



# SAFETY ALERT

## Lightning strikes stationary truck

### INCIDENT

A large rear dump truck (RDT) was struck by lightning while stationary and unattended. No employees or personnel were injured.

### CIRCUMSTANCES

Three tyres were blown off the truck between 2 to 5 minutes after the lightning strike. Two tyres exploded (position 1 and 3 tyres) on the driver's side of the truck, sending debris several hundred metres from the vehicle and causing extensive damage to the truck and other equipment.

One complete wheel base (weighing 1.6 tonnes) was thrown about 100 metres from the truck. A solid wheel flange (weighing 250kg) was thrown to the top of the stockpile about 275 metres from the truck.

The air blast and shock wave caused damage to the operator's cabin, other equipment and buildings up to 230 metres from the truck.

The tyres were ejected and finished between 50 to 60 metres from the truck.

### Damage to the truck

1. The truck operator's rear cabin window was blown into the cabin and all other windows were blown outwards from the cabin. The driver's door was blown open.
2. The final drive was extensively damaged. The rear outer position 3 wheel base exploded off the final drive breaking 57 one-inch grade 10.9 bolts in tension with a calculated force of approximately 270 kNewtons. The final drive outer planetary carrier and axle were blown off the truck.
3. Position 1 tyre (new tyre) had one complete side wall blown out.
4. Position 3 tyre had the side wall blown out for three-quarters of the circumference.
5. Position 4 tyre was inspected with no visual damage. This tyre was scrapped due to oil contamination inside the tyre.
6. The engine sump was cracked and damaged. The oil cooler was damaged.
7. The front position 1 wheel strut mounting was distorted, and the front wheel hub was bent.
8. Fuel tank mountings were significantly damaged.
9. The three wheel bases were damaged and scrapped.

### Other damage

The operator's cabin windscreen of a water truck parked 20 metres from the RDT was blown out.

A window of a car parked in the employee car park was broken.

Some washery office windows were broken by the shock wave, and damage was caused to some sheeting on the outside of the elevator building.

Some bath house windows were broken.

Five windows in the main office were also broken.

### Immediate action taken

The site Tyre Fire Procedure was put into place:

1. Area barricaded as a no-go zone.
2. Incident reported to the NSW DPI Mine Safety inspectorate.
3. No-go zone in place for minimum of 24 hours then to be reassessed.

## INVESTIGATION

Position 1 tyre (driver's side front) showed evidence of earthing through this tyre, and it's believed the lightning earthed through No 1 and No 3 position tyres.

### Further action:

All tyres have been sent to the manufacturer for further inspection.

Review the risk assessment of the mine's response when thunder storms are approaching and if equipment is struck by lightning.

Attempt to determine the energy released by the exploding tyres and the lightning strike.

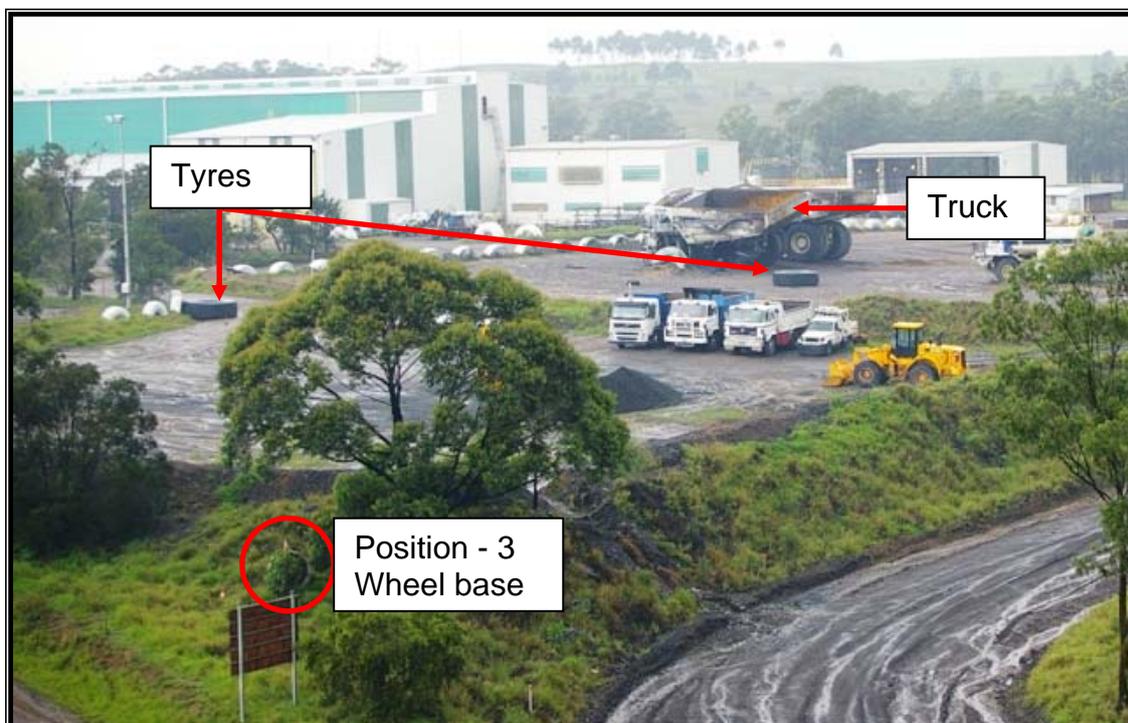


Figure 1: Parking area



Figure 2: Close-up of the truck



Figure 3: Tyre side wall from position number 1

## RECOMMENDATIONS

All mines should be aware of potential risks associated with mobile plant in electrical storms.

Consideration should be given to the following:-

1. Distance and time of exclusion zone from a suspect heating tyre.
2. Park-up procedures and locations around buildings.
3. Develop a Lightning Management Plan.
4. Review existing emergency procedures.
5. Review *AS 1768 – 2007 Lightning protection*.
6. Review NSW Department of Primary Industries Safety Alert SA04-01.

**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.

**Signed**



**Rob Regan**  
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**NSW DEPARTMENT OF PRIMARY INDUSTRIES**

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