FACILITIES AND SERVICES DIVISION

Hazardous Materials Management Manual

QMS-FS-MAN-20-018 Revision 2 – 16/11/2017

UNCONTROLLED WHEN PRINTED

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Revision History and Approval

Rev.	Nature of changes	Approval	Date
1	Original Issue	David Glavas	16 JUL 2014
2	Major QMS Revision	David Glavas	16 NOV 2017

1. INTRODUCTION

Australian National University (ANU or University) is committed to achieving the highest standards of management in all aspects of our business. This hazardous materials management manual has been developed by ANU to assist in meeting its statutory obligations and to provide a consistent and standardised approach to the management of hazardous materials in buildings and the built environment, for which it has responsibility.

The manual underpins the ANU Policy for Work, Health and Safety, ensuring the management of hazardous materials, as identified in the hazardous materials registers, is compliant with the following legislation:

- Work Health and Safety Act 2011;
- Work Health and Safety Regulations 2011;
- Code of Practice: How to Manage and Control Asbestos in the Workplace 2011;
- Code of Practice: How to Safely Remove Asbestos 2011;
- The Guidance Notes on the Membrane Filter Method for estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)];
- Guidance Note on the Membrane Filter Method for the Estimation of Airborne Synthetic Mineral Fibres [NOHSC: 3006-1989];
- National Standard for Synthetic Mineral Fibres [NOHSC:1004(1990)];
- Guide to Lead Paint Management, Part 2: Residential and Commercial Buildings Standards Australia, AS 4361.2 - 1998;
- Identification of PCB-Containing Capacitors; An information Booklet for Electricians and Electrical Contractors ANZECC 1997; and
- The Australian Refrigeration and Air-conditioning Code of Good Practice Standards Australia, HB 40.1 – 2001.

This manual establishes how ANU will manage hazardous materials and provide a safe and healthy work environment for its staff, students, contractors and visitors by:

- Safely identifying, documenting, eliminating/isolating and managing the risks associated with the management of hazardous materials;
- Providing relevant information to staff, students and visitors to ANU sites who may come into contact with hazardous materials in a workplace, either directly or indirectly;
- Providing relevant information to contractors and staff who carry out work at ANU sites and who may come into contact with hazardous materials in a workplace, either directly or indirectly;
- Meeting its legislative and regulatory obligations; and
- Reducing the risk of asbestos containing material (ACM), by ultimately achieving an asbestos free work environment.

The manual is publicly available on the F&S Division website and therefore readily accessible to the following workers:

- A worker, who has carried out, carries out or intends to carry out work at the workplace;
- Health and safety representatives who represent staff that carry out or intend to carry out work at the workplace;
- A person conducting a business or undertaking who has carried out, carries out or intends to carry out work at the workplace; and
- A person conducting a business or undertaking who has required, requires or intends to require work to be carried out at the workplace.

This manual will be reviewed, at a minimum interval, every five (5) years.

2. SCOPE

The requirements and controls in this manual extend to all building users including University staff, students, visitors, consultants, and contractors.

This manual is limited to the ANU site locations in the Australian Capital Territory, New South Wales, Victoria, and the Northern Territory, specific facilities in these states are listed at Appendix A.

This manual covers the most common hazardous materials found, and provides a management plan for the following, namely:

- Lead Paint;
- Synthetic Mineral Fibre (SMF);
- Polychlorinated Biphenyls (PCB);
- Ozone Depleting Substances (ODS); and
- Asbestos Containing Material (ACM).

Where a building or a built environment element was constructed after 31 December 2003, a survey was assessed as unnecessary and therefore, a hazardous materials register is not present. Refer to Section 8 through to Section 12, for the University's risk assessments for hazardous materials covered in this manual.

3. RESPONSIBILITIES

3.1 Facilities and Services

Facilities and Services Division (F&S, or the Division) is responsible for:

- Complying with this manual;
- Monitoring, updating and reviewing the performance of this manual;
- Updating and publishing changes to hazardous materials registers;
- Communicating processes and requirements to relevant stakeholders;
- Ensuring college building/facility managers or authorised building representatives (commonly known as building custodians), are aware of their responsibilities;
- Preparing budgets and programs for management, inspection and remediation of hazardous materials identified in the registers; and
- Ensuring contractors engaged have relevant accreditation, licences and insurances, and where required asbestos awareness training, and have been inducted to ANU.

3.2 College Building / Facility Managers

College Building / Facility Managers are responsible for:

- Complying with this manual;
- Raising maintenance work orders and ensuring a copy of the hazardous materials register is available to the persons executing works;
- Providing contractors with hazardous materials location and condition information; this information can be sourced through the hazardous materials register;
- Creating and maintaining a local area hazardous materials register for plant and equipment under the direct control of the local area e.g. research equipment;
- Addressing any local area hazardous materials maintenance issues (including asbestos) as they arise e.g. research equipment; and
- Ensuring contractors engaged directly (e.g. servicing research equipment), have as a minimum:
  - All relevant inductions, accreditations, licences and insurances;
  - Asbestos awareness training and insurance cover for work with asbestos; and

- Ensuring adherance to relevant legislation when performing work on plant and equipment that may contain asbestos.

3.3 Building Custodians

Building Custodians are responsible for:

- Complying with this manual;
- Raising maintenance work orders and ensuring a copy of the hazardous materials register is available to the persons executing works; and
- Directing any queries about hazardous materials to the relevant F&S Service Supervisor and/or the Work Environment Group (WEG).

3.4 Contractors

All ANU inducted contractors are responsible for:

- Undertaking ANU Contractor Induction;
- Being familiar with this manual and contractor responsibilities;
- Accessing the relevant hazardous materials register before undertaking work at ANU properties;
- Ensuring their employees have required training e.g. asbestos awareness or working with lead paint systems;
- Immediately notify ANU if further confirmation testing is required for suspected ACM;
- Notifying ANU prior to any works that could directly disturb any existing or known ACM;
- Complying with local regulatory requirements for asbestos removal;
- Preparing and implementing safe work method statements for work on or in the vicinity of ACM;
- Stop work if ACM is suspected in the work area not previously identified;
- Have professional indemnity insurance for work with ACM, if removing any ACM; and
- Notifying and obtaining approval from ANU of licensed asbestos removal contractor engagement and scope of work prior to any work beginning.

4. HAZARDOUS MATERIALS REGISTER

The University has inspected buildings and built environment elements for hazardous materials, and created hazardous materials registers, an example of a register is at Appendix B. Hazardous materials registers are publicly available on the University website and therefore readily accessible to the following workers:

- A worker, who has carried out, carries out or intends to carry out work at the workplace;
- Health and safety representatives who represent staff that carry out or intend to carry out work at the workplace;
- A person conducting a business or undertaking who has carried out, carries out or intends to carry out work at the workplace; and
- A person conducting a business or undertaking who has required, requires or intends to require work to be carried out at the workplace.

It is not the intention of the University to hold a local hardcopy at each building/facility.

ACM is deemed the most dangerous of the hazardous substances and there is strict legislation on how ACM is managed, monitored and removed. While the ANU strives to locate, identify and document all sources of ACM in its hazardous materials register, there is potential for unidentified sources of asbestos to be present in inaccessible parts of buildings, plant and structures. Inaccessible areas of buildings, plant and structures are therefore presumed to have ACM until proven otherwise.

Registers include the recording of ACM locations and survey and analysis results, which forms the basis of recording and documenting asbestos remediation and mitigation information. The ANU will maintain an accurate register of ACM. The register shall contain the following information:

- The locations, form, types, and condition of any ACM identified.
- Details of any material presumed to contain asbestos.
- Asbestos identification NATA laboratory results.
- Date the survey or reinspection was conducted.
- The name of the competent person who carried out the survey/reinspection.
- Risk assessment ratings.
- Results and date of air monitoring testing and clearance inspections.
- Control measures recommended and implemented.
- Remediation and maintenance measures and records.

Refer to Section 12 for further details on ACM management and related processes.

Other hazardous materials generally have less onerous management requirements and are covered in Sections 8 through to Section 11.

Buildings and built environment elements are re-surveyed on a five-yearly (5) cycle. Registers may also be updated between surveys when:

- There are changes to individual registered items e.g. as a result of maintenance works;
- There is a review of asbestos registered items or a control measure;
- ACM is removed from or disturbed, sealed or enclosed at the workplace;
- The plan is no longer adequate for managing ACM at the workplace; or
- A health and safety representative requests a review if they reasonably believe that any of the matters listed in the above points affects or may affect the health and safety of a member of their work group and the register was not adequately reviewed.

5. HAZARDOUS MATERIALS WORKS MANAGEMENT

Any work within the University that may interface with or potentially disturb hazardous materials will be managed in accordance with this manual.

All hazardous materials maintenance works executed by F&S will be recorded in the maintenance management system Maximo. Any works that change the state of hazardous materials will be recorded in the relevant hazardous materials register. Where a clearance certificates is issued by an independent party, these are attached to the related work order in Maximo. Procedures and processes for these works are can be found in the F&S quality management system.

All capital works projects executed by F&S maintain records of hazardous materials surveys conducted and where required, hazardous materials removed. Any works that change the state of hazardous materials will be recorded in the relevant hazardous materials register. Where a clearance certificate is issued by an independent party, these are recorded in the project file. Procedures and processes for these works are can be found in the F&S quality management system.

6. REFURBISHMENT/DEMOLITION WORKS

Hazardous materials may be present in a building/facility (hidden within the fabric of the building) but not recorded in the register. Prior to any major fit out, refurbishment work, major upgrade work on plant and machinery or demolition work which could disturb known or presumed ACM, an intrusive hazardous material audit shall be undertaken?

An intrusive hazardous material audit can involve investigating areas and surfaces not accessed in the previous survey e.g. hot water pipes in masonry walls, tiled or linoleum lined wall surfaces, eaves, voids, service risers or under carpeted areas.

F&S is responsible for organising a competent person to conduct an intrusive hazardous material building audit to identify all ACM, lead paint, PCB, SMF and ODS, so far as reasonably practicable. Any intrusive asbestos audit must be conducted by a suitably qualified person.

7. TRAINING

All F&S maintenance staff and college/school building custodians or facilities managers must complete the online Asbestos awareness training package in PULSE.

The following workers may be required to complete a face to face Asbestos training course provided by a registered training organisation (RTO). The justification for workers to attend Asbestos training provided by an RTO will be considered on a case by case basis.

- All ANU staff who engage contractors.
- All ANU maintenance personnel.
- All contractors who carry out work at any ANU site.
- All college building/faculty staff.

An asbestos awareness course or the non-friable removal unit of competency would be considered appropriate training.

8. LEAD PAINT SYSTEMS MANAGEMENT PLAN

8.1 Introduction

Lead paint is defined by the Australian Standard (AS 4361.2 – 1998 Guide to lead paint management Part 2: Residential 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 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) classifies paints having more than 0.25% lead as First Schedule Paint and prohibits their manufacture, supply or use.

Before 1970, paints containing high levels of lead were used in many Australian buildings. The recommended amount of lead in paint has declined from 50% before 1965, to 1% in 1965. In 1992, it was reduced to 0.25%, and in 1997 it was further reduced to 0.1%.

Exposure to lead is a health hazard. Even small amounts of dust or chips of paint containing lead, generated during minor building repairs, can be a health risk. 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.

Anyone painting a building or doing maintenance that could disturb paint containing lead should avoid exposing themselves, other workers, staff and students to its hazards.

8.2 Risk Assessment

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 national code of practice for the control and safe use of inorganic lead at work (NOHSC 1012 – 1994).

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).

8.3 Lead Paint Management Approach

The following information uses Australian Standard (AS 4361.2 – 1998) as the primary reference. Lead paint and first schedule paints in residential and commercial premises may be managed in one of four ways:

- Leave undisturbed;
- Stabilised (i.e. over painting or encapsulation);
- Abated (i.e. removed); or
- A combination of the three management options may be required.

Should removal be chosen, a high degree of skill, preparation and risk minimisation is required to avoid lead exposure, as dry sanding of lead levels as low as 0.25% can generate high lead dust. Therefore the Wet Scraping and Wet Sanding methods are amongst the safest methods available.

Strict adherence to the guidelines described in AS 4361.2 – 1998 will best ensure minimisation of risk. During this process personal protective equipment and waste containment equipment is essential and children, pregnant women and persons not directly engaged in the process should not be present. General workers may undertake this process providing they adhere strictly to the guidelines, however, a specialist lead paint removal contractor is recommended for extensive paint removal works.

Where remediation is required it is important to minimise ongoing maintenance costs by ensuring that the works are undertaken by a professional who is able to give a significant time guarantee of the painted surfaces at the completion of the works. The following website lists contactors by postcodes that have been included based on their indicated skills and training in working safely with lead paint. http://www.lead.org.au/paintersall.html. Contractors should however be assessed by current performance prior to engagement.

8.4 Lead Paint Removal and Containment

- Avoid dry sanding or any actions which create dust;
- Place ground sheets around the work area ensuring all paint debris are contained. Remove accumulated debris frequently to prevent its spread into surrounding areas using a vacuum cleaner fitted with a HEPA filter;
- Minimise the spread of debris, dust and fumes by avoiding dust-generating activities during windy conditions. Seal all windows and heating/cooling system duct registers to prevent dust or fumes from contaminating adjacent areas. Use negative air pressure for interior work;
- Use personal respirators according to AS/NZS 1715 [2009];
- Use disposable clothing; and
- Wipe down all surfaces using a wet cloth and dispose of all clothing, equipment and plastic used during paint removal as Hazardous Waste.

8.5 ANU Responsibilities

According to AS 4361.2 – 1998 owners of residences or commercial buildings that may contain lead should:

- Manage the property in such a manner as to effectively control any health risk to occupants, contractors or others;
- Ensure occupants are sufficiently informed about and protected from the hazards associated with lead paint; and
- If management work is to be undertaken, inform immediate neighbours about the nature of the work.

8.6 Contractor Responsibilities

- Obtain appropriate accreditation to undertake the proposed level of remedial work involving lead paint and have the required level of specialized training; and
- Undertake the contracted work in such a way as to protect the health and safety of employees, tenants and the general public.

9. SYNTHETIC MINERAL FIBRE (SMF) MANAGEMENT PLAN

9.1 Introduction

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 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.

There are two basic forms of SMF insulation; bonded and unbonded.

The bonded form is where adhesives, binding agents, facing/cladding, cement or other sealants have been applied to the SMF before delivery and the SMF product has a specific shape (e.g. a binding or sealing agents hold the SMF in a batt or blanket form). Some bonded SMF materials may also be clad in various coverings on one or more sides (e.g. a silver foil backing).

The unbonded form has no adhesives, binding agents, facing/cladding or sealants applied, and the SMF is a loose material (e.g. wet spray and loose fill).

Although glass fibre is classified as an irritant, levels of airborne fibreglass during routine occupation of the premises would be insignificant. During any large-scale installation or removal of fibreglass insulation, providing SMF fibre suppression measures as defined below are employed, exposure standards for SMF fibre would not normally be exceeded.

9.2 Risk Assessment

The following Risk Assessment is based on the requirements of Worksafe Australia, Sydney 1990, Synthetic Mineral Fibres: National Standard and National Code of Practice.

According to Worksafe Australia 1990 (p 9) health risks associated with SMF are "*significantly less potent … than white asbestos (Chrysotile) fibres*" and that "*...the possibility of lung cancer is eliminated at an exposure standard (time weighted average) of 0.5 respirable fibres per millilitre of air for all types of synthetic mineral fibres....*" (p V).

To reduce the possibility of skin, eye and upper respiratory tract irritation a maximum exposure standard of 2 milligrams per cubic metre of inspirable dust is recommended. These two standards are designed principally for the manufacture and end user industries in which significant dust clouds would be generated.

The same document also states: "*The overall conclusion based on available animal experiments and epidemiology is that provided work is carried out in accordance with (NOHSC 1990), and compliance is maintained with the exposure standards, then there is a negligible health risk associated with exposure to SMF under present-day manufacturing and usage patterns.*"

9.3 Working with SMF

Although of negligible health risk if undisturbed, it is strongly recommended that if fibreglass is to be removed or otherwise disturbed the following procedures and safety measures should be adopted.

- Workers wear personal protective equipment to minimise dust inhalation and irritation to eyes and skin. The correct use of filter masks, goggles, gloves and disposable coveralls should prevent significant irritation;
- Care should be taken to ensure minimal SMF or nuisance dust enters the occupied areas below the work area;
- If significant contamination of the occupied areas is likely, dust control measures such as the use of plastic screens and an effective extraction fan should be positioned to prevent such an occurrence; and
- Disposable suits and any removed insulation are to be appropriately bagged and disposed of as general waste.

10. POLYCHLORINATED BIPHENYLS (PCB) MANAGEMENT PLAN

10.1 Introduction

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 in the electrical industry as an insulating fluid inside transformers and capacitors. These transformers and capacitors have ranged in size from the very large transformers typically used by electrical supply companies, to the small capacitors used in commercial products. Capacitors containing PCBs were installed in various types of equipment including domestic appliances, motors and fluorescent light fittings during the 1950's, 60's and 70's.

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:

PCB scheduled waste means any PCB material that has no further use that contains PCBs at levels at, or in excess of, 50mg/kg and is of a quantity of 50g 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 10kg, they must be notified to the relevant Commonwealth agency prior to their disposal.

10.2 Risk Assessment

Small quantities of PCBs are usually found in sealed containers known as capacitors. PCB-containing capacitors are unlikely to pose a health risk, unless they become damaged and leak.

PCBs can enter the body in three ways:

- absorption through the skin
- inhalation of PCB vapour
- ingestion, e.g. by contamination of food or drink

The most commonly observed symptom in people exposed to high levels of PCBs is a condition known as chloracne. This is a severe, persistent acne-like rash due to repeated and prolonged contact of PCBs with skin. This condition has also occurred in people who have accidentally ingested PCBs orally.

Very high exposure to PCBs may also cause liver damage and damage to the nervous system.

There is the possibility that PCBs may cause cancers.

The likelihood of becoming sick from PCB exposure increases with the length of time and the amount of material that a person might come in contact with.

10.3 Working with PCBs

Care must be taken when handling damaged capacitors to ensure that spillage does not occur. The person handling the damaged capacitor should take the following precautions:

- put on personal protective equipment and clothing before removing damaged or leaking components
- wear gloves that are made of materials that are resistant to PCBs, such as Viton, polyethylene, polyvinyl alcohol (PVA), polytetrafluoroethylene (PTFE), butyl rubber, nitrile rubber, or neoprene
- do not use gloves made of polyvinyl chloride (PVC) or natural rubber (latex)
- use disposable gloves
- wear disposable overalls made of Tyvek or made of materials with similar chemical resistant properties
- when working with overhead equipment (e.g. Fluorescent light fixtures), wear a full face shield and appropriate hair protection
- wash any non-disposable contaminated equipment with kerosene and collect the kerosene for disposal as a PCB contaminated solvent
- if PCB vapours are suspected (e.g. PCB leaks onto a hot surface in a confined space), wear a twin cartridge type respirator suitable for chlorinated vapours
- always ensure adequate ventilation
- Note: PCBs do not vapourise readily at room temperature
- do not smoke
- after handling PCBs, employ good personal hygiene practices, including washing hands in warm, soapy water before eating, drinking, smoking, handling food, or using the toilet

10.4 Disposal of PCB's

It is advisable to check the current regulations in effect with the authority responsible for environmental protection authority in your State or Territory. In the ACT this is Environment Protection Authority.

Note: The absence of a capacitor from the ANZECC information booklet is not a guarantee that the capacitor does not contain PCBs: If there is any doubt as to whether a capacitor or any electrical equipment contains PCBs, treat the equipment as if it does contain PCBs.

11. OZONE DEPLETING SUBSTANCES (ODS) MANAGEMENT PLAN

11.1 Introduction

ODS 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 have 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).

Ozone depleting substances (ODS) include:

- Bromochloromethane (BCM)
- Carbontetrachloride (CCl4)
- Chlorofluorocarbons (CFCs)
- Halons
- Hydrobromofluorocarbons (HBFCs),
- Hydrochlorofluorocarbons (HCFCs),
- Methylbromide (CH3Br)
- Methylchloroform (CH3CCl3)

ODS are generally very stable in the troposphere and only degrade under intense ultraviolet light in the stratosphere. When they break down, they release chlorine or bromine atoms, which then deplete the ozone.

Chlorofluorocarbons (CFCs) contain chlorine and possess a large ODP, high GWP and long EAL. They are generally found in refrigeration and air-conditioning systems e.g. 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 (e.g. 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.

The Australian Strategy for Ozone Protection calls for personnel who handle, install, service, commission and decommission and maintain commercial and industrial refrigeration and air-conditioning equipment to be accredited, licensed, registered to work with ozone depleting substances.

Under the Federal Government's Ozone Protection and Synthetic Gas Management Act 1989 and its Ozone Protection and Synthetic Gas Legislation Amendment Bill 2003 it is illegal to vent an ODS (Scheduled Substances) to the atmosphere.

11.2 Risk Assessment

In addition to causing environmental degradation certain ozone depleting substances may present a risk to human health when they are improperly handled or released in to a poorly ventilated area.

11.2.1 Inhalation

The most significant exposure route for humans is through inhalation. Refrigerant gases displace oxygen in the air making breathing difficult.

Overexposure can cause central nervous system depression and oxygen deficiency. Effects of overexposure may include light-headedness, giddiness, shortness-of-breath, headaches, and in extreme cases, irregular heartbeats, cardiac arrest, asphyxiation and death.

Symptoms of overexposure at lower concentrations may include transient eye, nose and throat irritation.

11.2.2 Skin Contact

Contact with rapidly released refrigerant gas may cause frostbite. Symptoms of frostbite may include changes in skin colour to white or greyish yellow.

Other direct dermal contact may result in skin de-fatting, dryness, irritation or contact dermatitis.

Standard work clothes provide adequate protection of the skin but it is recommended that lined butyl gloves and goggles be used whenever handling liquid refrigerants.

11.2.3 Eye Contact

Eye contact with rapidly released refrigerant or air-conditioning gas may cause severe frostbite damage to eyes and eyelids. Eye irritation may occur if exposure occurs at lower concentrations.

11.2.4 Advice to Equipment Users

Users are advised that persons who service refrigeration and air-conditioning equipment are required by legislation to observe the Code of Good Practice and not to 'top-up' or 'charge' systems known to be leaking refrigerant, or to service equipment unless it can be returned into service in a leak-free condition.

If a user does not have trained staff to undertake service or maintenance work, then it is recommended that a routine maintenance agreement for their plant be undertaken with a reputable service organization.

All users should monitor the operation of their installation weekly and call the service person immediately if any abnormal condition is found.

When a refrigeration system contains in excess of 50 kg of refrigerant, that system should be leak tested on a quarterly basis.

11.3 Working with ODS

All refrigeration and air-conditioning plant should be regularly inspected for traces of leaking refrigerant and/or oil, and for signs of leak-indicating dye.

Whenever a system is charged with refrigerant and/or lubricant, the service person must clearly label the system with the refrigerant/lubrication type; name of service organization; and date of service. In addition, the ASHRAE/ARI refrigerant designated R number shall be clearly displayed.

A service person should be aware of the possibility that a refrigeration or air-conditioning system may have been incorrectly charged or incorrectly labelled. The type of refrigerant contained in the system must therefore be first established by checking the temperature/pressure relationship or by using other tests to verify that the labelling is correct.

11.3.1 Leak Testing

Various methods may be used for leak-testing, e.g. electronic leak detectors, halide lamp and or ultraviolet lamp.

Only a non-controlled refrigerant mixed with a pressurising substance such as dry nitrogen should be used to leak test refrigeration and air-conditioning systems.

Where an air-conditioning or refrigeration system is found to be leaking and needs to be repaired, the vapour and/or liquid must first be recovered from the leaking system.

Where pressurisation testing has determined that an air-conditioning or refrigeration system is not leaking, moisture and non-condensables must be evacuated from the system using dry nitrogen as the moisture absorber and either the deep or triple evacuation methods.

All refrigerants shall be recovered and either recycled, reclaimed or held for disposal in an approved manner.

It is highly recommended that a refrigerant charge monitor or leak detector be installed to alert equipment owners/operators of a refrigerant leak.

11.3.2 Recovery, Recycling and Disposal of Refrigerants

It is highly recommended, and in some cases mandatory, for recovery and/or recycling equipment to be used for the removal and recovery of refrigerant during service.

To avoid the danger of mixing different refrigerant types, the receiving containers shall be identified by the correct colour coding and labelling and shall only be used for the refrigerant type that is being transferred. The recovery containers shall conform to *AS 4484-2004, 'Gas Cylinders for Industrial, Scientific and Refrigerant use – labelling and colour coding'*.

As chillers have large internal volume, it is important that all refrigerant vapour be recovered. A chiller at atmospheric pressure can still hold many kilograms of refrigerant vapour after the liquid has been removed.

When recovering refrigerant from a chiller the refrigerant should be recovered until the internal system pressure is reduced to 3 kPa absolute for low-pressure systems (e.g., R-11) and 70 kPa absolute for positive pressure systems (e.g., R-12 and R-22). The internal pressure should then be taken up to atmospheric pressure with dry nitrogen if the chiller is to be opened. This will prevent moisture–laden air entering the system, which could lead to contamination and corrosion.

11.4 Disposal of Refrigerants

Unusable or surplus fluorocarbon refrigerant shall not be discharged to the atmosphere, but shall be returned to a supplier.

Empty residual refrigerant in a disposable container shall be recovered and the container disposed of at a recycling centre.

The utmost care must be taken to avoid mixing different types of refrigerants, as separation may be impossible and large quantities of refrigerant may be rendered unusable.

11.5 Handling and Storage

Losses of refrigerant to the atmosphere can occur during the handling and storage of refrigerant containers. Service persons have a duty of care to avoid such losses.

There are numerous hazards associated with the storage of refrigerant. These include asphyxiation in confined space due to leakage from refrigerant containers; and fire, which may overheat and explode refrigerant containers or decompose refrigerant into toxic substances.

11.6 Alternative Refrigerants and Lubricants

With the introduction of HFC alternative refrigerants, alternative lubricants need to be considered to ensure system reliability. Some of these alternative lubricants tend to exhibit greater hygroscopicity than mineral oils, so care must be taken to ensure they are kept in sealed containers at all times.

Care must be taken to ensure that all components used in the refrigeration/air-conditioning system are compatible with the new refrigerant and lubricant.

11.7 Recovery of Fluorocarbons Mixed with other Refrigerants

A number of different refrigerants and refrigeration mixtures have been used to replace or to 'top up' fluorocarbon based refrigerants in refrigeration and air-conditioning systems.

In many cases the equipment in question may not be labelled to indicate that hydrocarbon or hydrocarbon mixtures have been used and as the operating pressures of these replacement refrigerants are usually similar to those of the original refrigerant, their identification in the field is extremely difficult.

It is not safe therefore to recover flammable refrigerant (hydrocarbon) using equipment designed only for non-flammable refrigerants such as R-12 and R-134a.

Should it be suspected that refrigeration or air-conditioning system contains an unidentified mixture or, if on asking the owner, examining the labels, and/or detecting instruments indicate that a hydrocarbon/fluorocarbon mixture or any other non-standard mixture of refrigerant may be present; the following procedure should be followed:

If a hydrocarbon or flammable mixture that contains hydrocarbon is suspected, use only equipment designed for the recovery of flammable gasses and recover the refrigerant into a specially marked container.

In the case of refrigerant mixtures, it is not advisable to use recovery equipment as many mixtures have very high condensing pressures, which could result in equipment failure and/or injury to persons operating, or near the equipment.

The safest method of recovery is to use an evacuated and preferably chilled container to depressurise the system.

Label the container to show that it contains a mixture or the suspected composition, if known, and deliver it to a supplier for recycling.

Purge the residual gas from the system with dry nitrogen before proceeding with any repairs

12. ASBESTOS CONTAINING MATERIAL (ACM) MANAGEMENT PLAN

12.1 Introduction

Asbestos is a hazardous material that poses a serious risk to health by inhalation if the asbestos fibres become airborne and people are exposed to these airborne fibres. Breathing in asbestos fibres has been known to cause asbestosis, lung cancer and mesothelioma. The definitions of terms used in the management of ACM is at Appendix D.

The only recognised method used in identifying asbestos containing material (ACM) is to utilise competent persons to survey a building for materials likely to be ACM, sample the material and use a NATA accredited laboratory to identify if the material does contain asbestos fibres. If an area is inaccessible and is likely to contain asbestos containing materials, then it should be presumed that asbestos is present.

Where the risk assessment of ACM reveals a likelihood of exposure to asbestos fibres, all practical steps will be taken to ensure that all staff, students, visitors and workers are not exposed.

12.2 Assessment Criteria

The purpose of the risk assessment is to allow informed decisions to be made about asbestos control measures, including training, air monitoring and health surveillance requirements. Only competent persons (Class A Asbestos Assessor) must perform risk assessments or any subsequent reviews or revisions of risk assessments.

Decisions about control measures to protect workers will depend on the assessed risk. The risk assessment shall take into account the information in the register of ACM including:

- The condition of the ACM (e.g. whether they are friable or bonded and stable, and whether they are liable to damage or deterioration);
- The likelihood of exposure;
- Whether the nature or location of any work to be carried out is likely to disturb the ACM; and
- The results of the risk assessment should be documented in the register of ACM.

The following Risk Ratings are applied to the ACM in the register findings:

Risk Rating High: Has potential for high exposure risk if actively disturbed and immediate remediation is required. This generally means that the area has asbestos materials that is damaged or is being exposed to continual disturbance. Remedial action generally involves immediate evacuation of the area and sealing of the area until removal or repair of the asbestos product is completed.

Risk Rating Medium: Has potential for medium exposure risk if actively disturbed and some rectification may be required. The area will usually have ACM present that is unstable or has the potential for disturbance. Remedial action may involve removal, sealing or repair of the ACM.

Risk Rating Low: Has a low exposure risk potential in its current state. The ACM located in the building has minor damage and has a low potential for disturbance. No remedial action is required, although the ACM should be maintained and regular inspections (every 5 years) carried out to ensure product does not deteriorate.

Risk Rating Very Low: Has a negligible exposure risk potential in its current state. The ACM located in the building is undamaged and has a low potential for disturbance. No remedial action is required, although the ACM should be maintained and regular inspections (every 5 years) carried out to ensure product does not deteriorate.

12.3 Labelling

All Identified ACM should be labelled with approved asbestos warning labels or signs. Due to stigma associated with asbestos and to avoid malicious damage to ACM, labelling can be kept to discreet areas. Where labelling cannot be undertaken, ANU will adopt strict administrative controls to ensure ACM is not subject to accidental damage. Examples of compliant labels follow.

12.4 Working with Asbestos – Licensed Asbestos Removal

All asbestos removal works should be conducted in accordance with the Code of practice for the Safe Removal of Asbestos 2011.

It is mandatory to engage a Class A licensed asbestos removalist for:

- 10m² of non-friable asbestos removal; and
- All friable asbestos product or material works or removal.

ANU will engage a Class A licensed asbestos removal contractor to conduct works involving the removal of ACM within an ANU building/facility and in the built environment.

Where asbestos remediation work is required, ANU will nominate the Class A licensed asbestos removalist and a competent person, such as a licensed Class A Asbestos Assessor. The competent person must be engaged to conduct clearance inspections on all bonded asbestos removal work over 10m². The licensed Class A Asbestos Assessor must be totally independent of the asbestos removalist.

The Class A licensed asbestos removal contractor must submit an asbestos removal control plan for review by a competent person before work can commence. Attached at Appendix C is an example of what should be in an ARCP.

It is important to note that the Commonwealth require 5 working days notification/permit, submitted to the Regulator (Comcare) from the Class A licensed asbestos removalist prior to any removal work commencing – unless emergency conditions apply.

Contractors must ensure that all asbestos related works are carried out in accordance with:

- Work Health and Safety Regulations 2011;
- Code of Practice: How to Manage and Control Asbestos in the Workplace 2011;
- Code of Practice: How to Safely Remove Asbestos 2011; and
- The Guidance Notes on the Membrane Filter Method for estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)].

Air monitoring is mandatory during the removal of friable asbestos. A Licensed Class A Asbestos Assessor must also be employed to undertake the air monitoring and provide a clearance inspection, which involves a visual inspection and clearance monitoring of the asbestos work area.

Once it has been established that the removal work has been completed satisfactorily, a Clearance Certificate and copy of the air monitoring certificate must be issued to provide assurance that the area is safe for normal reoccupation.

Any asbestos that remains in-situ following asbestos removal works must be communicated to ANU and the relevant register must be updated.

The following Elements are required prior to any asbestos removal work:

- Review of proposed work by ANU competent person with the service contractor or builder.
- Review of ARCP and SWMS submitted by Class A licensed asbestos removalist prior to work commencing.
- Review of licensed asbestos removal contractor's ARCP and SWMS by ANU competent person, prior to work commencing.
- Review of proposed licensed asbestos assessor services relating to any supervision, air monitoring and clearance inspections.
- Review of previous asbestos remediation records.
- Inform all stakeholders who could be affected by the remediation works.

12.5 Working with Asbestos – Asbestos Removal Work that does not require a Licence

All asbestos removal works should be conducted in accordance with the Code of practice for the Safe Removal of Asbestos 2011.

Any asbestos removal from the built environment MUST be conducted by a licensed removalist, refer previous section.

Friable asbestos material removal MUST be removed by a person whom holds a Class A asbestos licence, refer previous section.

Removal of asbestos by a person who does not hold a Class A or Class B asbestos removal licence is permitted if the asbestos being removed is:

- 10m² or less of non-friable asbestos (approximately the size of a small bathroom); or
- Asbestos containing dust/debris (ACD) that is not more than a minor contamination and is associated with the removal of 10 m² or less of non-friable asbestos.

A worker carrying out asbestos removal work, including a self-employed person conducting a business or undertaking, must be trained in the identification and safe handling of asbestos prior to carrying out asbestos removal work without a licence. An asbestos awareness course or the non-friable removal unit of competency would be considered appropriate training.

ANU shall provide information on the presence of ACM to its contractors. Minor work must be performed in accordance with the safe work practices for minor work with ACM at the appendices of the Codes of Practice for the Management and Control of Asbestos in the Workplace 2011. Minor work usually involves:

- Cleaning of gutters for asbestos roofs;
- Drilling of asbestos cement sheeting;
- Patch repairing damaged asbestos cement sheeting or vinyl floor coverings;
- Preparation and painting of asbestos cement sheet claddings;
- Removal of asbestos cement sheeting in quantities amounting to less than 10m²; or
- Removal of small amounts of asbestos containing dust/debris (ACD).

All contractors who carry out any asbestos removal that does not require a licence must have insurance cover for working with ACM and have met the training requirements in section 7.

12.6 Accidental Exposure to ACM

Where staff have been exposed to asbestos through an accidental event, but the Exposure Standards not breached (air monitoring required to prove this) they would not normally be required to undergo health surveillance monitoring, staff are to be made aware of their opportunity to consult ANU Health and Safety Staff for counselling or assessment.

If a member of staff, student or worker is concerned about possible exposure to asbestos from work activities, they are advised to consult their GP and ask for a note to be made in their personal record about possible exposure, including date(s), duration, type of asbestos and likely exposure levels (if known).

12.7 Reporting ACM Incidents

Part 3 of the Work Health and Safety Act 2011 deals with notifiable incidents and explains what a notifiable incident is. Under the Act exposure to a substance is classed as a notifiable incident and must be reported to the regulator (Comcare) immediately.

ANU has developed a procedure to inform staff, students, contractors and visitors of mandatory reporting requirements for notifiable work health and safety incidents. In summary:

- The incident is to be reported by telephone to WEG;
- ANU online OHS Incident Notification MUST be completed; and
- Asbestos emergency procedures [insert link] MUST be followed.

12.8 Reporting Excessive Air Monitoring Results – Asbestos Removal Work

Once the results of the air monitoring are received, ANU responsible person must use the table below to determine if any action is required. The Class A licensed asbestos removalist must take action depending on the respirable asbestos fibre level. Where the results show that respirable asbestos fibre levels exceed the action levels outlined in Table 1, action must be taken immediately.

Action level	Control	Action
Less than 0.01 fibres/ml	No new control measures are necessary	Continue with control measures
At 0.01 fibres/ml or more than 0.01 fibres/ml but less than or equal to 0.02 fibres/ml	1. Review 2. Investigate 3. Implement	Review control measures Investigate the cause Implement controls to eliminate or minimise exposure and prevent further release
More than 0.02 fibres/ml	1. Stop removal work 2. Notify ANU Facilities & Services 3. Notify WEG 4. Investigate the cause 5. Implement controls to eliminate or minimise exposure and prevent further release 6. Do not recommence removal work until further air monitoring is conducted	Stop removal work Use the ANU, OHS online incident notification system ANU WEG will notify Comcare by phone followed by fax or written statement that work has ceased and send a copy of the results of the air monitoring. Conduct a thorough visual inspection of the enclosure (if used) and associated equipment in consultation with all workers involved with the removal work Extend the isolated/barricaded area around the removal area/enclosure as far as reasonably practicable (until fibre levels are at or below 0.01 fibres/ml, wet wipe and vacuum the surrounding area, seal any identified leaks (e.g. with expandable foam or tape) and smoke test the enclosure until it is satisfactorily sealed. Do not recommence until fibre levels are at or below 0.01 fibres/ml

Table 1 – Actions to Take with Excessive Air Monitoring Results

12.9 Health Monitoring

The ANU will arrange health monitoring where a member of staff or student is at risk of exposure to asbestos due to work on an ANU site that has exposed them to asbestos. Health monitoring must also be undertaken where there is a risk of exposure including for example ongoing unlicensed removal work, undertaking maintenance work on ACM regularly as part of another job (for instance, electricians or building maintenance staff in older buildings). The need for health monitoring for these people should be determined on the basis of:

- the potential for exposure;
- the frequency of potential exposure; and
- the duration of the work being undertaken.

Health monitoring must be carried out under the supervision of a registered Occupational Physician with the relevant competencies. Prior to deciding who the registered medical practitioner will be, the ANU will consult the person.

Appendix A: ANU Site locations

The ANU owns properties throughout Australia and a list of locations are noted below:

AUSTRALIAN CAPITAL TERRITORY (ACT):

Canberra City, Acton:

- Australian National University (ANU) Acton Campus
- ANU Exchange

ACT, other than Acton:

- Mt. Stromlo Observatory and associated facilities
- Boat Shed (Yarralumla)
- ANU Library Store (Leased)
- Fenner Hall, Northbourne Avenue
- Hackett, 75-77 Madigan Street
- O'Connor, 6 Moorhouse Street
- Western Creek Plantation
- Canberra Hospital
- Black Mountain, Paleomagnetic Lab and associated facilities
- Weston Creek, Block 7 Section 96
- Spring Valley Farm

NEW SOUTH WALES (NSW)

NSW Country:

- Cooma Hospital, 24 Murray Street
- Goulburn Base Hospital
- Mongarlowe (near Braidwood)
- Siding Spring Observatory (near Coonabarabran)
- Young, 73 Lynch Street

NSW South Coast:

- Batemans Bay Clinical School
- Bega Hospital
- Kioloa (London Foundation)
- Mossy Point, 6 River Road

VICTORIA:

- Melbourne, 52 Collins Street

NORTHERN TERRITORY:

- NARU (North Australia Research Unit)
- Warramunga Seismic Station (Tennant Creek)
- Tennant Creek, 3 Caroline Street
- Lot 604, Cnr West Road and Second Street (Yuendumu)

Appendix B: ANU Hazardous Materials Register Format

Australian National University

Site Location: Building 61, ANU

Assessors:
Kieran Shields - SWE
Colin Chapman - Robson Enviromental

Inspection Dates:
SWE - 18-19 June 2015
Robson Enviromental - 20/09/2017

Reinspection Date: June 2020 or as specified within comments.

Interim inspection of "immediate work" items performed 20 September 2017

Sample No.	Results	Photo ID	Description	Location	Asbestos Type	Condition	Accessibility	Airborne Potential	Exposure Potential	Risk Score	Action Priority	Quantity (m, m2, m3)	Actions/Comments
Asbestos Containing Materials													
61/J2/A01	CH, AM	1	Asbestos cement sheet	Building 61, Jaeger 2, interior; ground floor, fire hose cupboard, ceiling lining.	1	2	1	2	2	8	L	$2m^2$	Debris has been labelled to identify the presence of Asbestos. Remove ACM sheet from the cupboard ceiling and ACM debris from all other surfaces within the cupboard. Remove or encapsulate remaining ACM edges with spray paint. Remove prior to refurbishment or demolition.
Same as 61/J2/A01	CH, AM	2	Asbestos cement sheet	Building 61, Jaeger 2, interior; ground floor, cupboard adjacent to room g.40, ceiling lining.	1	1	1	2	2	4	L	$2m^2$	Label and maintain in current condition. Review condition of asbestos material by June 2020. Remove prior to refurbishment or demolition.
Same as 61/J2/A01	CH, AM	-	Asbestos cement sheet	Building 61, Jaeger 2, interior; first floor, cupboard adjacent to room 137, ceiling lining.	1	1	1	2	2	4	L	$2m^2$	Label and maintain in current condition. Review condition of asbestos material by June 2020. Remove prior to refurbishment or demolition.
Same as 61/J2/A01	CH, AM	-	Asbestos cement sheet	Building 61, Jaeger 2, interior; first floor, fire hose cupboard, ceiling lining.	1	1	1	2	2	4	L	$2m^2$	Label and maintain in current condition. Review condition of asbestos material by June 2020. Remove prior to refurbishment or demolition.
Same as 61/J2/A01	CH, AM	-	Asbestos cement sheet	Building 61, Jaeger 2, interior; second floor fire hose cupboard, ceiling lining.	1	1	1	2	2	4	L	$2m^2$	Label and maintain in current condition. Review condition of asbestos material by June 2020. Remove prior to refurbishment or demolition.
S1646	CH, CR	Refer to Robson Report	Moulded fibro cement sheet louvers	Building 61, Jaeger 6, external east wall.	1	2	3	2	2	24	M	~$2m^2$ (On 5 windows)	Sample taken by Robson's Licensed Asbestos Assessor on 20/09/2017. Label ACM moulded sheet louvers. Remove all ACM moulded sheet louvers.
S1645	CH, AM	Refer to Robson Report	Fire door core	Building 61, Jaeger 2, interior; all fire doors throughout labelled prior to 2003 or unlabelled. Sample taken from doors to B45 Switchroom.	1	1	1	1	1	1	L	Through-out	Label all fire doors with ACM sheet cores as the cores of these doors contain asbestos.
61/Ext/A05	CH	3	Window Putty	Building 61, Jaeger 2, exterior; putty to windows.	1	1	1	2	3	6	L	Through-out	ANU to generate guidance note regarding appropriate cleaning procedures for window glass with ACM putty. ANU to generate guidance note regarding appropriate encapsulation procedures for windows with ACM putty.
Same as S1645	CH, AM	Refer to Robson Report	Fire door core	Building 61, Jaeger 1, interior; all fire doors throughout labelled prior to 2003 or unlabelled.	1	1	1	1	1	1	L	Through-out	Label all fire doors with ACM sheet cores as the cores of these doors contain asbestos.

Appendix C: Contents of an Asbestos Removal Control Plan

Heading	Building & Structures		Plant & Equipment	
	Friable	Non-Friable	Friable	Non-Friable
Notification				
Notification requirements have been met and required documentation will be on site (e.g. removal licence, control plan, training records)	Yes	Yes	Yes	Yes
Identification				
Details of asbestos to be removed (e.g. the locations, whether asbestos is friable/non-friable, its type, condition and quantity being removed)	Yes	Yes	Yes	Yes
Preparation				
Consult with relevant parties (HSR's; workers; person who commissioned the removal work, licensed assessors)	Yes	Yes	Yes	Yes
Assigned responsibilities for the removal	Yes	Yes	Yes	Yes
Program commencement and completion dates	Yes	Yes	Yes	Yes
Emergency plans	Yes	Yes	Yes	Yes
Asbestos removal boundaries, including the type and extent of isolation required and the location of any signs and barriers	Yes	Yes	Yes	Yes
Control of other hazards including electrical and lighting installations	Yes	Yes	Yes	Yes
PPE to be used including RPE	Yes	Yes	Yes	Yes
Removal				
Details of air-monitoring program Control and clearance	Yes	No	Yes	No
Waste storage and disposal program	Yes	Yes	Yes	Yes
Method for removing the asbestos (wet and dry)	Yes	Yes	Yes	Yes
Asbestos removal equipment (e.g. spray equip, asbestos vacuum cleaners, cutting tools)	Yes	Yes	Yes	Yes
Details of required enclosures, including their size, shape, structure etc, smoke testing enclosures and the location of negative pressure exhaust units	Yes	No	Yes	No
Details on temporary buildings required by the asbestos removalist (e.g. decontamination units) including water, lighting and power requirements, negative pressure exhaust units and the locations of decontamination units	Yes	May be required depending on the job	Yes	May be required depending on the job
Other risk control measures to prevent the release of airborne asbestos fibres from the area where asbestos removal is undertaken	Yes	Yes	Yes	Yes

Heading	Building & Structures		Plant & Equipment	
	Friable	Non-Friable	Friable	Non-Friable
Decontamination				
Detailed procedures for workplace decontamination, decontamination of tools and equip, personal decontamination and decontamination of non-disposable PPE and RPE	Yes	Yes	Yes	Yes
Waste Disposal				
Method of disposing of asbestos wastes, including details on: • the disposal of protective clothing	Yes	Yes	Yes	Yes
• the structures used to enclose the removal area	Yes	No	Yes	Yes
Clearance and air monitoring				
Name of the independent licensed asbestos assessor or competent person engaged to conduct air monitoring (if any)	Yes	Clearance only	Yes	Clearance only
Consultation				
Consult with any people who may be affected by the removal work, including neighbours	Yes	Yes	Yes	Yes

Appendix D: Asbestos Definitions

Asbestos Terminology	Definition
Abatement	To remedy or repair
Air monitoring[1]	Air Monitoring means airborne asbestos fibre sampling to assist in assessing exposures and the effectiveness of control measures. Air monitoring includes exposure monitoring, control monitoring and clearance monitoring.
Asbestos[2]	Means the asbestiform varieties of mineral silicates belonging to the serpentine or amphibole groups of rock-forming minerals, including actinolite asbestos, grunerite (or amosite) asbestos (brown), anthophyllite asbestos, chrysotile asbestos (white), crocidolite asbestos (blue) and tremolite asbestos.
Airborne asbestos fibres[2]	Means any fibres of asbestos small enough to be made airborne. For the purposes of monitoring airborne asbestos fibres, only respirable fibres are counted.
Analysis	Detailed examination of the structure. Statement of results from the sample taken on site.
Asbestos Containing Material (ACM)	Any material, object, product or debris that contains asbestos.
Asbestos Register	Inventory of ACM by type, form, location, risk and required action.
Asbestos Removal Control Plan	An asbestos removal control plan is a document that identifies the specific control measures a licence holder will use to ensure workers and other persons are not at risk when asbestos removal work is being conducted. It is similar to a Job Safety Analysis (JSA) but is focused on the specific control measures necessary to minimise any risk from exposure to asbestos.
Asbestos Removalist[2]	A competent person who has a licence to perform asbestos removal work.
Asbestos Management Plan (AMP)	Document covering the identification, risk evaluation, control and management of identified asbestos hazards, developed in accordance with Current legislation

[1] *Note: Air monitoring should be undertaken in accordance with the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 2003 (2005)]*
[2] *Note: A 'Class A' asbestos removal licence is required for removal of all friable ACM.*

Asbestos Terminology	Definition
Asbestos Vacuum Cleaner[3]	Asbestos vacuum cleaners should comply with the Class H requirements in Australian Standard ***AS/NZS 60335.2.69 Industrial vacuum cleaners*** or its equivalent. Asbestos vacuum cleaners should not be used on wet materials or surfaces. Attachments with brushes should not be used as they are difficult to decontaminate.
Bonded asbestos	ACM that is bonded into a stable matrix and cannot be reduced to a dust by hand pressure.
Clearance inspection[2]	An inspection, carried out by a competent person, to verify that an asbestos work area is safe to be returned to normal use after work involving the disturbance of ACM has taken place. A clearance inspection must include a visual inspection, and may also include clearance monitoring and/or settled dust sampling.
Clearance monitoring[2]	Air monitoring using static or positional samples to measure the level of airborne asbestos fibres in an area following work on ACM. An area is 'cleared' when the level of airborne asbestos fibres is measured as being below 0.01 fibres/mL.
Comcare	Agency responsible for workplace safety, rehabilitation and compensation in the jurisdiction of the Australian Commonwealth (i.e. Federal) Government
Competent person[2]	A person possessing adequate qualifications, such as suitable training and sufficient knowledge, experience and skill, for the safe performance of the specific work.
Control monitoring[2]	Air monitoring, using static or positional to measure the level of airborne asbestos fibres in an area during work on ACM. Control monitoring is designed to assist in assessing the effectiveness of control measures. Its results are not representative of actual occupational exposures, and should not be used for that purpose.
Exposure monitoring	Air monitoring in the breathing zone to determine a person's likely exposure to a hazardous substance. Exposure monitoring is designed to reliably estimate the person's exposure, so that it may be compared with the National Exposure Standard.

[3] *Filters for these vacuum cleaners should conform to the requirements of* ***AS 4260-1997 High efficiency particulate air (HEPA) filters – Classification, construction and performance*** *or its equivalent.*

Asbestos Terminology	Definition
Exposure standard	For asbestos is a respirable fibre level of 0.1 fibres/ml of air measured in a person's breathing zone and expressed as a time weighted average fibre concentration calculated over an eight-hour working day and measured over a minimum period of four hours in accordance with: • the Membrane Filter Method • a method determined by Comcare.
Friable asbestos[2]	Asbestos containing material which when dry is or may become crumbled, pulverised or reduced to powder by hand pressure.
In situ[2]	Fixed or installed in its original position, not having been removed.
Inaccessible areas	Areas which are difficult to access, such as wall cavities and the interiors of plant and equipment.
Licensed Class A Asbestos Assessor	Person who is qualified to undertake the sampling and risk assessment of asbestos and provide recommendations on its safe management.
Membrane	A flexible or semi-flexible material, which functions as the waterproofing component in a roofing or waterproofing assembly.
NATA-accredited laboratory	Means a testing laboratory accredited by the National Association of Testing Authorities (NATA), Australia, or recognised by NATA either solely or with someone else.
Respirable asbestos fibres	Means an asbestos fibre that: • is less than 3 microns (µm) wide • is more than 5 microns (µm) long • has a length to width ratio of more than 3:1.
Respiratory protective equipment (RPE)	All workers engaged in removal work must wear RPE conforming to the requirements of **AS/NZS 1716:2009** ***Selection, Use and Maintenance of Respiratory Protective Devices***
Safe Work Method Statement (SWMS)	A detailed summary prepared by the contractor before any work commences detailing how the contractor will remove/repair or work with a property containing ACM to reduce the risk of exposure