1896 METHYL ISOTHIOCYANATE (MITC): RISK TO HUMANS FOLLOWING AGRICULTURAL APPLICATIONS OF METAM SODIUM (MS).

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Metam sodium (MS; sodium N-methyldithiocarbamate) is a fumigant used in agriculture as a preplant biocide. The primary degradation product and pesticidal agent, methyl isothiocyanate (MITC), evolves as a gas after MS application. MS gained public attention following the spill of 19, 500 gallons into the Sacramento River in July 1991. Subsequent exposure to airborne MITC and other MS breakdown products caused an array of irritational health effects in local residents. Drift incidents following MS agricultural applications have also resulted in irritational injuries. We evaluated the risks to humans from MITC following normative agricultural use of MS. Exposure of workers and the public was documented in a series of MITC air monitoring studies conducted mainly in the southern Central Valley. The critical acute NOEL of 220 ppb was determined in a human eye-only exposure study, based on eye irritation at 800 ppb. The subchronic NOEL of 100 ppb was based on nasal epithelial atrophy in a 4-week rat inhalation toxicity study; it was es-

timated from the study LOEL of 1.7 ppm using Haber's Law. The chronic NOEL of 10 ppb was calculated by dividing the subchronic NOEL by a default uncertainty factor of 10. Acute margins of exposure (MOE=exposure dose/NOEL) for occupational and application site scenarios ranged between <1 and 59, with many scenarios <10, indicating an acute health concern. The acute MOE range for ambient air scenarios was 15-2200. The seasonal MOE range for occupational/application site scenarios was 1-250, also indicating a health concern. Seasonal ambient air MOEs were 28-166, 667. Annual MOEs were <1-143 for occupational/application site exposures and 5-25, 000 for ambient air exposures. While some monitoring studies were not done using currently approved application methods, this evaluation does indicate a clear health concern for individuals exposed to airborne MITC near fields under treatment with MS.