the nominated amount has not been changed.

During the preparation of this nomination the USG has accounted for all identifiable means to reduce the request. Specifically, approximately 13 million kilograms of methyl bromide were requested by methyl bromide users across all sectors. USG carefully scrutinized requests and made subtractions to ensure that no growth, double counting, inappropriate use rates on a treated hectare basis was incorporated into the final request. Use when the requestor qualified under

some other provision (QPS, for example) was also removed and appropriate transition given yields obtained by alternatives and the associated cost differentials, was factored in. As a result of all these changes, the USG is requesting roughly 1/3 of that amount.

Therefore, due to the absence of technically and economically feasible alternatives, USG feels that no additional reduction in methyl bromide quantities is necessary, given the significant adjustments described above.

#### **(iv) ACTIONS TO ADDRESS ANY DELAYS/OBSTACLES IN CONDUCTING OR FINALISING TRIALS:**

Research takes both time and financial resources. The above experiments are continuing and require more time in order to complete. After the data are analyzed, the results will dictate what further actions will be needed. Any further investigations will need appropriate funding, most likely through competitive grants.

The USG has the ability to authorize Experimental Use Permits (EUPs) for large scale field trials for methyl bromide alternatives. As with other activities connected with registration of a pesticide, the USG has no legal authority either to compel a registrant to seek an EUP or to require growers to participate.

As noted in our previous nomination, the USG provides a great deal of funding and other support for agricultural research, and in particular, for research into alternatives for methyl bromide. This support takes the form of direct research conducted by the Agricultural Research Service (ARS) of USDA, through grants by ARS and CSREES, by IR-4, the national USDA-funded project that facilitates research needed to support registration of pesticides for specialty crop vegetables, fruits and ornamentals, through funding of conferences such as MBO, and through the land grant university system. As noted above, USG has provided seed money to fund research into alternatives for methyl bromide use in the production of dry-cured pork products.

Even though this is a very small industry composed mainly of independent, family-owned facilities, they are interested in participating with researchers to find a better method to control their pest problems. This industry is at a disadvantage in that it is so small and therefore its research funding potential is limited. In addition it cannot use any surrogate data from other sources, since its product is so unique.

## **7. TECHNOLOGY TRANSFER, SCALE-UP, REGULATORY APPROVAL FOR ALTERNATIVES**

### **(i) DESCRIPTION AND IMPLEMENTATION STATUS:**

At the current time, there are no available alternatives in this sector for launch and uptake by the industry.

The USDA maintains an extensive technology transfer system, the Agricultural Extension Service. This Service is comprised of researchers at land grant universities, county extension agents, and private pest management consultants. In addition to these sources of assistance for

technology transfer, there are trade organizations and grower groups, some of which are purely voluntary but most with some element of institutional compulsion, that exist to conduct research, provide marketing assistance, and to disseminate “best practices.”

**(ii) OUTCOMES ACHIEVED TO DATE FROM TECHNOLOGY TRANSFER, SCALE-UP, REGULATORY APPROVAL:**

See 7(i)

**(iii) IMPACT ON CRITICAL USE NOMINATION/REQUIRED QUANTITIES:** *(For example, provide advice on any reductions to the required quantity resulting from successful progress in technology transfer, scale-up, and/or regulatory approval.)*

The amount of this nomination has reduced greatly due to improved data on the usage and need of methyl bromide in the United States for this sector.

During the preparation of this nomination the USG has accounted for all identifiable means to reduce the request. Specifically, approximately 13 million kilograms of methyl bromide were requested by methyl bromide users across all sectors. USG carefully scrutinized requests and made subtractions to ensure that no growth, double counting, inappropriate use rates on a treated hectare basis was incorporated into the final request. Use when the requestor qualified under some other provision (QPS, for example) was also removed and appropriate transition given yields obtained by alternatives and the associated cost differentials, was factored in. As a result of all these changes, the USG is requesting roughly 1/3 of that amount.

The USG feels that no additional reduction in methyl is necessary.

**(iv) ACTIONS TO ADDRESS ANY DELAYS/OBSTACLES:**

At this time, an alternative to the use of methyl bromide in this sector has not been identified.

Research takes both time and financial resources. The above experiments are continuing and require more time in order to complete. After the data are analyzed, the results will dictate what further actions will be needed. Any further investigations will need appropriate funding, most likely through competitive grants. In addition, extension education (publications, websites) and industry engagement via trade-shows and conferences, and other venues (like the Methyl Bromide Alternatives Outreach Annual Meetings) will be pursued. Some groups will hold hands-on training and demonstrations.

USG has no legal authority to compel registrations; it can only act on registrations requested by private entities. The timely submission of data to support a registration decision is at the sole discretion of the registrant. Please see table above for additional detail.

**8. COMMERCIAL SCALE-UP/DEPLOYMENT, MARKET PENETRATION OF ALTERNATIVES**

**(i) DESCRIPTION AND IMPLEMENTATION STATUS:**

At this time, an alternative to the use of methyl bromide in this sector has not been identified.

**(ii) IMPACT ON CRITICAL USE NOMINATION/REQUIRED QUANTITIES:** *(For example, provide advice on any reductions to the required quantity resulting from successful commercial scale-up/deployment and/or market penetration.)*

Due to lack of technically feasible alternatives, no additional change in methyl bromide quantity requested is necessary on the basis of commercial scale up and/or market penetration.

**(iii) ACTIONS TO ADDRESS ANY DELAYS/OBSTACLES:**

USG has no legal authority to compel registrations; it can only act on registrations requested by private entities. The timely submission of data to support a registration decision is at the sole discretion of the registrant. Please see table above for additional detail

The USDA maintains an extensive technology transfer system, the Agricultural Extension Service. This Service is comprised of researchers at land grant universities and county extension agents in addition to private pest management consultants. In addition to these sources of assistance for technology transfer, there are trade organizations and user groups, some of which are purely voluntary but most with some element of institutional compulsion, that exist to conduct research, provide marketing assistance, and to disseminate “best practices”.

**9. CHANGES TO TRANSITION PROGRAM**

*If the transition program outlined in the Party’s original nomination has been changed, provide information on the nature of those changes and the reasons for them. Where the changes are significant, attach a full description of the revised transition program.*

Because there are no technically and economically feasible alternative, there are no changes to the transition program outlined in the original nomination.

See Appendix A

**10. OTHER BROADER TRANSITION ACTIVITIES**

*Provide information in this section on any other transitional activities that are not addressed elsewhere. This section provides a nominating Party with the opportunity to report, where applicable, on any additional activities which it may have undertaken to encourage a transition, but need not be restricted to the circumstances and activities of the individual nomination. Without prescribing specific activities that a nominating Party should address, and noting that individual Parties are best placed to identify the most appropriate approach to achieve a swift transition in their own circumstances, such activities could include market incentives, financial support to exemption holders, labelling, product prohibitions, public awareness and information campaigns, etc.*

Same as for 8(i).

## Part D: REGISTRATION OF ALTERNATIVES

*Progress in registration of a product will often be beyond the control of an individual exemption holder as the registration process may be undertaken by the manufacturer or supplier of the product. The speed with which registration applications are processed also can fall outside the exemption holder's control, resting with the nominating Party. Consequently, this section requests the nominating Party to report on any efforts it has taken to assist the registration process, but noting that the scope for expediting registration will vary from Party to Party.*

### **11. PROGRESS IN REGISTRATION**

*Where the original nomination identified that an alternative's registration was pending, but it was anticipated that one would be subsequently registered, provide information on progress with its registration. Where applicable, include any efforts by the Party to "fast track" or otherwise assist the registration of the alternative.*

Currently there are no identified viable alternatives to the dry cured pork product sector.

USG has no legal authority to compel registrations; it can only act on registrations requested by private entities. The timely submission of data to support a registration decision is at the sole discretion of the registrant. Please see table above for additional detail.

### **12. DELAYS IN REGISTRATION**

*Where significant delays or obstacles have been encountered to the anticipated registration of an alternative, the exemption holder should identify the scope for any new/alternative efforts that could be undertaken to maintain the momentum of transition efforts, and identify a time frame for undertaking such efforts.*

No chemical companies have submitted a request of a new chemical for registration.

USG has no legal authority to compel registrations; it can only act on registrations requested by private entities. The timely submission of data to support a registration decision is at the sole discretion of the registrant. USG endeavors to identify methyl bromide alternatives to move them forward in the registration queue. However USG has no legal authority to compel registrations; it can only act on registrations requested by private entities. The timely submission of data to support a registration decision is at the sole discretion of the registrant.

The USDA maintains an extensive technology transfer system, the Agricultural Extension Service. This Service is comprised of researchers at land grant universities and county extension agents in addition to private pest management consultants. In addition to these sources of assistance for technology transfer, there are trade organizations and grower groups, some of which are purely voluntary but most with some element of institutional compulsion, that exist to conduct research, provide marketing assistance, and to disseminate "best practices". The California Strawberry Commission is one example of such a grower group.

### **13. DEREGISTRATION OF ALTERNATIVES**

*Describe new regulatory constraints that limit the availability of alternatives. For example, changes in buffer zones, new township caps, new safety requirements (affecting costs and feasibility), and new environmental restrictions such as to protect ground water or other natural resources. Where a potential alternative identified in the original nomination's transition plan has subsequently been deregistered, the nominating Party would report the deregistration, including reasons for it. The nominating Party would also report on the deregistration's impact (if any) on the exemption holder's transition plan and on the proposed new or alternative efforts that will be undertaken by the exemption holder to maintain the momentum of transition efforts.*

No chemicals have been de-registered. However, methyl bromide use on structures, commodities, and post harvest treatments was reregistered in the US last year. The proposed mitigations for that reregistration include a fumigation management plan, treatment buffers to enhance worker safety and ventilation buffers to enhance bystander safety. The proposed buffers are based primarily on use rate, total amount of methyl bromide used, and the type and duration of aeration. The Reregistration Eligibility Decision for methyl bromide post harvest uses is available at: [http://www.epa.gov/oppsrrd1/REDs/methyl\\_bromide\\_tred.pdf](http://www.epa.gov/oppsrrd1/REDs/methyl_bromide_tred.pdf).

An additional complication in forecasting changes in the registration of alternatives is that under the US federal system individual states may impose restrictions above those imposed at the Federal level. Examples of these additional restrictions may include increasing buffer zones around facilities and chambers and requiring capture and destruction technology.

## Part E: IMPLEMENTATION OF MBTOC/TEAP RECOMMENDATIONS

*The Methyl Bromide Technical Options Committee and the Technology and Economic Assessment Panel may recommend that a Party explore and, where appropriate, implement alternative systems for deployment of alternatives or reduction of methyl bromide emissions.*

*Where the exemptions granted by a previous Meeting of the Parties included conditions (for example, where the Parties approved a reduced quantity for a nomination), the exemption holder should report on progress in exploring or implementing recommendations.*

*Information on any trialling or other exploration of particular alternatives identified in TEAP recommendations should be addressed in Part C.*

### **14. USE/EMISSION MINIMISATION MEASURES**

*Where a condition requested the testing of an alternative or adoption of an emission or use minimisation measure, information is needed on the status of efforts to implement the recommendation. Information should also be provided on any resultant decrease in the exemption quantity arising if the recommendations have been successfully implemented. Information is required on what actions are being, or will be, undertaken to address any delays or obstacles that have prevented implementation.*

USDA has several grant programs that support research into overcoming obstacles that have prevented the implementation of methyl bromide alternatives. In addition, USEPA and USDA jointly fund an annual meeting on methyl bromide alternatives. At the 2006 MBAO meeting (November, Orlando, Florida) sessions were held to assess and prioritize research needs and to develop a use/emission minimization agenda for methyl bromide alternatives research. The 2007 MBAO meeting (October, San Diego, CA) further deliberations were held to discuss more specific measures. It may take several years for researchers to get funding to support these research goals.

See above.

## Part F: ECONOMIC ASSESSMENT

### 15. ECONOMIC INFEASIBILITY OF ALTERNATIVES – Methodology

An economic analysis was not conducted because this sector has no technically feasible alternatives.

## Part G: CHANGES TO QUANTITY OF METHYL BROMIDE REQUESTED

*This section seeks information on any changes to the Party's requested exemption quantity.*

### 16. CHANGES IN USAGE REQUIREMENTS

*Provide information on the nature of changes in usage requirements, including whether it is a change in dosage rates, the number of hectares or cubic metres to which the methyl bromide is to be applied, and/or any other relevant factors causing the changes.*

The amount of this nomination has reduced greatly due to improved data on the usage and need of methyl bromide in the United States for this sector.

During the preparation of this nomination the USG has accounted for all identifiable means to reduce the request. Specifically, approximately 13 million kilograms of methyl bromide were requested by methyl bromide users across all sectors. USG carefully scrutinized requests and made subtractions to ensure that no growth, double counting, inappropriate use rates on a treated hectare basis was incorporated into the final request. Use when the requestor qualified under some other provision (QPS, for example) was also removed and appropriate transition given yields obtained by alternatives and the associated cost differentials, was factored in. As a result of all these changes, the USG is requesting roughly 1/3 of that amount.

The USG feels that no additional reduction in methyl is necessary.

### 17. RESULTANT CHANGES TO REQUESTED EXEMPTION QUANTITIES

**TABLE G.1: RESULTANT CHANGES TO REQUESTED EXEMPTION QUANTITIES**

QUANTITY REQUESTED FOR PREVIOUS NOMINATION YEAR:	19,669 kg
QUANTITY APPROVED BY PARTIES FOR PREVIOUS NOMINATION YEAR:	18,998 kg
QUANTITY REQUIRED FOR YEAR TO WHICH THIS REAPPLICATION REFERS:	4,465 kg

## Part H: CITATIONS

- Arthur, F. and T. W. Phillips. 2003. Stored-product insect pest management and control, In: Food Plant Sanitation eds: Y. H. Hui, B. L. Bruinsma, J. R. Gorham, W. Nip, P. S. Tong, and P. Ventresca. Marcel Dekker, Inc., New York, pp. 341-358.
- Rentfrow, G., D. J. Hanson, M. W. Schilling, and W. B. Mikel. 2006. Methyl bromide use to combat mite infestations in dry-cured ham during production. Presentation at MBAO, Orlando, Fl. November 8, 2006.
- Schilling, M. W. Assistant Professor of Meat Science, Mississippi State University. Personal Communication on 10/13/2006.
- Schilling, M.W., R. K. Sekhon, T. W. Phillips, and W. B. Mikel. 2007. Sulfuryl fluoride fumigation effect on the composition of dry cured ham slices. Presented at MBAO, San Diego, CA. October 30, 2007.

**APPENDIX A 2009 METHYL BROMIDE USAGE NEWER NUMERICAL INDEX EXTRACTED (BUNNIE)**

2010 Methyl Bromide Usage Newer Numerical Index - BUNNIE						Dry Cured Pork Products	
January 16, 2008	Region	Gwaltney of Smithfield	National Country Ham Association	Nahunta Pork Center	American Assoc. of Meat Processors	Sector Total	Notes
Dichotomous Variables	Currently Use Alternatives?	Yes	Yes	Yes	Yes		
	Pest-free Requirements?	Yes	Yes	Yes	Yes		
Other Issues	Frequency of Treatment of Product	1x per year	1x per year	1x per year	1x per year		
	Quarantine & Pre-Shipment Removed?	Yes	Yes	Yes	Yes		
Most Likely Combined Impacts (%)	Regulatory Issues (%)	0%	0%	0%	0%		
	Key Pest Distribution (%)	100%	100%	100%	100%		
	<b>Total Combined Impacts (%)</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>		
Most Likely Baseline Transition	(%) Able to Transition	0%	0%	0%	0%		
	Minimum # of Years Required	0	0	0	0		
	<b>(%) Able to Transition per Year</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>		
<b>EPA Adjusted Use Rate (kg/1000m3)</b>		<b>13</b>	<b>17</b>	<b>19</b>	<b>20</b>		
2010 Applicant Requested Usage	Amount - Pounds	6,000	2,738	200	40,000	48,938	
	Volume - 1000ft <sup>3</sup>	6,240	2,650	165	59,600	68,655	
	Rate (lb/1000ft <sup>3</sup> )	0.96	1.03	1.21	1.33	1	
	Amount - Kilograms	2,722	1,242	91	18,144	22,198	
	Volume - 1000m <sup>3</sup>	177	75	5	850	1,106	
	Rate (kg/1000m <sup>3</sup> )	15	17	19	21	20	
<b>EPA Preliminary Value</b>		<b>726</b>	<b>1,242</b>	<b>91</b>	<b>18,144</b>	<b>20,202</b>	
EPA Baseline Adjusted Value has been adjusted for:		IMBTOC Adjustments, QPS, Double Counting, Growth, Use Rate, Miscellaneous Adjustments, and Combined Impacts					
EPA Baseline Adjusted Value	kgs	726	709	91	2,940	4,465	
EPA Transition Amount	kgs	-	-	-	-	-	
<b>EPA Amount of All Adjustments</b>	<b>kgs</b>	<b>-</b>	<b>(533)</b>	<b>-</b>	<b>(15,204)</b>	<b>(15,737)</b>	
<b>Most Likely Impact Value (kgs)</b>	kgs	<b>726</b>	<b>709</b>	<b>91</b>	<b>2,940</b>	<b>4,465</b>	
	1000m <sup>3</sup>	<b>55</b>	<b>43</b>	<b>5</b>	<b>147</b>	<b>250</b>	
	Rate	<b>13</b>	<b>17</b>	<b>19</b>	<b>20</b>	<b>18</b>	
<b>Sector Research Amount (kgs)</b>		<b>-</b>	<b>2010 Total US Sector Nomination</b>		<b>4,465</b>		

1 Pound = 0.453592 kgs      1000 cubic feet = 0.028316847 1000 cubic meters  
 1 lb/1000 ft<sup>3</sup> = 0.0624 kg/1000 m<sup>3</sup>      (ounces/1000 ft<sup>3</sup> ~ kg/1000 m<sup>3</sup>)