

KAZ
MINERALS

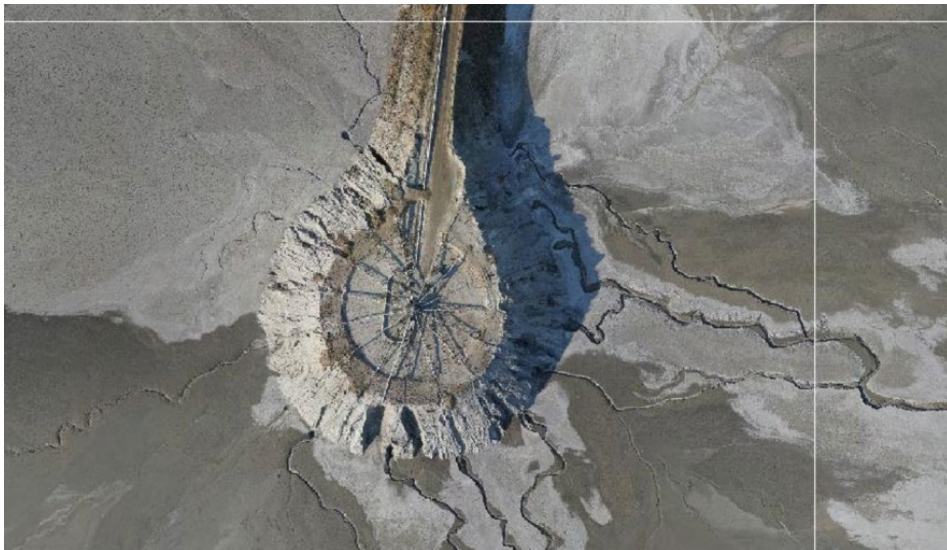


UNECE + Global Tailings Review

Needs and challenges in managing tailings by operators in Central Asia

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- ▶ Group Head of Dams and Tailings Storage Facilities
- ▶ 20 years working in Geotechnical Engineering (about 17 since I started specializing in Tailings)
- ▶ Worked in Australia, UK, Canada, Peru, Ghana, PNG, Chile and many other places and regulatory regimes.
- ▶ Have worked in consulting as a designer and auditor of facilities, have worked in construction and quality control of TSFs and have worked in operations of TSFs.
- ▶ I joined the company as Group Head of Dams and Tailings Facilities in April 2019.



Introduction – Kaz Minerals Operating Tailings Management Facilities

We are Kaz Minerals

- ▶ 6 Operating Sites
 - 5 in Kazakhstan
 - 1 in Kyrgyzstan
- ▶ 2 Projects being developed
- ▶ Operations range from 1,000,000 tons of tailings per year to 32,000,000 tons per year.
- ▶ We have dams designed to ANCOLD guidelines and dams to Kazakh and Kyrgyz standards as well as the older facilities being designed to soviet standards.
- ▶ We have upstream and downstream dams, down valley, up valley and both central and periphery discharge and dry stack.
- ▶ We do have isolated facilities as well as dams close proximity to communities.



Kaz Minerals' Operating
Management Facilities

- ▶ Kaz minerals recognises the importance of tailings governance and strategic planning. We have put in place a corporate and operational structure that supports tailings management including construction and operations.
- ▶ Tailings is such a huge and specialised area of mining that it requires a specialist who is dedicated to tailings issues.
- ▶ Kaz Minerals has a group advisor on tailings as well as a dedicated person on each site. These people are responsible for the tailings and have specific experience in tailings management and planning. Authority matches responsibility.
- ▶ As group head I advise the sites on everything from construction issues to daily inspections and many other aspects as well as working towards developing group standards, guidelines and assurance.
- ▶ We are committed to operating our tailings facilities as safely and efficiently as possible. We are also committed to minimising our impact on the environment by reducing our footprints, using existing voids where possible and also monitoring downstream impacts against a baseline.



- ▶ We are committed to comply with local RoK and RK requirements, however
- ▶ We are moving towards having all our future designs and operations meeting the ANCOLD Guidelines which we believe are above the local requirements.
- ▶ The ANCOLD guidelines are above Kazakh and Kyrgyz standards in several ways
 - E.g. requirements for post seismic states, drained and undrained states and liquefaction potential. The requirements for factors of safety, the requirements for calculating design storms, storages, channels, spillways and earthquake responses etc.
- ▶ To achieve the ANCOLD Guideline we are using foreign tailings engineers as Engineer of Record. We use local design institutes for permitting approvals only. There are challenges in how this works.
- ▶ The current local standards are not always compatible with international best practice eg.
 - ▶ with respect to emergency spillways.
 - ▶ decant pipelines under embankments.
 - ▶ construction licences





- ▶ Adoption of International Standards with support systems to aid designers, regulators and operators to adapt
- ▶ The ability for foreign consultants to produce designs and audits for our facilities more easily.
- ▶ Implementation of Technical Review Boards involving regulators, academics, consultants and operators (foreign and local) to assess future designs in the region.
- ▶ Less prescriptive standards which are risk based (set a bar but don't tell us how to jump over it)
- ▶ If there needs to be a licencing system for contractors, quality testers, inspectors and designers then implement an audit system over that to check that they are actually up to a decent standard.
- ▶ A system to allow an Engineer of Record and regular 3rd party audits who is outside the operator but supports design, construction QA, operations, etc.





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