Appendix 3.3

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Topic: ERT and EM surveys (HS2 Phase 1–S2)

Background
Whilst the evolution of the Thames Valley as a whole is relatively well understood, Bridgland (1994) suggests our knowledge of its evolution and the paradigm it provides counterpoints its relatively modest size. Despite the extensive corpus of data across other reaches of the Lower Thames Valley, the Pleistocene and Holocene evolution of the Colne Valley and its tributaries comprise one of the least understood catchments in the Thames Valley complex. Geoarchaeological and landscape investigation ahead of the construction of HS2 provides an opportunity to redress this bias. A suite of tried and tested geoarchaeological techniques were combined with novel, less commonly applied methods to investigate the evolution of the Colne Valley and potential locations for prehistoric activity.

The approach
The primary objective of the geophysical investigation was to search for evidence of Quaternary palaeochannels using the Electromagnetic (EM) and Resistivity Imaging (ERT) methods on the Copthall North and River Pinn sites (Figure 1). ERT has previously been used to great effect in the Trent Valley, mapping the complex palaeochannel systems at the confluence of the Trent and the Soar (Carey et al 2006). It was anticipated that the application of these techniques on the River Pinn and Newyears Bourne could potentially yield similar results.

The ERT data was more successful than the EM survey. The features detected using this method appear to be in-channel and bank features made of coarser sediments such as gravels. These features are potential locations of the foci of prehistoric activity on the floodplains and these surveys have enabled us to identify locations for further intrusive investigations along the Newyears Bourne (Figure 2).

Figure 1 EM survey in progress over the flooded southwestern half of the Copthall North site (© CSJV/HS2)
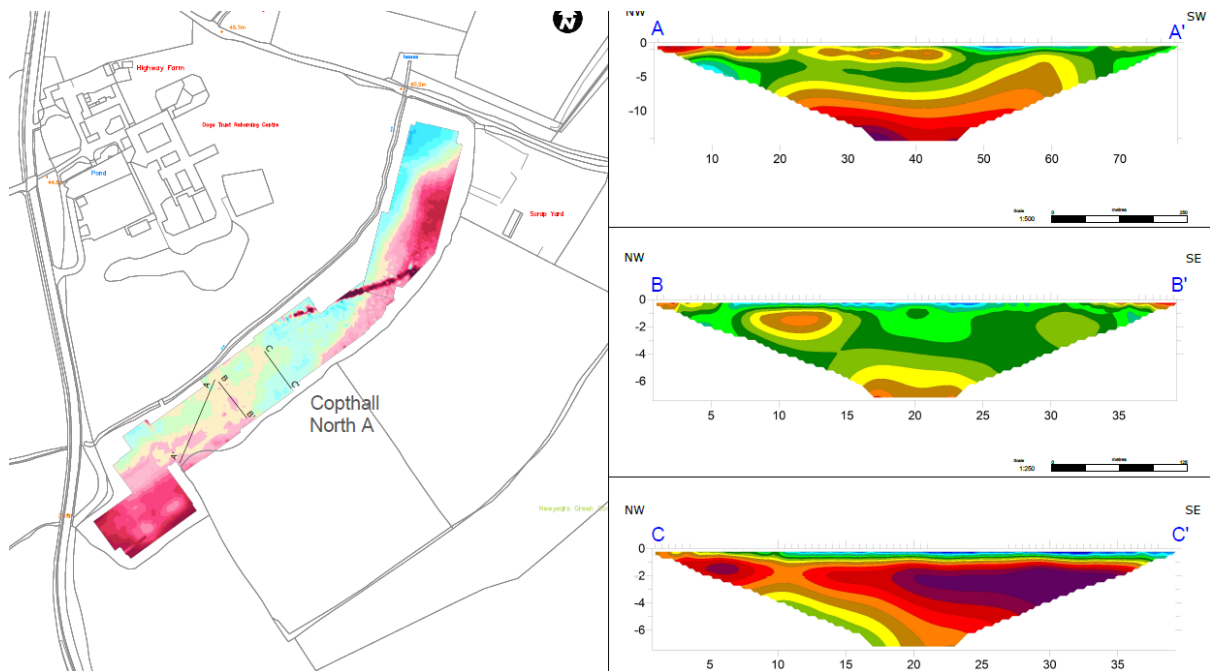
Figure 2 EM Results – Newyears Bourne (© CSJV/HS2)

References

Bridgland, D R, 1994 *Quaternary of the Thames*, Chapman & Hall, London

Carey, C J, Brown, A G, Challis, K C, Howard, A and Cooper, L, 2006 Predictive modelling of multi-period geoarchaeological resources at a river confluence, *Archaeological Prospection*, 13, 241–250