Thursday, January 19, 2006

HESS Building • 5430 Westheimer, Houston
Social 5:30 p.m.

Cost: $25
Reservations: Call or email Dale Bird, by noon Tuesday, January 17, 2006
281-463-3816 or dale@birdgeo.com (email is preferred)

GSH Potential Fields Group
Dinner Meeting

*by **Christian Abaco***
EnCana

Analysis of Magnetic Anomalies from the South-Central Alberta Foothills, Canada

Interpretation of airborne and ground magnetic data from the south-central Alberta Foothills shows a remarkable correlation between surface geology and residual magnetic anomalies. The near-surface magnetic anomalies are not related to the topography and are induced by the magnetic properties of the rock units underlying the survey area.

Siliciclastic strata dominate the surface geology; they have low magnetic susceptibility (10^{-5} to 10^{-2} SI) and therefore induce small magnetic anomalies ranging between 9.8 and −10.8 nano Telsa. Most of the magnetic anomalies occur in uppermost Cretaceous sandstones (Brazeau and Lower Coalspur strata) and appear to increase in intensity at the contact with the Tertiary Upper Coalspur Formation and with the underlying marine shale of Alberta Group strata. The Albian Beaver Mines sandstone also exhibits higher magnetic anomalies, contrasting with the underlying lower Blairmore strata and the overlying shale of the Blackstone Formation.

Ground magnetic data show good correlation with high-resolution aeromagnetic (HRAM) anomalies and the magnetic susceptibilities measured from the surface geology. The depth estimates to the magnetic sources that generate the magnetic anomalies indicate values ranging from 20 to 800 meters.

The occurrence of HRAM anomalies in the Beaver Mines, Brazeau and Lower Coalspur strata appears be related to their depositional history and petrographic compositional stages of the Middle and Upper Cretaceous sandstones from the southern and central Alberta Foothills. Cretaceous nonmarine sandstone from the study area contains up to 17% detrital opaque heavy minerals, which consist of magnetite, ilmenite and rare grains of chromite and pyrite.

The magnetization models constructed to reproduce the magnetic anomalies closely match both ground and airborne observed values. Seismic data interpretation constrains the magnetic mapping results and suggests that HRAM data may be used in the early stages of exploration to assist in mapping lithology and structure between 2D seismic lines. ■

Biographical Sketch

Christian Abaco received his BSc (Hons.) in geological engineering from the University "Alexandru Ioan Cuza" of Iasi, Romania, in 1985 and a degree in economics in 1992 from the Academy of Economic Sciences, Bucharest, Romania. In 2003 he completed his MSc in geophysics with the Fold-Fault Research Project at the University of Calgary.

Before completing his degree in geophysics, Christian worked as an exploration geologist for 16 years in Canada and Romania. He worked in both sedimentary and igneous/metamorphic rock projects exploring for oil and gas, coal, base metals, gold and diamonds. In 2002 Christian started working with PanCanadian Energy/EnCana, as geophysicist in the International & New Venture Group, and currently he is part of a development team working in Western Canada.

Christian's academic interests include integrated geophysical and geological analysis of fold and thrust belts and offshore frontier areas using seismic, gravity and magnetic data and AVO/LMR analysis and fracture detection in tight reservoirs. He is a member of SEG, CSEG and APEGGA (P. Geol).