



California
Environmental
Protection
Agency

Air
Resources
Board

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Naturally-Occurring Asbestos General Information

- “ Asbestos is a term used for several types of naturally-occurring fibrous minerals found in many parts of California. The most common type of asbestos is chrysotile, but other types are also found in California. Serpentine rock often contains chrysotile asbestos. Serpentine rock, and its parent material, ultramafic rock, is abundant in the Sierra foothills, the Klamath Mountains, and Coast Ranges. Serpentine rock is typically grayish-green to bluish-black in color and may have a shiny appearance.
- “ Asbestos is commonly found in ultramafic rock, including serpentine, and near fault zones. The amount of asbestos that is typically present in these rocks range from less than 1% up to about 25%, and sometimes more. Asbestos is released from ultramafic and serpentine rock when it is broken or crushed. This can happen when cars drive over unpaved roads or driveways which are surfaced with these rocks, when land is graded for building purposes, or at quarrying operations. It is also released naturally through weathering and erosion. Once released from the rock, asbestos can become airborne and may stay in the air for long periods of time.
- “ All types of asbestos are hazardous and may cause lung disease and cancer. Health risks to people are dependent upon their exposure to asbestos. The longer a person is exposed to asbestos and the greater the intensity of the exposure, the greater the chances for a health problem. Asbestos-related disease, such as lung cancer, may not occur for decades after breathing asbestos fibers. Cigarette smoking increases the risk of lung cancer from asbestos exposure.
- “ Other sources of asbestos are in man-made products. The most common sources are heat-resistant insulators, cement, furnace or pipe coverings, inert filler material, fireproof gloves and clothing, and brake linings. Asbestos has been used in the United States since the early 1900's; however, asbestos is no longer allowed as a constituent in most home products and materials. Many older buildings, schools, and homes still have asbestos containing products. Therefore, laws are in place to protect citizens when these buildings are renovated or demolished.
- “ There are many laws pertaining to asbestos. The Air Resources Board adopted two statewide control measures which prohibits the use of serpentine or ultramafic rock for unpaved surfacing and controls dust emissions from construction, grading, and surface mining in areas with these rocks. There may be additional or more stringent laws concerning asbestos in your area - please contact your local air pollution control district for further information.

For further information please see:

- Fact Sheet #1: Health Information on Asbestos
- Fact Sheet #2: School Advisory for Naturally-Occurring Asbestos
- Fact Sheet #3: Ways to Control Naturally-Occurring Asbestos Dust
- Fact Sheet #4: Naturally-Occurring Asbestos Around Your Home
- Fact Sheet #5: Monitoring for Asbestos



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Fact Sheet #1

Health Information on Asbestos

- “ Asbestos is classified as a known human carcinogen by State, federal, and international agencies. It was identified by the Air Resources Board (ARB) as a toxic air contaminant in 1986.
- “ Asbestos minerals belong to either the serpentine mineral group or the amphibole mineral group. The most common type of asbestos found in California is chrysotile, a serpentine mineral; other types include tremolite asbestos and actinolite asbestos which are amphibole minerals. State and federal health officials consider all types of asbestos to be hazardous. No safe asbestos exposure level has been established for residential areas.
- “ The risk of disease depends upon the intensity and duration of exposure. Exposure to low levels of asbestos for short periods of time poses minimal risk. Asbestos fibers can penetrate body tissues and remain in the lungs and the tissue lining of the lungs and abdominal cavity. The fibers that remain in the body are thought to be responsible for asbestos-related diseases. The illnesses caused by asbestos may not be observed for twenty or more years.
- “ The most common serious diseases caused by asbestos are listed below:
- Asbestosis:** Asbestosis is a non-cancerous lung disease related to diffuse fibrous scarring of the lungs. This disease has occurred in people heavily exposed to asbestos in the workplace and in household contacts of asbestos workers. Asbestosis can cause progressive shortness of breath and coughing.
- Lung cancer:** Lung cancer is a relatively common form of cancer which has been linked to smoking and a variety of occupational exposures. Cigarette smoking significantly increases the risk of lung cancer for those people exposed to asbestos.
- Mesothelioma:** Mesothelioma is a rare cancer of the thin membranes lining the lungs, chest, and abdominal cavity. Almost all cases are linked to prior occupational asbestos exposure.
- “ Most of the information on health effects comes from studies of people who were regularly exposed to high levels of asbestos in the workplace. Workplace exposures are higher and much more likely to cause disease than non-workplace exposures.
- “ Questions regarding health effects should be directed to your local air pollution control district, Mr. Jim Aguila of the ARB staff at (916) 322-8283, or Dr. Melanie Marty of the Office of Environmental Health Hazard Assessment at (510) 622-3154.



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Fact Sheet #2

School Advisory for Naturally-Occurring Asbestos

- “ **Why is there a concern with the use of ultramafic or serpentine rock material?** Serpentine and its parent material, ultramafic rock, often contains asbestos. Ultramafic rock material has been used in some areas for surfacing unpaved roads, parking lots, playgrounds and other open areas; therefore, some schools and day-care centers may currently have areas surfaced with this material. Children attending such schools or day-care centers may be exposed to asbestos fibers through various school activities.
- “ **What has been done to reduce exposure to asbestos from ultramafic rock?** In June 2000, the Air Resources Board (ARB) updated a regulation prohibiting the use of ultramafic rock (including serpentine rock) that contains asbestos for surfacing applications subjected to vehicular, pedestrian, or non-pedestrian use, such as cycling and horse-back riding. A school advisory was also released in 1990 and 1999. A second regulation was adopted in 2001, requiring construction, grading and surface mining activities to control dust emissions when they take place in areas with asbestos containing rocks or soils.
- “ **Where is ultramafic and serpentine rock found?** Ultramafic and serpentine rock is found in many parts of California and is especially abundant in the Coastal Ranges, the Klamath Mountains, and Sierra foothills, where it is commonly exposed near faults.
- “ **How can you determine if you have ultramafic or serpentine rock?** If there are areas surfaced with crushed rock or gravel, an identification of the material should be made. Serpentine rock is often glassy in texture, and usually ranges in color from pale green to bluish-black, but it is most commonly dark or dull green. Serpentine often contains veins of chrysotile asbestos, which appears from beige to white. Some green-colored rock is greenstone and may be mistaken for serpentine rock. If you are unsure, a registered geologist can identify ultramafic and serpentine rock.
- “ **What should you do if school areas are surfaced with ultramafic or serpentine?** If ultramafic or serpentine rock is found on school grounds, it should be tested, using ARB Test Method 435, to determine if there is asbestos present. If asbestos is found, you should consider implementing one of the appropriate mitigation methods listed in Fact Sheet #3. If you need assistance in locating a laboratory to conduct bulk sample analysis, please call the ARB’s Monitoring and Laboratory Division at (916) 322-3726.
- “ **Whom should you contact if you have any questions?** Questions regarding this advisory should be directed to Mr. Jerry Martin at the ARB Public Information Office at (916) 322-2990. A few of the local air pollution control districts (districts) in the State have adopted more stringent laws concerning asbestos - please contact your local district for further information.



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Fact Sheet #3

Ways to Control Naturally-Occurring Asbestos Dust

“ Shown below are ways to control asbestos dust from construction projects and roadways. These control actions will not eliminate asbestos, but offer options to reduce release of airborne asbestos fibers from various activities.

Construction Projects and Roadways

Dust Source	Mitigation Measure	Application Frequency	Relative Effectiveness ¹
Excavation	Water wetting	as needed	2-3
	Excavate during calm periods	when possible	1
Mobile Construction Equipment	Water wetting of roads surfaces	as needed	2-3
	Rinse vehicles / equipment	as needed	3
	Wet loads of excavated material	each load	3
	Cover loads of excavated material	each load	2-3
	Wet and cover loads	each load	4
Exposed Ultramafic or Serpentine Areas	Water wetting	as needed	3-4
	Cover with 6 to 12 inches of non-asbestos material	end of project	4
	Wind breaks / berms	where needed	1-2
	Chemical sealants / dust suppressants	3 mos. - 1 yr.	3
	Vegetative reclamation	end of project	3
	Asphalt cement paving	as needed	4
Roads	Water wetting	as needed	3-4
	Speed control	always	1-3
	Wind breaks / berms	where needed	1-2
	Cover with 2 to 4 inches of non-asbestos rock	as needed	3-4
	Chemical sealants / dust suppressants	3 mos. - 1 yr.	2-3
	Single-coat chip/seal	as needed	4
	Triple-coat chip/seal	as needed	4
	Petroleum sealants	as needed	4
	Asphalt cement paving	as needed	4

1. Subjective rating where: 1 = least effective, and 4 = most effective



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Fact Sheet #4

Naturally-Occurring Asbestos Around Your Home

- " This fact sheet is intended to provide information for homeowners who may have naturally-occurring asbestos sources, such as dust from unpaved roads or driveways surfaced with ultramafic or serpentine rock, near their homes. Other sources of asbestos dust from ultramafic or serpentine rock include disturbed rock deposits on your land, or nearby construction, quarrying operations, and mines. This fact sheet does not address asbestos from asbestos-containing products used or found in the home.
- " Any action to minimize dust generation from naturally-occurring asbestos sources will generally help to reduce your exposure. First identify the location of ultramafic rock (including serpentine) or faults on your property. If you are unsure whether the rock is ultramafic, a registered geologist can be contacted. Some suggestions to consider to reduce dust generation include:
- C paving over unpaved walkways, driveways, or roadways which contain ultramafic or serpentine rock;
 - C having crushed ultramafic or serpentine rock in yards/gardens covered with soil;
 - C having family members and guests remove shoes at the door to reduce track-in (a major entry route of outdoor asbestos fibers);
 - C keeping windows and doors closed on windy days and during periods when nearby ultramafic or serpentine rock may be disturbed, such as during construction;
 - C using a wet rag to dust, as opposed to a feather duster; and
 - C using washable area rugs on your floors.
- " If you are concerned about asbestos in your home, you may consider contacting a qualified expert to have your home tested. We recommend that you contact a certified asbestos consultant and/or a certified analytical laboratory. You can obtain a list of these certified consultants and laboratories by calling the Air Resources Board's Monitoring and Laboratory Division at (916) 322-3726. Collection of samples can be expensive. Analytical costs for bulk samples and air samples can be found in Fact Sheet #5.
- " If you choose to remove any asbestos found in your home, it is recommended that you contact a qualified professional with training in asbestos removal. These professionals use special equipment such as high efficiency particulate air (HEPA) filter vacuum cleaners, which are designed to remove the smaller asbestos fibers. Normal home vacuum cleaners are typically not designed to capture these tiny fibers and may only scatter them throughout the house. However, if the source of asbestos in your home is from naturally-occurring asbestos, unless those sources are controlled, the asbestos may return.
- " Fact Sheet #3 addresses ways to control asbestos dust from exposed serpentine areas, construction projects, and roadways.



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Fact Sheet #5

Monitoring for Asbestos

Note: The costs quoted in this Fact Sheet are approximate only for sample analysis and do not reflect the costs to obtain a sample or deliver the sample to a laboratory.

“ **How can you test for asbestos content in bulk material?** To determine the percent of asbestos for a rock pile or a gravel surface such as roadways and parking lots, use Air Resources Board (ARB) Test Method 435. The method calls for collecting an unbiased sample of material from several locations of a pile or surface, combining those samples, and then crushing the composite sample. A portion of the sample is then analyzed using polarized light microscopy to determine the percentage of asbestos in the bulk sample. Laboratories doing the analysis should be certified by the National Institute of Standards and Technology’s National Voluntary Laboratory Accreditation Program (NIST/NVLAP). The analytical costs is approximately \$50 to \$100 per sample when results are desired within 72 hours.

“ **How can you test for asbestos in the ambient (or outdoor) air?** A sampler consisting of a pump and cassette holder containing a filter is used to determine the amount of asbestos in the ambient air. Asbestos in the air is trapped onto the filter as air is drawn through the filter. The filter samples are analyzed by counting the number of asbestos fibers on the filters using transmission electron microscopy (ref. Federal Register, 40 CFR Part 763). The concentration of asbestos in the air is determined by relating the amount of asbestos trapped on a filter to the volume of air pumped through the sampler. Analytical cost ranges from \$50 to \$100 per sample for results within 72 hours.

For samples to be comparable to each other it is important to use an appropriate sampling method. In addition, laboratories doing the analysis should be certified by the NIST/NVLAP. If you need further information regarding a sampling method or certified laboratory, please contact the Monitoring and Laboratory Division of the ARB at (916) 322-3726.

“ **How can you test for asbestos in the workplace?** NIOSH Method 7400 can be used to estimate the asbestos concentration in the workplace. This method requires a small battery operated pump to collect samples on a filter cassette. Analysis is done by phase contrast microscopy (PCM) which does not differentiate between asbestos and non-asbestos fibers. Method 7400 is appropriate only for measuring asbestos indoors. Analytical cost is about \$10 to \$30 per sample for results within 72 hours.

“ **How can you test for asbestos in your home?** See Fact Sheet #4.

“ **Where can I get a list of laboratories who can perform bulk and ambient analyses?** Please contact the Monitoring and Laboratory Division of the ARB at (916) 322-3726 for the list of laboratories that do this work.