



SafeWork NSW

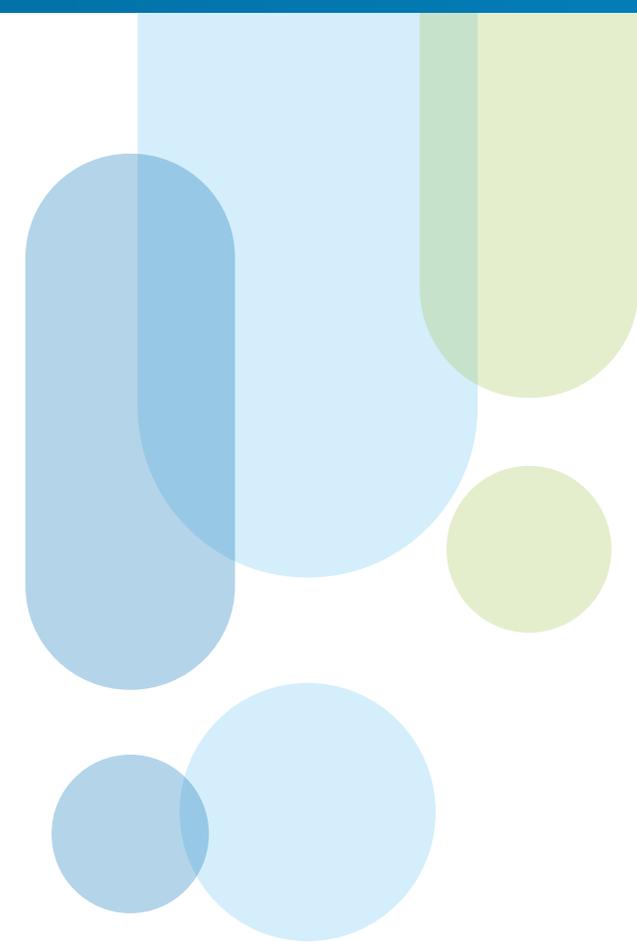


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# Reducing exposure to hazardous chemicals and materials project

## Midpoint Evaluation

February 2020



1

# MIDPOINT EVALUATION OVERVIEW

# Background and project aims

## Reducing exposure to hazardous chemicals and materials project – Midpoint evaluation



### The need to reduce exposure to Crystalline Silica and Formaldehyde

SafeWork NSW's Work Health and Safety Roadmap 2022 highlight within Action Area II a need to reduce injuries and illnesses in NSW workplaces as the result of exposure to hazardous chemicals and materials. Between 2012 and 2015, there were more than 6,500 injuries in NSW workplaces because of workers handling, storing or using hazardous chemicals unsafely, with eight people dying and more than 250 becoming permanently disabled. The SafeWork roadmap project identified, using evidence-based scoring criteria, the 'Top 10' priority chemicals from a pool of 40,000 registered chemicals in Australia. Consequently, it was determined the initial focus of this project to be on the 'Top 2' priority chemicals – **Crystalline Silica and Formaldehyde**.

1. **Crystalline Silica** - an increased number of workers in NSW are now being diagnosed with silicosis. On average, there have been nine claims of silicosis each year since 2011/12, in 2018/19 there were 40 adverse health monitoring reports\* from icare, with 21 in manufactured stone. There is the expectation that there will be an increased number of cases in the future from a previous lack of appropriate mitigation measures to prevent exposure and better awareness of health monitoring from project initiatives.
2. **Formaldehyde** – in 2006, the International Agency for Research on Cancer classified formaldehyde as carcinogenic (cancer causing substance) to humans.

\*adverse health monitoring reports are not confirmed cases or claims



### Project aims

Commencing in August 2016, the project aims to reduce the incidence rate of serious injury and illnesses through a 30% reduction in exposure to hazardous chemicals and materials by 2022. To achieve this, an exposure assessment was undertaken in June 2017 to serve as a measure to evaluate the reduction of serious injuries and illnesses relating to exposure to the top 2 priority hazardous chemicals – formaldehyde and crystalline silica; extensive research was conducted into International and Australian chemical risk registers and internal data from SafeWork NSW, SafeWork Australia and the State Insurance Regulatory Authority.

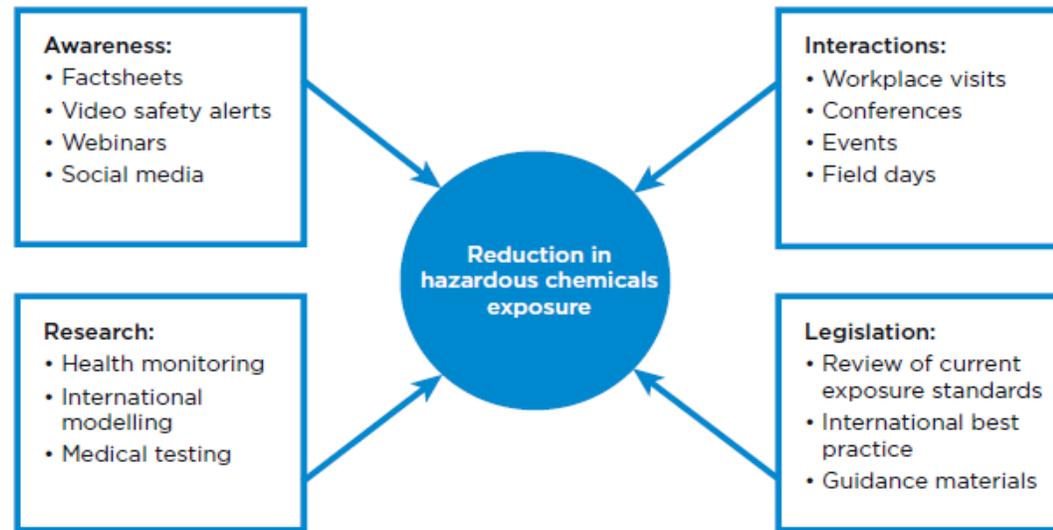
The key objectives of the project are to:

1. Deliver Action Area II of the WHS RoadMap 2022 by eliminating or significantly reducing workplace exposures to hazardous chemicals by 30% through the improvement in WHS outcomes and effecting sustainable change in business practices and workplace behaviours.
2. Research and adopt international best practice test methods for early detection of silicosis and other occupational respiratory diseases to prevent serious illness occurring (health monitoring requirements under Schedule 14 WHS Regulation).
3. Initiate legislative change requiring mandatory reporting of all occupational respiratory diseases and/or working above Australian Workplace Exposure Standards, in conjunction with relevant industry; regulatory; or worker taskforce
4. Influence changes to Australian Workplace Exposure Standards which adopt international best practice exposure limits for Crystalline Silica.
5. Disseminate and support international best practice controls to achieve reduction in workplace exposures.
6. Identify and reduce gaps to meet the needs of at-risk workers, particularly young people and culturally and linguistically diverse workplaces to improve key message reach.

# Key project components

## Reducing exposure to hazardous chemicals and materials project – Midpoint evaluation

### FOUR KEY PROJECT COMPONENTS



The mid-point evaluation will provide evidence-based recommendations to refine the current project plan with a focus on its **four key components**:

- 1. Awareness** – campaigns and events will be held to increase PCBU knowledge and capability, which will in-turn drive sustainable behavioural change in the longer-term. Rebates will also support the program and consideration will be given to the translation of materials where it would benefit identified culturally and linguistically diverse workplaces and communities.
- 2. Interaction program** - visits, presentations and events will be undertaken to achieve 9,000 interactions with PCBU's by 2022. The project's visit program will be three phased (Pilot, Awareness, Compliance) and will target specific workgroups across different subsectors. For example, laboratories and embalmers for Formaldehyde; and tunnelling, manufactured stone, construction and foundry work for Crystalline Silica.
- 3. Research** – the key outcome will be in the area of health monitoring for Crystalline Silica and the detection of silicosis and other occupational respiratory diseases. The NSW Centre for WHS are currently undertaking research into wearable detectors that could provide real-time alerts of the presence of silica dust. Expected completion 2020. The University of Newcastle are assessing the adequacy of the current Australian health monitoring (screening) tests with a report expected in 2020. The University of Western Sydney are assessing exposure level differences with dry and wet cutting.
- 4. Legislation** – in July 2018, the Manufactured Stone Industry Taskforce was established – convened by SafeWork NSW and comprised industry, peak bodies, medical professionals, unions and other government agencies including the Lung Foundation, Australian Industry Group and Unions NSW. The taskforce met monthly until its completion on 30 June 2019 with its regulatory considerations (in the areas of WHS, Health & Trade Skills) provided to the responsible Minister and subsequently submitted to SafeWork Australia.

# Current status – evaluating the key project components

## Reducing exposure to hazardous chemicals and materials project – Midpoint evaluation



### Current status

All four project components require a progress assessment to determine what components are meeting their target and which ones need more work for the 'Top 2' priority chemicals – Crystalline Silica and Formaldehyde. Prior to the commencement of this report, the status of the progress assessments is as follows:

- **Interaction:** a progress assessment is required within this Midpoint evaluation. A survey has measured the impact of site visits and Inspector capability and training for both Crystalline Silica and Formaldehyde.
- **Research:** a progress assessment is required within this Midpoint evaluation. External stakeholders highly involved in research on these top hazardous chemicals, particularly the Centre for WHS and Fire Rescue NSW whom have existing projects in conjunction with SafeWork NSW.
- **Awareness:** evaluation reports have been completed for the Crystalline Silica awareness projects (e.g. 2019 Silica Symposium, roadshow events and 2019 Silica awareness media campaign). Formaldehyde awareness needs to be measured as part of the Midpoint evaluation.
- **Legislation:** a report with recommendations has been completed for the taskforce activity, an activity that covers silica.



### Focus for this Midpoint Evaluation report

The focus of this Midpoint evaluation is to review the progress of the entire project (data until June 30, 2019) and to determine if the project is on track to reach its outcomes or if changes need to be made. It covers all the tactics (as per previous page) within the strategy. While progress assessments can be determined through the completion of other work (as detailed above), the Midpoint evaluation has also spoken to:

1. Those PCBUs who received a visit to determine, as a result of a SafeWork NSW visit to the four silica target industries and the target formaldehyde industries:
  - What behaviours and practices have changed in target industries to target controls?
  - What industries need more work in terms of compliance?
  - What industries need more work in terms of volume of SafeWork NSW visits?
2. SafeWork NSW Inspectors to determine capability and if they have the right capability and training for silica and formaldehyde.
3. External stakeholders who can provide insight to determine future direction for the research component.

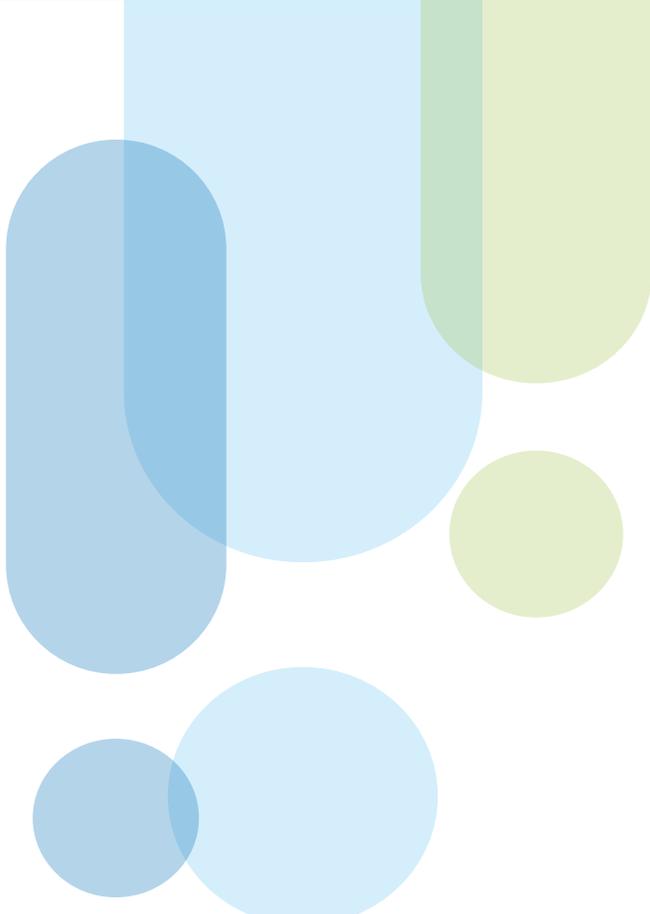


There are four key target industries for Crystalline Silica:

- a) Manufactured stone
- b) Construction
- c) Foundries
- d) Tunnelling

For formaldehyde, there are two main industries:

- a) Medical-related Laboratories – universities, hospitals and general
- b) Embalmers/funeral homes



2

# KEY FINDINGS

## Key Findings – Insights gained

What behaviours and practices have changed in target industries to target controls?



- Of the visits made to June 30, 2019 for the Silica target industries, 90% of PCBUs noticed at least 1 change in the approach of management, with Manufactured Stone PCBUs noticing more changes than Construction PCBUs (94% vs. 87%).
- Overall, the most mentioned changes were in general awareness, education (communication and training) and workplace discussions around exposure hazards, but 74% also reported new equipment or tools being purchased, 54% now have health checks and 49% have regular air monitoring.
- PCBUs in Manufactured Stone were significantly more likely to have noticed a change in health checks than in Construction (69% compared to 33%).
- For Formaldehyde, target industries have received far less visits as part of the interaction program. So the insights available can only provide an impression of the current position of Formaldehyde target industries for the mitigation measures currently taking place.
- Over the last 2 years, 71% of all Formaldehyde PCBUs noticed at least 1 change in the approach of management; 62% noticed efforts to communicate about the exposure hazards with workers and awareness of risks associated with exposure (57%).
- However, only about a quarter of all Formaldehyde PCBUs had seen a change in health checks being arranged within their workplace (24%).

## Key Findings – Insights gained

How frequently are mitigation measures being adhered to within target industries? And has any change occurred?



- For Silica PCBUs, PPE is now most frequently available to workers (95% stated every time), with 83% using PPE every time it was required. However measures such as health monitoring by a registered professional (49%) and receiving air monitoring results (54%) are not happening as frequently, with 3 in 10 Silica PCBUs never undertaking either of these measures.
- Manufactured Stone was significantly more likely to undertake mitigation measures more frequently, including wet methods (97% vs. 73% for Construction); ventilation controls (82% vs. 54%); workers being trained in use of PPE (95% vs. 79%), close fitting respirators being fit tested (81% vs. 52%) and health monitoring being conducted by a professional (63% vs. 33%).
- Those PCBUs who received visits have generally noticed positive changes in the use of mitigation measures. 83% of Silica PCBUs noticed at least one measure that had now increased in frequency in recent times. 2 in 3 believe more workers are using PPE than previously, 58% said worker training in PPE has increased while half stated that both PPE availability (53%) and wet methods to control dust (52%) have increased. Only 20% provided workers with access to air monitoring data results and less workers with facial hair wearing loose fitting respirators.
- Manufactured Stone PCBUs noticed a greater level of adherence with the use of wet methods to control dust and close-fitting respirators being fit tested.
- For Formaldehyde, 95% of PCBUs were confident workers were trained in the use of PPE, while also having it continuously available to them. However, 29% indicated that health monitoring conducted by a registered health professional never happened in the workplace. While half (57%) have noticed a change in the frequency of use of mitigation measures in the last two years, the degree of change seen in the Silica target industries was not experienced in the Formaldehyde PCBUs as most responses were that frequency of use has stayed the same.

## Key Findings – Insights gained

Do SafeWork NSW Inspectors have the right capability and training for silica and formaldehyde?



- Inspectors stated the tools provided to them by SafeWork NSW worked well to assist with informing how to work safely and how to meet legislative requirements, with SafeWork NSW's approach was going the right way to becoming more advisory and delivering appropriate practical guidance.
- But some indicated a need for better processes to identify site improvements, increased education to organisations on the impact exposure has on workers and an increased rebate to assist employers buy the right equipment (with Inspectors identifying the cost of change as a barrier for small businesses or Construction PCBUs having a problem with buy-in to the issue amongst its workforce).
- Refresher training session and project updates are likely required, particularly to inform about new data and statistics for the project's progression (Hard Copy report on the strategy so far and its impact), as well as leveraging the experience Inspectors have with site visits to collaborate with and re-evaluate the Roadmap and future planning.
- 12% of the silica PCBUs stated SafeWork NSW had provided enough support and another 10% said that they don't need help because they have good processes. Those who requested help stated more education, guidance (19%) and up to date information on any changes (15%).
- 29% of Formaldehyde PCBUs were satisfied with their internal processes and believed they didn't need help from SafeWork NSW. Those who required assistance asked to be kept up to date and informed on any changes, requirements or updates (14%); a code of practice (10%).
- SafeWork can look to leverage communications around stated barriers. 32% of Silica PCBUs identified barriers which limited action to reduce silica exposure (workers not caring about reducing the risks and that the job must get done no matter what the risks; and not knowing what the solution is). Comparatively, less Formaldehyde PCBUs (14%) stated there were barriers.

## Key Findings – Insights gained

Are PCBUs who were engaged with, aware of and understand their responsibilities and what needs to be in place to reduce the risk of exposure to hazardous chemicals?



- 57% of PCBUs at risk of Formaldehyde exposure could identify key health effects/routes of exposure to Formaldehyde (especially with surrounding exposure routes, and immediate health effects, from inhalation, ingestion or direct contact to the skin or eyes). However, knowledge was weaker regarding the source of exposure and the longer-term health effects (e.g. nasal cancer). Across the Formaldehyde target industries, there was strong buy-in to the importance of best practice control measures that could prevent exposure to Formaldehyde.
- 2 in 3 PCBUs at risk of Crystalline Silica exposure could identify key health effects/routes of exposure for Silica (little variation between Manufactured Stone and Construction). But while buy-in to addressing worker exposure to Silica exposure was almost universal in Manufactured Stone, Construction PCBUs were significantly less willing to redesign work practices.
- Across Silica PCBUs, there was strong buy-in to the importance of best practice control measures that could prevent Silica exposure (education and training for workers and management feature, suppressing dust with water and using a M or H class vacuum or wet clean-up methods, the focus on wet control measures was driven by the Manufactured Stone PCBUs.
- 91% of Silica PCBUs state they understood what their workplace exposure standard was while 90% agreed they were familiar with the Code of Practice for Managing Hazardous Chemicals. Manufactured Stone PCBUs claimed higher levels of understanding and familiarity. While within Formaldehyde PCBUs, only 68% understood their workplaces' exposure standard and were also familiar with their Codes of Practice for Managing Hazardous Chemicals.
- The 2019 Silica Symposium and statewide roadshows were found to be a strong success (95% said the symposium was valuable and the roadshows rated 4.4/5), raising awareness and knowledge among the target industries. The two-phase awareness campaign was a success with improving reach, strong reception to the targeted message and a reasonable call to action response.

## Key Findings – Interaction/site visit component



Progress assessment for the interaction/site visit component



This evaluation finds high value from those site visits that have been completed, leading to positive improvement outcomes as part of the strategy; but there is room for improvement in use of the full range of available mitigation measures, and widening the reach of visits will likely encourage further improved behaviour.

As of June 30, 2019, SafeWork NSW had achieved broad reach within Manufactured Stone, which was the primary focus of the program up to that point. Construction industry had also received a considerable focus. The volume of visits to formaldehyde businesses were less than silica, reflecting the focus of the program and the smaller cohort of businesses where formaldehyde is a harm.

Those who had a visit/interaction reported positive changes in the approach of management and a higher frequency in use of mitigation measures. The most prevalent changes have occurred through increased discussion and training, as well as PPE changes. As a result, more work needs to be done to drive change beyond these lower order preventative measures to ensure improvement in the full suite of required mitigation measures (e.g. engineering controls, air monitoring and health checks).

There is clear value in the impact of Inspector interactions with PCBUs, enabling SafeWork NSW to leverage the positive reception of the interaction across the program. PCBUs report a high belief in the value of the visit from Inspectors and that it left them more confident, but there is some room to improve leave-behinds, targeted solutions and direction that overcome the stated barriers of PCBUs. This knowledge could help empower Inspectors through knowing the positive impact of their work

The value of on-site visits can also be seen when comparing change outcomes between Silica and Formaldehyde PCBUs, where on-site visits are significantly higher. This may be reflective of the proportion of notices to visits, where manufactured stone accounted for 60% of visits and 88% of notices. It is important to understand this difference to further improve outcomes when visits ramp up for other target industries and to ensure a more nuanced approach is taken to educate PCBUs.

# Conclusions on progress of the components



## Progress assessment for the awareness component



- These outputs within the awareness component for the project have successfully increased PCBU knowledge and capability, which in-turn is starting to drive sustainable behavioural change in the longer-term. But as the interaction progress assessment shows, more work needs to be done to ensure an understanding of the full range of required mitigation measures is known and understood.
- PCBUs who were engaged with, are seemingly more aware of and understand their responsibilities and what needs to be in place to reduce the risk of exposure to hazardous chemicals.
  - Knowledge and awareness with the impact of high-risk Silica and Formaldehyde exposure is improving through a targeted approach that directed and reached the high-risk industries, with early indications suggesting positive changes in behaviour – though less PCBUs are directing this behaviour towards higher end control measures (e.g. engineering controls) than education, for instance.
  - PCBUs who have been engaged with SafeWork NSW are now more aware of the risks associated with both the top 2 priority chemicals, with a vast majority understanding their responsibilities (the Australian Workplace Exposure Standards exist, with increased knowledge of best practice controls measures (although clearer guidelines and practice is desired).
  - Currently, a reasonable majority of businesses at risk of Formaldehyde exposure can identify key health effects/routes of exposure for Formaldehyde, with the resulting buy-in to addressing and willingness to redesign work strong (caution: based on small sample).
  - Similarly, PCBUs who received a site visit for Silica shows strong awareness and knowledge for key health effects/routes of exposure for Silica, with strong buy-in as well. Manufactured Stone PCBUs have stronger knowledge base than Construction PCBUs.
- While strong progress has been made in raising awareness, further awareness outputs should be directed to educating to the requirement among PCBUs that higher end controls must be implemented.

# Conclusions on progress of the components



Progress assessment for the research component



Since June 2019, the following research projects have commenced planning and execution:

- Following a tender process, the Centre for Work Health and Safety has engaged Trolex Nome Australia to develop a respirable crystalline silica sensor which can provide real-time feedback to workers at risk of exposure. The project is expected to be completed in 2020.
- Newcastle University is currently partnering with SafeWork NSW on research to assess the adequacy of current Australian health monitoring testing.
- Safe Work Australia is conducting further research on the prevalence of occupational lung diseases through the Monash Centre for Occupational and Environmental Health as well as a systematic literature review on effective dust mitigation strategies and advances in technologies to control airborne dust at workplaces.
- University of Western Sydney has completed its research with a major manufactured stone fabricator to evaluate the worker exposure and efficacy of wet and dry cutting processes. Findings presented at the December 2019 AIOH Conference in Perth. TestSafe NSW (SafeWork NSW) provided testing services on the samples.
- The University of Wollongong Centre for Occupational, Public and Environmental Research in Safety & Health (COPERSH) is offering two PhD scholarships:
  - A near real-time sensing solution for Respirable Crystalline Silica in underground crushers.
  - Innovative control solutions for Respirable Crystalline Silica to protect workers against exposure to silica.

# Conclusions on progress of the components



## Progress assessment for the legislative component and Taskforce

Since the completion of the NSW Manufactured Stone Taskforce in June 2019, several the recommendations are now in the process of being implemented:

- SafeWork Australia members, including NSW have agreed to a reduction in the workplace exposure standard to a time-weighted average of  $0.05 \text{ mg/m}^3$ . The Minister is currently considering a commencement date for NSW in 2020.
- on-the-spot fines for dry cutting in manufactured stone was announced in October 2019, to support prohibition notices. This is anticipated to be considered by the NSW Government in early-mid 2020.
- A National Occupational Lung Disease Strategy has been agreed by Safe Work Australia Members. This included development of national guidance, released in September 2019, and an awareness campaign
- In January 2020 the National Dust Diseases Taskforce released its interim advice report which included five national actions including:
  - Develop and implement a prevention strategy with an initial immediate targeted education and communications campaign
  - Develop a National Dust Diseases Registry initially focussed on accelerated silicosis related to engineered stone (NSW approach currently being considered by SafeWork NSW and NSW Health)
  - Strategic investment in research including pathogenesis of engineered stone-associated silicosis, biomarkers associated with disease severity, best practice to minimise exposure and the efficacy of current silicosis diagnostic methods
  - National guidance on an approach to actively search for workers at risk from silica dust exposure
  - Strategic national approach to improve Australia's ability to detect and rapidly respond to any future emerging occupational diseases of significance
- The Trade Education findings relate to mandating silica syllabus in all trade courses and creating a standalone course for those not seeking a formal qualification or require a refresher training. Brick and Block and Stonemasonry qualifications now contain silica awareness and will be finalised shortly with other qualifications under review.
- SafeWork is in discussions with NSW Health on whether a NSW silicosis register can be achieved through existing notification mechanisms in the NSW Public Health Act 2010. These discussions are at the advanced stage.



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