

## **Liquefaction failure in a Derbyshire fluorspar tailings dam**

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**SYNOPSIS** In the early morning of 22 January 2007 the survey team on the site of a fluorspar mining operation in northern Derbyshire was disturbed by the noise of plastic barrels being propelled across the mine site and on to the public road. Within half-an-hour the residents of the nearby village of Stoney Middleton found their doorsteps awash with a mixture of tailings and rainwater. The flood emanated from a classified tailings facility in which a liquefaction failure had occurred. The liquefied tailings had overtopped the confining wall, leading to the discharge of water and tailings off-site. The tailings were rapidly contained and further off-site discharges prevented, although the limited outflow had been sufficient to cause traffic chaos and to lead to some environmental degradation of houses and gardens in Stoney Middleton and along the River Derwent. Though the initial impact was perceived to be devastating, the rapid clean-up operation, which commenced within hours, enabled the village to return to normal in a short space of time, the only long-term remediation required being that along the banks of the River Derwent.

This paper presents the technical assessment of the failure and the postulated mechanism for both the liquefaction of the tailings and the overtopping which followed. The paper summarises the work subsequently undertaken to prevent any further such incidents on the site and concludes with the lessons to be learnt with regard to emergency planning.