

What Local Officials Need to Know About Burning Trash and Leaves

by Mindy Kralicek, DNR Air Quality Information Specialist, printed in Iowa County magazine Nov. 2008 issue

It's fast, cheap, and gets rid of the mess. It's also poisonous.

Despite the health and environmental impacts of burning trash, one-third of Iowa's cities still allow it. It's also allowed in rural areas except within Polk County. Linn County officials are currently enacting a trash burning ban.

Many Iowans who burn trash and debris take pride in discussing their burning skills, often learned from family members during seasonal rituals or family outings. Some believe burning is an inherent freedom. Others believe burning is a sanitary method of trash removal.

Those attitudes and beliefs conflict with current reality. Today's trash is filled with toxic chemicals. Scientific evidence shows that lungs are damaged by breathing fine particles present in smoke. And, once pollutants are in the air, there is no way to prevent them from depositing on our crops and water sources. Some pollutants, such as dioxins, are persistent and bioaccumulative: their concentration levels increase as they move up the food chain, with the highest level of concentrations in humans. Other pollutants cause cancer. Still others damage the central nervous system.

The citizens you serve trust that you will give first priority to situations that threaten their lives and health; they hope you will protect the rights of all citizens. When they approach you with an open burning complaint, it is more than just a nuisance issue.

State law and open burning

In Iowa, state rules prohibit burning items that can be locally recycled. If curbside pick-up or a redemption center for plastics, glass, metal cans, and paper is nearby—even for a fee--those things **cannot** be burned legally.

Although it is still legal across much of the state to burn leaves and yard debris at the site where it originates, the Department of Natural Resources strongly encourages composting and mulching instead. Both of these activities replace nutrients to the soil, whereas burning pollutes the air, land and water.

When you burn trash and leaves, you're making poison

Among the common pollutants trash and leaf fires can release in the air are dioxins, polycyclic aromatic hydrocarbons, volatile organic compounds, carbon monoxide, hexachlorobenzene and ash. These pollutants are poisonous to breathe and are especially dangerous for small children, the elderly, and people with respiratory and heart conditions.

Dioxins may be the most toxic compounds made by mankind. Dioxins and dioxin-like compounds are a group of 30 chlorinated organic chemicals. Most commercial incinerators are equipped with emissions controls that limit dioxin formation and release. In contrast, when items containing a lot of chlorine, such as polyvinylchloride (PVC) pipe, or those with just a trace amount, such as a glossy magazine or plastic bottle, are burned in a barrel or on the ground, dioxins escape freely into the air where they attach to particles and fall back to earth.

Only about 10 percent of emitted dioxins are deposited within 30 miles of their source; the rest travel elsewhere. Wherever they land—streams, ponds, gardens, or crops--dioxins become part of the food chain, taken up by fish and livestock, and absorbed into the soil and water supplies. Exposure to dioxins can cause chloracne (a severe form of skin disease) as well as reproductive and developmental effects, liver damage and cancer.

Polycyclic aromatic hydrocarbons (PAHs) are a group of chemicals commonly found in small particles released from trash and leaf burning. They form from incomplete combustion of carbon-containing fuels such as wood, coal, diesel, tar, fat, or tobacco. Some PAHs cause cancer.

Volatile organic compounds (VOCs) are a class of organic chemical compounds that vaporize in open fires and enter the atmosphere. These chemical compounds are often used in paint, paint thinners, carpet, carpet backing, wood preservatives, and cosmetics. Inhaling certain VOCs can lead to eye, nose and throat irritation, headache, loss of coordination, nausea, and damage to liver, kidney and central nervous system. VOCs also contribute to ground-level ozone pollution, which also worsens respiratory, heart and other health conditions.

Carbon monoxide is generated from all types of burning. At low levels, even in open air, people may experience headache, fatigue, nausea and vomiting. Exposure to high levels can cause death.

Hexachlorobenzene (HCB) is a highly persistent environmental toxin (a chlorinated hydrocarbon) released in open burning of trash. It degrades slowly in the air and travels many miles. HCB bioaccumulates in fish, marine animals, birds, lichens, and animals that feed on fish or lichens. Based on studies conducted on animals, long-term exposures may damage a developing fetus, cause cancer, lead to kidney and liver damage, and cause fatigue and skin irritation. HCB is considered a probable human carcinogen and is toxic by all routes of exposure.

Ash, the residue of open burning, can contain toxic metals such as mercury, lead, chromium, and arsenic. Rain washes ash into groundwater and surface water, contaminating drinking water and food. Scattering ash in vegetable gardens or burying it on your property will result in growing vegetables which have absorbed and accumulated these metals. These metals can be toxic when ingested. For example, if a person ingests

hazardous amounts of lead, he or she may experience high blood pressure, cardiovascular problems, kidney damage, and brain damage.

These are only the most common pollutants. There are many more. Beyond their chemical properties, the microscopic size of emitted particles, whether solid or liquid, can become embedded in lungs and cause serious health problems, anywhere from irritation of the airways, coughing or difficulty breathing to premature death in people with heart or lung disease.

Recently the Environmental Protection Agency strengthened the National Ambient Air Quality Standards for exposure to fine particles and ozone smog because research has shown human health is impacted to a greater extent than previously thought. Stopping the legacy of residential burning will help ensure Iowans continue to enjoy the benefits of healthy air for generations to come.

The Air Quality Bureau of your Department of Natural Resources has materials to help your community implement residential burning bans at www.iowadnr.com/air/citizen/burn/burn.html. For information about resources to assist local governments with waste management practices, go to <http://www.iowadnr.com/waste/schools.html>.

What happens when you burn...

Plastic milk jugs. These contain chlorine. When burned, toxic dioxins are emitted.

Leaves and branches. Particulate matter (PM) is released, which interferes with respiratory systems.

An old picnic table. If made prior to 2004 and treated with a wood preservative, it contains arsenic, as do decks, steps, play sets, and railings. The smoke is poisonous. Arsenic is water soluble, so even without burning, rainwater will leach arsenic out of the treated wood into soil or onto whatever might be underneath the structure.

Insulated electrical wire. Lead and toxic dioxins are released.

Plastic garbage bags. These contain polyethylene, which releases dioxins when burned.

Asphalt shingles. Burning these will release PAHs (a carcinogen), hydrogen sulfide (a toxic gas), and possibly asbestos and silica (causes of lung disease).

Painted siding. The paint contains benzene, which can cause cancer, and VOCs are released.

Upholstered couch. Contains formaldehyde and dioxins. VOCs will be emitted.

Plastic PVC pipe. A huge amount of dioxins will be released.

Food Waste. Carbon monoxide will be emitted.

Magazines/catalogues. Burning paper bleached with chlorine and dyes and inks from the printing process will create dioxins.

Styrofoam cups and plates. This also releases dioxins.

Plastic toys. More dioxins are released.

Nylon carpet. Formaldehyde, which can cause nausea, respiratory problems, skin inflammation and eye irritation, will be released.

Fluorescent light bulbs. Mercury will be released into the atmosphere. Mercury is readily absorbed as vapor through the lungs. Mercury damages the central nervous system and symptoms typically include sensory impairment (vision, hearing, and speech), disturbed sensation and a lack of coordination.

A computer. Computers are a conglomeration of plastic and steel casings, circuit boards, glass tubes, wires, resistors, capacitors, and other assorted parts and materials. Poisonous heavy metals such as mercury and cadmium will be released into the air, as well as dioxins.

A rubber tire. Burning tires has been illegal in Iowa for over 35 years and the fine for burning tires is an amount up to \$10,000. When burned, tires release and form hundreds of toxic chemicals. These include carcinogens such as styrene and butadiene; extender oils, which contain carcinogenic benzene derivatives; up to 17 different metals, many of which are toxic; and carbon black, a fine particulate matter produced by the incomplete combustion of fossil fuels. When these chemicals are released, new, more toxic compounds, including dioxins, furans, polychlorinated biphenyls (PCBs) and polyaromatic hydrocarbons are created.

Encourage citizens to dispose of trash safely

Ask them to...

- Buy smart. Look for products with less packaging. Only buy the amount needed.
- Compost organic waste such as vegetable scraps, leaves and grass clippings. Add the compost to lawns or gardens.
- Reduce the amount they throw away. Reuse and recycle.
- Shred personal papers instead of burning them.
- Call their local garbage hauler for service options or bring their waste to the local transfer station.
- Drop off their recyclables at the community convenience center or materials recovery facility.
- Contact your office or their solid waste planning area for additional recycling opportunities (<http://www.iowadnr.com/waste/sw/compplan.html>).
- Check with the local landfill about the items they accept. Landfills take precautions to protect the surrounding air, water, and land from pollutants.