

PO Box 219  
14579 Government Road  
Larder Lake, Ontario  
P0K 1L0, Canada  
Phone (705) 643-1122  
Fax (705) 643-2191

# **RA RESOURCES LTD.**

## **Magnetometer Survey Over the**

### **CHURCHILL PROPERTY Churchill Township, Ontario**

**TABLE OF CONTENTS**

**1. SURVEY DETAILS .....3**

1.1 PROJECT NAME..... 3

1.2 CLIENT ..... 3

1.3 LOCATION ..... 3

1.4 ACCESS ..... 4

1.5 SURVEY GRID ..... 4

**2. SURVEY WORK UNDERTAKEN .....5**

2.1 SURVEY LOG..... 5

2.2 PERSONNEL ..... 5

2.3 SURVEY SPECIFICATIONS..... 5

**3. OVERVIEW OF SURVEY RESULTS.....6**

3.1 SUMMARY INTERPRETATION..... 6

**LIST OF APPENDICES**

- APPENDIX A: STATEMENT OF QUALIFICATIONS**
- APPENDIX B: THEORETICAL BASIS AND SURVEY PROCEDURES**
- APPENDIX C: INSTRUMENT SPECIFICATIONS**
- APPENDIX D: LIST OF MAPS (IN MAP POCKET)**

**LIST OF TABLES AND FIGURES**

Figure 1: General Location of Churchill Property ..... 3

Figure 2: Claim Map Churchill Grid ..... 4

Table 1: Survey Log ..... 5

## 1. SURVEY DETAILS

### 1.1 PROJECT NAME

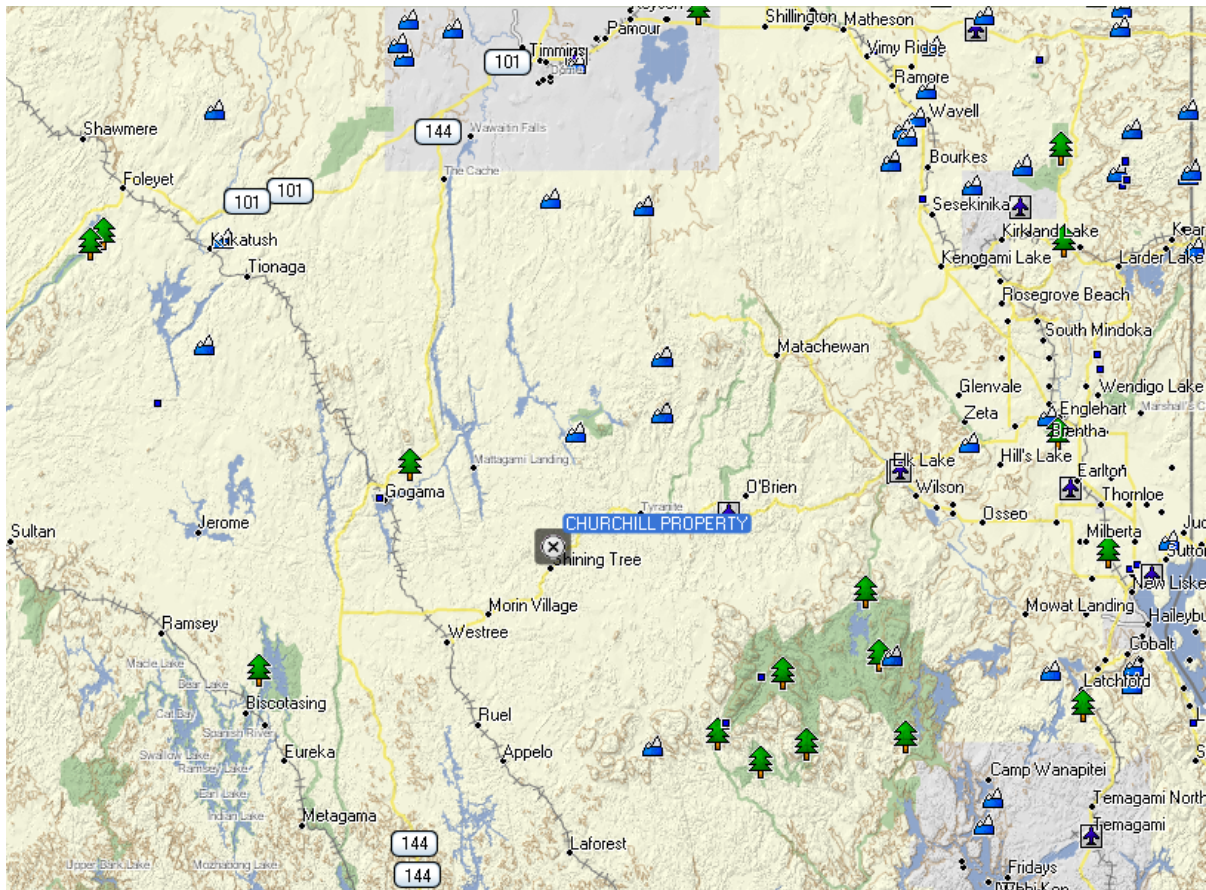
This project is known as the **Churchill Property**.

### 1.2 CLIENT

RA Resources Ltd.  
141 Adelaide Street West, Suite 110  
Toronto, Ontario  
M5H 3L5

### 1.3 LOCATION

The Churchill Property is located in Churchill Township within the Larder Lake Mining Division. The grid is located approximately 3.5 km north of Shining Tree, Ontario and covers a portion of mining claims 1191627, 1131966, 1240606, 1191629, 1191622 and 1191623.



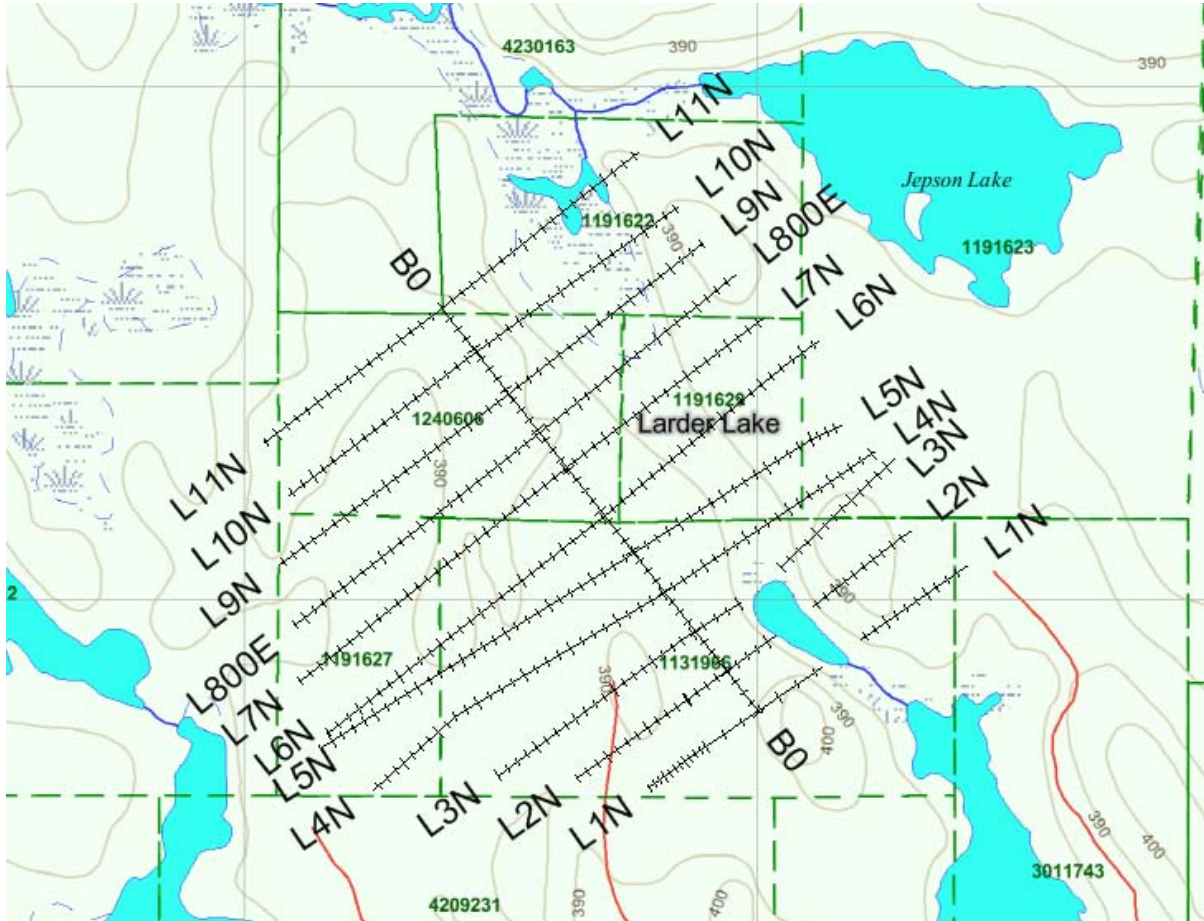
***Figure 1: General Location of Churchill Property***

**1.4 ACCESS**

Access is gained to the property via a forestry access road approximately 1.5km east along highway 560, from Shining Tree. This road was travelled north for a distance of 1.75km to where the grid crosses the road.

**1.5 SURVEY GRID**

The grid consists of 12.515 kilometers of recently established grid lines. The grid lines are spaced 100 meter increments with stations picketed every 25-30m intervals. The baseline ran at 322°N for a total length of 1000m.



**Figure 2: Claim Map Churchill Grid**

## 2. SURVEY WORK UNDERTAKEN

### 2.1 SURVEY LOG

Date	Description	Line	Min Extent	Max Extent	Total Survey (m)
October 19, 2010	Locate survey area and begin survey. Grid is poorly cut and chained.	11N	430W	490E	920
		10N	460W	485E	945
		9N	560W	480E	1040
		8N	625W	500E	1125
		7N	675W	490E	1165
		6N	680W	540E	1220
		4N	690W	210W	480
		3N	150W	0E	150
		0E	300N	1100N	800
		October 21, 2010	Complete survey. Grid is poorly cut and chained.	5N	725W
4N	210W			510E	720
3N	500W			525E	875
2N	375W			500E	875
1N	275W			500E	775
0E	100N			300N	200

**Table 1: Survey Log**

### 2.2 PERSONNEL

Jason Ploeger of Larder Lake, Ontario, conducted all of the data collection.

### 2.3 SURVEY SPECIFICATIONS

The survey was conducted with a GSM-19 v7 Overhauser magnetometer in walkmag mode. Samples were collected every second with the position extrapolated using the time to go 25m. A second GSM-19 was employed as a base station for diurnal corrections.

A total of 12.515 line kilometers of magnetic survey was conducted between October 19<sup>th</sup> and October 21<sup>st</sup>, 2010. This consisted of 14969 magnetometer samples.

### 3. OVERVIEW OF SURVEY RESULTS

#### 3.1 SUMMARY INTERPRETATION

Due to problems with the chaining on the lines, there may be inconsistencies in the data presentation. It is my recommendation that the survey be performed again once the grid issues have been resolved.

It would appear that only one magnetic domain occurs within the survey area. This would most likely indicate a generally uniform geological unit such as a volcanic.

There appears to be some magnetically elevated north-south magnetic trends. These elevated trends most likely represent a series of regionally diabase dikes striking through the survey area. These possible dikes appear to be broken and shifted in areas. This indicates presence of structural features such as faults or shear zones. These features may be a target for gold mineralization.

**APPENDIX A****STATEMENT OF QUALIFICATIONS**

I, C. Jason Ploeger, hereby declare that:

1. I am a geophysicist (non-professional) with residence in Larder Lake, Ontario and am presently employed as geophysical manager of Larder Geophysics Ltd. of Larder Lake, Ontario.
2. I graduated with a Bachelor of Science degree in geophysics from the University of Western Ontario, in London Ontario, in 1999.
3. I have practiced my profession continuously since graduation in Africa, Bulgaria, Canada, Mexico and Mongolia.
4. I am a member of the Ontario Prospectors Association, Director of the Northern Prospectors Association and a member of the Society of Exploration Geophysicists.
5. I have no interest or expect any interest in the properties and securities of Ra Resources Ltd.
6. I am responsible for the final processing and validation of the survey results and the compilation of the presentation of this report. The statements made in this report represent my professional opinion based on my consideration of the information available to me at the time of writing this report.

Larder Lake, ON  
November 2010



C. Jason Ploeger, B.Sc. (geophysics)  
Geophysical Manager of Larder Geophysics Ltd.

## APPENDIX B

### THEORETICAL BASIS AND SURVEY PROCEDURES

#### TOTAL FIELD MAGNETIC SURVEY

Base station corrected Total Field Magnetic surveying is conducted using at least two synchronized magnetometers of identical type. One magnetometer unit is set in a fixed position in a region of stable geomagnetic gradient, and away from possible cultural effects (i.e. moving vehicles) to monitor and correct for daily diurnal drift. This magnetometer, given the term 'base station', stores the time, date and total field measurement at fixed time intervals over the survey day. The second, remote mobile unit stores the coordinates, time, date, and the total field measurements simultaneously. The procedure consists of taking total magnetic measurements of the Earth's field at stations, along individual profiles, including Tie and Base lines. A 2 meter staff is used to mount the sensor, in order to optimally minimize localized near-surface geologic noise. At the end of a survey day, the mobile and base-station units are linked, via RS-232 ports, for diurnal drift and other magnetic activity (ionospheric and spheric) corrections using internal software.

For the gradiometer application, two identical sensors are mounted vertically at the ends of a rigid fiberglass tube. The centers of the coils are spaced a fixed distance apart (0.5 to 1.0m). The two coils are then read simultaneously, which alleviates the need to correct the gradient readings for diurnal variations, to measure the gradient of the total magnetic field.

#### VLF Electromagnetic

The frequency domain VLF electromagnetic survey is designed to measure both the vertical and horizontal in-phase (IP) and Quadrature (OP) components of the anomalous field from electrically conductive zones. The sources for VLF EM surveys are several powerful radio transmitters located around the world which generate EM radiation in the low frequency band of 15-25kHz. The signals created by these long-range communications and navigational systems may be used for surveying up to several thousand kilometres away from the transmitter. The quality of the incoming VLF signal can be monitored using the field strength. A field strength above 5pT will produce excellent quality results. Anything lower indicates a weak signal strength, and possibly lower data quality. A very low signal strength (<1pT) may indicate the radio station is down.

The EM field is planar and horizontal at large distances from the EM source. The two components, electric (E) and magnetic (H), created by the source field are orthogonal to each other. E lies in a vertical plane while H lies at right angles to the direction of propagation in a horizontal plane. In order to ensure good coupling, the strike of possible conductors should lie in the direction of the transmitter to allow the H vector to pass through the anomaly, in turn, creating a secondary EM field.

The VLF EM receiver has two orthogonal aeriels which are tuned to the frequency of the transmitting station. The direction of the source station is located by rotating the sensor around a vertical axis until a null position is found. The VLF EM survey procedure consists of taking measurements at stations along each line on the grid. The receiver is rotated about a horizontal axis, right angles to the traverse and the tilt recorded at the null position.



## APPENDIX C

### GSM 19



#### Specifications

##### Overhauser Performance

Resolution: 0.01 nT  
 Relative Sensitivity: 0.02 nT  
 Absolute Accuracy: 0.2nT  
 Range: 20,000 to 120,000 nT  
 Gradient Tolerance: Over 10,000nT/m  
 Operating Temperature: -40°C to +60°C

##### Operation Modes

Manual: Coordinates, time, date and reading stored automatically at min. 3 second interval.  
 Base Station: Time, date and reading stored at 3 to 60 second intervals.  
 Walking Mag: Time, date and reading stored at coordinates of fiducial.  
 Remote Control: Optional remote control using RS-232 interface.  
 Input/Output: RS-232 or analog (optional) output using 6-pin weatherproof connector.

##### Operating Parameters

Power Consumption: Only 2Ws per reading. Operates continuously for 45 hours on standby.  
 Power Source: 12V 2.6Ah sealed lead acid battery standard, other batteries available  
 Operating Temperature: -50°C to +60°C

##### Storage Capacity

Manual Operation: 29,000 readings standard, with up to 116,000 optional. With 3 VLF stations: 12,000 standard and up to 48,000 optional.

Base Station: 105,000 readings standard, with up to 419,000 optional (88 hours or 14 days uninterrupted operation with 3 sec. intervals)

Gradiometer: 25,000 readings standard, with up to 100,000 optional. With 3 VLF stations: 12,000, with up to 45,000 optional.

##### Omnidirectional VLF

Performance Parameters: Resolution 0.5% and range to  $\pm 200\%$  of total field. Frequency 15 to 30 kHz.

Measured Parameters: Vertical in-phase & out-of-phase, 2 horizontal components, total field coordinates, date, and time.

Features: Up to 3 stations measured automatically, in-field data review, displays station field strength continuously, and tilt correction for up to  $\pm 10^\circ$  tilts.

Dimensions and Weights: 93 x 143 x 150mm and weighs only 1.0kg.

## Dimensions and Weights

### Dimensions:

Console: 223 x 69 x 240mm

Sensor: 170 x 71mm diameter cylinder

### Weight:

Console: 2.1kg

Sensor and Staff Assembly: 2.0kg

## Standard Components

GSM-19 magnetometer console, harness, battery charger, shipping case, sensor with cable, staff, instruction manual, data transfer cable and software.

## Taking Advantage of a “Quirk” of Physics

Overhauser effect magnetometers are essentially proton precession devices except that they produce an order-of-magnitude greater sensitivity. These "supercharged" quantum magnetometers also deliver high absolute accuracy, rapid cycling (up to 5 readings / second), and exceptionally low power consumption.

The Overhauser effect occurs when a special liquid (with unpaired electrons) is combined with hydrogen atoms and then exposed to secondary polarization from a radio frequency (RF) magnetic field. The unpaired electrons transfer their stronger polarization to hydrogen atoms, thereby generating a strong precession signal-- that is ideal for very high-sensitivity total field measurement. In comparison with proton precession methods, RF signal generation also keeps power consumption to an absolute minimum and reduces noise (i.e. generating RF frequencies are well out of the bandwidth of the precession signal).

In addition, polarization and signal measurement can occur simultaneously - which enables faster, sequential measurements. This, in turn, facilitates advanced statistical averaging over the sampling period and/or increased cycling rates (i.e. sampling speeds).

The unique Overhauser unit blends physics, data quality, operational efficiency, system design and options into an instrumentation package that ... exceeds proton precession and matches costlier optically pumped cesium capabilities.

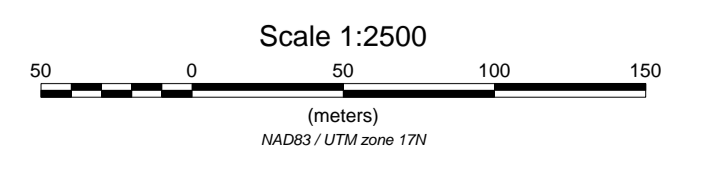
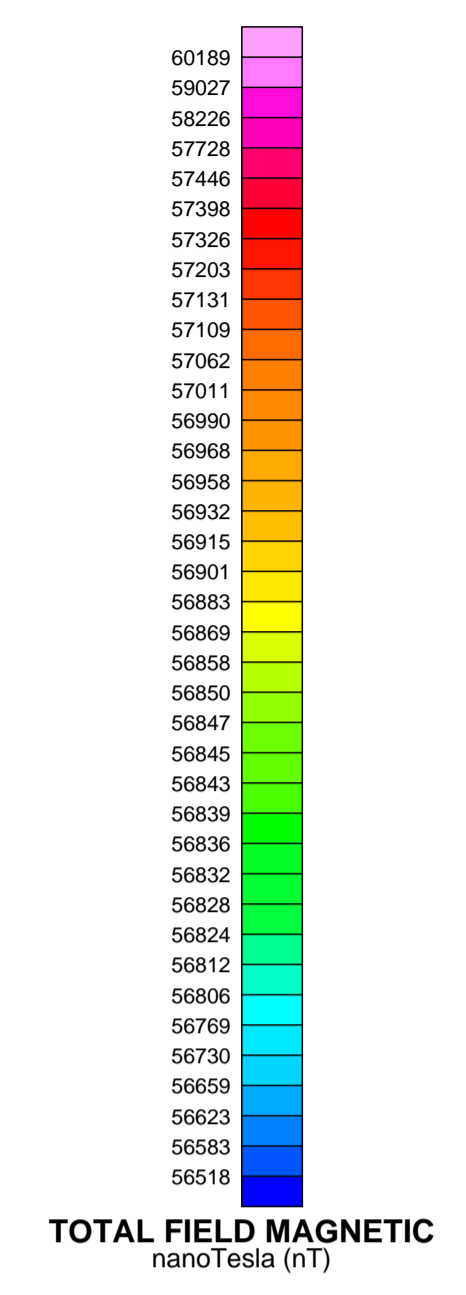
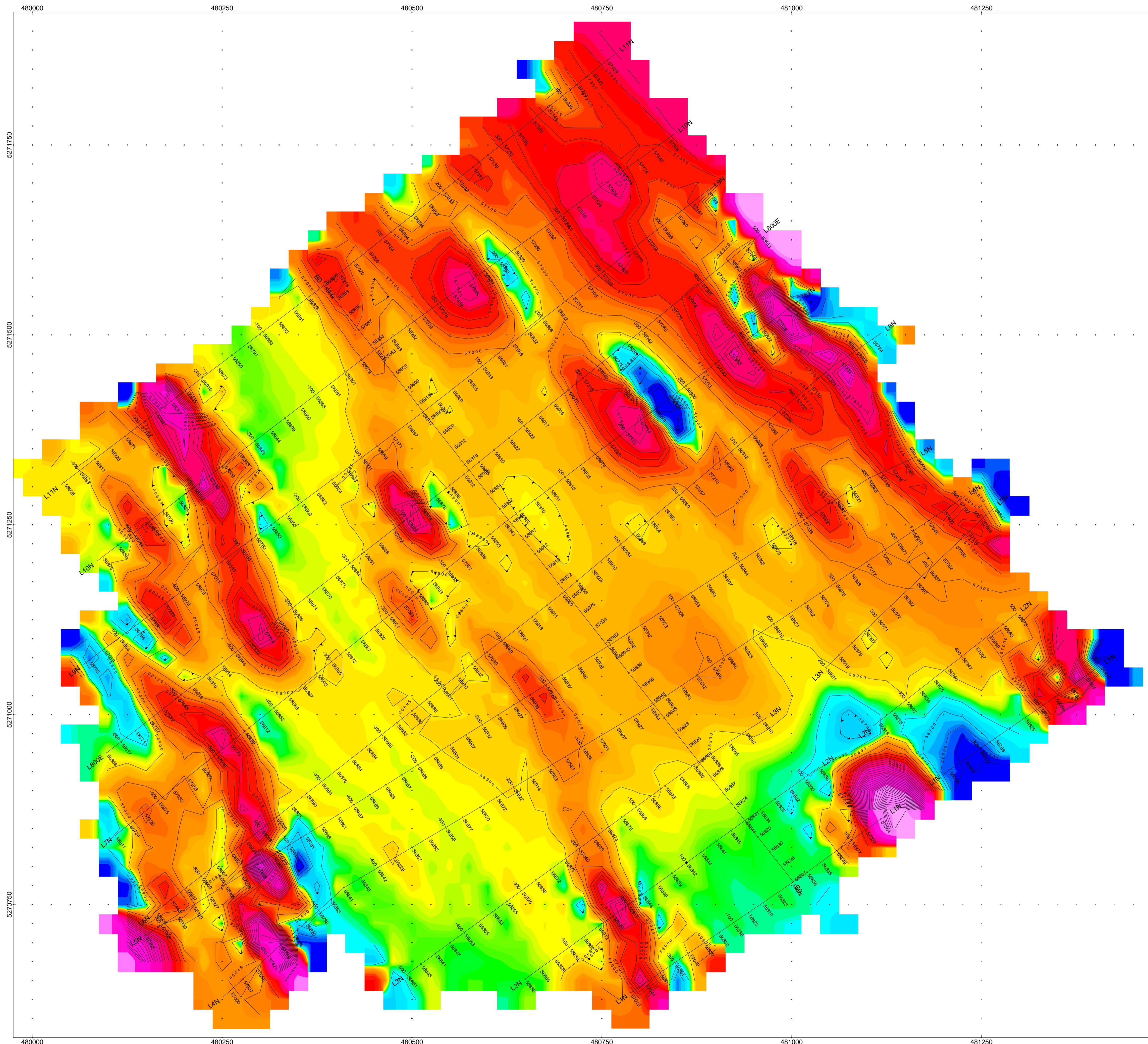
## APPENDIX D

### LIST OF MAPS (IN MAP POCKET)

Posted contoured TFM plan map (1:2500)

- 1) RA-CHURCHILL-MAG-CONT

**TOTAL MAPS=1**



**RA RESOURCES LTD.**  
**CHURCHILL PROPERTY**  
Churchill Township, Ontario

TOTAL FIELD MAGNETIC CONTOURED PLAN MAP  
Base Station Corrected

Posting Level: 0nT  
Field Inclination/Declination: 74degN/12degW  
Station Separation: walkmag 1 second interval  
Total Field Magnetic Contours: 100nT

GSM-19 OVERHAUSER MAGNETOMETER/VLF v7

Receiver Operated By: Jason Ploeger  
Processed by: C Jason Ploeger, B.Sc.  
Map Drawn By: C Jason Ploeger, B.Sc.  
November 2010

**LARDER**  
GEOPHYSICS LTD.  
7995249-3122

Drawing : RA-CHURCHILL-MAG-CONT