

# Mt Ruapehu Crater Lake Lahar - scientific glossary

## Glossary

**AEE:** Assessment of Environmental Effects - an abbreviation for the report "Environmental and risk assessment for mitigation of the hazard from Ruapehu Crater Lake". This assessment was begun in 1997 and was presented to the Minister in 1999 after public submissions and an independent review. It was a thorough and robust study of all the options for mitigating a worst case scenario lahar. Prepared according to the requirements of the Resource Management Act and the National Parks Act, the AEE aimed to provide a statutory basis for decision-making, provide further information to the community, and to highlight the risks posed by the situation at Crater Lake and the best form(s) of mitigation.

**Bund:** a rock and gravel embankment or stopbank build to prevent lahars from spilling out of the Whangaehu valley into the Tongariro and Lake Taupo catchment.

**Crater Lake:** lake occupying the active crater of Ruapehu and heated by volcanic fluids. One of the most active crater lakes in the world, Ruapehu Volcano has had at least 17 single or multiple eruptions since 1861'. Many more prehistoric eruptions have occurred and many were larger than historic events.

**Crater Lake tephra dam:** an unstable dam formed by unconsolidated volcanic material deposited over the former outlet to Crater Lake.

**Emergency Response Plan:** agreed plan of response to an alarm warning that a lahar has been initiated. This plan is being developed by Police, DOC and local authorities.

**ERLAWS:** Eastern Ruapehu Lahar Alarm and Warning System. A system of sets of sensors located at the Crater Lake and down the mountain and sending data to a base station computer at Tokaanu which then provides warnings of lahar events.

**Lahar:** an Indonesian word that refers to a rapidly flowing mixture of rock debris and water (other than normal water flows) from a volcano. When they overflow their channels, lahars can destroy, erode or bury obstacles in their path. There are various kinds of lahar. A debris flow lahar (the type expected in the current situation) flows like a slurry and contains large amounts of sediment (more than 60 per cent of volume) of varying size (from small particles to boulders). A hyperconcentrated flow lahar contains less sediment, mainly of sand-sized or smaller particles, and flows more like water. Lahars are produced by most eruptions on Ruapehu but also by dam or rim



collapse (eg 1953), landslides and heavy rain. Some very recent pre-historic lahars have been very much larger than any seen in historic times.

**Lahar Path:** route down a volcano taken by a lahar. The three major paths are the Whangaehu Valley (on eastern Mt Ruapehu, flowing towards the Rangipo Desert); the Mangaturuturu Valley (western Mt Ruapehu immediately north of Turoa Skifield); and the Whakapapaiti Valley (northern Mt Ruapehu, down the Whakapapa ski area). The most active lahar path by far on Mt Ruapehu is the Whangaehu Valley.

**Mitigate:** Reduce severity. Risk mitigation - reducing the severity or probability of significant risk by action such as warning people away, or building structures able to avoid or withstand lahar forces.

**Tephra:** fragmented or molten volcanic rock material blown from a volcanic vent and transported through the air.

**Tongariro National Park Management Plan:** the overarching policy document that guides park management by the Department of Conservation. The plan was prepared with a high degree of public input, and was approved by the New Zealand Conservation Authority.

**Whangaehu outwash fan:** volcanic material washed down the upper Whangaehu Valley over the last 1000-2000 years that has accumulated below the end of the Whangaehu gorge as a classic outwash fan, visible from State Highway 1. One of the most active lahar outwash fans in the world.

**World Heritage Area:** A UNESCO designation for places or monuments of exceptional interest and of universal value. New Zealand has signed the World Heritage Convention and has three 'World Heritage sites'. Natural landscapes are required to be 'outstanding examples' of 'the major stages of the Earth's evolutionary history', have 'ongoing geological processes or biological evolution' and 'superlative natural phenomena'. Cultural World Heritage landscapes must be directly or tangibly associated with events or living traditions, with ideas or beliefs, or artistic or literary works of outstanding universal significance.