



THE UNIVERSITY OF
NEW SOUTH WALES

SCHOOL OF MINING ENGINEERING

Environmental Monitoring: Tailings Storage Facilities - "TSFs"

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Monitoring Plans

- Monitoring programs should be planned and include the following:
 - Purpose & objectives of the program
 - Type & methods of monitoring
 - Monitoring locations
 - Equipment & instrumentation
 - Frequency of monitoring & duration

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Monitoring Plans (2)

- Quality assurance and quality control procedures
- Methods to be used to inspect, record and evaluate the data
- Parameters to be measured
- Analytical detection limits
- Procedures for analysing and reporting results
 - Importance of 'trigger values'

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Monitoring what ?

- Monitoring physical stability
 - U/g, open pit, waste rock dumps, tailings facilities, water management infrastructures
 - Visual, surveying, instrumentation
- Monitoring for chemical stability
 - Leachate
 - Migration
 - Ecology – biological parameters

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Monitoring what (2) ?

- Monitoring for environmental impacts
 - Air, noise, water – physical parameters
 - Ecology – biological parameters
 - Terrestrial
 - Aquatic

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Instrumentation Monitoring for TSFs

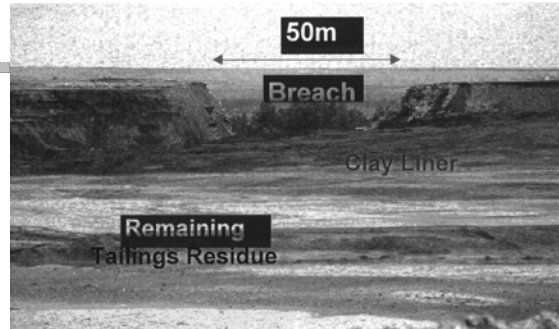
- Groundwater level
 - Piezometers
- Temperature
 - thermistors
- Condition of filters and drains
 - piezometers

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Instrumentation Monitoring for TSFs

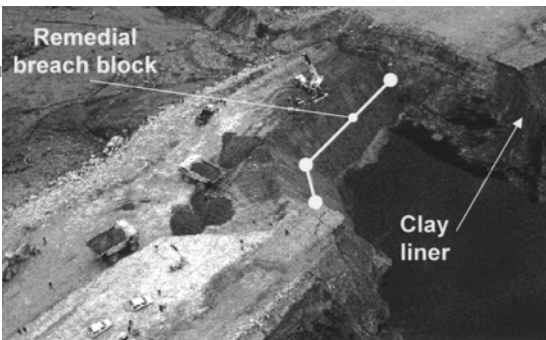
- Stability
 - Piezometers
 - Surveying
 - Inclinometers
 - Crack gauge
 - Visual

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Los Frailes Tailings incident, April 1998 – Photo shows breached tailing impoundment wall

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Los Frailes Tailings incident, April 1998 – Photo shows remedial works to breached embankment wall.

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Omai Tailing Storage Failure, Guyana 1995 – Photo shows embankment after failure.

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Marcopper tailing storage tunnel failure after an earthquake event, March 1996, Philippines – the dredge channel was used to trap tailings which discharged down the Boac River from the failed tailings storage.

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