

DIOXIN EXPOSURE

by Richard A. Maltby, AICP

August 3, 2007

While reading Midland County Environmental Health Services Director Chuck Lichon's article, "Dioxin: A difficult-to-define molecule entangled in hypothetical fears" (The Bay City Times, July 31, 2007), we should all be aware that the Michigan Department of Community Health continues to recognize the danger of exposure to dioxins.

For example, the state Department of Community Health says: "Not all dioxins have the same toxicity or ability to cause illness and adverse health effects. The most toxic chemical in the group is 2,3,7,8-tetrachlorodibenzo-para-dioxin (2,3,7,8-TCDD). Because it is the most toxic, 2,3,7,8-TCDD is the standard to which other dioxins are compared. The levels of other dioxins measured in the environment are converted to a '2,3,7,8-TCDD' equivalent concentration based on how toxic they are compared to 2,3,7,8-TCDD. These converted dioxin levels are then added together to determine the total equivalent (TEQ) concentration of the dioxins in a sample."

The state Department of Community Health also reported that it is not known whether people exposed to low levels of dioxins will experience the same health effects as seen in animal studies.

However, based on the available information, dioxins are believed to have the potential to cause a wide range of adverse effects in humans. The U.S. Environmental Protection Agency has characterized the mixture of dioxins to which people are usually exposed as "likely human carcinogens." The EPA has also characterized 2,3,7,8-TCDD as a "human carcinogen." The U.S. Department of Health and Human Services lists 2,3,7,8-TCDD as a substance "known to be a human carcinogen."

Furthermore, the National Research Council of the National Academy of Sciences recently informed us that 2,3,7,8-TCDD is among the most toxic anthropogenic substance ever identified. Animal studies have demonstrated potent effects of TCDD, including tumor development, birth defects, reproductive abnormalities, immune dysfunction, dermatological disorders, and plethora of other adverse effects. Because of their persistence in the environment and their bioaccumulative potential, TCDD and other dioxins, are now ubiquitous environmental pollutants and are detected at low concentrations in virtually all organisms at higher-trophic levels in the food chain, including humans.

Inadvertent exposures of humans through chemical waste byproducts, industrial accidents, occupational exposures to commercial compounds (primarily phenoxyacid herbicides), and through dietary pathways have led to a wide range of body burdens of TCDD and other dioxins and numerous epidemiological studies to a variety of adverse effects in humans.

As a practicing professional urban and regional environmental resources planner for 38 years, I am inclined to say it would be wise to take precaution with exposure to dioxins and other environmental pollutants than to be sorry.