Geophysical Research Abstracts, Vol. 8, 05442, 2006
SRef-ID: 1607-7962/gra/EGU06-A-05442

Multi-frequency GPR and other electromagnetic investigations of two Mars analog environments in the West Egyptian Desert

S. Clifford (1), E. Heggy (1,2), M. Ali (3), V. Ciarletti (4), C. Corbel (4), F. Dolon (4), A. Le Gall (4), R. Grimm (5), R. Ney (4), S. Sandberg (6).

(1) Lunar and Planetary Institute, Texas, USA, (2) Cairo University, Egypt, (3) Egyptian Geological Survey and Mining Authority, Egypt, (4) Centre d'étude des Environnements Terrestre et Planétaires, France, (5) Southwest Research Institute, Colorado, USA, (6) Albuquerque, New Mexico, USA (clifford@lpi.usra.edu / 281-486-2146)

During November 2005, research teams from the Lunar and Planetary Institute (LPI), Southwest Research Institute (SwRI), and Centre d'étude des Environnements Terrestre et Planétaires (CETP), in cooperation with Cairo University and the Egyptian Geological Survey and Mining Authority (EGSMA), conducted geophysical sounding investigations at two locations in the West Egyptian Desert as potential geologic and hydrologic analogs of Mars. These investigations included ground-penetrating radar (GPR) studies, using multiple instruments and techniques, at central frequencies ranging from 2 – 500 MHz. Schlumberger DC resistivity vertical electrical sounding (VES) and transient electromagnetic (TEM) sounding data, as well as field samples from cliff exposures (for later laboratory characterization of the principal stratigraphic units), were also acquired at these locations.

Although our analysis is still ongoing, initial findings indicate that considerable ambiguity exists in the geologic and hydrologic interpretation of data acquired from any single electromagnetic investigation—ambiguity that is substantially reduced by the application of multiple techniques and frequencies. These results suggest that obtaining an accurate understanding of the geology and distribution of water in the Martian subsurface will likely require a comprehensive program of geophysical investigations, employing multiple instruments, techniques and platforms.

We gratefully acknowledge the assistance of C. Dinwiddie and R. McGinnis, of the

Southwest Research Institute in Texas, who made substantial contributions to this research.