



Zonge Engineering and Research Organization (Australia) Pty Ltd

## **Melba Flats Gradient IP Survey**

### **Logistics Summary**

**January 2006**

**for**

**Allegiance Mining NL**

Compiled by:

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## **CONTENTS**

1. SUMMARY .....	1
2. IP INSTRUMENTATION .....	1
3. IP SURVEY PARAMETERS .....	1
4. PRODUCTION ISSUES .....	2
5. DATA QUALITY .....	2
6. PRODUCTION SUMMARY .....	3
7. DATA PROCESSING .....	3
8. EXPLANATION OF FILES .....	4

## **TABLES**

Table 1. Summary of Melba Flats Gradient IP data taken for Job 690.....	2
Table 2. Production summary of Job 690 .....	3

## **FIGURES**

Figure 1 Melba Flats gradient IP survey layout.....	5
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## **APPENDICES**

### **APPENDIX I**

Apparent Resistivity and Newmont Chargeability profiles of Trial Harbour Road gradient IP data lines.

### **APPENDIX II**

Colour Apparent Resistivity and Newmont Chargeability maps of Melba Flats Gradient IP data.

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## **1. SUMMARY**

During January of 2006, Zonge Engineering and Research Organization (Zonge) mobilised a three-person geophysical field crew to the Melba Flats Prospect near Zeehan in Western Tasmania to conduct a Gradient Induced Polarisation (Gradient IP) survey for Allegiance Mining.

A total of 20 gradient IP lines were read over the Melba Flats prospect and a single line was read along the road from Zeehan to Trial Harbour. All data was read using a 25 meter receiving dipole and station spacing. A total of 456 data points and 11.4 line kilometres of data were recorded during the six days required to complete the survey.

Data quality and repeatability were monitored throughout the course of the survey. Strict acquisition procedures were adhered to, which ensured that good quality data were collected.

## **2. IP INSTRUMENTATION**

A Zonge multipurpose GDP-32 receiver was used to take all of the IP data for this project. These receivers are backpack-portable, microprocessor-controlled and capable of simultaneously gathering data on up to sixteen channels. The raw data from each day was downloaded every evening from the receiver's solid-state memory to a portable computer. Preliminary processing and plotting were completed in the field. Final processing and plotting were completed in Zonge Engineering's Adelaide office.

Transmitted fields were generated with a Zonge GGT-10 geophysical transmitter powered by a ZMG-7.5 generator system. Signal frequency and synchronisation were controlled directly by an XMT-32 controller.

## **3. IP SURVEY PARAMETERS**

The gradient IP survey at Melba Flats consisted of five grids of lines of varying lengths from 300 to 800 meters in length (Figure 1). All grids lay adjacent to each other and have been labelled after the line on which the transmitting electrodes were located. Station numbers are line specific with 0mE on each line indicating where the access track intercepts the line. Receiving dipole and station spacing on all lines was 25 meters.

Data was recorded at 0.125 Hertz in time domain. Due to the high quality of the data, only two blocks of 16 cycles were recorded in most areas. In the few areas where more conductive ground resulted in lower signal magnitudes, three or four blocks were recorded.

For the Melba Flats survey transmitter electrodes were placed at the ends of lines 5, 11, 16, 19 and 22, as far as possible from the ends of the receiving lines. Transmitting electrodes for the line read on the Trial Harbour road were placed in-line and 500 meters from the ends of the receiving line. Due to the terrain, transmitter wires had to be laid within each grid and along a receiving line.

Co-ordinates in AMG84 have been calculated for all of the Melba Flats receiver stations and transmitter pits. These co-ordinates have been used in processing this data and are provided in spreadsheet form on the accompanying CD. Co-ordinates for the Trial Harbour road traverse transmitter pits and receiver line ends can also be found on the accompanying CD.

**Table 1. Summary of Melba Flats Gradient IP data taken for Job 690.**

<b>Line</b>	<b>Grid Number (Transmitter Line)</b>	<b>Transmitting Current (Amps)</b>	<b>Start (mE)</b>	<b>Finish (mE)</b>	<b>Data Points</b>
1	5	2.3	-800	0	32
3	5	2.3	-800	0	32
5	5	2.3	-800	0	32
7	5	2.3	-800	0	32
9	5	2.3	-600	0	24
9	11	2.2	-600	0	24
10	11	2.2	-800	-200	24
11	11	2.2	-800	-200	24
12	11	2.2	-800	-200	24
13	11	2.2	-800	-200	24
14	16	1.1	-800	-200	24
15	16	1.1	-800	-200	24
16	16	1.1	-750	-250	20
17	16	1.1	-800	-400	16
18	19	1.1	-300	0	12
19	19	1.1	-300	0	12
20	19	1.1	-300	0	12
21	22	2.2	-300	0	12
22	22	2.2	-300	0	12
23	22	2.2	-300	0	12
Road	Road	2.4	0	700	28
<b>Total number of data points</b>					<b>456</b>
<b>Total line kilometres</b>					<b>11.4</b>

Note: All line eastings given above refer only to position along each individual line with respect to the access track (0mE). No local grid was established at the time of reading so line eastings do not correlate between lines. Interpolated receiver station and transmitter electrode co-ordinates in AGD84 are provided in digital format on the CD provided.

No other data were processed during this survey.

#### **4. PRODUCTION ISSUES**

No delays to production occurred during the completion of this survey.

#### **5. DATA QUALITY**

The generally resistive ground conditions limited the magnitude of the transmitting current in all areas however; this also resulted in good signal magnitudes at the receiving dipoles. As a result, the data quality throughout the survey was excellent.

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In the situation where data was recorded along a line carrying an active transmitter wire, precautions were taken to ensure transmitter and receiving wires were separated as much as possible. Due to the terrain, this was generally not more than a meter. Data recorded adjacent to active transmitting wires did not appear to be of poorer quality.

## 6. PRODUCTION SUMMARY

Table 1 gives a summary of the production of job 690. For more detail on daily production see production reports on accompanying CD.

**Table 2. Production summary of Job 690**

<b>Date</b>	<b>Description</b>
27 <sup>th</sup> January	Crew arrived in Zeehan, moved into accommodation and met with client.
28 <sup>th</sup> January	Set-up first transmitter electrodes and laid out survey wires. Commenced reading first grid (grid 5).
29 <sup>th</sup> January	Read lines 3, 5, 7 and 9, completing grid 5.
30 <sup>th</sup> January	Read lines 9, 10, 11, 12 and 13, completing grid 11.
31 <sup>st</sup> January	Read lines 14, 15, 16 and 17, completing grid 16.
1 <sup>st</sup> February	Read lines 18, 19, 20, 21, 22 and 23, completing grids 19 and 22. Reading at Melba Flats complete.
2 <sup>nd</sup> February	Read line along Trial Harbour road, completing survey. Crew packed up all equipment and departed Zeehan for Spirit of Tasmania.
3 <sup>rd</sup> February	Crew travelled from Melbourne to Adelaide.

## 7. DATA PROCESSING

The quality of each decay curve for each block of data was examined before being averaged to create a single time series for each grid station. Blocks that were considered of poor quality were skipped before averaging each stations data. All raw data taken during this survey is included on the accompanying CD so that this data may be re-averaged if necessary. The averaged data for each gradient IP line was then used to produce apparent resistivity and Newmont chargeability profiles and maps. This data is included in digital format on the accompanying CD as well as in printed form in the Appendices.

No other data were processed for this survey.

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## 8. EXPLANATION OF FILES

Digital data is provided on CD along with paper plots of the data. Data from each gradient IP line are placed in the following directory structure on the accompanying CD: Processed\_Data\Grid#\line#. Combined data files from all lines are found in: Processed\_Data\Combined. File formats are explained below:

- \*.AVG** files created by Zonge's TDAVG containing averaged data.
- \*.DAT** data file containing observed and calculated properties for the gradient IP data in column text format.
- \*.FLD** Zonge field file format produced from SHRED.EXE from \*.RAW files
- \*.LOG** log files containing processing information
- \*.MDE** input files containing processing information
- \*.PDF** Adobe Acrobat Portable Document File containing plot files and report
- \*.RAW** the edited raw data downloaded from the GDP-32.
- \*.W\*** HPGL format plot files of averaged decay plots
- \*.X01** HPGL format plot files black and white "Apparent Resistivity" profile.
- \*.X02** HPGL format plot files black and white "Newmont Chargeability" profile.
- \*.X03** HPGL format plot files black and white "Metal Factor" profile.
- \*.X04** HPGL format plot files black and white "Peak Voltage" profile.
- \*.XLS** Microsoft Excel spreadsheet
- \*.XYZ** contains all averaged data for Gradient IP survey grid data
- \*.Z** files used for plotting containing Apparent Resistivities, Newmont chargeability, Metal Factor and Peak Voltage.

**DECAYS\\*.\*** HPGL format plot files non averaged decay plots

**GEO\_SOFT\\*.\*** Geosoft processing files for Gradient array IP plan maps

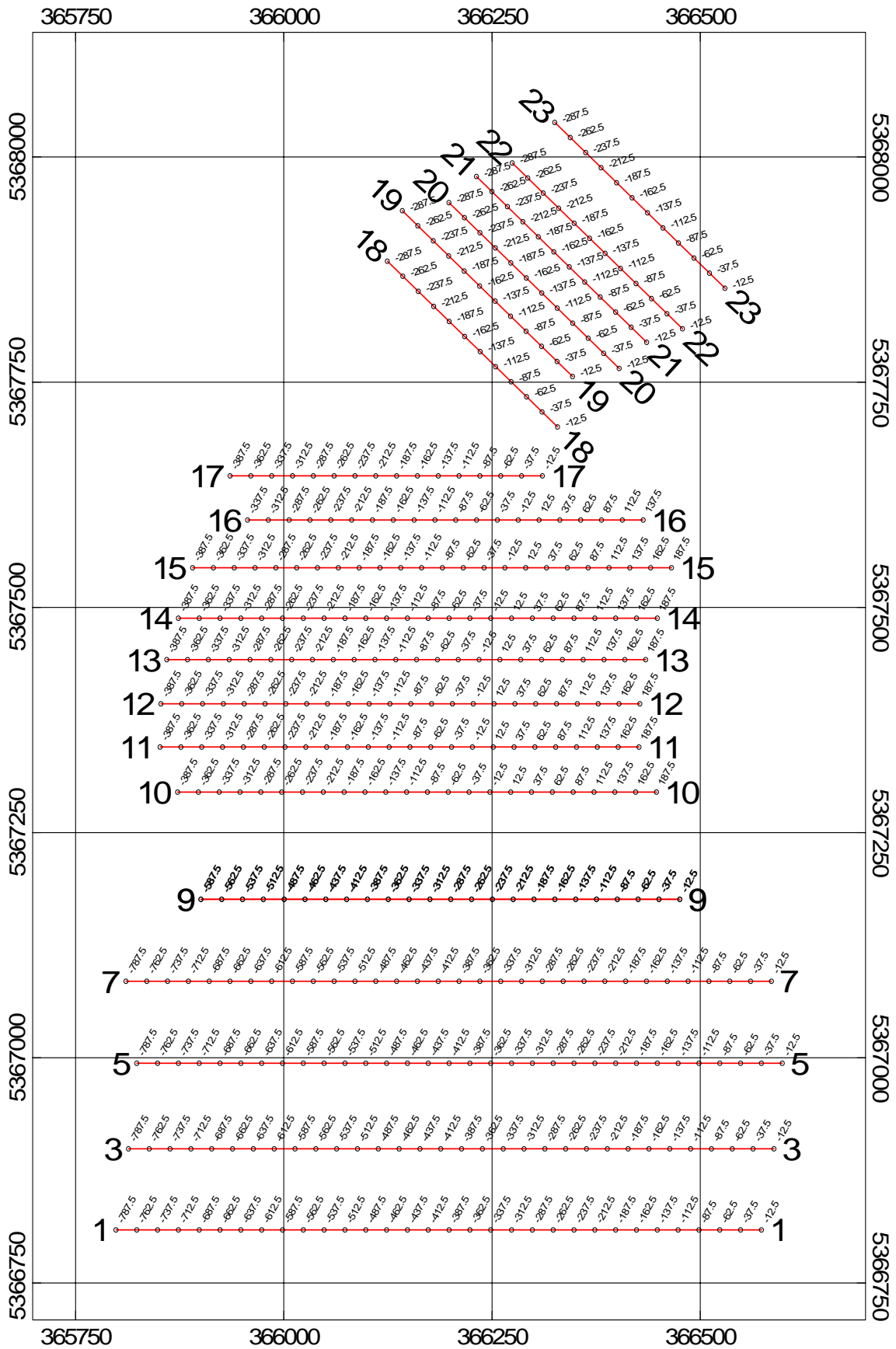


Figure 1 Melba Flats gradient IP survey layout.

## **APPENDIX I**

Apparent Resistivity and Newmont Chargeability profiles of Trial Harbour  
Road gradient IP data lines



Line Road  
Road Reference Line  
for  
Allegiance Mining NL

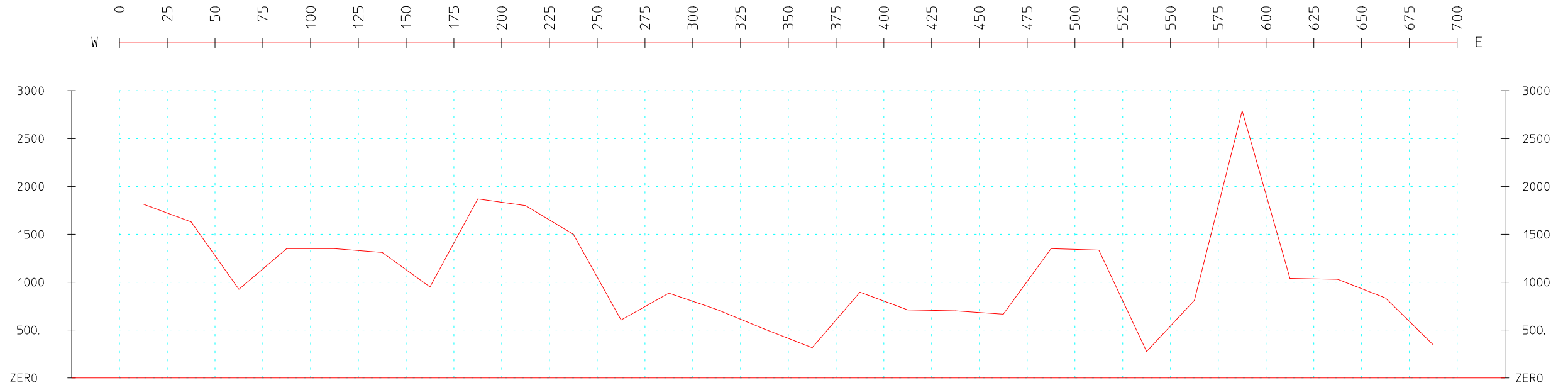
Field Job 690  
ZONGE ZPLOT 7. 27  
File ROAD. Z, Plotted 21 Feb 06



TIME DOMAIN IP SURVEY DATA  
Apparent RESISTIVITY  
values in ohm-meters

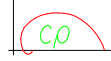
SURVEY LINE DATA  
A - Spacing= 25 m  
Survey Date= Jan 2006

Window NUMBER and TIME (seconds)  
: 0.000\*



Line Road  
Road Reference Line  
for  
Allegiance Mining NL

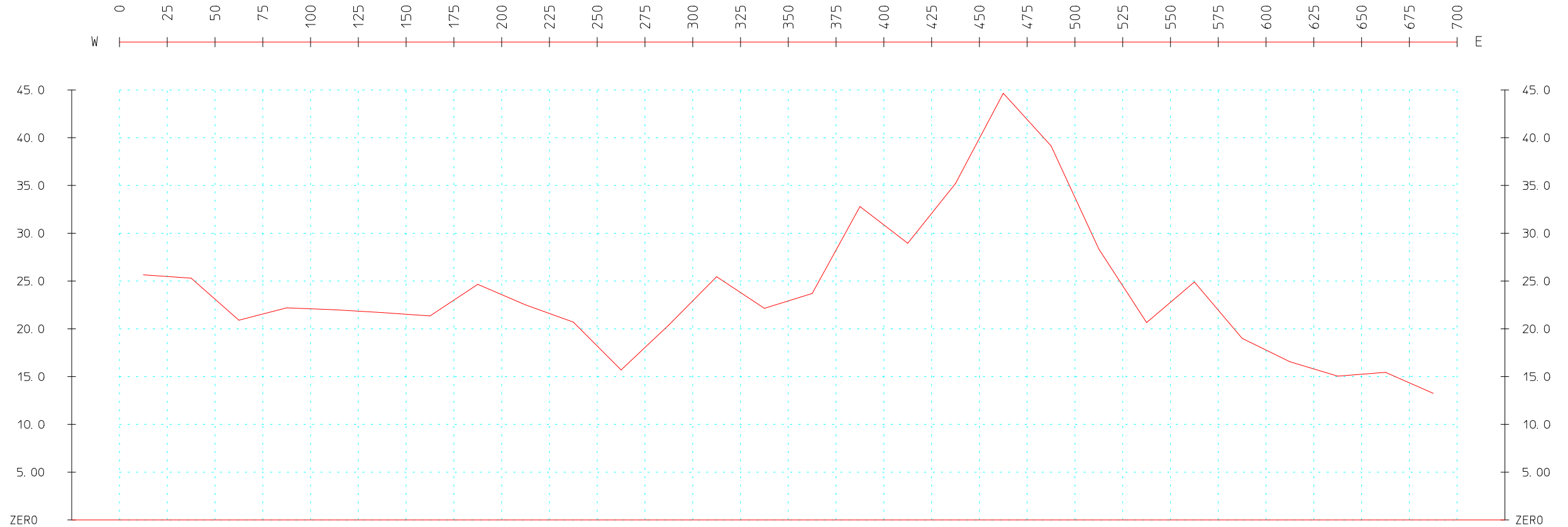
Field Job 690  
ZONGE ZPLOT 7. 27  
File ROAD.Z, Plotted 21 Feb 06



TIME DOMAIN IP SURVEY DATA  
Newmont CHARGEABILITY  
values in milliseconds

SURVEY LINE DATA  
A - Spacing= 25 m  
Survey Date= Jan 2006

Window NUMBER and TIME (seconds)  
: 0.000\*

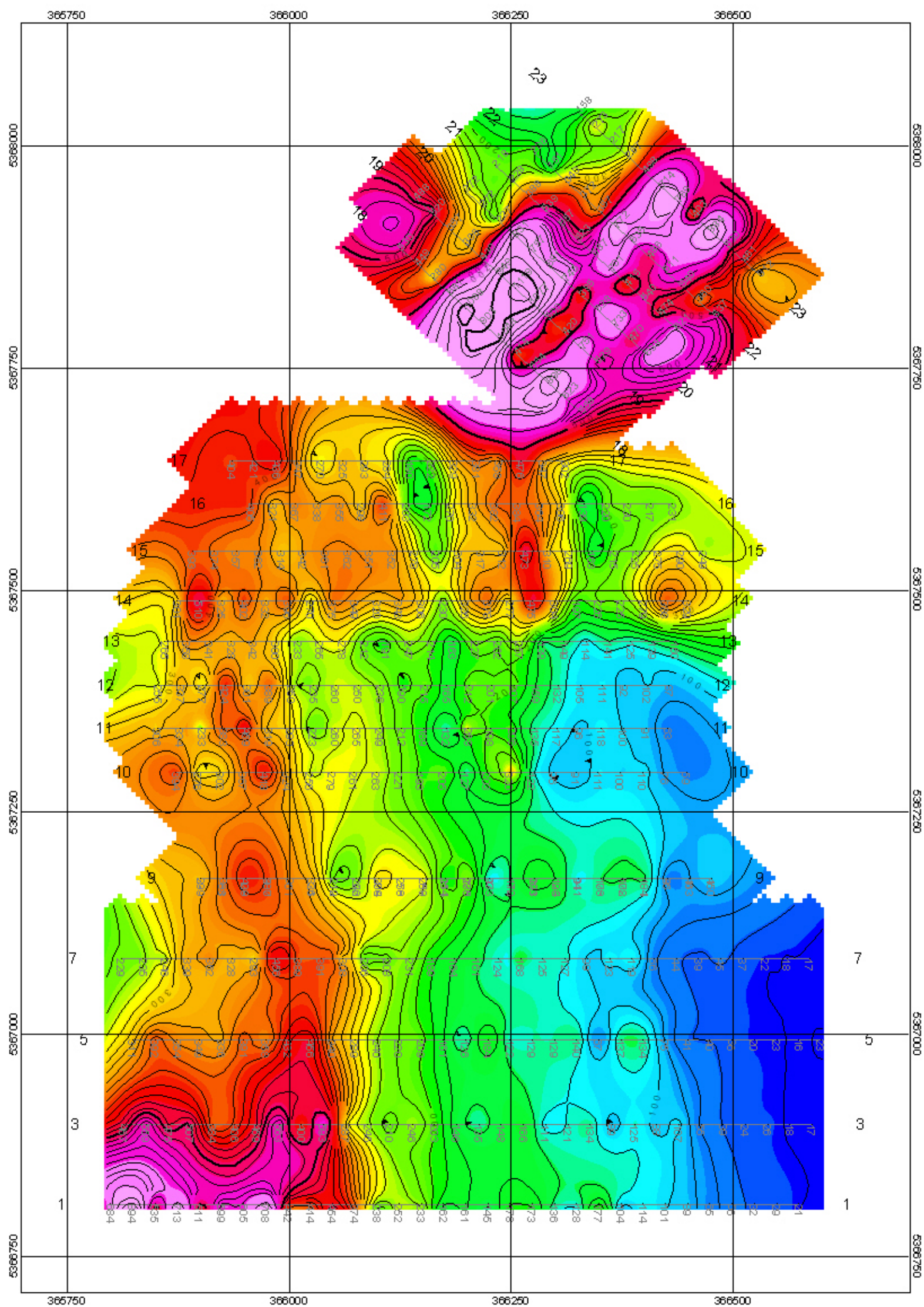


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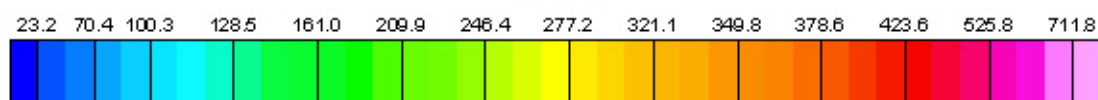
## **APPENDIX II**

Colour Apparent Resistivity and Newmont Chargeability maps of Melba  
Flats Gradient IP data.

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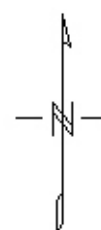
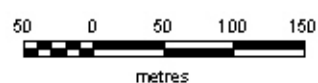
**Apparent Resistivity**  
ohm-m



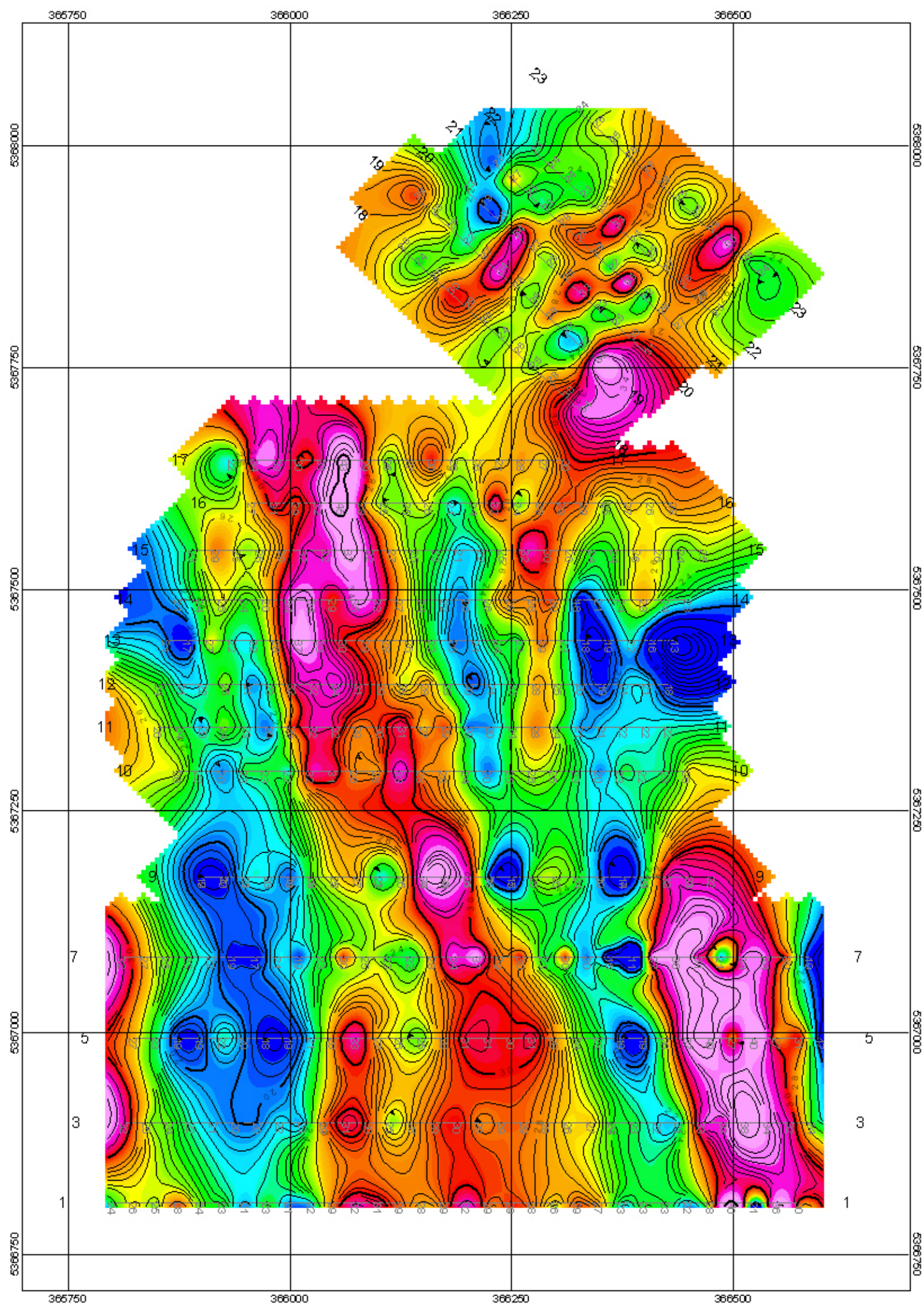
**ALLEGIANCE MINING NL**

Melba Flats - Gradient IP - Jan 2006

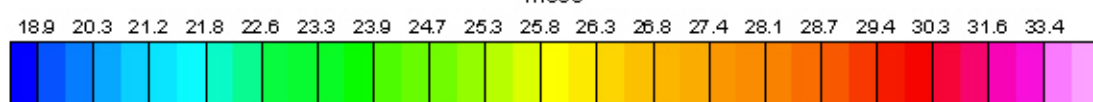
Apparent Resistivity (ohm-m)







**Newmont Chargeability**  
msec



**ALLEGIANCE MINING NL**

Melba Flats - Gradient IP - Jan 2006

Apparent Resistivity (ohm-m)

