

ATTACHMENT 8

Memo

Date: April 4, 2007

To: Tim Scherkenbach
Assistant Commissioner
Minnesota Pollution Control Agency

From: John Linc Stine, Division Director
Environmental Health Division
Minnesota Department of Health 

Subject: Hazard Determination of PFOA and PFOS

This memorandum is in response to your question regarding the potential for perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) to pose a substantial present or potential hazard to human health.

The Minnesota Department of Health (MDH) has determined that the chemicals are toxic in studies of laboratory animals and that the toxicity observed in these studies is relevant to humans. The health effect found in monkeys, rats and mice at the lowest doses that produce toxicity was increased liver weight along with clinical symptoms and histological evidence of liver toxicity (Butenoff et al. 2002; Sibinski 1987; Seacat et al., 2002; and other papers documented in the attachment). At similar doses or higher doses these chemicals also alter thyroid hormone levels and affect development in animals exposed during gestation (Seacat et al., 2002; Lau et al, 2003 and 2006; Wolf et al., 2007, Thomford 2001). Additional effects occur at higher levels: PFOA exposure to mice during gestation reduces pup survival and mammary gland development (White et al., 2007; Lau et al, 2006; Wolf et al., 2007) and PFOS exposure to mice affects the immune system (Peden-Adams et al., 2006). The MDH based the risk assessment for these chemicals primarily on the results of monkey studies, in part because the chemicals' biological mechanisms in monkeys are likely to be most similar and relevant to humans.

Rats exposed to high levels of either chemical develop tumors in the liver and other sites. The tumor sites occur in the same organs that are the most sensitive to the health effects noted above. Prevention of these sensitive, precursor effects will protect against the subsequent development of tumors. In addition, humans are not as sensitive as rats to what is believed to be the major mechanism action for inducing liver tumors.

The MDH has used the toxicity studies, information about the accumulation of each chemical in humans compared to animals, and standard risk assessment procedures to develop an oral reference dose for each chemical.

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The reference dose is combined with an appropriate water intake (encompassing 95 percent of the population) to develop Health Based Values for drinking water, which are described in the attached memos. The values (0.5 ug/L for PFOA and 0.3 ug/L for PFOS) represent a level at which no health effects to humans are anticipated. The findings and resources used to develop these findings are listed in the attachments.

PFOS has been found in some fish samples. The MDH issued fish consumption advice recommending limiting meals of certain fish in order to keep the public's exposure to PFOS from fish below the 2002 provisional reference dose. The MDH will use the 2007 oral reference dose for PFOS to reevaluate fish tissue concentrations. The MDH anticipates that future fish consumption advice will be more stringent (a lower PFOS level in fish fillets will trigger advice to limit consumption of fish).

PFOA and PFOS have been found in drinking water in Lake Elmo and Oakdale. When well results exceeded MDH guidelines or Health Based Values the MDH issued well advisories that recommended that the residents should not drink the water or use it for cooking. The MDH recommended that the residents should use an alternative source of drinking water. This advice has also been shared with the Minnesota Pollution Control Agency in order to guide investigation and remediation, and to provide alternative water supplies to citizens.

In summary, we believe these compounds pose a substantial present or potential hazard to human health.

Attachments:

PFOA Health Based Value memo with attachment
PFOS Health Based Value memo with attachment

cc: Larry Gust, MDH
Pam Shubat, MDH
Rita Messing, MDH
Paul Hoff, MPCA
Doug Wetzstein, MPCA