

Fact sheet

Centre for Excellence in Mining Innovation (CEMI)

CEMI, housed on Laurentian University campus in Sudbury, leads a new mineral sector research initiative from Northern Ontario directed by and for the Canadian Mining industry. It was incorporated in 2007 as a not-for-profit corporation and is mandated to develop excellence in mining innovation in collaboration with regional, national, and international Research & Development partners.

CEMI's vision

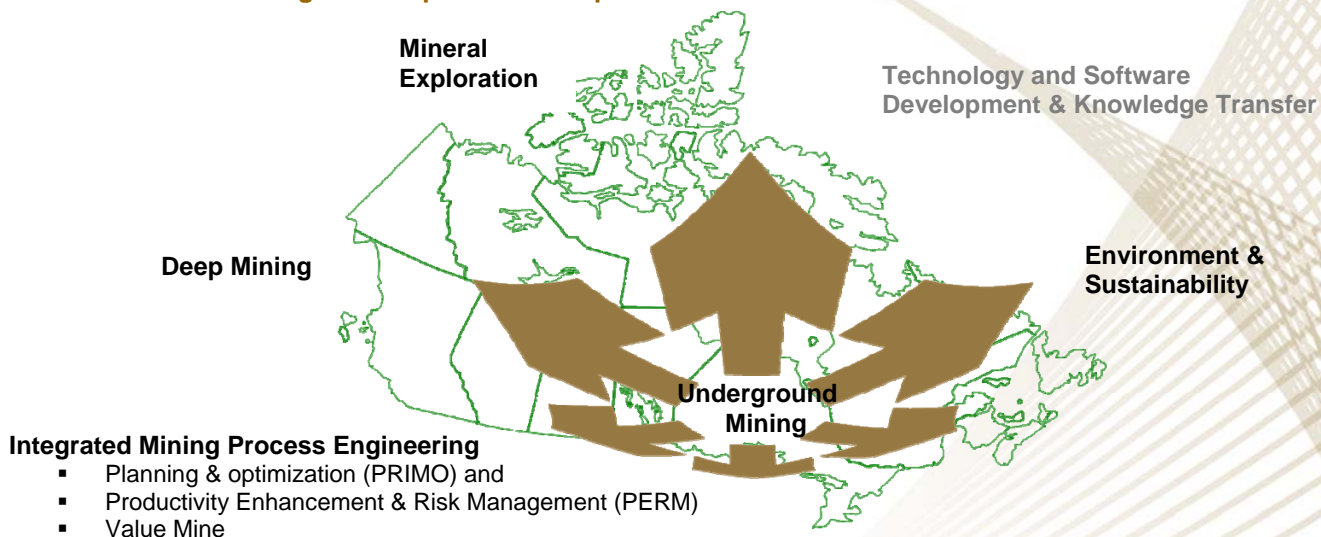
- become a **world-class, networked** centre
- for industry-focused research and innovation
 - advancing concepts, processes and methodologies
- in support of regional, national and international
 - exploration and mining industries
 - suppliers and service providers

CEMI's mission

- **add value** to mining operations in Ontario and beyond
- **strengthen capacity** and **develop HQP** (highly qualified personnel) to undertake world class, collaborative research
- form the hub of a **network of expertise**
- **sustain** the CEMI initiative and **foster growth**



R&D Themes / Programs as per business plan



CEMI's Strategic Research Projects

- Footwall /Offset Geological Environment Studies
- Geo-Risk Mitigation for Mining Highly Stressed Ore Bodies at Depth
- Mine Design to Extract Optimal Mining Value
- Underground Infrastructure Construction
- Environment/Sustainability- under development

To date CEMI has committed:

\$2M to Research Chairs
\$4M for 4 strategic R&D programs
\$2M to over 20 research projects

Fact sheet

Establish Excellence in Niche Areas

Industry focused or driven strategic R&D projects now constitute the primary focus for CEMI. These projects embrace topics identified by industry as having top priority for further research and are consistent with CEMI's strategic objective to become a global leader in specific research niches. Contact the CEMI office if you would like to be a part of these exciting projects, submit an application, and/or join the team at info@miningexcellence.ca

The Strategic Niche Areas are:

Footwall/Offset Geological Environmental Studies

Project Lead: Damien Duff

Focused on developing a greater understanding of the footwall geology of the Sudbury Igneous Complex

These projects will:

- Develop criteria for discriminating between unmineralized and mineralized breccia in the offset dykes;
- 4-D interpretations of the South Range before and after the geologic event producing the Sudbury Basin; and
- Define field and microscopic criteria to establish the nature and extent of later overprinting criteria on the footwall rocks.

Geo-Risk Mitigation for Mining Highly Stressed Ore Bodies at Depth

Project Lead: Damien Duff

Using newly constructed common earth models, datasets from collaborator companies (Xstrata Nickel Craig Mine; Vale Inco's Colman; and possibly LKAB's Kiruna mine, Sweden) will be examined to determine whether the risks associated with mining in high stress structurally complex ore zones can be identified and whether problems encountered during mining could have been anticipated sooner and more appropriate risk mitigation strategies implemented.

Mine Design to Extract Optimal Mining Value

Project Lead: Glenn Lyle

Mining companies are continually developing new and extending existing mines to create value for the stakeholders.

This project will focus on improvements to mine design. These projects are:

- Best Practice Mine Design Handbook
- Collection of case Histories
- Identification of gaps & opportunities in the mine design process

Tools & systems will be developed to optimize this process.

Underground Infrastructure Construction

Project Lead: Peter K. Kaiser

This project will support projects for underground construction by both conventional drill and blast as well as mechanical excavation and will focus on four key aspects:

- Speed and quality of underground infrastructure construction including shaft sinking and tunnelling logistics;
- Development and design of innovative support methods for different excavation systems including prototype development and testing;
- Reliable prediction of rock behaviour to properly select and implement construction technologies including effective, advanced ground characterization procedures;
- Use of smart (observational) approaches when working with the rockmass to minimize risks and uncertainties including feedback processes to facilitate flexibility in matching construction to different conditions that will be encountered in large, complex ore bodies (at km-scale).

Environment/Sustainability

Project lead: Damien Duff

Opportunities to support environmental research excellence as it relates to the sustainability of mines and mining is being evaluated. To date, scoping work is focusing on identifying research gaps associated with our understanding of: the impact of climate change on mining infrastructure; zero water discharge/effluents from mines and energy reduction/re-use/recycling in mining. It is anticipated that upon completion of the scoping work, strategic projects in one, or more of these research areas will be supported.