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GEOTHERMAL EXPLORATION

This brochure describes MEG's areas of technical expertise in mineral exploration and applications to geothermal resource evaluation. MEG has developed leading technologies in phytogeochemistry, mercury, and radon soil gas, which are described in a geothermal context..

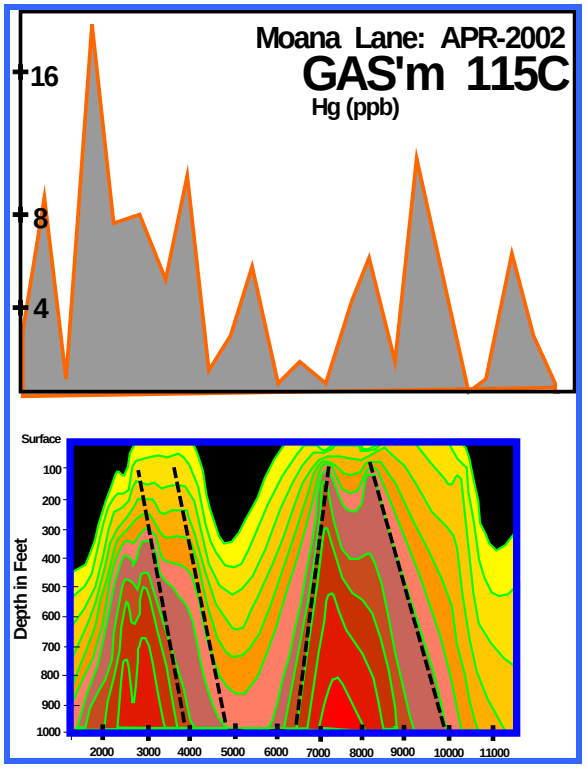
OVERVIEW

MEG is best known for its phytogeochemical services. This work has provided several published mineral and water exploration case histories that have become the foundation for several widely attended short courses on the application of phytogeochemistry in the natural resources industries.

MEG is also known for soil gas collection technology. Its proprietary GAS'm and GAS'r techniques have been used for precious, base metal, and uranium exploration, and more recently, several geothermal resource and environmental surveys.

LATE DEVELOPMENTS

Alternative energy initiatives are driving US markets toward the development of geothermal resources. MEG is retooling its leading technologies in phytogeochemistry and soil gases as viable methods for blind geothermal exploration. MEG's Moana Lane geothermal case history demonstrates the use of mercury soil gas, with a capability of defining hot water plumes as they approach the surface.



BELOW: An E-W cross-section of Moana Geothermal Area (Reno, NV) along Moana Lane (Flynn & Garside, 2001). ABOVE: Mercury soil gas profile from soils collected in 2002 and thermally desorbed at 115C. Note the close spatially correlation between the thermal plumes and the mercury profiles.

More lately, work in Lander County, north-central Nevada, has demonstrated that phytogeochemical data can be used to locate areas of relatively high enthalpy. More particularly, ratios of common major elements highlight the best areas for drill testing.

The Reese River project has moderate sagebrush coverage, but enough to collect samples every 100 feet. The tissue was macerated and analyzed for 45 elements by AR/ICP/MS. Plots of elements related to thermal alteration (As, B, Hg, Li, Sb) identify prospective areas of relatively high enthalpy.

Radiometric data, from three-channel scintillometry, also delineate prospective areas.

The advantages of soil gas mercury and phytogeochemistry are the ability to map subsurface structures clearly, without offset, and with the additional ability to identify relatively hot areas for drill testing. Both methods use media with long term exposure to the effects of the thermal system, and are not as susceptible to diurnal overprinting.

SOIL GAS GEOCHEMISTRY

Mercury soil gas methods have been tried and proven over geothermal areas. The response is clear and decisive. Structures are defined and thermal plumes related to hanging wall and foot wall features can be identified.

Radon gas methods have not been tried, but scintillometry data indicate that radioactive decay should relate to radon effusivity.

See details in the Soil Gas Brochure

Both methods use clays in soil as gas capture minerals. These clays have been resident for thousands of years. Unlike buried collectors or temperature probes, the chemical signature of the soils is imprinted with centuries of exposure to the thermal system. The resulting patterns should be in-place and robust.

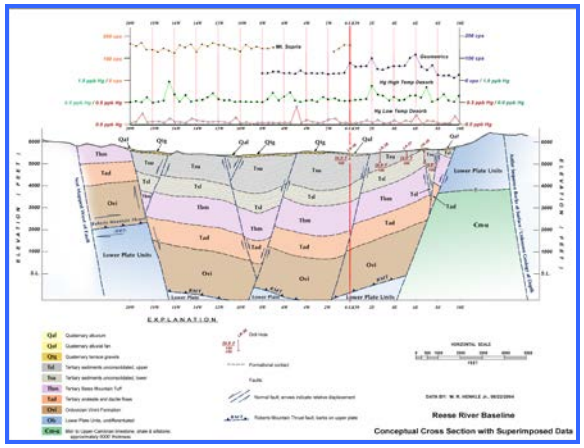
Mercury Soil Gas Geochemistry

GAS'm Prep & Analysis ……. US $18.90
Subsequent Desorptions (each) US $ 9.90

Radon Soil Gas Geochemistry

GAS'r Analysis …… US $21.00

BROCHURE 2014



Cross-section through the basin at the Reese River Project, Lander County, Nevada. Mercury soil gas profiles are anomalous over structures that bring hot water closer to the surface on the east side of the property. Radiometric data spatially correlates with the mercury data.

PHYTOGEOCHEMISTRY

Trace metal concentrations in plant tissues reveal subsurface ground water chemistry. Thermal ground waters significantly increase the availability of metals in solution that ultimately are absorbed by plant roots. Phytogeochemical profiles of metal concentration reveal thermally active and inactive structure, with "shoulders" revealing hanging-wall and foot-wall features. Most multi-element analyses report upwards of 50 elements, including typically volatile and mobile geothermal pathfinders like As, B, Cs, Hg, REE, Li, and Sb. These and others can be plotted singularly to identify zonation that indicates the geothermal feature. Another approach is to plot, metal ratios, which more directly indicate relative thermal anomalies. For instance, it was observed at the Reese River project that ratios of K-Mg, like geothermometry of thermal water, tend to highlight areas of anomalous enthalpy, rather than simple alteration.

TRAINING

Phytogeochemical, mercury, and radon soil gas geochemistry offer valuable targeting information for your geothermal exploration programs. MEG's proprietary methods are designed to detect deep bedrock and ground water sources. Rigorous phytogeochemical, soil collection protocols require experienced field personnel. MEG has the professionals who can train your field crews to collect reliable samples and assure that your surveys are correct and smartly executed.

Consulting Services

Office	US $120 /hour
Field	US $1200 /day

See the Phytogeochemical and Soil Gas Brochures for more details

"HALO" PATHFINDERS:

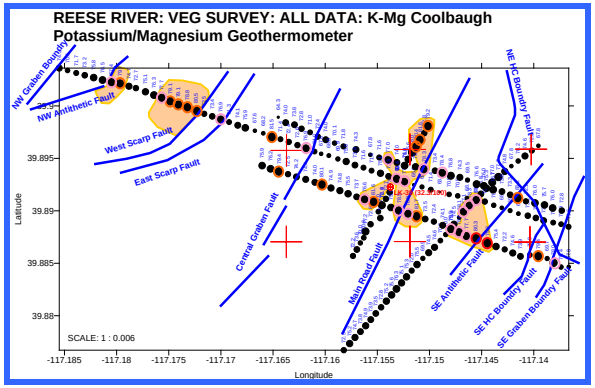
MEG R&D has developed analytical methods for detection of halogen pathfinders in plant tissue (including total salt). Analysis by ISE is used to detect structures and blind and deeply sourced mineralization and geothermal resources.

ISE Fluoride ……...…….	US $ 8.50
ISE Bromide ……...…….	US $ 8.50
Total Salt ……...…….	US $ 8.50

ANALYTICAL ASSOCIATES

MEG's associate laboratories have analytical capabilities that stand up well to continual quality assurance monitoring. In addition, these labs have demonstrated an ability to do well with exotic media like vegetation, soils, soil gases, and trace metals in water.

All of the associate laboratories provide multi-element packages, commonly reporting from 10 to 60 elements for costs under US $25. With improved understanding and recognition of metal zonation around natural and anthropogenic deposits, primary and secondary element data are of increasing importance in determining the location and character of the geochemical target.



Plan view of the Reese River phytogeochemical survey with K-Mg ratio values plotted.Anomalous areas are highlighted in orange, which tend to be on the hanging-wall side of indicated faults (blue). Prior test drilling (ca 1980's) just west of the Main Road Fault hit bottom temperatures of 50C.

OTHER SERVICES

SAMPLE PREPARATION: `Rock Soil Sediment`
SURVEY & COLLECTION CONSULTATION
GEOCHEMICAL INTERPRETATION
QUALITY ASSURANCE PROGRAMS
GEOCHEMICAL REFERENCE STANDARDS
MERCURY SOIL GAS ANALYSIS
PHYTOGEOCHEMISTRY

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