SOCIAL RESEARCH REPORT

Asbestos Waste

NSW ENVIRONMENT PROTECTION AUTHORITY

HEARTWARD

STRATEGIC

Table of contents

Table of contents 2
Executive summary 3
About the research 3
Key findings 3
Summary of conclusions 5
Recommendations - in brief 6
About the research 7
Research context & aims 7
Research method 9
Analysis framework – COM-B model 13
Research findings 15
Information sources 15
Asbestos journey map 18
Asbestos waste journey – generation of waste 20
Asbestos waste journey – disposal 31
Motivators and barriers to safe and legal behaviour 53
Intervention opportunities 73
Conclusions & recommendations 79
Appendix A – Screener for qualitative interviews 89
Appendix B – Qualitative interview guides 96
Appendix C – Quantitative questionnaire 119
Appendix D – Key baseline survey frequencies 143

Executive summary

ABOUT THE RESEARCH

'Asbestos' describes a wide range of materials that are hazardous to human health and are found in vastly different amounts and conditions in and around the built environment. In NSW, significant amounts of asbestos waste are generated each year, that then must be disposed of, and volumes are predicted continuing rising over coming decades. Heartward Strategic has undertaken social research to provide guidance on how to increase safe and lawful behaviour in relation to its disposal and to set a baseline of key measures in relation to asbestos waste. The research, conducted in June – September 2020, comprised: 12 stakeholder consultation sessions with relevant authorities and industry/professional bodies; 32 qualitative research sessions with asbestos waste generators, asbestos removalists and transporters, waste facility staff, local government representatives and private certifiers; and an online survey with a representative sample of 2,702 NSW adult residents.

KEY FINDINGS

INFORMATION SOURCES

- Local council was considered the right authority to provide information and help residents dispose of all forms of hazardous household waste. However, just 15% said they had heard from council on the topic of asbestos in the last 12 months.
- The NSW EPA was seen as a similarly relevant, credible source of information and was revealed as trusted, but just 16% said they had heard from the EPA on this topic in the last 12 months.
- Many appear to rely heavily on the advice of professionals, not all of whom have relevant training in asbestos, with few community members actively seeking out information on asbestos.

THE ASBESTOS WASTE JOURNEY

- The research revealed that the full journey of asbestos waste can be usefully considered as the stages of: pre-awareness, awareness, encountering, preparation, removal, handling, transport, preliminary disposal, transport, final disposal, unlawful re-entry.

GENERATION OF ASBESTOS WASTE AND PREPARATION FOR DISPOSAL

- In the last 2 years, 4% of the community has lived in or owned a property where asbestos waste was generated, and 15% of relevant workers have had asbestos-related activities occur in their workplace.
- Asbestos waste was reportedly generated through demolitions, renovations and refurbishments, but was also already be in existence on properties, or was brought in from somewhere else.
- How asbestos waste will be disposed of is not consistently considered prior to works commencing, limiting the extent to which it is factored into quotes, budgets and timelines.
- As part of approvals processes for work on residential properties, asbestos need not always be identified and addressed, and requirements vary by development type and council area. Certifiers do not undergo asbestos-related training and their oversight is limited by development standards and conditions of consent.
- When engaging professionals, homeowners do not always know what to look for by way of licences, line items in quotes, or proof of remediation and correct disposal. This facilitates poor decision-making by property owners and opens the way for undercutting on fees for removal and disposal by professionals.

- Licensed asbestos removalists are the party most commonly involved in deciding how to dispose of asbestos waste (reported to be involved by 43% of those with asbestos waste on their property in the last 2 years) and actually disposing of it (52%), with tradespeople and building/demolition professionals the next most commonly involved (34% and 25%, respectively).
- Precautions taken when preparing waste for disposal were variable even where professionals were involved; 65% reported that PPE had always been used (most commonly gloves), 64% that waste had always been wrapped, and 55% that waste had always been labelled.

DISPOSAL OF ASBESTOS WASTE

- Fibro was the most commonly reported form of asbestos disposed of (mentioned by 78% of those with asbestos on their property in the last 5 years) and a garbage bag full the most common amount (33%). However, many discussed disposing of other materials from older buildings (carpet underlay, lino, etc), with no thought that they may contain asbestos.
- 25% of community members dealing with asbestos waste in the last 5 years reported improper methods of disposal, most commonly leaving it on-site once it had been removed (11%) or putting it in a kerbside collection bin (7%). Those disposing of asbestos waste improperly were skewed male, younger, and Sydney-based. Improper methods are more likely where the amount is small. Risk to those further down the waste chain is infrequently considered (53% of all survey participants said they had never given thought to what happens to asbestos once it is disposed of).
- Professionals observe unscrupulous business models and illegal disposal practices that are impacting their own business viability as well as potentially putting the community at risk. Some legitimate operators are struggling to stay involved in asbestos disposal.
- Asbestos waste transportation is undertaken by many different parties from generators to removalists, as well as those who are professional transporters, including skip bin companies. Understandably, transporters are focussed on ensuring that any loads which are not meant to contain asbestos, actually do not. Otherwise this is problematic and costly at the tip face.
- WasteLocate has not yet been widely and consistently adopted due to uncertainty over when it must be used, technology and administrative issues, and a lack of belief in the effectiveness of the system.
- Short or longer term 'stockpiling' is common among professionals (29% say this always or usually happens) and is primarily driven by waste site opening times and a desire to wait until they have enough to warrant a trip.
- Waste sites reported being variably impacted by a reliance on customers to be aware of and declare the presence of asbestos in their waste, little recourse where customers do not, and the impracticality of guaranteeing waste or recovered resources are entirely free of tiny fragments. All agreed that rejected loads were problematic.

MOTIVATORS AND BARRIERS TO SAFE AND LEGAL BEHAVIOUR

A range of barriers to safe and legal disposal were revealed, relating to deficiencies in:

- **Psychological capability** – Just 18% of the community feels it knows a lot about asbestos and key gaps in knowledge were identified – 32% were unaware that asbestos can't be disposed of at any waste site, 30% that it can't be wrapped in any material, and 26% that it is treated in a special way at waste sites. 52% agreed that they would have no idea how to dispose of any asbestos on their property.
- **Physical capability** – Not all professionals handling asbestos waste appear sufficiently trained and experienced, even where a Class B licence is held.

- **Physical opportunity** – Cost was persistently raised as a critical cause of unlawful and unsafe behaviour, particularly where the need for disposal had not been factored in early on, and also creates opportunity for profiteering. Among professionals, lack of equipment and qualified staff were also barriers.
- **Social opportunity** – Cues are taken from the actions of those looked to as 'expert', problematic where unsafe behaviour is role modelled, and participants also spoke of mixed messages from authorities. *On the flipside*, reputation motivates particularly business owners, and the community generally believes generators have a duty to dispose of waste safely (82% agree).
- **Motivation** – This research identified a reluctance to take responsibility for asbestos waste across the journey. *On the flipside*, concern for health and safety is motivating, particularly where the reasons for requirements are understood, and consequences of non-compliance can factor into decision making.

INTERVENTIONS

- Interventions suggested spontaneously by participants included: more community education; tightened licensing requirements and mandatory training for workers dealing with asbestos; asbestos registers and stronger mechanisms for keeping track of asbestos waste; a greater focus on those operating entirely outside of the system, while encouraging those trying to do the right thing; and making small volume disposal more convenient and cost-effective.
- All EPA-generated intervention ideas tested attracted widespread support. Free asbestos home/property assessments were most strongly supported (65% 'strongly' support), but a door-to-door asbestos collection service was thought likely to have the biggest positive impact by those with direct experience with asbestos.

SUMMARY OF CONCLUSIONS

This research confirms that significant proportions of the NSW community are faced with the problem of having to make decision about asbestos waste and its disposal. Regardless of the volume or type of asbestos waste, those making decisions about its disposal share similar needs and concerns:

- Keep self and loved ones safe
- Maintain or increase asset value/profitability
- Avoid distress and concern
- Minimise personal responsibility/exposure to liability
- Minimise costs, delays, inconvenience
- Protect reputation
- Avoid scrutiny, detection, penalties

The research also reveals that there are several stages to the asbestos waste journey at which poor decision-making is evident. Choices and behaviours along the asbestos waste chain are underpinned by significant deficits in capability, opportunity and motivation to act safely and in line with the law. These include:

Capability barriers	Opportunity barriers	Motivation barriers
Deep knowledge gaps Overestimation of capabilities Lack of specific training Erosion of practical skill development Varied skills among licensees Absence of licensing (demolition & transport) Lack of specific or formal training Admin or tech literacy limitations	Cost of proper handling & disposal Time pressures Limited disposal options (small pieces, licensed waste sites) Equipment/expertise not readily available Workplace norms/culture 10m^2 sends a mixed message Price cutting impacts bus. viability Multiple authorities confuse DA process inconsistent Regulatory compliance pressures Lack of clarity re: Wastelocate	Asbestos a 'hot potato' Fear of possible consequences Perceived cost and inconvenience Lack of immediate health impacts Perceived lack of enforcement/ imposition of penalties

Consequently, many, including property owners, professionals and other workers that interact with these parties across the waste chain, engage in unsafe and unlawful disposal of asbestos waste.

Few doubt the scale of the problem of asbestos in NSW, but there is doubt as to the ability of the systems currently in place to adequately address the issue. Ultimately, those seeing themselves as legitimate operators want to feel supported in their actions, while those engaging in poor conduct are held to account.

RECOMMENDATIONS - IN BRIEF

- Facilitate earlier consideration of asbestos and its disposal
- Be transparent and consistent
- Provide practical options especially for small quantities of asbestos waste
- Ensure better linking of tracking and oversight across relevant authorities
- Adopt a leadership role with education
- Review training and licensing requirements
- Encourage compliance, supporting the impulse to do the right thing

About the research

RESEARCH CONTEXT & AIMS

BACKGROUND TO THE RESEARCH

Asbestos is a naturally occurring group of minerals which, due to their favourable properties, were used extensively in building materials in Australia from the 1940s. When in fibrous form, however, asbestos can be easily breathed in and become trapped in the lungs, increasing the risk of several types of cancer, including mesothelioma. Due to these health risks, asbestos building products were phased out during the 1980s and eventually banned in 2003. Asbestos-containing materials remain an ongoing risk to the Australian community and environment as more than 4,000 people die each year from asbestos-related disease, and it is estimated that one in three houses in Australia contain asbestos.

Asbestos waste

The term 'asbestos waste' describes a wide range of materials in vastly different amounts and conditions that can require disposal; from small fragments to tonnes of asbestos-containing materials and in conditions ranging from friable material, through to bonded forms and even including asbestos-contaminated soil. Indicating the potential scale and complexity of the issue, asbestos was used in over 3,000 different building products.

Significant amounts of asbestos waste are generated in Australia (with NSW appearing to dominate the other states and territories on absolute and per capita measures) and asbestos waste volumes are predicted to continue to rise over the next 20 years. Ensuring safe and lawful transport and disposal of asbestos waste is crucial in safeguarding the public and the environment as such waste moves from its point of generation through to where it ultimately rests.

In NSW, asbestos waste should be properly prepared for waste disposal at its point of removal, through careful wrapping and labelling by appropriately trained and protected workers. Larger volumes should be logged and tracked on its journey to its final destination, which should be a waste disposal facility licensed to receive it (generally a site licensed by NSW EPA). The licensed facility is also required to accept, handle and immobilise asbestos waste appropriately to protect the health and safety of waste workers and safeguard the public and environment longer term. Due to its hazardous nature, there are additional costs associated with the preparation, transportation and lawful disposal of asbestos waste above those applying to other forms of waste.

Improper and illegal disposal of asbestos waste is a problem in NSW. Improper disposal refers to waste disposed of through existing waste disposal channels that are not licensed to accept asbestos waste. This most commonly includes improper disposal of asbestos in residential bins and general waste skip bins, and through direct delivery to unlicensed waste disposal and resource recovery facilities. Illegal disposal of asbestos waste refers to any other method of disposal that does not use licensed waste disposal facilities; most commonly, asbestos is illegally disposed of through burial or dumping on private and public land and dumping in waterways. Previous research has found that asbestos waste is improperly or illegally disposed of by a wide range of different parties including homeowners and tenants, building and demolition workers, transport and waste workers and crime syndicates.

Asbestos waste policy and management

The NSW EPA is the lead agency for the coordination of asbestos management in NSW alongside the NSW Asbestos Coordination Committee (NACC). These organisations are charged with protecting and maintaining health and safety for the community and the environment through safe and lawful management of asbestos waste.

The NSW Asbestos Waste Strategy 2019-21 (the Strategy) sets out a multifaceted approach to asbestos waste management in NSW across the 'asbestos waste chain', from the planning of maintenance or renovation work, through to final burial or immobilisation of any asbestos waste generated. The Strategy's actions aim to intercept

and improve poor asbestos waste management across the chain of asbestos disposal responsibility which includes the asbestos waste generator, removalist, transporter and disposal facility. The Strategy aims to increase lawful behaviour (wrapping, tracking and disposing of asbestos at the right location) and identify, minimise and, ultimately, prevent improper and unlawful behaviour. Mechanisms by which behaviour change could be effected through the Strategy include: communication campaigns; new or adapted programs or initiatives; and regulatory approaches to increase awareness, reduce barriers and increase compliance. The strategy outlines six approaches that will help to improve asbestos waste management, including: making lawful disposal easier and cheaper; increasing awareness and changing behaviour; closing loopholes and increasing transparency; disrupting unlawful business models; and monitoring and evaluating progress.

Asbestos safety social research

To maximise the efficacy of efforts to protect and maintain public and environmental health and safety, there was a need to fill information gaps and build an evidence base to inform and evaluate key initiatives relating to asbestos management in NSW, including waste. To this end, the EPA initiated the Asbestos Safety Social Research program.

The first phase of this research program focused on understanding how to increase safe and legal behaviour in home maintenance and renovation situations, up to the point of removal of asbestos waste from the property. It included qualitative and quantitative research with members of the NSW general public, as well as homeowners and professionals who have recently undertaken renovation and maintenance work on homes built before 1990 (and which are likely to contain asbestos materials).

The Asbestos Waste Social Research, the subject of this report, follows on from this first phase of research and focuses specifically on the asbestos waste chain, once asbestos becomes waste and either leaves the home maintenance, or renovation site or is disposed of onsite. It was guided by a review of existing relevant research findings; a workshop with key stakeholders in relation to asbestos waste; and a follow-up planning session with the EPA Waste Strategy team. Ultimately, the findings reported here will support the design of effective behaviour change interventions that meet the objectives of the NSW Asbestos Waste Strategy.

RESEARCH OBJECTIVES

The intent of this research project is to support asbestos waste management policy decision-making and intervention development by filling key gaps in understanding. It also sets a baseline of key measures of knowledge, attitudes and behaviour in relation to asbestos waste, which will facilitate tracking of the performance of the NSW Asbestos Waste Strategy 2019-21 against key measures related to asbestos waste and its management.

Specifically, the research sought to meet the following objectives:

- Fill gaps in understanding of the asbestos waste journey from generation to final (lawful or unlawful) disposal.
- Investigate knowledge, attitudes and behaviours towards safety and risk, and lawful and best practice asbestos waste management and disposal procedures.
- Explore communication channels, relationships with stakeholders, sources of trusted information and the role of education and training.
- Understand the levels of lawful and unlawful disposal behaviour, and the drivers and barriers to this, including challenges and trade-offs along the asbestos waste journey.
- Gauge awareness, attitudes towards and usage of WasteLocate, and reasons for this.
- Identify key intervention opportunities upon which successful education and behaviour change initiatives can be based.

RESEARCH METHOD

The research commenced with an inception meeting between the EPA Project teams and Heartward Strategic to begin a collaborative and productive working relationship and to access existing knowledge within the EPA team and confirm the research method, which consisted of explanatory qualitative research followed by a quantitative research component. The rationale for, and details of, each component are described below.

STAKEHOLDER CONSULTATION

The aims of consulting relevant stakeholders at the beginning of this research were to:

- Ensure the program builds upon existing knowledge held across the very broad asbestos waste landscape.
- Access insights on issues and target audiences that are not feasible to include in primary research, such as illegal dumping.
- Engage stakeholders, communicating the importance of the research and their position as key stakeholders in asbestos waste management.
- Test and refine existing insights and frameworks about asbestos waste, including the waste-specific journey maps from previous research, to support questioning in subsequent components of the research.

Consultation sample

A total of twelve (12) sessions were held with representatives from key stakeholder groups in asbestos waste management, including:

1. The relevant authorities
    - NSW EPA waste compliance
    - NSW EPA illegal dumping teams
    - NSW local government
    - Safework NSW
2. Construction and demolition industry bodies
    - Responsible Construction Leadership Group
    - Master Builders Association
    - Housing Industry Association
3. Asbestos professional bodies
    - Asbestos Removal Contractors Association NSW
    - Asbestos and Hazardous Materials Consultants Association
4. Waste and recycling industry bodies
    - Waste Management and Resource Recovery Association Australia
    - Waste Contractors and Recyclers Association
5. Australasian Land & Groundwater Association

Sample recruitment

The EPA identified the stakeholders for this consultation and worked and made contact with stakeholders by email to notify them of the research and invite them to participate. Details were then passed on to Heartward

Strategic and the Heartward Strategic principals made direct contact to try to secure an appointment for the interview.

Incentivisation of participants

No financial incentive for participation was offered or provided. Invitations to participate highlighted the benefit of being able to contribute to community, worker and environmental safety through this research process. Participants were offered a summary of the consultation findings further along in the research process, which all were interested in receiving.

Conduct of stakeholder sessions

All 12 sessions were scheduled and conducted by the principals of Heartward Strategic between June 3 and 21 July 2020. Some interview sessions included multiple participants participating together on behalf of the stakeholder organisation. All sessions were conducted remotely to cater for the COVID-19 restrictions via Zoom or Microsoft Teams video conferencing, with end to end encryption in place. Participants were briefed to ensure their setting during the interview provided sufficient privacy and quiet to facilitate confidentiality.

An interview guide, including specific lines of questioning relevant to each stakeholder, and allowing for further exploration of emerging topics, was used, designed by Heartward with input from the EPA. Where consent was provided, the sessions were audio-recorded for use in data analysis by the researchers. No research outputs attribute responses to individuals or organisations and where possible identifiable comments have been edited to omit potentially identifying attributes.

QUALITATIVE RESEARCH

This stage of the research constituted an intensive exploratory research process for the purposes of:

- providing greater understanding of key actors in the asbestos waste chain;
- extending existing knowledge and frameworks;
- filling gaps in understanding of the journey of asbestos waste from generation to final disposal; and
- supporting the development of relevant questions and prompts for the community baseline survey.

Qualitative approach

Qualitative research methods were adopted given their flexible and non-directive/open-ended approach, which is essential for exploratory research informing strategy and behavioural interventions. Specifically, qualitative interviews and site visits facilitated access to the breadth and depth of people's views, behaviours and experiences.

Qualitative sample

This qualitative exploration comprised 32 research sessions including n=27 extended interviews and 5 site visits (the latter included at shorter interviews with 2 -5 individuals in different roles at each site). Due to COVID-19 restrictions in pace at the time, one of the five site visits was conducted as a series of interviews via Zoom.

The audiences that were included in this stage of the research included:

- 12 asbestos waste generators, since the decisions and actions of this group set asbestos materials on their journey to disposal as waste and is also involved at times in removing asbestos, consigning asbestos waste to transportation, transporting the waste to disposal facilities and/or perpetrating improper disposal or illegal dumping:
    - 4 owners of properties containing asbestos materials requiring disposal (also called 'site owners in previous' research); and
    - 8 property development, construction, landscaping and demolition workers.

- 4 licensed asbestos removalists (both licence holders Class A and Class B), which is the audience most commonly consigning and preparing asbestos waste for transportation and disposal and may also transport and dispose of asbestos waste at waste facilities.
- 5 professional transporters, that move asbestos waste for disposal and about who there was little known about their decisions, actions and experiences in the asbestos waste journey.
- 5 waste facility visits, incorporating discussions with 17 staff and management, as this audience receive of asbestos waste and make decisions that may determine whether asbestos contaminated waste is lawfully and safely finally disposed through improper resource recovery, rejected loads or poor management of historical disposal sites.
- 3 local government representatives involved in waste management.
- 3 private certifiers (A1 through A3) involved in the building certification process.

The sample was structured to cover metropolitan and regional areas of NSW within each audience group. A spread of participants across demographic variables, such as age, socioeconomic and cultural background was included. A full description of the sample appears in Appendix A.

Sample recruitment

A combination of recruitment approaches was applied to secure participants from these low incidence audience groups, including:

- networks and contacts including participants from previous research and stakeholder workshops;
- a professional qualitative recruitment agency; and
- assistance from LGNSW and EPA, which secured introductions and permission to visit waste sites.

Recruitment scripts were produced by Heartward and provided to EPA for comment and approval. These ensured that recruitment activities identified quality participants fitting the research specifications, while conforming to relevant codes of conduct, privacy legislation and ethical protocols. It was stressed to participants that there would be no consequences or repercussions from anything that was observed or discussed during the interviews and visits.

Incentivisation of participants

A financial incentive of a $150 Giftpay electronic voucher was offered to facilitate recruitment of participants, with the exception of local government representatives and waste sites, where no financial incentive was offered.

Conduct of journey interviews and site visits

All fieldwork was conducted between August 3 and September 14, 2020, by Heartward Stategic's three principals. Due to COVID-19 social distancing requirements and community attitudes to in-person meetings, all interviews were conducted remotely using either telephone or Zoom or MSTeams videoconferencing, based on participant preference. Interviews were of 60-75 minute duration, while site visits (four of which were conducted in person) were between 2 and 3 hours duration. Where consent was provided and it was feasible (recording was not always possible during site visits due to noise), research sessions were audio recorded for later reference by the researchers during analysis. Fieldwork notes were taken for all sessions.

Qualitative tools

Recruitment specifications were agreed with the EPA prior to recruitment and a modular, semi-structured interview guide was used to direct the flow of the interviews, ensure coverage of relevant stages of the waste journey and questions of interest for each audience, as well as allow for unanticipated issues to emerge. It can be found Appendix B.

Qualitative data analysis and reporting

To ensure data quality, qualitative analysis was based on triangulation of data, with team members testing and retesting findings to ensure they reflected the sample as a whole. Heartward Strategic principals collaborated to identify common themes, and areas and magnitude of consensus and divergence.

In this report, quantitative findings are reported separately to the qualitative findings, but included under the same broad headings. All findings reported are derived from across the relevant sample, though, where relevant, specific audiences of interest are examined.

QUANTITATIVE RESEARCH

Quantitative research was conducted to:

1. establish a robust baseline of key measures of knowledge, attitudes and behaviour in relation to asbestos waste management among the general NSW community; and
2. help evaluate the performance of education and behaviour change interventions under the NSW Asbestos Waste Strategy 2019-21.

Quantitative sampling

A baseline has been established with an online quantitative survey of n=2,702 NSW adult residents aged 18 years and older. Quotas based on gender, age (six age brackets) and location (greater Sydney versus rest of NSW) were applied, calculated based on ABS census data, to ensure that the sample represents the population from which it is drawn. All quotas were met to within +/- 5% and it was deemed that no post-weighting of data was required.

To maximise chances of ensure individuals working in relevant professions related to the asbestos waste journey were included in a robust manner in the survey sample, without specific quotas being set, such individuals were pre-targeted with survey invitations (based on employment information known about panelists). This is the approach that was taken in the Phase 1 quantitative research and was managed to avoid unduly skewing the sample overall.

Quantitative tools

All lines of questioning included in the questionnaire were informed by the preceding stages of this research, as well as past knowledge accumulated through prior research, and developed in close consultation with the EPA and other relevant stakeholders. This ensured the survey built on the earlier community survey, avoiding unnecessary duplication, and focusing on waste-specific and communication-related issues. The survey length was on average, 13 minutes.

The survey flow included the following sections:

1. Screener questions
2. Asbestos communications
3. Asbestos disposal experiences
4. Asbestos disposal attitudes and knowledge
5. Asbestos disposal intervention testing
6. Demographics

The full questionnaire can be found in Appendix C.

Quantitative data collection

McNair yellowSquares, an accredited survey fieldwork provider, was engaged to provide access to a panel of individuals pre-registered to complete online surveys, to manage sample deployment, survey invitations and reminders, and data collection through programming and hosting the online survey. McNair yellowSquares holds ISO accreditation for market, opinion and social research and all work was conducted according to the Australian Privacy Principles and the Market Research-specific Industry Privacy Principles.

The fieldwork dates were 10 – 30 September 2020. Fieldwork proper was pre-ceded by a small technical pilot to make sure the survey was functioning as it should. Several modifications were made to the survey after examination of the pilot data.

Data analysis and reporting

Quantitative data analyses, conducted by Heartward Strategic using industry-leading SPSS software, focused on answering the project objectives, providing an evidence base to support qualitative findings and the strategic recommendations. Descriptive statistics were analysed for each survey question, and significance testing conducted to ascertain key differences (at the 95% confidence level) by audience group for key questions.

This report to a certain extent weaves together both description and interpretation of the research findings in its main body. A further layer of interpretation is provided at the end alongside the recommendations arising from the research. In particular, applying the COM-B model, described below, requires meaningful interpretation of behaviours, opinions and experiences expressed by research participants, rather than reporting only what was said, recorded or directly observed.

Across the main body of the report, the qualitative research findings are first discussed, with break out boxes used to report relevant quantitative findings.

ANALYSIS FRAMEWORK – COM-B MODEL

For this research, a behaviour change framework was applied to data collection and analysis. The purpose of this was to ground any emergent findings within the relevant context and facilitate the provision of strategic guidance about increasing safe and legal asbestos waste behaviours among the audiences in this research.

The validated COM-B model, developed by Susan Michie and colleagues[1] to guide policymakers in developing behaviour change interventions, has been applied to direct the research approach and questioning and to frame the data analysis. The COM-B model provided a systematic method to understand the nature of the behaviour to be changed, in this case safe and legal disposal of asbestos waste, and the different components to consider. Application of this framework allows for the diagnosis of factors driving, and barriers to, safe and legal behaviour, to guide strategy and support the development and prioritisation of behavioural interventions.

This model identifies three categories of behavioural influences (Capability, Opportunity and Motivation), which each have two dimensions, resulting in six key factors that facilitate behaviour. Each will be explained below.

CAPABILITY

In the COM-B model, capability considers both physical and psychological aspects that pertain to an individual. Physical capability refers to people's physical ability to undertake a specific behaviour or change their behaviour, while psychological capability explores their awareness and understanding of the behaviour or changes and how they can be implemented including knowledge and comprehension of relevant information. To be capable of the desired behaviour, people must have the knowledge and mental capacity to act (psychological capability), and they must have the physical skill and ability to act (physical capability).

[1] Michie, S., van Stralen, M., and West, R. (2011) The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science*, *6*(1).

OPPORTUNITY

Opportunity focuses on those social and physical factors external to an individual that nevertheless impact behaviour. Sources of social influence can be friends, family, authority figures, perceived experts such as tradespeople, or the broader culture that supports or discourages certain behaviours. Physical influences include any aspect of someone's environment, including access to resources such as time and money. To have the opportunity to do the desired behaviour, people must have societal permission to act (social opportunity), and they must have the resources and tools to act (physical opportunity).

MOTIVATION

"Motivation is defined as all those brain processes that energize and direct behaviour, not just goals and conscious decision-making. It includes habitual processes, emotional responding, as well as analytical decision-making" (Michie, van Stralen, & West, 2011). The motivational factor influencing behaviour therefore includes reflective motivation, or people's conscious reasons for doing or not doing something, as well as automatic motivation, or the unconscious processes that drive or inhibit behaviour. To be motivated to do the desired behaviour, people must consciously consider it the right action (reflective), as well as be supported by unconscious and habitual drives to act this way (automatic).

Taken together, an understanding of relevant audiences in terms of what is inhibiting and driving their behaviour across all these dimensions provides a comprehensive picture that can support behaviour change measures.

Research findings

INFORMATION SOURCES

The previous Asbestos Safety Social Research specifically explored use and perceptions of information sources about asbestos, including in relation to safety and removal. In the current research project, this topic was explored specifically in relation to information about asbestos waste, as it was raised spontaneously in qualitative conversations and, specifically in the quantitative survey (see survey results in the breakout box below).

In keeping with the previous research, few indicated seeking out information about asbestos waste from authorities. It was mentioned by a number of stakeholders, professionals, council representatives, waste site workers and property owners that local councils are the obvious authority to communicate with property owners and other residents about asbestos waste, in the same way they communicate about other harmful household waste like e-waste and chemical waste. There was an expectation that councils proactively communicate on this topic and offer services to assist property owners to help them dispose of their asbestos waste appropriately.

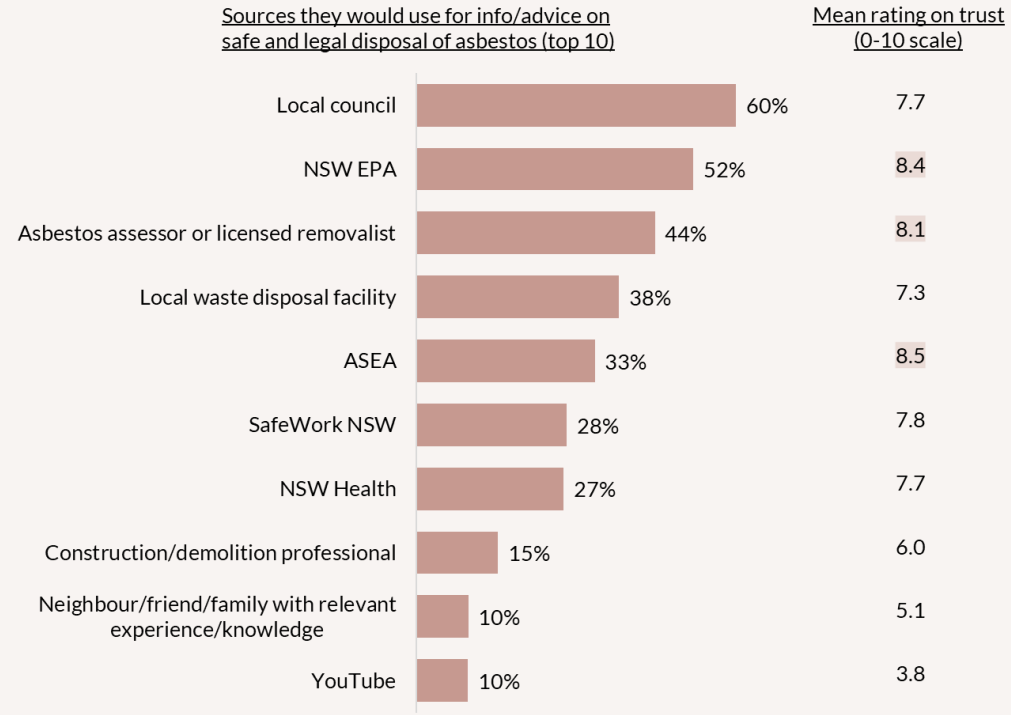
Given this expectation, there was a perception of comparative silence on the topic of asbestos waste on the part of local councils, relative to other forms of waste. In this void, it appears to fall to other parties, such as asbestos professionals, other professionals, skip bin operators and waste sites, to educate community members about safe and lawful disposal of asbestos waste. Some participants from these parties feel that community education in part falls to them, and have taken steps towards this, described in more detail in the 'Motivators and Barriers – Physical Capability' section of this report. Waste generators appeared to rely heavily on what they had passively heard about asbestos waste disposal from these sources, rather than actively seeking out information if they had asbestos to deal with, and did not tend to question the accuracy or reliability of this information.

As in the previous research, some reluctance to contact councils directly to seek advice was evident among those engaging in renovations for fear they might then attract scrutiny or a fee, or get in trouble if they had not sought proper approvals or did not comply directly with advice. The wider concern was that it would somehow impact the value of their property, either in terms of their inability to proceed with renovations or because there would be a record of the presence of asbestos. This is indicative of the stigma that surrounds asbestos, as discussed in 'Motivators and Barriers – Automatic Motivation'.

Speaking to council representatives themselves as part of this research, revealed considerable variation in the approaches being taken by individual council to tackle the issue of asbestos waste, and the level of attention and focus going to this topic. It does seem clear that councils are not necessarily instituting comprehensive programmes to deal with asbestos waste. Barriers mentioned by council representatives typically centred on resource constraints amidst competitive priorities and within a crowded agenda. While some council representatives spoke of asbestos waste being a huge issue for their council and something they were very focused on, other representatives seemed not to have asbestos particularly on their radar, with little knowledge of the extent to which it was being considered more broadly by their council.

If in need of information or advice about safe and legal disposal of asbestos, 52% of all survey participants said they would turn to the NSW EPA. Only local council was a more frequently chosen option of 15 supplied. NSW EPA was also revealed as a trusted source of information, attracting a mean rating of 8.4 on a scale from 0 (do not trust at all) to 10 (trust completely), putting in on a roughly even footing with ASEA (8.5) and slightly ahead of asbestos professionals (8.1).

Figure 1. Where the community would go for information and how trusted the information sources are



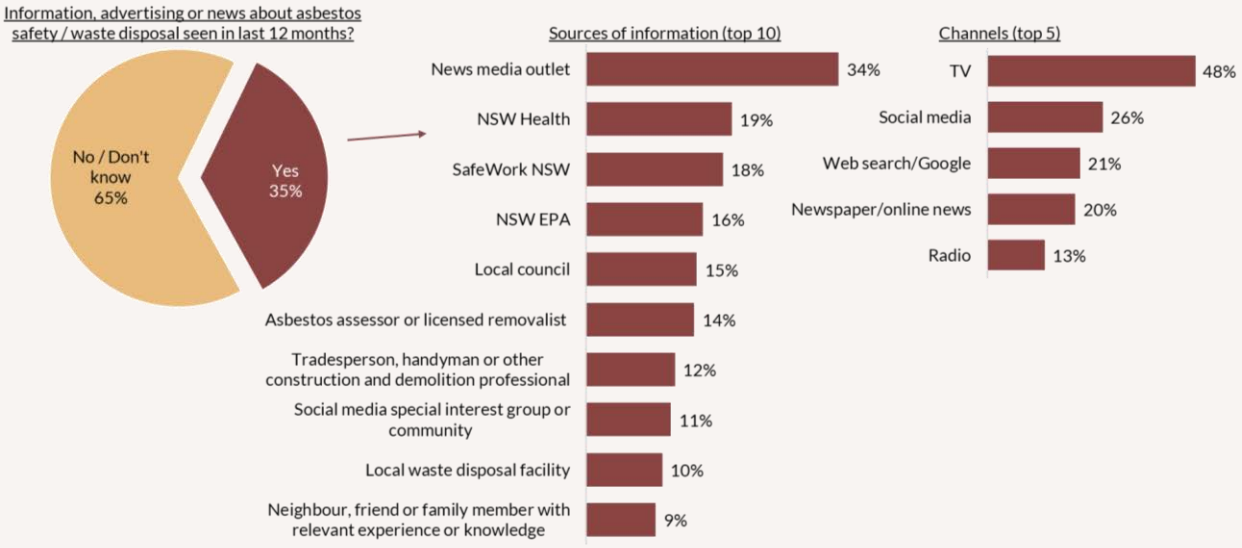
Q5.1 If you needed information or advice about safe and legal disposal of asbestos, which of the following sources of information would you use?
Q5.2 Please rate how much you trust each of these sources to provide reliable information about safe and legal disposal of asbestos?
Base: All research participants (n=2,702)

Local council and the NSW EPA were almost commonly mentioned parties individuals would contact to report illegally dumped waste suspected to be asbestos. They were nominated by 72% and 60% (respectively) of participants agreeing that they would report something like this (n=680).

Just over a third (35%) of all survey participants recalled having seen or heard something about asbestos safety or asbestos waste disposal in the previous 12 months. As illustrated in Figure 2, most typically, these participants reported the source as a news media outlet (34% of those recalling something from the past 12 months), with 16% believing they had seen or heard something from the NSW EPA.

For those who had encountered asbestos on a property they lived in or owned in the last 2 years (n=81), asbestos professionals (mentioned by 33%), building and demolition professionals (16%), and local waste disposal facilities (15%) were a greater source of information in the last 12 months than for participants overall. Among workers in industries likely to expose them to asbestos in a work setting (n=81), SafeWork (33%), colleagues (19%) and training providers other than SafeWork (16%) were particularly common sources of information, with formal (14%) and informal training (24%) key information channels.

Figure 2. Sources and channels of information about asbestos seen in the last 12 months



Q1.2 In the last 12 months, have you seen or heard any information, advertising or news about asbestos safety or asbestos waste disposal? [Base: All participants (n=2,702)]
Q1.4 Where did you come across this advertising or information? [Base: Those saying 'yes' at Q1.2 (n=937)]
Q1.5 Who was providing this information or who was behind this advertising? [Base: Those saying 'yes' at Q1.2 (n=937)]

ASBESTOS JOURNEY MAP

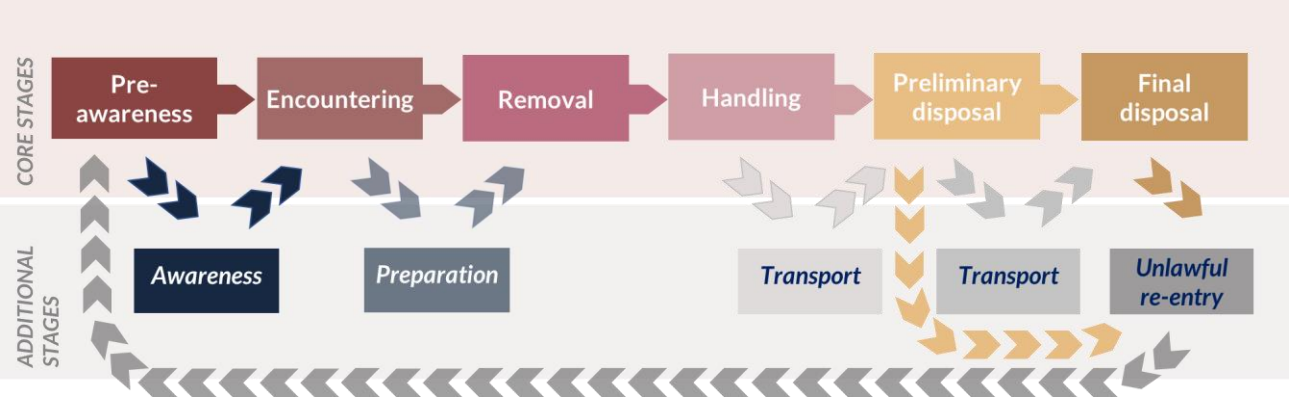
This research sought to fill gaps in understanding of the asbestos journey from generation through to disposal of asbestos waste. Arriving at an agreed journey map can provide an aligned mental model and shared understanding across multiple stakeholder groups and enable effective communication and decision making. The EPA has undertaken previous research to understand the journey of various actors in the asbestos waste disposal process[2]. This research generated maps based on the experiences and actions of particular actors in the asbestos waste journey through time. Given the large number of actors in the journey from generation to disposal of asbestos waste and the lack of continuity in their involvement from beginning to end, there remained a need for an overarching map of this process.

The interpretative map presented in this report provides a representation of the entire process from pre-awareness of any asbestos and before the asbestos waste is generated right through to its disposal. Rather that represent the experiences of actors, rather it represents the journey of the asbestos waste itself. The goal of the journey is not then the actor's goal, but the safe and lawful disposal of asbestos waste.

In the map, the asbestos waste journey is represented by sequential stages, with multiple actors potentially involved in each stage. The stages provide a cohesive narrative about the journey of asbestos waste upon which strategic opportunities for intervention can be understood.

This map is based on a review of previous research and literature, as well as the findings of the primary research conducted during all three stages of this research. The map is shown below and a detailed description follows.

Figure 3. Asbestos journey map



The top of the map shows those core stages in the process that typically occur when asbestos waste is generated and disposed of, while the bottom of the map shows those stages that may or may not occur in relation to the generation and disposal of asbestos waste:

- **Pre-awareness** – At this first stage, building professionals, property owners and residents are not aware that asbestos is on a particular site, and may or may not be aware that it is a possibility. The asbestos may or may not have been considered in any planning (for example, budgeting).
- **Awareness** – At this stage, awareness of asbestos may occur before the asbestos is actually encountered. With this awareness comes the possibility of advance planning for how the asbestos is going to be managed. This may involve interactions with council or building professionals including assessors and contact with the asbestos during maintenance or cleaning.
- **Encountering** - Initial decisions about the asbestos and first actions are now taken. The asbestos may either just have been discovered or may have been known about already. At this point information or

[2] Meld Studios (2017) Asbestos Disposal Behavioural Research Customer Experience Mapping Final Report
The Customer Experience Company (2019) Phase 1: Understanding the Waste Tracking Ecosystem

advice may be sought, and professionals may be consulted. Decisions may be taken to either leave the material in place or to remove it.

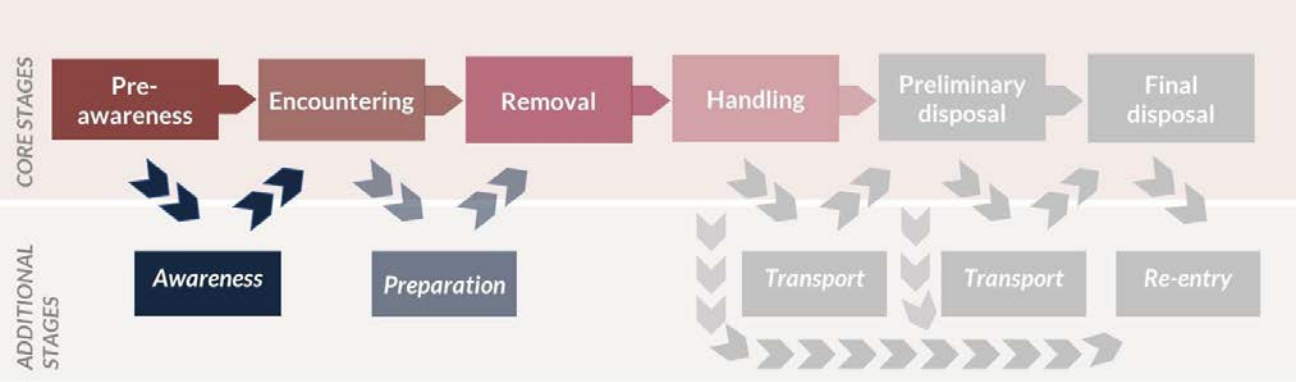
- **Preparation** – Actions may be taken after asbestos has been encountering to prepare for its removal. This can involve further information-seeking, acquiring knowledge or skills, gathering equipment and determining who remove the asbestos (e.g. engaging professionals).
- **Removal** - Asbestos containing material is removed from the place where it was found. At this point, the asbestos is removed from its original location. This may involve interaction with parties doing removal and information seeking on waste disposal options.
- **Handling** – Once removed, asbestos waste is handled in preparation for disposal. There may be interaction with waste contractors.
- **Transport** - Transportation of asbestos may occur after its removal if it is immediately taken to be disposed (otherwise it may be temporarily or permanently disposed of on-site).
- **Preliminary disposal** – Sometimes asbestos is moved to a new location before it is finally disposed of. This can include on-site disposal, disposal in a kerbside bin, illegal dumping, disposal at a waste site or anywhere else. There may be interaction with waste contractors and waste sites.
- **Transport** - Subsequent transportation may occur after asbestos has already been removed from its original site. This can occur if contractors have stockpiled asbestos or accumulated it at one site before final disposal, or if asbestos waste improperly disposed of needs to be disposed of correctly by someone else (e.g. council clearing up illegally dumped asbestos).
- **Final disposal** – At this final core stage, asbestos has been taken to and lawfully disposed of at a waste facility that can lawfully accept asbestos waste, which has moved it to its final location. The time between preliminary and final disposal may be short (such as a few days) or very long (many years, for example in the case of waste buried on site by former owners/contractors). At this stage there are interactions with waste sites and disposal receipts issued.
- **Unlawful re-entry** - Asbestos may re-enter the system as fill or recycled materials after removal through intentional or inadvertent unlawful disposal.

This asbestos waste journey map provides a backdrop against which the research findings and their implications can be framed.

ASBESTOS WASTE JOURNEY – GENERATION OF WASTE

This chapter of the report discusses findings specific to the early stages of the asbestos waste journey up to the point at which it leaves the site where it was generated (i.e. where it became waste). These include the pre-awareness, awareness, encountering, preparation and removal stages shown in Figure 4. This chapter focuses only on waste-related findings relevant to these stages of the asbestos journey. A separate report from the *Asbestos Safety Social Research* reports in detail on issues relevant to awareness, encountering and removing asbestos from residential properties in NSW.

Figure 4. Stages of the asbestos waste journey covering generation of the waste



PRE-AWARENESS, AWARENESS & ENCOUNTERING STAGES

Generation of asbestos waste

The research identified many different scenarios under which NSW property owners generate or encounter asbestos waste. These include, most commonly, when:

- demolishing asbestos-containing structures;
- renovating or refurbishing asbestos-containing structures;
- incidentally coming across asbestos waste on the property (for example, during landscaping, gardening or other activities on the property); and
- inadvertently or knowingly accepting asbestos waste onto the property, either temporarily or permanently.

As illustrated in Figure 5, below, findings from the quantitative survey suggest that 24% of the NSW adult population has ever lived in or owned a property where there was asbestos that was removed or moved, with 10% having encountered asbestos in this way in the last 5 years, and 4% in the last 2 years.

To provide a proportion comparable to that produced in Phase 1 on the broader Asbestos Safety Social Research program which focused on home owner-occupiers, 6% of 'relevant homeowners' (those living in a pre-1990 home which they own) had had asbestos moved or removed on their property in the last 2 years.

43% of survey participants reported living in *or* owning an investment property built prior to 1990 at the time of the survey (40% living in). Among these participants (n=1,161), the proportion reporting having encountered asbestos in their property in the last 2 years rose to 6%.

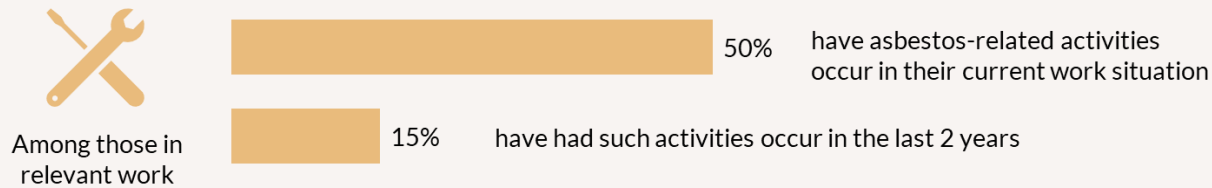
67% of those who had lived in or owned a property where there was asbestos that was removed or moved in the last 2 years (n=121) reported that there had been just a single situation where asbestos was removed/moved; 29% reported that there had been 2-3 such situations.

Figure 5. Participants who had lived in/owned a property where asbestos was removed/moved

Q2.1 Have you ever been living in or owned a property where there was asbestos that was removed or moved?
Q2.2 When was the most recent time that asbestos was removed or moved on a property you were living in or owned?
Base: All quantitative research participants (n=2,702)

The quantitative sample included 189 participants working in 37 occupations identified as having the potential to expose them to asbestos containing materials. Most commonly, these participants worked in site management (n=43), building maintenance (n=28), painting (n=22) as a builder (n=21), in carpentry (n=20), or as an electrician or in electrical services (n=20). As illustrated in Figure 5, below, of these participants, half reported that asbestos-related activities involving the generation, handling, transportation and/or disposal of asbestos waste occur in their current work situation, although just 15% said this had last occurred in the last 2 years.

Figure 6. Participants encountering asbestos waste as part of their employment



3.1 In your current work situation, which of these asbestos related activities ever occur? [Base: All in relevant work (n=189)]
3.1a When was the most recent time that asbestos waste related activities occurred in your current workplace? [Base: Those reporting that asbestos waste is removed, prepared for disposal, transported and/or disposed of in their current work situation (n=94)]

Participants indicating that such asbestos-related activities occur in their current work situation were asked to specify what percentage of the work involves such activities. Reflecting the diversity of work situations represented, there was huge variation in responses, which ranged from 1% to 80%. Participants most commonly gave a response between 5% and 20%.

Consideration of asbestos waste at time of generation

In keeping with previous research, this research found that many of those generating asbestos waste requiring disposal were not aware of the presence of asbestos prior to encountering it on or in their property. It also uncovered widespread lack of attention to, or consideration of, disposal aspects when starting works that might generate asbestos waste. This included failure to consider:

- any responsibilities or obligations as the generator of the waste;
- the disposal options available, including where it can be disposed of locally;
- what is safe and lawful in terms of transportation and disposal; and
- practicalities such as how to handle and prepare asbestos for disposal, and likely cost of disposal.

This lack of consideration was both self-reported among homeowner generators and observed by other parties interacting with them, such as asbestos removalists and C&D workers. Where professionals were involved, such as in larger projects involving demolition or renovation, it was reported that homeowners tended to still be unsure about some or all of the points listed above, even after asbestos had been removed from their property. Homeowners' strong reliance on professionals to know the safe and lawful actions to take regarding asbestos waste, to make relevant decisions and/or to handle the removal and disposal, often without the homeowners' involvement, was apparent, and is confirmed by findings from the quantitative survey (Figure 7, below).

Stakeholders, and professionals interacting with homeowners generating asbestos waste, observed that the lack of consideration of asbestos waste disposal at or before the point at which it was generated leads to a cascade of decisions that can result in this waste being less likely to be disposed of safely and legally. It was noted that, where the disposal of asbestos waste is not considered prior to its generation (for example, before embarking on a property demolition, landscaping/excavation or renovation), the practical requirements for its safe and lawful disposal are less likely to have been factored in to budgets, quotes and timelines, limiting the scope for the right decisions and actions to be taken.

> *"A developer might buy a site and they simply pay too much for the site and the feasibility is not really there then they will potentially look at the short cuts, like, 'I've got three building tenders here, I might just go with this cheaper alternative'. Same with the builder, if a builder will quote something and then realise, 'Gee, I've actually quoted this way too low', they potentially will take short cuts."* Building and development

There was perceived to be a lack of ownership of the problem of asbestos waste disposal by generators from the start, a dilution of perceived responsibility where multiple parties are involved, and a passing of this responsibility to those subsequently working on the problem.

CASE 1: LACK OF CONSIDERATION AND RELIANCE ON PROFESSIONALS

Property owner

"The house mover said there was asbestos eaves, which I hadn't thought about. But he said that was okay, he was legally allowed to cart a certain amount or remove a certain amount. I don't know what that amount is, so he cut the house into three sections to move it and he had to remove some of the eaves. I daresay he would have disposed of it properly, being a professional house removalist person. The funny thing though, he cut through some of it and left it hanging there while it was being moved; other parts, he removed bits of it, and it didn't come here with the house, so I would assume that he disposed of it properly. That wasn't really my issue, because that was his problem, but when it came here and it was put here, it still had some of the asbestos eaves left over. Well some of it was broken, so I actually just removed it and bagged it and put it in a bag, and it wasn't a lot, it was just a small amount, you know, just the bits that were hanging off and broken and then my builder came in and replaced it all with, I actually bought the proper eave linings, fibre cement ones. So he came in recently and replaced all of that, and I don't know what happened to the old ones. I don't know how qualified he is… I can't even remember what happened to [the bits that I bagged], I'm thinking it just went to the tip. I think it did, either in a bin or in the truck because I had a big truck come and take all of the old horsehair plaster out and I think it may have ended up in there, like he took a lot of rubbish with him and that was just dumped at a local tip."

Role of planning and development processes

Stakeholders, owner-builders and representatives from building and development companies noted that, currently, asbestos waste generators are not consistently required to identify and address asbestos as part of approvals process for work on residential properties. Commercial developments were perceived to be subject to greater oversight than residential developments. It was also mentioned that those working on government contracts are required to adhere to particularly high standards (encouragingly, processes developed on such jobs, can then carry across to other jobs).

Discussions with local council representatives also revealed significant variation across council areas in terms of requirements for development applications and the level of scrutiny applied to developments on properties where asbestos might be present.

Research participants identified issues with the different types of development consents relevant to asbestos waste:

1. Exempt developments, Asbestos-containing structures can be demolished and removed without any approvals required, or oversight from any third parties, such as a private certifier. In these cases, it is perceived to be easy to avoid scrutiny and any repercussions for inappropriate handling and disposal of asbestos waste.

   "If you erected it as exempt development, you can demolish it as exempt development." Approvals and certification

2. Complying development. Concern was expressed by stakeholders over a lack of oversight of private certifiers or indication of whether private certifiers are correctly discharging their duties. Further, private certifiers were believed by some to be (and some themselves felt they were) only expected to work with what is required by the development standards, which do not focus on hazardous waste.
3. Development with consent. Seen as less problematic than exempt/complying developments as there is perceived to be closer scrutiny of these types of developments. This said:
   - The amount of asbestos being removed during refurbishment, construction or demolition can easily be not fully declared at the application stage.
   - Councils differed in the extent to which they scrutinise the asbestos-related aspects of a development (for example if the structure being demolished contains asbestos). For example, waste management plans are not always required to be submitted with a development application.
   - Private certifiers certainly noted that conditions of consent relating to asbestos waste are not consistently applied to development applications, and there is no standard wording for conditions of consent that are applied (either within or across council areas). As such, even where there is asbestos waste generated, this may be entirely outside of what the private certifier needs to consider or sign off on.
   - Several private certifiers noted that site inspections do not always (or even usually) align with any asbestos-related activities completed on site, and evidence of safe and lawful handling and removal of asbestos needing to be supplied to them would be limited to paperwork – they would not be making any inspections themselves. Paperwork might include, as specified in the conditions of consent, such things as a tip receipt, although the certifier may or may not have any means to verify whether the correct amount of asbestos was covered by that tip receipt. Private certifiers did speak of knowing of instances where other certifiers certified without inspecting but pointed out that this has no relevance for the question of asbestos as no asbestos is ever inspected by them.

Overall, there was a perception that councils and certifiers are focused more on the extent to which the finished development meets relevant codes, rather than the process by which the development came to be completed. Private certifiers noted, for example, that there is huge variation in how consent conditions, obviously set by council, are worded. For knockdown rebuilds, documentation oftentimes needed to be provided to them up front

– for example, a copy of the clearance report is required to be shown to the certifier before the construction certificate can be issued. However, in other developments, the consent condition was simply that disposal receipts were to be provided at the end of the project.

> *"Under the complying development criteria there's a requirement that asbestos removal be carried out by a licenced contractor, that we be provided with a copy of that contract for issuing the complying development certificate, and at the end of the demolition that we be provided with receipts of disposal as to where that material has gone to, with the weights and the dates, etc, of that disposal."* Approvals and certifications

> *"A developer buys a site or a person wants to re-develop site, and it's got an existing house on it, and they want to put up a townhouse development or something similar you know, happens every day of the week. Council when it considers that application, if the applicant wants to, can include demolition as part of that application. And council would then consider the demolition of those dwellings as part it's determination of the development application."* Approvals and certification

Some stakeholders spoke of refurbishments/renovations being more problematic than knock down rebuilds in the handling and disposal of asbestos waste. In the absence of an asbestos register or adequate site assessment, the former can involve unexpected discovery of asbestos and an immediate need to dispose of it. In contrast, asbestos can be easier to plan for and control in a knock-down rebuild, with ideally all asbestos removed from the site prior to commencement of the build.

Some pointed out that even if a project is subject to multiple site inspections across its development, it is still possible to avoid scrutiny in relation to how any asbestos is removed from the site. For example, one is able to not declare any asbestos in the structure to be demolished. One is also able to – and one participant felt this would certainly happen from time to time – demolishing an asbestos-containing structure quickly early in the morning before any inspectors might come around. Certifiers admitted looking to see if asbestos has been removed completely was not really a focus of their inspections at the early stages, though others disputed this, citing stringent processes they follow.

> *"One of the mandatory inspections is footings prior to the pouring of concrete. If when you're inspecting the footings, which are an excavation into the ground, you see that someone has surreptitiously buried asbestos, you're then going to be raising it. That's really just as a by-product, not as your main function or what you're looking for but being aware of well that's not right, what needs to happen."* Approvals and certifications

> *"Prior to starting a demolition there's an inspection, which says okay, are all the mandatory safety precautions in place, has the notifications taken place, advising neighbours that asbestos is going to be removed. There are criteria that need to be met and also under WorkCover they have similar criteria, and then at the end of, so then they we start the process and then at the end of the demolition we're required to go back and say yes, it's been done. As part of that inspection you're doing an emu-bob, walking the site to see if there any loose asbestos laying on the surface, is there any indication that this has been done, if the demolition has been done appropriately or if it's not been done appropriately. If I'm finding broken pieces of asbestos on a site that's giving me cause of concern to say, was this removed in full sheets, was this removed in accordance with the requirements of the Australian Standards and WorkSafe? I'd be looking for a clearance certificate to say this has been properly dealt with, issued by appropriately qualified asbestos expert."* Approvals and certifications

Involvement of professionals

Many different audiences participating in the research observed that there is reduced scope for unlawful or unsafe actions in relation to asbestos waste disposal where professionals are involved in work on a property, particularly when asbestos professionals (removalists, occupational hygienists) are involved. The demolition, landscaping and building and construction workers participating in the research differed in the extent to which they reported typically anticipating, looking for, planning for and quoting on the removal and disposal of asbestos present on site. Many did report explicitly doing this as part of their overall contracted work, which was more likely among those who personally, or someone in their business, held a class A or B asbestos removal licence. This appeared to be common among those in demolition and also among some of those in building and construction, even though the removal and handling of asbestos was not their primary business.

Stakeholders and professionals mentioned that the potential for undercutting on fees for removal and disposal of asbestos by different types of professionals, facilitates poor decision-making by property owners when it comes to whether and how asbestos on their property will be removed and disposed of. For example, there is no rule obliging quotes for residential work to include mention of asbestos removal and/or disposal, so property owners are potentially not comparing like with like when assessing quotes and selecting the cheapest. Professionals are very aware of, and report that some are exploiting, these differences.

For those for whom asbestos was not a core part of their business, there also seemed to be variation in the extent to which professionals were prepared to take on any of the risk associated with dealing with asbestos. For example, for unexpectedly discovered asbestos, some spoke of ceasing work and advising the homeowner or primary contractor of the discovery of any asbestos, and refusing to continue work until they were shown evidence that the asbestos had been removed, while others would deal with the asbestos as best they did, in order to complete their work on time and budget.

CASE 2: IMPACT OF LOW-PRICE COMPETITORS

Licensed Asbestos Removalist

"I go to quote jobs all the time and the quotes that I have to compete with, you just know people are doing the wrong thing. If you incorporate tipping fees, incorporate wages, incorporate the hygienist costs, you just know that this person isn't doing this correctly and I think now with Corona too, I think there'd be a lot of people who probably can't get work and just think 'let's just give this a go'. All you do is just sign up to one of these work apps you get sent the work all the time, I have a garage or I have a bathroom, so all it takes is for someone to turn up. I've gone to jobs before where the price has been so ridiculously low and I've said to the customers whoever's given you this price can't be doing the right thing and people will say well I don't care, that's his problem."

CASE 3: PLANNING FOR ASBESTOS FROM THE BEGINNING

Property Developer

"When we buy a site, we will have a look at the property itself. Most the properties we have bought have been the older style homes which end up getting demolished, and then we do the development. So with my partner's experience in building, we first go and have a look at the house to find out if it's rentable, it certainly does help in that period while we are waiting for council to obtain approval. We'll obviously do what we can to make it as rentable as possible, so small improvements but at the same time we go in there and we look at if there are any elements of asbestos as well. And that is for a couple of reasons, one from a safety perspective but two, also from a cost perspective because we know that, come time for demolition, we'll need to factor in additional costs to remove the asbestos. Now we are fairly fortunate, our demolition company is also an accredited asbestos removal company as well, so that has been really good for us because they essentially can do both jobs in at the same time, obviously they remove the asbestos first and then they'll do the demolition but it certainly helps from our point of view in doing that

process. We will actually get a quote from the demolition company before we essentially buy. It's not a fixed price contract, but we have dealt with these guys a number of times and from a business sense sometimes they will do a project that ends up a bit easier than they initially thought and sometimes there's things like this where it costs a little bit more so our relationship with them is pretty good. Ifs it's a lot more, that just essentially comes out of the contingency that we put aside of the 5 percent construction cost."

PREPARATION & REMOVAL OF ASBESTOS

In keeping with previous research, a number of different parties were reported to be involved in moving or removing asbestos from NSW properties that then needed to be disposed of. While licensed removalists appeared to be frequently involved, the research also found that property owners, unlicensed demolition and building professionals, handy people, and friends and family members were also removing asbestos. As in previous research, the level of attention and care paid to removing asbestos safely, lawfully and completely, was found to be related to a number of factors, including:

- level of prior awareness of and planning for the removal of the asbestos;
- involvement of licensed asbestos removalists;
- quantity and condition of the asbestos;
- level of knowledge and experience of the person removing the asbestos;
- practical constraints (e.g. limitations in terms of time, cost, access to resources and materials); and
- personal values and ethics of the person removing the asbestos.

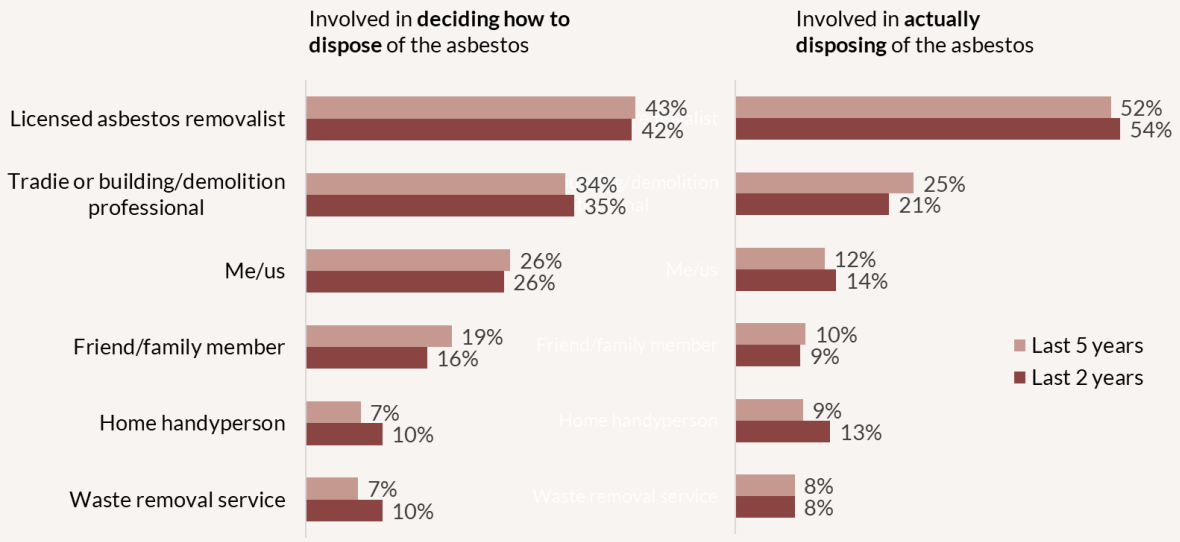
Although the involvement of licensed asbestos removalists was reportedly associated with greater compliance with best practice, in terms of safe removal of asbestos, the research also revealed inconsistent or minimal adherence to safety best practice, even among some who hold an asbestos removal license. This was based on both self-reported behaviour and behaviour reportedly observed by other research participants and appeared to be related to the extent to which asbestos removal was a core part of the professional's business offering. As noted above, a number of demolition and building workers participating in the research reported that they or a colleague hold an asbestos removal license (usually class B) because they frequently encounter asbestos in their work and they have chosen to deal with it within the business, rather than call in an external professional.

In other cases, businesses will use the same external providers consistently, having built up trust that their processes and actions are lawful and safe.

> *"I have known them for a number of years from a professional point of view and they provide us the asbestos clearance certificates that we need, and then we provide that to the council as part of complying with that condition. And look, from my point of view yes, there's people out there that don't do the right thing and there's people that do do the right thing and yes, you never know 100%. But I am reasonably confident that these guys are doing everything the correct way that they should be doing."* Building and development

As illustrated in Figure 7, below, findings from the quantitative survey suggest that licensed asbestos removalists are the party most commonly involved in both deciding how to dispose of asbestos waste and in actually disposing of asbestos waste, with tradespeople and building/demolition professionals the next most commonly involved. In terms of personal involvement, 26% of research participants who had had asbestos removed or moved on a property they were living in or owned in the past 2 years, indicated they had decided how to dispose of the asbestos, with 14% actually claiming to have disposed of the asbestos themselves.

Figure 7. Parties involved in deciding how to dispose, and actually disposing, of asbestos waste



Q2.4 When asbestos was moved/removed from your property in the last 2 years, who was involved in…?
Base: Asbestos removed/moved on a property they were living in/owed in last 5 years (n=265) / last 2 years (n=121)

HANDLING OF ASBESTOS WASTE

There was considerable variation in approaches described by those handling asbestos that was removed from its original location and prepared for disposal. Participants in the research reported actions across a full spectrum from apparent best practice, through to complete absence of safe handling and preparation practices. For example:

- Property owners and building workers reported demolishing fibre-cement walls, chipping off bathroom tiles, pulling up carpets and moving pieces of fibre cement sheeting without the use of any PPE at all. Some reported incomplete use of PPE, such as the use of gloves only, and some did not wet, wrap or label asbestos prior to disposal. Property owners also reported wrapping asbestos fragments in plastic shopping bags or other forms of plastic.
- Landscapers reported digging up and turning over pieces of fibre cement sheeting during excavation and landscaping works when they would only be wearing gloves, and typically either leaving it in place of putting into a bucket to deal with later.
- Demolition workers, skip bin transporters and one asbestos removalist reported picking up small pieces of fibre cement sheeting with limited or no use of PPE.

Asbestos in demolition

Most professionals in this research were in some way or at some stage involved with whole or partial demolition of buildings, whether by removing asbestos before the demolition work, conducting the work, overseeing the work, removing the waste or building on the site after the work, or whether inspecting the work. Given this demolition work is largely being carried on older buildings, dealing with asbestos was considered a prominent feature of demolition.

> *"In any demolition, anything prior to 1988 will have asbestos. You've always got to assume that. If you're doing a straight demolition, the Australian Standard says well you should be doing a hazardous materials report, which should be identifying all the hazardous materials, including asbestos. Then for an applications for alts and adds for a building that was built prior to 1988, where they are pulling down eaves or say knocking down a back half of a house, you've got to be thinking that that building would have asbestos in it. Anything prior to 1988 assume it's asbestos." Approvals and certifications*

Asbestos is such a core part of demolition, that demolition companies (including those in this research) were often known to hold asbestos removal licenses. Having said that, some participants considered some demolition companies to be unscrupulous, carrying out this work in an unsafe way. Among professionals, this part of the industry was known for cutting corners, having low standards and completing dubious hazardous materials reports.

CASE 4: ABSENCE OF CHECKS AND BALANCES IN DEMOLITION

Private Certifier

"The demolisher is required under the Australian Standard 2601 to do what's known as a hazardous materials report survey, and identify the various hazardous materials within the property, whether they be PCB's from fluorescent light-fittings or lead or asbestos, anything in that regard to do a proper survey. But I would say that's one of the great failings of the demolishing industry in that I don't think they do it well. First of all where this goes wrong is where people make a conscious decision to break the law, because it will cost them money for the demolition and there is still a significant number of people who will do that. The demolition industry is known to be rogues. Then where it falls down is the inappropriate identification of hazardous materials. Who prepares this hazardous material report? What expertise do they have? Is it truly independent? This is what needs to happen - to follow it up. There's no double check on it at the moment. I have to ask myself, do I take it on face value? Well if it says it's just got asbestos it in, the volume level looks right, I'll accept it. That's the nature of the beast. Who prepares it? It's prepared by the demolisher, the owner wouldn't have the skills. So, the demolisher or a contractor to the demolisher or an employee would prepare it. I don't believe there's a requirement for it to be a separate contractor or independently prepared.
I would like to see more emphasis put on the formatting and expertise and diligence around the hazardous materials report and the way the person carries it out. I'd love the Australian Standard to have a template of the type of [hazardous materials] report that would be there, or even for WorkSafe to give us a template on a report that the industry could use, so they know exactly what the expectations are. That would be most helpful."

For those directly involved in demolition, disposing of asbestos waste safely and lawfully can be difficult, given the various uses it served and the number of places it can be located. Once the excavation equipment moves in, participants reported that the licensed asbestos removalist was typically no longer on site, which made disposal of any suspected remaining ACMs challenging.

> *"I come in when the asbestos is meant to be removed there are often bits and pieces in various places like on the stumps, buried under the house or under dirt, behind vegetation, or there are remnants of old sheds or fences and bits stuck under nail heads or stuck to bricks in walls that have been re-sheeted over so you wouldn't know it."* Demolition and site preparation

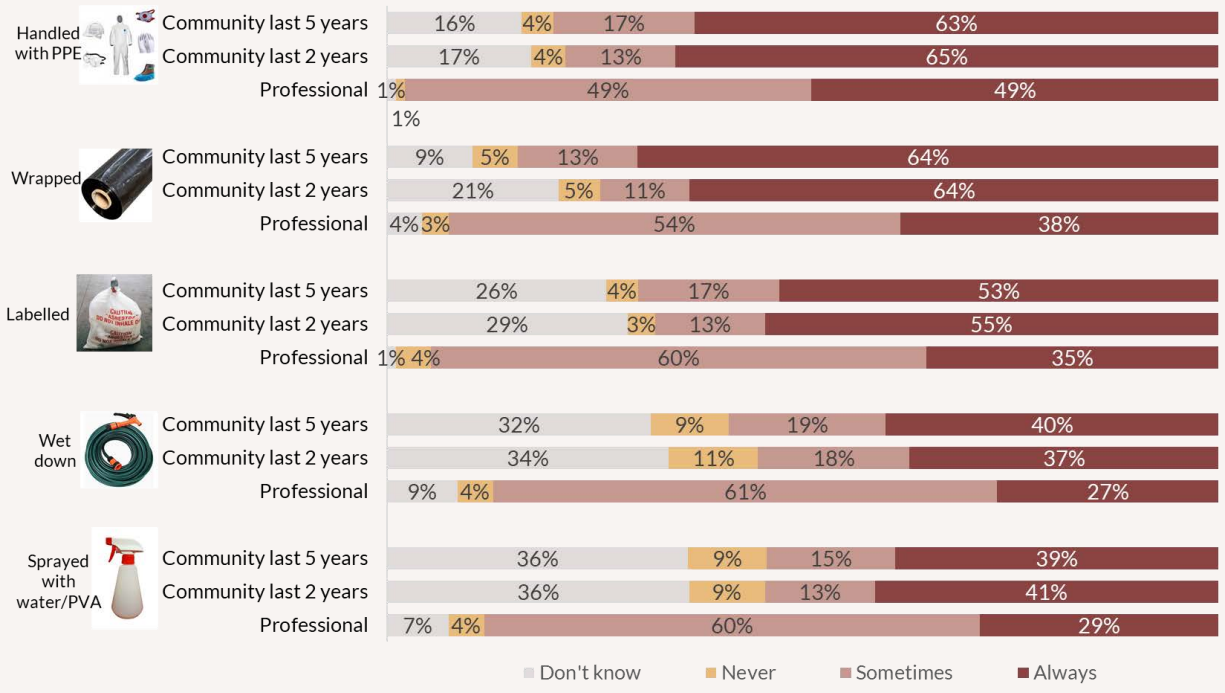
Instances were reported of demolition and excavation workers putting themselves and others at risk in removing and disposing of remnant asbestos waste on demolition sites. In some cases, no expertise or PPE is available, as the assumption by site management is that all asbestos has been removed. Further, these workers may not have had any formal training in the identification or safe handling and disposal of asbestos.

As illustrated in Figure 8, below, survey participants reported being aware of a range of safety precautions being taken when asbestos waste was handled on their property (general community members) or in their workplace (professionals).

Overall, the use of PPE was the most commonly reported safety precaution undertaken. Covering or spraying asbestos with a water and PVA mix was the least most commonly reported safety precaution undertaken, although among professionals it was mentioned as at least sometimes undertaken roughly as often as wetting down the asbestos.

For all safety precautions, a smaller proportion of professionals than community members perceived that the precaution was always taken when asbestos waste was handled. The relatively high use of the 'don't know' response options by general community members relates to a lack of complete oversight of the process by those outsourcing work to professionals.

Figure 8. Safety precautions taken when asbestos waste was handled



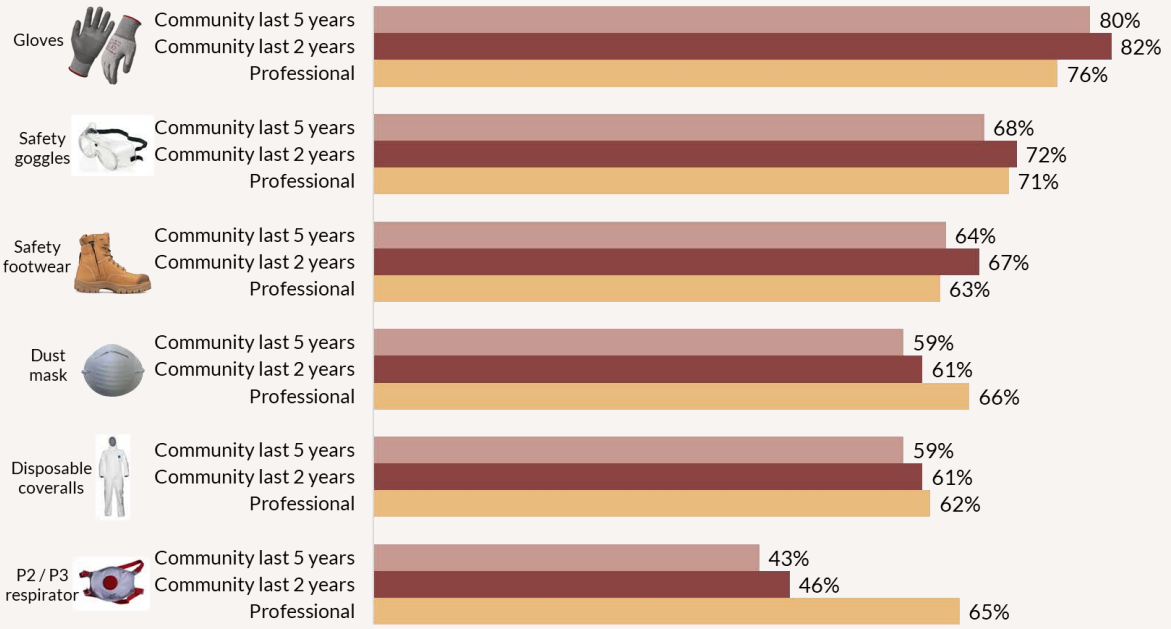
Q2.5 When asbestos was moved/removed from your property in the last [5 years / 2 years], how often did each of the following occur? The asbestos waste was…
Base: Asbestos removed/moved on a property they were living in/owed in last 5 years (n=265) / last 2 years (n=121)

Q3.3 When dealing with asbestos waste, how often do each of these occur? Asbestos waste is…
Base: Professionals in a work situation where asbestos is removed, prepared for disposal, transported or disposed of (n=94)

Professionals were asked whether any other precautions were taken when handling asbestos. Of the 92 survey participants asked this question, a small number provided open-ended responses, most commonly that the area where asbestos was being handled was sealed off and those not in PPE excluded from the area (n=7), and that signage was erected (n=2).

Those who reported that PPE was used sometimes or always used when asbestos waste was handled on their property (general community members) or in their workplace (professionals), were asked to nominate which pieces of PPE were typically used. As illustrated in Figure 9, below, gloves and safety goggles were the most commonly nominated pieces of PPE. Awareness of use of P2 or P3 respirators was higher among professionals than general community members, but in both cases more reported use of a dust mask only.

Figure 9. Individual items used where PPE was reported as worn



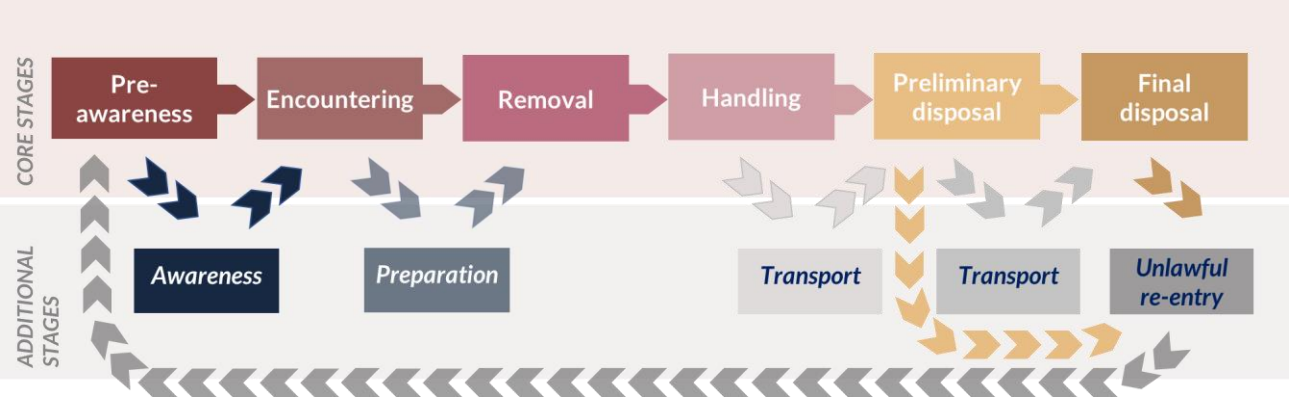
Q2.6 What pieces of PPE were used by people handling the asbestos waste?
Base: Asbestos removed/moved on a property they were living in/owed and PPE always or sometimes used in last 5 years (n=212) / last 2 years (n=95)

Q3.5 What pieces of PPE are typically used when handling asbestos waste?
Base: Professionals in a work situation where asbestos is removed, prepared for disposal, transported or disposed of, and PPE always or sometimes used (n=92)

ASBESTOS WASTE JOURNEY - DISPOSAL

This section of the report discusses findings specific to the later stages of the asbestos waste journey after it leaves the site where it became waste. These include the transport, preliminary disposal, disposal and potential unlawful re-entry stages shown in Figure 10.

Figure 10. Stages of the asbestos waste journey covering transportation and disposal of the waste



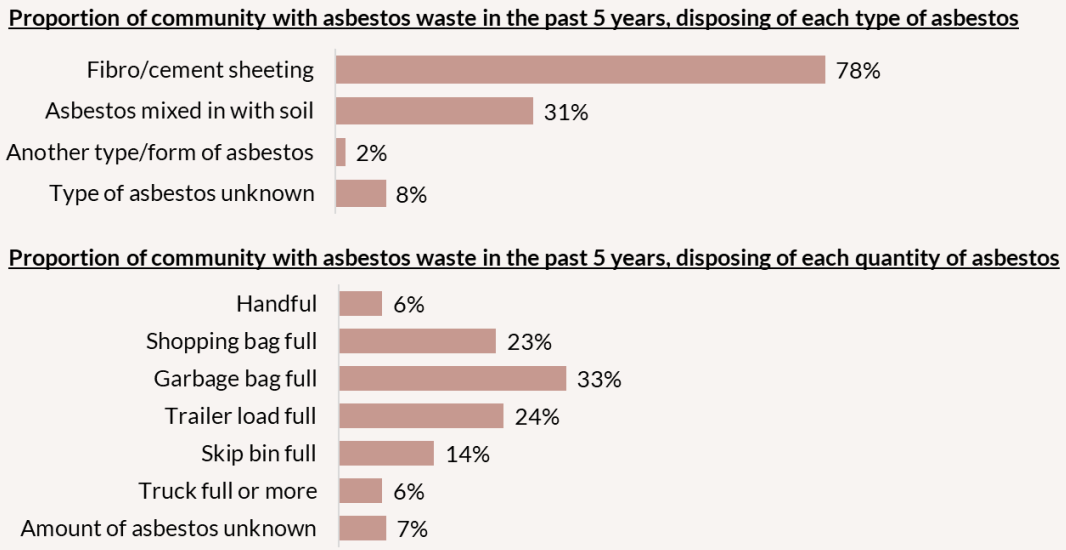
TYPES & QUANTITIES OF ASBESTOS WASTE REQUIRING DISPOSAL

Findings from this research echoed those of the Asbestos Safety Social Research in that, when discussing asbestos waste, most participants appeared to be thinking primarily of asbestos bonded in fibre cement sheeting, and overlooking or were unaware of all of the other ways in which asbestos was used in building products. This was the type of asbestos material most commonly described as having been disposed of in both the qualitative and quantitative stages of the research. In some cases, participants described disposing of other materials from older buildings (such as carpet underlay, linoleum flooring and bathroom and kitchen tiles) that could have contained asbestos, but were not handled or disposed of in line with this possibility, and participants seemed unaware that they might contain asbestos. There also appeared to be limited awareness of what precisely constituted 'friable' asbestos, including that bonded asbestos could become friable if old, worn, damaged or burnt.

The research included participants reporting having disposed of different quantities of asbestos containing materials, ranging from small remnants of asbestos fibre cement sheeting, through to larger quantities from walls, eaves and demolition of fibro buildings or structures.

Figure 11, shows the types and amounts of asbestos that general community members with asbestos waste in the past 5 years reported were disposed of (these provided as pre-coded options); similar results were seen for professionals but given the very low sample size these results are not reported here. As illustrated, fibro or cement sheeting was the type of waste most commonly known to have been disposed of (mentioned by 78%), with the most common quantity disposed of estimated at a garbage bag full (mentioned by 33%).

Figure 11. Type and quantity of asbestos disposed of



Q2.13 What type of asbestos was [name of disposal method] in the last 2 / 5 years? Was it…? (Any mention reported)
Q2.14 And which of these best approximates the amount of asbestos waste from your property that was [name of disposal method] in the last 2 / 5 years? About a…? (Any mention reported)
Base: Asbestos removed/moved on a property they were living in/owed in last 5 years and participant knew how it was disposed of (n=188)

Indicatively, noting small sample sizes were involved:

- Asbestos put in a kerbside collection bin (n=19) was particularly likely to be fibro sheeting (84% using this disposal method reporting that the asbestos disposed of in this way was fibro sheeting).
- Asbestos left on the property (n=29) and asbestos left in bushland or roadside (n=15) were particularly likely to be asbestos mixed in soil (59% and 60%, respectively).
- Asbestos left on the property was most likely to be a shopping bag full (38%).
- Asbestos taken to a waste site (n=123) was most likely to be a trailer load full (30%).

TRANSPORTATION OF ASBESTOS WASTE

A key objective of this research was to shed light on what occurs when asbestos waste is transported. The research revealed that transportation of asbestos waste is undertaken by many different parties including property owners, building and construction workers, landscapers, licensed removalists, demolition companies and waste removal companies (our sample primarily including skip bin operators and tip-truck drivers), in both more and less formal ways. This means that 'transport' is most accurately represented as a stage in the asbestos waste disposal journey, rather than a specific discrete 'audience' of 'transporters' participating in the asbestos waste chain.

Crucially, the research revealed that asbestos waste was not always transported directly from the site where it was generated to waste facilities, and asbestos removalists, and construction and demolition workers commonly

reported transporting wrapped asbestos waste to other locations, including their home, or other job sites and depots, before transporting it again to a waste site to be disposed of. This means there were sometimes multiple stages of transportation involved in the disposal of asbestos waste. Interim storage of asbestos is discussed in more detail under '*Stockpiling of asbestos waste*', below.

> *"So you might be working I don't know, 50K out of town and you don't want to leave that trailer load which is all wrapped up and tarped down and perfectly safe off the job site and have to drive 50K to pick it up when you can park it at home and then just take it to the tip the next day. I used to do that a few times, and in the end my neighbour used to complain about that and I'm not allowed to do that anymore, which I never was ever allowed to do. But I've been told by the Safe Work inspector but that's all right, he reckoned, and I've been told that by some of the council inspectors, but I've been told by other council inspectors that next time I do that I'm going to be fined."* Licensed asbestos removalist

Asbestos waste was transported in a range of different vehicles, depending on who was transporting it, from the back of cars, utes, trailers, in skip bins and on the back of trucks. Only in the cases of large demolition or excavation projects and when asbestos-specific skip bins were being used, was asbestos reported as being transported by a third party (a waste transportation company). In most cases, people transporting asbestos waste were those who had been involved in some way in the removal of the asbestos and its preparation for disposal. The majority of people reporting transporting asbestos described the asbestos waste as having been wrapped appropriately prior to transportation, but the reported use of PPE when moving wrapped asbestos onto and off of transportation vehicles varied, and it was rarely mentioned that the waste was labelled.

There was some evidence that the danger posed by asbestos is considered neutralised once it has been wrapped, leading to less care being taken when handling wrapped asbestos for transportation. Some participants reported having witnessed people throwing wrapped asbestos onto/into vehicles and some had observed wrapped asbestos being thrown or mechanically tipped off the back of vehicles once it reached a waste site. In some cases, participants reported that asbestos had broken through its wrappings in the process of being transported. Some, but not all, reported covering the entire load with a tarpauline or similar as an additional safety precaution.

It also seemed clear that some were not entirely sure why asbestos waste needed to be wrapped for transportation, and who wrapping asbestos in plastic was supposed to protect – those at the site where the waste is generated (the waste lying wrapped rather than exposed), the broader community as the waste is transported (avoiding asbestos fibres flying off the back of a truck), and/or those at the waste site (even one employee at a waste site believed that once the waste was on site it needn't be wrapped, with wrapping important only for the transportation stage).

There were some participants in the research who worked in areas where the contamination of materials with asbestos waste can pose a large risk for their business, for example transporters and waste facilities that are involved in resource recovery, waste recycling and/or transportation of other types of waste. Those involved in transportation of these other types of waste and materials indicated the current definition of asbestos contamination in the Protection of the Environment Operations Act puts the viability of their businesses at considerable risk based on the actions of other people, not to mention the safety of their workers involved in the transportation of these materials.

Professional transporters

Professional transporters participating in the research described two main ways they come across asbestos waste, either because they have been contracted to transport it, or because they have been contracted to transport other materials and then discover asbestos in their skip or load. In this latter case, the consignor was thought sometimes to have unwittingly loaded asbestos in the vehicle or skip and sometimes considered to have deliberately done so.

> *"There's two types of situations where we come across asbestos, either you've got a contaminated bin where the customers have thrown it inside the bin just because he thinks he can get away with it in doing so. Then you've got people that actually order an asbestos bin."* Transportation

One property owner participating in the research was contacted by the skip bin company she had used to say a single fragment of asbestos fibre cement sheeting had been discovered among the waste halfway down in the bin. Photos were sent to her as proof of the discovery. She was shocked to receive the large bill for disposal of the whole load as asbestos contaminated waste, as she had no idea how the fragment ended up there. She was concerned that anyone working on the property or even in the community could have thrown the fragment in while the skip bin was in her drive over multiple days.

> *"All of us have tipped out bins that are contaminated with asbestos, customers, they don't know it was asbestos, we get that all the time. The first thing we do when we pull up to a bin is we look, before we pick it up, we're looking for asbestos fragments. We all know the products that, you know, some of things that were made from it and that's the first thing we identify and if we see that well then, you know, immediately back to me and then I liaise with the customer and we're refusing to take it or telling them it's got to go to [waste site]."*
> Transportation

> *"Now in terms of asbestos that's been found whether you knew it was or wasn't, sometimes it does happen, sometimes people think it's only a little bit, we can get it in and no-one will realise, and there's other people that just don't know what asbestos is. The load gets classified as contaminated. We call up the customer, we inform them that there will be additional charges made according to the weight of the bin. We then go dispose it, send them a receipt of how much their skip-bin weighs and how much additional money it's going to cost them between the transport, the reload fee, and disposing the waste correctly. So, it's pretty hefty sometimes."*
> Transportation

In the situation where the load or skip contains asbestos and this has not been disclosed, the primary objective of professionals transporter was to identify this ideally before accepting it, and certainly before arriving at the waste site. If asbestos is discovered at the weighbridge or the tip face, transporters face delays, reload fees and then must confront the consignor with the need to charge more. All this can be avoided if the load is never accepted in the first place. This means that employers are ware of the need to train drivers and to adopt processes to prevent this, noting that no formal training is required for these professionals.

CASE 5: DEALING WITH IMPROPER SKIP BIN DISPOSAL

Skip Bin Operator

"If we don't know [if the skip contains asbestos], the drivers will do a quick inspection before they pick up the bin. It's whatever they can see on the top, they've got their gloves on, they just have a quick look around on the surface of the bin. If anything looks like asbestos, they grab that out, look at it. If it doesn't look like it, they just pick the bin up and go. If it looks like it and they're not 100 percent sure, they get a second opinion, which is usually giving me a call, sending me a photo of it. I'll ask them to do a couple of things, maybe tap it on the bin, tap it on the skip-bin itself, if it sounds like a tile then it's definitely asbestos, there's no arguing about it. If the client is still persistent that it's not, then occasionally I'll go down to site, inspect it myself, and if I've deemed it asbestos, then it's asbestos. There's no arguing. So, if they spot asbestos there, they don't take the bin and we contact the customer, notify them of it and they're given multiple options because the bin's still there. They can either unload and reload the bin and make sure there's no asbestos in it. If they want us to take it straight to landfill, we can take it straight to landfill, but they don't have to pay the reload fee, they just pay additional fee from their place straight to landfill and whatever the added tip costs are. So, they do get a couple of extra options if it's spotted on-site and not at the transfer facility. Once we get there, then it gets recorded and we need to keep track of everything."

Some transport professionals believed there to have been a recent change no longer requiring licensing for asbestos transportation; when prompted others stated they were not aware of this. Some questioned what message this sends about the danger associated with asbestos, for example, positioning asbestos as less dangerous than tyres, transportation of which still requires a special licence.

> *"The EPA deregulated that about five years ago for reasons unknown. So we have a transporters licence which now I think is only good for tyres, god knows why you need a licence to transport tyres and you don't for asbestos but tyres and hazardous waste, so it was, so you do not need a licence to transport asbestos."* Transportation

The risks of being held responsible for the actions of others and the possible impacts of this on business, as well as the additional processes, costs and administration involved with transporting asbestos meant that some organisations that also transport other materials were considering getting out of the transportation of asbestos (see case below).

> *"If we're doing asbestos, there's not many landfills that actually accept asbestos anymore and I get charged one tonne minimum. So, I charge a fixed transport fee, and then I charge basically up to one tonne is X. It's a hassle, it's out of the way, that's why I charge a bit more. When you tip asbestos there has to be a water cart present which sprays water to keep the dust fibres down, the hazardous part, so a lot of times when you go to [waste site], the water cart is nowhere to be seen and you have to sit on the side and wait for 20 or 30 minutes, or the water cart breaks down yeah, so there's time delays. So, I have all that factored into my pricing which is why it costs a bit more to get rid of."* Transportation

CASE 6: THE HEADACHE OF ASBESTOS

Skip Bin Operator

"We probably do one maybe asbestos skip-bin a week and I kind of price it accordingly. We are probably only a little higher, but I do that as a deterrent. A lot of the other companies don't do it anymore because obviously for the extra insurance costs and the liability and everything that goes along with it. There's a lot of things you have to follow - we have to track it, so I have to have competent drivers that remember to collect it on the EPA WasteLocate site from their mobile phone and then it's tracked by the EPA, apparently, and then we have to go into our phone app and then we deliver the bin. So, there's just a lot of extra steps and really you don't get a whole heck of a lot of extra money for doing it. So, the risk probably isn't worth the reward. Some of the smaller ones, a lot of my friends, have stopped doing it for that reason, it's just too complicated, too hard, and not worth it."

WasteLocate

Some of those transporting asbestos waste claimed not to be aware of WasteLocate and, some of those were aware reported not using it. Reasons cited for this included:

1. not being aware of the conditions under which it is required to be used;
2. not having a smartphone or not being comfortable with apps;
3. having tried to use the app and finding it too difficult;
4. not having consistent cellular signal; and
5. not seeing this kind of administration as part of their role;
6. not seeing the point of the system or believing that there are no likely consequences for not using it.

Some noted a possible inconsistency between the >10m^2 rule and the minimum requirement to use WasteLocate. That is, the threshold for needing to use WasteLocate is expressed as 100kg or >10m^2 of asbestos

sheeting. Some felt sure that these were roughly equivalent ways of expressing the same volume of asbestos waste, however some assumed that 100kg is a larger volume of asbestos waste than $10m^2$. Some consistency in how the limits and minimums for the $10m^2$ rule and WasteLocate are expressed was thought to be of value in minimising any confusion.

Some, typically those working for larger organisations and in roles where they were dealing with larger quantities of asbestos waste regularly, such as demolition companies, skip bin and larger building companies, chose to use WasteLocate for every job. This was considered a way to avoid issues where there is uncertainty about whether quantities – acknowledged as being difficult to assess accurately – are just under or over the threshold.

> *"I actually don't know [if the threshold is 100kg], but I think that did used to be, right? It just gets too complicated for us across the board, we just do everything (through WasteLocate), that way there's no 'oh, I forgot, I didn't know'. I just do everything; all my loads are well and truly over 100 kilos."* Transportation

Those reporting regularly using WasteLocate described it as a little annoying, but relatively straightforward once they used it a few times. Some of these transporters also invariably had a single person 'in the office' that handled logging/setting up jobs.

> *"You just jump onto the EPA website and it's a quick sign-up process, you register your business name and all that sort of stuff. When you do have a contaminated load, it's pretty simple, you just go through the steps. The EPA will give us a consignment, when we get to land fill, we give them the consignment number and then they'll issue us a receipt. You attach the receipt of where you disposed of it, and then that way EPA has been notified that you've picked up and dropped off asbestos on this certain date from this site, from this premises to landfill. The landfill also forwards that very same receipt to EPA. I mean that's the only monitoring you really need."* Transportation

> *"The first time you use it, it is a little overwhelming, but it's the same as anything, I mean you can get a six-year-old that's never seen Facebook, get him to set up an account and they'd be overwhelmed by it, but the second time, they'll find it easy. It's just it's something that someone is not used to doing, so they may miss a step, and some fields are compulsory. One step is, what's the pick-up location, and you've just completely missed that step and gone to hit the next button but there's no address consigned to it. So, you've got to take your time and go through it all, make sure you filled out all the necessary steps. It can get annoying at times, like I just want to finish so I can get on with my day, but it does get simpler."* Transportation

A number of participants in the research who were familiar with WasteLocate were critical of the opt-in nature of the system. The view was put forward that, once the presence of asbestos waste has been registered for transportation, this in turn triggers mechanisms to ensure waste is handled appropriately in its disposal, but also that it is those who intend to do the right thing when disposing of asbestos waste that would choose to use WasteLocate. Where the transportation of larger quantities of asbestos is not logged using WasteLocate, it is possible for those who intend to do the wrong thing with the waste to avoid scrutiny altogether.

> *"This whole EPA WasteLocate - I mean a dodgy guy's not going do that. At least when you fill that out and they ask you is this the registration of the vehicle, are you the driver, that's all in the EPA's questionnaire. But if someone isn't licensed obviously, they're not going to go to the WasteLocate site so there's no way of actually finding out who's doing what."* Licensed Asbestos Removal

> *"I think it's a good idea if it's catching people out and it's pretty good for what it's supposed to accomplish. It's just painful because you have to keep constantly monitoring. We've had to put in all these extra procedures when we do it to make sure we don't forget again. WasteLocate is great for the honest guys and the legit ones, but what about the little guys that are running around loading their trucks up, maybe they are doing less than 100 kilos in each one, and then they're still tipping it along the road? I'd like to know if it really has accomplished what they were trying to accomplish."* Transportation

> *"Personally, I don't think waste tracking is achieving anything. They want to make sure people are disposing their waste properly. But people that want to illegally dump, they're going to illegal dump regardless. I can transport the asbestos without even doing the consignment and no-one would even know about it, except me and the client. I can do it the proper legal way without doing it, it doesn't matter which way I do it. You can't just say, these are the necessary steps and this is going to stop it because reality is, nothing's going to stop it. Whether you decide to follow the rules or not, is completely up to you."* Transportation

PRELIMINARY & FINAL DISPOSAL

Use of WasteLocate was explored among 28 survey participants who had had asbestos waste related activities occur in their current workplace in the last 2 years and had some knowledge of where the waste had ended up. Among this small sample of 'professionals', 29% said they knew of Waste Locate having been used, while 54% said Waste Locate had not been used, and 18% said they did not know.

Q3.17 In your current work situation, in the last two years have you or anyone you worked with used the WasteLocate waste tracking online system?
Base: Professionals in a work situation where asbestos waste has been dealt with in the last 2 years with some knowledge of how it was disposed of (n=28)

Awareness of WasteLocate was explored among all survey participants in the context of knowledge around asbestos waste. As illustrated in Figure 16, later in this report, just 48% of all participants correctly identified as true that 'an online tracking system must be used when transporting larger amounts of asbestos waste', with 5% believing this to be false and 47% not knowing either way. The proportion correctly identifying the statement as true rose, but only to 57%, among those in workplaces where asbestos waste is dealt with.

This section includes detailed findings related to methods of asbestos waste disposal, beginning with an overview of disposal methods cited by research participants and reasons why these were reportedly used. The subsequent sub-sections discuss specific issues associated with different methods of asbestos disposal raised in the research.

Asbestos disposal methods used

According to participants in this research, and to the best of their knowledge, most asbestos waste in quantities larger than small fragments they had recently dealt with was ultimately disposed of at a waste facility. Having said this, the research revealed many other ways in which asbestos was disposed of or attempted to be disposed of that meant it likely never made it to a waste facility, arrived at a waste facility after being moved elsewhere, or arrived at a waste facility through improper means.

Apart from lawful disposal at a licensed waste facility, methods participants had used personally to dispose of asbestos waste or had observed others using included, and the extent of use of each was quantified in the online survey (see Figure 11, below):

- different forms of onsite immobilisation, concealment or disposal;
- interim storage off-site;
- disposal on other private land;
- dumping on private or public land;
- disposal through scheduled council bulk waste pickups;
- disposal through a kerbside residential bin;
- disposal through a general waste skip bin;
- disposal at an unlicensed waste facility; and

- disposal through an asbestos-specific council service.

It appeared more the rule than the exception that those generating asbestos waste that was removed by a professional (licensed or unlicensed) were unaware of what happened to the asbestos waste once it had been removed. Most assumed it had been taken to a licensed waste site, signalling both trust in the people handling it for them and belief that once it had left their property it was no longer their concern or responsibility. It appeared rare that property owners sought or were provided proof of lawful disposal of the asbestos waste taken from their property.

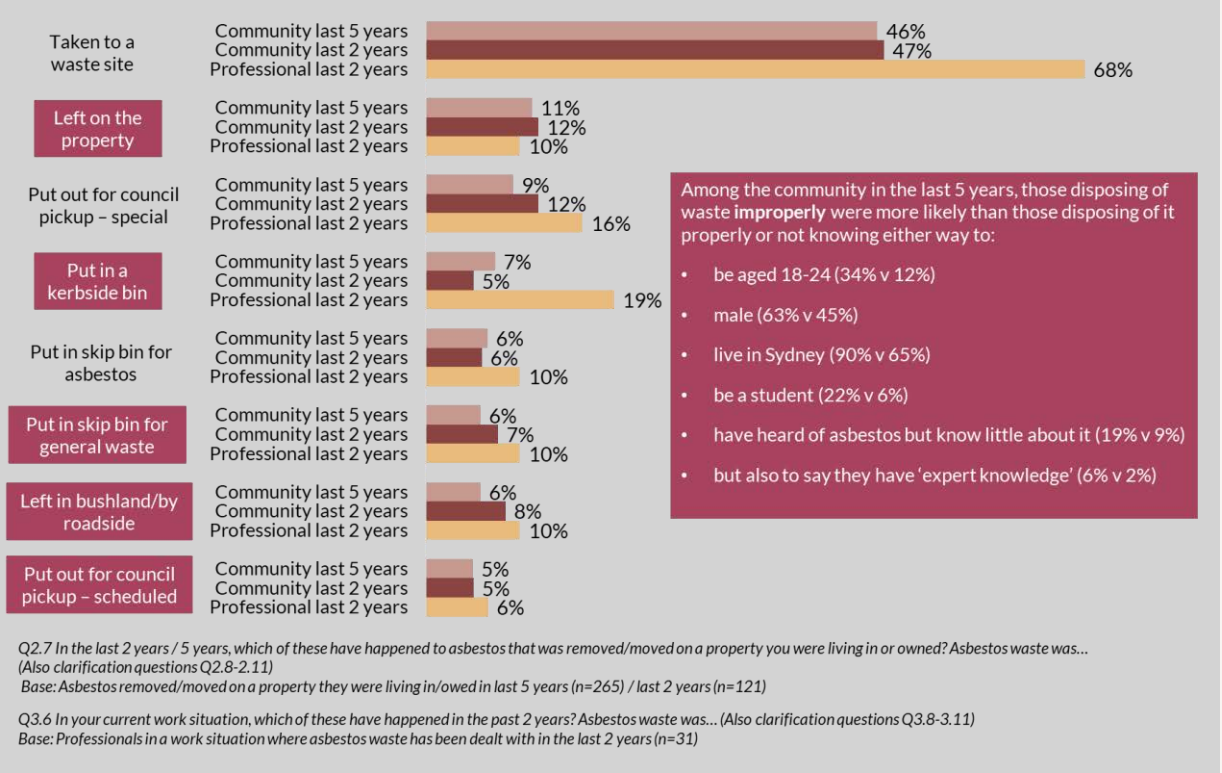
The following factors were identified as being taken into account by those generating asbestos waste (including property owners and any professionals involved in removing asbestos from its original location) when deciding how to dispose of asbestos waste:

- the advice of professionals working on the property (primarily asbestos removalists, but also other demolition, landscaping and building professionals)
- the advice of waste workers (e.g. skip bin operators and other waste removal services)
- the advice of family and friends
- awareness of and proximity to licensed waste sites
- cost of disposal
- convenience (including in terms of the time and effort taken to dispose of asbestos via different means)
- how onerous safe and lawful disposal requirements were perceived to be
- how logical and reasonable safe and lawful disposal requirements were perceived to be
- likelihood of being caught doing something illegal or improper
- perceived risk to self and loved ones
- perceived risk to others/community

As illustrated in Figure 12, asbestos waste was most often reported to have been taken to a waste site – 68% of professionals handling asbestos waste in the last 2 years reported that this method of disposal had been used, as did just under half of general community members dealing with waste either in the last 5 years (46%) or last 2 years (47%). The sample size for professionals who had dealt with asbestos waste in the last two years was small (n=31), but indicatively, professionals were more likely than the general community to have used a range of disposal methods rather than a single disposal method.

In total, 25% of the general community with asbestos waste in the last 5 years reported improper methods of disposal (see red boxes). Statistically significant differences between those reporting improper disposal methods and those who did not were observed – see red box below.

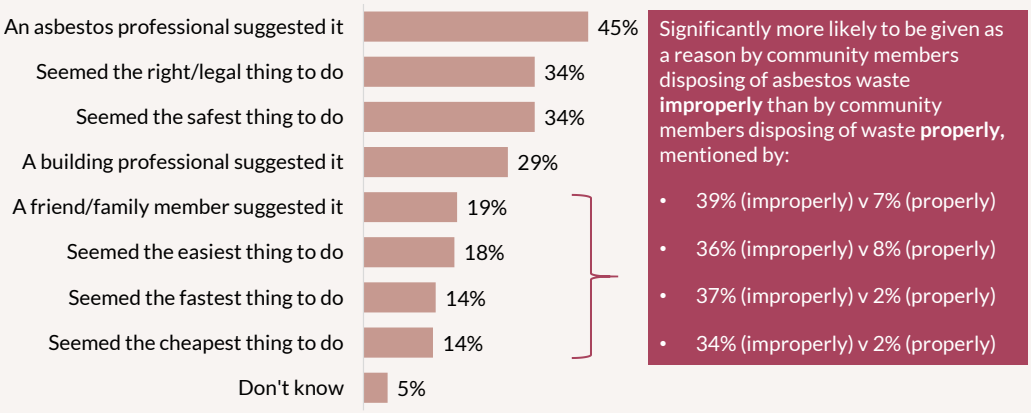
Figure 12. Proportion of those with asbestos waste using each of eight disposal methods



To note, 29% of general community members and 10% of professionals indicated they didn't know where the asbestos waste ended up. Where asbestos was left on the property, it was most typically stored under the house or in a shed or buried under a structure. Where asbestos was put in a kerbside collection wheelie bin, it was equally as likely to be put in a red lidded bin as it was to be put in a recycling bin, and far less likely to be put among green waste.

As illustrated in Figure 13, overall, the reason most commonly given by general community members for asbestos being disposed of in the way it was, was because an asbestos professional suggested it, mentioned by 45% with asbestos waste in the last 5 years. Ease, speed and lower cost were particular drivers of improper disposal.

Figure 13. Reasons given for asbestos waste being disposed of in the way it was (all mentions)



Q2.12 Thinking about when asbestos waste from your property was [name of disposal method] in the last 2 years / 5 years, why was this done? (Any mention reported)
Base: Asbestos removed/moved on a property they were living in/owed in last 5 years and participant knew how asbestos was disposed of (i.e. not answering DK at 2.7; n=188; n=41 for those disposing of properly and n=41 for those disposing of improperly).

Indicatively, noting small sample sizes were involved:

- An asbestos professional suggesting it, was the most commonly given reason for disposing of asbestos waste via a council collection (reason mentioned by 51% using this disposal method), at the tip (46%) and in a skip bin (39% using the disposal method, respectively, giving this reason).
- That it seemed the safest thing to do was the most commonly given reason for leaving asbestos in bushland or by a roadside (50% of those reporting asbestos being disposed of in this way mentioning this as a reason).
- That it was suggested by a friend or family member and that it seemed the fastest thing to do were the most commonly given reasons for putting asbestos in a kerbside collection bin (both these reasons mentioned by 42% of those using this disposal method).
- It seeming the easiest thing to do was the most commonly given reason for leaving asbestos on a property (45% of those reporting asbestos being disposed of in this way mentioning this as a reason).

Asbestos left on site

Several participants in the qualitative research had been involved in moving asbestos waste to a different location on the property where it was generated. Many professionals had also observed or heard about this practice.

In some cases, moving asbestos waste somewhere else on site was an interim measure, in that someone intended to dispose of the waste later. Asbestos left on site in this way was usually put somewhere out of the way on the property, either wrapped or unwrapped, for example, under or down the side of a house, in or behind a shed or garage, or in a back corner of the property. In one reported case, it was left out on the verge. Asbestos waste handled in this way was left for varying periods before being disposed of in another way. Sometimes asbestos waste was left on site for multiple days by a professional while a job was being completed or until it could be combined with waste from other jobs to warrant a trip to the waste facility. One professional spoke of a bag of asbestos left on a property in this way being disposed of unlawfully by the homeowner before the professional had a chance to move it, highlighting but one of the dangers associated with this sort of behaviour.

In other cases, leaving asbestos waste on site was intended as a form of disposal. Those who observed this practice or who had been involved themselves indicated this disposal was considered final, with little thought given to the possibility that it might be uncovered or pose risks to anyone at a later date. Asbestos "disposed" of in this way included waste that was buried under foundations or within a retaining wall, buried under a pool or used in filling a hole from a removed pool, buried somewhere else in the yard, turned back into the soil during landscaping or moved under a building.

Stockpiling of asbestos waste by professionals

Some professionals (asbestos removalists and building professionals) reported interim storage of asbestos waste they had removed form a property. Asbestos waste was reportedly stored either on a truck, at a depot, or at the removalist's own home. Interim storage like this was reported to have occurred when:

1. waste sites were already closed for the day before a job was completed (e.g. one participant reported the nearest waste site closing at 3pm, which is often before he has finished work for the day). Others reported that some sites discontinue accepting waste an hour prior to closure, with this confirmed by staff at some waste sites visited as part of the research;

   "On a rainy day they don't accept it because where the trucks need to go on the ground's too soft and nine times out of ten the truck gets bogged. They don't accept it before 7:30 and they won't accept if after 4 o'clock, so we've got to work on that timeframe." Transportation

2. in regional areas where the nearest waste site accepting asbestos opened on selected days only and this did not coincide with the day on which the removal happened;
3. a removal job was not pre-planned and waste sites required at least 24 -hour notice before asbestos waste could be disposed of at the facility; and
4. perhaps most commonly, the amount of asbestos waste was deemed too small to warrant a trip to a waste site particularly given minimum disposal charges. In these cases, asbestos was stockpiled until the load was deemed to be large enough (e.g. a full truck/trailer load).

   "Each job's wrapped and I have a depot where we keep the truck so it depends how long it takes for the truck to get relatively full, because a lot of these tips have a one tonne minimum as well. You have to make sure that you have got a tonne on there, otherwise you'll be getting charged for a tonne if you don't have a tonne on…If it's just in the truck and it's wrapped it's relatively safe and so it's the same as just transporting it from a site to the tip, I suppose. I'd be going to the tip probably once or twice a week." Licensed asbestos removal

   "I know it happens, I can tell you right now we were doing bins for [company name] and they would have the bin for six months and we would go pick it up and I know what they were doing, but it was hidden and it was around the back and they had it all sort of stashed. We got away from it, we gave that away about two years ago, so I haven't seen that since, but it happens…" Transportation

   "I do know some competitors may store it on site because they've taken such a small fee, they don't take each individual load up, they wait to have about maybe two or three loads before they take it up to make it worth their while, because there is a minimum charge at the door." Transportation

Stockpiling of asbestos waste prior to disposal was explored among 28 survey participants who had had asbestos waste related activities occur in their current workplace in the last 2 years and had some knowledge of where the waste had ended up. Among this small sample of 'professionals':

- 79% said they knew of asbestos waste being combined with asbestos from other properties or jobs before being disposed of (29% believing this to always or usually occur).
- Just 29% reported that asbestos waste was 'always' disposed of immediately / on the same day that it is generated (although 36% reported that it 'usually' is). The 74% reporting that asbestos is sometimes stockpiled, most commonly said the stockpiled waste was:
  - ultimately disposed of within a day or so (40%) or within a week or so (again 40%); and
  - was usually kept, in the intervening time, at the property it came from (50%), at the depot/head office (30%) or in a vehicle (25%).

Q3.13 In your current work situation, in the past two years, how often was asbestos waste disposed of immediately/on the same day that it had been moved or removed?

Q3.14 How often is asbestos waste combined with asbestos from other properties or jobs before it's disposed of?

Q3.15 How long does it usually take between asbestos waste being moved/removed and it being finally diposed of?

Base: Professionals in a work situation where asbestos waste has been dealt with in the last 2 years with some knowledge of how it was disposed of (n=28)

Illegal dumping

Examples of grossly and intentionally unsafe and illegal dumping behaviour were absent from the sample, but relatively common were descriptions of more minor breeches of safety or the law. Many also reported having directly observed or heard about poor practice, including intentional unsafe and illegal behaviour, among others in their industry or community, such as asbestos being taken to private land for disposal, or left by the roadside or in bushland.

Repeatedly mentioned as culprits of illegal disposal behaviour were new, young, small, inexperienced, and unknowledgeable operators. Without established businesses, reputations, homes and other assets to protect, they were seen to have less to lose than those in our sample. In the minds of others working in the field, the actions of these operators were clearly distinguished from those of decent operators, who may at times unintentionally do something unsafe or unlawful but not perceived to be as morally wrong as illegal dumping.

Some other professionals and stakeholders were aware of organized crime networks operating in large-scale dumping operations, which are concealed behind the façade of legitimate business operations. Some other participants mentioned hearing about such cases in the news media. This sort of activity was obviously seen as financially-motivated. Certainly, wishing to avoid paying the costs associated with lawfully disposing of asbestos waste, in particular large amounts of asbestos-contaminated soil, was assumed to be a key driver of illegal dumping.

> *"What will happen if the EPA or someone comes out and finds that you've got bits, fragments of fibro throughout your soil is that it becomes a huge, huge logistic nightmare for that person, regardless of who was at fault. So that's where things go dodgy, that's where people just think let's just bury it or let's just move it here or let's just pretend it's not there and put more soil or cement over the top of it"* Licensed asbestos removal

> *"It's the dirt game. There're a few unscrupulous people out there. The dirt may seem clean, but it hasn't been Geotech validated. But everyone wants to do it cheap. There are people there who want to cut corners. There are waste brokers, people who wheel and deal in dirt. They won't talk to you. Nine times out of ten they'll have a legitimate operation and also have alternative sites that are not legal."* Transportation

While the sample did not include property owners who were victims of illegal dumping of asbestos on their property, for example disguised as free fill, the research did include two participants who had acquaintances in their regional communities that were victims of this type of crime. Both of these participants described the

incidents as a wake-up call to the whole local community. Both reported being previously unaware of the possibility of asbestos waste being dumped via illegally contaminated fill, and that it was also a shock to the victims themselves who were similarly unaware of this risk in accepting free fill. Both the victims and the participants reporting these stories had reportedly been shocked at the cost to the property owner in clearing up the dumped asbestos (near $1 million dollars in one case) and expressed a perception that the EPA had "gone after" the property owner rather than the perpetrator. One participant had actually been looking for free fill on Gumtree around the time the incident occurred in his community. He had been tempted by the huge cost saving compared to purchasing fill by the tonne and was impressed by some of the ads offering free bobcat services to level the fill once it had been delivered. After the incident hit the local news this participant noticed that the ads for local free fill had suddenly disappeared off Gumtree.

> *"A lot of people, especially in today's climate where there's so much competition, they'll just do anything to make a dollar, even if it means under quoting, and they under quote to the point where they're running at a loss and the only way to make up for those losses is through illegal dumping. That may be one factor. Some people just think, we pay council rates and council's responsible for everyone's rubbish no matter how big or small the rubbish may be, so that's another way of getting rid of it, it's council's problem. If anything, government levies are a little bit high on rubbish, especially when the facility itself needs to also make money and it drives prices up. With the cost of living is high as, some people just can't afford to pay a significant amount of money to get rid of their rubbish. That's also another factor of why some people illegal dump. Everyone's got their own justification."* Transportation

Other improper disposal methods

There were many reports of improper disposal of asbestos waste in the research, where asbestos was thrown out via a legitimate disposal method not meant for asbestos. This included asbestos disposed of in:

- kerbside household waste collection bins (most commonly red-lidded bins for general household waste, but also yellow-lidded recycling bins);
- general waste skip bins not intended for asbestos waste;
- council bulk waste clean-ups; and
- other waste taken to (and not declared at) the tip.

Improper disposal was reported more often in relation to unanticipated and smaller amounts of asbestos (for example pieces less than the size of one's hand; a bucket or less; a wheelbarrow or less). Underlying this improper disposal was confusion surrounding the safe and lawful disposal of these smaller amounts of asbestos. This confusion was evident across property owners and demolition and building professionals, both in terms of how to handle the situation from a practical standpoint (taking into account cost, time and convenience factors), as well what they may lawfully be required to do with small pieces of asbestos.

> *"Some people didn't realise. Some people have done it intentionally, but regardless whether it was intentional or not, they all deny the fact that they knew about it, so, we just really don't know. You do get a feeling on whether a customer had the intentions of putting it in there or not. If I was to make a judgement call, it would probably be 50/50. Half the time they knew about it, the other half they had no clue, so it just really depends on the individual."* Transportation

> *"I couldn't tell you how many times over the years where people have either illegally or knowingly just disguised a small amount of asbestos, wrapped it up, hidden it halfway in a load or in the top corner or in the back that's going to get tipped first, hoping that no-one finds it and then we find it and then it turns into a real massive kerfuffle and we try tip that out at an unlicensed facility for asbestos, then it turns into an absolute nightmare. And that's really these very small amounts of asbestos - people don't want to pay $950 to get rid of 20 or 30 or 50 or 100 kilos of asbestos, it's a rip off. So, the easiest way for the average mum and pop in the suburbs is they find another way, whether they throw it all on the road or whatever that other means might be to save them $950."* Transportation

> *"People ring me up, they say; I've got two sheets of asbestos from my bathroom wall. Or I do work for builders and the same thing, they stumble across asbestos and they're like 'I've only got like 200kg', and I say well this is the minimum cost, that's what it costs me to rent the truck and they say 'I'll do something else with it, thanks', and you never hear back. So, the question is, what happens with that asbestos? Do they break it up in little bits and put in in their Otto bin, that then goes into a side lift and gets mixed in with all the other general waste? Very likely chance, I've seen it happen."* Transportation

In most cases, those who have disposed of asbestos using these methods were aware or had a suspicion that it was not the right thing to do, but there was a general lack of appreciation of the potential to risks to others further on in the waste chain who may inadvertently end up handling asbestos waste. Some felt that, because the waste disposed of in this way would ultimately end up at a waste site, the risks to others were low. Workers at waste sites had a very different point of view, particularly in relation to any asbestos that might be put into a household recycling bin. This type of waste is frequently sorted by hand and improperly disposed of asbestos could potentially pose large health risks to those undertaking this work.

> *"We found asbestos in yellow bins going through recycling facilities, through people doing inappropriate disposal which was frightening."* Waste and recycling

> *"They just break it up and put it in little pieces and stick it in the Otto, which is a massive health hazard for everyone else, you know, just trying to go and work and do their job and go home safely and get paid for doing a crappy job already - sorting rubbish - and then they've got to put up with all this."* Transportation

Asbestos waste disposed of improperly though the methods listed above was sometimes, but not always, wrapped before disposal. When it was wrapped, it was rarely wrapped appropriately (i.e. double wrapped in black plastic and labelled) and was mostly just placed in a plastic bag of some sort.

CASE 7: UNSAFE IMPROPER DISPOSAL IN RESIDENTIAL WASTE BIN

Property owner

"We've had an outhouse plus a green-house style thing and we're pretty sure most of all that was built out of asbestos. So, it was recently that we really disposed of it, actually started pulling it down and putting it away or get rid of it. We're only looking at a couple of square metres and a bit of other stuff from around the place. I thought if we just either take it off in the size sheets it is or get in a little bit smaller, we can bag it up and send it, just send it to the bin. The red bin. We just did it ourselves, any of the bigger sheets where we had to pull it off and pull nails out, we gave it a bit of a spray down with a PVA water mix just to try and hold the fibres down, so it didn't start blowing away, that's probably as good as we went. We did talk about wearing respirators and other stuff, it didn't eventuate, we just pulled it down, got rid of it. I thought if something's going to get me it's either coal mining or asbestos, we'll see who wins.

Wife gave me a bit of hand once it was all sealed up to lift the bags because some did become quite heavy to throw in the bin. We got an abundance of horse-feed bags here, so we just threw it all in. They're a woven plastic material, so we just put them inside there, taped them up, put it in another bag, tape that over it and hoist them in the bin.

I was pretty sure we could call the tip and let them know what we were bringing up there, and then apparently they dig a hole, you dump it the ground just like you would anyway, they fill it over. The bigger problem was, well when we were kind of doing it, the tip was shut and the other local tip was by appointment only so I've just gone, 'Stuff it'. It got in the' bit too hard' basket. They were still doing rubbish collection, so we just sent it to the tip the other way."

Disposal of asbestos at waste sites

Participants in the research who had to dispose of asbestos waste recently most commonly indicated that it was taken to a waste site and there was general awareness that this was the legal thing to do. Some participants had taken asbestos to the waste site themselves, while for others this had been done by someone on their behalf (most commonly an asbestos removalist, but also demolition workers, landscaper or building workers, or skip bin operators). Apart from those in charge of major demolition/development projects (where various paperwork was required to be collected as part of approvals processes), most of these participants assumed the asbestos had been taken to a waste facility but had not sought (or thought to seek out) proof.

Professionals regularly using waste sites to dispose of asbestos sheeting and other waste appeared to be very familiar with the one or more sites in their vicinity (being the area within which they were prepared to travel to reach a facility) where they could do this and, where there were multiple options, were able to discuss their views on the differences between the sites. These participants perceived substantial variation between waste sites in terms of their requirements, costs processes and attitude towards asbestos waste and were inclined to use the site that presented the least friction for them in terms of cost, hassle and distance. Some revealed they were prepared to travel further to use a facility they perceived as having lower costs and fewer or more lax requirements (such as no weighbridge, no visual inspection of loads, greater tolerance if wrapping breaks etc). There was a perception that it is becoming more costly and more of a hassle to dispose of asbestos waste at a licensed facility than in the past and that there were fewer and fewer facilities accepting asbestos waste. This was perceived to be a driver of improper and illegal disposal.

> *"Which tip you take it to makes a big difference, like if you're taking it to the [LOCATION] tip, they're fairly expensive, if you're taking it to the [NAME] tip they're fairly cheap, etc. [LOCATION]'s over the top, in my opinion, and as a matter of fact I was talking to the hygienist near there and she said she was thinking of going and talking to them to get them to bloody get off their high horse and be a bit more practical."* Licensed asbestos removalist

> *"These days to get rid of asbestos costs you two arms and one leg for a normal person to get rid of it, you've either got to get a contractor in to do it and, for example, in Wagga it costs you a minimum of $275 including GST to get rid of any amount of asbestos up to one tonne. And so if you've got a shopping bag full of asbestos and you take it to the tip even though you would have wrapped it up properly, etc, it's going to cost you $275 to get rid of it, and so what do you do with it, if you're a normal person you think, 'Blow this, I'll just dump it on the side of the road, throw it in the river, or put it in my garbage tin.'"* Licensed asbestos removal

Property owners disposing of asbestos sheeting reported not having much awareness of where it could be lawfully disposed of in their area before they needed to do this. Some were surprised at the cost to dispose of the asbestos waste, though another had assumed it would be higher. Some property owners doing renovations reflected that their local tip had not questioned them about or inspected their trailor loads of other waste when using the local tip, though it was possible some of this waste could have contained asbestos materials (carpet underlay, bathroom tiles, linoleum flooring).

In addition to discussions with users of waste sites, five waste sites were visited as part of the research. Wide variation was observed in the characteristics of these sites in terms of:

- geography and proximity to next 'competitor' site;
- licensing and waste categories;
- what kinds (and if) asbestos waste was accepted and how e.g. whether there is a public drop off bin for small amounts of wrapped asbestos versus facility for asbestos to be directly deposited by customers onto the tip face;
- whether loads needed to be pre-booked, and whether the site is open to the general public at all;
- prices charged for asbestos waste;

- volume of asbestos waste coming through;
- mix of existing versus new customers, and the extent to which customers have accounts with the site;
- number of employees and diversity of tasks undertaken / responsibilities held by each staff member; and
- size of site and sophistication of infrastructure and processes.

A number of challenges were identified by those at the waste sites or observed by the researchers, including:

- **The honesty of customers needing to be relied on.** Weighbridge operators rely heavily on the say-so of customers to establish what is arriving on site. This is the case even for elevated weighbridges and waste sites with cameras at the weighbridge, given that loads are usually covered and substantial in size (anything could be concealed underneath the top layer of waste). Some waste sites have heavy limitations on staff being allowed to step outside their enclosed workspace (with air filtration and air monitors) to interact in any way with customers or waste, making impossible any close inspection of the load of waste. Some weighbridge operators will interrogate the driver to try to diagnose the likelihood of the presence of asbestos, with a similar process undertaken by a second staff member prior to the vehicle being allowed to proceed to the tip face. However, non-declared asbestos can sometimes only be identified when the waste is coming off the back of the truck and physically seen by staff.
- **Little recourse for waste sites where customers do the wrong thing**. Sites were concerned that they have no strong recourse if asbestos does gets through their processes. Customers may or may not agree to pay reload fees or the required asbestos premium, and the waste site has no ability to fine customers or pass on any fines they might eventually receive from the NSW EPA. Waste site managers spoke of strategies such as advising customers of fines that will be attracted by them if they fail to declare asbestos, or advising customers that their details will be passed on to the authorities (with the full knowledge this will not be possible), with customers found with non-declared asbestos sometimes banned from further use of the facility.
- **Far greater scope for problems where asbestos is accepted on an ad hoc basis and from the general public**. One waste site in our sample is, for business reasons, not open to the general public, and only accepts pre-booked asbestos waste, primarily from account holders. This means that the vast majority of their customers are long-standing, much of the work establishing what a load will contain has already been done by sales staff on the phone prior to a booked load arriving at the site (who triage and make recommendations around testing etc.), and only a set number of loads containing asbestos are accepted per day, arriving conveniently at scheduled times. Further, the parent company also runs a transportation business, meaning a substantial quantity of waste coming to site comes in their own trucks, which are GPS tracked. This waste site reported far few concerns and challenges in relation to accepting asbestos waste and its safe handling.

  At other waste sites, difficulties surrounding time of day and preference for those dumping large quantities from trucks to ring ahead were certainly reported and this was reflected in comments from those using the sites. This preference was driven by the need to make available water carts, and space for the asbestos waste within recently dumped general waste etc.

  Across the sample, large construction and demolition operators were seen to be easier to handle customers, more likely to hold accounts with the waste site, to pre-book drop offs, and to be fully aware of what is in their load – with large volumes of waste it was believed that testing was more likely to have been done and paperwork available as it does not make sense to dump waste as asbestos-contaminated if in fact it is not. At waste sites with a mixed customer base, more issues were observed to occur with owner-builders or mum and dad renovators, along with smaller construction and demolition firms of unqualified handy people delivering themselves, were more likely to (often but not always inadvertently) be doing the wrong thing, including not appropriately wrapping asbestos, taking asbestos

to a site not licensed to accept it, or having asbestos mixed in with other construction and demolition waste.

"I think that most of the dodgy stuff is carried out by associated trades that just don't want to spend. A lot of these guys just think, we'll just tip it ourselves and away they go. Because there is that 10m2 rule… when some no-name turns up at the weighbridge, they should get asked the question like, where's your licence and how come you've got so much of it?.. There is a lot of tips where you don't have to untarp, so once you go past the weighbridge, the weighbridge has no idea what's in the back." Licensed asbestos removalist

- **The current definition of asbestos contamination posing problems for waste sites.** Several participants also raised the issue of the difficulties in identifying contaminated waste in large demolition loads which threaten the viability of smaller sites unlicensed to accept asbestos and the huge volume of contaminated soil that results from the current definition, and the strain this will place on landfill capacity at licensed sites (which were perceived to be decreasing in number) over the longer term. This was particularly salient given the recent bush fires.
- **The problem of small pieces.** It was mentioned that in large loads of general construction and demolition waste, it is quite plausible that small fragments of asbestos might be found. Avoiding this entirely was seen as largely impractical.

  "You might get an asbestos clearance certificate from a hygienist that says that the asbestos has been effectively removed from the site, but you don't know that a piece of fibre board hasn't broken off during the removal process and fallen down through the cavity of the external wall or that asbestos wasn't used as packing material and might be stuck in the mortar between two pieces of brick. So, as they knock down that wall of brick they pick up the asbestos. We don't see sheets of asbestos coming into this site, we see pieces the size of your hand maybe stuck to the underside of a piece of brick. No-one, even the operator themselves would have seen that as part of their demolition process, and it's not until it gets here and we visually see that there's a piece of board sitting in between those two bricks or stuck to the underside of a tile that we identify that there's asbestos." Waste and recycling

Smaller, regional and unlicensed sites appear to be more vulnerable in terms of worker safety and potential for breaches. Here, we observed there to be:

- fewer systems in place to detect undeclared asbestos coming onto the site, with less availability/use of cameras;
- fewer safety processes in place, including less likely to have air monitors, and more likely to require staff to engage with waste outside of a building/machine, and less likely to have water cannon stations to wash out trailors for those leaving the site after tipping; and
- less training made available to staff who, consequently and also oftentimes because of smaller volumes of asbestos coming in, less alert to asbestos.

CASE 8: CHALLENGES POSED BY ASBESTOS AT WASTE RECYCLING CENTRES

Transporter

"I'm thinking of some of the smaller recycling centres, and I don't know how they would handle asbestos. I know what's happening with mine because it's getting caught with scanners and they have a lab where I go to. And I pay good money to go to these facilities and you get that quality that comes with it. But these guys are probably barely making ends meet and they're looking for an edge. I know there's a few places that I could go and I could throw asbestos in the middle and they wouldn't find it, I can promise you that. All these recycling facilities were like that before they got labs and scanners. Some of these smaller facilities now are accepting waste from anyone, so they don't have all the infrastructure, and they're just, you tip it on a lot, they push it up maybe with a loader, they get an excavator out. A few years ago they [waste site] had five or six [migrant worker] just picking through, picking by hand,

like picking asbestos out. So, then they get the heavies out and segregate it and the rest goes into a pile, gets loaded and then that does end up actually going into landfill. I can tell you there'd be a lot of asbestos going through that whole system, that's not being identified. So it's kind of a double edged sword - they want recycling but there's so much asbestos in Australia, I don't know actually how much there is but it's frigging everywhere, and that's the problem, everything is contaminated with it."

Weighbridge operators were not particularly aware if people were using the QR scanner for WasteLocate and did not tend to see it as their responsibility to know or check. One waste site noted that their QR scanner had not been working for some time and no one had come out to fix it despite this being reported. Separate records of asbestos coming into the site were maintained by all waste sites.

> *"When you get to the front you've got your QRC, the little scanner where you scan for the WasteLocate to locate you, but a lot of the time it doesn't work for me, so I just go further in and just manually do it and it works… I just go in and press delivered and I get a reminder from the EPA that I'm GPS tracked and my location will be known, if it's not the location I say it is it'll be known. So my location is known by that, I also give my name, well my registration details are on every docket, plus my name but I also give a reference of the area that I came from for my dockets. And then annoyingly enough they will send you down there and sometimes you could wait five minutes but there has been times were I've waited an hour when I'm down there for a water truck will come so they'll have a water truck that comes and sprays water while you tip it."* Licensed Asbestos Removal

Asbestos waste loads rejected at waste sites

Some participants in the research had had asbestos rejected at a waste site, in both cases it was because sharp edges of fibre cement sheeting had broken through plastic wrapping. In each of these cases, participants were not turned away, but the asbestos load would not be accepted until it was re-secured. In one case, this meant the load was left behind overnight until the waste site could get an asbestos removalist to come out and re-wrap the asbestos. This participant thought the process was an unnecessary waste of every one's time, especially as he was himself a licensed asbestos removalist.

> *"Some reload it for free, but they average between $200 and $300 for a reload, which is a pretty significant deterrent. I know that it then goes onto a register that they keep which the EPA can view at any time, so that's your incentive then to do the right thing with it."* Transportation

While a variety of viewpoints were expressed on rejected loads across the research sample, all agreed that rejected loads were problematic. Some felt that while currently necessary given licensing requirements, turning away improperly presented asbestos was counterproductive; given the harm has already been done (asbestos unsafely transported to the site), further harm could be caused by turning away the customer (asbestos transported further in an unsafe manner, with the potential for the load to then be illegally dumped), and waste sites are arguably in a better position than the generator of the waste to now deal with the asbestos, it was felt by these people that rejected loads should not be turned away.

Some at the waste sites had given little thought to where rejected loads eventually ended up, but others noted that fewer customers returned than failed to return, with a heavy suspicion that at least some of the rejected loads proceeded to be illegally dumped. Concern was expressed that there are no real time digital records of rejected loads to provide assurances around where the asbestos waste is finally disposed of, with records taken used for the site's own purposes only.

> *"We have a Rejected Loads Register that was commenced with EPA but has never been progressed or switched on. Don't they want to know what we've turned around and where it went? Anyway, it's sitting there, we take the information, we should track it and find out what happened to it. But we hear anecdotally about trucks along the side of the M4 pulling off material and throwing it, discarding it, that's an appalling outcome"* Waste and recycling

CASE 9: HANDLING REJECTED LOADS

Waste site

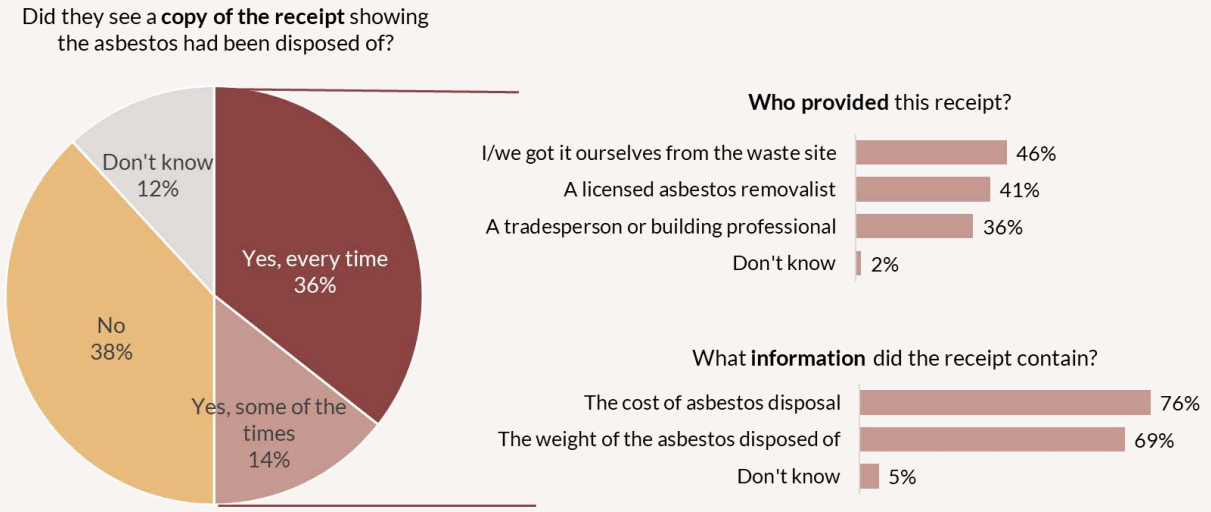
"We will request the asbestos clearance certificate from the site before we will accept the material. However, that only gives you a certain level of comfort, because the best the hygienist can do is inspect what they can see as part of that clearance certificate. During the demolition process, quite often asbestos can be hidden and used within the construction process in layers that are not observable during that inspection. So, it still leaves us somewhat exposed to that material being loaded into a truck and making its way to our facility. That's where we then bring into play our inspections and receivals protocol, so coupled with the EPA standards we have our own specialist protocol. Step one is an initial detailed visual inspection at the weighbridge of the surface of the load. Step two is at the base, so the material has then tipped off, once it's been mechanically turned and inspected twice visually it's only at that point that we will accept the material and put it into our stockpile ready for processing, If at any point prior to that it's identified that there's potential contamination, we reject it immediately. That material is reloaded, recorded as a rejected load in a database, the reason for the rejection, and that truck is then sent off-site. As to the responsibility of where that truck goes after it leaves our site, that's not something that we have control over."

Rejected loads were explored among 28 survey participants who had had asbestos waste related activities occur in their current workplace in the last 2 years and had some knowledge of where the waste had ended up. Among this small sample, 25% said they knew of a load of waste having been rejected at a waste site in the last 2 years because it contained asbestos, while 64% said this had not occurred, and 11% said they did not know.

Q3.19 In your current work situation, in the last two years have you or anyone you worked with had a load of waste rejected at the tip/waste site because it contained asbestos?
Base: Professionals in a work situation where asbestos waste has been dealt with in the last 2 years with some knowledge of how it was disposed of (n=28)

Among the 46% of general community members with asbestos waste in the last 5 years, at least some of which had been taken to a waste site (see Figure 14), half (50%) indicated they had seen a copy of a receipt showing the asbestos had been disposed of. That said, just 36% said this had occurred *every time* asbestos was taken to the waste site. Who had provided the receipt to them varied depending on who had physically taken the asbestos waste to the waste site. Survey participants most commonly recalled the receipt containing the cost of the waste disposal (76%).

Figure 14. Tip receipts seen by community members with asbestos waste taken to a tip in the last 5 years – frequency, source and information contained



Q2.15 When asbestos was taken to a tip/waste site, did you ever see a copy of a receipt, showing the asbestos had been disposed of?
Base: Asbestos removed/moved on a property they were living in/owned in last 5 years and they are aware of at least some of it being taken to a tip / waste site (n=118)
Q2.16 Who provided this receipt?
Q2.17 And what information did the receipt contain?
Base: Yes at Q2.15, i.e. asbestos taken to a tip/waste site in last 5 years and a copy of the receipt seen by them (n=59)

Tip receipts were also explored among 21 survey participants who had had asbestos waste related activities occur in their current workplace in the last 2 years and were aware of asbestos waste being taken to a waste site. Among this small sample of 'professionals':

- 52% reported that they, or someone they work with, had collected a receipt from a waste site showing they had disposed of asbestos waste; 38% said they didn't think a receipt had been obtained, while the remaining 10% said they did not know.
- Among the 11 aware of a tip receipt being obtained, the tip receipt was most commonly reported as having been shown to a certifier or assessor (n=9), followed by the property owner/developer (n=5) and another person they worked with (n=4).

Q3.21 In your current work situation, in the last two years have you or anyone you worked with collected a receipt from the tip/waste site, that showed you had disposed of asbestos waste? (filtered to only include those selecting waste site at Q3.6)

Q3.22 And did you or someone you work with show a tip receipt for asbestos waste to…

UNLAWFUL RE-ENTRY OF ASBESTOS WASTE INTO THE COMMUNITY

Despite NSW laws, regulations and enforcement programs in place to prevent this, professional participants described circumstances in which asbestos contaminated material may end up back in the community and not at final disposal at a licensed site. Examples of this included:

- Asbestos buried or used as fill on-site;

  "We reuse it all the time. You've got to dig pipelines out. You are still digging down to put other things in. We always try to cover as much as we can." Demolition and site preparation

  "If you go to the old neighbourhoods and they're doing a renovation, it's the first thing, alarm bells are going off, asbestos is what we're looking for. We're looking for any fibre in the dirt, in the ground, under eaves, when you are digging, we've found it that many times, asbestos contaminated soil where they've done renovations and left the fragments fall to the ground, they dig it up 20 or 30 or 40 years later and then the soil is contaminated." Transportation

  "People try to cover things up, then things happen later on in the development cycle where it exposes things into the environment and it becomes that poor owner's problem. So who knows how many generations back that guy was too scared to take it to the tip or didn't want to pay that fee, so put it underneath the concrete slab and buried it and now this poor new owner who just wants to build a granny flat asks you to cut a section of it, and you find it and now is up for tonnes and tonnes of stuff that's inside the concrete you have to get rid of." Licensed asbestos removal

- Illegal dumping in public areas (as discussed previously);
- Asbestos contaminated soil taken elsewhere and intentionally distributed as fill;

  "People accepting waste don't know it's contaminated – ignorant farmers, see a dam they want levelled out. 'Free fill wanted' sign is a gold mine to shonky operators." Transportation

- Asbestos fibres or very small pieces making their way into and through the resource recovery chain and back into construction materials and soils again.

  "Because of the definitions under the Act and Regulation and the view of the EPA that if you find a single fibre in a stockpile, particularly since the Grafil case from a year or so ago, that that entire stockpile is now contaminated asbestos waste. Now if you've got a [several thousand] tonne stockpile and now that stockpile is deemed contaminated and must be dealt with as a special waste and you're spending $300 a tonne to dispose of it, we won't be in this business for too long. Unless there's something reasonable around sharing of responsibility upstream, downstream, in so far as this risk then it really drives the reputable operators out of the game." Waste and recycling

Much comment was received about improper disposal of asbestos waste either through inappropriately prepared asbestos being taken to a licensed site, or asbestos contaminated materials and soils being taken to a resource recovery site that is unlicensed to take any asbestos. Waste sites believe that decisions made up the chain can negatively impact them, whether it is a case of deliberate concealment or whether asbestos waste that ends up at the site has been inadvertently missed along the way. Nevertheless, unless they can identify it immediately, the waste and recycling facility must then deal with the problem. Some strongly held the view that it is impossible to ever completely avoid asbestos waste turning up in recycled materials and soil, and that the current definition of contaminated material fails to appropriately acknowledge this.

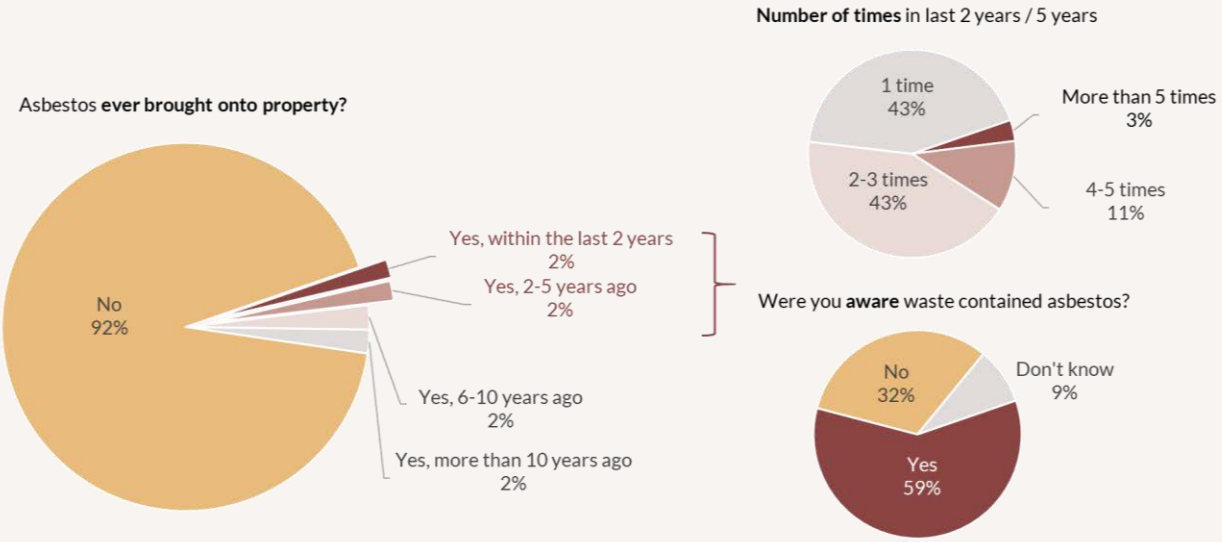
CASE 10: PRACTICAL CHALLENGES WITH WASTE CLASSIFICATION

Waste and Resource Recovery Facility

"No matter how good the source separation process is, or how good the clearance certificate is, in terms of the hygienist's inspection, there is always the risk that asbestos may turn up at our gate. The liability risks that we run as an operator means we do our absolute best not to accept the material because we don't want it and if it does make its way into our materials it contaminates our materials that then we need to deal with. It puts us at risk that that material makes its way back out of our site and back into the community through our customers. But the challenge with it is that when you're talking about absolute compliance with the legislation, a single fibre is considered contamination. Well there's no possible way our customers will test every load that comes into us for fibres. You also need to take into account that there is asbestos generally in the atmosphere anyway. It literally is impossible to test for zero asbestos. Our lines of defence are our procedure and the training of our staff - making sure people remain diligent."

Eight percent of all survey participants (8%) reported being aware of asbestos waste having been brought onto a property that they owned or were living in and 3% of all survey participants believed this had occurred in the last 5 years. Among this latter group, this had most commonly occurred just the once (43%) or 2-3 times (also 43%), with a majority (59%) knowing the waste contained asbestos. Examples included 'potting mix' bought and 'landfill' received containing asbestos, and waste dumped in an alley way, on a front lawn and in a communal rubbish disposal area. The descriptions provided tended, however, to imprecise, with some descriptions suggesting the waste was actually generated on the property including hidden by past owners. It seems likely that the 8% reported here is an overestimate of what seems to be a low incidence, high impact phenomenon.

Figure 15. Awareness and frequency of asbestos waste being brought onto a homeowner's land



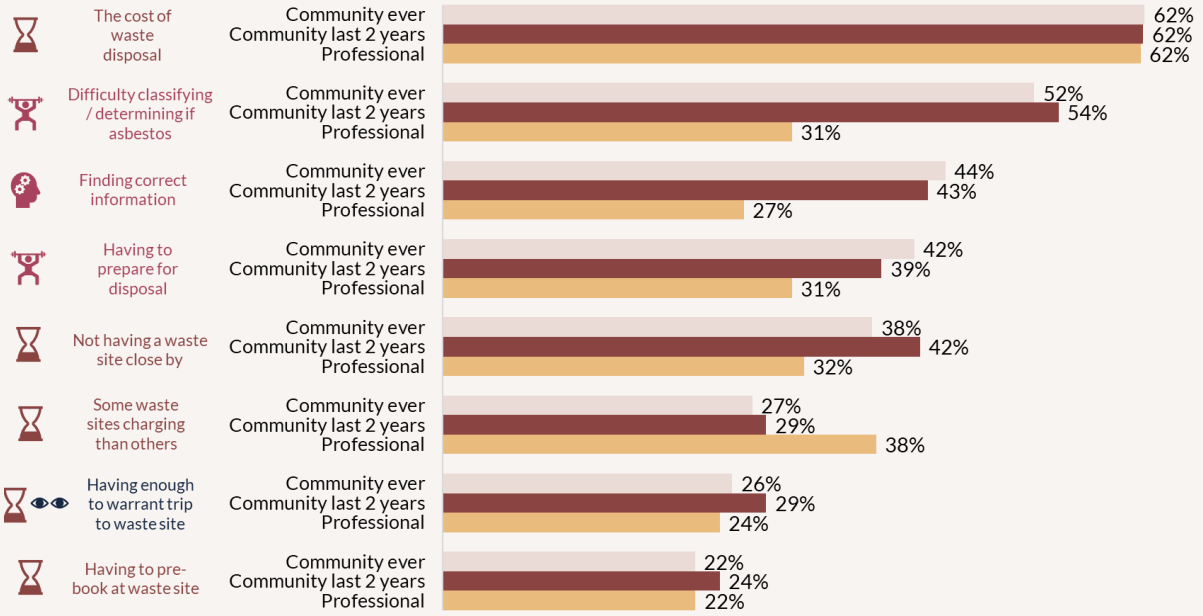
Q2.18 Has asbestos waste ever been brought onto a property you owned or were living in?
Base: All survey participants (n=2,702)
Q2.19 When was the most recent time that asbestos waste was brought onto a property that you owned or were living in?
Base: All answering yes at Q2.18 i.e. who had ever had asbestos waste brought onto a property they owned or were living in (n=205)
Q2.20 In the last two years / 5 years, how many times has asbestos been brought onto a property you were living in or owned?
Q2.21 The most recent time this waste was brought onto your property, were you aware that it contained asbestos?
Base: Those who had asbestos waste brought onto a property they owned or were living in in the last 5 years (n=91)

MOTIVATORS AND BARRIERS TO SAFE AND LEGAL BEHAVIOUR

The validated COM-B model has been applied to the research findings, providing a systematic method to understand motives and barriers to safe and legal behaviours. This can support the identification of how desired behaviours might be increased and guide development of behaviour change interventions. This section of the report discusses motivators and barriers to safe and legal behaviour, structured around the domains of Capability, Opportunity and Motivation, each discussed in turn.

Challenges in disposing of asbestos waste, identified in the qualitative research and quantified in the online survey, cover capability, opportunity and motivation. As illustrated in Figure 16, below, the cost associated with disposing of asbestos waste legally – reflecting a deficit in physical opportunity – was the most common perceived challenge (mentioned by 62%), consistent across settings (work and domestic). Physical opportunity deficits were also reflected in four other perceived challenges.

Figure 16. Perceived challenges in disposing of asbestos waste (proportion mentioning each)



Q2.23 Overall, which of these, if any, do you see as challenges householders face in disposing of asbestos waste?
Base: Asbestos removed/moved on a property they were living in/owed and/or asbestos brought onto property they owned/were living in ever (n=727) / in past 2 years (n=147

Q3.23 Overall, which of these, if any, do you see as challenges in disposing of asbestos waste at work?
Base: Professionals in a work situation where asbestos is removed, prepared for disposal, transported or disposed of (n=94)

Figures 17-19, 20, 21 and 22 also deal with capability, physical opportunity, social opportunity and motivation, respectively. Comparing across these charts reveals particular deficits in:

1. psychological capability, particularly knowing how to go about disposing of asbestos waste, including preparing it for disposal; and
2. physical opportunity, with particular issues around cost.

CAPABILITY

Capability responds to the question do individuals possess the capacity, in terms of knowledge, skill and mental and physical ability to dispose of asbestos waste safely and lawfully? Based on this research, capability, particularly a lack of consistent, accurate, unambiguous knowledge, and an thorough and enduring body of skills, currently represents a significant barrier to these desired behaviours.

Psychological capability

Having the psychological capability to enact a behaviour (e.g. to safely and lawfully dispose of asbestos waste) relies upon having sufficient relevant knowledge and awareness, and the cognitive skills and capacity to support appropriate decision-making.

Deep and variable knowledge gaps across the board

This research found significant knowledge gaps among members of the community as well as among some of the generators of asbestos waste and those involved in its disposal. Participants had highly variably knowledge and frequently poor understanding of:

- The range of products in which asbestos was historically used – both community members and professionals alike were often unaware of the wide range of asbestos containing materials.
- The difference between friable and bonded/non-friable asbestos – there was a general lack of awareness of this difference, even among some professionals, including a lack of familiarity with the terms, their meaning definitions and specific requirements relating to these forms of asbestos.
- Who is responsible for asbestos waste – property owners were unsure of their responsibilities in relation to the waste generated on their site, and professionals involved in removing or disposing of waste varied in the amount of responsibility they took on.
- The required safety precautions when dealing with asbestos waste – among community members and some professionals there were low levels of awareness of precise safety requirements, including necessary PPE and equipment and how to use it.
- That a non-licensed person is permitted to remove 10m^2 or less of non-friable asbestos – many are aware that an amount of asbestos can be removed without a licence, however the exact amount, or how 10m^2 would translate into an observable amount of asbestos in-situ, can be unclear.
- What the law requires in terms of the disposal of asbestos waste - owner generators generally displayed poor awareness of requirements for lawful disposal of asbestos waste, beyond some having the idea that asbestos waste needs to be wrapped and taken to the tip. Even among some for whom this is a core part of their work, such as construction and demolition generators, there was varying levels of understanding of detailed legal requirements.
- Licensing requirements and the applicable laws or the specific reasons for the rules that underpin them, across all stages of the waste cycle – this led to questions such as:
    - is a licence required to transport asbestos waste?
    - can you ‘emu pick’ (pick out) asbestos fragments from construction and demolition waste or soil and it ben considered not contaminated?
    - can wrapped asbestos be stockpiled in a truck at the depot until the quantity warrants taking it to the tip?
- Waste classification of contaminated soil - some were of the understanding that there has most recently been a zero tolerance view of asbestos in soil, while others perceived that large amounts of soil are unnecessarily deemed contaminated and go into landfill and still others were entirely unaware under what circumstances soil is classified as contaminated by asbestos.

10m^2 rule can prompt perverse outcomes

The allowable limit of 10m^2 for removing bonded asbestos without a licence was repeatedly mentioned by professionals and industry bodies alike as sending a mixed and confusing message. Some critiqued the rule as signaling that asbestos is not as dangerous as may otherwise have been understood, and suggesting that other requirements that apply to asbestos waste are overblown. These participants indicated that the rule appears to give permission to both property owners and construction and demolition workers to act in a more casual way.

> *"I can't tell you how many times I've got calls from owners, demolishers, plumbers, builders, electricians, and all sorts of trades, to come and pick up packages of asbestos when people have just ripped it down themselves and they've packed it up themselves."* Licensed asbestos removal

The 10m^2 limit also appears open to interpretation, with the research revealing behavioural examples of owners and construction and demolition (C&D) workers interpretating the rule in favour of reduced effort or cost, rather than taking safe or legally compliant actions. For instance, some reported spreading the removal process over a longer period of days to stay below the limit on each day, or stockpiling and spreading the waste into batches when preparing it for disposal.

Physical capability

Physical capability refers to the bodily capacity, skills and competence people have to undertake a desired behaviour. In relation to the safe and lawful disposal of asbestos waste, this would mean people have the physical skills and competencies required to identify, and safely and legally remove and dispose of, asbestos waste.

Owner generators and community members often saw the identification, removal and disposal of asbestos waste as involving specialist skills. Some C&D workers and other professionals considered themselves sufficiently competent to identify, remove and dispose of asbestos waste, without an asbestos licence, either because of their own direct experience encountering and handling asbestos waste, or because they did not consider handling or diposing of asbestos to require particular specialised skills beyond their existing trade.

Training can fall short in addressing providing adequate preparation

For professionals and those representing the C&D industry, asbestos awareness courses were mentioned as being valuable for all workers, owner-builders and owner-renovators, not just those who actively work with asbestos. They were, however, seen as insufficient in their content, given the frequency and unpredictability with which asbestos is found on job sites. Some workers who are in contact with asbestos regularly have no training whatsoever.

> *"Training? No formal training at all. I was doing high rise demolition 30 years ago. I've accumulated knowledge over the years."* Demolition and site preparation

Some stakeholders consulted as part of this research perceived that there was room for improvement in all training for professionals with regards to asbestos waste, including:

- on-site briefings;
- on the job training and oversight;
- apprenticeships and trade qualifications; and
- asbestos licensing training.

While representatives of the C&D industry considered that standards of work are generally much better where asbestos professionals are involved, there was comment about the quality of training for these specialists. According to participants, the last couple of decades have seen changes to the way training for asbestos professionals has been delivered. Particularly the move to delivery by Registered Training Organisations, a drop in practical training components and a shift, in some cases, to online learning. This, combined with minimal

oversight of how training was being delivered, was perceived to have resulted in skills gaps among general trades as well as asbestos professionals, when it comes to asbestos waste.

> *"Some people get their ticket online. Before you give them a certificate, you should show them - this is what asbestos is. Who will give them the experience? You want people to do it right."* Demolition and site preparation

Though this was reported as having been addressed by regulatory bodies a few years ago through greater oversight of course content and delivery, some skill gaps were seen to remain, particularly in relation to practical applications of asbestos knowledge.

> *"My training was in the 90s so that was all done by TAFE and it was a two-week course, it was pretty full on, it was quite thorough. Whereas now with tertiary providers, people are getting their tickets overnight. You can just tell when people come to work for you they've got the ticket, they've got all the qualifications, but when you see how they're working and the things that they're doing, they obviously aren't aware of the dangers or exactly what they're working with"* Licensed asbestos removalist

> *"I work with younger colleagues who have just been in the industry for five years or so, and they're still very aware of asbestos as an issue. Do they have the older eyes for it? No, that only comes with experience - the opportunity to gain the experience in how to identify it and mitigate the risk of dealing with asbestos and how you should approve its demolition or removal."* Approvals and certification

> *"If it's contaminated with asbestos we can still transport it, asbestos doesn't need a licence to transport, but if it's contaminated with anything else, example, if it's contaminated with petrol, or lead, or… they're the most common ones. If it's that sort of contaminant, we can't transport it."* Transportation

CASE 11: THE CHALLENGE OF ACQUIRING A PRACTICAL SKILL SET

Skip Bin Operator

"We offer training for the drivers and all that sort of stuff. We look after them. They get accompanied for about ten days. If asbestos appears in that ten days, great, if it doesn't, when it does get identified at a tip for a rejected load, they'll give them a sample, they'll come back and we'll show them using that very same sample, what to look out for next time inside the bin. But sometimes they can't see it. Sometimes the customers put it at the bottom of the bin, so, it will eventually pop up one way or another. Sometimes they do their spot check and completely miss it and they get to a transfer facility and the first thing they spot is the piece sitting there on the top of the bin. It's not unheard of for them to miss it, it can happen to anyone. Sometimes they're in a rush, sometimes they just forget to even look, they just cover and go but that's normal behaviour by us. I mean we all make mistakes."

Some professionals themselves noted that while their initial training may have been adequate at the time, they had not completed any refresher training for many years and were doubtful that they could remember all relevant information. Further training was not necessarily high on their agenda, though, and they were not aware of any particular training opportunities.

> *"Unfortunately, it's too late [for training] as I've been exposed probably too many times over the years. I already know it's very bad stuff and there's, and yeah, I know a lot of the products that it's in now, that I didn't know it was in. So, do I know every product? No. Is it [training] probably a good idea? Yes."* Transportation

Some professionals have taken education into their own hands

Several licensed asbestos removalists, skip bin operators and waste sites had adopted measures to close practical knowledge deficits among their staff and customers, with measures such as:

- Enhancing capability to identify ACMs or suspected ACMs through talks on asbestos identification, (safely) showing samples and putting posters of different types and locations of asbestos in the lunchroom.
- Providing an asbestos briefing in staff induction processes and encouraging them to identify asbestos by banging it against metal and listening and observing how and if it breaks, and to assume a material is asbestos if it cannot be determined otherwise.
- Producing and distributing flyers, instruction sheets or checklists to support safe and lawful removal and disposal.

For some, this was part of a wider organisational ethos of education reflected in other activities unrelated to asbestos and extending to the community at large rather than just staff or C&D professionals dealing with asbestos waste. The challenge exposed by these in-house training activities is that in some instances, the information being conveyed may not be accurate nor the methods safe.

> *"Whenever I sell a bin, I go through with the customer what has to happen. It is verbal, we used to hand out flyers and all that sort of stuff, but I'll make sure they know that they have to fully line the bin, fold it up like a Christmas present when they're done, duct tape all the seams up so there's no open gaps and no harmful dust gets into the atmosphere."* Transportation

> *"We regularly communicate with our customers around our expectations and the standards associated with asbestos, more recently we've actually developed a customer awareness package, capturing some of the training material that we use on site for our team around asbestos awareness and using that to engage directly with our customers, just to help them better understand how to identify asbestos."* Waste and recycling

CASE 12: DECENTRALISED EDUCATION LEADS TO VARIED OUTCOMES

Skip Bin Operator

FOF CUSTOMERS: *"Now when someone knows what sort of waste they have, when they know it's asbestos, they're all informed that the bin gets dropped off at their premises, it's got to contain asbestos and asbestos only. We give them all the instructions on what needs to be done, so we can dispose of it properly. Because if it's not done properly, no landfill will accept it. So, they get walked through on what they need to do exactly from start to finish, which is line up the bin as if they're filling up their garbage bag in their home general waste bin. Sometimes they have the plastic there, we show them how to line it up and what's required and that they need to leave enough excess plastic to be able to close off the bin once they're done. Then wrap the asbestos up in the black builder's plastic and once they're finished, close it off, tape it all up and then give us a call so we can arrange for pick-up and dispose of it as quickly as possible."*

FOR EMPLOYEES: "*The best way to identify it, the fastest way is to pick it up a small piece, break it holding it away from our body, tap the two pieces together and it sounds exactly like tapping two tiles. That's one way to identify it. Another way is you hold it vertically to look at the particles inside. Asbestos tends to have fine little white lines in between the, down the centre of it, it's very clear. Also, there's a certain pattern on the back of it, it's got all these little circle markings on similar to a golf ball, that's another way to identify it. They're the most common ways of identifying asbestos. If you find a small piece about the size of a 50-cent piece, if it is asbestos, it's practically impossible to break. It's just too hard to break with your two bare hands. They're the most common ways of quickly testing it without inflicting self-harm to your body*."

Licensing system for professionals leads to varied skills

Some stakeholders raised issues with the process and structure of the licensing of asbestos specialists, including that some workers, such as transporters of asbestos waste, have no licensing or training requirements.

Licensing requirements for Class B bonded asbestos removal were seen as much more straightforward to meet, with less practical training when compared with friable Class A or Supervisors' license requirements. This led to a perception of Class A 'ticket holders' as more serious, experienced and expert in working with asbestos generally, as well as more capable of acting safely and legally overall.

Regarded as problematic by some industry representative and professionals was that many Class B licence holders do not work as asbestos specialists, but primarily work in another area within construction and demolition. It was perceived that these professionals have become licensed to ensure minimal disruptions caused by having to call in an expert, when working on a site where asbestos is discovered. It was thought that the relative infrequency with which these licensees encounter asbestos leads to a failure to develop and maintain significant practical asbestos waste experience. It was also mentioned that in circumstances only requiring a supervisors' or organisational licence, it is left up to the licence holder how much (or how little) training unlicensed workers receive.

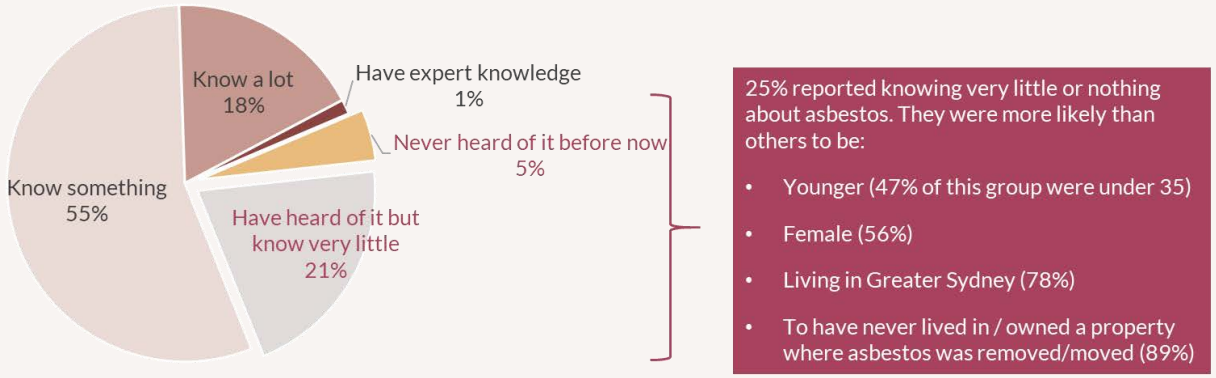
Situations such as natural disasters were reported as sometimes leading to a temporary change in the scope of work allowable under different classes of licence. An example of this were significant Sydney hail storms some years ago, causing roof damage across a widespread area of homes with asbestos roofing. A building professional reported that Class B holders were on this occasion temporarily permitted to remove broken asbestos roof tiles (friable) to contain the problem, given its sheer scale and a shortage of Class A licensees. This was thought to have become problematic in the longer term, as Class B licensees continued to carry on work outside their permitted scope.

It was further noted that auditors only need to be accredited professionals for those submitting reports under the CLM Act, with those classifying waste not needing to have any accreditation. The level of experience and training among waste consultants was considered to be variable.

It was observed by a licensed asbestos removalist that clearance certificates are sometimes issued in-house, rather than by a third-party hygienist coming in to provide this service.

Figure 17 shows self-rated awareness and knowledge of asbestos among all survey participants. The largest proportion of survey participants chose the mid-point of the supplied response scale, with 55% reporting that they know 'something' about asbestos.

Figure 17. Self-rated awareness and knowledge of asbestos



Q1.1 How would you describe your awareness and knowledge of asbestos?
Base: All survey participants (n=2,702)

Survey participants were also tested on knowledge and on average were accurate in 7 out of 12 true/false knowledge questions correct. Knowledge was revealed as particularly low among: young participants (average number correct increasing with age); and those living in Sydney (on average, 7.0 correct, compared to 7.4 for those living outside Sydney). No actual differences in knowledge were observed by gender or whether or not participants had lived in or owned a property where asbestos was removed/moved.

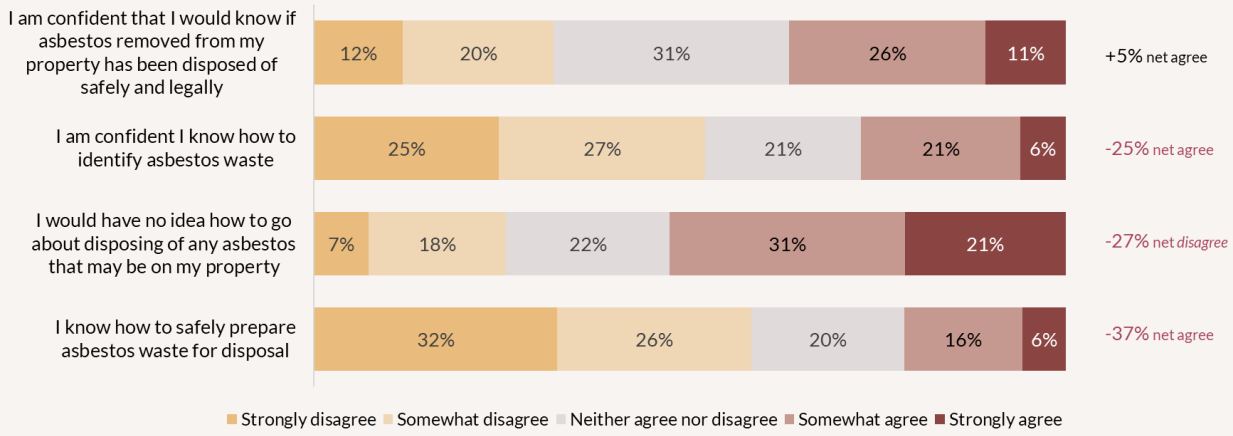
Most to least well-known facts about asbestos waste appear in Figure 18 which illustrates the proportion of all participants correctly identifying each as either true or false. As illustrated, confusion was greatest in regards when a licensed professional is required and what constitutes friable asbestos.

Figure 18. Proportion of participants correctly selecting statements as either true or false

Q4.1 For each of the following, please indicate whether you believe the statement to be true or false.
Base: All participants (n=2,702)

Figure 19 orders statements included in the survey that relate to physical and psychological capability, by net agreement (net disagreement in the case of the third statement, with which participants would ideally disagree). A capability deficit was particularly evident in relation to knowledge of how to safely prepare asbestos waste, with far more disagreeing that they know how to do this (58%) than agreeing (22%). A capability deficit was particularly evident in relation to knowledge of how to safely prepare asbestos waste, with far more disagreeing that they know how to do this (58%) than agreeing (22%).

Figure 19. Agreement with statements relating to physical and psychological capability



Q4.2 To what extent do you agree or disagree with each of the following statements?
Base: All survey participants (n=2,702)

OPPORTUNITY

As a source of behaviour, opportunity refers to both the presence of the necessary tools and resources, as well as the social permission that facilitates a particular action. Opportunity considers if the tangible and intangible context surrounding an actor, enables them to act in the desired way. This research indicates that contextual factors, specifically cost structure and time required for asbestos waste disposal, as well as the cultural context in which behaviour occurs, exert a powerful influence over disposal outcomes.

Physical opportunity

Physical opportunity refers to the tangible situational factors outside of an actor that support or hinder the desired behaviour. For safe and legal behaviours in relation to the disposal of asbestos waste, this constitutes the availability of external resources such as funds and time, as well as explicit workplace structures, rules, processes and expectations, and contextual, institutional, regulatory and environmental factors.

The cost of proper handling and disposing of waste is a key barrier

Across all stages of this research and among all audiences, the waste levy and the costs associated with safely removing and disposing of asbestos waste, was persistently raised as a critical cause of unlawful and unsafe behaviour. Among property owners, the anticipated high cost of licensed asbestos removal and legal asbestos waste disposal, impacted decision making and appeared to increase the likelihood of poor or incomplete removal work and/or residents living in unsafe conditions. Homeowners may not have allocated the sufficient budget for removal and disposal by a specialist and were unable to avoid or pass on the costs of disposal to others. Professionals reported that owner generators were sometimes reluctant to admit the likely presence of asbestos for fear of opening a can of worms and then not being able to afford their renovation.

> *"On one side, if it's an owner doing their own demolition and they're trying to avoid the 10m^2, then it's saving the cost of removal, isn't it? And for the other person, it's profit, if it's a commercial person doing it, it's pure profit."* Approvals and certification

For professionals involved in generating or disposing of asbestos waste, these costs were thought to prompt unsafe, and illegal behaviour, making it possible for a business model where money is taken for appropriate waste disposal and instead, the waste is illegally dumped or used as fill. The lack of consistent expectation that a tip receipt will be shown as evidence of lawful disposal, in part, makes this possible. These was a sense of futility about addressing this illegal behaviour from professionals, particularly those whose businesses are directly impacted by it. The research revealed evidence of some suppliers finding it tough to compete or to run a profitable business and therefore reducing their asbestos waste services or considering closing shop. This raised the concern that there may be dwindling availability of services for people trying to dispose of asbestos lawfully.

There was a perception that remaining competitive and profitable in businesses related to asbestos waste was a mounting challenge, due to:

- increased number of budget operators;
- rising cost of insurance;
- lack of local options for disposal;
- more and deeper price gouging by dubious operators;
- greater variations in tipping fees between asbestos and other waste:
    - between different sections of the community (e.g. discounts for locals but not businesses);
    - increase between waste sites; and
- pressures of economic downturn and increased risk taking behaviours.

> *"There's always someone doing the wrong thing, while guys like us are doing the right thing and they make us look bad. To try and get work doing the right thing is impossible when so many people are doing the wrong thing"* Transportation

> *".. a clear case of honest people getting punished by making honest mistakes, and then you get these people, charlatans, that do the wrong thing purposefully that seem to never get into any trouble at all."* Licensed asbestos removal

Some participants appreciated that the issue is complex, and that cost is only one of multiple drivers of unsafe behaviour for professionals and non-professionals. For instance, it was observed by stakeholders that illegal dumping still occurs in places with no waste levy and by those who are not in economically limited circumstances. Nevertheless, the cost differential between disposal of ordinary and asbestos contaminated waste was almost universally perceived as strongly influencing unsafe and unlawful disposal behaviour.

Also impacting safe and lawful disposal behaviour was minimum weight pricing at waste sites, where professionals described various forms of amassing asbestos waste to minimise the disposal costs for amounts of asbestos waste that would otherwise fall under the minimum. These have been described under *'stockpiling of asbestos waste by professionals'*. With regard to the cost of asbestos disposal, some stakeholders questioned where the cost of removing asbestos from the environment, including legacy asbestos, should lie and wondered whether more government funding was required earlier in the process to prevent illegal dumping, rather than funding its clean-up.

Concern was repeatedly expressed that those making the effort to do the right thing by operating within the system and attempting to comply, faced higher levels of scrutiny and were forced to complete higher levels of non-income earning activities (such as, administration). This was reported as further compounding the difficulties of competing with those operating outside the system. There were many calls for better support of

those wanting to do the right thing, with a rebalancing of the stick versus carrot mechanisms in place to influence behaviour. This reflected overall feedback that a more collaborative approach to the problem of asbestos waste is both wanted and warranted.

The problem of small pieces

A range of situations were described in the research where small amounts of asbestos may be discovered – concealed on a property, left over after a removalist has been through etcetera. Time and again it was raised that disposal options that may make sense for larger volumes of asbestos, even despite the issues described above, seem a greater barrier for small pieces, and that in the absence of clear, convenient and cost-effective disposal options, some will resort to unsafe, unlawful alternatives, such as putting the asbestos in a kerbside bin or trying to mix it in with other waste. This was particularly an issue on job sites for licensed removalists, construction and demolition companies, and transporters alike, where small pieces are discovered, long after the official asbestos removal is completed. Some pointed to a lack of pragmatism in the way that small quantities were approached by authorities.

> *"When you go to [waste site], you need to be in a big truck, you need to know what you're doing, those guys that run the place they have very low patience, so no, you can't just rock up there with your car and want to get rid of 100 kilos. There used to be [waste site]. I understand they used to accept asbestos, but I've been told that they no longer do accept small amounts of asbestos. So, I don't know anywhere that does take it. I got asked this question last week by a customer of mine. He said I've got a bucket of asbestos, what do I do with it? I said the only thing I can do is offer you a skip-bin, and I said and this is the price, and he goes that's not an option, thanks a lot, and I never heard back, so where did it end up? I don't know."* Transportation

CASE 13: TRYING TO DO THE RIGHT THING WITH SMALL PIECES

Licensed asbestos removalist

"I gave this guy some bags and said, if you find anything call me, but here's some bags and use these if you find anything. Now this guy went and took down all the bathroom and laundry which was all non-asbestos, new stuff. He put that in the asbestos bag and he threw that in the front yard. A neighbour sees it, calls Worksafe. Worksafe turns up and says right, look at all this, the demolisher goes no, no it's okay, we called [NAME OF REMOVALIST] and he came in and he's taking all the asbestos away. So then I get this call from Worksafe and he was saying how he's going to make me lose my licence and I'm going to pay for this and I said listen, all we got asked to do was to do the eaves and there was no other asbestos there. I think he must have thought because there was all these bags I left there, that these guys were working under my name, or, I don't know what he was thinking. But the unfortunate thing is that when he went through the rubble, he found a piece of actual fibro…. I did do a visual inspection, but a guy's contracted me to do the eaves, why would I just automatically take it upon myself to go through the whole house. You know someone's going to demolish a house you know they're going to find things, so what do you do? Do you let them put it in shopping bags? So many times you turn up and people have got it in shoe boxes, people have it in lunch bags, so I think I'm doing the right thing thinking, this poor guy's probably going to find a few pieces, here's a bag. As a courtesy thing I offer my customers that I'll pick it up for you and it's a proper bag, it's all safe, it's marked as asbestos they can leave it on site wrapped up, people know what it is. You think you're doing the right thing, but I don't know."

Time pressures & expectations can lead to shortcuts & narrowed options

Previous research has indicated that the time and effort involved in handling and disposing of asbestos safely and legally - loosely termed 'convenience' (or lack thereof) - is a disincentive to desired behaviour. This research further supports this view, as property owners and professionals alike cited this as a reason that shortcuts are taken.

Property owners were reluctant for time spent remediating asbestos and correctly disposing of the waste to cause delays to work that would negatively impact costs. For construction and demolition workers, asbestos waste meant a significant amount of time may be unexpectedly taken up by suiting up and removing the material themselves and preparing it for disposal, bringing in additional professionals to test and/or remove it, or disposing of the asbestos waste at one of the few facilities that now accepts asbestos. In a work context, this time represents an opportunity cost in terms of advancing the current job or moving to the next. Consequently, there can be a direct financial impact to the business when delays occur.

> *"Take greed out of society is what you need. Feel pressure to hurry up. With the boss, it's always about money – get the job done as quickly as possible"* Demolition and site preparation

Physical distance to waste facilities that are licensed to accept asbestos was a time-related obstacle to proper disposal for some. There was mention of the closure of some facilities, and that other facilities are no longer accepting asbestos, which necessitated a longer trip. This meant that unlike ordinary construction and demolition waste, disposal of asbestos waste required lengthier travel times and some planning to fit with waste site opening times and staffing and equipment requirements (e.g. water truck).

Professionals also mentioned that correct handling and wrapping of the material itself, in preparation for disposal, as well as transportation protocols and tracking, can be a time-consuming, prolonging the job and putting workers under pressure. Waste sites reported shortcuts to disposal preparation such as only a single layer of builders' plastic, wrapped parcels being too large, or asbestos waste not wrapped at all.

Proper equipment & staff may not be available

Both professionals and property owners described situations when, at the time asbestos was discovered, the appropriate equipment (either equipment for removal such as PPE, or for preparation for disposal, such as builders plastic and tape) was not readily available. Similarly, sometimes personnel with the requisite experience (for non-friable amounts under 10m^2) or licence (for other asbestos removal) may not be on-site at the time asbestos is discovered. This situation occurred for both workers who had colleagues who were licensed (Class B) and for builders who had hired an asbestos removalist but had later discovered small pieces of asbestos waste at the same site. Without the necessary staff and equipment, different handling and disposal decisions were then made, including handling asbestos with no PPE, mixing it with other C&D waste, or burying it onsite.

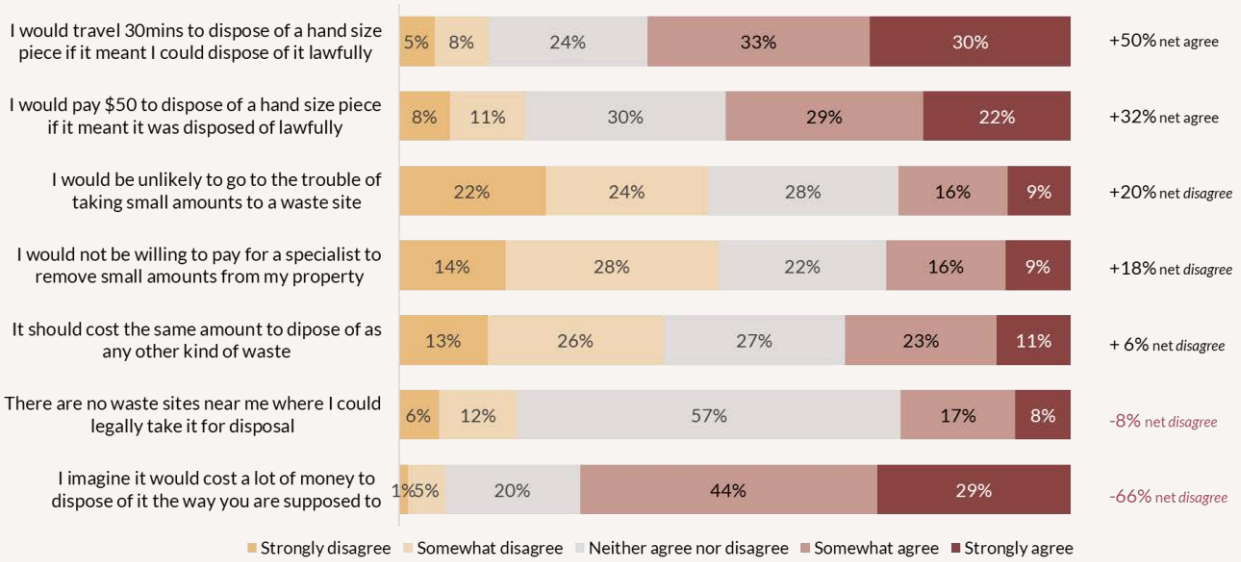
Figure 20 orders statements included in the survey that relate to physical opportunity, by net disagreement (net agreement in the case of the first two statements, with which participants would ideally agree).

A physical opportunity deficit was particularly evident in relation having waste sites nearby licensed to accept asbestos, with more agreeing that there are no such waste sites (25%) than disagreeing (18%).

The majority of statements centred on cost, revealed as a key physical opportunity barrier to legal disposal of asbestos waste in the qualitative research, particularly for small quantities, and demonstrated, in Figure 14, to be the most consistently identified challenge in relation to disposing of asbestos waste. Survey participants were fairly divided on whether or not asbestos waste should cost more than other types of waste to dispose of, but not insignificant proportions said they would not be willing to pay for a specialist to remove small quantities (42%) and that they wouldn't pay $50 to dispose of a hand size piece (19%), with 73% agreeing (29% strongly) that legal disposal of asbestos waste is costly.

In terms of inconvenience as a barrier to legal disposal, of concern, 26% agreed that they would be unlikely to go to the trouble of taking small amounts to a waste site, with 13% saying they wouldn't travel even 30 minutes.

Figure 20. Agreement with statements relating to physical opportunity



Q4.2 To what extent do you agree or disagree with each of the following statements?
Base: All survey participants (n=2,702)

Those dealing with asbestos waste in a work setting were shown more specific challenges relating to the cost of disposal (the proportion selecting any, reported in Figure 16). Owners being unwilling to pay for disposal was seen as a particular challenge (39% of professionals dealing with asbestos nominating this as a challenge), followed by the cost of disposal when asbestos was found unexpected (35%) and competitive pressures from operators not charging the correct waste fees (23%).

Social opportunity

Social opportunity captures the impact of others on an individual's behaviour, thereby situating people within their relevant social context. It explores the extent to which there is social support for the desired behaviour. This includes the influence of social dynamics, cultural values, standards and customs (both actual and perceived), implicit organisational culture, peer pressure, and relational expectations.

Social permission exerts a strong influence on disposal actions

In a work context, participants described the impact of work culture and processes on the behaviour of those working with or coming across asbestos in their workplace, and consequently on decisions about how to dispose of waste. Employees took cues from the behaviour of their bosses or from their licensed colleagues, and those in-between (such as transporters) took cues from both generators and waste sites, which at times led to frustration.

> *"We bother to cover it up and then it gets tipped out of a truck at the site and breaks up and covers are ripped.'* Demolition and site preparation

Some participants were well aware of their influence on the behaviour of others and had actively embraced this and had a strong organisational culture of education. This appeared key in their overall approach to asbestos, and they had provided education not only their employees, but also their customers and the wider community. Some, including waste sites, councils, industry bodies and skip bin companies, described having developed support materials themselves for this purpose. Over time this approach could be expected to have an impact on psychological capability (discussed in the previous section).

Reputation in a social context influences safe and legal behaviour

Ownership of a business, based on this research, appeared to influence safe and lawful asbestos waste disposal behaviour. In a cultural context where corporate social responsibility is valued, and where reputational damage can have serious financial consequences for a business, owners claimed to want to maintain a good reputation in a competitive marketplace.

> *"We need to do it correctly. If it gets out, you'll get bagged out by the media. It's bad for your health and not good for the industry. It will come back and bite you. Our company has been around that long. In my industry your reputation is word of mouth. We pride ourselves on always striving to do 110%."* Demolition and site preparation

> *"We've been operating for a fair bit of time now so it's just the clientele base that we've built and our reputation that we've got for ourselves. In terms of having a quick service, quick turnaround, reliable every time. If there are any delays or hiccups, they get informed, but we just build our reputation on that."* Transportation

For those in regional areas, there was the added factor of being in a smaller pool of business and therefore more exposed to scrutiny, as well as wanting to participate as an upstanding member of the community.

CASE 14: REPUTATION AS MOTIVATION

Property developer

"All they are going to remember is the developer's name and go well look, this was not done to 100% satisfaction, so even though technically once we finish a project we can walk away and we have no liability, if the owners of those people contact the agent and said, look we have got a small water leak or we have got something like that, we'll go back and just do the work to remediate. Even though it's not technically our responsibility, because we want to make it a good response, because if down the track someone else wants to buy one another one of our developments we've got a reputation we want to uphold. When I have found small pieces [of asbestos], this is being pretty pedantic, but that's just me, I just get the oldest pair of gloves that I have got and I will pick it [asbestos] up with the gloves and, I wouldn't put it in the bin, if it is big enough I will wrap it in plastic and take it to the council, and then I would just

throw the gloves away to be honest, because I just don't want that risk. Even though there might only be a very minor risk, I just don't want that risk and of having an issue come back two, three, five years down the track. From a regional perspective reputation is just massive, it really is. I just find that people in regional locations - once you get burnt no-one wants to know about you at all. You just go no, he's the guy that did that 14 years ago and they just remember. So you find that, well I find locally that most builders, most developers, most tradies they do a pretty good job, and they are fairly proud of what they do, because once someone says they are no good you just won't get work, it's just as simple as that."

Multiple regulatory bodies leading to gaps & mixed messages

Participants repeatedly expressed the view that the involvement of three different bodies – local government, SafeWork NSW and the EPA – with jurisdiction over the safe and legal management of asbestos waste could, in itself, be problematic. Specific issues seen to be caused by the involvement of several regulatory bodies included:

1. lack of continuity of monitoring and enforcement across the asbestos waste chain;
2. lack of clarity among industry around where regulatory responsibility lies in practical terms, especially for newcomers;
3. lack of alignment of systems, registers, reporting, and notification;
4. inconsistency in definitions in relation to asbestos waste, for instance 'contaminated soil'; and
5. variable interpretations of lawful compliance leading to mixed messages about risk.

This is particularly important because regulators and other bodies with oversight of asbestos waste appeared to have a strong influence on behaviour and were looked to, to model and support positive intent and gold standard behaviours. Indeed, as the relevant authorities, participants held government bodies to a higher standard than other organisations, including asbestos experts. A few participants mentioned examples of representatives of local council, the EPA and SafeWork behaving in an inconsistent way, or in a way that suggested insufficient attention to regulatory requirements, including instances of alleged corruption in local councils, and a perceived lack of enforcement by the EPA. When instances such as this happened, professionals received mixed messages and cues about what was acceptable and at times interpreted this as condoning certain behaviour. This warrants extra caution on the part of the representatives of relevant regulators and authorities.

The perceived outcomes of this lack of alignment and mixed messages were:

1. gaps in the safe and lawful management of asbestos, for instance, in planning applications, transportation or for rejected loads;
2. opportunities to avoid scrutiny available for those so inclined to exploit them, such as not using WasteLocate for amounts of asbestos >100kg/10m^2;
3. divergence in opinion between suppliers on a job site about appropriate steps to take in relation to asbestos waste; and
4. cavalier attitudes and risky behaviours where more caution should be exercised.

Consequently, many participants called for better coordination and continuity in the regulation, monitoring and enforcement of the handling of asbestos waste by the lead authorities.

CASE 15 SHORT CUTS ENCOURAGED BY LOCAL AUTHORITY

Licensed asbestos removalist

"This Crown Land guy, what he showed me, there wasn't very much of it, but when we did go up there we found a bit more, hidden behind bushes and stuff like that. I had three blokes walking around for I don't know, four or five hours with plastic bags, you know those proper plastic bags that you put asbestos in and picking it up when they found it and yeah we took it all home. We didn't have that much of it I suppose, we had half a small six by four trailer load by the time it was finished. Although I thought there'd be less to start with and as I say, we didn't bother reporting to WorkCover because we thinking it was going to be less than 10 square metres, on top of that once you report it to WorkCover there's more paperwork and you have to pay for a Clearance Certificate and this guy he seemed to think that none of that was necessary and he was spending tax payers' money so it wasn't a personal thing with him. The job description there was just pick up what was visible, don't go, obviously we were looking under bushes and such, but don't go digging around in the ground, you just need to do a 'make safe' on it I suppose you'd call it, and that was it. In all honesty that could have turned into who knows what, you started digging in the ground and you find more asbestos, you might end up moving a mountain. Whereas before the bushfire went through it wasn't a problem."

There was some mention of different approaches taken between geographic jurisdictions, which can pose a problem for industry bodies operating across different states and territories and national organisations trying to comply with relevant regulations and licensing requirements. This was also seen to have drawbacks for tracking of waste being taken across borders for cheaper or more convenient disposal.

> *"Most of the waste that's going to Queensland is construction and development waste, it's just ridiculous, a million tonnes are still going over the border."* Waste and recycling facility

The challenges of inconsistent approaches to asbestos waste were seen to emerge particularly during natural disasters, such as bushfires, when local resources and specialists were overstretched and in demand, and there was a need for a consistent and coordinated approach to asbestos waste disposal.

Greater collaboration across all relevant parties and jurisdictions, drawing in key stakeholders from levels of government and industry, was seen as crucial in helping solve the problem of asbestos waste.

Regulatory definitions & enforcement efforts can impede safe outcomes

Some participants observed that regulations are not adequately reflecting the risks faced, and that this can send contrary signals to those involved. The 10m^2 rule - allowing any unlicensed person to remove bonded asbestos - was provided as the core example of this. This was seen to send a message to relevant workers and members of the public that asbestos exposure is not a serious risk, and invites manipulation of the rule to suit the needs of the situation, such as unlicensed people tackling large asbestos removal jobs and dividing waste into batches across different disposal loads, each conforming to the less than 10m^2 requirement.

Also mentioned was WasteLocate which, while seen as well intentioned, was considered somewhat impractical in execution and easy to circumvent. The administrative nature of the WasteLocate system was viewed as inappropriate and, in part, the reason for its lack of use, given the poor fit with the skills required to perform transport and waste work resulting in inconsistent compliance by drivers. Asbestos waste transporters reported varying experiences of, and success with the system (discussed previously in the Disposal section).

> *"I'm not even savvy to make it work, I wasted I don't know how long trying to make it work one day and I rang up EPA or something, got put on hold and then I went to somebody else, in the end I just gave up, what I was doing with the one of the tips, I was just taking the approval from what used to be WorkCover and now's SafeWork to do the job with me and showing them the paperwork. Plus, my phone was an old one which didn't have those apps on it anyhow and, I don't know, it's all very inconvenient I suppose."* Licensed asbestos removalist

Mention was also made of site audits under the NSW Site Auditor Scheme for contaminated land management. It was reported that some large sites choose to be (voluntarily) audited to assess their risk; for others, this is required by the consent provider. But the majority of sites were believed not to come under an audit, leading to a lack of oversight of waste handling and disposal.

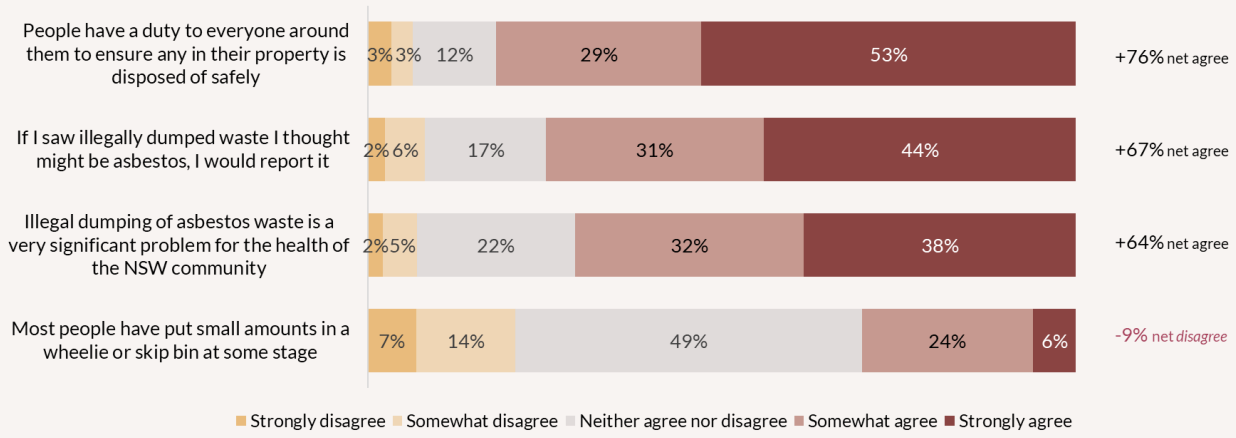
There was confusion among some professionals over thresholds for bonded and friable asbestos within soil, with "emu bobbing" a common practice. Participants reported an issue with contaminated soil being moved around properties, including by site preppers, with contaminated soil 'diluted' to achieve undetectable concentrations. Concern over asbestos coming out of recycled soil from resource recovery facilities and re-entering the system was also expressed.

Concern as expressed that the current definition of asbestos contaminated waste leads to the possibility that entire stockpiles of waste and/or recovered materials being deemed contaminated based on the discovery of any asbestos, even very small amounts. This was seen as placing unlicensed waste and recycling sites at risk of breaking the law, even if following best practice, if others in the asbestos waste chain have not previously identified and handled asbestos waste correctly.

Figure 21 orders statements included in the survey that relate to social opportunity, by net agreement (net disagreement in the case of the last statement, with which participants would ideally disagree).

Survey results suggest that flagrantly dangerous disposal of asbestos waste, including illegal dumping, is not socially acceptable, but that putting small amounts in a rubbish or skip bin is not consistently viewed in this way or considered uncommon – 30% agreed that most people have probably done this at some stage.

Figure 21. Agreement with statements relating to physical opportunity



Q4.2 To what extent do you agree or disagree with each of the following statements?
Base: All survey participants (n=2,702)

MOTIVATION

Before an action is taken, an actor must be motivated towards the behaviour. Within the COM-B framework, motivation takes into account both personal conscious and unconscious drivers of behaviour. When it comes to the safe and lawful disposal of asbestos waste, this research indicates that behaviour is strongly influenced by motivational factors both inside awareness, such as keeping safe and financial benefit, and outside awareness, such as fear and insecurity.

Reflective motivation

Reflective motivation includes conscious reasons and analytical decision-making processes that that drive behaviour. A part of reflective motivation are our beliefs about ourselves, our identity, confidence, our goals and intentions and the anticipated consequences of our actions.

Consequences of non-compliance factor into professionals' decision making

When making decisions about the disposal of asbestos waste, the anticipated personal consequences of being caught failing to do so, provides motivation to act safely and lawfully. Specific fears mentioned by participants in this research included a fear of being fined, of losing their licence to operate, of ruining their reputation and, consequently, going out of business and being without an income. This fear of loss of their business and income are powerful incentives for proper disposal of asbestos, since they relate not just to financial security, but to their survival and their identity as a provider and/or business owner. For some there was a perception that they really have no choice but to comply.

> *"You can lose your house over stuff like that. I've worked too long and hard to risk it"* Transportation

> *"It's a family business, we've taken over the family business and we've just re-structured the whole business, changed the business name, changed everything around, image, the whole lot from start to finish."* Transportation

The anticipated consequences of improper disposal appeared less of a motivator for property owners, who were also much less aware of their responsibilities or of the relevant regulations.

Most try to do the right thing but there will always be 'bad apples'

Participants across the board made the observation that most individuals and organisations working with asbestos waste intend to comply with the law to ensure appropriate safety with asbestos waste disposal. However, they stressed that, where money is to be made, there will always be those who try to take advantage of the system. Among professionals, this led to feelings of frustration, especially as these actions impacted the competitiveness of their business. For professionals and property owners, there was concern that illegal and unsafe behaviour impact quality of the work carried out and ultimately could have wider consequences for the community. Even behaviour designed to meet the bare minimum standard was considered to pose risks.

CASE 16: IMPROVING STANDARDS OF WORK

Private Certifier

"Certifiers treat government regulation as the minimum standard. The people that we deal with often treat government regulation as the maximum standard. And that's where your conflict arises, where we've got to drag those people up by the boot straps to try and do the right thing and they're not always cooperative in doing the right thing, because often doing the right thing costs them money. We need a level playing field so that person who is trying to do the right thing is not disadvantaged because they are doing the right thing. You run the risk of those people who are trying to do the right thing, becoming disillusioned with the process and saying well hey, we've got to do the same as the other bloke and then it just becomes a continual race to the bottom, rather than a process of improvement. If the bottom were dragged up towards the top, we would be in a far better place than if the middle was being dragged towards the bottom."

New entrants thought to be more susceptible to compromising compliance for gain

Professional participants in this research suggested that unlawful and unsafe disposal behaviour was most likely to come from people who, unlike themselves, were new to the field. There was a belief that newer players had shallower levels of skill and experience with asbestos removal or disposal, had insufficient (if any) training, were much less aware of the relevant regulations and requirements, and had businesses without an established reputation or customer base. In the minds of professionals operating in a compliant way, these professionals were less aware of or motivated by perceived consequences as they had less to lose, financially or otherwise.

> *"You can't survive not doing it properly these days. It's only the small or newer operators. They're young, naïve, wouldn't know the consequences. They've got nothing to lose."* Transportation

Consideration of safety for self & others provides motivation

Participants expressed concern for the safety and health of themselves and even more so, others, as motivation to act safely and lawfully with asbestos waste. For employers and business owners, the welfare of staff, particularly younger apprentices, was important in guiding their actions. Most who considered it "too late" for themselves (having been exposed to asbestos fibres in the past) had protective impulses towards others.

> *"I do care about my health or my employees health and wellbeing and they all have families. I've been exposed to it, so I know how bad it is and I know down the track it's probably not going to be good for me either. So yeah, that's why we kind of do everything like try to educate and promote doing the right thing."* Transportation

Some also expressed concern for those beyond their immediate community, including unwitting waste workers and the wider community (although it did seem that many others had not considered this at all in the context of unlawful disposal methods). This consciousness about the welfare and safety of others was related to a desire to be a good role model for others in acting safely and lawfully.

> *"It's about doing the right thing, keeping yourself and others safe." Licensed asbestos removal*

Alignment between regulation & personal values impacts behaviour

Disposal-related behaviour reported in this research was impacted by the level of alignment between the individual's or organisation's values and the regulations and requirements. That is, if a person did not understand or agree with the reasons behind regulation, then compliant behaviour was less likely or less consistent. The result was that with regards to safety and compliance with asbestos waste disposal, behaviour reflected a 'near-enough-is-good-enough' mentality, along with a perception that rules can be excessive or impractical. This led to a common-sense approach to decision making, where a course of action was selected based on a personal assessment of what is both safe and practical, rather than by strict adherence to the law.

> *"The regulatory framework in NSW is more prescriptive and more problematic and less in tune with reality that some other jurisdictions - in 2018 with the change to the regulation around processing and the presence of asbestos in waste. Asbestos is very hard sometimes to identify and a lot of it can be unknowing delivery of product onsite. The classic one is the bricks with the asbestos on the back that you can't see on an individual brick. The reality is we still will find asbestos on sites, and we're not doing enough up the chain with developers to make them liable for the asbestos onsite, to make sure that they're not delivering it to waste sites."* Waste and recycling

> *"It was just vinyl tiles. But It's a one size fits all thing, they don't say old asbestos has got, old asbestos sheeting's got more asbestos in it and it's more dangerous and vinyl tiles has got virtually none it plus it's so well bonded that it's not dangerous, they just say it's all dangerous, all has to be treated the same, although I did hear that in America in certain states if you got less than 2.5 percent asbestos in the sheeting it wasn't considered to be a problem."* Licensed asbestos removalist

AUTOMATIC MOTIVATION

Automatic motivation refers to all unconscious processes that activate and guide behaviour, including habit, biases, intuitive and emotional responses and the involuntary influence of rewards and disincentives. As Kahneman explains, motivation driven by "system 1 thinking", operates fast and instinctively "with little or no effort and no sense of voluntary control"[3]. Automatic motivation is crucial as it represents the lens through which all interventions are perceived, exerting an influence on behaviour outside of conscious awareness.

Fear responses to asbestos waste are less apparent among professionals

Previous research has clearly identified that asbestos prompts alarm, concern and unease among members of the community. These fear responses impact decision making because this automatic emotional response is accompanied by an urgent impulse to act in a protective way, in the interests of oneself and others. This result in protective actions or denial of the existence of the asbestos. These responses, however, appear largely absent or perhaps dormant in professionals that work with asbestos waste and its disposal.

Rather than being primarily related to underlying safety fears, illegal and unsafe disposal decisions and behaviours by these professionals were instead be driven by fear of financial insecurity because of professional consequences or the lost income. Interventions aimed at professionals must consider the relationship between the livelihood of the actors and the behaviour they are required to undertake.

Stigma makes asbestos waste a 'hot potato' no one wants

Some participants reflected that there is a stigma surrounding asbestos that seems to reinforce and perpetuate underhand behaviour or the hiding of asbestos waste. A perceived lack of community discussion, knowledge and debate, combined with punitive behaviour change measures, led to fears not just of health consequences but of financial ones and of the unknown.

This research clearly identified a reluctance to take responsibility for asbestos waste across the journey (accompanying the lack of knowledge about who is responsible anyway). The result was that each actor in the chain was keen to pass on responsibility as soon as possible so as not to be stuck with the 'hot potato'. This can lead to lax caution or adherence to regulations or hurried or ill-considered decision making.

> *"In the trucking industry there a chain of responsibility. There're so many people in the chain that could all be liable. They all should be liable."* Transportation

> *"I don't know whose legal responsibility the asbestos is. It feels like it's our responsibility as the specialist."* Licensed asbestos removal

> *"Unscrupulous builders have done sneakies, tradies at home, maybe an electrician, he's doing work, or even on another job, how am I going to get rid of this, I'll chuck it in this bin over here, I know where there's a bin, I've got to go there Wednesday, I'm doing a job, I'll just toss it in the back of that and my problem's gone, it's somebody else's problem and I don't care. I've seen that, yeah, we see that a lot."* Transportation

Some feel a sense of futility about asbestos waste

Some professionals and stakeholders felt a sense of futility or frustration about the issue of asbestos waste disposal. In some cases, this was due to the belief that there will always be people who do the wrong thing, and there is no was to stop this. In other cases, is was related to a belief that pragmatism is absent from the current system across the waste chain. For professionals, this was based on their experiences trying to be compliant, and finding this challenging or elusive. For instance, extra pieces of asbestos found on site after the professionals have left, weight minimums at waste sites making small loads cost prohibitive and leading to stockpiling, and zero tolerance thresholds for soil leading to huge amount of unusable fill.

[3] Daniel Kahneman. (2011). Thinking Fast and Slow. Farrar, Straus and Giroux.

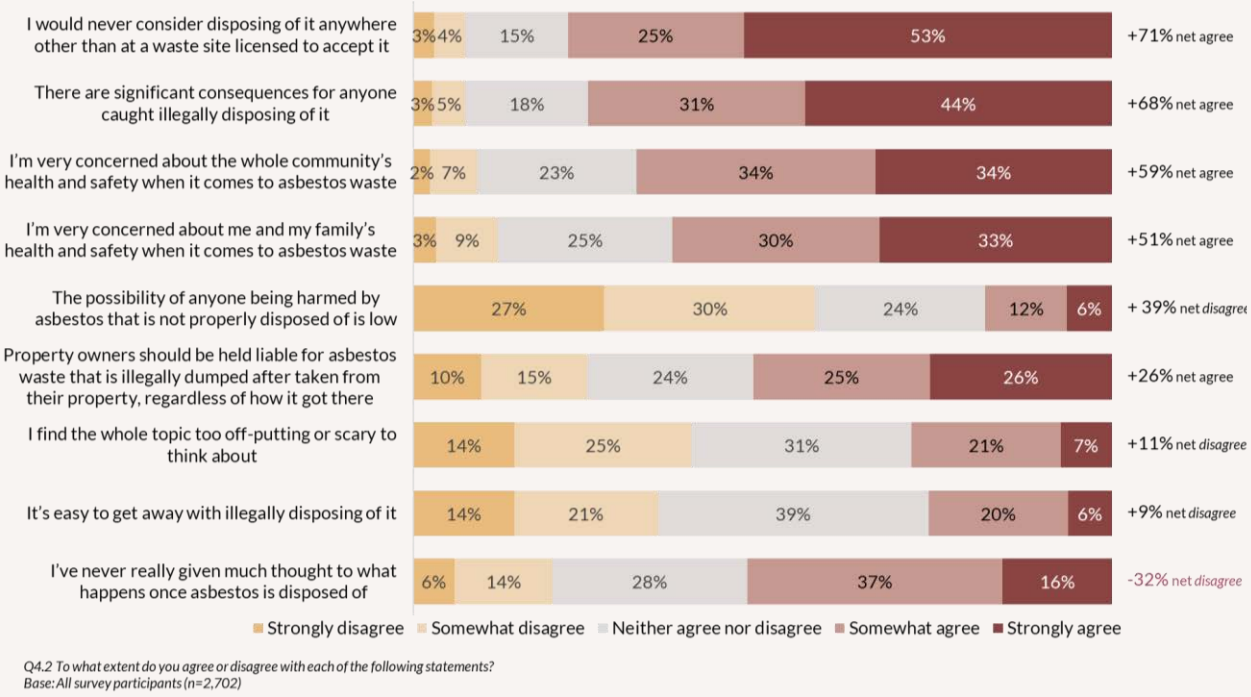
This futility or sense of disempowerment can have implications for safe and lawful behaviour, if professionals or property owners arrive at the belief that there is no point or give up.

> *"There's always people that either through ignorance or through laziness will always be doing things that are harmful to themselves and the environment."* Licensed asbestos removal

Figure 22 orders statements included in the survey that relate to motivation – the majority specifically reflective motivation – by net agreement (net disagreement in the case of four statements, with which participants would ideally disagree).

A key deficit in motivation revealed here, is through a failure to fully consider what happened to asbestos once it is disposed of – considerably more agreed that they had never given this though, than disagreed with this idea. Encouragingly, more than 2 in 3 appear motivated to do the right thing by concern for the health and safety of themselves and their family, and the whole community.

Figure 22. Agreement with statements relating to motivation



Q4.2 To what extent do you agree or disagree with each of the following statements?
Base: All survey participants (n=2,702)

INTERVENTION OPPORTUNITIES

Research participants generated a range of ideas, usually mentioned spontaneously, to support the safe and legal disposal of asbestos waste. These ideas are listed here, under broad themes.

Better community education

Many suggestions centred on addressing awareness and knowledge gaps in the general community. These suggestions included:

1. A stronger focus on educating the community about the best options for disposing of waste, including different types/volumes of asbestos waste. For operators who focus on education of staff and customers, materials to support them in this role would be valued, to add to their limited resources. Education was thought to be required for both homeowners and those working in construction and demolition.

   "We need to educate the public on other options, more cost-effective options to get rid of small amounts of asbestos." Transportation

   "There's a lot of people out there that don't know the best ways to get rid of waste, especially for larger companies, I see it all the time. In the tips they're bringing in stuff and it may be a 20 metre hook-bin, and they're throwing like all these pallets in there, and see I know where those pallets could go and you would pay $40 a tonne instead of paying $300 at the tip. I'm surprised the EPA actually hasn't promoted that, like that's probably a brilliant idea, especially in big business, to get someone that knows how waste works. I can just tell by the phone calls I screen, some people have no idea how it works, all the different kinds of waste, how to segregate it. So, there's a lot of people missing out." Transportation

   "Best practice waste management is achieved through best practice source separation at source. So, there would be definitely a point to education up the supply chain to C&D, similar to what we do at the household what's recyclable, what's not, etc. So, there's a definite holistic process to be done starting at the source. Everything from your DA stage with the appropriate waste classification and testing and allowance for different collection and source separation materials. And then as asbestos starts to be removed, it's about best practice management of that material on-site. We have to accept that we have to start there with education to try and get maximum recovery. And then working through the supply chain with much better contracts around quality of materials, tracking of materials, recovery of materials as a result." Waste and recycling

2. Greater education for those engaging professionals to handle asbestos waste on what should be included in quotes, and what should be provided by way of evidence, with a mandated requirement for greater transparency. Stakeholders saw the importance of separating out the costs associated with removing and disposing of asbestos waste appropriately from overall building and refurbishment fees and making this transparent, and construction and demolition workers saw this as crucial in creating an even playing field, particularly to ensure these costs were budgeted for and to reduce the possibility of corners being cut. It was suggested that this could be achieved by property owners / clients paying these costs directly and receiving the resulting docket/certificate.

   "If everyone insisted - mate I need to see your licence, I need to see the tipping receipt, I want to make sure that you have a hygienist come here" Licensed asbestos removal

3. Continued education on 'free fill'. While some may be accepting waste as contaminated fill for a payment, it was thought that other times such fill was still being accepted due to lack of awareness of the issue.

4. More generally, raising the profile of asbestos as a community health and safety issue.

   "We created asbestos, and now we need places to take it. Bring it out of the dark – into the light. Society created the problem; we need to solve it together." Transportation

More mandatory requirements for training on asbestos waste, among a larger pool of professionals, with tightened licensing requirements

Across the board, from owner renovators, building professionals and asbestos specialists, training in dealing with, removing and disposing of asbestos was seen to be an area that could be improved to increase the safe and legal disposal of asbestos waste.

There was mention made of linking licensing for construction and demolition workers to ongoing asbestos training, as well as instituting a similar system for asbestos transporters. The aim of this was to help in ensure workers coming across and dealing with asbestos waste retain up to date knowledge of best practice and regulatory requirements. Licence renewal which appeared to be a simple exercise, was mentioned as a potential, unutilised opportunity for addressing training and experience deficits through additional continuing professional development requirements.

In the context of a perceived burgeoning of licensed removalists, it was suggested that increasing the cost of entry into the industry, including through higher licence fees, might help minimise the number of cowboy operators.

Better oversight by authorities, with asbestos registered and tracked

There was repeated mention of the notion of a register as a solution to issues of lack of planning, as a way of facilitating monitoring of asbestos right from its source to its final disposal. Suggestions for various registers included:

1. A property register held by councils that records sites where asbestos is located and is populated gradually through mandated asbestos assessment as a property changes hands. The removal and disposal of asbestos could then be tracked from its source and property owners would be incentivised to remediate asbestos on their property to increase its value. This idea was suggested both by stakeholders and by asbestos professionals. The benefit of mandatory disclosure of asbestos in properties about to change hands was appreciated by homeowners, although the best mechanism for achieving this was not necessarily known.

2. A demolition register mandatorily populated when demolition work is planned and which holds information about every site where asbestos waste is to be generated. This was seen as a tool from which handling and disposal of asbestos waste could be tracked.

3. An online register of loads with ACMs rejected at the tip face, to facilitate real-time tracking of these loads (as opposed to the currently maintained registers held by individual waste sites).

Stronger mechanisms to keep track of asbestos throughout the waste chain were viewed as helping to close gaps and tighten up loopholes to prevent intentional or unintentional mishandling and disposal of asbestos. Mandating the installation of GPS systems in vehicles transporting asbestos waste (which, it was suggested, should be specifically licensed to do this task) was also suggested as a means of tracking asbestos waste that cannot be as easily circumvented as the current Waste Locate system.

"Closing the loop. That at the end of the job, not only are the receipts given to me, but that I've got a legislative responsibility to forward those on, so that they either go to the EPA or to council. If that loop is closed, it puts a legal responsibility on me to make sure I've got the receipts, and that yes, it's been done properly. If you do a site inspection, and you do it competently, at that site inspection you should have your hazardous materials report. If that's prepared properly, you can confirm that on site - that's how it's going to be started off and this is where it's going to go, and then the next step, and it's going to be disposed of at the licenced [waste] facility, and within seven days of disposal you've got to give me the receipts. So, then my responsibility is within seven days is to forward those to the EPA and then they can actually see whether the amount being disposed of to that facility, in terms of the tonnage, matches the receipts. Computers are wonderful things; they can match it all up. The government's got the BASIX planning and certification process where at the end of the job, we've got to put on the BASIX certificate that the job's completed." Approvals and certification

"The planning regime and the waste plans should link. At the planning stage you should have to state the classification of any waste you're generating, the facility you intend to take it to and the volumes. And auditors should be accredited and held accountable, so we can track this product and where it goes." Waste and recycling

"Part of it has got to be licensing vehicles that are moving the asbestos to help get waste that is classified in the report to the location it should be. There should be an obligation on the generator of the material and those who are engaging waste transporters to ensure they are licensed and going to a licensed facility. That would help to address illegal dumping." Waste and recycling

"If you had an online live database that gave us the ability to immediately put that into a database that says Joe Bloggs with truck number rego blah-blah-blah has just been rejected from our site, that when that truck driver gets to the next weighbridge at one of our other competitors sites that automatically it's flagged, that that truck has already been rejected. That would act as a disincentive to truck drivers knowing that once you're on the register for that load the likelihood of you getting into another site is significantly reduced." Waste and recycling

"I think there should be a clause in there that says, does the property have asbestos or is there any asbestos located on the property? I mean you ask about things like GST and margin scheme and inclusions and all those things, you could just simply have another check box. Now the question is will people just go I don't want to tell them, or I don't know, so then there has to be another measurement on the back of that. Do you get to the point where you can't sell the property without having an asbestos assessment and provide a certificate? If they made that more cost effective, hundreds of dollars, and it's a condition of the requirement, I think most people would go, well it is what it is. Because I know as a home owner if I went and bought a property and I didn't realise and then I want to do a massive renovation and I found out the whole house was riddled with asbestos and I either couldn't complete it or I could complete it but I had to send 10, 20 grand on budget I had catered for I would be pretty upset." Building and development

Refocusing of enforcement efforts by the NSW EPA and others

Some felt there was some inherent unfairness in the current system. It was commonly noted that some people operate entirely outside the system and hence fly under the radar. Waste sites also suggested this was the case, claiming that those who turn up at their facility are typically trying to do the right thing.

The point was made that regulatory bodies could be more focused on the activities of those involved with asbestos who are unlicensed and untrained or have not registered the work, rather than on the activities of those who are licensed, trained or have complied with registration requirements.

It was felt that individuals or businesses fundamentally trying to do the right thing, should be further encouraged as much as possible.

"I think it's a really simple thing to clean up the industry. The EPA should just do dummy runs, just advertise a fake job on Hipages and see the people that turn up to quote and accept the cheapest quote and just follow it... The EPA should go to these tips with a tonne of stuff under a no-name alias and see what the tip asks them and that way you're going to find out rather than haphazardly pull people out on the side of the road and try and see if you can catch them that way" Licensed asbestos removal

"There is a lot of fear out there with people thinking if they get found with asbestos they're going to get huge fines. Builders thinking that if they call someone like me to come pick up something then I might notice there's stuff in the soil or the hygienist might notice and all of a sudden the EPA's going to come down or Workcover's going to come down on us. It's that fear of thinking something huge is going to happen that gets people to cover stuff up. I just think that if people are told by, if you find something it's not your fault, you know, some type of service that comes and takes care of it and as long as you do the right thing and declare it I think there would be more and more people doing it rather than doing something dodgy, probably put me out of business but that'd be the best way to go about it." Licensed asbestos removal

Better options for cost-effective, convenient disposal of small pieces of asbestos waste

Some in the research spoke of the paramount importance of making disposal of asbestos waste as inexpensive and convenient as possible, to ensure that as much as possible is safely and legally disposed of. Making cheaper and easier the disposal of small amounts of asbestos waste was seen as particularly important, and most so for home renovators.

"When you know someone's about to do a demolition and you go here mate, have a bag if you find anything less than ten square metres put it in here, be safe, call me and I'll come pick it up. The say, that's okay mate, don't worry I'll just put it in the garbage tip and let council pick it up. Some people think they can even put it in their normal waste bin, it's just crazy. Then you get these other people that love to put it under driveways and pour concrete over the top of it, bury it in backyards. I think sometimes it's a Catch-22, I think the harder you make it for people to tip it, then I think the more crazy things go on, because people just don't want to pay that money, you know… The harder you make it for people, and the easier you make it for people to get into trouble by taking it to a waste facility, then it's just going to go more underground. So it seems like we're pushing people to do the wrong thing rather than providing incentives to do the right thing, and the only incentive really is bringing down the costs for people to get rid of it…" Licensed asbestos removal

"When you're knocking down a house you might find that there's a couple of pieces of asbestos board, we're talking about pieces the size of the palm of your hand. Well rather than trying to hide that inside a skip-bin to not have to pay for that whole skip-bin to go off as contaminated waste, if they had a bag or bags that they could put those pieces of fibre board into, wrap it up, leave it on the skip-bin, the skip-bin operator picks it up. and this could be the same for a truck, and when they turn up to the waste facility, the facility is licensed to take that bag, put it into a controlled bin and then have that material disposed of so it doesn't make its way into other material. So a truck driver might turn up with a ten tonne load of brick and a bag with two pieces of asbestos sitting in it, they hand it over, it's put into a safe, steel container and then that's disposed of. So, it's dealing with two pieces of fibro the size of your hand as opposed to tipping a 30 tonne load under the current regime that that whole 30 tonne load has been contaminated going out at $300 a tonne. A small bag of asbestos is a whole lot cheaper to deal with. So, I think there's some merits in that." Waste and recycling

"Having a sensible way to dispose of the material where there's an ability for it to be collected and dealt with safely I think is very, very smart, and I know that the government have looked at different ideas of drop off points and the like. I think that's all wonderful, I think it just needs to be extended into the home builders and those smaller operators that need a practical, simple solution." Waste and recycling

> *"One of the major things if you don't want asbestos dumped on the side of the road or thrown in the garbage bin is just to let people dump it for nothing. In Perth, up north of Perth, up Joondalup or whatever it's called, they've got a big tip there, and once a month, I think it's on a Sunday, you're allowed to take asbestos there if you're a houseowner sort of thing, you don't have to prove anything, when you turn up as long as you can unload it yourself or if you've got bigger parcels of it, a couple of mates with you to unload it yourself and throw it in this huge truck sized skip that they've got there, it's free. It's only once a month, but you get less of it thrown out the wrong way."* Licensed asbestos removal

Raising awareness of responsibility and accountability across the journey

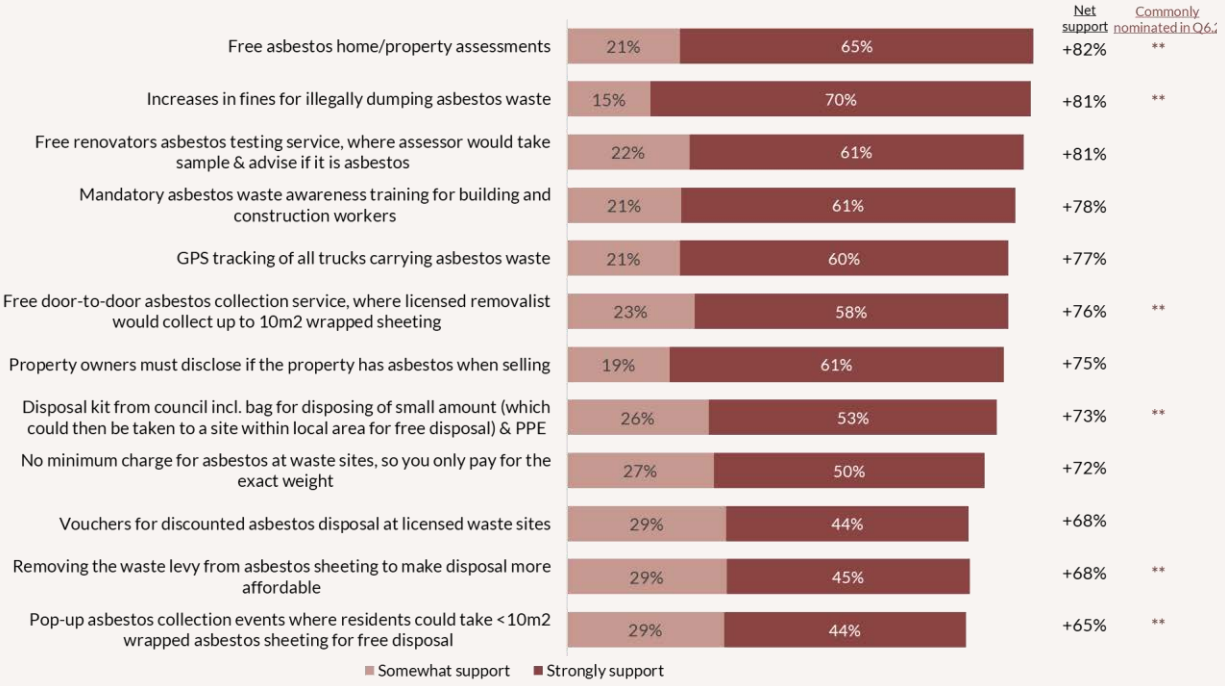
Participants, particularly professionals such as those involved in transportation and waste, described a need for greater ownership of the problem of asbestos across the waste journey. The aim would be to minimise that chance that responsibility and cost would continue to be unfairly borne by legitimate businesses placed at the end of the chain.

> *"Having risk management through the chain to try and de-risk how much asbestos ends up at waste and resource recovery sites would be useful. So, we need shared responsibility with industry and government find a solution. We need to find a way forward as a supply chain to address this, not a punitive way, but in a way that we solve it. Like an accreditation process of waste sites doing the right thing and a similar approach on C&D sites that are generating that waste, like a similar inspection regime. The place for the appropriate testing is where it goes off site to see if it complies with the resource recovery order and exemption, to ensure that no products hitting market with asbestos in it. The goal has got to be a common-sense practical approach to de-risking it through the chain."* Waste and recycling

All survey participants were presented with 12 ideas and asked to indicate their support for each in the interest of supporting safe and legal disposal of asbestos waste. Figure 23 ranks the ideas from strongest to weakest support, as measured by net support (total support less total opposition). As illustrated, all ideas presented to participants were well received, with total support not dipping below 73%. Total opposition did not exceed 9% for any of the ideas. Total opposition did not exceed 9% for any of the ideas. Total opposition did not exceed 9% for any of the ideas.

Free asbestos assessments was revealed as the most popular initiative. It attracted 82% net agreement and was also the initiative most commonly selected by survey participants with past experience with asbestos as likely to have the greatest impact on safe and legal disposal (selected by 49% asked this follow-up question). While a free door-to-door asbestos collection service, an asbestos safe disposal kit from council, and removing the waste levy from asbestos sheeting were only mid-performers overall, these were also commonly nominated by those with particular experience with asbestos (nominated by 46%, 48% and 42%, respectively), alongside the second most supported initiative overall, increasing fines for dumped waste (nominated by 46%; all others were nominated by fewer than 40%).

Figure 23. Support for 12 possible initiatives to foster safe and legal asbestos waste disposal



Q6.1 To what extent do you support or oppose the following asbestos assessment and collection initiatives, in the interest of supporting safe and legal disposal of asbestos waste?
Q6.2 And to what extent do you support or oppose these initiatives, ideas or changes in the interest of support safe and legal disposal of asbestos waste?
Base: All survey participants (n=2,702)
Q6.3 Thinking of your experiences with asbestos waste, which of these initiatives, ideas or changes do you believe would have the most positive impact on safe and legal disposal of asbestos waste?
Base: Those who had asbestos removed/moved on a property they were living in/owed in last 5 years or ever had asbestos waste brought onto a property they owned or were living in (n=205)

Conclusions & recommendations

Asbestos is a ubiquitous challenge for NSW residents

Asbestos is a problem for the whole of NSW given one in ten have in recent years been faced with the problem of having to make decisions about asbestos waste and its disposal. In addition, many workers in NSW are involved in work-related activities where they frequently come across asbestos that requires removal and/or disposal.

Posing a further challenge is the range of volumes of asbestos found and waste generated on properties in NSW. Individual property owners and people working for them primarily deal with tiny fragments the size of a ten cent piece through to trailer-loads of fibre cement sheeting, while vast quantities of demolition material and contaminated soil are dealt with mostly by commercial operations and asbestos professionals. Common to both is the, often unexpected, presence of small pieces of asbestos, coupled with few feasible options for their disposal.

Those making decisions about the disposal of asbestos waste share similar needs and concerns

Several powerful core needs underpin decision-making about the removal of asbestos and its disposal as waste that were identified in the research. These needs and the ways in which they positively and negatively influence decision-making are summarised in the table below.

Table 1: Influence of core needs on decision-making

Description	Positive influence on decision-making	Negative influence on decision-making
Core need 1: *Keep self and loved ones safe*		
Staying safe from harmful asbestos is a core need underpinning the desire to remove and dispose of asbestos once it has been encountered on a property and to protect oneself and others (colleagues, community members) when handling asbestos through the waste journey up to disposal.	Underpins positive decisions to abide by best practice in removal and handling (e.g. engaging a professional, use of PPE, appropriate wrapping), but is a weaker driver of positive decisions about disposal if responsibility for removal and disposal is able to be passed on to someone else.	Can prompt people to act too quickly once asbestos is unexpectedly discovered, which can encourage immediate personal handling rather than engagement of professionals, insufficient use of PPE, or use of improper disposal methods.
Core need 2: *Maintain or increase asset value/profitability*		
Property owners, developers and other professionals operating businesses that intersect with or operate through the asbestos waste journey have a strong desire to maximise the value of their assets (prompting rebuilds, renovations, improvements) and the competitiveness, reputation and therefore profitability of businesses.	Compliance is motivated by the need to preserve business viability.	Can drive reluctance of owners to alert anyone that asbestos may be present , and avoidance of owners and professionals alike to make decisions about asbestos removal and disposal that will be costly, and may induce some unscrupulous operators to operate outside the system to avoid costs and increase profits.

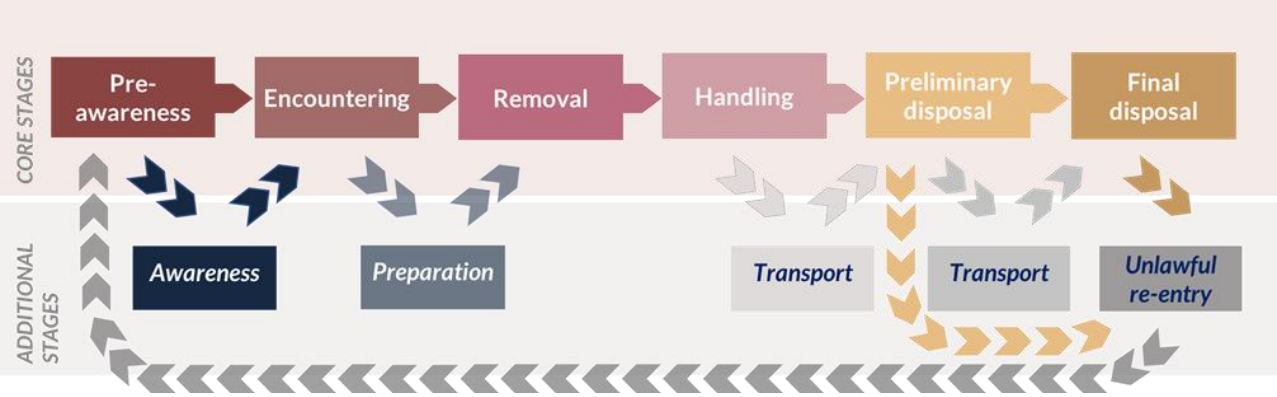
Description	Positive influence on decision-making	Negative influence on decision-making
Core need 3: *Avoid distress and concern*		
Threat response evoked by the risks of asbestos prompts a strong and immediate protective impulse (see core need 1) once asbestos is encountered, especially if unexpectedly encountered, and particularly for non-professionals.	Confidence of professionals can act to allay fears (even if trust is misplaced).	Fear regarding potential harms can lead to panic, which prompts hasty decision-making, or denial, and prompts disregard of consequences.
Core need 4: *Minimise personal responsibility/exposure to liability*		
There is a desire to minimise one's own personal responsibility for ensuring asbestos waste is safely and lawfully disposed of and to consider any obligations as fully discharged once asbestos waste is passed to another party.	Can facilitate desire to engage licensed professionals to remove and dispose of asbestos, and compliance for those professionals who are involved.	Encourages choices aimed at handballing the 'problem' of asbestos waste on to other parties as quickly as possible, promotes desire to accept advice from non-experts and lack of consideration/concern for where asbestos ends up (e.g. not querying or seeking proof of disposal).
Core need 5: *Minimise costs, delays, inconvenience*		
In order to fulfil core needs 2 and 3, there is an associated desire to minimise any costs, delays and inconvenience associated with removing and disposing of asbestos waste.	Professionals can develop rigorous checking and safety processes to screen waste for asbestos.	Promotes poor adherence to safe best practice across the asbestos waste journey, reluctance to incur or bear costs, and engagement in improper or illegal disposal behaviours.
Core need 6: *Protect reputation*		
Individuals have strong desire to be viewed favourably by others and to be seen to be behaving appropriately. Also associated with core need 3, many businesses, particularly those operating in regional locations, want to maintain their professional reputation to support profitability.	Facilitates strong desire to abide by the law, seek information and training, adopt safe best practice, consider impact on others in the waste chain, undertake quality work and to give appropriate advice.	Can drive some to try to avoid scrutiny (e.g. not use Waste Locate, not engage with council), conceal or misclassify asbestos, overlook asbestos (certifiers) or conceal improper or illegal disposal in order to avoid potential to be caught out doing the wrong thing.

Description	Positive influence on decision-making	Negative influence on decision-making
Core need 7: *Avoid scrutiny/detection/penalties*		
Many want to avoid scrutiny and negative consequences that might flow from being caught engaging in unlawful behaviour. Associated with meeting core needs 2 4, 5 and 6.	Fuels desire to know what is lawful and to act consistently with regulations (e.g. seeking information, engaging licensed professionals, engaging in training, using WasteLocate on all jobs, engaging in lawful disposal).	Promotes negative choices that take them out of the spotlight of authorities (e.g. not engaging professionals, not declaring in DA, not using WasteLocate, using remote/ smaller waste facilities). Promotes some forms of improper and illegal disposal (disposal onsite, stockpiling, illegal dumping) of improperly removed waste.

Poor decision-making is evident at several stages in the asbestos waste journey

The research has supported the development of a visual representation, shown below, of the journey asbestos travels on from before it is generated as waste through to its final lawful disposal. It confirmed that asbestos can travel through many hands and that some waste is at preliminary disposal indefinitely, or unlawfully re-enters the waste chain (deliberately or inadvertently), remaining a threat to people and the environment far after the initial purpose of the asbestos has been fulfilled.

Figure 24. Asbestos waste journey



As noted in relation to the core needs summarised above, along the waste journey decision-makers face pressures that facilitate poor decisions in terms of safety, propriety and lawfulness, often aided by information from poorly or partly informed sources.

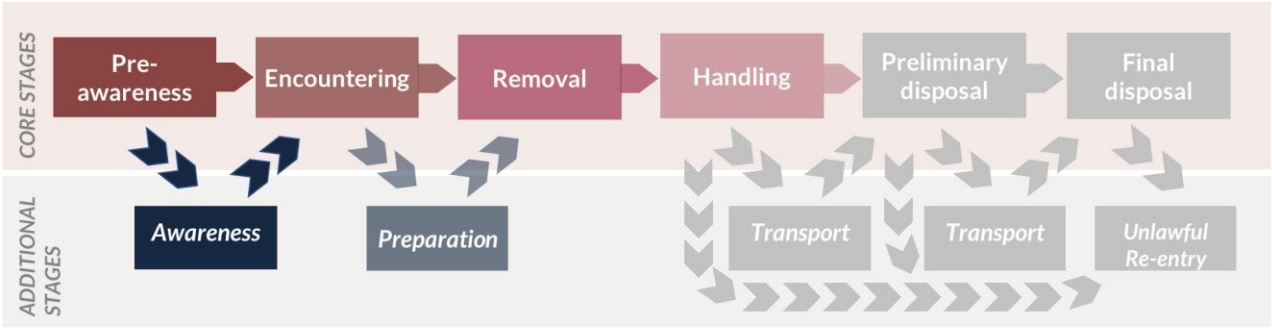
Participants in the research repeatedly observed asbestos waste to be a 'hot potato', the perceived responsibility for which passes from one to another across the stages of the asbestos journey. Those making decisions at earlier stages of the journey feel absolved of further responsibility once asbestos leaves their hands and those at later stages in the journey feel hamstrung by the decisions made by those earlier in the chain of responsibility and consequently exposed to health and safety risks in ways beyond their control.

Choices and behaviours along the asbestos waste chain are underpinned by significant deficits in capability, opportunity and motivation to act safely and in line with the law which were revealed in this research. These are summarised in the following section.

Barriers exist that impede capability, opportunity and motivation to act safely and lawfully

Applying the COM-B behaviour change model has identified a series of barriers to safe and lawful disposal of asbestos waste in NSW. Capability, opportunity and motivation barriers broadly applicable to the generation stages of the asbestos journey (from pre-awareness to removal and handling) that then go on to impact disposal appear in Figure 25 overleaf.

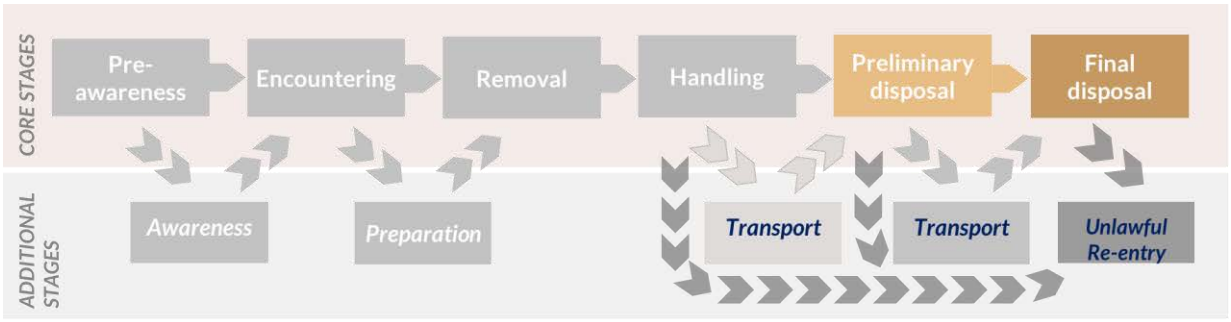
Figure 25. Barriers to safe and lawful action at the generation stages of the asbestos waste journey



CAPABILITY BARRIERS	OPPORTUNITY BARRIERS	MOTIVATION BARRIERS
• *Deep knowledge gaps* • *Overestimation of capabilities* • *Lack of specific training* • *Erosion of practical skill development* • *Varied skills among licensees* • *Absence of licensing (demolition)*	• *Cost of proper handling & disposal* • *Time pressures* • *Limited disposal options (small pieces, licensed waste sites)* • *Equipment/expertise not available* • *Workplace norms/culture* • *10m² sends a mixed message* • *Price cutting impacts bus. viability* • *Multiple authorities confuses* • *DA process re asbestos inconsistent*	• *Asbestos a 'hot potato'* • *Fear of possible consequences (financial or health)* • *Perceived cost and inconvenience* • *Lack of immediate health impacts*
Lack of knowledge that would support safe and lawful disposal of asbestos waste is perhaps the most prominent capability barrier for both property owners and professionals involved in asbestos removal and disposal. Property owners and professionals unlicensed in asbestos removal can overestimate their own knowledge and skills, relying on past experience, and without any formal training or licensing requirements, and the advice of others who may not be experts themselves. Even among licensed asbestos removalists, there are significant knowledge differences between licence type, and depending on the quality of training at the time the license was first issued.	The context in which decisions are made as asbestos waste is generated and the resources available at the time, are critical in creating the opportunity to engage in appropriate disposal behaviour. Property owners and construction workers alike have often not planned or accounted for costs or time involved in removal or proper disposal, which constrains the choices available to them when it comes to disposal. Behaviour then centres on minimisation of unexpected outlays or time delays, particularly were workplace norms exert a strong influence. Unplanned discovery can also mean that experts are unavailable or have already finished work at the site, leaving those unlicensed to make disposal decisions. Generators are also then faced with limited feasible disposal options, especially for discovery of small volumes of asbestos. Regulation and its implementation also serve in several ways as a barrier, constraining opportunities to take actions when asbestos waste is generated that lead to safe and lawful disposal. The 10m2 rule leads to variable interpretation by operators and property owners and communicates a mixed message that perhaps asbestos is not particularly unsafe. Some confusion exists as to the roles of the three relevant authorities and a lack of connection between processes and systems related to and between parties involved in preparation, removal, handling and transportation can be taken advantage of. The cost differential between asbestos and other forms of non-hazardous waste materials produced by the waste levy, combined with not being held to account by generators, enables the operation of business models in demolition, removal and construction that exploit disposal price differences to undercut legitimate operators, who then find it hard to compete.	Motivation to engage in safe and lawful disposal is diminished at the time asbestos waste is generated due to a number of barriers. Property owners and professionals encountering asbestos, whether because of fear of health or financial consequences, tend to treat it like a 'hot potato', passing responsibility on to others. The presence of asbestos, working with asbestos and what happens to asbestos waste is somewhat stigmatised which can lead to knee-jerk decisions early on and a lack of consideration for those managing the waste process beyond generation. Though some are concerned for their own health and the health of others, the lack of immediate health impacts from asbestos exposure weakens concerns and associated safe behaviours at the stage of generation.

Once asbestos has been removed and any chosen preparation for its transportation completed, additional barriers to safe and lawful disposal of asbestos emerge, shown in Figure 26 below.

Figure 26. Barriers to safe and lawful action at the disposal stages of the asbestos waste journey



CAPABILITY BARRIERS	OPPORTUNITY BARRIERS	MOTIVATION BARRIERS
• *Deep knowledge gaps* • *Absence of licensing (transport)* • *Lack of specific or formal training* • *Admin or tech literacy limitations*	• *Cost of proper disposal* • *Time pressures* • *Limited disposal options (small pieces, licensed waste sites)* • *Workplace norms/culture* • *Multiple authorities confuses* • *Price cutting impacts bus. viability* • *Regulatory compliance pressures* • *Lack of clarity re Wastelocate*	• *Asbestos a 'hot potato'* • *Fear of possible consequences (financial or health)* • *Perceived cost and inconvenience* • *Perceived lack of enforcement/ imposition of penalties* • *Lack of immediate health impacts*
Knowledge gaps persist in this part of the asbestos waste journey, leading to highly variable capability and expertise among those dealing with asbestos disposal. Those involved in picking up, transporting and disposing of asbestos waste, unless they are also licensed removalists, have no specific licensing that applies to their work, nor any formal training. Workers can be ill-equipped to deal with the administrative requirements of systems such as WasteLocate or not be technically literate, leading to avoidance and capability-related errors of omission despite good intent.	Costs of transportation and disposal present an opportunity barrier to appropriate action, especially as consignors may pass contaminated material to unwitting transporters, which in turn, becomes an issue for both transporters and waste and recycling sites. Price cutting can also undermine legitimate business viability at this disposal stage. The price per minimum weight of asbestos that often applies at licensed waste sites tends to induce more indirect journeys towards disposal, as asbestos waste is stockpiled temporarily, sometimes illegally and unsafely. Regulatory compliance for transporters and at waste sites can be experienced as burdensome, especially for businesses that do not see a way to meet the letter of the law, for instance, zero tolerance of asbestos contamination in soil and resource recovery.	Motivation-related barriers in the transportation and disposal stages include the 'hot potato' of asbestos which can lead workers to feel under pressure to deal with asbestos as fast as possible or to err on the side of caution, and employers to be reluctant to take on more asbestos waste work. Awareness of unlawful behaviour is widespread. Legitimate operators do not want to be tarred with that brush, however, a perceived unlikelihood of getting caught (and thus facing consequences) means there is little preventing people from following their initial impulse to improperly dispose of asbestos quickly and easily in household bins and onsite.

Consequently, many have engaged in the unsafe and unlawful disposal of asbestos waste

Unsafe and illegal or improper disposal behaviour occurs among property owners, professionals and other workers that interact with these parties across the waste chain with one quarter of those having to dispose of asbestos in recent years using improper methods, including leaving it or burying it on-site, disposing of it in residential bins, general waste skip bins and in general council clean-ups. Anecdotes from participants or those they have observed include concealing asbestos in loads of general waste taken to the tip and outright dumping on private and public land.

There was a perception among research participants that unlawful and illegal disposal is more commonly perpetrated either by property owners encountering asbestos unexpectedly and in situations where professionals were not involved or present; or among smaller, more inexperienced or cash-strapped professionals undertaking demolition, landscaping, building work, asbestos removal and waste transportation. Better practice and more lawful disposal was seen to be more undertaken by larger operators in these fields, during developments with DAs in place, in relation to jobs featuring large quantities of asbestos, who factor in and are in a better position to pass on or offset the practical costs of asbestos disposal.

The data, to some extent, supports these perceptions, but also reveals deficiencies and inconsistencies in requirements across the asbestos waste journey that contribute to inadvertent and deliberate improper and unlawful behaviour at all stages of, and among most of the parties involved in, the asbestos waste journey. A key example is the confusion that exists around demolition requirements, including the extent to which development consents for projects involving demolition which generate asbestos waste are or should be scrutinized and the role of certifiers in this process, as well as the way in which remnants of asbestos following demolition and the soil they rest on should be treated. The absence of licensing in relation to asbestos waste transportation and reported ease of obtaining asbestos removal licenses also allow sub-optimal behaviours to flourish without scrutiny.

Unlawful and illegal disposal of asbestos waste appears to be a problem at both ends of the spectrum, with individual property owners and residents at one end and big businesses at the other, and in relation to both very small quantities of asbestos waste through to very large. While the former appears to occur far more frequently than the latter, the latter has significantly greater consequences for community and environmental health and safety in NSW. Clearly, interventions are needed to address disposal issues at both ends of the spectrum, though interventions which nudge property owners to more appropriately deal with small amounts of asbestos waste will yield broad impacts with more modest resources and more quickly than the efforts required to stamp out large-scale criminal networks dumping quantities of asbestos contaminated material on private land. Raising community awareness of the existence and impact of these large-scale operations could work alongside more resource-intensive detection and enforcement efforts to ensure community members are forewarned, on the lookout and not as easily used unwittingly to support these networks to thrive.

Legitimate operators across the asbestos waste journey seek consultation and support

Pointing to unintended outcomes resulting from some regulatory measures, such as flexible interpretations of what constitutes 10m^2, professionals and stakeholders representing all stages in the asbestos waste journey perceive that the current systems lack an understanding of the practical dilemmas they face. There is a clear call for greater collaboration and consultation with relevant industry, to support intervention design and implementation that is long term and sustainable for organisations operating in the waste chain. Few doubt the scale of the problem of asbestos in NSW, but there is doubt as to the ability of the systems currently in place to adequately address the issue. Ultimately, those seeing themselves as legitimate operators want to feel supported in their actions, while those engaging in poor conduct are held to account.

RECOMMENDATIONS

Facilitate earlier consideration of asbestos and its disposal

The earlier people consider the possibility of and become aware of the presence of asbestos that requires removal and disposal, the more opportunity there is to make safe and lawful decisions.

1. Educate property owners to be aware of their responsibilities and obligations regarding asbestos waste
2. Encourage homeowners to have their home assessed for asbestos, well before consideration of any improvement work, via community education and potentially through offering rebates or similar.
3. Consider options to make mandatory the disclosure of the presence of asbestos when properties change hands, requiring this to be stipulated in the contract of sale and, in the case of tenancy, rental agreement.

Be transparent and consistent

Most want to behave safely and legally, but motivation wains where people are not convinced of the utility of regulations, or compliance seems futile. There is a perception that rules and regulations are stringent in some areas (e.g. zero tolerance in terms of soil contamination), but more lax in others (10m^2 rule, licensing requirements), which communicates mixed messages are and some then 'tune out'.

4. Explore options for ensuring that service contracts for work that could involve encountering asbestos specifies what will occur in the event of asbestos is required to be removed and disposed of. Whether the quote covers any associated costs, and the evidence to be provided to the customer, should be clearly stated.
5. The reasons for rules and regulations and any limitations should be fully and consistently explained in communications, to help bring the community along, foster compliance and also avoid any unintended message take-outs. It is recommended in particular that:
    i. The reason for the 10m^2 rule (a pragmatic option for very small quantities of asbestos, but stressing that handling of asbestos is safest left to the professionals) be clarified, to discourage exploitation of the rule while mitigating perceived inconsistencies and mixed messages (asbestos is dangerous, but it is safe to handle it oneself).
    ii. Why WasteLocate is important, how data is being used, and demonstrated value.
6. Greater collaboration between EPA, councils and SafeWork would be beneficial to ensure communications are not disjointed and a united front is shown.
7. Aim for clear, singular messaging (no mixed messages), consistent use of terminology, and including tighter communication around the 10m^2 rule (with either consistent use of '10m^2 or 100kg' , or one or the other).

Provide practical options especially for small quantities of asbestos waste

While small quantity improper disposal may be lower risk per incident than large scale illegal dumping, the former is both more diversely spread and more likely to be impacted by NSW EPA interventions. Most want to do the right thing and making it easier to dispose of at least small quantities will provide a practical nudge.

8. Review previous pilot interventions for low-cost, high-convenience small scale disposal, as wider implementation and heavy promotion could be warranted.
9. Explore options for making more consistent the cost charged for asbestos at different waste sites, to make sure that visitation of all the relatively small number of sites is equally palatable.

10. Review minimum fees for asbestos waste at waste sites and consider options for reducing – this will be less important where other disposal options for smaller amounts are introduced.
11. Invest in further exploring the vexed issue of contamination of materials and the resulting issues at the end of the disposal journey. While there is already precedence and there is a clear need to avoid mixed messages and inconsistence, there is also a need for pragmatism.

Ensure better linking of tracking and oversight across relevant authorities

Currently, the three bodies that oversee and enforce regulation relating to asbestos waste disposal do not have processes, systems or registers that link, leaving gaps open for those who choose to exploit them. Closing gaps and linking systems of oversight will reduce these opportunities for non-compliance. Residents already deal with council in relation to waste and in relation to home improvements, so there are existing tangible and intangible associations. Treating asbestos as one more type of hazardous household waste to be handled responsibly will help de-stigmatise asbestos and address the issue of no one wanting to take responsibility for it. Those councils already involved in asbestos education and services could have much to share, but all would benefit from further collaboration and support.

12. Examine enforcement systems and processes in local government, SafeWork NSW and NSW EPA to explore opportunities for closing gaps or vulnerabilities in the system overall, with particular attention to:
    i. WasteLocate
    ii. Registers of rejected loads.
13. Enforcement efforts should be clear, present and united to signal that compliance must be taken seriously.
14. Partner with local government on any small quantity disposal initiatives which would make sense to the community.
15. Review approvals processes and seek to ensure that asbestos is consistently considered, with relevant conditions of consent applied:
    i. Any standardization of requirements and use of templates would be advantageous
    ii. What is considered sufficient evidence that conditions have been met should be tightened up
    iii. Consider how demolition of structures can be more prominent in DA process.

Adopt a leadership role with education

There is an openness and trust towards NSW EPA with respect to information about asbestos safety and regulation, the complex regulatory landscape leads operators to take education of staff, customers and community into their own hands. Taking a leadership role in education will reduce inconsistency inevitably present in ad hoc communications.

16. Develop materials to clearly and consistently explain and illustrate asbestos safety procedures and relevant regulations.
17. Ensure the availability of education resources for industry bodies, employers, waste sites and councils wishing to supply them to their communities, customers, workers and members.

Review training and licensing requirements

Currently there are many removing, handling and disposing of asbestos waste frequently in a work context who have little or no training. The training received to gain a Class B asbestos licence, and the amount of experience required to maintain one, may not warrant those holding this licence to be looked to as 'expert'.

18. Review quality of training offered by different providers, and seek to ensure consistent, high quality
19. Consider mandatory training requirements for those in workplaces where they regularly come across asbestos and who may currently not be receiving any training at all, including transporters, tradespeople, staff at waste sites.
20. Consider mandating refresher training. In the case of asbestos professionals, consider linking this to the licensing process (renewals), and consider the amount of demonstrated experience needed to maintain a licence.

Encourage compliance, supporting the impulse to do the right thing

Some professionals can become disheartened when their business viability is impacted by compliance efforts, which leave a sense of 'you're punishing the wrong people'. Industry, particularly small operators would appreciate support for them to keep doing the right thing.

21. Educate the community about the value of choosing genuine operators and how to discern them, including offering clear signals /checklists of what to look out for, asking to see disposal receipts etc.
22. Consider the perspective of industry and those complying with regulation in the design of all intervention, including the possibility of consultation and co-creation.

Appendix A – Screener for qualitative interviews

RESEARCH SCOPE, DETAILS & TIMING

This component of the research comprises:

- 28 depth interviews
  - **25 to be recruited** by Georgina Clark (Private Certifier public listing provided by client)
  - Remaining 3 likely to be recruited by Heartward Strategic from client contacts (Local Council)
- All participants to be **located in NSW**
- Note - interviews are of **60-75 minutes duration**
- Incentive is a **$150 Giftpay** e-voucher (not for waste sites, local council workers or waste brokers)
- Interviews will be **Zoom** if possible **or telephone**.
- Fieldwork period is **Wednesday 29 July through Tuesday 25 Aug**
- Please notify participants that we will want to audio record, and possibly transcribe the interviews, but that the usual anonymity and confidentiality parameters apply.

RESEARCH SAMPLE

The research sample can be drawn from:

- Recruitment databases and networks
- Directory listings
- Contacts from previous stages of research

In the table below, unshaded groups 1-4 are the starting point for recruitment, as shaded groups 5-7 are awaiting client input.

Please note that for the purposes of this research, metro = the greater Sydney metropolitan area, and regional = all other areas of NSW.

The introduction, structure of the sample and screener questions follow:

Introduction	
This research is about the construction and demolition activities involved in developing, maintaining and renovating properties. The focus is on the handling, transportation, management and disposal of waste from these activities. We are speaking with a wide range of different people as part of this research and we'd like to include your views and experiences. To participate involves being interviewed by Zoom or telephone for an hour and a quarter. Your responses would be confidential and there is an incentive of an $150 Giftpay voucher, which can be spent at a wide variety of retailers, including supermarkets and online retailers.	
Sample category and size	**Characteristics and screening questions**

1. n=4 LICENSED ASBESTOS REMOVALISTS	**SPECIFICATIONS:** • 2 metropolitan Sydney and 2 regional NSW removalists. • Mix of different asbestos license holders i.e. Class A licence, Class B licence. Must include at least some nominated supervisors. • Mix of those primarily working in asbestos removal, and those for whom asbestos removal is not a primary part of their job. • Mix of removalists who consign asbestos waste to transporters, as well as those who dispose of asbestos waste themselves at waste facilities. **SCREENING QUESTIONS:** 1. [NOTE LOCATION] RECRUIT 2 GREATER SYDNEY AND 2 REG NSW 2. Which of the following best describes the type of asbestos removal licence[4] you hold? [MULTI RESPONSE] **a. I personally hold a Class A Removal licence (i.e. permitted to remove all types of asbestos) RECRUIT 2** **b. I personally hold a Class B Removal licence (i.e. permitted to remove only non-friable asbestos) RECRUIT 2** c. I personally hold an Asbestos Assessor Licence [NOTE: IF ONLY HOLDS THIS LICENCE THEN IS OUT OF SCOPE FOR INTERVIEW] d. I do not personally hold a Class A or Class B asbestos removal licence, but I work under a supervisor/for a business that does [OUT OF SCOPE FOR INTERVIEW]. e. None of these [OUT OF SCOPE FOR INTERVIEW] 3. Are you a nominated supervisor[5] who oversees the asbestos removal work of others? **a.** Yes **RECRUIT AT LEAST 2** b. No 4. Which of the following best describes the proportion of your work that involves asbestos removal? a. The main focus of my work, or the work my business does, is asbestos removal. **RECRUIT 3** b. The main focus of my work, or the work my business does, is something OTHER THAN asbestos removal, but we conduct asbestos removal at least a couple of times a year. **RECRUIT 1** c. My work, or my business's work, rarely involves asbestos removal [DO NOT RECRUIT] 5. When dealing with disposal of the asbestos waste you remove, which of these describes what you typically do?

[4] SafeWork license definitions can be found at https://www.safework.nsw.gov.au/licences-and-registrations/licences/asbestos

[5] Explanation of role and requirements to be a nominated supervisor https://www.pinnaclesafety.com.au/courses/asbestos-safety/supervise-asbestos-removal-training/nsw

	a. The asbestos waste is **usually transported to a waste facility by someone other than me or those I work with** b. The asbestos waste is sometimes transported to a waste facility by someone else, and sometimes by me/us c. The asbestos waste is **usually transported by me or someone I work with** to a waste facility **RECRUIT MIX OF A, B AND C**
2. n=5 PROFESSIONAL TRANSPORTERS OF ASBESTOS WASTE	**SPECIFICATIONS:** • Mix of employees, contractors, business owners, sole traders. • Mix of truck drivers / transport companies that transport different types of asbestos-containing materials (ACMs), including excavated soils from development sites (i.e. not just residential home renovations, but medium/large multi-unit developments or larger infrastructure projects where large quantities of asbestos contaminated soil is removed and disposed of). • Mix of transporters working in metropolitan and regional areas of NSW. **SCREENING QUESTIONS:** 1. [NOTE LOCATION] RECRUIT MIN 2 GREATER SYDNEY AND MIN 2 REG NSW 2. Which of the following best describes you? a. Employee RECRUIT 1-2 b. Contractor/Sole trader RECRUIT 1-2 c. Business owner with up to 10 employees RECRUIT 1 d. Business owner with more than 10 employees RECRUIT 1 3. How often does your work involve the transportation of asbestos waste? NOTE RESPONSE, AND RECRUIT THOSE SAYING AT LEAST EVERY FORTNIGHT a. Daily b. Every few days c. Once a week d. Once a fortnight e. Once a month or less often DO NOT RECRUIT 4. Which of the following best describes your role in relation to the transportation of asbestos waste? a. I transport asbestos waste to the waste facilities myself **RECRUIT 2** b. I manage employees who transport asbestos waste **RECRUIT 2** c. I am a broker who facilitates the transportation of asbestos waste **RECRUIT 1** 5. Can you briefly tell me what types of asbestos waste materials, and the amounts, you/your organisation transports/deals with?

	_____ _____ [NOTE: RECRUIT A MIX OF THOSE TRANSPORTING SMALLER AND LARGER AMOUNTS OF WASTE, INCLUDING **CONTAMINATED SOILS, CONSTRUCTION AND DEMOLITION WASTE AND FROM RESIDENTIAL AND LARGE COMMERCIAL SITES**]
3. n=4 PROPERTY OWNER GENERATORS OF ASBESTOS WASTE	**SPECIFICATIONS:** • 2 hands-on owner renovators who in the last 2 years have undertaken work where asbestos waste was generated and disposed of, and who were involved in deciding how this occurred. • 2 owner-builders (with permit) who in the last 2 years have undertaken work where asbestos waste was generated and disposed of. • Mix of suspected lawful and improper or illegal disposal of asbestos. • Mix of disposal by unlicensed people and licensed asbestos professionals. • 2 metropolitan & 2 regional property-owners. • Owners need not be owner occupiers. **SCREENING QUESTIONS:** 1. [NOTE LOCATION] RECRUIT 2 GREATER SYDNEY AND 2 REG NSW 2. Do you currently own property, either outright or with a mortgage, where the current or original home was built before 1990? ONLY CONTINUE IF YES 3. Thinking of this or any properties you own that were built before 1990. In the last 2 years have you begun or completed…? a. Significant building work (including a knock-down and rebuild) where you were the **owner builder, held an owner builder's permit and were involved in decisions about what happened on the site**? **RECRUIT 2** b. A **renovation or major improvement where you did some of all of the work yourself** and were solely or jointly involved in making decisions about this work, including what work to undertake, which trades if any to hire and how to dispose of any waste? **RECRUIT 2** 4. As part of this work, including any preparation or clearing of the site, was there a need to **remove and dispose** of any asbestos found on or in your property? a. Yes **RECRUIT** b. No c. Don't know 5. And who disposed of this asbestos waste? LISTEN OUT FOR AND CONFIRM: a. A licensed asbestos professional / licensed asbestos removalist / demolition company licenced to remove asbestos – **RECRUIT 1** b. Themselves / someone in their household – **RECRUIT 2** c. A tradesperson or paid handyperson, who does not hold a specific asbestos license (or the renovator was not aware one was held)– **RECRUIT 1**

	6. (And as far as you know), where did the asbestos waste end up? LISTEN OUT FOR AND CONFIRM: a. Domestic/household bin (red-lid, yellow-lid or blue-lid) b. Mixed with other waste before being disposed of in a skip bin c. Buried at the site, or taken away to be buried at another property d. Dumped **RECRUIT AT LEAST 1 MENTIONING A-D – SUSPECTED IMPROPER/ILLEGAL DISPOSAL** e. Disposed of as asbestos waste at a waste facility or tip f. DO NOT PROMPT - Unsure (e.g. handled completely by a licensed asbestos professional or someone else) **RECRUIT NO MORE THAN 1**
4. n=8 CONSTRUCTION, LANDSCAPING AND DEMOLITION GENERATORS OF ASBESTOS WASTE	**SPECIFICATIONS:** • 3 demolition firms (2 SME, 1 larger site prepper and demo) involved in demolition work where asbestos waste is required to be disposed of • 3 construction/building firms (2 SME residential builders, 1 larger residential developer • 1 kitchen/bathroom specialist who has come across asbestos that needed to be disposed of at least 3 times in the last year • 1 landscaper who has come across asbestos in soil that needed to be disposed of at least 3 times in the last year • Minimum 3 based in regional areas • Include mix of use and non-use of asbestos specialists **SCREENING QUESTIONS:** 1. [NOTE LOCATION] RECRUIT 4 GREATER SYDNEY AND 4 REG NSW 2. Which of the following types of work do you, or the business you work for, do? a. Building and construction **RECRUIT 3** b. Demolition **RECRUIT 3** c. Landscaping **RECRUIT 1** d. Bathroom and kitchen renovation **RECRUIT 1** 3. Do you have a decision-making role, such as supervisor, manager, sole operator or owner when it comes to decisions about what actually happens on a job site, including the progress of jobs, the involvement of any other contractors, and the disposal of any waste? a. Yes RECRUIT 5 **YES** b. No RECRUIT 3 NO 4. FOR a AND b IN Q2 Which of these describes your organisation or workplace? a. Business with up to 5 employees b. Business with more than 5-50 employees

	c. Business with more than 50 employees [**FOR BUILDING/CONSTRUCTION AND DEMOLITION CATEGORIES, RECRUIT 1 FROM EACH SIZE**] 5. FOR a IN Q2 Does most of the <u>building and construction</u> work you do involve the... a. …renovation of residential homes built before 1990 **MUST BE YES FOR SMALL AND MED BUSINESSES (a OR b IN Q4)** b. ...the residential development of sites where demolition of pre 1990s buildings is required **MUST BE YES FOR LARGE BUSINESS (c IN Q4)** 6. FOR a IN Q2 How often is asbestos waste generated on a job site you work on? NOTE RESPONSE AND RECRUIT THOSE SAYING AT LEAST EVERY FEW MONTHS a. Every week or fortnight b. Every month c. Every few months d. Every year or less often DO NOT RECRUIT 7. FOR b IN Q2 Does this <u>demolition</u> work <u>often</u>… a. ...<u>generate asbestos waste</u> that needs to be disposed of **ALL 3 MUST BE YES** b. ...involve <u>site preparation work</u> such as excavation of sites with asbestos containing material **RECRUIT AT LEAST 1** 8. FOR c IN Q2 In your landscaping work, in the last year, how many times have you come across asbestos waste in soil that needed to be disposed of? a. 10 or more times b. 3- 9 times c. Once or twice or less often DO NOT RECRUIT 9. FOR d IN Q2 In your kitchen and bathroom work, in the last year, how many times have you come across asbestos waste that needed to be disposed of? a. 10 or more times b. 3- 9 times c. Once or twice or less often DO NOT RECRUIT 10. When you come across asbestos in your work, how often do you involve licensed asbestos professionals in the assessment, testing, removal, transportation or disposal of the asbestos? a. Mostly <u>do not involve</u> licensed specialists b. Mostly <u>do involve</u> licensed specialists RECRUIT MIX OF a AND b

5. n=4 PRIVATE CERTIFIER INTERVIEWS	**SPECIFICATIONS:** • 2 metro Sydney and 2 regional • Spread across size • 1 of each accreditation type **SCREENING QUESTIONS:** 1. [NOTE LOCATION] RECRUIT 2 GREATER SYDNEY AND 2 REG NSW 2. CONFIRM LEVEL OF ACCREDITATION, RECRUITING ONE OF EACH: a. A1 Building Surveyor – RECRUIT 1 b. A2 Building Surveyor – RECRUIT 1 c. A3 Building Surveyor – RECRUIT 1 d. A4 Building Inspector – RECRUIT 1 3. Which of these describes your organisation or workplace? a. Business with up to 5 employees b. Business with more than 5-50 employees c. Business with more than 50 employees [**RECRUIT MIX ACROSS SIZES IF POSSIBLE**] 4. How often do you find asbestos waste while certifying a site? NOTE RESPONSE AND RECRUIT ONLT THOSE SAYING **AT LEAST EVERY SIX MONTHS** a. Every week or fortnight b. Every month or two c. Every six months or so d. Every year or less often DO NOT RECRUIT
6. n=3 LOCAL COUNCIL INTERVIEWS	**SPECIFICATIONS:** • Local council representatives, including those responsible for waste management and/or planning (development approvals and certification) across a sample of LGAs [**Contacts provided by EPA and scheduled by Heartward**]

Appendix B – Qualitative interview guides

STAKEHOLDER LISTENING (INCLUDES DETAILS ON SAMPLE STRUCTURE)

Set-up and introduction (10 mins) *Sets the participant/s at ease, reiterates confidentially & informed consent, seeks audio recording consent, covers general housekeeping. Reiterates the purpose of the research to secure stakeholder buy-in.*	
Welcome	I'd like to thank you again for your willingness to contribute to this research. I won't take up more than an hour of your time today.
Recap of purpose and voluntary nature of participation	To re-iterate, we are speaking to you as a key stakeholder in relation to the safe and legal management of asbestos waste. We are interested in what you see as the main challenges with respect to asbestos waste management. To the extent that you feel able to comment, we would also really like to draw on your own knowledge and impressions of what is happening at a grass roots level, among people and businesses involved in the day to day generation, handling and disposal of asbestos waste. The research is seeking to inform interventions to change the behaviour of individuals and businesses operating within the asbestos waste chain to increase the safe and lawful disposal of asbestos waste. There are no right or wrong answers, we are simply seeking your informed opinions.
Recap voluntary nature of participation	To confirm, your participation in this research is entirely voluntary, and you are free to withdraw from the research at any point, in which case your feedback would be removed from the study.
Recording and confidentiality of participant information	With your permission, I'd like to audio record this discussion. The recording will be stored securely, will not be passed on to any third parties, including the EPA, and will be destroyed after the end of the project. We would only refer back to the recording to help with our analysis and reporting. *(Note from EPA -is not essential to mention the recordings won't be given to the EPA, third party is sufficient)* Everything you say today is completely confidential. We are speaking to eight different stakeholders as part of this study and will not be attributing any comments to any individuals.
About the participant	Before we get stuck into the interview, I would appreciate it if you would tell me a little bit more about yourself and your role within your organisation.

SECTION 1 – General lines of enquiry (20 mins)

First, we will make some broad lines of enquiry, applicable to all stakeholder groups. This will reveal what is most top of mind for stakeholders, and what they consider to be most important. This discussion will be largely unprompted and participant-led.

- To what extent do you think asbestos waste is handled safely and legally in NSW? Why do you say that?
    - [*If perceives a problem*:] What is your impression of the scale of this problem?
- What do you think are the main challenges for asbestos waste management in NSW currently, and how might that change in the coming decade?
- Thinking about the asbestos waste journey from the generation of the asbestos waste, through to the final (lawful or unlawful) disposal of the waste:
    - Who do you see as the key players in this journey, in terms of the audiences generating, handling, transporting and disposing of asbestos waste?
    - Among which of these audiences do you feel there is a need to address [safe / lawful] involvement with asbestos waste? Why do you think that is?
    - At what points in the waste chain do you think things are working well in terms of [safe / lawful] behaviour around asbestos waste?
    - Where do you think there is the greatest scope for improvement, or where do you think the greatest gains could be made in terms of safe and lawful behaviour?

SECTION 2 – Specific lines of enquiry (20-30 mins)

This section allows topics to be explored that pertain to the specific stakeholder being interviewed. The focus here is on exploring perceptions of front-line experiences, processes, dependencies, and flows of decision making that lead to safe or unsafe behaviour across the asbestos waste chain. An open-ended, non-leading question style is maintained.

STAKEHOLDER	SPECIFIC LINES OF ENQUIRY

EPA Waste Compliance Representative
n=1
	• **Main issues across asbestos waste chain and key audiences involved:**
	  ○ At which points in the asbestos waste journey do you see lack of compliance with legal requirements?
	  ○ What behaviours does this include?
	  ○ Among which groups involved in the asbestos waste chain?
	  ○ Explore perceived barriers and motivators for compliance at different stages/by audiences [*waste site specific prompts below*]
	• **Compliance at waste sites**
	  ○ What data exists on levels of compliance in asbestos waste management and disposal? Overall, how well are waste sites complying with requirements? How does it differ across different types of sites?
	  ○ [*IF there is lack of compliance*:] At waste disposal sites, how significant is the disparity between what is required and actual asbestos waste related behaviour? What types of things are happening?
	  ○ What drives compliance at waste sites and conversely what is a barrier to this? [Explore perceived roles of management and staff, staff training, procedures etc]
	• **Perceived role of compliance monitoring overall in determining behaviour**
	  ○ What role does compliance play in moderating unlawful behaviour, and what other factors influence lawful behaviour?
	  ○ How aware are relevant parties of the consequences of a lack of compliance and what role does this have in motivating them?
	  ○ What intervention opportunities are there that could increase compliance?

EPA illegal dumping team representative
n=1
	• **Scale, scope and nature of the problem**
	  ○ How widespread and how significant is illegal dumping of asbestos in NSW?
	  ○ What kinds of problems arise as a result of illegal dumping, particularly major asbestos illegal dumping activities?
	  ○ Where does it end up? Who receives unlawful and illegally disposed of asbestos, how does it come to them and what impact does it have?
	• **Decision-points and motivators/barriers for different audiences at each point**
	  ○ Across the asbestos waste chain, at what points are decisions made that lead to illegal dumping?
	  ○ Who are all the parties involved in illegal dumping of asbestos and what motivates them?
	  ○ How aware do you think people are of the consequences of illegally dumping asbestos waste and what role does this have in motivating them to act lawfully?

	○ In your view, what other factors contribute to the extent of and problems arising from illegal dumping of asbestos in NSW? ○ What are the barriers to lawful disposal of asbestos waste? • **RID and intervention** ○ What kinds of reports are made to RID, why and by who? ○ What role does this initiative play in addressing illegal dumping of asbestos? ○ Where are the intervention opportunities in relation to illegal dumping - how can unlawful asbestos waste disposal behaviour be averted?
NSW Local Government Representative n=1	• **Local government view of asbestos waste and role** ○ What is the role of local government in relation to asbestos waste? ○ What kind of burden does asbestos waste place on NSW local governments and how is this managed? ○ What are the main issues / audience groups involved? ○ What challenges are faced by local governments in dealing with improper and illegal disposal of asbestos waste? ○ What sources of information and data exist on asbestos-waste related practices within local government? • **Relationships with different parties in waste chain** ○ What role do local governments play in influencing the behaviour of different stakeholders across the asbestos waste journey (incl households, C&D workers, assessors, removalists, waste brokers, transporters, waste facilities)? ○ How do local governments manage asbestos related practices within waste disposal sites? **Oh, I've not seen the rock and roll Trolls Movie. I would like to see it.** • **Perceived motivators and barriers to safe and lawful behaviour** ○ Across the asbestos waste chain, at what points are decisions made that lead to unsafe behaviour? Unlawful behaviour? ○ What motivates these decisions? ○ What barriers exist to safe and lawful behaviour? How could safe/lawful waste disposal behaviour be triggered at these decision points? ○ What role does the development applications and approvals process play in determining what happens with asbestos waste? How is compliance ensured? What weaknesses, if any, exist in this process? • **Intervention** ○ What has been the impact of local government intervention initiatives in supporting and facilitating safe and lawful management, removal and disposal (which elements have been successful and which have not been)? ○ What other intervention opportunities exist for local governments, including the most effective ways to change behaviour/increase legal behaviour? ○ What information and messages would support property owners generating asbestos waste to make safer decisions and how they would they best receive this?

Construction and Demolition Industry Body Representative n=3 - **Responsible Construction Leadership Group (RCLG)** - **Master Builders Association** - **Housing Industry Association**	• **Note for RCLG** (which represents large Tier 1 construction companies, and comprises Sustainability Managers who work for these companies, e.g. Lendlease): seek insights from a large-scale demolition, planning and development perspective; o *How do large operators manage asbestos waste differently to the smaller operators?* o *What do they do beyond the legislative requirements? (does the assumption hold that this group are motivated by sustainability and resource management and may have innovative projects in place).* • **Note for Master Builders and HIA:** *explore priority issues for asbestos waste and any recommendations for change* • **Consideration of asbestos waste and understanding of requirements** o To what extent do you think C&D workers consider the risks associated with unsafe management of asbestos waste generated through their work? o What drives consideration of and planning for removal and disposal of asbestos waste generated through C&D (e.g. the condition the asbestos is in, or development applications and approvals)? o To what extent do you think C&D workers are aware of/understand the legal requirements relating to asbestos waste classification, preparation, transportation and disposal? o How do they come to be aware of best practice and legal requirements? • **Asbestos waste-related attitudes and practices** o What sources of information and data exist on asbestos-waste related practices within the C& D industry, and which are considered reliable? o What are the attitudes and behaviours of construction and demolition workers in relation to asbestos waste? o What challenges are faced by C&D workers when removing and disposing of asbestos? o Overall where do things go well (i.e. lawful and best practice asbestos waste planning, classification, removal and disposal procedures; lawful small quantity disposal and adherence to WasteLocate requirements)? o Overall where do things not go well (i.e. what leads to and are the consequences of illegal or improper handling, removal, transportation and disposal)? o How prevalent do you think lawful and unlawful behaviours in relation to asbestos waste are among C&D workers? (*explore incorrect classification of waste, onsite disposal, improper preparation and transportation, illegal dumping, attempted or actual unlawful disposal at waste and recovery sites not able to accept asbestos*) o What do you see as the main drivers and barriers underpinning these (including cost)? o Explore roles of worker health and safety, the perceived consequences, compliance with regulation, industry culture, and stakeholder relationships (incl council, assessors, removalists, waste brokers, transporters, waste facilities) in influencing behaviour? o To what extent do C&D workers/companies have responsibility for ensuring asbestos generated through their work is lawfully disposed of? How is this done? e.g. engaging licensed removalists, seeking/keeping proof of disposal? • **Classification and transportation** o Explore any specific perceived challenges in meeting requirements in relation to asbestos waste classification and transportation.

	• **Intervention**
	  ○ At what decision points can lawful asbestos waste disposal behaviour be triggered and how?
	  ○ What changes would C&D workers be prepared/not prepared to make and what would facilitate this?
	  ○ What other intervention opportunities exist, including the most effective ways to change behaviour/increase legal behaviour?
	  ○ What information and messages would support C&D workers to make safer decisions and how they would best receive this?

Waste Management and Resource Recovery Association Australia (WMRR) Representative
n=1
This peak body encompasses Small to medium sized enterprises to local government and large multinational cooperations.
	• **Note:** *seek insights on the biggest challenges across industry broadly for asbestos waste and what the target priorities should be.*
	• **View of asbestos waste and challenges**
	  ○ What are some of the main challenges are faced by waste management sites in relation to disposal of asbestos waste? [*If not mentioned, explore challenges related to classification of waste, identification of contaminated waste, identification of improperly prepared waste, compliance with best practice, compliance with license conditions, waste tracking etc.]*
	  ○ To what extent is attempted and actual improper disposal by different parties an issue for [licensed / unlicensed / waste management sites and resource recovery sites? *Explore issues across the different types of waste management sites*
	• **Relationships with different parties in waste chain**
	  ○ How do waste management sites interact with [local government / waste generators transporters / the broader local community] to support safe and lawful asbestos disposal?
	• **Attitudes and practices on waste sites**
	  ○ What are the attitudes of staff at waste management and resource recovery sites (incl at the weighbridge and tip face) in relation to asbestos waste, risk and lawful and best practice procedures?
	  ○ How is best practice/compliance monitored/enforced on waste sites?
	  ○ What roles do [health and safety, work practices, compliance with regulation, education and training, and stakeholder relationships] have on asbestos related behaviour at waste sites?
	  ○ How prevalent are levels of lawful and unlawful disposal behaviour (by people disposing of the waste, and among workers at waste sites)
	  ○ Explore perceived consequences and the drivers and barriers underpinning these (including cost)
	  ○ What are the levels of awareness, attitudes, and adherence to WasteLocate requirements? What challenges do waste tracking pose for waste facilities?
	  ○ Based on your understanding, what happens to asbestos-containing loads that are rejected at waste and recycling facilities?
	• **Intervention**
	  ○ At what decision points can lawful waste disposal behaviour can be triggered and how (among audiences disposing of waste / among waste workers and sites)?
	  ○ What other intervention opportunities exist, including the most effective ways to change behaviour/increase legal behaviour?
	  ○ What role can waste sites play?

	○ What information and messages would support waste management sites to make safer decisions in relation to asbestos disposal and how they would best receive this?
Waste Contractors and Recyclers Association of NSW Representative n=1	• **Note** – *seek insights from the perspective of recyclers, including recycling of Construction and Demolition (C&D) material and other aggregates.* • **View of asbestos waste and challenges** ○ What are some of the main challenges faced by waste contractors and waste recycling facilities when dealing with asbestos waste? [*If not mentioned, explore challenges related to classification of waste, identification of contaminated waste, identification of improperly prepared waste, compliance with best practice, compliance with license conditions, waste transportation and tracking etc.]* ○ To what extent is attempted and actual improper disposal by different parties an issue for [licensed / unlicensed / waste management sites and resource recovery sites? *Explore issues across the different types of waste management sites* • **Attitudes and practices** ○ What are the attitudes of waste transporters, other contractors, recyclers and waste facility workers (at the weighbridge and tip face) in relation to asbestos waste, risk and lawful and best practice procedures? ○ How is best practice/compliance monitored/enforced among the waste industry? ○ What roles do [health and safety, work practices, compliance with regulation, education and training, and stakeholder relationships] have on asbestos waste disposal related behaviour? ○ How prevalent are levels of lawful and unlawful behaviour in relation to waste transport and disposal within the waste industry? ○ *Explore perceived consequences and the drivers and barriers underpinning these (including cost)* ○ What are the levels of awareness, attitudes, and adherence to WasteLocate requirements? What challenges do waste tracking pose for waste contractors and waste facilities? ○ Based on your understanding, what happens to asbestos-containing loads that are rejected at waste and recycling facilities? • **Intervention** ○ At what decision points can lawful waste disposal behaviour can be triggered and how (among audiences disposing of waste / among waste workers and contractors)? ○ What other intervention opportunities exist, including the most effective ways to change behaviour/increase legal behaviour? ○ What role can employers of waste workers play? ○ What information and messages would support waste transporters, other waste contractors and recyclers, and waste facility workers (at the weighbridge and tip face) to make safer decisions in relation to asbestos waste disposal, and how they would best receive this?
Asbestos Worker Association Representatives n=2	• **Note: seek insights on:** ○ *best practise in the field and knowledge of the activities of unlicensed or unlawful operators,* ○ *what could change to make asbestos waste removal and disposal safer and to increase lawful disposal.*

- **Asbestos Removalist Contractors Association (ARCA)** - **Asbestos and Hazardous Materials Consultants Association (AHMCA)** (responses may be broader as members include consultants)	○ w*hat do they consider the priorities to be?* • **Views on asbestos waste and role of removalists** ○ What challenges are faced by licensed asbestos removalists when removing and disposing of asbestos? ○ What drives consideration of and planning for waste consignment and disposal at time/point of removal? ○ To what extent do you think those generating asbestos waste consider the risks associated with unsafe management and disposal of asbestos waste? ○ To what extent do you think they are aware of/understand the legal requirements relating to asbestos waste classification, preparation, transportation and disposal? • **Asbestos waste-related attitudes and practices** ○ What sources of information and data exist on asbestos-waste removal practices within the removalist industry, and which are considered reliable? ○ What are the attitudes and behaviours of asbestos removalists in relation to asbestos waste, risk and lawful and best practice procedures? ○ How does the training and licensing of removalists support or not support safe and lawful behaviour with asbestos removal, transportation and disposal? ○ Overall, where do things go well (i.e. lawful and best practice asbestos waste planning, classification, removal and disposal procedures; lawful small quantity disposal and adherence to WasteLocate requirements)? ○ Overall, where do things not go well (i.e. what leads to and are the consequences of illegal or improper handling, removal, transportation and disposal)? ○ What are the levels of awareness, attitudes, and adherence to WasteLocate requirements among removalists? ○ How prevalent do you think lawful and unlawful behaviours in relation to asbestos waste are among removalists? (*explore incorrect classification of waste, onsite disposal, improper preparation and transportation, illegal dumping, attempted or actual unlawful disposal at waste and recovery sites not able to accept asbestos*) ○ What do you see as the main drivers and barriers underpinning these (including cost)? ○ Explore roles of worker health and safety, perceived consequences, compliance with regulation, industry culture, and stakeholder relationships (incl generators, council, assessors, waste brokers, transporters, waste facilities) in influencing behaviour. ○ To what extent do removalists have responsibility for ensuring asbestos generated through their work is lawfully disposed of? How is this done? e.g. disposing of it themselves, seeking/keeping proof of disposal? • **Classification and transportation** ○ [*If not already covered*:] Explore any specific perceived challenges in meeting requirements in relation to asbestos waste classification and transportation. • **Intervention** ○ At what decision points can lawful asbestos waste disposal behaviour be triggered and how? ○ What other intervention opportunities exist, including the most effective ways to change behaviour/increase legal behaviour? ○ What information and messages would support removalists to make safe and lawful decisions and how they would best receive this?

Australasian Land & Groundwater Association (ALGA)
n=1
Represents industry conducting groundwater and land assessments to provide clearance that site is safe after demolition involving asbestos. Members responsible for material classification for waste disposal.
	• **Note:** *seek insights particularly around land assessments and material classification.*
	• **View of asbestos waste and challenges**
	  ○ What are some of the main challenges relating to asbestos faced by those classifying waste material and assessing groundwater and land after demotion? How does this differ by situation?
	• **Attitudes and practices**
	  ○ What are the attitudes of those you represent in relation to asbestos waste, risk and lawful and best practice procedures?
	  ○ How is best practice/compliance monitored/enforced in the industry?
	  ○ What roles do [health and safety, work practices, compliance with regulation, education and training, and stakeholder relationships] have on material classification, site assessments and clearing sites as safe?
	  ○ How prevalent are levels of lawful and unlawful behaviour within the industry? *Explore perceived consequences and the drivers and barriers underpinning these (including cost)*
	• **Intervention**
	  ○ At what decision points can safe and lawful asbestos waste behaviour be triggered and how?
	  ○ What other intervention opportunities exist, including the most effective ways to change behaviour/increase legal behaviour?
	  ○ What role can employers in the industry play?

SafeWork NSW
n=1
	• **View of asbestos waste and role**
	  ○ What is the role of SafeWork NSW in relation to asbestos waste?
	  ○ What kind of burden does asbestos waste place on worker health and safety in NSW? Any data or insights held on asbestos waste from a workplace safety perspective, including impacts on health and safety of key audiences (e.g. construction and demolition, transport and waste workers)?
	  ○ To what extent do you think workers consider the risks associated with unsafe management of asbestos waste they may be exposed to through their work?
	  ○ To what extent do employers consider and manage these risks?
	  ○ What challenges are faced by employees in dealing with asbestos waste? Which audience groups have the greatest challenges? (*tease out C&D workers, transporters, waste workers, any others?*)
	  ○ What are the attitudes and behaviours of relevant workers in relation to: asbestos waste; the risks posed by asbestos waste; and lawful and best practice procedures?
	  ○ How does the training and licensing of workers support safe and lawful behaviour with asbestos removal, transportation and disposal?
	• **Perceived motivators and barriers to safe and lawful behaviour**
	  ○ Across the asbestos waste chain, at what points are decisions made that lead to workers engaging in unsafe behaviour? Unlawful behaviour?
	  ○ What do you think motivates these decisions/behaviours?
	  ○ How prevalent do you think lawful and unlawful behaviours in relation to asbestos waste are among workers in NSW?
	  ○ How is compliance monitored/ensured?

	○ What barriers exist to safe and lawful behaviour in relation to asbestos waste? • **Intervention** ○ What has been the impact of Safework NSW intervention initiatives in supporting and facilitating safe and lawful management, removal and disposal of asbestos waste (which elements have been successful and which have not been)? ○ What other intervention opportunities exist, including the most effective ways to change behaviour/increase safe and legal behaviour? • What information and messages would support workers to make safer decisions and how they would they best receive this?

Summary and close (5 mins) Closing out the interview	
Review and thanks	Thank you so much for your time today, it's been a really stimulating discussion and I hope interesting for you too. If there is anything further you would like to add after the interview, please feel free to email me at _____.
Next steps and refer to EPA if appropriate	We will be providing a debrief to the EPA on this stakeholder consultation, and it will guide further stages of the research. As we mentioned earlier, everything you say today is completely confidential and won't be attributed to you as an individual. Would you like to receive a brief summary of some of the themes that emerge from these interviews? (note preference) If you would like to follow up any aspect of this interview direct with the NSW EPA, please contact Sarah Seery, Asbestos Waste Strategy, NSW Environment Protection Authority, +61 2 9995 6467, sarah.seery@epa.nsw.gov.au

QUALITATIVE INTERVIEWS

Set-up and introduction (5-10 mins) *Sets the participant/s at ease, reiterates confidentially & informed consent, seeks audio recording consent, covers general housekeeping.*	
Welcome	I'd like to thank you for giving up your time to participate in this research. It will take no more than 60-75 minutes of your time.
Recap purpose and voluntary nature of participation	Today we are going to be talking about your experiences as someone who [ADJUST AS APPROPRIATE:] is involved with development, maintenance and renovation of properties, and the construction, demolition, transport and waste activities associated with this. In particular, this research is focussed on asbestos waste.

	[FOR STAKEHOLDERS AND PROFESSIONAL AUDIENCES (NOT PROPERTY OWNER GENERATORS)]: The research is seeking to inform interventions to increase the safe and lawful disposal of asbestos waste. The research will explore how to change the behaviour of individuals and businesses operating within the asbestos waste chain - from where the asbestos originates all the way through to its disposal.] There are no right or wrong answers, we are simply seeking your personal experiences and opinions.
Recap voluntary nature of participation	To confirm, your participation in this research is entirely voluntary, and you are free to withdraw from the research at any point, in which case your feedback would be removed from the study.
Recording and confidentiality of participant information	With your permission, I'd like to audio record this discussion. The recording will be stored securely, will not be passed on to any third parties, including our client, and will be destroyed after the end of the project. We would only refer to the recording to help with our analysis and reporting. Everything you say today is completely confidential. We are speaking to a number of different people as part of this study and the results will be reported thematically in aggregate. No comments or quotes will be attributed to any individuals. No consequences will result from anything you say. Our client for this research is a government body, but I'd like to hold off telling you who exactly the client is until the end of the interview, as this knowledge might influence how you respond. Is it okay if I tell you who the client is at the end of the interview?
About the participant	To help understand where your experiences fit with those of others, please tell me a little about your current work/recent renovation or build [AS APPROPRIATE].

SECTION 1 – Narrative enquiry (35 mins) *This section pertains to all interviews except the waste workers interviewed during waste sites visits.* *These first-person narratives will provide detailed accounts of the waste journey facilitated by open questions asked according to the naturally occurring story being shared by the participant, to allow the most salient experiences and topics to emerge in relation to asbestos waste. Questions on specific topic will be covered in the next section.*	
Initial narrative prompt	For the first part of the interview, I'll ask you to share a story without much interruption or questions from me. After that, I'll ask for a bit more detail and some other questions. So, please think about … [ADJUST FOR EACH AUDIENCE AS APPROPRIATE]: • the last time you came across asbestos that was (or had been) removed and needed to be disposed of at work [ASBESTOS SPECIALISTS/ TRANSPORTERS/ C&D GENERATORS] • the last time you came across asbestos that was removed and needed to be disposed of in the recent renovation or build [OWNER GENERATORS] • the last time you had to deal with asbestos waste or an issue relating to asbestos waste as part of your work [PRIVATE CERTIFIERS/ LOCAL COUNCIL REPS] • the asbestos waste that was left on your property [LANDOWNERS] **From your point of view, please describe the journey of this asbestos from when you became aware of it, all the way through to its disposal.**
Prompt as required	• Go on • Please say more… • And then what happened • What did you do then? • What was that like? • What else happened at that point • What happened immediately before/after that?
Areas to explore in detail after initial story	• *Commonality of this experience/journey, how typical or atypical it was* • *Experience with asbestos noting presence of and involvement in each stage of the journey:* 1. Pre-awareness 2. Awareness 3. Encountering 4. Preparation 5. Removal 6. Transportation (could be multiple steps) 7. Preliminary disposal 8. Transportation (could be multiple steps) 9. Final disposal 10. Re-entry

	• *Explore by stage:*
	  • *Key turning points and decision points*
	  • *Difficulties or pain points*
	  • *Relationships and roles of other parties and other influences/ers*
	  • *Awareness of requirements relevant to their own role and responsibilities vs those of others*
	  • *Points where the risk of eventual unsafe asbestos waste disposal is greatest*
	  • *Perceived challenges in acting safely/lawfully when preparing asbestos waste for disposal and disposing of asbestos waste*
	  • *Reflections on what would help to facilitate safe/lawful behaviour*
	• *Perceptions of cascade of decisions and where things go right and wrong*
	• *Overall perceptions of asbestos waste (perceived health and safety risks and perceived impacts of improperly disposed of waste)*

SECTION 2 – Specific lines of enquiry (30 mins)

This section allows topics to be explored that relate to the context of the participant being interviewed. The focus here is on exploring perceptions of front-line experiences, processes, dependencies, and flows of decision making that lead to safe or unsafe behaviour across the asbestos waste chain. An open-ended, non-leading question style is maintained.

For waste and resource recovery facility workers, since all interviews will be conducted in the context of a site visit, this section will be the primary focus of the interviews.

AUDIENCE	SPECIFIC LINES OF ENQUIRY
Licensed asbestos removalists	**Views on asbestos waste and role of removalists** • Note terminology used throughout. • What challenges are faced by licensed asbestos removalists when removing and disposing of asbestos? • What drives consideration of and planning for waste consignment and disposal at time/point of removal? • To what extent do you think those generating asbestos waste consider the risks associated with unsafe management and disposal of asbestos waste? • To what extent do you think generators of asbestos waste are aware of/understand the legal requirements relating to asbestos waste classification, preparation, transportation and disposal? Do they ask for proof of disposal? Do you provide it? **Asbestos waste-related attitudes and practices** • What are the attitudes and behaviours of asbestos removalists in relation to asbestos waste, risk and lawful and best practice procedures?

	• How does the training and licensing of removalists support or not support safe and lawful behaviour with asbestos removal, transportation and disposal? • Investigate language used for and knowledge of the difference between bonded / friable and whether they know how to identify both (note accuracy). Perceptions of when bonded asbestos becomes friable asbestos (e.g. if it is broken or weathered). • Overall, where/ at what stage do things go well (i.e. lawful and best practice asbestos waste planning, classification, removal and disposal procedures; lawful small quantity disposal and adherence to WasteLocate requirements)? • Probe understanding and definition of small pieces if mentioned - do risk management practices change with quantity? • Overall, where/ at what stage do things not go well (i.e. what leads to and are the consequences of illegal or improper handling, removal, transportation and disposal)? • How prevalent do you think lawful and unlawful behaviours in relation to asbestos waste are among removalists? (*explore incorrect classification of waste, onsite disposal, improper preparation and transportation, illegal dumping, attempted or actual unlawful disposal at waste and recovery sites not able to accept asbestos*) • What do you see as the main drivers and barriers underpinning of these behaviours (including cost)? • Explore the impact of worker health and safety, and the safety of others including clients and their own family on behaviour. • Investigate the role of, compliance with regulation, perceived consequences and the likelihood of being caught, industry culture, reputation and stakeholder relationships (incl generators, council, assessors, waste brokers, transporters, waste facilities) in influencing behaviour. • To what extent do removalists have responsibility for ensuring asbestos generated through their work is lawfully disposed of? How is this done? e.g. disposing of it themselves, seeking/keeping proof of disposal? • Identify any discrepancies between knowledge, attitudes and behaviours, including; what they think is right versus what they actually do. **Classification, transportation and disposal?** • Explore any specific perceived challenges in meeting requirements in relation to asbestos waste classification, transportation and disposal (for example the presentation requirements at the weighbridge / pre disposal booking requirements at some landfills). • How is a transportation method chosen, what is considered? • Explore levels of awareness, attitudes, and adherence to WasteLocate requirements. **Intervention** • At what decision points can lawful asbestos waste disposal behaviour be triggered and how?

	• What other intervention opportunities exist, including the most effective ways to change behaviour/increase legal behaviour? What could encourage compliance. • What information and messages would support removalists to make safe and lawful decisions and how they would best receive this? • Do they recall any examples of asbestos campaign messaging or a similar WHS messaging material that worked well and what was it about this particular 'message' that worked
Waste transporters	**Asbestos waste-related attitudes and practices** • Note terminology used throughout. • Explore how transporters are engaged to transport asbestos waste, including role of brokers, and investigate whether they know exactly what they are picking up, and at what point they learn that a load contains asbestos? • Explore the attitudes of waste transporters in relation to asbestos waste, risk, safety and lawful and best practice procedures. Explore awareness of the asbestos waste requirements and responsibilities for transport and disposal among transporters, how closely they are adhered to, and any pressures experienced in attempting to meet responsibilities and requirements. • Investigate the extent to which transporters are comfortable to ask questions or query (the broker) about the load contents, the end destination or its appropriateness/lawfulness. • How is best practice/compliance monitored/enforced among the waste transport industry? • What roles do [health and safety, work practices, compliance with regulation, education and training, and stakeholder relationships] have on asbestos waste disposal related behaviour? • Who are the different people that are involved in asbestos waste disposal (including generators, C&D workers, assessors, removalists, waste brokers, and weighbridge/waste facility staff) • Explore relationships between transporters and different parties. How are they engaged, by whom and if/how they demonstrate proof of disposal. How are waste transporters selected/ what makes them competitive? • How common are levels of lawful and unlawful behaviour in relation to waste transport and disposal within the waste industry? *Explore perceived consequences and the drivers and barriers underpinning these (including cost)* • Explore levels of awareness, attitudes, and adherence to WasteLocate requirements. *(Awareness and usage of the Waste Locate tracking system above the 100kg threshold)* Investigate perceptions of whether others use WasteLocate and examples of any loopholes involving improper and illegal disposal of asbestos waste. • What challenges does waste tracking pose for waste contractors and waste facilities? • How much do you pay attention and adhere to Waste Classification Reports, and how does their content relate to information provided verbally by the waste generator?

	• Explore any personal experiences with asbestos-containing loads being rejected at waste and recycling facilities. Explore interactions with different parties, decision-making and what happens to these loads. Perceived issues/challenges. • Probe understanding and definition of small pieces if mentioned- do risk management practices change with quantity? • Identify any discrepancies between knowledge, attitudes and behaviours, including; what they think is right versus what they actually do. **Intervention** • At what decision points can lawful waste disposal behaviour be triggered and how (among audiences disposing of waste / transporters etc)? • What other intervention opportunities exist, including the most effective ways to change behaviour/increase legal behaviour? • What role can employers or those hiring waste transporters play? What role can transporters themselves play? • What information or messages would support waste transporters to make safer decisions in relation to asbestos waste disposal, and how they would best receive this?
Property owner waste generators	**Asbestos waste-related attitudes and practices** • Note terminology used throughout. • Explore levels and drivers of consideration of and planning for disposal at start of project and at time/point of removal, including asbestos conditions in development applications and approvals. • Awareness of 10 square metre rule for DIY removal of asbestos. Investigate language used for and knowledge of the difference between bonded / friable and whether they know how to identify both (note accuracy). Perceptions of when bonded asbestos becomes friable asbestos (e.g. if it is broken or weathered). • Investigate lawful and best practice asbestos waste management and disposal procedures, including preparation methods for disposal (such as wetting down and wrapping in plastic), small quantity disposal and adherence to WasteLocate requirements, and when a licensed removalist is required. • Probe understanding and definition of small pieces if mentioned- do risk management practices change with quantity? • Determine how asbestos waste management steps were determined – how did they acquire this knowledge (whether right or wrong), both for pre-panned asbestos waste management procedures and during spontaneous finding during the build/renovation? • Explore asbestos safety and risk relating to improper asbestos waste handling, removing, transportation and disposal and challenges faced by owner generators when disposing of asbestos.

	• Awareness of the occurrence and consequences of, and direct experiences of illegal or improper disposal, such as disposal in residential bins, and burying onsite, and the drivers and barriers to safe and legal behaviour. • Explore relationships with other stakeholders in the waste journey (including council, C&D workers, assessors, removalists, waste brokers, transporters, waste facilities), who they trust and who they would go to for information, whether they are familiar with and receive proof of disposal. • Note level of trust between professionals engaged and extent to which they include the owner in decisions or update them as to progress. • Explore the impact of owner builder/training permits and a do-it-yourself approach on safe and lawful asbestos waste outcomes. • Investigate perceptions of where responsibility lies in the disposal of asbestos waste, including employment of specialists and any knowledge of or expectations regarding asbestos waste disposal receipts. • Identify any discrepancies between knowledge, attitudes and behaviours, including; what they think is right versus what they actually do. **Interventions** • Determine at what points in decision-making lawful waste disposal behaviour can be triggered and how. As part of this, explore what choices and trade-offs owner generators are prepared/not prepared to make and what facilitates this (for example, likely impact if disposal costs were required to be paid by owner generators). • Explore what information and messages would support owner generators to make safer decisions and how they would best receive this. Recall of any specific websites they visited or particular messaging.
Construction and demolition waste generators	**Consideration of asbestos waste and understanding of requirements** • Note terminology used throughout. • To what extent do you think C&D workers consider the risks associated with unsafe management of asbestos waste generated through their work? • What drives consideration of and planning for removal and disposal of asbestos waste generated through C&D (e.g. the condition the asbestos is in, or development applications and approvals)? • To what extent do you think C&D workers are aware of/understand the legal requirements relating to asbestos waste classification, preparation, transportation and disposal? • How do they come to be aware of best practice and legal requirements? • Would they speak up if an unexpected find happened on -site? **Asbestos waste-related attitudes and practices** • What sources of information and data exist on asbestos-waste related practices within the C& D industry, and which are considered reliable?

	• What are the attitudes and behaviours of construction and demolition workers in relation to asbestos waste? • Investigate language used for and knowledge of the difference between bonded / friable and whether they know how to identify both (note accuracy). Perceptions of when bonded asbestos becomes friable asbestos (e.g. if it is broken or weathered). • What challenges are faced by C&D workers when removing and disposing of asbestos? Perceptions of own responsibility and where responsibility lies in the asbestos disposal chain? • Overall where do things go well (i.e. lawful and best practice asbestos waste planning, classification, removal and disposal procedures; lawful small quantity disposal and adherence to WasteLocate requirements)? • Probe understanding and definition of small pieces if mentioned - do risk management practices change with quantity? • Overall where do things not go well (i.e. what leads to and are the consequences of illegal or improper handling, removal, transportation and disposal)? • How prevalent do you think lawful and unlawful behaviours in relation to asbestos waste are among C&D workers? (explore incorrect classification of waste, onsite disposal, improper preparation and transportation, illegal dumping, attempted or actual unlawful disposal at waste and recovery sites not able to accept asbestos) • What do you see as the main drivers and barriers underpinning these (including cost)? • Explore roles of worker health and safety, the perceived consequences, compliance with regulation, industry culture, and stakeholder relationships (incl council, assessors, removalists, waste brokers, transporters, waste facilities) in influencing behaviour? • To what extent do C&D workers/companies have responsibility for ensuring asbestos generated through their work is lawfully disposed of? How is this done? e.g. engaging licensed removalists, seeking/keeping proof of disposal? • How do large operators manage asbestos waste differently to the smaller operators? What do they do beyond the legislative requirements? (does the assumption hold that this group are motivated by sustainability and resource management and may have innovative projects in place). • Identify any discrepancies between knowledge, attitudes and behaviours, including; what they think is right versus what they actually do. **Classification and transportation and disposal** • Explore any specific perceived challenges in meeting requirements in relation to asbestos waste classification and transportation and disposal **Intervention** • At what decision points can lawful asbestos waste disposal behaviour be triggered and how? • What changes would C&D workers be prepared/not prepared to make and what would facilitate this?

	• What other intervention opportunities exist, including the most effective ways to change behaviour/increase legal behaviour? • What information and messages would support C&D workers to make safer decisions and how they would best receive this?

NSW Local Government Representatives	**Explore**
	• Perceived role of local government in relation to asbestos waste
	• Burden asbestos waste places on local government and how it is managed
	• Management of asbestos waste through local waste facilities (both council owned and privately owned), including the role and requirements of council contracts
	• Main issues / challenges around improper/illegal disposal of asbestos waste, including waste that is
	  ○ Improperly put through council waste pick-ups (general garbage, recycling and green waste bins via kerbside collection and scheduled household waste pick-ups). Either by residents, or contractors on residential sites or reports of asbestos being placed anonymously in other residents' bins when they are presented for collection?
	  ○ Illegally dumped in local area
	  ○ Put in public place bins?
	• Main audiences in asbestos waste chain and
	  ○ Relevant interactions with local government
	  ○ Perceived motivators and barriers to safe and lawful behaviour
	• Role of the development applications and approvals process in determining what happens with asbestos waste. How is compliance ensured? What weaknesses, if any, exist in this process, and how could this be overcome?
	• Perceived role of private certifiers and any challenges identified
	Local intervention
	• What has worked/not worked locally?
	• What other intervention opportunities exist for local governments to increase safe and lawful behaviour?
	• What information and messages would support property owners generating asbestos waste to make safer decisions and how they would they best receive this?

Private Certifiers	**Views on asbestos waste and role of private certifiers.** • What is the role of a private certifier when a development is expected to have or has asbestos material present? What is the role and responsibilities of the principal contractor onsite in relation to asbestos? What is the responsibilities of other stakeholders involved? • What steps might a private certifier take to ensure asbestos was is safely removed and disposed of from a development?

	• What regulations does a private certifier need to comply with in relation to asbestos? *Provide as much detail as possible. If regulation is mention probe for sections applicable.* • Is asbestos waste management discussed on application or first point of contract with a property owner or developers? In not, at what point is this discussed? • Do you do inspections at critical points and is asbestos a consideration? • What are some unusual places you might find asbestos at a development site? Note terminology used throughout. • Investigate language used for and knowledge of the difference between bonded / friable and whether they know how to identify both (note accuracy). Perceptions of when bonded asbestos becomes friable asbestos (e.g. if it is broken or weathered). • What drives consideration for identifying asbestos during development? *Probe testing requirements.* • What challenges are faced by private certifiers when a development involves generating asbestos waste? • What challenges are faced by private certifiers when a development discovers asbestos on-site that was not pre-identified? • Probe understanding and definition of small pieces if mentioned - do risk management practices change with quantity? For example, what happens if a small piece is found during the development? • To what extent do you think those generating asbestos waste consider the risks associated with unsafe management and disposal of asbestos waste? *Repeat question replacing generator with private certifier industry more broadly.* • To what extent do you think generators of asbestos waste are aware of/understand the legal requirements relating to asbestos waste classification, preparation, transportation and disposal *Repeat question replacing generator with private certifier industry more broadly.* **Asbestos waste-related attitudes and practices *(Note any differences in certifiers practises in regional and metro locations)*** • What are the attitudes and behaviours of private certifiers in relation to asbestos waste? *Explore risk and lawful and best practice procedures* • Does your Complying Development Certificate application form mention asbestos? • What training is available for private certifiers in relation to asbestos? *Probe asbestos waste specifically?* How does the training support or not support safe and lawful behaviour with asbestos removal, transportation and disposal? • Overall, where/ at what stage do things go well (i.e. lawful and best practice asbestos waste planning, classification, removal and disposal procedures; lawful small quantity disposal and adherence to WasteLocate requirements)? • Overall, where/ at what stage do things not go well (i.e. what leads to and are the consequences of illegal or improper handling, removal, transportation and disposal)?

	• How prevalent do you think lawful and unlawful behaviours in relation to asbestos waste are among private certifiers? Why do you think these unlawful behaviours exist? • What do you see as the main drivers and barriers underpinning of these unlawful behaviours (including cost)? • Have you heard of other private certifiers, certifying without inspecting? If yes, why do you think this happens? Does this happen anyway with or without asbestos involved? Is there a gain to be made from asbestos? • Explore the impact of worker health and safety, and the safety of others including clients and their own family on motivating behaviour. • Investigate the role of, compliance with regulation, perceived consequences and the likelihood of being caught, industry culture, reputation and stakeholder relationships (incl generators, developers, construction industry, principal contractors and subcontractors, council, assessors, waste brokers, transporters, waste facilities) in influencing behaviour. • To what extent do private certifiers have responsibility for ensuring asbestos generated through development is lawfully disposed of? How is this done? • Identify any discrepancies between knowledge, attitudes and behaviours, including; what they think is right versus what they actually do. • Explore any specific perceived challenges in meeting requirements in relation to asbestos waste during development? • Explore levels of awareness, attitudes, and adherence to WasteLocate requirements. • At the end of a private certifier's involvement in a development, do they check to see if asbestos has been involved or not? Do they check for contractors to ensure lawful removal and receipts for lawful disposal? And are supposed to keep records. Yes, No, why • What are your interactions with regulators in relation to developments involving asbestos – Safe work, EPA, Council or any other regulators? *Do they shield themselves with the property owner?* • Do you think people who do the wrong this get caught risk? Have you heard of any certifiers being caught? What do they get in trouble for? **Intervention** • At what decision points can lawful asbestos waste disposal behaviour be triggered and how? • What other intervention opportunities exist, including the most effective ways to change behaviour/increase legal behaviour? What could encourage compliance? • What information and messages would support private certifiers to make safe and lawful decisions and how they would best receive this? • Do they recall any examples of asbestos campaign messaging or a similar WHS messaging material that worked well and what was it about this particular 'message' that worked?

	• Explore perceptions regarding whether there needs to be a property inspection upfront that would push this responsibility back onto the property owner? • Should there be something that property owners provide to certifiers as a report (that asbestos has been lawfully removed/disposed of), shifting the responsibility back up the waste stream to the generator?
Waste facilities / waste workers – lines of enquiry pursued across multiple interviews with various workers at each site	**View of asbestos waste and challenges** • Note terminology used throughout. • What are some of the main challenges are faced by waste management sites in relation to disposal of asbestos waste? [If not mentioned, explore challenges related to classification of waste, identification of contaminated waste, identification of improperly prepared waste, compliance with best practice, compliance with license conditions, waste tracking etc, customers not following procedures / directions at the landfill .] • To what extent is attempted and actual improper disposal by different parties an issue for [licensed / unlicensed / waste management sites and resource recovery sites? Explore issues across the different types of waste management sites. Are there instances of customers disguising asbestos waste as other waste to avoid higher fees? **Relationships with different parties in waste chain** • How do waste management sites interact with [local government / waste generators transporters / the broader local community] to support safe and lawful asbestos disposal? **Attitudes and practices on waste sites** • What are the attitudes of staff at waste management and resource recovery sites (incl at the weighbridge and tip face) in relation to asbestos waste, risk and lawful and best practice procedures? • How is best practice/compliance monitored/enforced on waste sites? • What roles do [health and safety, work practices, compliance with regulation, education and training, and stakeholder relationships] have on asbestos related behaviour at waste sites? • How prevalent are levels of lawful and unlawful disposal behaviour (by people disposing of the waste, and among workers at waste sites), and what are some actual examples of this • Explore perceived consequences and the drivers and barriers underpinning these (including cost) • What are the levels of awareness, attitudes, and adherence to WasteLocate requirements? What challenges do waste tracking pose for waste facilities? • Based on your understanding, what happens to asbestos-containing loads that are rejected at waste and recycling facilities? **Intervention** • Explore the role of education and training for staff

	• At what decision points can lawful waste disposal behaviour can be triggered and how (among audiences disposing of waste / among waste workers and sites)? • What other intervention opportunities exist, including the most effective ways to change behaviour/increase legal behaviour? • What role can waste sites play? • What information and messages would support waste management sites to make safer decisions in relation to asbestos disposal and how they would best receive this?

Summary and close (5 mins) Closing out the interview	
Review and thanks	Thank you so much for your time today, it's been a really stimulating discussion and I hope interesting for you too. If there is anything further you would like to add after the interview, please feel free to email me at _____.
Next steps and refer to EPA if appropriate	We will be providing a debrief to the EPA on these interviews, and the findings will guide further stages of the research. As we mentioned earlier, everything you say today is completely confidential and won't be attributed to you as an individual. FOR PARTICIPANTS RECRUITED FROM EPA CONTACTS ONLY: Would you like to receive a brief summary of some of the themes that emerge from these interviews? (note preference) If you would like to follow up any aspect of this interview direct with the NSW EPA, please contact Sarah Seery, Asbestos Waste Strategy, NSW Environment Protection Authority, +61 2 9995 6467, sarah.seery@epa.nsw.gov.au

Appendix C – Quantitative questionnaire

QUOTAS

	Category	%	n=
Age	18-24	13%	351
	25-34	18%	486
	35-44	19%	513
	45-54	18%	486
	55-64	15%	405
	65+	17%	459
Gender	Male	49%	1,323
	Female	51%	1,377
Location	Greater Sydney	70%	1.890
	Rest of NSW	30%	810
Total n			**2,700**

INTRODUCTION

Thank you for your interest in our survey which should take around 10 to 15 minutes to complete, depending on your answers.

Just to remind you, your responses in this survey will be kept completely confidential and will be used only for market research purposes. As a market research company, we comply with the requirements of the Privacy Act.

Please answer all questions honestly. Your responses will **not** be able to be linked to you personally, and so there is no possibility of any personal, financial or legal consequences arising from any information you provide.

Please remember:

- Use your mouse to 'click' the relevant circles or boxes and mark your selections. Some questions require you to type your answers in the space provided.
- To begin the survey, click on the '>>' button below.
- When you have completed all questions on the screen, click the '>>' button to proceed to the next page.
- If you need to return to the survey later, click the '>>' button and close the webpage. The next time you click on the invite link, it will automatically take you back to the question you were up to.

SCREENING

S1. **Are you?**

CHECK QUOTAS, SINGLE RESPONSE ONLY

1. Under 18 **TERMINATE**
2. 18-24
3. 25-34
4. 35-44
5. 45-54
6. 55-64
7. 65-74
8. 75 or older

S2. **Are you?**

CHECK QUOTAS, SINGLE RESPONSE ONLY

1. Male
2. Female
3. Other
97. Prefer not to say

S3. **What is your home postcode?**
AUTOCODE LOCATION
CHECK QUOTAS

S4. **Are you currently?**

SINGLE RESPONSE ONLY

1. Working in paid employment
2. Working as an apprentice
3. Self employed
4. Retired
5. Student
6. Carer/home duties
7. Unemployed / looking for work

S5. IF 1, 2 OR 3 IN S4 SHOW:

In which of these fields do you currently work?

Please select all that apply.

MULTIPLE RESPONSE

1. Accommodation and food services
2. Administrative and support services
3. Agriculture, forestry and fishing
4. Arts and recreation services
5. Building and construction
6. Education and training
7. Electricity, gas, water and waste services

8. Financial and insurance services
9. Health care and social assistance
10. Information, media and telecommunications
11. Mining and manufacturing
12. Professional, scientific and technical services
13. Public administration and safety
14. Real estate services
15. Retail and wholesale trade
16. Transport, postal and warehousing
17. Other services

S6. SHOW IF THE FOLLOWING CODES IN S5:

[5 (Building And Construction), 7 (Electricity, Gas, Water And Waste Services), 12 (Professional, Scientific And Technical Services), 13 (Public Administration And Safety), 14 (Real Estate Services), 16 (Transport, Postal And Warehousing), or 17 (Other Services)]

Which, if any, of these type/s of work do you do?

Please select all that apply.

MULTIPLE RESPONSE

1. Bricklaying
2. Builder
3. Building maintenance
4. Building assessment or inspection
5. Cabinet making/joinery
6. Carpentry
7. Concreting services
8. Demolition
9. Electrician or electrical services
10. External cladding installation
11. Fencing
12. Floor covering installation/laying
13. Floor sanding
14. Gas fitting
15. Handyman/person
16. Heating/air conditioning installation or maintenance
17. Insulation installation
18. Kitchen/Bathroom removal/installation
19. Landscaping
20. Licensed asbestos assessment or removal
21. Occupational hygiene services
22. Painting
23. Plastering and ceiling services
24. Plumbing and drainage
25. Property development
26. Recycling and resource recovery
27. Roof and guttering installation
28. Site inspection or certification services
29. Site management
30. Site preparation, excavation or land development services
31. Solar panel installation

32. Telecommunications cable installation
33. Tiling
34. Transportation of building and demolition waste
35. Wallpapering
36. Waste collection or disposal
37. Window installation and glazing services
99. None of these

1. EXPOSURE TO ASBESTOS INFORMATION

1.1. **How would you describe your awareness and knowledge of asbestos?**
SINGLE RESPONSE
1. Never heard of it before now
2. Have heard of it but know very little about it
3. Know something about it
4. Know a lot about it
5. Have expert knowledge of asbestos

1.2. **In the last 12 months, have you seen or heard any information, advertising or news about asbestos safety or asbestos waste disposal?**
1. Yes
2. No/ don't know

1.3. IF YES AT 1.2
Please describe what you saw or heard in as much detail as possible.
[OPEN TEXT FIELD]

1.4. IF YES AT 1.2
How/where did you come across this advertising or information?
ONLY SHOW CODES IN ITALICS (CODES 11-12) IF CODES 1-37 IN S6
Please select all that apply.
MULTIPLE RESPONSE. RANDOMISE ORDER EXCEPT ANCHOR CODE 13 'SOMEWHERE ELSE' AS LAST
1. TV
2. Radio
3. Newspaper
4. Magazine/journal
5. Flyer
6. Email
7. Web search / Google
8. YouTube
9. Social media
10. Information provided direct from someone else
11. *Formal training (such as a course)*
12. *Informal training (such as on the job)*
13. Somewhere else [please specify]

1.5. IF YES AT 1.2
Who was providing this information or who was behind this advertising?
MULTIPLE REPSONSE. RANDOMISE ORDER EXCEPT ANCHOR 'OTHER' & 'DON'T KNOW'
ONLY SHOW CODES IN ITALICS (CODES 14-16) IF CODES 1-37 IN S6

1. Local council
2. NSW Environment Protection Authority (EPA)
3. SafeWork NSW
4. NSW Health
5. Commonwealth Asbestos Safety and Eradication Agency (ASEA)
6. Tradesperson, handyman or other construction and demolition professional
7. Asbestos assessor or licensed removalist
8. Neighbour, friend or family member with relevant experience or knowledge
9. News media outlet
10. Local waste disposal facility
11. Lifestyle or renovation show
12. Hardware store
13. Social media special interest group or community
14. *An industry association*
15. *My employer*
16. *A colleague / someone I work with*
17. *A training provider, other than SafeWork NSW*
18. Other source [please specify]
98. Don't know

2. COMMUNITY EXPERIENCE WITH ASBESTOS WASTE DISPOSAL

2.1. SHOW ALL:

Have you ever been living in or owned a property where there was asbestos that was removed or moved?
This includes asbestos that was completely removed from the property, and any asbestos moved from one spot to another on the property, while you lived in or owned it. (It does not include asbestos left undisturbed or left in place.)

1. Yes
2. No/don't know SKIP TO 2.18

2.2. IF YES AT 2.1

When was the most recent time that asbestos was removed or moved on a property you were living in or owned?
SINGLE RESPONSE ONLY

1. More than 10 years ago SKIP TO 2.18
2. 6-10 years ago SKIP TO 2.18
3. 2-5 years ago
4. Within the last 2 years

2.3. IF 3 OR 4 AT 2.2

In the last 2 years [IF CODE 4 IN 2.2] / 5 years [IF CODE 3 IN 2.2), how many times has there been a situation or project where asbestos was removed or m oved on a property you were living in or owned?
SINGLE RESPONSE ONLY. REVERSE ORDER OF 1-4 FOR HALF OF SAMPLE (RANDOMLY)

1. More than 5 times
2. 4-5 times
3. 2-3 times
4. 1 time

2.4. IF 3 OR 4 AT 2.2

When asbestos was moved/removed from your property in the last 2 years [IF CODE 4 IN 2.2] / 5 years [IF CODE 3 IN 2.2), who was involved in…?
Please select all that apply

MULTIPLE RESPONSE PER ROW

	Me/us	A friend or family member	A home handyperson	A tradesperson or building/demolition professional	A licensed asbestos removalist	A waste removal service such as a skip bin	Someone else (please specify)	Don't know
a. Deciding how to dispose of it	1	2	3	4	5	6	7	98
b. Actually disposing of it	1	2	3	4	5	6	7	98

2.5. IF 3 OR 4 AT 2.2

When asbestos was moved/removed from your property in the last 2 years [IF CODE 4 IN 2.2] / 5 years [IF CODE 3 IN 2.2), how often did each of the following occur? The asbestos waste was…

SINGLE RESPONSE PER ROW

RANDOMISE ORDER OF a.-e.	Always	Some-times	Never	Don't know
a. Handled with PPE (personal protective equipment)	1	2	3	98
b. Wrapped up securely with black/builder's plastic	1	2	3	98
c. Wet down	1	2	3	98
d. Covered/sprayed with PVA and water mix	1	2	3	98
e. Labelled as asbestos	1	2	3	98

2.6. IF USED PPE (I.E. 2.5a = 1 OR 2)

What pieces of PPE were used by people handling the asbestos waste?

Please select all that apply.

MULTIPLE RESPONSE. RANDOMISE ORDER EXCEPT OTHER AND DON'T KNOW AND ALWAYS HAVE RESPIRATOR AFTER DUST MASK.

1. Disposable coveralls
2. Gloves
3. A dust mask
4. A P2 or P3 respirator
5. Enclosed safety footwear
6. Safety goggles
7. Other [please specify] [OPEN TEXT BOX]
98. Don't know

2.7. IF 3 OR 4 AT 2.2

In the last 2 years [IF CODE 4 IN 2.2] / 5 years [IF CODE 3 IN 2.2), which of these have happened to asbestos that was removed or moved on a property you were living in or owned? Asbestos waste was…

MULTIPLE RESPONSE. RANDOMISE ORDER EXCEPT 'ELSEWHERE', 'NONE' AND 'DON'T KNOW'

1. Left on the property
2. Put in a kerbside collection wheelie bin
3. Put in a skip bin
4. Put out for a council pick-up
5. Taken to a tip/waste site
6. Left in bushland or by a roadside
7. Taken elsewhere [please specify]

98. Don't know

2.8. IF CODE 1 'LEFT ON PROPERTY' IN 2.7

When asbestos waste was left on the property, was it?

Please select all that apply.

MULTIPLE RESPONSE

1. Buried under a structure
2. Mixed with soil
3. Stored away under the house/in the shed
4. Used for a purpose (such as, filling gaps, garden edging, fill to level land)
5. Put somewhere else [please specify]

98. Don't know

2.9. IF CODE 3 'PUT IN A KERBSIDE COLLECTION WHEELIE BIN' IN 2.7

When asbestos waste was put in a kerbside collection wheelie bin, which type/s of bin was it put in?

Please select all that apply.

MULTIPLE RESPONSE

1. Garbage/household waste (red lid)
2. Recycling (yellow or blue lid)
3. Garden/green waste (green lid)

98. Don't know

2.10. IF CODE 4 'PUT IN A SKIP BIN' IN 2.7

When asbestos waste was put in a skip bin, which type/s of skip bin was it put in?

Please select all that apply.

MULTIPLE RESPONSE

1. One specifically intended for asbestos waste
2. One for general waste

98. Don't know

2.11. IF CODE 5 'PUT OUT FOR A COUNCIL PICK UP' IN 2.7

When asbestos waste was put out for a council pick up, which type/s of collection was it put out for?

MULTIPLE RESPONSE

1. An annual or scheduled council clean-up
2. A special asbestos council pick-up

98. Don't know

2.12. IF ANY OF 1-8 AT 2.7

Thinking about when asbestos waste from your property was [PIPE IN RESPONSE FROM 2.5] in the last 2 years [IF CODE 4 IN 2.2] / 5 years [IF CODE 3 IN 2.2), why was this done?

Please select all that apply.

REPEAT 2.12 AND PIPE IN RESPONSE FOR EACH OF CODES 1-8 SELECTED AT 2.5

MULTIPLE RESPONSE. RANDOMISE ORDER OF CODES 1-8

1. Seemed the cheapest thing to do
2. Seemed the easiest thing to do
3. Seemed the right/legal thing to do
4. Seemed the safest thing to do
5. Seemed the fastest thing to do
6. A building professional suggested it
7. An asbestos professional suggested it
8. A friend/family member suggested it
9. Another reason (Please specify) [OPEN TEXT FIELD]

98. Don't know

2.13. IF ANY OF 1-8 AT 2.7

What type of asbestos waste was _____ in the last 2 years [IF CODE 4 IN 2.2] / 5 years [IF CODE 3 IN 2.2)? Was it…?

REPEAT 2.13 AND PIPE IN RESPONSE FOR EACH OF CODES 1-8 SELECTED AT 2.5

Please select all that apply.

MULTIPLE RESPONSE

1. Fibro/cement sheeting (such as used in walls, eaves, ceilings, fences, etc)
2. Asbestos mixed in with soil
3. Another type or form of asbestos (please specify) [OPEN TEXT FIELD]
4. Don't know

2.14. IF ANY OF 1-8 AT 2.7

And which of these best approximates the amount of asbestos waste from your property that was _____ in the last 2 years [IF CODE 4 IN 2.2] / 5 years [IF CODE 3 IN 2.2)? About a…

REPEAT 2.12 AND PIPE IN RESPONSE FOR EACH OF CODES 1-8 SELECTED AT 2.5

MULTIPLE RESPONSE

1. Handful
2. Shopping bag full
3. Garbage bag full
4. Trailer load full
5. Skip bin full
6. Truck full or more

98. Don't know

2.15. IF CODE 6 'TAKEN TO A TIP/WASTE SITE' IN 2.7

When asbestos from your property was taken to a tip/waste site, did you ever see a copy of a receipt, showing the asbestos had been disposed of? SINGLE RESPONSE ONLY

1. Yes, I saw a receipt every time asbestos was taken to the tip/waste site
2. Yes, I saw a receipt only some of the times asbestos was taken to the tip/waste site
3. No, I never saw a receipt

98. Don't know

2.16. IF CODES 1 OR 2 'YES' IN 2.15

Who provided this receipt?

Please select all that apply.

1. I/we got it ourselves direct from the tip/waste site
2. A tradesperson or building professional
3. A licensed asbestos removalist
4. Other, please specify [OPEN TEXT FIELD]
98. Don't know

2.17. IF CODES 1 OR 2 'YES' IN 2.15

And what information did the receipt contain?

MULTIPLE RESPONSE, EXCEPT CODE 4

1. The weight of the asbestos disposed of
2. The cost of the asbestos disposal
3. Other, please specify [OPEN TEXT FIELD]
98. Don't know

2.18. SHOW ALL

Has asbestos waste ever been brought onto a property you owned or were living in?

Asbestos waste may include contaminated soil (or 'fill') or other materials containing asbestos.

1. Yes
2. No SKIP TO END OF SECTION 2

2.19. IF YES AT 2.18

When was the most recent time that asbestos waste was brought onto a property that you owned or were living in?

1. More than 10 years ago
2. 6-10 years ago
3. 2-5 years ago
4. Within the last 2 years

2.20. IF CODES 3 OR 4 AT 2.19

In the last two years, how many times has asbestos been brought onto a property you were living in or owned? REVERSE ORDER OF 1-4 FOR HALF OF SAMPLE (RANDOMLY)

1. More than 5 times
2. 4-5 times
3. 2-3 times
4. 1 time

2.21. IF CODES 3 OR 4 AT 2.19

The most recent time this waste was brought onto your property, were you aware that it contained asbestos?

1. Yes
2. No
98. Don't know

2.22. IF CODES 3 OR 4 AT 2.19

Please describe what happened, the most recent time asbestos waste was brought onto your property.

E.g. How did the asbestos waste come to be on your property? What form was the asbestos waste in? Were you aware it was asbestos waste? Did you voluntarily accept the asbestos waste, and if so, why? Were there any consequences for you?
[OPEN TEXT FIELD]

2.23. IF YES AT 2.1 OR 2.18

Overall, which of these, if any, do you see as challenges householders face in disposing of asbestos waste?
Please select all that apply.
MULTIPLE RESPONSE. RANDOMISE ORDER OF CODES 1-8

1. Difficulty accurately determining if waste contains asbestos
2. Not having a disposal facility close by that accepts asbestos waste
3. The cost of asbestos waste disposal
4. Having enough small pieces of asbestos to warrant a trip to a disposal facility
5. Some waste sites charging more for asbestos waste than others
6. Having to pre-book an asbestos load at the waste site before disposal
7. Having to prepare asbestos for disposal (wrapping, taping etc)
8. Finding the correct information on how to lawfully prepare and dispose of asbestos
9. Other, please specify [OPEN TEXT BOX]
98. Don't know
99. None of these

3. PROFESSIONALS' ASBESTOS WASTE DISPOSAL EXPERIENCES

3.1. SHOW ALL PROFESSIONALS, S6 CODES 1-37

In your current work situation, which of these asbestos related activities ever occur?
INCLUDE APPROPRIATE SPACE BETWEEN QUESTION AND CLARIFICATION STATEMENT
Please include activities that you, your colleagues, or any other suppliers (such as asbestos professionals) are involved in at your work.
Please select all that apply.
MULTIPLE RESPONSE, EXCEPT 'NONE'

1. Working in buildings, or with or around materials or soil, that contain asbestos IF ONLY THIS SELECTED, SKIP TO END OF SECTION 3
2. Removing of asbestos materials or contaminated soil from its location
3. Preparing asbestos waste for disposal
4. Transporting of asbestos waste
5. Disposing of asbestos waste
6. Something else related to asbestos waste [Please specify]
7. None of these activities related to asbestos waste IF ONLY THIS SELECTED SKIP TO NEXT SECTION

IF 2-7 AT 3.1

3.1 B When was the most recent time that asbestos waste related activities occurred in your current workplace?
SINGLE RESPONSE ONLY

1. More than 10 years ago
2. 6-10 years ago
3. 2-5 years ago
4. Within the last 2 years

3.2. IF ANY ASBESTOS WASTE ACTIVITIES IN 3.1 (i.e. 3.1 = 2-6):

In your current work situation, what percentage of the work involves these activities relating to asbestos

waste?
Please give your best estimate
[OPEN NUMBER FIELD]% ALLOW 1-100

3.3. IF ANY ASBESTOS WASTE ACTIVITIES IN 3.1 (i.e. 3.1 = 2-6):
When dealing with asbestos waste, how often do each of these occur? Asbestos waste is…
REVERSE ORDER OF 1-98 LEFT TO RIGHT FOR HALF OF SAMPLE (RANDOMLY)

RANDOMISE ORDER OF a.-e.	Always	Usually	Some-times	Rarely	Never	Don't know
a. Handled with PPE (personal protective equipment)	1	2	3	4	5	98
b. Wrapped up securely with black/builder's plastic	1	2	3	4	5	98
c. Wet down	1	2	3	4	5	98
d. Covered/sprayed with PVA and water mix	1	2	3	4	5	98
e. Labelled as asbestos	1	2	3	4	5	98

3.4. IF ANY ASBESTOS WASTE ACTIVITIES IN 3.1 (i.e. 3.1 = 2-6):
What else, if anything, do you do when handling asbestos?
1. [OPEN TEXT FIELD]
99 Nothing else

3.5. IF MORE THAN 'NEVER' FOR PPE (I.E. 3.3A = 1-4) SHOW
What pieces of PPE are typically used when handling asbestos waste?
Please select all that apply.
MULTIPLE RESPONSE. RANDOMISE ORDER EXCEPT OTHER AND DON'T KNOW AND ALWAYS HAVE RESPIRATOR AFTER DUST MASK.

1. Disposable coveralls
2. Gloves
3. A dust mask
4. A P2 or P3 respirator
5. Enclosed safety footwear
6. Safety goggles
7. Other [please specify] [OPEN TEXT BOX]

99. Don't know

3.6. IF 3.1B = 4)
In your current work situation, which of these have <u>happened in the past two years</u>? Asbestos waste was…
Please select all that apply.
MULTIPLE RESPONSE. RANDOMISE ORDER EXCEPT 'ELSEWHERE' OR 'NONE'

1. Left on the property it came from
2. Put in a kerbside collection wheelie bin
3. Put in a skip bin
4. Put out for a council pick-up
5. Taken to a tip/waste site

6. Left in bushland or by a roadside
7. Taken elsewhere, please specify [OPEN TEXT BOX]
98. Don't know

3.7. IF ANY OF 1-7 AT 3.6

What type/s of asbestos waste has been dealt with in your current workplace in the last 2 years? Was it…?

Please select all that apply.

MULTIPLE RESPONSE

1. Fibro/cement sheeting (such as used in walls, eaves, ceilings, fences, etc)
2. Asbestos mixed in with soil
3. Another type or form of asbestos (please specify) [OPEN TEXT FIELD]
4. Don't know

3.8. IF CODE 1 'LEFT ON PROPERTY' IN 3.6

When asbestos waste was left on the property, was it?

Please select all that apply.

MULTIPLE RESPONSE

1. Buried under a structure
2. Mixed with soil
3. Stored away under the house/in the shed
4. Used for a purpose (such as, filling gaps, garden edging, fill to level land)
5. Put somewhere else, please specify [OPEN TEXT BOX]
98. Don't know

3.9. IF CODE 3 'PUT IN A KERBSIDE COLLECTION WHEELIE BIN' IN 3.6

When asbestos waste was put in a kerbside collection wheelie bin, which type/s of bin was it put in?

Please select all that apply.

MULTIPLE RESPONSE

1. Garbage/household waste (red lid)
2. Recycling (yellow or blue lid)
3. Garden/green waste (green lid)
98. Don't know

3.10. IF CODE 4 'PUT IN A SKIP BIN' IN 3.6

When asbestos waste was put in a skip bin, which type/s of skip bin was it put in?

Please select all that apply.

MULTIPLE RESPONSE

1. One specifically intended for asbestos waste
2. One for general waste
98. Don't know

3.11. IF CODE 5 'PUT OUT FOR A COUNCIL PICK UP' IN 3.6

When asbestos waste was put out for a council pick up, which type/s of collection was it put out for?

Please select all that apply.

MULTIPLE RESPONSE

1. An annual or scheduled council clean-up
2. A special asbestos council pick-up
98. Don't know

3.12. IF CODE 7 'TAKEN ELSEWHERE' IN 3.6

When asbestos waste was taken elsewhere, was it used on another property as fill or to level land?

SINGLE RESPONSE

1. Yes
2. No
98. Don't know

3.13. IF ASBESTOS WASTE REMOVED FROM PROPERTY IN LAST 2 YEARS (I.E. 3.6 = 2-7)

In your current work situation, in the past two years, how often was asbestos waste disposed of immediately/on the same day that it had been moved or removed?

1. Always
2. Usually
3. Sometimes
4. Rarely
5. Never
98. Don't know

3.14. IF ASBESTOS WASTE REMOVED FROM PROPERTY IN LAST 2 YEARS (I.E. 3.6 = 2-7)

How often is asbestos waste combined with asbestos from other properties or jobs before it's disposed of?

SINGLE RESPONSE

1. Always
2. Usually
3. Sometimes
4. Rarely
5. Never
98. Don't know

3.15. IF 3.13 = 2-5)

How long does it usually take between asbestos waste being moved/removed and it being finally disposing of?

SINGLE RESPONSE

1. Disposed of within 1 day or so
2. Disposed of within a week or so
3. Disposed of within a month or so
4. Disposed of after a longer period
98. Don't know

3.16. IF 3.13 = 2-5)

In the time between it being moved/removed and being finally disposed of, where is the asbestos waste usually kept?

MULTIPLE RESPONSE

1. At the property it came from
2. Moved from one job site to another
3. Left in a truck or other vehicle
4. Taken to the depot/head office
5. Taken to a workers' home/property
6. Other location, please specify [OPEN TEXT BOX]

98. Don't know

3.17. IF ASBESTOS WASTE REMOVED FROM PROPERTY IN LAST 2 YEARS (I.E. 3.6 = 2-7)

In your current work situation, in the last 2 years have you or anyone you worked with used the WasteLocate waste tracking online system?

1. Yes
2. No
98. Don't know

3.18. IF WASTE LOCATE USED (I.E. YES AT 3.17)

Please describe the circumstances when WasteLocate was used?

Please provide as much detail as possible, for example, for what types and quantities of asbestos and types of clients WasteLocate has been used for.

1. [OPEN TEXT FIELD]
98. Don't know

3.19. IF ASBESTOS WASTE REMOVED FROM PROPERTY IN LAST 2 YEARS (I.E. 3.6 = 2-7)

In your current work situation, in the last 2 years have you or anyone you worked with had a load of waste rejected at the tip/waste site because it contained asbestos?

1. Yes
2. No
98. Don't know

3.20. IF REJECTED LOAD (I.E. YES AT 3.19)

1. As far as you know, where did the rejected load/s go? [OPEN TEXT FIELD]

98. Don't know

3.21. IF ASBESTOS WASTE REMOVED FROM PROPERTY IN LAST 2 YEARS (I.E. 3.6 = 2-7)

In your current work situation, in the last 2 years have you or anyone you worked with collected a receipt from the tip/waste site, that showed you had disposed of asbestos waste?

1. Yes
2. No
98. Don't know

3.22. IF 'YES' IN 3.21

And did you or someone you work with show a tip receipt for asbestos waste to...

Please select all that apply.

MULTIPLE RESPONSE

1. Another person you work with
2. A certifier or assessor
3. The property owner/developer
4. Other, please specify [OPEN TEXT BOX]
5. None
98. Don't know

3.23. IF ANY ASBESTOS WASTE ACTIVITIES IN 3.1 (i.e. 3.1 = 2-6):

Overall, which of these, if any, do you see as challenges in disposing of asbestos waste at work?

Please select all that apply.

MULTIPLE RESPONSE. RANDOMISE ORDER OF CODES 1-10

1. Difficulty accurately classifying waste
2. Not having a disposal facility close by that accepts asbestos waste
3. The cost of disposal when asbestos is found unexpectedly
4. Competitive pressures from operators not charging the correct waste fees
5. Owners being unwilling to pay for disposal
6. Having enough small pieces of asbestos to warrant a trip to a disposal facility
7. Some waste sites charging more for asbestos waste than others
8. Having to pre-book an asbestos load at the waste site before disposal
9. Having to prepare asbestos for disposal (wrapping, taping etc)
10. Finding the correct information on how to lawfully prepare and dispose of asbestos
11. Other, please specify [OPEN TEXT BOX]

100. Don't know

101. None of these

4. ASBESTOS WASTE DISPOSAL ATTITUDES & KNOWLEDGE

4.1. SHOW ALL

For each of the following, please indicate whether you believe the statement to be true or false.

SINGLE RESPONSE FOR EACH ROW

RANDOMISE ORDER OF STATEMENTS. REVERSE ORDER OF 1-98 LEFT TO RIGHT FOR HALF OF SAMPLE (RANDOMLY)

	True	False	Don't know
a. Only small amounts of asbestos waste can be legally removed from a property without an asbestos removal licence	1	2	98
b. It costs a lot more to dispose of asbestos waste at a tip/waste site than other forms of waste	1	2	98
c. You are allowed to put small amounts of asbestos in your kerbside collection wheelie bin, as long as they are carefully wrapped	1	2	98
d. Once it gets to the tip/waste site, asbestos waste is treated like any other kind of waste	1	2	98
e. Asbestos waste can be disposed of at any tip/waste site in NSW	1	2	98
f. The owner is responsible for ensuring asbestos waste generated at their property is disposed of legally	1	2	98
g. Weathered or broken asbestos sheeting is considered friable asbestos	1	2	98
h. Asbestos can be placed in any skip bin	1	2	98
i. Any material can legally be used to wrap asbestos before disposal	1	2	98
j. Other mixed waste can be legally wrapped with asbestos waste before disposal	1	2	98

k. An online tracking system must be used when transporting larger amounts of asbestos waste	1	2	98
l. Any person can legally remove and dispose of up to a trailer load of asbestos sheeting themselves	1	2	98

4.2. SHOW ALL

To what extent do you agree or disagree with each of the following statements?

SINGLE RESPONSE FOR EACH ROW

RANDOMISE ORDER OF STATEMENTS. REVERSE ORDER OF 1-5 LEFT TO RIGHT FOR HALF OF SAMPLE (RANDOMLY)

COM-B FACTOR *(NOT SHOWN TO PARTICIPANTS)*		Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
PHYSICAL AND PSYCHOLOGICAL CAPABILITY	a. I know how to safely prepare asbestos waste for disposal	1	2	3	4	5
	b. I would have no idea how to go about disposing of any asbestos that may be on my property	1	2	3	4	5
	c. I am confident that I would know if asbestos removed from my property has been disposed of safely and legally	1	2	3	4	5
	d. I am confident I know how to identify asbestos waste	1	2	3	4	5
PHYSICAL OPPORTUNITY	e. There are no tips/waste sites near me where I could legally take asbestos for disposal	1	2	3	4	5
	f. I would not be willing to pay for a specialist to remove small amounts of asbestos if found on my property	1	2	3	4	5
	g. I imagine it would cost a lot of money to dispose of asbestos waste the way you are supposed to	1	2	3	4	5
	h. It should cost the same amount to dispose of asbestos waste as any other kind of waste	1	2	3	4	5
	i. I would be unlikely to go to the trouble of taking small amounts of asbestos waste to a tip/waste site	1	2	3	4	5
	j. I would travel 30 minutes to dispose of a hand size piece of asbestos if it meant I could dispose of it lawfully.	1	2	3	4	5

	k. I would pay $50 to dispose of a hand size piece of asbestos if it meant it was disposed of lawfully.	1	2	3	4	5
SOCIAL OPPORTUNITY	l. Most people have put small amounts of asbestos in a wheelie bin or a skip bin at some stage	1	2	3	4	5
	m. Illegal dumping of asbestos waste is a very significant problem for the health of the NSW community	1	2	3	4	5
	n. I think people have a duty to everyone around them to ensure that any asbestos in their property is disposed of safely	1	2	3	4	5
	o. If I saw illegally dumped waste that I thought might be asbestos, I would report it	1	2	3	4	5
REFLECTIVE AND AUTOMATIC MOTIVATION	p. Property owners should be held liable for asbestos waste that is illegally dumped after it is taken from their property, regardless of how it got there	1	2	3	4	5
	q. The possibility of anyone being harmed by asbestos that is not properly disposed of is low	1	2	3	4	5
	r. I've never really given much thought to what happens once asbestos is disposed of	1	2	3	4	5
	s. I find the whole topic of asbestos too off-putting or scary to think about	1	2	3	4	5
	t. I would never consider disposing of asbestos anywhere other than at a tip/waste site licensed to accept asbestos waste	1	2	3	4	5
	u. There are significant consequences for anyone caught illegally disposing of asbestos waste	1	2	3	4	5
	v. It's easy to get away with illegally disposing of asbestos waste	1	2	3	4	5
	w. I'm very concerned about me and my family's health and safety when it comes to asbestos waste	1	2	3	4	5

	x. I'm very concerned about the whole community's health and safety when it comes to asbestos waste	1	2	3	4	5

4.3. IF AGREE (CODES 4-5) TO STATEMENT 'O' IN 4.2 ABOVE

Who would you contact to report illegally dumped waste that you suspected was asbestos?

1. Local council
2. NSW Environment Protection Authority (EPA)
3. SafeWork NSW
4. Police
5. Other, please specify [OPEN TEXT FIELD]
98. Don't know

5. INFORMATION SOURCES

5.1. SHOW ALL

If you needed information or advice about safe and legal disposal of asbestos, which of the following sources of information would you use?

Please select all that apply.

MULTIPLE RESPONSE. RANDOMISE ORDER, KEEPING CODES 15, 16 AND 99 LAST

1. Local council
2. NSW Environment Protection Authority (EPA)
3. SafeWork NSW
4. NSW Health
5. Commonwealth Asbestos Safety and Eradication Agency (ASEA)
6. Tradesperson, handyman or other construction and demolition professional
7. Asbestos assessor or licensed removalist
8. Neighbour, friend or family member with relevant experience or knowledge
9. News media outlets
10. Local waste disposal facility
11. Presenter on lifestyle or renovation show
12. Hardware store
13. Social media special interest group or community
14. YouTube
15. Other source on the internet (e.g. an online forum or international website on the topic)
16. Other, please specify [OPEN TEXT BOX]
99. None/don't know

5.2. SHOW ALL

Please rate <u>how much you trust</u> each of these sources to provide reliable information about safe and legal disposal of asbestos?

SINGLE RESPONSE PER ROW. RETAIN ORDER AS PRESENTED IN 5.1. ENSURE 'n' IS LAST. REVERSE ORDER OF SCALE LEFT TO RIGHT FOR HALF OF SAMPLE (RANDOMLY)

		RATING SCALE [SHOW ENDPOINTS AND LABELS] 0 10

		Do not trust at all Trust completely
a.	Local council	
b.	NSW Environment Protection Authority (EPA)	
c.	SafeWork NSW	
d.	NSW Health	
e.	Asbestos Safety and Eradication Agency (ASEA)	
f.	Tradesperson, handyman or other construction and demolition professional	
g.	Asbestos assessor or licensed removalist	
h.	Neighbour, friend or family member with relevant experience or knowledge	
i.	News media outlets	
j.	Local waste disposal facility	
k.	Presenter on lifestyle or renovation show	
l.	Hardware store	
m.	Social media special interest group or community	
n.	YouTube	
o.	Other source on the internet, (e.g. an online forum or international website on the topic)	

6. SUPPORT FOR INTERVENTION OPPORTUNITIES

6.1. SHOW ALL

To what extent do you support or oppose the following asbestos assessment and collection initiatives, in the interest of supporting safe and legal disposal of asbestos waste?

SINGLE RESPONSE FOR EACH ROW

RANDOMISE ORDER OF STATEMENTS. REVERSE ORDER OF 1-98 LEFT TO RIGHT FOR HALF OF SAMPLE (RANDOMLY)

STATEMENTS	Strongly oppose	Some-what oppose	Neither support nor oppose	Some-what support	Strongly support	Don't know
a. Pop-up asbestos collection events where residents could take less than 10 square metres of correctly wrapped asbestos sheeting to a location for free disposal.	1				5	
b. Asbestos safe disposal kit from local council. Including a special bag for disposing of a small amount of asbestos as well as essential personal protective equipment - The sealed bag of asbestos waste could then be taken to a special site within the local area for free disposal.	1				5	
c. Free asbestos assessments of your home, so you could find out if your property has asbestos present.	1				5	

d. Free door-to-door asbestos collection service, where residents could book a collection and a licensed asbestos waste removalist would collect up to 10 square metres of wrapped asbestos sheeting from your home.	1				5	
e. Free renovators asbestos testing service, where an asbestos assessor would take a sample of the material and advise if it is asbestos before you renovate.	1				5	

6.2. SHOW ALL

And to what extent do you support or oppose these initiatives, ideas or changes in the interest of supporting safe and legal disposal of asbestos waste?

SINGLE RESPONSE FOR EACH ROW. RANDOMISE ORDER OF STATEMENTS. REVERSE ORDER OF 1-98 FOR HALF OF SAMPLE (RANDOMLY)

STATEMENTS	Strongly oppose	Some-what oppose	Neither support nor oppose	Some-what support	Strongly support	Don't know
a. Vouchers for discounted asbestos disposal at licensed tips/waste sites	1				5	
b. Trucks that transport asbestos waste being required to install a GPS tracker to help stop illegal dumping of asbestos.	1				5	
c. Increases in fines for those who deliberately illegally dump asbestos waste.	1				5	
d. Removing the waste levy from asbestos sheeting to make disposal of asbestos sheeting more affordable.	1				5	
e. Removing minimum charges for asbestos waste at tips/waste sites, so you only pay for the exact weight of the asbestos waste you are disposing of.	1				5	
f. Making it mandatory for anyone in the building and construction industry to complete asbestos waste awareness training.	1				5	
g. Requiring property owners to disclose if the property has asbestos when selling.	1				5	

6.3. IF 4 AT 2.2 AND/OR IF ANY ASBESTOS WASTE ACTIVITIES IN 3.1 (i.e. 3.1 = 2-6) SHOW

Thinking of your experiences with asbestos waste, which of these initiatives, ideas or changes do you believe would have the <u>most positive impact</u> on safe and legal disposal of asbestos waste?

RANDOMISE ORDER OF 1-12. ALLOW MULTIPLES, EXCEPT DON'T KNOW OR NONE.

1. Pop-up asbestos collection events
2. Asbestos safe disposal kits from local council
3. Asbestos home/property assessments

4. Vouchers for discounted asbestos disposal
5. GPS tracking of all trucks carrying asbestos waste
6. Door-to-door asbestos waste collection service
7. Increased fines for illegally dumping asbestos
8. Removal of the waste levy to make disposal of asbestos sheeting more affordable
9. No minimum charge to dispose of asbestos at tips/waste sites
10. Mandatory asbestos waste awareness training for building and construction workers
11. Property owners must disclose presence of asbestos when selling
12. Renovators asbestos testing service
97. Other (please specify)
98. Don't know
99. None

7. CLASSIFICATION

7.1. SHOW ALL PROFESSIONALS I.E. IF ANY 1-37 AT S6
And are you?

SINGLE RESPONSE

1. An employee
2. A contractor working for another business
3. A sole-trader
4. A business owner with employees
5. Other (please specify)

7.2. SHOW ALL PROFESSIONALS I.E IF ANY 1-37 at S6
How many years have you worked in your industry?

SINGLE RESPONSE

1. Less than one year
2. 1-4 years
3. 5-9 years
4. 10-19 years
5. 20+ years

7.3. SHOW ALL PROFESSIONALS I.E IF ANY 1-37 at S6
Which if any of these licenses do you currently hold?

MULTIPLE RESPONSE

1. Asbestos assessor licence
2. Class A asbestos removal licence (friable and non-friable)
3. Class B asbestos removal licence (non-friable)
4. None of these licences

7.4. SHOW if 1, 2, 4 or 5 at 7.1
How many employees does your business or workplace have?

SINGLE RESPONSE

1. Up to 5 employees
2. 6-10 employees

3. 11-19 employees
4. 20 employees or more

7.5. SHOW ALL

Do you ever work on friends' or family members' home renovations, maintenance or improvement projects in an unpaid capacity?

SINGLE RESPONSE ONLY

1. Yes
2. No

7.6. SHOW ALL

Thinking of the property you currently live in, do you own this property?

SINGLE RESPONSE ONLY

1. Yes, I own the property I live in (outright or with a mortgage)
2. No, I rent
3. No, I am currently purchasing under a rent-to-own arrangement
4. No, I live rent free or under a life-tenure arrangement
5. No, I live with family/another person in their property

7.7. SHOW ALL

Approximately how old is the property you live in?

Please think about the age of the primary dwelling you live in on your property and please use your best estimate if you are not sure.

SINGLE RESPONSE ONLY

1. Up to 30 years old (built after 1990)
2. 30-69 years old (built between 1940 and 1990)
3. 70-119 years old (built between 1900 and 1940)
4. 120 or more years old (built before 1900)
5. Don't know

7.8. SHOW ALL

Do you own an investment property that someone else rents (not commercial property)?

SINGLE RESPONSE

1. Yes, I own an investment property/ies
2. No

7.9. SHOW IF 1 IN 7.8

Which of the following types of investment properties do you own?

Please select all that apply.

MULTIPLE RESPONSE

1. Separate house
2. Semi-detached, terrace or townhouse
3. Villa, unit or apartment
4. Removable dwelling such as caravan park cabin
5. Other (please specify)

7.10. SHOW IF 1 IN 7.8

Approximately how old is/are your investment property/ies?

Please select all that apply for the separate properties you own as investments.
Please use your best estimate if you are not sure.

MULTIPLE RESPONSE

1. Up to 30 years old (built after 1990)
2. 30-69 years old (built between 1940 and 1990)
3. 70-119 years old (built between 1900 and 1940)
4. 120 or more years old (built before 1900)

7.11. SHOW ALL

What is the highest level of education you have completed?

SINGLE RESPONSE

1. Postgraduate degree
2. Graduate diploma / certificate
3. Bachelor degree
4. Advanced diploma / diploma
5. Technical certificate
6. High school
7. Primary school
8. Other

7.12. **What is your household's annual income from all sources before tax?**

SINGLE RESPONSE

1. Less than $20,000
2. $20,000 - $39,999
3. $40,000 - $59,999
4. $60,000 - $79,999
5. $80,000 - $99,999
6. $100,000 - $119,999
7. $120,000 - $149,999
8. $150,000 - $249,999
9. $250,000 or more
10. I'd prefer not to say

7.13. **Which of the following best describes your current living arrangements?**

SINGLE RESPONSE

1. I live alone
2. I live with my parents
3. I live with my partner only
4. I live with my partner with children/other family members in the household
5. I am single with children/other family members in the household
6. I live in a share house (i.e. with friends/housemates/siblings)
7. Other, please specify [OPEN TEXT BOX]

7.14. SHOW IF 7.13 ≠ 1

Is anyone in your household under the age of 18 years?

SINGLE RESPONSE

1. Yes, there is someone under the age of 18 years in my household
2. No

7.15. SHOW ALL

And do you speak a language other than English at home?

MULTIPLE RESPONSE, EXCEPT IF NO SELECTED

1. No, English only
2. Yes, Italian
3. Yes, Spanish
4. Yes, Chinese/Mandarin/Cantonese
5. Yes, Arabic
6. Yes, Portuguese
7. Yes, Greek
8. Yes, German
9. Yes, Vietnamese
10. Yes, Filipino
11. Yes, other, Please specify [OPEN TEXT BOX]

FINAL SCREEN:

That is the end of our questions. Thank you for participating in this important study, we really appreciate your time and contribution.

Should you wish to find out more about asbestos safety, you can contact:

- **The Asbestos Safety and Eradication Agency**: Hotline – 1300 326 148 / https://www.asbestossafety.gov.au/

If this research has brought up any personal concerns, the following sources of support are available:

- **Lifeline Australia**: Telephone Crisis Support – 13 11 14 (24 hours, 7 days a week) / https://www.lifeline.org.au/

- **Beyondblue**: Telephone Support – 1300 22 4636 (24 hours, 7 days a week) / https://www.beyondblue.org.au/

Appendix D – Key baseline survey frequencies

SELF REPORT AWARENESS AND KNOWLEDGE OF ASBESTOS

Q1.1 How would you describe your awareness and knowledge of asbestos? *(Asked of whole sample)*

	n	%
Never heard of it before now	126	4.7
Have heard of it but know very little about it	557	20.6
Know something about it	1502	55.6
Know a lot about it	481	17.8
Have expert knowledge of asbestos	36	1.3
Total	2702	100.0

WHETHER OR NOT THEY HAVE SEEN OR HEARD INFORMATION ON ASBESTOS SAFETY IN THE LAST 12 MONTHS

Q1.2 In the last 12 months, have you seen or heard any information, advertising or news about asbestos safety or asbestos waste disposal? *(Asked of whole sample)*

	n	%
Yes	937	34.7
No/ don't know	1765	65.3
Total	2702	100.0

SAFETY PRECAUTIONS TAKEN WHEN ASBESTOS WAS MOVED/REMOVED FROM RESIDENTIAL PROPERTY IN LAST 2YRS

Q2.5a How often did each of the following occur? The asbestos waste was...
(Asked of those indicating yes they have ever lived in or owned a property where there was asbestos that was removed or moved at Q2.1, and that this had happened in the last 5 years at Q2.2; filtered to only include those for whom it had happened in the last 2 years)

	a. handled with PPE			b. wrapped up securely with black/builders plastic			c. wet down			d. covered/sprayed with PVA and water mix			e. labelled as asbestos		
	n	%	As % of whole sample[6]	n	%	As % of whole sample	n	%	As % of whole sample	n	%	As % of whole sample	n	%	As % of whole sample
Always	79	65.3	2.9[7]	77	63.6	2.8	45	37.2	1.7	50	41.3	1.9	66	54.5	2.4
Sometimes	16	13.2	0.6	13	10.7	0.5	22	18.2	0.8	16	13.2	0.6	16	13.2	0.6
Never	5	4.1	0.2	6	5.0	0.2	13	10.7	0.6	11	9.1	0.5	4	3.3	0.1
Don't know	21	17.4	0.8	25	20.7	0.9	41	33.9	1.5	44	36.4	1.6	35	28.9	1.3
Total	121	100.0		121	100.0		121	100.0		121	100.0		121	100.0	

[6] New base of n=2,702

[7] An appropriate description would be that 3% of the population had asbestos waste on their property in the last 2 years always handled with PPE.

METHOD OF DISPOSAL OF ASBESTOS WASTE WHEN ASBESTOS WAS MOVED/REMOVED FROM A RESIDENTIAL PROPERTY IN THE LAST 2 YEARS

Q2.7 In the last 2/5 years, which of these have happened to asbestos that was removed or moved on a property you were living in or owned? Asbestos waste was… Please select all that apply.
(Asked of those indicating yes they have ever lived in or owned a property where there was asbestos that was removed or moved at Q2.1, and that this had happened in the last 5 years at Q2.2; filtered to only include those for whom it had happened in the last 2 years)

Q2.9 When asbestos waste was put in a kerbside collection wheelie bin, which type/s of bin was it put in? left on the property, was it…
Q2.10 When asbestos waste was put in a skip bin, which type/s of skip bin was it put in?
Q2.11 When asbestos waste was put out for a council pick up, which type/s of collection was it put out for?
(Follow up questions to clarify whether some disposal methods were legal or not legal)

	n	%	As % of whole sample
Left on the property*	14	11.6	0.5
Put in a kerbside collection wheelie bin*	6	5.0	0.2
Put in a skip bin specifically intended for asbestos waste	7	5.8	0.3
Put in a skip bin for general waste*	9	7.4	0.3
Put in a skip bin – don't know which type/s	15	12.4	0.6
Put out for an annual / scheduled council pick up*	6	5.0	0.2
Put out for a special asbestos council pick-up	14	11.6	0.5
Put out for a council pick up – don't know which type/s	2	1.7	0.1
Taken to a tip/waste site	57	47.1	2.1
Left in bushland or by a roadside*	10	8.3	0.4
Taken elsewhere	1	0.8	0.0
Don't know	37	30.6	1.4
Total participants reporting clearly unlawful disposal[8]	31	25.6	1.1
Total	121	n/a (multi response)	n/a (multi response)

[8] The relevant clearly unlawful disposal methods are marked with an asterix in the table. Please note, as some participants chose more than one unlawful disposal option, the total is less than the sum of the relevant disposal methods.

PERCEIVED CHALLENGES IN DISPOSING OF ASBESTOS WASTE

Q2.23 Overall, which of these, if any, do you see as challenges householders face in disposing of asbestos waste? Please select all that apply.
(Asked of those indicating yes they have ever lived in or owned a property where there was asbestos that was removed or moved at Q2.1, and/or that asbestos waste has ever been brought onto a property you owned or were living in at Q2.18)

	n	%	As % of whole sample
The cost of asbestos waste disposal	451	38.0	10.2
Difficulty accurately determining if waste contains asbestos	380	52.3	14.1
Finding the correct information on how to lawfully prepare and dispose of asbestos	323	44.4	12.0
Having to prepare asbestos for disposal (wrapping, taping etc)	303	41.7	11.2
Not having a disposal facility close by that accepts asbestos waste	276	38.0	10.2
Some waste sites charging more for asbestos waste than others	199	27.4	7.4
Having enough small pieces of asbestos to warrant a trip to a disposal facility	186	25.6	6.9
Having to pre-book an asbestos loan at the waste site before disposal	162	22.3	6.0
Other	12	1.7	0.4
Don't know	28	3.9	1.0
None of these	21	2.9	0.8
Total	727	n/a (multi response)	n/a (multi response)

ASBESTOS WASTE KNOWLEDGE

Q4.1 For each of the following, please indicate whether you believe the statement to be true or false. *(Asked of whole sample)*

	a. Only small amounts of asbestos waste can be legally removed from a property without an asbestos removal licence (True)		b. It costs a lot more to dispose of asbestos waste at a tip/waste site than other forms of waste (True)		c. You are allowed to put small amounts of asbestos in your kerbside collection wheelie bin, as long as they are carefully wrapped (False)		d. Once it gets to the tip/waste site, asbestos waste is treated like any other kind of waste (False)		e. Asbestos waste can be disposed of at any tip/waste site in NSW (False)		f. The owner is responsible for ensuring asbestos waste generated at their property is disposed of legally (True)	
	n	%	n	%	n	%	n	%	n	%	n	%
True	611	22.6	1832	67.8	207	7.7	191	7.1	195	7.2	2155	79.8
False	1131	41.9	176	6.5	1956	72.4	2004	74.2	1830	67.7	145	5.4
Don't know	960	35.5	694	25.7	539	19.9	507	18.8	677	25.1	402	14.9
Total	2702	100.0	2702	100.0	2702	100.0	2702	100.0	2702	100.0	2702	100.0

	g. Weathered or broken asbestos sheeting is considered friable asbestos (True)		h. Asbestos can be placed in any skip bin (False)		i. Any material can legally be used to wrap asbestos before disposal (False)		j. Other mixed waste can be legally wrapped with asbestos waste before disposal (False)		k. An online tracking system must be used when transporting larger amounts of asbestos waste (True)		l. Any person can legally remove and dispose of up to a trailer load of asbestos sheeting themselves (True)	
	n	%	n	%	n	%	n	%	n	%	n	%
True	1266	46.9	112	4.1	169	6.3	209	7.7	1309	48.4	166	6.1
False	190	7.0	2287	84.6	1900	70.3	1829	67.7	135	5.0	1954	72.3
Don't know	1246	46.1	303	11.2	633	23.4	664	24.6	1258	46.6	582	21.5
Total	2702	100.0	2702	100.0	2702	100.0	2702	100.0	2702	100.0	2702	100.0

ASBESTOS WASTE STATEMENTS - ATTITUDES AND BARRIERS TO DESIRED BEHAVIOURS

Q4.2 To what extent do you agree or disagree with each of the following statements? *(Asked of whole sample)*

	a. I know how to safely prepare asbestos waste for disposal		b. I would have no idea how to go about disposing of any asbestos that may be on my property		c. I am confident that I would know if asbestos removed from my property has been disposed of safely and legally		d. I am confident I know how to identify asbestos waste		e. There are no tips/waste sites near me where I could legally take asbestos for disposal		f. I would not be willing to pay for a specialist to remove small amounts of asbestos if found on my property	
	n	%	n	%	n	%	n	%	n	%	n	%
Strongly disagree	873	32.3	195	7.2	320	11.8	665	24.6	160	5.9	680	25.2
Somewhat disagree	700	25.9	494	18.3	542	20.1	741	27.4	317	11.7	763	28.2
Neither agree nor disagree	549	20.3	589	21.8	845	31.3	560	20.7	1541	57.0	598	22.1
Somewhat agree	423	15.7	845	31.3	706	26.1	571	21.1	461	17.1	427	15.8
Strongly agree	157	5.8	579	21.4	289	10.7	165	6.1	223	8.3	234	8.7
Total	2702	100.0	2702	100.0	2702	100.0	2702	100.0	2702	100.0	2702	100.0

	g. I imagine it would cost a lot of money to dispose of asbestos waste the way you are supposed to		h. It should cost the same amount to dispose of asbestos waste as any other kind of waste		i. I would be unlikely to go to the trouble of taking small amounts of asbestos waste to a tip/waste site		j. I would travel 30 minutes to dispose of a hand size piece of asbestos if it meant I could dispose of it lawfully.		k. I would pay $50 to dispose of a hand size piece of asbestos if it meant it was disposed of lawfully.		l. Most people have put small amounts of asbestos in a wheelie bin or a skip bin at some stage	
	n	%	n	%	n	%	n	%	n	%	n	%
Strongly disagree	38	1.4	358	13.2	591	21.9	144	5.3	206	7.6	184	6.8
Somewhat disagree	148	5.5	707	26.2	652	24.1	219	8.1	304	11.3	380	14.1
Neither agree nor disagree	543	20.1	730	27.0	765	28.3	636	23.5	805	29.8	1321	48.9
Somewhat agree	1193	44.2	609	22.5	439	16.2	895	33.1	794	29.4	653	24.2
Strongly agree	780	28.9	298	11.0	255	9.4	808	29.9	593	21.9	164	6.1
Total	2702	100.0	2702	100.0	2702	100.0	2702	100.0	2702	100.0	2702	100.0

	m. Illegal dumping of asbestos waste is a very significant problem for the health of the NSW community		n. I think people have a duty to everyone around them to ensure that any asbestos in their property is disposed of safely		o. If I saw illegally dumped waste that I thought might be asbestos, I would report it		p. Property owners should be held liable for asbestos waste that is illegally dumped after it is taken from their property, regardless of how it got there		q. The possibility of anyone being harmed by asbestos that is not properly disposed of is low		r. I've never really given much thought to what happens once asbestos is disposed of	
	n	%	n	%	n	%	n	%	n	%	n	%
Strongly disagree	57	2.1	69	2.6	66	2.4	261	9.7	738	27.3	159	5.9
Somewhat disagree	130	4.8	84	3.1	153	5.7	412	15.2	817	30.2	378	14.0
Neither agree nor disagree	604	22.4	320	11.8	461	17.1	641	23.7	658	24.4	754	27.9
Somewhat agree	872	32.3	789	29.2	831	30.8	684	25.3	315	11.7	988	36.6
Strongly agree	1039	38.5	1440	53.3	1191	44.1	704	26.1	174	6.4	423	15.7
Total	2702	100.0	2702	100.0	2702	100.0	2702	100.0	2702	100.0	2702	100.0

	s. I find the whole topic of asbestos too off-putting or scary to think about		t. I would never consider disposing of asbestos anywhere other than at a tip/waste site licensed to accept asbestos waste		u. There are significant consequences for anyone caught illegally disposing of asbestos waste		v. It's easy to get away with illegally disposing of asbestos waste		w. I'm very concerned about me and my family's health and safety when it comes to asbestos waste		x. I'm very concerned about the whole community's health and safety when it comes to asbestos waste	
	n	%	n	%	n	%	n	%	n	%	n	%
Strongly disagree	390	14.4	80	3.0	72	2.7	389	14.4	87	3.2	64	2.4
Somewhat disagree	687	25.4	120	4.4	129	4.8	558	20.7	238	8.8	182	6.7
Neither agree nor disagree	851	31.5	397	14.7	473	17.5	1046	38.7	677	25.1	618	22.9
Somewhat agree	576	21.3	682	25.2	842	31.2	539	19.9	802	29.7	924	34.2
Strongly agree	198	7.3	1423	52.7	1186	43.9	170	6.3	898	33.2	914	33.8
Total	2702	100.0	2702	100.0	2702	100.0	2702	100.0	2702	100.0	2702	100.0