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# MERCURY SOIL GAS
# RADON SOIL GAS

***This brochure highlights mercury soil gas and radon soil gas technology offered by MEG, including proprietary GAS'm and GAS'r methods. Both methods rely on soil as the primary soil gas trap, so the geologist makes only one trip to the field for soil sample collection.***

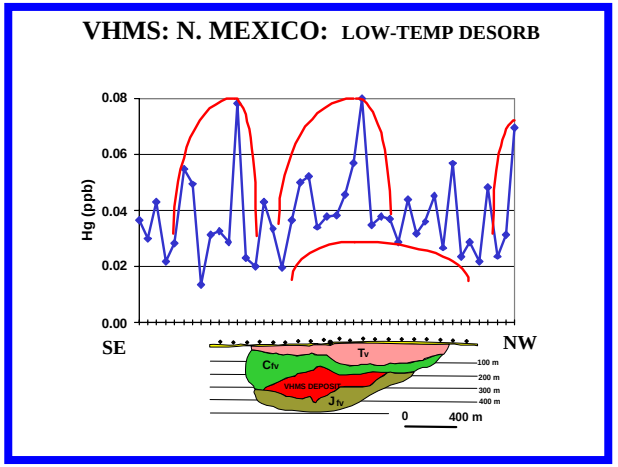
## *OVERVIEW*

MEG runs two independent sample preparation laboratories (biogeochemical & inorganic), and works closely with several analytical 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, mercury analysis, and geochemical interpretation. It is fully equipped to handle drill core and cuttings, rock chip, soil, sediment, vegetation, humus, and other exploration materials, providing special care to samples that may contain labile constituents at ppb and ppt concentrations.

MEG is also known for its mercury collection technology. Its proprietary **GASic** (integrative collector) methods have been used by the minerals industry for precious and base metal exploration since 1985. In 1998, **GAS'm** was developed to determine the speciated mercury flux from various natural and anthropogenic sources. These two techniques have been incorporated into several mineral exploration, geothermal resource, and environmental surveys. In 2004, investigations into radon soil gas detection have resulted in the development of **GAS'r** (Radon Soil Gas).

## *LATE DEVELOPMENTS*

Two radically new ways of doing soil gas surveys replace the use of buried collectors. Development since 1998 has resulted in a large file of case histories from around the world that demonstrate **GAS'm** sensitivity to deeply buried mineralization up to 400 meters from the surface. Differentiation of various mercury species in soil by stepped thermal desorption results in several vectoring strategies as the relationships of near-surface to deep ore are explored.




*GAS'm results over a VHMS deposit in Sonora, Mexico. Depth to ore is 150 m through Tertiary volcanics. Sample interval is 100 m. Lowest thermal desorption temperatures do the best job of revealing this deep, sub-economic mineralization.*

## *DISCUSSION*

Buried collectors have always been problematic. They need to be in the ground several weeks, they require two trips (or more) to the field, burial and collection requires trained personnel, and they get lost, stolen, or disturbed. They are not easy to QA/QC since duplicates, standards and blanks are difficult to create in the analysis stream.

An in-lab method using soil as the primary collector avoids all of these problems. The soils can be collected like any other soil sample. In the lab they are gently dried and sieved to retain 2 g of the desired fraction. Hg is concentrated during a slow desorption process, then flushed into a cold vapor atomic fluorescence spectrometer (CVAFS) with detection to 0.005 ppb. At these levels we always see background as well as all of the anomalous patterns that relate to deeply buried ore, or surface contamination.

**GAS'm** data provides a first-pass look at mercury speciation. Very weakly bound mercury is thermally evolved from the neutral soil substrate. At higher desorption temperatures, more tightly bound mercury is evolved. Operationally defined speciation produces different sets of patterns that relate to mercury mineralogy and its mobility from deep sources to shallow sinks. This results in several vectoring strategies as the relationships of shallow to deep ore are explored. The **GAS'm** method has been successfully used in Australia, Mexico, Indonesia, Alaska, with a high concentration of development and application work coming from the western U.S. Surveys have been conducted over carbonate replacement Pb-Zn-Ag, epithermal / hydrothermal gold, Pt-Pd, VMS Cu-Pb-Zn, porphyry Cu-Au, and roll-front U. Geothermal surveys have also been successful. Several case histories are available that show excellent reproducibility through the incorporation of duplicate pairs and standards in the analytical stream. Please ask for a discussion packet.

**GAS'm Prep & Analysis ……. US $16.90**
**Subsequent Desorptions (each) US $ 7.90**

**SOIL: P330-09-00260 (Expires 12-16-2012)**
**VEGETATION: PDEP-07-00480 (10-4-2010)**

Permit and Quarantine Stickers must be applied to the outside of all shipping containers.
Please notify MEG prior to shipping for late information on USDA import requirements.

BROCHURE 2010

## *GAS'r Radon Soil Gas Geochemistry*

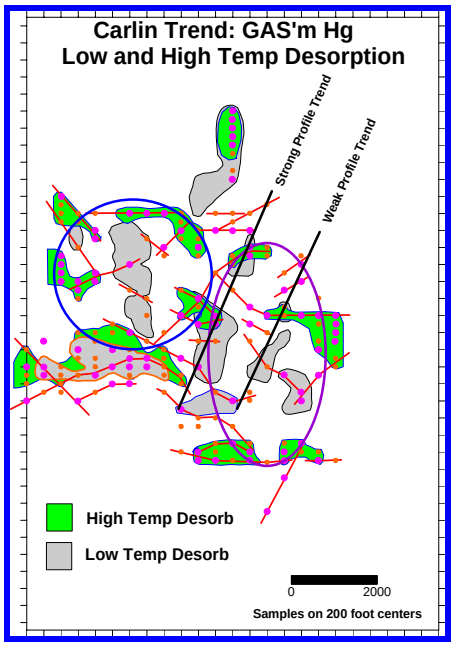
***Radon soil gas ($^{222}$Rn) is a daughter product of $^{238}$U that decays to $^{226}$Ra and can be detected by alpha emissions as it subsequently decays to $^{218}$Po over a half-life of 3.82 days. This is a useful guide to deep uranium and geothermal resources. Uranium is also associated with rare-metal pegmatites, epithermal precious metal deposits, Co-Ni-Ag deposits, and some porphyry Cu deposits. GAS'r uses a soil collection method that selectively measures $^{222}$Rn in a controlled laboratory environment. Buried alpha-track methods, on the other hand, are often over exposed in just a few days, compromising desirable integrative characteristics. GAS'r exposure to radiogenic soil is controlled so over-exposure is not an issue.***

**GAS'r Analysis ..... US $19.00**

### *SAMPLE COLLECTION*

MEG is expert in survey design and sample collection. With 30 years of experience in varied terrains throughout N.A., MEG can lead you directly to success. From reconnaissance to detailed grids, we know what to do and how to get it done. Soil sampling is an art and a science, so dovetailing soils for **GAS'm, GAS'r** and conventional analysis requires as much experience as you can find. MEG can put one crew in the field to complete the entire geochemical survey and expedite the preparation and analysis of all your samples together. GPS, fast, efficient collection, and coordination with the MEG Sample Preparation Laboratories for rapid return of data. We are happy to train and work with other contract or in-house crews. Time and materials pricing. No padding.

***Just honest pay for honest work.***




*GAS'm results over a deposit on the Carlin Trend showing mercury speciation from high & low temperature desorption. The high temperature data give a "rabbit ears" pattern that surrounds the deep, low temperature sources. Profile trends are interpreted from concentration profiles that show weak pattern anomalies seemingly related to low angle regional fault systems. Dots connected by lines are inferred structures from the high temperature GAS'm data. A known resource lies just off the western margin of the survey grid and is spatially coincident with the GAS'm anomaly that projects into the center of the grid.*

### *CONSULTING SERVICES*

MEG is expert in the field of mercury soil gas. MEG can provide detailed examples and discussions on methods for minerals exploration and environmental studies. Specific services include field and office training, data review, and interpretation, leading to target selection and assessment.

Office ..... US $ 105 /hour
Field ..... US $1050 /day

### *FIELD SERVICES*

Soil gas geochemistry provides your exploration and environmental programs with new targeting information. Rigorous soil collection protocols require experienced field personnel. MEG can provide teams that will assure your surveys are correct and smartly executed.

### *FIELD COSTS*

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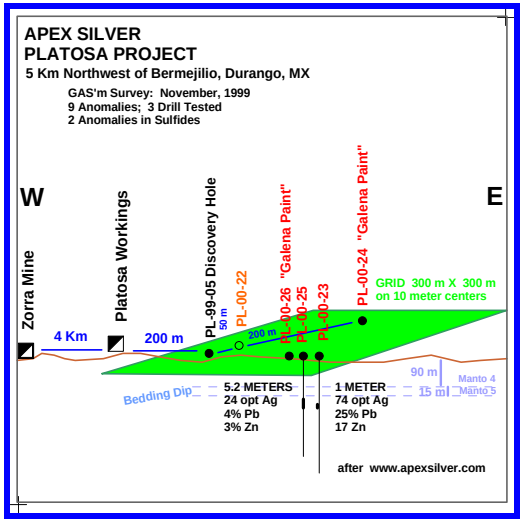
| Crew …… | US $ 295/day |
| Supervisor ……. | US $ 470/day |
| Vehicle …… | US $ 0.70/mile |
| Expenses …….. | Cost + 10% |

### *POWER POINT*

Several power point presentations have been created to more thoroughly discuss aspects of soil gas geochemistry that are only briefly introduced here. Please call for details.




*Summary of GAS'm and drilling results that discovered new ore in the Platosa District, Durango, Mexico, as reported on Apex Silver Corporation's website, July, 2000.*

## *OTHER SERVICES*

SAMPLE PREPARATION:
Rock, Soil, Sediment, Vegetation
DRILL SAMPLE PICKUP
SURVEY & COLLECTION
GEOCHEMICAL INTERPRETATION
QUALITY ASSURANCE PROGRAMS
STANDARD REFERENCE MATERIALS

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