Contaminated mulch management plan

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Introduction

General overview

The contaminated mulch management plan (the plan) is the central guidance document to manage the assessment and removal work of contaminated mulch placed across sites in NSW. The plan has been structured to provide clear guidance, which ensures a consistent and safe approach for the assessment and removal of mulch contaminated with asbestos fragments and building and demolition waste. Management of the sites may differ as some sites may not be open or accessible to the public. This plan has been developed by a technical working group with stakeholders from NSW Public Works Advisory (PWA), the Environment Protection Authority (EPA) and SafeWork NSW.

Current situation as at March 2024

On 10 January 2024, mulch contaminated with physical contaminants including asbestos (mostly bonded fragments and building and demolition waste such as engineered wood and glass was discovered at a site. Subsequent investigations, including 'supply chain tracing' from one identified mulch supplier to the delivery sites and intermediary parties identified a number of sites where potentially contaminated mulch may have been received.

Site assessments for the presence of contaminated mulch have been carried out by the EPA, Fire and Rescue NSW, local councils and site controllers (property owners and occupiers). These site assessments have varied from rapid damage assessments such as site inspections with sampling, to more comprehensive investigations. These results have been communicated back to site controllers, including where asbestos has been identified within the mulch product.

Where asbestos has been identified, the recommendation from the NSW Government has been to isolate the areas of mulch on the site, install asbestos signage and have a competent person such as a licensed asbestos assessor or occupational hygienist conduct a risk assessment.

As at 13 March 2024, 78 sites have tested positive for asbestos fragments and other building and demolition waste have been observed within some of the contaminated mulch. The sampling has included bulk mulch samples and fragments. The majority of fragments that have been found, are non-friable (bonded). Site controllers (such as site owners or occupiers) with management and control of a premises have been managing the removal and disposal of contaminated mulch, with guidance from the EPA and other agencies. The EPA is providing extra support for residential households and not-for profit property owners.

Principles

The principles of the plan are summarised in Table 1.

Table 1 – Principles of the contaminated mulch management plan (the plan)

Impact management	• Identification and supply chain tracing of sites which have received potentially contaminated mulch • Proactive management of contaminated mulch by providing guidance for assessment and removal • Communication to the wider community and stakeholders to make sure contaminated mulch is managed in accordance with the plan
Evidence based decision making	• All decisions regarding the contaminated mulch will be in accordance with the plan • Categorise the mulch for assessment and removal • Use site assessment and data to identify sites requiring management. • Quantify the cost and time for removal.
Transparency	• Develop and use templates to control quality and support impacted stakeholders such as site controllers and contractors. • All stakeholders to have access to the relevant information

The plan will be communicated widely, including to relevant site controllers, workers and parties and the affected community. The plan has been developed in line with the NSW Work Health and Safety Regulation 2017 (WHS Regulation) and relevant codes of practice, or the requirements under other relevant legislation.

Taskforce

The NSW Government has set up a taskforce to co-ordinate government agencies' response to the identification of contaminated mulch and to help in prioritising sites considered open and accessible to the public. This increase in resources will make sure affected sites are secured and cleaned up as required.

The taskforce will also provide support to make sure environmental risks to public land are appropriately managed.

A technical working group consisting of PWA, EPA and SafeWork NSW are responsible for developing guidance (including this plan and attached documents) for the management of contaminated mulch. The technical working group is responsible for ensuring this plan is considered by the taskforce for endorsement and publication. Review and update of this plan is also the responsibility of the technical working group.

Responsibilities of agencies

The responsibilities of each agency directly involved in the management of contaminated mulch is as follows:

- EPA – lead
- NSW Public Works Advisory – technical support
- SafeWork NSW – technical support and WHS regulator
- NSW Health – technical support

A summary of the key roles and responsibilities associated with the non-friable mulch removal is included as Appendix B.

Definitions of mulch

The EPA administers a resource recovery framework which allows the beneficial and safe reuse and recycling of waste. The EPA has issued a 'resource recovery order' for mulch (the Mulch Order 2016) that allows persons to supply mulch that has been generated, processed or recovered.

Compliant clean (suitable) mulch

This is mulch that is considered suitable, is clean and from a reliable source. This is shredded timber and contains no evidence of asbestos or building and demolition waste or foreign materials including painted or engineered timbers. Refer to Figures 1 and 2 below.

Figure 1

Figure 2

Compliant (suitable) mulch with incidental low risk contaminants

This is mulch that is mostly clean and reliably sourced shredded timber. The mulch contains no asbestos and only small amounts (e.g. a handful of engineered timber pieces in a 10-tonne stockpile or similar) of non-desirable materials which are of low risk to human health or the environment. Refer to Figures 3 and 4 below.

Figure 3 - Two pieces (blue) of what appears to be a shredded chep pallet in otherwise clean shredded timber.

Figure 4 - Single piece of painted timber in otherwise clean shredded timber mulch.

Non-compliant (unsuitable) mulch with unacceptable contamination

This is mulch consisting of shredded timber containing asbestos and/or multiple and varied building and demolition waste and foreign material throughout. Refer to Figures 5 and 6 below.

Figure 5 - Shredded timber with building and demolition waste and multiple foreign materials including bricks, metal screws, painted and engineered timbers throughout.

Figure 6 - Shredded timber with multiple foreign materials including paper, insulated wiring, engineered and painted timbers throughout.

Conceptual scenario and risk from contaminated mulch

Source

Foreign materials seen in contaminated mulch include building and demolition debris such as asbestos (mostly bonded fragments), engineered woods (including painted woods) and physical contaminants such as plastics, glass, wire and metal.

Forms and occurrence of asbestos

There are two different forms of asbestos containing materials which have different risk profiles as follows:

- Bonded (non-friable) asbestos: where the asbestos is mixed with cement or other hard bonding materials, and in good condition, the asbestos fibres are unlikely to become airborne and pose a very low risk of being inhaled. This includes the commonly found asbestos fragments.
- Friable asbestos: can be crumbled, pulverised or reduced to a powder by hand pressure when dry. If asbestos fibres then become airborne and breathed in they can become a health risk. This is the most common way asbestos enters the body. The more fibres that are breathed in, the higher the risk.

Potential exposure pathway

The potential exposure pathway to contaminated mulch is through:

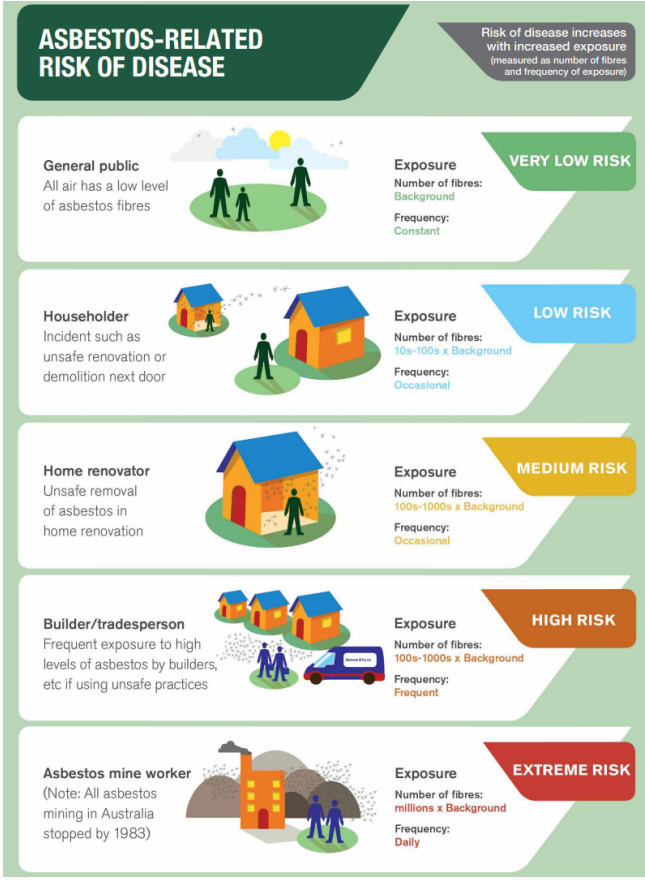
- physical (dermal) exposure to contaminants by handling building and demolition debris (such as glass or metal),and/or
- inhalation exposure by breathing contaminants, such as asbestos fibres. It is noted that almost all asbestos fragments identified within the mulch are in a non-friable (bonded) form which is stable.

Public and worker health risk

Based on the contamination (including the form and very low quantity of asbestos identified), the public health risk from the identified sites is very low and where the mulch remains undisturbed, the risk is negligible. The health risk for a worker applying the mulch is also considered low, based on the form and concentration of asbestos identified across the sites where asbestos fibres could have had the potential to be released and breathed in.

A semi-quantitative representation of health risk from exposure to asbestos fibres is reproduced below from *enHealth (2013) A guide for householders and the general public.* The risk to the general public, site controller or worker handling potentially contaminated mulch is likely equivalent to the general public risk as outlined below.

Figure 7 - Extract from enHealth 2013



Air monitoring

Air monitoring for asbestos fibres has been carried out at some sites since the identification of contaminated mulch. This monitoring has not identified asbestos fibres in the air above the laboratory limit of detection. Due to the form of asbestos identified and the low concentrations within the mulch, at this stage there is no apparent need for ongoing or periodic airborne monitoring of asbestos across the identified contaminated mulch sites, during isolation or removal.

Objectives and scope

Contaminated mulch management plan (the plan) objectives

The objectives of the plan include:

- Document guidance for the assessment and management processes to be put in place to make sure mulch contaminated with asbestos fragments is controlled, handled, removed and disposed of appropriately and in compliance with the WHS Regulation and current codes of practice.
- To provide a guidance framework for site controllers (owners or occupiers), contaminated mulch removalists (contractors) and licensed asbestos assessors, so the mulch can be removed safely, efficiently, consistently and in a cost-effective manner.
- Ensure the safe, consistent and thorough removal of contaminated mulch within public and private properties for the long-term confidence of impacted areas.
- Provide a consistent and transparent approach to the management of contaminated mulch on public and private properties.

Scope of the plan

The scope of the plan is for the following areas that have been affected by contaminated mulch:

- Private residential properties and not for profit properties (like places of worship).
- Educational and care facilities such as schools and preschools.
- Public open spaces such as parklands, playgrounds and areas next to footpaths.
- Commercial and industrial land use settings.

The scope and guidance provided by this plan does not apply to pre-existing or legacy contamination below the imported mulch at the land use settings mentioned above.

The requirements of the WHS Regulation and code of practice are reflected in this plan. The WHS requirements for mulch removers for non-friable asbestos removal are summarised in the *Contaminated Mulch Removal Checklist* presented as Appendix A and the *Contaminated Mulch Template Scope of Works* presented as Appendix B.

The process for assessment, categorisation and removal of contaminated mulch is outlined in the *Contaminated Mulch Decision Flowchart* (Appendix C). Where a site assessment has been carried out per the *Contaminated Mulch Assessment Strategy* (Appendix D) and no asbestos is present, the mulch areas can be considered Category 2 per the flow chart and not treated as asbestos waste.

About the plan

The plan provides a guidance framework on how contaminated mulch is assessed and removed from properties, the roles and responsibilities and the structured approach to removal and clearance.

Structure of the plan

The plan contains the following information:

- Flowchart and supporting documentation for unlicensed contractors to safely remove mulch contaminated with non-friable asbestos fragments according to the WHS Regulations.
- The flow chart provides clear steps from categorisation, planning removal, removal, transportation and disposal and clearance.
- Removal and validation processes including issuing of a template contaminated mulch clearance certificate.
- Roles and responsibilities.
- Management of unexpected finds within mulch.
- Safe working practices.
- Scope and limitations of the plan.

Assessment of potentially contaminated mulch

An initial assessment should be carried out to determine whether mulch is contaminated. This may be done rapidly to inform presence/absence of contaminants and initial controls such as isolation and asbestos signage. Where the initial assessment has identified asbestos fragments and/or building and demolition waste, mulch can be removed according to the *Contaminated Mulch Decision Flowchart* in Appendix C.

For sites where there are multiple suppliers or supply dates of mulch, a more comprehensive assessment may be done to characterise the mulch across a site. These results may be used to re-classify the contaminated mulch or justify keeping some on a site that does not visually contain asbestos (refer to the *Contaminated Mulch Decision Flowchart* in Appendix C and the *Contaminated Mulch Assessment Strategy* in Appendix D).

To support site controllers and competent persons (such as licensed asbestos assessors or hygienists) to complete assessments, template data quality objectives have been developed below.

Step 1: State the problem:

- Contaminated recycled mulch has been received at multiple sites across NSW.

- This contaminated mulch contains building and demolition waste and in some instances asbestos fragments. This mulch does not meet the requirements of the Mulch Order 2016.

Step 2: Identify the decision/goal of the study – The key decisions are:

- Have you received mulch on your site between March 2023 and December 2023 which is potentially contaminated with asbestos fragments and/or building and demolition waste?
- Where the mulch contains asbestos fragments, is building and demolition waste visible as well?

Step 3: Identify the information inputs:

- Initial site walkover observations.
- Size of the area of mulch applied.
- Systematic offset grid/herringbone sampling to identify asbestos and/or building and demolition waste.
- The media to sample is mulch only, with a visual assessment of the presence/absence of asbestos or building and demolition waste. No underlying soil or other media need to be assessed.
- The site criteria is presence/absence of asbestos or building and demolition in the mulch.

Step 4: Define the boundaries of the study:

- The lateral and vertical extent of the areas on a site where the mulch has been received and placed.
- Timeline is limited to the period when the mulch was being produced and received from relevant supplier, being March 2023 to December 2023.
- The assessment does not include investigation or sampling of historical mulch placed on a site or mulch received from other suppliers.

Step 5: Develop the analytical approach or decision rule:

- The analytical approach is a qualitative visual assessment of all mulched areas on the site to identify potential asbestos fragments or building and demolition waste materials.
- In field sampling is a visual assessment only, with friability assessed using work health and safety definitions, and with laboratory analysis only required to confirm that asbestos is present in the potential asbestos fragments collected.
- No quantitative assessment or calculation of the concentration of asbestos in the mulch is required.
- If asbestos and building and demolition waste are identified, the mulch is considered contaminated and is to be categorised as per the decision flowchart.
- Where building and demolition waste only is identified and sampling (Appendix D – Contaminated Mulch Assessment Strategy) does not identify asbestos, this can be removed from the site as general solid waste.

Step 6: Specify performance or acceptance criteria:

- The acceptance criteria is the visual presence or absence of asbestos fragments or building and demolition waste within the samples of mulch.

Step 7: Develop the plan for getting data/optimising the design:

- The assessment design is optimised by reviewing the results of the initial site walkover and whether asbestos or building and demolition has been identified.
- The plan for getting data is supported by the sampling methodology (Appendix D – Contaminated mulch assessment strategy).

Removal of contaminated mulch

Decision rules

The following key decision rules apply to the removal of contaminated mulch:

1. Contaminated mulch is often co-contaminated with asbestos and building and demolition waste.
2. Mulch contaminated with asbestos fragments does not need a Class B (non-friable) licensed removalist as the amount of asbestos will be less than 10 m^2.
3. Removalists of mulch contaminated with asbestos fragments must still do this work according to work health and safety legislation, the code of practice and the minimum standards within this plan, including putting in place of an unexpected finds protocol (Appendix G). All work must be done using asbestos related controls.
4. Only mulch media needs to be removed from the identified sites. No soils require removal.
5. A mulch assessment (as described in Appendix D) should be carried out to find out the extent of asbestos and building and demolition waste and the extent of removal works required.
6. Site controllers (owners and occupiers) are responsible for removing mulch from their properties. The NSW Government will be organising the removal on residential and not-for-profit sites.
7. Licensed asbestos assessors will complete and issue a clearance certificate for contaminated mulch based on Appendix E.

While all contaminated mulch should be attempted to be removed where possible, there may be sites where complete removal may not be required because the site has been assessed and is not open and accessible to the public or there is only incidental physical contaminants within the mulch or asbestos is not present. For these situations, site controllers should make sure a risk assessment is done to justify keeping the mulch on the site. Further information is provided in Table 2 below.

Land use type scenarios

Private residents/not-for-profit

For private residential and not-for-profit sites that have received contaminated mulch, the NSW Government will facilitate the management and removal works.

Commercial/industrial and open space

For all other sites that have received contaminated mulch including commercial/industrial and public open spaces, the management and removal works is to be done by persons in control of the site.

Categorisation of contaminated mulch

As a general guide, sites identified as having received potentially contaminated mulch may be assessed against the categories listed in Table 2 below. This categorisation can be used to determine the appropriate removal options. The categories are outlined in Table 2 below, which should be read with the *Contaminated Mulch Decision Flowchart* in Appendix C:

Table 2: Contaminated Mulch Categories

Category	Description	Mulch compliance	Removal?
1	Mulch contains visible asbestos fragments and building and demolition waste or other physical contaminants. * **	Unsuitable mulch	To be assessed for disposal at a licensed landfill as special waste asbestos general solid waste (non-putrescible).
2	Mulch contains visible building and demolition waste or other physical contaminants*, with no visible asbestos. Mulch is assumed to contain asbestos unless further sampling is done (in accordance with Appendix D). **	Unsuitable mulch – physical contaminants identified	Assumed asbestos containing. To be assessed for disposal at a licensed landfill as special waste asbestos general solid waste (non-putrescible).
		Unsuitable mulch – physical contaminants (building and	Sampling has demonstrated no asbestos. To be assessed for disposal at a licensed landfill as general

		demolition waste) identified	solid waste (non-putrescible).
		Suitable mulch – no asbestos fragments identified. Building and demolition waste at extremely low levels (incidental) and does not present a risk based on land use	Sampling has demonstrated no asbestos and incidental building and demolition waste. Can be kept onsite, subject to risk assessment and site controller's agreement.
3	Mulch does not contain building and demolition waste, but has isolated asbestos fragments	Suitable mulch, subject to implementation of an existing asbestos management plan	Can be kept onsite, subject to the asbestos fragments being removed.
4	Mulch does not contain asbestos fragments or building and demolition waste	Suitable mulch	Can be kept onsite.

* Examples of physical contaminants include but are not limited to glass, metal, rigid plastics, flexible plastics, or polystyrene, as per the NSW EPA Resource Recovery Order *The Mulch Order 2016*.

** Site assessment to determine whether the site is open or accessible to the public.

Sites may have scenarios where the imported mulch is of varying quality, with multiple categories. In these circumstances, it may be appropriate to segregate and dispose or keep mulch across different areas of the site. Robust sampling, including confirmation that different loads are part of different products or deliveries will need to be shown to provide justification for keeping of mulch in these circumstances.

Contaminated mulch removal scope of work template

A scope of work template to support site controllers with the removal of contaminated mulch has been developed as presented in Appendix F. This template can be used with site specific conditions to inform the removal works.

Depth and lateral extent of contaminated mulch

Both the depth and lateral extent of contaminated mulch must be included within the scope of work template and site figure. Due to variability as to how contaminated mulch may have been applied to land, removal requirements will be dependent on the following:

- Application depth
- Lateral extent of application of mulch
- Previous applications of suitable mulch in the past

Contaminated mulch is required to be removed to a point at which either:

- Another layer of material other than contaminated mulch is encountered (e.g., soil); or
- in scenarios where suitable mulch has been previously applied at the site, another level of suitable mulch which is able to be visually distinguished from contaminated mulch is encountered.

Removal requirements

A contaminated mulch removal checklist has been developed to support the contaminated culch removalists (contractor), refer to Appendix A

The removal of contaminated mulch does not need a licenced asbestos removal contractor for non-friable asbestos removal. However, contractors must stick to safety requirements, including all removal work must be done using asbestos related controls and an unexpected finds protocol. All workers must be:

- trained in the identification and safe handling of asbestos before carrying out asbestos removal work, which can be achieved through the completion of an asbestos awareness course (https://www.safework.nsw.gov.au/hazards-a-z/asbestos/asbestos-workers-and-removalists/training).
- clean shaven and have a fit test for a respirator, which can be provided at the place of purchase or see www.respfit.org.au/findafittester.
- provided with health monitoring (for ongoing asbestos removal or related work).
- wearing appropriate asbestos personal protective equipment and respiratory protective equipment.

The minimum standards for the mulch removal are outlined in the Contaminated mulch removal checklist (Appendix A) and the Template scope of work document (Appendix F).

Indicate the removal area

Signs and barricades must be installed to clearly indicate the area where removal works are being carried out. For most of the sites, these controls may already be in place and should be kept during removal works and until a clearance certificate has been issued.

Removal methods

The following methodology is recommended for the removal of contaminated mulch:

- Hand tools should be used for the removal of contaminated mulch, in order to prevent disturbance of underlying, established vegetation and nearby landscaping.
- Controls for nuisance dust should be available during removal works.
- Removal of contaminated mulch should happen until target depths are reached, noting:
    - Removal of established vegetation is not required.
    - Removal of soils is not required.
- Contaminated mulch can be placed in bulker bags before being placed in a covered, leak-proof truck for transport. Further details on disposal and transportation are provided below.
- A licensed asbestos assessor must be engaged to conduct a contaminated mulch clearance inspection (for asbestos only). Further details on clearance inspections and certification are provided below.

Transportation and tracking requirements

The transportation of contaminated mulch must be tracked and reported to the EPA using integrated waste tracking solution. Information on how to set up an account and track waste is found here https://www.epa.nsw.gov.au/your-environment/waste/integrated-waste-tracking-solution. The tracking documentation provided by these systems must be given to the person who has organised the contaminated mulch removal works, and must also be included in the clearance certificate completed by the licensed asbestos assessor.

The transport of contaminated mulch does not need a transport licence, assuming it will not be transported out of NSW. The vehicle used for transportation must be covered, and leak-proof, according to the *Protection of the Environment Operations (Waste) Regulation 2014*.

Waste classification and disposal requirements

Mulch contaminated with asbestos must be disposed of at a landfill which is licensed to receive asbestos waste. The contaminated mulch must not be disposed of at a facility for resource recovery.

The waste classification of contaminated mulch is the responsibility of the site controller. It is likely the contaminated mulch will have a pre-classification of **special waste (asbestos) general solid**

waste (non-putrescible). Chemical assessment is not needed based on this pre-classification. Where asbestos is not identified as being present but the mulch contains building and demolition waste, this is pre-classified as g**eneral solid waste (non-putrescible).** An assessment of the mulch using the Contaminated mulch assessment strategy (Appendix D) can be completed to show the material does not contain asbestos and therefore suitable for disposal as general solid waste (non-putrescible).

Tipping dockets must be given to the person who has organised the contaminated mulch removal works, and provided to the EPA.

Clearance inspections by licensed asbestos assessors

Following the removal of asbestos contaminated mulch, an independent licensed asbestos assessor must be engaged to do a clearance inspection of the removal work area. This must include a visual assessment for evidence of contaminated mulch, including building and demolition waste, engineered wood products, asbestos fragments and physical contaminants.

Following a clearance inspection in which no evidence of contaminated mulch is identified, a clearance certificate must be issued before the removal work area is taken down. The clearance certificate (non-friable) template provided in Appendix E should be used by the licenses asbestos assessor.

Unexpected finds protocol

A template unexpected finds protocol has been developed to provide guidance if an unexpected find is identified during removal works. An unexpected find could include any discovery of asbestos fragments in an unanticipated state of friability or quantity, or other contamination such as stained or odorous materials, ash and fibrous materials.

The unexpected finds protocol is detailed in Appendix G.

Audit program

Regular audits will be carried out of contractor and licenses asbestos assessor performance by the EPA and SafeWork NSW to ensure compliance with the plan.

Stakeholder engagement

The technical working group has developed a best practice plan that complies with the NSW work health and safety laws and ensures the health and safety of all workers and people living within, on or accessing areas with mulch contaminated with asbestos fragments and/or building and demolition waste.

Stakeholder engagement with potentially affected sites is being carried out by the EPA in an ongoing basis through direct contact phone calls and letters. More broader stakeholder engagement is being completed by the EPA and NSW Government through website updates and media releases.

Review and improvement

The technical working group will regularly review progress of mulch management and removal. The group will also review this plan for currency. An after-action review will be completed at the conclusion of the removal works.

Limitations

Nothing contained within the plan may be considered to alter or modify guidelines as set down in the work health and safety Regulation and relevant SafeWork NSW codes of practice, or the requirements of other relevant NSW legislation.

No one section, or part of a section in the plan should be taken as giving an overall idea of this report. Each section must be read with the whole of this report, including its appendices and attachments.

Appendices

Appendix A – Contaminated mulch removal checklist

Item	Guidance	Comments	Complete
Stakeholder engagement – notification	Template communication to occupants of the removal site or neighbours adjoining.	There is no airborne risk of asbestos with this work. No relocations are required, normal access to adjoining properties. Workers on removal site not involved with removal to not enter work zone.	
Asbestos awareness training	https://www.safework.nsw.gov.au/hazards-a-z/asbestos/asbestos-workers-and-removalists/training	All workers removing mulch to have asbestos awareness training.	
Safe work method statements	Use of standard safe work method statements for applying/removing mulch amended with SafeWork guidance template.		
Fit test for respirator	www.respfit.org.au/findafittester	Place of purchase may provide fit testing. Must be clean shaven.	
Workers must be clean shaven prior to starting shift.			
Personal protective equipment Respiratory protective equipment (P2 respirator minimum)	Purchased at your local safety store.		

Item	Guidance	Comments	Complete
Type 5, category 3 asbestos coveralls Disposable gloves Dedicated boots (gum boots)			
Site plan including removal area, decontamination, removal access/egress			
Removal area	Defined by making sure people not involved in the removal can't access.		
Decontamination	Minimum 200-micron plastic on ground with access to wet wipes, spray bottle and asbestos waste bags.		
Waste classification	Contaminated mulch likely to be pre-classified as general solid waste (non-putrescible) special waste asbestos.		
Transport and waste disposal	Bulker bags or placement into a sealed truck/vehicle for transport to a licensed landfill able to access asbestos waste.		
Dust suppression to be available	If nuisance dust is an issue it can be controlled with dust suppression.		
Clearance inspection	Licensed asbestos assessor required to complete a site inspection and complete template certificate.		

Appendix B – Contaminated mulch removal (non-friable asbestos) roles and responsibilities

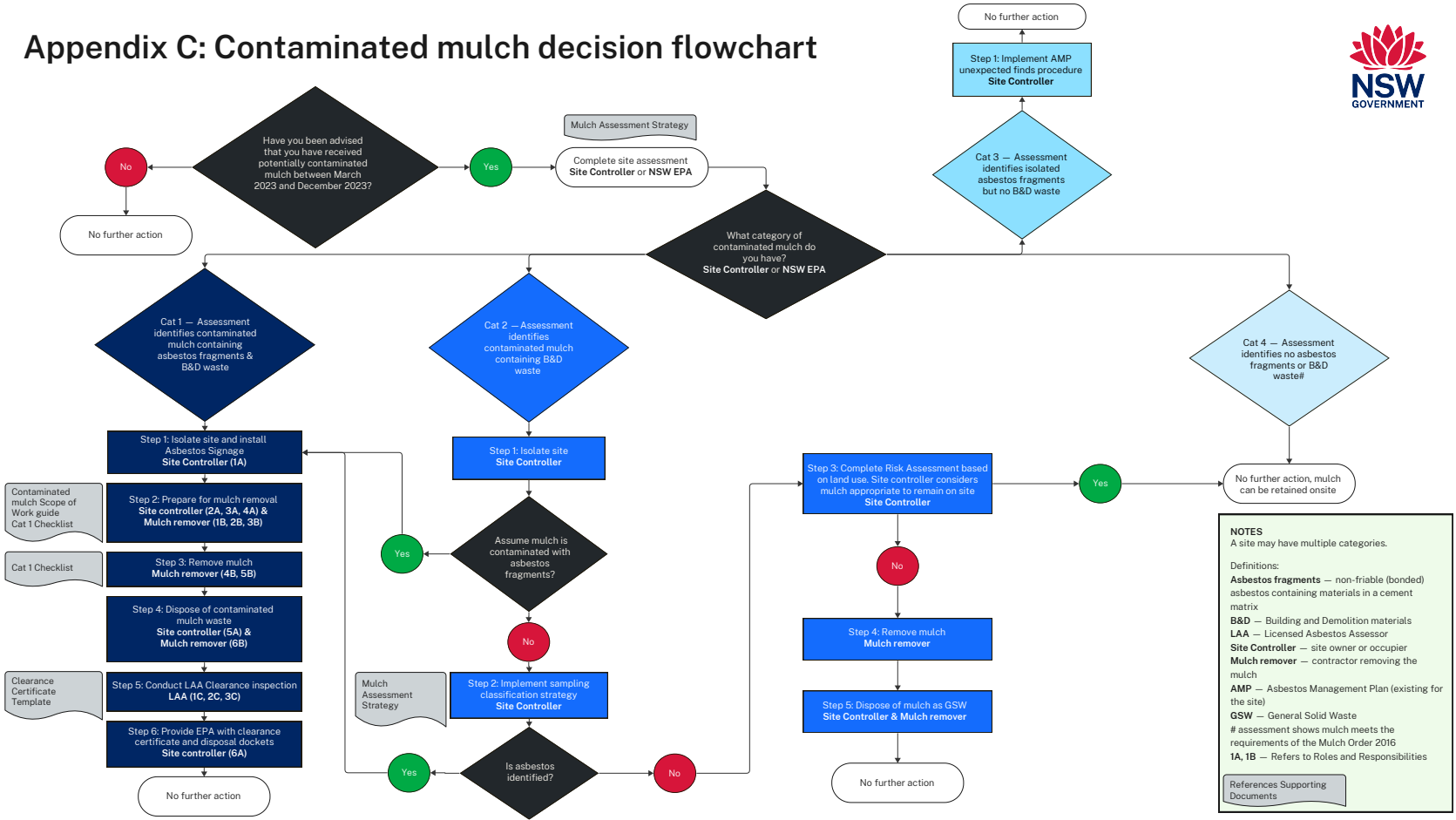
A	Site controller
1A	Site controller to isolate site and install asbestos signage.
2A	Site controller to define scope and clean-up works for contaminated mulch remover (based on relevant reports and on contaminated mulch removal scope of works template).
3A	Removal of mulch waste volumes should correlate to the delivery volumes of contaminated mulch.
4A	Site controller to engage a licensed asbestos assessor to complete the template (non-friable) contaminated mulch visual clearance, once mulch removal has been completed (SafeWork has a list of registered licence asbestos assessors).
5A	Site controller is the waste generator. Contaminated mulch waste is likely pre-classified as special waste asbestos general solid waste (non-putrescible), and to be removed offsite to a licensed landfill for disposal; remover to keep landfill disposal dockets.
6A	Site controller to make sure completed template (non-friable) contaminated mulch visual clearance certificate and disposal dockets are issued to the EPA.

B	Contaminated mulch remover (contractor)
1B	Contaminated mulch remover reviews contaminated mulch assessment report, the site controller's scope for removal, and defines mulch removal areas on a site figure.
2B	Contaminated mulch remover to complete removal checklist before starting onsite works to make sure minimal work health and safety requirements are met. Note, if total asbestos to be removed is less than 10m^2, no asbestos licence is necessary. Where greater than 10m^2 of asbestos (non-friable) fragments are present, a Class B licensed removalist is needed.
3B	Contaminated mulch remover to notify neighbours and workers of proposed removal.
4B	On day of removal, contaminated mulch remover to complete removal checklist again as part of tool-box talk.
5B	Contaminated mulch remover to visually assess the depth for removal of contaminated mulch containing asbestos and building and demolition waste, and get licensed asbestos assessor visual clearance. The base of mulch removal should be visually judged by the absence of building and demolition waste in mulch.

6B	Transportation of contaminated mulch for disposal does not require a licence, but needs to be tracked. Operators need to use the integrated waste tracking solution (formerly Waste Locate), mulch pre-classified special waste asbestos general solid waste (non-putrescible) to be placed into bulker bags or in a leak-proof sealed truck (with enviro-tarp cover).

C	Licenced asbestos assessor (consultant)
1C	Review initial contaminated mulch report, scope and removal areas as marked on a site figure.
2C	Carry out site inspection at completion of removal works, use the template contaminated mulch visual clearance certificate, collect all waste disposal receipts.
3C	Issue the completed template contaminated mulch visual clearance certificate to the property owner, with the disposal dockets.

Appendix C: Contaminated mulch decision flowchart



NOTES
A site may have multiple categories.

Definitions:
Asbestos fragments — non-friable (bonded) asbestos containing materials in a cement matrix
B&D — Building and Demolition materials
LAA — Licensed Asbestos Assessor
Site Controller — site owner or occupier
Mulch remover — contractor removing the mulch
AMP — Asbestos Management Plan (existing for the site)
GSW — General Solid Waste
assessment shows mulch meets the requirements of the Mulch Order 2016
1A, 1B — Refers to Roles and Responsibilities

References Supporting Documents

Appendix D – Contaminated mulch assessment strategy

Guideline for site controllers and consultants – contaminated mulch assessment strategy

Objective of site assessments

The purpose of a contaminated mulch site assessment is to determine whether the mulch is contaminated with asbestos and where present, the asbestos condition. The assessment is also to determine if building and demolition waste is present. The asbestos and/or building and demolition waste may be on the surface or within the mulch matrix. The outcome will determine whether the mulch will be:

- disposed of as general solid waste (non-putrescible) special asbestos waste or
- disposed of as general solid waste (non-putrescible) (with no asbestos contamination) or
- be considered suitable to be kept.

A contaminated mulch assessment should be carried out by a competent person (such as a licensed asbestos assessor or occupation hygienist).

The table below and assessment criteria have been developed using information from the National Environment Protection (Assessment of Site Contamination) Measure April 2011, Schedule B2 Guideline for site characterisation.

Sample assessment strategy for contaminated mulch areas:

- Review documentation to ascertain where mulch has been placed across a site.
- Conduct an initial walk over across all mulched areas to assess potential hot spots for asbestos or ACM and mark locations. Use this walkover to identify presence/absence of visible building and demolition waste and/or potential asbestos-containing materials.
- Visible potential asbestos-containing materials should be representatively sampled. This is as well as mulch assessments as per the below.
- Estimate in square metres the approximate size of the mulched area, and rake some locations to ascertain depth, to be able to estimate cubic metres of contaminated mulch. This may need to be divided into smaller areas for larger mulched areas.
- Determine the number of mulch assessments to be taken with regards to the size of the mulched area using supporting sampling density table.
- Divide mulch area into grids, whether of a regular or offset grid or herringbone pattern. This may depend upon the size and topography of the assessment area. The grid origin and orientation can be based on random selection or aligned with or around a convenient site feature, including above potential hot spots.
- Mark sample locations as per above and include potential hotspots.
- Complete each mulch assessment by:

- collecting a 10-litre bucket of the surrounding mulch, making sure full depth of mulch is taken down to the pre-existing surface prior to mulch application
- spreading evenly the contents of the 10-litre bucket over a $1m^2$ area onto a contrasting 200-micron plastic sheet
- conducting a visual inspection/sort collecting all 'fibro' cement fragments and potential asbestos materials
- conducting a visual inspection/sort and record the nature and type of building and demolition waste materials
- determining friability of potential asbestos materials, that is, can the material be crumbled or pulverised under hand pressure when dry? (work health and safety definition of friable asbestos)
- placing all potential asbestos or ACM into the one sample bag/jar (composite sampling) for asbestos (absence/presence) analysis as per AS4964

Sampling density table

The table below outlines the minimum number of mulch assessments needed based on the estimated cubic metres of mulch to be assessed.

If the volume of mulch that was installed at the site was in tonnes, this can be converted as per below;

- One (1) m3 is equivalent to 500kgs. E.g. 10 tonnes = 5 cubic metres.

Mulch (m3)	Number of mulch Assessments (minimum)
2 or less	3
5	5
20	5
40	10
100	15
200	20

Reporting

The report must:

- be in a format on business letter head, that includes the name of person who did the assessment, including their qualifications and contact details
- provide the observations of the coverage of the mulch, including the nature and extent of building and demolition waste within the mulch
- include a site/aerial map of the site that shows all mulch areas, along with assessment locations and correlating sample numbers (positive and negative)
- state the friability of all the positive asbestos or ACMs
- include the NATA results of analysis reports from the NATA accredited laboratory
- include an overview of the controls in place and their ability to prevent accessibility of the public, for example site fencing, barricades, barrier tape and signage
- confirm whether asbestos has been identified within the mulch and comment on its the nature and extent
- make a determination on the category of the mulch on the site based on the assessment. The Category of the mulch is referred to in the contaminated mulch management plan and Appendix C (decision flowchart).

Appendix E – Contaminated mulch clearance certificate (non-friable) template

The following is a template of the certificate that will need to be completed by the contaminated mulch removalist. The areas shaded in grey are the fields that require information to be entered. This is a sample only. A fillable Word version of this certificate can be found on the EPA website.

dd/mm/yyyy File: contammulchmngtplan hc markup.docx (non-friable)

[abc company]

CONTAMINATED MULCH MANAGEMENT PLAN

[insert site name (where applicable) and full site address]

1. Background

Some sites across NSW have been found to contain mulch that includes building and demolition waste. Some of this contaminated mulch also may contain asbestos materials.

This contaminated mulch removal clearance certificate complies with Clause 474 of the NSW Work Health and Safety Regulation 2017, "Clearance certificates", in relation to the removal of asbestos-containing materials.

2. Work details

Contaminated mulch was removed from [insert locations e.g. "garden bed to the north east corner of the site" or "various garden beds throughout the site", include a dot point list if appropriate] of the site. See aerial/site plan attached for the extent of mulch removal. The contaminated mulch was removed to a level which there was no further visible indication of asbestos and/or building and demolition debris remaining on the surface.

Asbestos Removal Work	**Details**
Contaminated Mulch Removal Contractor:	XXXX
Mulch Removal Date(s):	DD MM YYYY
Clearance Inspection Date:	DD MM YYYY
Approximate Mulch Removal Footprint Area (m^2)	XXX
Approximate Total Property Land Size Area (m^2)	XXX
Integrated Waste Tracking Solution Reference:	XXX

3. Inspection Details

A visual inspection was carried out of the mulch removal area(s) and the transit and waste routes (as marked on the attached aerial/site plan).

The clearance inspection consisted of a visual walkover inspection on dd/mm/yyyy for any visible asbestos and/or building and demolition waste.

Clearance Inspection Items	**Details**
Licensed asbestos assessor:	XXXX
Asbestos assessor licence no.:	XXXX
Mulch removal scope of works and site plan sighted?	Yes/no
Was the mulch removal work carried out according to the mulch removal scope of works?	Yes/no

4. Limitations

The visual inspection was to the surface area(s) immediately below the removed contaminated mulch.

Subsurface soils and other fill material are outside the scope of this clearance inspection.

Some residual mulch may remain onsite which is unrelated to the identified contaminated mulch and does not contain asbestos and/or building and demolition material.

5. Clearance declaration

I declare that on completion of the contaminated mulch removal work:

- I carried out a visual inspection of the mulch removal area(s), and areas in the vicinity, including transit and waste routes and declare the areas are free from any visible asbestos.
- As part of this inspection, I also observed these areas to be free from building and demolition material associated with the contaminated mulch.
- All identified contaminated mulch in the scope of the removal work has been removed [edit if rolling clearances are being carried out]. The area(s) indicated on the aerial/site plan attached can be reoccupied.

Yours sincerely,

XXXX XXXX

Licensed Asbestos Assessor Number: [insert number]

Attachments:

- Aerial/site plan indicating location(s) of mulch removal
- Insert photographs of visually inspected and cleared area(s) (three minimum)

Appendix F – Contaminated mulch removal template scope of works

Application

This contaminated mulch scope of works is applicable to sites where non-friable asbestos fragments have been identified in mulch materials.

Extent of works

The extent of mulch to be removed is determined by the site assessment(s) and to be outlined in site plan/figure to be developed by the contaminated mulch removalist (the contractor). The depth of mulch to be removed is limited to the amount of contaminated mulch placed and should be provided to the contractor. This scope of works doesn't require soils to be removed, only contaminated mulch. No soils are required to be removed as part of this scope of works.

If asbestos fragments and building and demolition waste have been identified in the (contaminated) mulch on the site, the mulch is to be removed and disposed of to a landfill and must not be reused or put through a recovery process. The contaminated mulch is likely pre-classified as general solid waste (non-putrescible) special waste asbestos. The categorisation of mulch and potential options are outlined in the contaminated mulch management plan and decision flowchart.

People removing mulch, should read the site assessment reports, this scope of works and the site plan, and follow the recommendations as to the extent of removal needed.

Minimum safety standards (general)

Mulch must be removed according to the *NSW Work, Health and Safety Act 2011* and NSW Work Health and Safety Regulation, 2017.

Mulch to be removed must be treated as though contaminated with asbestos. That is, all work must be carried out using asbestos related controls. For further information please call SafeWork NSW on 131 050.

All works to be carried out according to the NSW Code of Practice "How to safely remove asbestos".

Non-asbestos hazards must also be considered and managed. These include, but are not limited to:

- potential for striking services
- weather conditions
- protection of the public and premises occupiers
- manual handling
- lone worker.

Minimum safety standards (mulch removal workers)

The following outlines the minimum safety standards for all mulch removal workers.

1. Have received appropriate training on the risks of harm from asbestos.

- Asbestos removal or asbestos awareness training (https://www.safework.nsw.gov.au/hazards-a-z/asbestos/asbestos-workers-and-removalists/training), according to Clause 445 of the NSW Work Health and Safety Regulation, 2017 plus task specific training (e.g. toolbox talk) is likely to meet this requirement.

2. When in the mulch removal area(s) wear type 5, category 3 coveralls and respirators (minimum rating P2 disposable).
3. Be fit tested and able to present a fit test certificate for the respirator(s) they are using.
4. Be clean shaven at all times when wearing a close-fitting respirator.
5. Wear dedicated safety footwear - such as safety gumboots or safety boots, when in the mulch removal work area(s). This footwear is to be dedicated to mulch removal only, removed and bagged in 200µm plastic asbestos bags when leaving the mulch removal work area to prevent spread of materials from footwear. At the end of the works any footwear that cannot be decontaminated (such as laced boots) will need to be disposed of with the mulch waste.

Documentation

The mulch removal contractor is to produce a safe work method statement that includes, as a minimum:

- details of mulch to be removed – locations and quantity of contaminated mulch, and a site plan/figure
- worker training and competency
- consultation with neighbours in the immediate vicinity of the mulch removal works
- roles and responsibilities
- dates of works
- method of works (e.g. shovels, keeping it damp)
- assessment of hazards (e.g. weather, lighting, live services etc.)
- details of personal protective equipment to be used, including disposable coveralls and gloves
- respirator selection
- potential dust generation process, including water suppression to be readily available
- communication procedure
- exclusion zone designs
- decontamination
- emergency procedures
- clearance certification
- waste disposal.

Exclusion zones

An exclusion zone must be set up around each mulch removal area. The purpose of this exclusion zone is to prevent access by unauthorised persons. The exclusion zones will need to be determined on a site-by-site basis but must:

- create a buffer zone between mulch removal areas and non-protected workers
- have at least one dedicated access/egress point complete with decontamination area
- give due consideration to emergency procedures and emergency exit
- feature signage "danger asbestos removal in progress" in multiple locations. Locations to be determined by giving consideration to potential interactions with other people.

Decontamination

The contractor is to determine the type of decontamination required. It is envisaged that for non-friable mulch removal works, dry decontamination as per page 44-47 of the NSW Code of Practice "How to safely remove asbestos" is likely to be enough in most circumstances. The use of wet wipes should also be considered for coveralls and gum boots.

Clearance standards

To receive satisfactory clearance, the contaminated mulch must be removed. A licensed asbestos assessor will inspect to confirm removal. This is a visual inspection and should not usually involve further sampling.

This inspection will need to include the following declaration;

"I declare that:

- I undertook a visual inspection of the mulch removal area(s), and areas in the vicinity, including transit and waste routes and declare the areas are free from any visible asbestos.
- As part of this inspection, I also observed these areas to be free from building and demolition material associated with the contaminated mulch.
- All identified contaminated mulch in the scope of the removal work has been removed (edit if rolling clearances are being carried out). The area(s) indicated on the aerial/site plan attached can be reoccupied."

For the licensed asbestos assessor to be able to confidently make the above declaration, the mulch removal contractor will need to make sure the contaminated mulch is removed in full and that the areas they have traversed to and from the waste container are also free from asbestos and building and demolition waste.

Full removal of contaminated mulch does not necessarily mean the removal of the material located immediately beneath the contaminated mulch. The mulch removal contractor will have to assess and determine and what point the contaminated mulch has been removed. No soil materials are

required to be removed with the identified contaminated mulch. If the licensed asbestos assessor is not confident that all of the contaminated mulch from that area has been removed, they are not to issue the clearance certificate. This should be stated in the limitations of the clearance certification.

Waste classification, transport, tracking and disposal

While is it the waste generator's responsibility to classify the waste, the contaminated mulch is likely pre-classified as general solid waste (non-putrescible)-special waste (asbestos). Where there is uncertainty on the waste classification, contact the EPA.

The transportation of contaminated mulch must be carried out according to the requirements of the Protection of the Environment (Waste) Regulation 2014, including the vehicle used must be covered and leak-proof. Contaminated mulch may also be placed in bulker bags which are then placed in a covered leak proof truck.

Contaminated mulch containing asbestos fragments must be tracked using the integrated waste tracking solution, formerly WasteLocate. The mulch removal contractor must provide the tracking documentation to the licensed asbestos assessor to include in the clearance certificate.

Contaminated mulch must be disposed of at a landfill which is licensed to receive asbestos waste. Under no circumstances should the contaminated mulch be disposed of at a facility for the purpose of resource recovery or reuse.

Resources

NSW Code of Practice "How to Safely Remove Asbestos"

SafeWork NSW "Asbestos"

iCare NSW website

NSW EPA Waste Classification Guidelines

Appendix G – Contaminated mulch removal - unexpected finds protocol

Introduction

During the removal of contaminated mulch, there is a risk of encountering unexpected contamination within or below the mulch. The material within or below the mulch could contain asbestos fragments, stained soils with odours, ash, scrap metal, ores, concrete, fibrous materials or other contaminated materials that were not previously identified.

Management of unexpected finds protocol

The contaminated mulch remover (contractor) will review the contaminated mulch assessment report and the site controller's scope of works. The contractor is responsible for defining mulch removal areas on a figure and completing a mulch removal checklist. This checklist includes completion of an unexpected finds protocol.

The unexpected finds protocol will outline the following items:

- Induction of site workers for unexpected finds protocol, including responsible person for worker induction
- In the event of an unexpected find, isolation of any potentially contaminated areas with temporary barricade, geofabric and signage, advise the site manager
- The contractor will make every effort to continue site works in an uncontaminated area of the site
- After identification of potential contamination, notification to Site Controller within 24 hours
- Within 48 hours after notice of an unexpected finds, the site controller will provide a preliminary site assessment of the potential contamination, including provide advice on the engagement of any specialist environmental consultants or specialist monitoring or sampling.

A unexpected finds protocol template is provided as Table 1.

Table 1. Unexpected Finds Protocol

Step	Summary actions	Documentation
Isolate the unexpected find of contamination	Contractor site foreman to place temporary barricade and signage around	Register unexpected finds into site log book.

	potentially contaminated area. The contractor site foreman to notify the site controller within 24 hours. Works to continue in other area of site.	
Communication to site workers	Contractor site foreman to provide toolbox talk that inducts workers.	Record of site induction on site tool box meeting.
Communication to site controller and response within 48 hours	Site controller to carry out site inspection.	Site controller to provide site instruction on scope of works going forward.
Assess for contamination risk by environmental consultant/competent Person	Site controller to engage a contaminated land specialist and/or competent person (licensed asbestos assessor or hygienist) to mobilise to site.	Contaminated land specialist and/or competent person (licensed asbestos assessor or hygienist) to carry out sampling, monitoring, or reporting.
Carry out validation or clearance	Environmental consultant to carry out necessary works to mitigate risk of identified contamination.	Validation reporting, clearance, or letter style report to reopen site.