

Key hazards series: Floor Heave

The Latrobe Valley declared mines must be rehabilitated to a state which is safe, stable, sustainable and suitable for proposed post-mining land uses. Mitigating hazards, both during operations and rehabilitation, is a key responsibility of mine licensees.

This fact sheet is part of the Key Hazards series which addresses hazards such as block sliding, floor heave and fire. Key concepts are explained in the MLRA Rehabilitation Concepts fact sheet series, with terminology defined in the MLRA Vocabulary on our website.

Floor Heave

Floor heave refers to the upward movement of a mine's floor caused by pressure from underlying aquifers. This ground movement can destabilize mine batters and surrounding areas, potentially triggering block slides, batter collapses, and increased fire risks in rehabilitated batters.

Additionally, floor heave may cause groundwater aquifers to break through into the mine void, leading to water inflow and potential aquifer contamination.

How can floor heave occur?

When coal and overburden are removed during mining, the resulting void disrupts the balance of forces in the ground. With the weight of the removed material no longer counteracting the pressure from underlying aquifers, an upward force is exerted on the pit floor, causing it to rise. This process is illustrated in Figures 1 to 4.

Floor heave requires proactive management during both mining operations and rehabilitation to minimize risks to the stability of the mine and surrounding environment.

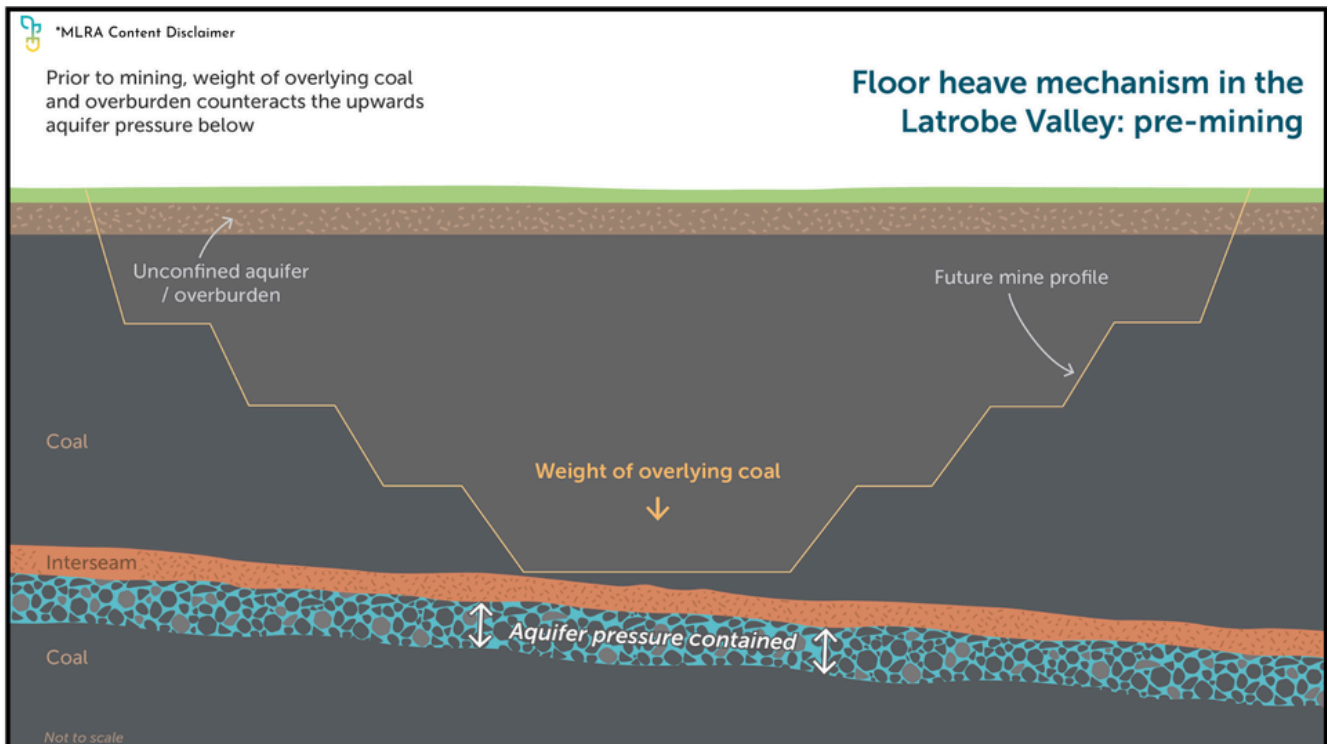


Figure 1.

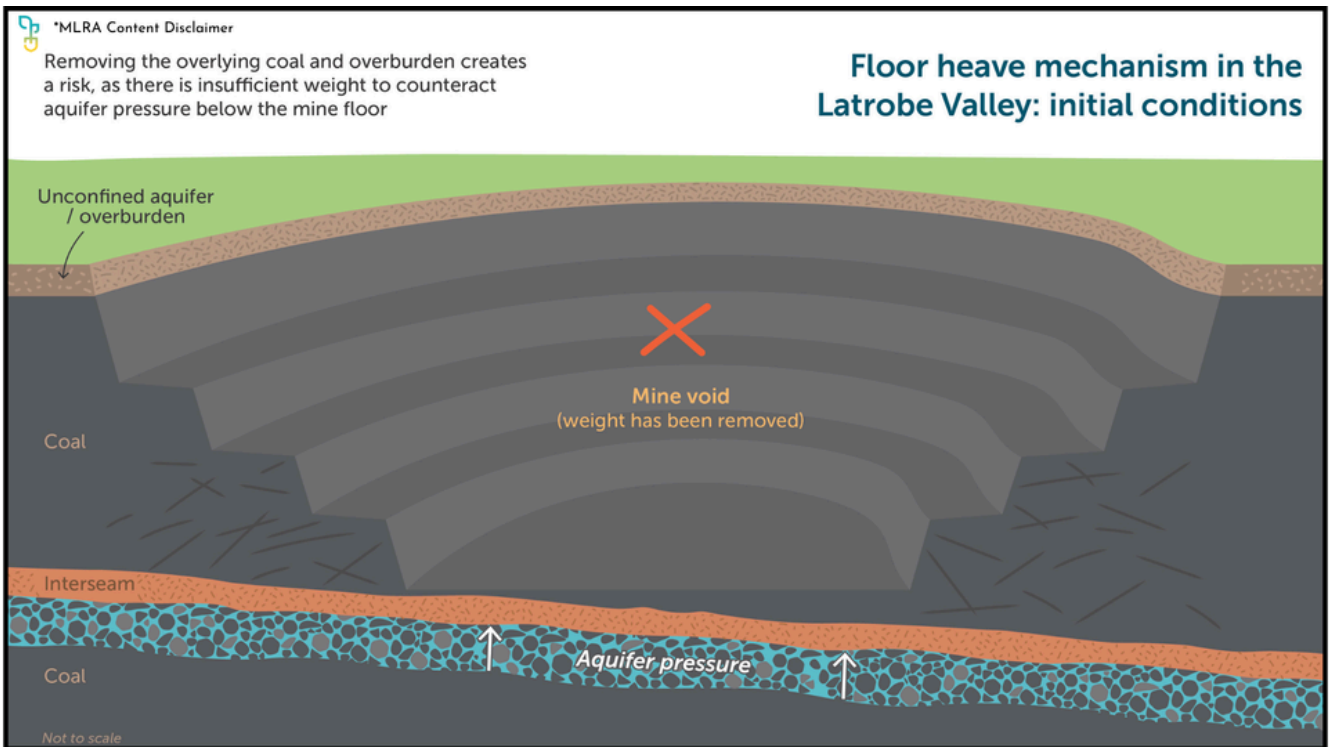


Figure 2.

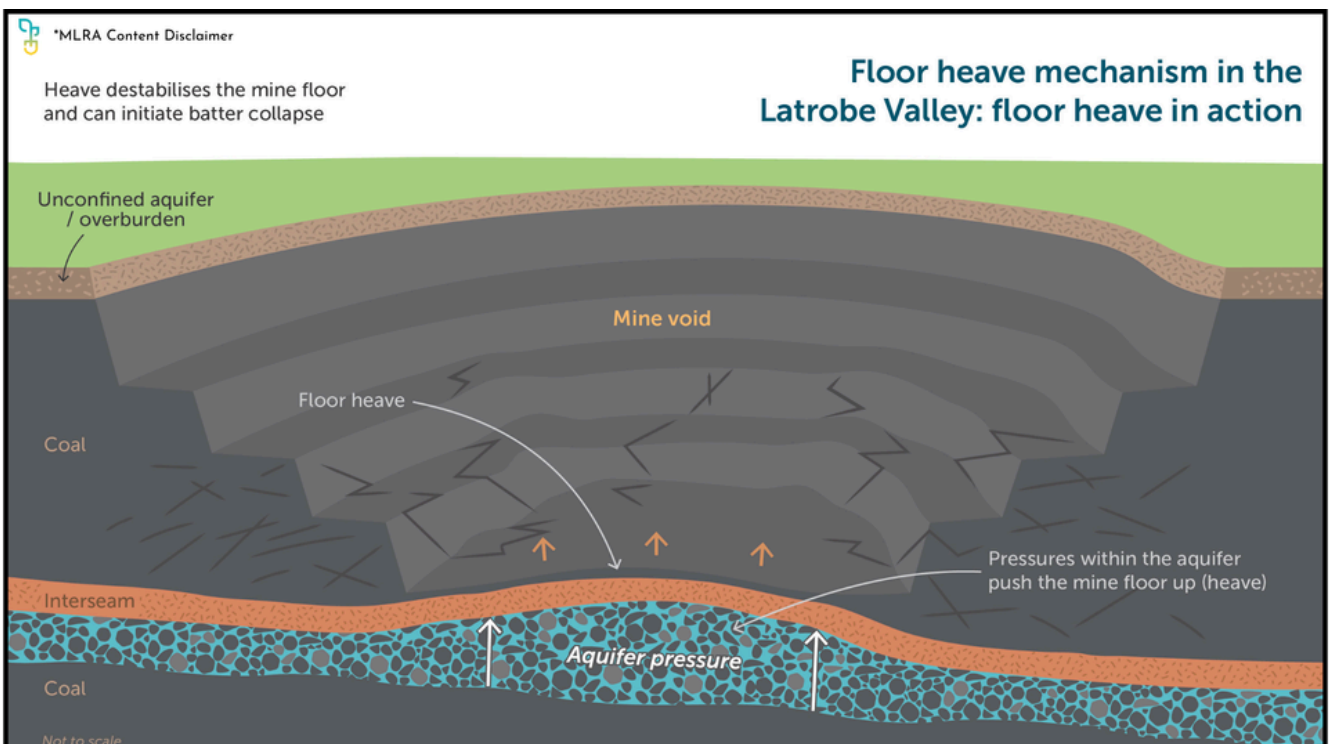


Figure 3.

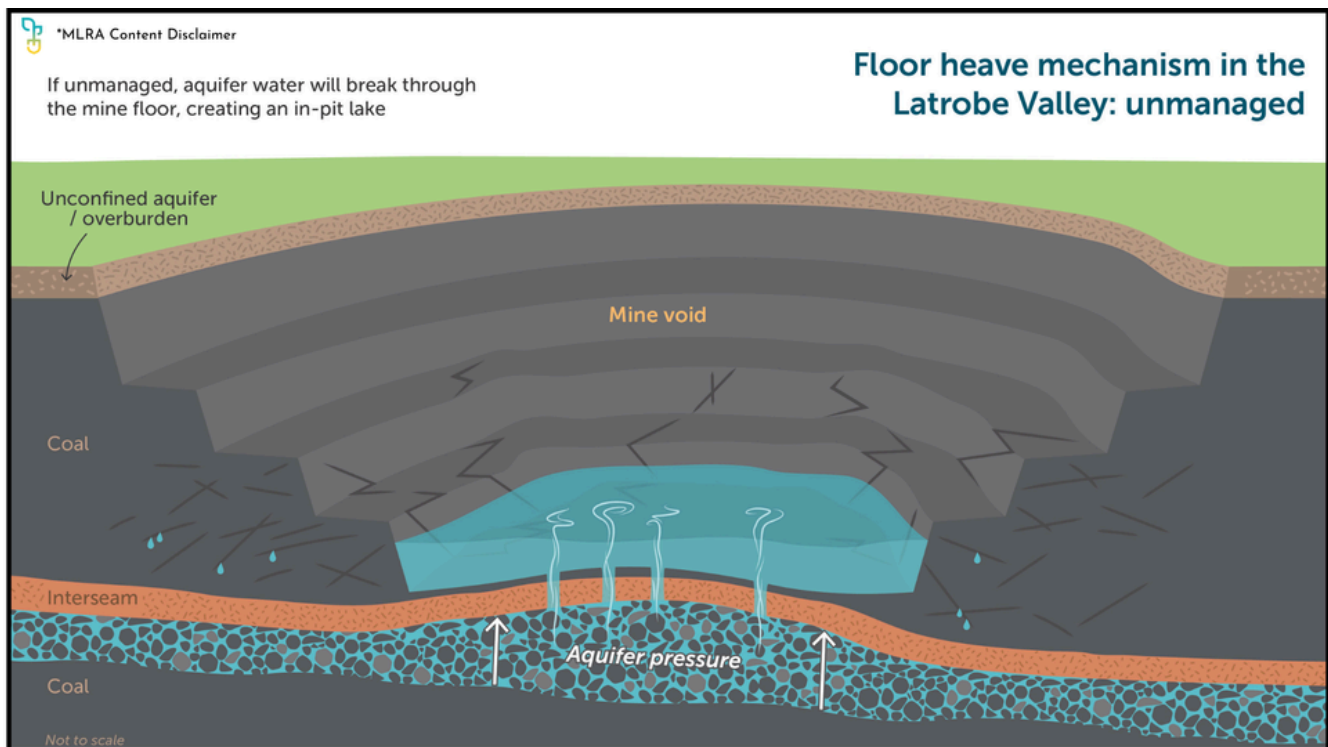


Figure 4.

How can floor heave be prevented?

Common operational measures aimed at achieving weight balance include;

- **Aquifer Depressurisation:** Pumping water from aquifers to reduce upward pressure.
- **Strategic Overburden Placement:** Adding overburden in the mine void to counteract aquifer pressures (surcharges) and buttress the mine batters.

For rehabilitation, passive mitigation strategies are preferred. See the MLRA Rehabilitation Concepts fact sheet series for additional information. Rehabilitation options aim to achieve weight balance with minimal ongoing management. However, finding sufficient material for weight balance is challenging since the removed coal has been burned. The MLRA is aware of the following mitigation methods, currently in use or under consideration:

- **Overburden Placement:** Adding overburden in the void to counteract aquifer pressures and buttress batters.
- **Pit Lakes:** Using water to provide the necessary weight to stabilize aquifers.
- **Aquifer Depressurisation:** A non-passive solution, which should only be considered if weight balance cannot be achieved and maintained through other methods.

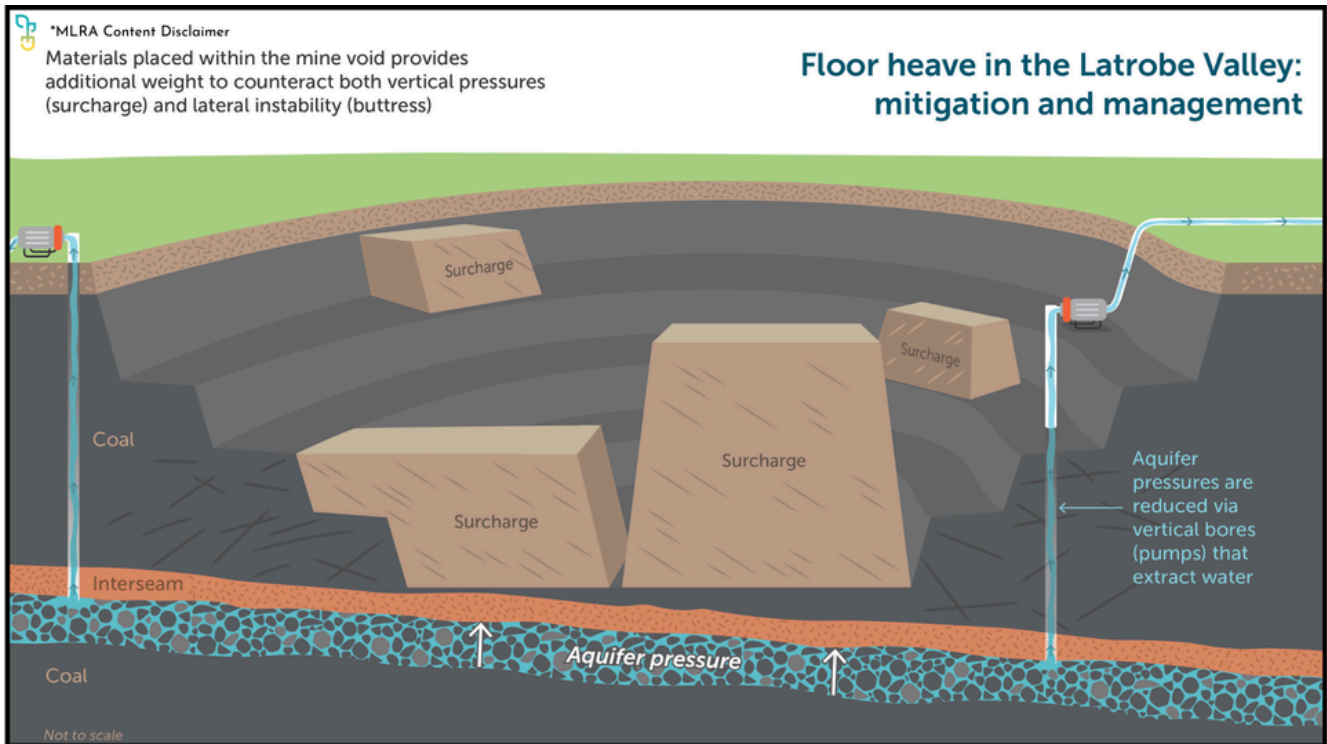


Figure 5.

Disclaimer:

This content provides the MLRA's high-level overview of aspects of mine rehabilitation in the Latrobe Valley. It does not reflect the opinions, pre-empt decisions or policies of Resources Victoria, mine licensees or any other government department. The information was accurate to the best of the MLRA's knowledge at the time of publication and is intended to inform the community, stakeholders and Traditional Owners.

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