Report on
Spectral IP/Resistivity and Magnetic Surveys
South, East and West Grids – Argentia Ridge Project
South Lorrain Township, Ontario

For: Adroit Resources Inc.
1111 Melville Street, Suite 610
Vancouver, B.C.
V6E 3V6
Ph : (604) 688-3304
Fax : (604) 682-6038
info@adroitresources.ca

By : JVX Ltd.
60 West Wilmot Street, Unit 22
Richmond Hill, Ontario
L4B 1M6
Ph: (905) 731-0972
Fax : (905) 731-9312
bwebster@jvx.ca

Ref. 6-79
March, 2007

Table of Contents

Figures

Attachments

Maps

The results of the survey are presented as plan maps and stacked pseudosections at 1:2500. Plan maps include a UTM grid (NAD83, Z17N), latitude and longitude co-ordinates, drainage and claim boundaries from the claimap3 website of the Ministry of Northern Development and Mines. Plan map types for each grid are

Total magnetic intensity, colour + line contours
Mx chargeability (n=2), colour + line contours
Apparent resistivity (n=2), colour + line contours
Compilation

Stacked pseudosections show the total magnetic intensity profile and colour + line contoured pseudosections of apparent resistivity, Mx chargeability and the spectral parameters MIP, tau and c. There is one stacked pseudosection for each of the 16 lines surveyed.

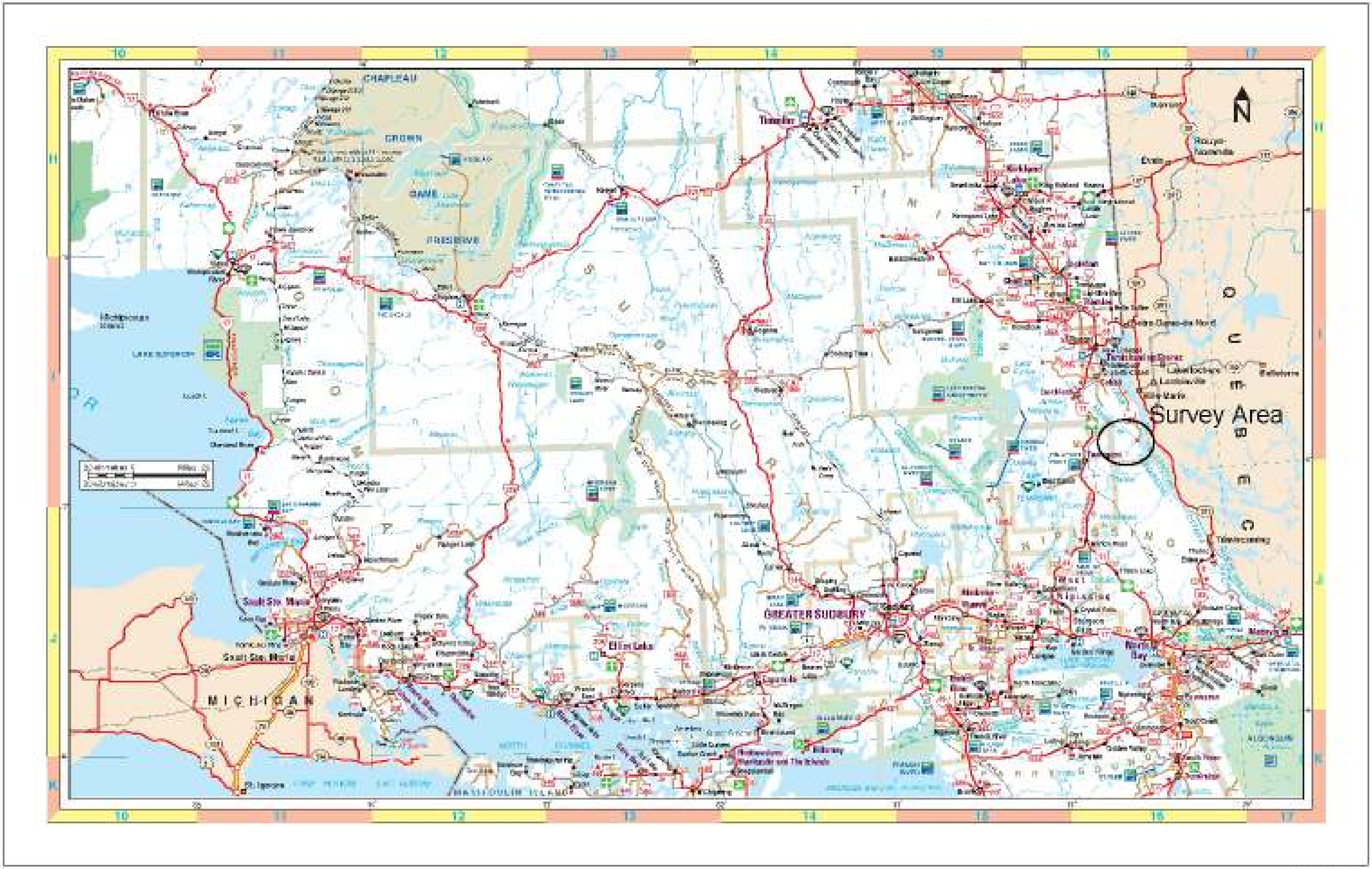


FIGURE 1

LOCATION MAP

ADROIT RESOURCES INC.
SOUTH, EAST AND WEST GRIDS - SOUTH LORRAIN TWP.
ONTARIO - NTS: 21 M/01
SPECTRAL IP / RESISTIVITY, MAGNETOMETER SURVEYS

Surveyed by: JVX LTD
January - February 2007
Ref. no. 6-79

Spectral IP/Resistivity and Magnetic Surveys
South, East and West Grids – Argentia Ridge Project
Adroit Resources Inc.

Spectral IP/resistivity and magnetic surveys were done on the East, South and West grids in the Argentia Ridge property of Adroit Resources Inc. in South Lorrain Township, Ontario. The work was done for Adroit Resources Inc. by JVX Ltd. under JVX job number 6-79.

The field work was done in the period January 18 to February 21, 2007. Total IP/resistivity survey coverage was 23,000 m. Total magnetic survey coverage was 25,487.5 m. Results have been presented as stacked pseudosections and plan maps at 1:2500.

Method	**Grid**	***Coverage***
IP/Resistivity	South	*4175*
	East	*11375*
	West	*7450*
		23,000 m
Magnetics	South	*4837.5*
	East	*12500*
	West	*8150*
		25,487.5 m

Table 1. Coverage by method and grid.

The regional setting of the project area is shown in figure 1. The layout and local setting of the grids are shown in figure 2. The South grid is largely within claims 4210606, 4212815 and 4213019. The East grid is within claims 4213022 and 4213023. The West grid is within claims 4205144, 4210608 and 4213017.

Production summaries, survey grids, survey methods, instrumentation, data processing, presentation and archives are described in Appendix 1. A short note on IP anomaly forms and Instrument specification sheets are attached.

1. Presentation

The results of the survey are presented as plan maps and stacked pseudosections at 1:2500. Plan maps include a UTM grid (NAD83, Z17N), latitude and longitude co-ordinates, drainage and claim boundaries from the claimap3 website of the Ministry of Northern Development and Mines (Copyright Queen's Printer for Ontario).

Plan map types for each grid are

Total magnetic intensity, colour + line contours
Mx chargeability (n=2), colour + line contours

Apparent resistivity (n=2), colour + line contours
Compilation map

The plan map of Mx chargeability for the East grid is reproduced below as figure 3.

Stacked pseudosections show total magnetic intensity profiles plus colour / line contoured pseudosections of apparent resistivity, Mx chargeability and the spectral parameters MIP, tau and c. There is one stacked pseudosection for each of the 16 lines surveyed.

Digital results (this report, raw and processed ASCII data files, Geosoft database and map and AutoCAD map or drawing files) are archived on CD.

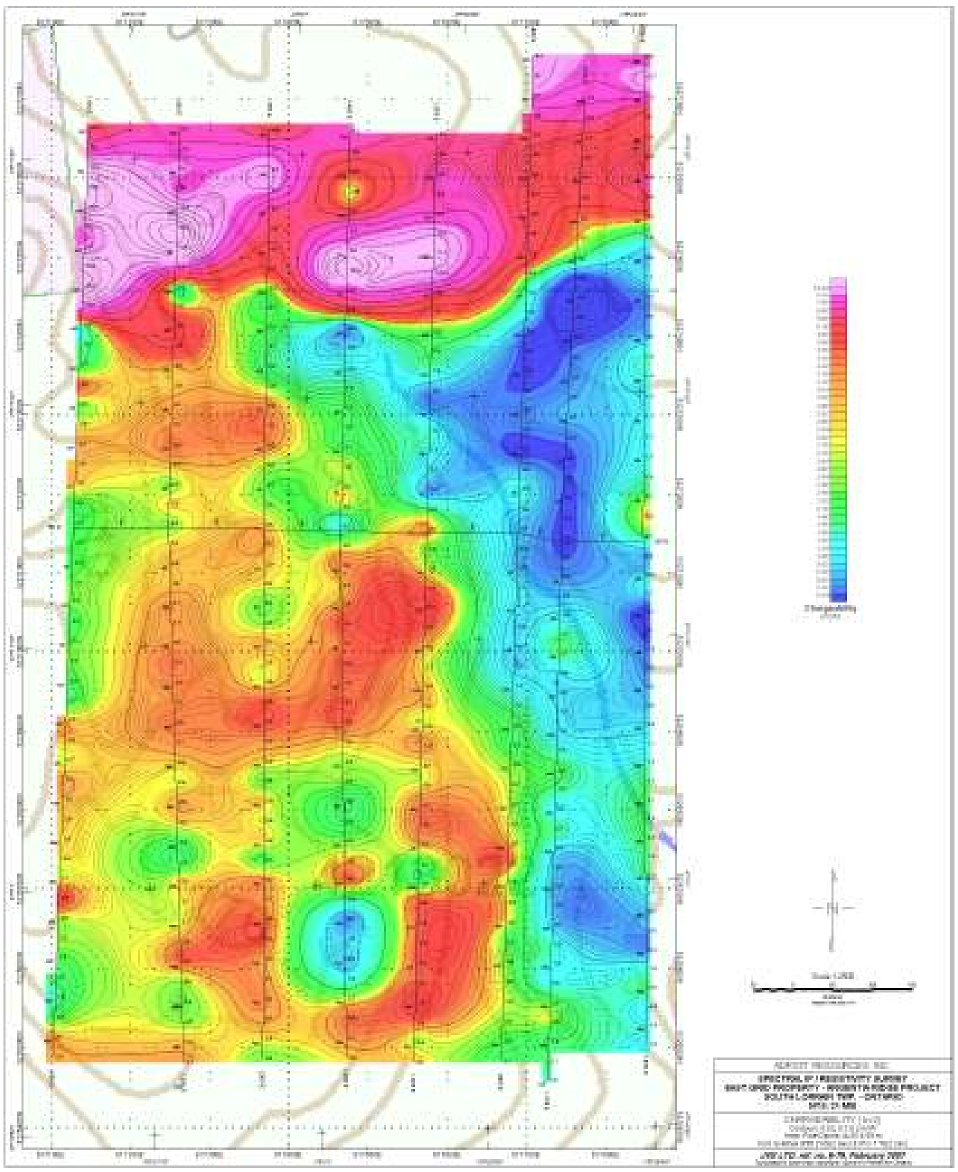


Figure 3. Mx Chargeability (n=2 dipole), East Grid

2. Geology

The area geology with ideal survey grids is shown in figure 4 (from Adroit Resources). Major units are Huronian sediments - Gowganda formation (tan), Archean volcanics (green) and Nipissing gabbro (purple). The small red triangles (XYAR_EM_picks) are AeroTEM EM anomalies.

The exploration target is presumed to be base and/or precious metals. Area silver mines were most active in the early 1900s.

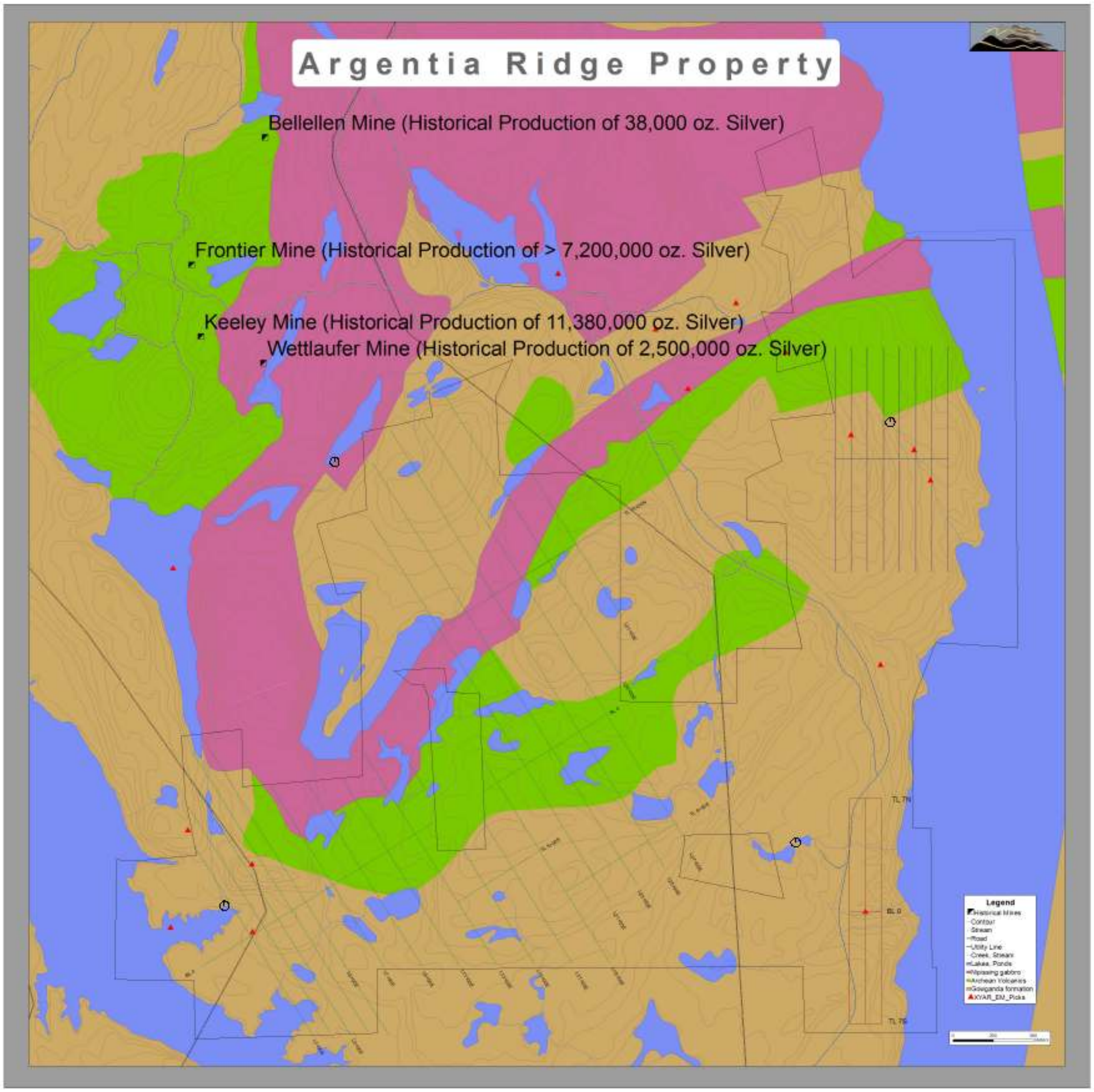


Figure 4. Area Geology and Ideal Survey Grid Layouts

3. AeroTEM Survey

The area was flown with AeroTEM in October, 2006. Coverage was 241 line km (22 km^2) at a 100 m line spacing. Results were presented at 1:10,000. The survey yielded 15 EM anomalies, two of which were strong enough to give a conductance estimate. One EM anomaly (A on line 10050) is within 50 m of a power line and is not shown on final maps.

An EM anomaly on 10480 (617856 e, 5226107 n) was not picked. It is on land but within 50 m of Lake Temiskaming. It is a well-formed 'thick' type anomaly with responses in all Zoff and Zon channels. It may be cultural. If not, it should be considered as a possible strong bedrock conductor at depth.

The three ground grids include 7 of the 15 AeroTEM EM anomalies. By grid they are

South Grid

10430	**A**	**617359.59**	**5224341.59**	**41.97**	**222.34**

East Grid

10420	**A**	**617269.85**	**5227305.14**	**33.29**	**288.77**
10460	**A**	**617659.99**	**5227212.06**	**41.29**	**228.03**
10470	**A**	**617761.94**	**5227024.26**	**45.96**	**216.81**

West Grid

10010	**A**	**613160.82**	**5224847.37**	**45.39**	**297.06**
10050	**A**	**613563.00**	**5224214.42**	**43.97**	**265.56**
10050	**B**	**613557.93**	**5224636.47**	**51.06**	**299.58**

These are taken from Appendix 2 of the AeroQuest report and show line, anomaly identifier, UTM e, UTM n, EM bird height (m) and DTM elevation (m). UTM coordinates are NAD83, Z17N. All were interpreted as due to 'thick' conductors with a conductance less than 1 S. Thick means there was no evidence of a vertical thin sheet type conductor; AeroTEM saw only the flat conductor top.

The EM anomaly on the South grid is a Z1off only peak and is probably due to conductive overburden. On the East Grid, the EM anomaly on 10420 is very small but there are reasons to expect a metallic conductor at this location. The other 2 EM anomalies are probably due to conductive overburden. The EM anomaly on line 10010 – West Grid – is outside the survey area. The other two EM anomalies in the West Grid are weak, noisy and unconvincing affaires near or over the power line.

4. Survey Results : General Comments

<u>South Grid</u>

Overburden is moderately conductive over 30 % of the grid and very conductive over 40 %. In terms of overburden masking, this is the worst of the three grids. The West grid is the least affected by conductive overburden.

The magnetic results show few marked trends or patterns. Most readings are in the range of ± 75 nT from the mean.

Peak IP amplitudes are barely above background levels and many very weak chargeability highs are probably due to local bedrock highs. The AeroTEM anomaly is near line 300E, station 0+25S. There is no IP anomaly here or nearby. Low surficial resistivities over this small creek (100 to 400 ohm.m) are consistent with a thick layer of conductive overburden.

East Grid

Overburden is moderately conductive over 23 % of the grid and very conductive over 12 %. The magnetics are dominated by a 200 to 1000 nT magnetic high that crosses the northern part of the grid. This magnetic high is within an area mapped as volcanics.

There are a number of IP anomalies in the northern part of the grid. Many are of good quality and clarity and some may be considered for follow-up (see below).

The AeroTEM EM anomaly on 10420 has no expression in the IP/resistivity survey. Resistivities are uniform and high. Chargeabilities are uniform and low. The other two AeroTEM EM anomalies on this grid are over areas of conductive overburden (n=1 apparent resistivities are 100 to 500 ohm.m).

West Grid

Overburden is moderately conductive over 24 % of the grid. The magnetic results are dominated by a central 250 nT magnetic high in an area mapped as Gowganda formation sedimentary rocks.

There are a number of weak to moderate IP anomalies – the best is centered near 2+50N on line 500E. The strong IP anomaly on line 200E, 3+25N is an unattractive affair with an uncertain cause.

From the operator’s notes, power line intercepts are at line 200E, station 1+00N and line 300E, stations 2+75N to 6+00N (eol). There is nothing at this location on line 200E. Other than a weak IP anomaly at line 300E, 3+25N, the IP/resistivity data is well behaved. The power line does not have a clear IP or resistivity expression.

5. IP Anomalies

IP anomalies are picked, characterized and interpreted based, in part, on the result of model studies (see attached note ‘IP Anomalies’). The results are tabled below.

South Grid

Line	ID	Centre-Top	Mx	C	n	MIP	TC	Rho1	Resistivity
200E	S2A	5+25N	4.6 – 4.8	w	1	107	S	8573	-

East Grid

Line	ID	Centre-Top	Mx	C	n	MIP	TC	Rho1	Resistivity
100E	E1A	3+25N	10.5 – 14.8	M	1	433	L	7979	-
	E1B	4+25N	15.6 – 16.9	M	1	291	L	2472	low
200E	E2A	3+75N	13.6 – 17.4	M	1	480	L	1579	high
	E2B	4+75N	7.6 – 10.6	w	1	193	L	854	low
300E	E3A	4+75N	7.8 – 11.7	M	1	367	L	664	high
400E	E4A	3+25N – 3+50N	15.9 – 19.8	M	1	520	L	593 - 696	-
500E	E5A	3+50N – 4+00N	9.0 – 13.1	M	1,3	365	L	3547 - 5454	low
	E5B	5+50N ?	9.3 – 9.9	w	?	317	L	?	high
600E	E6A	4+00N – 4+75N	7.3 – 7.9	w	4	290	L	3640 – 17206	-
	E6B	6+00N	8.4 – 10.4	w	1	330	L	2651	-
700E	E7A	6+25N ?	10.5	w	?	272	L	?	-
800E	E8B	6+00N	8.8 – 12.2	M	1	288	L	2400	high

West Grid

Line	ID	Centre-Top	Mx	C	n	MIP	TC	Rho1	Resistivity
100E	W1A	3+25N	5.7	w	3	-	-	8870	-
200E	W2A	3+25N	18.6 – 26.4	S	1	-	-	4389	-
300E	W3A	3+25N	4.0 – 5.3	w	1	-	-	25414	high
400E	W4A	1+50N - 2+50N	10.2 – 20.2	M	2,3	-	-	2818 – 17795	high
	W4B	3+50N	8.1	w	1	169	M	4403	-
	W4C	4+50N	12.7	M	1	406	L	7812	high
	W4D	5+50N – 6+00N	7.0 – 10.4	w	1	305	M	3172 - 4345	-
500E	W5A	2+00N – 3+00N	13.2 – 17.7	M	1	620	L	2055 - 4795	-

IP anomaly characteristics are

1. ID : anomaly identifier
2. Centre-Top : centre-top of the IP anomaly and best estimate for location of the centre-top of the chargeable body.
3. Mx : peak Mx chargeabilities at and near centre-top, mV/V
4. C : classification by amplitude – weak (Mx ≤ 10 mV/V), Moderate (10 < Mx ≤ 20 mV/V) or Strong (Mx > 20 mV/V).
5. n : dipole number of IP anomaly top
6. MIP : peak spectral chargeability amplitude at anomaly centre-top, mV/V
7. TC : spectral time constant as Short (0.01 to 0.1 sec.), Moderate or Mixed and Long (10 to 100 sec.).
8. Rho1 : n=1 apparent resistivity at or over IP anomaly centre-top
9. Resistivity : coincident resistivity anomaly

A blank entry means the results were incomplete, inconclusive or unavailable. A question mark means the anomaly is at the end of line and not fully defined. The centre-top station is that of the nearest P1 potential electrode and therefore 6.25 m from the standard pole-dipole plot point.

6. Compilation Maps

Selected features have been extracted from the IP anomaly listings, pseudosections and plan maps and drafted onto compilation maps. Features shown are

- IP anomalies. Tops of chargeable bodies as picked on the pseudosections. Shown as an orange bar parallel to and above the survey line. Bar thickness is an indicator of anomaly strength. Symbols are

  Strong
  Moderate
  Weak

- Attached to the IP anomaly symbol are the MIP peak value (mV/V), the spectral time constant range as Short, Medium or Mixed and Long, and the 'n' value that best characterizes the top of the IP anomaly.

- Apparent resistivity in the first dipole. Shown as a bar under the survey line with bar symbols

  $\rho_a \leq 500$ ohm.m
  $500 < \rho_a < 2500$ ohm.m

- IP zones. Two or more IP anomalies on neighbouring lines connected into zones. Isolated weak IP anomalies or weak near-neighbours of uncertain connection are not shown as part of an IP zone.

- Prominent magnetic highs.

- IP anomalies or anomaly sets of interest. Circled and labelled.

7. Suggested Targets

A total of 21 IP anomalies have been picked. They have been classified as weak (10), moderate (10) and strong (1). Many of the best IP anomalies are in the north end of the East grid.

Based primarily on anomaly amplitude, clarity and quality, five IP anomalies have been highlighted. They are circled and labelled as

East Grid, Line 100E, E1A : T1 at 3+25N
East Grid, Line 100E, E1B : T2 at 4+25N
East Grid, Line 400E, E4A : T3 at 3+25N to 3+50N
West Grid, Line 500E, W5A : T4 at 2+00N to 3+00N
West Grid, Line 200E, W2A : T5 at 3+25N

Target locations should be within ± a/2 of the centre-top of the chargeable body. Target depths are thought to be good to ± half of the value given.

Dip, even dip sense, is uncertain – profile IP anomalies are insensitive to dip over the range of ± 45° from vertical. The natural tendency of pole-dipole IP anomalies to show higher values on the current side of the target should be ignored. Dip should be taken from the geology or other geophysical methods. In some cases, dipole-dipole reconstruction may help.

East Grid, L100E : T1 at 3+25N and T2 at 4+25N

Two moderate to strong IP anomalies 100 m apart (see figure 5). T1 has a centre-top near 3+25N. T2 has a centre-top near 4+25N. A coincident resistivity low at T2 suggests a bedrock conductor but the AeroTEM results do not support this. The resistivity low must be the result of overburden effects, terrain, a block of more conductive bedrock or other. Estimated depths to top are 20 m (T1) and 10 m (T2).

Coincident n=1 resistivities are 7979 (3+25N) and 2472 (4+25N) ohm.m. High values on either side of 4+25N (10,825 and 13,513 ohm.m) suggest possible scattered outcrop.

Any sense of dip from pole-dipole anomaly forms is speculative. Without dip direction from outcrop or dip from other means, drilling should allow for this uncertainty. If drill testing -

Option 1: Drill collar at 2+75N. Drill azimuth - grid north. Inclination -50°. L 250m.
Option 2: Drill collar at 4+75N. Drill azimuth - grid south. Inclination -50°. L 250m.

If the targets are vertical, Option 1 will intersect T1 at 60 m and T2 at 180 m. Reverse for Option 2. Greater depth of T1 supports Option 2.

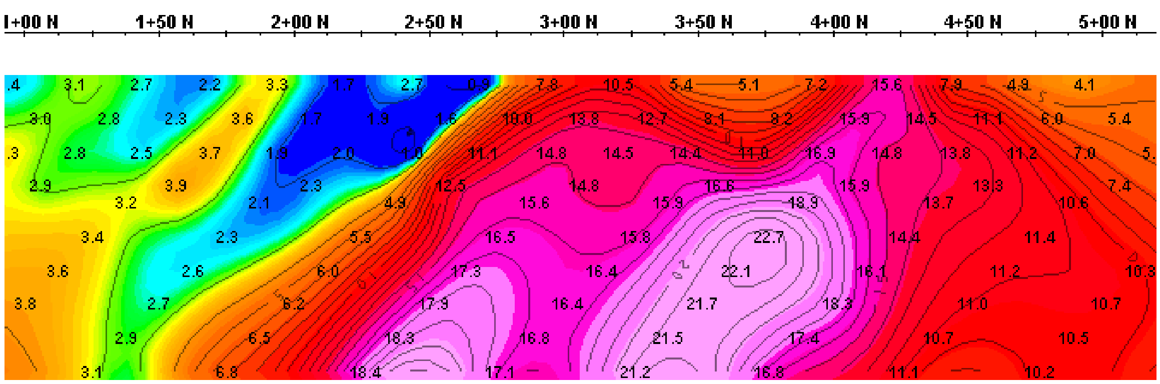


Figure 5. Mx Chargeability, East Grid, L100E

East Grid, L400E : T3 at 3+25N to 3+50N

T3 is 300 m east of T1/T2. The target top is defined by moderate IP amplitudes at two stations. As with T2, low coincident resistivities suggest a bedrock conductor but AeroTEM does not support this. Lower chargeability values in the later dipoles suggest the target is narrow. The target appears to be within 10 m of surface.

Low surficial resistivities over the target (less than 1000 ohm.m) suggest some thickness of conductive overburden. If the effects of this overburden could be stripped away, IP anomaly amplitudes should be much larger.

If drill testing -
Option 1 : Drill collar at 2+75N. Drill azimuth – grid north. Inclination -50°. L 100 m.
Option 2 : Drill collar at 4+00N. Drill azimuth – grid south. Inclination -50°. L 100 m.
If it is vertical, T3 should be intersected at 70 m.

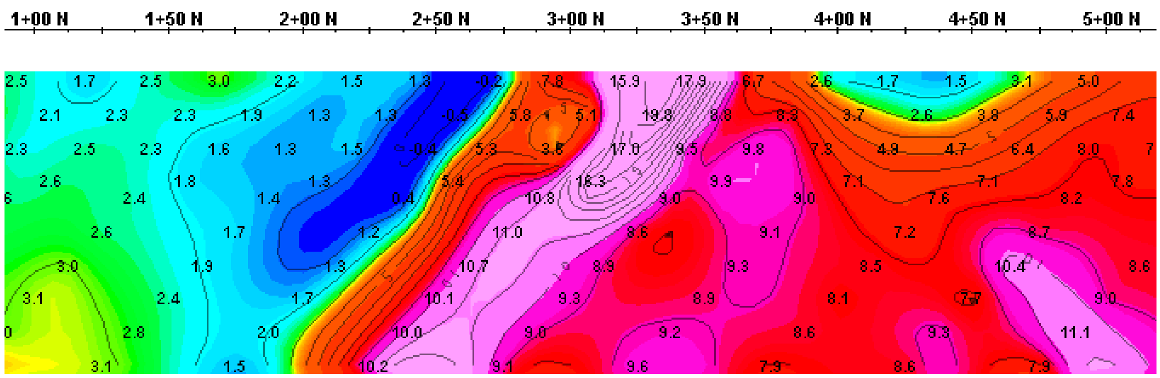


Figure 6. Mx Chargeability, East Grid, L400E

West Grid, L500E : T4 at 2+00N to 3+00N - W5A

T4 is a broad IP anomaly that suggests a target that is up to 100 m wide. The width of the anomaly may be due to a target that runs parallel with the survey line. The best part of the target is near 2+50N. Coincident n=1 apparent resistivity is 3763 ohm.m – the target is probably buried but within 10 m of surface. If drill testing -
Option 1 : Drill collar at 2+00N. Drill azimuth – grid north. Inclination -50°. L 100 m.
Option 2 : Drill collar at 3+00N. Drill azimuth – grid south. Inclination -50°. L 100 m.

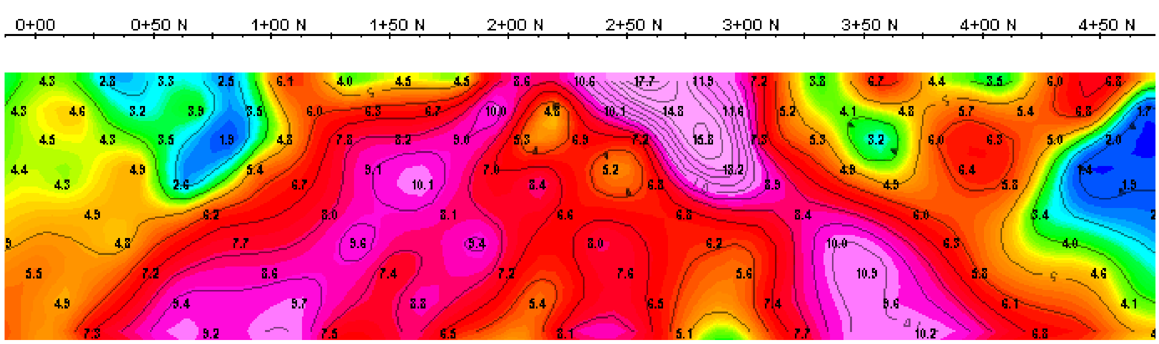


Figure 7. Mx Chargeability, West Grid, Line 500E

West Grid, L200E : T5 at 3+25N – W2A

T5 is an unattractive affair that is included here only because of high chargeabilities – it is the only IP anomaly in this survey that has been rated as strong. The n=1 apparent resistivity at the target centre top is 4889 ohm.m. High values 25 m on either side (15367 and 25785 ohm.m) suggest some outcrop. The target is within 10 m of surface. Field notes suggest a lot of terrain in this area and this, in some way, may have contributed to this awkward looking IP anomaly.

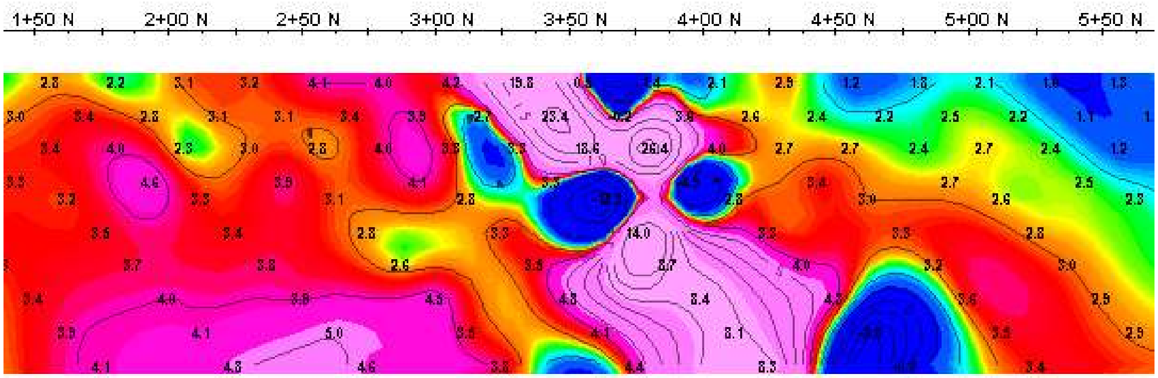


Figure 8. Mx Chargeability, West Grid, Line 200E

8. Conclusions

A total of 21 IP anomalies have been picked. They have been classified as weak (10), moderate (10) and strong (1). Many of the best IP anomalies are in the north part of the East grid. Five of the best IP anomalies have been suggested for follow-up. Three are in the northern part of the East grid and two are in the West grid.

Ian Johnson Ph.D., P.Eng. Blaine Webster, B.Sc., P. Geo.
March 10, 2007

IP Anomalies

The results from most surface IP/resistivity surveys are boiled down to a set of IP and resistivity anomalies. These anomalies are picked from pseudosections, graded by clarity, quality and strength and drafted onto a compilation map. The best IP anomalies are highlighted for follow up.

Drill testing is based on best estimates of location and depth and some idea about dip or dip direction. This information is extracted from IP/resistivity anomaly forms with varying levels of confidence with dip as the biggest problem. This note has been prepared to illustrate these and other issues basic to IP anomaly selection, ranking and drill testing.

Most of this note applies to glaciated Archean terrain with little or no topographic relief. Unless otherwise noted, all modeling is based on time domain surveys with a pole-dipole array (‘a’ = 25 m, n=1,6). In all model profiles, the current is on the left.

Survey # 1

Figure 1 is from a time domain, pole-dipole survey for Goldeye Explorations Ltd. in north central Ontario. ‘a’ = 50 m, n=1,6. The current is left (south) of the potentials. The area is sand covered with little outcrop.

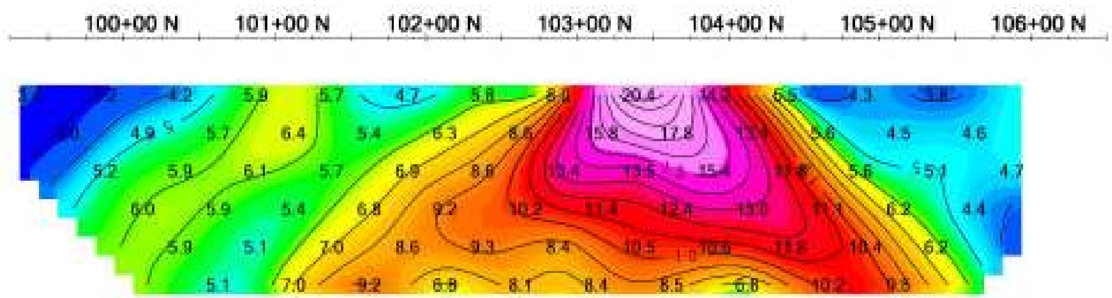


Figure 1. Contoured Mx chargeabilty. Courtesy Goldeye Explorations Ltd.

The IP anomaly centered at 103+50N is clear and well formed. Coincident n=1 apparent resistivities are 7,500 to 15,000 ohm.m. The cause looks shallow and may have appreciable width. Most of the anomaly features may be explained by a vertical tabular body under 10 m of resistive overburden. To explain the lower chargeabilities at depth, the body has to be more conductive than the host. This is not seen in the apparent resistivities. The higher chargeabilities on the potential side of the anomaly can not explained by simple models.

This IP anomaly was drill tested from the north. The collar was at station 104+35N. Drill inclination was -50°. Below the 8.5 m of overburden, most of this hole passed through mafic and felsic volcanics (80 %). There were two intersections of intrusives (total 13 %) and one of metasediments (7 %). The drill intersected 1 to 4 % pyrite in volcanics (162.8 to 170.6 m) and graphitic metasediments (170.6 to 182.6 m). End of hole is at 191 m. The drill results suggest the target dips at 80° to the south.

Survey # 2

The pseudosections of chargeability and resistivity in figure 2 have been provided by Goldeye Explorations Ltd. They are from a time domain, pole-dipole survey in north central Ontario. 'a' = 25 m, n=1,6. The current is right (north) of the potentials. Most of the area is covered by sandy overburden. There is no outcrop.

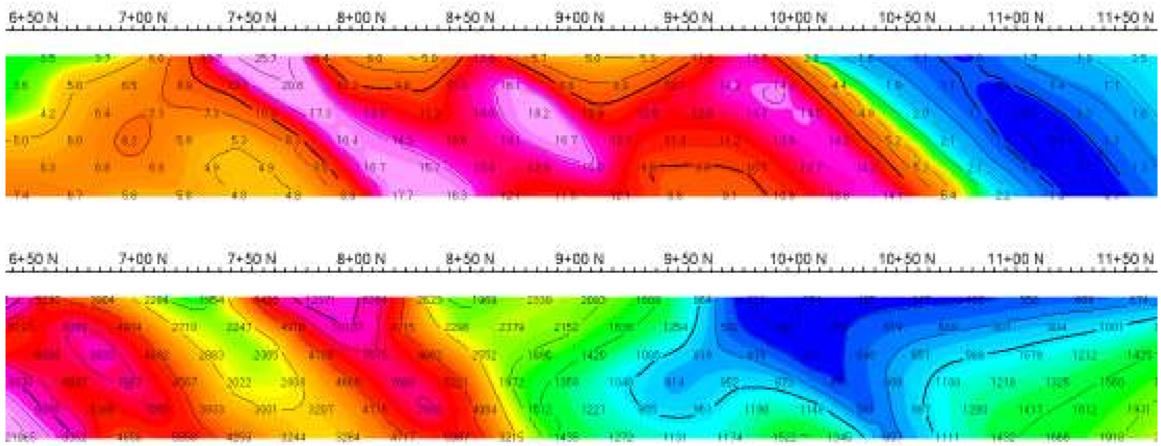


Figure 2. IP and resistivity pseudosections. Courtesy Goldeye Explorations Ltd.

Three IP anomaly tops are centered at 7+50N, 8+50N and 9+75N. Under standard classification, they would be ranked as strong, moderate and moderate. Their resistivity expressions are flanking a high, neutral and low. The low resistivities at 9+75N suggest a coincident bedrock conductor. This was confirmed by an HLEM survey that showed at bedrock conductor at 9+87.5N with dip 75° south, depth 25 m and conductance 3 S.

The IP anomaly forms suggest dips to the north. This would be incorrect – pole-dipole IP anomalies nearly always show a stronger leg on the current side. Without further work, the dip of these three chargeable zones must be assumed to be unknown. The HLEM results suggest at least one zone has a steep dip to the south.

Two holes were drilled to test these three IP anomalies ; BL06-02 collared at 7+00N and BL06-03 collared at 8+35N. Azimuth grid north and inclination -50° in both cases. Under 10 m of overburden, BL06-02 encountered rhyolite/tuff and feldspar porphyry, both units mineralized with pyrite to the end of hole at 127 m. BL06-03 encountered tuff, sediments (including graphitic argillite, 56-64 m) and a large package of feldspar porphyry. The sediments carried most of the mineralization with vuggy bands of pyrite. If the graphitic argillite centered around 60 m is the main cause of the IP anomaly at 8+50N, it dips to the north.

Physical Properties - Resistivity and Chargeability

The electrical resistivity of most rocks and soils is determined by their porosity, water content, resistivity of that water and the volume percent clays. This is because most minerals are insulators; electrical currents pass through the ground water as an electrolyte. The exception is a small set of minerals that are electronic conductors (e.g. pyrrhotite, pyrite, magnetite, graphite, specular hematite).

In most glaciated Archean terrain, the resistivity of water saturated overburden is in the range of 100 to 1000 ohm.m. Wet clays can reduce this to less than 10 ohm.m. Dry sandy soils and glacial till can have resistivities of 10,000 ohm.m.

The resistivity of most crystalline bedrock is in the range of 25,000 to 75,000 ohm.m. Massive pyrrhotite and graphite have resistivities on the order of 10^{-4} ohm.m. Although magnetite has a high crystal conductivity, in polycrystalline or even massive form, it is rarely considered a good conductor.

The IP method was developed in the 1950s to explore for porphyry copper deposits – large volumes of disseminated sulphides. It responds equally well to conductors. The IP effect or chargeability is measured in time domain as mV/V or in frequency domain as phase. In time domain surveys, the measured chargeability is normally taken around 1 second after shut-off of a 2 second current pulse.

In time domain IP surveys, the measured chargeability for overburden is usually 2 mV/V or less. It is characteristically uniform when the overburden is thick. Background chargeabilities of crystalline rock are usually in the range of 3 to 5 mV/V. Anything above this may constitute an anomaly. IP anomalies are commonly classed as weak (up to 10 mV/V), moderate (10 to 20 mV/V) and strong (more than 20 mV/V).

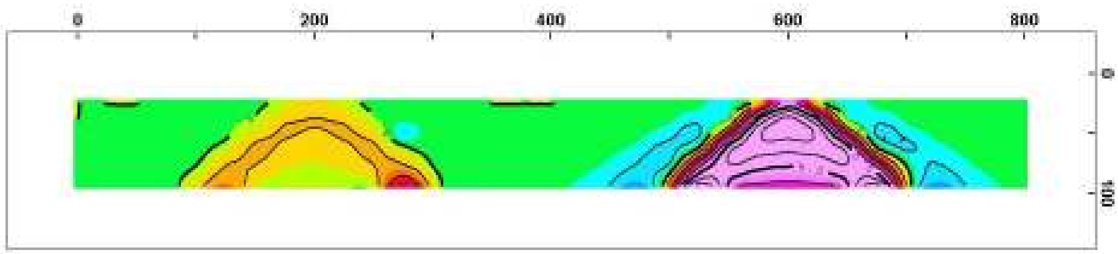


Figure 3. IP Model Results, Targets of Different Grain Size

Spectral IP was introduced in the 1970s. In time domain, it means analyzing the IP decay to extract three physical properties – amplitude, time constant (grain size) and exponent (grain size uniformity). Amplitude is better than measured chargeability as an estimate for the volume % metallic sulphides.

Model IP anomalies (dipole-dipole array) for two chargeable bodies are shown in figure 3. All parameters for the two bodies are the same except for the grain size. The body on the left is made up of fine grained disseminated sulphides. The body on the right is made up of coarse grained disseminated to semi-massive sulphides. The measured IP anomaly of the coarse grained body is at least 5 times that of the fine grained body. Spectral analysis would show that IP amplitudes are the same for both targets.

Overburden

Thick and/or conductive overburden suppresses the IP response of any underlying chargeable body. In extreme cases, the IP response may be extinguished and no IP anomaly will be recorded.

Apparent resistivities for 10 m of overburden with resistivities of 62.5 to 4000 ohm.m over crystalline basement rocks of 25,000 ohm.m are listed in table 1. A pole-dipole array with ‘a’ = 25 m is assumed. These numbers would apply to other ‘a’ spacings if overburden thickness is scaled accordingly.

Resistivity	n=1	n=2	N=3	n=4	n=5	n=6	Ratio 1/6
4000	9488	13395	15953	17744	19046	20046	0.473
2000	5580	8560	10840	12640	14120	15360	0.363
1000	3080	4980	6600	8000	9220	10320	0.298
500	1620	2720	3700	4600	5430	6200	0.261
250	835	1425	1970	2485	2975	3440	0.242
125	424	728	1016	1290	1557	1813	0.234
62.5	213	368	514	656	793	928	0.230

Table 1. Apparent Resistivities, Layered Earth Model

It turns out that apparent resistivities for 10 m of 500 ohm.m ground are the same as those for 5 m of 250 ohm.m ground and 20 m of 1000 ohm.m ground. Overburden resistivity and/or thickness up to 25 m cannot be recovered from the measured apparent resistivities. This is a fundamental limitation of the array that cannot be overcome by modeling or inversion.

Overburden conductivity x thickness product can be recovered however and may be useful as a measure of IP amplitude attenuation. For any IP/resistivity survey segment, the conductivity x thickness product can be estimated using the ratio of segment averages of the n=1 to n=6 apparent resistivities. From the appropriate set in table 1, all resistivities are scaled to fit the measured apparent resistivities. The conductivity * thickness product is then 10 / (the scaled resistivity).

Applied to the north end of figure 2, this method returns a conductance estimate of 20/140 over a substratum of 6000 ohm.m. The overburden could be 10 m of 70 ohm.m ground, 20 m of 140 ohm.m ground or 40 m of 280 ohm.m ground. The substrate is probably more overburden. In this segment, bedrock is outside the range of the array used.

Location and Amplitude

The chargeable body is centered under the peak of the anomaly top as seen in a pseudosection plot. This is true for a variety of target depths, dips and widths, overburden thickness and resistivity. Location uncertainty is about half the ‘a’ spacing – more for deep targets. The width of the target top is taken from the width of the anomaly top.

IP anomaly amplitudes are a complicated function of array geometry, target and host properties. The most important target properties are size, depth, chargeability and spectral characteristics. The most important host properties are overburden thickness and resistivity. Ranking IP anomalies is relatively easy where the overburden is thin and resistive. It is more difficult where overburden thickness or conductivity varies. Amplitudes corrected for overburden conductivity x thickness product may help.

Depth

IP anomaly amplitudes for a standard target in a homogeneous earth (no overburden) at depths of 5 to 60 m are shown in figure 4. The target is 10 m wide x 200 m strike length x 200 m length and is vertical. It has the same resistivity as the host rock. A normalized plot of the 1/depth curve (dashed line) is included for comparison.

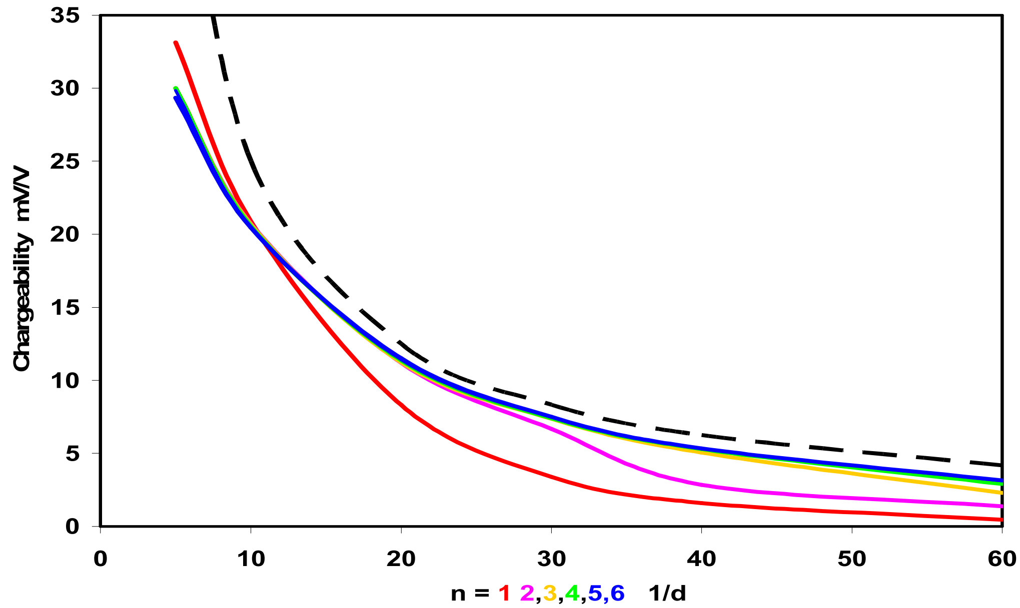


Figure 4. IP anomaly amplitudes vs. depth of burial

Over most of this range, IP anomaly amplitudes fall off as 1/depth. Doubling the depth reduces anomaly amplitudes by a factor of 2.

IP anomalies from targets at 10, 20 and 40 m are shown in figure 5. To correct for depth of burial, amplitudes have been multiplied by 2 for the target at 20 m and by 4 for the target at 40 m. Targets are centered at 300, 700 and 1100 m.

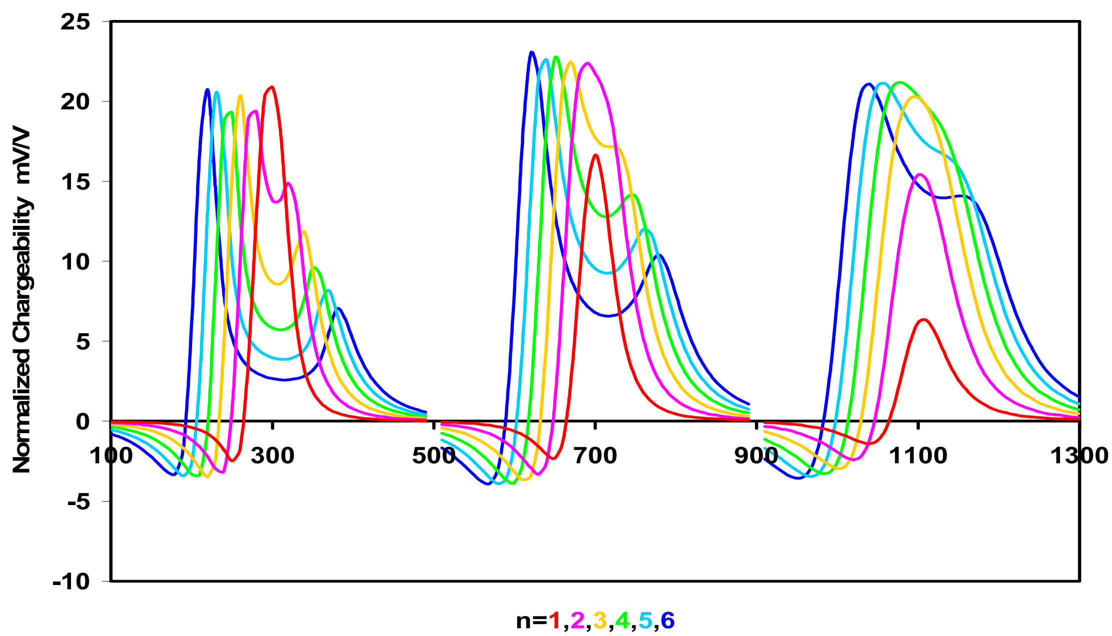


Figure 5. IP anomalies from targets at 10, 20 and 40 m depth.

At greater depths, the anomaly widens somewhat, the central low disappears and the response in the early dipoles is less. The last may be used to estimate depth.

Relative peak amplitudes for a standard target at varying depths are listed in table 2. These numbers are for a half space (no overburden). All differences from unity are less for any amount of conductive overburden. 20 m of 2000 ohm.m ground for example changes the relative n=1 dipole response from 0.74 to 0.88.

Depth	n=1	n=2	n=3	n=4	n=5	n=6
5	1.14	1	1	1	1	1
10	1.04	1	1	1	1	1
15	0.90	1	1	1	1	1
20	0.74	1	1	1	1	1
30	0.46	0.90	1	1	1	1
40	0.30	0.74	1	1	1	1
50	0.21	0.57	0.87	1	1	1
60	0.15	0.46	0.76	1	1	1

Table 2. Relative Peak Amplitudes, Varying Target Depth

These numbers may be used to derive a rough estimate of depth. Based on these simple rules, the IP anomalies in survey #2 would have depths to target of less than 5 m (7+50N), 15 to 20 m (8+50N) and 10 to 15 m (9+75N). All three IP anomalies were shown on the compilation map with the IP anomaly top at n=1.

Dip

As seen in survey #2, pole-dipole IP anomalies show higher values on the current side of the target even when the target dips the other way. Pole-dipole anomalies from a tabular body at 10 m depth are shown in figure 6. The target dips at 60° to the left (at 300), is vertical (at 700) and dips at 60° to the right (at 1100). The target is in a 25,000 ohm.m half space under 5 m of moderately conductive overburden (1000 ohm.m). The current is left of the potentials.

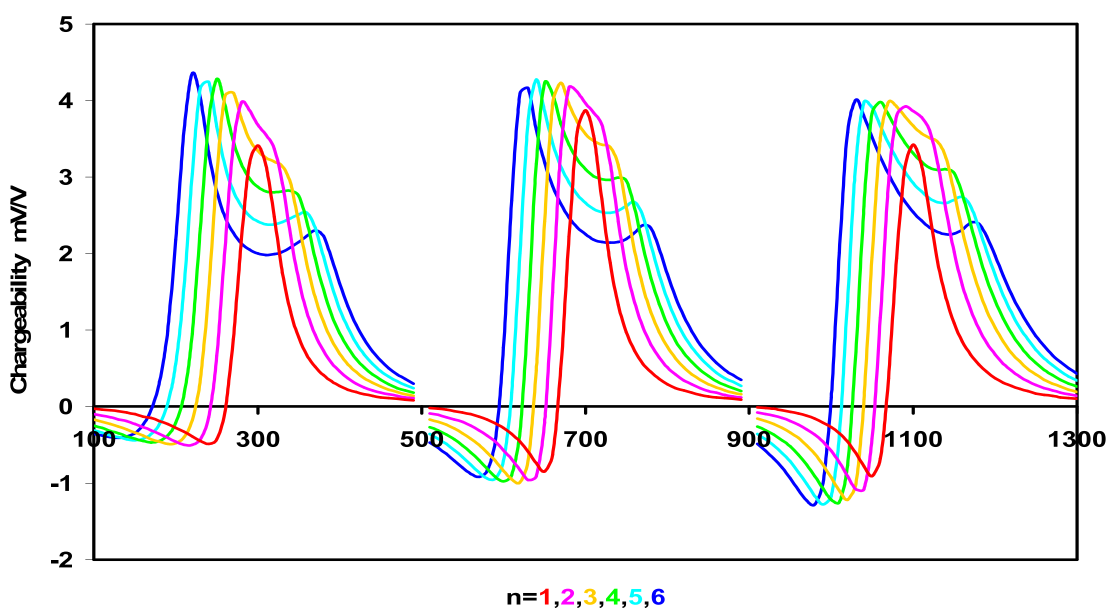


Figure 6. Pole-dipole anomalies, variable dip.

There is very little difference in these profiles. The relative n=6 down-dip peak is higher when the target dips towards the current electrode but this would be difficult to see in all but the best cases. These differences are also small when compared to the effects of depth of burial (figure 5) and different overburden resistivity (figure 8). There is little chance of recovering a sense of dip direction, let alone dip, from pole-dipole IP anomaly forms. Inversion will not help. If not available from area outcrop or other means, drilling should allow for a 50 – 50 uncertainty in target dip.

Dipole-dipole is a better array for dip direction. Dipole-dipole IP anomalies favour the down dip side and this is not affected by depth of burial or overburden resistivity.

Dipole-dipole apparent resistivities and chargeabilities can be reconstructed from any pole-dipole survey. The reconstructed dipole-dipole IP results for survey #1 suggest the target has a steep dip to the south. Reconstructed dipole-dipole IP results for survey #2 suggests a steep dip to the north at 7+50N and 8+50N and vertical or a steep dip to the south at 9+75N. These results are consistent with the drilling.

Overburden Masking

IP anomalies in figure 5 (left) and figure 6 (centre) are for the same chargeable body. The only difference is overburden – none in figure 5 and a thin layer (5 m) of moderately conductive overburden (1000 ohm.m) in figure 6. For this target, the overburden reduces IP anomaly amplitudes by a factor of 5. Without allowance for overburden masking, the two anomalies would be ranked as strong and weak. The strong anomaly would be drilled first. The weak anomaly might be ignored. Yet they represent identical geophysical targets.

This illustrates the sensitivity of IP anomaly amplitudes to overburden resistivity. IP anomaly peak amplitudes for a standard target under 5, 10, 20 and 40 m thick overburden of varying resistivity are shown in figure 7. With no overburden, peak chargeabilities are 33.1 mV/V (t=5 m), 20.9 mV/V (t=10 m), 11.5 mV/V (t=20 m) and 5.3 mV/V (t=40 m).

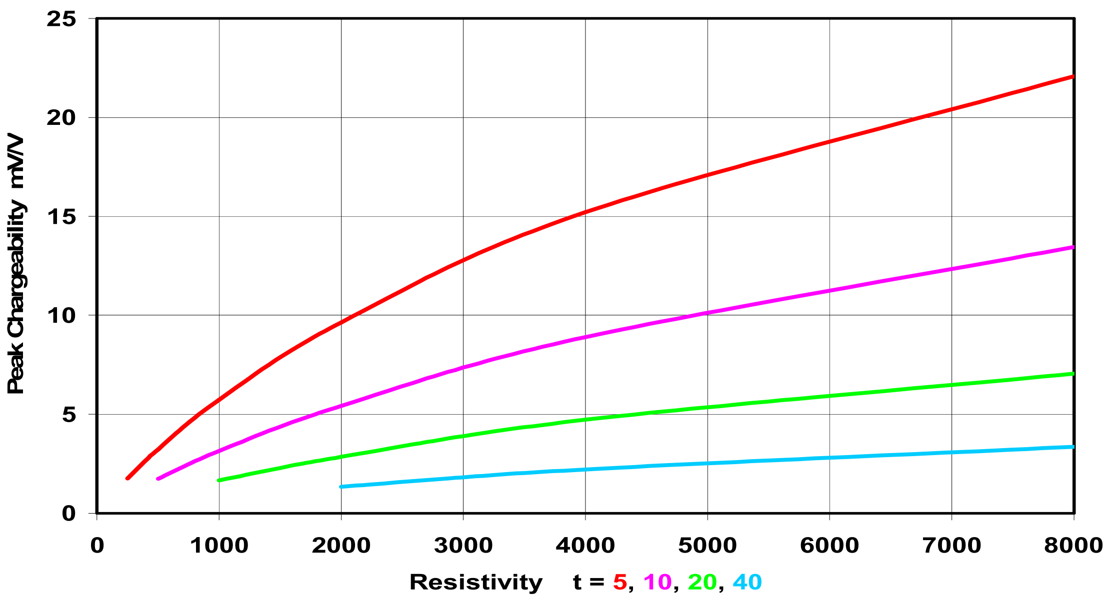


Figure 7. Anomaly amplitude for a target under different overburden

For overburden of fixed thickness, IP amplitudes roughly double as the resistivity is doubled. The effect is similar to halving the depth of burial. Combining these two forms of attenuation, IP anomaly amplitudes are roughly the same for this target under 5 m of 250 ohm.m, 10 m of 500 ohm.m, 20 m of 1000 ohm.m and 40 m of 2000 ohm.m. In other words, they are the same for the same overburden conductivity x thickness product.

IP anomalies from a vertical tabular body under 10 m of overburden are shown in figure 8. Overburden resistivities from left to right are 25,000 ohm.m (same as host rock), 4000 and 1000 ohm.m. The IP anomaly under 4000 ohm.m overburden has been multiplied by 2.35. The anomaly under 1000 ohm.m overburden has been multiplied by 6.65.

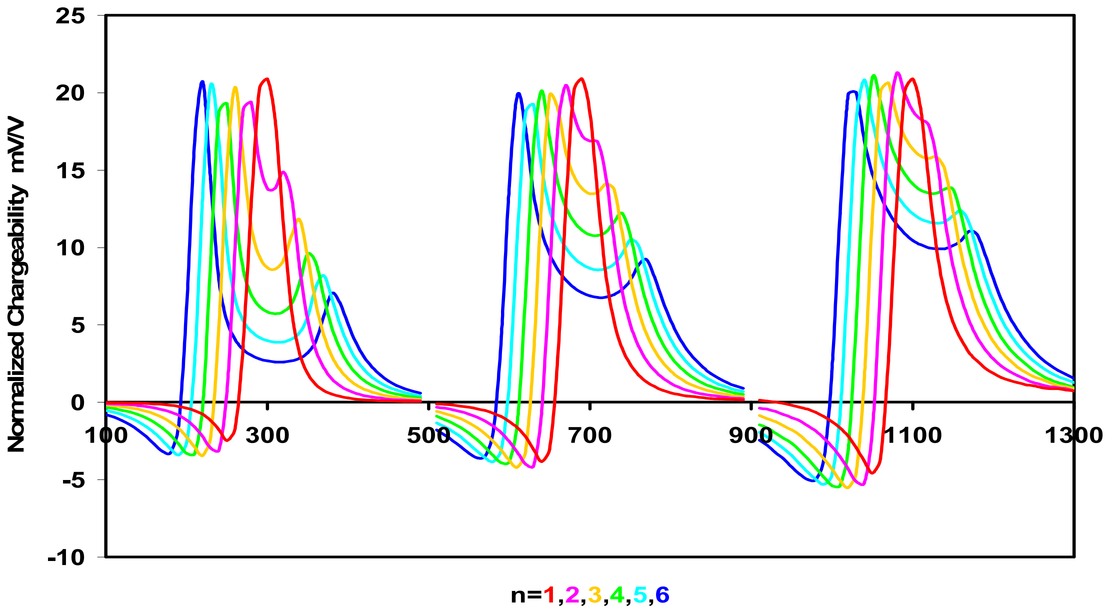


Figure 8. IP anomalies, Different overburden resistivity.

The form of the anomaly is largely unaffected by changes in overburden resistivity. Differences are in the later dipoles - a higher central low and less difference between outside peaks as overburden resistivity decreases.

Resistive and Conductive IP Targets

All targets considered to this point have the same resistivity as the host rock. This is often not the case – target resistivities more or less than the host are important. IP anomalies over three targets that differ only in the resistivity of the target are shown in figure 9. The target is at 10 m depth in a 25,000 ohm.m earth (no overburden). The centre anomaly at 7+00 is for the target with the same resistivity as the host rock. The target is less resistive (12,500 ohm.m) on the left and more resistive (50,000 ohm.m) on the right.

The more conductive target produces higher IP amplitudes in the early dipoles and amplitudes that fall off with depth. This was noted for the IP anomaly in survey #1. The more resistive target produces lower amplitudes in the early dipoles, a central low and amplitudes that increase with depth. These are distinct anomaly forms, regardless of what is seen in the apparent resistivities.

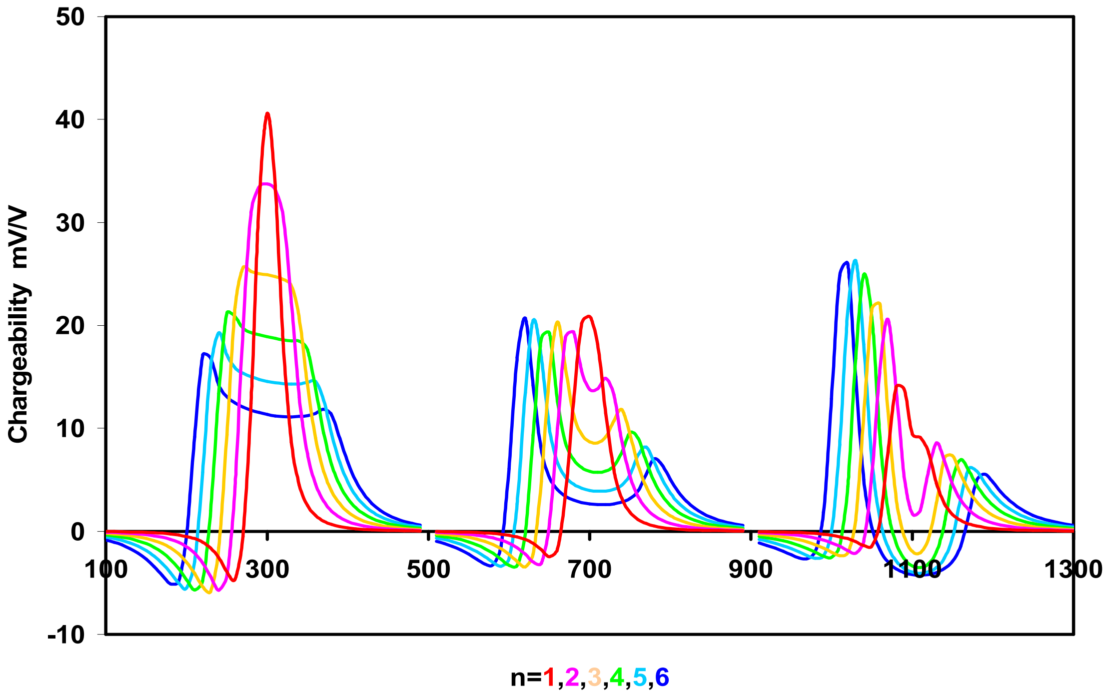


Figure 9. IP anomalies for targets of different resistivity.

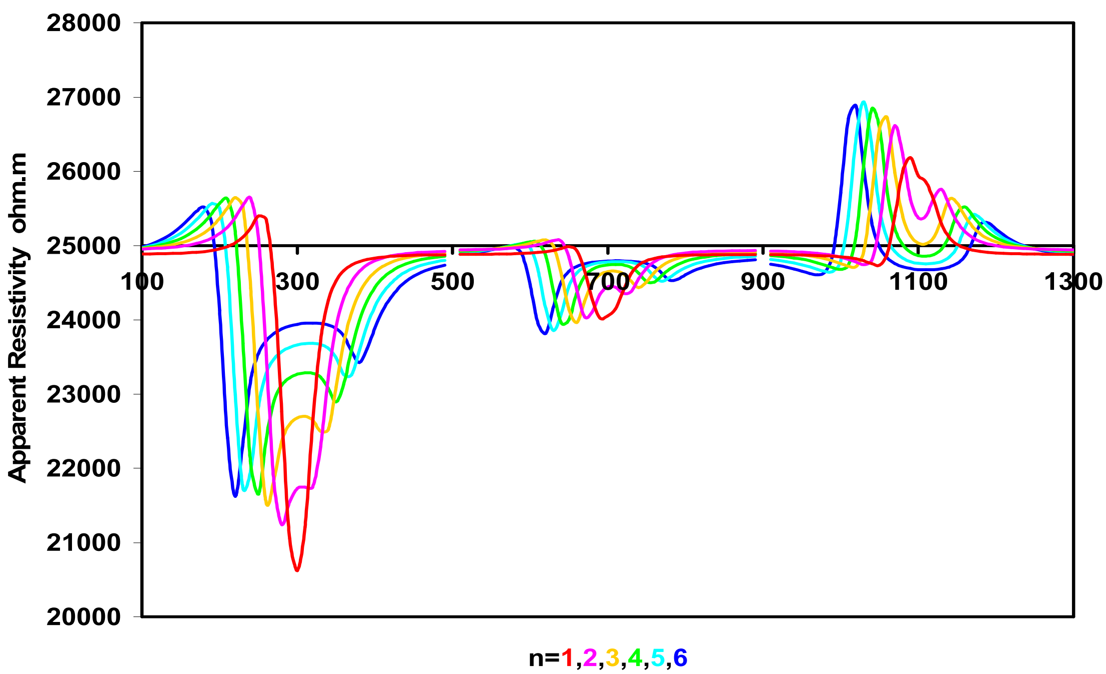


Figure 10. Apparent resistivity profiles for targets in figure 9.

Apparent resistivities for the three targets in figure 9 are shown in figure 10. The lower apparent resistivity over the centre target (same resistivity as the host) is because resistivity in the modelling program is the theoretical DC resistivity. The measured resistivity includes both resistivity and IP effects.

Summary

Pole-dipole IP anomalies are asymmetric pant-leg forms with a top over the body top-centre and stronger chargeabilities in the later dipoles on the current side. These basic features change little for different depths, dip and overburden resistivity.

Standard compilations normally provide an overview of IP targets with estimates of location, depth and amplitude. Before target selection and ranking, some attempt could be made to correct IP amplitudes for overburden masking. Before drilling, a more detailed analysis with modelling is suggested.

1. Location

The anomaly peak or top in the chargeability pseudosection is a good estimate of location for the top-centre of the chargeable body. Where the anomaly top is unusually wide, width is added to the interpretation. For weak IP anomalies, location and width may be better defined in the pseudosection of the spectral chargeability amplitude.

2. Depth

Depth is estimated from relative peak amplitudes in the early and late dipoles. It should be consistent with overburden conductance estimates. Depth may be represented as the dipole number that best represents the target top.

3. Dip Direction

In general, dip or even dip direction cannot be extracted from pole-dipole IP anomalies. The best way to get some sense of dip direction from pole-dipole IP anomalies alone is to look at the reconstructed dipole-dipole anomaly. This may fail however – dip should be taken from the geology or other means. If not available, drilling should assume a 50 – 50 chance on dip.

4. Amplitude

IP anomaly amplitudes are determined by array geometry, target width, depth, chargeability, grain size and resistivity, overburden thickness and resistivity and the resistivity of the host rock. Corrections for grain size are done through spectral analysis. The effects of relative overburden masking may be compensated using the conductivity x thickness product.

5. Resistivity

Any coincident resistivity response is of interest. A coincident resistivity low, no matter how feeble, may suggest a bedrock conductor. A resistivity high may indicate silicification. Even where there is no coincident resistivity response, IP anomaly forms may indicate a coincident resistivity high or low.

6. Grain Size

In some applications, the spectral chargeability amplitude and grain size are distinctive features that change target ranking. These are taken from spectral analysis.

Ian Johnson
February, 2007

Modelling

Modelling is based on Emigma V6.4 from PetrosEikon.

All model results are for a time domain IP survey where the chargeability is measured in mV/V 1 second after shutoff of a 2 second current pulse. A pole-dipole array with an potential electrode spacing of 25 m, n=1,6 is used. The current electrode is always left of the potential electrodes.

The plot point is midway between the moving current and the nearest potential electrode. The plot point in the survey examples is midway between the moving current and the centre of the potential dipole. The difference is a/4 m.

The general model consists of a uniform overburden layer over bedrock. There is no topography. The target is a tabular body within the bedrock. The target is assumed to be 10 m wide x 200 m strike length x 200 m depth extent. The survey line runs across the middle of and normal to the target.

Chargeability is defined by the spectral IP parameters amplitude (0.5 V/V), time constant (1 second) and exponent (0.5). For all models, host rock resistivity is 25,000 ohm.m.

Appendix 1 : JVX 6-79
Surveys, Data Processing, Presentation and Archives

Spectral IP/resistivity and magnetic surveys were done on the South, East and West grids, Argentia Ridge Project, South Lorrain Township, Ontario. The work was done for Adroit Resources Inc. by JVX Ltd. under JVX job number 6-79. The field work was done in the period January 18 to February 21, 2007. Total coverage was 23,000 m (IP/resistivity) and 25,487.5 m (magnetics).

IP/resistivity coverage by grid and line is listed in Table 1. Coverage is shown from the first current electrode station to the last potential electrode station. Magnetic coverage by grid and line is listed in Table 2. All distances are in metres (ideal grid).

Grid	Line	From	To	Separation	Date
South	200E	7+00N	6+75S	1375	January 18, 2007
	300E	7+00N	6+75S	1375	January 19, 2007
	400E	7+00N	7+25S	1425	January 21, 2007
				4,175 m	
East	100E	7+00S	7+25N	1425	January 23, 2007
	200E	7+00S	7+25N	1425	January 22, 2007
	300E	7+00S	7+25N	1425	January 26, 2007
	400E	7+00S	7+25N	1425	January 28, 2007
	500E	7+00S	7+25N	1425	January 29, 2007
	600E	7+00S	7+25N	1425	January 31, 2007
	700E	7+25S	6+75N	1400	February 4, 2007
	800E	7+00S	7+25N	1425	February 7, 2007
				11,375 m	
West	100E	5+25N	5+50S	1075	February 21, 2007
	200E	8+00N	7+75S	1575	February 19, 2007
	300E	6+25N	7+50S	1375	February 18, 2007
	400E	11+75N	7+00S	1875	February 9, 2007
	500E	11+50N	4+00S	1550	February 14, 2007
				7,450 m	

Table 1. IP/Resistivity Survey, Coverage by Grid and Line

The current electrode was north of the potential electrodes in the South grid, south of the potentials on the East grid and southeast of the potentials on the West grid.

Corrected start and end stations are shown for line 700E of the East grid. For the IP/resistivity data, 25 m was added to all stations. Station 7+25S recorded in the field, for example, has been changed to 7+00S.

Operators have noted a number of chaining / picket label errors on all grids (see below). Surveys proceed at regular intervals with regularly spaced station increments as if the error did not occur. In these cases, the station as shown on the pickets may not in all cases coincide with the station as recorded in the geophysical survey.

Grid	Line	From	To	Separation	Date
South	200E	6+75N	3+25N	350	January 20, 2007
		2+75N	7+00S	975	January 20, 2007
	300E	7+00N	7+25S	1425	January 20, 2007
	400E	7+00N	7+87.5S	1487.5	January 20, 2007
	700N	2+00E	3+75E	175	January 20, 2007
	BL	2+00E	4+00E	200	January 20, 2007
	700S	2+00E	4+25E	225	January 20, 2007
			Total	**4,837.5 m**	
East	100E	6+87.5N	7+00S	1387.5	January 19, 2007
	200E	7+00N	7+00S	1400	January 19, 2007
	300E	7+00N	7+00S	1400	January 19, 2007
	400E	7+00N	7+00S	1400	January 19, 2007
	500E	7+00N	6+87.5S	1387.5	January 19, 2007
	600E	7+00N	7+00S	1400	January 20, 2007
	700E	7+00N	7+00S	1400	January 19/20, 2007
	800E	7+00N	7+00S	1400	January 19, 2007
	700N	0+75E	8+00E	725	January 19, 2007
	BL	1+00E	4+25E	325	January 20, 2007
		5+00E	8+00E	300	January 19, 2007
			Total	**12,500 m**	
West	100E	5+50N	5+25S	1075	January 22, 2007
	200E	6+50N	7+50S	1300	January 21, 2007
	300E	6+00N	8+50S	1450	January 22, 2007
	400E	11+75N	9+00S	1975	January 22, 2007
	500E	11+25N	8+25S	1950	January 21/22, 2007
	BL	1+00E	5+00E	400	January 21, 2007
			Total	**8,150 m**	

Table 2. Magnetic Survey, Coverage by Grid and Line

Grids

Grid lines are north/south for the South and East grids, northwest/southeast for the West grid. Nominal line separation = 100 m. The East and South grids are immediately west of Lake Temiskaming. A power line runs through parts of the West grid. The 3 grids are in South Lorrain Township and centered some 30 km east southeast of Cobalt, Ontario.

Selected grid points were surveyed by JVX with a Garmin Etrex Legend GPS receiver. This unit is equipped with WAAS – Wide Area Augmentation System. At any control point, readings were averaged over 30 seconds for a positional accuracy of around ± 5 m in x or y, better in open ground. Elevations are less accurate. Coordinates (NAD83, Z17N) of these points are listed in Table 3.

Grid	Line	Station	UTM e	UTM n	Elevation
South	200E	0+00	617263	5224362	
	200E	7+00N	617247	5225029	244 m
	200E	7+00S	617279	5223662	
	300E	0+00	617358	5224363	
	300E	7+00S	617369	5223663	201 m
	300E	7+00N	617346	5225035	
	400E	0+00	617459	5224367	
	400E	7+00N	617446	5225041	
	400E	7+00S	617474	5223667	202 m
East	200E	7+00N	617267	5227856	312 m
	200E	7+00S	617268	5226451	266 m
	300E	7+00N	617379	5227854	
	300E	7+00S	617367	5226456	
	400E	7+00N	617482	5227851	
	400E	7+00S	617473	5226457	313 m
	500E	7+00N	617591	5227849	
	500E	7+00S	617557	5226451	
	600E	7+00N	617711	5227848	
	600E	7+00S	617667	5226453	
	700E	7+00N	617784	5227848	
	700E	7+00S	617728	5226429	233 m
	800E	7+00N	617848	5227849	238 m
	800E	7+00S	617852	5226476	219 m
	BL	2+00E	617248	5227157	271 m
	BL	3+00E	617368	5227156	287 m
	BL	4+00E	617465	5227154	277 m
	BL	7+00E	617745	5227139	233 m
	BL	8+00E	617847	5227141	239 m
West	100E	0+00	613578	5224248	268 m
	200E	0+00	613670	5224300	274 m
	200E	6+00N	613339	5224825	288 m
	200E	7+50S	614056	5223670	261 m
	300E	0+00	613767	5224362	285 m
	300E	5+00N	613454	5224748	307 m
	300E	5+25S	613991	5223999	274 m
	300E	6+00N	613396	5224827	262 m
	300E	9+50S	614231	5223659	264 m
	400E	0+00	613866	5224429	294 m
	400E	11+75N	613256	5225408	282 m
	400E	9+00S	614295	5223632	265 m
	500E	0+00	613920	5224456	294 m
	500E	11+25N	613283	5225384	286 m
	500E	8+50N	614388	5223776	278 m

Table 3. Grid Control Points

Operator's Notes

South Grid

Line 200E end of line is 7+00S. TL 700 S starts at 2+25E at line 200E, read as 2+00E-4+00E marked as 2+25E – 4+25E.
Line 400E, two large cliffs, chainage error of 50m due to elevation change. Was chained from TL 700S to cliff 1 and chained from BL to cliff 2.
Line 300E - chainage error around 5+00N. There was 50m between two pickets. Therefore the line goes 25m further to the south (E.O.L. at 7+25S).
Base line was established on a ridge.

East Grid

Line 700E was cut 50 m south of the tie line.
Line 700S - no chained pickets so no readings were taken.
BL between 2+00E and 1+00E pickets were labeled wrong.
BL is not passable to the east of 4+50N

West Grid
L100E
  Creek at 4+87.5N
  Cliff at 5+37.5N
L200E
  Pond at 6+50N
  First picket says 6+00N but really starts at 6+50N
  Power line at 1+00N
Base Line
  Power Line 1+50E to1+75E
L300E
  2+75N to 6+00N directly under the powerline
  Station 2+75N labeled the same.
  EOL at 6+00N
  Chainage error 4+25S then 3+00S ; 100m error, so that reading at 375S is the same as station 2+75S and line actually started at 8+50S not 9+50S.

Line 200E - chainage error of 50 m. Line was chained from 6+50N to cliff and chained from base line to cliff. Line 200E continues past 6+50N to the north but moving water under ice caused it not to freeze so it was too dangerous to pass.
Line 100E - no pickets south of 5+25S due to un-frozen lake system.
Line 500E last picket was labeled 11+00N - should be 11+25N due to chainage error at 5+00N.
Lines 400E and line 500E are within metres of each other at the north end.
Around 3+00N on line 400E there is a very big hill 200ft -100m in width

Surveys

The IP/resistivity survey was done in time domain using the Scintrex IPR12 receiver (2 second current pulse, 0.125 Hz base frequency) and Scintrex IPC7 2.5 kW transmitter. The magnetic survey was done with GEM Systems GSM-19 receivers. Station spacing for the magnetic survey was 12.5 m.

For the IP/resistivity survey, the pole-dipole array was used with a current-potential electrode layout that combines two ‘a’ spacings in up to 7 potential electrode pairs. The distance from the current electrode to the first potential electrode is always 25 m. When fully extended, the potential electrode separation (‘a’ spacing) for the first 4 electrode pairs is 25 m. The ‘a’ spacing for the last 3 electrode pairs is 50 m. This might also be described as a=25 m, n=1,4 + a=50 m, n=2.5,4.5. It is equivalent to a=25 m, n=1,10 with some loss of resolution in the later dipoles.

On every second move, the current electrode is advanced 25 m to a position formerly occupied by the first potential electrode. The receiver moves to what was P2. The array is now defined by a=25 m, n=1,3 + a=50 m, n=2,4 and would be equivalent to a=25 m, n=1,9. The whole string of potential electrodes is then moved forward 25 m and the process repeated until end of line.

The current electrode was north of the potential electrodes (South grid), south of the potential electrodes (East grid) and southeast of the potential electrodes (West grid). A sketch map on each pseudosection shows array orientation.

Personnel

Scott Mortson, senior operator from JVX acted as crew chief. He was responsible for all technical aspects of the field work and operated the IPR12 receiver. Assistants included Jason Ingleton, Dave Lukey, James Flowers, Chris Flowers, Mackenzie Craig and Joe Gamblin. The magnetometer surveys were done by Jon Dufoe and Alex Jelenic. Data processing was handled by Lily Manoukian of JVX at the JVX office in Richmond Hill, Ontario.

Instrumentation

Scintrex IPR12 time domain receiver.

For each potential electrode pair, the IPR12 measures the primary voltage (Vp) and the ratio of secondary to primary voltages (Vs/Vp) at 11 points on the IP decay (2 second current pulse). These 11 points (slices or windows) are labeled M0 to M10. There is the option for an additional user defined slice (Mx). Units of measurement are millivolts for Vp and milliVolts/Volt (mV/V) for M0 to M10 and Mx. Time settings are

Vp : 200 to 1600 msec
M4 centered at 60 msec (50 to 70)
M5 centered at 90 msec (70 to 110)
M6 centered at 130 msec (110 to 150)
M7 centered at 190 msec (150 to 230)
M8 centered at 270 msec (230 to 310)
M9 centered at 380 msec (310 to 450)
M10 centered at 520 msec (450 to 590)
M11 centered at 705 msec (590 to 820)
M12 centered at 935 msec (820 to 1050)
M13 centered at 1230 msec (1050 to 1410)
M14 centered at 1590 msec (1410 to 1770)
Mx centered at 870 msec (690 to 1050)

The apparent resistivity is calculated from Vp, the transmitted current and the appropriate geometric or K factors. M4 to M14 define the IP decay curve. The M12 or Mx slice is commonly presented in contoured pseudosections.

JVX has chosen the above settings for Mx in order to better reflect an IP measurement (M7) from the older Scintrex IPR11 time domain receiver. In IPR11 surveys from the 1980s, this chargeability window was most often plotted and experience gained is based in part on this measurement.

The IPR12 also calculates the theoretical decay that best fits the measured decay. The theoretical decay is based on the Cole-Cole impedance model developed in the 1970s. The fit is based on a set of theoretical master curves with restrictions (fixed c value) that limit the value of the calculation. JVX uses a different method to calculate impedance parameters (see below).

Scintrex IPC-7 2.5 kW time domain transmitter

This transmitter is powered by an 8 hp motor generator and produces a commutated square wave current output with current on times of 2, 4, 8, or 16 seconds. A 2 second current pulse was used (base frequency of .125 Hz). Output current is stabilized to within ±0.1% for up to 50% external load or ± 10% input voltage variations. Voltage, current and circuit resistance are displayed in analog and digital form.

GEM Systems GSM-19 magnetometers

The GEM Systems GSM-19 system can be configured to carry any or all of a ground proton precession magnetometer, vertical magnetic gradiometer and/or VLF-EM receiver. In stop and measure mode, total magnetic intensities and/or VLF fields are measured and recorded with line, station, date and time in digital memory. Total magnetic intensity is measured to 0.01 nT. The GSM-19 unit can also operate as a base station.

Data Processing and Presentation

Grid

GPS control points are taken into a Geosoft database (normally called gps.gdb). UTM coordinates of line / stations in other databases (IP/resistivity, magnetics, etc.) are taken from gps.gdb using a lookup procedure. Values for intermediate stations are interpolated or extrapolated. Where there are less than two GPS control points on any survey line, synthetic control points may be added.

Chaining errors noted in the field are reported but no attempt is made to adjust the survey results. Unless otherwise noted, line / station values of GPS control points and of geophysical survey points are as recorded in the field.

Base Map

A topographic base map has been downloaded from the claimap3 website of the Ontario Ministry of Northern Development and Mines. These maps show drainage, elevation contours, claim boundaries and claim numbers. See www.mndm.gov.on.ca/mndm/mines/lands/claimap3/. Copyright Queen's Printer for Ontario. Unless otherwise noted, registration is based on the NAD83 (WGS84) datum.

Magnetics

At the end of every survey day, the data from the mobile and base station magnetometers are dumped to a PC. Data dumps are text files with a .dmp extension named by date. The mobile data files show line, station, reading and time. The base data show time and reading. Base station corrections are applied and the results gathered in ASCII *.xyz files (Geosoft format). There is one *.xyz file per survey line.

In this survey, the base station magnetometer was not working properly. Mobile readings were corrected from tie line intercepts. There are no base station data files and no *.xyz files.

The corrected total magnetic intensity data is merged with the position data and collected into a database (*.gdb extension, Geosoft montaj format). Grid (random gridding) and contour. Generate map (colour + line contours, lines, surrounds, title block, legend, etc.). Output is a *.map (Geosoft montaj) file.

IP/Resistivity

At the end of every survey day, the IP/resistivity data are dumped from the IPR12 to a PC. Output is an ASCII *.dmp file with the date as the file name. Raw data from each survey line are collected in an ASCII *.i12 file with the line number as the file name. The data are checked for quality and quantity. The data are archived for transfer to JVX Ltd. in Toronto.

Office data processing is based largely on Geosoft Sushi and Geosoft Oasis montaj v6.3 (see www.geosoft.com). Impedance modelling software (see below) is based on a suite of programs developed by JVX for the IPR12. The compilation map was prepared using AutoCAD drafting software (see www.autodesk.com).

Data in the *.i12 files are merged with the position data. The IP decays are analysed for spectral content (see below). Stacked pseudosections (see below) and plan maps of the n=2 Mx chargeability and apparent resistivity are generated. Random gridding is used in both cases.

Plan maps show the true grid layout (GPS surveyed), a UTM grid (NAD83, Z17N), latitude/longitude coordinates, lakes and rivers, claim boundaries and claim numbers. All maps and pseudosections are drawn at a scale of 1:2500. IP/resistivity survey lines show tick marks at n=2 plot points.

Pseudosections

The pseudosections are plotted using standard depth and position conventions. The plot position for any measured quantity for the n^{th} potential dipole pair is (n+½)a/2 m forward of and below the current electrode. Pole-dipole anomaly shapes depend on array orientation. The array sketch shown with each pseudosection shows the correct array orientation.

These plot forms have been found to give a reasonable image of target location, width and depth where 1) the anomalously chargeable and/or resistive body is an isolated, near-vertical tabular body, 2) where background chargeabilities and resistivities (overburden and host rock) are uniform and 3) where the terrain is relatively flat. They are more difficult to interpret for irregular or nearby chargeable bodies and where there is any amount of conductive cover or topographic relief. Forward or inverse modelling may be useful in such cases.

For Mx and MIP chargeability and for apparent resistivity, colour contours in the pseudosections are assigned by equal area distribution for each individual pseudosection. Line to line changes in colour assignment will occur. Colour assignments for the spectral tau are fixed.

Impedance Modelling

The Cole-Cole impedance model was developed in the 1970s after it became clear that chargeability is a complex property that includes amplitude (volume percent electronic conductors), grain size and grain size uniformity. In this model, the low frequency electrical impedance Z(ω) of rocks and soils is defined by 4 parameters. They are

r_0 :	DC resistivity in ohm.m
m :	true chargeability amplitude in V/V (also called MIP)
τ :	tau - time constant in seconds
c :	exponent

The form of the model is

$$Z(\omega) = r_0 \{1 - m [1 - (1+(i\omega\tau)^c)^{-1}]\} \text{ ohm.m}$$

where ω is the angular frequency ($2\pi f$).

The true chargeability is a better measure of the volume percent electronic conductors (some metallic sulphides, magnetite, graphite). The time constant is a measure of the square of the average grain size. The exponent is a measure of the uniformity of the grain size. Common or possible ranges are 0 to 1 (m), .001 to 1000 seconds (tau) and .1 to .5 (c).

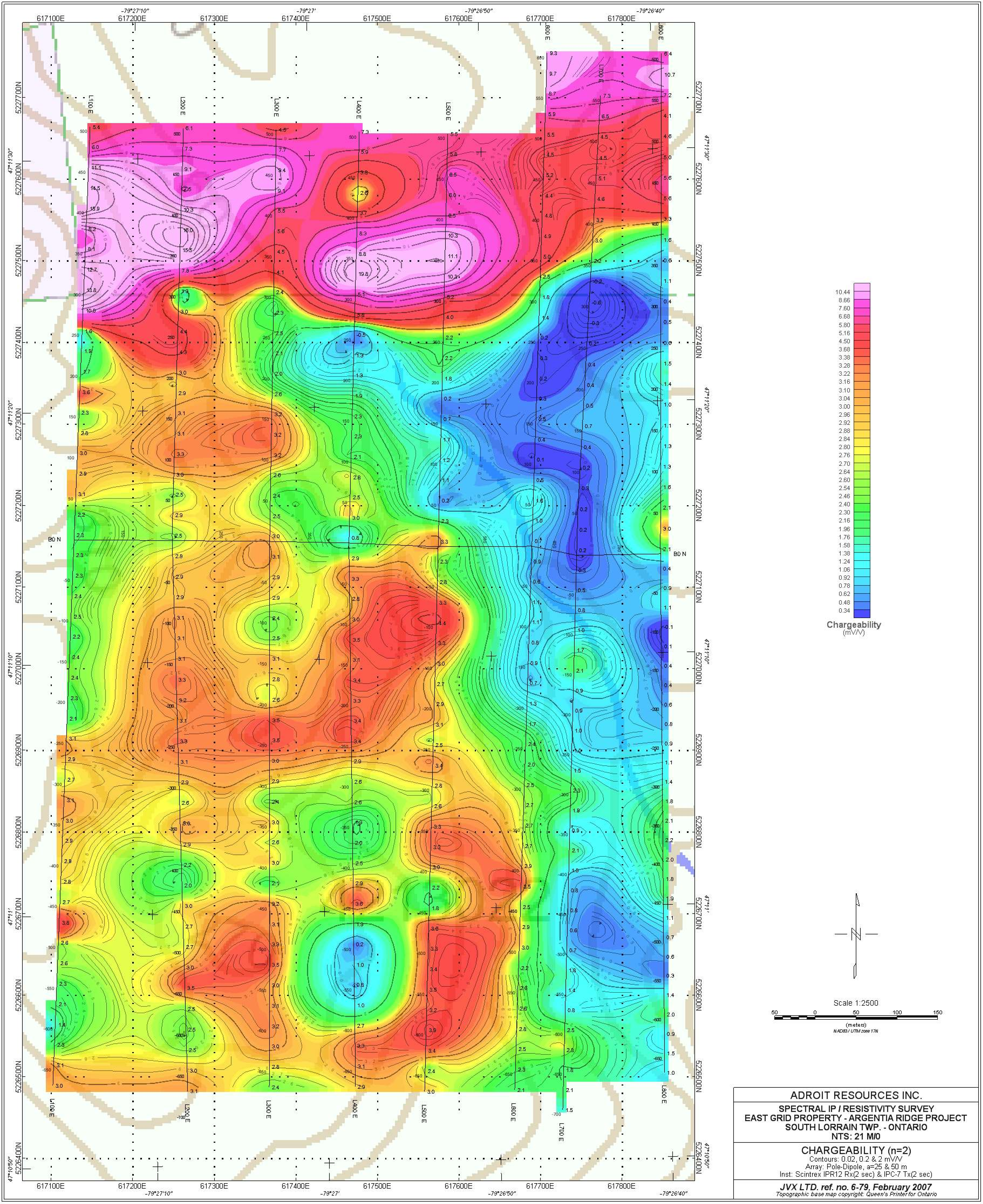
In time domain IP surveys, impedance model parameters may be estimated using a best fit between theoretical and measured decays. (Johnson, I.M., 1984, Spectral induced polarization parameters as determined through time-domain measurements: Geophysics, 49, 1993-2004). Software to affect this best fit has been developed by JVX. Program input is *.xyz files (export from Oasis *.gdb). Output is *.sip (spectral parameters) and *.rpt (report) files.

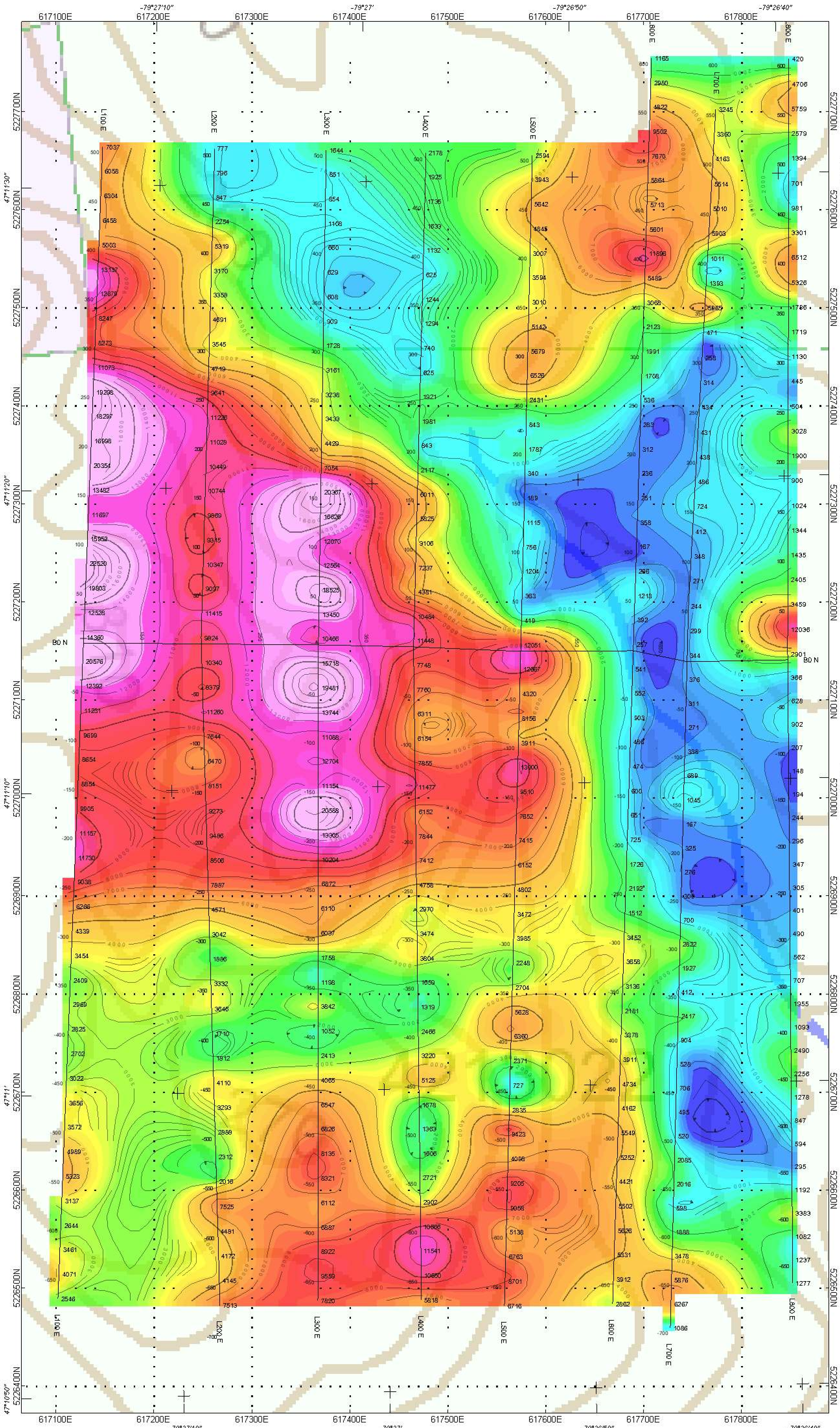
The extraction of impedance model parameters may fail if the measured decay is too noisy. In this case, the pseudosections are left blank. Impedance model parameters are only apparent. Resistivity and chargeability amplitude are subject to the effects of array geometry, target shape, size and attitude, geometric and physical attenuation. The time constant and c values are less affected by geometric effects.

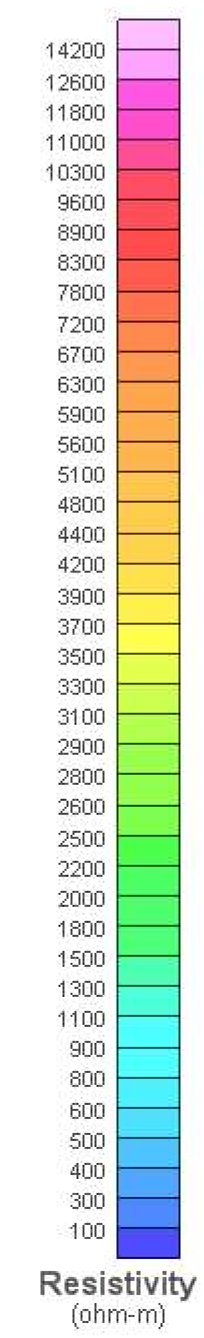
Archives

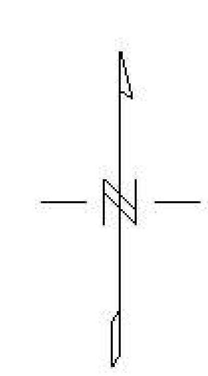
The results of the survey are archived on CD. Included on the CD is the Oasis Montaj viewer. File types include

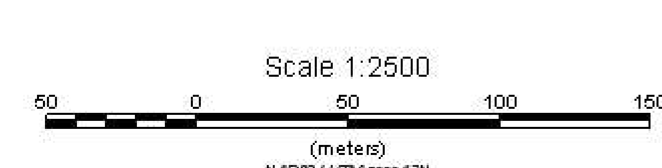
ASCII *.dmp	instrument data dumps (GEM GSM-19)
ASCII*.i12	IPR12 collected dump files (raw data)
Geosoft *.gdb	database files (Geosoft Oasis montaj format)
Geosoft *.map	map image files (Geosoft Oasis montaj format)
MS WORD *.doc	report
Image files *.jpg	figures in the report


ADROIT RESOURCES INC.
SPECTRAL IP / RESISTIVITY SURVEY
EAST GRID PROPERTY - ARGENTIA RIDGE PROJECT
SOUTH LORRAIN TWP. - ONTARIO
NTS: 21 M/0
CHARGEABILITY (n=2)
Contours: 0.02, 0.2 & 2 mV/V
Array: Pole-Dipole, a=25 & 50 m
Inst: Scintrex IPR12 Rx(2 sec) & IPC-7 Tx(2 sec)
JVX LTD. ref. no. 6-79, February 2007
Topographic base map copyright: Queen's Printer for Ontario
Chargeability
(mV/V)
Scale 1:2500
(meters)
NAD83 / UTM zone 17N









ADROIT RESOURCES INC.

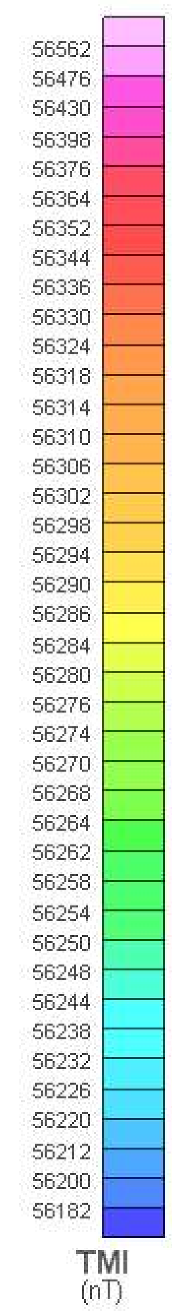
SPECTRAL IP / RESISTIVITY SURVEY
EAST GRID PROPERTY - ARGENTIA RIDGE PROJECT
SOUTH LORRAIN TWP. - ONTARIO
NTS: 21 M/0

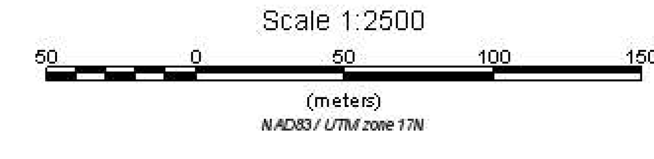
RESISTIVITY (n=2)

Contours: 100, 1000 & 5000 Ohm-m
Array: Pole-Dipole, a=25 & 50 m
Inst: Scintrex IPR12 Rx(2 sec) & IPC-7 Tx(2 sec)

JVX LTD. ref. no. 6-79, February 2007

Topographic base map copyright: Queen's Printer for Ontario



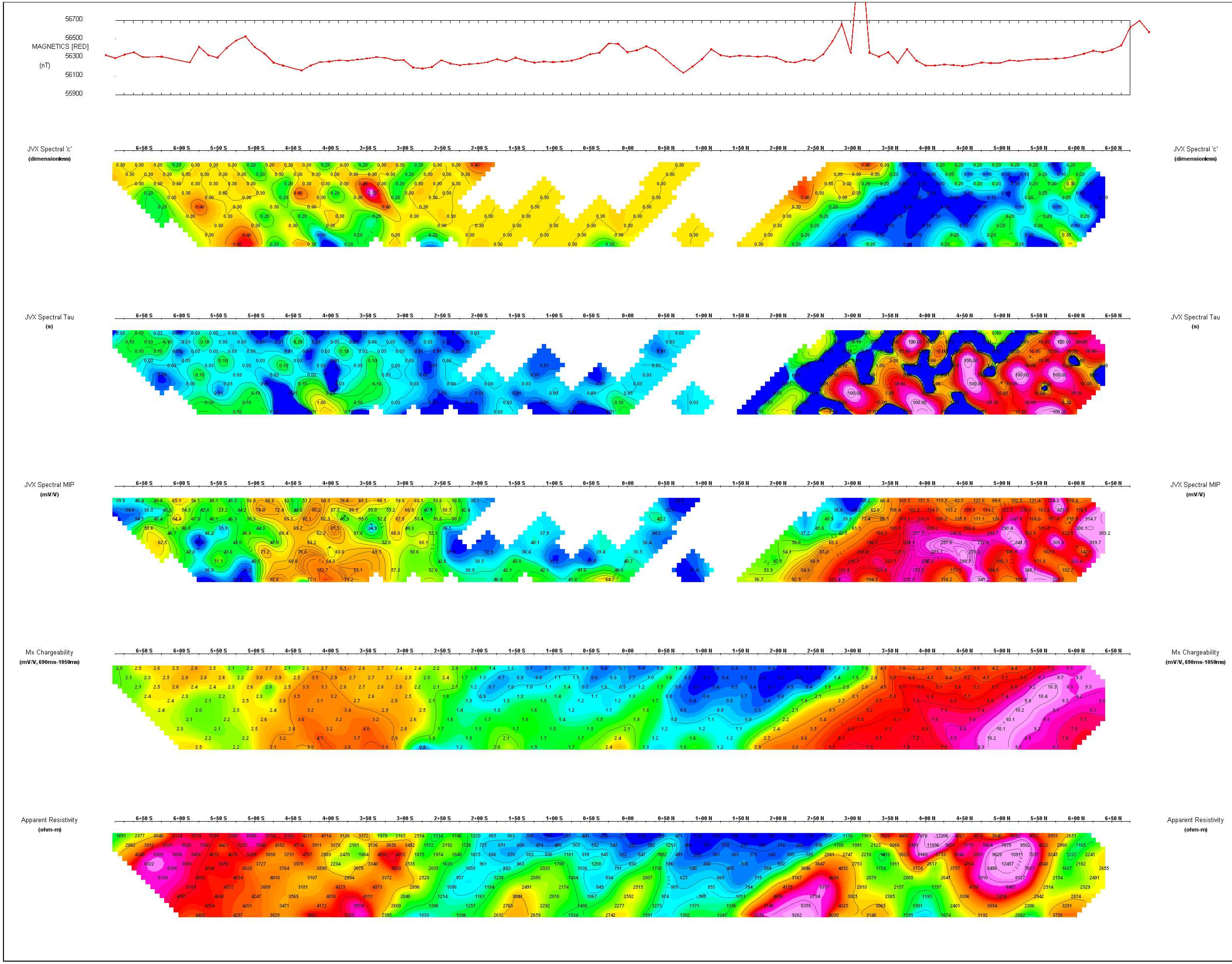


ADROIT RESOURCES INC.

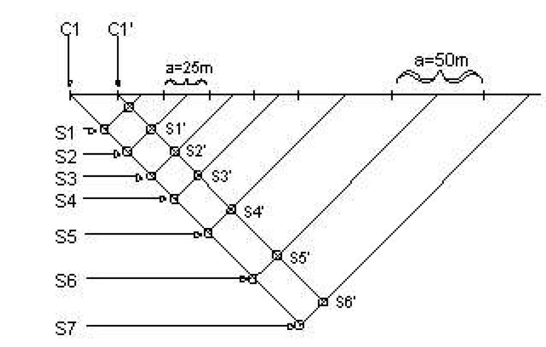
EAST GRID PROPERTY - ARGENTIA RIDGE PROJECT
SOUTH LORRAIN TWP. - ONTARIO
NTS: 21 M/0

TOTAL MAGNETIC INTENSITY MAP
TMI Contour Interval: 2, 10, 100 & 1000 nT
Base removed: 56300 nT
Value posted: Right, Stations posted: Left
Instrument: ENVI GSM-19G

JVX LTD., ref. no. 6-79, February 2007



600 E



Pole - Dipole Combination Array

Scale 1:2500

25 0 25 50 75 100 125 15

(meters)

ADROIT RESOURCES INC.

JVX SPECTRAL IP/RES SURVEY

EAST GRID PROPERTY - ARGENTIA RIDGE PR

SOUTH LORRAIN TWP. - ONTARIO

NTS: 21 M/01

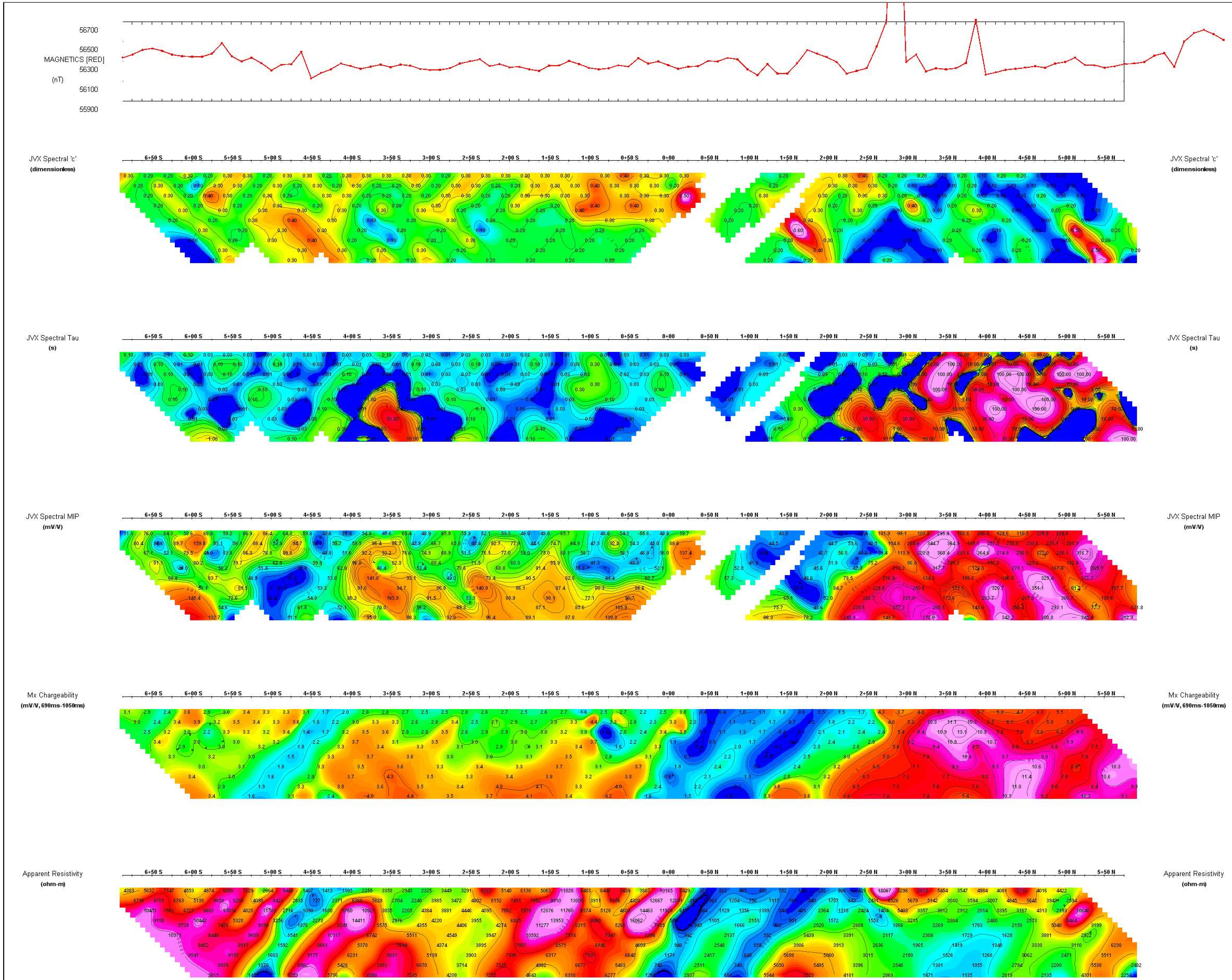
600 E

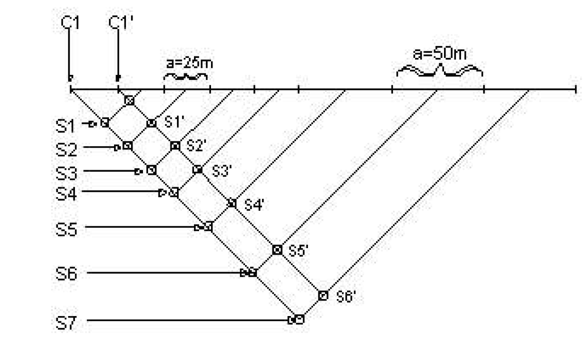
07/02/05

Rx (2 sec): Scintrex IPR12, Tx (2 sec): Scintrex IP

JVX Ltd. ref. no. 6-79

500 E





Pole - Dipole Combination Array

Scale 1:2500

25 0 25 50 75 100 125 150

(meters)

ADROIT RESOURCES INC.

JVX SPECTRAL IP/RES SURVEY

EAST GRID PROPERTY - ARGENTIA RIDGE PROJECT

SOUTH LORRAIN TWP. - ONTARIO

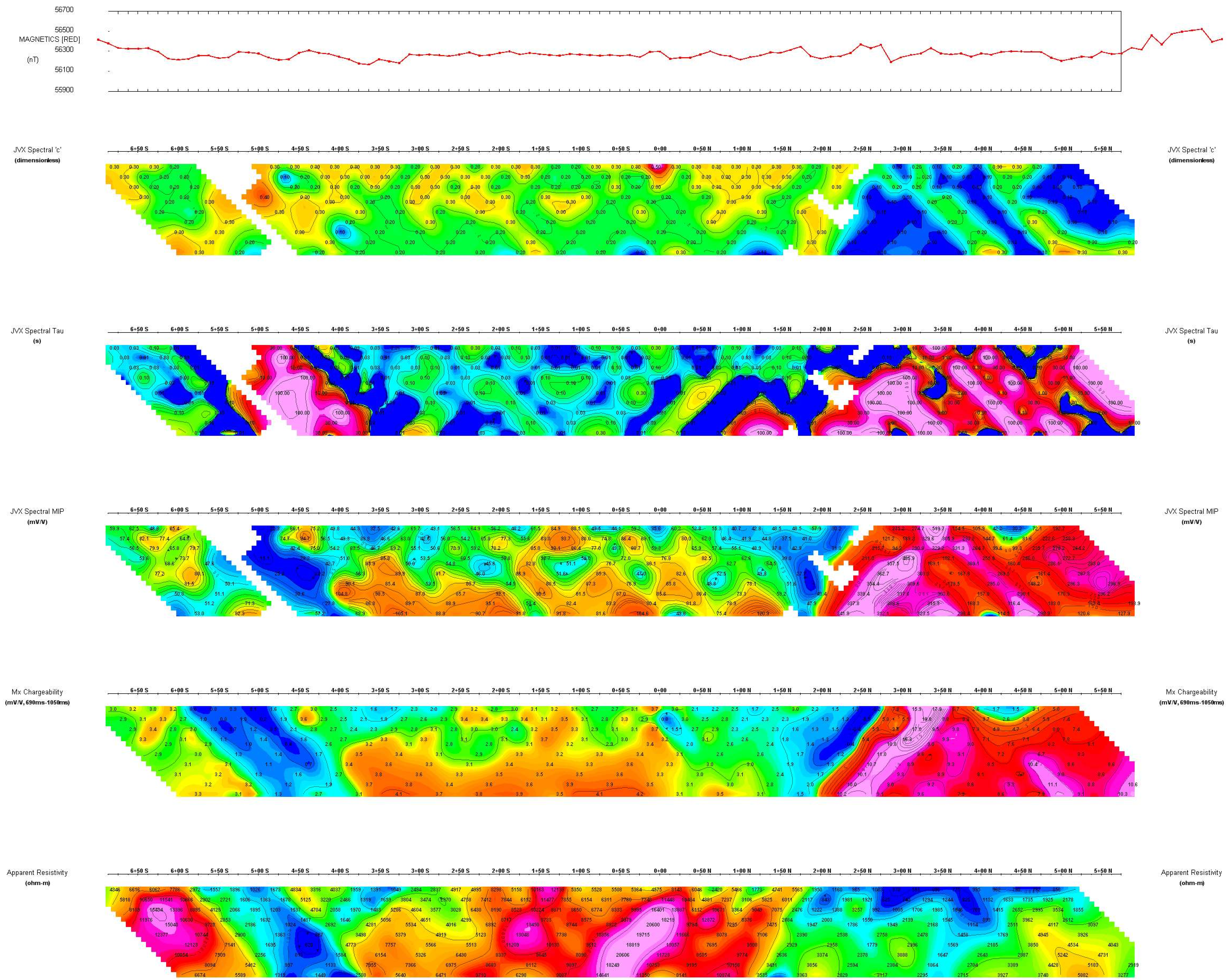
NTS: 21 M/01

500 E

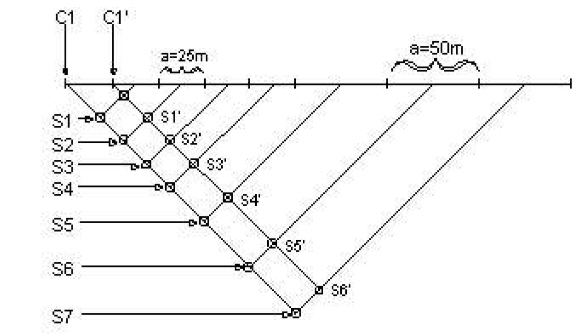
07/02/05

Rx (2 sec): Scintrex IPR12, Tx (2 sec): Scintrex IPC-7

JVX Ltd. ref. no. 6-79



400 E



Pole - Dipole Combination Array

Scale 1:2500

25 0 25 50 75 100 125 150

(meters)

ADROIT RESOURCES INC.

JVX SPECTRAL IP/RES SURVEY

EAST GRID PROPERTY - ARGENTIA RIDGE PROJECT

SOUTH LORRAIN TWP. - ONTARIO

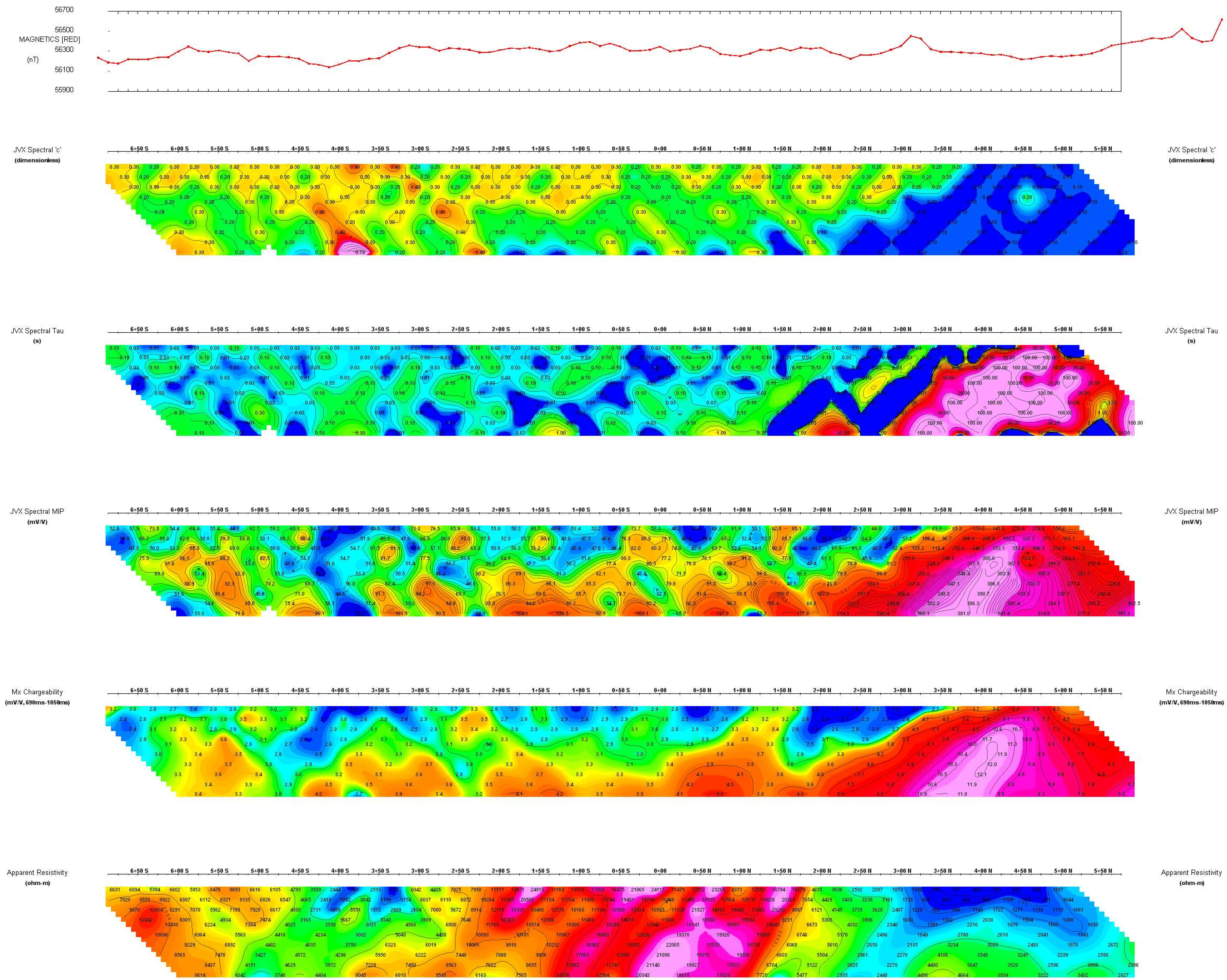
NTS: 21 M/01

400 E

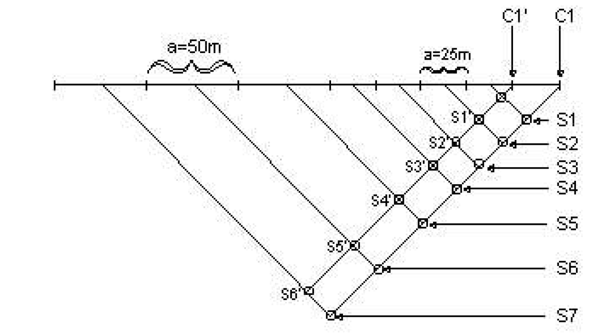
07/02/05

Rx (2 sec): Scintrex IPR12, Tx (2 sec): Scintrex IPC-7

JVX Ltd. ref. no. 6-79



300 E



Pole - Dipole Combination Array

Scale 1:2500

25 0 25 50 75 100 125 150

(meters)

ADROIT RESOURCES INC.

JVX SPECTRAL IP/RES SURVEY

EAST GRID PROPERTY - ARGENTIA RIDGE PROJECT

SOUTH LORRAIN TWP. - ONTARIO

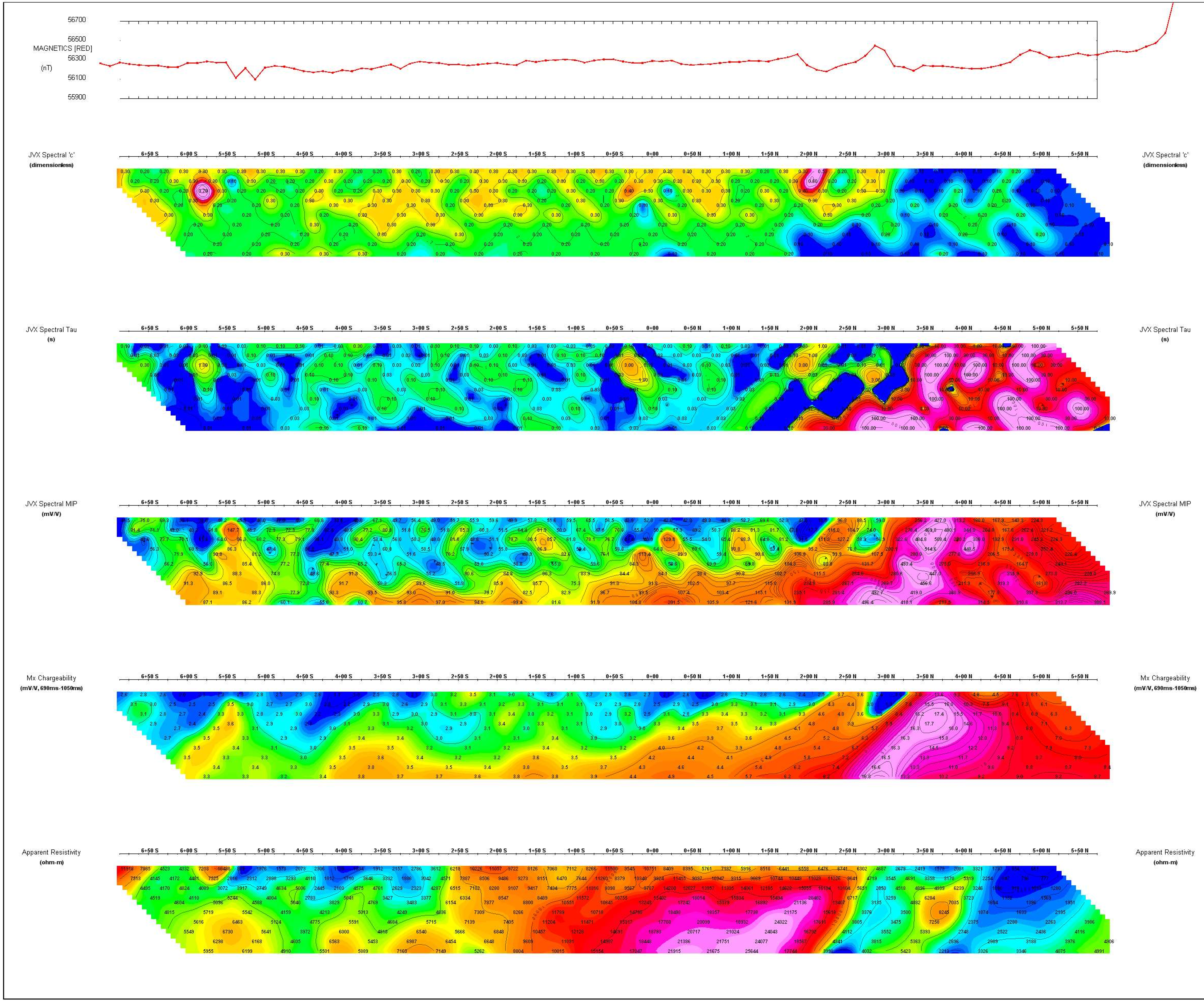
NTS: 21 M/01

300 E

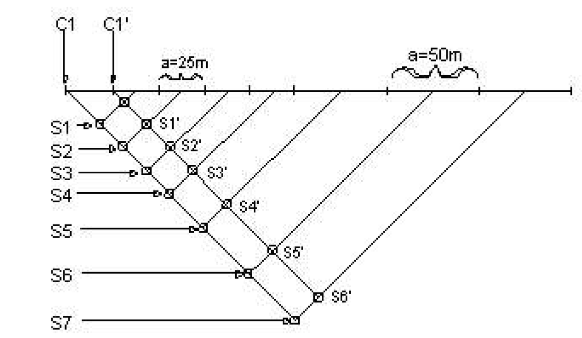
07/02/13

Rx (2 sec): Scintrex IPR12, Tx (2 sec): Scintrex IPC-7

JVX Ltd. ref. no. 6-79



200 E



Pole - Dipole Combination Array

Scale 1:2500

25 0 25 50 75 100 125 150

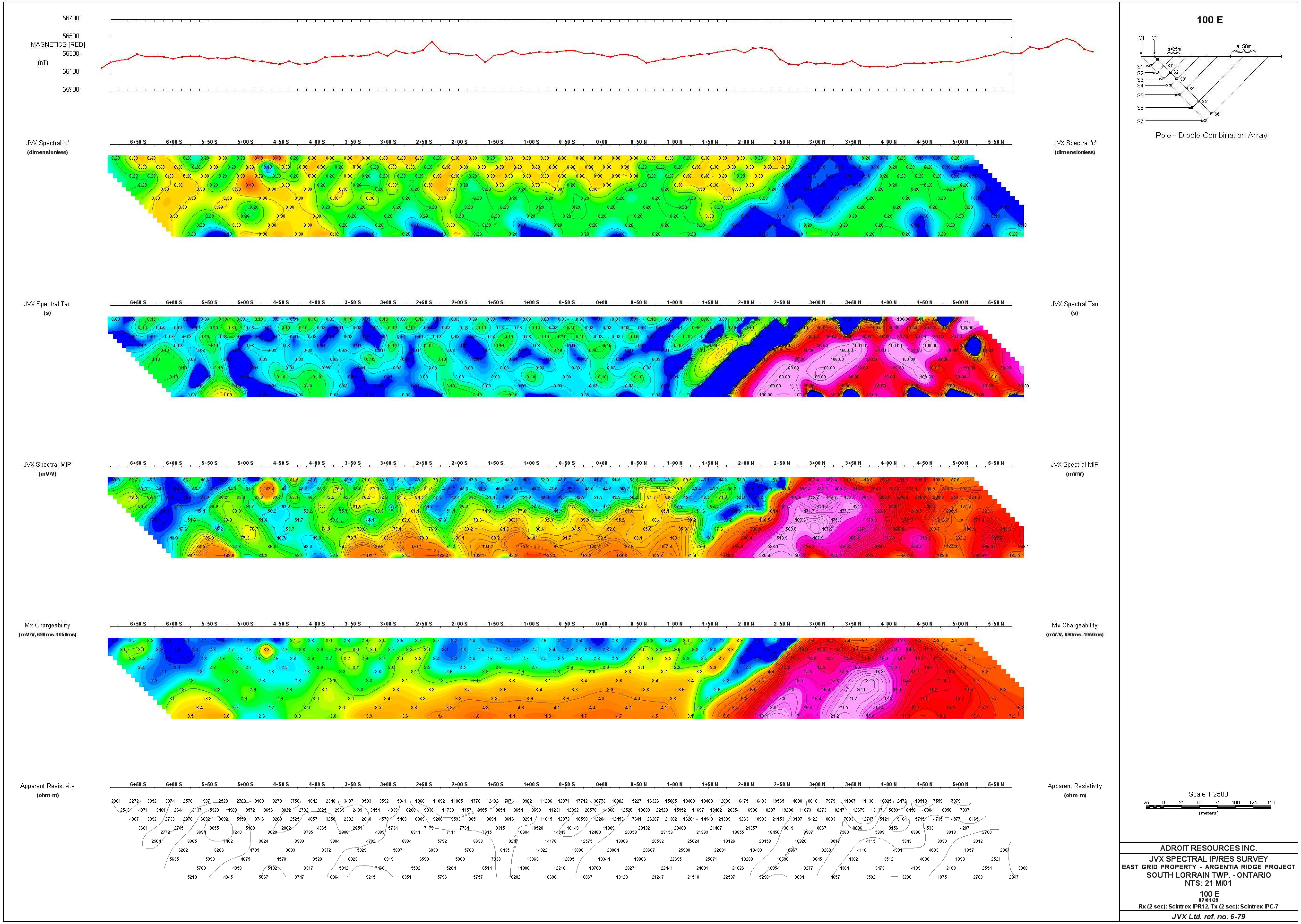
(meters)

ADROIT RESOURCES INC.

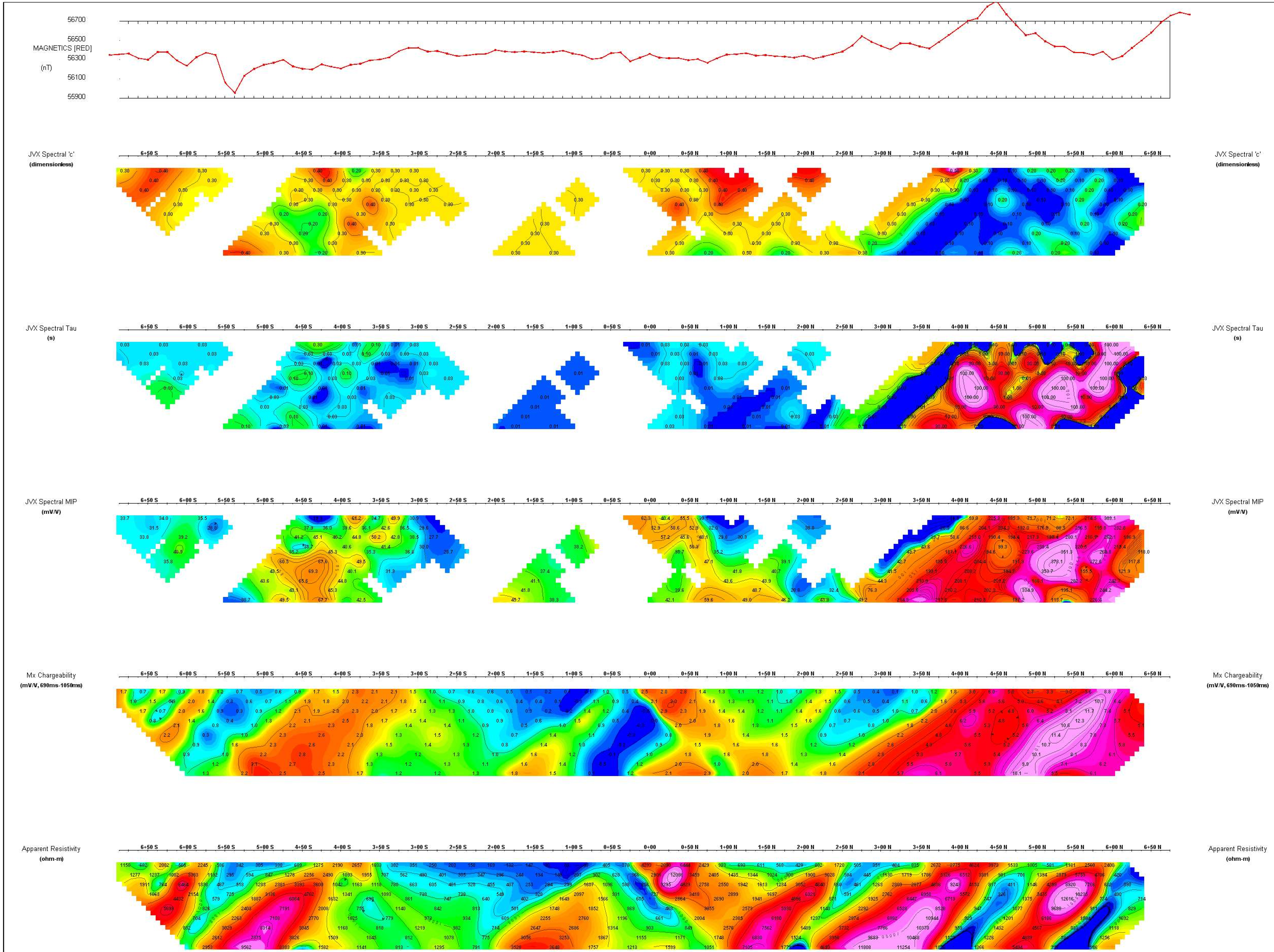
JVX SPECTRAL IP/RES SURVEY
EAST GRID PROPERTY - ARGENTIA RIDGE PROJECT
SOUTH LORRAIN TWP. - ONTARIO
NTS: 21 M/01

200 E
07/01/29
Rx (2 sec): Scintrex IPR12, Tx (2 sec): Scintrex IPC-7

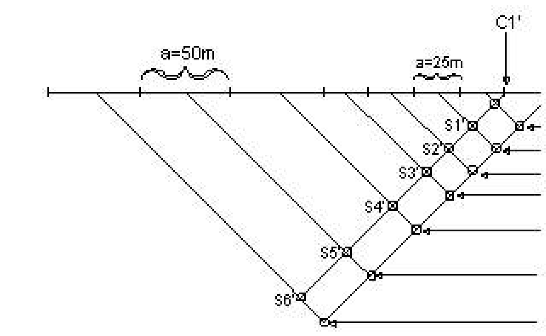
JVX Ltd. ref. no. 6-79



100 E
Pole - Dipole Combination Array
MAGNETICS [RED]
(nT)
JVX Spectral 'c'
(dimensionless)
JVX Spectral Tau
(s)
JVX Spectral MIP
(mV/V)
Mx Chargeability
(mV/V, 690ms-1050ms)
Apparent Resistivity
(ohm-m)
Scale 1:2500
(meters)
ADROIT RESOURCES INC.
JVX SPECTRAL IP/RES SURVEY
EAST GRID PROPERTY - ARGENTIA RIDGE PROJECT
SOUTH LORRAIN TWP. - ONTARIO
NTS: 21 M/01
100 E
07/01/29
Rx (2 sec): Scintrex IPR12, Tx (2 sec): Scintrex IPC-7
JVX Ltd. ref. no. 6-79



800 E



Pole - Dipole Combination Array

Scale 1:2500

25 0 25 50 75 100 125 150

(meters)

ADROIT RESOURCES INC.

JVX SPECTRAL IP/RES SURVEY

EAST GRID PROPERTY - ARGENTIA RIDGE PR

SOUTH LORRAIN TWP. - ONTARIO

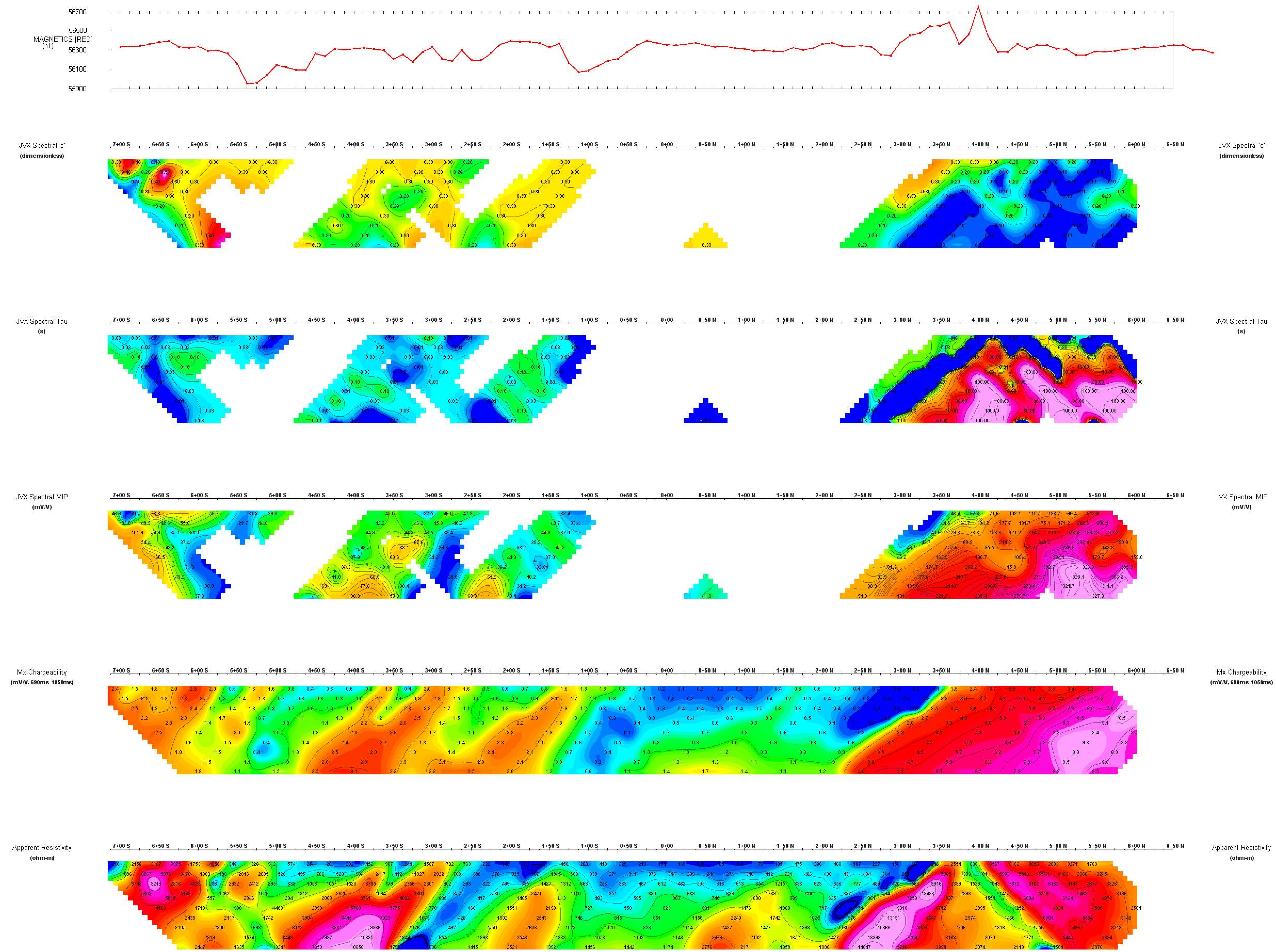
NTS: 21 M/01

800 E

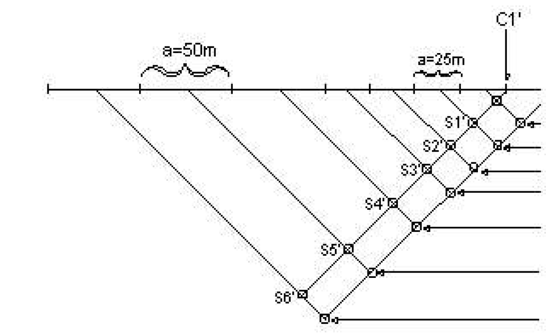
07/02/11

Rx (2 sec): Scintrex IPR12, Tx (2 sec): Scintrex IPC

JVX Ltd. ref. no. 6-79



700 E



Pole - Dipole Combination Array

Scale 1:2500

25 0 25 50 75 100 125

(meters)

ADROIT RESOURCES INC.

JVX SPECTRAL IP/RES SURVEY

EAST GRID PROPERTY - ARGENTIA RIDGE PR

SOUTH LORRAIN TWP. - ONTARIO

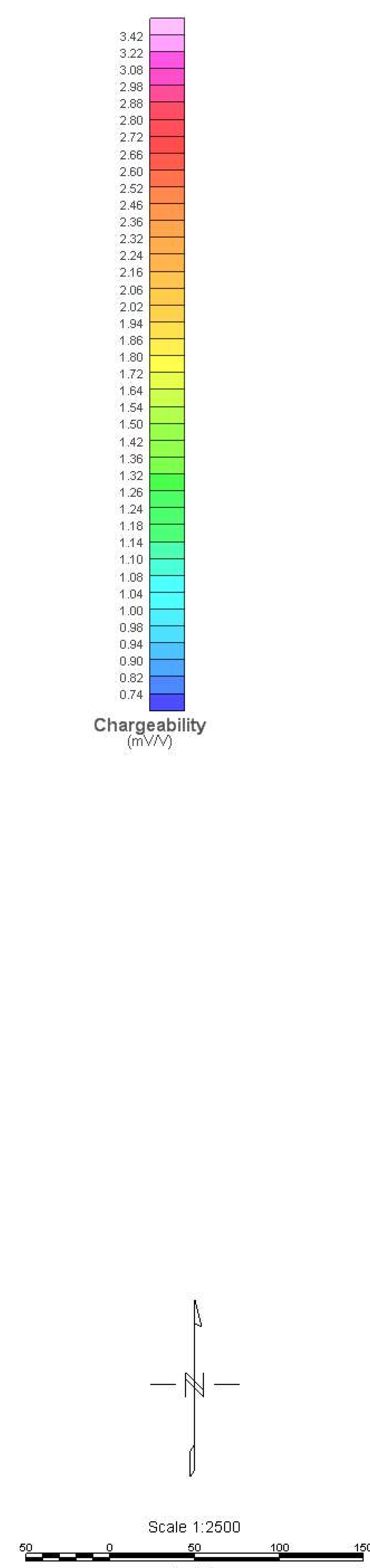
NTS: 21 M/01

700 E

07/02/14

Rx (2 sec): Scintrex IPR12, Tx (2 sec): Scintrex IPC

JVX Ltd. ref. no. 6-79



ADROIT RESOURCES INC.

SPECTRAL IP / RESISTIVITY SURVEY
SOUTH GRID PROPERTY - ARGENTIA RIDGE PROJECT
SOUTH LORRAIN TWP. - ONTARIO
NTS: 21 M/0

CHARGEABILITY (n=2)
Contours: 0.02, 0.2 & 2 mV/V
Array: Pole-Dipole, a=25 & 50 m
Inst: Scintrex IPR12 Rx(2 sec) & IPC-7 Tx(2 sec)

JVX LTD. ref. no. 6-79, February 2007
Topographic base map copyright: Queen's Printer for Ontario

ADROIT RESOURCES INC.

SPECTRAL IP / RESISTIVITY SURVEY
SOUTH GRID PROPERTY - ARGENTIA RIDGE PROJECT
SOUTH LORRAIN TWP. - ONTARIO
NTS: 21 M/0

RESISTIVITY (n=2)
Contours: 20, 200 & 2000 Ohm-m
Array: Pole-Dipole, a=25 & 50 m
Inst: Scintrex IPR12 Rx(2 sec) & IPC-7 Tx(2 sec)

JVX LTD. ref. no. 6-79, February 2007

ADROIT RESOURCES INC.

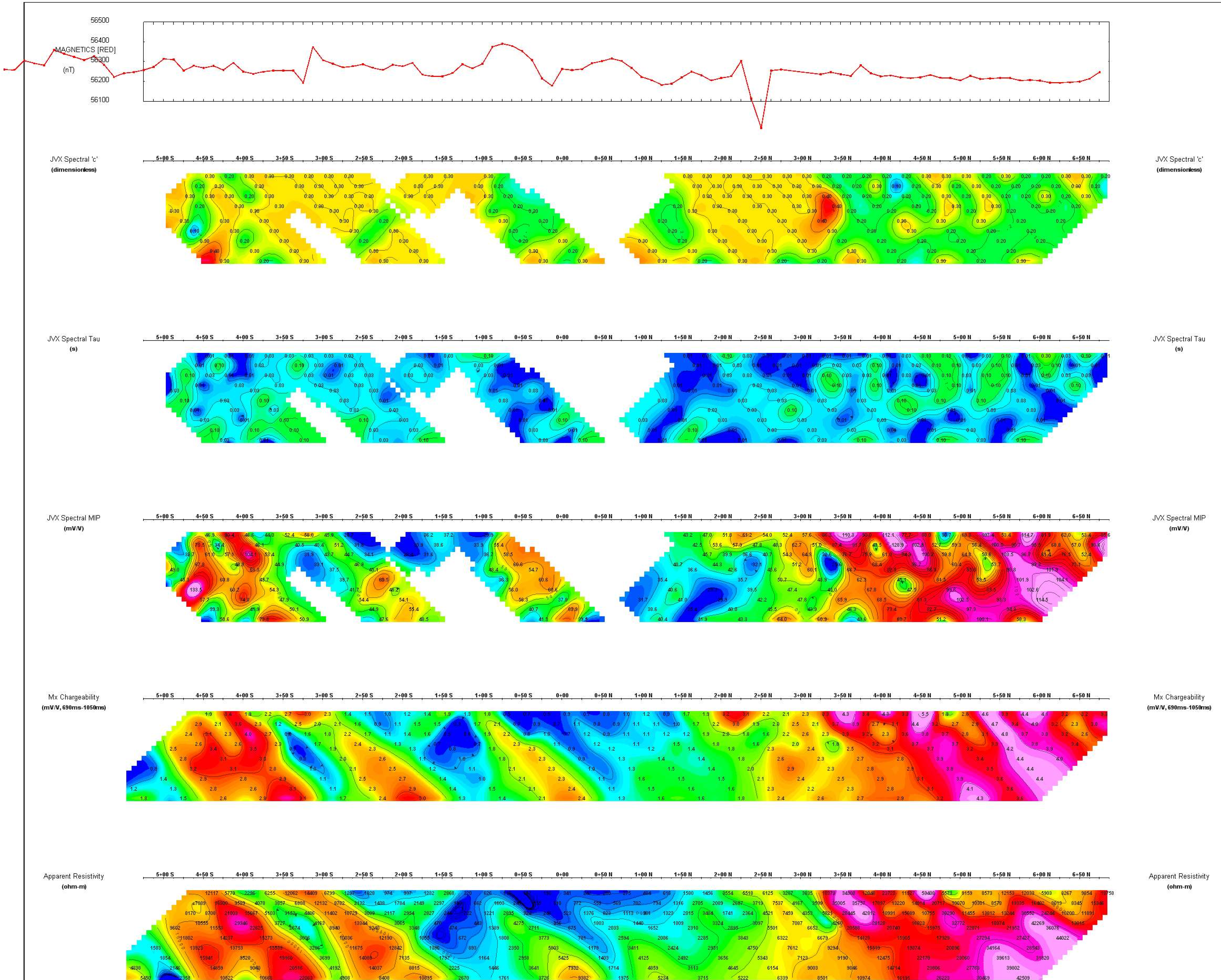
SOUTH GRID PROPERTY - ARGENTIA RIDGE PROJECT
SOUTH LORRAIN TWP. - ONTARIO
NTS: 21 M/0

TOTAL MAGNETIC INTENSITY MAP

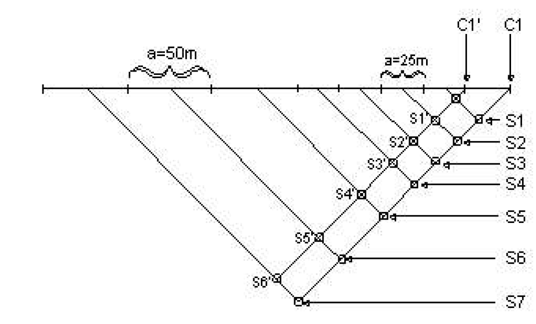
TMI Contour Interval: 1, 10, 100 & 1000 nT
Base removed: 56400 nT
Value posted: Right, Stations posted: Left
Instrument: ENVI GSM-19G

JVX LTD., ref. no. 6-79, February 2007

Topographic base map copyright: Queen's Printer for Ontario



200 E



Pole - Dipole Combination Array

Scale 1:2500

25 0 25 50 75 100 125 150

(meters)

ADROIT RESOURCES INC.

JVX SPECTRAL IP/RES SURVEY

SOUTH GRID PROPERTY - ARGENTIA RIDGE PROJECT

SOUTH LORRAIN TWP. - ONTARIO

NTS: 21 M/01

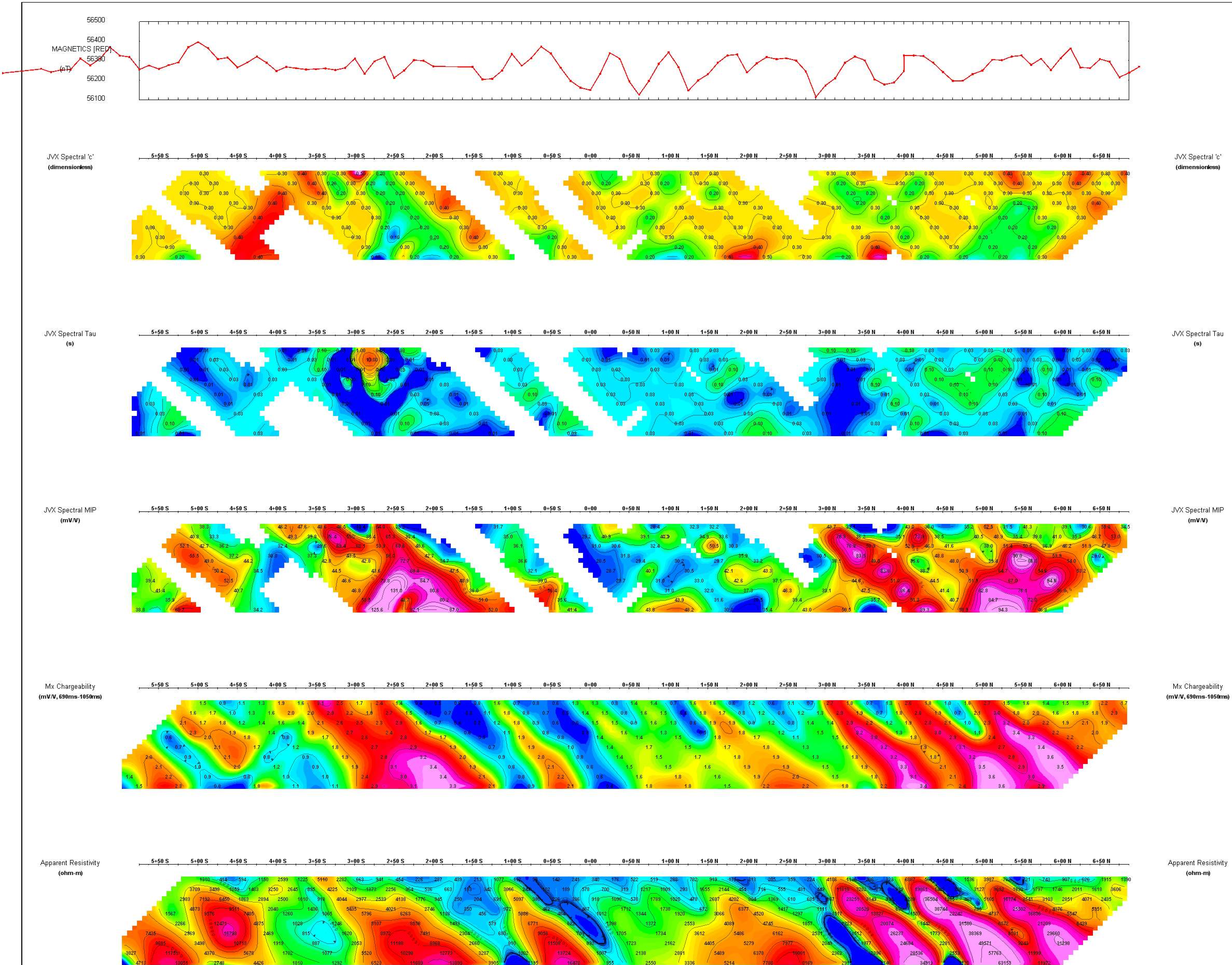
200 E

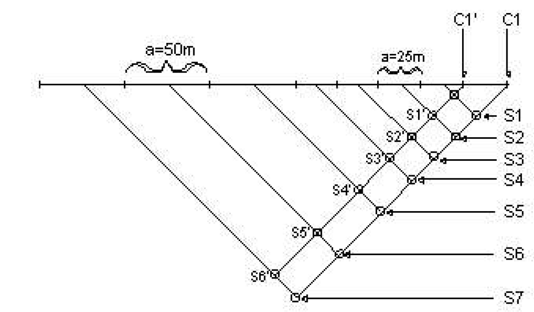
07/01/29

Rx (2 sec): Scintrex IPR12, Tx (2 sec): Scintrex IPC-7

JVX Ltd. ref. no. 6-79

400 E





Pole - Dipole Combination Array

Scale 1:2500

(meters)

ADROIT RESOURCES INC.

JVX SPECTRAL IP/RES SURVEY

SOUTH GRID PROPERTY - ARGENTIA RIDGE PROJECT

SOUTH LORRAIN TWP. - ONTARIO

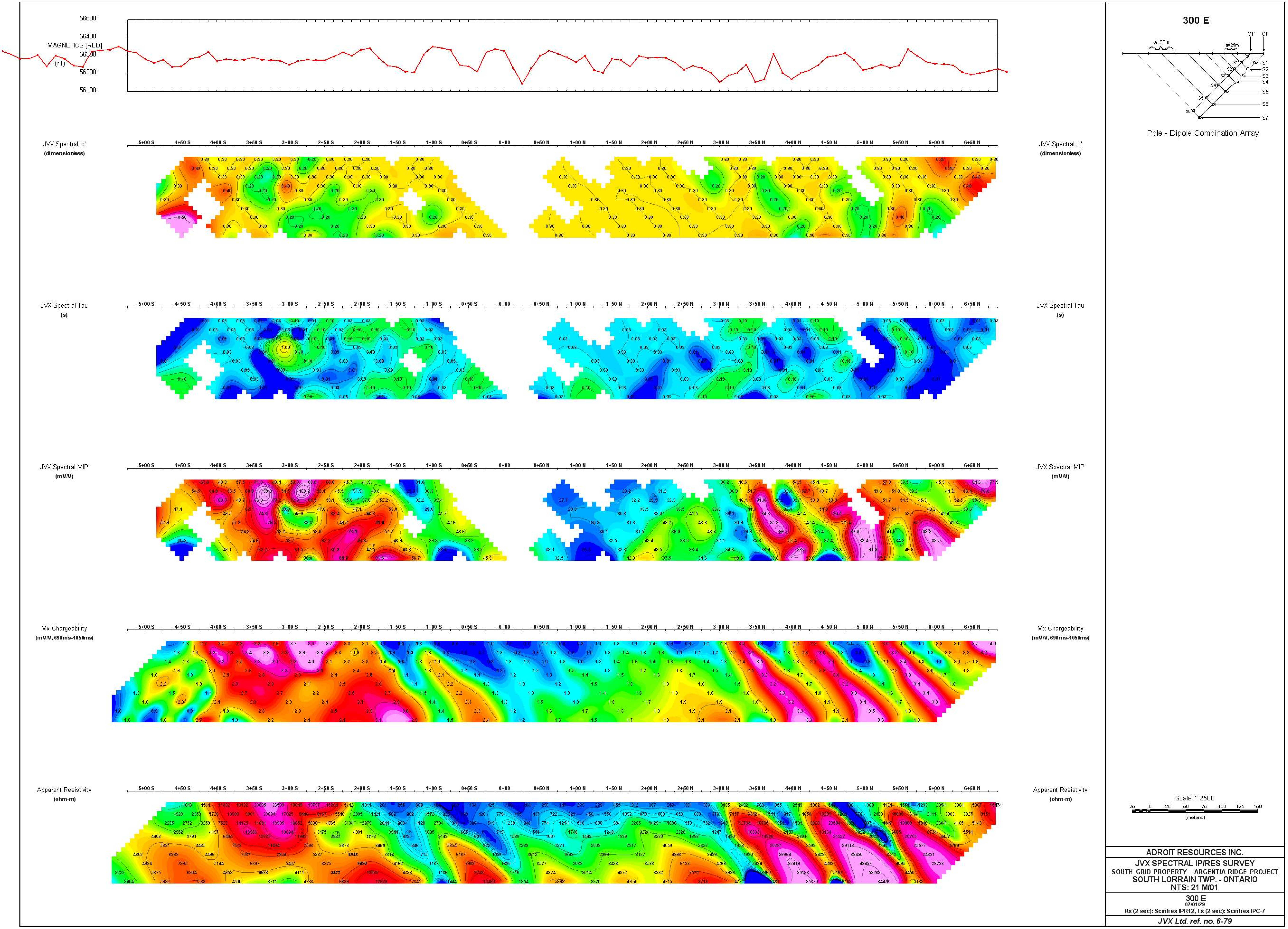
NTS: 21 M/01

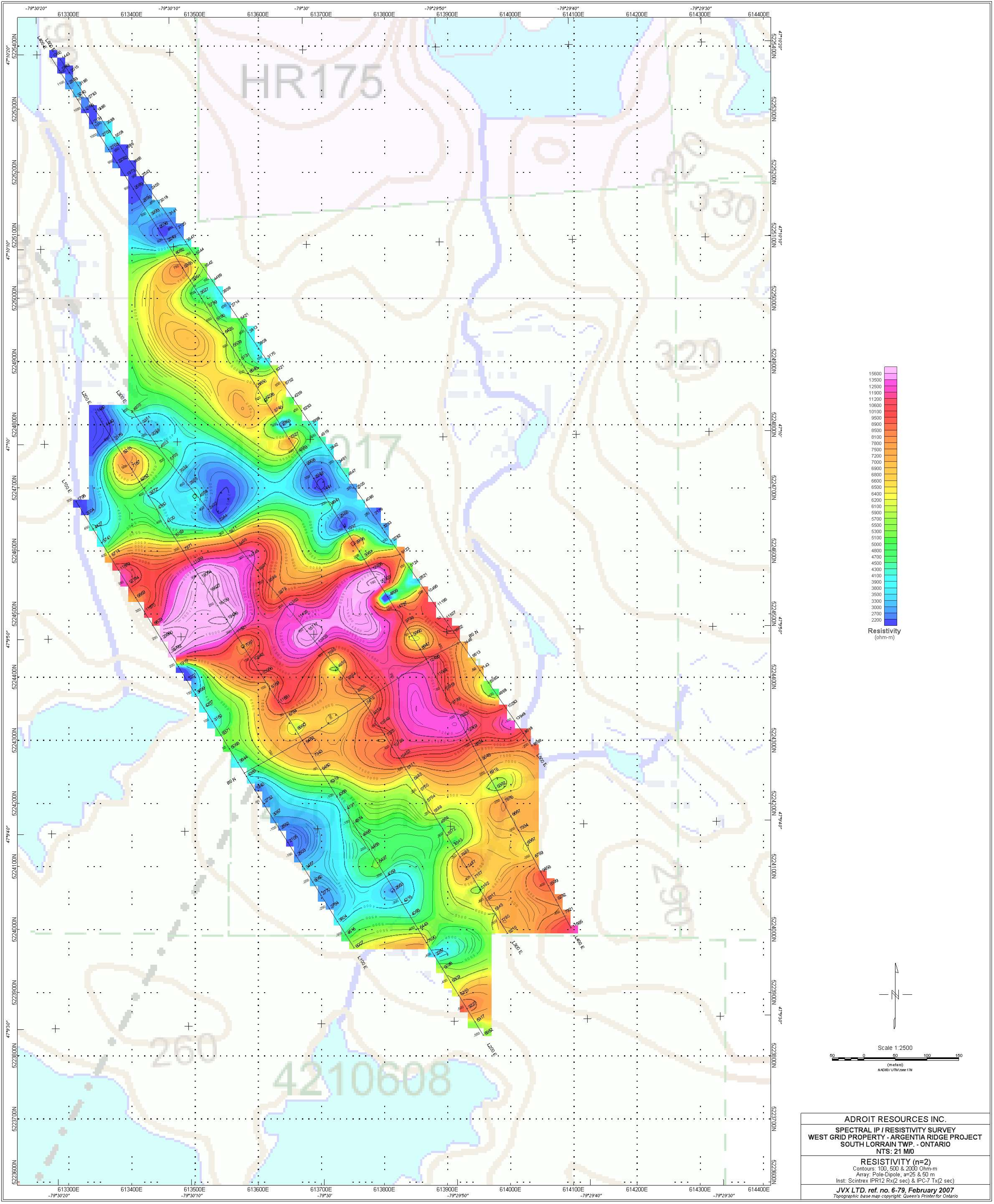
400 E

07/01/29

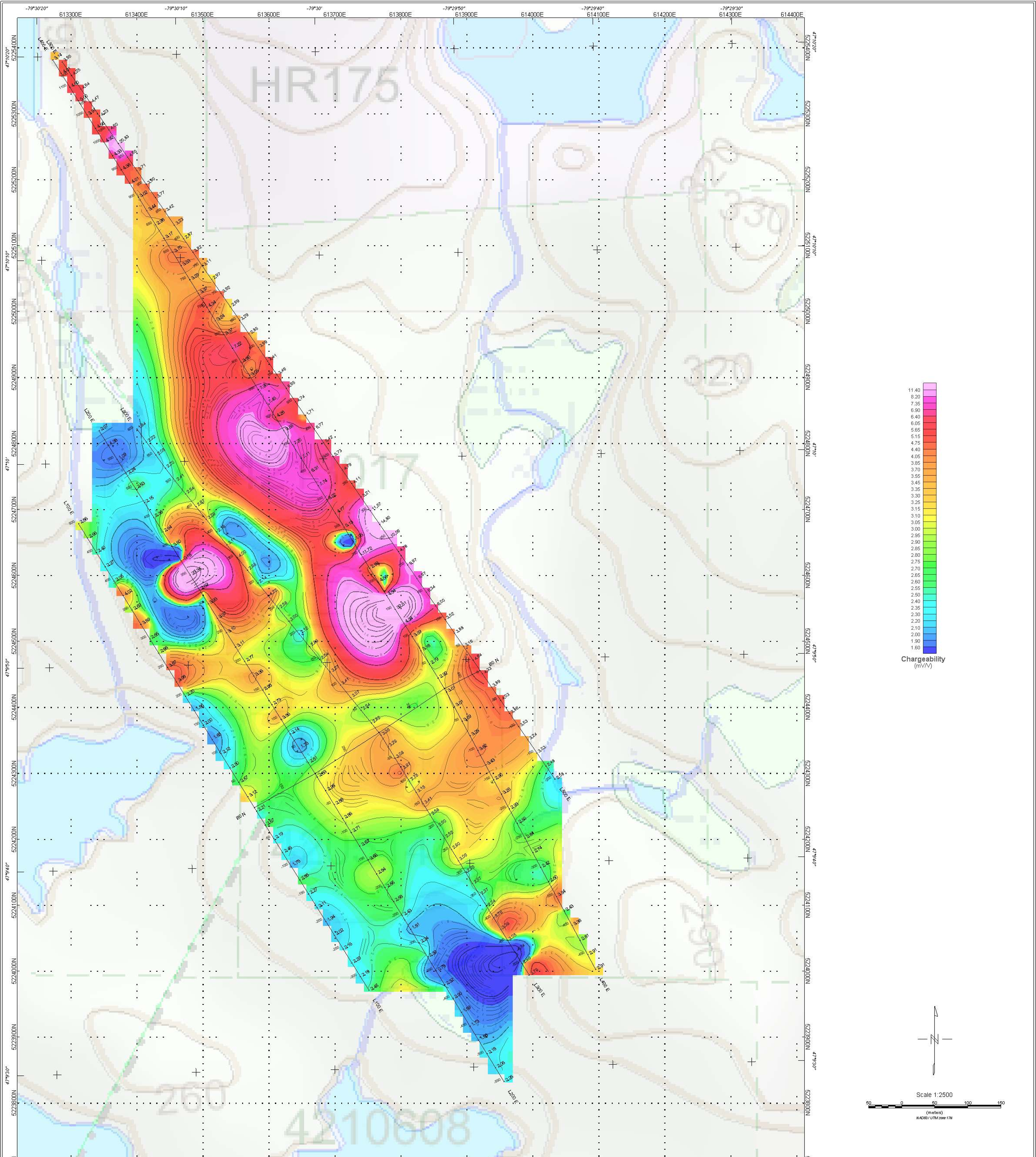
Rx (2 sec): Scintrex IPR12, Tx (2 sec): Scintrex IPC-7

JVX Ltd. ref. no. 6-79


MAGNETICS [RED]
(nT)
56500
56400
56300
56200
56100
JVX Spectral 'c'
(dimensionless)
JVX Spectral Tau
(s)
JVX Spectral MIP
(mV/V)
Mx Chargeability
(mV/V, 690ms-1050ms)
Apparent Resistivity
(ohm-m)
5+00 S
4+50 S
4+00 S
3+50 S
3+00 S
2+50 S
2+00 S
1+50 S
1+00 S
0+50 S
0+00
0+50 N
1+00 N
1+50 N
2+00 N
2+50 N
3+00 N
3+50 N
4+00 N
4+50 N
5+00 N
5+50 N
6+00 N
6+50 N
300 E
a=50m
a=25m
C1'
C1
S1
S2
S3
S4
S5
S6
S7
Pole - Dipole Combination Array
Scale 1:2500
25 0 25 50 75 100 125 150
(meters)
ADROIT RESOURCES INC.
JVX SPECTRAL IP/RES SURVEY
SOUTH GRID PROPERTY - ARGENTIA RIDGE PROJECT
SOUTH LORRAIN TWP. - ONTARIO
NTS: 21 M/01
300 E
07/01/29
Rx (2 sec): Scintrex IPR12, Tx (2 sec): Scintrex IPC-7
JVX Ltd. ref. no. 6-79



HR175
Resistivity
(ohm-m)
15600
13500
12500
11900
11200
10600
10100
9500
8900
8500
8100
7800
7500
7200
7000
6900
6800
6600
6500
6400
6200
6100
5900
5700
5500
5300
5100
5000
4800
4700
4500
4300
4100
3900
3800
3500
3300
3000
2700
2200
Scale 1:2500
(meters)
NAD83 / UTM zone 17N
ADROIT RESOURCES INC.
SPECTRAL IP / RESISTIVITY SURVEY
WEST GRID PROPERTY - ARGENTIA RIDGE PROJECT
SOUTH LORRAIN TWP. - ONTARIO
NTS: 21 M/0
RESISTIVITY (n=2)
Contours: 100, 500 & 2000 Ohm-m
Array: Pole-Dipole, a=25 & 50 m
Inst: Scintrex IPR12 Rx(2 sec) & IPC-7 Tx(2 sec)
JVX LTD. ref. no. 6-79, February 2007
Topographic base map copyright: Queen's Printer for Ontario

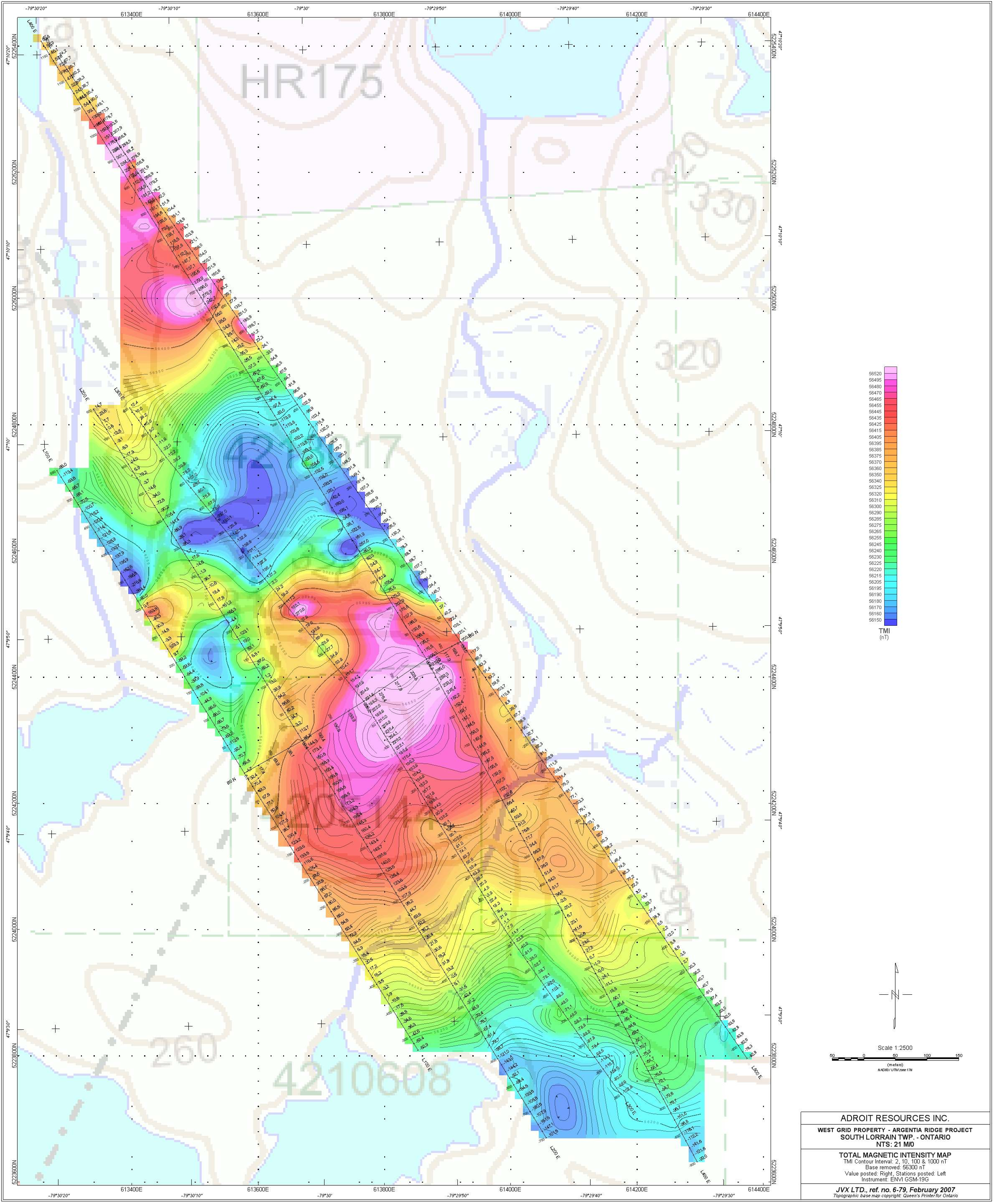


ADROIT RESOURCES INC.

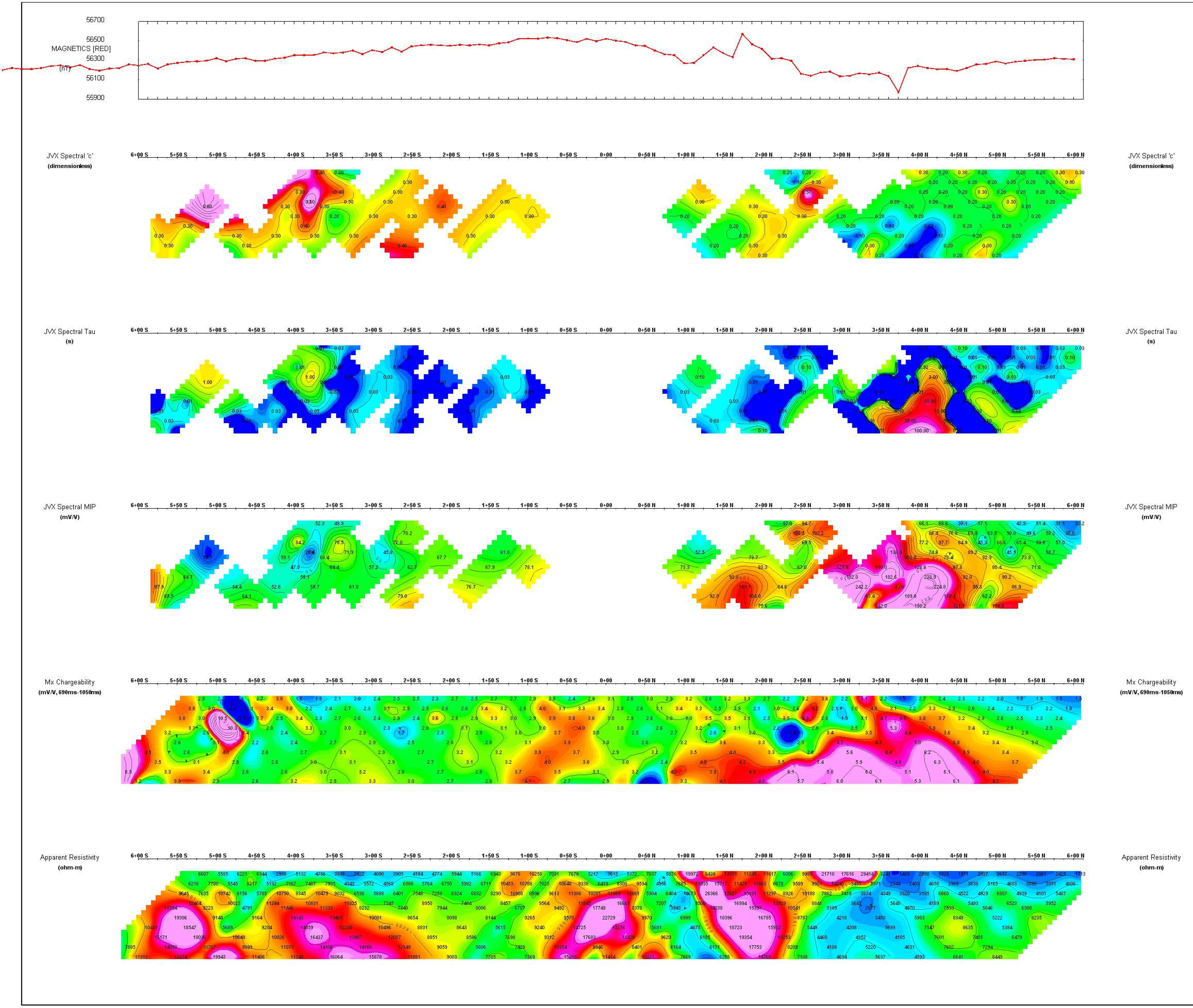
SPECTRAL IP / RESISTIVITY SURVEY
WEST GRID PROPERTY - ARGENTIA RIDGE PROJECT
SOUTH LORRAIN TWP. - ONTARIO
NTS: 21 M/0

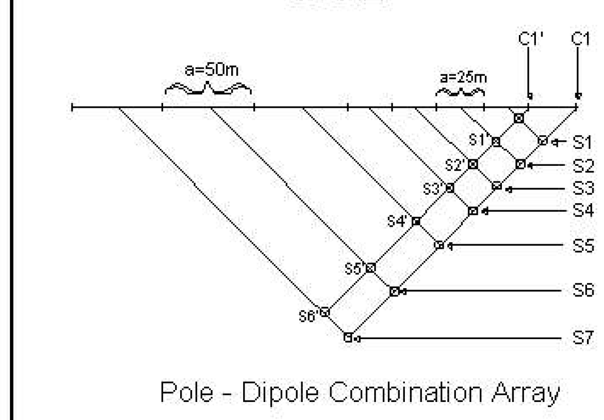
CHARGEABILITY (n=2)
Contours: 0.02, 0.2 & 2 mV/V
Array: Pole-Dipole, a=25 & 50 m
Inst: Scintrex IPR12 Rx(2 sec) & IPC-7 Tx(2 sec)

JVX LTD. ref. no. 6-79, February 2007


HR175
TMI
(nT)
Scale 1:2500
(meters)
NAD83 / UTM zone 17N
ADROIT RESOURCES INC.
WEST GRID PROPERTY - ARGENTIA RIDGE PROJECT
SOUTH LORRAIN TWP. - ONTARIO
NTS: 21 M/0
TOTAL MAGNETIC INTENSITY MAP
TMI Contour Interval: 2, 10, 100 & 1000 nT
Base removed: 56300 nT
Value posted: Right, Stations posted: Left
Instrument: ENVI GSM-19G
JVX LTD., ref. no. 6-79, February 2007
Topographic base map copyright: Queen's Printer for Ontario

300 E





Scale 1:2500

(meters)

ADROIT RESOURCES INC.

JVX SPECTRAL IP/RES SURVEY

WEST GRID PROPERTY - ARGENTIA RIDGE PROJECT

SOUTH LORRAIN TWP. - ONTARIO

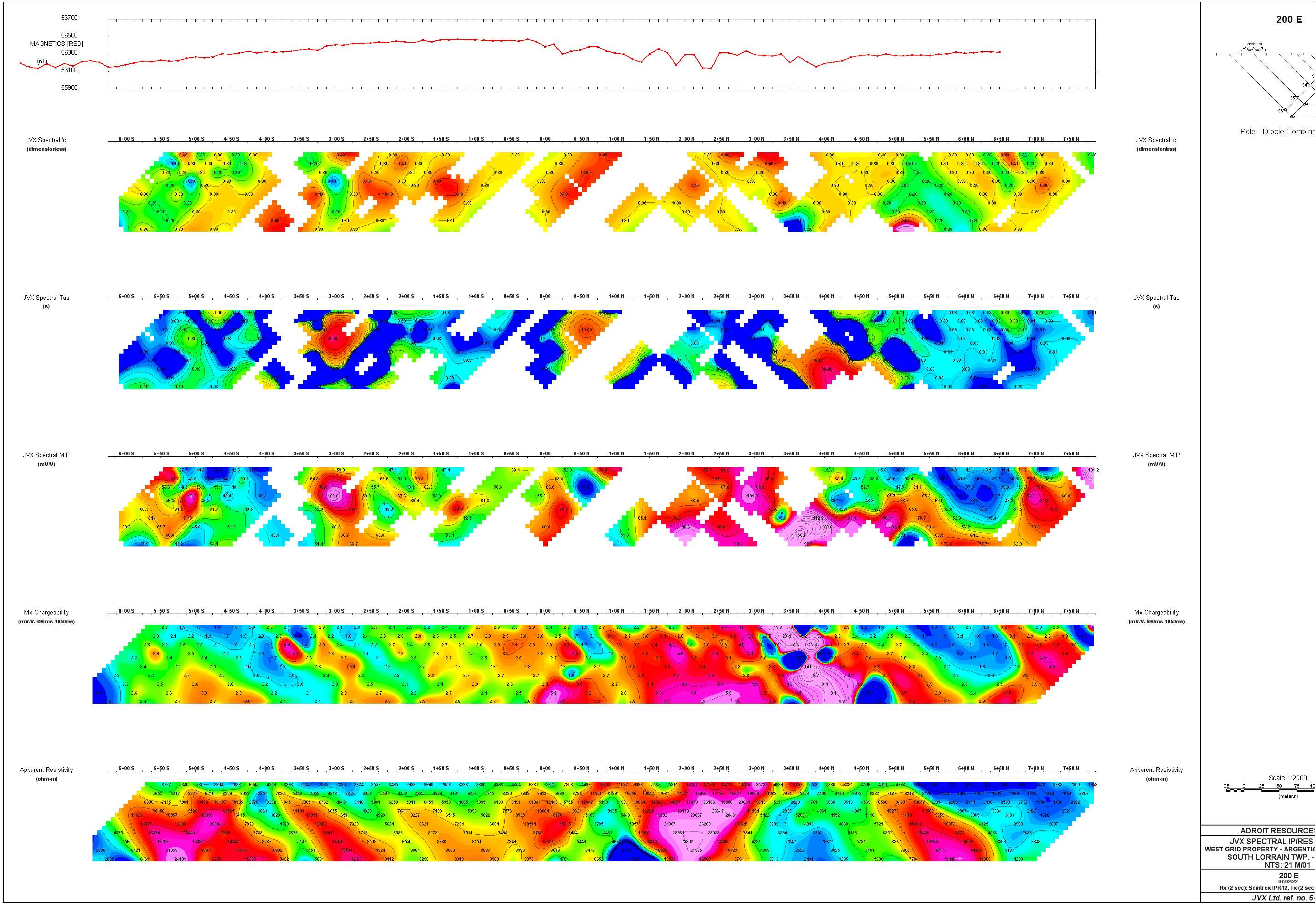
NTS: 21 M/01

300 E

07/02/22

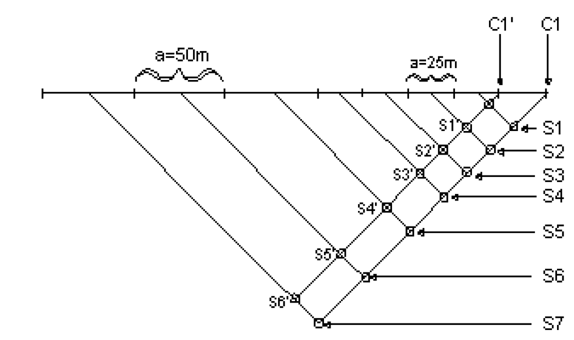
Rx (2 sec): Scintrex IPR12, Tx (2 sec): Scintrex IPC-7

JVX Ltd. ref. no. 6-79

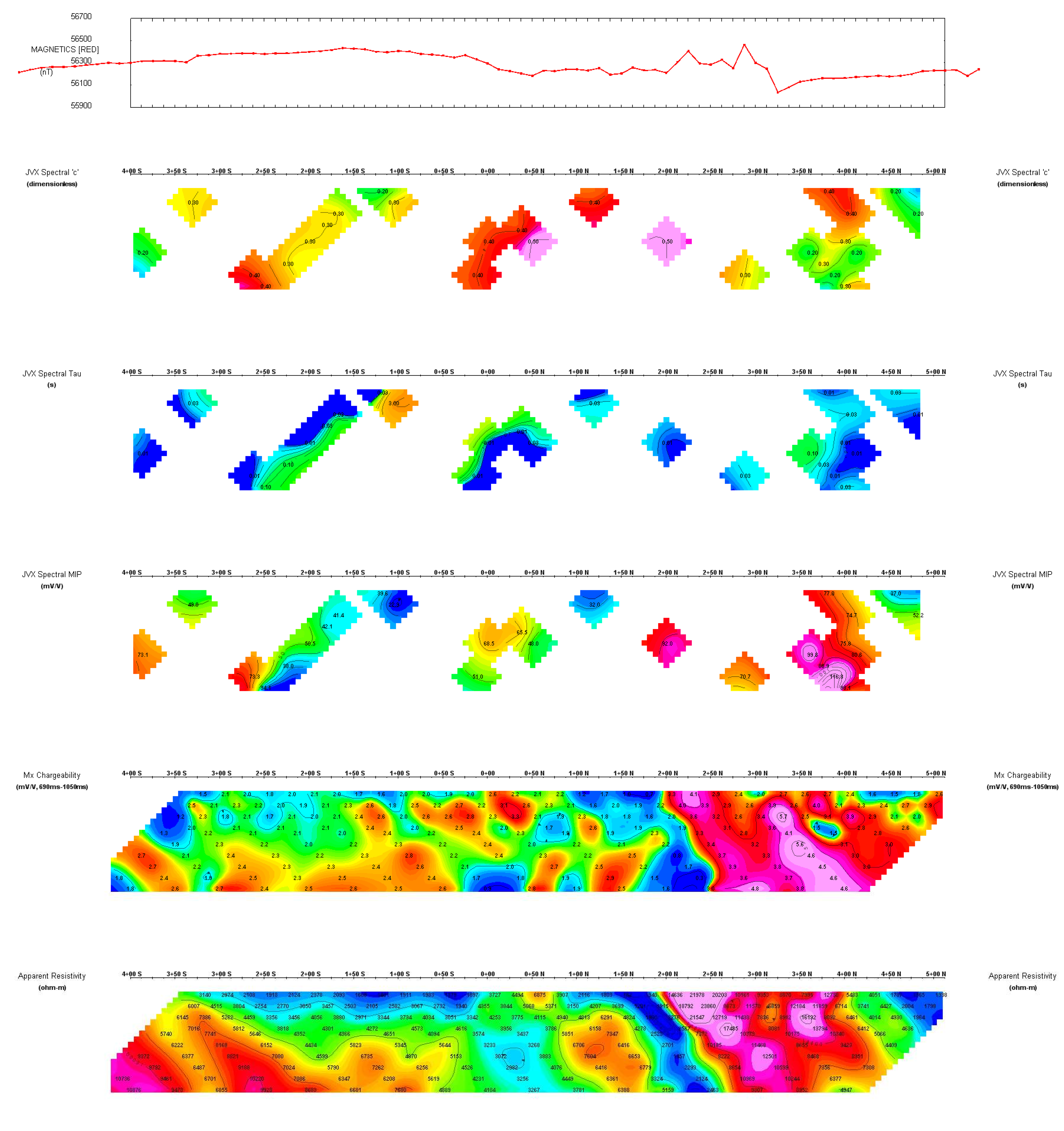


MAGNETICS [RED]
(nT)
56700
56500
56300
56100
55900
JVX Spectral 'c' (dimensionless)
JVX Spectral Tau (s)
JVX Spectral MIP (mV/V)
Mx Chargeability (mV/V, 690ms-1050ms)
Apparent Resistivity (ohm-m)
6+00 S
5+50 S
5+00 S
4+50 S
4+00 S
3+50 S
3+00 S
2+50 S
2+00 S
1+50 S
1+00 S
0+50 S
0+00
0+50 N
1+00 N
1+50 N
2+00 N
2+50 N
3+00 N
3+50 N
4+00 N
4+50 N
5+00 N
5+50 N
6+00 N
6+50 N
7+00 N
7+50 N
200 E
a=50m
Pole - Dipole Combina
Scale 1:2500
(meters)
ADROIT RESOURCE
JVX SPECTRAL IP/RES
WEST GRID PROPERTY - ARGENTI
SOUTH LORRAIN TWP. -
NTS: 21 M/01
200 E
07/02/22
Rx (2 sec): Scintrex IPR12, Tx (2 sec
JVX Ltd. ref. no. 6-

100 E



Pole - Dipole Combination Array



Scale 1:2500

25 0 25 50 75 100 125 150

(meters)

ADROIT RESOURCES INC.

JVX SPECTRAL IP/RES SURVEY

WEST GRID PROPERTY - ARGENTIA RIDGE PROJECT

SOUTH LORRAIN TWP. - ONTARIO

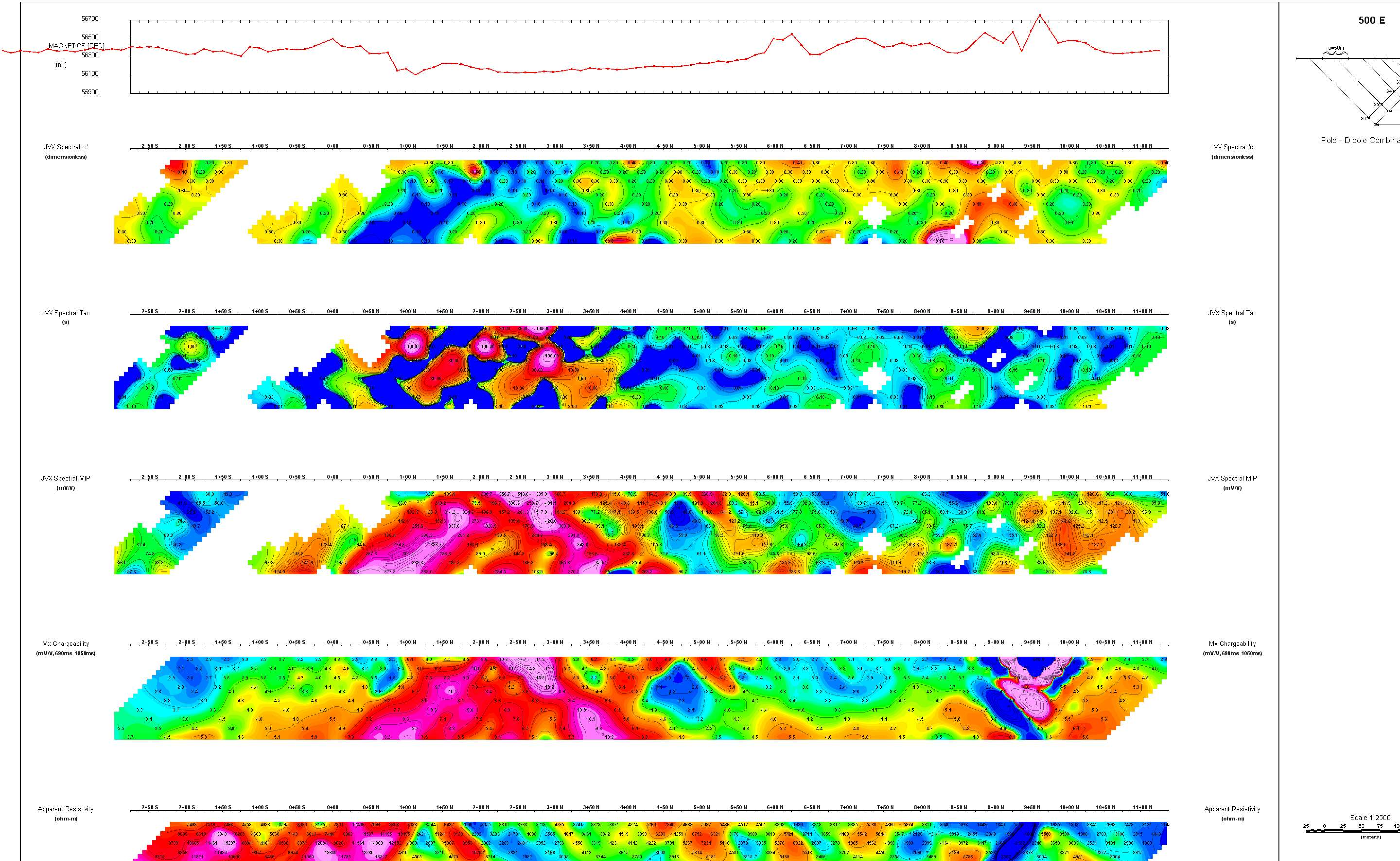
NTS: 21 M/01

100 E

07/02/22

Rx (2 sec): Scintrex IPR12, Tx (2 sec): Scintrex IPC-7

JVX Ltd. ref. no. 6-79

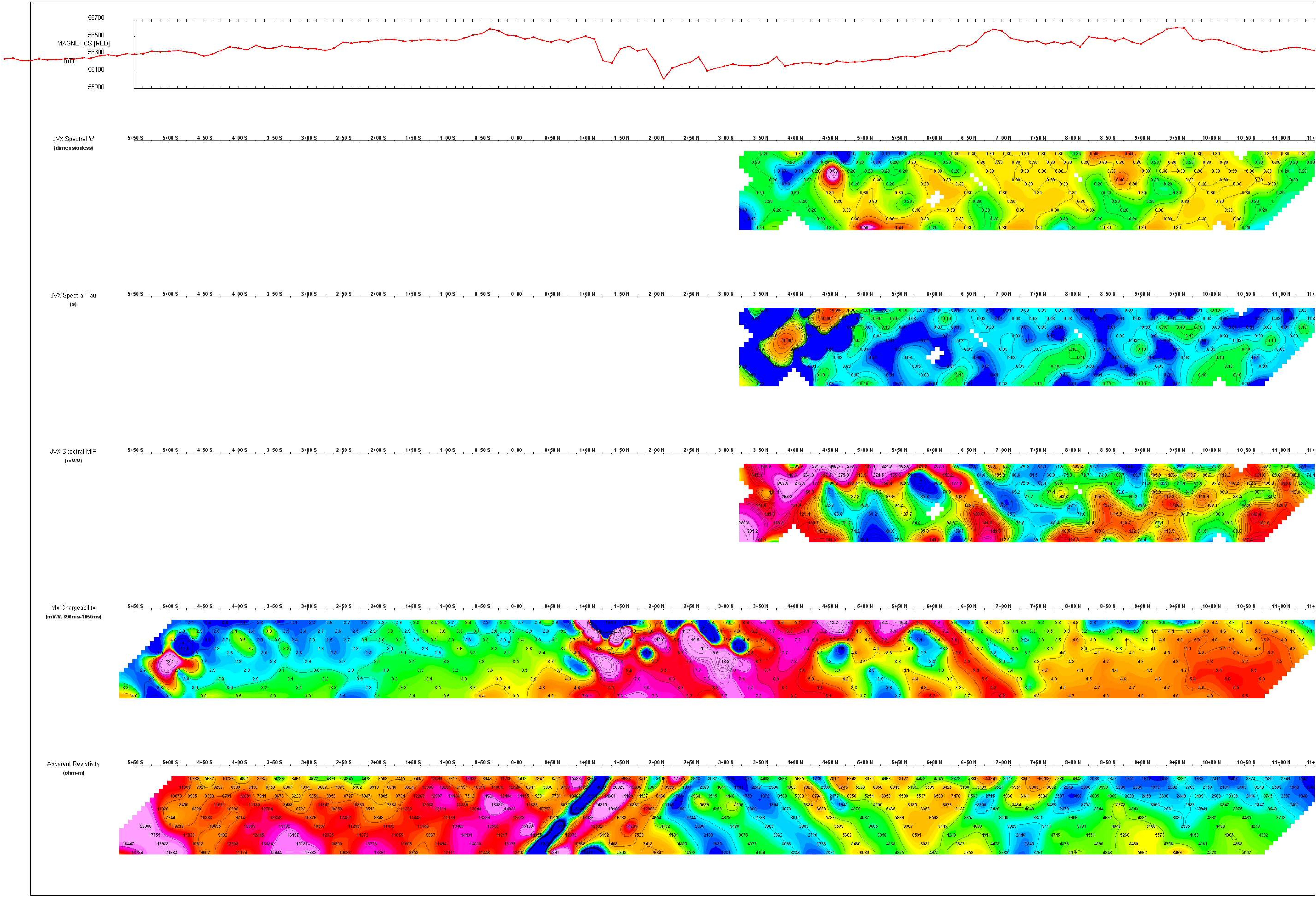


ADROIT RESOURCES

JVX SPECTRAL IP/RES
WEST GRID PROPERTY - ARGENTIA
SOUTH LORRAIN TWP. -
NTS: 21 M/01

500 E
07/02/16
Rx (2 sec): Scintrex IPR12, Tx (2 sec)

JVX Ltd. ref. no. 6-



MAGNETICS [RED]
(nT)
56700
56500
56300
56100
55900
JVX Spectral 'c'
(dimensionless)
JVX Spectral Tau
(s)
JVX Spectral MIP
(mV/V)
Mx Chargeability
(mV/V, 690ms-1050ms)
Apparent Resistivity
(ohm-m)
5+50 S
5+00 S
4+50 S
4+00 S
3+50 S
3+00 S
2+50 S
2+00 S
1+50 S
1+00 S
0+50 S
0+00
0+50 N
1+00 N
1+50 N
2+00 N
2+50 N
3+00 N
3+50 N
4+00 N
4+50 N
5+00 N
5+50 N
6+00 N
6+50 N
7+00 N
7+50 N
8+00 N
8+50 N
9+00 N
9+50 N
10+00 N
10+50 N
11+00 N