



CASE STUDY

MAPPING HISTORIC LANDFILL SITE

HYDROCK
CONSULTANTS
2018

PROJECT SUMMARY

LandScope Engineering were commissioned to locate and map the extents of an historic landfill site over approximately 50 hectares of agricultural land. The client required the delineation of the former landfill site to aid in design and planning of a new residential development. The survey involved two geophysical techniques that would be collected over two phases.

RESOURCES



Field Resources

CMD Explorer
Allied Tigre
Trimble R8 RTK GNSS Base Station
Trimble R10 GNSS Receiver



Office Resources

Autodesk AutoCAD Civil 3D
Res2DInv
CMD Software



PROJECT PHASES

1 PHASE 1

Rapid collection of electromagnetic data, specifically measuring changes in ground conductivity.

2 PHASE 2

Collection of ERT (Electro-Resistivity Tomography) transects based on the results from Phase 1.

THE DETAIL

Phase 1 site works were completed over 4 days using a CMD Explorer connected to a GNSS receiver. The CMD explorer data was collected over the entire area by walking parallel lines with an approximate 5m line spacing. The CMD explorer is capable of taking readings at three different depths intervals simultaneously (~2.3, 4.2 and 6.7m) and logs ground conductivity and magnetic susceptibility.

Data was collected over two separate locations of interest. One area clearly demonstrated elevated ground conductivity readings, as to be expected for a former landfill site. The second area exhibited background readings typical of natural ground therefore no further investigations were completed here.

Phase 2 ERT transects were strategically placed to cross cut the expected landfill body as identified during phase 1. The ERT survey enabled the measurement of both resistivity and charge-ability. Traditionally, landfills will exhibit a lower resistivity and higher conductivity than surrounding areas of natural ground due to the presence of leachate and metals.

The ERT transect data closely matched the results collected with the CMD Explorer, allowing a high degree of confidence to be taken from the results. The CMD transects were also used to measure the depth of landfill material at each transect location - in general, the transects showed approximately 1.5m of cover material and 5-8m of landfill material.

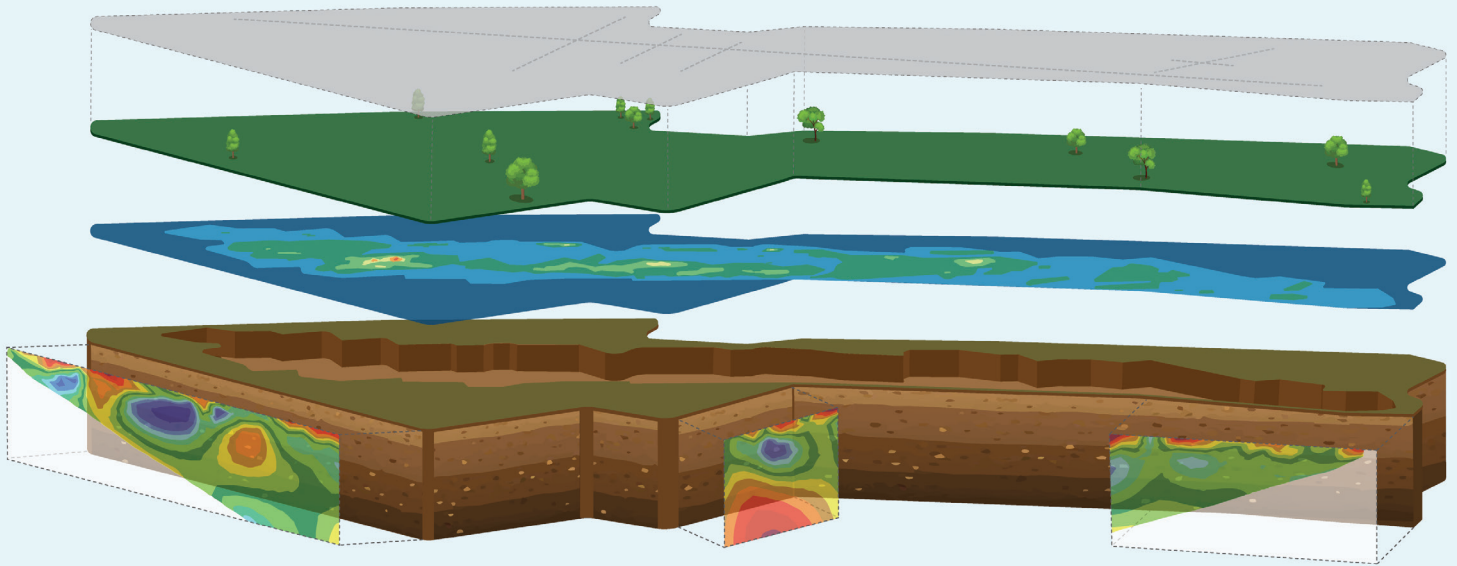
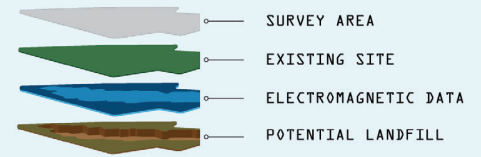
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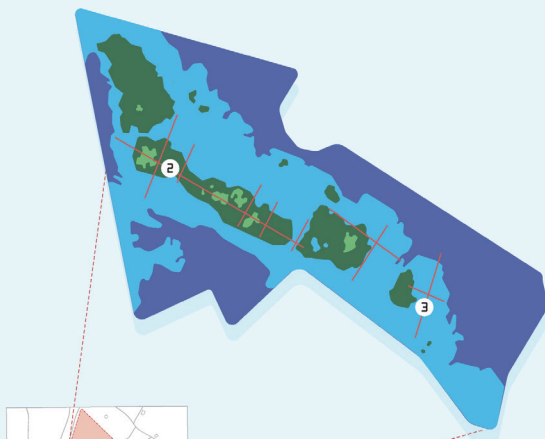
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GEOPHYSICAL EM AND RESISTIVITY SURVEY TO MAP EXTENTS OF A FORMER LANDFILL SITE



RESISTIVITY DATA



SURVEY AREA

- BACKGROUND LEVEL
- LANDFILL LEACHATE
- POTENTIAL LANDFILL MATERIAL
- ERT TRANSECT LOCATIONS

- TOP SOIL LEVEL
- IDENTIFIED LANDFILL

