POROUS POTS FOR SELF-POTENTIAL AND INDUCED-POLARIZATION SURVEYS

WHAT ARE POROUS POTS?

Also known as "non-polarizable electrodes," porous pots are a simple tool for enhancing conductivity between the ground and voltage meters for geophysics operations.

A.G.O.'s porous pots use shatterproof polycarbonate for the body. Unlike ceramic pots, this allows users to view the fluid level inside, and makes the pots extremely durable.

HOW ARE POROUS POTS USED?

Porous pots are essential components for self-potential (diagram shown below) and inducedpolaraization (IP) surveys used to locate potential ore bodies underground.

A GOVENVIRONMENTAL ELECTRONICS LTD

BASIC REQUIRED MATERIALS

All methods:

- Copper(II) sulfate, ~50g (~1 TBSP) per pot (~100mL water)
- Water for dampening soil at measurement sites
- Walkie-talkies

Self-potential method:

- Two (2) porous pots
- Spool of wire (optionally on a winch with a slip ring)
- Millivoltmeter

Induced-polarization method:

- Many porous pots
- Multiple spools of wire
- IP transmitter and receiver system
- Stainless steel electrodes

IP surveys are much more labour intensive than SP surveys, but typically yield more detailed results.



S.V. Burr, "A Guide to Prospecting by the Self-Potential Method," Ontario Geological Survey, Miscellaneous Paper 99, 1982.



- A. Copper electrode
- B. Ultra-durable polycarbonate tube
- C. Copper-sulfate solution
- D. Tough porous fireboard bottom

Each A.G.O. pot also comes with a ~5ft (~1.5m) length of 18AWG insulated copper wire soldered to the copper electrode.

APPLICATIONS

Porous pots, when used in SP and IP surveys, can be used for:

- Finding metals and ores such as gold and silver, base metals (e.g. copper, lead, zinc), or disseminated sulfides (e.g. pyrite)
- Finding sink holes
- Mapping presence and flow of groundwater and liquid soil contaminant plumes
- Guiding the addition of soil amendments during bioremediation work
- Finding subsurface geothermal activity

#10-626 Esquimalt Rd Victoria, BC, Canada, V9A3L4 info@agoenvironmental.com T: +1 (250) 386-4015

SP SURVEY METHOD QUICK REFERENCE FIELD GUIDE

PREPARING THE POROUS POTS



1. Pre-soak the pots overnight

Fill the pots with water 24hrs before the field trip and set them on a paper towel.

A damp spot within the first few hours indicates a leak – reseal the bottoms with RTV silicone sealant before using the pots. A damp spot after 24hrs indicates that the bottoms have saturated and are ready for use.



2. Scuff the copper electrode

Scrub and scuff the copper electrode with sandpaper or an abrasive pad like Scotch-Brite to remove any surface oxidation.

This improves conductivity between the copper electrode and the copper sulfate solution.



3. Fill with copper sulfate

Add ~50g (~1 tablespoon) of copper(II) sulfate crystals to each pot. Add ~100mL of water to each and stir until dissolved.

Plug the filled pots with the rubber stoppers.

Performing the survey



1. Connect the pots and voltmeter

Connect the pots, voltmeter, and wire spool like this:





2. Measure baseline potential

Moisten the ground at the datum/starting point and place the two pots close together. Measure the baseline potential between the two pots. Swap their positions and re-measure the baseline potential. A reading of a few millivolts is usually good enough to perform a survey.



3. Take measurements

Walk the pot connected to the free end of the wire out to each measurement point in the grid covering the survey area. Radio back to the partner at the datum to record the potential difference after placing a pot.



4. Record and interpret data

Record the millivolt potentials measured at each survey area grid point, including +/- polarity. Measurements of several times the baseline potential that switch polarity between grid points indicate presence of a conductive body below the soil.

Refer to technical geophysics literature for detailed information on interpreting SP survey data.

PLACING POROUS POTS





Pour a bit of water on the patch to moisten the dirt.

Place the pot. Ensure it has full contact between the bottom and the damp dirt.

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