

Remedial grouting works at Upper Rivington Reservoir

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SYNOPSIS In January 2002 a serious leak into the culvert below the Yarrow embankment of Upper Rivington led to a rapid drawdown of the reservoir being required. Subsequently a grouting programme was undertaken during which a defect in the puddle clay core was identified. A geophysical survey was undertaken which revealed that the grout curtain had successfully sealed the original leak but that other seepage paths existed around the curtain and beneath the dam.

A weighted filter was identified as the most likely solution and contract documents were prepared. However, before tenders were invited an event tree analysis was carried out to identify the most likely failure modes. This was done using the “Toolbox” methodology developed by the United States Bureau of Reclamation, the US Army Corps of Engineers, The University of New South Wales and URS. This process showed that the most likely mode of failure was erosion of the puddle clay in the base of the shallow cut-off trench by water flowing in the fissured rock beneath. Failure by seepage through the dam was shown not to have a sufficiently high probability to justify the planned remedial works and the tender was not issued. Instead a contract was awarded to grout the fissured rock at its interface with the core.