



Saskatchewan Research Council rare earth minerals in Saskatchewan and the world

By Sheila Bautz
For L-P/SP Specialty Products
The Saskatoon-based Saskatchewan Research Council (SRC) focuses on key sectors of the province's economy, including mining and minerals, in its world-renowned potash, uranium and diamond laboratories. Recently, SRC made an expansion into a rare earth minerals laboratory that supports mineral development here and abroad.

"Within our division — devoted to mining and minerals consulting and research — we provide services from exploration to mineral extraction, processing, tailings management, mine closure and site mediation," said Craig Murray, vice-president of SRC.

SRC has been working for a while on rare earth minerals processes in their labs in Saskatoon and, this past winter, it opened a Rare Earth Mineral processing pilot plant on 51st Street. Historically, China has been the location for rare earth mineral processing.

"We're developing rare earth mineral separation processes in our lab. In our new mineral processing pilot plant, we will verify those processing designs before having them applied in the field," said Murray.

Rare earth minerals are becoming increasingly important in high tech applications like batteries, flat screen TVs and smart phones. Currently, 90 per cent of those minerals are also mined in China. However, locating areas where rare earth minerals are situated is ongoing and finds have been made in Saskatchewan.

"There is an interest around the world to develop other deposits of these rare earth minerals. Canada has many," said Murray. "Dysprosium, cerium, neodymium and lanthanum are examples of rare earth

minerals found in Saskatchewan."

SRC has been in business for over 60 years, growing their expertise over time. The council has worked closely with key clients and well-known companies to assist them with locating and developing various mineral deposits through geo-science work. As a result, SRC has developed methodologies over the years that provide invaluable information while developing specific assay methods, processes and technologies, enabling SRC to provide quality information.

"Over time, our teams of geoscientists, engineers and other scientists have worked together to develop new methods with the client. Usually, our clients have a specific need or challenge and we'll develop a new system," said Murray.

Mineral processing begins with exploration. SRC predominantly provides geo-analytical assay to exploration companies that drill and send their samples to SRC for analysis. SRC can tell them what type of minerals they have, and information regarding the concentrations and quality of the minerals.

The processing aspects involve removing minerals from the ground and separating them from surrounding rock. SRC works with clients to develop processes and equipment to extract and separate the mineral. There are many types of equipment used in the separation process: crushing and grinding; floatation valves; magnetic separation; cyclotronic, which involves spinning the samples; and chemical separations, where the mineral is leached out of rock that has been crushed.

"Often there is a recipe that works particularly well for a given geology or mineralogy. We work with our clients to find that method and develop it. We do so through many ways, including really



advanced analytical tools in our Advanced Microanalysis Centre," said Murray.

Not only does SRC work with exploration and separation processes, but the council also works with mining companies to develop specialized mining tools and equipment. Saskatchewan has unique geological challenges that require the development of specialized mining methods for the province.

"Saskatchewan has an abundant resource of uranium and potash with a mature industry, which is still expanding. We've developed methodologies and tests here that are used as standards around the world," said Murray.

SRC has two locations in Saskatoon: Innovation Place and 51st Street. For more information, visit www.src.sk.ca.



Top: SRC's Development Engineering team works on a wide range of projects with clients from across Canada and around the globe.

Photo courtesy of Saskatchewan Research Council

Bottom: The Saskatchewan Research Council's Advanced Microanalysis Centre™ electron probe micro-analyzer, also referred to as an electron microprobe, can be used to perform highly sensitive chemical analyses of micro-volumes of samples.

Photo courtesy of Saskatchewan Research Council

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Brandt – Committed to Mining

For over 80 years, Brandt has provided powerful value to their customers through a solid commitment to strong core values. Quality, Innovation, Commitment and Customer Focus have been at the heart of their business.

Brandt is known worldwide as a growing, dynamic and diverse group of companies that has strong roots in Saskatchewan.

The key to Brandt's reputation is their focus on creating and maintaining the great relationships they have built with employees, customers and the communities they have invested in.

One of Brandt's key strengths is that their team of professionals finds solutions for clients, with a focus on designing and manufacturing the most innovative equipment to meet customers' needs.

Brandt also understands the importance of mining in Saskatchewan. With a long and successful history of serving this industry, Brandt is committed to helping the industry grow through outstanding service and support.

From surface to underground mining, Brandt has a selection of equipment to fit their customers' wants and needs. With a commitment and track record in high-quality, innovative, customer-focused products and services, no other company is more committed to provide the mining sector with better solutions, more reliable products or smarter technology.

For the last four years, Brandt has focused on creating solutions for companies in the underground mining industry.

The highly talented and experienced design team takes pleasure in working closely with customers to achieve productive solutions for all their mining needs.

"Mining is an exciting and unique industry. All mining companies are faced with unique challenges and we are committed to listening to the customer to develop solutions to overcome these challenges," said Andy Semple, business manager of mining and custom projects. "We create custom equipment and develop solutions with a focus on quality and overall value for their operation."

According to Semple, the key to Brandt's success has been customer service and responsiveness to their development needs.

From that point, Semple and his team evaluate the next steps by mapping out the challenges and creating a plan of action. This includes researching what is currently being used, then investigating ways to optimize the process by utilizing leading-edge technology.

"Our team works with the customer to develop a solution," said Semple. "We also offer support and stand by the products we develop."

A great example of Brandt's commitment to their customers is the relationship and investment they have with Potash Corporation of Saskatchewan (PotashCorp). With a focus on employee safety, both organizations worked together to develop a new version of ground-penetrating radar.

Mining professionals use ground-penetrating radar to



PotashCorp's Darren Cuthill with Jim Thompson and Gilda Valenzuela from Brandt.

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Andy Semple
Brandt Business Manager of Mining
and Custom Projects

accurately locate underground anomalies while mining. The ground-penetrating radar is instrumental in helping to identify overhead separations in order to identify the potential for ground collapses.

With employee safety being a priority, Michael Pletz, Brandt's mining platform team lead, helped develop the ground-penetrating arm that effectively positions the ground-penetrating radar for a real-time, accurate visual of ground conditions.

The one-of-a-kind product, which is eight feet long and has about four feet of travel, was developed concurrently with PotashCorp.

"By maintaining constant contact with the back (ceiling) of the mine, it allows for an opportunity to identify any potential danger areas. By identifying these areas, the necessary precautions can be taken to mitigate any potential

risk," said Pletz. "Together we created this innovative new customized equipment."

PotashCorp brought their safety needs to Brandt and together they created a solution to ensure optimum safety for their miners.

"With a strong design team and the manufacturing capabilities to support it, we design and create equipment for the specific application instead of force-fitting something that already exists," said Pletz. "We are confident in the fact that our customers benefit from our solutions but creating what is needed to help them succeed"

The new equipment assists in making sure the cut is safe. The radar arm can project a live readout that detects whether the geology above the cut is safe or if precautions need to be taken before advancing forward.

"Successful collaboration means that the end product lives up to PotashCorp's requirements for safety, reliability and efficiency. The added bonus is that we are both based in Saskatchewan," said Darren Cuthill, PotashCorp Rocanville's chief mine maintenance engineer.

The new ground-penetrating radar highlights the Brandt philosophy of creating working relationships with customers that lead to solutions that reduce costs, improve productivity, enhance safety and increase operational efficiencies. Over the years, other manufacturers attempted to develop a similar product that would work. Together, Brandt and PotashCorp found the solution in less than seven weeks.

It's Brandt's company-wide promise to help their customers succeed by empowering them with the outstanding performance of their people and the uncompromising quality of their products and services.