

PROJECT WIND FARM ELECTROMAGNETIC INVESTIGATION - PIPELINE DETECTION

CLIENT CONFIDENTIAL

PROJECT DESCRIPTION

ELECTROMAGNETIC INVESTIGATION

The primary goal of the survey was to determine the existence of a potential oil pipeline running near to the location of T4. The pipe was assumed to be metallic and possibly running along the southern side of a main field boundary ditch directly to the north of the turbine position. The EM method was chosen for fast data collection over horizontal areas and on-site processing.

SERVICES PROVIDED

ELECTROMAGNETIC METHOD

The EM method uses a transmitter coil and receiver coil a fixed distance apart carried above the ground, the transmitter coil induces a current in the ground, this current then induces a secondary field at the receiver coil. The magnitude and phase of the secondary field are dependent on the conductive properties of the subsurface. Electromagnetic surveys are used to produce a map of ground conductivity, high conductivity anomalies can locate buried ferrous objects such as pipelines.

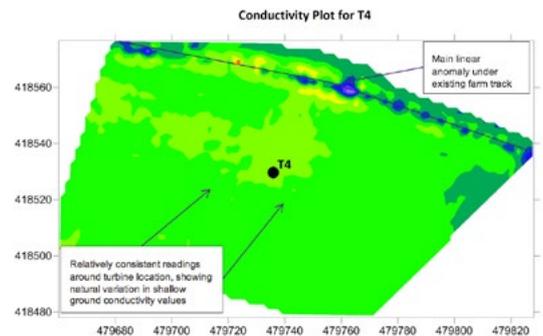
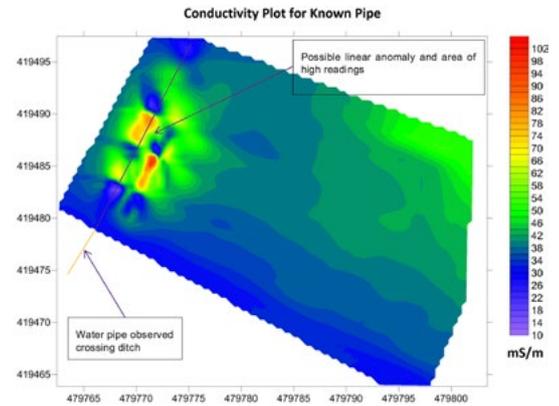
RESPONSE TEST

The response of the Geonics E-31 MK2 equipment was tested over an existing cast iron water pipe located away from the main wind farm infrastructure in order to validate the results obtained at the main survey location. The test clearly identified a high conductivity anomaly at the location of the existing pipe.

SURVEY RESULTS

The main EM survey, located around T4, generally shows low variation in conductivity, with values between 21 and 31 (mS/m). One main anomaly can be detected running west northwest to east southeast. This corresponds to an existing farm track which was observed to contain fragments of ferrous slag causing the high conductivity anomalies. Low conductivity anomalies also seen linearly along the track are attributed to the well-drained nature of granular material making up the track. This contrasts to the surrounding clay soils.

The conductivity results show no evidence of a shallow metallic pipeline intersecting the indicated position of T4. Similarly there are no linear anomalies across the turbine position which may indicate disturbed ground through historic trenching activity.



ADDED VALUE

Extensive intrusive ground investigation to locate the pipe was avoided by fast and efficient geophysical survey. The survey determined the pipe was not located near T4, avoiding expensive mitigation or redesign. Risk of hitting possible oil pipeline during construction works greatly reduced.



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