

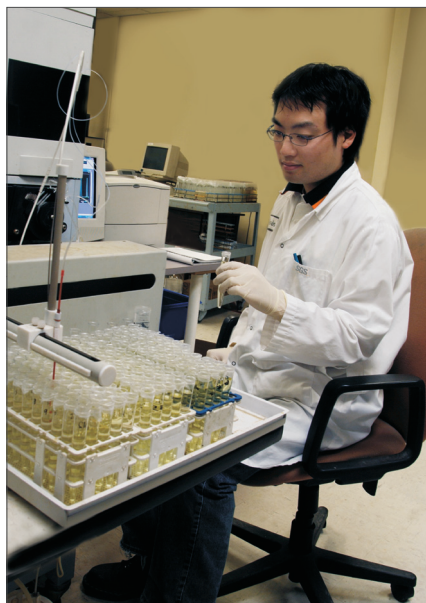
ANALYSIS OF URANIUM

ANALYTICAL SERVICES – ANALYSIS OF URANIUM- BEARING SAMPLES (NORM)

Uranium is a naturally-occurring radioactive element commonly present in rocks and soils in low quantities. This silver-colored heavy metal is fairly abundant and is best known for its usage in the production of nuclear energy. Uranium is considered a highly valuable commodity, because the nuclear production of energy is currently viewed as a viable solution to meet the green energy demands of our global community.

SGS' experienced analytical professionals and technicians can provide bankable test results for your uranium project. While many of our labs can perform uranium analysis on non-radioactive materials, we are licensed to perform uranium analyses on higher level materials in Perth Australia, Lakefield Canada and Johannesburg, South Africa facilities. Services that we offer for uranium include:

- Sample preparation
- Laboratory analysis including XRF, ICP-AES, ICP-MS and NAA
- Major elements and pathfinder elements including B, As, V, Ni, Co, Cr, Mo, Pb and Zn
- Proper disposal and short term storage
- Mineralogical testing
- Metallurgical testing



SAMPLE TYPES - "NORM" – NATURALLY OCCURRING RADIOACTIVE MATERIAL

EXPLORATION MATERIALS

Low-grade solids such as soils, rocks and related materials can be prepared by:

- Mobile metal ion leach (MMI-ME)
- Aqua regia leach (ICM12B or IMS12B)
- Multi-acid digest (ICM40B)
- Sodium peroxide fusion (ICM90A) or by borate fusion
- Lithium metaborate fusion (IMS95A)

After preparation, samples can be analyzed by ICP-AES, ICP-MS, XRF or by neutron activation (INAA) to get the appropriate detection limits for a given application.



ORES, CONCENTRATES AND HEAVY MINERAL SEPARATES

High-grade uranium ore and metallurgical products are best analyzed by XRF or INAA.

QUALITY

As part of our quality control program, we analyze certified reference materials to monitor our performance. Reference materials used span the expected concentration range and are of similar matrix, when available.

MINERAL IDENTIFICATION AND TEXTURES

SGS has many mineralogical tools for uranium minerals. These include electron microprobe, optical microscopy, image analysis, scanning electron microscopy, XRD and QEMSCAN.

MINERAL CHEMISTRY

The composition of uranium minerals is quantified at our facility in Lakefield, Canada using electron microprobe and QEMSCAN™. This equipment determines uranium in trace phases or can highlight environmental concerns.

HANDLING PROCEDURES

SGS has worked with uranium for over 50 years. We have stringent handling and safety procedures that include, receiving, handling, testing, disposing and short-term storage of NORM substances. We have screening procedures for all samples and a containment room for high uranium material. SGS radiation safety procedures are based on the Canadian Guidelines for the Management of Naturally Occurring Radioactive Materials. A policy of "ALARA" (As Low as Reasonably Achievable) has been adopted.

SHIPPING

Transport Canada considers samples containing radioactive concentrations greater than 70 kBq/Kg to be dangerous goods. SGS follows Transportation of Dangerous Goods – CLASS 7 Regulations and Canadian Nuclear Safety Commission (CNSC) Packaging Guidelines. For more information, please contact the appropriate government agency and request info on transportation of CLASS 7.

RECEIVING

All shipments will be measured for total radioactivity. All shipments determined to be NORM (up to 18 micro sieverts) are handled and prepared using standard NORM safety procedures. All material exceeding our prescribed action level (> 18 micro sieverts=Effective Dose) will require special NORM management handling and preparation in our containment booth and a surcharge will be applied.

TESTING

SGS' lab in Lakefield, Canada has a fully serviced containment booth. Under SGS' standard operating procedures we require NORM MANAGEMENT CLASSIFICATION. When our threshold action level is exceeded, NORM samples are prepared in a separately ventilated and supplied air containment booth. Our staff is continuously monitored for radiation exposure levels, with a maximum yearly exposure as set by Health Canada. SGS conducts this testing to ensure exposures are "as low as reasonably achievable" (ALARA).

DISPOSAL

Low level radioactive material (NORM) is returned to you at cost. No long term storage is allowed. Yellowcake and precipitates disposal can be arranged using MONSERCO. Liaison and handling costs to be paid by client.

CONTACT INFORMATION

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