

DEMO day 2026



Connecting
Innovation
to Industry

www.imii.ca



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DEMOday 2026 Launch - SK MSCF

Lesley McGilp, Executive Director
Clyde Deletsu, Innovation Coordinator

Date: April 16, 2026

Time: 1:00-2:30 PM

Location: Terrace Room - Prairieland Park

Land Acknowledgement:

*We acknowledge that the land on which we gather is
Treaty six territory and the homeland of the Metis people.*



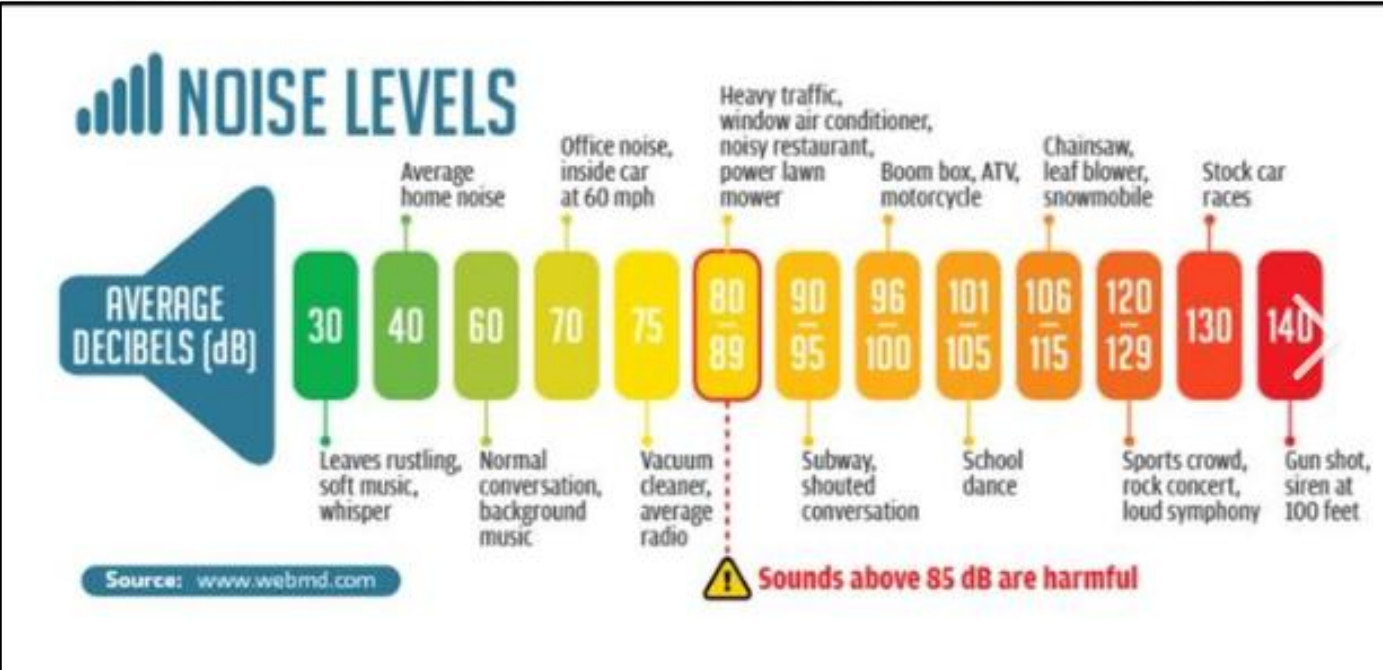
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Safety Moment: Noise and Hearing Loss



Cause: Prolonged Exposure above 85 decibels:
ex. Noisy Restaurant, Heavy Traffic.

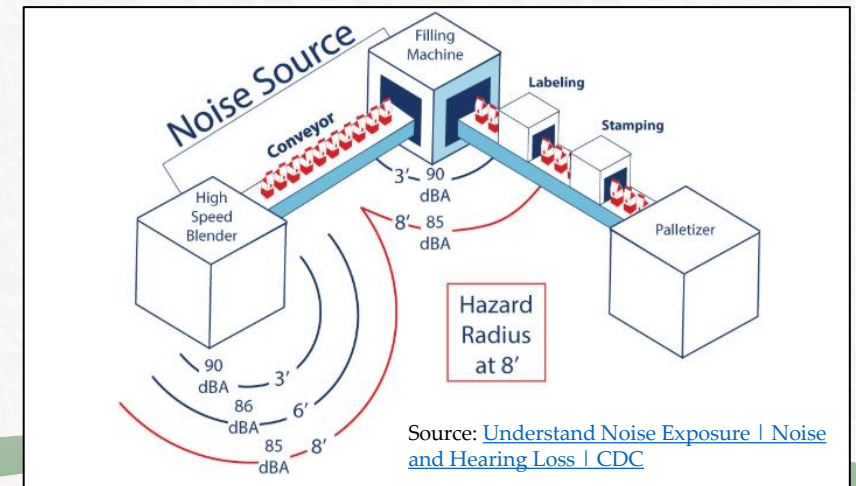
- **Signs:** Frequently Delayed
- **Long-term Impacts:**
 - Reduced situational awareness
 - Permanent Loss, Comms Challenges
 - Reduced QoL, Social withdrawal
 - Increased Dementia Risk
- **Mitigation Strategies:**
 - Noise monitoring and mapping
 - Hearing Protection



Metal Grinding: 95-110 dB



Coffee Grinder (blade type): 88-95 dB



DEMOday Launch Agenda

- **IMII Strategic Overview – Lesley**
- **Innovation Strategic Priorities – Clyde & Industry Reps**
 - **Safety**
 - **Reliability**
 - **Sustainability**
- **DEMOday 2026 Overview**



IMII Mission: IMII is a member-based consortium that brings together industry, post-secondary education, government and solution providers to collaboratively pursue innovation, workforce development and thought leadership to sustain and strengthen the Saskatchewan Minerals Sector.

Vision: To be a valued leader in building collaborative innovation and workforce development capacity that drives the growth and advancement of Saskatchewan's minerals sector.

Values:

Collaboration: We are a unique network that accomplishes more by working together.

Trust: The network shares non-competitive information openly for the collective success of the minerals industry ecosystem.

Impact: We invest to generate positive outcomes for industry and society.

Sustainability: We acknowledge that all things are connected, and our decisions support a more sustainable world.



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Strategic Imperative: All IMII members receive and perceive value from their IMII Membership.

IMI:

- Facilitate intersections to drive innovation.
- We belong where collaboration matters
- Draw and deliver value for all collaborators.



Cameco

Industry

BHP

2026 Members



Academia

Solution Providers



HATCH



Government



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IMII's strategic plan focuses on achieving meaningful value across 3 pillars that represent our core organization purpose:



Innovation

- Support technology development



People

- Strengthen workforce capacity, diversity and skills.



Knowledge

- Thought leadership and strategic insights to facilitate industry analysis and future thinking.

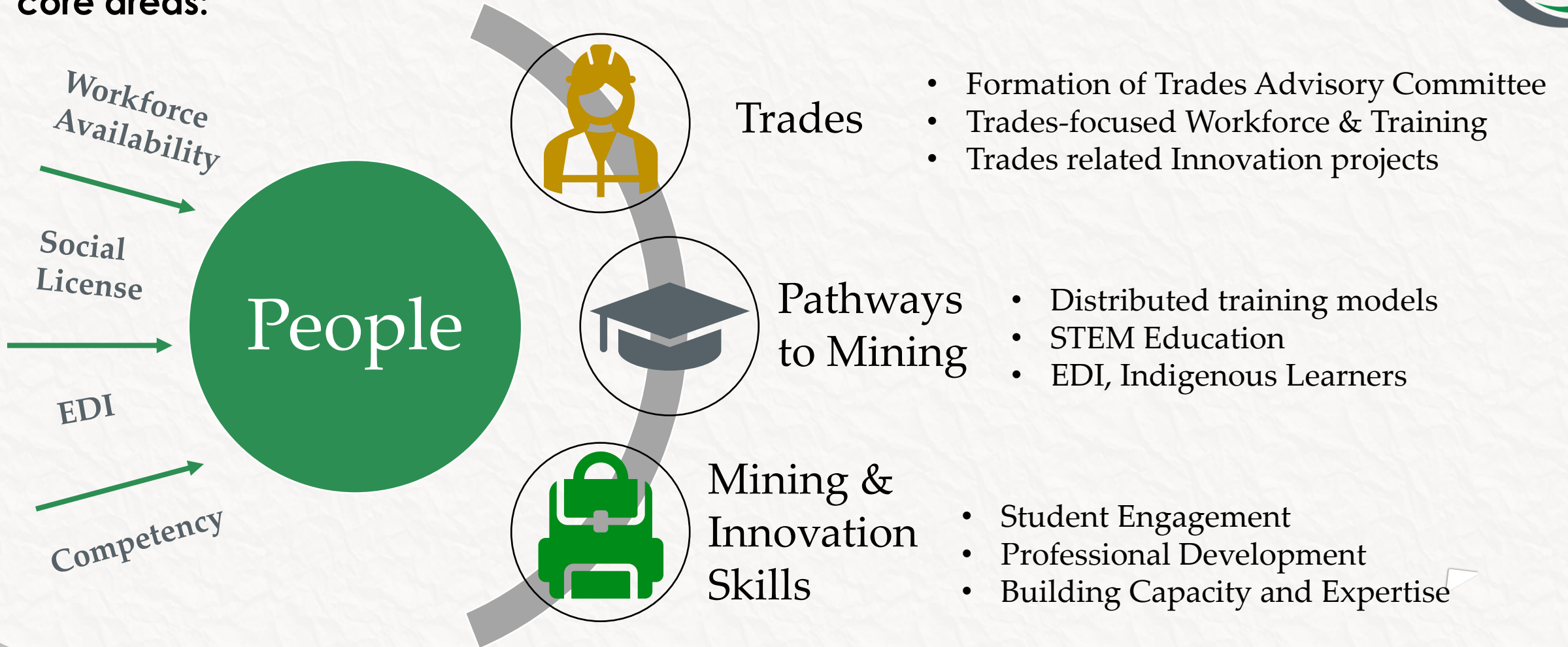


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IMI People Strategy



Develop projects to strengthen workforce capacity, diversity and skills across 3 core areas:



IMI Knowledge Strategy

Thought Leadership and Strategic Insights to facilitate industry analysis and future thinking



Knowledge



Engage senior leaders in IMI activities to guide identification of key interest areas.



Execute studies, publish and present outcomes on identified topics.



Generate discussion that elevates knowledge and understanding of key issues.



IMII Innovation Strategy

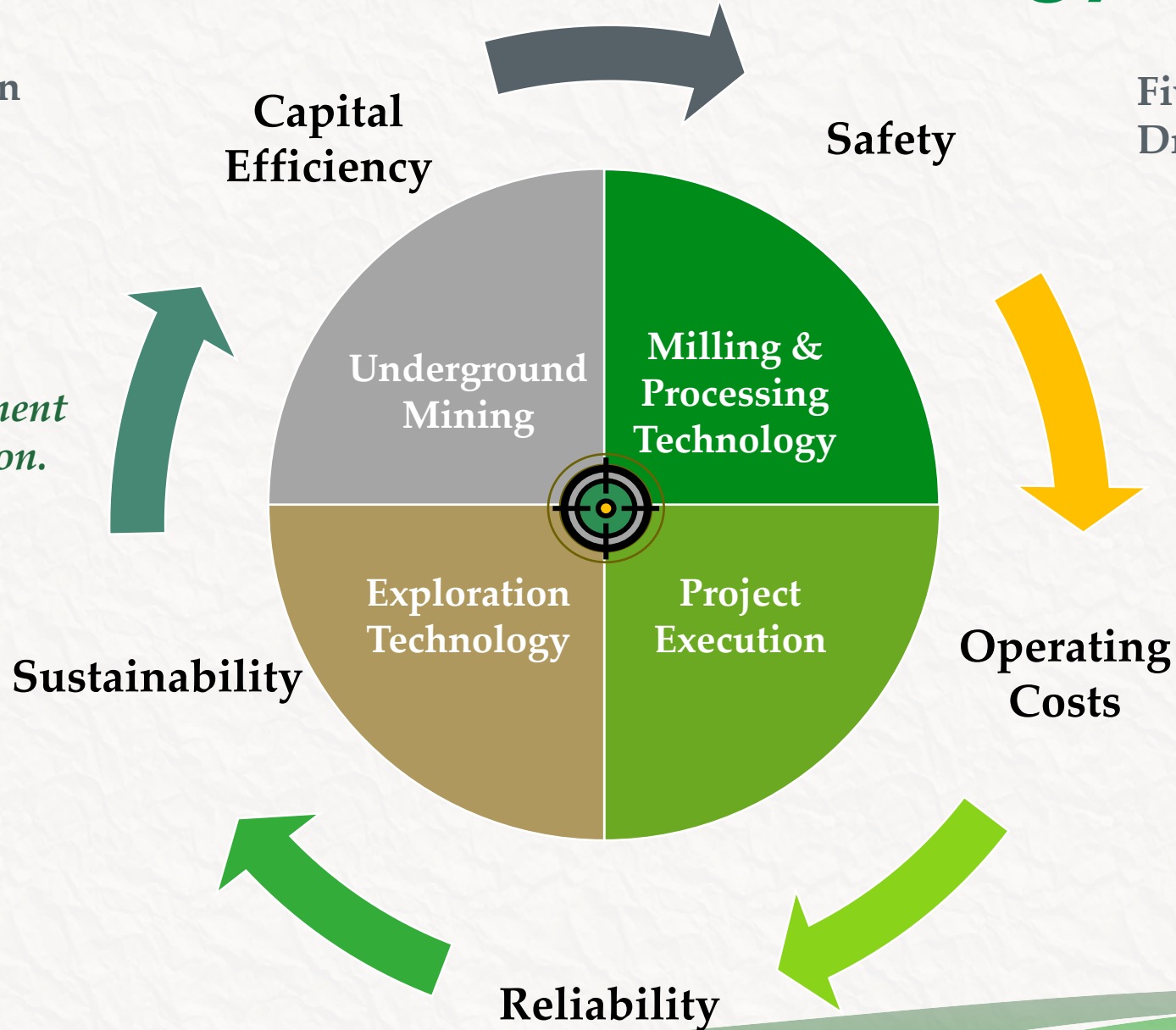


Four Innovation Focus Areas

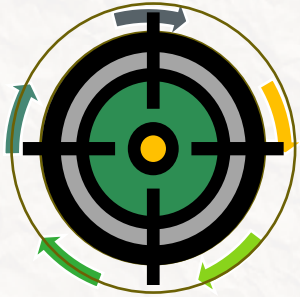
Five Innovation Drivers

Advancing Ideas toward Development and Demonstration.

Driving growth for the Saskatchewan minerals sector.



Working with the IMII Target



Fundamentals Skills, Ideas
Innovative Concepts
Innovative Inventions
Demonstrations, Core Skills, Core Goals

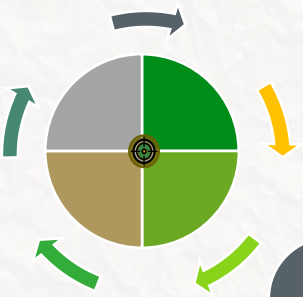
Bullseye: Core goals that are strategically meaningful

IMII Collaborative Innovation Projects: Drive toward core goal, focus on the Grey & Green zones.

Leveraging the Tool Box:

Innovation Tool Box:

- Automation/AI/Digital Tech
- Sensors
- Machines
- Bio-Tech
- Process Chemistry
- Foundational or Strategic Knowledge



Innovation Strategic Priorities:

DEMOday 2026 submissions should align with these priorities.



Safety

- Eliminate serious injuries from human-equipment interactions
- Mitigate/eliminate human-environment interaction hazards
- Reduce Repetitive/Routine Task Injuries
- Mitigate human factor risks

Reliability

- Reduce maintenance downtime
- Explore advanced materials to enhance equipment reliability.
- Enhance predictive maintenance
- Improve sustainable production and operations

Sustainability

- Reduce water use or enhance water reuse
- Tailings Deposition & dewatering



Innovation Strategic Priorities: Safety

- 1. Eliminate serious injuries from human-equipment interactions**
 - Reduce human exposure to hazards during maintenance
 - Predictive or inspection tools to anticipate equipment failures
 - Lock out/tag out enhancements
- 2. Mitigate/eliminate human-environment interaction hazards**
 - Proactive hazard management “tech on your shoulder”
- 3. Reduce Repetitive/Routine Task Injuries**
 - Reduce human exposure to accumulative hazards (vibration, noise, heavy lifting)
 - Eliminate poor ergonomics in repetitive tasks (ex. awkward positioning)
- 4. Mitigate human factor risks**
 - “Tech on your shoulder” to enhance situational awareness, fit for duty awareness
 - Training technology (ex. VR)

Opportunities to reduce ‘dull, dirty or dangerous’ activities.

Safety Priority Area Specific Items:



Underground

- Sensors to anticipate collisions
- Geologic hazard sensors
- Emergency alert systems: radiation, fire, excessive dust
- Dust collection & mitigation 'smart chute'
- Stoper operation (vibration hazard)

Mill/ Processing

- Load-out (rail car loading)
- Sensing technologies for reducing collisions
- Equipment inspection/health monitoring tools.

Exploration

- Remote Emergency Response (connectivity)

Project Execution

- Contractor Training & management
- Situational awareness during construction/maintenance

Innovation Strategic Priorities: Safety

- **Detailed Examples**
 - **Ground control – Proactive Detection** - Philippe Lepage, Nutrien
 - **Vehicle and People Interactions (Collision Avoidance)** – Clyde Deletsu
 - **Addressing Physical Ergonomic Challenges to reduce LTIs** – Clyde Deletsu
 - **Efficiency - Intelligent Workflow Optimization** - Clyde Deletsu





Safety Challenges – Examples

Ground Control – Proactive Detection

- Lack of forward visibility:
 - Creates uncertainty in detecting geological anomalies, voids or stress conditions ahead of mining,
 - Increases risk of sudden roof failures, unplanned ground falls and associated safety hazards.

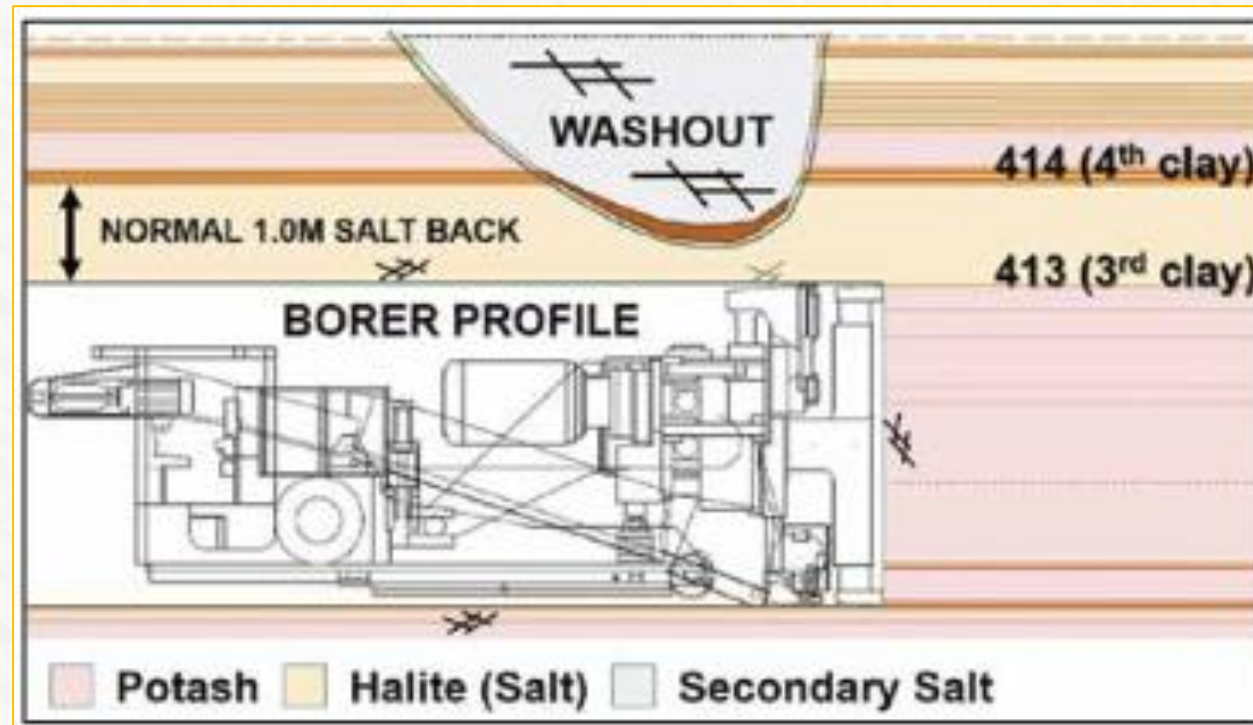


Illustration of potential fall-of-ground hazards in potash Mines (from PotashWorks 2026)



Safety Challenges – Examples

Ground Control – Proactive Detection

- Current ground control practices in potash mining rely on reactive measures such as sounding, scaling and established procedures, supplemented by ground penetrating radar (GPR) for limited subsurface imaging.
- Does not provide a direct or continuous way to “see” beyond the active cutting face.
- **Proactive solutions that enable real-time, reliable imaging or predictive modeling beyond the mining face is essential to improve hazard anticipation, enhance worker safety and optimize mine planning.**



Current sounding techniques using scaling bar are unreliable and inconsistent from worker to worker

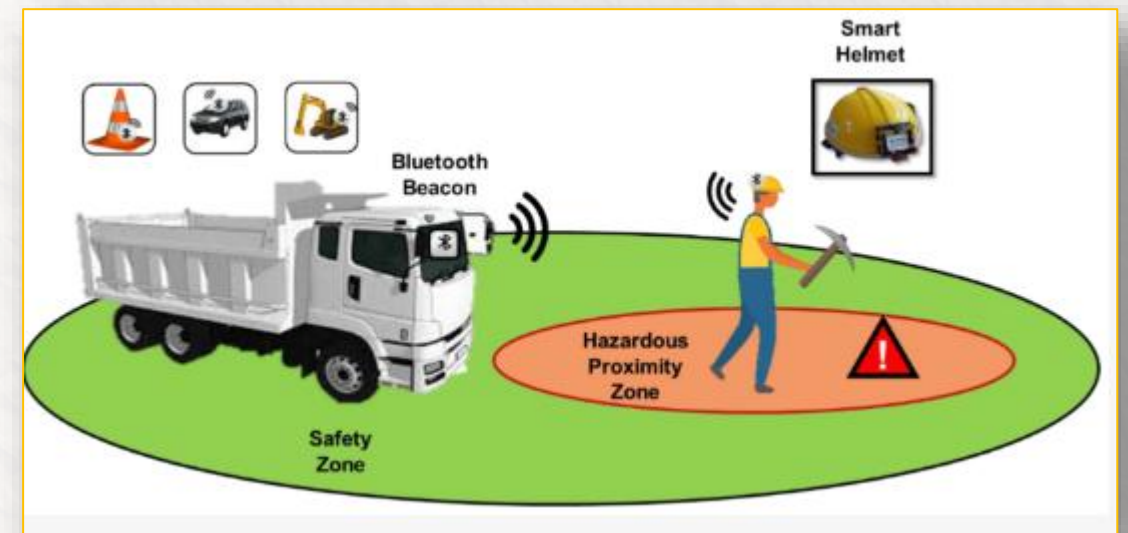
Safety Challenges – Examples

Vehicle and People Interactions (Collision Avoidance)



- **Interaction between mobile equipment and personnel** is consistently identified as one of the **top risks** in underground mining and surface activities. **Confined spaces, low visibility and procedural complexity** amplify this hazard.
- Proximity incidents, especially involving personnel carriers and haulage units remain a high-priority risk area.
- Proactive solutions such as proximity detection, warning systems and technologies that enhance visibility or awareness in low visibility or congested environments are essential

Personal proximity warning system



Kim, Y., Baek, J., & Choi, Y. (2021). Smart Helmet-Based Personnel Proximity Warning System for Improving Underground Mine Safety. *Applied Sciences*, 11(10), 4342. <https://doi.org/10.3390/app11104342>

Safety Challenges – Examples

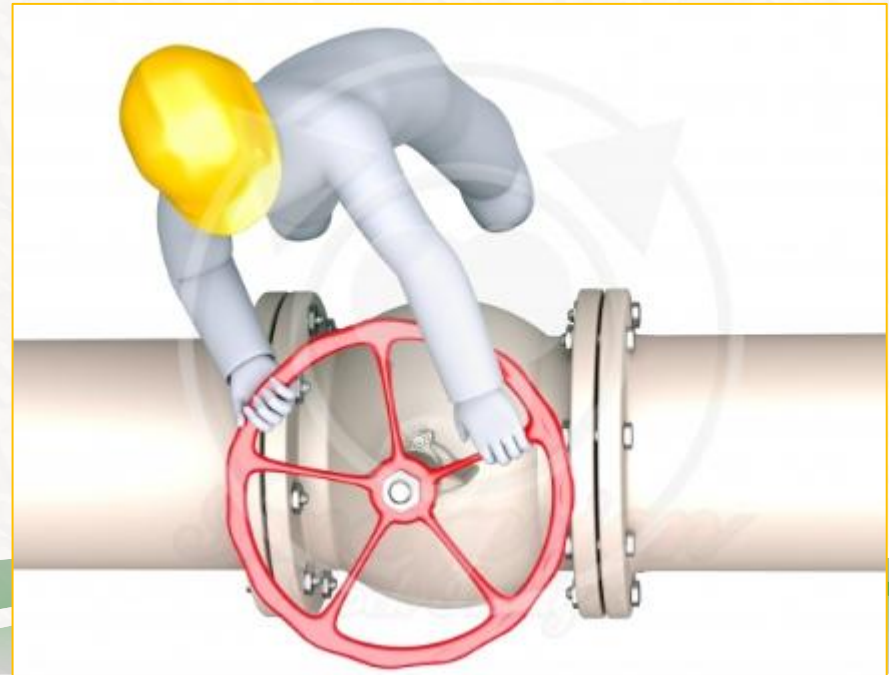


Addressing Physical Ergonomic Challenges to reduce LTIs

- Innovations that mitigate challenges with tasks in hard to reach areas.
- Innovations to avoid putting workers in Line of Fire of an accidental energy release.



- Innovations to **reduce awkward and strenuous tasks**, such as operating equipment such as large gate valves.



Safety Challenges – Examples

Intelligent Workflow Optimization

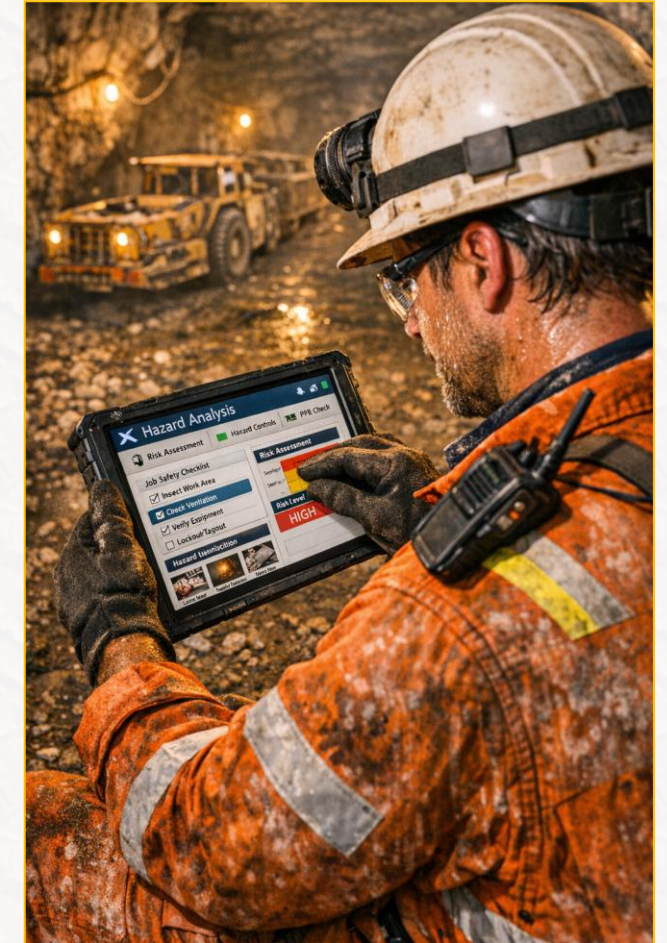


Challenges

- Many frontline and supervisory workflows—work planning, task coordination, approvals, reporting, and issue escalation—remain manual or loosely digitized.
- Reliance on paper, spreadsheets, emails, and disconnected systems leads to fragmented information, delayed decisions, and inconsistent execution across sites.

Opportunity

- As operations become more complex, dispersed, and time-sensitive, incremental digitization is no longer enough.
- Intelligent workflow automation offers a step change—improving real-time visibility, situational awareness, and proactive decision-making across the work lifecycle.



Innovation Strategic Priorities: Reliability



1. Reduce maintenance downtime

- Dust Reduction
- Innovations to allow maintenance w/o shut-down
- Efficient downtime:
 - Enhanced lock-out/tag-out methods
 - Effective planning tools: Easily accessible updated drawings

2. Enhance Equipment Integrity

- Improved hoisting reliability, belt and miner equipment reliability
- Advanced materials & manufacturing methods to enhance equipment integrity
- New (novel) measurement methods for health monitoring of mechanical components
 - Looking for novel concepts only.

3. Enhance Sustainable Production and Operations

- Predictive process control
- Advanced process analytics and measurement
 - New measurement tools: online moisture to dryers, radiation monitoring equipment

Innovation Strategic Priorities: Reliability

- Detailed Examples

- Corrosion Challenges – Jackson Lake, Mosaic
- Innovative Solutions to Improve Reliability of Mainline Ore Belts – Jackson, Mosaic
- Innovative Solutions to Improve Hoist Reliability – Christopher Maierhoffer, BHP
- Connectivity Challenges for Remote Uranium Mines – Clyde Deletsu



Reliability Challenges - Examples

Corrosion Challenges



- Corrosion in the potash industry is a significant challenge due to the corrosive nature of the material itself
- What advanced materials and manufacturing processes can be explored to mitigate these issues?
- What advanced materials can be used to easily perform temporary patches to extend life of failed pipes and ducts in the field – allowing time to plan for proper replacement



Pictures showing the effects of corrosion in Potash Mills

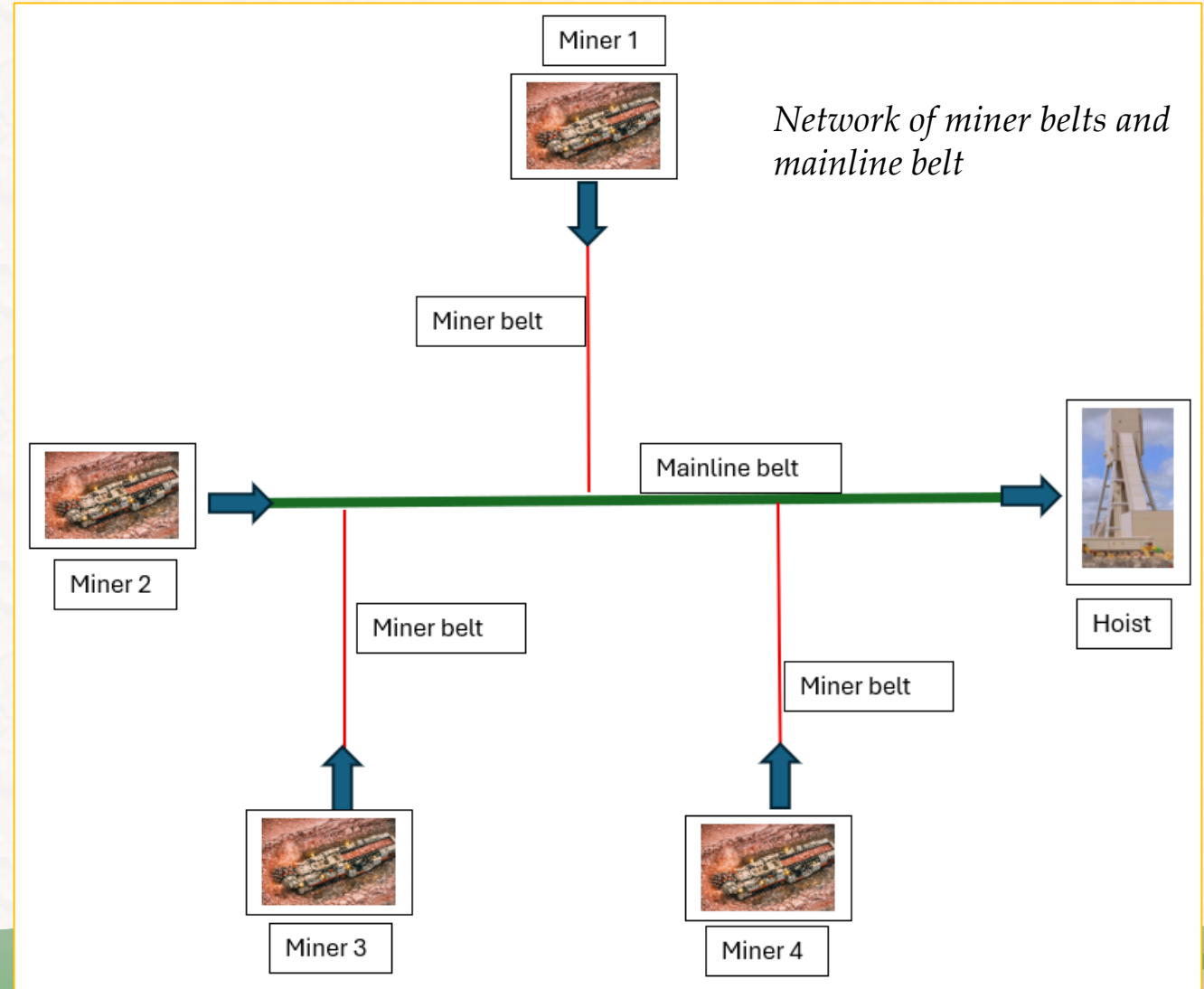


Reliability Challenges - Examples

Innovative to Improve Reliability of Mainline Ore Belts



- Mainline conveyor belts are critical to mine production, transporting the combined output of multiple mining sections to the main shaft for hoisting
- Because they operate continuously over long distances, any unplanned downtime can halt production across several areas, creating significant operational and financial impacts.



Reliability Challenges - Examples



Innovative Solutions to Improve Reliability of Mainline Ore Belts

- Predictive maintenance is essential for ensuring their reliability.
- **Monitoring technologies can detect early signs of belt wear, misalignment, roller failures, and drive system issues, helping prevent unexpected breakdowns and reducing downtime.**
- **Belt-vision systems, in particular, offer early warning capabilities by identifying potential splice failures before they occur but there's still room for improvement – to detect roller failures, drive system issues etc.**



Reliability Challenges - Examples

Innovative Solutions to Improve Hoist Reliability



- **Hoisting systems are critical** to underground mining, responsible for transporting people, ore, equipment, and supplies between surface and underground operations.
- Because these systems **operate continuously under heavy loads and strict safety requirements**, any interruption can stop production immediately, limit personnel movement, hinder emergency response, and significantly increase operational and safety risks.
- **Even short periods of downtime can result in major production losses and costly delays.**



Hoist transporting ore from underground to surface

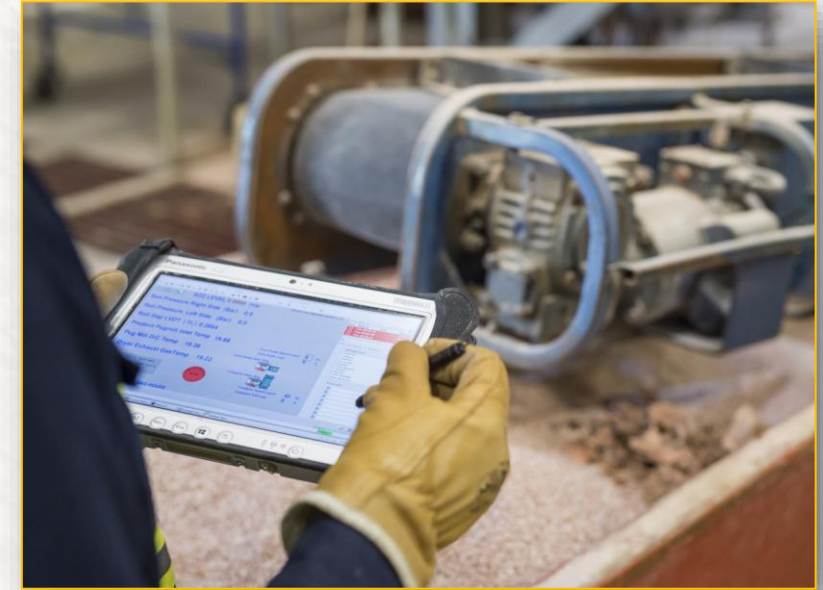
Reliability Challenges - Examples

Innovative solutions to Improve Hoist Reliability



Challenges

- Mechanical Wear & Component Degradation
- Control System & Sensor Failures
- Insufficient real-time condition monitoring
- Environmental and Operational Stressors (temperature fluctuations, moisture etc.)



Reliability Challenges - Examples

Connectivity Challenges for Remote Uranium Mines



- Mining operations in Northern Saskatchewan operate in some of the most remote and environmentally challenging conditions in Canada. Reliable, resilient connectivity is critical to maintaining safe, efficient, and compliant uranium mining operations.
- These operations rely on connectivity for
 - Core logging and geological interpretation
 - Environmental monitoring and reporting
 - Worker safety, emergency response, and communications
 - Production systems, automation, and remote operations
 - Cloud-based applications and data platforms
- Challenges
 - Dependence on a single telecommunications provider or network
 - Limited redundancy for critical operations systems
 - Growing connectivity needs for AI, automation, and monitoring systems (Increasing bandwidth)



Innovation Strategic Priorities: Sustainability



1. Impactful energy use reduction

- Potash drying retro-fit
- Energy storage technologies
- Northern mines: Off-grid Energy efficiency

2. Reduce water use or enhance water reuse

- Technologies to reduce water use
- Tech to improve circularity of water use:
 - Desalination
 - Contaminant removal



3. Tailings Deposition & dewatering

- Increased density of tailings output
- Supernatant treatment after dewatering (ex. sulphate)

Innovation Strategic Priorities: Sustainability

- **Detailed Examples**
 - **Low-cost Potash Tailings Deposition Strategy Solutions** – Clyde Deletsu
 - **Innovative Monitoring Systems for Utility Usage and Leak Detection** – Chantel Coburn, Nutrien
 - **Potash Water Challenges** – Chantel Coburn, Nutrien



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Sustainability Challenges - Examples

Low-cost Potash Tailings Deposition Strategy Solutions



- Unlike hard-rock tailings, potash tailings are highly soluble and can undergo rapid changes in moisture content, strength, and behavior when exposed to precipitation, seepage, or process-water variability.
- These characteristics make potash tailings particularly sensitive to slope instability, surface erosion, embankment softening, and unexpected settlement.
- Maintaining stable deposition slopes, managing brine movement, and anticipating geotechnical changes are essential to reducing operational risk and meeting regulatory expectations.
- Given these complexities, operators increasingly require real-time insight into tailings performance and predictive tools that support proactive planning.

Potash Tailings Management area





Sustainability Challenges - Examples

Innovative Monitoring Systems for Utility Usage and Leak Detection in Mining Operations – Energy use

Monitoring utility usage:

- Mining operations rely heavily on critical utilities such as compressed air, hydraulic fluids, and glycol-based heating/cooling media.
- Undetected losses in these systems—whether through small leaks, faulty fittings, or equipment failures—can result in: operational inefficiencies, increased energy consumption, elevated maintenance costs, equipment downtime, environmental or safety risks.
- Technologies that enable actionable insights without excessive installation or maintenance complexity (i.e. options that do not involve extensive additional instrumentation).



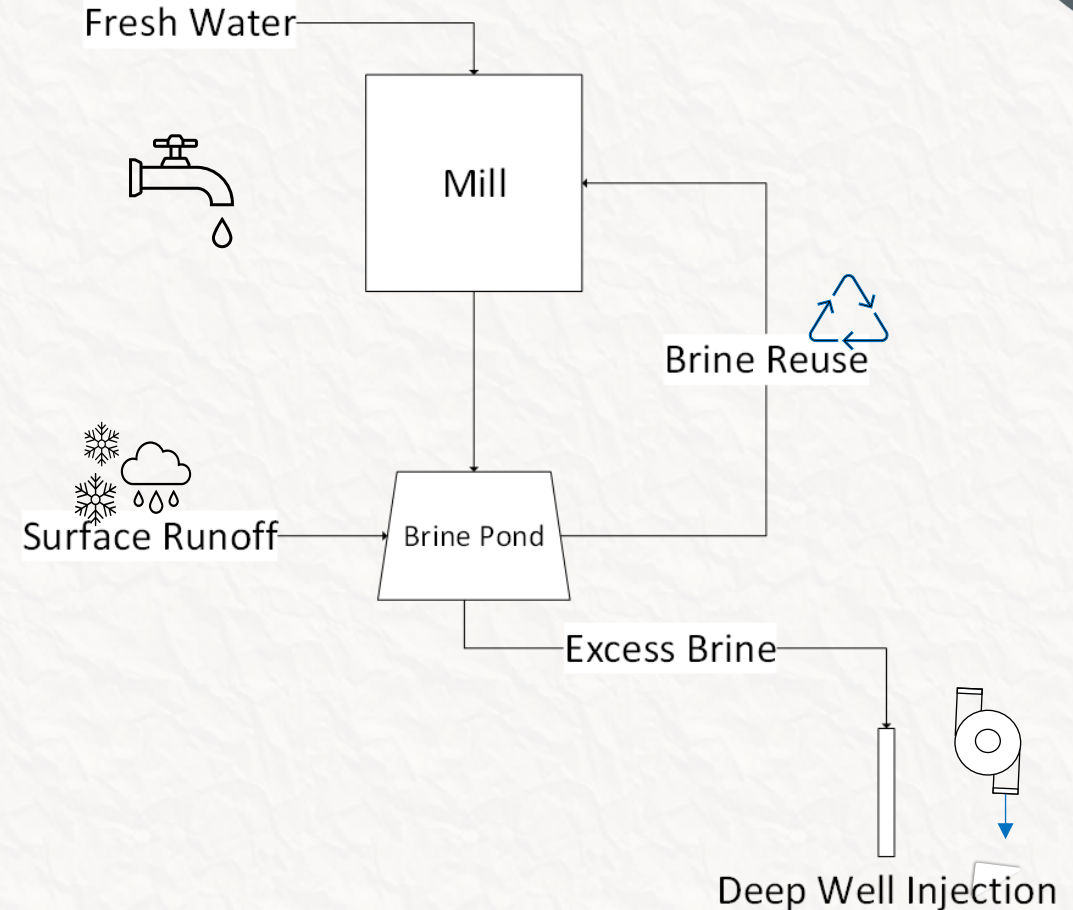
Sustainability Challenges - Examples

Potash Water Challenges



Potash mines in SK follow a zero liquid-discharge policy.

- All excess water, from precipitation (rain & snow) collected on-site or additional fresh water pumped in, is deep-well injected to maintain relatively consistent brine containment levels.
- Result: Large volumes of co-saturated brine are injected.
- Economic brine desalination and KCl recovery represents a major environmental opportunity.
- Fresh water is used in the mill for: grade control (in flotation or crystallization), cleaning, and scrubbers.
 - Mitigating water use in any of these areas will also help decrease consumption.



IMIIE DEMOday 2026 Overview:



Application Requirements

- Length: 4-5 pages
- Innovation Name
- Innovation Category
- Differentiation
- Demand and Adoption Drivers
- Stage Development
- Innovation Description
- Path to commercialization

IMIIE DEMOday 2026 Event - Format

- Present to Industry
- Closed door Meeting
- Innovation Awards
- Follow-up process: invitations for project proposals



DEMOday 2026
QR Code



IMII DEMOday 2026 Overview: Timeline

Activity	Date
DEMOday Launch	16-Apr
Applications Open	17-Apr
Applications Close	29-May
Industry Selections	30-Jun
Invitations to Pitch	06-Jul
Registration Opens	20-Jul
Registration Closes	28-Aug
DEMOday Event	10-Sep



IMII INNOVATION AWARD 2025

IMPACT INNOVATION



The World needs more IMII

- Pooling Resources
- Driving Change
- Connecting People
- Facilitating Learning
- Growing Impacts

DEMOday Info available at:



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Questions?

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