SGS METALLURGICAL CAPABILITIES IN CANADA

An Overview of Metallurgy Expertise in Canada

For nearly 80 years, SGS has been providing bankable metallurgical expertise across Canada. With locations in Lakefield, Ontario, Vancouver, British Columbia and Quebec City, Quebec, our network of metallurgical facilities across Canada provides the global mining industry with effective flowsheets and practical technical solutions to processing issues.

Our metallurgical expertise covers a wide range of commodities including:

- Precious metals (gold, silver, platinum, palladium, etc.)
- Base metals (copper, cobalt, zinc, nickel, lead, molybdenum, manganese, etc.)
- Rare earth element minerals
- Uranium/ Naturally occurring radioactive material
- Industrial minerals (lithium, graphite, etc.)
- Iron Ore
- Hydrocarbons

Our scope of metallurgical capabilities in Canada includes:

MINERAL PROCESSING

Flotation

Flotation is one of the most extensively used and adaptable mineral processing techniques. The flotation process ultimately produces saleable concentrate grade from both simple and complex ores. Bench scale flotation test programs generate parameters including flowsheet design, flotation kinetics, reagent schemes and optimization and grind size. Our flotation capabilities include:

- Flotation Equipment
- Mineral Flotation Test (MFT)
- Column Flotation
- Oxide Flotation
- Mini Flotation Pilot Plant

Comminution

With grinding circuits typically being the largest or second largest capital investment for a mine, it is vitally important to be confident in your grinding circuit design, to ensure positive project economics. We offer several comminution tests that have been created to design grinding circuits or optimize existing operations including:

- SAG Power Index (SPI)
- Bond Ball (BWI)
- Bond Ball (RWI)
- Bond Low Energy Impact
- Abrasion Index
- Modified Bond
- HPGR
- JK Drop Weight
- SAG Mill Comminution (SMC)
- SAG Pilot Plant

Beneficiation

Beneficiation is the process where ore is reduced in size and gangue separated from the ore. Separation of certain minerals can be efficiently achieved by taking advantage of the physical, electrical and magnetic properties. Our beneficiation capabilities include:

Gravity Separation

- Gravity Recoverable Gold (GRG)
- Spirals
- Mozley Tables
- Falcon Separator
- Knelson Concentrator
- Wilfley Tables
- Dense Media Separation (DMS)/ Heavy Liquid Separation (HLS)

Magnetic Separation

- Davis Tube
- SATMAGAN
- Electrostatic
- High Intensity
- Perma Roll
- High Magnetic Intensity / Low Magnetic Intensity

Size Classification

- Screens / Sieves
- Cyclosizer
- Malvern (Laser PSA)

Ore Sorting

EXTRACTIVE METALLURGY

Our extractive metallurgy enables you to develop trusted flowsheets which will allow you to recover maximum recovery yields while meeting environmental and health and safety regulations. Our extractive metallurgy capabilities include:

Gold Extractive Metallurgy

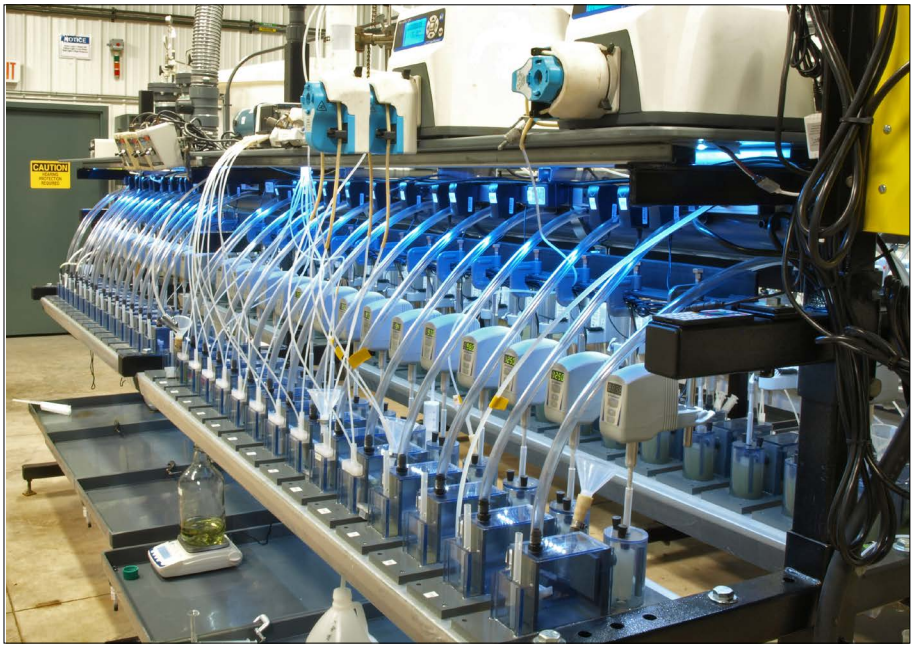
- Cyanide Leaching
  - o Bottle Rolls
  - o Column Leaching
- Bioleaching
- Thiosulphate Leaching
- CIP/CIL Modelling
- SART Testing
- Cyanide Destruction/Recovery

Hydrometallurgy

- Atmospheric and Pressure Leaching
- PLATSOL™
- Product Purification
  - o Selective precipitation
  - o Solvent extraction
  - o Ion exchange
  - o High purity product production

Solid-Liquid Separation

- Static and dynamic thickening
- Pressure and vacuum filtration
- Rheological testing



MINERALOGY

Mineralogy is the expert quantitative study of minerals using manual and automated techniques. Our mineralogy experience spans a wide range of elements, commodities and deposit types. We provide testing for a multitude of applications – from exploration, through to production, industrial hygiene, environmental applications and mine closure.

Our mineralogy capabilities include:

- Optical Microscopy
- QEMSCAN
- XRD
- SEM
- Gold Deportment

GEOMETALLURGY

Geometallurgy is the integration of geological, mining, metallurgical, environmental and economic information to maximize the Net Present Value (NPV) of an orebody while minimizing technical and operational risk. Our geometallurgy capabilities include:

- EXPLOMIN™
- Plant Design, Production Optimization and IGS Simulations
- Geostatistics
- Domaining
- Production Forecasting

PILOT PLANT TESTING

Pilot plant testing is used to demonstrate and confirm that the flowsheet developed at the bench is viable. SGS pilot plants are unique in that they operate in an integrated fashion. Our main pilot plant facilities are fully supported by state of the art analytical laboratories. Our pilot plant capabilities include:

- Mini Flotation Pilot Plant Testing
- Mini and Large Scale Pilot Plant Testing
- SAG Mill Pilot Plant Testing
- Dense Media Separation Pilot Testing
- Continuous Pressure Oxidation (Autoclave)
- CIP/CIL Pilot Plant Testing
- Cyanide Destruction Pilot Plant Testing

ENVIRONMENTAL SERVICES

It is vital to minimize all environmental considerations to achieve a successful mining operation. Our environmental capabilities include:

- ARD Testing
  - o Static Testing
  - o Kinetic Testing
- Water Treatment Solutions

OTHER CAPABILTIES

- Engineering Design
  - o Rheology
  - o Paste Backfill
  - o Filtering
  - o Thickening
- Plant Operations and Audits
- Geotechnical Engineering and Hydrogeology
- Advanced Process Control Systems
- Flotation Equipment Supply (Spargers)

CHEMISTRY LAB

Our metallurgical capabilities are supported by an internal geochemical network designed to provide rapid turn around time on all metallurgical products.

SUMMARY

For decades, the mining industry has turned to SGS for trusted metallurgical testing solutions. Our demonstrated success in metallurgical testing has provided thousands of companies and mines with effective flowsheets and practical technical solutions to processing problems. Our team across Canada has the depth and wealth of experience with nearly every commodity to provide an effective, safe and sustainable resolution to any processing challenge.

Our team in Canada is backed by a global network allowing us provide the trusted metallurgical expertise needed for project success no matter where your project is located globally.

METALLURGY LOCATIONS

Lakefield

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WHEN YOU NEED TO BE SURE