

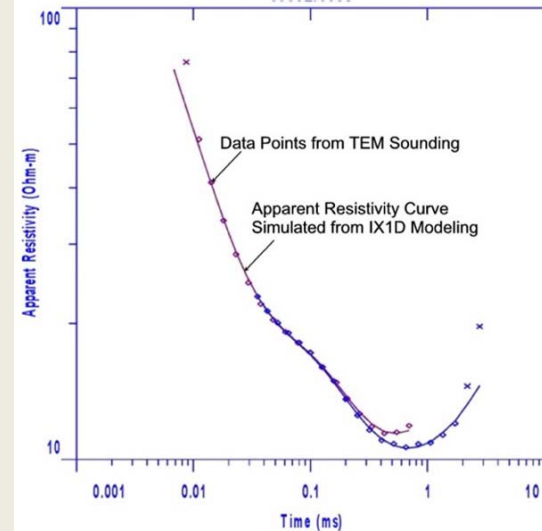
Transient Electromagnetic (TEM) Electrical Resistivity Soundings

TEM soundings use a large square wire loop set up on the ground surface to transmit on-off-on pulses of electrical current for short durations at fixed frequencies to induce “eddy currents” at various depth levels in the earth. A smaller receiver coil is used to measure the decaying electromagnetic field from these eddy currents over very short time intervals during the off time of the transmitter.

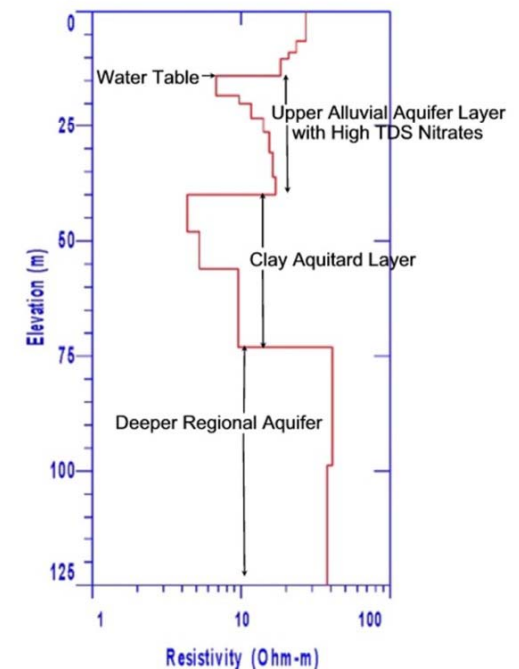
The TEM measurements are used to generate an apparent resistivity versus time “decay curve” (as shown on the left). This decay curve is used in a modeling program such as IX1D (Interpex, Ltd.) or SPIA-TEM (Hydrogeophysics Group at University of Aarhus) to generate 1D resistivity vs. depth profiles. These resistivity versus depth profiles can be integrated with borehole and well data to prepare “hydrogeologic profiles”.

Several TEM sounding points along a single survey line can be used to prepare a 2D resistivity profile of the earth’s resistivity structure. TEM sounding points along a series of grid lines can also be used to prepare cross-section and map-view images of 3D earth resistivity variations.

TEM Apparent Resistivity Decay Curve



Program IX1D Resistivity Profile

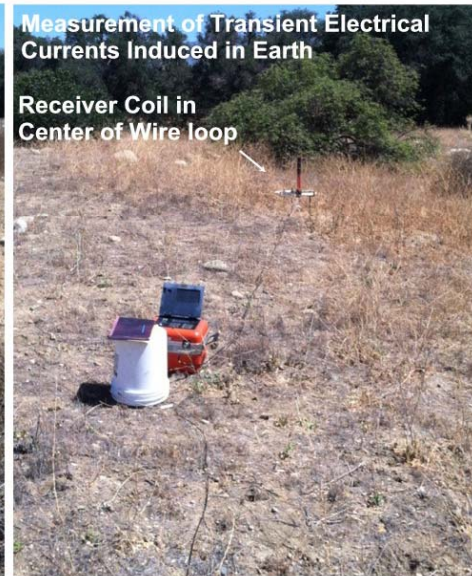
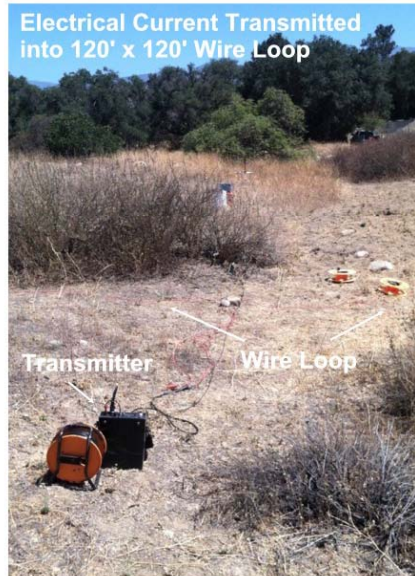
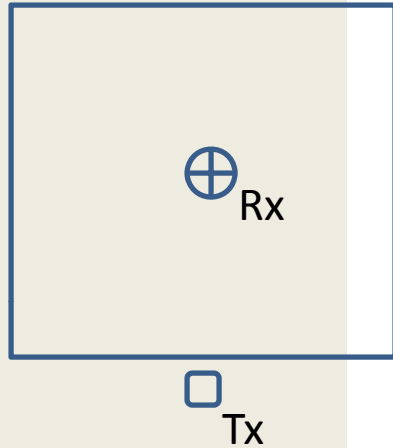


TEM Surveys for Shallow Subsurface Investigations- Upper 300 Feet

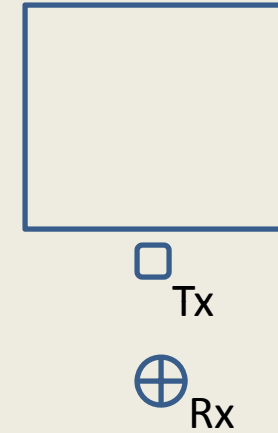
Geonics TEM 47

Transient Electromagnetic Resistivity Surveys

Central Loop Soundings with
120 x 120 ft Transmitter Loops



Offset Loop Soundings with
70 x 70 ft Transmitter Loops



TEM Surveys for Deeper Subsurface Investigations- 200 to 2,000+ Feet

Geonics TEM 57

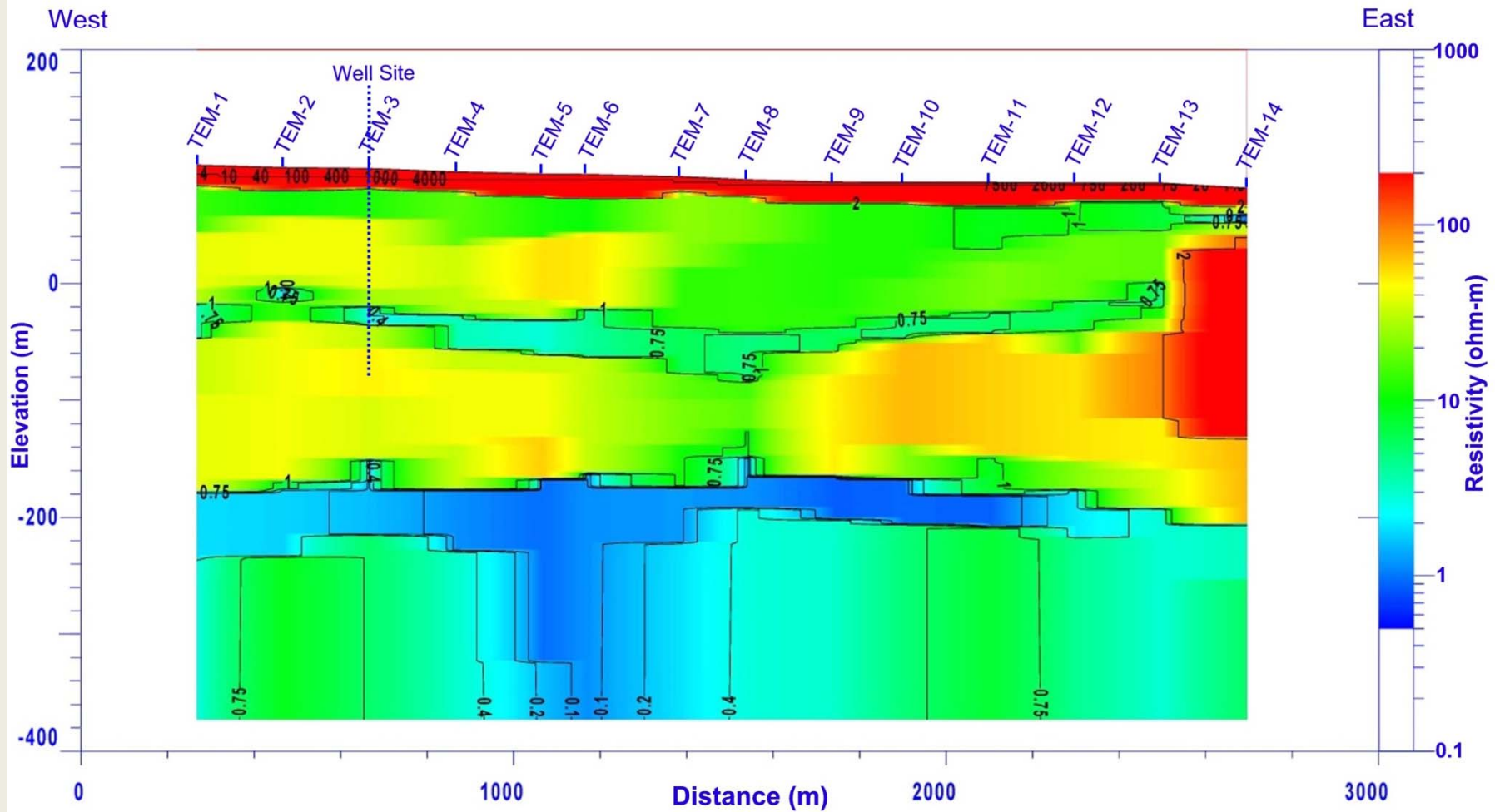
Transient Electromagnetic Resistivity Surveys

Central Loop Soundings with
300 x 300 m Transmitter Loops



Advanced Geoscience, Inc.

2D Electrical Resistivity Profile from TEM Soundings for Groundwater Exploration at USAF Chabelley Airfield, Djibouti (East Africa)



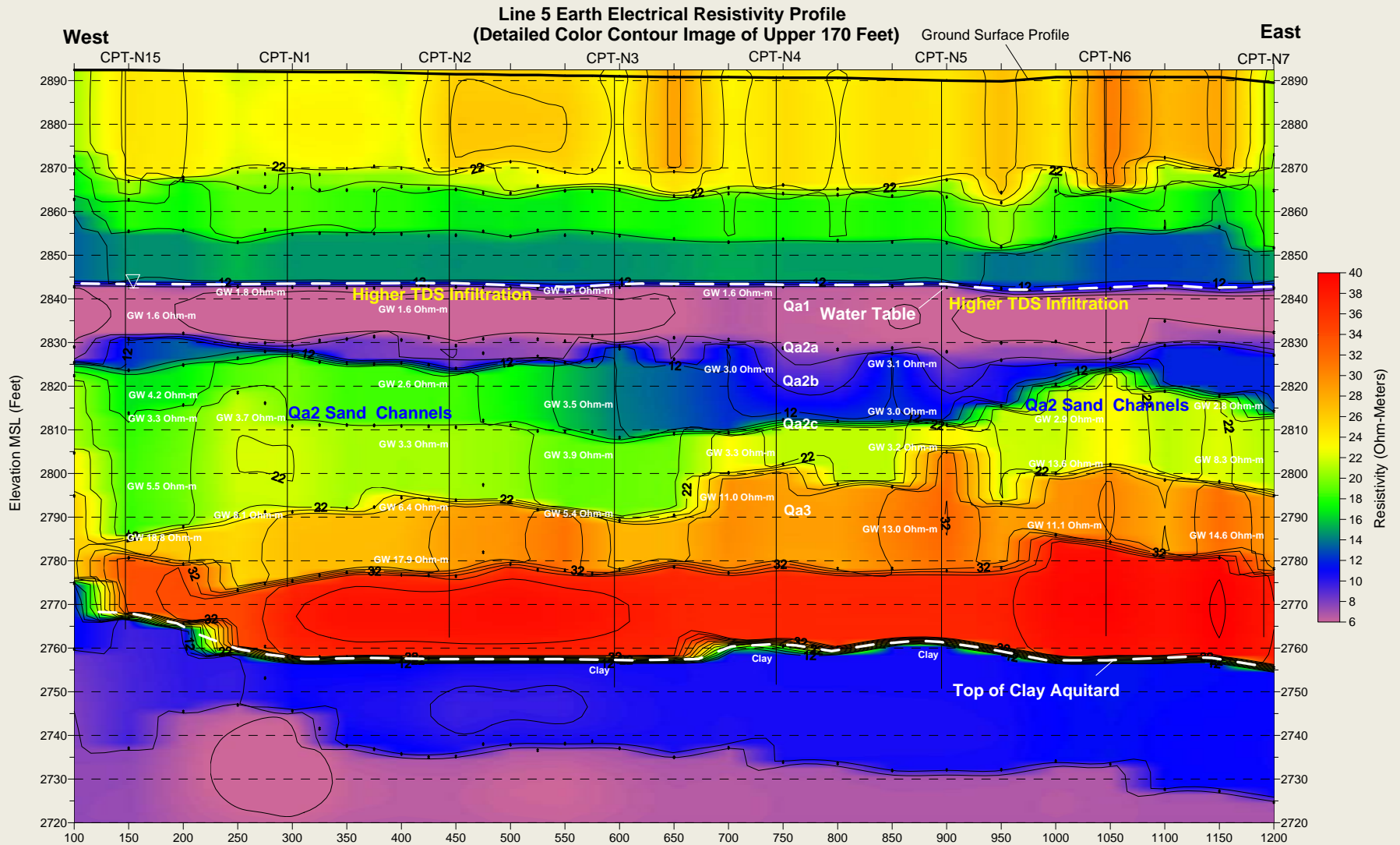
Resistivity Elevation Profile Generated by Program IX1D Developed by Interpex, Ltd.
 Based on Computer Gridding and Contouring of 1D TEM Resistivity Models
 Contour Lines Show Logarithmic Values

Vertical Scale 1 inch= 80 m
 Contour Lines Show Logarithmic Values

Subsurface Electrical Resistivity Profile
 Along Transect from Measurement Points TEM-1 to TEM-14
 Geophysical Investigation for Groundwater Exploration at CADJ

Figure 4
 Advanced Geoscience, Inc.

2D Electrical Resistivity Profile from TEM Soundings for Off-Site Groundwater Contamination Investigation at Aerospace Facility, Near Victorville, CA



Transient Electromagnetic (TEM) Soundings Recorded with Offset 20x20 m Transmitter Loop
 Profile Based on 1D 18-Layer Resistivity Models Generated by Interpex IX1D Inversion Software
 1D Resistivity Models Gridded and Contoured using Golden Software Surfer
 Contour Interval 2 Ohm-meters, Horizontal Scale 1 inch= 80 Feet, Vertical Scale 1 inch= 20 Feet (x4 Exaggeration)

Line 5 Earth Electrical Resistivity Profile
 Ducommun AeroStructures Adelanto, CA

Figure 7
ADVANCED GEOSCIENCE, INC.

Applications of TEM Electrical Resistivity Surveys

Groundwater Investigations:

Prepare 2D Hydrogeologic Profiles Showing Groundwater-Bearing Zones and Structural and Stratigraphic Conditions- Integrate with CPT, Borehole, and Well Data

Evaluate Groundwater Quality- Estimate TDS and Salinity

Find Best Location and Depth for New Groundwater Production Wells- Develop “Analog Resistivity Profile” from TEM Soundings at Successful Producing Wells for TEM Exploration of New Areas

Delineation of Sea Water Intrusion and Contaminant Plumes

Mining and Geothermal Exploration:

Prepare 2D Profiles Showing Lower Resistivity (Conductive Mineral) Zones Associated with Disseminated Mineral Deposits and Ore Bodies- Delineate Structure with 3C TEM

Prepare Deeper 2D Profiles Showing Lower Resistivity Zones in Groundwater Basins Associated with Upwelling Geothermal Brines