STATE OF ALASKA

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

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Dr. Scott Masten, PhD
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National Toxicology Program
National Institute of Environmental Health Sciences
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10-10-11P01:11 RCVD

Dear Dr. Masten,

On behalf of the State of Alaska Department of Environmental Conservation (ADEC), I am submitting a nomination for consideration by the National Toxicology Program (NTP) to conduct additional toxicology studies on sulfolane.

Sulfolane, or tetrahydrothiophene 1, 1-dioxide, is a widely used industrial solvent, especially in the extraction of aromatic hydrocarbon mixtures and purification of natural gas. There are at least 150 sulfolane extraction units in use in the United States. Sulfolane is on the U.S. Environmental Protection Agency's High Production Volume Chemical List that indicates the volume of sulfolane either manufactured or imported into the U.S. exceeds one million pounds per year. At the Flint Hills Resources North Pole Refinery (NPR), sulfolane is used to extract aromatics from naptha to produce gasoline. Its use in the North Pole Refinery began in 1985. It is likely that the releases of sulfolane to the environment began shortly after that. The primary source of sulfolane in the groundwater at the refinery is believed to be historic releases of wastewater and fuel that contained sulfolane, although there were also spills of pure sulfolane. Gasoline is the only current product that requires the sulfolane extraction process, but kerosene and diesel may also contain sulfolane due to mixing in piping and storage areas. The wastewater is known to have had significant concentrations of sulfolane and large volumes of wastewater were released.

Sulfolane was first detected in the groundwater on the refinery in 2000, but not at concentrations considered to be a risk at that time. In October 2009 however,

sulfolane was detected in groundwater downgradient of the NPR facility's property boundaries, impacting residential and commercial drinking water wells. DEC contacted the Alaska Department of Health and Social Services (ADHSS) and, given the exposure to humans, a lower interim cleanup level was adopted until the investigation could be completed.

To date, there are nearly 300 drinking water wells that show detections of sulfolane from the NPR, including the raw water in two public drinking water supply wells for the City of North Pole. On February 14, 2011, the City of North Pole brought online two new drinking water wells to serve as the municipal water source located outside of the plume's capture zone. In addition, an alternative water supply has been provided to private well owners. Drinking water wells have been sampled and a network of monitoring wells has been installed and will continue to be sampled to ensure that concentrations are not increasing and the plume is not growing. The groundwater plume is currently approximately 3.5 miles long and 2 miles wide.

In addition to groundwater sampling, a total of 27 types of vegetable plant parts from seven North Pole gardens were collected during July–September 2010. Sulfolane was found in all parts of plants that were sampled (leaves, fruits, flowers, stems and roots), with the highest concentrations in the leafy produce (e.g., lettuce, beet leaf). Flint Hills Resources has since provided bulk water tanks for those North Pole residents that have impacted well water and wish to garden.

The ADEC is the regulatory agency overseeing the contaminant characterization and cleanup at the NPR site. In March 2010, ADEC formed a Technical Project Team (TPT) that includes experts in environmental investigations and cleanup, state and federal regulatory agencies, University of Alaska, and the responsible parties to direct the response to the contaminant releases on the NPR. The ADEC has been working on assessing the toxicology of sulfolane and determining benchmarks that could be used for site remediation at the site with state and federal partners including ADHSS, the federal Agency for Toxic Substances and Disease Registry (ATSDR), and the Environmental Protection Agency.

The uncertainty surrounding the current body of toxicology literature on sulfolane has been well documented in the ATSDR 2010 and 2011 health consultations on sulfolane. Sulfolane has been shown to be acutely toxic at relatively high doses in a number of species; however, a shortage of data exists on the longer term effects of sulfolane as well as the potential of reproductive and developmental effects. Only limited sub-chronic studies exist and no long-term studies on the effects of sulfolane are available. Given the uncertainties, ATSDR's 2011 health consult recommends a public health action level for chronic exposure to sulfolane in water of 20 parts per billion (ppb) for infants and 70 ppb for adults.

North Pole residents may have been exposed to the chemical for nearly 20 years through their water and garden produce so additional toxicology studies will be

invaluable to them. In addition, more data will be critical in setting an appropriate cleanup level for this site as well as others across the nation. We hope you will seriously consider accepting this chemical into your program. Thank you for your consideration.

Sincerely,

[Redacted]

[Redacted]

Ann Farris
Contaminated Sites Project Manager

Steve Bainbridge
Contaminated Sites Program Manager

Enclosure: ATSDR 2010 Health Consultation and supporting documentation
ATSDR 2011 Health Consultation and supporting documentation
ADHSS 2010 Companion Guide to ATSDR's Health Consultation on Sulfolane
OASIS 2010 Sulfolane and Technical Assistance and Evaluation Report