To: Flowers, Christine B (NIH/NIEHS) [E][bruskec@niehs.nih.gov]
From: Clark, Becki
Sent: Fri 1/17/2014 10:56:55 PM
Subject: Re: WV chem spill update

Thank you, Christine!

From: Flowers, Christine B (NIH/NIEHS) [E] <bruskec@niehs.nih.gov>
Sent: Friday, January 17, 2014 5:38:15 PM
To: Clark, Becki; Grevatt, Peter; 'Wright.davida.@Epa.gov'; Werner, Lora S. (ATSDR/DCHI/EB)
Cc: Weis, Christopher (NIH/NIEHS) [E]; Werner, Lora S. (ATSDR/DCHI/EB); Scheel, Christian (CDC/ONDIEH/NCEH)
Subject: WV chem spill update

Hello – Reaching out to you on behalf of ATSDR and NIH. We wanted to provide you with an update.

ATSDR will post excerpts from the draft health advisory in about 15 mins http://emergency.cdc.gov/chemical/MCHM/westvirgina2014/ . See the text below.

The HSDB data will go up around 7pm.

What is MCHM?

4-methylcyclohexanemethanol (MCHM) is a chemical used to process coal. MCHM does not explode or catch fire. As a class of organic alcohols, it has an obvious odor and is reported to smell like licorice.

What is the acceptable level of MCHM in drinking water?

There should be no MCHM in drinking water. Following a chemical release, communities may need to determine when it would be appropriate to issue an alert about the potential risks of drinking water with low levels of MCHM present. Scientists have recommended a screening level of 1 ppm (parts per million) for drinking water. A level of 1ppm or below is not likely to be associated with any adverse health effects. Additionally, the public may continue to use tap water for cooking. It is also safe to consume food which may have been prepared using tap

water, as with food cooked in restaurants. Also, there is no known risk for bathing.

Due to limited availability of data, and out of an abundance of caution, pregnant women may wish to consider an alternative drinking water source until the chemical is at non-detectable levels in the water distribution system. For mothers with babies, there is no research that suggests consuming water with these low levels of MCHM poses any health risk to their baby. However, if you have any concerns, please consult your doctor.

How was the 1 ppm level calculated?

Few studies on this specialized chemical exist and most have been conducted on animals. Scientists used the limited information available about this chemical to calculate how much MCHM a person could ingest without resulting in adverse health effects. These calculations use uncertainty factors to take into account the differences between animals and people and to consider possible effects on special populations. An additional factor was applied to account for the limited availability of data. Based on the application of these uncertainty factors and the available research studies, scientists recommend a screening level of 1 part per million (1 ppm), or lower, of MCHM in drinking water.

CDC used the following calculation to establish a screening level of 1 part per million (ppm) for the MCHM spill in the Elk River:

$$DW\,Advisory \leq \frac{NOEL \times BW}{UF \times Intake}$$

Where:

- DW Advisory = Drinking Water Advisory
- NOEL = No Observed Effect Level in the experimental species (100 mg/kg/day)
- BW = Body weight of a child (10 kg)
- UF = Uncertainty factors that address differences between animals and humans (10X), address differences accounting for sensitive humans (10x), and account for weaknesses in the toxicological database (10X).
- Intake = The estimated intake from drinking water of a 10 kg child (1 liter/day).

NOEL (mg/kg/d)	BW (kg)	UF (unitless)	Intake (L/day)	DW Advisory (mg/L or ppm)
100	10	1000	1	1

What studies were used in calculating the 1ppm recommendation?

Although we evaluated several studies obtained from the manufacturer of MCHM, the recommended level of 1ppm was based on one study, the Pure MCHM 28 Day Daily Oral Study. This was the only study available that provided an estimate of the dose in test animals that was not associated with any observed effects or the NOEL.

We then extrapolated downwards to come up with the recommendation for a level that we believe would not be associated with any adverse health effects. This methodology is widely accepted and commonly used in environmental public health and risk assessment.

Pure MCHM 28 Day Daily Oral Study Details - Rats received 0, 25, 100, and 400 mg/kg/day, 5 days a week, for 4 weeks. In this study, the administration of 400 mg/kg/day for 4 weeks was associated with erythropoietic, kidney, and liver effects, including increased liver weight, inflammation, and kidney tubular degeneration. The study determined that the No Observed Effect Level was 100 mg/kg/day.

Additional Resources

American Water Updates

West Virginia Department of Health and Human Resources

West Virginia Governor's State of Emergency Updates

CDC's Letter to the West Virginia Department of Health and Human Resources

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