MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: File for Hydrazine (CAS No. 302-01-2)

FROM: Mike Depa, Air Quality Division

DATE: September 11, 2015

SUBJECT: Screening Level

The initial risk screening level (IRSL) and secondary risk screening level (SRSL) for hydrazine were established in 1991 (see attached memo) from a U.S. Environmental Protection Agency (EPA) inhalation unit risk of 4.9E-3 per µg/m³ (EPA, 1991) as follows:

$$\text{IRSL} = \frac{1\text{E-}6}{4.9\text{E-}3\ (\mu g/m^3)^{-1}} = 0.002\ \mu g/m3\ \text{(annual averaging time)}$$

$$\text{SRSL} = \frac{1\text{E-}5}{4.9\text{E-}3\ (\mu g/m^3)^{-1}} = 0.02\ \mu g/m3\ \text{(annual averaging time)}$$

EPA calculated the inhalation unit risk from an oral slope factor of 1.7E+1 per (mg/kg)/day as follows:

Inhalation Unit Risk = Oral Slope Factor x 20m³/70kg
Inhalation Unit Risk = 1.7E+1 per (mg/kg)/day x 20m³/70kg x 1mg/1000µg
Inhalation Unit Risk = 4.857E-3 per µg/m³

Reference:
EPA. 1991. U.S. Environmental Protection Agency (EPA) Integrated Risk Information System (IRIS) Hydrazine.

Michigan Department of Natural Resources

Interoffice Communication

Nov. 26, 1991

To: Hydrazine File

From: Gary Butterfield

Subject: Updating the AAC

A review of EPA's IRIS database found that in 1987 EPA produced a verified inhalation carcinogenicity assessment for hydrazine. EPA based that assessment on the study reported by MacEwen et al (1981). A review of that study shows it to be a complete oncogenicity assay using several species that included mice, hamsters, rats and dogs. Animals were exposed to hydrazine vapors for one year and then observed for an extended period of time. In the development of an AAC this study is superior to oral studies because it is more desirable to base the AAC on inhalation data. In addition to route, this study also has the advantage of exposing the animals to hydrazine. The oral studies typically use hydrazine sulfate dissolved in water or other solvent rather than hydrazine. The respiratory tract tumors produced by both routes of administration show that the tumor endpoint of the inhalation route is also consistent with the oral studies. Therefore, the most appropriate data upon which to base the AAC is the MacEwen inhalation study as utilized in EPA IRIS, with a resultant value of 2 E-4 $\mu g/m^3$.

References

MacEwen et al. 1981. chronic inhalation toxicity of hydrazine : oncogenic effects. AFAMRL TR-81-56.

EPA IRIS. 1991.

EPA. 1984. Health and environmental effects profile for hydrazine and hydrazine sulfate.