

ADDRESSING COMMON CONTAMINANTS ASBESTOS, LEAD, RADON

A public service of the **Churchill Area Environmental Council (CAEC) 2018**
2300 William Penn Highway, Pittsburgh PA 15235

INTRODUCTION: The purpose of this advisory is to inform residents of potential health dangers from exposure to three common contaminants in the home and local environment. Individual reports were created for asbestos, lead, and radon to provide background information on each contaminant. Known environmental and health risks are reviewed along with recommendations to help mitigate exposure.

ASBESTOS:

Background

The collective name "asbestos" is given to six naturally occurring fibrous minerals, all of which are fire resistant and not easily destroyed by natural processes. The minerals are silicates - compounds containing atoms of silicon and oxygen in their structure. Most asbestos used in our area is *chrysotile*, a magnesium-containing silicate mined in Ontario. It has had many commercial applications because its curly fibers separate easily and can be woven like thread. Other types of asbestos are the iron-containing silicates ("amphiboles"), e.g., *crocidolite* and *amosite* from South Africa. Their needle-shaped fibers are more dangerous because they penetrate human tissues more deeply and are retained indefinitely by the body.

Use of asbestos has been declining since the early 1980s when its carcinogenic (cancer-causing) and other health risks were confirmed, a series of OSHA regulations went into effect, and the leading asbestos product producer (Johns Manville) declared bankruptcy in 1982. However, older buildings and consumer products may still contain small to significant amounts of asbestos:

- cement sheeting, roofing, gutters, and flexible building board;
- drainage and flue pipes; asbestos floor and ceiling tiles; ductwork sheathing;
- fire retardant insulation, textured paint; sound deadener sprays and coatings;
- vehicular brake shoes, clutches, and gaskets;
- talc-containing crayons, powders; hot pads in laboratories;
- soil mixes containing vermiculite for planting and seed starting;

Today there are more jobs in asbestos litigation and abatement services than in the asbestos industry itself.

Environmental and Health Issues

In order to be a health risk, asbestos fibers must be taken in over time from the air we breathe or the water we drink. The fibers can escape from mines, soils, or buildings. There is no level of exposure to asbestos fibers that experts have deemed "safe."

Mesothelioma (cancer of the membranes lining the body cavities) is a "marker" disorder of long term asbestos exposure. It is almost always fatal.

Asbestosis is an inflammatory condition leading to thickening, hardening, plaque formation, and fluid collection (effusion) in lung tissue.

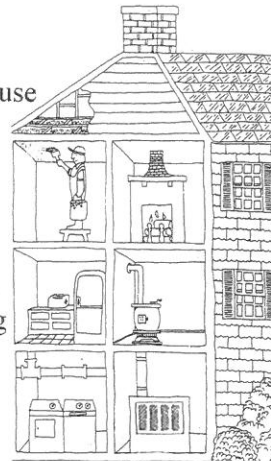
Cancers of the lung and larynx (voice box), have been linked to asbestos exposure, especially in pack-a-day smokers whose lung cancer risk is eight times greater than that of nonsmokers exposed to the same asbestos levels.

The correlation between asbestos exposure and health was not well understood early on because there can be long "latency" periods. Diagnoses of mesothelioma can come 30+ years after an initial exposure to asbestos, especially in asbestos workers.

The special problem of asbestos in school buildings

Asbestos was widely used as fireproof insulation in school construction from 1940 - 1978. Schools of that era, now with flaking asbestos, can expose children and staff members today. In 1980 Congress passed the "Asbestos School Hazard Detection and Control Act," providing financing for asbestos identification and remediation in ALL schools, but no funds were

Asbestos in
the Home



appropriated at the time. In 1982 the Environmental Protection Agency (EPA) issued a ruling requiring all school districts to inspect their buildings for loose asbestos and notify parents and employees of the results. A chronic shortage of funds led to spotty compliance although the City of Pittsburgh and Woodland Hills districts have good compliance records. Woodland Hills demolished or sold off many of its older buildings, inspected the rest, and has an ongoing program of monitoring, notification, and sealing or removing problem areas. The Allegheny County Health Dept. (ACHD) web site <www.achd.net/air/asbestos/html> has a fact sheet on regulations, a brochure on asbestos health issues, links to EPA information, and more.

In most cases it is safer to leave existing asbestos "*in situ*," encapsulating it, enclosing it in a sealant, or bonding it in a matrix. This will bind the fibers tightly and safely. Federal regulations require asbestos to be removed from any public or commercial building before it is demolished. Asbestos abatement is big business these days, but requires highly trained contractors, "moon-suited," respirator-wearing workers, and special procedures including air monitoring, prior permitting, and stringent disposal procedures. **Note:** These government regulations do NOT apply to private homes, but the ACHD encourages the use of licensed contractors for any work to be done in places where the presence of asbestos is suspected.

A local asbestos removal story

A news story in the Pittsburgh Post-Gazette (8/6/2017) illustrates the perils of asbestos removal if done by unlicensed contractors. In June of 2017, a development firm was fined a total of \$2 million for the illegal (without permit) removal and disposal of carcinogenic amosite asbestos at the 135-acre site of the former Westinghouse Research and Development Center in Churchill Borough. According to the ACHD, workers cutting/grinding high asbestos content floor tile and pipe insulation were not given proper protective clothing and masks. Asbestos-laden waste was not wetted down properly nor was it taken to a certified landfill. A building inspector for the Borough noted illegal activity at the site. Following an investigation that included EPA staff, work was halted by the ACHD in May, 2017 pending payment of fines and legal appeals. In contrast, asbestos removal and building demolition work at the former Churchill Country Club House (actually located in Penn Hills) was "done by the book" according to the ACHD. There was asbestos inspection, assessment, permitting, and removal before the club house was cleared to be taken down in summer/fall, 2017.

What can individuals do? What should we not do?

First, and foremost, there is no need for panic. Health effects from exposure to asbestos are generally suffered by people employed in the asbestos mining, milling, product making, and installation industries, or those who work(ed) in uncertified remediation and removal.

If you have an older home (one built prior to the 1970s), and you are planning renovations, it is wise to have an accredited asbestos handler do an assessment. Until the ACHD has its list of such firms posted on its web site, the Asbestos Removal Contractors Association or your municipal office may be helpful.

In general, do not tackle "do-it-yourself" home improvement projects in basements, attics, or around electrical fittings where old, exposed insulation is present. If handled carelessly asbestos particles can contaminate an entire house for a very long time.

Do not dust, sweep, or vacuum places suspected of containing asbestos; this may make the fibers airborne. Many fibers can pass through ordinary vacuum filters.

When replacing non-wood flooring, place new flooring directly over old tiles or linoleums. Never sand, cut, or saw flooring materials that may contain asbestos.

Don't use products that may contain "talc," often present in asbestos mines.

Avoid vermiculite-containing soil mixes and additives. Substitute leaf compost ("Black Gold") made in your backyard or available at little or no charge from your municipality.

Report suspicious asbestos removal activity to authorities. Call the Allegheny County Health Dept (ACHD) to report suspected, improper asbestos handling (412-578-8026).

LEAD

Background

Lead (#82, Symbol "Pb" on the Periodic Table of the Elements) is a naturally occurring element found in small amounts in the earth's crust. It is a bluish-white, lustrous metal, soft, highly malleable, ductile, and a relatively poor conductor of electricity. It is very resistant to corrosion but tarnishes upon exposure to air. While it has some beneficial uses, it can be toxic to humans and animals, potentially causing serious health effects.

Fortunately, the story of a supplier providing drinking water contaminated with high levels of lead (as in Flint MI in 2015) is not typical. More frequently, lead leaches into drinking water when service pipes that contain lead corrode, especially where the water has high acidity or low mineral content that wears away pipes and fixtures. The most common problems tend to be from brass or chrome-plated faucets and from lead service pipes between the utility water main near the curb and in-house copper pipes joined with lead solder. The chance of exposure through lead pipes and fixtures is greater if your house was built before 1986. Other important sources of lead exposure are dust particles and chips from peeling paint in old apartments/homes, and soil from old industrial or demolition areas. Prior to the 1970s, when it was banned, leaded gasoline (to prevent pre-ignition cylinder knocking) was a major source of air-borne lead.

What are the Health Issues?

Lead can affect almost every organ and system in the body. Ingested or inhaled, lead enters the bloodstream and inhibits the production of hemoglobin (needed by red blood cells to carry oxygen). It also locks on to essential enzymes in the brain and nervous system. Lead exposure can affect anyone, but pregnant women and children (especially those six years old and younger) are most imperiled. Even low levels of lead in the blood of children can result in:

- Behavior and learning issues; lower IQ and memory impairment; hearing problems;
- Abdominal pain; muscle weakness; fatigue; anemia;
- Slowed growth; high blood pressure.

In rare cases, ingestion of lead can cause seizures, coma, and even death. Lead can accumulate in our bodies over time, and stored in the bones along with calcium. During pregnancy, these minerals may be released from the mother's bones and used to help form the bones of the fetus. This is particularly true in women who do not have enough dietary calcium. Lead can also cross the placental barrier exposing the fetus to dangerous levels. The result can be serious effects to mother and baby, including reduced growth and premature birth of the fetus. The Journal of Pediatrics (2016) reported that 3% of American children have high levels of lead in their blood, and in 2017 a federal appeals court ordered the EPA to revise its lead action level without delay. It now stands at 15 ppb (parts per billion). USA Report (3/18/16) listed Pennsylvania as having the most schools, day cares, businesses, churches, etc. with lead in their potable water exceeding 15 ppb. Starting in 2018, the ACHD has ordered mandatory lead testing of all children at 9-12 months and again at 24 months of age. Treatment for lead poisoning is difficult, using calcium-disodium EDTA, a chelating agent (chemical attachment and release), to flush lead out in the urine. Prevention is better and much preferred.

What can individuals do? What should we not do?

Since lead in drinking water typically comes from your plumbing lines and fixtures, NOT from the supplier of your water, it is important for public water consumers and private well users to follow these tips to reduce exposure to lead.

Run your water to flush out lead. If water has not been used for several hours, run it for 15-30 seconds or until it becomes cold or reaches a steady temperature before using it for drinking or cooking. This flushes out any stagnant water in your home plumbing and replaces it with fresh

water from the water main in your street. For homes with lead service lines, customers may have to flush the line for a longer period, perhaps one minute, before drinking. Store a supply of flushed water for consumption in the refrigerator as a conservation and time saving measure.

Use cold water for cooking and preparing baby formula. Do not cook with or drink water from the hot water tap; lead dissolves more readily in hot water. Never use water from the hot tap to make baby formula or for cooking and drinking in general.

Do not boil water to remove lead. Lead concentrations will be higher in water that is boiled since some of the water is removed as steam.

Test your water for lead. Contact your water supplier (Wilkesburg-Penn Joint Water Authority) for more information about getting your water tested. WPJWA also provides a list of certified, local laboratories that conduct lead testing at www.wpjwa.com.

Find out if your plumbing fixtures contain lead. There are lead check swabs that can detect lead on plumbing surfaces such as solder and pipes. These swabs can be purchased at plumbing and home improvement stores. **Warning: The disturbance that occurs when replacing just a portion of a lead water line may increase the amount of lead entering a home.** Pilot programs in Pittsburgh are underway to coat the interior of lead service lines with an epoxy liner. Other approved options include using additives like orthophosphate to the water to build a protective layer inside pipes (Post-Gazette 9/28/17 and 10/16/17). Long-term safety is a must.

Our Water Supplier

Chalfant, Churchill, and Forest Hills Boroughs, and Wilkes Township are all serviced by the Wilkesburg-Penn Joint Water Authority (WPJWA). WPJWA provided the following statement on lead in drinking water in its 2016 Water Quality Report found at www.wpjwa.com.

"At the WPJWA, we take our responsibility to protect your health very seriously and want you to make informed decisions about your drinking water. LEAD is not present in the water when it leaves our treatment facility or in the water mains that run below the streets. However, LEAD can be present in old service lines connecting homes to the water system or in-home plumbing. WPJWA takes steps at the treatment plant to reduce the potential of LEAD dissolving into the water and ending up at the tap. WPJWA has always been in compliance with all federal regulations for LEAD. However, some risks remain.

Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The WPJWA is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in water, you may wish to have your water tested by a certified laboratory listed at www.wpjwa.com. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from [the Safe Drinking Water Hotline or at www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).

Coating the interior of a lead service line with a safe epoxy liner — and restoring that line to service — can take up to four hours, according to Pipe Restoration Technologies of Santa Ana, Calif. The process, which can prevent a more costly line replacement, generally involves three workers.

1. Access the pipe. This means digging a hole to reach the privately owned segment of the lead service line from outside. Workers disconnect the private segment from the adjacent public service line. They also open the line inside the home's basement, a step that can include removing the water meter.

2. Drain the pipe. Workers remove any water from the private lead line, which is the focus of the coating work.

3. Dry and clean the pipe's interior. This prepares it for the epoxy.

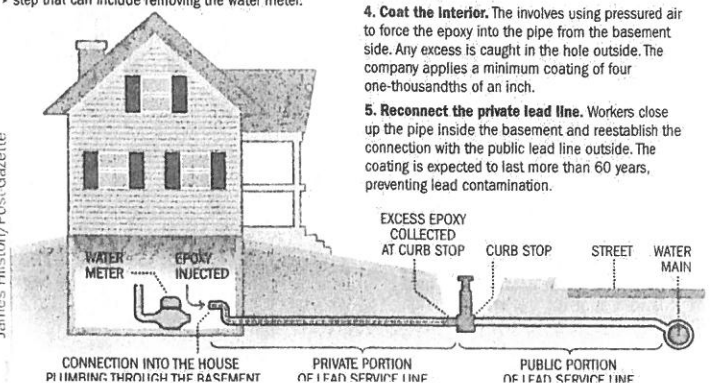
4. Coat the interior. The involves using pressured air to force the epoxy into the pipe from the basement side. Any excess is caught in the hole outside. The company applies a minimum coating of four one-thousandths of an inch.

5. Reconnect the private lead line. Workers close up the pipe inside the basement and reestablish the connection with the public lead line outside. The coating is expected to last more than 60 years, preventing lead contamination.

Making lead pipe safe

Source: Pipe Restoration Technologies LLC

James Hixson/Post-Gazette



RADON

Background

Radon (#86, Symbol "Rn" on the Periodic Table of the Elements) is a naturally occurring, odorless, colorless, radioactive gas that seeps from various uranium-containing rocks (e.g., granite, shale, rock phosphate, schist), soils, and underground water sources. It forms from the breakdown chain of uranium into radium (the immediate parent of radon), followed by the radon daughters - polonium, bismuth, and finally to stable lead. Radon has a half-life of only 3.8 days and disappears quickly, but it is regenerated by the decay of uranium (half-life in the billions of years) and will always be with us. The first two radon daughters - polonium-218 and -214 are very short lived (half-lives of 3.1 and 26.8 minutes respectively), but they are "sticky" solids and tend to adhere to dust. If inhaled, the further decay of these natural elements releases damaging high energy particles that contribute significantly to lung cancer. In 2016, The American Lung Association and the Pennsylvania Department of Environmental Protection held a webinar to raise awareness about the alarming nexus between radon and lung cancer. Radon is the #1 cause of lung cancer among non-smokers, and exposure to radon is the #2 leading risk factor for lung cancer among smokers.

According to the Environmental Protection Agency (EPA), Pennsylvania has one of the most serious radon problems in the United States, with roughly 40% of homes having unsafe radon levels - above 4 picocuries (pCi) per liter ("pico" = trillionth). Rising levels of radon in the air and water are also being linked to the increase of fracking/natural gas in our area, although anything that disturbs the ground can release radon gas (earthquakes, mining, drilling, construction, etc.) An article in the Pittsburgh Post-Gazette (1/20/18) reported high levels of radioactivity over the past six years from radium measured in Allegheny River sediments downstream from three treatment plants that still accept wastewater from conventional oil and gas wells in Venango and Indiana Counties. By law, fracking wastewater must now go into deep injection wells.

Radon in the home and what to do about it

Radon moves easily through rock crevices and soil. It seeps through foundation cracks, drains, and sumps. Home water systems may contain radium if a private well is contaminated. Outdoors, radon levels are very low and rarely pose a health threat other than for miners and drillers working at contaminated sites. Indoors, radon concentrates in areas of low air flow and poor ventilation (basements, crawl spaces, closets) and can reach levels high enough (4- to 20-pCi per liter) to warrant quick corrective action. It is always a good idea to increase air circulation and ventilation throughout a home (what our parents called "airing it out"). Window screens and fans may be better (and more energy saving) than whole-house air-conditioning, and can be used flexibly even in inclement weather. Recent tendencies to seal up every small air leak should be re-examined; it appears that even buildings need to "breathe" a bit. The EPA has determined that living in a home with 4-pCi of radon per liter of air gives you a one percent lifetime risk for lung cancer. It assumes spending 70 years in such a home, so the risk is quite low, but not negligible.

Testing your home is the only way to know if it has unsafe levels of radon. Radon levels are usually the most elevated in the basement, which is why it is a good idea to do at least one detection test there. Short-term testing (2 - 7 days) is done if results are needed quickly, but long-term (up to 90 days) testing is more accurate for a home's average levels. Common ways to test your home include EPA-approved short term test kits available at hardware/home improvement stores like Home Depot - \$12 per set of two radon absorbing charcoal canisters for short-term testing plus \$40 for mail-away laboratory analysis. Long-term testing is done with costly alpha-track detectors and metering, and is best done by professionals

Follow the directions that come with commercial short term kits or hire a state-certified testing company. Free kits are provided at some American Lung Association events. If testing indicates that your home has elevated levels of radon, there are effective mitigation techniques. A certified radon contractor can determine how to disperse and lower dangerous radon levels. The cost of

sub-slab depressurizing and venting to the outdoors with piping and built-in fans can be anywhere from \$800 - \$2,000. Buyers of real estate are advised to delay, decline, or bargain over a purchase if the seller has not successfully abated radon to less than 4-pCi/L. For the most up-to-date information, contact the EPA Radon Hotlines and Information Resources at:

<https://www.epa.gov/radon/radon-hotlines-and-information-resources>

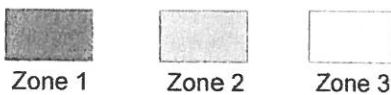
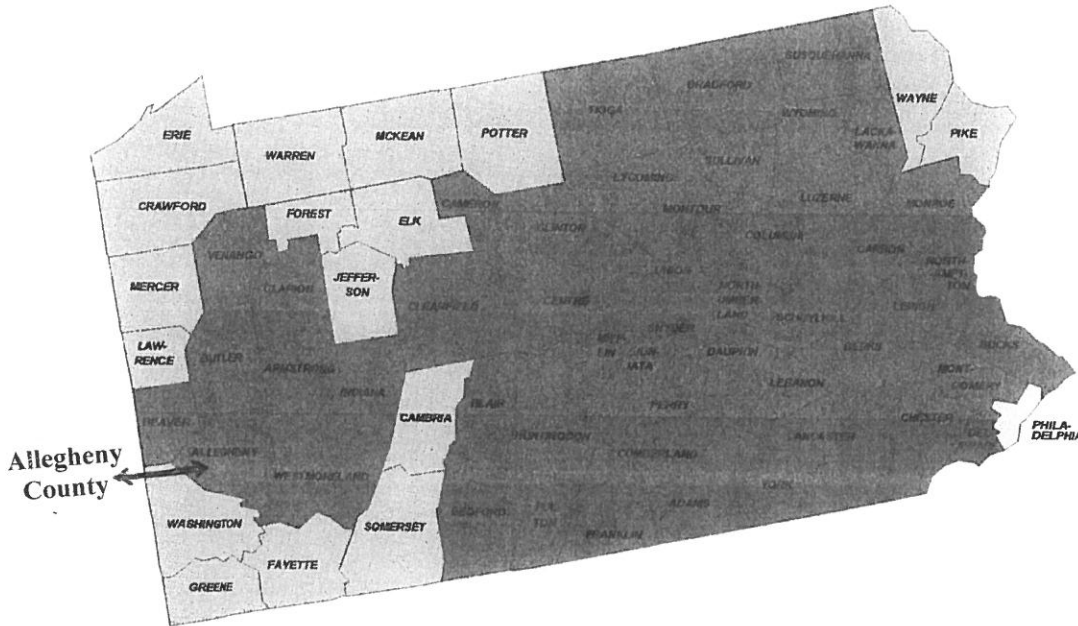
PENNSYLVANIA - EPA Map of Radon Zones

<http://www.epa.gov/radon/zonemap.html>

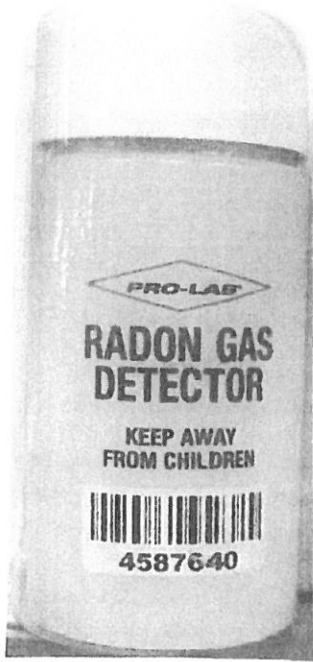
The purpose of this map is to assist National, State and local organizations to target their resources and to implement radon-resistant building codes.

This map is not intended to determine if a home in a given zone should be tested for radon.

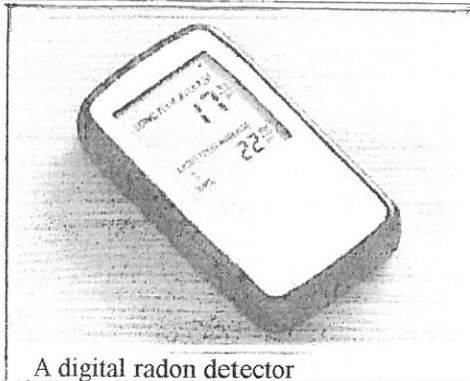
All homes should be tested, regardless of zone designation.



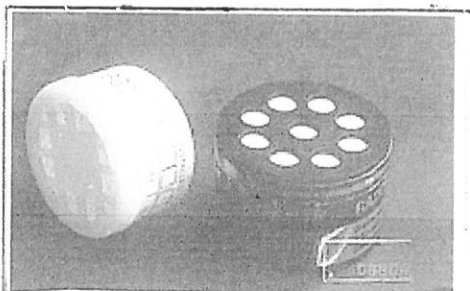
IMPORTANT: Consult the publication entitled "Preliminary Geologic Radon Potential Assessment of Pennsylvania" (USGS Open-file Report 93-292-C) before using this map. <http://energy.cr.usgs.gov/radon/grpinfo.html> This document contains information on radon potential variations within counties. EPA also recommends that this map be supplemented with any available local data in order to further understand and predict the radon potential of a specific area.



Charcoal Canisters
Test Period: 3 to 7 days



A digital radon detector



Alpha Track Detectors
Minimum Test Period: 2 to 4 weeks

