



CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

NEWS RELEASE

OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT

OEHHA Lists 5 Toxic Air Contaminants of Concern for Children

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SACRAMENTO – Dioxin, lead and particulate matter emissions from diesel-fueled engines are three of five toxic air contaminants that may cause children and infants to be especially susceptible to illness, according to a new evaluation conducted by the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA).

Polycyclic organic matter and acrolein are the other two toxic air contaminants identified in the evaluation.

"This was one of the most extensive evaluations to date of the effects that toxic pollutants in our air may have specifically on children and infants," said OEHHA Director Dr. Joan Denton.

"There is increasing evidence that children and infants may be more vulnerable than adults to the toxic effects of many pollutants," Dr. Denton said. "However, most past scientific research focused on the effects of pollution on adults. For that reason, most air-quality regulations are based on the effects of air contaminants on adults, rather than children. This evaluation is a key step in California's efforts to ensure children receive the protection they deserve from toxic air contaminants."

The OEHHA evaluation was mandated by the Children's Environmental Health Protection Act (Senate Bill 25), which was authored by Senator Martha Escutia and signed into law by Governor Gray Davis in October 1999. The Act requires OEHHA to evaluate available information on toxic air contaminants and develop a list of up to five toxic air contaminants that may cause children and infants to be especially susceptible to illness. OEHHA is forwarding the list to the California Air Resources Board (ARB), which is required by the Act to review existing regulations for those contaminants and, if necessary, amend them or develop new regulations to ensure the adequate protection of children and infants.

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The Act also requires OEHHA to continue evaluating the health effects of other toxic air contaminants on children and infants. Beginning in 2004, OEHHA will annually evaluate at least 15 contaminants and then present an updated list of contaminants to ARB, which will review and revise its regulations as needed.

Children may face greater risks than adults from air pollution, in part because their exposure to airborne pollutants is greater. Infants and children generally breathe more air per pound of body weight than adults, which increases their exposure to any pollutants in the air. Infants and children often breathe through their mouths, bypassing the filtering effect of the nose and allowing more pollutants to be inhaled. Children also tend to be more active physically than adults, and spend more time outdoors.

Exposure to toxic air contaminants during infancy or childhood could interfere with the development of the respiratory, nervous, endocrine and immune systems, and could increase the risk of cancer later in life.

Beginning in early 2000, OEHHA scientists conducted an initial review of the toxicity and prevalence of more than 200 toxic air contaminants. OEHHA then oversaw focused reviews of the scientific literature on 36 of those contaminants, and selected 17 contaminants for further evaluation based on evidence of their potential effects on children. The state's Scientific Review Panel on Toxic Air Contaminants, a committee of independent scientists affiliated with the University of California, reviewed OEHHA's draft report and endorsed the selection of the final five contaminants, as described below:

Dioxins are a family of chemicals that include polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). Dioxins typically are released to the air during waste incineration, the burning of fuels to produce power for industrial purposes, and motor vehicle use. Dioxins persist for long periods of time in the environment. Airborne dioxins can settle on crops, which are then eaten by humans directly, or by livestock that humans later consume.

Fetuses and newborns are particularly vulnerable to dioxin exposure. Dioxins have been found in amniotic fluid and placenta samples, and breast-fed infants can have blood levels of dioxin greater than in their mother. Evidence indicates that exposure to dioxins during infancy may affect the development of the immune system and later make the child more susceptible to infectious diseases. Fetal exposure to dioxins may be associated with low birth weight. Early dioxin exposure may also increase cancer risk later in life.

Regulatory efforts have led to a substantial decrease in dioxin emissions. By 1995, dioxin releases were 80 percent lower than in the 1970s. Federal and

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state regulations in recent years have targeted municipal waste and medical waste incinerators. ARB is initiating a new evaluation of the sources of dioxin emissions.

Lead has long been associated with toxic effects in children. Low levels of lead exposure have been associated with delays in mental development; decreases in intelligence, short-term memory and visual motor functioning; and aggressive behavior in children.

Airborne lead levels have decreased dramatically in recent decades, primarily due to the ban on leaded gasoline. Deteriorating lead-based paint is now a more significant source of lead exposure for California's children than lead in the ambient air. However, lead emissions still occur from a number of industrial facilities in California. Children living close to these facilities may face an increased risk of lead-related health effects, especially if they are further exposed to lead from paint and other sources.

Polycyclic Organic Matter (POM) consists of a family of more than 100 chemicals, including benzo[a]pyrene and naphthalene. They are produced by the combustion of fossil fuels, vegetable matter and other carbon-based materials. POM is present in exhaust from diesel- and gasoline-powered motor vehicles, fireplace smoke, tobacco smoke, and emissions from paper mills, industrial machinery manufacturing plants, and petroleum refineries. POM can be a significant indoor air pollutant due to smoking, wood burning, and infiltration of outdoor polluted air.

A number of POM substances have been identified as causing cancer in humans or animals. Early-in-life exposures to POM may increase the risk of cancer later in life. Transfer of POM from the mother to the fetus has been well documented, and several studies indicate POM exposure in the womb may result in low birth weight, birth defects or cancer.

ARB regulations have significantly reduced POM emissions from motor vehicles, and new ARB motor vehicle measures are expected to further reduce POM emissions. Industrial facilities with significant POM emissions are required by state law to submit health risk assessments for OEHHA's review and, if necessary, implement risk-reduction measures.

Particulate matter emissions from diesel-fueled engines are microscopic particles present in diesel exhaust. These particles can inflame the airways, enhance allergic responses and may make children more susceptible to allergies and asthma. They also contribute to overall levels of airborne particles, which have been associated with exacerbation of asthma, bronchitis, cough and wheeze in children. Diesel particles also contain a number of toxic substances, including POM.

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ARB has previously approved various regulations to reduce diesel-exhaust emissions. In September 2000, ARB approved a risk reduction plan that is expected to reduce diesel particle emissions by 85% by 2020. ARB will determine whether any changes in its diesel regulatory program are needed as a result of OEHHA's identification of diesel exhaust particles.

Acrolein is present in motor vehicle exhaust, tobacco smoke, wood smoke and some industrial emissions, and is used as an herbicide in irrigation canals. It can also be formed in the atmosphere from chemical reactions involving 1,3-butadiene, another pollutant present in motor vehicle and industrial emissions. Acrolein is very difficult to measure in ambient air, but studies indicate it is routinely present in urban settings at concentrations that may affect the respiratory system.

Several studies in animals strongly suggest that acrolein may exacerbate asthma. OEHHA believes this is of special concern for children, because asthma is more prevalent among children than adults, and because asthma episodes can be more severe in children than adults due to their smaller airways.

Other toxic air contaminants that may make children and infants especially susceptible to illnesses and that will be given a high priority in future OEHHA reviews are arsenic, benzene, carbon disulfide, chlorine, formaldehyde, glycol ethers, manganese, mercury, methyl bromide, methylene chloride, polychlorinated biphenyls (PCBs) and vinyl chloride.

In other activities related to the Children's Environmental Health Protection Act, OEHHA and ARB are studying whether the state's ambient air quality standards for particulate matter and other pollutants adequately affect the health of children. For more information, please see the fact sheet, "Air Pollution and Children's Health" on OEHHA's Web site at www.oehha.ca.gov/public_info/facts/airkids.html.

The Office of Environmental Health Hazard Assessment is one of six entities within the California Environmental Protection Agency. OEHHA's mission is to protect and enhance public health and the environment by objective scientific evaluation of risks posed by hazardous substances.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see California's official "Flex Your Power" Web site at www.flexyourpower.ca.gov.

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