BACKGROUNDER

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The Facts About Dioxin

What is dioxin?

- Dioxin is the common name for a large group of compounds made up of carbon, chlorine, hydrogen and oxygen. Dioxin is formed in trace quantities during the combustion of almost every material, as well as in some industrial chemical processes. Dioxins can also be formed naturally during the biological degradation of organic material. Among this family of compounds there are 17 specific species (or isomers) which are toxic to humans and animals but only at extremely high exposures.

What are the sources of dioxin to which people are generally exposed?

- The general population is exposed primarily through the consumption of food containing trace levels of dioxin, in particular beef and dairy products. The source of the dioxins found in foodstuffs is unclear. The western and midwestern food-growing regions of the nation are far from most known sources of man-made dioxin releases to the environment. It should be noted that forest fires, both controlled and uncontrolled, as well as field straw burning, are the largest dioxin emissions source today. These emissions sources, especially forest fires, are in fact upwind of the nation's food-growing regions.

Are dioxins and dioxin-like compounds harmful to human health? What about claims of dioxins causing various illnesses?

- EPA's most recent dioxin reassessment report shows that there is no evidence that current dioxin exposures to the general population are causing harm. The only evidence of human health effects has occurred in workers exposed to high doses accidentally. The inference that other health effects may be occurring at exposures near our current exposure levels is based for the most part on extrapolations of animal study results at high comparative doses.

Is human exposure to dioxin and dioxin-like compounds increasing?

- Dioxin levels in our bodies are decreasing. EPA's Draft Reassessment indicates that fat tissue dioxin levels in Americans have declined from 55 parts per trillion (ppt) to less than 25 ppt over the last 10 years. It is believed that this reduction is due to large reductions in industrial emissions, as well as the environmental decline in PCB concentrations since PCB use was banned. PCBs are considered to be dioxin-like compounds with similar health effects.
- Further, current levels of dioxin in our bodies are so low that are so low that a 2003 study by the Centers for Disease Control found dioxin levels in the blood of the average U.S. resident were below levels of detection.

How much do CRRA's waste-to-energy dioxin emissions contribute to Connecticut's environment?

- It is difficult to get an accurate picture of dioxin in Connecticut's environment. There does not exist a detailed dioxin emissions inventory for the State of Connecticut or an assessment of the amount that arrives by atmospheric transport from upwind out-of-state sources. It is not known with any certainty what the relative contributions of sources of dioxin emissions are other than waste-to-energy facilities. Emissions from trucks, power plants, home heating, fireplaces, wood stoves, crematoria, sewage sludge incinerators and other known sources have not been measured or estimated. There is, however, ample evidence that the dioxin emissions from the CRRA waste-to-energy facilities are not impacting the environment to any measurable degree.
- Nationwide, waste-to-energy facilities today represent less than one percent of the manmade inventory of dioxin sources, according to an EPA Fact Sheet, "Final Air Regulations for Municipal Waste Combustors."
- Ambient monitoring has been conducted in the vicinity of the four CRRA waste-to-energy facilities since they started operations. The Connecticut Department of Environmental Protection set an annual ambient air limit of 1.0 pg/m^3 TEF[(1)] which is not to be exceeded near waste-to-energy facilities. The maximum measured concentrations in any year, in any season of the year, and at any site was .025 pg/m^3 TEF – 97.5 percent less than the allowable limit.
- Put another way, if the CRRA Mid-Connecticut Project waste-to-energy facility were to run at full capacity 24 hours a day, 365 days a year, based on the most recent DEP-witnessed emissions tests, it would produce about two teaspoons of dioxin/furan per year.
- In addition to the state's ambient monitoring, cows' milk was monitored before and after the start-up of the CRRA Southeast Project waste-to-energy facility in Preston. The measurements were made by the Connecticut Agricultural Experiment Station on milk samples from four nearby farms. No differences were found between the "before" and "after" samples.

(1) – picograms per cubic meter, toxic equivalency factor

How do we know what CRRA's waste-to-energy emissions are?

- DEP has required annual dioxin stack emissions testing on each of the four CRRA waste-to-energy facilities since 1994. Emissions from the facilities have been in compliance with state limits. In addition to these annual direct measurements, other operational parameters are monitored continuously to maintain those conditions that minimize dioxin emissions. Stricter U.S. Environmental Protection Agency limits for dioxin emissions took effect at the end of 2000, but all of CRRA's facilities were already in compliance with those stricter limits for many years.
- In fact, all four of CRRA's waste-to-energy plants have been so far below DEP's limits for so long that they qualified for reduced testing. DEP is satisfied the plants are environmentally sound.

How do CRRA's waste-to-energy dioxin emissions test data compare to state and federal emissions limits?

- CRRA's waste-to-energy facilities have always had emissions well below, generally, a small fraction of the allowable dioxin emissions test limit. The new dioxin emissions limit for waste-to-energy facilities is based on the maximum available control technology. CRRA does everything technologically possible to keep dioxins out of its waste-to-energy emissions.

How does CRRA take dioxin out of its emissions?

- At our Bridgeport, Wallingford and Preston waste-to-energy facilities, we inject the flue gases coming out of the combustors with activated carbon, which absorbs dioxin. The carbon is then captured in fabric filters.
- Our Hartford facility uses combustion technology different from that of the other three plants. This technology destroys virtually all the dioxin when the waste is burned.

If CRRA's waste-to-energy facilities are not responsible for Connecticut's human dioxin exposure, then what is?

- Studies indicate that most of Connecticut residents' dioxin exposure comes from foodstuffs, including fast foods. Imported food products, as well as those grown within the state, contribute to the current intake of dioxins. The sources of dioxins that are in locally grown foodstuffs are highly speculative. When one considers the proximity of roadways to farms in our state, emissions from diesel trucks may be the most likely source. Measurements of milk produced near CRRA facilities clearly show that other sources are the main contributor to the observed levels of dioxin in milk.

What is the health risk associated with current dioxin exposure compared to other commonly accepted health risks?

- Based on available science, levels of dioxin exposure are far less hazardous than exposure to substances found in other common products. For example, based on data from studies on lab animals, someone living at a point of maximum impact near any one of CRRA's waste-to-energy facilities may have an estimated cancer risk due to dioxin exposure between 1 and 10 chances per million. A person eating one fast-food hamburger per week has a 12 chance per million dioxin cancer risk.

What is the significance of the latest EPA report, which indicates that dioxins are a greater cancer threat than previously thought?

- While its draft reassessment found that cancer potency may be six times higher than previously reported, EPA still concluded that there are no recognized health impacts associated with the current population's exposure to dioxins.

Since CRRA's waste-to-energy facilities have known dioxin emissions, why not use alternative disposal methods to eliminate such risks?

- All other waste disposal methods have associated dioxin risks, in addition to other significant environmental risks which are not associated with waste-to-energy facilities. Municipal solid waste (MSW) contains measurable levels of dioxin.
    - Municipal waste combustion removes all but barely-measurable quantities of dioxin. Composting does not destroy or reduce the dioxin present in MSW.
    - Landfilling does not affect the dioxin levels present in MSW, and because of the potential threat to ground water landfilling of raw MSW is prohibited by state policy.
    - The long hauling of MSW to distant landfills increases the calculable risk of injury and death due to transportation accidents tenfold.
    - Even some recycling operations, such as newsprint de-inking and aluminum can de-lacquering, while economically beneficial in some respects, have significant dioxin emissions associated with them.

How concerned should Connecticut citizens be about CRRA's waste-to-energy facilities and their dioxin emissions?

- Every solid waste management strategy has associated dioxin exposure risks. In Connecticut, the waste-to-energy process is the best alternative with the least risk. Both emissions testing data, as well as actual environmental measurement data, have confirmed this conclusion. It is quite clear the current mix of strategies poses the least risk to the people of Connecticut.