GUIDELINES FOR HAZARDOUS MATERIALS RISK ASSESSMENT

QMS-FS-GUI-20-016 Revision 1 – 23/06/2022

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Revision History and Approval

Rev.	Nature of changes	Approval	Date
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1. Purpose

This document was created to help the Australian National University (ANU) adopt a consistent approach for assessing the risk of identified and presumed hazardous materials at the ANU Acton Campus and other ANU properties. It is applicable to Asbestos Containing Materials (ACM), Lead Paint, Polychlorinated Biphenyls (PCB), Synthetic Mineral Fibres (SMF), Ozone Depleting Substances (ODS) and Above & Underground Storage Tanks (A/UST) for fuel.

This document is to be read in conjunction with:

- The respective building Hazardous Material (HazMat) Report / Register.
- The current and document controlled version of ANU's Hazardous Materials Management Manual (QMS-FS-MAN-20-018).

2. Risks associate with Hazardous Materials

The Australian Standard for Risk Management – Principles and guidelines (AS/NZS ISO 31000:2009) was published in Australia and New Zealand in 2009 and describes the process for managing risk. It is identical to the process detailed in the superseded AS/NZS 4360:2004. It details the principles that organizations must follow to achieve effective risk management.

As part of their risk management process, ANU has adopted a numerical risk assessment scoring system to quantify the level of risk that identified and presumed hazardous materials pose to staff, contractors, students, visitors and members of public to the ANU Acton Campus and other ANU properties.

The risk assessment score allows ANU to make informed decisions about the most practicable ways to manage, maintain, reduce and/or remove the risks associated with hazardous materials.

Note: There is an important difference between the *Work Health and Safety Regulation 2011* republished and administered within the ACT by the ACT Parliamentary Counsel and the *Work Health and Safety Regulation 2011* administered nationally by Safe Work Australia. In the ACT, Regulation 422 states that the person with management or control of the workplace (PMCW) must ensure that ACM can only be identified/presumed by a licensed Asbestos Assessor. In all other states and territories, Regulation 422 states that the PMCW must ensure that ACM is identified/presumed by a competent person.

Since ANU has campuses/properties across several states and territories in Australia, different requirements apply. For consistency and best business practice, ANU use licensed Asbestos Assessors to identify/presume ACM regardless of the campus/property location within Australia.

3. Asbestos Containing Materials (ACM)

Asbestos is a hazardous material that poses a risk to health by inhalation if the asbestos fibres become airborne and people are exposed to these airborne fibres. Exposure to asbestos fibres is known to cause mesothelioma, asbestosis and lung cancer.

Asbestos-containing materials were used extensively in Australian buildings and structures, plant and equipment and in ships, trains and motor vehicles during the 1950s, 1960s and 1970s, and some uses, including some friction materials and gaskets, were only discontinued on 31 December 2003. This was the final prohibition for asbestos in the workplace (Standards Australia, 2016).

The well-known adverse health consequences of exposure to airborne asbestos fibres can be prevented if precautions are taken and appropriate procedures are followed. The risks posed by ACM depend on the nature and condition of the materials and the potential for exposure.

Managing the risks associated with asbestos involves:

- Identifying asbestos and ACM at the workplace and recording this in the asbestos register;
- Assessing the risk of exposure to airborne asbestos;
- Eliminating or minimising the risks by implementing control measures; and,
- Reviewing control measures to ensure they are effective.

3.1 Risk Assessment Criteria for Asbestos Containing Materials (ACM)

During a Hazardous Materials Survey and/or Reinspection, the following criteria are considered by a licensed Asbestos Assessor (or competent person) when assessing the risk associated with all identified and presumed ACM. Once a selection is made, the associated risk point is used in the calculation of the total risk score.

- Type of material
    - Asbestos not detected (Points = 0)
    - Non-friable asbestos detected (Points = 1)
    - Friable asbestos detected (Points = 2)
- Condition of the ACM
    - Stable surface with no cracks, breaks, exposed edges or weathering (Points = 1)
    - Reasonably stable surface with only minor cracks, breaks, exposed edges or natural weathering (Points = 2)
    - Unstable surface with major cracks, breaks, exposed edges with visible fibre bundles loose associated debris, extreme weathering or mechanically deteriorated from cutting/sanding/drilling (Points = 3)
- Accessibility of the ACM
    - Not exposed: Fully sealed/painted, fully obstructed from view behind other materials, in very low activity areas (Points = 1)
    - Partially exposed: Mostly sealed/painted, partially obstructed from view, in low activity areas (Points = 2)
    - Fully exposed: Not sealed/painted, fully visible, in high activity areas (Points = 3)
- Potential for the ACM to become airborne
    - Not exposed to air movement (Points = 1)
    - Exposed to natural or low velocity air movement (Points = 2)
    - Exposed to mechanical or high velocity air movement (Points = 3)
- Likelihood of exposure to the ACM
    - Accessed only by Asbestos Awareness trained and/or authorised maintenance personnel (Points = 1)
    - Accessed only by a small number of non-trained and/or unauthorised personnel (Points = 2)
    - Accessed by large number of non-trained and/or unauthorised personnel (Points = 3)

The points assigned to each material are multiplied together to quantify a risk score and an action priority for each identified or presumed ACM. These are shown in Table 1.

Note: A licensed Asbestos Assessor or competent person may choose to increase/decrease the Risk Score for a particular material based upon the observed exposure risk for that material (i.e. a risk of 'high' may be assigned to severely damaged ACM pipe lagging even if the criteria scores do not total 50 points).

Table 1: Risk Score, Action Priority Ranking and Action Plan

Risk Score	Action Priority	Action Plan and Recommendations
50 and above	High (H)	Exposure to airborne asbestos fibres may result from extremely minor disturbance. Action should be taken immediately to reduce exposure risk.
20 to less than 50	Medium (M)	Exposure to airborne asbestos fibres may result from significant disturbance. Action should be taken as soon as practicable to reduce exposure risk.
1 to less than 20	Low (L)	Exposure to airborne asbestos fibres is unlikely during normal building use. Ongoing actions to maintain the ACM in good condition and to check it periodically to ensure a low exposure risk.
0	Nil (N)	Asbestos was not detected in the material being assessed. No action required.

4. Lead Paint

Lead in paint (as lead carbonate) is found extensively in homes and commercial and industrial buildings built pre-1970. Although Australian industry has generally phased out lead in paint, levels of below 1 percent are still permitted and industrial application of high-lead paint to residential/commercial dwellings may still continue (Standards Australia, 2017).

Lead-based paint may be a health issue if it becomes mobile in the environment or if ingested. For this reason, sealing or safe removal of paint is strongly recommended, particularly where it is flaking or exposed to the elements.

Currently, lead paint is defined by the Australian Standard AS 4361.2 – 2017 (Guide to hazardous paint management Part 2: Lead paint in residential, public and commercial buildings) as a paint or component coat of a paint system containing lead or lead compounds, in which the lead content (calculated as lead metal) is in excess of 0.1% by weight of the dry film as determined by laboratory testing.

Analytical values of ≤ 0.1% Pb allow the sample to be categorised as being lead free paint.

Note: The following definition is superseded and is only present to assist personnel referencing ANU Hazardous Materials Survey and/or Reinspection Reports that were produced before December 2017.

> Prior to the revision of AS 4361.2 in December 2017, AS 4361.2 – 1998 defined lead paint as a paint or component coat of a paint system containing lead or lead compounds, in which the lead content (calculated as lead metal) is in excess of 1.0% by weight of the dry film as determined by laboratory

testing. Further, the Standard for the Uniform Scheduling of Drugs and Poisons (National Drugs and Poisons Schedule Committee July 2000) classified paints having more than 0.25% lead as First Schedule Paint and prohibited their manufacture, supply or use. It has been shown that the dust generated from dry sanding or abrasive blast cleaning of paints with a lead concentration of > 0.25% can have sufficient content to produce exposure levels that exceed those that define a 'lead task' in NOHSC 1012. Therefore, paints with a lead concentration greater than 0.25% (if they are to be removed) must be treated as a lead paint (i.e. subject to the regulations in NOHSC 1012). Prior to December 2017, analytical values of <0.25% Pb allow the sample to be categorised as being lead free paint.

4.1 Risk Assessment Criteria

During a Hazardous Materials Survey and/or Reinspection, the following criteria are considered by a licensed Asbestos Assessor (or competent person) when assessing the risk associated with lead paint systems. This qualitative assessment determines the Action Priority. These are shown in Table 2.

- Location of the lead paint system
- Surface area of the lead paint system
- Condition of the lead paint system
- Accessibility of the lead paint system
- Likelihood of ingesting and/or inhaling lead paint particles

Table 2: Action Priority Ranking and Action Plan

Action Priority	Action Plan and Recommendations
High (H)	Lead is present in paint that is in very poor condition (i.e. bad cracking, flaking, chalking and peeling observed). It covers a large surface area and/or is on a surface that is easily accessible to children. It may present a health hazard with minor disturbance. Action should be taken immediately to reduce exposure risk.
Medium (M)	Lead is present in paint that is in average condition (i.e. some cracking, flaking, chalking and peeling observed). It covers a small surface area and/or is on a surface that is not easily accessible to children. It may present a health hazard with moderate disturbance. Action should be taken as soon as practicable to reduce exposure risk.
Low (L)	Lead is present in paint that is still in good condition (i.e. no cracking, flaking, chalking or peeling observed) and is not a friction or impact surface. It is not likely to present a health hazard unless significantly disturbed. Ongoing actions to maintain the lead paint system in good condition and to check it periodically to ensure a low exposure risk.
Nil (N)	Lead was not detected in paint system being assessed. No action required.

5. Synthetic Mineral Fibres (SMF)

SMF is a generic term used to collectively describe a number of amorphous (non-crystalline) fibrous materials including glass fibre, mineral wool (Rockwool and Slagwool) and ceramic fibre. Generally referred to as SMF, these materials are also known as 'Man-Made Mineral Fibres' (MMMF).

SMF products are used extensively in commercial and residential buildings for thermal and acoustic insulation, and as a reinforcing agent in cement, plaster and plastic materials. In some specialised instances, SMF materials have also been used as alternatives to asbestos, especially where high temperature insulation properties are required.

5.1 Risk Assessment Criteria

During a Hazardous Materials Survey and/or Reinspection, the following criteria are considered by a licensed Asbestos Assessor (or competent person) when assessing the risk associated with all identified and presumed SMF. This qualitative assessment determines the Action Priority. These are shown in Table 3.

- Type of SMF
- Condition of the SMF
- Accessibility of the SMF
- Potential for the SMF to become airborne
- Likelihood of exposure to the SMF

Table 3: Action Priority Ranking and Action Plan

Action Priority	Action Plan and Recommendations
High (H)	SMF is unbonded, can be made easily airborne and/or is in easily accessible areas. It may present a health hazard with minor disturbance (i.e. exposed to a light breeze, etc.). Action should be taken immediately to reduce exposure risk.
Medium (M)	SMF is unbonded or bonded but in poor condition, can be made airborne with moderate disturbance and/or is in less accessible areas. It may present a health hazard with moderate disturbance (i.e. crawled through, exposed to moderate breeze, etc.). Action should be taken as soon as practicable to reduce exposure risk.
Low (L)	SMF is bonded and in good condition, can only be made airborne with significant disturbance and/or is in very inaccessible areas. It is not likely to present a health hazard unless significantly disturbed (i.e. torn apart, sanded, machined, etc.). Ongoing actions to maintain the SMF in good condition and to check it periodically to ensure a low exposure risk.
Nil	SMF was not detected in the material being assessed.

(N)	No action required.

6. Polychlorinated Biphenyls (PCBs)

PCB is the common name for polychlorinated biphenyls. PCBs range in appearance from colourless, oily liquids to more viscous and increasingly darker liquids, to yellow then black resins, depending on the chlorine content of the PCB.

PCBs are chemically stable synthetic compounds that do not degrade appreciably over time or with exposure to high temperatures. The major use of PCBs was as an insulating fluid inside transformers and capacitors. Capacitors containing PCBs were installed in various types of equipment including domestic appliances, motors and fluorescent light fittings during the 1950s, `60s and `70s.

These applications generally do not present an immediate risk to human health or the environment as the equipment is sealed and contains relatively small amounts of PCB. The equipment can continue to be used safely provided that the capacitors do not leak.

The Australian and New Zealand Environment and Conservation Council (ANZECC) in its *PCB Management Plan* of *2003* stipulate cessation dates for the generation of PCB scheduled waste, the use of articles containing PCB scheduled waste, and the disposal of PCB scheduled waste.

Note: PCB scheduled waste means any PCB material that has no further use that contains PCBs at levels at, or in excess of 50 mg/kg and is of a quantity of 50 g or more.

Small equipment items and capacitors found in households and commercial buildings that contain scheduled PCBs (i.e. at or in excess of 50mg/kg) are to be disposed of as scheduled PCB waste. Where the aggregate weight of the items or capacitors exceeds 10 kg, they must be notified to the relevant Commonwealth, State or Territory Government agency prior to their disposal.

6.1 Risk Assessment Criteria

During a Hazardous Materials Survey and/or Reinspection, the following criteria are considered by a licensed Asbestos Assessor (or competent person) when assessing the risk associated with all identified and presumed PCBs. This qualitative assessment determines the Action Priority. These are shown in Table 4.

- Type of material
- Condition of the material
- Accessibility of the material
- Concentration of the PCB
- Amount of the PCB
- Likelihood of exposure to the PCB

Table 4: Action Priority Ranking and Action Plan

Action Priority	Action Plan and Recommendations
High (H)	PCB leaking from the item being assessed. Action should be taken immediately to reduce exposure risk.

Medium (M)	PCB is contained within the item being assessed but the item is not in good condition (i.e. swelling, rust, damage observed). Action should be taken as soon as practicable to reduce exposure risk.
Low (L)	PCB is contained within the item being assessed and the item is in good condition (i.e. no swelling, rust, damage observed). Ongoing actions to maintain the PCB in good condition and to check it periodically to ensure a low exposure risk.
Nil (N)	PCB was not detected in the item being assessed. No action required.

7. Ozone Depleting Substances (ODSs)

ODSs are used for heat transfer in refrigeration and air conditioning systems, absorbing or releasing heat according to vapour pressure. Release of these substances to the atmosphere has the ability to cause long term atmospheric pollution that can lead to ozone depletion, global warming, petrochemical smog and acid rain.

The ozone depletion potential (ODP) of a fluorocarbon refrigerant gas, its global warming potential (GWP) and estimated atmospheric life (EAL) all contribute to its potential to deplete the stratospheric ozone layer and enhance the greenhouse effect leading to global warming.

- ***Chlorofluorocarbons*** (CFCs) contain chlorine and possess a large ODP, high GW and long EAL. They are generally found in refrigeration and air-conditioning systems (i.e. centrifugal chillers).
- ***Hydrochlorofluorocarbons*** (HCFCs) are less saturated with chlorine than are CFCs and the hydrogen within these compounds give the HCFCs a much shorter EAL and lower ODP. They are generally found in refrigeration systems that are used for food display, cold stores and self contained, split, multi-split and central plant chillers used for building air-conditioning.
- ***Hydrofluorocarbons*** (HFCs) are a class of replacement gases for CFCs. They do not contain chlorine or bromine and therefore do not deplete the ozone layer. While all HFCs have an ODP of zero, some do have a high GWP (i.e. R-404A, R-407B, R-125, etc.).
- ***Halons*** are synthetic chemical compounds that contain one or two carbon atoms, bromine and other halogens. They have a long atmospheric lifetime and cause very aggressive ozone depletion when breaking down in the stratosphere. Halons were introduced into Australia as fire-extinguishing agents in the early 1970s and quickly replaced many previously accepted fire-fighting products because of their superior fire-extinguishing characteristics and ease of use.
    - Halon 1211 was commonly used in portable fire extinguishers, while fixed fire protection systems, such as those that protect computer rooms and ship engine rooms, commonly contained Halon 1301.
    - Halon 1301 has an ODP that is 10 times greater that of CFCs, while Halon 1211 has an ODP 3 times greater than that of CFCs.

7.1 Risk Assessment Criteria

During a Hazardous Materials Survey and/or Reinspection, the following criteria are considered by a licensed Asbestos Assessor (or competent person) when assessing the risk associated with all identified and presumed ODSs. This qualitative assessment determines the Action Priority. These are shown in Table 5.

- Type of ODS

- Condition of the ODS-containing item
- Accessibility of the ODS
- Likelihood of disturbing the ODS
- Amount of the ODS
- Likelihood of exposure to the ODS

Table 5: Action Priority Ranking and Action Plan

Action Priority	Action Plan and Recommendations
High (H)	ODS leaking from the item being assessed. Action should be taken immediately to reduce exposure risk.
Medium (M)	ODS is contained within the item being assessed but the item is not in good condition (i.e. swelling, rust, damage observed). Action should be taken as soon as practicable to reduce exposure risk.
Low (L)	ODS is contained within the item being assessed and the item is in good condition (i.e. no swelling, rust, damage observed). Ongoing actions to maintain the PCB in good condition and to check it periodically to ensure a low exposure risk.
Nil (N)	ODS was not detected in the item being assessed. No action required.

8. Above/Underground Storage Tanks for Fuel (A/USTs)

Prior to the introduction of natural gas commercial premises generally utilised heating systems where boilers were fuelled by diesel or heating oils which were stored in USTs.

Heating oil and other petroleum products are classified as a Dangerous Substance under the ACT Dangerous Substances Act 2004. In the ACT the management of fuel storage tanks is regulated by ACT WorkSafe who administers the *Dangerous Substances Act 2004* and the *Dangerous Substances (General) Regulation 2004.*

In NSW the management of fuel storage tanks is administered by the Local Councils under the *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2014 (UPSS Regulation)* which aims to improve the environmental management of storage systems.

8.1 Risk Assessment Criteria

During a Hazardous Materials Survey and/or Reinspection, the following criteria are considered by a licensed Asbestos Assessor (or competent person) when assessing the risk associated with all identified and presumed A/USTs. This qualitative assessment determines the Action Priority. These are shown in Table 6.

- Type of A/UST
- Condition of the A/UST
- Accessibility of the A/UST
- Likelihood of disturbing the A/UST

- Volume of the A/UST

Table 6: Action Priority Ranking and Action Plan

Action Priority	Action Plan and Recommendations
High (H)	Visible signs of leakage from UST (i.e. discoloured/smelly soil in area). Visible signs of leakage from AST (i.e. hydrocarbons present in bund or on ground under the AST). AST in very poor condition (i.e. significant amounts of rust, damage and/or pitting). Action should be taken immediately to reduce risk.
Medium (M)	AST in average condition (i.e. minor amounts of rust, damage and/or pitting). Information that physical volume of fuel in the UST does not match the records kept since delivery. Action should be taken as soon as practicable to reduce risk.
Low (L)	AST in good condition (i.e. no rust, damage and/or pitting). Information that physical volume of fuel in the UST matches the records kept since delivery. Ongoing actions to maintain the A/UST in good condition and to check it periodically to ensure a low risk.
Nil (N)	A/UST was not detected in the area being assessed. No action required.

9. References

These guidelines are for internal use only and references the following legislation:

- *Work Health and Safety Act 2011*
- *Work Health and Safety Regulations 2011*
- *Risk Management – Principles and guidelines, Standards Australia, AS/NZS ISO 31000:2009*
- *Safe Work Australia (How to Manage and Control Asbestos In The Workplace) Code of Practice 2020*
- *Safe Work Australia (How to Safely Remove Asbestos) Code of Practice 2020*
- *Guide to Hazardous Paint Management Part 2: Lead paint in residential, public and commercial buildings, Standards Australia, AS 4361.2 – 2017*
- *Safe Work Australia (Guide to handling refractory ceramic fibres) July 2020*
- *National Standard for Synthetic Mineral Fibres [NOHSC:1004(1990)]*
- *Identification of PCB-Containing Capacitors; An information Booklet for Electricians and Electrical Contractors* ANZECC 1997
- *The Australian Refrigeration and Air-conditioning Code of Good Practice* Standards Australia, HB 40.1 –

2001

- *Dangerous Substances (General) Regulation 2004*
- *Dangerous Substances Act 2004*
- *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2014*