



**PUBLIC PROCUREMENT TO ASSESS THE PRESENCE ON THE MARKET OF COMPANIES PROVIDING AN AIRBORNE GEOPHYSICAL SURVEY SERVICE CAPABLE TO ACQUIRE, PROCESS AND MODEL HTEM (HELICOPTER-BORNE TIME-DOMAIN ELECTROMAGNETIC) OR TDM(/TDEM) (TIME DOMAIN ELECTROMAGNETIC) DATA, FOR HYDROGEOLOGICAL MAPPING**

*The Water Research Institute (IRSA) of Italy's National Research Council (CNR)*

**GRANTED THAT**

- It intends to contract an airborne geophysical survey service capable to acquire, process and model HTEM (Helicopter-borne Time-Domain Electromagnetic) or TDM(/TDEM) (Time Domain Electromagnetic) data, for hydrogeological mapping of an area of about 1000 km<sup>2</sup>;
- The requested service is characterized by considerable technical complexity that makes it necessary a prior assessment, through an international public procurement, of the presence of contractors capable of providing the above mentioned service; to allow said contractors to make available to CNR-IRSA the technical characteristics of their equipment and of the services they provide; and at the same time to allow CNR-IRSA to verify which contractors are capable to provide a product and a service tailored to the requirements of the VIGOR project;

**PUBLISHES THE PRESENT PUBLIC PROCUREMENT**

to assess the presence on the market and the technical capabilities of the companies capable to provide following services, and consequently to evaluate them in order to start a call for tender.

**PROCEDURE**

1. Public procurement not constituting a public procedure.
2. After the publication of the current procurement, the interested contractors will send, according to the terms specified in clause 3, their expression of interest with the detailed description of the service they provide together with detailed information about their technical capabilities in the specific field.
3. The interested companies will send their expression of interest and the requested technical documentation in a closed envelope no later than 11 a.m. of August 26, 2011, by:
  - registered letter or express mail shipped by the postal service "Poste Italiane SpA" or by alternate qualified private postal services;
  - express courier;
  - hand-delivered registered letter.

The deadline is mandatory and CNR-IRSA cannot be held responsible for missed or late deliveries.

The envelope must contain the following caption "PUBLIC PROCUREMENT TO ASSESS THE PRESENCE OF POTENTIAL CONTRACTORS OF A HTEM-TDM SERVICE"

IRSA - CNR - IRSA

Tit: IV.5

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**N. 0003754**

**02/08/2011**





*Il Direttore*

The expression of interest must necessarily contain:

- technical specifications of the provided survey equipment, complying with the requirements below (section 4.1);
- technical specifications of the provided data acquisition and processing service, complying with the requirements below (section 4.2);
- declaration of availability for a full demonstration of the provided service, whose terms and location will be agreed between the parties.

Failure to comply with the above requests will result in exclusion from the public procurement.

The public procurement, at the risk of the documents being inadmissible, **SHOULD NOT CONTAIN** a quotation of the provided service.

The public procurement together with the requested documentation, at the risk of the documents being inadmissible, must **MANDATORILY BE NOTIFIED BY FAX** at the number 06/90672787, not later than 11:00 a.m. of August 26, 2011.

4.1 Technical specifications of the provided equipment

- a. Electromagnetic transmitter-receiver loop assembly.
- b. Loop assembly maximum towed weight of 500 kg, mounted on a rigid structure towed as a sling load by the helicopter.
- c. Transmitter loop mean terrain clearance (MTC) of 30 m.
- d. Monitoring of loop altitude and tilt during data acquisition.
- e. Dual moment transmitter, for combined higher near-surface resolution and deeper penetration.
- f. Square wave broadband transmitter with selectable base frequency  $\geq 12.5$  Hz.
- g. Ramp-down transient duration  $< 10 \mu\text{s}$ , to reach a residual current  $< 10\%$  of peak current.
- h. Dipole moment  $\geq 120.000 \text{ Am}^2$ .
- i. Unbiased or self-response-free first gate at less than  $12 \mu\text{s}$  before beginning of ramp-down.
- j. Last programmable gate no later than  $\approx 10 \text{ ms}$  before beginning of ramp-down.
- k. EM data requiring no levelling, or lengthy primary field removal procedures at the preprocessing stage, in order to process and invert the data at the end of each flight.

4.2 Technical specifications of the provided acquisition and processing service

- l. Processing and modelling of EM and navigation data acquired by a broadband airborne HTEM system for hydrogeological applications.
- m. Navigation and EM data will be processed on a GIS platform.
- n. CNR will provide all geographical data of the areas to be mapped in digital format together with, whenever available, all information concerning the localization of any surface or underground feature which could interfere with the Tx-Rx system and that could ease data acquisition and processing.
- o. Whenever available, CNR will provide any significant geophysical support data of the mapped areas. If relevant, such data will be used as a priori information for the inversion of the EM data.



**ISTITUTO DI RICERCA SULLE ACQUE**  
*del Consiglio Nazionale delle Ricerche*

*Il Direttore*

- p. All EM and loop navigation data will be accurately edited before processing, removing all artifacts due to surface or underground features and applying a light filtering to the acquired data in order to increase the S/N ratio without reducing the lateral resolution. Data editing will be independently optimized for each mapping and on the whole mapping area.
- q. Data will be “conditionally” inverted, using an exact direct 1D modeling and 3D spatial constraints. Data inversion will use both smooth (multi-layer) and blocky methods.
- r. After each flight, or at least at the end of each day, the above described data will be downloaded to a data processing facility located in the surroundings of the landing area. Data will be processed and inverted at the end of the flight or overnight. This first stage of processing has a purely preliminary character, merely representing a first approximation of the final results, and is meant to monitor the acquisition system and to confirm the predefined flight plans. Immediately after processing, the preliminary maps will be sent to the project manager.
- s. Finally, acquired data will be processed off-line at the contractor’s offices, in order to obtain the final results. Data will be accurately edited to remove all artifacts due to surface or underground features, to increase the underground S/N ratio, and to assign “late times” noise levels. Data will be inverted using an exact direct 1D modeling, accurately describing all characteristics of the Tx-Rx system, without approximations. A map of the system penetration depth in the scanned areas will be produced.
- t. The results, together with original and modeled data, maps of QA/QC, and processing and inversion settings, will be delivered in form of workspaces to the client, so that the whole workflow can be checked.
- u. The best inversion results will be further processed to produce geophysical maps, such as he average resistivity at different depths below the terrain surface.
- v. If necessary, the contractor will cooperate with the client on further geological interpretation of the results.
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- **The publication of the present public procurement and the expression of interest of the contractor does not, in any case, bind this Institute to invite the contractor to a further call for tender.**
  - **All collected information will be used only for this public procurement and treated in accordance with the current Italian Data Protection Law (D.Lgs. 196/2003).**
  - **The present public procurement is published on the Board of CNR-IRSA and on the website of CNR Public Relations Office (<http://www.urp.cnr.it/index.php?lingua=E>), section “Bands and Competitions”, for all contractors capable of providing the above mentioned service; The expressions of interest do not, in any case, bind the Institute, since it has the sole objective to assess the presence on the market of contractors possessing the above mentioned technical requirements.**
  - **The expression of interest by a contractor does not give the said contractor any right to participate to a further call for tender), nor will place any specific obligation upon the Contractor Office.**

The Director of CNR-IRSA

Dott. Maurizio Pettine