Department of Industry
Resources Regulator

Mine Safety

SAFETY ALERT

Non-compliant stone dust supplied to underground coal mine

INCIDENT

A routine targeted assessment of the explosion suppression systems was conducted by the Resources Regulator at a Hunter Valley underground coal operation on

9 November 2016.

Inspectors obtained samples of stone dust to verify compliance with the legislated requirement. A sample of stone dust was obtained from a bagged explosion suppression barrier and was found not to be white in colour.

Further testing by the department confirmed that the stone dust failed to meet correct colour, moisture content and composition specifications.

Figure 1: Bat Bag barrier and samples of stone dust obtained for testing.

CIRCUMSTANCES

The non-compliant stone dust was identified in an Alfabs Bat Bag barrier system as supplied by Alfabs Mining Group Pty Ltd. Based on further investigation and subsequent reporting by mine operators, non-compliant stone dust has been identified in both the Hunter and Southern coal fields. The Bat Bag barrier system has been supplied to underground coal operations from Alfab Mining Groups Hunter and Wollongong distribution points.

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INVESTIGATION

The circumstances relating to the non-compliance is being investigated by the department.

Testing identified non-compliance with the following:

- colour – the stone dust was not white in colour as per the legislative requirements
- composition – the testing identified that the composition of the stone dust did not comply with legislative requirements.

Free silica results were within prescribed limits. The test results are attached in Appendix 1.

The supplier Alfabs Mining Group Pty Ltd has identified the non-compliant stone dust batch and is taking action to isolate the stone dust from the supply chain.

LEGISLATION

Under the *Work Health and Safety (Mines and Petroleum Sites) Regulation 2014* clause 65 (1) (e) mine operators are to ensure that any stone dust used:

(i) is of a type or grade that is suitable for its proposed use, and
(ii) is white in colour, and
(iii) does not contain more than 3% by mass of free silica, and
(iv) has a composition such that at least 95% by mass of the stone dust is finer than 250 micrometres and of that stone dust that is finer than 250 micrometres, at least 60% by mass (and not more than 80% by mass) is finer than 75 micrometres.

RECOMMENDATIONS

Stone dust is a critical control in the mitigation of coal dust explosion in underground coal mines. The use of non-compliant stone dust exposes mine workers to an unacceptable risk in the event of a coal dust explosion.

Mine operators have an obligation under clause 9 *Work Health and Safety (Mines and Petroleum Sites) Regulation 2014* to manage risks to health and safety and ensure stone dust used at mines complies with the legislative requirements.

Mine operators have in place a quality assurance program for receipt of goods and materials that ensures only fit-for-purpose goods and materials are used on site. The quality assurance program should include the following for the receipt of stone dust:

- a process to confirm the validity of the received stone dust by ensuring appropriate certification is provided with each stone dust batch. Certification must be in the form of a test certificate from a creditable provider such as a NATA-accredited testing laboratory for construction materials
- keeping a copy/record of the stone dust batch test reports for audit and quality assurance and for tracking each batch of stone dust used at the mine site
- completing independent compliance sampling of stone dust as part of a quality assurance program.

Although this incident at this point of time appears to be isolated to the Alfabs Bat Bag barrier system, mine operators should apply a quality assurance process to all suppliers of stone dust to the mine site.

Furthermore, mine operators that have received deliveries of the stone dust referred to above, should have been notified and given advice by Alfabs on the appropriate actions to be taken that rectify the matter and minimise risk to the health and safety of workers and the safety of the mine.

NOTE: Please ensure all relevant people in your organisation receive a copy of this Safety Alert, and are informed of its content and recommendations. This Safety Alert should be processed in a systematic manner through the mine's information and communication process. It should also be placed on the mine's notice board.

Issued by

Dave McLean
Chief Inspector of Mines
Appointed pursuant to Work Health & Safety (Mines and Petroleum Sites) Act 2013

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Appendix 1

Roadway dust:

17 November 2016

MSTC REPORT No. T16-00584/0001

ROADWAY DUST PARTICLE SIZE DETERMINATION

Sample Description: Roadway dust sample from Alfabs bag barrier. [redacted] Bag No. 1. Received 15/11/2016.

Size Analysis of Stone Dust

Sieve Size	% Passing	Requirements	Compliance
250µm	98.74	>95%	Complies
75µm	55.75	>60% and <80%	**Does not comply**

Notes: Results are percentages by mass.

Requirements: The Work Health and Safety (Mines) Regulation 2014 states that the mine operator of an underground coal mine must ensure: that any stone dust used is:
- white in colour, and
- has a composition such that at least 95% by mass of the stone dust is finer than 250 micrometres and of that stone dust that is finer than 250 micrometres, at least 60% by mass (and not more than 80% by mass) is finer than 75 micrometres.

Method of Analysis: NSW Code of Practice: Roadway Dust Analysis in Underground Coal Mines, February 2015, Section 3 Size Analysis of Stone Dust.

Compliance status: The sample submitted for analysis **did not comply** with relevant sections of the WHS (Mines) Regulation 2014.

17 November 2016

MSTC REPORT No. T16-00584/0002

ROADWAY DUST PARTICLE SIZE DETERMINATION

Sample Description: Roadway dust sample from Alfabs bag barrier. [redacted] Bag No. 2. Received 15/11/2016.

Size Analysis of Stone Dust

Sieve Size	% Passing	Requirements	Compliance
250µm	98.79	>95%	Complies
75µm	56.03	>60% and <80%	**Does not comply**

Notes: Results are percentages by mass.

Requirements: The Work Health and Safety (Mines) Regulation 2014 states that the mine operator of an underground coal mine must ensure: that any stone dust used is:
- white in colour, and
- has a composition such that at least 95% by mass of the stone dust is finer than 250 micrometres and of that stone dust that is finer than 250 micrometres, at least 60% by mass (and not more than 80% by mass) is finer than 75 micrometres.

Method of Analysis: NSW Code of Practice: Roadway Dust Analysis in Underground Coal Mines, February 2015, Section 3 Size Analysis of Stone Dust.

Compliance status: The sample submitted for analysis **did not comply** with relevant sections of the WHS (Mines) Regulation 2014.

17 November 2016

MSTC REPORT No. T16-00584/0003

ROADWAY DUST PARTICLE SIZE DETERMINATION

Sample Description: Roadway dust sample from Alfabs bag barrier. [redacted] Bag No.3 . Received 15/11/2016.

Size Analysis of Stone Dust

Sieve Size	% Passing	Requirements	Compliance
250µm	98.55	>95%	Complies
75µm	54.48	>60% and <80%	**Does not comply**

Notes: Results are percentages by mass.

Requirements: The Work Health and Safety (Mines) Regulation 2014 states that the mine operator of an underground coal mine must ensure: that any stone dust used is:
- white in colour, and
- has a composition such that at least 95% by mass of the stone dust is finer than 250 micrometres and of that stone dust that is finer than 250 micrometres, at least 60% by mass (and not more than 80% by mass) is finer than 75 micrometres.

Method of Analysis: NSW Code of Practice: Roadway Dust Analysis in Underground Coal Mines, February 2015, Section 3 Size Analysis of Stone Dust.

Compliance status: The sample submitted for analysis **did not comply** with relevant sections of the WHS (Mines) Regulation 2014.

17 November 2016

MSTC REPORT No. T16-00584/0004

ROADWAY DUST PARTICLE SIZE DETERMINATION

Sample Description: Roadway dust sample from Alfabs bag barrier. [redacted] Bag No.4 . Received 15/11/2016.

Size Analysis of Stone Dust

Sieve Size	% Passing	Requirements	Compliance
250µm	98.55	>95%	Complies
75µm	56.92	>60% and <80%	**Does not comply**

Notes: Results are percentages by mass.

Requirements: The Work Health and Safety (Mines) Regulation 2014 states that the mine operator of an underground coal mine must ensure: that any stone dust used is:
- white in colour, and
- has a composition such that at least 95% by mass of the stone dust is finer than 250 micrometres and of that stone dust that is finer than 250 micrometres, at least 60% by mass (and not more than 80% by mass) is finer than 75 micrometres.

Method of Analysis: NSW Code of Practice: Roadway Dust Analysis in Underground Coal Mines, February 2015, Section 3 Size Analysis of Stone Dust.

Compliance status: The sample submitted for analysis **did not comply** with relevant sections of the WHS (Mines) Regulation 2014.

Moisture determination:

16 November 2016

MSTC REPORT No. T16-00584/0001

LIMESTONE MOISTURE DETERMINATION

Sample Description: Bat Bag stone dust samples from [redacted]

Analysis of Incombustible Content (Determination of moisture only)

	Moisture Content (%)			
	Sample 1	Sample 2	Sample 3	Mean
Bag 1	14.4	14.5	14.7	14.5
Bag 2	0.1	0.1	0.1	0.1
Bag 3	3.6	3.5	3.6	3.6
Bag 4	0.2	0.2	0.2	0.2

Notes: Results are percentages by mass.
Three samples were taken from each bag at different locations within the bag.

Method of Analysis: NSW Code of Practice: Roadway Dust Analysis in Underground Coal Mines, February 2015, Section 4 Analysis of Incombustible Content (determination of moisture only) and MSTC Test Method TM017.

Accuracy: The uncertainty of the reported quantities is ±0.4% (absolute) and is an expanded uncertainty using a coverage factor of 2, which gives a level of confidence of approximately 95%