This document is one section from EPA's "Chemical Management Resource Guide for School Administrators," published in December 2006. The reference number is EPA-747-R-06-002. You can find the entire document at http://www.epa.gov/opptintr/chemmgmt/index.htm.

Chemical Management Resource Guide for School Administrators

Section IV
Special Cases

IV. Special Cases

Certain chemicals are worthy of special consideration due to their presence in schools and their negative impacts upon human health and the environment. It is important to identify potential sources of exposure to these chemicals in schools and to follow procedures for minimizing the risk of such exposures. Although this section is not all-inclusive, several examples of chemicals that pose special risks to children (arsenic, asbestos, lead, and mercury) are discussed.

IV.A. Arsenic

Arsenic is a toxic heavy metal used in products such as wood preservatives and pesticides. Exposure to arsenic is associated with an increased risk of bladder and lung cancers, among other serious health effects.[8] Children may be exposed to arsenic on school grounds through contact with materials containing arsenic compounds, such as chromated copper arsenate (CCA). CCA is a preservative and pesticide that was historically used to pressure-treat lumber for outdoor products, including playground equipment. Children can be exposed to arsenic by playing on CCA-treated recreational equipment. Arsenic-contaminated soil from playground areas containing CCA-treated wood also can be tracked into classrooms on shoes or clothing.[9]

The likelihood that wooden playground equipment at existing schools has been treated with CCA is high. Though its use was discontinued in 2003, existing stocks of CCA-treated wood may have been sold through mid-2004. If there is any question as to whether wooden playsets have been treated with CCA, it should be assumed that they have.[10] Exposure to CCA-treated wood can be minimized. Children should wash their hands thoroughly with soap and water immediately after outdoor play. Children also should be discouraged from eating near CCA-treated wood.[11]

If your school is planning to replace its playground equipment, alternatives to CCA are available. These alternatives include several arsenic-free wood pressure treatments and building material alternatives to pressure-treated wood. EPA provides information on alternatives to CCA at the Chromated Copper Arsenate (CCA) homepage, http://www.epa.gov/oppad001/reregistration/cca/index.htm#alternatives.

IV.B. Asbestos

Asbestos is a naturally occurring mineral that was once widely used in products for its heat resistant properties, though its uses have diminished substantially. Exposure to asbestos, particularly for long periods of time, can lead to diseases such as asbestosis, lung cancer, and mesothelioma.[12] Intact, undisturbed asbestos-containing materials (ACMs) generally do not pose a health risk. These materials may become hazardous if they are damaged, disturbed, or allowed to deteriorate and thus release asbestos fibers into building air.

Though its use has been discontinued in many products, ACM can be found in most of the nation's primary, secondary, and charter schools. Asbestos is most commonly found in insulation and building materials such as floor and ceiling tile, cement asbestos pipe, corrugated paper pipe wrap, acoustical

Check It Out

The EPA provides links to detailed information on Chromated Copper Arsenate (CCA), its uses, and its potential health effects on the CCA homepage, http://www.epa.gov/oppad001/reregistration/cca/.

and decorative insulation, pipe and boiler insulation, window caulking, spray-applied fireproofing, and plaster walls in older schools. Asbestos has also been used in laboratory gloves, laboratory hoods, and chalkboards.[13] *Some of these products remain on the market.*

Federal requirements for asbestos management in schools were established by the Asbestos Hazard Emergency Response Act (AHERA) of 1986, which requires public school districts and non-profit private schools to inspect buildings for asbestos; develop plans to manage any asbestos found in these buildings; and carry out management plans in a timely fashion.[14] Damaged ACM may be managed through repair; various containment methods; or, in cases where loose fibers are present, proper removal. It is important to note that AHERA only applies to building materials. No regulations govern the purchase or use of certain asbestos-containing products, such as laboratory gloves, in schools.[15] EPA recommends that asbestos-free versions of these products be purchased for use in schools, along with proper disposal of existing asbestos-containing materials.

Asbestos in Schools

EPA's The ABCs of Asbestos in Schools (available at http://www.epa.gov/asbestos/pubs/abcsfinal.pdf) answers common questions about asbestos in schools and outlines the responsibilities of school boards and other school officials to protect children and employees from exposure to asbestos.

IV.C. Lead

Lead is a highly toxic metal once widely used in products like paint, gasoline, solder, pipes, plumbing, and construction materials. Other sources of lead in the environment include lead from industrial emissions. Exposure to lead occurs when it enters the body through inhalation or ingestion of lead dust, particles, or chips. Lead can cause serious damage to the brain, nervous system, kidneys, and red blood cells. Young children, especially those 6 years and younger, are at particular risk for lead exposure because they have frequent hand-to-mouth activity and absorb lead more easily than do adults. Even at low levels, lead can cause children to have learning and behavior problems, delays in physical growth, and lower IQs.

In schools, lead is most commonly found in the paint, dust, soil, and water. Some schools may have other sources of lead, such as art and photography supplies, pottery glazes, and science lab materials. Consider reducing the use of lead in science experiments and, where it must be used, only use it in dilute solutions that are captured and properly disposed.

Lead paint hazards are of special concern in areas occupied by children. In 1978, the Consumer Product Safety Commission banned the use of lead in paint; therefore, lead-based paint is limited to older school buildings. These buildings and the surrounding soil can be contaminated by flaking paint chips or dust. The only way to know for sure whether your school has lead-based paint is to have the paint and soil tested for lead by a state-certified lead inspector.

Check It Out

Lead in Paint, Dust, and Soil:

- EPA , Rules and Regulations, http://www.epa.gov/lead/pubs/regulation.htm

Lead in Drinking Water in Schools:

- EPA, 3Ts for Reducing Lead in Drinking Water in Schools, http://www.epa.gov/safewater/schools/pdfs/lead/toolkit_leadschools_guide_3ts_leadschools.pdf
- EPA, Guidance and Tools, http://www.epa.gov/safewater/schools/guidance.html

Lead can also leach into drinking water from pipes, solder, or brass plumbing fixtures. There is no federal law requiring sampling of drinking water in schools that are served by a public water system, although schools and local jurisdictions may establish programs for testing drinking water lead levels in schools. EPA and others have issued guidance designed to help schools develop and implement a sampling protocol to test for lead in their drinking water.[16,17,18,19]

IV.D. Mercury

Mercury is a naturally occurring element used to make many consumer products. Exposure to high levels of mercury, as would occur with the direct inhalation of mercury vapor released during a mercury spill, is associated with damage to the brain, heart, kidneys, lungs, and immune system.[20] While the general public can clean up small mercury spills no greater than the amount contained in a single fever thermometer following proper instructions, larger spills must be cleaned up by professionals.[21] In fact, when a spill of more than two tablespoons of mercury occurs, it is mandatory to call the National Response Center (800-424-8802).[22]

Science classrooms and storerooms often contain elemental mercury or mercury compounds used as laboratory reagents. Science classes also may use mercury thermometers, or other mercury-containing laboratory instruments such as barometers (pressure gauge for measuring the pressure of the atmosphere). These all create significant risks of mercury spills, particularly if students have access to them. There is no need for science classrooms to use these chemicals or devices; there are safe, non-mercury replacements for all of them. In addition, nurses' offices often contain mercury fever thermometers and sphygmomanometers (blood pressure measuring devices), which also pose spill risks because they are easily breakable. EPA encourages schools to prevent spills by removing all elemental mercury, mercury compounds, and mercury measurement devices from classrooms and nurses' offices.

Schools should not use or store elemental mercury or mercury compounds. They should replace all mercury thermometers and manometers with mercury-free products. Mercury must be disposed of properly.

A Mercury Spill in Washington, D.C.

"On October 2, 2003, the Washington, D.C.'s Fire Department Hazmat Unit responded to an emergency call unlike any call Ballou High School had ever had to make. What the D.C.'s Hazmat unit found that afternoon proved to be the beginning of a long, exhausting search for and clean up of an elemental mercury spill. By the time the D.C. Hazmat Team and the D.C. public health officials arrived, it was too late to contain all the spills; varying amounts of mercury were found in the classrooms, gymnasium, and cafeteria. Contamination did not stop there. Students unknowingly carried mercury through the streets, onto city and school buses, and into their homes. As a result of the spill, Ballou High School was closed for 35 days and over 200 homes were tested for mercury contamination."

For additional information, see EPA's Superfund Featured News Article, http://www.epa.gov/superfund/news/mercury.htm

Mercury is also used in many of the types of items that are found in all buildings, such as thermostats, flow meters, boiler controls, and electrical equipment. Generally, such equipment poses little risk of spill because the mercury is not easily accessible and the products are not easily broken. However, such equipment needs to be disposed of properly at the end of its life, and new equipment should be mercury free. School building maintenance staff should inventory mercury-containing equipment, properly dispose of it when it comes out of service, and implement mercury-free purchasing policies. Maintenance staff should also not use, and instead properly dispose of, any remaining stores of old janitorial supplies, such as latex paints (prior to 1992) and pesticides (prior to 1994), because these may contain mercury.[23]

Schools should continue to use one category of mercury-containing product – fluorescent lamps. There is currently no alternative to mercury-containing fluorescent lamps that is as energy efficient and that is appropriate for general indoor lighting. The energy efficiency of fluorescent lamps makes them a good environmental choice because of less emissions of mercury and other pollutants from power generation. However, while the amount of mercury in each lamp is small, schools use significant numbers of lamps, and these must be disposed of properly. Contact your EPA Regional Office, the EPA RCRA hotline at (800-424-9346), or your state agency to confirm the most current rules and information on fluorescent lamp waste management and disposal in your state.