NSW GOVERNMENT Trade & Investment

MINE SAFETY INVESTIGATION UNIT

Serious incident involving an inrush of water and cuttings in an underground mine

21February 2010

www.dpi.nsw.gov.au/investigation-unit

The incident

- A raise borer was excavating a ventilation shaft
- The raise bored pilot hole was being back-reamed to a 5 metre diameter.
- Reamed cuttings piled up such that they choked the bottom of the hole.
- An unknown quantity of cuttings and water built up in the hole.
- When an operator began to bog from beneath the hole the inrush occurred

Path of inrush

- Pushed a 57 tonne bogger 30 – 40 metres
- Travelled 814 metres down a drive
- Struck a ventilation structure.
- Pushed a 6 tonne excavator approx. 300 metres.
- Entered a second shaft and dropped 375 metres to a level below.

Path of inrush

- Washed away a vent control consisting of built up material and a brattice.
- Struck an electrical vent fan.
- Struck a second bogger in the area beneath the second shaft.
- Prevented 3 persons from driving from the area of the mine in a light vehicle

Inrush Flow

1. Inrush path commencing at the base of the ventilation shaft.
2. Height of inrush a short distance from the base of the ventilation shaft

Bogger pushed 30-40 metres along drive

1. Mud material coating the front windscreen
2. Mud material coating bogger up to cabin level – rear view.

Height to top of cabin 2.99m

Inrush impacts ventilation structure

Note height of inrush material relative to persons standing in doorway

Top of second ventilation shaft

(814 metres from inrush site)

Six tonne excavator that was swept approx. 300 metres to the vicinity of the top of the second shaft is on its side with tracks exposed

Bottom of second shaft

Red arrow points to vicinity where a mound of material and the brattice was located for ventilation purposes. Inrush material fell 375 metres to base of this shaft

The inrush washed away part of the mound of material and the brattice and consequently changed the ventilation in the mine.

The second bogger impacted by inrush

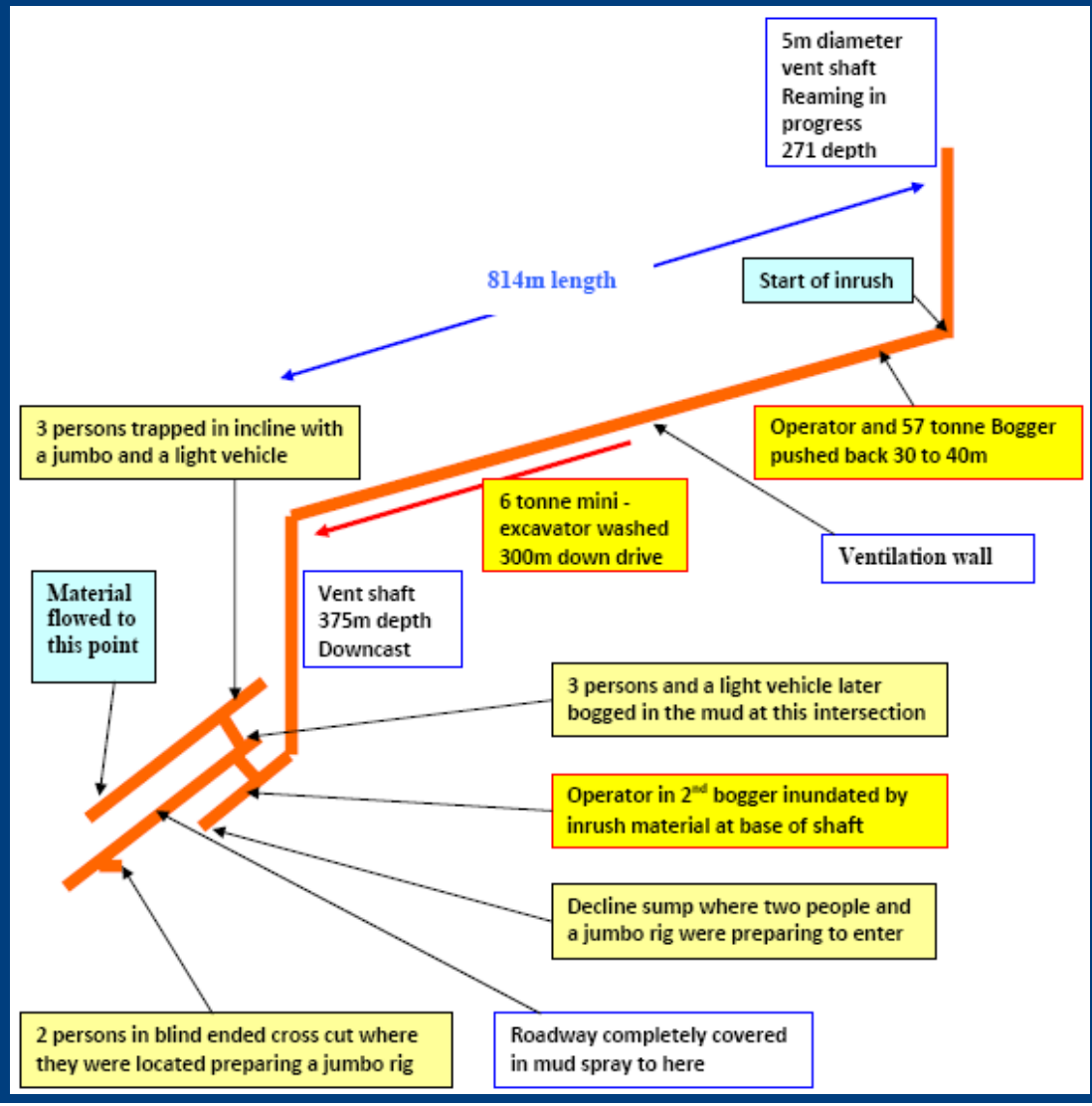
This bogger was located nearby to the base of the 2nd shaft, it was struck by wet material and subject to a higher than normal wind velocity

Light vehicle bogged by inrush material

Three persons in “bogged” light vehicle unable to drive through inrush material to exit the area.

Incident Outcome

While no one was injured during this incident there was potential for serious injury or a fatality to occur.



NSW GOVERNMENT Trade & Investment

Findings

- Raiseborer cuttings were able to pile up and choke the hole undetected
- An unknown quantity of water and mud built up in the shaft.
- Drain Holes (tell tales) were not drilled up into the bottom of the raisebore hole.

Findings

- Failure to do a risk assessment when the reaming rate was increased
- Failure to address the potential effect on personnel exposed to the path of the inrush
- Failure to do a timely review or audit of Safety Management System documents

Best practice

- Ensure there is a robust, comprehensive system in place
- Review and audit the system and ensure it is maintained to industry best practice
- Ensure actions and decisions do not lead to an exposure of persons to potential injury outcomes
- Provide independent inspections and audits of the documented procedures and operational practice
- Ensure system can identify and react to changed circumstances

Related published resources

- SA11-01 Water inrush from raisebore hole
- MDG 1030 Guideline for Raiseboring Operation
- MDG 1024 Guideline for Inrush Hazard Management
- MDG 1010 Risk Management Handbook
- AS 4360:2002 Risk Management

www.dpi.nsw.gov.au/minerals/safety/safety-alerts