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MINING AND QUARRYING

Working near historic underground workings

There have been two recent near-miss incidents involving operations above historic underground workings. In both cases, underground voids were unexpectedly revealed when the surface caved into the void underneath working machinery.

Incident 1

An underground void was exposed on the surface of an active coal-crushing and screening plant when a front-end loader passed over the area. The ground collapsed under the rear right wheel. The operator immediately noticed the void and was able to drive out.



FIGURE 1: Historic underground void visible on ground surface

Incident 2

In an open cut operation, mining was actively progressing above a historic underground mine. Waste material was being top-loaded into dump trucks and when a dump truck moved out from the digger, the ground collapsed under the rear offside wheels. The truck was not able to drive out and needed to be towed out of the void.



FIGURE 2: Ground collapse under wheels of loaded dump truck

Comment

These incidents show that it is important to:

- identify historic workings under the coal processing area as a hazard
- sufficiently verify historic underground plans for spatial accuracy, checking to ensure that the information is correct and stability hasn't been further compromised
- identify weak rock above underground voids as they can collapse into the void
- be aware high ground water increases the propensity for caving (and reduced bulking of caved material).

More information

Historic underground workings pose significant risks to mining operations. All mines should identify any historic underground workings within their operations and use the [New Zealand mine plans](#) website as part of any investigation.

Assess the risk in areas where historic underground workings have been identified to exist, and involve a geotechnical engineer in the risk assessment team.

1. Include in your assessments:
 - information on depth of workings from the surface
 - potential size of underground voids
 - what rock types exist below surface, and what caving/bulking characteristics they have
 - potential for voids to contain water and/or dangerous gases.
2. Do not rely solely on historic underground plans to accurately locate underground tunnels as these are known to be spatially inaccurate. Use them to identify areas where workings exist, then utilise other investigation methods to verify tunnel locations (eg drill holes).
3. Continually review risk assessments with updated information.

Further guidance can be found in WorkSafe New Zealand's Good Practice Guidelines on [Health and Safety at Opencast Mines, Alluvial Mines and Quarries](#)

**AUTHORISED BY PAUL HUNT, CHIEF INSPECTOR EXTRACTIVES
ISSUED BY WORKSAFE NEW ZEALAND**