



ERDENES SILVER RESOURCE SALKHIT MINE CLOSURE PLAN PILOT

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BUILDING CAPACITY WITHIN THE SALKHIT MINE CLOSURE PLANNING TEAM

Capacity building is a primary objective of MERIT. The purpose of capacity building for the Erdenes Silver Resource LLC (ESR) Salkhit Mine Closure Plan project is to provide our planning team with the knowledge, skills, and tools to not only conduct their work on the Salkhit mine closure plan, but to also conduct closure planning independently in the future. Our planning team consists of a multi-disciplinary team of national consultants, ESR employees, MERIT staff and international technical advisors.

WHY IS CAPACITY BUILDING IMPORTANT?

Capacity building is a critical component of our project to enable our team to develop a pilot mine closure plan that includes international best practices and meets the government expectations to advance closure planning in Mongolia.

WHAT TOPICS DOES THE CAPACITY BUILDING INCLUDE?

Capacity building sessions on six themes will be held between September and November, 2022, concurrent with the mine closure planning and design work for the Salkhit mine. The themes are:

Landform design: Is about designing landforms and reclaiming features on the mine site that will provide value to local communities and citizens. It also includes identifying areas where we need to be concerned with contamination risks, so proper techniques can be conducted to prevent pollution problems in the future.

Socio-economic impacts and transition: Information is provided to our closure planning team on the socio-economic impacts the Salkhit mine currently has on local communities, including the projected impacts when the mine closes. The planning team will use this knowledge to develop strategies to mitigate the impacts of mine closure. The team will learn about processes used to identify economic opportunities and how to develop strategies to transition toward those opportunities after mine closure.

Surface water and groundwater resources: Water is an important resource in Mongolia. Citizens depend on adequate clean water supplies to live. Access to clean water is critical for the local herders to raise healthy livestock. This capacity session advises our planning team on closure methods to protect the quantity and quality of water after the mine closes. Special reclamation techniques and water monitoring requirements will be learned.

Adaptive management: We are developing a mine closure plan, which is based on the best information we have today. What happens if conditions change? What happens if the vegetation we plant does not perform well? When unplanned events happen, we must adapt our plan so we can achieve our closure goals and objectives. The adaptive management capacity session will inform our planning team of the processes we will use to adapt our plan when unplanned events occur.

Climate change: Climate and weather events are important for Mongolians. Already we are seeing changes to our climate, for example, more frequent and more intense dust storms are occurring. Desertification is rapidly expanding the Gobi Desert. How will projected climate changes impact our mine closure? What can we do to prevent negative impacts to the reclaimed land into the future? The capacity session will answer these questions and inform our planners of processes they will use to develop adaptive climate change strategies.

Post-closure monitoring: After the mine closes and the reclamation work is complete, the mining company must monitor the performance of the site. Monitoring informs us whether any contamination is present, if our vegetation is growing well, if the water supply has returned to normal and if the site is stable (no landslides or erosion). Monitoring also advises us whether we are on track to achieving the closure goals and objectives. Our team members will learn about leading edge methods that can be used to design the reclamation monitoring program for the closure plan.

WHAT DID THE TEAM LEARN ABOUT IN SEPTEMBER?

The team attended the landform design and socio-economic capacity building sessions in September.

The landform design session presented material developed by the Landform Design Institute, a Canadian educational and technical organisation. Examples of two of the many landform design concepts and best practices presented discussed at the session are progressive reclamation and water management, shown in the graphics below. These concepts are new to Mongolian technical professionals, and integrating them into the Salkhit Mine Closure Plan, to the extent feasible, will be an important advancement in mine closure and reclamation in Mongolia. Landform design capacity building sessions were not only for the Salkhit mine closure plan, but also covered the general concept of landform design, why it is important, and how it relates to mine closure goals. The participants concluded that the training presented entirely new issues not previously discussed in Mongolia, and that the information and knowledge gained could improve the mining industry in Mongolia.

Follow every drop of water		Progressive reclamation	
Follow every drop of water through the landscape. Water is both a key to life and a great agent of disruption.		Progressive reclamation of a landform and a landscape is key to success. Learn by doing and demonstrate good performance.	
1 Be deliberate with your water balance.	Design to partition the water between the atmosphere, soil, surface water, and groundwater.	1 Reclaiming all land as it becomes available	Allow no land to remain idle – once mining is done with even a small parcel of land, reclaim it within 1 to 2 years.
2 Keep clean water clean	Design robust run-on diversions.	2 Reclaiming land every year	Set up plans to reclaim land every year. Some mines aim for consistent efforts every year to aid in planning and contracting. One mine reclaims a little more every year than the year before. All this demonstrates commitment.
3 Don't let ponded water spill over the crest.	Use watershed berms and channels to direct water to armoured swales down and safely off the landform.	3 Monitoring maintaining adapting learning	Learn as you go, correct deficiencies, do even better next time. Adapt your designs and fieldcraft.
4 Design covers to hold enough water for vegetation	Design enough available water-holding capacity to allow plants to survive the drought.	4 Progressive access	Provide permanent access to newly reclaimed land every year. Allow users to evaluate the land for themselves. Monitor use and seek feedback. Challenge any obstacles to progressive access (so few are real).
5 Route your water safely through and off the site	Establish a dendritic drainage pattern from Day 1. Once in a channel, always in a channel.	5 Progressive signoff	Sign off on reclaimed land every year, as soon as residual risks are low (usually within 10 years). Access need not wait for signoff. Challenge every obstacle.
6 Protect all waters	Seepage and groundwater and surface water are the same thing. Protect them all.	6 Accelerated progressive reclamation	Adapt the mine plan to provide large contiguous areas for reclamation every year on an accelerated schedule. Strip-mining does this already. Get in, get done, get out. Be done with the land quickly.
#02	landformdesign.com	#08	landformdesign.com

Caption 1. Graphs on water management and progressive reclamation presented during the capacity building sessions on landform design. Source: *Illustrated by Derril Shuttleworth, Landform Design Institute*



Caption 2. Day 3 of the capacity building session on landform design for multidisciplinary planning team



Caption 3. Day 1 of socio-economic capacity building sessions for multidisciplinary planning team

The socio-economic transition session was facilitated by LEOS, the socio-economic consultant for the Salkhit Mine Closure Plan project. Participants learned why measuring and monitoring social development and wellbeing in affected communities is important in the context of mine operation and closure, while governments need to play an active role in planning for the community's future. LEOS facilitated discussion sessions in which the planning team members brainstormed socio-economic impacts of the Salkhit Mine when operating and at closure. Potential measures to mitigate the negative impacts and boost the positive impacts were also discussed. The socio-economic component of the risk assessment (conducted in Stage 1) was presented, and the participants further analyzed the original risk ratings assigned by ESR and brainstormed potential mitigation strategies for each risk. LEOS also briefly discussed the results of their focus group discussions with local community citizens and emphasized to participants the importance of including a broad diversity of citizens in stakeholder engagement activities.

In conclusion, the capacity building participants had the following feedback:

Participants pointed out that *“Capacity building sessions on landform design have been informative and covered many aspects that they have never considered before, and the knowledge and experience will surely contribute to the mineral resource industry development in Mongolia.”*

Batchimeg, the lead of Environmental Consulting team expressed that *“One key learning from the socio-economic capacity building sessions was that the community must be happy after the mine closure, so all the work we carry out must ensure to meet this important goal”.*

At the end of these two capacity sessions, some of the local consultants highlighted that *“These capacity building sessions have greatly contributed to their understanding and knowledge on different topics and aspects of mine closure and that they can incorporate the best practices and concepts into their upcoming work”.*

Merit aims to provide engaging and relevant content on the Salkhit mine closure plan project. We value our stakeholders' feedback and would like to hear from you on how we can improve our newsletter.

References:

Landform Design Institute (2019). *Mining with the end in mind: Landform design for sustainable mining.*
 <<https://www.landformdesign.com/pdf/LDI-PositionPaper2021.pdf>>
 Retrieved September 19, 2022.

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