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Asbestos Handling Guideline

Preamble:

What is Asbestos?

Asbestos is a natural mineral with unusual qualities. It is strong enough to resist high temperatures, chemical attack and wear. A poor conductor, it insulates well against heat and electricity.

Asbestos crystals become long, flexible, silky fibres, so it can be made into a wide variety of forms. It can be spun into yarn, woven into cloth or braided into rope. Asbestos can also be added to materials as diverse as cotton and cement.

This combination of properties gives asbestos performance capabilities that are difficult to match.

1. Asbestos Sources

Asbestos has been used in hundreds of applications and products over the past 4,500 years. The ancient Greeks wove it into oil lamp wicks, funeral shrouds and ceremonial tablecloths. During the 1800s, it insulated the hot engines, boilers and piping that powered the Industrial Revolution.

For half a century, until the 1980s, asbestos was used in office buildings, public buildings and schools. It insulated hot water heating systems, and was put into walls and ceilings as insulation against fire and sound.

Asbestos has also been widely used in transportation and electrical appliances, frequently mixed with, and encased in, other materials.

Asbestos has also been found in many products around the house. It has been used in clapboard; shingles and felt for roofing; exterior siding; pipe and boiler covering; compounds and cement, such as caulk, putty, roof patching, furnace cement and driveway coating; wallboard; textured and latex paints; acoustical ceiling tiles and plaster; vinyl floor tiles; appliance wiring; hair dryers; irons and ironing board pads; flame-resistant aprons and electric blankets; and clay

pottery. Loose-fill vermiculite insulation may contain traces of “amphibole” asbestos. **See Appendix 1 for pictures and descriptions of asbestos material examples (page 7).**

2. Asbestos Containing Materials (ACM’S)

Asbestos-containing materials are categorized as friable or non-friable in order to show how easily they may release asbestos fibres when disturbed.

2.1 Friable

A material that is **friable** is one which can be crumbled, pulverized or powdered by hand pressure. If a friable asbestos-containing material is damaged or disturbed, it presents an inhalation risk because asbestos fibres are more easily released into the air. Examples of friable materials include sprayed fireproofing on structural steelwork, or thermal insulation on pipes.

2.2 Non-Friable

A **non-friable** asbestos product is one in which the asbestos fibres are bound or locked into the product matrix, so that the fibres are not readily released. Such a product would present a risk for fibre release only when it is subject to significant abrasion through activities such as sanding or cutting with electric power tools. Examples of non-friable asbestos products include vinyl asbestos floor tiles, acoustic ceiling tiles, and asbestos cement products.

ASBESTOS HANDLING GUIDE

1. Asbestos Identification

It is often very difficult to identify the presence of asbestos by sight. The only way to be certain is to have a sample of the material analyzed by a laboratory.

Sampling of anything you suspect may contain asbestos is itself hazardous and should only be done by a qualified person (a person who has experience in sampling for asbestos and taking the recommended precautions to protect people and the environment while sampling), and analyzed only in accredited laboratories.

2. Inspection of Loads

RDMW employees should be careful when inspecting loads of waste that may contain asbestos. As read in the forgoing sections there are many potential sources of asbestos. Follow the

precautions outlined in the following sections to protect yourself and those around you from being exposed to asbestos fibers.

Inspection Precautions (Scale House – Landfill Entry Point)

Utilize the following precautions when inspecting loads of waste that are known or suspected of containing asbestos:

2.1 Known Asbestos Loads (bagged or otherwise properly identified)

- Contact the landfill supervisor to inform him/her that an asbestos waste load is at the scale.
- Inspect the load to ensure there is no loose materials present (e.g. fibers, bits of insulation) and that it properly stored within sealed containers, bagged or contained in some form that will not allow the release of asbestos material into the air (environment).
- If the waste is not contained in a safe manner, contact the landfill supervisor and hold the load at the scale entry point, moving the transport vehicle off to the side of the scale house, if required.
- Do not disturb or move the waste in such a manner that will cause it to break apart, rip, tear or otherwise break into pieces.

2.2 Suspected Asbestos Waste Loads

- Contact the landfill supervisor to inform him/her that a suspected asbestos waste load is at the scale
- Try to determine if the waste is asbestos by asking the driver of the transport vehicle if the source of the waste is known to be asbestos.
- If it is determined that it is asbestos, then follow all precautions listed in “Known Asbestos Loads” above.
- If it cannot be determined that it is asbestos (no information offered by the transporter), and you suspect that it is, contact the landfill manager for further instructions.

3. Handling Precautions – Asbestos Waste

Asbestos waste can be handled with no or little risk of exposure to fibers if it is properly packaged and handled as per work safe BC regulations. **See Appendix 2 Asbestos Regulations at Work for further guidance (page 19).**

Asbestos which is classified as a hazardous waste (friable asbestos) must be saturated with water and put into a non-leaking sealed drum, or if it is dry the material shall be placed within a 6 mil plastic bag which is sealed within a non-reusable drum or a second 6 mil plastic bag.
Non-friable asbestos materials classified as non-hazardous (e.g.ceiling tiles, floor tiles, cement pipes or cladding) can become hazardous if the material is broken-up or damaged by the handling or disposal at the landfill. Non-friable asbestos should be buried in the landfill at the location designated for asbestos waste.

Non-friable asbestos waste brought to the landfill from construction or destruction activities may be packaged the same as friable waste if there was cutting or breaking of the non-friable asbestos materials during the removal process. The cutting or breaking of the material during removal would likely cause asbestos fibers to be released and therefore take on the physical properties of friable asbestos (easily introduced to the environment if allowed to be exposed to air or ground).

3.1 Physically Moving. Lifting, Placing Asbestos Waste

- When moving, lifting or placing asbestos waste use extreme care to ensure the packaging material is not damaged or opened to allow asbestos fibers, or material containing asbestos, to be exposed to the environment.
- Use landfill available equipment (forklifts, pick-ups) as necessary to assist in the safe movement of asbestos waste. Do not damage or break-open containers/packages containing asbestos waste.
- Transporters of asbestos waste should bring the waste to the land fill site in highway approved vehicles and packaged or stored in approved and sealed bags or containers. Check shipping manifests against the load delivered to ensure it is accurate.
- All forms of waste shall be dumped carefully at the designated area for asbestos waste in such a manner that ensures that packaging used to contain the asbestos waste is not damaged, punctured or opened in any way.
- Asbestos waste packages shall be buried (covered with soil, dirt etc.) the same day it is received (it is recommended to do this within a few minutes of placing the waste).

3.2 Personal Protective Equipment and Exposure Control

If asbestos loads have been accepted and brought into the landfill area for disposal and you are confronted by loose asbestos or loads that potentially pose a friable asbestos condition, because they have been:

- dropped or damaged by MWRD employees moving, lifting or dumping the loads, or
- if the loads appeared to be properly packaged but were not (e.g. ripped bag bottoms or damaged drum underneath)

Apply the following procedures:

- MWRD employees shall protect themselves and those around them and the environment, by utilizing safe work procedures and personal protection equipment devices as outlined in the sites Health & Safety Policies and Procedures.

- The type of personal protective equipment and the appropriate safe work procedure to be employed shall be based on an assessment of the risk of exposure to asbestos.

- The risk assessment shall determine the potential level of asbestos that MWRD landfill site employees may be exposed to and shall outline the controls required to control exposure and form the basis for writing and applying an appropriate safe work procedure and identify the required personal protective equipment and other control devices, such as water sprays, bags, drums, ventilation etc.

4. Packaging & Transporting Requirements for Transporters to the Landfill Site

Transporting asbestos containing materials which are hazardous waste, but not mixed with any other hazardous waste(s), may be transported and disposed of at any authorized landfill provided each of the following conditions, as identified in Section 40 of the Hazardous Waste Regulation, are met:

- the disposal is approved by the landfill operator and the Regional Environmental Protection Manager,
- the asbestos is saturated with water and put into a non-leaking sealed drum, or if it is dry the asbestos is placed within a 6 mil plastic bag which is sealed within a non-reusable drum or a second 6 mil plastic bag, and
- the asbestos is buried immediately with 0.5 m of cover material at the landfill.

If the waste asbestos is determined to be a hazardous waste and is to be transported to a landfill by someone **other than the homeowner**, a manifest must be used. Please note that the manifest also serves as the shipping document required by the federal Transportation of Dangerous Goods

Regulation. The transporter must also hold a licence to transport asbestos under Section 45 of the Hazardous Waste Regulation.

If the waste asbestos is determined to be non-friable, it is not defined as a hazardous waste pursuant to Part 1 Section (1) of the Hazardous Waste Regulation and does not, therefore, require the use of a manifest when being transported from the generation site to the landfill. Section 10 of the *Environmental Management Act* and Section 46 of the Hazardous Waste Regulation establish the requirement and associated conditions for the use of a manifest for the transportation of hazardous waste.

Section 46(2)(c) of the Hazardous Waste Regulation exempts householders and farmers from the manifest and transport licence requirement when they transport hazardous waste, including asbestos, from their homes or farms directly to a facility operated by a government agency, including a municipality.

However, it is the policy of the Seven-Mile recycling (landfill) site that non-friable asbestos waste or suspected asbestos waste delivered by home owners that has been handled and collected in such a way that the handling/collecting has produced friable asbestos waste within the package or within the load, it shall be packaged/sealed in a manner that will not expose landfill employees, or others, to asbestos fibers. Asbestos waste loads that are not packaged or sealed properly shall be refused entry to the landfill.

See Appendix 3 for information on transporting and disposing asbestos waste from residential buildings (page 20).

Appendix 1 – Asbestos Examples

Photos of Typical Asbestos Containing Materials

FRIABLE ASBESTOS

i. Loose Asbestos

ii. Vermiculite Insulation (can be found in attics/ceilings):

Asbestos Building insulation: depending on the mine from which it was obtained, some vermiculite insulation (photo below), a loose-fill building insulation material, contains asbestos. Vermiculite insulation can be comprised of a mix of both small reflective mineral fragments (mica-like) as well as larger fragments up to almost 1/4" of expanded vermiculite insulation

material. The industrial product sold as Zonolite (mined in Montana) and sold in Canada is mica (vermiculite) contaminated with **friable** asbestos.

NON-FRIABLE ASBESTOS

i. Ceiling Tiles

Asbestos Ceiling tiles containing asbestos were widely used in buildings, particularly acoustical ceiling.

Also ceiling fireproofing slabs of asbestos (as well as spray-on asbestos) were used in commercial buildings.

ii. Cement-Asbestos Roofing Shingles

Asbestos cement roof shingles were in popular use in the U.S. from the 1920's through the 1960’s and were sold in the U.S. and Canada into the 1970's and according to some sources even in the 1980's.. The mixture of asbestos fibers and portland cement to form a hard material that was durable and fire resistant.

The typical life expectancy of a cement asbestos shingle roof was given as 30 years, but we've seen these roofs that were now 50 years old in good condition. Typical roof wear or failure patterns are either failure of the shingle fasteners or broken and falling shingles.

Asbestos cement corrugated roofing has been in use over the same time period and was generally a thicker material used in low-cost applications such as on sheds, barns, and low-income housing in some areas.

iii. Duct-Asbestos Insulation

Asbestos paper was used to wrap the exterior of heating ducts and their connection to heating registers. Asbestos fabric was used to form the vibration damper at the connection between heating ducts and heating furnaces. (see photo below).

iv. Vinyl-Asbestos Floor Tiles and Vinyl Asbestos Flooring

These were used in buildings as vinyl-asbestos floor tiles. Flooring backing materials such as the backing on sheet flooring also contained asbestos in some products. Sheet flooring such as early vinyl flooring contained asbestos fibers and filler.

v. **Asbestos Heating Boilers & Heating furnaces: vibration damper** material, typically located between the blower compartment and the supply plenum, may be asbestos-based cloth on older furnaces. Asbestos was used for **door insulation** on heating boilers. Hot water boilers were coated

with a thick asbestos insulating paste; other models used corrugated asbestos paper insulation.

vi. **Asbestos millboard** (photo below) used for stoves and heaters, in garages, as fireproof wallboard, as gaskets, as washers in electrical applications, stove mats, safes, motion picture booths, automobile hoods. Asbestos millboard is a cementious product that was produced in sheets and used for fire barriers and in other applications.

v. Paper Made of Asbestos

This product was used for products such as: heating air duct wrap and ceiling heat barriers.

vi. Asbestos Pipe Insulation

Made of high asbestos content papers (for straight pipe runs) and mastics (for pipe elbows) this insulation was applied on hot water and steam heating systems and occasionally on ordinary building plumbing piping.

vii. Asbestos Cement Pipes

Asbestos cement pipes were used for air ducts or chimneys. Cement asbestos pipe was also used for water piping (mains in streets) and for plumbing vents on homes (photo below).

viii. Asbestos Siding

Some building siding materials contain asbestos: Cement-asbestos siding shingles (photo below) and cement asbestos board siding as well as under sheeting.

Appendix 2 - Asbestos Regulations at Work

The BC **Occupational Health and Safety Regulations** represent the minimum requirements for performing work safely in the province of British Columbia. These regulations outline the general health and safety requirements, the safe use of equipment, the use and care of personal protective equipment and permissible concentrations for airborne contaminants such as asbestos.

Sections 6.1 to 6.32 of the Occupational Health and Safety Regulations pertain to operations involving the use of asbestos or materials containing asbestos. The permissible concentration of all types of airborne asbestos is 0.1 fibres/ml for an 8-hour workday (i.e. 8-hour exposure limit), amendment to Schedule A of the regulations effective November 1, 1993. This permissible concentration refers to an airborne concentration of asbestos under which it is believed that nearly all workers may be repeatedly exposed without any adverse effect.

WorkSafeBC has developed recommended procedures for handling asbestos in British Columbia which are outlined in the booklet **Safe Work Practices for Handling Asbestos (PDF).**

Appendix 3 - Transporting and Disposing Asbestos Waste from Residential Buildings

The management of waste asbestos, including transportation and disposal, from residential buildings is within the ministry's jurisdiction, but the decision to remove and the removal process is not.

Special techniques are required to remove asbestos safely. Home owners should call in a removal expert or at least not disturb asbestos or attempt removal without following all precautions as set out in the Workers' Compensation Board handbook "Safe Work Practices Handling Asbestos".

The following information has been provided for home owners to assist in the transportation and disposal of asbestos waste if the waste is classified as hazardous waste according to the Hazardous Waste Regulation. Waste asbestos must be transported according to the federal *Transportation of Dangerous Goods Act* and Regulations, and transported and managed according to the provincial *Environmental Management Act*, the Hazardous Waste Regulation, and any applicable local government landfill rules.

The Hazardous Waste Regulation defines "waste asbestos" as a hazardous waste if the waste contains more than 1%, by weight, of asbestos fibres and the waste is either a powder or friable.

Friable waste means a waste that when dry, can be easily crumbled or powdered by hand. Friable material containing asbestos may appear:

- fluffy or spongy (always applied by spraying)
- irregular, soft surface (usually applied by spraying)
- textured, dense, fairly firm surface (usually applied by trowelling)

Asbestos that is tightly bound within a solid matrix so that it is not easily crumbled by hand is non-friable and is not a hazardous waste.

However, it is the policy of the Seven-Mile recycling (landfill) site that non-friable asbestos waste or suspected asbestos waste delivered by home owners that has been handled and collected in such a way that the handling/collecting has produced friable asbestos waste within the package or within the load, it shall be packaged/sealed in a manner that will not expose landfill employees, or others, to asbestos fibers. Asbestos waste loads that are not packaged or sealed properly shall be refused entry to the landfill.