MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: File for N,N-Dimethylformamide (CAS # 68-12-2)

FROM: Robert Sills, AQD Toxics Unit Supervisor

SUBJECT: Screening levels for N,N-Dimethylformamide

DATE: August 13, 2015

The initial threshold screening level (ITSL) for N,N-Dimethylformamide (DMF) is 30 µg/m^3 with an annual averaging time (AT). The ITSL was established on 8/23/90, at 30 µg/m^3 with a 24-hr AT as per the default AT (Rule 232(2)(b). The AT is being changed at this time to annual, as allowed under Rule 229(1)(c) as discussed below.

The basis for the ITSL is EPA (1990; IRIS) which established an RfC of 30 ug/m^3. The RfC is based on human occupational studies which identified digestive disturbances and minimal hepatic changes suggestive of liver abnormalities. The LOAEL was 22 mg/m^3; the $LOAEL_{ADJ}$ and $LOAEL_{HEC}$ were 7.9 mg/m^3 (EPA, 1990). The two key studies involved occupational exposures for an average of 5 years (range of 1 to 15 years), and, more than 5 years, respectively. EPA (1990) applied a total uncertainty factor (UF_T) of 300, consisting of UF_H = 10, and a factor of 30, "…to account for the use of a LOAEL, the lack of reproductive toxicity data, and the less than chronic duration of exposure." AQD will retain this UF_T . However, the AT is being changed from 24 hours to annual as justified by the duration of the exposure in the key studies and the adjustment to chronicity in the UF_T that is applied in deriving the RfC and the ITSL.

$$ITSL = \frac{NOAEL_{HEC}}{UF_T} = \frac{7900\ \mu g/m^3}{300} = 26.3\ \mu g/m^3 \sim 30\ ug/m^3 \text{ (annual AT)}$$

References

EPA. 1990. IRIS database. Chemical entry for N,N-Dimethylformamide. Inhalation RfC assessment. Last revised 10/1/90. Still current as of 8/13/15.

RS:lh