Minerals Analysis and Processing
at SRC
About SRC

The Saskatchewan Research Council (SRC) is one of Canada’s leading providers of applied research, development and demonstration (RD&D), and technology commercialization. With over 400 employees, $78 million in annual revenue and 65 years of RD&D experience, SRC provides services and products to its 1,900 clients around the world in four main industries: Agriculture/Biotechnology, Energy, Environment and Mining & Minerals.

About SRC’s Minerals Group

The Minerals Group provides leading-edge Smart Mining Solutions™ to its mining and mineral clients. It has developed a strong international reputation and client base. Services focus on advanced analytical testing and mineral processing as well as RD&D of models and methods for discovery and recovery of uranium, gold, rare earths, diamonds, base metals, potash, oil sands and oil shale, coal and industrial minerals. SRC’s world-renowned experience and research background allows for continual improvement in the reliability of processes and analyses, helping ensure clients’ success.

SRC has developed substantial minerals processing and metallurgical testing capabilities and is internationally recognized for geoanalytical expertise which lends itself to exploration through processing and tailings management. SRC’s state-of-the-art equipment, labs and facilities including the Advanced Microanalysis Centre™ and Mineral Processing Pilot Plant, offer valuable resources for new endeavours. The experience of the Minerals Group, combined with SRC’s broad base of specialists, enables the organization to develop unique and comprehensive solutions in one convenient location for industry in Saskatchewan and around the world.

Mineral analytical services and mineral processing are available for:

- Uranium
- Potash
- Rare Earth Minerals
- Gold
- Diamonds
- Base Metals
- Oil Sands and Oil Shale
- Coal and Industrial Minerals

SRC’s labs and experts are focused on providing leading-edge RD&D and geoanalytical services to support companies, consultants, researchers and governments with mineral exploration, mineral processing, tailings management, and reclamation and decommissioning. We provide services performed in internationally recognized, accredited and reputable labs that provide independent reporting for a wide scope of clients from junior to senior mining companies. Our team of experts readily adapts to meet our clients’ specific needs and assists with the development of new technologies and solutions.

www.src.sk.ca/mining
Minerals Analysis

SRC is an advanced and complete minerals analysis centre supporting resource industries. We have the necessary analytical tools, expertise and experience to provide you with a wide range of services and analytical packages — all accessible from one source. Our key objectives are to achieve total customer satisfaction with a diverse range of analytical exploration packages and to help develop new analytical methods to meet the growing demands of industry. Services are available for exploration, mineral processing, tailings management and remediation.

Key Services

Custom Analytical Packages

- Multi-element and uranium analysis
- Potash analysis
- Gold and base metals analysis
- High Resolution (Isotope analysis) (HR-ICP-MS)
- Kimberlite processing and diamond recovery
- Gold grain and precious metal recovery
- Carbon and sulfur analysis
- Loss on ignition
- Sand, silt and clay determination
- Specific gravity or density measurements
- Sample preparation and archiving services

Key Features

- Comprehensive analytical packages to suit exploration needs
- ISO/IEC 17025:2005 accreditation
- Facilities that are licensed by the Canadian Nuclear Safety Commission to safely receive, process and archive samples from uranium projects

www.src.sk.ca/mineralsanalysis
Advanced Microanalysis Centre™

In early 2010, SRC’s Advanced Microanalysis Centre™ opened to offer clients in the mining and minerals industries leading-edge services that were previously unavailable in Saskatchewan. The Centre, along with SRC’s Geoanalytical Laboratories, supplies all of the necessary analytical tools for mineral exploration — everything from sample preparation right through to trace element analysis. Backed by a powerful lineup of advanced analytical equipment and a robust array of services all in one convenient location, SRC’s Advanced Microanalysis Centre™ has become a reliable source for resource industries’ growing analytical needs.

In partnership with SRC Geoanalytical Laboratories, the Advanced Microanalysis Centre™ works with global clients to develop and provide services suitable for various mineral sectors including uranium, gold, base metals, diamonds, potash, rare earths and oil sands and shales. The Centre’s services are beneficial to companies, consultants, researchers and governments working in the minerals sector.

With ever-increasing industry demands, the Centre has become a one-stop shop for clients in the province, across the country and around the world.

What kind of minerals analysis do we perform?

- Custom analytical packages (XRF)
- Quantitative mineralogy (QEMSCAN®)
- Trace element analysis (LA-ICP-MS)
- High magnification imaging (SEM)
- Qualitative and quantitative sample analysis (XRD)
- Petrography slide preparation and interpretation
- Microprobe analysis (EPMA)
- Scanning Electron Microscope analysis (SEM)
- Pb isotope analysis (Pb204, Pb206, Pb207, Pb208)

All of our equipment is operated and maintained by a highly-skilled group of scientists and technicians dedicated to providing the best quality data and services to the mining industry and other sectors.

www.src.sk.ca/microanalysis
QEMSCAN®

In spring 2013, SRC announced a new QEMSCAN® service that will assist the mining industry by providing precise quantitative mineralogical analyses that are essential for proving resource deposits that lead to mine development. The increased knowledge gained through QEMSCAN analyses helps clients improve their mineral deposit models, increase mineral processing and recovery efficiency and aid in environmental monitoring of tailings.

QEMSCAN® is a sophisticated electron microscope outfitted with multiple electron and X-ray detectors that enable scientists to determine the bulk mineralogy and liberation characteristics of uranium, potash, base metals, gold, rare earth, coal and other ore samples.

The QEMSCAN® service complements the current testing services of the Saskatchewan Research Council’s (SRC) Advanced Microanalysis Centre™ and Mineral Processing Pilot Plant. SRC is internationally recognized as an expert in mineral analysis with an unparalleled range of services for the mining and minerals industry.

What will the QEMSCAN® service be used for?

- Pilot plant studies
- Ore characterization
- Mineral liberation analysis
- Processing audit studies
- Mine planning
- Environment studies
- Rehabilitation analyses
- Classification of deposit type and structure

Metal nanospheres imaged using the SRC QEMSCAN®. The largest spheres are 500 nanometres in diameter.
Mineral Processing and Metallurgical Testing

From exploration to processing and tailings management, SRC identifies solutions to improve productivity in an environmentally and economically sustainable way. We assist industry by developing mineral processing and metallurgical testing solutions to maximize recovery while minimizing costs and environmental impacts of mine and mill operations. Our knowledge, methods and technologies can be applied to operations throughout the world.

Key Services

Custom Analytical Packages

- Mineral processing and hydrometallurgy
- Process development and metallurgical testing
- Rare earth elements, uranium, potash, gold, base metals and placer minerals processing
- Pilot plant testing and process engineering
- Plant optimization
- Environmental sustainability process development
- Mine water and process effluent treatment

Key Features

- Implementing, improving or modifying processes to suit clients’ site-specific conditions
- Increasing process efficiencies resulting in less waste and less environmental effect
- Efficient environmentally sustainable processing treatment of tailings and slimes
Mineral Processing Pilot Plant

In fall 2012, SRC announced a new, unique-to-Western Canada, mineral processing pilot plant that will allow mining companies all over the world access to testing services and facilities that will develop more effective and efficient methods of processing minerals.

The pilot plant will support initiatives for processing minerals such as potash, rare earth minerals, gold, base metals, coal, oil sand and oil shale. It will create knowledge and technology to increase mining yields and decrease costs by providing bench and industrial scale testing. Examples of research projects at the facility include developing processing improvements for potash and recovery and concentration of rare earth minerals.

The facility will greatly increase SRC’s ability to develop, test, scale-up and demonstrate extraction and processing methods for rare earth minerals — one of the few centres in Canada with this emphasis. Difficult and costly to recover, rare earth minerals are in high demand worldwide for use in products such as smart phones, flat-screen monitors, electric car batteries and aerospace alloys.

Together, the pilot plant and SRC’s existing mineral processing expertise, laboratory and testing facilities ensure clients have leading-edge support capabilities to develop mineral deposits in the most effective and efficient ways, while minimizing costs and environmental impacts.

**What kind of mineral processing do we perform?**

- Applied research, development, process design, scale-up and pilot-scale demonstration
- New and improved processes for the recovery of valuable metals and minerals
- New and improved processes for sorting diamonds
- Technologies for future potential mills for rare earth minerals, potash and other minerals

www.src.sk.ca/mineralprocessing
Serving Clients

In our most recent survey, clients expressed their satisfaction in our ability to provide practical and technically sound solutions.

- **98%** of clients said they would return to SRC
- **99%** said they would refer SRC to others and
- **96%** said they were very satisfied or satisfied with the overall quality of the product or service they received from SRC

What Clients Are Saying

“We have found that SRC is able to meet our needs when other ‘proven’ labs have fallen short. We have now moved most of our processing business to SRC.”

James Tuer, President, Hudson Resources Inc

“It’s been a really good opportunity for us to work with SRC, because there are not many labs where you can go in and work with them as closely as we have. It’s almost like we’ve got our own lab, but then you’ve got all the facilities there and back up for mineralogy and assaying work.”

Richard Hogan, Vice-President of Operations, Great Western Minerals

“We presented SRC with an abnormal thin section preparation problem and they solved the problem in a very timely manner. We are very satisfied and would not hesitate to recommend SRC’s services.”

John Rowson, Scientific Advisor, Areva Resources Canada Inc.

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“SRC is still recognized as the world standard lab for potash. It still enjoys that reputation around the world. And Saskatchewan is the potash capital of the world, so what better place to have the lab.”

Dr. Peter MacLean, Senior Vice-President of Exploration, Allana Potash
Related Mining Services Offered at SRC

From exploration to reclamation planning, SRC provides sustainable solutions throughout the mining cycle. Our integrated approach to tackling industry challenges allows you to bring your operational needs to one location.

**Minerals Analysis** – SRC’s Geoanalytical Laboratories offers additional mineral analysis and processing services that complement the services offered by the Minerals Group.

**Kimberlite Processing and Diamond Recovery** – Diamond mining companies around the world send their rock samples to SRC’s diamond lab – one of the world’s largest commercial diamond labs.

**Environmental Remediation** – SRC has scientific, technical and management expertise in environmental remediation.

**Mechanical and Electrical Design** – SRC has experience engineering and designing a wide variety of mining tools, instrumentation and equipment.

**Slurry Applications** – SRC’s Pipe Flow Technology Centre™ provides test facilities and expertise for researching and developing slurry handling systems and applications.

**Environmental Testing** – SRC offers air quality, water, soil and other environmental analytical tests for mining clients.