

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY**

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**INTEROFFICE COMMUNICATION**

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January 14, 2016

TO: Dimethylsilane File (CAS # 1111-74-6)  
FROM: Mike Depa, Toxics Unit, Air Quality Division  
SUBJECT: Update of screening level for Dimethylsilane

The initial threshold screening level (ITSL) for dimethylsilane is 30  $\mu\text{g}/\text{m}^3$  (annual averaging time).

Previously, the averaging time (AT) assigned to dimethylsilane was 24 hours, as per the default methodology (Rule 232(2)(b))(see attached memo from Gary Butterfield dated August 10, 2010). The current file review concludes that the AT may appropriately be set at annual, based on the nature and duration of the key study and the ITSL value derivation, as allowed under Rule 229(2)(b). Therefore, the AT is set to annual.

# MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

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## INTEROFFICE COMMUNICATION

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TO: Dimethylsilane File (CAS # 1111-74-6)

FROM: Gary Butterfield

SUBJECT: Review/update of screening level for Dimethylsilane

DATE: August 10, 2010

Dimethylsilane had a default ITSL established in the early 1990s due to a lack of available toxicity data. Literature searches conducted June 21, 2010 also did not find any published toxicity studies for this chemical upon which the ITSL could be set. The following references or databases were searched to identify data to determine the screening level: U.S. Environmental Protection Agency (EPA) Integrated Risk Information System (IRIS), National Institute for Occupational Safety and Health (NIOSH) Registry for Toxic Effects of Chemical Substances (RTECS), American Conference of Governmental and Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), Michigan Department of Environmental Quality (DEQ) library, International Agency for Research on Cancer (IARC) Monographs, Chemical Abstract Service (CAS) Online (1968 - June 2010), National Library of Medicine (NLM) - Toxline and National Toxicology Program (NTP) Status Report.

Due to a lack of available toxicity data on dimethylsilane, other possible means for establishing a screening level were considered. There have been several different substituted silane compounds reviewed in the past for screening level development. Some of those chemicals were looked at again. A trend indicating that with greater substitution the degree of toxicity of the silane compound decreases can be observed. This trend can also be seen when comparing the silane (CAS # 7803-62-5) screening level (30  $\mu\text{g}/\text{m}^3$  24-hour) to the higher substituted trimethyl silane (CAS # 993-07-7) screening level (340  $\mu\text{g}/\text{m}^3$  annual) and tetramethylsilane (CAS # 75-76-3) screening level (1300  $\mu\text{g}/\text{m}^3$  annual). In other words, dimethylsilane would probably be less toxic than the unsubstituted silane. Following this logic, because the dimethylsilane may be assumed to be less toxic than silane, the dimethylsilane ITSL (if there was toxicity data available) would probably be greater than the silane ITSL. This leads to the conclusion that using the ITSL for silane as a substitute for a dimethylsilane ITSL would probably be sufficiently protective for toxic effects from dimethylsilane exposure. Therefore, it is considered to be appropriate to set the dimethylsilane ITSL at 30  $\mu\text{g}/\text{m}^3$  with 24-hour averaging (equivalent to the silane ITSL) rather than continue use of the overly protective default ITSL of 0.1  $\mu\text{g}/\text{m}^3$  with annual averaging.

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