



Significant Incident Report No. 282

Subject: Fall of ground in a development heading resulting in serious injury

Date: 10 August 2020

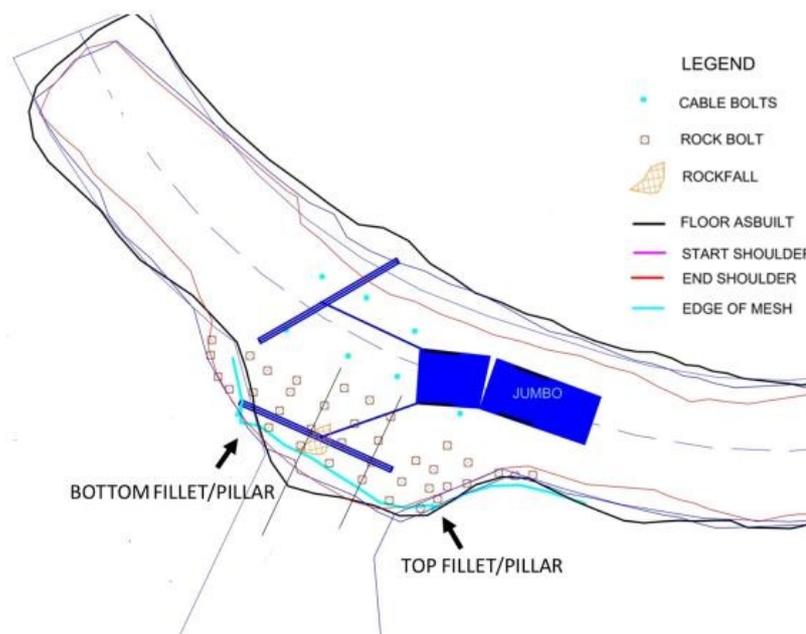
Summary of incident

Note: The Department of Mines, Industry Regulation and Safety's investigation is ongoing. Information contained in the significant incident report is based on findings at the time of writing.

In April 2020, a development drill rig (jumbo) operator and fitter were injured when a 750 kg rock fell from a height of approximately five metres from the face of an access development heading, striking both workers.

The fitter received serious injuries. The workers were approaching the face of the second cut to install lifter tubes into the lifter holes of the last two rows of blast holes. At the time, most of the face had been bored with only the last two rows remaining.

The first cut was taken the day before in a single blast, from top fillet to bottom fillet using a drag round and 4.9 m drill steel.



Plan view of the incident site.

Direct causes

The rock dislodged from the bored face, from a geological structure, striking the two workers approaching the face to install lifter tubes.



View of the face from the bottom pillar. Note the geological structures on the face and large rock that struck the two workers.

Contributory causes

- Use of an out-of-date rock mass model to assess the design.
- The planning and design process did not consider local geotechnical information at the newly established heading.
- Geological information was not available for the development heading due to infrequent mapping.
- Geotechnical inspections were not completed as per the Ground Control Management Plan.
- A large number of geological structures that indicate the presence of blocky ground were not identified prior to the incident.
- Excessive material fell from the backs during scaling, indicating the presence of poor ground conditions, however additional ground support was only installed on the side wall leaving the face unmeshed.
- Development methodology and jumbo setup resulted in rows on the face bored before all the lifter tubes had been installed.
- A 4.9 metre drill steel was used to establish the heading and may have impacted on directional control within fractured or blocky ground resulting in excessive damage to the perimeter and face.
- Inadequate inspections by competent person(s) before commencement of drilling.
- Lack of training in geotechnical hazard awareness.

Additional factors

- Development methodology did not allow perimeter control on the bottom pillar/fillet to be used.
- Significant over break had been recorded during the establishment of new accesses, but appropriate action to address the root cause of the problem was not taken.

Actions required

The Department recommends the following actions.

- Establish a system that confirms adequacy of the geotechnical model used in the design process.
- Ensure planning and design incorporates up-to-date information from geological and geotechnical inspections before the commencement of new development accesses.
- Conduct an inspection by a competent person before survey direction is issued for new development accesses.
- Use a Trigger Action Response Plan (TARP) that include alerts and controls where excessive scaling/bogging occurs in development headings.
- Where over break is measured, ensure perimeter controls are implemented for all development, including fillets.
- Where poor ground is noted and the face is undercut, ensure all lifter holes are drilled and lifter tubes installed before boring of the face commences.
- Use a drill steel of suitable length when new development accesses are established.
- Provide the workforce with geotechnical hazard awareness training, to enable them to recognise geotechnical hazards and implement appropriate controls.
- Install face mesh (as a minimum) in all headings where poor ground conditions are expected and include additional measures, where appropriate, based on the inspection conducted by a competent person, or on the TARP.
- Include guidance in existing procedures for establishing new development accesses, and/or develop a new procedure for this.

Further information

- Department of Mines, Industry Regulation and Safety

Code of practice – Ground control for Western Australian mining operations

www.dmp.wa.gov.au/Documents/Safety/MSH_CoP_GroundControl.pdf

Guideline – Ground control management in Western Australian mining operations

www.dmp.wa.gov.au/Documents/Safety/MSH_GL_GroundControl.pdf

This Significant Incident Report was approved for release by the State Mining Engineer on 10 August 2020