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November 7, 2013

Dr. Robert Rolfs
Deputy Director
Utah Department of Health
288 N. 1460 W.
Salt Lake City, UT 84114

Dear Dr. Rolfs,

Thank you for your inquiry to the Environmental Epidemiology Program (EEP) regarding public concerns on the health effects of dioxins released from the Stericycle medical waste incinerator in North Salt Lake City, UT.

After careful research of the available literature regarding the human health impacts of dioxins, as well as available historical data, it is our opinion that the presence of a health hazard is not likely. However, the amount of time that has passed since the last sampling study coupled with the recent citations of Stericycle emission violations introduces sufficient uncertainty as to warrant investigational soil sampling and the completion of a data-driven Health Consultation study.

Therefore, the EEP recommends that the UDOH encourage the Governor's office to approve an investigational study aimed at determining the actual health risk associated with dioxins present in residential soils within the Stericycle vicinity.

Please find attached a copy of our formal report to the Agency for Toxic Substance and Disease Registry (ATSDR).

Again, thank you for your inquiry and please contact us with further questions or concerns.

Sincerely,

Craig J. Dietrich, Ph.D.
Toxicologist
Utah Department of Health



Concerns Regarding Dioxin Release from the Stericycle Medical Incinerator

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November 7, 2013

In September 2013, the Environmental Epidemiology Program (EEP), Utah Department of Health (UDOH), received a request from the Utah Governor's office for technical assistance regarding an environmental concern. The concern focused on potential health effects of exposures to dioxins released from the Stericycle medical incineration facility.

Background

The Utah Department of Environmental Quality (UDEQ) Division of Air Quality (DAQ) recently issued a citation to the Stericycle waste incineration facility in North Salt Lake for air pollution and record-keeping violations.

The pollution violations included nitrogen oxides and hydrochloric acid, chemicals that contribute to general bad air quality such as ozone and inversions. Violations were also issued for excess release of harmful chemicals known as dioxins, which are known byproducts of waste incineration.

This brief report focuses upon the health risks associated with dioxins and provides information regarding the known risks of dioxin release from incinerators as well as outlining historical environmental studies performed in Davis County aimed at assessing the presence of dioxins.

Health Effects

Dioxins can be formed and released into the environment from multiple sources including, but not limited to, the combustion of municipal and medical waste, combustion of coal and wood from power plants, combustion of petroleum-based compounds, wood burning furnaces, uncontrolled burning of waste, forest and brush fires, structural fires, cement kilns, metals processing, and chemical manufacturing.

Dioxins are mainly distributed through the air. Only a small exposure occurs by breathing in air containing dioxins. Eating contaminated food is the primary route of unhealthy exposures. The greatest risk for a potentially harmful exposure would come from eating large amounts of food grown within the immediate vicinity of a large contamination source.

Consumed dioxins tend to build up in body fat and are excreted if that body fat is burned through normal metabolic function. Dioxins break down slowly in the environment when exposed to the sun.

The most common health effect seen in people exposed to large amounts of dioxins is chloracne. Chloracne is a severe skin disease with acne-like lesions that occur mainly on the face and upper

body. Both the Environmental Protection Agency (EPA) and the Agency for Toxic Substance and Disease Registry (ATSDR) classify dioxins as likely cancer-causing substances.

Known Environmental Sampling

Due to the chemical nature of dioxin, air exposures (and therefore existing air emissions data) is of little use in assessing the toxicological impact of this contaminant upon the community's health. It is desirable to measure ambient concentrations of dioxins in soil and other environmental media to allow comparison of these levels with dioxin levels from sites with regulatory or health concerns. A comprehensive study to characterize dioxins, furans and PCBs in soil samples from the Denver Front Range area was funded by the U.S. EPA and completed in July 2001 (USEPA, 2001). The study was performed to establish typical ambient concentrations of these chemicals in soils in and around Denver for comparison with soil samples collected at the Rocky Mountain Arsenal.

In 2003, a soil dioxin study was carried out by the Rocky Mountain Center for Occupational and Environmental Health, University of Utah, in collaboration with the DAQ and the Davis County Health Department. That study compared dioxin values in Davis County to the Denver Front Range (DeRosso, 2003). These data indicate that in 2003, Davis County averaged a third of the soil dioxin toxic equivalency (TEQ) compared to the Denver Front Range. These data provide a starting point for comparison of general dioxin soil accumulation since 2003. Table 1 below summarizes the sampling data collected in Davis County during the 2003 study.

Table 1. Data Summary from DeRosso, 2003.

Data Set	Observations	TEQ Range (ppt)	Geometric Mean
Davis County Residential Soils	22	0.323-4.466	0.998
Denver Front Range Residential Soils	38	0.213-42.88	3.248

The dioxin screening level, or concentration that indicates the need for further toxicological investigation, is 50 part per trillion (ppt) TEQ (ATSDR, 2013). The closest sampling to the Stericycle facility was collected from 1100 West and Center Street in North Salt Lake (roughly 300 meters from the Stericycle facility). This sample showed a value of 1.24 ppt TEQ. This indicates that in 2003, the soil dioxin content in the Stericycle vicinity was about 2% of the ATSDR screening value. Again, the screening level is a contaminant concentration that indicates the need for further investigations. ATSDR considers soil dioxin levels below 1,000 ppt on residential property to represent a low health risk (ATSDR, 2008).

It should be noted that the medical incinerator located at the Stericycle location has operated since 1992 by Browning-Ferris Industries. Stericycle became the operator of the facility in 1999.

Conclusions and Recommendations

Though the 2003 sampling data indicates that the levels of dioxin found in the soil within the vicinity of the Stericycle incinerator are well below the levels that would indicate a health concern, the cited air emissions violations create an environmental concern. Due to the amount of time since the last sampling, the EEP cannot determine whether dioxins released from the Stericycle facility could pose a health risk to nearby residents. Therefore, EEP recommends that investigative soil sampling for dioxin be conducted to determine if a potential health hazard exists. The EEP will then use that sampling data, and available health outcome data for the area, to generate an in-depth Health Consultation aimed at assessing the health risks that dioxins in the area may present to residents.

Recommendations for the Public

The EEP further recommends that if citizens suspect they have experienced a harmful exposure to dioxins, they should consult their physician to determine if they should be referred to a specialist.

Direct questions regarding the amounts of release or degree of violation should be referred to the Utah Department of Environmental Quality's (UDEQ) Division of Air Quality (801) 536-4000.

The ATSDR ToxFaq sheet on dioxins can be found here:

<http://www.atsdr.cdc.gov/tfacts104.pdf>

This fact sheet answers the most frequently asked questions about dioxins, including ways for families to reduce their exposure to dioxins.

The ATSDR Public Health Statement on dioxins can be found here:

<http://www.atsdr.cdc.gov/ToxProfiles/tp104-c1-b.pdf>

This Public Health Statement is the summary chapter from the ATSDR Toxicological Profile for Dioxins.

References

Agency for Toxic Substance and Disease Registry (ATSDR), 1998. Toxicological profile for chlorinated Dibenzo-p-Dioxins. <http://www.atsdr.cdc.gov/toxprofiles/tp104.pdf>

Agency for Toxic Substance and Disease Registry (ATSDR), 2008. Update to the ATSDR Policy Guideline for Dioxins and Dioxin-Like Compounds in Residential Soil. http://www.atsdr.cdc.gov/substances/dioxin/policy/Dioxin_Policy_Guidelines.pdf

Agency for Toxic Substance and Disease Registry (ATSDR), 2013. Soil comparison values for common contaminants. 2013

DeRosso, F., (2003) A comparison of dioxin levels found in residential soils of Davis County Utah with those found in residential soils in the Denver front range. Rocky Mountain Center for Occupational and Environmental Health Department of Family and Preventive Medicine. June 24, 2003.

United States Environmental Protection Agency (USEPA), 2001. Denver Front Range Study Dioxins in Surface Soils. Study I: Characterization of Dioxins Furans, and PCBs in Soil Samples Collected from the Denver Front Range Area; Region 8, July, 2001.