

# SGS OVERVIEW OF OIL SANDS CAPABILITIES

From its base of operations in Fort McMurray, Alberta, SGS offers integrated solutions to oil sands mining and in-situ operations. SGS has the capability to provide a wide range of integrated services. Our services are diverse, from a full service laboratory to tailings management expertise to an advanced pilot testing facility for testing mining processes for ore and process optimization. SGS solutions include:

## EXPLORATION AND RESOURCE DEFINITION

- Complete management of exploration programs and QA programs
- Geological mapping
- Layout of reference grids and topographic surveys
- Supervision of drilling and core logging
- Trenching and bulk sampling
- Core cutting, logging and sample selection
- Chemical and mineralogical analysis
- Bench-scale process testing

## GEOLOGICAL AND PROCESS MODELING

- Block estimation of geological, assay, and process parameters.
- Construction of process models that represent plant and process conditions.
- Process simulations to obtain details of expected extraction and tailings performance.
- Reconciliation of resource block model with mined zones.

## QUALITY SYSTEMS

Globally, SGS is at the forefront of providing quality work. Our facilities operate under internationally recognized quality standards, which consist of a documented quality system. Upon request, we can detail our full scope of our ISO/IEC 17025 accreditation for our oil sands laboratory.

## PROCESS DEVELOPMENT AND PILOTING

- Extraction and froth treatment flowsheet development.
- Bitumen extraction technology assessment and piloting.
- Pilot testing of alternative processing methods or technologies.
- Detailed process engineering including heat and material balancing.
- Commissioning support.

## PLANT OPTIMIZATION AND ADVANCED PROCESS CONTROL

- Pilot testing to identify optimum operating conditions and to benchmark the process performance of new ore-types.
- Pilot-scale comparison of flotation and primary separation equipment design.
- Instrumentation selection and process control engineering.
- Advanced process control systems.
- Image analysis of froths linked to automated process control system.
- Ore blending recommendations.

## MINE PLANNING

- Identification of controls (geotechnical stability, ore/waste contacts, geological features, etc.)
- Ultimate pit design.
- Long range (maximize NPV) and short range planning (logistically and cash-flow driven).
- Communication interface between mine planning and extraction to link block processing characteristics and recommended operating conditions.
- Reconciliation of as-built mine and update ultimate pit design.



**GEOTECHNICAL SERVICES**

- Media stability, compaction and permeability.
- Construction product testing.
- Sediment and slurry flow and hydrology.
- Site reclamation and monitoring.



**ENVIRONMENTAL SERVICES AND TAILINGS MANAGEMENT**

- Air, water and soil hazard analysis.
- Environmental baseline studies, monitoring, mineralogy and auditing.
- Acid rock drainage prediction and mitigation.
- Water and effluent testing, treatment and management.
- 3-D pond surveys.
- Mine closure and tailings reclamation planning.
- Settling strategies to ensure consolidated tailings and rapid reclamation.
- Pilot testing of advanced tailings settling technologies.
- Reconciliation between claimed material and survey results.
- Wildlife deterrents.
- Industrial hygiene, silica, dust, air quality and noise analysis.
- Greenhouse gas emission verification.

**MINING EQUIPMENT AND FLEET OPTIMIZATION**

- Inspection, maintenance and certification of AC and fire suppression systems.
- Comprehensive fire hazard management programs.
- Mining equipment maintenance outsourcing.

**INDUSTRIAL SUPPORT**

- Non-destructive testing of metals and corrosion products.
- Outsourcing and on-site services.
- Testing natural, construction and industrial materials.
- Supply chain and asset integrity management.

**AUDITING AND CERTIFICATION**

- ISO 9001:2008 Quality Management Systems.
- ISO 14001:2004 Environmental Management Systems.
- OHSAS 18001 Occupational Health and Safety Management Systems.
- BS EN 16001:2009 Energy Management.



**CONTACT INFORMATION**

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