The most dangerous products of incineration are tiny, invisible, pollution-coated particles released into the atmosphere. In the air pollution business, these are known as "fine particles." Despite the best available control technology, incinerators emit large quantities of such particles, which typically measure two micrometers or less in diameter. A micrometer is a millionth of a meter and a meter is 39 inches. Pollution control devices like Venturi scrubbers and baghouse filters are not very effective at trapping these small particles, so to save money for incinerator operators (and thus encourage incineration, which is the stated goal of the EPA), the U.S. Environmental Protection Agency has declared it "OK" for incinerators to emit large quantities of the smallest particles.

Federal law says that an incinerator is allowed to emit 180 milligrams of particles with each cubic meter of air (or 0.08 grams with each cubic foot of air). There are 437.5 grams in an ounce. One large incinerator smoke stack may emit 100,000 cubic feet of air every minute, day in and day out, or 52 billion cubic feet per year. It would be legal for such an incinerator to emit 300 tons of particles yearly. Typically, half of these particles will measure 2 micrometers or less in diameter and thus will be "respirable," which means that you and I can breathe them into the very bottom of our lungs because nature has provided us with no defense against particles this small. From our lungs, they can pass directly into our blood. (See RHWN #131, where we discussed the penetration of these fine particles into human lungs.)

The National Academy of Sciences, in AIRBORNE PARTICLES (Baltimore: University Park Press, 1979), discussed the health dangers of fine particles from many points of view. The "background level" of these fine particles in uninhabited regions of Canada is 1 to 3 micrograms in each cubic meter of air; in the rural Midwest, you'll find 5 to 12 micrograms in each cubic meter of air. This is not a "natural" background level; it represents pollution created by humans. Nevertheless, this background level is a good standard against which to judge the allowable emission of particles from incinerators. The allowable emissions from an incinerator exceed background concentrations by anywhere from a factor of 15,000 to a factor of 180,000. The EPA is relying upon dilution to protect you. They will argue that, by the time those particles reach your lungs, they will be diluted in a lot of fresh air and thus won't be quite so far above background levels when you breathe them. But this, of course, depends upon how close you live to an incinerator, how the wind currents go, whether there are thermal inversion conditions in your local atmosphere, and so forth. There is growing evidence (to be presented next week) that the EPA's dilution strategy isn't safe.

Fine particles remain airborne for long periods of time, and before they fall to earth they can travel several hundred miles or even farther. They can present a danger to humans all along their route. "In summary," said the National Academy, "particulate atmospheric pollutants may be involved in chronic lung disease pathogenesis as causal factors in chronic bronCHissis, as predisposing factors to acute bacterial and viral bronchitis, especially in children and cigarette smokers, and as aggravating factors for acute bronchial asthma and the terminal stages of oxygen deficiency (hypoxia) associated with chronic bronchitis and/or emphysema and its characteristic form of heart failure (cor pulmonale)."

--Peter Montague

FRONTLINE TV BROADCAST FEATURES A NOTORIOUS INCINERATOR IN WHO'S KILLING CALVERT CITY?

PBS (the Public Broadcasting System) aired a program about Calvert City, Kentucky June 20, 1989. Called WHO'S KILLING CALVERT CITY?, the program is part of the network's regular "Frontline" series. This story focuses attention on one of the most shameful and dangerous polluters in America--the LWD Incinerator--and its neighbors (GAF, BF Goodrich and others). Like many places in the Midwest and South, Calvert City is dominated by good old boys who bristle when anyone suggests there's something wrong with a town that has allowed itself to be victimized by predatory businessmen whose smoke stacks belch tons of poisonous chemicals into the public's airspace. But there IS something wrong with towns like Calvert City. This is a heroic story of grass roots struggle by the Coalition for Health Concern as they battle the poisoners and try to save the children of Calvert City from a legacy of danger and disease.

--Peter Montague

Descriptor terms: lung disease; particulates; air pollution; air quality; canada; bronchitis; emphysema; calvert city, ky; ky; pbs tv; tv;