



ITA TUNNELLING
AWARDS 2019



Air Quality Working Group

An industry-first collaboration on silica dust control

Australian Tunnelling Society (ATS), Australia

Presented by : Kate Cole



Miami, USA 18th November 2019



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“One of the hardest things to hear is the doctor tell you that you have an incurable lung disease”

Brendan Gilheany, Superintendent
30 years in tunnelling

Miami, USA 18th November 2019

Author Kate Cole



Consulted Stakeholders

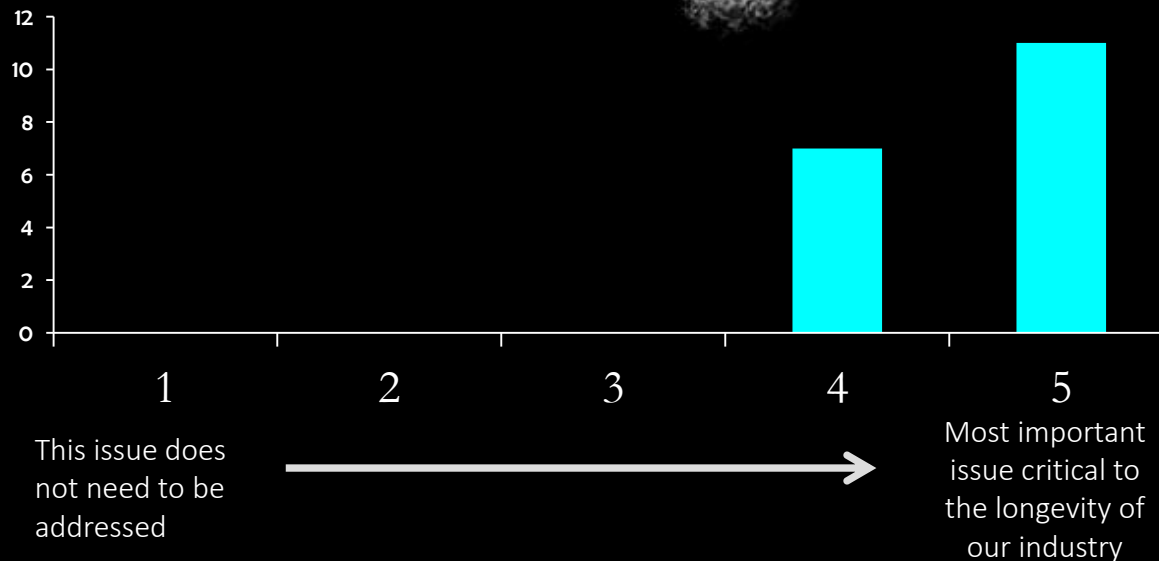
- SafeWork NSW
- Comcare
- Transport for NSW
- Sydney Motorway Corporation
- Roads & Maritime Services
- Transurban
- Sydney Metro – John Holland CPB Contractors Ghella
- Sydney Metro – Laing O'Rourke
- WestConnex M4 East – CPB Contractors, Samsung, John Holland
- WestConnex New M5 – CPB Contractors, Dragados, Samsung
- NorthConnex – Bouygues, Lendlease



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SILICA IN TUNNELLING WORKSHOP

HOW IMPORTANT
IS IT THAT WE
ADDRESS THE
ISSUE OF
SILICOSIS IN
TUNNELLING?





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"It's Our Moral Duty"

*"A healthy workforce is
critical for any business"*

*"Every worker has
the right to work in a
safe environment"*

*"Worker health needs of
utmost importance"*

WHY IS IT
IMPORTANT
THAT WE
ADDRESS THE
ISSUE OF
SILICOSIS IN
TUNNELLING?

*"Important for the long term
health of our industry"*

"Because Silica kills workers"

*"It's as important as any other
safety risk we deal with that
threatens human life"*

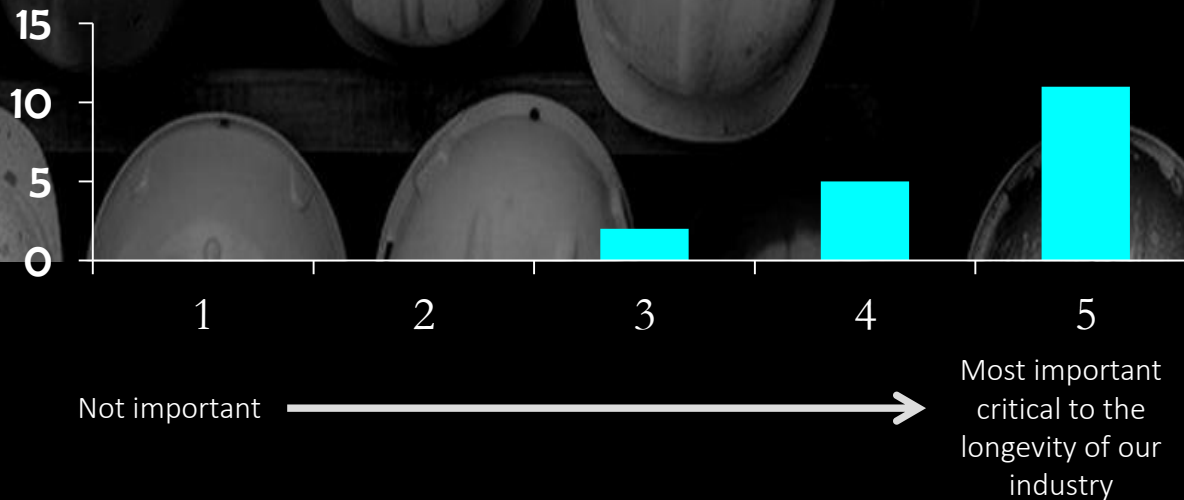
*"It is not perceived by our
workforce to be a major issue.
It's a Silent Killer"*



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SILICA IN TUNNELLING WORKSHOP

How important is it that we
work with in collaboration
with the Regulator to
address the issue of silica
dust control?





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"Critical for the Regulator to understand the challenges and develop industry best practice and compliance material"

"Because it is an industry-wide problem that needs assistance to achieve its goals"

"So that the eventual standards are well informed and achievable"

"We need a balance of regulation and self-management and INDUSTRY holds the bulk of the knowledge and experience"

"This is too important an issue not too"

"Consult and achieve best practice"

"We have been looking after this for 30 years. Good to see drive to work together finally"

"As individuals we cannot solve this issue it needs to be a collective effort"

"Consultation leading to the practicality of compliance means less chance of failure"

"A Regulatory influence is needed to embed occupational health and hygiene in the design and concept phase"



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SILICA IN TUNNELLING WORKSHOP

Things that are working well

1

culture

A genuine desire to care for our workforce
Putting health and safety first
Good consultation with the workforce
Acceptance to continually improve
Taking a proactive approach

4

technology

Good use of technology e.g. cameras on plant,
enclosed cabins, walking scrubbers, atomisers
Use of technology to capture data
New technologies are more affordable,
smaller, and lighter in weight
Improved engineering in ventilation

2

experience

Vast experience that can be tapped into
Embedding occupational hygienists into
project teams
Skills and experience in developing
first class ventilation solutions

5

awareness

Workforce awareness is improving
Procurement is trying to buy better equipment
Good project inductions
Good "pockets" of best practice
Good practices occurring on some sites

3

information sharing

Lessons learned within Contractor's
organisation and Tunnel managers forums
Collaborative discussion of controls with
workforce
International best practices are being openly
shared more than ever

6

monitoring

Identifying the problem
Agreement on our approach of measurement
Identification of Similar Exposed Groups
Gathering "real and accurate" data

Challenges

1

leadership

Silica control is not considered a priority by
project leaders
We get good data but sometimes don't act
on it
Need to work together to solve these issues
It's important that reporting is encouraged &
supported

2

broad awareness

Silica hasn't been elevated to the same level of
importance as other safety risks
You can't see it, you don't know when it's not
working
Awareness through the supply chain is low
Complicated terminology leads to confusion

3

data availability

No reliable silicosis statistics
No centralised reporting of illness or exposure
How do we benchmark ourselves?
Are we comparing "apples" with "apples"?

4

reliance on PPE

Poor implementation of high-grade PPE
Compliance relies on every person doing
the right thing
Onus is placed on workforce to be clean-shaven
and wear PPE 100% of the time

5

technology

Tunnel plant suppliers must get on board
Controls shouldn't be an after thought
Need greater reliance on Engineering Controls
Inconsistent ventilation practices
Greater control is needed at design stage
Interlocks can be overridden

6

contracts

More time is required at Concept design
Clients need to understand the impact of
condensing programs
Construction methodology mandated by Clients
impacts the outcome



Silica Dust Awareness Package



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GOLDEN RULES

1. Minimise dust generation
2. Good ventilation
3. Clean cabins
4. Use water
5. Use respiratory protection
6. Routine measurement
7. Health Monitoring



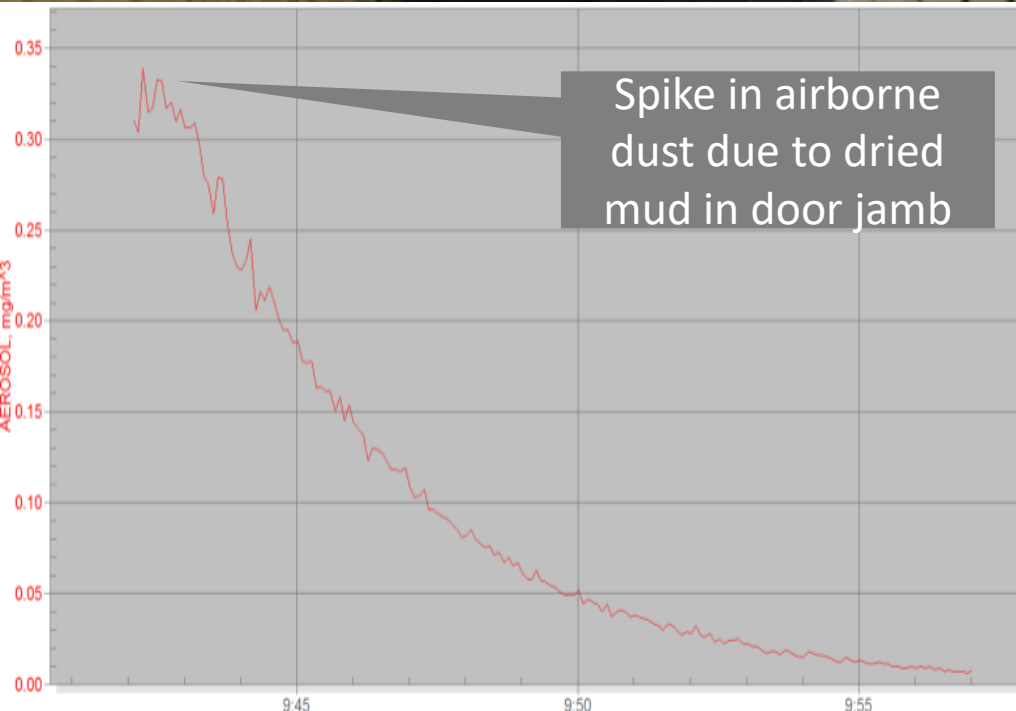
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Dried Mud

Dried mud in
door jamb

Spike in airborne
dust due to dried
mud in door jamb



- Dried mud forms fine dust particles
- Dust is easily disturbed and gets into the air
- Simply closing the cabin door can cause high levels of airborne dust in the cabin
- Vibration in the cabin will also cause dust to become airborne
- You can be exposed to high levels of silica dust just from opening and shutting the door

Clean Shaven

Silica dust

*Facial
hair*

- Silica dust is much smaller than facial hair
- If you use a respirator that relies on correct facial fit to be effective (such as a dust mask), then you must be clean shaven to prevent facial hair interfering with that fit



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Water is wonderful



- Silica dust has a small particle size so any water used to capture the dust also needs to be small in size
- Garden hoses or high-pressure hoses won't drop out silica dust from the air
- Fine "mists" or "misting systems" are used for this purpose



AIR QUALITY WORKING GROUP



DESIGN AND PROCUREMENT INDUSTRY CONSIDERATIONS

*Air Quality Working Group
Information Package - Part 5 of 12*

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Key Focus Area 1: Select construction methodologies and processes

Key Focus Area 2: Encourage and enable innovative practices

Key Focus Area 3: Select minimum engineering techniques

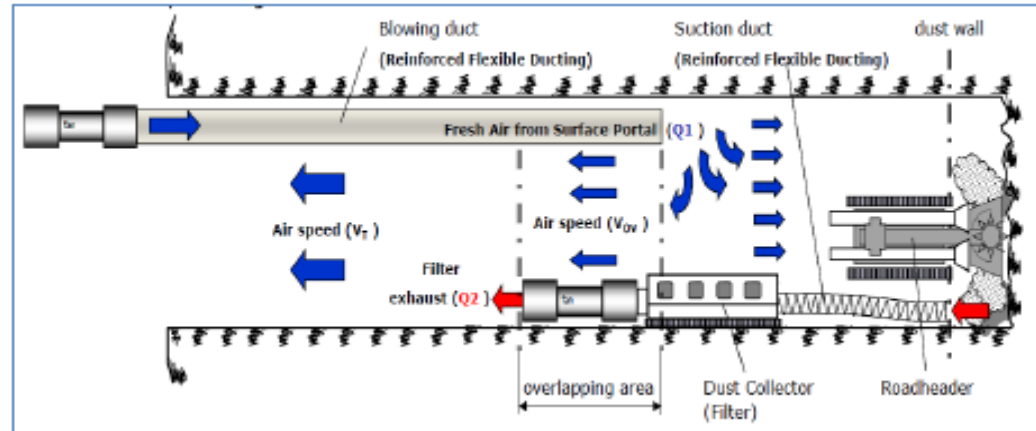
Key Focus Area 4: Select minimum risk management processes

Key Focus Area 5: Select minimum tender scope

SCRUBBER SYSTEM CASE STUDY

*Air Quality Working Group
Information Package - Part 6 of 12*

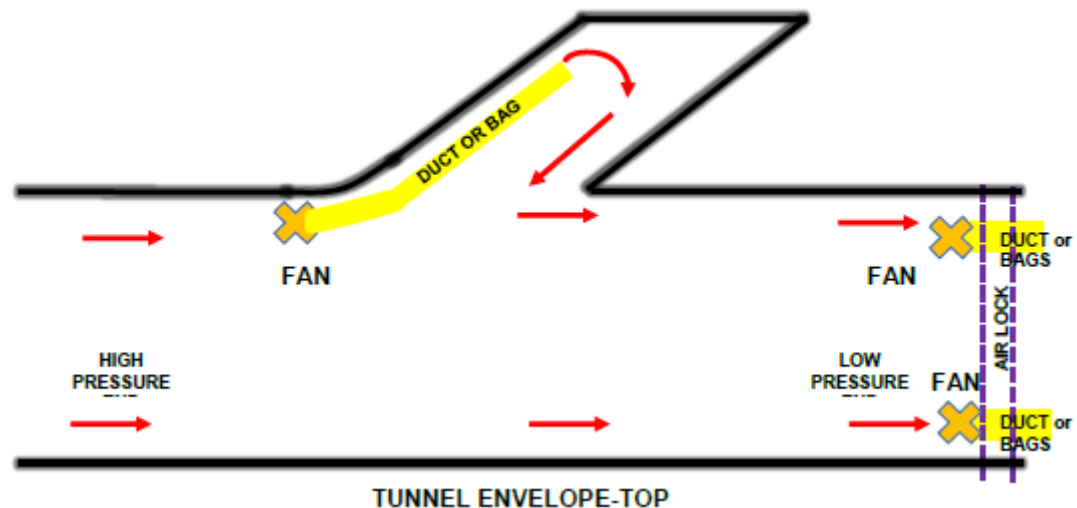
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VENTILATION DURING TUNNEL CONSTRUCTION INDUSTRY CONSIDERATIONS

*Air Quality Working Group
Information Package - Part 7 of 12*

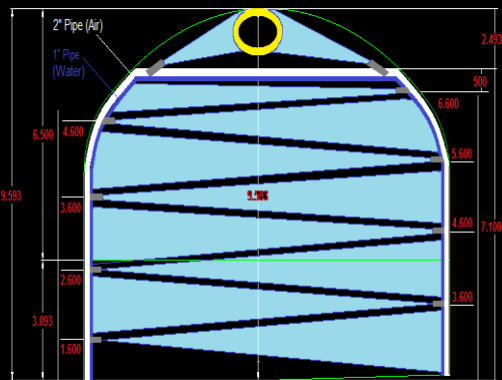
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**Air Quality Working Group
Information Package - Part 8 of 12**

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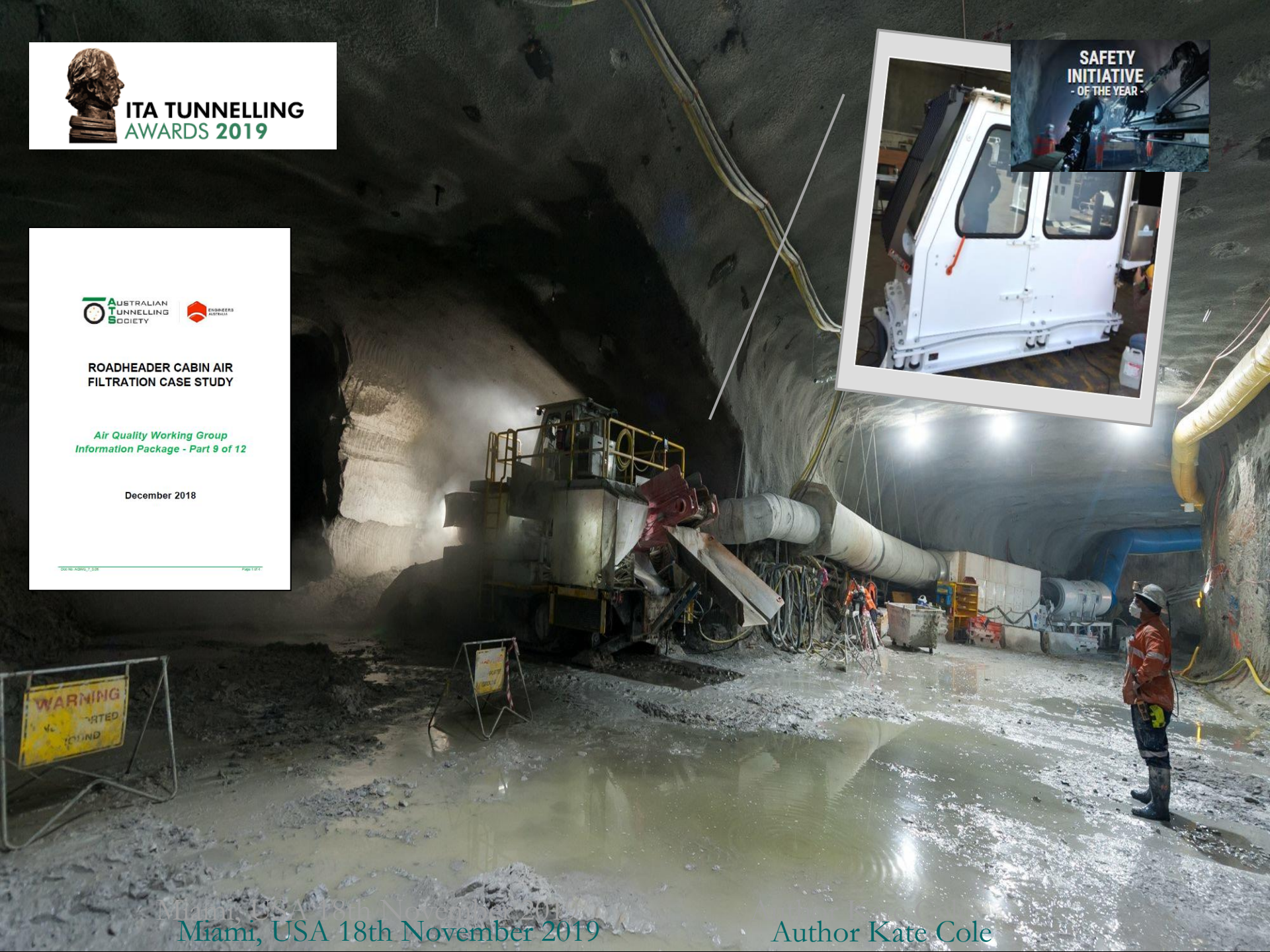


ROADHEADER CABIN AIR FILTRATION CASE STUDY

*Air Quality Working Group
Information Package - Part 9 of 12*

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AIR QUALITY WORKING GROUP



RESPIRATORY PROTECTIVE EQUIPMENT INDUSTRY CONSIDERATIONS

*Air Quality Working Group
Information Package - Part 10 of 12*

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HEALTH MONITORING FOR NEW SOUTH WALES TUNNEL CONSTRUCTION WORKERS INDUSTRY CONSIDERATIONS

*Air Quality Working Group
Information Package - Part 12 of 12*

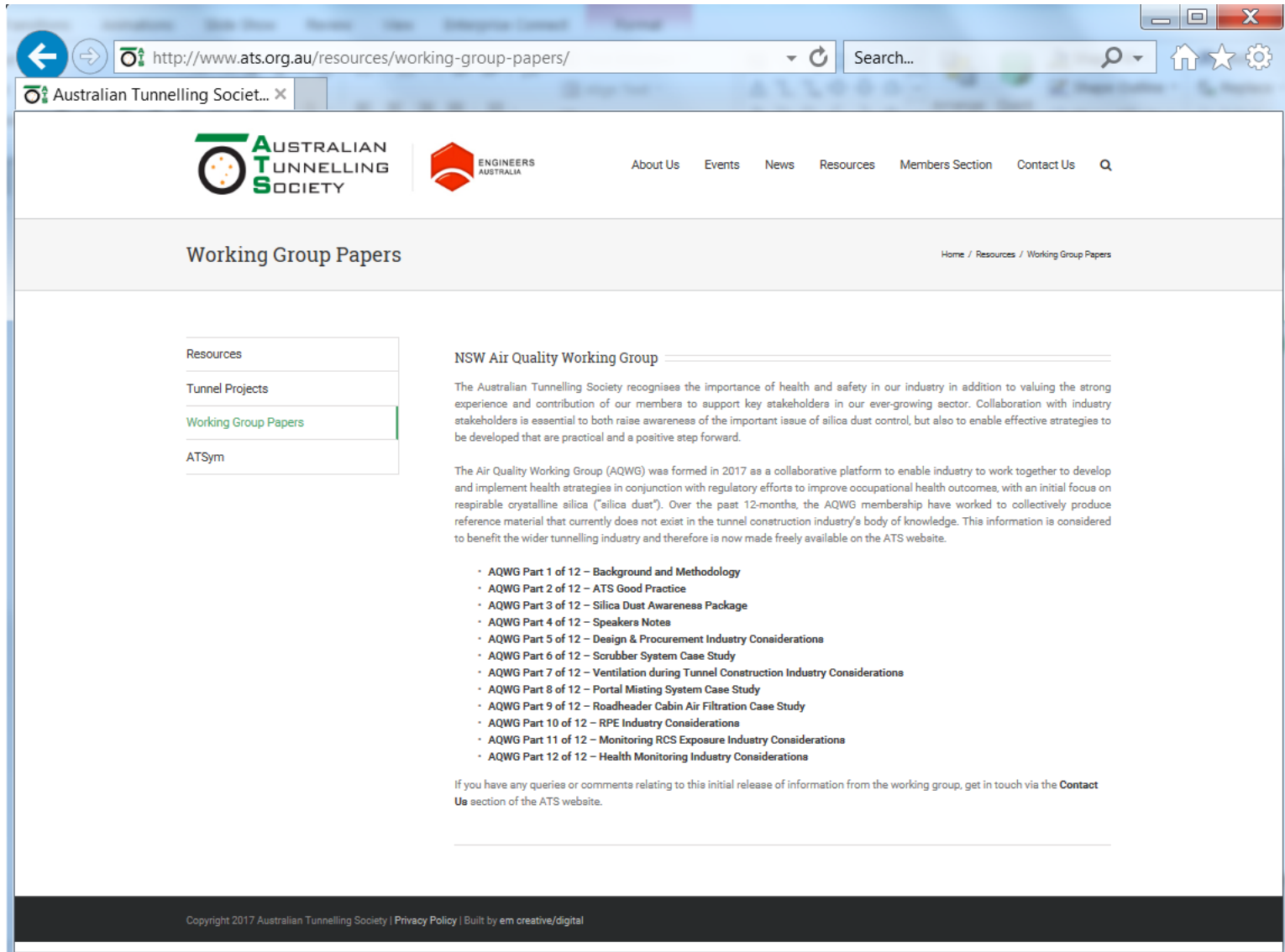
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MONITORING RESPIRABLE CRYSTALLINE SILICA EXPOSURE INDUSTRY CONSIDERATIONS

*Air Quality Working Group
Information Package - Part 11 of 12*

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NSW Air Quality Working Group

The Australian Tunnelling Society recognises the importance of health and safety in our industry in addition to valuing the strong experience and contribution of our members to support key stakeholders in our ever-growing sector. Collaboration with industry stakeholders is essential to both raise awareness of the important issue of silica dust control, but also to enable effective strategies to be developed that are practical and a positive step forward.

The Air Quality Working Group (AQWG) was formed in 2017 as a collaborative platform to enable industry to work together to develop and implement health strategies in conjunction with regulatory efforts to improve occupational health outcomes, with an initial focus on respirable crystalline silica ("silica dust"). Over the past 12-months, the AQWG membership have worked to collectively produce reference material that currently does not exist in the tunnel construction industry's body of knowledge. This information is considered to benefit the wider tunnelling industry and therefore is now made freely available on the ATS website.

- AQWG Part 1 of 12 – Background and Methodology
- AQWG Part 2 of 12 – ATS Good Practice
- AQWG Part 3 of 12 – Silica Dust Awareness Package
- AQWG Part 4 of 12 – Speakers Notes
- AQWG Part 5 of 12 – Design & Procurement Industry Considerations
- AQWG Part 6 of 12 – Scrubber System Case Study
- AQWG Part 7 of 12 – Ventilation during Tunnel Construction Industry Considerations
- AQWG Part 8 of 12 – Portal Misting System Case Study
- AQWG Part 9 of 12 – Roadheader Cabin Air Filtration Case Study
- AQWG Part 10 of 12 – RPE Industry Considerations
- AQWG Part 11 of 12 – Monitoring RCS Exposure Industry Considerations
- AQWG Part 12 of 12 – Health Monitoring Industry Considerations

If you have any queries or comments relating to this initial release of information from the working group, get in touch via the **Contact Us** section of the ATS website.

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***“I’ve worked in
tunnel construction
for 25 years. In
hindsight, I wish we
had the focus on
reducing exposure
that we do today”***

Marty Bell, Plant Manager

