

Investigation information release

Date: January 2025

Causal investigation – polyurethane ground stabiliser fire exposes workers to health, safety risk

Incident date: 12 January 2025

Event: A polyurethane ground stabiliser (PUR) fire may have exposed the contract workers to a serious risk to their health and safety at the Perilya Southern Operation, Broken Hill.

Location: Levels 22 to 23 haulage shaft, Perilya Southern Operation, Broken Hill NSW

Overview

The Resources Regulator has begun a causal investigation to determine the causal factors that led to an underground mine fire at Perilya Southern Operations, Broken Hill, NSW, on 12 January 2025.

A line of enquiry in the investigation will consider if a PUR used to stabilise the ground self-heated after being applied by workers who were undertaking ground support and remedial work in an isolated underground area.

Workers undertaking remediation identified fumes and vapour while applying the PUR product. The workers successfully retreated to fresh air bases where they remained until it was assessed as safe to leave the mine. Ultimately, all workers were safely removed from the mine. There were no injuries reported by the mine operator regarding this incident.

The mine

Southern Operations underground mine is at the southern extent of the Broken Hill mineral deposit in far western NSW. The Broken Hill operation produces 2 products, a zinc, silver concentrate and a lead concentrate. Concentrates from the mine are a premium, coarse-grained product, being of low complexity and containing a grade of about 50% zinc in the zinc concentrate and 70% lead in the lead concentrate. Mining is principally conducted using a long hole open stope method of mining. Long hole stoping accounts for 70% of underground production, with pillar extraction and development ore contributing approximately 30% of the total production.

Perilya Broken Hill Pty Ltd (Perilya) is the nominated operator of the mine. Perilya Limited is the ultimate holding company of Perilya Broken Hill Pty Limited.

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The incident

Workers were using chemical and mechanical ground support to remediate an area in the haulage shaft at level 23 underground at the Southern Operations in Broken Hill. Level 23 is about 980 metres underground and required remediation due to a wedge failure of rock at the area intersecting the haulage shaft and the level 23 platform.

The chemical ground stabiliser is a two-part chemical classified as a polymeric or polyurethane chemical. When both reagents (typically an isocyanate and a polyol) are mixed, self-heating occurs. This is known as an exothermic reaction. Heating is usually managed through careful application in correct mixing ratios of the chemicals or by using chemicals that do not significantly self-heat.

During the stabilisation process, workers reported fumes and vapour. All workers who were underground at the time retreated from work areas to fresh air bases and awaited rescue or clearance until the fumes subsided. But the fumes and vapour did not subside and the area ignited. Most workers were able to safely exit the mine unassisted, however, 5 workers stayed in a fresh air base for several hours until it was deemed safe by mine's emergency team rescue for them to safely retreat. There were no reported injuries because of the incident.

The investigation

The Regulator has initiated a causal investigation into the incident. The purpose of the causal investigation is to enable the quick and full understanding of the causes of this incident, and publication of corresponding lessons to industry in a timely manner to reduce the likelihood of a recurrence.

A preliminary investigation of the incident undertaken by the Regulator did not identify any material breaches of the *Work Health and Safety Act 2011* and the Regulator has no intention of conducting any further investigation into any potential non-compliance issues or taking any prosecutorial enforcement action, subject to the terms of the Causal Investigation Policy.

The investigation team is being developed and will comprise representatives from the Regulator, Perilya, and other stakeholders where appropriate.

An investigation report will be published at the conclusion of the investigation, which may include an explanatory animation.

Recommendations

Please note that these recommendations are based on the knowledge the Regulator had at the time of drafting. As further information becomes available, the Regulator may reissue this IIR or make new recommendations as required.

- Metalliferous mine operators are expected to take a risk-managed approach to introducing and using chemicals on site and are encouraged to review their chemical manifests because of this incident. The risks associated with fire and exothermic reaction runaway in polymerics are well known and should be considered during any risk assessment or introduction-to-site process.
- Polymerics are licensed for use in the NSW underground coal industry. The Regulator has guidance available regarding testing requirements and licence conditions that may be relevant

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and should be considered as part of any risk managed process review. For further information the Regulator has published a [Guide – Licence testing requirements – materials to be polymerised underground](#).

About this information release

The Regulator has issued this information to draw attention to the occurrence of a serious incident in the mining industry. Further information may be published as it becomes available.

Visit our [website](#) to:

- learn more about our work on causal investigations and emergency response
- view our publications on other causal investigations

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