DC for Opal Exploration

Coober Pedy, South Australia

Eureka Minerals, AMG Surveys, ZZ Resistivity

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The Setup

Flat Terrain,
Horizontal Layering,
50x100 & 100x200 Claims

Overlying units include
Russo Beds - ‘biscuit’
Silcrete – ‘green death’

Opal is mined from Bulldog Shale, known locally as ‘sandstone’, with ‘good sandstone’ hosting opal
-along & near structures or ‘slips’
-as replacement of bio features (shells, burrows)
‘bad sandstone’ & ‘blue ground’ are not considered as prospective

~20m

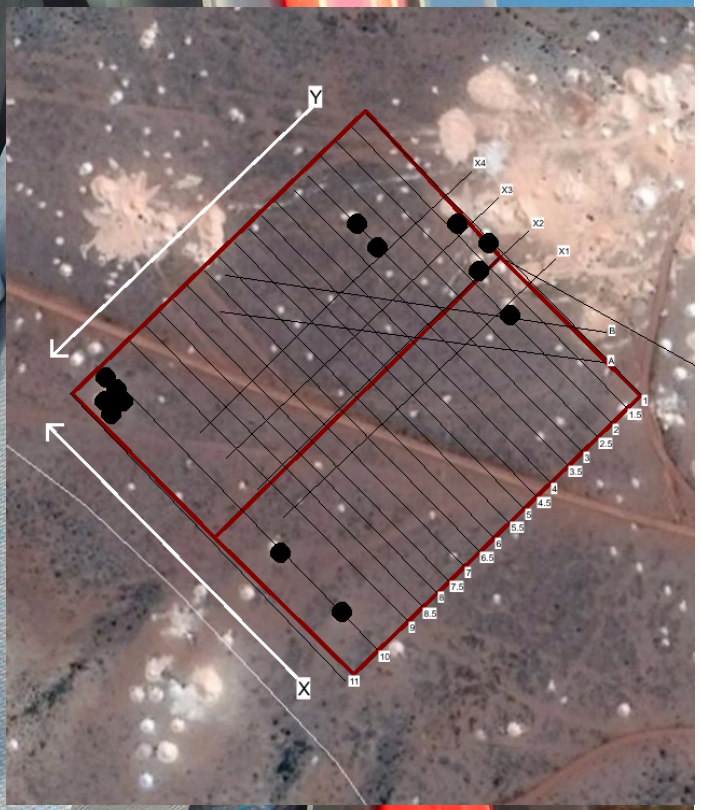
Physical Properties

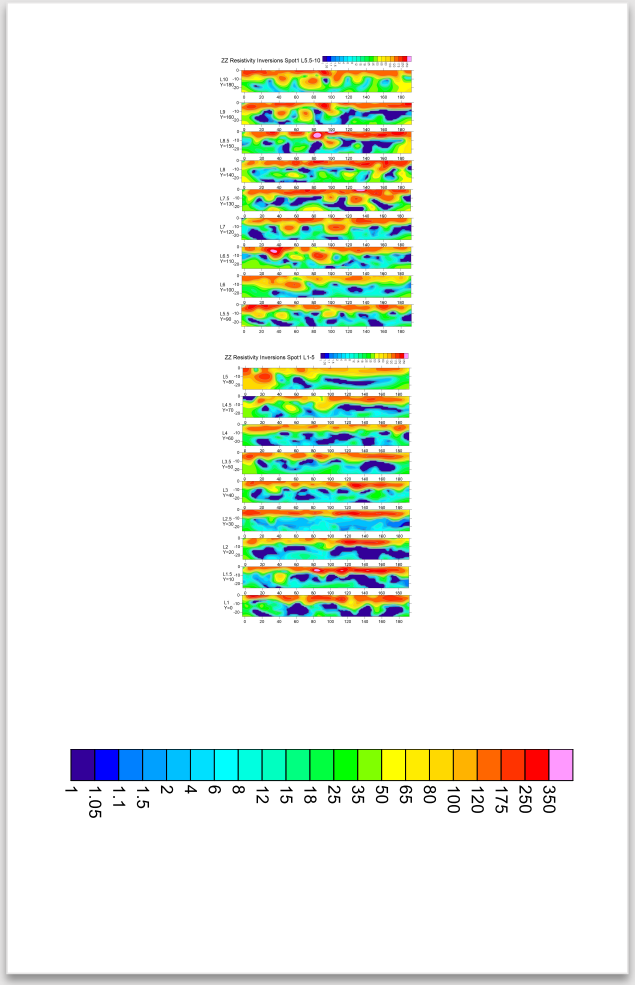
Not well known (other resistivity survey inversion results)
Relatively…
Silcrete – High Resistivity
Russo Beds – Low Resitivity
Bulldog Shale – Very Low Resistivity
Opal Bearing Structure - ???

Surveys

Type – DC/EM

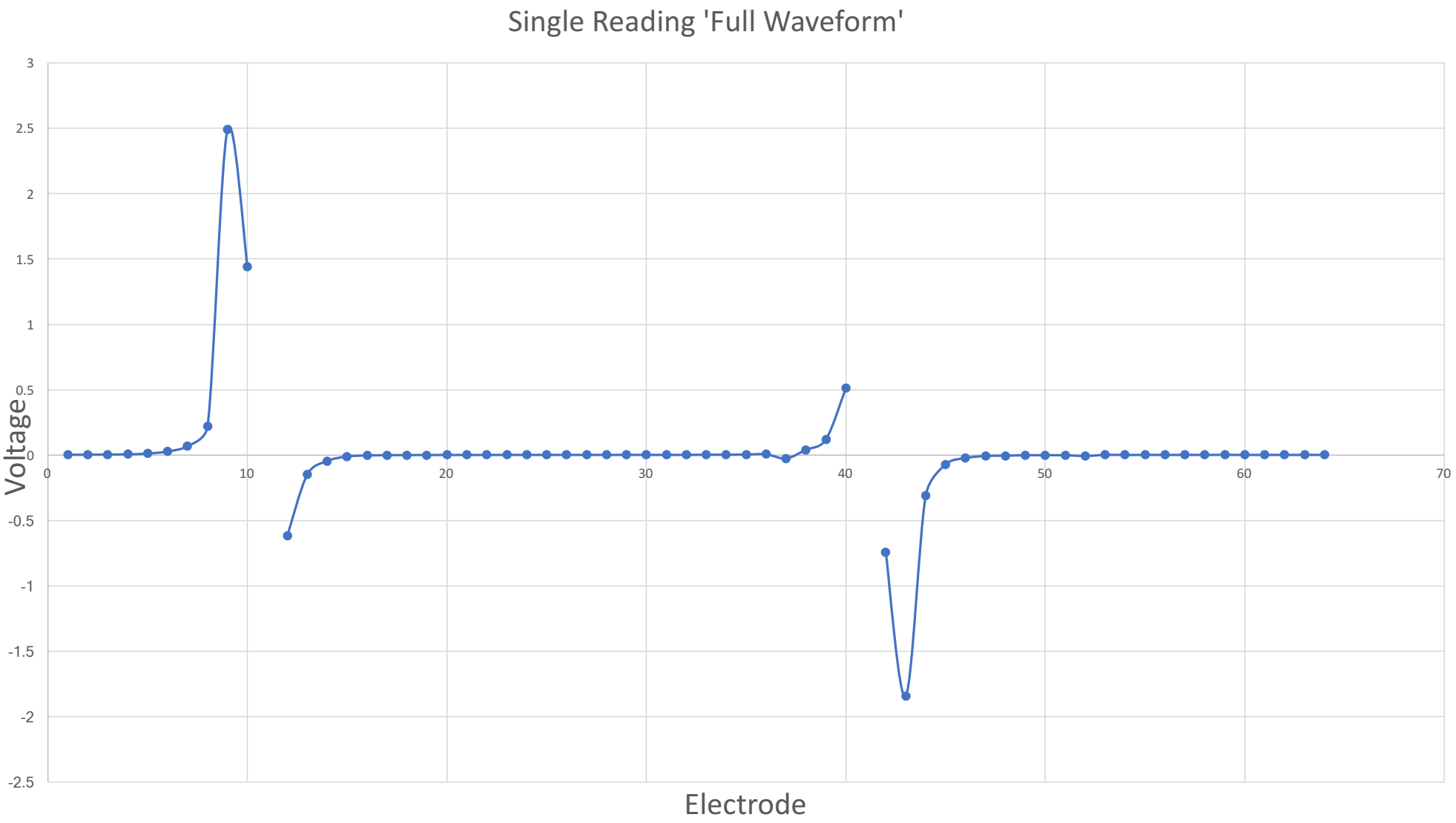
DC Survey – ZZ Resistivity
64 channel ‘Full Waveform’
3m spaced electrodes
25 x ~180m lines in 10 days
ZZ array & Dipole-Dipole

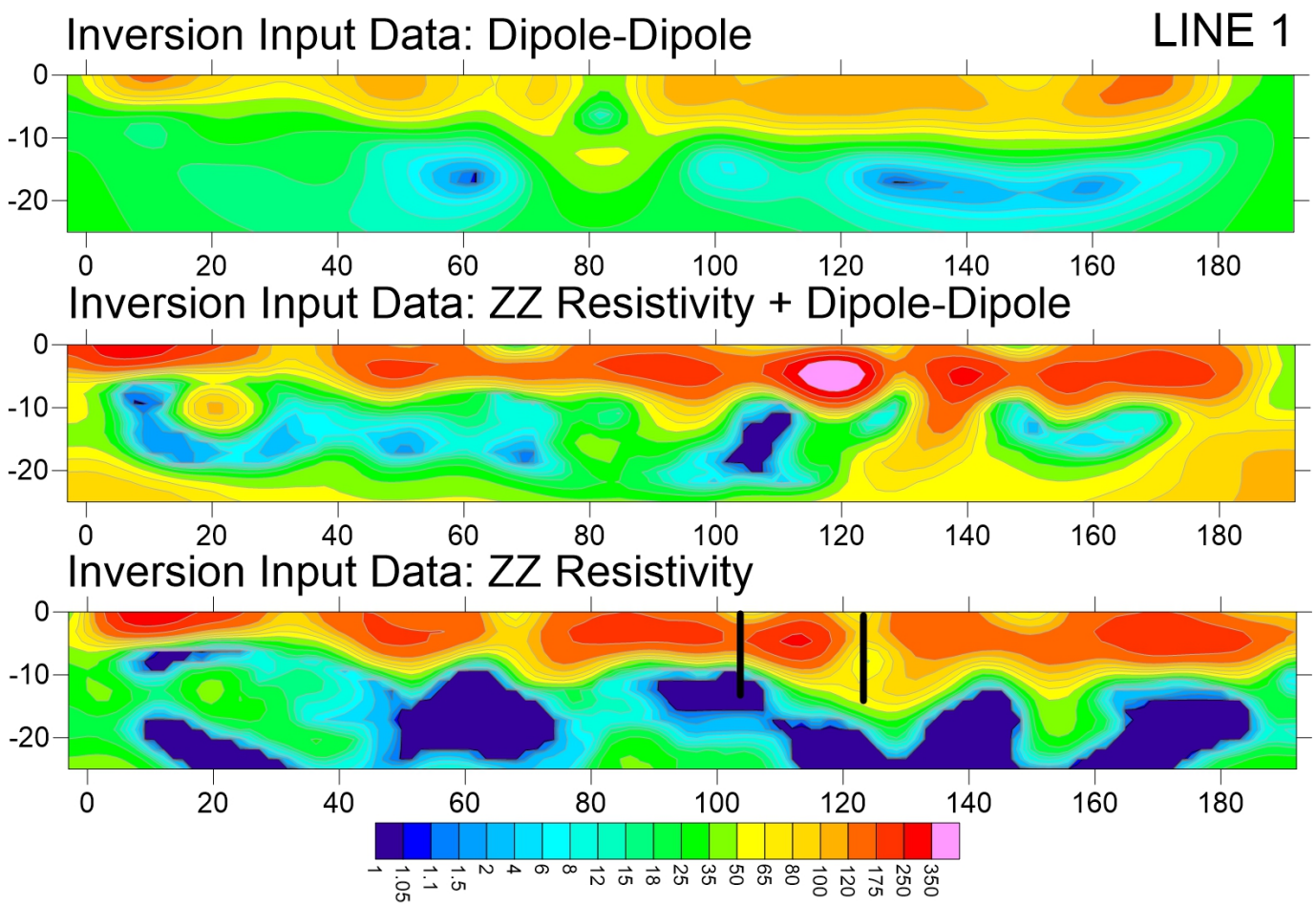




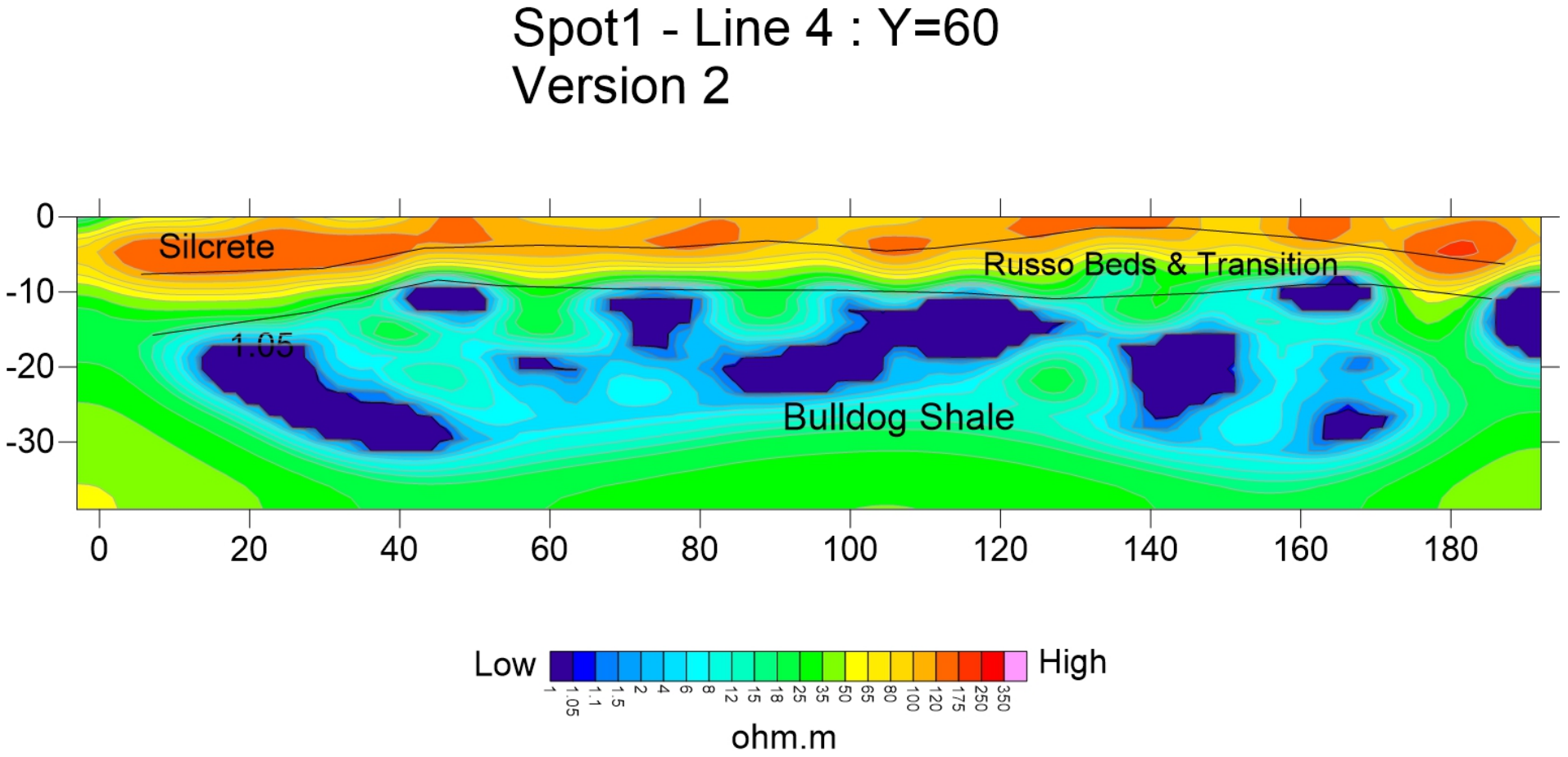
Data & Processing

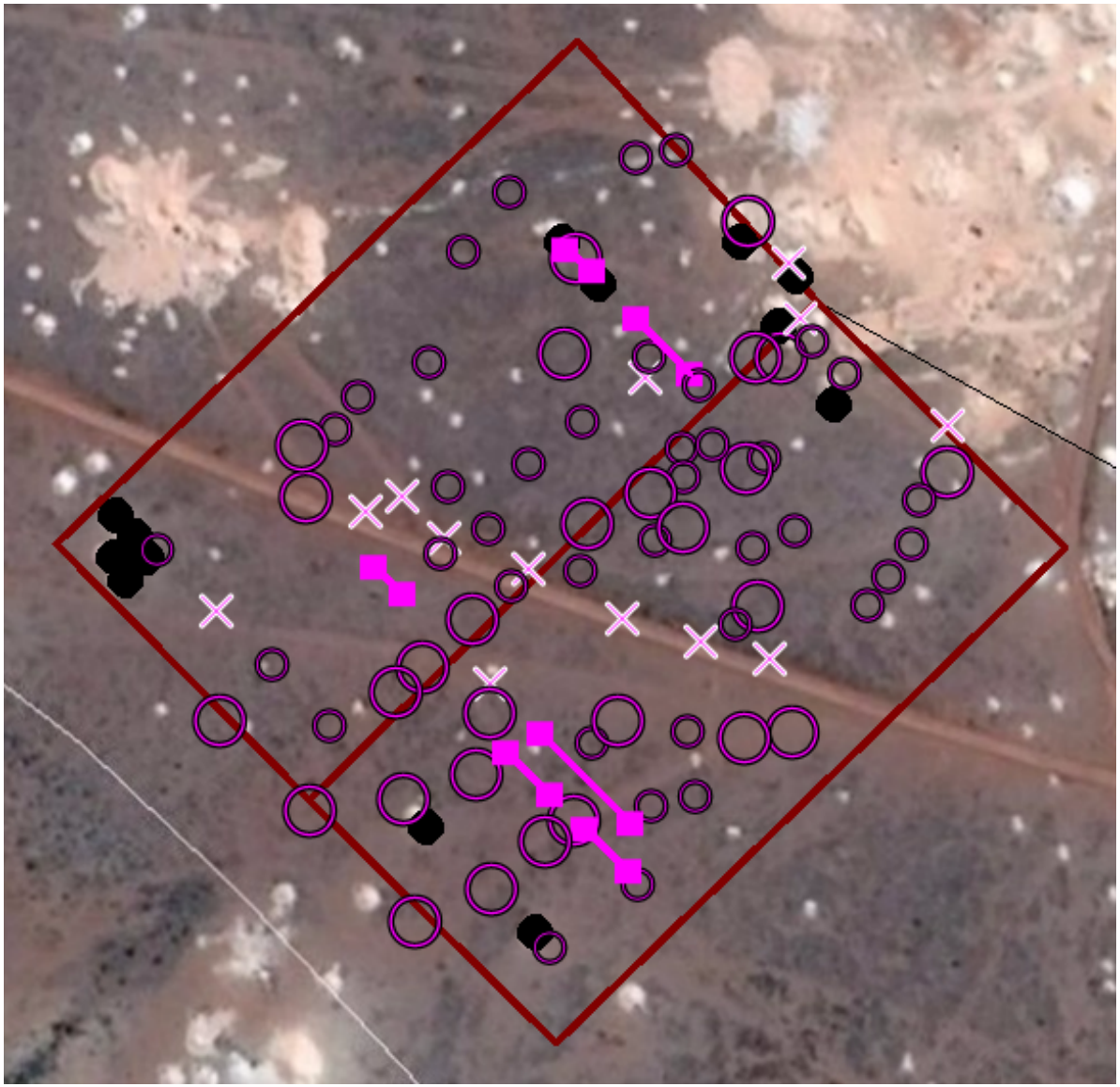
- Data were processed and inverted on a line by line basis using ZZ Resistivity Software
- The Inversion Results were then plotted as sections using a custom colour scale
- Sections presented in 2D & 3D


Single Reading 'Full Waveform'
Voltage
Electrode
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
0
10
20
30
40
50
60
70


Inversion Input Data: Dipole-Dipole
LINE 1
0
-10
-20
0
20
40
60
80
100
120
140
160
180
Inversion Input Data: ZZ Resistivity + Dipole-Dipole
0
-10
-20
0
20
40
60
80
100
120
140
160
180
Inversion Input Data: ZZ Resistivity
0
-10
-20
0
20
40
60
80
100
120
140
160
180
1
1.05
1.1
1.5
2
4
6
8
12
15
18
25
35
50
65
80
100
120
175
250
350

Interpretation





Synthesis

- The inversion results match observed geology
- Apparent relationship between resistivity and quality of sandstone
- Results similar to but not exactly the same as previous survey
- Did we solve the problem?
  - Apparent guide to prospective areas
  - Need to feed geological information back in
- Would like to try 3D modelling existing data
- Would like to re-survey with many more array types and geometries
- Would like to collect data at 1.5m electrode spacing on rolling lines