Management of Asbestos in Zonolite® - Vermiculite Insulation

INFORMATION FOR PWS STAFF AND FACILITY USERS

The Issue:

Some vermiculite insulation may contain amphibole asbestos fibres. These products can cause health risks if disturbed during maintenance, renovation or demolition. However, there is currently no evidence of risk to your health if the insulation is sealed (encapsulated) behind wallboards and floorboards, isolated in an attic, or otherwise kept from exposure to the occupied areas of a building.

Purpose

This document is to inform PWS staff about vermiculite loose fill thermal insulation and provide operational safety guidelines for use when vermiculite is present in a building. Loose fill insulation is usually installed in attic spaces above ceilings, and occasionally in the sealed compartments between studs in wood frame construction or as fill in cement block construction. Vermiculite was also used in fireproofing materials, and as a lightweight aggregate in construction materials.

Vermiculite is a shiny mineral, similar to mica, which pops like corn when heated. The puffy product, as light as cork, was once a popular form of building insulation and is still an ingredient in potting soil. Vermiculite itself is harmless: The problem is that the layers of igneous rock where it is found may contain asbestos, exposure to which has been definitively linked to several fatal lung diseases. Vermiculite mined by the W.R. Grace Company at the Libby Montana mine and marketed under the brand name "*Zonolite*" has been shown to contain a type of amphibole asbestos fibre, commonly called *tremolite*. Vermiculite from the Libby mine has not been utilized in Canada since it's closure in 1990.

Not all vermiculite contains asbestos fibres, but the Libby mine supplied the majority of the world market in vermiculite-based insulation until it was closed. This insulation was sold predominantly under the name Zonolite, but may have been sold under other brand names and may contain a small percentage of free asbestos fibres (especially tremolite). To be safe, if your building has older vermiculite based insulation, assume it may contain some asbestos.

The only way to identify asbestos is through microscopic examination of the material.

What is Vermiculite?

Vermiculite is a naturally occurring "mica-like" mineral that was mined and processed into attic insulation starting in the 1920's and ending in the early 1990's. When heated to around 1000 degrees C, it pops (or puffs up) which creates pockets of air. This expanded form, and the fact that vermiculite does not burn, made the material suitable for use as insulation.

Identifying Asbestos Contaminated Vermiculite:

Asbestos contaminated vermiculite insulation is visually indistinguishable from other uncontaminated brands. Pieces of vermiculite are silver-gold to gray-brown and are typically 2mm to 10mm long. The pieces look like they are made of several layers.

Loose fill vermiculite insulation containing asbestos can cause health risks if disturbed during maintenance, renovation or demolition. However, there is currently no evidence of health risk if vermiculite insulation is sealed (enclosed) behind wallboards and floorboards, isolated in an attic, or otherwise kept from exposure to the occupied portions of a building.

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Department of Public Works and Services

Northwest Territories

What Are The Health Risks Associated With Exposure To Asbestos Contaminated Vermiculite?

While the actual percentage of asbestos in bulk vermiculite is very low (typically <1% or trace asbestos), should these fibres be disturbed and become airborne, the potential to inhale them is increased, and poses a potential risk to long-term health. Breathing in very small airborne asbestos fibres has been associated with respiratory system diseases. The potential risk for acquiring the associated diseases will depend on the concentration and size of asbestos fibres in the air, exposure duration and frequency, and the time since the last exposure incident. However, in rare cases very minimal exposures to asbestos containing material (ACM) have been linked to serious health problems.

Asbestosis is a lung disease that occurs when asbestos fibres are inhaled. It is a chronic disease with slow onset. Asbestosis is characterized by pulmonary fibrosis (the formation of scar-like tissue). Shortness of breath is the most common symptom. In most cases, the first and often the only physical sign is a crackling sound that can be heard through a stethoscope. Lung function tests and x-ray diagnosis can help to determine the degree of affect.

Mesothelioma is a very slowly developing cancer of the pleural and peritoneal cells which form the liner of the lung and abdominal cavity. It may take as little as ten or as much as forty years to present. Patients with lung cavity mesothelioma experience chest and shoulder pain and frequent dry cough. As the mesothelioma progresses and the tumor grows bigger, weight loss, weakness, and fever may also occur.

Lung Cancer - all types of asbestos can cause lung cancer. Lung cancer can take many years to develop, but changes in the lung can begin almost as soon as a person is exposed to asbestos. Lung cancer usually does not cause symptoms in the early stages. When symptoms occur the cancer is often advanced. Symptoms of lung cancer include chronic cough, weight loss, shortness of breath, fever, and chest pain. These symptoms are also common with other lung disorders, therefore to confirm the diagnosis it is necessary to carry out laboratory tests including chest x-ray.

How Can The Risk Be Minimized?

According to the Health Canada advisory “Vermiculite Insulation Containing Amphibole Asbestos”, the best way to minimize your risk of asbestos exposure is to **avoid disturbing vermiculite insulation**. If vermiculite insulation is confined and not exposed to the actively used spaces of the building, it poses very little risk.

If you know you have, or believe you may have, vermiculite-based insulation in your building, the following precautionary steps are recommended:

- Seal all cracks and holes in the ceilings of the rooms below the insulation (for example, apply caulking around light fixtures and access hatches with weather stripping seals) to prevent insulation sifting through.
- Restrict access to the space containing the insulation and make sure anyone going into the space knows about the possible presence of ‘ACM’. Install warning signs just inside the affected area.
- Do not allow storage of any type in the space.
- If you must go into the space, use appropriate protective clothing and a respirator mask. Common dust masks are not effective protection against asbestos fibres. Half-face air-purifying respirators with P100 filters can be used and are available from retailers who sell safety equipment. A person should also wear disposable coveralls, gloves and booties.
- Walk on boards in order to minimize disturbance of the insulation.
- Do not remain in the space any longer than is necessary.

It may not be easy to discern whether an attic has vermiculite insulation present due to energy retrofits when many attics were retrofitted with “batt” or blanket insulation or loose cellulose over the existing vermiculite. Care should be taken whenever moving existing insulation.

What Do You Do If You Have Been Exposed To Vermiculite Insulation?

Asbestos related illnesses are usually associated with frequent and prolonged exposure. The time it takes to develop disease following exposure to asbestos is usually measured in decades. However, there are some steps you can take if you may have been exposed.

- Talk to your health care provider. Currently, there are no effective screening methods to determine if exposure to asbestos has occurred. For those with more frequent or prolonged exposure, your health care provider may recommend having a chest X-ray and may refer you to a specialist.
- Avoid or minimize further exposure to any form of asbestos. This includes making sure future work is done safely, as well as proper clean up of the area. Asbestos awareness training is required if working with asbestos when disturbing the material is necessary.
- Don't smoke. Avoid second hand tobacco smoke and other irritants that could affect your lungs. The combination of exposure to cigarette smoke and asbestos greatly increases the chance of developing lung cancer.

What Should be Done When Vermiculite Is Found In A Building?

The best way to reduce the exposure to asbestos is to avoid disrupting the insulation product. If the product is confined, the risk is minimal. By contrast, asbestos fibres in vermiculite insulation are not contained, and can become airborne when the loose granules are disturbed. Follow these steps recommended:

- Review the PWS reference "Asbestos Management Plan for GNWT Buildings."
- Review the "Asbestos Removal and Disposal Guidelines" and follow the recommended procedures.
- Contact the Asbestos Coordinator at (867) 920-8835 for clarification of any steps contained in the above reports.

What Are The Methods For Identifying, Containing and Isolating Vermiculite Insulation?

If you suspect that you have vermiculite insulation in the walls or above the ceiling, as a precautionary step, seal all cracks and holes. For example, apply caulking around window and door frames, along baseboards and around electrical outlets. Collect random samples of the insulation and have it sent to an accredited testing agency for accurate identification and asbestos type verification. PWS currently has a Standing Offer Agreement in place for this testing.

Samples should be taken from the bottom lower section of the insulation as the asbestos fibres tend to settle out of the vermiculite particles. Samples should be taken from different areas of the space the vermiculite is contained in. As this product was mainly shipped in bags it is possible that samples from one area can be negative for asbestos but samples from different locations could be positive. Samples should also be taken of any dust collecting on pipes, ducts or other surfaces in the area.

Assistance with this process, which will vary from building to building, can be obtained by contacting the Asbestos Coordinator, Technical Support Services at PWS Asset Management Division in Yellowknife.

Precautions should be taken even after multiple samples show negative laboratory results. There is always a chance some asbestos is in the vermiculite if the material was installed in the early 1990s. It is best to treat all vermiculite as if it is positive for asbestos.

What About Vermiculite Insulation Removal?

If you decide to have vermiculite insulation removed, or if you are planning renovations, consult with agencies of persons trained and qualified in dealing with asbestos. You should not attempt to remove the insulation yourself, unless you have been properly trained and have the necessary specialized equipment.

Regulatory Requirements

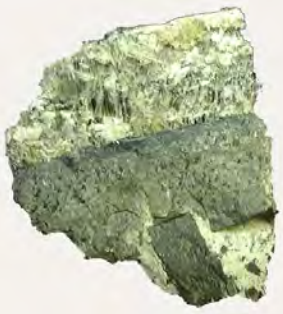
The NWT Workers Safety and Compensation Commission provides worker safety information which should be consulted through the local WSCC representative in the community where the building is located. For any work involving asbestos containing material a work plan must be submitted to the WSCC prior to the start of work.

Summary

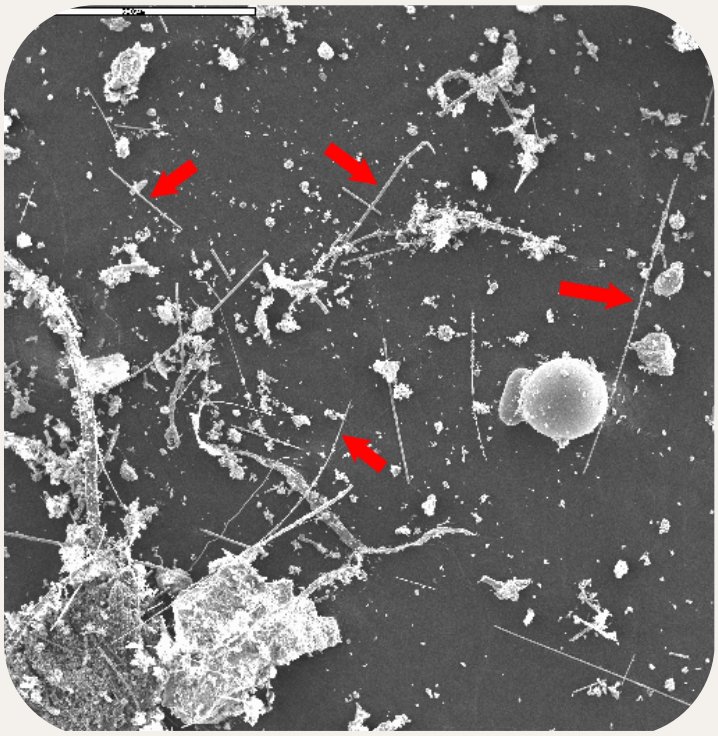
'Vermiculite' insulation presents a small but identifiable risk to long term health. When it is identified in a building, it should be verified and isolated from the occupied spaces of the building. Personnel required to enter the space containing the vermiculite insulation must wear protective clothing and approved respiratory apparatus.

For additional Information, contact Technical Support Services, Asset Management Division, Public Works and Services.

Minerals Containing Asbestos Fibres



Asbestos Fibres



Who Do You Contact?

Your primary contact regarding asbestos in vermiculite and vermiculite proucts is the Asbestos Coordinator:

PWS Asbestos Coordinator
Technical Support Services
Asset Management Division, Public Works and Services
S.M. Hodgson Building, 3rd Floor
Box 1320, Yellowknife, NT X1A 2L9
Tel: (867) 920-8835 or (867) 920-8088
Fax: (867) 873-0226

Further Contacts In Various Areas:

• Regional Superintendent (PWS)	– Fort Smith Region	(867) 872-7401
• Regional Manager (PWS)	– Hay River	(867) 874-7002
• Regional Superintendent (PWS)	– Inuvik Region	(867) 777-7140
• Regional Superintendent (PWS)	– North Slave Region	(867) 873-7650
• Area Manager (PWS)	– Fort Simpson	(867) 695-7285

Reference Sources:

http://www.hc-sc.gc.ca/iyh-vsv/prod/insulation-isolant_e.html
http://www.ccohs.ca/oshanswers/diseases/vermiculite.html
http://www.gov.mb.ca/health/publichealth/cmoh/vermiculite.html
http://www.forces.gc.ca/hr/cfpn/engraph/6_04/6_04_vermiculite-insulation_e.asp
http://dspinspections.com/vermiculite_insulation.htm
http://www.doh.wa.gov/ehp/ts/IAQ/AsbestosVermiculiteInsulation.html
http://www.rhdsc.gc.ca/en/lp/lo/ohs/hazard-alerts/vermiculite.shtml
http://www.gov.mb.ca/labour/safety/pdf/bulletins/bltn245.pdf

Helping to raise awareness of the health risks associated with the various forms of asbestos in the North.

Mike Aumond
Deputy Minister of Public Works and Services