

**Aggregates Levy Sustainability Fund: Where Rivers Meet**

**Geophysical Survey At Catholme**

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**Report Contents:**

This document contains the results of the geophysical study conducted by the University of Birmingham (Birmingham Archaeology Unit and HP Vista Centre) as part of the Where Rivers Meet: Landscape, Ritual, Settlement and the Archaeology of River Gravels project (WRM).

A short discussion of geophysical techniques and methods used in this project is followed by a presentation of all of the geophysical data collected during the first season. Data are discussed and presented for each survey area with two main figures: 1. processed data without interpretations and 2. processed data with interpretations. The Appendix contains selected images of maps at a larger scale than in the report body.

All of the geophysical data and interpretations are integrated into the overall project GIS for the most comprehensive presentation of results. The ArcIMS site (see Chapter 3, Volume 3 in this report) will enable easy access to the full GIS data set used for the geophysical interpretation. Images and data presented in this report are representative of the information in the GIS. The report ends with an overall assessment of the geophysical survey and recommendations for future work.

## Introduction:

### Summary

Magnetometry, Resistance and Ground penetrating radar (GPR) surveys were conducted at the Where Rivers Meet Focus area. The Focus area is the location of the principle monuments of the Prehistoric Catholme Ceremonial Complex, the Catholme Saxon Settlement and the Wychnor Anglo-Saxon cemetery. This location is of particular archaeological significance that not only because of the variety of archaeological features but also the geological nature of the area with complex river channel activity at the confluence of the Tame, Trent, and Mease Rivers.

Archaeological features in the focus area have been generally described as a type *not readily susceptible to detection by conventional archaeological prospection techniques*. (Buteux et al. 2002, p. 11) Building on past geophysical survey conducted in the focus area, the Where Rivers Meet survey goals are to better classify the geophysical survey methods that will or will not positively identify this particular type of archaeological feature within its surrounding environment.

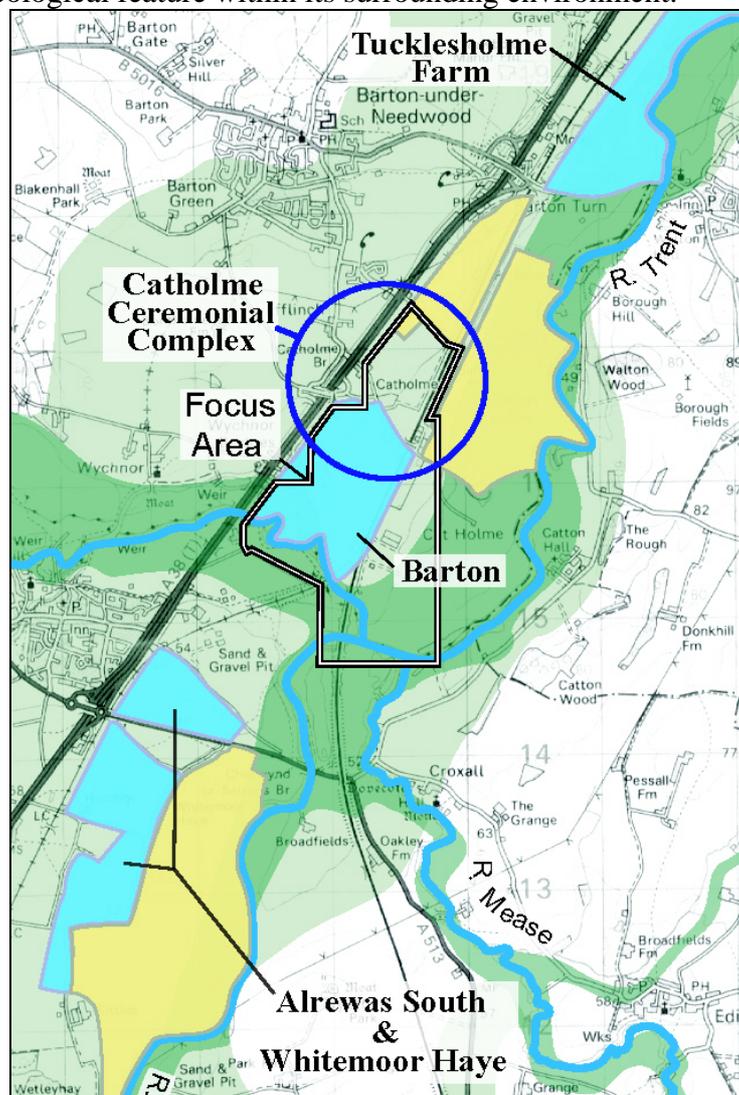


Figure 1 The ALSF Study Area with inset Focus Area (blue circle) for geophysical survey.

Many factors must be taken into consideration when defining appropriate geophysical methods for one specific type of site. Two main factors significantly effect the focus area: farming and gravel extraction. In addition to investigating suitable geophysical

methods for feature identification, consideration of the impact from these two activities (farming and gravel extraction) plays a critical role in the final results of this project.

The archaeogeophysical survey for the Where Rivers Meet project has a number of aims:

1. to non-invasively investigate the project area for archaeological features;
2. to accurately map and help identify archaeological features;
3. to establish effective methodologies for successful geophysical mapping including: grid location, survey technique (magnetometry, resistance, GPR), data collection parameters (sampling intervals), site environment (soil saturation), etc.;
4. to assess the impact of contemporary land use (farming and gravel extraction); and
5. to contribute to a larger dynamic landscape model for better understanding not only of the present-day site, but also of the human use and occupation of the area over time.

Geophysical data were collected over approximately 5 months for a coverage of approximately 15 hectares of the Catholme farm complex. A combination of area coverage for all three geophysical techniques employed is approximately 24 hectares.

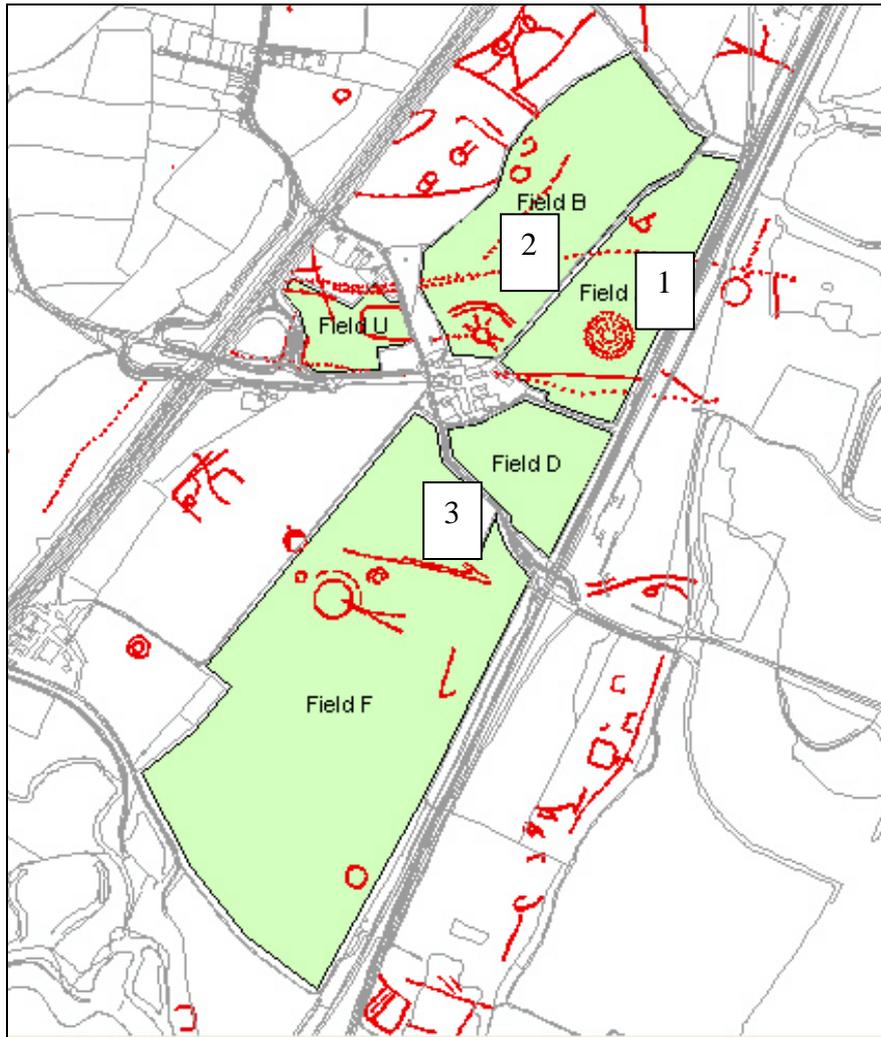
### *Survey Strategy*

Preliminary areas of interest are focused around mapped crop marks. Two of these features are scheduled ancient monuments (SAM) with English Heritage, a supposed 'woodhenge' and a 'sunburst'.



**Figure 2** Aerial Photograph with (1) the 'woodhenge' and (2) 'sunburst' crop marks.

The third main crop mark is a 60 m diameter circle with two extending linear features. Pit alignments run throughout the fields of Catholme Farm.



**Figure 3 The ALSF Focus area with three crop marks that are the focus of the geophysical survey project. The (1) 'woodhenge', (2) 'sunburst', and (3) a circular feature with associated linear features.**

The WRM project is aimed at concentrating significant time and finances to the geophysical investigation of the Focus area. In direct relation to this, keeping in mind the entire focus area is 235 hectares; geophysical survey was concentrated on the above-mentioned three crop marks. Survey was conducted over the mapped crop marks and extended as far as possible into the surrounding fields.

This is the first step in assessing the effectiveness of using aerial photo interpretation as a reliable tool for preliminary site assessment and in project planning. Further discussion of aerial photography use in field investigations can be found in the Conclusions and Recommendations section at the end of this report.

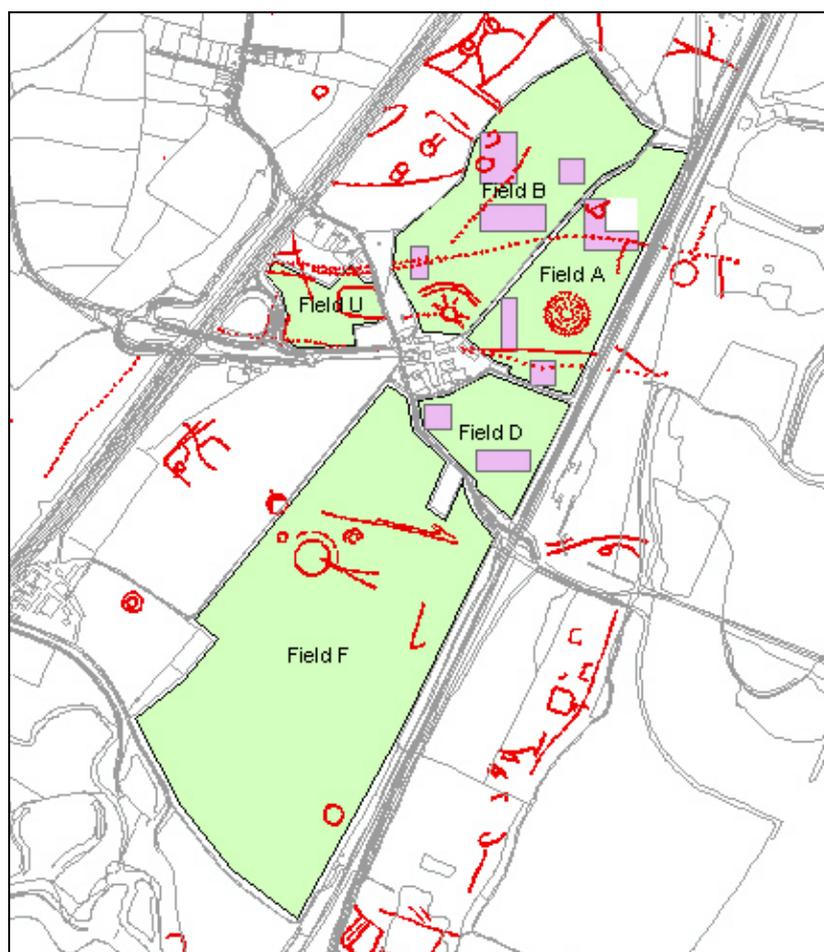
Resistance, magnetometry and ground penetrating radar (GPR) methods were each employed in the geophysical mapping of this project. Magnetometry and resistance were selected because they are the typical kit employed by most archaeological investigations and were readily available. GPR was used because it is an appropriate tool to employ in this environment and has been overlooked generally as a mapping tool in day to day archaeological investigations in Britain. Data collection began with

resistance survey in April 2003 because this method typically takes up to twice as long as the other methods to conduct. Magnetometry survey was introduced in June 2003 and GPR survey in October 2003.

### Review of Past Geophysical Survey in the WRM focus area:

A geophysical survey was conducted as a part of the archaeological evaluation of the site extending to the north and east of Catholme Farm in August of 1999. Survey was commissioned by Phoenix Consulting and conducted by the Bartlett-Clark Consultancy Company on behalf of Hanson Aggregates. (Bartlett 1999) The purpose of the survey was to test to see if any archaeological features in *addition* to the crop marks could be identified.

Geophysical grids were located to provide an overall sample of the site and to include the archaeological features that had been recorded as crop marks. (Bartlett 1999, p.1)

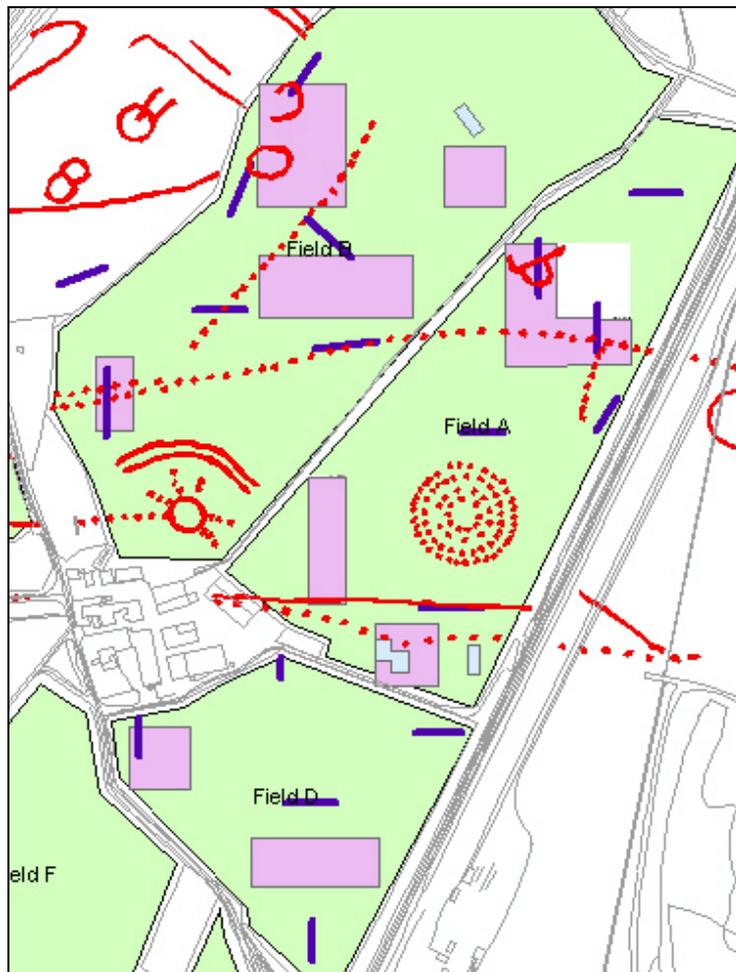


**Figure 4** Map of geophysical investigations conducted previous to the ALSF Focus area project.

Magnetometry data were collected with a 0.25 m sampling rate along 1 m spaced transects with the Geoscan fluxgate magnetometer. Limited resistance survey was carried out in this area over selected features identified in the magnetometry survey data. Resistance data were collected with a 1 m sampling rate collected along 1m spaced transects with the Geoscan RM15 resistance meter. (Bartlett 1999, p.2) This geophysical survey did not provide any conclusive results for the identification of known crop marks or other possible archaeological features. (Bartlett, 1999, p.3-4)

Further archaeological investigations were undertaken in this area of geophysical analysis with excavation trenches placed over possible anomalies in the geophysical

data, the mapped crop marks and in unrelated areas for control. (Hughes and Coates 1999).



**Figure 5** Excavation unit plan during 1999 investigations by BUFAU.

A review of other geophysical survey work conducted in the general ALSF study area (see *Grey Literature for ALSF Study Area Geophysical Survey*) shows some positive archaeological feature mapping, such as at Whitmore Haye (Bartlett 1998, 1995), but in general, the geophysical evaluation in this region has not successfully mapped existing crop marks and other possible archaeological features.