

Attachment AX

Hazardous Material Survey for the Heritage Core DA

Hazardous Materials Survey & Management Plan

Re inspection

Canberra Brickworks
Denman Street
Block 1 Section 102
Yarralumla
ACT 2600

March 2021

This report includes information from the report dated October 2015



This report MUST NOT be used as a removal specification

Client: ACTPRO Depots,
255 Canberra Ave Fyshwick ACT 2609



Accredited for compliance
with ISO/IEC 17020



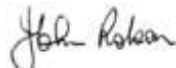
CERTIFICATE OF APPROVAL FOR ISSUE OF DOCUMENTS

Document No: T-01123
Title: Reinspection - Hazardous Materials Survey
 Canberra Brickworks
 Denman Street
 Block 1 Section 102
 Yarralumla
 ACT 2600

Revision Status: 1
Date of Issue: 14/04/2021

Client: ACTPRO Depots

Copy No: One

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1 PREFACE

This Hazardous Materials Survey and Management Plan (HMSMP) was commissioned by ACTPRO Depots in order to assure the occupants of the site the highest standards of occupational health and safety in relation to hazardous materials. The safe removal of hazardous materials must be undertaken by appropriately licensed and skilled personnel prior to the demolition of the premises.

The HMSMP contains sections covering the identification, evaluation and control of hazardous materials including asbestos containing materials (ACM), Lead Paint, Polychlorinated Biphenyls (PCB), Synthetic Mineral Fibre (SMF), Ozone Depleting Substances (ODS) and fuel storage above and underground storage tanks (AUST).

Robson Environmental Pty Ltd undertook the hazardous material survey on 15 to 16 March 2021 and incorporated previous findings from the site hazmat report(s). This report will take precedence over any previously issued hazmat survey for this property. Any changes to the condition/location of previously identified hazardous materials will be expressed within this report. The information contained in this document will assist the PMCW (person with control or management of a workplace) in fulfilling their obligations under the latest editions of the following regulations/Acts:

- *How To Manage and Control Asbestos In The Workplace Code of Practice*
- *How To Safely Remove Asbestos Code of Practice*
- *Dangerous Substances (General) Regulation 2004*
- *Dangerous Substances Act 2004*
- *Work Health and Safety Act 2011*
- *Work Health and Safety Regulations 2011*
- *National Code of Practice for the Safe Use of Synthetic Mineral Fibre [NOHSC:2006(1990)]*
- *National Standard for Synthetic Mineral Fibres [NOHSC:1004(1990)]*
- *Guide to Hazardous Paint Management Part 2: Lead paint in residential, public and commercial buildings Standards Australia, AS 4361.2 – 2017*
- *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*

2 EXECUTIVE SUMMARY

2.1 Purpose

This report presents the findings of a Hazardous Materials survey conducted at the site on 15 to 16 March 2021 at the request of the client. The survey was undertaken to assess the extent and condition of hazardous materials and document safe management procedures in accordance with current legislation. The safe removal of hazardous materials must be undertaken by appropriately licensed and skilled personnel prior to refurbishment or demolition of the premises or where the risk assessment recommends removal. This report includes information which must be known and acted upon prior to the commencement of any demolition, refurbishment, or hazardous material removal or remediation. It also details responsibilities that the PMCW (person with management or control of a workplace) and occupier must address to ensure safe occupation of the premises.

It was noted that unauthorized access to the site has resulted in further damage to the ACM. As asbestos exposure would be highly likely to occur it is required by the Code that the site be secured to prevent entry and that remediation be undertaken as a matter of urgency.

2.2 Scope

The Hazardous Materials survey was non-destructive and non-intrusive in nature with the extent limited to the following areas:

- Interior and exterior of the building
- Roof, amenities and immediate surrounding land
- A/UST filler points and breather vents

The survey did not include the inspection or assessment of the following areas:

- Subterranean areas (e.g. infill/soil)
- Concealed cavities
- Formwork and subterranean electrical cable ducts and water pipe ducts

2.3 Survey Methodology

The survey involved the visual inspection of accessible, representative, construction materials and the collection and analysis of sampled materials suspected of being potentially hazardous to human health.

Hazardous materials assessed included ACM, SMF, PCBs, lead containing paint, ODS and A/UST.

The site inspection included the sampling of representative materials suspected of being hazardous, was undertaken in accordance with Robson's NATA ISO/IEC 17020 accreditation, ISO9001, ISO14001, AS4801 and current legislation. The particular sampling methodology used for each hazardous materials type is provided below:

Asbestos: The asbestos materials survey was conducted in accordance with the current legislation. It involved a visual inspection of accessible representative construction materials suspected of containing asbestos. Materials were not sampled from all areas due to the uniformity of the materials used throughout the building(s). Samples were analysed in Robson

Environmental's National Association of Testing Authorities (NATA) accredited laboratory for the presence of asbestos by polarising light microscopy and dispersion staining.

Note that electrical switchboards and other similar areas were only inspected where they were isolated by a qualified electrician. Live switchboards were not inspected, and accordingly are presumed to be ACM until conclusively proven otherwise.

Lead (Pb) Based Paints: Representative paint samples were collected in accordance with AS4361.2-2017 and analysed for lead content. The sampling criterion provided below is taken from AS4361.2-2017 Section A4 Sampling Strategy clauses (a, b, c);

- (a) An adequate number of sample sites should be analysed to properly characterise the paint systems present on site.
- (b) For small surfaces such as architraves, windows and doors and cupboards, a **single** sample may suffice.
- (c) For large, uniformly painted surface areas such as the exterior facade of high rise buildings, or for interior walls and ceilings of large rooms, and where laboratory testing is employed, **composite** samples should be taken from three separate locations in 10m² sections.

Collected paint samples were analysed for their lead (Pb) content by Envirolab Services Pty Ltd – NATA accreditation number: 2901 using ICP/AES techniques and in-house Method No.4.

Within the same building, wherever a paint coating had a similar surface texture, colour, etc. to a paint coating that had already been sampled because of its suspected lead content, it was presumed that these paint coatings were identical. However, results can only be guaranteed valid for directly tested/sampled paints (especially due to deliberate attempts to match new paint to existing coatings in some applications).

SMF: Synthetic Mineral Fibre (SMF) materials were visually identified and a determination made as to whether they were bonded or un-bonded.

PCBs: The information (make, type, capacitance etc.) recorded for each representative fluorescent light fitting capacitor suspected of containing PCB was cross-referenced against *ANZECC Identification of PCB Containing Capacitors – Information Booklet for Electricians and Electrical Contractors - 1997*.

This identification booklet provides a list of electrical equipment that is known to contain PCBs, and a list of electrical equipment known not to contain PCBs. Where the information recorded from the capacitor case(s) correlated exactly with the information listed in the ANZECC Information Booklet for known PCB-containing capacitors it was determined that PCBs were present in the capacitor under analysis.

Wherever a capacitor could not be identified in either list, this was noted in the PCB register as being a capacitor suspected to contain PCBs.

Note that light fittings were only inspected where they were isolated by a qualified electrician. Live light fittings were not inspected, and accordingly no determination about whether or not they contain PCB is included in this report.

Ozone Depleting Substances: A visual examination was made of refrigerant gas labels affixed to representative air-conditioning and refrigeration units. Information concerning the ASHRAE/ARI refrigerant designated R number was noted for later cross-reference to relevant air-conditioning and refrigeration industry Codes of Practice and Guidelines. In addition, the condition of the plant was noted and comment made as to possible refrigerant or lubricant leaks.

Where refrigerant gas labels were absent from representative air-conditioning and refrigeration plant, an assessment was made as to the likelihood of the plant using an ozone depleting substance based on its age and condition.

Fuel Storage Facilities: The survey included a visual inspection for above ground storage tanks (AST) and underground storage tank (UST) filler points and breather vents.

2.4 Key Findings

Asbestos

Table 1A: ACM locations and required actions

ACM	Locations	Action to be taken
Millboard (Friable)	K2 east end - debris post removal	Restrict access Remove
Sheet (Non-Friable)	Ground floor A4 - perimeter eave and eave soffits	Label and maintain Inspect every 5 years
Sheet (Non-Friable)	In all buildings on site - electrical switchboard backing (throughout building)	Label and maintain Inspect every 5 years
Debris (Non-Friable)	Ground floor between BH & SS1 - sheet fragments	Encapsulate with soil Remove
Sheet (Non-Friable)	Ground floor BH - ceilings	Seal Label and maintain Inspect every 5 years
Sheet (Non-Friable)	Ground floor BH - eave soffits	Label and maintain Inspect every 5 years
Bituminous product (Non-Friable)	Ground floor Electrical control board building - switchboard backing sheet	Label and maintain Inspect every 5 years
Sheet (Non-Friable)	Ground floor Electrical control board building and throughout site - casing for earthing tapes	Label and maintain Inspect every 5 years
Sheet (Non-Friable)	Ground floor F south end - casing for earthing tape	Remove
Rope (Friable)	Ground floor FH1 - flange joint the ducting	Label and maintain Inspect every 5 years
Sheet (Non-Friable)	Ground floor FH1 - on wall adjacent switchboard	Restrict access Seal Remove
Rope (Friable)	Ground floor FH2 - flange joint to ducting	Label and maintain Inspect every 5 years
Debris (Non-Friable)	Ground floor FH2 and various areas - fragments in the soil	Remove Inspect every 5 years
Debris (Non-Friable)	Ground floor former canteen - fire damaged ceiling sheet	Remove

ACM	Locations	Action to be taken
Gaskets (compressed) (Non-Friable)	Ground floor front corner B block main kilns - gaskets adjacent downpipes	Label and maintain Inspect every 5 years
Sheet debris (Non-Friable)	Roof space K1 ceiling space - fragments on south side	Remove
Gaskets (compressed) (Non-Friable)	Roof space K2 walkway - heat exchange gasket	Label and maintain Inspect every 5 years
Millboard (Friable)	Ground floor K3 ceiling space - above kiln	Remove Inspect every 5 years
Debris (Friable)	Ground floor K3 to soil - fragments	Remove Inspect every 5 years
Rope (Non-Friable)	Ground floor open courtyard between K1 & K2 - old brick making machine	Label and maintain Inspect every 5 years
Sheet (Non-Friable)	Ground floor small building adjacent A4 - ceiling and narrow eave soffits surround buildings	Restrict access Label and maintain Inspect every 5 years
Sheet (Non-Friable)	Ground floor small room adjacent former canteen - ceiling sheet & debris on floor	Restrict access Remove
Sheet (Non-Friable)	Ground floor SS1 & SS2 - eave soffits	Removed
Sheet (Non-Friable)	Ground floor SS3 - ceilings	Restrict access Seal Label and maintain Inspect every 5 years
Sheet (Non-Friable)	Ground floor SS4 - ceiling	Label and maintain Inspect every 5 years
Sheet (Non-Friable)	Ground floor SS4 - electric switchboard backing	Label and maintain Inspect every 5 years
Sheet (Non-Friable)	Ground floor SS4 - lining to former shower area	Label and maintain Inspect every 5 years
Debris (Non-Friable)	Ground floor former wood store adjacent main kilns - fragments	Restrict access Remove Inspect every 5 years

Refer to Section 2.4 - Table 1B for presumed ACM and Section 3.2 for exclusions

Table 1B: Presumed ACM, concealed locations and required actions

Type	ACM	Locations	Action to be taken
The materials listed below while not identified on site, should be presumed to be present until a destructive survey confirms otherwise			
Presumed ACM	Insulation/pipe lagging	Inaccessible ducts, risers and ceiling and wall space cavities	<p>Destructive survey under controlled conditions prior to any refurbishment which is likely to disturb possible ACM in these areas.</p> <p>Until these areas are surveyed they should be presumed to contain asbestos.</p> <p>No access to unauthorised personnel should be given</p>
	Asbestos millboard lining	Interior of air conditioning ductwork adjacent to heater elements	
	Asbestos insulation and gaskets/joints	Within mechanical equipment concealed by outer metal cladding, structure or housing	
	Asbestos vinyl floor tiles, covering, cushioning underlay and adhesive	Found beneath carpets and vinyl flooring	
	Asbestos sheeting	Backing material to ceramic tiles (roofs, floors and walls) and packers to building construction joints, such as gable end verge undercloaking	
	Asbestos cement sheet formwork and electrical cable duct / water pipe	Subterranean areas	

Prior to any planned demolition, refurbishment or maintenance, its effect upon any in situ asbestos must be established by reference to this document including amendments.

Lead Paint

It should be assumed that all similar paints throughout the building contain comparable percentages of lead.

Lead Paint (>0.1%) - Canberra Brickworks		
Location	Paint Colour	Required action
Ground floor main internal yard - brick maker machine	Cream	Maintain
Ground floor BH - door frame and throughout	Red	Maintain Apply appropriate dust control measure during demolition

Lead Free Paint (<0.1%) - Canberra Brickworks		
Location	Paint Colour	Required action
Ground floor SS2 - interior timber door frame	White	No action required

Synthetic Mineral Fibre (SMF)

It should be presumed that SMF materials may be present to inaccessible areas.

Canberra Brickworks		
Material	Location & Material	Required action
Batts	Ground floor pipes throughout site	Maintain
Batts	Ground floor ceiling space throughout site	Maintain

Polychlorinated Biphenyls (PCB)

PCB - Canberra Brickworks			
Make - Type	Location	Total	Required action
Presumed	Ground floor K1 ceiling space	1	Manage during demolition or refurbishment
Dawco metal – BS 4017-1966 3.25µ	Ground floor A4	1	Manage during demolition or refurbishment
Ducon metal – APF 260CR 6µF	Ground floor R1	8	Manage during demolition or refurbishment
Ducon metal – APF 265CR 6.5µF	Ground floor A4	2	Manage during demolition or refurbishment

* Note that light fittings were only inspected where they were isolated by a qualified electrician. Live light fittings were not inspected, and accordingly no determination about whether or not they contain PCB is included in this report.

Ozone Depleting Substances (ODS)

R Number	Location	Total	Required action
No ozone depleting substances located			

Non – Ozone Depleting Substances

R Number	Location	Total	Required action
No non-ozone depleting substances located			

Above Ground Storage Tanks (AST) & Underground Storage Tanks (UST)

A/UST	Location	Total	Required action
No storage tanks located			

2.5 Key Recommendations

Asbestos

- It was noted that unauthorized access to the site has resulted in further damage to the ACM, such as the fire damaged former canteen. As asbestos exposure would be highly likely to occur it is required by the Code that the site be secured to prevent entry and that remediation be undertaken as a matter of urgency.
- A large amount of asbestos sheet debris was sighted in the area between BH and SS1 and in front of BH. It emerged from depth as a result of the soil disturbance during or after the field assessment which found buried ACM sheet on site. It is recommended that the debris be removed as soon as possible or be covered with soil until all ACM sheet is removed from the area.
- ACM debris was also found in various locations such as the Ground floor and ceiling space of K1, Ground floor of K3, former wood store and external areas near FH2. As it is known that the site will undergo a major asbestos remediation prior to redevelopment, it is recommended for short-term action that any visible ACM debris be removed by a licensed Asbestos Removalist.
- Asbestos millboard and sheet debris is still present throughout the roof space of K3. All were found to be in an extremely poor condition and therefore access to this area must be prohibited until the area has been completely remediated and a clearance certificate has been issued.
- Small amounts of asbestos millboard debris remain to the roof space of K2 following asbestos removal works being carried out. Access to this area must be restricted until all remaining pieces of millboard debris have been removed and a clearance certificate has been issued.
- The former canteen was found in a fire damaged condition with building debris including ACM ceiling sheet identified in the previous report found amongst the building rubble. It is recommended that access to the area be restricted and all fire related debris be removed as ACM.
- ACM debris present in the room adjacent to the former canteen. It is recommended that the ACM be removed by a licensed Asbestos Removalist as soon as possible. Access should be restricted until a clearance certificate is given by an Asbestos Assessor.
- Corrugated moulded ACM sheet debris was found on the ground within the B Building wood store area and on top of three main kilns. Based on previous reports noting that corrugated moulded ACM roof sheet was removed from this building and discussions with staff on site who reported the material, it is likely to be debris remaining from the old roof. Any further debris found should be removed, and an environmental clean undertaken in the vicinity.
- ACM casing for earthing tapes was found throughout different areas of the site and particularly in the Electrical Switchboard Control room. It is recommended that access be restricted and the ACM removed as soon as practicable.

- The debris noted in the previous report in front of the former canteen, in front of B, adjacent the tall chimney and adjacent FH2 was not observed during this re-inspection. It may have been removed; however, it should be presumed to remain present as contamination in the soil until either a valid clearance certificate is produced or investigations demonstrate conclusively that no asbestos remains.
- Access within FH1 should be restricted until the damaged asbestos sheet fixed to the wall has been removed.
- The asbestos ceiling sheets in SS3 should be sealed with paint where exposed surfaces are visible.
- The asbestos shower wall sheets in SS4 should be sealed with paint where exposed surfaces are visible.
- The asbestos gaskets to pipe flange joints to the front of B Building should be sealed where exposed surfaces are visible.
- All the electrical switchboard backing should be presumed as ACM and removed by a licensed Asbestos Removalist.
- As access could not be gained to all areas of the building, it should be presumed that any similar materials located within these areas could contain asbestos until proven otherwise. Strict controls should be put in place to brief all contractors and an Unexpected Finds protocol developed.
- Access was not possible to the tip area on the western side of the site, as this area is now fenced off from the main site.
- ACM must not be drilled, cut, sanded, damaged or abraded and a good paint finish maintained. Asbestos work on non friable ACM may be undertaken by a licensed Class A or B Asbestos Removalist. Any works on, or in the vicinity of friable ACM must only be undertaken by a licensed Class A Asbestos Removalist.
- Any ACM identified in this report that is to remain in situ should be inspected by a licensed Asbestos Assessor at the intervals stated in Section 4.5 Table 3A Asbestos Register.
- As access could not be gained to all areas of the building, it should be presumed that any similar materials located within these areas could contain asbestos until proven otherwise. Strict controls should be put in place to brief all contractors.
- ACM should be labelled with approved asbestos warning labels or signs. Due to the stigma associated with asbestos and to avoid malicious damage to ACM, labelling can be kept to discrete areas. Where labelling cannot be undertaken, the PMCW must adopt strict administrative controls to ensure ACM is not subject to accidental damage.

Asbestos Removal

Removal of ACM must be undertaken by a licensed Asbestos Removalist in accordance with current legislation. The removal/remediation of friable ACM must be undertaken by a licensed Class A Asbestos Removalist. Removal or remediation of non friable asbestos may be undertaken by either an A or B Class Asbestos Removalist.

Prior to the commencement of any removal or remediation works associated with any amount of friable or non friable asbestos a building certifier must be engaged and building approval granted. An application must be submitted to WorkSafe ACT and ComCare (where applicable) at least 5 days prior to removal works commencing. An asbestos removal contractor must supply an Asbestos Removal Control Plan (ARCP) and a Safe Work Method Statement (SWMS). An independent licensed Asbestos Assessor should be engaged to ensure that the ARCP addresses all safety issues relating to the planned asbestos works.

Air monitoring is mandatory during the removal or remediation of friable asbestos and should be considered during the removal or remediation of non friable asbestos. Air sampling is to be undertaken in accordance with the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres, 2nd Edition* and test certificates should be NATA endorsed.

An independent Asbestos Assessor must also be employed to undertake a Clearance Inspection of both friable and non friable asbestos removal or remediation works. A satisfactory clearance certificate for the remediated areas must ensure that no visible asbestos or presumed asbestos remains. Additionally no asbestos fibres should be detected by laboratory analysis if any validation samples are taken. All surfaces within the remediated area must be free of general dust and debris.

Lead Paint

- Lead paint were detected on the red door frame in BH and cream paint on the old brick maker machine. It is recommended that lead paint be maintained until demolition of the building. Appropriate dust control measure must apply during demolition.
- It should be assumed that all similar paint applications throughout the building would contain similar percentages of lead.
- Refer to Appendix D for further general information on lead paint.

SMF

- SMF is utilised as ceiling insulation in some buildings and insulation to pipes throughout the site.
- If these materials are to be disturbed during refurbishment appropriate PPE should be worn. SMF materials being removed should be done so using effective dust control procedures.
- Refer to Appendix D for further general information on SMF.

PCBs

- Light fittings containing PCB capacitors were located in some buildings.
- Any damaged light fittings containing capacitors with PCBs should be removed and be suitably disposed of in accordance with the ACT regulatory authorities. Refer to Appendix D for the correct handling and disposal of PCB containing capacitors.
- Refer to Appendix D for further general information on PCB.

ODS

- No ODS located

A/UST

- No A/UST located

Legislation and Guidelines (UST): Section 3.2 of AS4976 (2008) *The Removal and Disposal of Underground Petroleum Storage Tanks*, states that the out-of-service period for a A/UST should not exceed that laid down in any applicable regulation and should not normally be greater than twelve (12) months. Also, Section 6 (Decommissioning) of the ACT EPA (2009) *Environmental Guidelines for Service Station Sites and Hydrocarbon Storage* indicates that all decommissioned tanks must be removed unless there are specific operational or structural reasons as to why they must remain. These reasons must be outlined or substantiated by an experienced and competent person.

Demolition and Refurbishment

Robson Environmental Pty Ltd recommends that prior to any demolition our office be contacted. Our licensed Asbestos Assessors can attend the site to observe the demolition process, advise as necessary and in the event of previously inaccessible hazardous materials being located, assist with assessing the extent, type and removal or abatement of materials as required.

Robson Environmental Pty Ltd provides a range of occupational hygiene services in relation to the safe remediation or abatement of hazardous materials as well as contaminated land advice in relation to hydrocarbon contamination.

To assist with the tendering process Robson Environmental could be engaged to attend the walkthrough to show the extent of ACM and to respond to questions of clarification.

3 INTRODUCTION

The following Hazardous Materials Survey and Management Plan (HMSMP) has been designed to address the safe control of hazardous materials. It covers current requirements for hazardous material management as at 15/03/2021 to 16/03/2021 only and must therefore be updated to comply with any future changes to legislative requirements. The safe removal of hazardous materials must be undertaken by appropriately licensed and skilled personnel prior to any renovation or demolition of the premises.

This HMSMP includes the following:

- a register of all identified hazardous materials
- extent, form, condition and risks associated with nominated hazardous materials
- labelling requirements for identified hazardous materials
- a timetable for managing risks including priorities for removal or control of ACM and for reviewing risk assessments
- responsibilities of all persons involved in hazardous materials management
- procedures to address incidents or spillage involving ACM
- safe work and removal methods
- guidelines on reviewing and updating the HMSMP and hazardous materials register

3.1 Requirements for the HMSMP

This HMSMP must be held on site for ready access. All personnel undertaking any repair or maintenance work must be provided with a copy of the HMSMP before commencement of work.

Maintenance, trade and other personnel must be instructed not to remove or damage identified hazardous materials if hazardous material is identified in the area where work will be undertaken it must be removed or remediated before work begins.

Removal of hazardous material must be undertaken by suitably qualified persons in accordance with relevant Regulations and Codes of Practice.

3.2 Exclusions

The HMSMP commissioned by the client was to be non-destructive and non-intrusive in nature. This type of commission limits or restricts access to the building structure, some surfaces and materials.

The survey undertaken was limited to those areas available for access at the time of building inspection. Only the areas accessible to the surveyors at the time of the building inspection are included in this HMSMP.

No Access Areas:

- Canberra Brickworks, Ground floor A4

Unless specifically noted, the survey did not cover exterior ground surfaces and sub-surfaces (e.g. infill/soil) or materials other than normal building fabric such as materials in laboratories or special purpose facilities.

At the time of survey no access was gained to materials and / or void areas located behind, above, or attached to any sampled or assumed hazardous materials.

The HMSMP does not include the areas, locations and equipment items to which the surveyors could not gain access at the time of inspection.

Some other areas which *may* conceal asbestos include:

Material	Location
Asbestos millboard lining	Air conditioning duct work adjacent to heater elements
Asbestos insulation and gaskets/joints	Within mechanical equipment concealed by outer metal cladding
Asbestos insulation	Walls and cavities (e.g. as lagging to hot water pipes set into and sealed within masonry walls)
Vinyl floor tiles and floor covering	Beneath carpets
Sheeting	Backing material to ceramic tiles and as packers to building construction joints
Asbestos cement sheet formwork and electrical cable/water pipe duct	Sub-ground floor slab

No absolute determination can be made regarding the possibility of concealed or inaccessible hazardous materials or items in the areas, locations and equipment listed in the table above until access is gained to allow for inspection.

Materials and equipment in any non-accessed area should therefore be assumed to contain ACM, SMF, lead paint, PCB, ODS and A/UST (the nominated hazardous materials) and be treated appropriately until assessment and sample analysis confirm otherwise.

Samples were not taken where the act of sampling would endanger the surveyor or affect the structural integrity of the item concerned.

This HMSMP, although extensive, is not intended for and must not be used as a specification or method statement for any future hazardous material removal project. In this instance detailed plans, quantities etc. would be required.

Before any refurbishment or hazardous material removal projects, the contractor(s) carrying out the work must fully acquaint themselves with the extent of the hazardous materials, particularly in those areas which may need full or partial demolition in order to determine the exact extent and location of such materials.

Care should be taken when demolishing or excavating to determine the existence or otherwise of hazardous materials. For example subsurface pipes and drains, revealed through excavation may be constructed of asbestos cement. Wherever a material is uncovered or revealed and it is suspected to be hazardous, it should be assumed to be hazardous and treated appropriately until such time as assessment and sample analysis of the material confirms otherwise.

Until this confirmation occurs the building work must cease in the immediate vicinity of the suspect material and a suitably qualified person must issue a clearance certificate or report before the building work can recommence in the affected area.

To ensure contextual integrity, this HMSMP must always be read in its entirety and should never be referred to in part only.

3.3 Limitations

This report is based on the information obtained by Robson Environmental Pty Ltd at the time of inspection. Robson Environmental Pty Ltd will not update this report; nor take into account any event(s) occurring after the time that its assessment was conducted.

As both the range and use of manufactured products containing hazardous materials was extremely widespread, Robson Environmental Pty Ltd cannot accept responsibility for any consequential loss or damage that results from non-recognition of a material that may later be established to contain hazardous material. For example, certain textured wall and ceiling finishes may contain small traces of asbestos fibre. In situ, textured finishes are often composed of assorted batches of product, or may have been repaired/patched at various times. It is therefore always a possibility that the samples collected may not always be representative of the entire material.

While Robson Environmental Pty Ltd has taken all care and attention to ensure that this report includes the most accurate information available, it has been unable to examine any inaccessible materials or materials hidden from view.

Under normal construction practices some materials are "built in" or "randomly applied". These materials are therefore not readily accessible and can only be exposed through demolition or damage to the structure or finishes. Access to a material may also be prevented or restricted by "in service" or operational equipment, or where to obtain access contravenes a relevant statutory requirement or code of practice. (e.g. electrical switchboards) Consequently, while all reasonable care and attention was taken in compiling this report no guarantee to its completeness can be given.

Robson Environmental Pty Ltd has taken all care to ensure that this report includes the most accurate information available, where it uses test results prepared by other persons it relies on the accuracy of the test results in preparing this report. In providing this report Robson Environmental Pty Ltd does not warrant the accuracy of such third party test results.

4 ASBESTOS SURVEY RESULTS

4.1 Survey Details

The survey of the site included all accessible areas of the building(s) except where stated otherwise. For further asbestos management information, refer to Appendix D.

4.2 Survey Methodology

The re-inspection of hazardous materials previously identified on site involved a visual inspection and condition assessment of known hazardous items. It also involved sampling and analysis of any suspect asbestos materials not identified on the previous report. These samples were analysed in Robson Environmental's National Association of Testing Authorities (NATA) laboratory using polarising light microscopy (PLM) and dispersion staining. Samples from the previous surveys were analysed by Robsons and/or other NATA accredited laboratories as shown in Appendix A. Samples were a representative selection of materials suspected of containing asbestos. Samples were not taken from all areas due to the uniformity of the materials used throughout the building. Laboratory analysis certificates are presented in Appendix A.

4.3 Sample Analysis

Table 2: Mineralogical Analysis of Samples for Asbestos using PLM

Sample reference	Sample location	Sample type	Composition
2810-40-A3	Roof space K2 walkway - heat exchange gasket	Gaskets (compressed)	Chrysotile Asbestos Detected
2810-40-A4	Ground floor FH2 - flange joint the ducting	Rope	Chrysotile Asbestos Detected
2810-40-A5	Ground floor former canteen - fire damaged ceiling sheet	Debris	Chrysotile Asbestos Detected
2810-40-A9	Ground floor A4 - perimeter eave and eave soffits	Sheet	Chrysotile Asbestos Detected
3617-103-A1	Ground floor open courtyard between K1 & K2 - old brick making machine	Rope	Chrysotile Asbestos Detected

Sample reference	Sample location	Sample type	Composition
3617-103-A4	Ground floor front corner B block main kilns - gaskets adjacent downpipes	Gaskets (compressed)	Chrysotile Asbestos Detected
3617-103-A7	Ground floor FH2 and various areas - fragments in the soil	Debris	Chrysotile, Amosite Asbestos Detected
B1701	Ground floor R2 - fragments	Sheet debris	No Asbestos Detected
B1702	Ground floor A3 - ceiling	Cement sheet	No Asbestos Detected
B1703	Ground floor Electrical board room and throughout site - casing for earthing tapes	Sheet	Amosite, Chrysotile, Crocidolite Asbestos Detected
E1132	Ground floor A3 - fascia, infill panels & eave soffits	Sheet	No Asbestos Detected
E1136	Ground floor K3 ceiling space - above kiln	Millboard	Chrysotile Asbestos Detected
E1137	Ground floor K3 to soil - fragments	Debris	Chrysotile Asbestos Detected
E1138	Ground floor FH1 - on wall adjacent switchboard	Sheet	Chrysotile Asbestos Detected
E1141	Ground floor former wood store adjacent main kilns - fragments	Debris	Chrysotile Asbestos Detected
M0100	K2 east end - debris post removal	Millboard	Chrysotile Asbestos Detected
M0101	Ground floor SS1 & SS2 - ceiling	Sheet	Removed
M0101	Ground floor SS3 - ceilings	Sheet	Chrysotile Asbestos Detected
Y2048	Ground floor Electrical board room - switchboard backing sheet	Bituminous product	Chrysotile Asbestos Detected

Sample reference	Sample location	Sample type	Composition
Y2049	Ground floor A3 - fragments to south side of the building	Sheet debris	No Asbestos Detected
Y2050	K1 ceiling space - fragments on south side	Sheet debris	Amosite, Chrysotile, Crocidolite Asbestos Detected
Y2051	Ground floor F south end - casing for earthing tape	Sheet	Chrysotile Asbestos Detected
Y2052	Ground floor M3 south end - electrical cable insulation	Cable wrap	No Asbestos Detected
Y2053	Ground floor M3 south end side - seal to electrical equipment	Mastic	No Asbestos Detected
Y2054	Ground floor FH1 - flange joint the ducting	Rope	Chrysotile Asbestos Detected
Y2055	Ground floor FH1 - cable wrap	Woven product	No Asbestos Detected
Y2056	Ground floor FH1 - mastic	Debris	No Asbestos Detected
Y2057	Ground floor SS1 & SS2 - eave soffits	Sheet	Amosite, Chrysotile Asbestos Detected
Y2058	Ground floor between BH & SS1 - sheet fragments	Debris	Amosite, Chrysotile Asbestos Detected
Y2059	Ground floor BH - glaze between timber frame and glass	Caulking	No Asbestos Detected

NATA accredited laboratory:

Robson Environmental Pty Ltd

Accreditation number: 3181

Chrysotile	=	white asbestos
Amosite	=	grey or brown asbestos
Crocidolite	=	blue asbestos

It should be noted that the above samples were a representative selection of materials suspected of containing asbestos.

On-site inspections and an examination of the Asbestos Register within this report should be undertaken prior to the commencement of any asbestos removal programme.

4.4 Risk Assessment

The purpose of the risk assessment is to enable informed decisions to be made concerning the control of ACM.

The risk assessment should take account of the identification information in the Asbestos Register, including:

- type of ACM (non-friable or friable)
- condition and location of ACM
- whether the ACM is likely to be disturbed due to its condition and location
- the likelihood of exposure

Types of ACM

Non-friable ACM	<p>Non-friable ACM is any material that contains asbestos bound into a stable matrix. It may consist of cement or various resins/binders and cannot be reduced to a dust by hand pressure. As such it does not present an exposure hazard unless cut, abraded, sanded or otherwise disturbed. Therefore, the exposure risk from non-friable ACM is negligible during normal building occupation.</p> <p><i>Note: If non-friable ACM is damaged or otherwise deteriorated, the risk assessment may be reviewed to reflect a higher potential for exposure to asbestos fibres. A licensed Asbestos Assessor should perform the risk assessment.</i></p>
Friable ACM	<p>Friable ACM can be crumbled or reduced to a dust by hand pressure when dry and can represent a significant exposure hazard. Examples of friable asbestos are hot water pipe lagging, severely damaged asbestos cement sheet, limpet spray to structural beams and electrical duct heater millboard.</p>

ACM CONDITION RATING

1	Severe	Deteriorated surface in extremely poor condition
2	Poor	Deteriorated material
3	Normal	Stable asbestos with little damage
4	Good	Well sealed stable surfaces in accessible locations

ACM RISK RATING

A	Very High	Exposure to airborne asbestos as a consequence of extremely minor disturbance
B	High	Exposure to airborne asbestos likely as a consequence of significant disturbance
C	Medium	Exposure to airborne asbestos unlikely during normal building use
D	Low	No exposure to airborne asbestos during normal building use

4.5 Asbestos Register

The Asbestos Register details the type, location, risk assessment and action required for all identified ACM. The Register should be accessed to inform all decisions made concerning control of ACM. Action taken to control ACM must be recorded in this Register in order to comply with current legislation.

Table 3A: Asbestos Register

Sample No.	Material Description & Location	Condition Rating	Risk Rating	Approx Quantity	Recommended Management Action	Action Undertaken	Assessor/ Date assessed
2810-40-A3	Roof space K2 walkway - Gaskets (compressed) - heat exchange gasket (Non-Friable)	3	D	1 no	Label and maintain Inspect every 5 years		
2810-40-A4	Ground floor FH2 - Rope - flange joint the ducting (Friable)	2	C	42 m ²	Label and maintain Inspect every 5 years		
RA 2810-40-A5	Ground floor small room adjacent former canteen - Sheet - ceiling sheet & debris on floor (Non-Friable)	2	B	-	Restrict access Remove		
2810-40-A5	Ground floor former canteen - Debris - fire damaged ceiling sheet (Non-Friable)	2	B	-	Restrict access Remove		
RA 2810-40-A9	Ground floor small building adjacent A4 - Sheet - ceiling and narrow eave soffits surround buildings (Non-Friable)	2	B	-	Restrict access Label and maintain Inspect every 5 years		

Sample No.	Material Description & Location	Condition Rating	Risk Rating	Approx Quantity	Recommended Management Action	Action Undertaken	Assessor/ Date assessed
2810-40-A9	Ground floor A4 - Sheet - perimeter eave and eave soffits (Non-Friable)	3	C	-	Label and maintain Inspect every 5 years		
3617-103-A1	Ground floor open courtyard between K1 & K2 - Rope - old brick making machine (Non-Friable)	3	C	1	Label and maintain Inspect every 5 years		
3617-103-A4	Ground floor front corner B block main kilns - Gaskets (compressed) - gaskets adjacent downpipes (Non-Friable)	3	C	1	Label and maintain Inspect every 5 years		
3617-103-A7	Ground floor FH2 and various areas - Debris - fragments in the soil (Non-Friable)	2	C	1	Remove Inspect every 5 years		
B1703	Ground floor Electrical control board building and throughout site - Sheet - casing for earthing tapes (Non-Friable)	3	C	-	Remove Label and maintain Inspect every 5 years		
E1136	Ground floor K3 ceiling space - Millboard - above kiln (Friable)	2	B	-	Remove Inspect every 5 years		
E1137	Ground floor K3 to soil - Debris - fragments (Friable)	2	B	-	Remove Inspect every 5 years		

Sample No.	Material Description & Location	Condition Rating	Risk Rating	Approx Quantity	Recommended Management Action	Action Undertaken	Assessor/ Date assessed
E1138	Ground floor FH1 - Sheet - on wall adjacent switchboard (Non-Friable)	2	C	m ²	Restrict access Remove Seal		
E1141	Ground floor former wood store adjacent main kilns - Debris - fragments (Non-Friable)	2	B	-	Remove		
M0100	K2 east end - Millboard - debris post removal (Friable)	1	A	1 m ²	Restrict access Remove		
RA M0101	Ground floor BH - Sheet - ceilings (Non-Friable)	3	C	42 m ²	Seal Label and maintain Inspect every 5 years		
RA M0101	Ground floor SS4 - Sheet - lining to previous shower area (Non-Friable)	2	C	m ²	Label and maintain Inspect every 5 years		
RA M0101	Ground floor SS4 - Sheet - ceiling (Non-Friable)	2	C	m ²	Label and maintain Inspect every 5 years		
M0101	Ground floor SS3 - Sheet - ceilings (Non-Friable)	2	C	42 m ²	Restrict access Seal Label and maintain Inspect every 5 years		

Sample No.	Material Description & Location	Condition Rating	Risk Rating	Approx Quantity	Recommended Management Action	Action Undertaken	Assessor/ Date assessed
Y2048	Ground floor Electrical control board building - Bituminous product - switchboard backing sheet (Non-Friable)	3	D	-	Label and maintain Inspect every 5 years		
RA Y2048	In all buildings on site - Sheet - electrical switchboard backing (throughout building) (Non-Friable)	3	C	-	Label and maintain Inspect every 5 years		
RA Y2048	Ground floor SS4 - Sheet - electric switchboard backing (Non-Friable)	2	C	m ²	Label and maintain Inspect every 5 years		
Y2050	Roof space K1 - Sheet debris - fragments on south side (Non-Friable)	2	C	-	Remove Inspect every 5 years		
RA Y2050	K1 on top of three main kilns - fragments of corrugated sheets	2	C	-	Remove Inspect every 5 years		
RA Y2050	Ground floor K1 - fragments	2	C	-	Remove Inspect every 5 years		
Y2051	Ground floor F south end - Sheet - casing for earthing tape (Non-Friable)	2	C	1 m ²	Remove		

Sample No.	Material Description & Location	Condition Rating	Risk Rating	Approx Quantity	Recommended Management Action	Action Undertaken	Assessor/ Date assessed
Y2054	Ground floor FH1 & FH2 - Rope - flange joint the ducting (Friable)	2	C	m ²	Label and maintain Inspect every 5 years		
Y2057	Ground floor SS1 & SS2 - Sheet - eave soffits (Non-Friable)	3	C	18 m ²	Seal Label and maintain Inspect every 5 years		
RA Y2057	Ground floor BH - Sheet - eave soffits (Non-Friable)	3	C	12 m ²	Label and maintain Inspect every 5 years		
Y2058	Ground floor between BH & SS1 - Debris - sheet fragments (Non-Friable)	2	B	-	Encapsulate with soil Remove		

Refer to Section 2.4 Table 1B for presumed ACM and Section 3.2 for exclusions

Table 3B: Register of sampled materials which have been confirmed as non ACM

Sample number	Type	Locations
B1701	Sheet debris	Ground floor R2 - fragments
B1702	Cement sheet	Ground floor A3 - ceiling
E1132	Sheet	Ground floor A3 - fascia, infill panels & eave soffits
Y2049	Sheet debris	Ground floor A3 - fragments to south side of the building
Y2052	Cable wrap	Ground floor M3 south end - electrical cable insulation
Y2053	Mastic	Ground floor M3 south end side - seal to electrical equipment
Y2055	Woven product	Ground floor FH1 - cable wrap
Y2056	Debris	Ground floor FH1 - mastic
Y2059	Caulking	Ground floor BH - between timber frame and glass

5 LEAD PAINT SURVEY RESULTS

5.1 Introduction

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 $\leq 0.1\%$ Pb allow the sample to be categorised as being lead free paint.

5.2 Results

Representative paint samples were collected in accordance with AS4361.2-2017 and analysed for lead content. The sampling criterion provided below is taken from AS4361.2-2017 Section A4 Sampling Strategy clauses (a, b, c);

- (a) An adequate number of sample sites should be analysed to properly characterise the paint systems present on site.
- (b) For small surfaces such as architraves, windows and doors and cupboards, a **single** sample may suffice.
- (c) For large, uniformly painted surface areas such as the exterior facade of high rise buildings, or for interior walls and ceilings of large rooms, and where laboratory testing is employed, **composite** samples should be taken from three separate locations in 10m² sections.

Collected paint samples were analysed for their lead (Pb) content by Envirolab Services Pty Ltd – NATA accreditation number: 2901 using ICP/AES techniques and in-house Method No.4.

Within the same building, wherever a paint coating had a similar surface texture, colour, etc. to a paint coating that had already been sampled because of its suspected lead content, it was presumed that these paint coatings were identical. However, results can only be guaranteed valid for directly tested/sampled paints (especially due to deliberate attempts to match new paint to existing coatings in some applications).

Table 4: Lead Composition in Paint by Inductively-Coupled Plasma Spectroscopy

Canberra Brickworks				
Sample No.	Item No.	Sample location	Colour	Lead in Paint %
Pb03	PB2673	Ground floor main internal yard - brick maker machine	Cream	1.3
Ph01	PB2675	Ground floor BH - door frame	Red	0.17
Pb02	PB2676	Ground floor SS2 - interior timber door frame	White	0.01

Notes:

Lead Paint (> 0.1% Pb)
 Lead-free Paint (≤ 0.1% Pb)

5.3 Discussion and Conclusion

The analytical result(s) of paint sampling revealed that the cream paint to the brick maker machine and red paint on the door frame in BH contains lead.

It is recommended that red lead paint be maintained until demolition in underway and appropriate lead dust control measure apply. The cream lead paint to the old brick making machine is in good condition and should be maintained.

Any areas that begin to flake, peel or otherwise deteriorate should be appropriately remediated. If the paint is to be removed this should be undertaken by a suitably qualified person.

It should be assumed that all similar paint(s) throughout the premises contains comparable percentages of lead.

6 Synthetic Mineral Fibre (SMF) Survey Results

6.1 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' (MMMMF).

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.

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).

6.2 Results

Table 5: Visual Assessment of Samples

Canberra Brickworks			
Item No.	Location	Sample Type	Form
SMF2229	Ground floor ceiling space throughout site	Batts	Bonded
SMF2228	Ground floor pipes throughout site	Batts	Bonded

6.3 Conclusion

It should be presumed that SMF materials may be present to inaccessible areas including the ceiling space of areas which are inaccessible. If building work is likely to significantly disturb the insulation, the SMF materials should be removed using effective dust control procedures.

Refer to Appendix D for safe SMF handling.

7 POLYCHLORINATED BIPHENYLS (PCB) SURVEY RESULTS

7.1 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 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*.

- * 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, State or Territory Government agency prior to their disposal.

7.2 Results

Table 6: PCB and non PCB Containing Capacitors Identified on fluorescent light fittings

PCB - Canberra Brickworks			
Item No.	Location	Make - Type	Capacitance (µF)
PCB818	Ground floor R1	Ducon metal – APF	260CR 6µF
PCB819	Ground floor K1 ceiling space	Presumed	-
PCB820	Ground floor A4	Ducon metal – APF	265CR 6.5µF
PCB821	Ground floor A4	Dawco metal – BS	4017-1966 3.25µ
Item No.	Location	Make - Type	Capacitance (µF)
No Non-PCB capacitors were located			

* Note that light fittings were only inspected where they were isolated by a qualified electrician. Live light fittings were not inspected, and accordingly no determination about whether or not they contain PCB is included in this report.

For further PCB management information refer to Appendix D.

8 OZONE DEPLETING SUBSTANCES SURVEY RESULTS

The site was surveyed for the presence of air conditioning and refrigeration units that contain ozone depleting substances.

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 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 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.

8.1 Results

Table 7: Chemical properties of ODS located during survey

ODS Item No.	Location	R Number	Chemical name	ODP	GWP	EAL
No ozone depleting substances located						

Chemical properties of non ODS located during survey

Non ODS	Location	R Number	Chemical name	ODP	GWP	EAL
No non-ozone depleting substances located						

For further refrigerant management information refer to Appendix D.

9 FUEL STORAGE FACILITIES

9.1 Results

A/UST Type	Item No.	Location	Recommendations
No storage tanks located			

10 ASBESTOS MANAGEMENT

10.1 Management of ACM

General requirements

- ACM identified as representing an exposure risk (see [Table 3A Asbestos Register](#)) should be removed or otherwise controlled.
- Any ACM that is not scheduled for immediate removal should be labelled with appropriate warnings and maintained in good condition.
- The location of ACM must be entered into the Asbestos Register.
- Maintenance and other personnel must be made aware of the location of ACM.
- The Asbestos Register must be freely available.
- Unless they have valid ACT Asbestos Removal licence, maintenance workers, trades or occupants shall not remove or knowingly damage identified ACM.
- Before any planned demolition, refurbishment or maintenance, its effect upon any in situ asbestos must be established by reference to this document, including amendments.

10.2 Management of Contractors

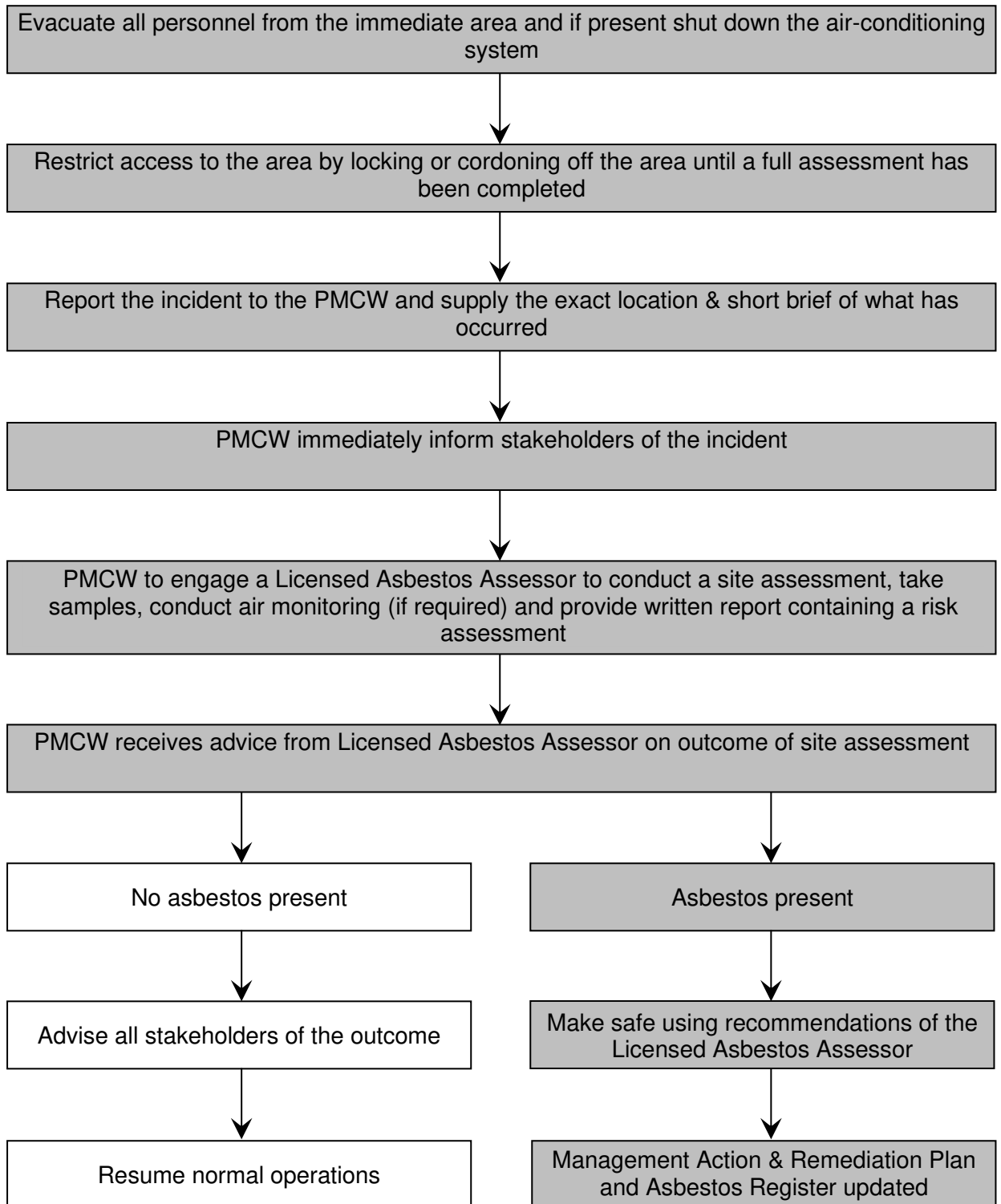
Before any contractor is engaged to carry out work on a site, the Asbestos Register, site plan and photographs should be checked to ensure the work will not interfere with, or disturb asbestos containing materials (ACM).

The chart below should be used by the PMCW to induct contractors onto sites:

Contractor arrives on site	Check Safe Work Method Statement (SWMS) and Trade Licenses (including Asbestos Awareness training) of all personnel involved in the work
Induct contractor	Conduct contractor's induction for the personnel involved in the work and ensure they are aware of any special requirements for ACM, security, no smoking, etc.
Check the Asbestos Register	The Asbestos Register and plan should be readily accessible (i.e. front office/reception) and in colour. Check the Asbestos Register with the contractor for ACM in the proposed work area.
Is asbestos present in the work area?	
No	Yes
Contractor may proceed with work	
Will the asbestos be disturbed?	
No	Yes
Contractor may proceed with work	No work to be conducted – contact the PMCW immediately informing them of the problem.

10.3 Asbestos Emergency Procedures

The following course of action should be taken **immediately** if ACM or suspected ACM is disturbed, or is accidentally damaged.



10.4 PMCW Decision Record

Option 1: Defer action

Item no.	ACM and Location	Reason	Authorisation	Date

Option 2: Encapsulate or seal

Item no.	ACM and Location	Reason	Authorisation	Date

Option 3: Removal

Item no.	ACM and Location	Reason	Authorisation	Date

10.5 Timetable for Action

The timetable for action should be administered to ensure the PMCW has a clear plan for all works which may affect ACM in the workplace. This includes maintenance work, scheduled removal work and risk assessment reviews, which may impact ACM.

Table 8: Timetable for action

ACM removal/ work	Date of scheduled works	Details	Authorisation	Date
Asbestos review/audit	Date of scheduled review	Details	Authorisation	Date

11 RESPONSIBILITIES

11.1 Asbestos - Provision of Information

The PMCW must:

- ensure the ACM register and all relevant information pertaining to asbestos in the workplace is freely available upon request
- provide occupants with up-to-date information relating to the condition and relative risk of ACM in the workplace
- provide information on the control measures in place to contain ACM-related risk and
- provide information to staff and contractors on measures to be taken to ensure that they are not exposed to asbestos in the workplace, either through accident or negligence

PMCW Action Record

Record all communication activities undertaken to inform staff/occupants of ACM in the workplace.

Action	Authorisation	Date

11.2 Updating the Risk Assessment

The register of ACM, including any risk assessments, should be reviewed every 12 months or earlier where:

- a risk assessment indicates the need for reassessment; or
- any ACM has been disturbed or moved

A visual inspection of identified ACM should be undertaken as part of any review.

Each review should critically assess all asbestos management procedures and their effectiveness in:

- preventing exposure to asbestos fibres
- controlling access to asbestos
- highlighting the need for action to maintain or remove ACM
- maintaining the accuracy of the ASMP

Details of any mitigating actions must be recorded in the Asbestos Register (refer Table 3A).

11.3 Key Personnel

This section outlines the responsibilities of all persons involved in the safe management of ACM.

1. PMCW

Name:	
Contact details:	
Responsibilities:	<i>e.g. provision of information</i>

2. Occupational Health and Safety Representative

Name:	
Contact details:	
Responsibilities:	<i>e.g. keeping occupants informed of any changes to the status of ACM in the workplace</i>

3. Facilities Management (if applicable)

Name:	
Contact details:	
Responsibilities:	<i>e.g. arrange removal and repair works as required; maintaining the HMSMP</i>

4. Other

Name:	
Contact details:	
Responsibilities:	

12 ASBESTOS REMOVAL WORKS

12.1 PMCW Responsibilities

Where it has been determined that ACM is to be removed, the PMCW must ensure that a risk assessment is performed before the removal work commences and that the removalist takes this risk assessment into account. The risk assessment must include the possibility of uncovering previously concealed ACM, and that concealed ACM is subsequently identified by a licensed Asbestos Assessor.

The PMCW should provide a detailed scope of works prepared by a licensed Asbestos Assessor for the removalist, including potential hazards, details on areas, which contain asbestos and arrangements for clearance inspections and airborne fibre monitoring.

12.2 Removalist Responsibilities

Before the commencement of removal work, the licensed removal contractor must:

- Provide a site-specific Asbestos Removal Control Plan(ARCP)
- Ensure the removal is adequately supervised and carried out in a safe manner
- Ensure that the equipment used in the project is appropriate for the task
- Ensure all persons carrying out the removal are competent and trained for the type of work being carried out
- Demonstrate that they have a health surveillance program in accordance with the requirements of Code Of Practice: How To Safely Remove Asbestos

12.3 Licensing Requirements

All Asbestos Removalists in the ACT are licensed by WorkSafe ACT

As a minimum the holder of an ACT Asbestos Removal Licence is required to demonstrate practical experience in the industry for at least three years and possess a full and complete understanding of the requirements of:

- *How to Manage and Control Asbestos in the Workplace Code of Practice*
- *How to Safely Remove Asbestos Code of Practice*
- *Work Health and Safety Act 2011*
- *Work Health and Safety Regulations 2011*

Environment and Planning Directorate (EPD) specify requirements for authorising certifiers and WorkSafe ACT and ACT NOWaste for the removal and transport of ACM.

12.4 Approval to Begin Asbestos Removal Works

- All removal methods and procedures are required to be undertaken in accordance with current legislation.
- The PMCW in conjunction with a licensed Asbestos Assessor where required, will inform the asbestos removalist of the 'Scope of Works'.
- The licensed Asbestos Assessor will be required to provide a clearance certificate on satisfactory completion of the works.

12.5 Emergency Work in Areas Containing Asbestos

- If emergency access is required contact the PMCW.
- If the PMCW determines that asbestos is likely to be disturbed, all works must be undertaken in accordance with current legislation - that is, a licensed Asbestos Removalist must be contracted to undertake any asbestos removal works.
- A licensed Asbestos Assessor will be required to provide a clearance certificate on satisfactory completion of the works.

12.6 Monitoring Arrangements

Control air monitoring should be performed when indicated by a Risk Assessment to ensure the control measures are effective.

All air monitoring must be performed by a licensed Asbestos Assessor accredited to perform air sampling for asbestos. Sampling should be performed in accordance with the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres* [NOHSC: 3003 (2005)].

It is the Asbestos Removalist's responsibility to ensure that the maximum fibre levels throughout asbestos removal and associated works does not equal or exceed the minimum practical detection limit of 0.01 fibres per millilitre of air (F/ml). If the airborne fibre levels are observed at or exceeding those specified below, the licensed Asbestos Assessor will instruct the contractor to take the appropriate control /action as per current legislation.

Table 9: Control levels and required actions

Control Level (airborne asbestos fibres/ml)	Control/Action
< 0.01	Continue with control measures
≥ 0.01	Review control measures
≥ 0.02	Stop removal work and find the cause

12.7 Clearance Inspections

Following removal work, a licensed Asbestos Assessor must undertake a clearance inspection before re-occupation of an asbestos work area.

All barriers and warning signs should remain in place until the area has been cleared.

12.8 ACM removal/maintenance record

The Asbestos Register, Section 4.5, Table 3A is to be completed by the PMCW after receiving appropriate clearance certification from a licensed Asbestos Assessor.

The 'Work Performed' and 'Asbestos Control Measure' Tables are required to be completed by the PMCW.

1. Work Performed

Company name	Contact details	Date of work + job no.	Scope of work

2. Asbestos Control Measures

Work performed	Air monitoring/ decontamination	Clearance certificate issued	Other

3. Additional Information

.....

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.....

.....

.....

.....

.....

13 FURTHER INFORMATION

13.1 Useful Contacts

Additional information on asbestos can be obtained from the following organisations and agencies.

**Environment and Planning Directorate
(EPD)**

Dame Pattie Menzies House
16 Challis Street
Dickson ACT 2602
Phone: 02 6207 1923
Internet: www.environment.act.gov.au

ACT Government

Phone: 13 22 81
Internet: www.asbestos.act.gov.au

WorkSafe ACT

480 Northbourne Avenue,
Dickson ACT 2602
Phone: 02 6205 0200
Email: worksafe@act.gov.au
Internet: www.WorkSafe.act.gov.au

14 APPENDICES

14.1 APPENDIX A – Laboratory Reports



Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 47547

Client:

Robson Environmental Pty Ltd
PO Box 112
Fyshwick
ACT 2609

Attention: Michael Robson / Ged Keane

Sample log in details:

Your Reference:	<u>3617-103, Yarralumla</u>
No. of samples:	7 Materials
Date samples received:	28/10/10
Date completed instructions received:	28/10/10

Analysis Details:

Please refer to the following pages for results and methodology summary.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Note, even after disintegration it can be difficult to detect the presence of asbestos in some asbestos -containing bulk materials using PLM and dispersion staining. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Report Details:

Date results requested by:	4/11/10
Date of Preliminary Report:	Not Issued
Issue Date:	2/11/10

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Accredited for compliance with ISO/IEC 17025.

Tests not covered by NATA are denoted with *.

Results Approved By:

Asbestos was analysed by Approved Identifier:	Matt Mansfield
Asbestos was authorised by Approved Signatory:	Matt Mansfield


Matt Mansfield
Approved Signatory



Envirolab Reference: 47547
Revision No: R 00

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Client Reference: 3617-103, Yarralumla

Envirolab Ref:	Sample ID:	Date analysed	Sample Description	Asbestos ID in materials
--	--	-	-	-
47547-1	3617-103-A1	1/11/2010	4x2.5x1mm Fibrous gasket	Chrysotile asbestos detected
47547-2	3617-103-A2	1/11/2010	42x14x7mm Fibre cement fragment	Chrysotile asbestos detected
47547-3	3617-103-A3	1/11/2010	18x3x2.5mm Compressed mastic	No asbestos detected
47547-4	3617-103-A4	1/11/2010	16x4x1.5mm Fibrous gasket	Chrysotile asbestos detected
47547-5	3617-103-A5	1/11/2010	4x3x1mm Fibrous insulation	Chrysotile asbestos detected
47547-6	3617-103-A6	1/11/2010	10x4x3mm Compressed mastic	No asbestos detected
47547-7	3617-103-A7	1/11/2010	21x14x4mm Fibre cement fragment	Chrysotile asbestos detected Amosite asbestos detected

Envirolab Reference: 47547
Revision No: R 00



Page 2 of 3

Client Reference: 3617-103, Yarralumla

Method ID	Methodology Summary
AS4964-2004	Asbestos ID - Qualitative identification of asbestos type fibres in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques.

Envirolab Reference: 47547
Revision No: R 00



Page 3 of 3

Fibre Identification Certificate of Analysis

Report Number: 7504-23 Date of Report: 28.02.2012 Samples Taken by: Robson Environmental Page 1 of 2

Client Details	Laboratory Details
Client: ACT Property Group	Address: 140 Gladstone Street, Fyshwick, Canberra 2609
Attention: Peter Ozols	Manager: Ian Welsh
Received: 27/02/2012	Telephone: 02 6239 5656
Client Reference: Canberra Brickworks	Fax: 02 6239 5669
Email/Tel.No:	Email: fibroid@robsonenviro.com
Test Specification(s) Employed: AS4964 (2004) & In-House Procedure No.2	

Methodology Summary

Samples of material are examined to determine the presence of asbestos fibres using AS4964 (2004) & In-House Procedure No.2 i.e. Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by **Polarised Light Microscopy (PLM)** in conjunction with **Dispersion Staining (DS)**. Unequivocal identification of asbestos minerals present is made by assessing fibre properties to see whether the values are typical and consistent with published data. This provides a reasonable degree of certainty to determine whether a fibre under investigation is asbestiform or not. Careful application of the test procedure provides sufficient diagnostic clues to allow unequivocal identification of asbestos types, and so, to determine whether a sample contains asbestos or not. If sufficient diagnostic clues are absent, then positive identification of fibrous asbestos is not possible.

Client Supplied Samples

Robson Environmental is not responsible for the accuracy or competence of sampling carried by third parties. Sample location(s) and/or sample type(s) of third party samples delivered to the laboratory are given by the client at the time of delivery. Under these circumstances, Robson Environmental cannot be held responsible for the interpretation of the results shown. When the test certificate indicates that bulk samples were taken by the client, they are outside the scope of our NATA Accreditation for sampling. Robson Environmental takes responsibility of information reported only when a staff member takes the sample(s).

Reporting of Results

'Asbestos Detected': Asbestos detected by **Polarised Light Microscopy (PLM)**, including **Dispersion Staining (DS)**
'No Asbestos Detected': No Asbestos detected by **Polarised Light Microscopy (PLM)**, including **Dispersion Staining (DS)**
'UMF Detected': Mineral fibres of unknown type detected by **Polarised Light Microscopy (PLM)**, including **Dispersion Staining (DS)**. Confirmation by another independent analytical technique may be necessary.
"Hand-picked" refers to small discrete amounts of asbestos unevenly distributed in a large body of non-asbestos material.

Limit of Detection & Reporting Limit

Known limitations of the test procedure using **Polarised Light Microscopy (PLM)** are:

- **PLM** is a qualitative technique only;
- It does not cover identification of airborne or water-borne asbestos;
- The less encountered asbestos mineral fibres actinolite, anthophyllite and tremolite exhibit a wide range of optical properties that preclude unequivocal identification by **PLM** and **Dispersion Staining (DS)**. Thus, the method is used to positively identify the three major asbestos minerals: amosite ("brown"), chrysotile ("white") and crocidolite ("blue");
- Valid identification requires that the sample material contains a sufficient quantity of the unknown fibres in excess of the practical detection limit used (in this case, **PLM** and **Dispersion Staining**, which has a calculated practical detection limit of 0.01-0.1% equivalent to 0.1-1g/kg (AS4964-2004:App.A4).

Results relate only to the sample(s) submitted for testing.

Test report must not be reproduced except in full.

Test report issued in accordance with NATA's accreditation requirements and compliance with ISO/IEC 17025.

Sample No.	Client Ref.	Location	Physical Structure	Sample Description	Analysis of Fibrous Content
M0097	-	Opposite canteen – debris	Sheet material	<1g	No Asbestos Detected
M0098	-	K3 – switchboard backing	Tar board	<1g	No Asbestos Detected
M0099a	-	Small shed – debris	Fibrous sheet material (pink)	20g	No Asbestos Detected
M0099b	-	Small shed – debris	Fibrous sheet material	30g	Chrysotile Asbestos
M0100	-	K2 – top floor debris	Fibrous sheet material	8g	Chrysotile Asbestos
M0101	-	Shed – ceiling sheet	Fibrous sheet material	3g	Chrysotile Asbestos



Kyle Hulme
 Approved Identifier



No. 3181



Kyle Hulme
 Approved Signatory

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Fibre Identification Certificate of Analysis

Laboratory Report Number: 7504-23 **Analyst:** Kyle Hulme **Page** 2 of 2

M0102	-	Between chimney & K3 Debris	Cement sheet material	9g	Crocidolite Asbestos Amosite Asbestos Chrysotile Asbestos
M0103	-	Front of main building Debris	Cement sheet material	>15g	Crocidolite Asbestos Amosite Asbestos Chrysotile Asbestos



Kyle Hulme
Approved Identifier




Kyle Hulme
Approved Signatory

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Fibre Identification Certificate Of Analysis

Report Number: 7504217 Date of Report: 20.10.2015 Samples Taken by: Robson Environmental Page 1 of 2

Client Details	Laboratory Details
Client: ACT Property Group	Address: 140 Gladstone Street, Fyshwick, Canberra 2609
Attention: Peter Ozols	Manager: Shane Conaghan
Received: 16.10.2015	Telephone: 02 6239 5656
Client Reference: Canberra Brickworks	Fax: 02 6239 5669
Email: peter.ozols@act.gov.au	Email: hazmat@robsonenviro.com.au
Test Specification(s) Employed: AS4964 (2004) & In-House Procedure No.2	

Methodology Summary

Samples of material are examined to determine the presence of asbestos fibres using AS4964 (2004) & In-House Procedure No.2 i.e. Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by **Polarised Light Microscopy (PLM)** in conjunction with **Dispersion Staining (DS)**. Unequivocal identification of asbestos minerals present is made by assessing fibre properties to see whether the values are typical and consistent with published data. This provides a reasonable degree of certainty to determine whether a fibre under investigation is asbestiform or not. Careful application of the test procedure provides sufficient diagnostic clues to allow unequivocal identification of asbestos types, and so, to determine whether a sample contains asbestos or not. If sufficient diagnostic clues are absent, then positive identification of fibrous asbestos is not possible.

Client Supplied Samples

Robson Environmental is not responsible for the accuracy or competence of sampling carried by third parties. Sample location(s) and/or sample type(s) of third party samples delivered to the laboratory are given by the client at the time of delivery. Under these circumstances, Robson Environmental cannot be held responsible for the interpretation of the results shown. When the test certificate indicates that bulk samples were taken by the client, they are outside the scope of our NATA Accreditation for sampling. Robson Environmental takes responsibility of information reported only when a staff member takes the sample(s).

Reporting of Results

'Asbestos Detected': Asbestos detected by **Polarised Light Microscopy (PLM)**, including **Dispersion Staining (DS)**
'No Asbestos Detected': No Asbestos detected by **Polarised Light Microscopy (PLM)**, including **Dispersion Staining (DS)**
'UMF Detected': Mineral fibres of unknown type detected by **Polarised Light Microscopy (PLM)**, including **Dispersion Staining (DS)**. Confirmation by another independent analytical technique may be necessary.
 "Hand-picked" refers to small discrete amounts of asbestos unevenly distributed in a large body of non-asbestos material.
Limit of Detection & Reporting Limit
 Known limitations of the test procedure using **Polarised Light Microscopy (PLM)** are:

- **PLM** is a qualitative technique only;
- It does not cover identification of airborne or water-borne asbestos;
- The less encountered asbestos mineral fibres actinolite, anthophyllite and tremolite exhibit a wide range of optical properties that preclude unequivocal identification by **PLM** and **Dispersion Staining (DS)**. Thus, the method is used to positively identify the three major asbestos minerals: amosite ("brown"), chrysotile ("white") and crocidolite ("blue");
- Valid identification requires that the sample material contains a sufficient quantity of the unknown fibres in excess of the practical detection limit used (in this case, **PLM** and **Dispersion Staining**, which has a calculated practical detection limit of 0.01-0.1% equivalent to 0.1-1g/kg (AS4964-2004:App. A4).

Results relate only to the sample(s) submitted for testing.
 Test report must not be reproduced except in full.
 Accredited for compliance with ISO/IEC 17025

Sample No.	Client Ref.	Location	Physical Structure	Sample Description	Analysis of Fibrous Content
E1132	N/A	A3 building fascia, eaves & infill panels	Sheet	4grams	No Asbestos Detected
E1133	N/A	On top of K3	Millboard debris	3grams	Amosite Asbestos Detected Chrysotile Asbestos Detected

 Robson Approved Signatory
Morgan Leech



 Robson Approved Identifier
Morgan Leech

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The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards

Robson Environmental Pty Ltd ~ ABN: 55 008 660 900 ~ www.robsonenviro.com.au
 p: 02 6239 5656 ~ f: 02 6239 5669 ~ admin@robsonenviro.com.au
 PO Box 112 Fyshwick ACT 2609 ~ 140 Gladstone Street Fyshwick ACT 2609

Client: ACT Property Group 7504217_Fibre ID res_20151020



Fibre Identification Certificate of Analysis

Laboratory Report Number: 7504217

Analyst: Morgan Leech

Page 2 of 2

Sample No.	Client Ref.	Location	Physical Structure	Sample Description	Analysis of Fibrous Content
E1134	N/A	On top of K3	Sheet debris	12grams	Chrysotile Asbestos Detected
E1135	N/A	Packers, on top of K3	Millboard debris	21grams	Amosite Asbestos Detected Chrysotile Asbestos Detected Crocidolite Asbestos Detected
E1136	N/A	Above kiln, above K3	Millboard	3grams	Chrysotile Asbestos Detected
E1137	N/A	Ground level of K3	Sheet debris	23grams	Chrysotile Asbestos Detected
E1138	N/A	FH1 on wall adjacent switchboard	Sheet	7grams	Amosite Asbestos Detected Chrysotile Asbestos Detected
E1139	N/A	Small blackboard, top of K2	Blackboard	4grams	No Asbestos Detected
E1140	N/A	Lower level, K1	Sheet	5grams	No Asbestos Detected
E1141	N/A	Wood store opposite Thor's Hammer office	Moulded sheet debris	15grams	Amosite Asbestos Detected Chrysotile Asbestos Detected Crocidolite Asbestos Detected



Robson Approved Signatory

Morgan Leech



No. 3181

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Robson Approved Identifier

Morgan Leech

Fibre Identification Certificate of Analysis

Report Number: T-01123
Date of Report: 21/04/2021
Samples Taken by: Robson Environmental
Page 1 of 3

Client Details

Client: ACTPRO Depots
Attention: ACT Response Centre
Date of Testing: 19/03/2021, 22/03/2021
Client Reference: Canberra Brickworks
Email:

Canberra Brickworks					
Sample Number	Client Reference	Location	Physical Structure	Sample Weight	Analysis of Fibrous Content
B1701		R2 - fragments	Sheet	10g	No Asbestos Detected*
B1702		A3 - ceiling	Sheet	2g	No Asbestos Detected*
B1703		Electrical control board building and throughout site - casing for earthing tapes	Sheet	18g	Amosite, Chrysotile, Crocidolite Asbestos Detected
Y2048		Electrical control board building - switchboard backing sheet	Sheet	3g	Chrysotile Asbestos Detected
Y2049		A3 - fragments to south side of the building	Sheet	12g	No Asbestos Detected*
Y2050		K1 on top of kiln - fragments on south side	Sheet	24g	Amosite, Chrysotile, Crocidolite Asbestos Detected
Y2051		F south end - casing for earthing tape	Sheet	23g	Chrysotile Asbestos Detected
Y2052		M3 south end - electrical cable insulation	Cable wrap	1g	No Asbestos Detected*
Y2053		M3 south end side - seal to electrical equipment	Mastic	<1g	No Asbestos Detected*
Y2054		FH1 - flange joint the ducting	Rope	<1g	Chrysotile Asbestos Detected
Y2055		FH1 - cable wrap	Woven product	1g	No Asbestos Detected*
Y2056		FH1 - mastic	Mastic	<1g	No Asbestos Detected*
Y2057		SS1 & SS2 - eave soffits	Sheet	1g	Amosite, Chrysotile Asbestos Detected
Y2058		between BH & SS1 - sheet fragments	Sheet	96g	Amosite, Chrysotile Asbestos Detected
Y2059		BH - glaze between timber frame and glass woo	Caulking	1g	No Asbestos Detected*

Robson Environmental Pty Ltd ~ ABN: 55 008 660 900 ~ www.robsonenviro.com.au
 p: 02 6239 5656 ~ f: 02 6239 5669 ~ Hazmat@robsonenviro.com.au
 PO Box 112 Fyshwick ACT 2609 ~ 140 Gladstone Street Fyshwick ACT 2609

Client: ACTPRO Depots T-01123_Canberra Brickworks-Fibre Identification Certificate of Analysis_20210421

Non Asbestos Fibre Table

- * Y2053 - Organic Fibres Detected
- * Y2056 - Organic Fibres Detected
- * Y2049 - Organic Fibres Detected
- * Y2059 - Organic Fibres Detected
- * B1701 - Organic Fibres Detected
- * B1702 - Organic Fibres Detected
- * Y2055 - Organic Fibres Detected
- * Y2052 - Organic Fibres Detected

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No. 3181

LABORATORY METHODOLOGY

Samples of material are examined to determine the presence of asbestos fibres using AS4964 (2004) & In-House Procedure HMP002 – Fibre Identification. Unequivocal identification of asbestos minerals present is made by assessing fibre properties to determine if the values are consistent with published data. Careful application of the test procedure provides sufficient diagnostic evidence to allow unequivocal identification of the common asbestos types to determine whether a sample contains asbestos or not. If diagnostic evidence is insufficient or fibres are not able to be unequivocally identified by Polarising Light Microscopy (PLM), further testing may be required.

CLIENT SUPPLIED SAMPLES

Samples are analysed as received and as such Robson Environmental accepts no responsibility for the accuracy or completeness of third party sampling. Insufficient sample volume may lead to inaccurate results. Large samples may be sub-sampled.

REPORTING OF RESULTS

Asbestos Detected: Asbestos detected by PLM, including Dispersion Staining (DS).

No Asbestos Detected: No Asbestos detected by PLM, including DS. Non asbestos fibres such as organic and Synthetic Mineral Fibres detected in samples will be marked with an *. Please refer to non asbestos table beneath main table.

UMF Detected: Mineral fibres of unknown type detected by PLM, including DS. Confirmation by further independent testing may be necessary, usually scanning electron microscopy (SEM).

Contaminated: Small discrete amounts of asbestos unevenly distributed in a large body of non asbestos material.

- Reported results relate only to the sample(s) submitted for testing.
- Test report must not be reproduced except in full.
- Accredited for compliance with ISO/IEC 17025 – Testing.
- The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

LIMIT OF DETECTION & REPORTING LIMIT

Known limitations of the test procedure using PLM are:

- PLM is a qualitative technique only.
- This method is not sufficient for the identification of airborne or water-borne asbestos.
- The less encountered asbestos mineral fibres actinolite, anthophyllite and tremolite exhibit a wide range of optical properties that preclude unequivocal identification by PLM and DS. Thus, the method is used to positively identify only the three major asbestos minerals: amosite (brown), chrysotile (white) and crocidolite (blue).
- Valid identification requires that the sample material contains a sufficient quantity of the unknown fibres in excess of the practical detection limit used (in this case, PLM and DS, which has a calculated practical detection limit of 0.01-0.1% equivalent to 0.1-1g/kg (AS4946-2004:App. A4).



Robson Approved Identifier
Patrick Cerone



Robson Approved Signatory
Natasha Pearson

Accredited for compliance with ISO/IEC 17025 – Testing



No. 3181



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customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 264537

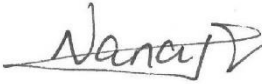
Client Details	
Client	Robson Environmental Pty Ltd
Attention	Dian Wardrobe
Address	PO Box 112, Fyshwick, ACT, 2609

Sample Details	
Your Reference	T01123
Number of Samples	3 paint
Date samples received	18/03/2021
Date completed instructions received	18/03/2021

Analysis Details	
Please refer to the following pages for results, methodology summary and quality control data.	
Samples were analysed as received from the client. Results relate specifically to the samples as received.	
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.	

Report Details	
Date results requested by	25/03/2021
Date of Issue	24/03/2021
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By
Jaimie Loa-Kum-Cheung, Metals Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

Envirolab Reference: 264537
Revision No: R00



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Client Reference: T01123

Lead in Paint				
Our Reference		264537-1	264537-2	264537-3
Your Reference	UNITS	Pb01	Pb02	Pb03
Date Sampled		15/03/2021	15/03/2021	15/03/2021
Type of sample		paint	paint	paint
Date prepared	-	23/03/2021	23/03/2021	23/03/2021
Date analysed	-	23/03/2021	23/03/2021	23/03/2021
Lead in paint	%ww	0.17	<0.005	1.3

Envirolab Reference: 264537
Revision No: R00

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Client Reference: T01123

Method ID	Methodology Summary
Metals-020/021/022	Digestion of Paint chips/scrapings/liquids for Metals determination by ICP-AES/MS and or CV/AAS.

Envirolab Reference: 264537
Revision No: R00

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Client Reference: T01123

QUALITY CONTROL: Lead in Paint				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			23/03/2021	2	23/03/2021	23/03/2021		23/03/2021	[NT]
Date analysed	-			23/03/2021	2	23/03/2021	23/03/2021		23/03/2021	[NT]
Lead in paint	%w/w	0.005	Metals-020/021/022	<0.005	2	<0.005	<0.005	0	94	[NT]

Envirolab Reference: 264537
Revision No: R00

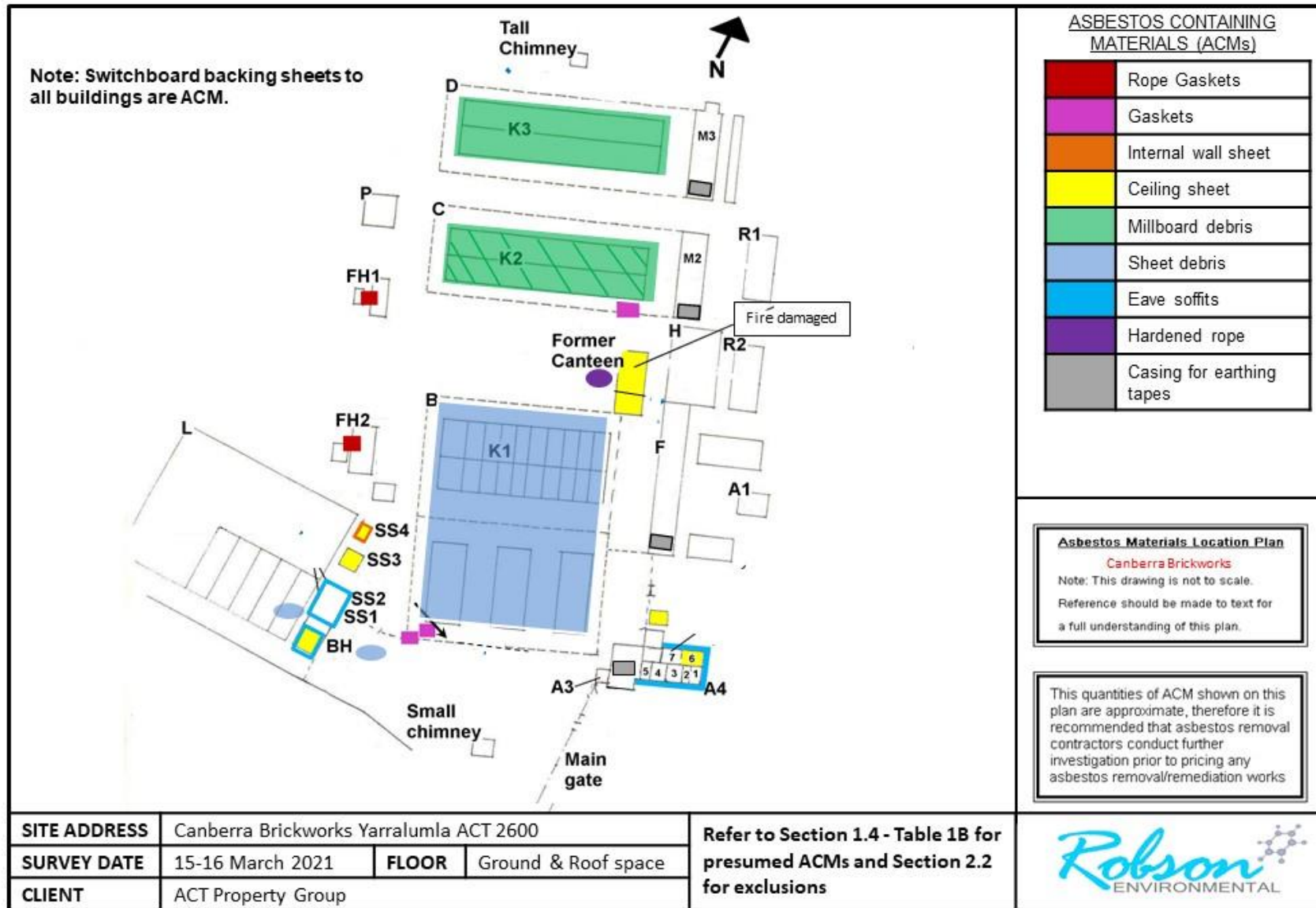
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Result Definitions	
NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported





Quality Control Definitions	
Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMCC 2011.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	





Laboratory Acceptance Criteria
<p>Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.</p> <p>Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.</p> <p>Spikes for Physical and Aggregate Tests are not applicable.</p> <p>For VOCs in water samples, three vials are required for duplicate or spike analysis.</p> <p>Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.</p> <p>Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.</p> <p>In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.</p> <p>When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.</p> <p>Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.</p> <p>Measurement Uncertainty estimates are available for most tests upon request.</p> <p>Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.</p> <p>Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.</p>





14.2 APPENDIX B – Plans






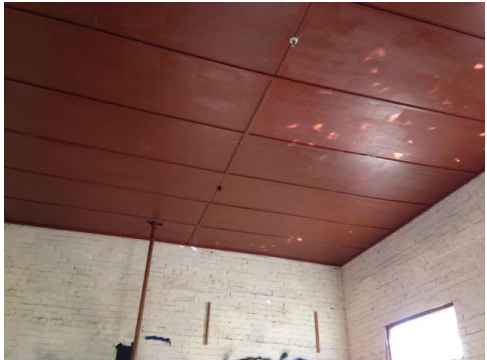



14.3 APPENDIX C – HAZMAT Item locations & representative photographs



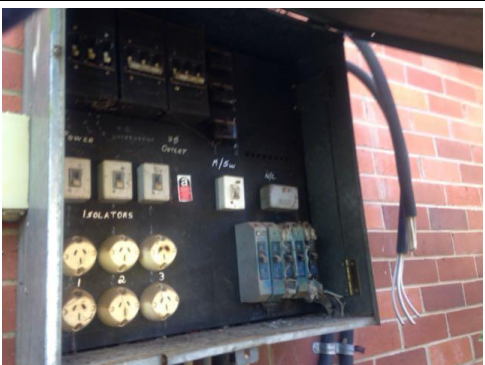

SAMPLE NO.	LOCATIONS	MATERIAL DESCRIPTION	PHOTOGRAPH
2810-40-A3	Roof space K2 walkway - heat exchange gasket	Gaskets (compressed) (Non-Friable)	
2810-40-A4	Ground floor FH2 - flange joint the ducting	Rope (Friable)	
RA 2810-40-A5	Ground floor small room adjacent former canteen - ceiling sheet & debris on floor	Sheet (Non-Friable)	
2810-40-A5	Ground floor former canteen - fire damaged ceiling sheet	Debris (Non-Friable)	





SAMPLE NO.	LOCATIONS	MATERIAL DESCRIPTION	PHOTOGRAPH
RA 2810-40-A9	Ground floor small building adjacent A4 - ceiling and narrow eave soffits surround buildings	Sheet (Non-Friable)	
2810-40-A9	Ground floor A4 - perimeter eave and eave soffits	No Access to Sheet (Non-Friable)	
3617-103-A1	Ground floor open courtyard between K1 & K2 - old brick making machine	Rope (Non-Friable)	
3617-103-A4	Ground floor front corner B block main kilns - gaskets adjacent downpipes	Gaskets (compressed) (Non-Friable)	




SAMPLE NO.	LOCATIONS	MATERIAL DESCRIPTION	PHOTOGRAPH
3617-103-A7	Ground floor FH2 and various areas - fragments in the soil	Debris (Non-Friable)	
B1703	Ground floor Electrical control board building and throughout site - casing for earthing tapes	Sheet (Non-Friable)	
E1136	Ground floor K3 ceiling space - above kiln	Millboard (Friable)	
E1137	Ground floor K3 to soil - fragments	Debris (Friable)	



SAMPLE NO.	LOCATIONS	MATERIAL DESCRIPTION	PHOTOGRAPH
E1138	Ground floor FH1 - on wall adjacent switchboard	Sheet (Non-Friable)	
E1141	Ground floor former wood store adjacent main kilns - fragments	Debris (Non-Friable)	
M0100	K2 top floor - debris post removal	Millboard (Friable)	



SAMPLE NO.	LOCATIONS	MATERIAL DESCRIPTION	PHOTOGRAPH
RA M0101	Ground floor BH - ceilings	Sheet (Non-Friable)	
RA M0101	Ground floor SS4 - lining to previous shower area	Sheet (Non-Friable)	
RA M0101	Ground floor SS4 - ceiling	Sheet (Non-Friable)	
M0101	Ground floor SS3 - ceilings	Sheet (Non-Friable)	



SAMPLE NO.	LOCATIONS	MATERIAL DESCRIPTION	PHOTOGRAPH
Y2048	Ground floor Electrical control board building - switchboard backing sheet	Bituminous product (Non-Friable)	
RA Y2048	In all buildings on site - electrical switchboard backing (throughout building)	Sheet (Non-Friable)	
RA Y2048	Ground floor SS4 - electric switchboard backing	Sheet (Non-Friable)	
Y2050	K1 roof space - fragments on south side	Sheet debris (Non-Friable)	

SAMPLE NO.	LOCATIONS	MATERIAL DESCRIPTION	PHOTOGRAPH
RA Y2050	K1 on top of three main kilns - fragments of corrugated sheets	Sheet debris (Non-Friable)	
RA Y2050	Ground floor K1 - fragments	Sheet debris (Non-Friable)	
Y2051	Ground floor F south end - casing for earthing tape	Sheet (Non-Friable)	
Y2054	Ground floor FH1 - flange joint the ducting	Rope (Friable)	

SAMPLE NO.	LOCATIONS	MATERIAL DESCRIPTION	PHOTOGRAPH
Y2057	Ground floor SS1 & SS2 - eave soffits	Sheet (Non-Friable)	
RA Y2057	Ground floor BH - eave soffits	Sheet (Non-Friable)	
Y2058	Ground floor between BH & SS1 - sheet fragments	Debris (Non-Friable)	

LEAD PAINT - Canberra Brickworks			
ITEM NO.	LOCATION	Lead %	PHOTOGRAPH
PB2673	Ground floor main internal yard - brick maker machine	1.3	
PB2675	Ground floor BH - door frame	0.17	

SMF - Canberra Brickworks			
ITEM NO.	LOCATION	MATERIAL TYPE	PHOTOGRAPH
SMF2229	Ground floor ceiling space throughout site	Batts	
SMF2228	Ground floor pipes throughout site	Insulation	

POLYCHLORINATED BIPHENYLS - Canberra Brickworks			
ITEM NO.	LOCATION	MATERIAL TYPE	PHOTOGRAPH
PCB818	Ground floor R1	Ducon metal – APF 260CR 6µF	
PCB819	Ground floor K1 ceiling space	Presumed	
PCB821	Ground floor A4	Dawco metal – BS 4017-1966 3.25µ	No Photo Available

POLYCHLORINATED BIPHENYLS - Canberra Brickworks			
ITEM NO.	LOCATION	MATERIAL TYPE	PHOTOGRAPH
PCB820	Ground floor A4	Ducon metal – APF 265CR 6.5µF	No Photo Available

14.4 APPENDIX D – Hazardous Material Management Information

ASBESTOS

Some 3000 products have been manufactured using asbestos, of which cement sheeting, pipe insulation, textiles, gaskets, vinyl floor tiles and fire door cores are the most commonly encountered. The mineral asbestos (i.e. Crocidolite, Chrysotile and Amosite and other forms) is classified by the National Occupational Health and Safety Commission as a Category 1 carcinogen. If respirable asbestos fibres are inhaled they may cause an inflammatory response, which in turn may lead to asbestosis (scarring of the lung), mesothelioma (cancer of the pleura or peritoneum) or lung cancer.

It is illegal under Commonwealth, State and Territory legislation to manufacture asbestos building materials or to reuse asbestos products.

Asbestos sheeting or 'fibro' is bonded into a stable matrix and as such does not present an exposure hazard unless it is cut, abraded, sanded or otherwise disturbed. This material is referred to as non friable ACM. Friable ACM has the potential to release fibre with only minor disturbance.

The health risks associated with asbestos exposure increase with the fibre type, level and frequency of exposure. Crocidolite (blue asbestos) is the most hazardous type. Amosite (brown asbestos) is not as hazardous as crocidolite but is significantly more hazardous than chrysotile (white asbestos). Exposure to all types of asbestos can result in diseases including asbestosis, lung cancer and mesothelioma. Smoking increases the risk of disease 50 fold. The often heard adage 'one fibre can kill you' is overly simplistic. Evidence indicates that risk increases with the level, type and frequency of exposure. Some individuals may be predisposed to disease at low and infrequent exposure, while others suffer no ill effect even after prolonged industrial exposure. We do not know what level can be considered safe nor what level may be considered hazardous. Asbestos may also be naturally present in the environment at very low levels. Therefore controls should be implemented to avoid exposure as far as practicable.

Asbestos is only hazardous if it becomes airborne and inhaled. When it is fully encapsulated within the structure it cannot become airborne. Simple engineering controls can ensure it remains encapsulated. These controls are detailed in the Required Actions and Recommendations detailed in this report.

Provided the site has been inspected by a licensed Asbestos Assessor and their recommendations adopted, normal occupation would not be hazardous. It is vital that any maintenance or renovation be in strict accordance with the Assessor's recommendations.

Any person employed to undertake any maintenance or refurbishment must be informed of the presence of friable and/or non friable asbestos in the premises. The PMCW must ensure that if planned work may impact on any asbestos materials, the asbestos is removed or remediated by the appropriate class of removalist prior to commencement.

LEAD PAINT

Introduction

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 content in paint, levels of below 1 percent are still permitted and industrial application of high-lead paint to residential/commercial dwellings may still continue.

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.

Assessment Criteria

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.

Lead Paint Management and Recommendations

The following information uses Australian Standard (AS 4361.2 – 2017) 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)
- 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 0.1% 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 – 2017 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>. These contractors should however be assessed by current performance prior to engagement.

Responsibilities of Owners and Contractors

According to AS 4361.2 – 2017 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
- If management work is to be undertaken, inform immediate neighbours about the nature of the work

Contractors should:

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

SYNTHETIC MINERAL FIBRE

SMF refers to man-made mineral fibrous materials commonly used for their insulating and reinforcing properties. The amorphous (non-crystalline) materials include glass fibre, mineral wool and ceramic fibre products.

Discussion

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.

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

SMF Risk Assessment

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."

PCB

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 chlorine content of the PCB.

Discussion

The major use of PCBs in the electrical industry has been 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 fluorescent light fittings during the 1950s, 60s and 70s.

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 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.

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.

OZONE DEPLETING SUBSTANCES

Introduction

Ozone depleting substances (ODS) are compounds that contribute to stratospheric ozone depletion. They are widely used in refrigerators, air-conditioners, fire extinguishers, in dry cleaning, as solvents for cleaning, electronic equipment and as agricultural fumigants.

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.

Ozone Protection Strategy

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.

Best Management Practices

In Australia a 'Code of Good Practice' has been drawn up with the objective of assisting the reduction of emissions into the atmosphere of substances that deplete the ozone layer and contribute to global warming.

The Australian Refrigeration and Air-conditioning Code of Good Practice (HB 40.1 – 2001) recommends best practice for the maintenance, design, servicing, labelling and manufacture of refrigeration and air conditioning systems towards this objective.

Legislation

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.

General Maintenance

- 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

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

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

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

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

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

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

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

Health Effects

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.

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.

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.

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.

FUEL STORAGE FACILITIES

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*.

Heating oil and other petroleum products are classified as a Dangerous Substance under the ACT Dangerous Substances Act 2004.

The Dangerous Substances (General) Regulation 2004 – Division 2.4.2-233 *Decommissioning* (applies to a container used to store a dangerous substance) states the following:

'The container is thoroughly cleaned so that the container is in the condition it would be in if it had never contained the substance';

This would be difficult to achieve therefore it is advantageous to remove the tank.

In the ACT, Environment Protection and Heritage prefers underground fuel storage tanks be removed once they are no longer in use, unless there are extenuating circumstances i.e. their removal undermines permanent infrastructure. This is also emphasized in the Australian Standard *The Removal and Disposal of Underground Petroleum Storage Tanks* (AS 4976-2008).

Further, the ACT Environment Protection Authority (Environment Protection and Heritage) which administers the Environment Protection Act 1997 which contains contaminated land provisions responsible for the development of policy and guidelines to facilitate best practice when it comes to the management of contaminated land.

Environment Protection and Heritage deems all sites known to have had fuel storage facilities as potentially contaminated until investigated and assessed and shown to be free of contamination.

Based on this information and for the long-term management of the sites with fuel storage tanks, Robson Environmental Pty Ltd recommends that the USTs be removed in accordance with the requirements of ACT WorkSafe and Environment Protection and Heritage.

Removal of the UST does require approvals from relevant ACT Government agencies which include:

- ACT Planning and Land Authority (ACTPLA)
- ACT WorkSafe - Dangerous Goods Unit.

15 GLOSSARY

ACM	<i>See asbestos containing material</i>
Air monitoring	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. <i>Note: Air monitoring should be undertaken in accordance with the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC:3003 (2005)]</i>
Airborne asbestos fibres	Any fibres of asbestos small enough to be made airborne. For the purposes of monitoring airborne asbestos fibres, only respirable asbestos fibres (those less than 3µm wide, more than 5µm long and with a length to width ratio of more than 3 to 1) are counted.
Amosite	Grey or brown asbestos
AR	<i>See Asbestos Register</i>
Asbestos Containing Material	Any material, object, product or debris that contains asbestos.
Asbestos Register	Inventory of ACM by type, form, location, risk and required action.
Asbestos Removalist	A competent person who performs asbestos removal work. <i>Note: an asbestos removal licence is required in all State and Territory jurisdictions.</i>
Asbestos Survey and Management Plan	Document covering the identification, risk evaluation, control and management of identified asbestos hazards, developed in accordance with current legislation.
Asbestos ²	The fibrous form of mineral silicates belonging to the serpentine and amphibole groups of rock-forming minerals, including actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite or any mixture containing one or more of the mineral silicates belonging to the serpentine and amphibole groups.
Asbestos–cement (AC)	Products consisting of sand aggregate and cement reinforced with asbestos fibres (e.g. asbestos cement pipes and flat or corrugated asbestos cement sheets).
ASCC	<i>See Safe Work Australia Council</i>
Non-friable asbestos	ACM that is bonded into a stable matrix and cannot be reduced to a dust by hand pressure.
Chrysotile	White asbestos
Clearance inspection	An inspection, carried out by a licensed Asbestos Assessor, 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	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.
Control monitoring	Air monitoring, using static or positional sampling devices 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.
Crocidolite	Blue asbestos
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.
HMSMP	<i>See hazardous material survey re-inspection and management plan</i>
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 Asbestos Assessor	Person who is qualified to undertake the identification and 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	National Association of Testing Authorities
NOHSC (<i>now SWA</i>)	National Occupational Health and Safety Commission (<i>now known as Safe Work Australia</i>)
PMCW	Person with management or control of a workplace
Safe Work Australia Council (SWAC)	A council that provides a national forum for State and Territory governments, employers and employees to consult and participate in the development of policies relating to OHS and workers' compensation matters, and promote national consistency in the OHS and workers' compensation regulatory framework.
SWMS	Safe Work Method Statement

16 REFERENCES

- *How To Manage and Control Asbestos In The Workplace Code of Practice*
- *How To Safely Remove Asbestos Code of Practice*
- *Work Health and Safety Act 2011*
- *Work Health and Safety Regulations 2011*
- *Australian Capital Territory Parliamentary Counsel (2006), Asbestos Legislation Amendment Act 2006 [A2006-16], Canberra, Australia*
- *ANZECC 1997, Identification of PCB-Containing Capacitors; An information Booklet for Electricians and Electrical Contractors*
- *Guide to Hazardous Paint Management Part 2: Lead paint in residential, public and commercial buildings Standards Australia, AS 4361.2 – 2017*
- *Standards Australia, HB 40.1 – 2001 The Australian Refrigeration and Air-conditioning Code of Good Practice*
- *WorkSafe Australia, Sydney 1990, Synthetic Mineral Fibres: National Standard and National Code of Practice*