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Reference Standards

This brochure describes MEG's procedures for preparation of standard reference materials (SRM's) and related services. MEG is uniquely positioned as an independent prep-only laboratory servicing the mining industry. This gives the community assured third-party quality control on critical samples, like those from the drill rig.

OVERVIEW

MEG is an independent sample preparation laboratory working closely with several associate laboratories to provide geochemical data for the mining and environmental industries. Established in 1984, it is now highly regarded for its sample preparation, quality control, geochemical interpretation, and advanced mercury methods. It is fully equipped to handle rock, soil, sediment, vegetation, humus, and other exploration materials, providing special care to samples that may contain labile constituents at ppb and ppt concentrations.

MEG's success is due in part to its use of sound quality control / quality assurance (QA/QC) procedures. Standards, replicates and blanks are dubbed blindly into every job as a daily monitor of its and associate laboratory performance. Randomization of sample submittals is frequently used to reveal systematic error during prep and analysis.

MEG is out of the data loop, creating double blind testing where only the client has all of the information to assess the quality of the analysis. This works particularly well because MEG is independent of the associate labs it works with.

BROCHURE 2014

WORLDWIDE SERVICE:

As the mining industry has grown globally, so has MEG. Despite added shipping costs from remote exploration frontiers, MEG receives samples from around the world. We are also a preferred subcontractor for many major N.A. laboratories. Please note our import permits:

SOIL: P330-12-00341 (Expires 12-17-2015)
VEGETATION: PCIP-13-00190 (7-17-2015)
Permit and Quarantine Documents must be applied to the outside of all shipping containers.
Please notify MEG prior to shipping for late information on USDA import requirements.



SRM SOURCES

MEG has access to several ore, soil, and vegetation types with a wide variety of naturally occurring metal grades and concentrations. Whenever possible, we manufacture SRM's using natural material only. This is always true for vegetation standards, but for rock and soil standards, we will dope natural materials with nominal metal grades up to concentrations that meet exploration and drilling requirements. Particularly for fire assay work, it is important that some portion of the economic mineralization is bound mineralogically as a test of the fire fusion process. Because many samples are analyzed for multi-element suites, it is equally important that associated elements (toxics, pathfinders, etc) are part of the SRM matrix.

MEG maintains a limited inventory of readily available SRM's for both internal and external use. The current inventory includes gold and silver, a**nd** a variety of other source rock from porphyry Cu and Mo deposits, and yet other deposits of copper, tungsten, cobalt, nickel, platinum, lithium, tellurium, vanadium, and uranium. BLANKs are also important in an analytical submittal, and we produce these from barren country rock, or quartz sand. This material is sold in 50g envelopes and comes with a minimal number of preliminary assays to establish a reference value for later use. Use MEG's website for current pricing and availability.

Most SRM manufacturing is done under contract from operating mines. Under these circumstances, rock from the mine is shipped to MEG for processing. The objective is to provide a good match of ore characteristics and ancillary metal assemblages between SRM and sample so that the SRM is blind in the analytical submittal, and also create an analytical environment that gives more accurate and precise results. MEG can handle bulk quantities of 100-150 Kg efficiently. Manufacturing takes about 14 days.

MANUFACTURING PROCEDURES

Source rock is dried in controlled electric ovens at appropriate temperatures. Jaw crushers and a roll-crusher are used to create a predominantly 30-mesh product. A ceramically lined ball-mill with a capacity of 150Kg reduces particle size to 150-200 mesh. The intermediary product is sieved to -80 mesh (177 um), and this is sieve tested to determine particle size distribution from 100 mesh to 325 mesh (149um – 44um). Sulfide ores are further homogenized with rotary splitters (12 bucket, 27Kg) before packaging in 50-100g paper envelopes. If required, these are heat-sealed in plastic. Homogeneity testing is done through one of MEG's associate analytical laboratories.

Vegetation starting material is washed to remove external dust, and then dried in microwave

and conventional ovens. A Wiley Mill is used to reduce twigs and leaves to 0.5-2 mm particles. The intermediary product is further reduced by pulverization in mild steel. A bottle-roll process is used to blend the organic mass to homogeneity.

To each envelope is affixed a removable sticky label that can be used by the geologist to accurately record which standards are placed in his / her copy of the analytical submittal. This reduces transcription mistakes that can be very costly at a later time.

ROUND ROBIN ASSAY PROCEDURES

Analytical labs (usually 8-12) with reputable assay capabilities provide homogeneity testing and initial assay data for SRM's. Since requirements are different for each material, several local, national, and international laboratories are used for this testing.

Homogeneity testing is done at one laboratory with good multi-element (ICP/OES or ICP/MS) capability. This provides metal characterization information that determines the mineral and metal matrix. If these results indicate good homogeneity, then 7-11 more labs are chosen for the certification process. If a suite of standards have been created that represent a range of grades all within similar matrix characteristics, the samples are submitted to each analytical laboratory in random order, so that the submittal is much like a production run. Since later use of the SRM will be in production runs, randomization during the round robin is desirable.

As much as possible, each laboratory runs the same digestion / fusion and instrumental analysis. Instructions are provided when necessary (eg. non-standard partial digestions). The round robin process takes from 1month to 4 months to complete.

CERTIFICATION PROCEDURES

Data are compiled and statistically enumerated and charted. Outlier data is identified using standard statistical methods. Mean, standard deviation, 95% confidence, and 10% error limits are calculated, which become the basis for certification as a geochemical standard. This only begins the longer-term process of further data accumulation and further refinement of the "true" mean and other statistical parameters as the SRM is used.

MANUFACTURING & ASSAY COST

Cost per 100Kg of Rock (estimate):
This will create 2000 envelopes of 50 grams.

Dry, crush, pulverize, blend …. US $1600.00
Package in Kraft envelopes ….. US $2400.00
Heat seal (add) …….. US $2400.00
Round Robin Assay ……. US $7000.00
Total …….. US$13400.00
Average cost per 50 g envelope = $6.70
Average cost per Kg = $ 134/Kg

