



DESERT BREEZE

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POLLUTANT OF THE QUARTER: WOODSMOKE



Woodsmoke and Air Quality: A Growing Concern for Health

Wood burning, whether for heating, cooking, or recreational purposes, is a common practice in many parts of the world. While it provides warmth and a sense of comfort, the smoke released from burning wood can pose significant risks to both air quality and human health. This article explores the impact of woodsmoke on air quality, its potential health effects, and steps that can be taken to mitigate these risks.

What is Woodsmoke?

Woodsmoke is the byproduct of burning wood, typically in stoves, fireplaces, or outdoor fire pits. It contains a mixture of gases, fine particulate matter (PM_{2.5}), and other pollutants such as carbon monoxide (CO), volatile organic compounds (VOCs), and polycyclic aromatic hydrocarbons (PAHs). These pollutants can be harmful when inhaled, particularly when exposure is prolonged or occurs in high concentrations.

How Woodsmoke Affects Air Quality

Woodsmoke significantly deteriorates outdoor and indoor air quality. When wood is burned, it releases particulate matter into the atmosphere, including tiny particles that are less than 2.5 micrometers in diameter (PM_{2.5}). These fine particles are small enough to penetrate deep into the lungs and even enter the bloodstream, where they can have widespread effects on the body.

In addition to PM_{2.5}, woodsmoke also contains gases such as carbon monoxide, nitrogen oxides, and sulfur dioxide, all of which contribute to air pollution. These substances can create smog, particularly when burned in large quantities or in urban areas, further reducing air quality.

Health Impacts of Woodsmoke

The health risks associated with woodsmoke exposure are particularly concerning for vulnerable populations such as children, the elderly, and individuals with pre-existing respiratory or cardiovascular conditions. Short-term exposure to woodsmoke can lead to irritation of the eyes, nose, and throat, coughing, and difficulty breathing. Long-term exposure, however, can have more serious consequences.

- Respiratory Issues:** Woodsmoke is a known irritant to the respiratory system. It can exacerbate conditions such as asthma, bronchitis, and chronic obstructive pulmonary disease (COPD). Studies have shown that individuals living in areas with high woodsmoke exposure are more likely to experience respiratory symptoms and may have a higher incidence of lung infections.
- Cardiovascular Effects:** Fine particulate matter from woodsmoke can reach the bloodstream and affect cardiovascular health. Research has linked long-term exposure to increased risks of heart disease, stroke, and high blood pressure. People with existing heart conditions are particularly at risk.
- Cancer Risk:** Woodsmoke contains carcinogens such as PAHs and benzene, which can increase the risk of developing lung cancer over time. The International Agency for Research on Cancer (IARC) has classified woodsmoke as a Group 1 carcinogen, meaning it is a substance known to cause cancer in humans.
- Pregnancy and Children:** Pregnant women and children are especially vulnerable to the effects of air pollution. Exposure to woodsmoke during pregnancy can lead to low birth weight and premature birth. Children exposed to woodsmoke may have an increased risk of developing respiratory problems such as asthma and reduced lung function.



Pollutant of the Quarter: Woodsmoke Cont.



Woodsmoke and Indoor Air Quality

While outdoor air pollution from wood burning is a concern, indoor air quality can be even worse. Many people use wood stoves or fireplaces for heating during the winter months, and inadequate ventilation can lead to high concentrations of indoor air pollutants. In some cases, wood-burning stoves may release more pollution indoors than outdoor sources. Poorly maintained stoves, wet wood, or improper burning techniques can intensify the problem.

Reducing the Impact of Woodsmoke

While wood burning is a significant source of air pollution, there are steps that individuals and communities can take to reduce the health risks associated with woodsmoke exposure.

1. **Use Cleaner Burning Technologies:** Modern wood stoves, pellet stoves, and fireplaces designed to burn wood more efficiently produce less smoke and fewer pollutants. These technologies, which include features like catalytic converters and better air circulation, help reduce emissions of fine particulate matter.
2. **Burn Dry, Seasoned Wood:** Burning wet or green wood produces more smoke and pollutants. Well-seasoned, dry wood burns more efficiently and with less smoke. Ideally, wood should be dried for at least six months before use.
3. **Proper Stove Maintenance:** Regular cleaning and maintenance of wood-burning stoves can help ensure they operate efficiently and produce fewer emissions. It's essential to check for creosote buildup in chimneys and ensure that air vents are functioning correctly.
4. **Limit Wood Burning on High Pollution Days:** Many regions have air quality monitoring systems in place to track pollution levels. On days when particulate matter levels are high, it's advisable to limit or avoid burning wood altogether. Some areas even issue burn bans during times of high air pollution.
5. **Consider Alternative Heating Sources:** If possible, consider using alternative heating sources such as electric or gas-powered heaters, which do not produce the harmful emissions associated with wood burning. These options may be more environmentally friendly and healthier in the long term.

Written By: Melissa Stevenson, Air Quality Specialist

NEED TO OBTAIN A BURN PERMIT?

Online Hazard Reduction Burn Permit Portal

Continuing from the previous open burning seasons, the Eastern Kern Air Pollution Control District (EKAPCD) and Kern County Fire Department (KCFD) will be using the Community Connect online system for the public to obtain permits for fire hazard reduction burning during the upcoming 2024-25 open burn season.

Through Community Connect, Eastern Kern County residents can access, manage, and seek approval for hazard reduction pile burning from EKAPCD and KCFD right from the comfort of your home; no need to drive to the fire station for a permit.

Community Connect is a free, secure, and an easy way for Kern County residents to provide the KCFD with critical information about your property, as well as the people and animals who live there. By providing the information you feel is important for emergency response personnel to be aware of, you can help them provide better protection and

service in the unfortunate event there is an emergency in your household.

Residents can access Community Connect from both the EKAPCD and KCFD websites, or at the following URL:

<https://www.communityconnect.io/info/ca-kerncounty>



Scan QR code and make a profile today!

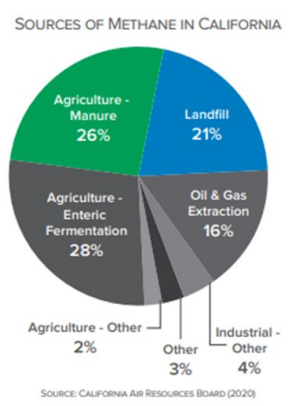
Written By: Sam Johnson, Air Quality Engineer



Landfill Series Part 4: Methane Emissions from Landfills

In the last three editions of the Desert Breeze we covered the ins and outs of landfills from how they operate to what emissions they emit and ultimately how emissions are controlled. In this edition, we will cover a very specific problem that has received recent attention. That problem is methane emissions.

As we know from previous editions of desert breeze, methane is considered a “super pollutant” in the class of Green House Gases (GHGs) contributing to global warming (see December 2017 for more information). Methane is estimated to be approximately 28 times more potent than carbon dioxide (CO₂) at trapping heat in the atmosphere. New satellite-based analysis by NASA, JPL and other agencies have revealed methane emissions in 2019 were approximately 13 percent higher than EPA’s estimates. According to the California Air Resources Board (CARB) landfills are the third largest source of methane in California contributing approximately 21% of emissions.



Education and outreach: Local governments are responsible for educating residents and businesses on how to properly separate organic waste.

Enforcement: Local jurisdictions have the authority to enforce SB 1383 regulations through inspections and potential fines for non-compliance.



Methane Gas



What’s Being Done to Reduce Methane from Landfills?

Studies have confirmed that the main sources for methane in landfills is organics including the following: food scraps, yard trimmings, paper, wood, and cardboard which make up about half of what Californians dump in landfills.

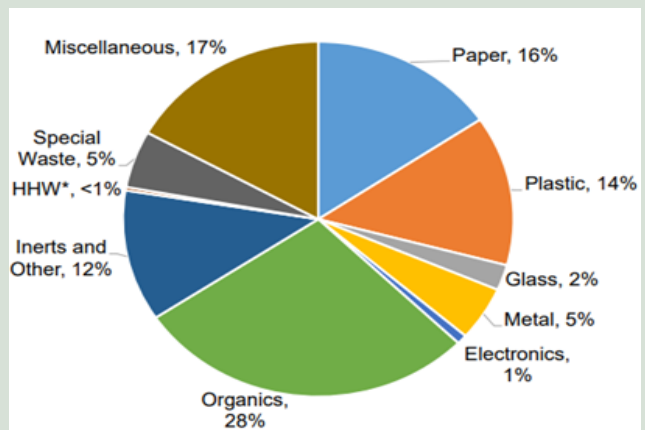
In 2016, Governor Jerry Brown signed SB 1383, also known as the Short-Lived Climate Pollutant Reduction Law, to reduce methane emissions from landfills. The law's goals include reducing organic waste disposal by 75% by 2025 and recover and redistribute at least 20% of edible food that would otherwise be thrown away by 2025. This is to be accomplished in the following ways:

Organic waste collection and recycling: All jurisdictions will be required to provide organic waste collection services for residents and businesses. Organics will be diverted from landfill and sent to be recycled in composting, mulching, and anaerobic digestion facilities. This means approximately 20-25 millions tons of organic waste that will need to be diverted and recycled. To achieve this the state is planning on allocating approximately \$130 million in grants to support part of an additional 50-100 composting facilities. As of January 2024, California has 166 composting facilities with and additional 21 facilities under construction.

Food donation mandate: Large food generators like grocery stores and restaurants are required to donate excess edible food to food recovery organizations.

Why the District Cares?

Composting can both improve reduction of overall greenhouse gases but it can also negatively impact local air quality depending on how it is done. The composting process often results in large quantities of Volatile Organic Compounds (VOCs) being released during the decomposition process of organics in windrow piles. As we know, VOCs react with Nitrogen Oxides (NO_x) in the presence of sun to form ground level ozone, a major issue for our District and most of the state. The facilities can also be source of odor nuisance complaints if near offsite receptors. Our District along with other air District will be tasked with ensuring new composting facilities are built with best control technologies and mitigation strategies are implemented for reducing VOCs. Lastly, state agencies will also be tasked with conducting analysis of GHG benefits via diversion while at the same time evaluating of any unwanted criteria and toxic pollutant impacts.



Source: Cal Recycle: Material Categories in California's Overall Disposed Waste Stream



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Board of Directors meet once every two months starting in January at the District's Board Room, 414 W. Tehachapi Blvd., Suite D, in Tehachapi. The Meeting Agenda can be located on the District website www.kernair.org, under the "Board" tab.

Air Pollution Control Officer

Gary Ray, Jr.

Hearing Board Members

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For news updates and other information, please visit the Eastern Kern APCD website at www.kernair.org

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