

**LOGISTICAL REPORT**  
**FOR**  
**ICON RESOURCES LTD.**

**3D INDUCED POLARIZATION SURVEY**  
**ON THE**  
**PROFESSOR PROJECT**

*Zeehan, Tasmania*

*363000E, 5349000N,  
AGD 66, Zone 55.*

SURVEY CONDUCTED BY  
SJ GEOPHYSICS LTD.  
APRIL 2007

REPORT WRITTEN BY  
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APRIL 2007

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## **1. INTRODUCTION**

A three-dimensional Induced Polarization (3D-IP) survey was conducted on Icon Resources Ltd.'s Professor project. The exploration lease is located between Zeehan and Strahan on both sides of highway B27 in western Tasmania.

The property is located over a series of folded sedimentary units, dipping at approximately 45 degrees to the northwest. The target is a planar, strataform body of sulphide mineralization associated with zinc occurrences located on the contact between the Gordon Limestone and Moina sandstone units. Previous exploration has included geological mapping, soil sampling, airborne magnetics and drilling. The purpose of the survey is to locate deep occurrences of sulphides which are thought to be associated with the zinc deposits.

The ground geophysical program was surveyed by SJ Geophysics Ltd. during April 2007. Initial data processing and some quality control were performed on site by the field crew, and the initial coarse inversion was submitted before the geophysicist returned to Canada. The final modeling was completed at the SJ Geophysics office in Vancouver, Canada.

This logistical report summarizes the operational aspects of the survey and the survey methodologies used. This report does not discuss any interpretation of the results of the geophysical survey.

## **2. LOCATION AND LINE INFORMATION**

The Professor tenement consists of several adjoining exploration leases located along highway B27 about 20km south of Zeehan and 30km north of Strahan, Tasmania. Crew meals and cabin accommodations were at the Cecil Hotel and Miners Cottages in Zeehan. Figure 1 shows the general location of project region.

The IP survey was conducted over a portion of this property, the central portions of the lines running through a broad valley, with the ends of most lines extending up onto more resistant plateaus. The surveyed area included the "Grieves South", "Grieves Siding" and "Baura" showings. Vegetation varies from open buttongrass to thick scrub and dense rainforest. The valley floor was covered in quaternary sediments but outcrops are numerous along the edges of the plateaus. Numerous creeks run through the property with water levels varying with the

amount of rainfall.

The total area surveyed was approximately 2.4km by 3.2km along 17 lines oriented east-west, as shown in Figure 2. The central portion of the grid was extended to cover an additional area of 0.8km by 2.5km.

The initial 9 transmitter lines were approximately 2400m long with station spacing of 100m. The 8 receiver lines were 1600m with 100m stations. Lines 47600N and 47800N were shortened by 1000m due to a narrowing of the target rock unit. At the end of the survey, lines 9200N to 8400N were extended to the west by 2000-3000m.

The grid was put in by chain and compass concurrent with the IP surveying. Due to the last-minute nature of the survey, line cutting was minimal, and thus some lines were deliberately skewed to avoid sections of extremely dense scrub. GPS and clinometer data was recorded for all stations.



Figure 1: Professor Project location in Tasmania

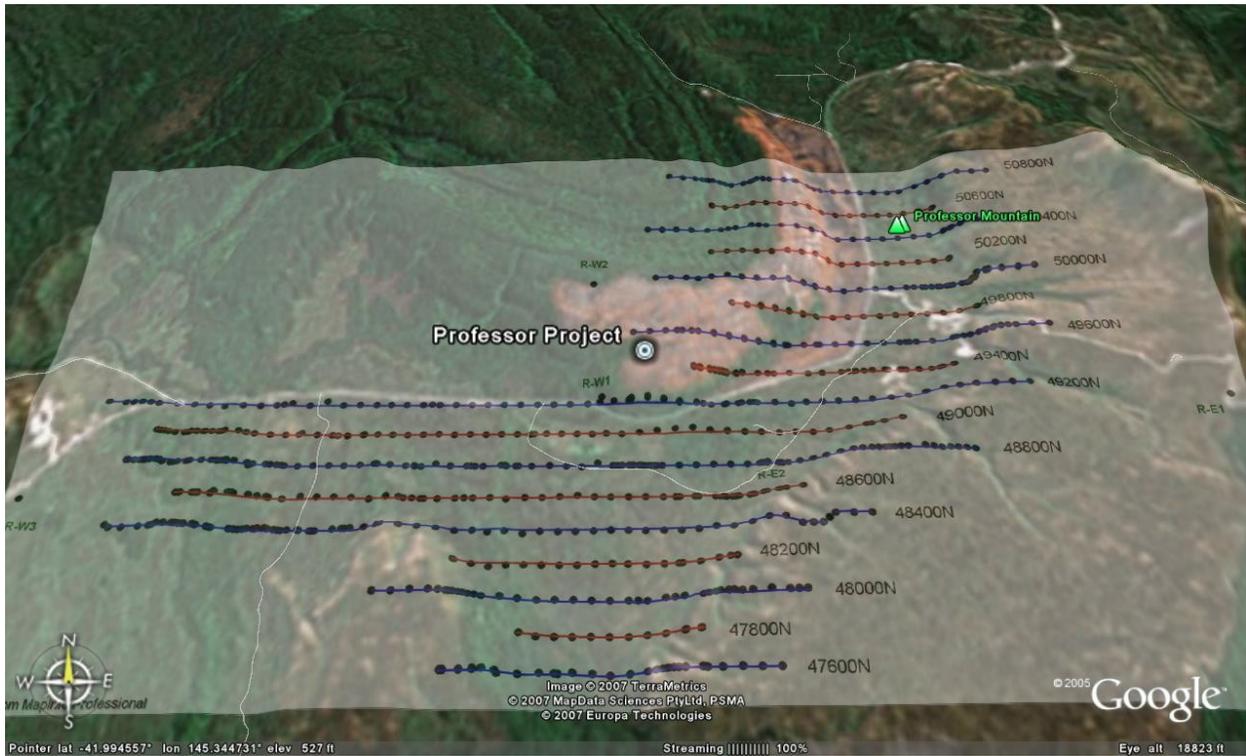


Figure 2: Professor 3D-IP gridlines- Rx=red, Tx=blue

### **3. FIELD WORK AND INSTRUMENTATION**

#### ***3.1. FIELD LOGISTICS***

The SJ Geophysics Ltd. crew consisted of two SJ Geophysics employees: Aaron Snider (Geophysicist) and Gary Cooper (Geophysical Technician). Icon's Bronwyn Kimber (Project Geologist) organized logistical issues, line cutting and aided the IP survey for the duration of the project. Nick Truchanas was available to help with the survey for the duration, while Matt Munro, Simon Mackenzie, Shawn Barber, and Emma Watt were available for the first two weeks. Steve and Alex Northey were available after April 11. In addition numerous local helpers from Zeehan and Queenstown came and went throughout the survey with varying degrees of commitment. Icon Resources director John Bishop was on site periodically throughout the survey along with other Icon representatives.

Garry mobilized from Bangkok, Thailand to Sydney on March 29 where he picked up the IP equipment and vehicle and proceeded to drive to the ferry in Melbourne. Aaron mobilized from Vancouver, Canada on March 30 and arrived in Hobart on April 1 where he was met by Garry. After picking up some supplies in Hobart the following morning, the SJ crew picked up John Bishop and drove to Zeehan. The rest of the IP crew mobilized earlier that morning and began pegging the first lines. April 3 was spent chaining lines 50000N, 49800N, and 49600N, testing equipment and setting up wires. Recording began on the following day and proceeded southwards over the next nine days to line 47600N. This set of recordings required a transmitter site move due to communications and amount of wire on the ground. After this, the entire survey was moved to the north end of the grid, specifically lines 50000N to 50800N. The eastern remote (E1) was used for this portion of the grid as well, but a new western remote was needed (W2). On April 15 the entire survey was once again packed up and moved to record extensions on lines 49200N to 48400N, which took 5 days. On April 20, the crew removed all wire, cable and equipment from the grid and demobilized to Hobart the following day, after which Aaron spent 2 days in Icon's Hobart office processing data and preparing the inversions while Garry drove the truck and equipment back to Sydney.

Access to the grid was excellent with a sealed highway (B27) running through the middle of

the property. However, this presented challenges to the survey as receiver cables had to be extended and ran through culverts to avoid the relatively heavy road traffic. Other than highway B27 and one small mining track, the rest of the grid was not accessible by vehicle and all equipment and wire had to be brought in by hand. The most challenging logistical problem was the lack of properly cut lines: requiring crew members to assist with the lines otherwise slated for IP and the difficulty in traversing the dense bush while carrying equipment and cables. Aside from the poor reliability of local helpers, crew members worked very well together.

Due to the questionable weather windows at this time of the year, Icon opted to survey the grid in order of priority of targets. Because of this some efficiency was lost due to moving the equipment and wire from one end of the grid to the other.

### ***3.2. SURVEY PARAMETERS AND INSTRUMENTATION***

A modified pole-dipole 3D-IP configuration array was used with 16 dipoles of 100m and 200m separations. The IP data was collected using SJ Geophysics' SJ-24 Full Waveform receiver. The current was injected with a 2 seconds on, 2 seconds off duty cycle into the ground via a transmitter. A GDD 3.6kW voltage-regulated transmitter was used for the duration of the survey.

For the production phase, the 3D configuration consists of two current lines being recorded into the receiver line. The current lines were located on either side of the receiver line, and subsequent lines were surveyed with a single current line overlap.

The potential array was implemented using specialized 8 conductor IP cables configured with 100m takeouts for the potential electrodes. At each current station, electrodes consisted of two 1.0m stainless steel rods, 15mm in diameter. For the potential line, the electrodes consisted of stainless steel 'pins, 50cm long and 10mm in diameter, which were hammered into the ground.

Five IP remote stations were used, as shown in Figure 2, located off the east and west ends of the associated survey lines. In an effort to achieve better depth penetration and cleaner data, the eastern remotes were used when surveying the western side of the lines and vice versa. Gradient shots were also taken using a eastern and western remote as the two current injection locations.

The remote current locations consisted of three to four 1m stainless steel rods, 15mm in

diameter. The exact locations of the remote currents were acquired by GPS for use in the geophysical calculations.

## **4. GEOPHYSICAL TECHNIQUES**

### **4.1. IP METHOD**

The time domain IP technique energizes the ground surface with an alternating square wave pulse via a pair of current electrodes. On most surveys, such as this one, the IP/Resistivity measurements are made on a regular grid of stations along survey lines.

After the transmitter (Tx) pulse has been transmitted into the ground via the current electrodes, the IP effect is measured as a time diminishing voltage at the receiver electrodes. The IP effect is a measure of the amount of IP polarizable materials in the subsurface rock. Under ideal circumstances, IP changeability responses are a measure of the amount of disseminated metallic sulfides in the subsurface rocks.

Unfortunately, there are other rock materials that give rise to IP effects, including some graphitic rocks, clays and some metamorphic rocks (serpentine for example). So from a geological point of view, IP responses are almost never uniquely interpretable. Because of the non-uniqueness of geophysical measurements it is always prudent to incorporate other data sets to assist in interpretation.

Also, from the IP measurements the apparent (bulk) resistivity of the ground is calculated from the input current and the measured primary voltage. IP/resistivity measurements are generally considered to be repeatable to within about five percent. However, they will exceed that if field conditions change due to variable water content or variable electrode contact.

IP/resistivity measurements are influenced, to a large degree, by the rock materials nearest the surface (or, more precisely, nearest the measuring electrodes), and the interpretation of the traditional pseudosection presentation of IP data in the past has often been uncertain. This is because stronger responses that are located near surface could mask a weaker one that is located at depth.

#### **4.2. 3D-IP METHOD**

Three dimensional IP surveys are designed to take advantage of the interpretational functionality offered by 3-D inversion techniques. Unlike conventional IP, the electrode arrays are no longer restricted to in-line geometry. Typically, current electrodes and receiver electrodes are located on adjacent lines. Under these conditions, multiple current locations can be applied to a single receiver electrode array and data acquisition rates can be significantly improved over conventional surveys.

In a common 3D-IP configuration, a receiver array is established, end-to-end along a survey line while current electrodes are located on two adjacent lines. The survey typically starts at one end of the line and proceeds to the other end. A typical 12 dipole array normally consists of four 200m dipole, followed by eight 100m dipoles. In some areas these spacings are modified to compensate for local conditions such as inaccessible sites, streams, and overall conductivity of ground. Current electrodes are advanced along the adjacent lines at 100m increments. Receiver arrays are typically established on every second line (200m apart).

#### **4.3. INVERSION PROGRAMS**

“Inversion” programs have recently become available that allow a more definitive interpretation, although the process remains subjective. The purpose of the inversion process is to convert surface IP/Resistivity measurements into a realistic “Interpreted Depth Section.” However, note that the term is left in quotation marks. The use of the inversion routine is a subjective one because the input into the inversion routine calls for a number of user selectable variables whose adjustment can greatly influence the output. The output from the inversion routines do assist in providing a more reliable interpretation of IP/Resistivity data, however, they are relatively new to the exploration industry and are, to some degree, still in the experimental stage.

The inversion programs are generally applied iteratively to evaluate the output with regard to what is geologically known, to estimate the depth of detection, and to determine the viability of specific measurements.

*3D-IP Logistical Report: Professor Project, Icon Resources Ltd.*

The Inversion Program (DCINV3D) used by the SJ Geophysical Group was developed by a consortium of major mining companies under the auspices of the UBC-Geophysical Inversion Facility. It solves two inverse problems. The DC potentials are first inverted to recover the spatial distribution of electrical resistivity, and, secondly, the chargeability data (IP) are inverted to recover the spatial distribution of IP polarizable particles in the rocks.

The interpreted depth section maps represent the cross sectional distribution of polarizable materials, in the case of IP effect, and the cross sectional distribution of the resistivity, in the case of the resistivity parameter.

## APPENDIX 1: INSTRUMENT SPECIFICATIONS

### SJ-24 Full Waveform Digital IP Receiver

#### Technical:

Input impedance:	10 Mohm
Input overvoltage protection:	up to 1000V
External memory:	Unlimited readings
Number of dipoles:	4 to 16 +, expandable.
Synchronization:	Software signal post-processing user selectable
Common mode rejection:	More than 100 dB (for $R_s = 0$ )
Self potential (Sp):	Range: -5V to + 5V Resolution: 0.1 mV Proprietary intelligent stacking process rejecting strong non-linear SP drifts
Primary voltage:	Range: 1 $\mu$ V – 10V (24bit) Resolution: 1 $\mu$ V Accuracy: typ. <1.0%
Chargeability:	Resolution: 1 $\mu$ V/V Accuracy: typ. <1.0%

#### General (4 dipole unit):

Dimensions:	18x16x9 cm
Weight:	1.1 Kg
Battery:	12V External
Operating temperature range:	-20°C to 40°C

### GDD Tx II IP Transmitter

Input voltage:	120V / 60 Hz or 240V / 50Hz (optional)
Output power:	3.6 kW maximum.
Output voltage:	150 to 2200 Volts
Output current:	5 ma to 10Amperes
Time domain:	1,2,4,8 second on/off cycle.
Operating temp. range:	-40 <sup>0</sup> to +65 <sup>0</sup> C
Display:	Digital LCD read to 0.001A
Dimensions (h w d):	34 x 21 x 39 cm
Weight:	20kg.

## 5 APPENDIX 2 : 3D-IP SUMMARY TABLE

<i>Line # (Local Coord)</i>	<i>L.Series</i>	<i>Start Station</i>	<i>End Station</i>	<i>Surveyed Length</i>	<i>Rx Dates Surveyed</i>
50800	N	62900	65300	2400	
50600	N	63300	64900	1600	14/04
50400	N	62900	65300	2400	
50200	N	63300	64900	1600	13/04
50000	N	63000	65400	2400	
49800	N	63400	65000	1600	3-5/04
49600	N	62800	65400	2600	
49400	N	63200	64800	1600	6/04
49200	N	59600	65200	5600	
49000	N	59800	64400	4600	7/04,16-17/04
48800	N	59600	64600	5000	
48600	N	60200	63800	3600	9/04, 19/04
48400	N	59800	64200	4400	
48200	N	61800	63400	1600	10-11/04
48000	N	61400	63800	2400	
47800	N	62200	63200	1000	11-12/04
47600	N	61800	63600	1800	

*Total Linear Metres = 46 200*