MAPPING INDUCED POLARIZATION WITH NATURAL ELECTROMAGNETIC FIELDS FOR EXPLORATION AND RESOURCES CHARACTERIZATION BY THE MINING INDUSTRY

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Abstract

In this quarter we completed the field test of the first two prototypes of the MT-24/LF . Two prototypes were deployed in Japan as land remote reference systems during a marine MT survey. The two systems acquired data continuously for about two weeks. Data processing is in progress.
The IP Target Test Area has been selected. The complete survey will be conducted in Arizona Safford-Sol prospect owned by Kennecott. This is a large porphyry copper with a significant IP response.
Finally the Acquisition software has been completed.

Table of Contents

1. Objective

2. Poroject description

3. Summary of Progress

    3.1 Field test survey in Japan

    3.2 Software

    3.3 Survey Plan

Mapping induced polarization with natural electromagnetic fields for exploration and resources characterization by the mining industry

1. Objective

The objectives of this project is to demonstrate the use of a new geophysical system to collect economically competitive induced polarization (IP) data using natural electromagnetic (EM) field as a source.

The proposed technology uses naturally-existing EM fields, which provides greater depth of exploration and significant economic, energy, environmental and safety benefits.

2. Project Description

The purpose of this project is to use a new geophysical field system, designed to efficiently collect EM data along a profile line, to obtain IP data using natural EM fields as the source. The technique is non-invasive, eliminates the need for current electrodes and motor generator sets, and provides greater depth of exploration than controlled-source IP surveys. During the course of the project we will complete the adaption of a new field system for natural IP data collection, determine the procedures for its efficient deployment, and demonstrate the usefulness of natural IP.

3. Summary of Progress

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The IP Target Test Area has been selected. The complete survey will be conducted in Arizona Safford-Sol prospect owned by Kennecott. This is a large porphyry copper with a significant IP response.
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3.1 Field survey test in Japan

Two complete prototypes systems have been deployed in Japan for a period of two weeks. These system sere used as remote refernce systems during a marine MR survey performed for JAMSTEC in Japan. The two systems went recording continuously for a period of two weeks. Below is a picture of the area were the two systems were deployed.

The data from this survey are being processed. Preliminary in field processing shows data quality according to expectation. Based on these preliminary results, we have started manufacturing of additional five systems.

As a result of the bench testing of the system a new PCB will be made to include the modification in the circuit of the electric preamplifier. No change will be done for the digital acquisition which is working up to specs.

In July we will complete production of two systems that will be employed as remote reference units in Japan during a marine MT survey. This test will allow to characterize the system in the field. The two systems will be collecting data continuously for a period of three weeks.

After this field test five more units will be manufactured for the survey in Nevada.

3.2 Software

The firmware and acquisition software has been very successfully tested during the two week deployment in Japan of the two prototype systems.

3.3 Survey Plan

Kennecott has agreed to conduct our field trials on their property in Arizona (Stafford-Sol prospect). This area has a large porphyry copper which presents a significant IP target. We expect to be able to conduct the survey in between September and October, as soon as the additional five systems will be manufactured and tested.