Characterization of Particulates in Australian Mines

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22 October 2020
Australian Mining
Australian Coalmines
Australian Health Surveillance & Exposure Monitoring

- Compulsory health surveillance scheme
- NSW order 43 now 3 years for UG coal, 6 years for other workers
- All workers monitored every 5 years in QLD
- Robust Workers Compensation scheme
- Medicare system
- Sampling the person, not the Designated Occupation
Difference in States

Queensland
• 2015 exposure limit was 3.0mg/m³ with shift adjustment
• Sampling performed by hygiene consults
• Variety of sampling equipment used
• Portal to portal sampling

New South Wales
• 2015 WES was 2.5mg/m³ without shift adjustment
• Sampling performed by statutory body
• Sampling performed with Casella cyclones and Apex 2 pumps
• Crib room to crib room sampling (dinner hole)
Queensland Mine Dust Lung Disease Cases

Figure 4 – Cases of MDLD reported to the department for all mining since 1984 by financial year (current as at 31 August 2020)

US production samples compared to Australian CM samples

US data From Saver et al 2019 Data in Brief 25-
Sample analysis performed at Virginia Tech
Further Sampling of Australian Mines

MLA Analysis Samples

- Carbon
- Quartz
- Kaolinite
- Muscovite
- Amphibole
- Chlorite
- Plagioclase
- Orthoclase
- CaSlicate
- StainlessSteel?
- Calcite
Particle Size and Volume

- **Count of particles by size**
  - CM1
  - CM2
  - CM3
  - CM4

- **Spherical volume of particles by size**
  - CM1
  - CM2
  - CM3
  - CM4

Legend:
- <2µm
- 2-4µm
- 4-10µm
- >=10µm
Large Particles

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<th>2001</th>
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</tr>
</tbody>
</table>

[Image of particle size distribution with measurements 23.36 μm and 33.82 μm]
Particle size distribution by chemical composition

Mine 3

Mine 2

Carbon
Aluminosilicate
Silica
DPM on filter
Thank you!

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