

# GEM-2A Broadband HEM Sensor

## GEM-2A Summary

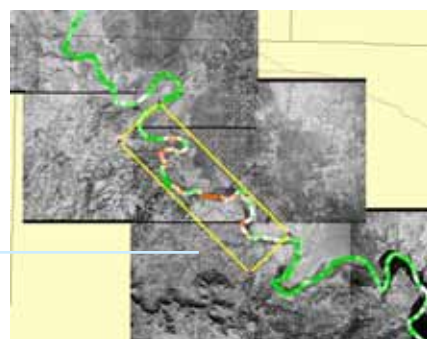
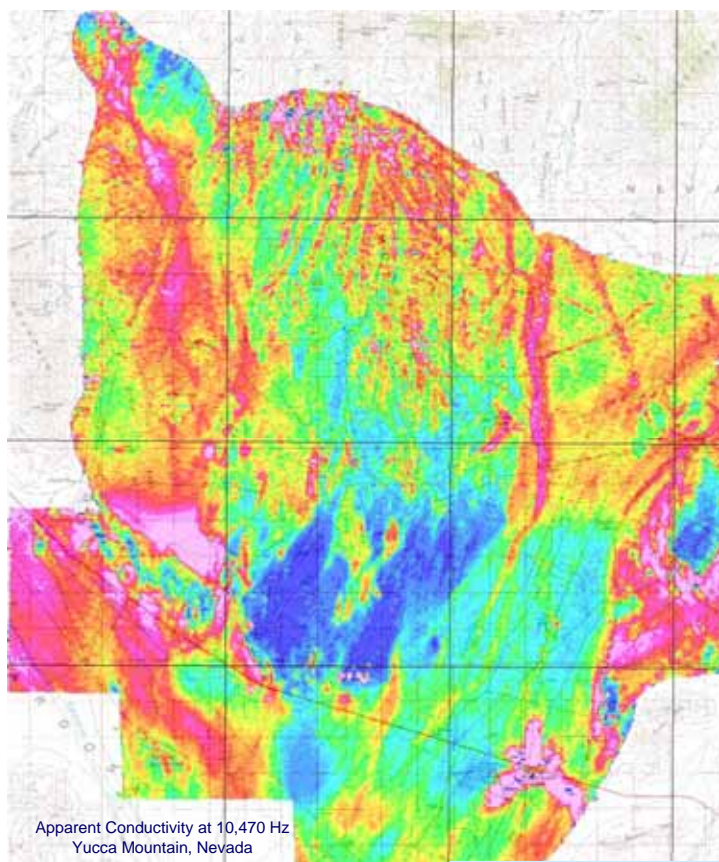
New airborne EM sensor for mineral prospecting and geologic mapping.

1. Current bandwidth of 90Hz to 48kHz
2. Passive powerline monitoring

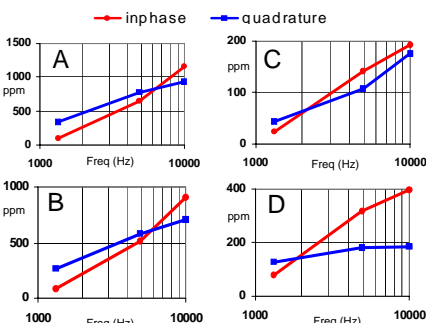
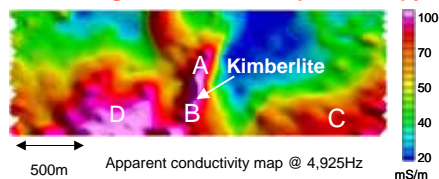
## Technical Advantages

Coherent drift characteristics among frequencies

1. Spectral integrity for anomaly classification and discrimination
2. Tolerance to sferics and powerline noise
3. Light tow-body with minimal cockpit hardware to fit in a small helicopter



## Electromagnetic Induction Spectroscopy



Each mineral deposit, depending on its electrical conductivity and magnetic susceptibility, should exhibit a unique frequency dependence in its inphase and quadrature responses.

EMIS is a method of identifying a particular geologic body based on its broadband EMI spectrum. In this example, Points A and B are on a kimberlite pipe, but Points C and D are not.

## GEM-2A Specifications

Total length	643 cm (21.1 ft);
Weight	110kg (230 lbs.)
Tow cable length	30 m (100 ft)\
Power supply	28 VDC
Frequency range	330 Hz to 96 kHz
Frequencies	Programmable typically 5-7 frequencies
Sampling rate	30 samples/sec

### Horizontal Coplanar Coils

TX-RX separation	510 cm (16.7 ft)
Transmitter current	45 amp RMS max
Transmitter moment	400 Am <sup>2</sup> at 330 Hz

### Coaxial Coils

TX-RX separation	592 cm (19.4 ft)
Transmitter current	45 amp RMS max
Transmitter moment	200 Am <sup>2</sup> at 330 Hz

# GEM-2A Survey in Yucca Mountain, Nevada

Geophex GEM-2A flew a 17,000 kilometer survey in Yucca Mountain, Nevada to support geological site characterization study for a proposed nuclear waste repository. The survey took about 40 days to complete.



Yucca Valley, Nevada



Takeoff



Terrain Map



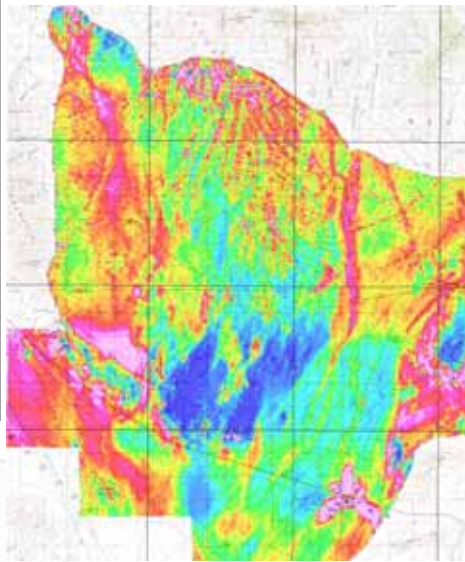
Ground Transportation



Ground Support

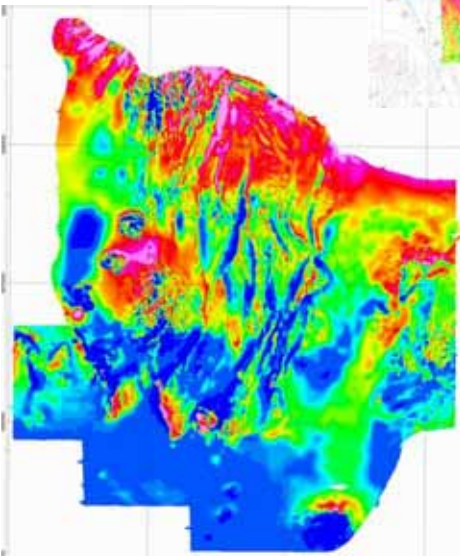


Pilot Navigation Screen



Apparent Conductivity @10,470Hz

Reduced-to-Pole  
Magnetic Anomaly Map



Extent of Cockpit Instrumentation



Base Magnetometer and GPS

