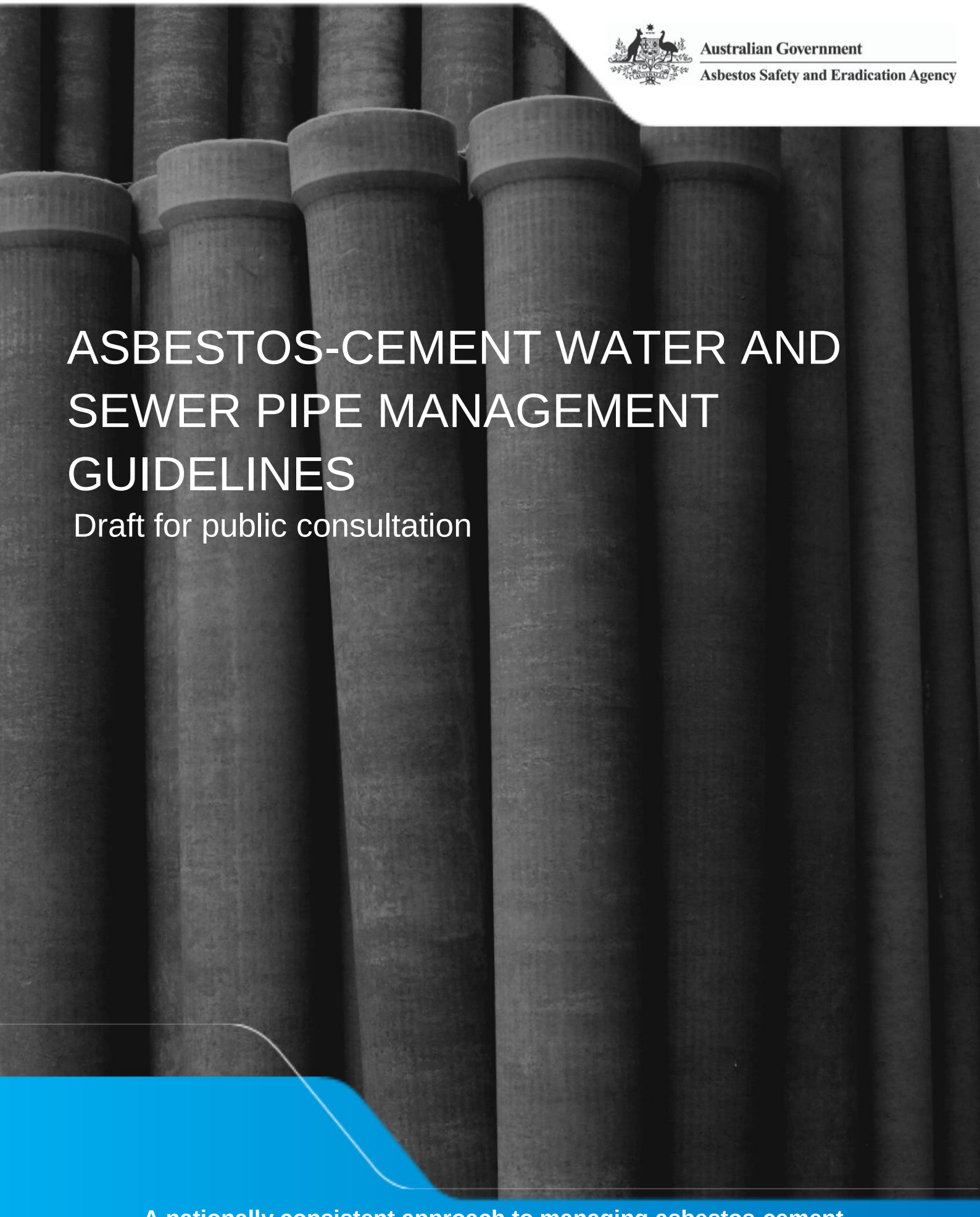

Australian Government
Asbestos Safety and Eradication Agency

ASBESTOS-CEMENT WATER AND SEWER PIPE MANAGEMENT GUIDELINES

Draft for public consultation

A nationally consistent approach to managing asbestos-cement water and sewer pipes

Contents

Public consultation draft:
Asbestos-Cement Water and Sewer Pipe Management Guidelines

The Asbestos Safety and Eradication Agency has released this document to seek feedback on the draft *Asbestos-Cement Water and Sewer Pipe Management Guidelines* (the draft Guidelines).

PART 1 includes information on:

- why and how the draft Guidelines were developed
- the scope of draft Guidelines
- specific matters about which we are seeking comment and information, and
- how to make a submission.

PART 2 contains the draft Asbestos-Cement Water and Sewer Pipe Management Guidelines.

PART 3 has information on industry innovation and includes research into new practices. This part also contains a list of contacts and resources.

A nationally consistent approach to managing asbestos-cement water and sewer pipes

In 2018, the Asbestos Safety and Eradication Agency (the Agency) released the report, *Case studies of asbestos water pipe management practices*. The report examined six cases of rehabilitating water and sewer pipes containing asbestos in Victoria, Queensland and Western Australia and identified best practice for safe and effective management and removal.

The report recommended that a clear, nationally consistent approach to managing asbestos-cement water and sewer pipes is needed for cost-effectively managing approximately 40,000 kilometres of water mains pipes and 5,000 kilometres of sewer mains pipes containing asbestos-cement across Australia.

The Water Pipes Working Group

In response to the report, the Agency convened the Water Pipes Working Group (WPWG) so that governments, water authorities, industry and unions could work together to develop nationally consistent information on how to eliminate or minimise the risk of asbestos exposure when managing and removing asbestos-cement and sewer water pipes.

The WPWG was established under the *Asbestos Safety and Eradication Agency Act 2013* as the primary consultative mechanism for developing a nationally consistent approach to managing asbestos-cement water and sewer pipes. The WPWG is comprised of representatives from environment authorities, work health and safety regulators, peak industry and unions. The draft Guidelines were developed using the input and expertise of WPWG members.

The scope of the Asbestos-Cement Water and Sewer Pipe Management Guidelines

The Guidelines provide information on asbestos-cement water and sewer pipe removal and remediation methods and the issues that water agencies should consider in deciding how to safely manage AC water and sewer pipes.

The Guidelines aim to provide practical guidance on how to eliminate or minimise the risks of asbestos exposure when managing water and sewer pipes in accordance with the work health and safety and environment protection laws that currently exist across Australia.

The Guidelines, even if endorsed by state and territory regulatory authorities, would not be legally binding. The Guidelines do not change existing regulations relating to asbestos management and removal.

The Guidelines cannot be relied upon to comply with the law – a person must ensure they meet all legal requirements by referring to relevant legislation and codes of practice.

However, it is possible that the Guidelines, if endorsed by governments and industry, may be considered by a regulator or court as contributing to a person's state of knowledge in relation to meeting their duties under current laws.

How to make a submission

Your views are sought on the consultation questions as well as on any other areas of the draft Guidelines.

Submissions can be lodged via email to engage@asbestossafety.gov.au

Online submissions are preferred. However, submissions can also be made by post to:

Asbestos Safety and Eradication Agency

Level 10, 255 Elizabeth Street

Sydney NSW 2000

Key Dates	
Public consultation commences	29 June 2020
Public consultation closes	5pm, 7 August 2020
Final Asbestos-*Cement Water and Sewer Pipe Management Guidelines* published	4 November 2020

Contacts

Stacey Tomley
Phone: 07 3404 4805 or 1300 326 148
Email: engage@asbestossafety.gov.au

Consultation questions

1. **Are there additional asbestos-cement maintenance and management techniques that should be included in the guidelines? Or, alternatively, are there any that should be excluded from the guidelines?**

2. **In which circumstances is it appropriate to use pipe bursting and pipe reaming methods for managing asbestos-cement water and sewer pipes? When using these methods is it possible to ensure that all asbestos-cement is removed from the ground during the clean up? How can the risks of future contamination be managed?**

3. **Should the guidelines include more detail on the requirements to consult:**
   - **other duty holders in order to carry out the work safely under WHS laws,**
   - **councils, consumers and affected members of the public?**

   If so, please advise what type of information you would like to see included.

4. **How should disused asbestos-cement water and sewer pipe be managed? Can it be adequately managed in situ?**

5. **Should guidance on temporary storage and disposal of asbestos waste be added?**

6. **Is there further practical guidance that should be included in the guidelines?**

7. **Are the guidelines user-friendly in terms of the language, layout and format? Or is there a better way to communicate a nationally consistent approach to managing asbestos-cement water and sewer pipes?**

PART 2

Purpose

1. These guidelines provide an overview of how ageing asbestos-cement (AC) water and sewer pipes may be maintained and managed in accordance with Australian environment and work health and safety (WHS) laws.[1] The guidelines are designed to help water authorities and other people engaged in, or responsible for, maintaining and managing AC water and sewer pipes (such as contractors) understand how they may comply with the relevant laws.
2. These guidelines should not be relied upon to comply with the law. The guidelines complement codes of practice and the procedures of water authorities and other responsible entities. They should be read in conjunction with those documents and the law, not as a substitute for them.
3. In these guidelines, reference to 'AC pipes' includes both AC water pipes and sewer pipes (pressure pipes and gravity mains).

Background

4. Exposure to asbestos fibres can cause life-threatening illnesses like cancer and mesothelioma.
5. The use of asbestos was completely banned in Australia in 2003. However, the risk of exposure to asbestos fibres remains because the asbestos that was used before that date is still in situ. The risk of exposure can occur with increased maintenance work on ageing AC pipes and unplanned disturbances of AC pipes.
6. It was estimated in 2018 that there was about 40,000 km of asbestos-cement water pipes in Australia and a further 5,000 kilometres of AC sewer mains pipes. Although it is non-friable (also known as bonded asbestos) and underground, the exposure risks still need to be managed when maintaining or renewing pipes to ensure service standards to customers and regulators are met.
7. AC pipes that contain non-friable asbestos and are in good condition only pose a risk if they are damaged or disturbed in a way that allows the release of asbestos fibres. This could result from either deterioration of the AC pipes in situ or from disturbance when maintenance work is carried out on or near AC pipes.

Considerations when working with asbestos-cement water and sewer pipes

8. It is important that AC pipes are managed and maintained in a controlled manner[2] that is compliant with all relevant laws. Regulatory requirements are found in jurisdictional WHS laws and environment protection laws, and local councils may also have specific requirements that must be followed.
9. AC pipes must be maintained and/or managed to eliminate, so far as reasonably practicable, exposure of persons to airborne asbestos fibres arising from the pipes. However, if elimination of exposure is not reasonably practicable, the risks – both present and future - must be minimised so far as is reasonably practicable.

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[1] The term work health and safety laws, or WHS laws, is used throughout this document to refer to workplace safety laws however they are described in a jurisdiction. This includes the *Occupational Health and Safety Act 2004* in Victoria, and the *Occupational Safety and Health Act 1984* in Western Australia, as well as the model WHS Act adopted in Queensland, New South Wales, the Australian Capital Territory, Tasmania, South Australia, Northern Territory and the Commonwealth.

[2] Asbestos Safety and Eradication Agency, *Case studies of asbestos water pipe management practices*, 2018.

10. A **risk assessment** will assist in determining the appropriate methods that should be adopted to minimise or eliminate the risk of airborne asbestos fibres. This will typically involve assessing a range of issues including the condition and location of the pipe, the risks of asbestos exposure and the cost of various management methods. A risk assessment should also include other risks to health and safety not directly related to asbestos. For example, risks associated with the use of machinery.
11. Management and maintenance techniques should be supported by documented **policies and procedures**, with clear allocation of roles and responsibilities to ensure safety standards are maintained.
12. If it is not reasonably practicable to eliminate the future risk of asbestos exposure by removing AC pipes, the most effective control measures that are reasonably practicable must be implemented in accordance with the **hierarchy of control measures**. It is also necessary to ensure that the control measures that are implemented remain effective over time. For instance, if disused AC pipes are intended to be left in situ, they must be covered with an appropriate level of soil to avoid exposure due to ground erosion. It is good practice to not leave disused AC pipes in the ground on private property (either residential or commercial) where it is difficult for the water agency to manage risks to health and safety due to restricted access to the site. If a water agency decides to leave disused AC pipes in the ground, for example on private agricultural land, they must be satisfied that all risks are eliminated, or minimised, so far as is reasonably practicable in the circumstances.
13. Care must be taken to ensure the measures used to maintain or refurbish AC pipes do not release asbestos fibres. The use of high-pressure water spray and compressed air on AC pipes is **prohibited** under WHS laws. If a water agency decides to use one of these methods, for example using high pressure spray to clear blockages in AC sewer pipes, they must first obtain approval from the WHS regulator. This may involve showing there is no reasonably practicable alternative method for clearing blockages.
14. Power tools and brooms, or other implements that may cause the release of fibres may only be used on AC pipes if the tools, brooms or implements are enclosed or otherwise used in a way that captures or suppresses fibres safely.
15. WHS laws require that all workers who are or may be involved in work in relation to AC pipes are **trained** in the identification and safe handling of, and suitable control measures for, asbestos. If workers will be involved in asbestos removal there are also additional training and licensing requirements.
16. Effective public communication, particularly where the rehabilitation or removal of AC pipes is occurring in public places, is important to maintain transparency and reduce any community concern. Additionally, it is a WHS requirement that an asbestos work area must always have **barricades and clear warning signs** to alert people in the vicinity of the potential risk of asbestos exposure.
17. WHS laws also require that an **asbestos register** for the workplace is kept up to date, including to record any removal of AC pipes or maintenance work on AC pipes. As the term ‘workplace’ has broad meaning under WHS laws, the requirement to have an asbestos register is applicable to any place where work is carried out by any workers, including employees and/or contractors.
18. Repairing or removing AC pipes is classified as **high risk construction work** under WHS laws because it involves, or is likely to involve, the disturbance of asbestos. A **Safe Work Method Statement** (SWMS) must be prepared before the high risk construction work commences and must include details on the measures that are to be implemented to eliminate or minimise the risks of asbestos exposure. Workers, including employees and contractors, need to carry out the work in accordance with the SWMS.
19. Other safeguards include ensuring that an appropriately **licensed removalist** manages the work and handles the pipe material. This will depend on the volume and condition of AC pipe being removed – only a Class A asbestos removalist can remove and handle friable asbestos and both Class A and Class B removalists can remove and handle non-friable asbestos. Although less

than 10m2 of non-friable asbestos can be removed without an asbestos licence it is safest to always engage a licensed removalist.

20. All removed AC pipe material and contaminated soil should be double wrapped and sealed in 200 micron plastic, including during transportation to disposal facilities.

Maintenance in situ

21. The water agency or other body with management or control of AC water pipes has a number of obligations in relation to maintaining the pipes while they are in use.
22. As noted above, risks to health and safety arising from in situ AC pipes, including exposure to asbestos fibres during maintenance, must be managed by eliminating or minimising those risks so far as is reasonably practicable.
23. These obligations continue if disused AC pipes are left in situ.

Asbestos registers, asbestos management plans and environment protection

24. The location and condition of both used and disused AC pipes, and any pieces of AC pipe that remain in the ground as a consequence of past management practices such as pipe bursting, must be recorded in an asbestos register.
25. A written asbestos management plan must also be prepared to include information such as decisions made regarding the management of the AC pipes and procedures for detailing incidents or emergencies involving the AC pipes.
26. Both an asbestos register and asbestos management plan must be kept up to date, including to reflect condition assessments or maintenance or removal that has been carried out. The presence and condition of AC pipes may be assumed where it is not reasonably practicable to undertake an inspection. In these instances, it may be reasonable to assume the AC pipes are in poor condition, given that pipes are subject to weathering and chemical erosion, particularly in areas where the water has high alkalinity or PH levels. This approach assists in ensuring that anyone using the register in the future applies the highest safety measures.
27. An asbestos register and an asbestos management plan must also be easy to access so that anyone working in the area of the AC pipes can first confirm the location of the pipes and their condition to ensure that appropriate safety measures are implemented.
28. As an asbestos register is a document that lists all identified (or assumed) asbestos in a workplace, it may be possible to incorporate it with other required documentation of a water agency, such as a GIS (Geographic Information System), as long as all requirements for each document are met.
29. If AC pipes in situ are disused, there may be additional requirements to register the AC pipe on the land title and seek relevant approval from the environment regulator. For example, in New South Wales, the presence of buried asbestos at concentration above a certain level should be noted on a planning certificate issued under the *Environmental Planning and Assessment Act 1979* or captured on the land title. There may be similar requirements in relation to contaminated sites in other jurisdictions.

Sampling and testing AC water and sewer pipe

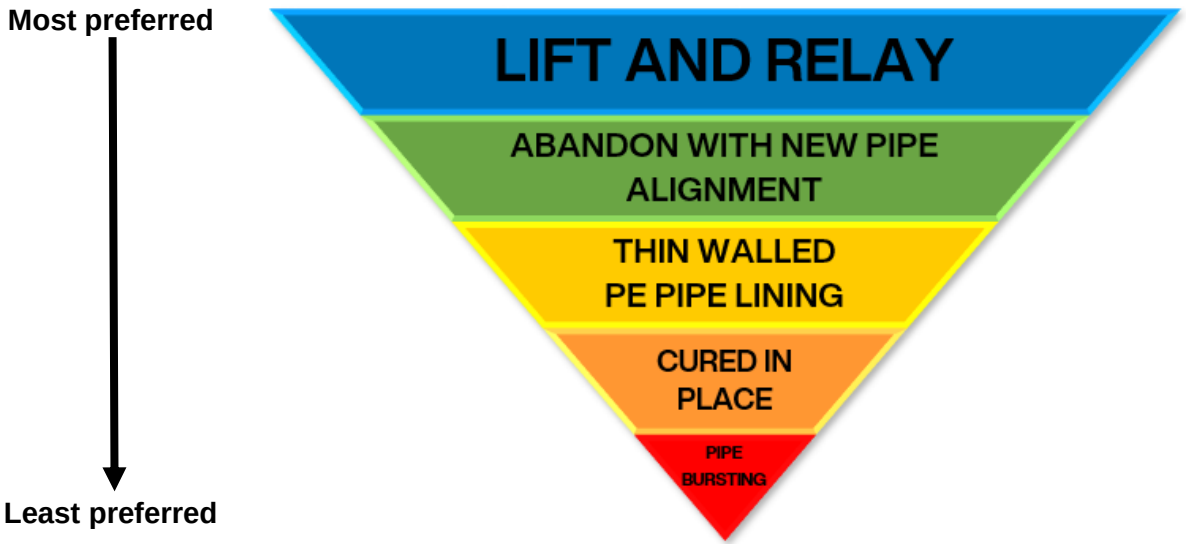
30. Determining the condition or deterioration of AC pipes may be necessary to help decide which methods should be used to manage the AC pipes safely.
31. There are both destructive and non-destructive testing techniques available. Where appropriate, non-destructive testing techniques should be used in the first instance if they will not create a risk of exposure to airborne asbestos fibres. Current and emergent non-destructive testing techniques include, for example, PCat (Pipeline Condition Assessment Technology) and in situ CT scanning.

32. If non-destructive testing is not appropriate or sufficient in determining the condition of the AC pipes, destructive testing and sampling may be the best approach. It involves coring an AC pipe in the field and removing a cored or pipe slice sample and transporting it off-site for analysis. The sample/s must be suitably wrapped and/or sealed, and labelled clearly as containing asbestos, to ensure safe transport from site to the point of further analysis.
33. Testing and sampling AC pipe is permitted under WHS laws as maintenance or service work on non-friable asbestos or ACM, fixed or installed before 31 December 2003, or as genuine research and analysis.
34. However, release of asbestos fibres during maintenance or service work must be eliminated or, if that is not possible, minimised so far as is reasonably practicable. The entire process must be well documented.
35. In the Australian Capital Territory there are more rigorous standards that must be followed – a sample of AC pipe removed for analysis must only be removed by a licensed asbestos removalist. This is also good practice that may be adopted in other jurisdictions.
36. Samples of AC pipe must be disposed after testing and analysis is complete, at a facility licensed by the environment regulator to receive asbestos waste. The water agency must ensure the disposal. This might be done by instructing the laboratory that undertook the analysis to dispose of the waste appropriately.

Common management methods

37. There are a number of common methods for managing ageing AC pipes that are permitted under current laws. Figure 1 shows the common management methods in a hierarchy based on how effective the method is for eliminating or minimising the risk of future asbestos exposure.
38. A risk assessment should be used to assist in deciding the method that is most appropriate in each circumstance by taking into account a range of factors including the location and condition of the AC pipes.

Figure 1: Common management methods



Pipe removal and replacement (lift and relay)

39. Full removal of existing AC pipes and replacement with new pipe is the only method of rehabilitation that completely removes any residual asbestos risk.
40. Typically pipe lengths are removed in whole segments from collar to collar, reducing breakage of the AC pipes and therefore the risk of exposure to airborne fibres.
41. This is the most expensive AC pipe rehabilitation option as full excavation is required and asbestos must be removed and disposed of in accordance with WHS laws, including relevant WHS codes of practice or compliance codes, and environment protection laws. The laws require that asbestos is only removed by an appropriately licensed asbestos removalist.
42. However, there are a number of benefits. The most significant is that the risk of future exposure is eliminated by the removal of the AC pipe. It also requires no ongoing AC pipe management and maintenance, and the associated costs.
43. However, if short sections of AC pipes remain in the ground, such as under roads, structures and large trees, the water agency remains responsible for managing the risks associated with that AC pipe and complying with all relevant statutory requirements, including recording the AC pipe on the asbestos register, and on the Geographic Information System (GIS) and asset registers.

EXAMPLE

New estate created over an AC water pipe trunk main

A new estate was being developed over a 300mm AC water pipe main which had been progressively disconnected and replaced over time since its installation. As a development condition, all the AC water pipe within private land needed to be removed once the water main was disconnected. It was also a requirement that removal of the AC water pipe within the new road reserve should be considered prior to construction of the new road and services over the alignment.

Road closure, lot creation, removal of AC pipes and construction of new water main

Due to a new bypass being created for a coastal town, a section of through road was closed and a cul-de-sac created with a lot for a new rural fire station and ambulance station. The existing sections of 150mm and 200mm AC water main, installed in 1974, were removed from the new private lot to enable the construction of the fire station and ambulance station structures. The AC water pipe was replaced with 180mm and 250mm high-density polyethylene respectively in a dual trench.

Subdivision over decommissioned AC main in regional Victoria

The GIS recorded that an abandoned AC water main existed from a previous road alignment across residential lots. Upon application for re-subdivision, the developer was requested to locate and remove the AC water pipes at the water authority's cost. After extensive site investigation, no AC water pipe could be located indicating the asset information was incorrect, likely due to the pipe having previously been removed. The subdivision was then approved and the GIS corrected.

By-passing and construction of a new alignment

44. The most common approach to AC pipe rehabilitation is by-passing. It involves making an AC pipe section redundant through disconnection and installing a brand-new service pipeline alongside, leaving the redundant AC pipe section in-situ. Although the redundant pipe will be disused, it remains the responsibility of the water agency to manage the risks associated with it. This includes the water agency recording the AC pipe in an asbestos register and ensuring that exposure to airborne asbestos is eliminated or minimised so far as is reasonably practicable.

45. Any abandoned AC pipe should be reported on all asset information requests, such as dial-before-you-dig, to confirm ownership and ensure future accidental damage to the abandoned AC pipe – and the consequential risk of exposure to airborne asbestos – is minimised.

46. As by-passing may involve connecting new pipe to existing AC pipe it may create asbestos waste if the AC pipe is broken or fragmented during the process. Any resulting asbestos waste cannot be left in the ground—this is a requirement of both WHS and environment protection laws. The asbestos waste, and contaminated soil surrounding it, must be safely removed and handled in accordance with WHS laws and disposed of at a disposal facility licensed by the environment regulator to receive that type of waste.

EXAMPLES

New main across farming

A 7km section of 150mm AC main, installed in 1940, was replaced by constructing a new pipeline parallel with a 2m off-set across rural farming land in Southern New South Wales. Both mains were retained within an easement and the pipes are both shown on GIS (Geographic Information System Mapping). All surface fittings were removed from the old AC main and it will remain in the ground, as risk of contact has been determined to be negligible. Both mains have adequate depth to ensure no impact on farming practice, are protected from development by easement and have minimal risk of being struck if pipeline route remains signposted.

New main in residential street

A 160m length of 100mm AC water pipe, installed in 1961, existed within a residential street and was being impacted by street trees planted over the main. Difficulties were encountered connecting into the old main due to driveways and rocks when removing required sections of AC water pipe. In response, the water agency designed and installed a new main on alignment between trees and kerb which overcame the need to remove AC water pipe from below driveways and under trees. The disconnected AC water pipe remains in the ground and shown on the GIS. The project had no impact on driveways and street trees.

Slip lining and curing-in-place pipe lining

47. Slip lining involves using plant to pull through a smaller diameter pipe inside the existing AC pipe.

48. Curing-in-place pipe lining is a well-established method of pipe rehabilitation. It involves lining an existing AC pipe by inserting a resin saturated fabric tube inside the AC pipe, by inversion or with a winch, and then inflating the fabric tube with air or water until the resin saturated fabric hardens to fully line the internal pipe surface. The tube is constructed of a mix of plastic-coated fabric of polyester or glass fibre.

49. Both methods may create asbestos waste if the existing AC pipe is broken or fragmented when the work is undertaken.

Pipe bursting/splitting, removal and replacement

50. Pipe bursting techniques involve machinery that is pushed up the AC pipe section to expand, split or break the pipe, creating a cavity for a replacement pipe to be inserted into the void.

51. This technique results in broken AC pipe fragments which are considered asbestos waste under both WHS and environment protection laws and therefore cannot be left in the ground without approval from the regulator. The asbestos waste, and contaminated soil surrounding it, must be safely removed and handled in accordance with WHS laws and disposed of at a facility licensed by the environment regulator to receive that type of waste.

52. Removing all fragments and traces of asbestos from the ground is considered difficult to achieve using current technologies. This means that, in reality, it is unlikely that a water agency could carry out pipe bursting of AC in a way that complies with WHS and environment laws.

53. If broken AC pipe fragments from pipe bursting are left in the ground, following permission by the WHS regulator or following pipe-bursting that occurred before 31 December 2003, the water agency remains responsible for managing the associated risks, including minimising contact while the fragments remain in the ground and removing the fragments when they become exposed during repair or maintenance activities.

EXAMPLE

Tapping application on PE pipe burst AC water main in a regional city

THE GIS at the site identified the water main as a 110mm PE main installed by pipe bursting a pre-existing 100mm AC water main. The plumber is advised by the water authority that there is a pipe burst AC water main and therefore the main must not be exposed. The plumber is also advised to excavate a 300mm hole above the tapping location that is to be filled with water and fenced off appropriately the day before the pipe is to be tapped. The following day the water authority will excavate the main, remove all broken AC water pipe and surrounding soil. The exposed AC water pipe ends will be painted to seal them. This leaves a clean PE pipe for the public and water authority workers to install the PE tapping band. The plumber may then backfill the site.

Pipe reaming

54. This technique is similar to pipe bursting. However, during pipe reaming, drilling fluid is pumped into the existing AC pipe and, as the reaming tool attached to the new pipe comes forward, the pipe fragments are captured in the drilling fluid along with some of the soil which is then flushed down stream to the receiving pit. The resulting mixture of mud, soil and pipe fragments is asbestos waste and therefore must be collected for disposal in accordance with WHS law, including the relevant asbestos removal code of practice or compliance code, and environment protection law. The asbestos waste must only be disposed of at a disposal facility licensed by the environment regulator to receive that type of waste.

55. As with pipe bursting, the resulting asbestos waste cannot be left in the ground to contain the release of asbestos fibres—it must be removed unless the WHS regulator approves another method of asbestos management.

56. Unless the water agency can completely remove all resulting asbestos waste, pipe reaming should not be carried out.

57. If broken AC pipe fragments from pipe reaming are left in the ground, following permission by the WHS regulator or as a result of pipe-reaming that occurred before 31 December 2003 (when the asbestos ban took effect), the water agency remains responsible for managing the associated risks. This includes minimising contact with fragments that remain in the ground and removing the fragments when they become exposed during repair or maintenance activities.

New rehabilitation techniques

58. New techniques for rehabilitating AC pipes are emerging. A water agency is permitted to use any rehabilitation technique they deem appropriate so long as all applicable laws are complied with.

Sites of previous AC water and sewer pipe removal, replacement or rehabilitation

59. If prior to 31 December 2003 AC pipes have been replaced, removed or rehabilitated in a way that resulted in asbestos waste remaining enclosed in the ground (e.g. through methods such as

pipe bursting), the asbestos waste is permitted under WHS laws to remain in situ. However, the responsible water agency must take steps to ensure risks to community health and safety are minimised. These steps should ensure that future users of the land do not unknowingly expose themselves to abandoned asbestos waste. The water agency or person with management or control of the site must:

- Ensure, as far as is reasonably practicable, that the known sites are safe in respect of risks to health and safety resulting from the enclosed asbestos waste. This might include removing all broken AC pipe and contaminated soil in the vicinity of future tapings, fittings and repairs, as they occur.
- Keep an up-to-date asbestos register for the site, which may include identifying the location, depth and length of the asbestos waste and have that available for inspection.
- Make a copy of the asbestos register available to workers, their health and safety representatives and provide a copy to other agencies or contractors who carry out work at the workplace that involves a risk of exposure to airborne asbestos.
- Ensure that all environment protection law requirements are complied with. For instance, sites where there is in situ asbestos waste may need to be declared as contaminated sites.

Appendix A: Checklist

The below list of questions may assist in ensuring that that relevant factors are taken into account when determining an appropriate and safe method for managing AC pipe. It is not an exhaustive list.

Relevant matters	Comments/considerations
Have you accessed and reviewed the **asbestos register** for the site? Is the AC pipe listed on the register, including details about its condition?	
Is there an **asbestos management plan** for the AC pipe? If so, have you accessed and reviewed the plan?	
Have you referenced relevant **laws and codes of practice** as well as the water agency's policies and procedures for managing AC pipes?	
What is the process for consultation with all relevant persons with management or control of the workplace? For instance, if it is public land, how will the Council be consulted about the method of AC pipe management?	
Is **sampling and testing** needed to determine the condition of the AC pipe? If so, how will asbestos exposure risks be managed?	
Has a **risk assessment** been completed to determine the risk of exposure to asbestos fibres that includes consideration of: > **Location** of the AC pipe (depth in the soil, on public or private land, near public facilities or other service infrastructure) > **Condition** of the AC pipe (failure rates, signs of deterioration, whether the pipe is whole or fragmented) > Whether the AC pipe is **decommissioned** or still **in use** (to assess future maintenance requirements)	
What **methods of managing the AC pipe** are reasonably practicable taking into account the risks of asbestos exposure? > Will any of those methods eliminate exposure to asbestos fibres now and/or into the future? > If elimination of asbestos exposure is not reasonably practicable, what methods will best minimise the risk of asbestos exposure?	
Are **regulatory approvals** required for the work? For example, environment protection or work health and safety regulator approval for specific activities.	

Is **public communication** required to address any community concern about the work?	
Is the work being carried out in accordance with the **Safe Work Method Statement** (SWMS)?	
Is the work undertaken or supervised by someone with an **asbestos removal licence**? What type of licence do they have? Is it current?	
Are all workers appropriately **trained**?	
Is the appropriate **personal protective equipment** provided and worn?	
Does the work area have **barricades and clear warning signs** to alert people in the vicinity of the potential risk of asbestos exposure?	
How will the resulting **asbestos waste**, including contaminated disposable PPE, be disposed of?	
Is a **clearance inspection** required by an independent competent person to ensure all asbestos is removed?	
How will any remaining AC pipe left in-situ be managed?	
Who will be responsible for revising the **asbestos register** after the work is completed?	

Research into new practices

The Water Services Association of Australia (WSAA) have undertaken research into issues associated with AC pipes. WSAA's research notes that due to the long useful life of water infrastructure much of what has been installed is still in use. However, due to the age of the assets and failure rates, a steady increase in the number of AC pipes that require renovation or replacement is predicted.

CIPP Class A Liners

An investigation was completed in 2019 into the use of Class A (fully structural) cured-in-place-pipe lining products and their use in asbestos-cement (AC) and cast iron (CI) water pipes. Lining systems can extend the life of assets. The advantage of using liners in AC pipes is that by extending the life of the AC pipe the interaction between workers and AC pipe is reduced (compared to lift and relay replacement), the pipe remains controlled under the water agency's asset management system, and trenchless replacement technologies reduce community impacts and costs. This project produced two documents: (1) Performance requirements and evaluation methods and (2) a product and installation guide. These document feed into a larger CRC project outlined below.

Deterioration Model for AC Pipes

This project will produce a deterioration and failure prediction model for AC pipes and is due for completion at the end of 2020. The failure modes for AC pipe were identified and a theoretical model of pipe failure mechanisms was developed using data from Australian water utilities. A team at UKWIR has concurrently developed a model for the United Kingdom and both teams were able to share data and compare results of the models developed. These models predict break rates (breaks/km/yr) and the likelihood that a particular pipe may fail at least once in a particular year. Asset managers can use these models to understand current and future behaviour of existing pipeline systems to assist with budgeting, renewals planning and risk management of their pipeline systems.

CRC-P Smart Linings for Pipe and Infrastructure

The Smart Linings Project is a $24m, three year project funded through the Cooperative Research Centre (CRC) Program and participants from the water industry. The CRC Program supports industry-led collaborations between industry, researchers and the community. This project builds on the previous two projects but focuses on four types of lining products and looks at their application in water and wastewater assets more generally.

The project involves over 30 participants from utilities, manufacturers, liner applicators and universities collaborating to provide confidence in lining products. For example, a utility provides a test site to install a product, a manufacturer provides a product, a liner applicator applies the product and a university tests the installed product materials in a laboratory. The project will produce Codes of Practice and Product Standards to provide guidance to the water industry on cured-in-place-pipe and spray liners for water pipes, and calcium-aluminate-cement and geopolymers for sewer applications. Sensing technologies are also being developed to provide quality assurance on installed products.

For water infrastructure eight of ten field trials have been completed, three of these in AC pipes, and extensive product testing at universities is being undertaken. Technical workshops were held in five capital cities around Australia in October and November 2019 and included a detailed update on the

project's progress and findings. All the presentations are available at the project's website. The Codes of Practice and Product Standards are in their second draft. Sensors for both water and wastewater linings have been prototyped and are undergoing field testing. A second round of technical workshops will be held in early 2021.

Together these projects seek to improve the way that the water industry can manage AC pipes by providing confidence in products that can extend the pipe's service life.

Contacts and resources

State and Territory work health and safety information

https://worksafe.tas.gov.au/asbestos-safety

https://worksafe.nt.gov.au/licensing-and-registration/asbestos

https://www.commerce.wa.gov.au/worksafe/asbestos

https://www.worksafe.qld.gov.au/injury-prevention-safety/asbestos

https://www.safework.nsw.gov.au/hazards-a-z/asbestos

https://www.accesscanberra.act.gov.au/app/home/workhealthandsafety/worksafeact

https://www.worksafe.vic.gov.au/asbestos

https://www.safework.sa.gov.au/

https://www.comcare.gov.au/safe-healthy-

State and Territory information about asbestos safety

www.asbestos.qld.gov.au
www.asbestos.nsw.gov.au
www.asbestos.act.gov.au
www.asbestos.vic.gov.au
www.asbestos.sa.gov.au
www.asbestos.nt.gov.au

Industry contacts

Water Services Association of Australia:
https://www.wsaa.asn.au/

The Water Directorate (NSW):
https://www.waterdirectorate.asn.au/

Environment protection information

https://environment.des.qld.gov.au/

https://www.epa.nsw.gov.au/

https://www.epa.vic.gov.au/

https://epa.tas.gov.au/epa

http://www.epa.sa.gov.au/

https://www.epa.wa.gov.au/

https://ntepa.nt.gov.au/

https://www.accesscanberra.act.gov.au/app/answers/detail/a_id/3149/~/environment-protection

Resources

Model WHS Codes of Practice

(see local versions adopted in Queensland, New South Wales, Australian Capital Territory, Tasmania, South Australia, the Northern Territory and the Commonwealth):
How to manage and control asbestos in the workplace
How to safely remove asbestos

WA Codes of Practice:

Management and control of asbestos in workplaces [NOHSC:2018 (2005)]- Safe Work Australia
Safe Removal of Asbestos [NOHSC:2002 (2005)] - Safe Work Australia

Victorian Compliance Codes:

Managing asbestos in workplaces