

Stericycle Medical Waste Incinerator

North Salt Lake, Davis County, Utah



Stericycle, Inc.'s medical waste incinerator in North Salt Lake

Public Meeting

The EEP hosted a public meeting on October 14th, 2015 to discuss environmental health assessments relating to the Stericycle medical waste incinerator. The slides from the

meeting are available [here](#)



Background

Stericycle, Inc., a large national provider of regulated waste disposal services, operates a medical waste incinerator in North Salt Lake, Davis County, UT. Constructed in the early 1990s, this facility accepts and burns medical waste from a variety of markets throughout North America, primarily the Pacific coast and intermountain states.

Prior to 2001, the area north of the incinerator was zoned for industrial and manufacturing purposes and was largely undeveloped. However, the City of North Salt Lake rezoned this area for mixed purpose use, and development on a residential subdivision began in 2003. As of 2014, residential properties border the incinerator to the north and extend in that direction for approximately two miles. The properties east and south of the facility are a mix of industrial and undeveloped land, and the area west is largely undeveloped.

Incineration of medical waste produces a number of potentially hazardous pollutants, and Stericycle is required to comply with all relevant Federal and State regulations regarding air emissions as outlined in their Title V operating permit issued by the Utah Division of Air Quality (UDAQ). Stericycle is required to monitor the emission levels of nine pollutants: cadmium, carbon monoxide (CO), dioxins, hydrogen chloride gas (HCl), lead, mercury, nitrogen oxides (NOx), particulate matter (PM), and sulfur dioxide (SO₂). The levels of these pollutants are periodically measured at the exhaust stack of the incinerator (a 'stack test').

- [Click here to visit the Utah Department of Environmental Quality's website on Stericycle](#)

Operating Permit Violations

On May 28, 2013, UDAQ issued a Notice of Violation and Order to Comply to Stericycle for multiple violations of the pollutant emission limits specified in its operating permit. On August 28, 2013, UDAQ issued an amended Notice of Violation to explicitly cover each day of emissions exceedance. The violations identified by UDAQ occurred between 2011 and 2013 and include:

- Emissions exceeding the permit limits for dioxins;
- Emissions exceeding the permit limits for nitrogen oxides on multiple occasions;
- Emissions exceeding the permit limits for hydrogen chloride gas;
- Failure to report these emission exceedances to UDAQ in the requisite time frame;
- Failure to maintain normal operating conditions during the December 2011 stack test;

- Failure to include the test results demonstrating these emission exceedances in the requisite annual and semi-annual monitoring reports.

In September 2013, the Utah APPLETREE program, within the Environmental Epidemiology Program of the Utah Department of Health, received a request from the 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 waste incineration facility. To address these concerns, the Utah APPLETREE program has developed a series of reports to address health questions associated with exposures to contaminants from the incinerator, as well as a summary of the past dioxin soil sampling in that area.

New Emission Standards

New EPA incinerator emission standards that lower the permitted emission levels for several contaminants went into effect in Utah on October, 2014. These new regulations are expected to be protective of human health for both cancer and non-cancer adverse health effects. Stericycle's North Salt Lake facility was refitted with new air pollution control equipment and demonstrated compliance with these new standards during a stack test on October 1, 2014.

Relocation

In December 2014, the Utah Department of Environmental Quality (UDEQ) and Stericycle reached a Settlement Agreement for the Notice of Violation issued to the company. As part of the settlement, Stericycle will relocate their incinerator to a remote location in Tooele County that also includes U.S. Magnesium, ATI Metals, and the Wasatch Regional Landfill. Stericycle must permanently stop operations at their North Salt Lake facility no later than three years from the date the company obtains all necessary final, non-appealable permits and approvals. In February 2015, Stericycle submitted permit applications to UDAQ and the Division of Solid and Hazardous Waste for the construction and operation of their new facility.

- Click [here](#) to visit UDEQ's webpage on Stericycle's proposed Tooele County facility

Documents

Follow-Up Health Consultation for the Soil and Air Exposure Assessments

(October 2015)



- Expands on the cancer and non-cancer health assessment of air exposures to dioxins using EPA regional screening levels (RSLs).
- The maximum predicted residential air concentration of dioxins was below the non-carcinogenic RSL.
 - Harmful, non-cancer health effects are not expected from inhalation exposure.
- While modelled residential exposures to dioxins during Stericycle's violation of their operating permit exceeded the cancer-based RSL, cumulative exposure from 2003 - 2014 is not expected to result in significant excess cancer risk.
 - The excess cancer risk was calculated to be $2.52E-06$, or a little over 2.5 cases in one million exposed people, which is within the U.S. Environmental Protection Agency's (EPA) acceptable target cancer risk range of 1 in 10,000 to 1 in one million.
- The total excess cancer risk from all contaminants that exceeded cancer-based comparison values at this site (i.e., arsenic in soil and dioxins in air) is not expected to be significant.
 - The total excess cancer risk from all contaminants was calculated to be $6.47E^{-05}$, or about 6.5 cases in 100,000 exposed people, which is within the EPA's acceptable target cancer risk range.
- Exposures to bypass event smoke plumes, while very unlikely to result in immediately dangerous adverse health effects, should be reduced as much as possible.
 - The most sensitive people, like those with severe respiratory disorders, may experience minor adverse health effects associated with sulfur dioxide.
- Compliance with new emissions regulations, which became effective in October 2014, substantially lowered the permitted levels of contaminant emissions and are expected to be protective of human health, including cancer.

Soil Exposures Health Consultation (October 2015)



- Certified by the federal Agency for Toxic Substances and Disease Registry (ATSDR) after a comprehensive scientific review process.

- The concentration of arsenic exceeded the chronic (greater than one year of exposure) comparison value for children in one sample of playground sand from the neighborhood adjacent to the Stericycle incinerator.
 - Calculated exposure doses for children were below the Minimal Risk Level and are not expected to harm people's health.
 - Exposure is not expected to result in significant excess cancer risk.
 - Based on data from a U.S. Geologic Survey study, the arsenic in playground sand does not appear to be representative of typical background levels for the region.
- The concentration of total chromium in residential soil samples exceeded one comparison value for hexavalent chromium.
 - Chromium can be found in several forms with differing toxicities. Hexavalent chromium is the most dangerous, but the total chromium found in soil is likely to be mostly the trivalent form, which is much less toxic.
 - Calculated exposure doses did not exceed the Minimal Risk Levels for hexavalent chromium and are not expected to harm people's health.
 - Total soil chromium concentrations near the incinerator appear to be at or below typical background levels based on U.S. Geologic Survey data.
- The concentrations of barium, cadmium, lead, mercury, selenium, silver, and dioxins in residential soil were below the applicable comparison values.
 - Exposure is not expected to harm people's health.

Adverse Birth Outcomes Statistical Review (October 2015)



- The EEP reviewed the incidence of adverse birth outcomes among residents of the west side of Bountiful, and all of West Bountiful, Woods Cross, and North Salt Lake between 1991 and 2012.
 - The birth outcomes evaluated were low birth weight births, premature births, small-for-gestational-age births, and infant deaths.
- No evidence was found to indicate that the risk for adverse birth outcomes in the study area was higher than the risk in the rest of the state of Utah.

Air Exposures Letter Health Consultation (February 2014)



- Based on air dispersion modeling analyses, exposure via inhalation to emissions from the Stericycle medical waste incinerator is not expected to harm people's health.

- o Residential air concentrations of contaminants are predicted to be below health-based comparison values, even if the incinerator released emissions at the maximum permitted level.
 - Actual pollutant emissions are typically much lower than their permitted levels.
- The highest recorded emission levels of pollutants during the periods of violation are not expected to have harmed people's health.
 - o Assessment of the potential health effects of inhalation exposure to dioxins was limited due to a lack of relevant health-based comparison values. This analysis was expanded upon in the follow-up Letter Health Consultation released June 2015 and summarized above.

Cancer Incidence Statistical Review (January 2014)




- The EEP reviewed the incidence of cancer among residents of portions of Bountiful, West Bountiful, Woods Cross, and North Salt Lake from 1976 to 2011.
- Colon cancer, anal cancer among women, bone and joint cancer, cutaneous melanoma, breast cancer, and prostate cancer were elevated in the last analytical period (2006-2011).
 - o Breast cancer was elevated for the last two analytical periods covering the time between 2000 and 2011.
 - o A historical cluster of prostate cancer between 1988 and 1999 was also detected.
- The elevated cancer types are not typically associated with environmental exposures.
 - o Behavioral and genetic influences are the most common known risk factors.
- The elevated cancer types are often preventable.
 - o Residents are encouraged to make healthy life choices, such as smoking cessation, maintaining a healthy diet and weight, avoiding excessive sun exposure, and getting enough physical exercise.
- This study provides a base-line of the cancer incidence in the study area, and a starting point for potential future studies.

Health Effects of Dioxin Exposure Technical Assist (November 2013)



- Utah APPLETREE composed a document providing technical assistance on the human health effects of exposure to dioxins.

- The technical assist also provides a brief summary of a 2003 study assessing the concentration of dioxins in soil from Davis County.
 - 2003 Davis County soil dioxin study
- **Addendum to the Technical Assist (11/19/2013)** 
 - Clarifies sampling locations from the 2003 Davis County soil dioxin study.

Documents

- Health Consultation: Follow-up to the Soil and Air Exposure Assessments (2015)
- Health Consultation: Dioxins and Heavy Metals in Soil (2015)
- Adverse Birth Outcomes Statistical Review (2015)
- Letter Health Consultation: Modeled Air Exposures (2014)
- Cancer Incidence Statistical Review: South Davis County (2014)
- Technical Assist: Health Effects of Dioxin Exposure (2013)
 - Addendum to the Dioxins TA (2013)
- Davis County Soil Dioxins Study (2003)

Contaminant Information

- Arsenic ToxFAQs
 - Arsenic ToxZine
- Cadmium ToxFAQs
- Carbon Monoxide ToxFAQs
- Dioxins ToxFAQs
 - ATSDR Policy Guideline for Dioxins in Residential Soil
- Hydrogen Chloride ToxFAQs
- Lead ToxFAQs
 - Lead ToxZine
- Mercury ToxFAQs
 - Mercury ToxZine
- Nitrogen Oxides ToxFAQs
- Particulate Matter
- Sulfur Dioxide ToxFAQs

Additional Links

- [City of North Salt Lake](#)
- [Davis County Health Department](#)
- [Utah Department of Environmental Quality](#)
 - [UDEQ's page on Stericycle](#)
 - [Division of Air Quality](#)
 - [Division of Solid and Hazardous Waste](#)