# Office of Environmental Health Hazard Assessment

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## MEMORANDUM

**TO:** Susan Edmiston, Chief
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**FROM:** Anna M. Fan, Ph.D., Chief
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**DATE:** August 27, 2009

**SUBJECT:** COMMENTS ON PROPOSED MITIGATION MEASURES TO CONTROL OFF-SITE AND BYSTANDER SHORT-TERM EXPOSURE TO METAM SODIUM, METAM POTASSIUM AND DAZOMET

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To meet our consultative obligation under Food and Agricultural Code sections 14023-14024, the Office of Environmental Health Hazard Assessment (OEHHA) has reviewed the draft strategy proposed by the Department of Pesticide Regulation (DPR) to control off-site and bystander short-term exposure to methyl isothiocyanate (MITC) following the use of metam sodium, metam potassium and dazomet (*Metam Sodium, Metam Potassium and Dazomet Mitigation to Control Off-Site and Bystander Short-Term Exposure*, July 2009). OEHHA supports DPR's proposed strategy for the mitigation of acute human health risks following the use of metam products that generate the breakdown product, MITC, and recommends that this be transmitted to the County Agricultural Commissioners (CAC) for implementation.

OEHHA believes that these proposed mitigation measures offer significantly more protection to the public than current practices, while still providing CACs with the flexibility to apply previously adopted controls that have successfully limited off-site movement of MITC. However, OEHHA does have the following questions/comments.

5. One of the changes in this current mitigation proposal is the expansion of the buffer zone tables to include additional application methods. Were the buffer zones for these additional application methods developed using the Probabilistic Exposure and Risk Model for Fumigants Version 2 (PERFUM2), as described in the January 27, 2006 DPR memorandum on the development of MITC buffer zones (DPR, 2006)? If so, OEHHA has the following concerns with the use of the PERFUM model.

   A. According to the 2006 DPR memo, the upper limit on field size in PERFUM2 is 40 acres, but the new buffer zone tables in the present draft mitigation proposal include treated areas up to 80 acres. How were the buffer zones for those areas >40 acres determined?

   B. According to the 2009 Draft Risk Characterization Document for Methyl Iodide, DPR does not favor the use of the PERFUM model because using this to estimate the whole field buffer zone does not control the per application buffer zone failure rate. "A 99% whole field buffer zone only guarantees that over 5 years, at 1 application per year, if a single receptor is picked at random from the generalized distribution of air concentrations at the whole field buffer zone distance (independent of the individual applications), there will be a 1% chance that the air concentration at that receptor will be greater than the threshold concentration…The 99% whole field buffer zone per application failure rates were…7.5% to 22% for metam sodium (8-hour TWA)" (DPR, 2009). Has DPR recalculated all of the buffer zones using a different model? Was the methodology for developing the previous buffer zones harmonized with the methodology for determining the new buffer zones to ensure consistency? This should be briefly described in the mitigation proposal.

Minor comments:
p. 4, line 2: add period at the end of the sentence.
p. 4, lines 29 and 38: *hours* should be hour.
p. 4, lines 29, 32, and 38: *inches* should be inch.
p. 4, line 39: *untreated soil available* should be untreated soil must be available.
p. 4, line 40: *1mile* needs a space between 1 and mile.
p. 7, lines 11, 22, and 37: *determine appropriate* should be determine the appropriate.
p. 7, line 21: change *by underway* to be underway.
p. 8, line 27: *determine appropriate* should be determined the appropriate.
p. 8, lines 39-40: *Anytime* at the beginning of the sentence and *any time* at the end of the sentence are redundant.
p. 8, line 41: *criterion* should be criteria.
p. 9, line 2: change *by underway* to be underway.
p. 9, line 3: *Tables* should be Table.
p. 9, line 4: left justify.

1. The document clearly describes the procedural requirements for mitigating off-site and bystander short-term exposure to MITC. However, it would be helpful if the document state the toxicity endpoints, the acute reference exposure level of 22 ppb, and how the target values (220 ppb instead of 22 ppb) for these mitigation measures would be health-protective for the general population as well as for sensitive groups such as children, pregnant women, the elderly, and people who are susceptible to respiratory distress symptoms.

2. Page 12 (numbered points 1b, 1e, and 2) describes the application of metam sodium or metam potassium as a band or to pre-formed beds followed by the placement of 6 inches of untreated soil over the treated area. Is the source of the untreated soil adjacent to the applied band or pre-formed beds? If so, how will the applicators prevent accidental disturbance of the treated soil or mixing of treated and untreated soil during this procedure, which could allow the treated soil to remain on the surface and allow vapor phase MITC to drift?

3. In the Field Monitoring section on page 12, as well as the MITC Control Plan in Appendix III, the post-application conditions that must be recorded are:

   - Wind speed and wind direction at the application site.
   - Air temperature at the completion of application and at 1 hour before sunset.
   - Post-application watering information.
   - Any unusual conditions observed at the worksite (e.g., dry soil conditions, odor, irrigation equipment failure).

   There is no mention of air monitoring for MITC. In fact, the document only mentions odor detection away from the application site and/or symptoms reported off-site as signs of off-site or bystander exposure. In its 2003 Risk Characterization Document for MITC, DPR noted that the observed odor threshold for MITC ranges from 0.2 to 8 ppm, with a geometric mean of 1.7 ppm (DPR, 2003). The odor threshold level is significantly higher than the acute REL of 22 ppb, which is the concentration at or below which no adverse health effects are anticipated for a short-term exposure (DPR, 2003). Therefore, OEHHA questions whether odor detection is a health-protective means of determining off-site exposure, especially in a scenario where persons with reactive airways dysfunction syndrome or other compromised respiratory function could be exposed.

4. Through communication with DPR staff, OEHHA was informed that field monitoring of MITC was hindered by the lack of field instrumentation for accurately detecting MITC. Since the breakdown of metam sodium and MITC in the environment results in measureable air levels of hydrogen sulfide, OEHHA suggests that DPR explore the feasibility of measuring hydrogen sulfide as a surrogate for MITC.

p. 9, line 15: remove colon after *unless*.
p. 9, lines 18, 30, and 41: *determine appropriate* should be determine the appropriate.
p. 10, lines 7, 14, and 36: *determine appropriate* should be determine the appropriate.
~~p. 11, lines 6, 9, 12, 17, 20, 26, and 29: *inches* should be inch.~~
p. 11, line 25: *first* should be First and *apply* should be Apply.
p. 11, line 39: *and the application block...* does not fit in the context of the rest of the sentence.
p. 12, lines 20, 27, 30, and 33: *inches* should be inch.
p. 12, line 24: rate of water application is missing.
p. 15: add line break after line 3.
p. 21, line 8: *inches* should be inch and *hours* should be hour.

We appreciate the opportunity to have worked cooperatively with DPR and look forward to our continued collaboration on any subsequent issues pertaining to the permit conditions for metam sodium, metam potassium and dazomet. If you have any questions, please contact Dr. Elaine Khan at (916) 324-1277, Dr. Charles Salocks at (916) 323-2605, or you may contact me at (510) 622-3165.

References

DPR (2003). Risk Characterization Document: Methyl Isothiocyanate (MITC) Following the Agricultural Use of Metam Sodium. Medical Toxicology Branch, Department of Pesticide Regulation, California Environmental Protection Agency, July 25, 2003.

DPR (2006). Development of Methyl Isothiocyanate Buffer Zones Using the Probabilistic Exposure and Risk Model for Fumigants Version 2 (PERFUM2). Memorandum to Charles Andrews dated January 27, 2006. Environmental Monitoring Branch, Department of Pesticide Regulation, California Environmental Protection Agency.

DPR (2009). Methyl Iodide (Iodomethane) Risk Characterization Document for Inhalation Exposure, DPR and External Review Draft. Medical Toxicology Branch, Department of Pesticide Regulation, California Environmental Protection Agency, March 2009.

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