



# The British Dam Society

## EVENING MEETING

Tuesday 15<sup>th</sup> October 2019 at 6:00pm

One Great George Street, London (Nearest tube: Westminster)

## Tailings Dam Failures

Mike Cambridge, Cantab Consulting  
Rafael Monroy, Wood  
Darren Shaw, Arup



*[Image by Ricardo Moraes/Reuters]*

**For brief presenter biographies see overleaf | Admission free | Teas available from 5.30pm**

This meeting will be streamed live on the internet. For more details, including enjoying the live stream as part of a group at one of our Regional Hubs around the UK, please visit the meetings page on the BDS website: [www.britishdams.org](http://www.britishdams.org)

For more information please contact the ICE on 020 7665 2147 or email: [societyevents@ice.org.uk](mailto:societyevents@ice.org.uk)

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## Synopsis

The failure on 25<sup>th</sup> January 2019 of the Brumadinho Dam No. 1 at the Minas Córrego do Feijão in the Minas Gerais region of Brazil resulted in more than 220 deaths, together with major environmental impacts in the downstream catchment. This was the fifth tailings dam disaster to have occurred in the same region in an 18-year period and the third reported major global tailings dam failure since 2015.

The presentation will introduce different types of mine waste management and describe typical forms of tailings dam construction and the key engineering principles and potential modes of failure with particular respect to the Brumadinho event. The important aspect of liquefaction potential as it relates to the failure of similar tailings dams constructed using the upstream method will also be explored. Finally, the legislative background will be discussed with particular respect to recent major tailings dam failures in Brazil, namely Mineração Rio Pomba Cataguases, Barragem do Fundao do Samarco and Brumadinho (Brazil). Publicly-available information on the causes of failure will be presented together with a discussion of the regulatory and dam engineering lessons learnt.

## Presenter Biographies

**Mike Cambridge** is the Managing Director of Cantab Consulting Ltd and has more than forty-five years' experience of mining, water and environmental projects throughout the world, having been engaged extensively on metalliferous and non-metalliferous mine sites as well as on hydro-electric power and water resources projects. He has particular expertise on all aspects of dam engineering, with involvement in the design, construction and statutory monitoring of tailings and water dams and mine waste dumps. In addition he was the lead author and editor of the Springer publication "The Hydraulic Transport and Storage of Extractive Waste – Guidelines to European Practice" and has in addition authored numerous papers on technical and environmental aspects of mining, quarrying, dam engineering and waste disposal.

**Rafael Monroy** is a Principal Civil/Geotechnical engineering with Wood. He is a Chartered Civil engineer with experience in design and construction supervision of tailings management facilities in Canada, Argentina and Botswana. Rafael is the current UK representative on ICOLD Technical Committee L on Tailings Dams and Waste Lagoons, has been recently appointed as Convenor of TC396/WG6, which is drafting part 7 of the European Standards on Earthworks (prEN 16907-7 Earthworks – Part 7: hydraulic placement of extractive waste), and was one of the contributing authors to the publication titled "The Hydraulic Transport and Storage of Extractive Waste – Guidelines to European Practice".

**Darren Shaw** is an Associate at Arup and leads the Dams and Reservoirs Team in the West Region of the UK. He is a Chartered Civil Engineer and is appointed to the Panel of Supervising Engineers under the Reservoirs Act 1975. Prior to his current role, Darren was a Senior Engineer for Knight Piésold Consulting based in Australia where he was responsible for design and construction supervision of a number of tailings dams, heap leach projects and mining infrastructure schemes in Australia, Indonesia, the Philippines, Zambia and Burkina Faso.