

## Dr. Scott Hurst

The concentration of five oil refineries, I-15, Legacy Parkway, nearby Hill AFB, and numerous smaller industries, all emitting pollution that converge on South Davis and North Salt Lake make this area a true pollution hot spot.

Perhaps it is not surprising then that Stericycle as a relatively minor ingredient in the larger pollution stew, often flies under the radar of citizens, public health advocates, and regulators. That should never have been the case, but especially now that Stericycle has been caught by the Division of Air Quality falsifying records and emitting 400% more dioxins than their permit allows.

A few days ago another study of the health consequences of air pollution, that received widespread media attention, should make Stericycle front and center in the battle of public health protection along the Wasatch Front. **Slide** In a survey of pregnant mothers throughout the country, those exposed to the highest levels of air pollution ended up having their child be diagnosed with autism at twice the rate of mothers exposed to the least amount of pollution. The strongest correlations were specifically tied to mercury and diesel exhaust.

Previous smaller studies have also shown this strong correlation. **Slide** Furthermore, dozens of other studies have confirmed a similarly strong association between air pollution and numerous other types of adverse brain outcomes in both children and adults--lower intelligence, attention deficit and behavioral disorders, more addictive behavior and depression, higher rates of strokes, multiple sclerosis, Parkinson's and other neurodegenerative diseases, microscopic changes in brain tissue indicative of Alzheimer's, and an acceleration of the cognitive decline that naturally

occurs with aging. A very disturbing laundry list indeed.

**Slide** Utah has the highest rate of autism in the nation--about double the national average--afflicting one in every 32 Utah boys, and one in every 85 Utah girls. While genetics does play a role, other studies suggest that two thirds of the “epidemic” of autism is environmentally caused.

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## Dr. Kirtley Jones

**Slide** At any one time about 40,000 Utah women are pregnant. That means most of them will, at some time during the pregnancy, be forced to breathe Utah’s infamous air pollution. It is now generally accepted that chemicals that are not toxic to an adult can have devastating effects on the newborn. **Slide** None of the safety regulations that apply to incinerators are designed to protect the fetus, no do they address the fact that the timing of exposure during embryonic development is often more important than the concentration of exposure. The first three months after conception are the most critical for brain development. The fetal brain adds about 250,000 cells per minute reaching an eventual total of about 200 billion brain cells between the age of one and two. Tiny amounts of chemicals and a single exposure during this window can damage this delicate process with life long and irreversible affects.

Harmful chemicals are normally stored in fatty tissue. In the fetus there is little or no fatty tissue except for that in the brain and nervous system, which helps explain the brain’s vulnerability. During this extraordinary period of brain growth the tiny particles, chemicals and heavy metals found in air pollution can reach the fetal brain from the mother through the placenta where they can actually penetrate those new brain cells, change the chemical envelope of the chromosomes, and alter their destiny as the

foundation of that person's intellect, personality, behavior and emotional well being. That autism may be one of those end results is entirely consistent with previous well established research.

**Slide** About 15 years ago over 2,373 hospital incinerators operated throughout the country. But because of citizen pressure and tighter regulations, all but a few dozen have closed. Stericycle now burns waste imported from many surrounding states, including a myriad of items like bloody surgical bandages, toxic chemicals like chemotherapy agents, human organs and animal carcasses suspected of dying of diseases known to be transmissible to humans, for example Mad Cow disease. Stericycle may sometimes have no idea what is being burned because it is our understanding that many of the containers they burn are never opened to verify their content.

Incinerators do not eliminate hazardous substances, they concentrate them, and even create new ones. They emit a nasty brew of dioxins, chlorine, mercury, arsenic, lead, cadmium, ammonia and benzene spreading miles from the smoke stack, eventually inhaled by local residents or swallowed when they eat vegetables from their gardens, or their children play on a backyard swing set. **Slide** Dioxins are likely the most toxic manmade substance known after plutonium. They are known carcinogens and the main substance in the chemical warfare gas, Agent Orange. Many of these chemicals are both toxic and bio-accumulative, building up over time in the body insidiously with the risk of chronic effects from even very low, continuous exposure.

The amount of chemicals that a baby absorbs relates to the total persistent contaminants that have built up in the mother's fat over her lifetime. This will increase for women who live near incinerators. 90% of samples of human breast milk contain a disturbing 350 chemicals. **Slide** Dioxins for example, concentrate in humans, especially in breast milk, and nursing

infants consume 10 to 20 times as much dioxin as the average adult. Six months of breast feeding will transfer 20% of the mother's lifetime accumulation of organochlorines chemicals, like dioxins, to the nursing child. These compounds and heavy metals in Stericycle's emission stream are known to be toxic to the brain, and are implicated not just in autism, but in dyslexia, subclinical loss of intelligence, attention deficit, hyperactivity, criminal behavioral disorders, and Alzheimer's.

## Dr. Tyler Yeates

**Slide** There is no such thing as a safe level of exposure to many of these highly toxic substances, especially for a pregnant mother, despite Stericycle's permit to release them. **Slide** The calculation behind standards for incinerator pollution is more, "how much risk will society tolerate," not how much can we call safe. What little toxicity assessment has been made of the safety of Stericycle's emission has only examined exposures of one compound at a time. **Slide** But carcinogens are far more dangerous when combined than when in isolation. A safe dose of aspirin, combined with safe doses of ibuprofen, tylenol, toradol, acetaminophen, and two glasses of wine can add up to be lethal. When a supposedly tolerable exposure to mercury is combined with a tolerable exposure to dioxins, to cadmium, lead, and arsenic, etc--the end result can be an intolerable health consequence.

Most of the particulate pollution from a waste incinerator falls into the most dangerous category of "ultrafine", because this fraction is too small to be captured by filters. Ultrafines are also the most likely to be inhaled deep into the lungs and penetrate into cells of the body and the most likely to carry adsorbed particles of heavy metals. Numerous studies demonstrate a broad range of health consequences to people living within several miles of waste incinerators--from higher rates of childhood cancer, to still births, birth defects and learning disabilities. Other studies have

shown a direct correlation between autism rates and proximity to sources of atmospheric mercury pollution, like power plants and incinerators.

**Slide** Between 15 and 30% of individuals are extra sensitive to the toxic compounds found in Stericycle's emissions. They can be affected by concentrations hundreds of times less than the rest of the population. That's one of the reasons why not everyone who lives near by may have health problems from the incinerator, but for those who do, the consequences are very real indeed, and the supposed safety provided by regulations doesn't apply to them at all.

There is also a possibility that Stericycle is incinerating human and animal tissue contaminated with the highly infective proteins called "prions" that transmit Creutzfeldt-Jakob disease, or human "Mad Cow," a 100% fatal encephalopathy. Those proteins have been shown to survive temperatures hotter than the incinerator, and Stericycle's smoke stack emissions may indeed be disseminating active prions.

A branch of the National Academy of Sciences concluded that it is not just local populations that are affected by incinerator pollution. **Slide** They stated, "Persistent air pollutants, such as dioxins, furans and mercury can be dispersed over large regions – well beyond local areas and even the countries from which the sources emanate. Food contaminated by an incinerator facility might be consumed by local people close to the facility or far away from it. However, distant populations are likely to be more exposed through long-range transport of pollutants and low-level widespread deposition on food crops at locations remote from an incineration facility." Moreover, the more dangerous smaller particulates, which typically have more toxic chemicals and carcinogens attached, will travel the furthest.

**Dr. Ellie Brownstein**

**Slide** Native tribes in Northern Canada have been found to have twice the levels of dioxin in their breast milk as Canadian mothers living in the South despite the fact that there is no source of dioxin for 300 miles. A computer programming analysis of toxic releases from 44,000 sources of dioxin in Northern America and meteorological records has demonstrated that the primary source of exposure for these Native tribes were three municipal incinerators in the United States.

The permit violations of Stericycle are obvious reasons for concern, but even if the operation of this facility was conducted with utmost integrity, it would still represent an unacceptable community health hazard. **Slide** Start ups and shut downs and other “events” result in bypass of pollution control equipment on a regular basis. Studies at other incinerators show that bypass may be occurring 10% of the time. **Slide** Dioxins produced during start-ups can be twice the annual dioxin emissions under steady state conditions (this is the equivalent of 24 months of dioxin release within 2 days). Spot monitoring as is done by the DAQ, has been shown to be grossly inadequate and likely underestimates the actual dioxin and heavy metal emissions by 30-50 times. Levels of emissions achieved under test conditions or when inspections occur by prior arrangements are likely to be far lower than under real life conditions.

Measuring concentration of pollutants released in the stack gives no information about the levels of toxic material that have accumulated in the environment surrounding the facility. Assessing pollutant concentration in dust, vegetation and in the bodies of local residents is the only way to actually quantify exposure risk and clearly none of that is being done. We are not aware of any epidemiologic studies by the Utah Health Department that would enlighten us further, so we are left with anecdote and personal stories of ill health among Stericycle’s neighbors, and these are indeed alarming.

# Dr. Cris Cowley

**Slide** The state's risk assessment upon which the permit of this facility is based is grossly inadequate. Risk assessment is a method developed for engineering but is very poor for assessing the complexities of human health for the following reasons.

**Slide 1.** Risk assessments using dispersion modeling are not accurate in predicting ground level concentrations of pollutants. For example, modeling almost never takes into account secondary particulates formed as the products of combustion rise up the stack. These secondary particulates can double the total volume of particulates beyond the stack. These risk assessments have almost always concluded that incinerators are safe which flies in the face of epidemiological data showing the opposite.

2. Typically it involves estimating the risk to health of only a small fraction of the hundreds of different pollutants emitted by incinerators. The assumption is made that all substances emitted but not assessed (the overwhelming number of toxic pollutants) are absurdly treated as if they have zero risk.

3. Toxicology assessments assume, wrongly, that all pollutants have thresholds below which they are safe. The science is very clear this is not the case. Many pollutants, including dioxins, many heavy metals and radioactive particulates do not have "safe" thresholds and some may even be more dangerous at lower concentrations.

**Slide 4.** It assumes wrongly that only air emissions need to be considered and bioaccumulation in food can be ignored. Air emissions may be only the tip of the iceberg. Most food today is contaminated with dioxins, predominantly from past incinerator emissions. 93% of human

dioxin exposure comes from meat and dairy products despite the fact that 96% of dioxins originated as air emissions.

5. Risk assessment focuses on diseases like cancer, but almost completely ignores other health outcomes like infertility, immune suppression, endocrine disruption, altered behavior and reduced intellectual capacity.

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6. **Slide** Build up in the environment faster than biodegradation can occur is not factored in. In the case of heavy metals--they are not combustible, do not degrade and cannot be destroyed. Dioxins only degrade over several decades. Concentrations of these toxins in the local environment will steadily increase over time.

7. **Slide** It incorrectly assumes that the hazard posed by each individual compound tested out of context and in isolation can predict the hazard of the entire complex mixtures of chemicals, ignoring the cumulative risk and the likelihood of synergistic impacts.

8. It ignores the impact of toxic exposures to genetics and epigenetics and the inevitability of adverse impacts being passed on to multiple subsequent generations.

9. It assumes wrongly that the cumulative burden from all the air toxics sources in North Salt Lake and South Davis County can be ignored and that the emissions from Stericycle can be viewed in isolation as if residents were not further exposed by other sources, like freeways, and the five refineries.

**Slide** 10. It assumes wrongly that we have a comprehensive understanding of the complexity of biological processes and chemical toxicity when in reality there are vast information gaps. Lack of

knowledge cannot be equated with safety.

11. Unique and exaggerated vulnerabilities of the human embryo, children and chemically sensitive adults are not considered. **Slide**

## **Dr. Brian Moench**

In Sum:

1. **Slide** Stericycle is constantly releasing “poison” in the most heavily populated part of Utah. With Utah having the highest rates of autism in the nation, having sometimes the worst air pollution in the nation, with the medical literature repeatedly showing a strong correlation between the two, every contributing source to the problem must receive renewed scrutiny. **Slide** The scientific evidence that facilities like this cause serious harm to the surrounding community is as undeniable as the evidence that smoking causes lung cancer. **Slide**
2. **Slide** This facility does not provide a necessary product or service to the community. There are safer ways to dispose of hospital waste that we will leave to others to offer details.
3. **Slide** Finally, the health consequences of this incinerator make it unquestionably an overall economic liability to the community. It is long over due that the incinerator part of this facility be shut down.