

DESK-BASED ASSESSMENT AND
UPDATED PROJECT DESIGN:
RIPPLE QUARRY, RIPPLE,
WORCESTERSHIRE
(PNUM 3369)

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Aerial photographic assessment: archaeology. Ripple Quarry, Worcestershire (Chris Cox, CGMS)

Desk based assessment and updated project design: Ripple Quarry, Ripple, Worcestershire

Anna Deeks and Robin Jackson
With a contribution by Chris Cox

Part 1 Project summary

An archaeological desk-based assessment was undertaken at Ripple Quarry, Ripple, Worcestershire (centred on NGR SO 8730 3700). The work took place in response to a planned programme of mineral extraction by RMC Aggregates (Western) Limited who have an outstanding, pre-PPG 16 planning permission for the extraction of sand and gravel at the site. The project was commissioned by English Heritage through the Aggregates Levy Sustainability Fund (ALSF).

The project aimed to collate and assess existing documentary and aerial photographic evidence in conjunction with a site visit and landscape appraisal. This was in order to evaluate the potential character and level of preservation of archaeological remains within a defined study area. The study area was centred on the permitted quarry area and covered approximately 7.5km, encompassing the villages of Ripple, Uckinghall, Holdfast and Queenshill.

Further to the collation and analysis of information, the desk-based assessment aimed to assess the potential impact of the permitted development upon archaeological remains, and inform proposals for subsequent stages of evaluation at this site. All the information gathered during this project will be made available through accession within the County Sites and Monuments Record, deposition of the project archive at the County Museum and through publication in an appropriate journal, and will thus inform future research and development control in this area.

The collation of documentary sources indicated that several potential sites of archaeological significance, ranging from Late Neolithic to post-medieval, were present within the confines of the site as well as in the immediate surroundings. This was further supported by the analysis and interpretation of existing aerial photographic records, which identified several potential sites of interest, both bounding and within the permitted development. In particular strong evidence exists for the presence of Iron Age and Roman deposits relating to settlement within a landscape of fields and trackways. A range of information indicates the presence of considerable depths of alluvium over parts of the site, which has strong potential to have contributed to the good survival and condition of deposits and associated palaeoenvironmental remains. A field visit identified upstanding earthworks in the north-east of the site, possibly associated with enclosures identified through aerial photography. These also indicate good potential preservation of any archaeological remains.

An updated project design has been produced to accompany the desk-based assessment and proposes further fieldwork assessment comprising metal detecting, geophysical and earthwork surveying of selected areas leading to a programme of targeted trial trenching. Training and participation of local archaeologists from the South Worcestershire Archaeological Group will form part of the project. The concluding report will allow appropriate mitigation strategies to be designed in advance of the permitted aggregate extraction, which it is hoped will allow further community involvement.

Part 2 Assessment report

1. Background

1.1 Reasons for the project

An archaeological desk-based assessment was undertaken at Ripple Quarry, Ripple, Worcestershire (NGR SO 9730 3700; Fig 1), as the first part of a proposed staged programme of evaluation commissioned by English Heritage through the Aggregates Levy Sustainability Fund (ALSF). The assessment is accompanied by an updated project design for further stages of evaluation of the site.

The project has been implemented in response to a planned programme of mineral extraction by RMC Aggregates (Western) Limited who have an outstanding, pre-PPG 16 planning permission for the extraction of sand and gravel at the site. The development is considered by the Worcestershire Historic Environment and Archaeology Service to have the potential to affect an archaeological site (WSM 32187).

This is an area of prime concern in terms of the remaining pre-PPG16 aggregate extraction permissions within Worcestershire. The site will shortly be prepared ready for extraction with a quay to be constructed to enable sand and gravel to be transported up the River Severn for processing at an existing processing plant at Clifton. The proposed start date for extraction is during the current financial year (2003/4), site preparation works having already commenced. The area to be affected covers approximately 52ha of which only a very small area has been stripped in order to activate the permission.

1.2 Project parameters

The project conforms to the *Standard and guidance for archaeological desk-based assessment* (IFA 1999)

The project also conforms to a proposal prepared by The Service (AS 2003) and to English Heritage guidelines (English Heritage, 1991 *Management of Archaeological Projects*; English Heritage, 2001 *Commissioned archaeology programme, guidance for applicants*).

1.3 Aims

The primary aim of the desk-based assessment was to collate all existing information relating to the archaeological potential of the site. This information was analysed to determine the character and significance of archaeological remains as well as assess their level of preservation. In addition a field visit/walkover was carried out in order to observe the topography of the site as well as any previously unrecorded earthworks.

A full analysis and interpretation of existing aerial photographs was also completed for the study area (Appendix A). The results of this study and the walkover were used in conjunction with the collated documentary evidence to provide an overall assessment of archaeological potential of the site.

Further to the appraisal of the archaeological potential, the desk-based assessment aimed to assess the impact of the permitted development upon any extant remains and inform the accompanying updated design for subsequent stages of evaluation.

The information collated and assessed during the course of this project will also inform future research and development control.

The information collected will become publicly available through:

- accession onto the County Sites and Monuments Record;
- deposition of the project archive at the County Museum;
- publication in an appropriate journal.

2. Methods

2.1 Documentary search

Prior to fieldwork commencing a search was made of the Worcestershire Sites and Monuments Record (SMR) concentrated in a 7.5km² area centred on the permitted quarry. Searches were also carried out at the Worcestershire County Records Office as well as the Gloucestershire Sites and Monuments Record.

In addition the following sources were also consulted:

Cartographic sources

- Ripple Inclosure Plan 1807 (19th century copy). WRO BA 12483/3;
- Queenshill Inclosure Plan 1807 (19th century copy). WRO BA r143/40;
- Holdfast Inclosure Plan 1807 (19th century copy). WRO BA 2396/989/976;
- Ordnance Survey. 1st Edition 1886. 25" to the mile. Sheet number 47SE, 48SW, 54NE & 55NW;
- Ordnance Survey. 1923 Edition. 6" to the mile. Sheet number 47SE, 48SW, 54NE & 55NW;
- Soil survey of England and Wales (Beard *et al* 1986);
- Bristol Channel: Solid geology (Barclay *et al*);
- Ripple Geological plan (with borehole data) 1:2500 1987 RMC (UK) Ltd.

Aerial photographs

- See Appendix A: Aerial photographic assessment.

Documentary sources

- Place-names (Mawer and Stenton 1927);
- English Field Names (Field 1972);
- Victoria County Histories Worcestershire, Volumes 1-4 (Doubleday 1971, Page 1971);
- History of Worcestershire (Nash 1795);
- Old Ripple (Gray 1936);
- The Antiquities and Folklore of Worcestershire (Allies 1852);

- Site archives from Watching Brief at the Paddock, Ferry Lane, Uckington (Pearson 1999);
- Site archives from Watching Brief and Building Recording at St Marys Church, Ripple (Glyde 2000).

The following sources were also consulted but were not considered relevant to this project;

- The Parish of Ripple in the 18th Century (Sidney 1969);
- Manor of Eastington 1640. BA 2411;
- Estate of Lord Fortesque 1771. BA 2394;
- Beale Estate 1850. BA 4120/36;
- Coventry Estates 1810. BA 849.

A bibliography of the written sources consulted during the course of the project is provided in Section 16.

2.2 **Fieldwork**

2.2.1 **Field walkover/landscape appraisal**

Fieldwork was undertaken on 16th April 2003. The field walkover was carried out to appraise ground conditions and topography as well as checking for any previously unrecorded earthworks. All observed features were noted onto a base map (1987 1:10 000 Ordnance Survey map), and those of the greatest clarity were also recorded using a global positioning system. Two small test holes were dug to evaluate the nature of the soils.

2.3 **Aerial photographic assessment**

An aerial photographic assessment was carried out by Chris Cox (CGMS). The full report complete with illustrations and references is provided in Appendix A.

2.4 **Analysis of pottery assemblage (reported by Allies 1852)**

The report by Allies clearly describes a substantial assemblage of Roman pottery that was discovered in the parish of Ripple, more specifically 'in the next field but one to the verge of the county of Gloucestershire' on the eastern bank of the River Severn (Allies 1852). This location corresponds to the southern end of the permitted quarry and therefore these finds are of significance to the current appraisal.

The report states that the finds were deposited with 'the Worcestershire Museum'. Enquiries were carried out at a number of local museums including Worcester City Museum, Hartlebury Museum, Cheltenham Museum, Birmingham City Museum and the Almonry Museum in Evesham. Unfortunately the finds were not recorded or accessioned with any of these repositories. One explanation for their apparent loss was provided by Worcester City Museum, which stated that many items had been misplaced, both during the war and inter war periods (Tim Bridges *pers comm*).

2.5 The methods in retrospect

The methods adopted allow a high degree of confidence that the aims of the project have been achieved. The documentary and cartographic collation and analysis using material from both Worcestershire and Gloucestershire SMR and Worcestershire Records Office provides a comprehensive appraisal of the available sources of both primary and secondary information. The aerial photographic assessment also encompassed all existing aerial records for the study area. Neither element of the desk-based assessment was impeded by limited access to sources.

The only short falling was the failure to locate and analyse the pottery assemblage referred to by the 19th century antiquarian J Allies. However, although the identification and analysis of this assemblage would have been useful, the description by Allies provides a relatively high level of confidence that the material is indeed of Roman date.

The assessment has successfully provided information to allow production of an updated project design for a carefully targeted programme of subsequent evaluation.

3. Topography, soils and geology

The site, a strip of land aligned north-west to south-east centred on NGR SO 87003700, is located to the south-west of the villages of Ripple and Uckington, Worcestershire (Fig 1). The area, measuring approximately 52 ha, is bounded by the River Severn to the west and by field boundaries to the north, south and east. The land lies at approximately 10m AOD, on the floodplain of the River Severn.

The soils are a combination of gleyic brown alluvial soils of the Trent and Clwyd series, along the western half of the site, and alluvium of the Fladbury series, to the east. The soils of the Trent and Clwyd series are stoneless clay and silty clay loams, which are liable to flooding but can be productive as either arable or grass/meadow land. The soils of the Fladbury series are a stoneless clay, also susceptible to flooding and water-logging, necessitating under-drainage and water-table control in order to be successfully used as arable land (Beard *et al* 1986).

The underlying drift is first terrace (sand and gravel) of the River Severn, overlying solid geology of Upper/Middle Triassic Mercia Mudstone (British Geological Survey 1976 and 1990). The localised geology of the permitted area has also been mapped from borehole data (Fig 2) which indicates a far greater depth of alluvial overburden is present in both the western and southern limits of the site, almost certainly reflecting a pattern of repeated overbank flooding within these areas.

Current land-management reflects the nature of the local soils with land drains running north-south across the centre of the site and extensive water management with associated osier beds along the eastern boundary (Fig 3).

The site is currently under crop in the northern half with a combination of sown green cover, wild bird cover and arable crop in the southern half. Arable crops include wheat and sugar beet. A combination of temporary and permanent grass is planted along the western border, immediately adjacent to the River Severn.

4. Archaeological and historical context

There is considerable evidence of archaeological activity both on and around the site, ranging from the Early Neolithic to the post-medieval period. A total of 57 sites are listed in the SMR within 2500m of the study area (Fig 4) and are summarised below in Table1.

In addition, this project has identified additional information and potential archaeological sites not recorded by the SMR.

Table 1 Sites registered with the SMR within a 5km² area of the study area

SMR reference/status	OS grid reference	Site name/description	Date
WSM 01345	SO87403660	Pit cluster, enclosure, settlement	Iron Age - Roman
WSM 01435		Spot finds of Roman finds, Bow Farm.	Roman
WSM 01436	SO87443912	Possible Roman road	Roman
WSM 01437	SO86503847	Occupation, enclosures	Early Neolithic - Roman
WSM 01343	SO87103730	Enclosures seen as cropmarks	
WSM 05736	SO87263780	Enclosure seen as cropmarks	
WSM 05737	SO 86803730	Enclosure seen as cropmarks	
WSM 07627	SO87603770	Roman Fort , Ripple	Roman
WSM 09181	SO85803650	Findspot- RB pottery	Roman
WSM 10480	SO86313819	Enclosure seen as cropmark	
WSM 25282	SO87463795	Occupation site	Roman
WSM 31188	SO87353663	Trackway seen as cropmark	
WSM 00308	SO86843794	Village cross in Uckinghall	Medieval
WSM 05565	SO87503770	Market cross in Ripple	Medieval
WSM 005566	SO87603780	Palm cross in churchyard, Ripple	Medieval
WSM 05939	SO85603760	Moat and Hollow way	Medieval
WSM 07613	SO87693801	Watermill	
WSM 07622	SO87613773	Church , wall painting,	Early Medieval
WSM 07622	SO87613773	Minster, church	Dark Age
WSM 07623	SO86103670	Church yard cross, Queenhill	Medieval
WSM 07624	SO86073664	St Nicolas church , Queenhill	Medieval
WSM 07626		Shrunken village, findspot	
WSM 09115		Manor house	
WSM 09116	SO86073682	Churchend Farm, Queenhill	Medieval
WSM 10231	SO86603840	Ridge and furrow	Medieval
WSM 12996	SO87663779	Vicarage	Medieval
WSM 15903	SO87803650	Ridge and furrow	Medieval
WSM 20536	SO87503777	Building, Ripple	Medieval
WSM 20538	SO87503770	Building Manor Farm, Ripple	Medieval
WSM 20539	SO87503770	Haynes House, Ripple	Medieval
WSM 21250	SO85903780	Burley DMV, Barley House, Holdfast	Medieval
WSM 21293	SO86053675	Queenhill DMV	Medieval
WSM 23760	SO87503770	Medieval village, Ripple	Medieval
WSM 23820	SO85803650	Fish wier, Rver Severn	Medieval
WSM 25271	SO87503777	Uckington Historic Settlement	Medieval
WSM 25272	SO86813806	Ripple Historic settlement	Medieval
WSM 25988	SO86773781	Watching Brief at The Paddock, Uckinghall	Medieval
WSM 28835	SO85703589	St Marys Church, Ripple, Bushley	Medieval
WSM 03269	SO87473825	Pound 1540-1900AD	Post-Medieval
WSM 05684	SO85583761	Dwelling	Post-Medieval
WSM 07618	SO87603770	Whipping post and stocks	Post-Medieval
WSM 12991	SO86753823	Tithe Barn	Post-Medieval

WSM 12992	SO86923793	Dwelling ,Ripple	Post-Medieval
WSM 12993	SO87303810	Battlefield ,Ripple	Post-Medieval
WSM 12994	SO87553768	Ripple Hall	Post-Medieval
WSM 20537	SO87503770	Ripple Cottage, Ripple	Post-Medieval
WSM 22884	SO87703790	Crossing of Ripple brook	Post-Medieval
WSM 23760	SO87503770	Uckinghall ferry	Post-Medieval
WSM 24804	SO87413782	Wistow Cottage, Ripple	Post-Medieval
WSM 28882	SO85133899	Park, Garden, Garden Building, Upton on Severn	Post-Medieval
WSM 28928	SO87583768	Park, Ripple	Post-Medieval
WSM 30581	SO86833790	Timber framed building, Uckinghall	Post-Medieval
WSM31672	SO86613890	Disused railway	Post-Medieval-Modern
GSMR 446	388000 237000	Towbury Hill Camp	Prehistoric
GSMR 4472	388150 236750	Cropmarks S of Towbury Hill	Unknown
GSMR 4473	388470 236450	Enclosure? and pit -Puckrup	Unknown
GSMR 4473	388470 236450	Axehead	Prehistoric
GSMR 5540	389390 236510	Rectilinear enclosure and ditch	Unknown
GSMR 7453	389000 239100	Possible trackway	Unknown
GSMR 7460	388000 238300	Earthworks	Unknown
GSMR 7461	388350 236850	Linear feature	Unknown
GSMR 9878	389500 237600	Site and cropmark site N of Twyning Green (linear feature)	Prehistoric

Table 1 Sites registered with the SMR within a 7.5km² area of the site (continued)

OS grid reference	Site name/description	Date
SO 87780 37510	Rectilinear platform in north east field of permitted quarry. Identified during walkover	April 2003
SO 86784 37471	Low mound area in north east field of permitted quarry. Identified during walkover	April 2003
SO8680 3750	Areas of former ridge and furrow, identified during Aerial photographic analysis (Cox 2003)	March 2003

Table 2 Additional sites and information

In addition to these sites, pollen analysis of peat samples from the Ripple Brook (SO 881387), which runs immediately to the east, has indicated the high level of palaeoenvironmental potential for this general area (Brown 1982).

4.1 Prehistoric and Roman

The presence of prehistoric and Roman archaeology is well attested in the Worcestershire SMR data for the study area. In particular cropmarks indicate several settlement enclosures and associated landscape features (field boundaries and tracks) of probable Iron Age and Romano-British date. These include one or more enclosures and broad curvilinear cropmarks in the north-east part of the permitted area (WSM 05737) and an enclosure just beyond the eastern site boundary (WSM 01343). To the south and further east, a ring-ditch (?), enclosures and pit clusters, a trackway and pit alignment have been recorded (WSM 1089, 1345 and 5736).

These features have been identified and discussed in the aerial photographic assessment (Appendix A). Further enclosures have been noted as cropmarks (WSM 10480 and WSM 01437) to the north, beyond Uckinghall and Ripple (see Fig 4). The site of Towbury Hill,

situated less than 500m to the east, provides certain evidence of significant Iron Age activity in the immediate vicinity (GSMR 446). In addition to the hillfort, numerous enclosures, earthworks and trackways have been identified locally (GSMR 4472, 4473, 4476, 7460, 7453), further adding to the level of potential prehistoric activity immediately to the east of the study area (Fig 5). A number of features located to the east of the permitted area apparently lead from the hillfort towards the river indicating that a continuation into the permitted area is highly probable. One possibility is that the most clearly identifiable of these features, a trackway (Appendix A, Feature E), may link Towbury hillfort to a fording point across the River Severn.

The recorded Roman activity is mostly located to the north, in the villages of Uckinghall and Ripple. The activity comprises a Roman fort (WSM 07627), a road (WSM 01346) running south from this and which is presumably associated, and conjectural Roman occupation to the north of Ripple (WSM 25282). A findspot of Roman pottery is also listed to the west of the river (WSM 09181).

Further evidence of Roman activity in the area is provided by a 19th century report (WSM 1435; Allies 1852). This records a layer of:

‘black ashes and cinders, with pieces of pottery; (and) that also occasionally below the stratum they found similar fragments of pottery, and that the earth above the black stratum appeared to have been a gradual accumulation, which, in the course of time, had been deposited upon the plain by occasional overflowings of the river’.

The latter deposit can be interpreted as representing alluvium. This is recorded as being about 4 feet deep (1.22m), while the disturbed deposits below the black stratum and associated with pottery are described as being up to 5 feet deep (1.52m). The pottery ‘both red and black’ was identified as being of Roman date and ‘oxidised iron’ was also recorded. These finds are recorded as being deposited in the Worcestershire Museum, however, attempts to locate them during the course of this project proved unsuccessful. Nevertheless the description provided by Allies original document provides a certain level of confidence as to their date and form. Their approximate location and discovery are recorded on the SMR (WSM 1435). The report states that the finds were made ‘on the eastern border of the Severn, in Worcestershire’ in ‘the next field but one to verge of the county of Gloucestershire’ which would place it within the south-west corner of the site and adjacent to the river. A strong possibility is that they represent an occupation site or area of other activity lying adjacent to the trackway identified through cropmark evidence (Appendix A; Feature E) running towards the river, an alignment which would coincide with the northern end of this field.

A geological survey has also been carried out consisting of twenty-three, 150mm diameter boreholes. This indicates that the mineral reserves are overlain by an overburden of topsoil and silty clay. This ranges from 1.5m to 5.5m in thickness, with an average depth of 3.10m. These depths support the 19th information suggesting that substantial deposits of alluvium cover the site. This also correlates with the geological classifications (Section 3)

4.2 Medieval

Medieval occupation to the north and west of the site is well documented. The Victoria County Histories, Worcestershire (Vol III) record that a Manor of Ripple was in existence from the early medieval/Dark Age period, with a grant being made by Oshere, King of Hwiccas to Frithowald, a monk of Wynfrid, ex-Bishop of Lichfield in 680 (Page 1971). The estate later passed to the Bishop of Worcester in 1086 at which time it comprised Ripple, Upton-upon-Severn, Welland, Farley, Holdfast, Queenhill, Hill Croome, Early Croome, Croome d’Abitot and Little Malvern, the total value of which was placed at 37 hides. The estate remained in the ownership of the Bishop of Worcester until 1860 when it passed to the Ecclesiastical Commissioners.

The SMR contains numerous listings, which represent the remains of this period. The village of Ripple, to the north, has extant remains of medieval occupation, including dwellings and farmhouses (WSM 20536, WSM 20538, WSM 20538), St Mary The Virgin's Church which dates to the early medieval/Dark Age period (WSM 07622) and a market cross (WSM 05565). The name Ripple, which applies not only to the village but to the entire manor (and later Parish), has origins in the 8th century as *Rippell*. The root of this word is believed to derive from the Norwegian word *ripel*, meaning strip, which later became used to describe 'a strip of wood, coppice'. The suggestion that this name refers to the form of the Ripple Manor as a strip/tongue of land flanking the River Severn seems a highly likely explanation (Mawer and Stenton 1927).

Further medieval occupation is represented to the north by buildings (WSM 25271) and a village cross (WSM 00308) at the village of Uckinghall. To the west, in Queenshill (WSM 07623, WSM 07626, WSM 09116) records include a deserted medieval village (SMR 21293) on the south-west outskirts of the present village, and a further deserted medieval village (SMR 21250) and moat and hollow way (WSM 05939), both at Holdfast (Fig 4). Although recorded as deserted villages, these more probably represent evidence for settlement shrinkage.

Evidence of the field systems associated this period of occupation is provided by the extensive remains of ridge and furrow, features typical of medieval cultivation and detected as cropmarks. These have been identified in fields to the north of Uckinghall (WSM 10231), immediately east of the permitted quarry (WSM 15903) and possibly to the south of Uckinghall, although these are somewhat narrower and may be the remains of more recent cultivation. These features have also been highlighted by the aerial photographic assessment (see Appendix A).

4.3 Post-medieval and modern

There is no indication of any break in occupation from medieval to the post-medieval period., although evidence of a reduction in the population of both Queenshill and Holdfast is indicated by earthwork sites located on the main village's outskirts. The villages of Uckinghall and Ripple have remained relatively contained with little evidence of expansion beyond their historic centres.

There is no direct evidence for the early post-medieval landuse of the fields surrounding these settlements. The earliest cartographic evidence is the 1807 inclosure map, which shows fairly small plots of land typical of the inclosure period (Fig 6). A number of these field boundaries appear to correspond to the more modern boundaries and the alignment of narrower ridge and furrow noted in the aerial photographic assessment (Appendix A). In contrast the broader ridge and furrow observed to the south of the study area follow a more east-west alignment indicating a degree of movement in the layout of field systems.

The inclosure map also contains field names, which may give some indication of the land use. Often the use of field names, much as with manorial and village names, can reflect far earlier origins indicating the landform or usage. The study area encompasses three main inclosure areas; Ripple, Queenshill and Holdfast. In Ripple the fields within the permitted quarry area predominantly refer to *Swineham* and *Cow Croft*, both of which indicate that the land was under pastoral rather than arable usage. This usage would certainly be suited to local geology and soils and the fact that the area was liable to seasonal flooding. One further area of interest lies in 'Berkley's Middle Lake Ground' and adjacent strip of marshy ground, which may occupy the course of a former channel of the river.

The land immediately adjacent to the site itself includes field names such as *Hither Moor*, *Swineham* and *Lower Meadow*, which may again suggest that the fields had not been historically used for arable cultivation. To the west of the River Severn, land in both Holdfast and Queenshill includes the field names *Brick Kiln Bank* and *Brickwork Fields*, which suggests that clay extraction and processing and possibly even kilns were located in this

vicinity, immediately adjacent to the river. This exploitation of local alluvial clays is almost certainly not confined to the post-medieval period alone.

The 1886 edition map of the study area indicates that several smaller fields noted on the inclosure map have been amalgamated to form larger field units resulting in fewer boundaries (Fig 7). There is no information regarding the land use at this time other than the presence of withy lake/osier beds along the eastern boundary of the permitted quarry (on the line of the postulated former channel) and a small sub oval area, almost central to the site, which appears to house an area of trees/orchard. The map does note that the area is liable to floods along the eastern banks of the river, this would again correlate with the known geology of the site. The map also shows clearly a section of the Ashchurch to Malvern railway line (WSM 31672; Fig 4).

4.4 Undated landscape features and characteristics

A field walkover was carried out which identified a number of earthwork features. The most pronounced of these were in the north-east field (Field 2) and comprised a broadly rectilinear raised platform area in the north-east corner of the field and a less defined rounded mound to its south (Fig 8). This field has also been highlighted by the aerial photographic assessment as it shows clear signs of enclosures and curvilinear features interpreted as potential settlement and stock management features. The location of the visible earthworks does not correlate exactly with those features observed as cropmarks. This may indicate a higher level of activity than previously recognised by aerial photographic assessment. Unfortunately no surface material was recovered during the walkover, however, the earthworks and aerial photographic evidence indicate that further evaluation may be appropriate. The field boundary depicted running diagonally across the south east corner on the 1987 1:10000 Ordnance Survey is no longer extant but there was a corresponding area of abundant 19th – 20th century building debris in this area which may indicate the infill of the former boundary. The field is currently under cultivation and at the time of the walkover the wheat crop stood approximately 300m in height.

The north-west field (Field 1) was also under cultivation (sugar beet) but showed little sign of archaeologically significant features, with the exception of an area of concentrated crop growth which may represent an area of deeper plough and subsoil indicative of some form of disturbance. At the time of the walkover the crop was newly sown and stood at a height of 30 to 50mm.

At the centre of the permitted quarry area, the southern extent of Field 3 had been extensively disturbed by excavation to create a sump on the east side of the field. In addition a substantial mound of the up-cast material from this excavation covered the remaining area as far as the southern field boundary. The land between the sump and up-cast mound was sown with green cover (grass), which stood less than 100mm. The boundary between Field 3 and 4 was no longer extant and Field 4 was largely truncated to the south by the M50 road bridge (Plate i). The northern extents of both Fields 3 and 4 were cultivated with wheat, which stood at a height of 300mm.

To the south-west of Field 3, Field 5 was uncultivated and employed as wild bird cover. The vegetation of the eastern side of this field was indicative of a seasonally flooded area with scrub grass rich in with occasional outgrowths of reeds and grasses. This vegetation did slightly obscure the topography in this area, the only visible earthwork being a ridge running north to south, which corresponded with the former location of a field boundary shown on the 1987 1:10000 Ordnance Survey map. This boundary is also shown on all mapped sources back to the 1813 enclosure map and appears to form a link between the field drain boundary still extant in Field 7 to the south and an area of osier beds at the north of Field 5. Given the nature of the land drain in Field 7 (see below) it seems likely that the former boundary in Field 5 was also a land drain, which fed into the osier bed. The osier bed itself is now entirely dried up and has been reused as a pheasant den. The southern boundary of Field 5 is a fairly well maintained hedge line with evidence of the remains of hedge laying.

At the far south, Field 6 is also covered by wild bird cover with similar vegetation as observed in Field 5 with the addition of profuse marram grass, which largely obscures the topography (Plate ii). A small test hole was excavated. This revealed dark grey/browny black alluvium directly below the vegetation, however, no topsoil was evident. The test pit was excavated to a depth of 0.40m, the alluvium was still present at this depth and was a more pure grey in colour. The form and depth of alluvium indicates that this area has been successively covered by standing water either as a result of flooding or more probably resulting from use as a water meadow.

The south-west field (Field 7) was under wheat cultivation, which stood at a height of 300mm. There were no apparent earthworks in this field other than a slight ridge running north to south approximately 35 metres east of the western field boundary. This feature is not in the vicinity of any known former field boundaries. A small test hole was also excavated and revealed topsoil to a depth of 0.40m directly onto orangey-red alluvium. The western boundary of the field is provided by a field drain/stream, which runs approximately north to south. The line of the boundary is highly irregular and looks to be a natural formation (Plate iii). In conjunction with the extensive osier beds to the east and north and the areas of probable former water meadow in Fields 5 and 6, this demonstrates that water management features and watercourses (both current and former) are a common feature of the site as would be expected given its location on the floodplain.

5. Archaeological potential

5.1 Overall site

The collation of existing historic and archaeological sources indicates sites of varying potential archaeological significance both within and in the immediate vicinity of the permitted quarry. The patterns of landuse, geology and alluvial accumulation across the site indicate that areas of well preserved deposits can be anticipated. The potential for archaeological remains within the permitted area has been clearly demonstrated and is anticipated to comprise a range of prehistoric, Roman and later activity as well as associated paleoenvironmental remains potentially including channels of former watercourses.

Any sites located within the quarrying area will be disturbed or totally removed by the process of extraction.

The permitted area has been divided into three zones.

5.2 The northern zone (F1, F2, and northernmost ends of F3 and F4)

Within the northern extent of permitted area, assessment has confirmed the potential of the cropmarks already recorded on the SMR (WSM 5737). Aerial photographic interpretation has indicated that these potentially represent later prehistoric or Roman activity including an enclosure, possible pits and curvilinear features (see Appendix A; Features A and B). The results of the walkover also highlighted this field, which, despite being under cultivation, contained upstanding earthworks in the form of an apparent platform and low mound.

In the light of these observations, this zone is therefore considered to be of high archaeological potential.

5.3 The central zone (Southernmost ends of F3 and F4, northern half of F 5)

Immediately adjacent to (but beyond) the central of the permitted quarry are a series of cropmarks comprising a complex of linear and sinuous ditches and associated ditched enclosures with areas of dense pits suggestive of extensive occupation (WSM 1345; Appendix A, Features D and F). The presence of alluviated soils over much of the site (as

shown by geological mapping and borehole data) is likely to mask any continuation of this activity into the permitted area.

The archaeological potential of some of this area has been affected by truncation and disturbance by construction of the M50 road-bridge and along its east side (adjacent to the features described above) by the excavation of a large area to form a sump. However, areas of surviving deposits may be present away from the extracted area and below the resultant upcast from the sump and underlying alluvium. As with the northern zone any surviving archaeological remains in this area are liable to relate to later prehistoric and Roman activity.

In the light of the truncation of parts of this area, this zone of the site is considered to have only a low to moderate potential with perhaps limited areas of high potential.

5.4 **The southern zone (Southern half of F5, F6 and F7)**

The series of cropmarks, immediately adjacent to (but beyond and east of) the permitted quarry site (WSM 1345) and discussed above for the central zone, extend to the south. These comprise a double ditched track or roadway and a similarly aligned row of closely spaced pits (Appendix A; Feature E). These appear to be running from the nearby hillfort at Towbury towards the River Severn and therefore almost certainly extend into the permitted area where they are probably masked (from aerial photography) by alluvium. These are liable to be of later prehistoric or Roman date.

The walkover in this zone provided firm evidence of deep alluvium, which had been indicated by the geological classifications for the site as well as the 19th century reports by A J Allies (see Section 4.1). The two test holes revealed a difference in the type of alluvium, which may prove indicative of the manner in which it was deposited. Notably, the alluvium to the east of the site indicated that the area may have been used as a water meadow. The presence of alluvium is of considerable interest as it raises the potential for archaeological deposits to be both well preserved and deeply buried within it. This requires further evaluation to determine its depth and the location of any archaeological deposits sealed within it.

The report of Romano-British finds beneath 4 feet (1.22 metres) of alluvium in this vicinity during the 19th century (WSM 1435; Allies 1852) indicates that such remains do survive deeply buried below these deposits. These are liable to represent an area of settlement or other activity, potentially lying adjacent to the projected line of a trackway running towards the river. Their description and deeply buried character indicate a high level of potential preservation of deposits and associated artefactual and ecofactual material.

The fields to the south east (Fields 5 and 6) were uncultivated and had no apparent topsoil, indicating that the area has never been cultivated. The absence of regular ploughing suggests that good preservation of any archaeological or palaeoenvironmental deposits again might be anticipated. There were no obvious signs of earthworks or landscape features but this may be partially due to the vegetation cover.

In the light of the presence of deep alluvial deposits, the lack of arable cultivation, the reports of finds by Allies and the adjacent cropmarks apparently extending into this area, this zone is considered to have a high archaeological potential.

6. **Recommendations**

The permitted quarrying activity will undoubtedly remove any surviving archaeological remains and as a result further targeted evaluation is highly desirable to inform appropriate mitigation measures.

The desk-based evaluation and field walkover has defined two zones of high archaeological potential, namely the north and south ends of the permitted quarry. These areas have a high potential for *in situ* preservation of both archaeological and environmental remains, while limited survival might be anticipated in the central zone.

Future investigations within these zones should comprise an initial phase of non-intrusive evaluation (Stage 2 as outlined in the UPD). The most suitable forms of this evaluation would be as follows:

6.1 **The northern zone (F1 and F2 and northernmost ends of F3 and F4)**

As these fields are currently under arable cultivation fieldwalking and/or metal detecting survey would be suitable to provide further evidence of the potential extents and date of the deposits.

Ground conditions in these fields are also suitable for geophysical survey. In Field 2 this could be targeted to further evaluate the potential of the well defined cropmark features (Appendix A; Feature B), especially the internal areas of the enclosures. In Field 1 this method would be appropriate to further evaluate the possible pits identified through cropmark assessment and interpretation (Appendix A; Feature A), while in Fields 3 and 4 this would be an appropriate technique to investigate the potential continuation of the cropmarks into these fields.

Field 2 has also been recorded to contain low earthwork features and a survey of these is also recommended both to further refine the assessment of their potential and to provide a record of their extents prior to destruction.

Following completion of any fieldwalking, earthwork, metal detector and geophysical surveys, suitable targets for trial trenching should be identified. Trenching would aim to further assess areas of high potential within this zone of the site and in particular to test the survival and condition of any deposits present.

6.2 **The central zone (Southernmost ends of F3 and F4, northern half of F 5)**

While compromised by recent intrusive works comprising the sump and the M50 road bridge as well as the considerable depth of resultant upcast, the central zone also has a potential for archaeological deposits.

Geophysical survey (where possible) would aid in clarifying the archaeological potential or otherwise of this area. In particular geophysical survey should be targeted to evaluate the continuation of cropmarks evident immediately to the east.

Following completion of any geophysical survey, it may be possible to identify suitable targets for trial trenching to further assess areas of high potential within this zone of the site and in particular to test the survival and condition of any deposits present.

6.3 **The southern zone (Southern half of F5, F6 and F7)**

As Field 7 is currently under cultivation, fieldwalking and/or metal detecting survey would be suitable to provide further evidence of the potential extents and date of the deposits indicated, although alluviation may mask any such deposits.

Ground conditions in Field 7 are also suitable for geophysical survey, which should target areas flanking the drainage ditches around the field (especially those on its north side on the projected trackway alignment) to try to locate the area recorded by Allies. Areas of Fields 6 and the southern part of Field 5 may also be suited to geophysical survey since the grass cover is not uniform and areas of lower cover are present. Survey should be targeted to

further test the potential of the well defined cropmark features which appear to run from Towbury Hillfort towards the River Severn and thus potentially cross this area (Appendix A; Feature E).

Following completion of any fieldwalking, metal detector and geophysical surveys, trial trenching should be undertaken of any suitable targets which have been identified. This would aim to further assess areas of high potential within this zone of the site and in particular to test the survival and condition of any deposits present.

6.4 **Overall site**

Further information on alluvial depth (to support the borehole data and aerial photographs), site topography and potential former watercourse alignments may possibly be derived from Light Detection and Ranging (LiDAR) data which is available for this area and thus should be examined. Such information may support the identification of evaluation trenching targets and the overall record for the site.

On completion of Stage 2 of the evaluation, areas should be selected for trial trenching (Stage 3) using the information derived from the first two stages of the project.

7. **The archive**

The archive consists of:

- 1 Photographic record AS3
- 1 Colour transparency film
- 1 Folder of drawings, notes and SMR print-outs
- 2 Computer disks
- 1 Aerial photographic assessment
- 1 Assessment report and updated project design

The project archive is intended to be placed at:

Worcestershire County Museum
Hartlebury Castle
Hartlebury
Near Kidderminster
Worcestershire DY11 7XZ
Tel Hartlebury (01299) 250416

Part 3 Updated project design

8. Introduction

This updated project design (UPD) has been produced to accompany the desk-based assessment presented above (Part 2) and in line with the original Project Design (AS 2003). The UPD has been produced following discussions with English Heritage, RMC Aggregates (Western) Limited, the County Archaeology Officer and the South Worcestershire Archaeology Group (SWAG).

The project will be undertaken by the Service in conjunction with members of SWAG who will participate in fieldwork and analysis and for whom training will be provided to expand their archaeological skills base.

The UPD presents methods statements, estimates and programme proposal for Stages 2 and 3 of the programme of evaluation as defined in the original Project Design. An additional stage (Stage 4) for reporting has been separately identified.

Proposed works will be limited to the extents of the proposed quarrying area. Stage 3 work will be only be undertaken following completion of Stage 2 and is designed to further evaluate areas of high potential identified by Stages 1 and 2. Stage 4 will be completed following all fieldwork and will be accompanied by an Updated Project Design for mitigation works as appropriate.

Project funding is requested through the Aggregates Levy Sustainability Fund (ALSF) within its currently agreed programme period (ending March 2004). Proposed methods and programming within the UPD are necessarily constrained by this completion date.

The proposals made in this document have been outlined to RMC Aggregates (Western) Limited, the quarry company and landowner who have expressed support for the project and who have agreed access for undertaking the proposed works.

Malcolm Atkin, the County Archaeologist for Worcestershire has expressed his support for the project and has offered specific support (in the form of core staff time) for school visits and a public exhibition proposed to present any discoveries made to the wider local population.

9. Aims and objectives

The original broad aims of the project were to provide sufficient information to:

- assess the potential significance of any archaeological remains and the built heritage;
- assess the impact of the proposed development on these archaeological remains and the built heritage;
- recommend mitigation measures to offset any detrimental effects of the development on the archaeological resource (in line with current development control practice as identified by PPG16 and incorporated within the Minerals Local Plan);
- inform the local population of the archaeological resource within the parish.

Stage 1 (Desk-based assessment) of the project has now been completed and the identified aims of this stage have been fulfilled (AS 2003, section 2.1).

Stages 2 and 3 of the proposed evaluation programme (as defined in the original project design; AS 2003) had the following defined aims and objectives:

- further identify and refine understanding of the character and potential significance of any archaeological sites identified during Stage 1 and which may be affected by the development;
- test for the presence of unknown sites and assess their character and potential;
- assess the impact of the development on any archaeological deposits which may be present;
- inform the design of an appropriate mitigation strategy for any archaeological deposits which may be present.

In the light of the assessment and discussions with English Heritage the following additional broad aims have been identified:

- to involve local archaeologists (SWAG) in any fieldwork undertaken;
- to provide training for local archaeology group members (SWAG) to support their interest in archaeology and extend their archaeological skills base.

The specific aims and objectives of each proposed approach (method) are identified below.

10. **Methods statement**

10.1 **Task 1: Management**

The Project Manager will co-ordinate Service staff, SWAG and external specialists, and liaise with English Heritage, Tarmac Aggregates (Western) Limited and the tenant.

The Project Manager will maintain project tracking (using the Gantt chart, Microsoft Project and weekly time sheets completed by Service staff recording at quarter day increments). The Project Manager will produce progress reports for the English Heritage Project Monitor.

10.2 **Stage 2 Non intrusive survey (Tasks 2 to 6)**

Recommendations for Stage 2 have been made following completion of the Stage 1 Assessment (see Section 6). These comprise geophysical survey, earthwork survey, metal detector survey, geophysical survey and fieldwalking, as well as consideration of available LIDAR data. Where relevant, training elements are identified for local archaeological group members (SWAG).

Upon completion of Stage 2 works it is intended that trial trenching (Stage 3) will be undertaken to further evaluate areas of higher potential within the site in the light of results

10.2.1 **Task 2: Geophysical survey**

Geophysical survey has been identified as an appropriate further survey technique within all three zones of potential identified and especially within the northern and southern zones. This will provide further information relating to the character and extents of the previously identified cropmarks and potentially may identify further areas of deposits not identified during Stage 1.

Survey will be undertaken only where suitable ground conditions are present – anticipated to be those fields due to be harvested by mid-September (Fields 1, 2, 3, 4, and 7) with limited areas in grass cover fields (Fields 5 and 6).

The survey will be undertaken by GSB Prospection. The equipment used (Bartington Gradiometer 601–2) will be suitable for use on alluviated landscapes having a previously demonstrated capability in certain conditions to detect archaeological deposits buried to a depth of up to 2.5m below ground surface.

In the first instance a total of 9ha scanning will be undertaken within the total evaluation area of c 52ha (c 17.5%). A series of 50m wide transects will be undertaken as follows:

- Northern zone – Four scan transects totalling 4.5ha to target the internal part of the main enclosure, a smaller enclosure to the north, the possible pit area to the west and the extension of the curvilinear features to the south (WSM 5737; Appendix A, Features A and B);
- Central zone – Single transect placed to test for continuation of cropmarks (WSM 1345; Appendix A, Features D and F) to east into evaluation area (0.5 ha allocated);
- Southern zone – Five transects totalling 4ha to target continuation of cropmarks (Feature E) into and across the evaluation area to the River Severn and also potentially to more specifically locate the 'site' identified by Allies (WSM 1435).

Provision is also made for up to 3ha detailed gradiometer survey to be undertaken following scanning. The latter will be targeted to areas indicated by the scan as having responses indicative of buried remains and will provide more detailed information on extents, layout and character of any such deposits.

A report will be produced presenting the results of the fieldwork. This will help inform the identification of target areas for Stage 3 evaluation trenching and will be incorporated in an overall assessment and updated project design (Stage 4).

Following completion of the magnetometer survey, GSB Prospection will undertake a training session (1 day) for a small number of SWAG members (max 5 persons) on the application and limitations of remote sensing techniques. In the light of current SWAG proposals to purchase resistivity survey equipment, particular focus will be made on this technique. If possible a practical element will be incorporated into the training, either using GSB Prospection's equipment or if SWAG have secured their own equipment by this date using their own equipment.

10.2.2 **Task 3: Metal detector survey**

Metal detector survey has been identified as a suitable approach for further survey within the fields currently under arable cultivation (Fields 1, 2, 3, 4 and 7) following harvesting of crops, which is anticipated to have been completed by the middle of September 2003.

Detecting is considered appropriate for survey of the area of cropmarks in the northern zone (Fields 1, 2, 3 and 4) due to its potential for providing dating evidence. In the absence of the potential for fieldwalking this area within the project programme period, the usefulness of metal detecting is enhanced.

Other zones of the evaluation area are not considered suited to metal detecting due to an absence of clearly defined targets and unfavourable ground conditions (alluvial masking).

Metal detecting will be undertaken by members of SWAG, co-ordinated by a member of the Service's finds team and a specialist metal detector user with whom the Service has regularly worked (Dean Crawford, Metodet, <http://www.metodet.ndo.co.uk>).

The following will be undertaken:

- topsoil search incorporating GPS recording;
- findspots recorded and located with GPS ten figure grid references which will then be downloaded to map and passed on by document or CD;
- all finds identified and recorded;
- finds of significant nature will be photographed and quality images printed and passed on as image files on disc;
- a report will be produced cataloguing and assessing the finds made in the light of the overall aims and objectives of the project. This report will be accompanied by a distribution plot and will help inform the identification of target areas for Stage 3 evaluation trenching and will be incorporated in an overall assessment and updated project design (Stage 4).

SWAG members with metal detectors will be invited to participate (maximum 5 persons) and training will be provided as follows:

- search methods (getting the most out of the detector, scanning, recovery techniques);
- dealing with finds – on site (recording, bagging and marking, map location, GPS use);
- dealing with finds – off site (bagging, cleaning guidelines, identification, conservation, reporting to SMR);
- good practice (legal requirements, codes of practice, etc).

10.2.3 **Task 4: Earthwork survey**

Earthwork survey has been identified as a suitable approach for further evaluation and recording in Field 2 in the northern zone of the site. These earthworks may relate to cropmarks plotted by the assessment (Appendix A; Feature B), although they do not seem to correspond and these earthworks may therefore reflect later activity. Survey may refine understanding of these features and will provide an accurate record of their location and extent.

SWAG members will undertake the fieldwork survey of the earthworks, co-ordinated by two members of Service staff who will provide training and one of whom will compile the earthwork survey report.

Methods used will those already established and used by SWAG and which are based on English Heritage guidelines (English Heritage, March 2002 *With alidade and tape. Graphical and plane table survey of archaeological earthworks*). All participants from the local group will be provided with a copy of these guidelines in advance of the survey and also for future reference.

In summary methods will comprise:

- plotting of all artificial and natural scarps using the 'tape and offset method' and using established conventions (graphical survey);

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- location of baselines to OS map detail;
 - production of written field notes describing earthworks;
 - levelling selected profiles;
 - a brief report will be produced on the results of the survey and in the light of the overall aims and objectives of the project. This report will help inform the identification of target areas for Stage 3 evaluation trenching and will be incorporated in an overall assessment and updated project design (Stage 4).

In the light of the relatively simple form of the earthworks, these are considered to be ideal for providing basic earthwork survey training to members of SWAG who have little or no experience of such survey.

It is estimated that surveying should only require 1 day of fieldwork during which up to 10 SWAG members can be accommodated led by two members from the Service's staff (Field Officers). Training will be provided to cover:

- identification of earthworks in the field;
- recording (setting out and location of baseline, 'tape and offset recording', use of level, depiction of earthworks using appropriate conventions).

Subsequent to the fieldwork it is proposed to hold a half day training seminar on the principles of archiving, reporting and presentation of results. The seminar would be open to 10 SWAG members and would be led by two members of the Service's staff (Field Officers). This will cover:

- background desk-based research (use of historic maps, etc);
- illustration of results; and
- archiving and reporting of surveys (using a model report document, which will be established for use by the group).

10.2.4 **Task 5: LiDAR data**

High resolution LiDAR data is available for the entire evaluation area (LiDAR filename D0021711; SO 8636). Since the data is required for a research project rather than for commercial purposes it is understood that this data can be obtained from the Environment Agency free of charge.

This data will allow a highly resolved model of the topography of the site to be produced. This may reveal (through subtle differences in height) the location of shallow depressions and rises in the floodplain, which may represent former channels or gravel islands providing favourable locations for former occupation.

The information derived will be used as a base plan against which other data will be considered (borehole data and aerial photographic coverage). This will support the identification of possible former channels or gravel islands, which may provide suitable target locations for trial trenches. A brief report will be produced summarising the results of this stage and which will be incorporated in the final assessment report and UPD (Stage 4).

10.2.5 **Fieldwalking (Not applicable)**

Fieldwalking was identified following initial assessment as a suitable approach for further survey to refine understanding of the potential date and extents of archaeological activity within five fields (Fields 1, 2, 3, 4 and 7) of the permitted quarrying area. These are all under arable cultivation. Unfortunately, although crops will be harvested late summer/early Autumn 2003, it is not the intention to plough for sowing until the Spring of 2004. This is to prevent erosion of exposed, ploughed soils during winter flooding by the adjacent river.

Consequently, although this method is considered appropriate to site conditions, the time constraints of the ALSF mean that fieldwalking cannot be undertaken within the proposed programme period for this project. In the event of extension of the ALSF, future proposals relating to this site might consider fieldwalking.

10.2.6 **Task 6: Revision of Stage 3 design**

At the completion of Stage 2, it is proposed that a brief statement be prepared summarising the results of the project to date and identifying/refining areas of potential.

The information provided will form the basis for a decision by English Heritage on whether Stage 3 works are justified and support determination of appropriate trench locations. A programme will be finalised for Stage 3 works within the overall project timetable.

10.3 **Stage 3 Trial trenching (Tasks 7 to 9)**

Trial trenching is intended to follow the non-intrusive work detailed above (Section 10.1) and will only be taken in the event that the results of Stages 1 and 2 are felt to justify further evaluation.

Trenching will be kept to the minimum to meet the aims and objectives of the project and will be closely targeted to identified areas of high potential.

Evaluation will aim to ensure that a sample of the full range of potential deposits and conditions of survival is tested.

In the light of the results of Stage 1 it felt likely that some element of Stage 3 work is likely to required, however, a final decision on this will only be made (by English Heritage in consultation with the Service) on completion of Stage 2.

Trench locations will be closely targeted to further evaluate areas of higher potential identified through completion of earlier stages of the project.

The aims of this stage of the evaluation will be to:

- further assess the character and current survival, condition and vulnerability of any deposits within the Evaluation Area and in the light of the results of Stages 1 and 2;
- to ensure that a sample of the full range of potential deposits and conditions of survival is tested;
- provide training in fieldwork techniques for SWAG members. This is a commonly requested area for training, however, rarely can be offered due to the nature of the majority of most archaeological work undertaken (developer funded). The circumstances of the project therefore provide a rare opportunity to provide SWAG members with training in evaluation excavation techniques.

The results of all evaluation stages will be used as the basis of a report. This will summarise results of Stages 1 and 2 and discuss those of Stage 3. Assessment will be made of the potential archaeological significance of archaeological deposits identified within the evaluation area. The resultant report will form the basis of an Updated Project Design for any further stages of work (mitigation), which may be appropriate in advance of the permitted gravel extraction.

10.3.1 **Task 7: Trench location and machine excavation**

To maximise the potential for identifying both linear features (eg enclosure ditches and trackways) as well as structural and other features (eg pits, hearths and postholes) a combination of trench types will be used. Wider trenches than normal will also be used to provide additional areas for training of SWAG members. Trenches may include both linear trenches (30 x 4m; 50 x 4m; 100 x 4m; 150 x 4m) and more open area box trenches (5 x 5m).

These will cover a total area of 5000m² (representing *c* 1% of the development site area of 520,000m²). It is proposed that 2000m² of trenching is allocated to the Northern Zone and that 3000m² is allocated to the Central/Southern Zone.

Trench locations will be determined in the light of the results of Stages 1 and 2. The Service would welcome the advice of the Curator and English Heritage in determining the location of trenches.

Trenches will be located in the field using an EDM and tied to Ordnance Survey detail.

All trenches will be opened by machine using a toothless bucket and under supervision of an archaeologist (Field Officer – banksman). Please note that the precise location and size of trenches will vary according to health and safety and archaeological requirements. All subsequent excavation will be by hand.

10.3.2 **Task 8: Excavation and recording of deposits**

Trial trenching will follow the procedures of the Manual of Service Practice: fieldwork recording manual, 1995 as amended (County Archaeological Service internal report, 399). Of particular importance here are the Guidelines on evaluation, Finds recovery policy, and Guidelines for environmental sampling. Copies of the guidelines will be supplied on request.

The following will be undertaken:

- Clean surfaces will be inspected and preliminary trench records will be made;
- Selected deposits will be fully or partially excavated and recorded to determine their nature and retrieve artefactual material and environmental samples;
- Deposits will be initially selected for excavation on the basis of the minimum required to meet the aims of the project;
- Where possible less significant deposits will be excavated in order to define the nature and extent of those which are likely to be of greater significance.
- Recognisable human remains, structured deposits, and areas of complex stratigraphy likely to be a significant part of the site will not be removed as part of the evaluation.
- Selection for excavation will be on the judgement of the Project Leader.
- The assistance of the Curator in selection of deposits for excavation is welcomed by the Service.

- The Service's specialist staff in artefacts and environmental evidence will be available for on-site advice.
- A soil scientist (David Jordan of Terra Nova) will be available to provide on-site advice on the character of deposits (alluvium and palaeochannels).
- Unless otherwise specified reinstatement shall consist of simple replacement of the excavated material.

10.3.3 **Task 9: Training**

Additional deposits will be identified for further excavation by SWAG members to provide training in excavation techniques (cleaning, excavation, finds retrieval, environmental sampling and recording). The intention will be that following sample excavation of features (as described above), the remaining portions will be used to provide training. This will result in a complete site archive from the Service team and a 'parallel archive' and enhanced sample as a result of SWAG input.

It is intended to provide training for two groups of 5 SWAG members, one group receiving 5 days training during work on the Northern Zone, the other 5 days training during work in the Central/Southern Zone.

Training will be provided in the following:

- feature/deposit identification and excavation (training by Field Officer, Field Supervisor, and Archaeologists);
- feature/deposit recording (written, photographic and drawn records; training by Field Officer, Field Supervisor, and Archaeologists);
- site surveying (levelling and site grid; training by Field Officer and Field Supervisor);
- dealing with finds (on site as well as preliminary post-excavation processing – washing, marking, etc; training by Finds Officer and Finds Assistant);
- environmental sampling (training by Environmental Archaeologist).

10.4 **Stage 4 Post-fieldwork: assessment, report and outreach (Tasks 10 to 12)**

10.4.1 **Task 10: Assessment and analysis**

Upon completion of Stages 2 and 3, the following will be undertaken:

- fieldwork records will be checked and cross-referenced (by the Field Officer and Archaeologist);
- preliminary processing of finds (washing and marking) with assistance from SWAG (by the Finds Assistant);
- processing of selected environmental samples for assessment (by the Environmental Archaeologist);
- assessment of structural data (by Field Officer);
- assessment of artefactual material (by Finds Officer);

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- assessment of environmental material (by Environmental Officer);
 - production of plans and sections for report and finds illustration (by Illustrator)
 - external specialist assessment (as required; budget allowance £1000)

10.4.2 **Task 11: Assessment report and UPD**

The following will be undertaken:

- collation of report;
- editing;
- production of UPD (mitigation recommendations).

The results of all stages of fieldwork will be presented as a report in the Service's internal report series.

The report will contain:

- a non-technical summary;
- background;
- aims;
- methods;
- location and size of archive;
- a summary of the results of all stages;
- an assessment of the potential significance of deposits; and
- an Updated Project Design (mitigation) for further works as appropriate at the site.

Assessment will employ the criteria for the scheduling of ancient monuments used by the Department for Culture Media and Sport as a guide (DoE, PPG 16 1990, Annex 4). Other criteria, such as those prepared by English Heritage for the Monuments Protection Programme or contained in structure or local plans, may also be used where appropriate.

In assessing the state of deposit preservation, physical, artefactual and environmental aspects will all be considered. An assessment of the quantity and range of artefactual and environmental material will be presented. Appropriate specialists will be consulted or contracted where appropriate.

The Service will supply six copies of the report to English Heritage, two copies to RMC Aggregates (Western) Limited, copies to all SWAG members who have participated in the project and two copies to the County Archaeological Officer.

The Service has a professional obligation to make archaeological information available within a reasonable period (outside of any period of confidentiality reasonably required by the Client). The report will be submitted to the SMR with a short summary to be published in one or more regional journals (eg West Midlands Archaeology, Transactions of the Worcestershire Archaeological Society) where appropriate. The report will be submitted to

the SMR within three months of completion of the fieldwork, unless the Service is notified to the contrary.

All artefacts, except articles defined as treasure under the Treasure Act 1996 (or other legal requirements), discovered in the course of the archaeological project shall be the property of the landowner, RMC Aggregates (Western) Limited. The Service will encourage RMC to donate any artefacts to an appropriate museum where they may be curated and made available for research and education. The Service will approach RMC after completion of the project with regard to the final deposition of artefacts.

The record archive will be prepared in accordance with the specification provided by English Heritage in MAP2 (Appendix 3) and is intended to be placed at:

Worcestershire County Museum
Hartlebury Castle
Hartlebury
Near Kidderminster
Worcestershire DY11 7XZ
Tel Hartlebury (01299) 250416

Security copies will be kept by the Service (or other appropriate arrangement).

10.4.3 **Task 12: Outreach**

Apart from the training to be provided to SWAG members and described above, it is proposed that the following provision is also made to encourage local community involvement and interest:

- Website – the Services' website (<http://www.worcestershire.gov.uk/home/index/cs-index/cs-archeo.htm>) will be updated (by the Project Manager, Field Officer and Illustrator) with a page to include information on the project. Initially this will include an outline of the project. Further information will be added following Stage 2 and also at the completion of Stage 3.

Where trial trenching is undertaken the following additional tasks will be undertaken:

- Local school/s – Upon completion of fieldwork, the Service will organise visits to local village schools (2 schools). Results of the work will be described, finds displayed and associated activities organised. This will be undertaken by the Historic Environment Record Officer with special responsibility for outreach assisted by a member of the project team. This element of the project will form part of the Services' overall commitment to the local community, the input of the Environment Record Officer being funded through the Service's core budget;
- Display – Upon completion of the fieldwork; a display and presentation of artefacts will be arranged in the local village hall. Organisation and publicity for this event will be undertaken in conjunction with the local parish council and through the Historic Environment Record Officer with the assistance of the Field Officer and Illustrator.

11. **Health and Safety**

The Service is covered by the conditions and requirements of the County Council's health and safety policies and procedures (as amended):

- Health and Safety, corporate health and safety policy 1998;
- Corporate Services safety policy (Cultural Services) 2000.

The County Council also produces supplementary guidance, which may be applicable (for example):

- Guide to general risk assessment, no date;
- Display screen equipment, information for users, 1992;
- Manual handling in libraries, no date.

The Service has issued Manual of Service practice: safe working practice (1996 as amended, County Archaeological Service internal report, 461) which are guidelines drawn from its risk assessments of common situations. The following guidelines are relevant to this project, and all staff and volunteers will be made aware of them through an initial site induction:

- Working out of doors and working with soils;
- Travelling;
- Processing finds and environmental samples;
- Working with tools and small equipment;
- Working with large plant.

In addition provision has been made within the guidelines for assessing further risks which may be encountered during the project (The specific circumstances of the site).

All these documents may be viewed at the Service's offices, and may be copied to the English Heritage on request.

The Service will check with RMC Aggregates Western Limited on the location of any hazards within the archaeological site before the project commences. These include the location of existing services, contaminated ground and any agricultural chemicals.

The project is for the purposes of survey (partly to establish site conditions) and is considered to fall outside of the Construction (Design and Management) Regulations 1994. Should the Service be asked to participate in any development programme it will fulfil its responsibilities both as an archaeological designer and contractor, where requested.

- Protective clothing will consist of hard hat, protective boots, and high visibility jacket.
- All staff will be appropriately certified in the use of any equipment used during the project. Any equipment or plant (including scaffolding) will be inspected before use by Service staff.

12. Resources and programming

12.1 Personnel

The Project Manager (Robin Jackson) will direct the project and should be the first point of contact in all matters relating to the project.

All staff will be appropriately qualified with an established record of expertise. Profiles of key members of the team will be made available on request.

The team will comprise the following, as required.

- Project Manager (Robin Jackson) Responsible for the project.
Co-ordination/liaison. Edit assessment.
Produce UPD
Outreach;
- Field Officer (to be notified) Lead fieldwork.
SWAG training
Prepare assessment report and UPD
Outreach;
- Field Supervisor Support Project Leader.
Provide SWAG training;
- Archaeologists (x3) Undertake fieldwork.
Provide SWAG training
Check and cross-reference fieldwork
archive;
- Finds Assistant (Erica Darch) Finds processing .
SWAG training.
Support Finds Officer
- Finds Officer (Laura Griffin) Finds co-ordination, analysis and
assessment.
External specialist liaison;
- Environmental Officer (Elizabeth Pearson) Environmental sampling policy,
processing, analysis and assessment.
SWAG training
External specialist liaison
- Illustrator (to be determined) Production of report figures
Outreach;
- Historic Environment Record Officer Outreach (funded by County Council).

The following external specialists will be sub-contracted to assist with the project:

- GSB Prospection (£3000 fee) Geophysical survey.
SWAG training
- Metodet (Dean Crawford; 2 days @ £100/day) Metal detecting survey.
SWAG training
- Terra Nova (David Jordan; 2 days @ £225/day) Soil science, geoarchaeology

The Service has worked previously with a range of external specialists in other fields who may be used as appropriate (details will be supplied on request). The following allowance has been made for post-excavation specialist assessment (Samian assessment, pollen assessment, geoarchaeology assessment, etc):

- 5 days input @ £200.00 per day

The following English Heritage and EH retained specialist staff will be consulted and involved in the undertaking of this project:

Kathy Perrin

Project Monitoring

Ian George

Inspector of Ancient Monuments

12.2 Task list and programme

Task	Task name	Staff	Days
	<i>Project Management</i>		
1.0	Manage project	RJ	4
	<i>Non intrusive survey (Stage 2)</i>		
2.0	Geophysical survey	FO Geophysics team	0.5 5
3.0	Metal detector survey	Metodet (Metaldetecting) ED I	3 3 0.5
4.0	Earthwork survey	FO FO I	2.5 1.5 1
5.0	Lidar data	FO I	3.5 1
6.0	Revision of design	RJ FO	1 1
	<i>Trial trenching (Stage 3)</i>		
7.0	Location and machining (banksman) of trenches	FO A	10 2
8.0	Excavation and recording of deposits	FO FS A Terra Nova (geoarchaeology)	10 10 48 2
9.0	Training	FO FS A EP ED	5 5 15 2 2
	<i>Post-fieldwork assessment, analysis and reporting (Stage 4)</i>		
10.0	Assessment and analysis	FO LG ED EP I A Ext Specialist (TBA)	14 9 4 7 8 5 5
11.0	Report edit, collation and UPD	RJ FO LG EP	5 1 1 1
12.0	Outreach	RJ I FO	1 3 2

The level of resources indicated is for the purposes of demonstrating that an adequate level of resources have been committed to the project and variation may occur due to staff availability and the nature of the archaeological site. Any such variation will not compromise the quality or standard of the project.

The project will commence on a date to be mutually agreed in writing. The Service would prefer a period of 4 weeks to complete Stage 2 of the project, a period of 6 weeks to complete Stage 3 and a period of 8 weeks to complete Stage 4.

It is intended that fieldwork stages shall be completed by 19 December 2003 and that all stages of the project will be completed and the report submitted to English Heritage by 27 February 2004.

Publication summary

The Service has a professional obligation to publish the results of archaeological projects within a reasonable period of time. To this end, the Service intends to use this summary as the basis for publication through local or regional journals. The client is requested to consider the content of this section as being acceptable for such publication.

An archaeological desk-based assessment was undertaken at Ripple Quarry, Ripple, Worcestershire (NGR SO 9730 3700), as part of a staged programme of evaluation supported by English Heritage through the Aggregates Sustainability Levy (ALSF).

A combination of existing SMR and documentary sources, aerial photographic interpretation and field walkover identified evidence of occupation and other activity dating from the prehistoric, Roman, medieval and post-medieval within the project study area. The area included evidence for enclosures, trackways and other features, some of which may be associated with occupation at Towbury Hillfort lying only 500m to the east. In the south-west of the quarry, a quantity of Romano-British ceramics has been recorded from beneath 4 feet (1.22m) of alluvium by the 19th century antiquarian Allies. In addition evidence of medieval settlement in the vicinity was focused around the villages of Ripple, Uckinghall, Queenhill and Holdfast with associated cultivation represented by ridge and furrow in adjacent fields.

The desk-based assessment has indicated a high potential for archaeological remains ranging from the prehistoric to the post-medieval period, which where buried by alluvium have the potential to be well preserved and associated with palaeoenvironmental remains. An updated project design has been produced for further evaluation of the archaeological potential of this area.

13. Acknowledgements

The Service would like to thank the following for their kind assistance in the successful conclusion of this project:

From English Heritage, Kathy Perrin, Kath Buxton, Tim Cromack and Gareth Watkins;

From RMC Aggregates (Western) Limited, Alison Pritchard and Mike Roberts; and

The tenant farmer Mike Evans.

14. Personnel

The fieldwork and report preparation was led by Anna Deeks. The project manager responsible for the quality of the project was Robin Jackson. Fieldwork was undertaken by Anna Deeks and Adam Mindykowski, and illustration by Steve Rigby. Chris Cox contributed the Aerial photographic assessment.

15. Bibliography

- Allies, J, 1852 *The antiquities and folklore of Worcestershire*. 62-4
- AS, 2003 *Proposal for an archaeological desk-based assessment at RippleQuarry, Ripple, Worcestershire*, Archaeological Service, Worcestershire County Council, unpublished document dated 3rd February 2003, P2338
- Barclay, W J, Green, G W, Holder, M T, Moorlock, B S P, Smart, J G O, Strange, P J, and Wilson, D, 1988 *Bristol Channel (sheet 51°N-04°W): solid geology*, 1:250,000 map, British Geological Survey, Keyworth
- Beard, G R, Ragg, J M, George, H, Heaven, F W, Hollis, J M, Jones, R J A, Palmer, R C, Reeve, M J, Robson, J D, and Whitfield, W A D *et al*, 1986. *Soils of Worcestershire and the Malverns district*. Soil Survey of England and Wales, sheet 150 1:50 000. Harpenden
- Grey, E F, 1936 *Old Ripple*. Transactions of the Worcestershire Archaeological Society, **Vol XIII**, pp 50 - 64
- Field, J, 1972 *English Field Names. A Dictionary*. David & Charles: Newton Abbott
- IFA, 1999 *Standard and guidance for archaeological desk-based assessment*, Institute of Field Archaeologists
- Mawer, A, and Stenton, F M, 1927 *The place-names of Worcestershire*, Cambridge University Press, London
- Nash, 1795 *History of Worcestershire. Volume III*
- Pearson, E, 1999 *Watching brief at the Paddock, Ferry Lane, Uckington* Archaeological Service, Worcestershire County Council, unpublished document dated March 1999, **P1614**
- Robson, S. 2000 *Watching brief and building recording at St Marys church, Ripple*. Archaeological Service, Worcestershire County Council, unpublished document dated 27th June 2000, **P1802**
- Sidney, S. 1969 *The parish of Ripple in the 18th century*. Dissertation Worcester College of Education.
- VCH I, Doubleday, H A (ed), 1971 *Victoria History of the County of Worcestershire*. Dawsons of Pall Mall Folkstone and London
- VCH II- IV, Page. W (ed), 1971 *Victoria History of the County of Worcestershire*. Dawsons of Pall Mall Folkstone and London

16. Abbreviations

- | | |
|------|---|
| WSM | Numbers prefixed with 'WSM' are the primary reference numbers used by the Worcestershire County Sites and Monuments Record. |
| WCRO | Worcestershire County Records Office. |
| NMR | National Monuments Record. |
| SMR | Sites and Monuments Record. |

	Task name	Staff	Days	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12	Wk 13	Wk 14	Wk 15	Wk 16	Wk 17	Wk 18
Project Management																					
1.0	Manage project	RJ	4	■				■						■					■		
Non intrusive survey																					
2.0	Geophysical survey	FO	0.5		■	■															
		GSB	5		■	■															
3.0	Metal detector survey	DC	3		■	■															
		ED	3		■	■															
		I	1		■	■															
4.0	Earthwork survey	FO	3		■	■															
		FO	2		■	■															
		I	1		■	■															
5.0	Lidar data	FO	3.5		■	■															
		I	1		■	■															
6.0	Revision of design	RJ	1				■														
		FO	1				■														
		I	1				■														
Trial trenching																					
7.0	Location and machining (banksman) of trenches	FO	10					■	■												
		A	2					■	■												
8.0	Excavation and recording of deposits	FO	10					■	■	■	■	■	■								
		FS	10					■	■	■	■	■	■								
		A	48					■	■	■	■	■	■								
9.0	Training	FO	5							■	■										
		FS	5							■	■										
		A	15							■	■										
		EP	2							■	■										
		ED	2							■	■										
Post-fieldwork assessment, analysis and reporting																					
10.0	Assessment and analysis	FO	14											■	■	■	■	■	■	■	
		LG	9											■	■	■	■	■	■	■	
		ED	4											■	■	■	■	■	■	■	
		EP	7											■	■	■	■	■	■	■	
		I	8											■	■	■	■	■	■	■	
		A	5											■	■	■	■	■	■	■	
		Ext Sp	5											■	■	■	■	■	■	■	
11.0	Report edit, collation and UPD	RJ	5											■	■	■	■	■	■	■	■
		FO	1											■	■	■	■	■	■	■	■
		LG	1											■	■	■	■	■	■	■	■
		EP	1											■	■	■	■	■	■	■	■
12.0	Outreach	RJ	1				■														
		I	3				■														
		FO	2				■														



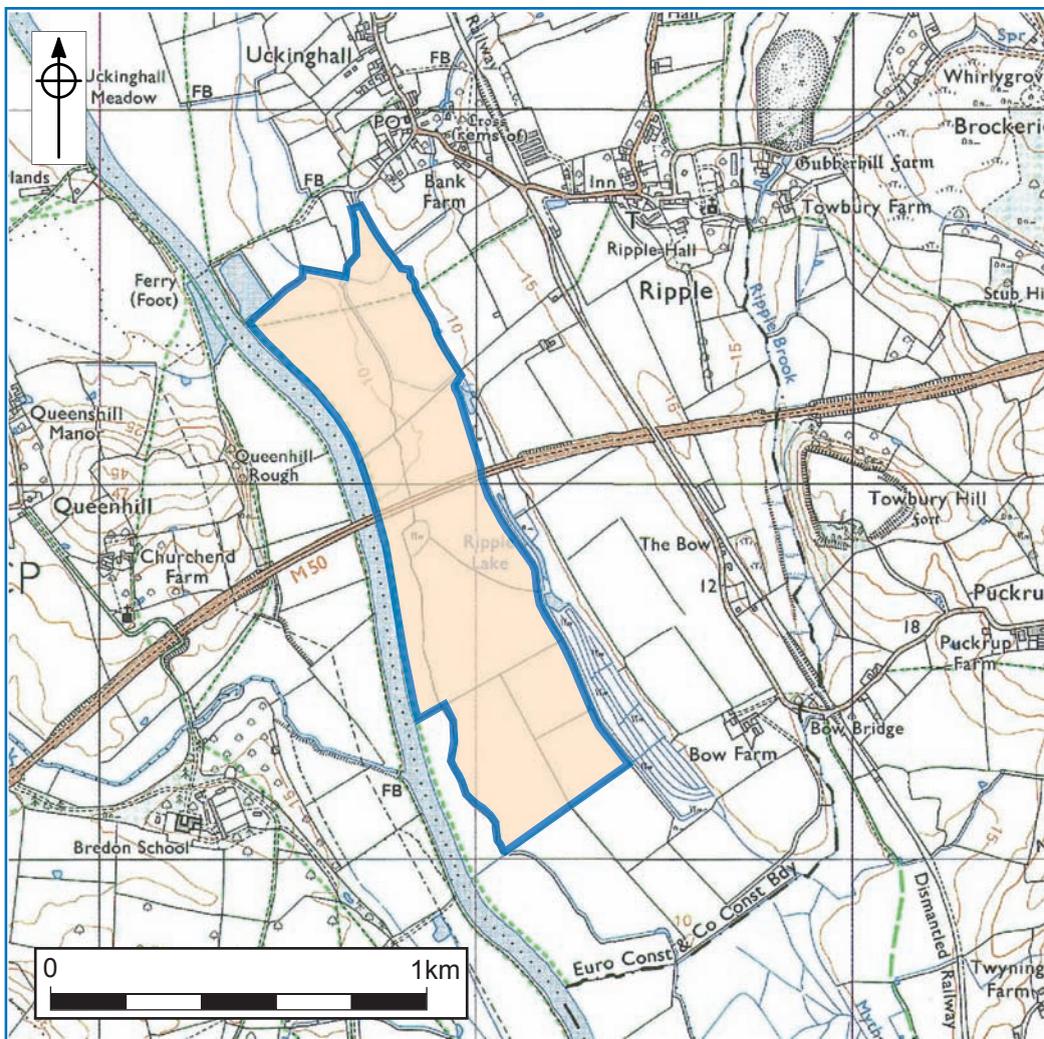
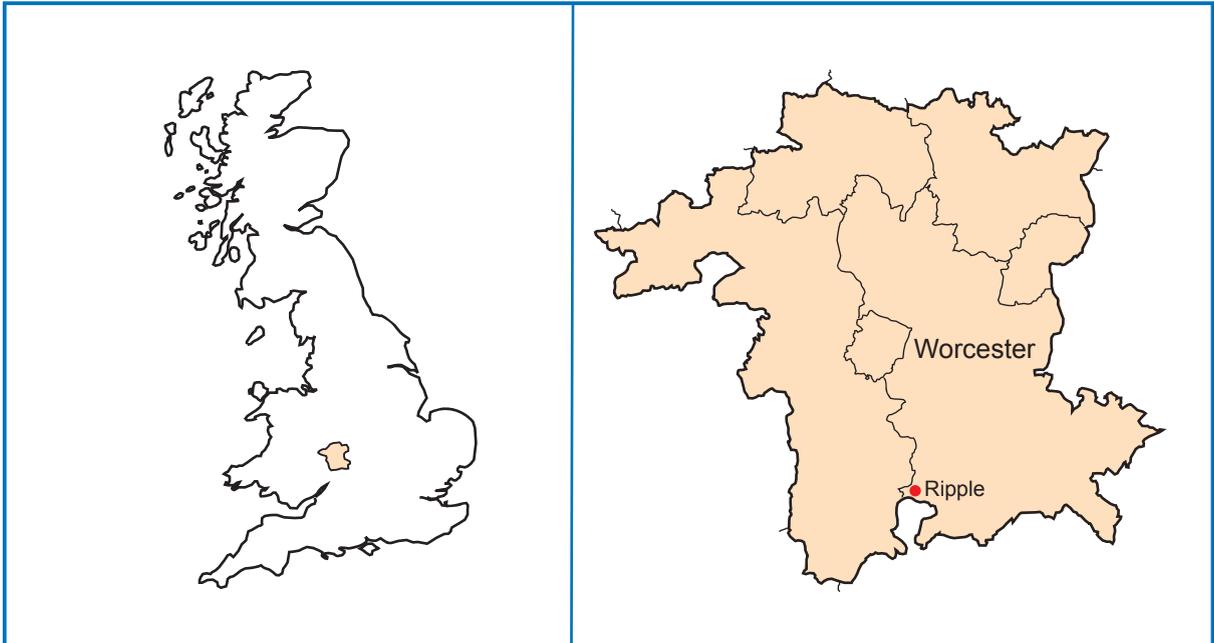
Plate 1: M50 road bridge spanning northern extent of field 3 and 4



Plate 2: Marram grass coverage in field 6



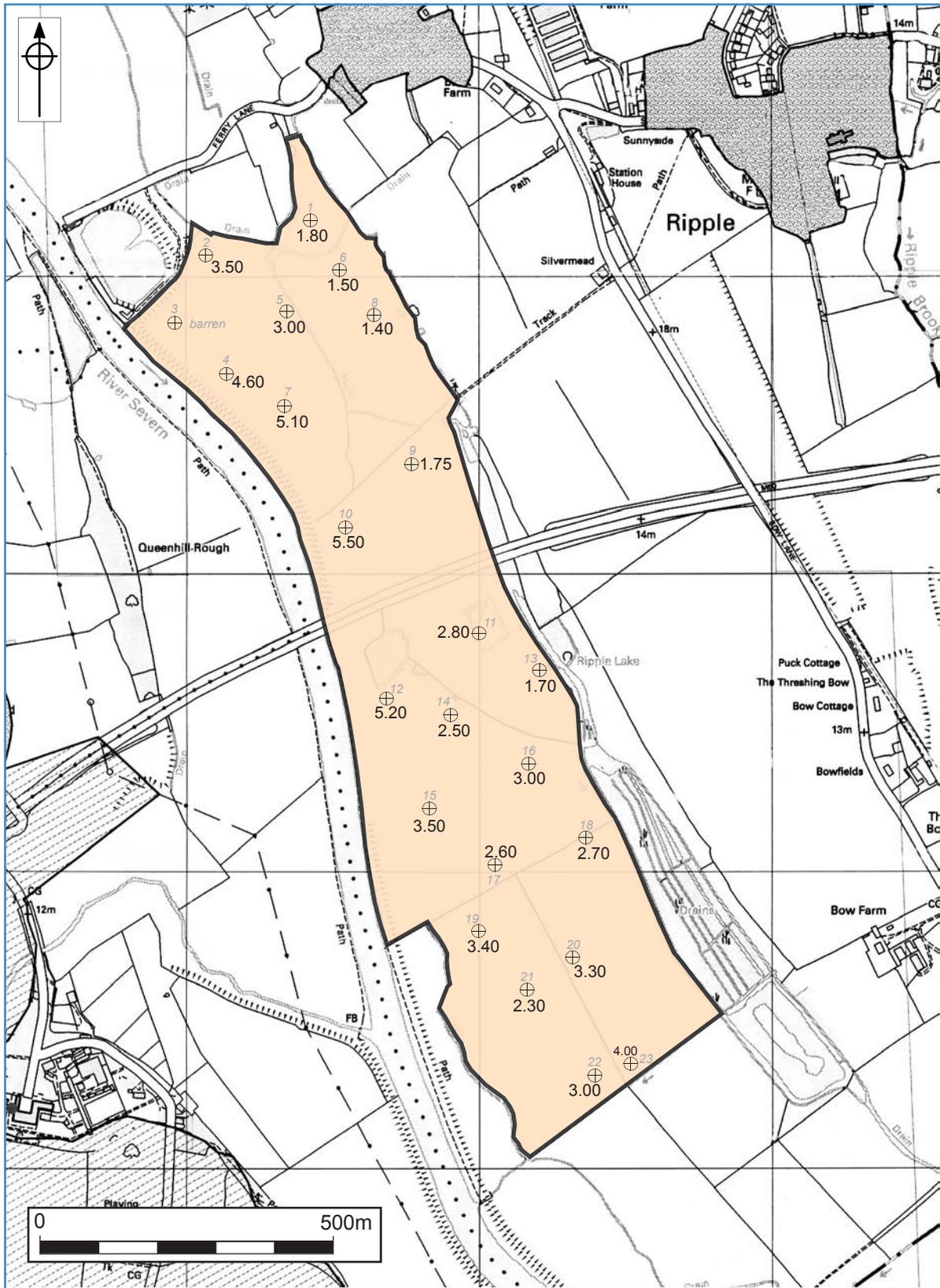
Plate 3: Field boundary at western edge of field 7

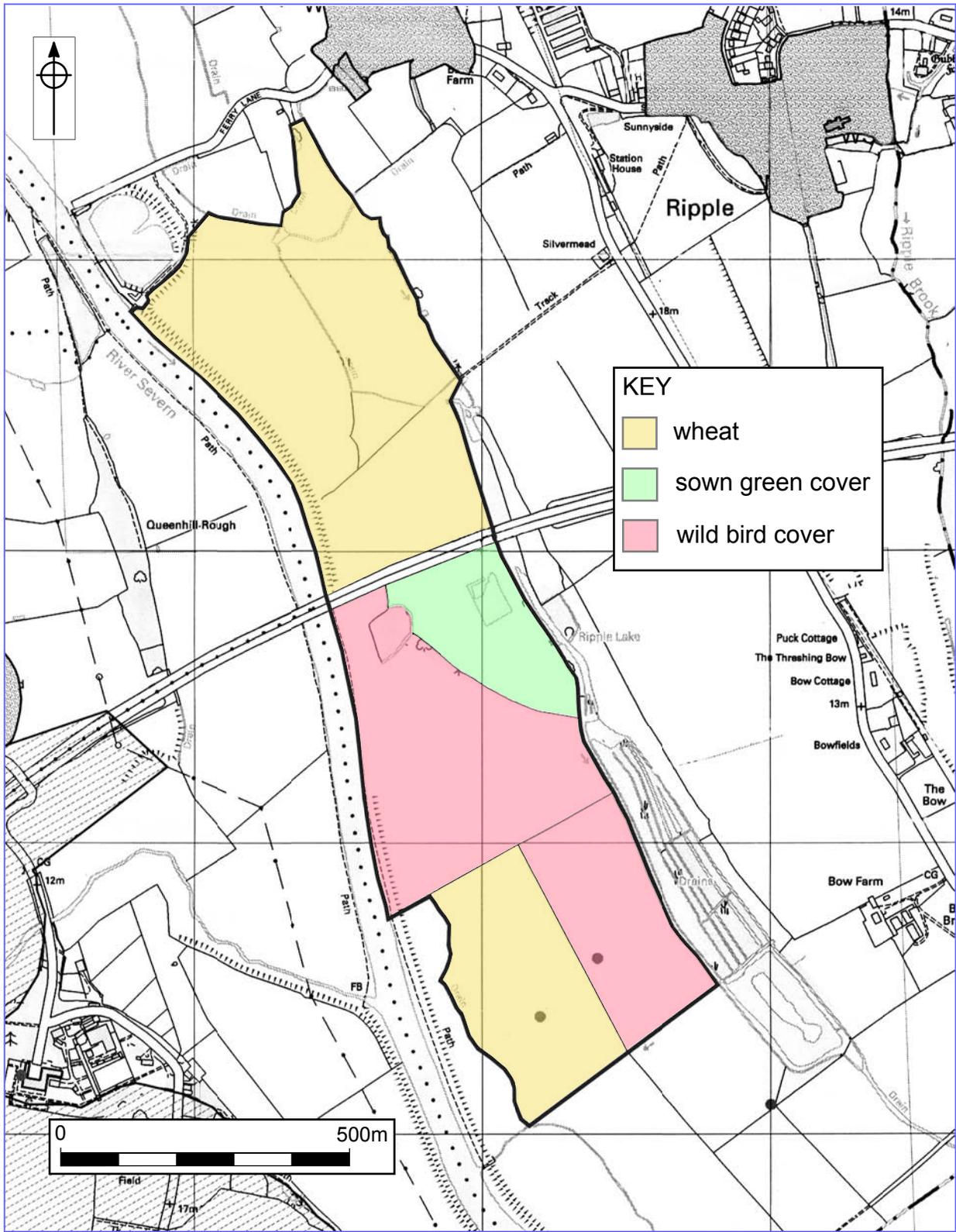


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Location of the site.

Figure 1

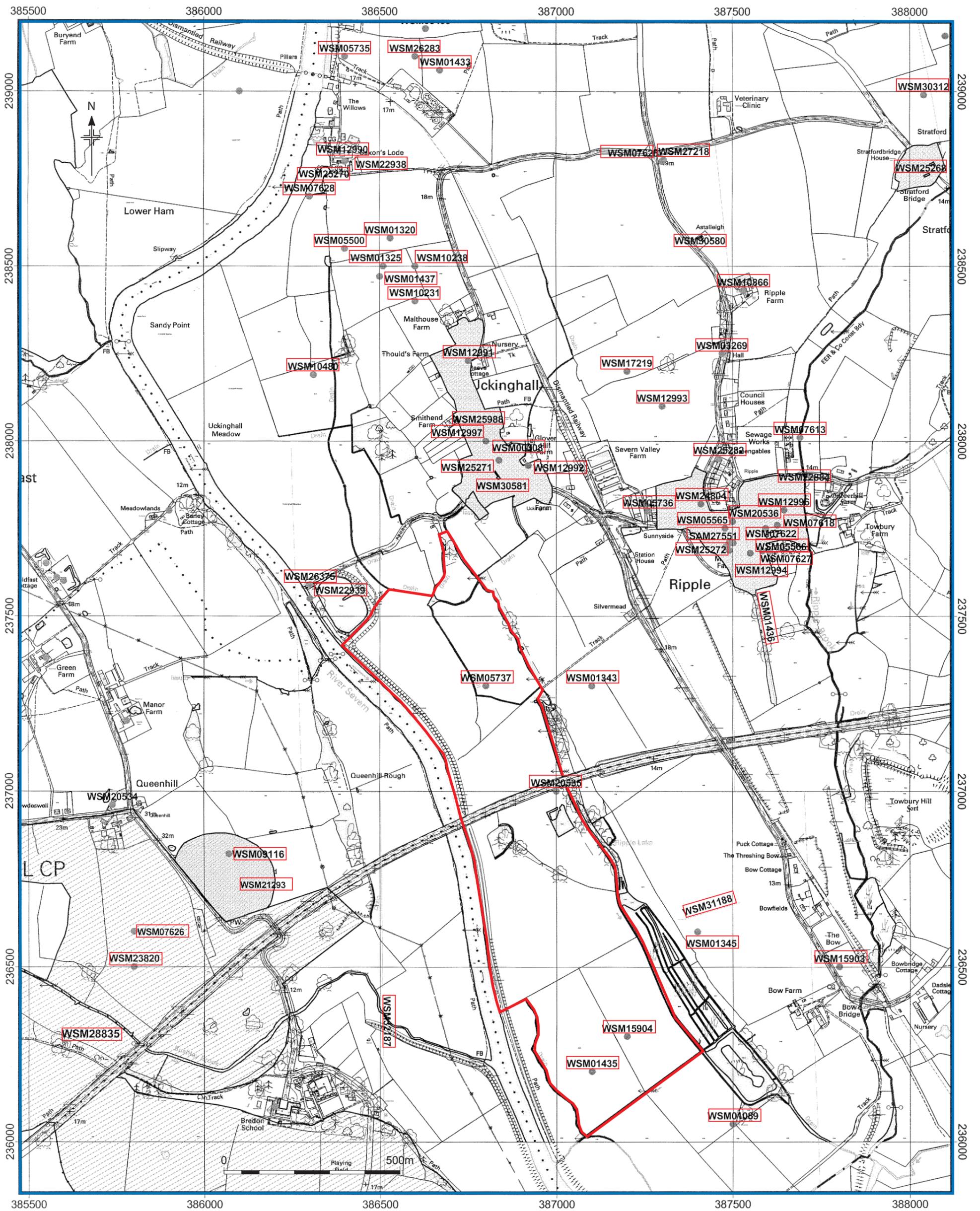




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Map of current use

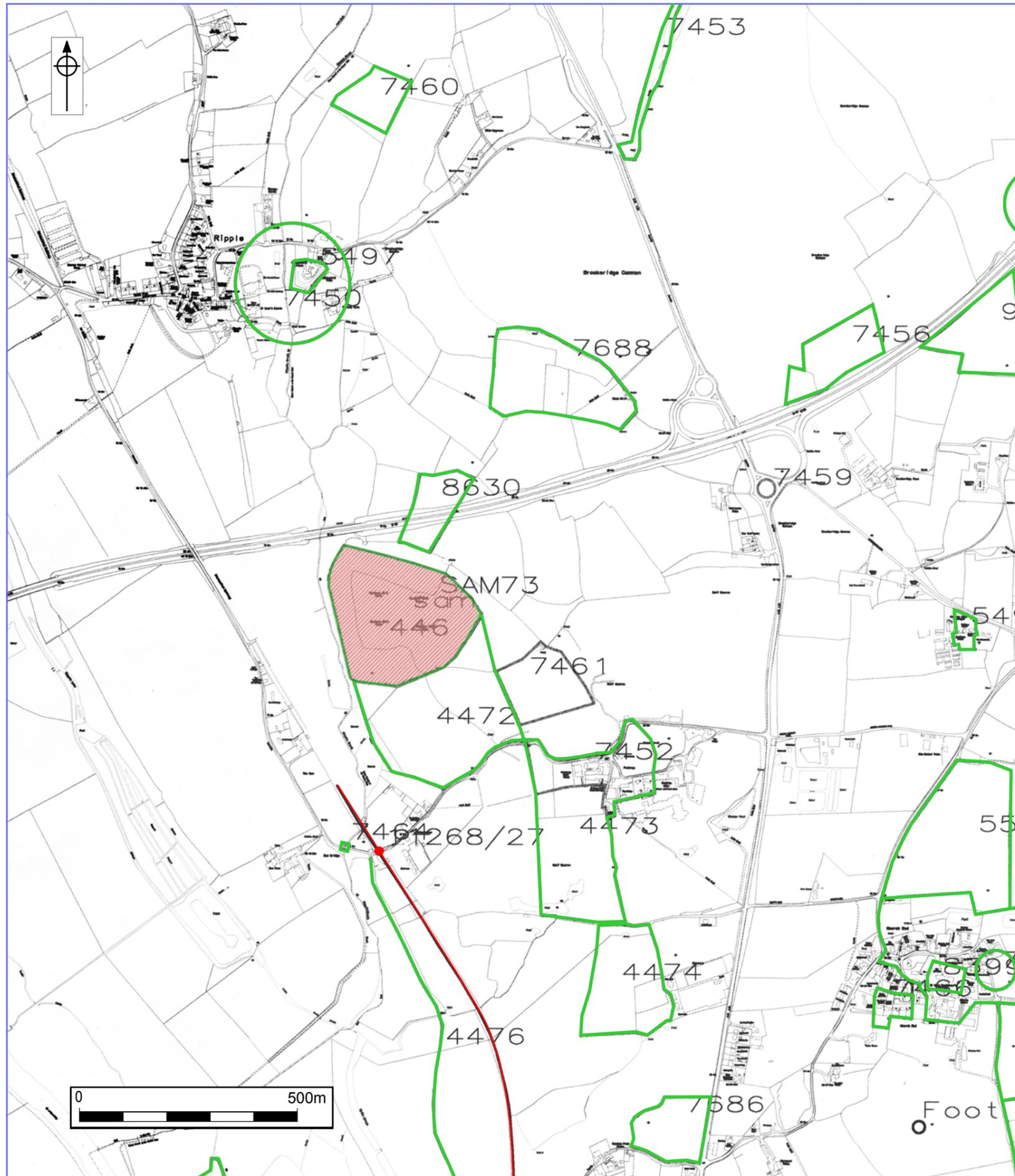
Figure 3



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Figure 4

Sites registered on the WSMR (within 7.5² of study area).

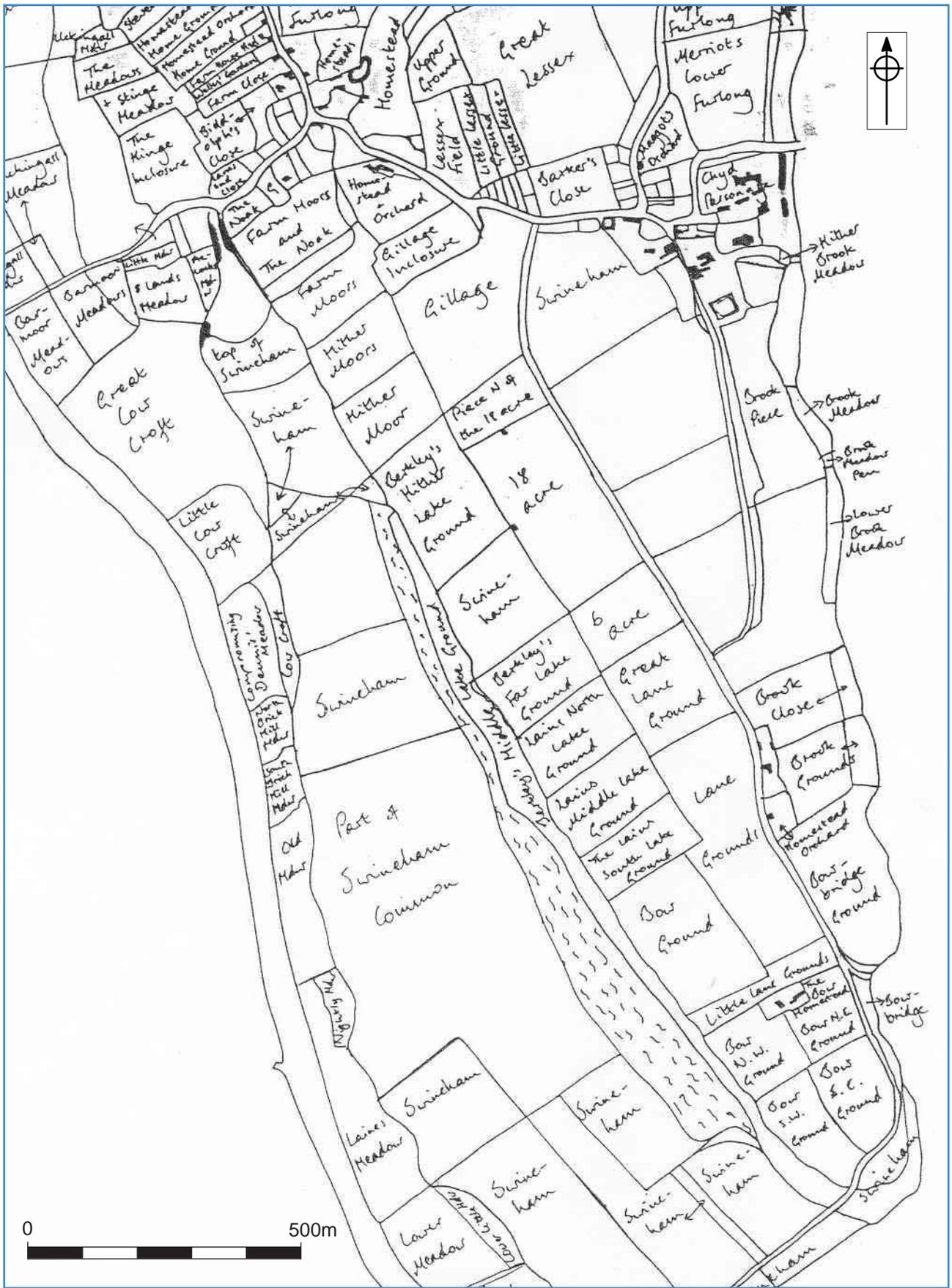


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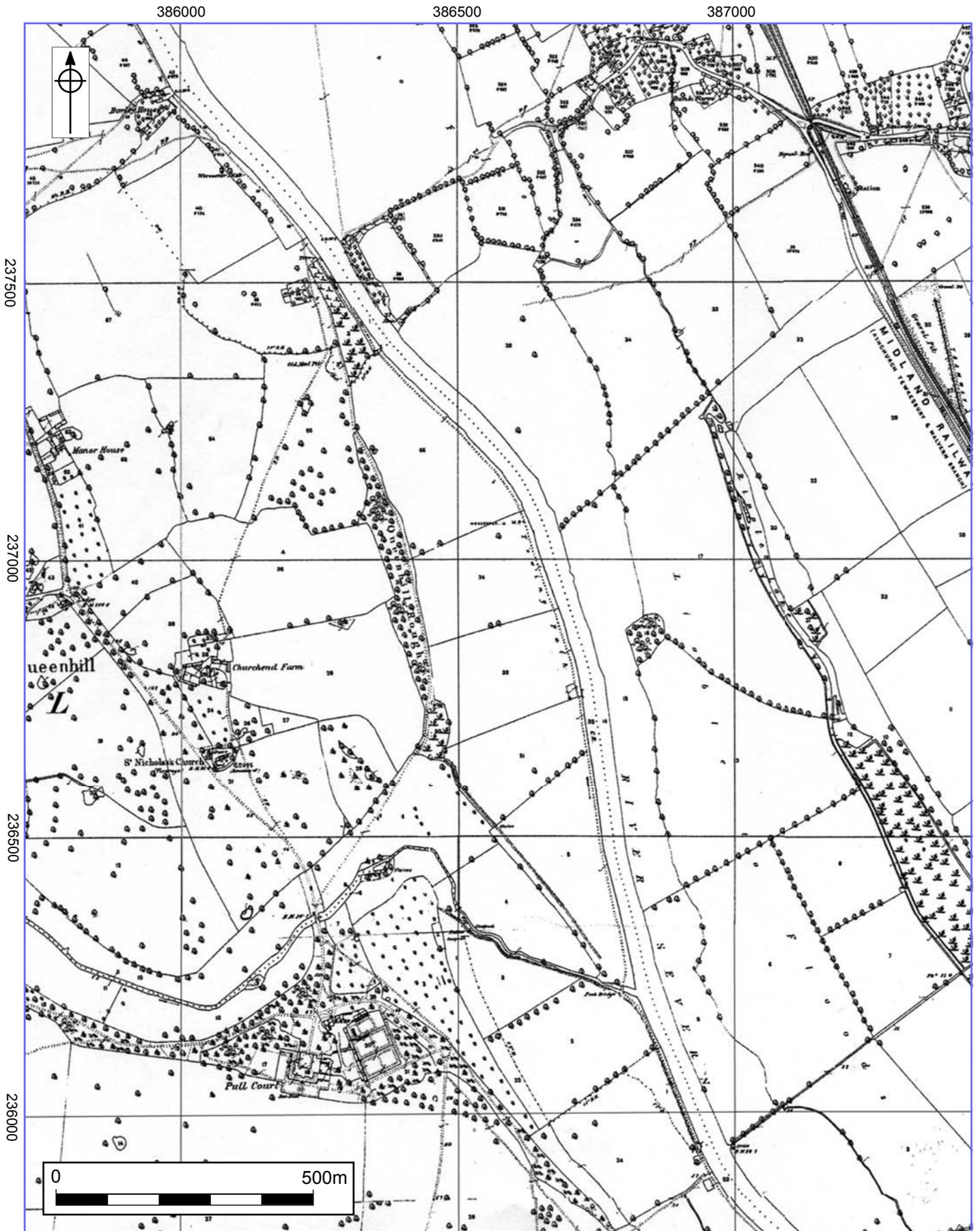
Sites registered on the GSMR (within the proximity of Towbury hillfort
 (reproduced with kind permission of Gloucestershire County Council)

Figure 5



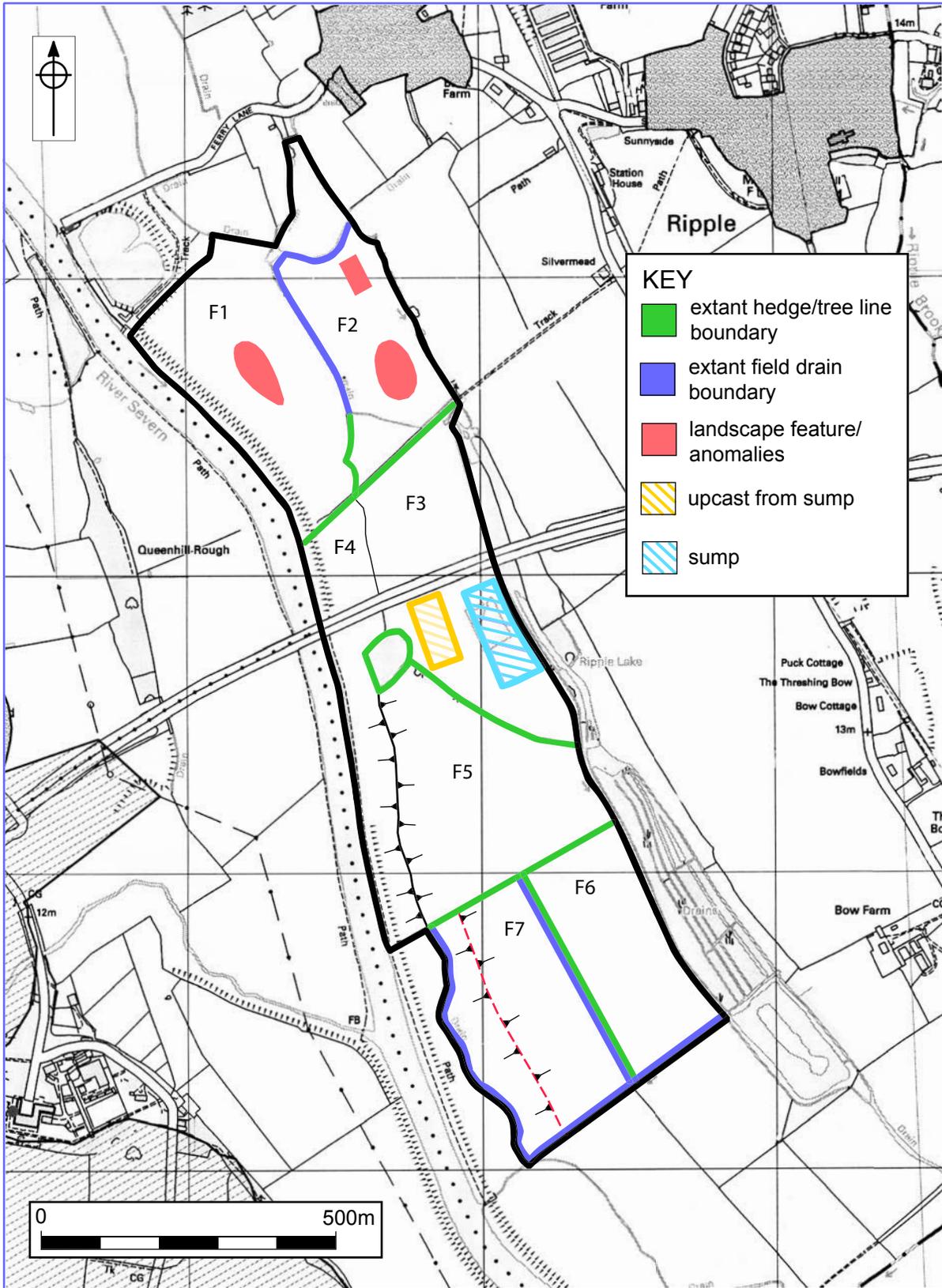
Extract from Inclosure map of Ripple, 1807

Figure 6



1886 edition map of the study area

Figure 7



© Crown copyright.

Plan of results of field walkover

Figure 8

APPENDIX A: AERIAL PHOTOGRAPHIC ASSESSMENT

CONTENTS

- 1 INTRODUCTION**
- 2 THE STUDY AREA, FIGURE 1**
- 3 ARCHAEOLOGY FROM AERIAL PHOTOGRAPHS**
- 4 AERIAL PHOTOGRAPHS: TYPES AND SOURCES**
- 5 INTERPRETATION AND MAPPING METHODOLOGY**
- 6 MAPS**
- 7 RESULTS**
- 8 CONCLUSION**

APPENDIX 1

Aerial Photographs Consulted At the NMR

FIGURE 1 Archaeological features recorded within the Site

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1 INTRODUCTION

- 1.1 Chris Cox BA MA MIFA, of CgMs Consulting, undertook this assessment of aerial photographs during March 2003.
- 1.2 It was completed on behalf of Worcestershire County Archaeological Service, to identify and provide detailed mapping of archaeological features visible on aerial photographs within the study area at Ripple Quarry, Worcestershire.

2 THE STUDY AREA, Figure 1

2.1 Location

2.1.1 The site lies to the southwest of Ripple village on the east bank of the River Severn. It centres upon National Grid Reference SO 875365.

2.2 Soils and Geology

2.2.1 The study area is alluviated on its west side, where the land shows evidence of drainage for cultivation, with first terrace sand and gravels to its east. The well-drained soils on these areas allow the formation of marks in crops over cut buried features.

2.3 Archaeology

2.3.1 The study site and its environs contain evidence for prehistoric, Iron Age, Roman and Medieval land use and settlement. There is a Roman site at Ripple, and an Iron Age fort 500m to the east of the study area at Towbury Hill. Traces of Medieval farming and settlement may be discerned to the west of the area across the river, and at least part of the study area was cultivated in the Medieval period.

2.3.2 The site shows clear evidence for past occupation, and is likely to have been settled and farmed in later prehistory or during the Roman occupation.

2.4 Land-use and condition

2.4.1 The area is relatively level and lies partially within the alluviated floodplain of the River Severn. The majority of the area is in arable cultivation. Features contained within the top and sub soils may be heavily eroded.

3 ARCHAEOLOGY FROM AERIAL PHOTOGRAPHS

3.1 The role of aerial photographic interpretation

- 3.1.1 Air photo interpretation provides a unique overview of landscape history and changes in land-use. It provides informed guidance for subsequent desk and ground-based investigations and complements cartographic and documentary research.
- 3.1.2 Information gained from aerial photographs cannot easily be detected by other means and the interpretation of contemporary and archival aerial photographs is thus an important component of multi-disciplinary archaeological investigation.
- 3.1.3 Interpretation of aerial photographs allows the accurate mapping of archaeological sites recorded as crop, grass or vegetation marks (caused by the differential growth of plants over buried features); soil marks (caused by differences in soil colour over ploughed buried features) and shadows cast by upstanding earthworks and features seen in relief. In this instance, features were seen as positive marks in crops and grass.

3.2 Limitations of the data

- 3.2.1 Aerial photographic evidence is limited by seasonal, agricultural, meteorological and environmental factors which affect the extent to which either buried or upstanding archaeological features can be detected. It is thus advantageous to examine a range of photos taken under a variety of environmental conditions in order to build up a comprehensive interpretation of the archaeological landscape.
- 3.2.2 The visibility of archaeological features may differ from year to year. Individual photographs thus often record only a small percentage of the actual extent of buried or upstanding features. In this case, I consider that the buried features which show as crop marks are likely to be much more extensive in both area and complexity than shown by existing aerial photographs. Alluviated areas will not show marks in crop over features buried deep within the alluvial deposits.

4 AERIAL PHOTOGRAPHS: TYPES AND SOURCES

4.1 Types

- 4.1.1 Two types of aerial photograph are used for archaeological interpretation. Vertical aerial photographs are taken for general-purpose survey using a camera mounted inside a modified aircraft. The aircraft is flown on a pre-planned set of overlapping flight-lines which cover the survey area completely. The camera points straight towards the ground. The vertical viewpoint provides aerial photographic coverage from a fixed scale and constant 180° angles at the centre of each frame. The overlap between the areas covered by each consecutive frame is usually 60%. This overlap between frames enables the photo interpreter to study each pair of vertical photos under a stereoscope.
- 4.1.2 The stereoscope combines the two images to allow the interpreter to see one three-dimensional image of the ground surface. Vertical aerial photographs carry inherent distortions introduced by variations in perspective and ground height, but are essentially ‘map-like’ in appearance. They are generally taken for non-archaeological, civil and military purposes and form the basic data from which most modern maps are compiled. Vertical aerial photographs are a very useful source of archaeological data, particularly in areas where features survive as earthworks. They also constitute historical ‘documents’.
- 4.1.3 Oblique aerial photographs are taken using a hand held camera by an aerial archaeologist to portray features which have been identified during specialist survey. These photos are extremely useful, but contain inherent perspective distortions, which must be accounted for in rectification and mapping procedures. All features recorded during this assessment were interpreted from oblique aerial photographs, and supplementary data were derived from verticals.

4.2 Sources of data

- 4.2.1 Vertical and oblique aerial photographs taken between 1946 and 2000 were interpreted. These are archived at the English Heritage National Monuments Record (NMR - EH Coversearch number AP 53788, 20-02-03, at Appendix 1) and at Worcestershire SMR.

5 INTERPRETATION AND MAPPING METHODOLOGY

- 5.1 Photographic interpretation, rectification and mapping were carried out following procedures defined by IFA Technical Paper Number 12. All photographs were closely examined, under 1.5x and 4x magnification and interpreted with the aid of a mirror stereoscope where appropriate.
- 5.2 Transparent interpretative overlays were prepared, from which archaeological and associated relevant data were scanned for rectification to the map base.
- 5.3 Interpreted features were rectified, where appropriate, by computer using ortho-photo rectification software, AirPhoto 2.17. This software calculates values for the closeness of control point match between the photograph and an accurately surveyed digital map base. It utilises an initial plane surface mathematical rectification technique to match photo and map data.
- 5.4 The mean error value of the control points when matched to the map was less than 1.8m in all cases, which is acceptable when matching to maps surveyed at 1:2500 scale.

6 MAPS

- 6.1 Aerial photographic data were rectified to an OS digital map base. This base was used for geo-referencing and presentation of the results in both digital and paper formats.
- 6.2 The mapping was produced using AutoCAD Map Release 14 and 2000 and may be exported as required subject to checking of complete data transfer and positional accuracy by the client.

7 RESULTS Figure 1

7.1 The following features were identified within the Site:

Feature A

NGR	SO 866373
Photo number	WSM 05737 J. Pickering
Location	East bank of River Severn

Oblique aerial photos, which cover a buried enclosure to the immediate west, also record traces of possible pits at Location A.

These features are very faint, and may be natural anomalies. They did not show on any other photographs.

Feature B

NGR	SO 868374
Photo number	WSM 05737 J. Pickering
Location	Between Silvermead and River Severn

Marks in crop or grass at Location B show traces of buried enclosures and possible cut curvilinear features. These are highly likely to be of archaeological origin – probably a stock penning or settlement enclosure. Two wide dark features on either side of the enclosure may be associated, or may be traces of later drainage or other cultivation land use.

Feature C

NGR SO 871373
Photo number WSM 01343, J. Pickering
Location West of Silvermead

Definite traces of an incompletely visible buried ditched enclosure, fragment of a possible further enclosure and a pit. These features show as positive marks in crops and pre-date the modern landscape.

The field to the immediate north of the enclosure contains crop-marked traces of a ploughed-out Medieval ridge and furrow.

Feature D

NGR SO 875367
Photo number SO8736/37
Location Between Bow Farm and Ripple Lake

Extensive traces of a probable later prehistoric site show at this location, which also contains feature D, a later system of ditched boundaries. These boundaries were not extant in the 1940s.

Feature E

NGR SO 875366
Photo number SO8736/37
Location Between Bow Farm and Ripple Lake

Extensive traces of a probable later prehistoric site show at this location, which also contains features at E, which comprise a double ditched probably rutted track or road way and a similarly aligned row of closely spaced pits, indicative of a former boundary or fence line.

The trackway is bounded by double ditches and shows further ditches in its interior, which probably reflect a well-used and rutted surface. It is likely to have been in use at the same time as the pit alignment.

Feature F

NGR SO 873368

Photo number SO8736/37

Location Between Bow Farm and Ripple Lake

Sinuuous and linear ditches with associated complexes of ditched enclosures. The enclosures contain multiple pits and internal and external features. Although they are the subject of extensive photographic coverage, and have been seen as crop marks over a number of years, their extent and morphology has never been seen very clearly.

It is obvious that these features represent a very dense and complex area of past settlement which comprises ditched enclosures, and is likely to have been a farmstead with associated trackways, and land boundaries such as those seen to its immediate south.

The entire area within and around these enclosures contains many minor cut features and areas of dense pits, indicative of extensive past landuse and possibly a long period of occupation.

Feature G

NGR SO 876364

Photo number J.Pickering

Location Between Bow Farm and Ripple Lake

Traces of ploughed out broad ridge and furrow indicative of Medieval agriculture.

Feature H

NGR SO 876362

Ripple Quarry Worcestershire, Aerial Photographic Interpretation.

Photo number 1:2500 scale vertical (WSM)

Location East of Ripple Lake

Faint traces of linear features which show as marks in grass or crop. These may be agricultural features, but their regularity suggests a possible archaeological significance, given the proximity of a definite ancient trackway to the immediate north.

8 CONCLUSION

- 8.1 The study area contains a very extensive complex of possible Iron Age settlement remains, which comprise enclosure, pits, tracks and boundaries. Further enclosures to the north may be contemporary.
- 8.2 The area was thus settled and farmed in later prehistory, as attested by the proximity of a hill-fort structure at Towbury.
- 8.3 Farming obviously continued into the Medieval period.
- 8.4 It is likely that the archaeological features recorded as crop marks are more extensive than shown on the aerial photos, and may continue beneath the alluvium.

Ripple Quarry Worcestershire, Aerial Photographic Interpretation.

Appendix 1: Aerial Photographs consulted at EH

Ripple Quarry Worcestershire, Aerial Photographic Interpretation.

ENGLISH HERITAGE - NATIONAL MONUMENTS RECORD
National Monuments Record - Air Photos Library

Summary report for specialist collection

Date : 20-Feb-2003 Time : 12:45:24

Customer Enquiry Reference No. 53788

NGR Index Number	Accession Number	Frame	Original Number	Copy right	Repos itory	Film Details	Date Flown	DF	6 Fig NGR	
S08536/10	NMR 18986	18		EHC	NMR	B 35 mm	Colour neg	14-DEC-2000	1	S0858368
S08635/1	HAW 9388	47	AB	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	S0866358
S08635/2	HAW 9388	48	AB	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	S0866358
S08636/1	HAW 9388	51	AB	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	S0863361
S08636/2	HAW 9388	49	AB	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	S0863361
S08636/3	HAW 9388	50	AB	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	S0862361
S08636/4	HAW 9388	52	AB	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	S0862361
S08636/5	HAW 9388	53	AB	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	S0862361
S08636/23	NMR 21083	07		EHC	NMR	B 70mm,120,220	Black& white	14-DEC-2000	1	S0865369
S08636/24	NMR 21083	08		EHC	NMR	B 70mm,120,220	Black& white	14-DEC-2000	1	S0865369
S08637/1	JAP 6932	212	89.3	JAP	NMR	B 35 mm	Copy slide	23-JUN-1989	1	S0869374
S08637/2	JAP 6932	213	89.3	JAP	NMR	B 35 mm	Copy slide	23-JUN-1989	1	S0868373
S08637/3	JAP 6932	214	89.3	JAP	NMR	B 35 mm	Copy slide	23-JUN-1989	1	S0867373
S08637/4	HAW 9389	04	AC	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	S0863377
S08637/5	HAW 9389	05	AC	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	S0863377
S08637/20	NMR 21083	09		EHC	NMR	B 70mm,120,220	Black& white	14-DEC-2000	1	S0869371
S08638/1	WAB 136	29		WAB	NMR	B 5x5"	Black& white	01-JUL-1969	2	S0865385
S08638/2	WAB 136	30		WAB	NMR	B 5x5"	Black& white	01-JUL-1969	2	S0865385
S08638/3	CAP 7891	14	BPX	CAP		B Unknown	Black& white	18-JUN-1974	1	S0864384
S08638/4	JAP 1728	26		JAP	NMR	B 35 mm	B&W copy clr	28-JUL-1979	1	S0865385
S08638/6	JAP 1728	27	446	JAP	NMR	B 35 mm	B&W copy clr	05-AUG-1979	1	S0865385
S08638/7	JAP 1731	07	851	JAP	NMR	B 35 mm	B&W copy clr	21-JUL-1979	1	S0865385
S08638/8	JAP 1731	08	852	JAP	NMR	B 35 mm	B&W copy clr	21-JUL-1979	1	S0865385
S08638/9	NMR 4644	03		CRW	NMR	B 70mm,120,220	Black& white	10-JUN-1990	1	S0865385
S08638/13	JAP 6933	256	89.4	JAP	NMR	B 35 mm	Copy slide	23-JUN-1989	1	S0864385
S08638/14	JAP 6933	257	89.4	JAP	NMR	B 35 mm	Copy slide	23-JUN-1989	1	S0866385
S08638/15	JAP 6968	672	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	S0865384
S08638/16	JAP 6968	673	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	S0864384

Ripple Quarry Worcestershire, Aerial Photographic Interpretation.

NGR Index Number	Accession Number	Frame	Original Number	Copy right	Repos itory	Film Details	Date Flown	DF	6 Fig NGR
SO8638/17	JAP 6968	674	86.21	JAP	NMR	B 35 mm Copy slide	17-JUL-1986	1	SO865385
SO8638/28	NMR 21694	21		EHC	NMR	B 70mm,120,220 Black& white	15-JUL-2002	1	SO865385
SO8638/29	NMR 21694	22		EHC	NMR	B 70mm,120,220 Black& white	15-JUL-2002	1	SO865385
SO8638/30	NMR 21694	23		EHC	NMR	B 70mm,120,220 Black& white	15-JUL-2002	1	SO865385
SO8638/31	NMR 21694	24		EHC	NMR	B 70mm,120,220 Black& white	15-JUL-2002	1	SO863384
SO8736/1	JAP 1728	22	451	JAP	NMR	B 35 mm B&W copy clr	05-AUG-1979	1	SO875365
SO8736/2	JAP 1728	23	450	JAP	NMR	B 35 mm B&W copy clr	05-AUG-1979	1	SO875365
SO8736/3	JAP 1728	24	449	JAP	NMR	B 35 mm B&W copy clr	05-AUG-1979	1	SO875365
SO8736/4	JAP 1731	03	847	JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	SO875365
SO8736/5	JAP 1731	04	848	JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	SO875365
SO8736/6	JAP 1731	05	849	JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	SO874367
SO8736/7	JAP 1731	06	850	JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	SO875365
SO8736/8	JAP 1783	13		JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	SO875366
SO8736/9	JAP 5342	2135	40	JAP	NMR	B 35 mm Copy slide	08-AUG-1987	1	SO872367
SO8736/10	JAP 5342	2136	40	JAP	NMR	B 35 mm Copy slide	08-AUG-1987	1	SO872367
SO8736/11	JAP 5342	2137	40	JAP	NMR	B 35 mm Copy slide	08-AUG-1987	1	SO874366
SO8736/12	NMR 4644	01		CRW	NMR	B 70mm,120,220 Black& white	10-JUN-1990	1	SO872367
SO8736/13	NMR 4644	02		CRW	NMR	B 70mm,120,220 Black& white	10-JUN-1990	1	SO872367
SO8736/14	JAP 6984	244	87.37	JAP	NMR	B 35 mm Copy slide	08-AUG-1987	1	SO873368
SO8736/15	JAP 6932	215	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO871368
SO8736/16	JAP 6932	216	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO873367
SO8736/17	JAP 6932	217	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO873367
SO8736/18	JAP 6932	218	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO873367
SO8736/19	JAP 6932	219	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO874366
SO8736/20	JAP 6932	220	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO872366
SO8736/21	JAP 6932	221	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO872367
SO8736/22	JAP 6932	222	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO872367
SO8736/23	JAP 6932	223	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO872367
SO8736/24	JAP 6933	249	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO875366
SO8736/25	JAP 6933	250	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO873367
SO8736/26	JAP 6933	251	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO871367
SO8736/27	JAP 6933	251A	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO871367
SO8736/28	JAP 6933	252	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO872366
SO8736/29	JAP 6933	253	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO871367
SO8736/30	JAP 6933	254	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO872366
SO8736/31	JAP 6943	682	89.14	JAP	NMR	B 35 mm Copy slide	06-JUL-1989	1	SO872368
SO8736/32	JAP 6947	706	89.18	JAP	NMR	B 35 mm Copy slide	23-JUL-1989	1	SO874366

Ripple Quarry Worcestershire, Aerial Photographic Interpretation.

NGR Index Number	Accession Number	Frame	Original Number	Copy right	Repos itory	Film Details		Date Flown	DF	6 Fig NGR
SO8736/33	JAP 6947	707	89.18	JAP	NMR	B 35 mm	Copy slide	23-JUL-1989	1	SO874366
SO8736/34	JAP 6968	666	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO875366
SO8736/35	JAP 6968	667	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO875366
SO8736/36	FXH 14150	01	92.16	FXH	FXH	B 70mm,120,220	Black& white	07-JUL-1992	1	SO874367
SO8736/37	FXH 14150	02	92.16	FXH	FXH	B 70mm,120,220	Black& white	07-JUL-1992	1	SO874367
SO8736/38	FXH 14150	03	92.16	FXH	FXH	B 70mm,120,220	Black& white	07-JUL-1992	1	SO874367
SO8736/39	JAP 6972	1254	86.25	JAP	NMR	B 35 mm	Copy slide	26-JUL-1986	1	SO874366
SO8736/40	JAP 6972	1255	86.25	JAP	NMR	B 35 mm	Copy slide	26-JUL-1986	1	SO874366
SO8736/41	JAP 6980	AK	86.33	JAP	NMR	B 35 mm	Copy slide	23-JUL-1988	1	SO874366
SO8736/42	JAP 6985	201	88.38	JAP	NMR	B 35 mm	Copy slide	23-JUL-1988	1	SO874366
SO8736/43	JAP 6985	202	88.38	JAP	NMR	B 35 mm	Copy slide	23-JUL-1988	1	SO874365
SO8737/1	JAP 6968	668	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO871373
SO8737/2	JAP 6968	669	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO871373
SO8738/1	JAP 6968	670	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO872381
SO8738/2	JAP 6968	671	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO872381
SO8738/3	HAW 9389	01	AC	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	SO878381
SO8738/4	HAW 9389	02	AC	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	SO878381
SO8836/4	JAP 1728	20	453	JAP	NMR	B 35 mm	B&W copy clr	05-AUG-1979	1	SO880367
SO8836/5	JAP 1728	21	452	JAP	NMR	B 35 mm	B&W copy clr	05-AUG-1979	1	SO880367
SO8836/6	JAP 1731	01	844	JAP	NMR	B 35 mm	B&W copy clr	21-JUL-1979	1	SO881367
SO8836/7	JAP 1731	02	845	JAP	NMR	B 35 mm	B&W copy clr	21-JUL-1979	1	SO881367
SO8836/8	JAP 5342	2132	40	JAP	NMR	B 35 mm	Copy slide	08-AUG-1987	1	SO881363

Total 87 Records

Ripple Quarry Worcestershire, Aerial Photographic Interpretation.

ENGLISH HERITAGE - NATIONAL MONUMENTS RECORD
National Monuments Record - Air Photos Library

Summary report for vertical coversearch

Date : 20-Feb-2003 Time : 12:47:31

Customer Enquiry Reference No. 53788

Sortie Number	Library Number	Cam Pos	Start Frame	End Frame	Held	National Reference Start	Reference End	Date	Date Flag	Qual ity	Scale 1:	Focal Length	Format	Repos itory	Copy Right
RAF/106G/UK/1345	209	V	5082	5084	P	S0878380	S0865381	01-APR-1946	1	A	9800	20.00	BW87	MOD	RAF
RAF/106G/UK/1652	427	RP	3220	3220	P	S0857376	S0857376	11-JUL-1946	1	AB	10000	36.00	BW87	MOD	RAF
RAF/106G/UK/1652	427	V	5220	5220	P	S0855356	S0855356	11-JUL-1946	1	AB	10000	36.00	BW87	MOD	RAF
RAF/CPE/UK/1926	542	RS	4120	4122	P	S0862386	S0876381	16-JAN-1947	1	A	10000	36.00	BW87	MOD	RAF
RAF/CPE/UK/2110	669	RP	3374	3376	P	S0875358	S0864358	28-MAY-1947	1	A	9800	20.00	BW87	MOD	RAF
RAF/CPE/UK/2110	669	RS	4374	4376	P	S0873376	S0863376	28-MAY-1947	1	A	9800	20.00	BW87	MOD	RAF
RAF/540/144	967	V	5066	5075	N	S0876356	S0865379	05-JAN-1949	1	A	3400	14.00	BW87	MOD	RAF
RAF/541/429	1725	RP	3052	3057	P	S0866355	S0862378	14-FEB-1950	1	B	9600	20.00	BW87	MOD	RAF
RAF/541/429	1725	RS	4053	4056	P	S0881367	S0878381	14-FEB-1950	1	B	9600	20.00	BW87	MOD	RAF
RAF/58/5304	2067	F21	52	52	N	S0876352	S0876352	13-JUL-1962	1	AB	10000	24.00	BW99	MOD	CRW
RAF/58/5304	2067	F22	59	60	N	S0872374	S0864367	13-JUL-1962	1	AB	10000	24.00	BW99	MOD	CRW
RAF/58/5516	2120	F21	34	35	P	S0874375	S0864374	17-OCT-1962	1	A	10000	24.00	BW99	MOD	CRW
RAF/58/5516	2120	F21	37	37	P	S0876358	S0876358	17-OCT-1962	1	A	10000	24.00	BW99	MOD	CRW
RAF/58/5516	2120	F22	37	37	P	S0864374	S0864374	17-OCT-1962	1	A	10000	24.00	BW99	MOD	CRW
RAF/106G/UK/1337	3360	V	5079	5080	P	S0875382	S0867382	29-MAR-1946	1	BC	10200	20.00	BW87	MOD	RAF
RAF/106G/UK/1337	3360	V	5100	5102	P	S0857359	S0872356	29-MAR-1946	1	BC	10200	20.00	BW87	MOD	RAF
RAF/106G/UK/1337	3360	V	5156	5157	P	S0866370	S0874370	29-MAR-1946	1	BC	10200	20.00	BW87	MOD	RAF
RAF/13A/UK791	6407	V	154	154	P	S0862377	S0862377	09-JUL-1941	1	AB	10000	5.00	BW55	FDM	RAF
OS/64150	9369	V	17	19	P	S0861358	S0865373	22-AUG-1964	1	A	7500	12.00	BW99	NMR	CRW
OS/65117	9372	V	63	66	P	S0879355	S0878375	21-JUN-1965	1	A	7500	12.00	BW99	NMR	CRW
OS/65122	9373	V	60	64	P	S0864377	S0865354	28-JUN-1965	1	A	7500	12.00	BW99	NMR	CRW
OS/68168	9427	V	201	201	P	S0861378	S0861378	10-JUN-1968	1	A	7500	12.00	BW99	NMR	CRW
OS/83019	13016	V	9	9	P	S0869381	S0869381	09-APR-1983	1	A	7600	12.00	BW99	OS	CRW
OS/88007	13218	V	61	61	P	S0863377	S0863377	10-MAR-1988	1	A	7900	12.00	BW99	OS	CRW
OS/88007	13218	V	137	141	P	S0870355	S0877376	10-MAR-1988	1	A	7900	12.00	BW99	OS	CRW

Total 16 Sorties 69 Prints

Ripple Quarry Worcestershire, Aerial Photographic Interpretation.

ENGLISH HERITAGE - NATIONAL MONUMENTS RECORD
National Monuments Record - Air Photos Library

Summary report for specialist collection

Date : 20-Feb-2003 Time : 12:45:24

Customer Enquiry Reference No. 53788

NGR Index Number	Accession Number	Frame	Original Number	Copy right	Repos itory	Film Details	Date Flown	DF	6 Fig NGR
SO8536/10	NMR 18986	18		EHC	NMR	B 35 mm Colour neg	14-DEC-2000	1	SO858368
SO8635/1	HAW 9388	47	AB	CRW	NMR	B Sheet film Black& white	16-AUG-1958	1	SO866358
SO8635/2	HAW 9388	48	AB	CRW	NMR	B Sheet film Black& white	16-AUG-1958	1	SO866358
SO8636/1	HAW 9388	51	AB	CRW	NMR	B Sheet film Black& white	16-AUG-1958	1	SO863361
SO8636/2	HAW 9388	49	AB	CRW	NMR	B Sheet film Black& white	16-AUG-1958	1	SO863361
SO8636/3	HAW 9388	50	AB	CRW	NMR	B Sheet film Black& white	16-AUG-1958	1	SO862361
SO8636/4	HAW 9388	52	AB	CRW	NMR	B Sheet film Black& white	16-AUG-1958	1	SO862361
SO8636/5	HAW 9388	53	AB	CRW	NMR	B Sheet film Black& white	16-AUG-1958	1	SO862361
SO8636/23	NMR 21083	07		EHC	NMR	B 70mm,120,220 Black& white	14-DEC-2000	1	SO865369
SO8636/24	NMR 21083	08		EHC	NMR	B 70mm,120,220 Black& white	14-DEC-2000	1	SO865369
SO8637/1	JAP 6932	212	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO869374
SO8637/2	JAP 6932	213	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO868373
SO8637/3	JAP 6932	214	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO867373
SO8637/4	HAW 9389	04	AC	CRW	NMR	B Sheet film Black& white	16-AUG-1958	1	SO863377
SO8637/5	HAW 9389	05	AC	CRW	NMR	B Sheet film Black& white	16-AUG-1958	1	SO863377
SO8637/20	NMR 21083	09		EHC	NMR	B 70mm,120,220 Black& white	14-DEC-2000	1	SO869371
SO8638/1	WAB 136	29		WAB	NMR	B 5x5" Black& white	01-JUL-1969	2	SO865385
SO8638/2	WAB 136	30		WAB	NMR	B 5x5" Black& white	01-JUL-1969	2	SO865385
SO8638/3	CAP 7891	14	BPX	CAP		B Unknown Black& white	18-JUN-1974	1	SO864384
SO8638/4	JAP 1728	26		JAP	NMR	B 35 mm B&W copy clr	28-JUL-1979	1	SO865385
SO8638/6	JAP 1728	27	446	JAP	NMR	B 35 mm B&W copy clr	05-AUG-1979	1	SO865385
SO8638/7	JAP 1731	07	851	JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	SO865385
SO8638/8	JAP 1731	08	852	JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	SO865385
SO8638/9	NMR 4644	03		CRW	NMR	B 70mm,120,220 Black& white	10-JUN-1990	1	SO865385
SO8638/13	JAP 6933	256	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO864385
SO8638/14	JAP 6933	257	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO866385
SO8638/15	JAP 6968	672	86.21	JAP	NMR	B 35 mm Copy slide	17-JUL-1986	1	SO865384
SO8638/16	JAP 6968	673	86.21	JAP	NMR	B 35 mm Copy slide	17-JUL-1986	1	SO864384

Ripple Quarry Worcestershire, Aerial Photographic Interpretation.

NGR Index Number	Accession Number	Frame	Original Number	Copy right	Repos itory	Film Details	Date Flown	DF	6 Fig NGR
SO8638/17	JAP 6968	674	86.21	JAP	NMR	B 35 mm Copy slide	17-JUL-1986	1	SO865385
SO8638/28	NMR 21694	21		EHC	NMR	B 70mm,120,220 Black& white	15-JUL-2002	1	SO865385
SO8638/29	NMR 21694	22		EHC	NMR	B 70mm,120,220 Black& white	15-JUL-2002	1	SO865385
SO8638/30	NMR 21694	23		EHC	NMR	B 70mm,120,220 Black& white	15-JUL-2002	1	SO865385
SO8638/31	NMR 21694	24		EHC	NMR	B 70mm,120,220 Black& white	15-JUL-2002	1	SO863384
SO8736/1	JAP 1728	22	451	JAP	NMR	B 35 mm B&W copy clr	05-AUG-1979	1	SO875365
SO8736/2	JAP 1728	23	450	JAP	NMR	B 35 mm B&W copy clr	05-AUG-1979	1	SO875365
SO8736/3	JAP 1728	24	449	JAP	NMR	B 35 mm B&W copy clr	05-AUG-1979	1	SO875365
SO8736/4	JAP 1731	03	847	JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	SO875365
SO8736/5	JAP 1731	04	848	JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	SO875365
SO8736/6	JAP 1731	05	849	JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	SO874367
SO8736/7	JAP 1731	06	850	JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	SO875365
SO8736/8	JAP 1783	13		JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	SO875366
SO8736/9	JAP 5342	2135	40	JAP	NMR	B 35 mm Copy slide	08-AUG-1987	1	SO872367
SO8736/10	JAP 5342	2136	40	JAP	NMR	B 35 mm Copy slide	08-AUG-1987	1	SO872367
SO8736/11	JAP 5342	2137	40	JAP	NMR	B 35 mm Copy slide	08-AUG-1987	1	SO874366
SO8736/12	NMR 4644	01		CRW	NMR	B 70mm,120,220 Black& white	10-JUN-1990	1	SO872367
SO8736/13	NMR 4644	02		CRW	NMR	B 70mm,120,220 Black& white	10-JUN-1990	1	SO872367
SO8736/14	JAP 6984	244	87.37	JAP	NMR	B 35 mm Copy slide	08-AUG-1987	1	SO873368
SO8736/15	JAP 6932	215	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO871368
SO8736/16	JAP 6932	216	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO873367
SO8736/17	JAP 6932	217	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO873367
SO8736/18	JAP 6932	218	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO873367
SO8736/19	JAP 6932	219	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO874366
SO8736/20	JAP 6932	220	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO872366
SO8736/21	JAP 6932	221	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO872367
SO8736/22	JAP 6932	222	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO872367
SO8736/23	JAP 6932	223	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO872367
SO8736/24	JAP 6933	249	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO875366
SO8736/25	JAP 6933	250	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO873367
SO8736/26	JAP 6933	251	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO871367
SO8736/27	JAP 6933	251A	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO871367
SO8736/28	JAP 6933	252	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO872366
SO8736/29	JAP 6933	253	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO871367
SO8736/30	JAP 6933	254	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	SO872366
SO8736/31	JAP 6943	682	89.14	JAP	NMR	B 35 mm Copy slide	06-JUL-1989	1	SO872368
SO8736/32	JAP 6947	706	89.18	JAP	NMR	B 35 mm Copy slide	23-JUL-1989	1	SO874366

Ripple Quarry Worcestershire, Aerial Photographic Interpretation.

NGR Index Number	Accession Number	Frame	Original Number	Copy right	Repos itory	Film Details		Date Flown	DF	6 Fig NGR
SO8736/33	JAP 6947	707	89.18	JAP	NMR	B 35 mm	Copy slide	23-JUL-1989	1	SO874366
SO8736/34	JAP 6968	666	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO875366
SO8736/35	JAP 6968	667	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO875366
SO8736/36	FXH 14150	01	92.16	FXH	FXH	B 70mm,120,220	Black& white	07-JUL-1992	1	SO874367
SO8736/37	FXH 14150	02	92.16	FXH	FXH	B 70mm,120,220	Black& white	07-JUL-1992	1	SO874367
SO8736/38	FXH 14150	03	92.16	FXH	FXH	B 70mm,120,220	Black& white	07-JUL-1992	1	SO874367
SO8736/39	JAP 6972	1254	86.25	JAP	NMR	B 35 mm	Copy slide	26-JUL-1986	1	SO874366
SO8736/40	JAP 6972	1255	86.25	JAP	NMR	B 35 mm	Copy slide	26-JUL-1986	1	SO874366
SO8736/41	JAP 6980	AK	86.33	JAP	NMR	B 35 mm	Copy slide	23-JUL-1988	1	SO874366
SO8736/42	JAP 6985	201	88.38	JAP	NMR	B 35 mm	Copy slide	23-JUL-1988	1	SO874366
SO8736/43	JAP 6985	202	88.38	JAP	NMR	B 35 mm	Copy slide	23-JUL-1988	1	SO874365
SO8737/1	JAP 6968	668	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO871373
SO8737/2	JAP 6968	669	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO871373
SO8738/1	JAP 6968	670	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO872381
SO8738/2	JAP 6968	671	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO872381
SO8738/3	HAW 9389	01	AC	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	SO878381
SO8738/4	HAW 9389	02	AC	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	SO878381
SO8836/4	JAP 1728	20	453	JAP	NMR	B 35 mm	B&W copy clr	05-AUG-1979	1	SO880367
SO8836/5	JAP 1728	21	452	JAP	NMR	B 35 mm	B&W copy clr	05-AUG-1979	1	SO880367
SO8836/6	JAP 1731	01	844	JAP	NMR	B 35 mm	B&W copy clr	21-JUL-1979	1	SO881367
SO8836/7	JAP 1731	02	845	JAP	NMR	B 35 mm	B&W copy clr	21-JUL-1979	1	SO881367
SO8836/8	JAP 5342	2132	40	JAP	NMR	B 35 mm	Copy slide	08-AUG-1987	1	SO881363

Total 87 Records

Ripple Quarry Worcestershire, Aerial Photographic Interpretation.

ENGLISH HERITAGE - NATIONAL MONUMENTS RECORD
National Monuments Record - Air Photos Library

Summary report for vertical coversearch

Date : 20-Feb-2003 Time : 12:47:31

Customer Enquiry Reference No. 53788

Sortie Number	Library Number	Cam Pos	Start Frame	End Frame	Held	National Reference Start	Reference End	Date	Date Flag	Qual ity	Scale 1:	Focal Length	Format	Repos itory	Copy Right
RAF/106G/UK/1345	209	V	5082	5084	P	S0878380	S0865381	01-APR-1946	1	A	9800	20.00	BW87	MOD	RAF
RAF/106G/UK/1652	427	RP	3220	3220	P	S0857376	S0857376	11-JUL-1946	1	AB	10000	36.00	BW87	MOD	RAF
RAF/106G/UK/1652	427	V	5220	5220	P	S0855356	S0855356	11-JUL-1946	1	AB	10000	36.00	BW87	MOD	RAF
RAF/CPE/UK/1926	542	RS	4120	4122	P	S0862386	S0876381	16-JAN-1947	1	A	10000	36.00	BW87	MOD	RAF
RAF/CPE/UK/2110	669	RP	3374	3376	P	S0875358	S0864358	28-MAY-1947	1	A	9800	20.00	BW87	MOD	RAF
RAF/CPE/UK/2110	669	RS	4374	4376	P	S0873376	S0863376	28-MAY-1947	1	A	9800	20.00	BW87	MOD	RAF
RAF/540/144	967	V	5066	5075	N	S0876356	S0865379	05-JAN-1949	1	A	3400	14.00	BW87	MOD	RAF
RAF/541/429	1725	RP	3052	3057	P	S0866355	S0862378	14-FEB-1950	1	B	9600	20.00	BW87	MOD	RAF
RAF/541/429	1725	RS	4053	4056	P	S0881367	S0878381	14-FEB-1950	1	B	9600	20.00	BW87	MOD	RAF
RAF/58/5304	2067	F21	52	52	N	S0876352	S0876352	13-JUL-1962	1	AB	10000	24.00	BW99	MOD	CRW
RAF/58/5304	2067	F22	59	60	N	S0872374	S0864367	13-JUL-1962	1	AB	10000	24.00	BW99	MOD	CRW
RAF/58/5516	2120	F21	34	35	P	S0874375	S0864374	17-OCT-1962	1	A	10000	24.00	BW99	MOD	CRW
RAF/58/5516	2120	F21	37	37	P	S0876358	S0876358	17-OCT-1962	1	A	10000	24.00	BW99	MOD	CRW
RAF/58/5516	2120	F22	37	37	P	S0864374	S0864374	17-OCT-1962	1	A	10000	24.00	BW99	MOD	CRW
RAF/106G/UK/1337	3360	V	5079	5080	P	S0875382	S0867382	29-MAR-1946	1	BC	10200	20.00	BW87	MOD	RAF
RAF/106G/UK/1337	3360	V	5100	5102	P	S0857359	S0872356	29-MAR-1946	1	BC	10200	20.00	BW87	MOD	RAF
RAF/106G/UK/1337	3360	V	5156	5157	P	S0866370	S0874370	29-MAR-1946	1	BC	10200	20.00	BW87	MOD	RAF
RAF/13A/UK791	6407	V	154	154	P	S0862377	S0862377	09-JUL-1941	1	AB	10000	5.00	BW55	FDM	RAF
OS/64150	9369	V	17	19	P	S0861358	S0865373	22-AUG-1964	1	A	7500	12.00	BW99	NMR	CRW
OS/65117	9372	V	63	66	P	S0879355	S0878375	21-JUN-1965	1	A	7500	12.00	BW99	NMR	CRW
OS/65122	9373	V	60	64	P	S0864377	S0865354	28-JUN-1965	1	A	7500	12.00	BW99	NMR	CRW
OS/68168	9427	V	201	201	P	S0861378	S0861378	10-JUN-1968	1	A	7500	12.00	BW99	NMR	CRW
OS/83019	13016	V	9	9	P	S0869381	S0869381	09-APR-1983	1	A	7600	12.00	BW99	OS	CRW
OS/88007	13218	V	61	61	P	S0863377	S0863377	10-MAR-1988	1	A	7900	12.00	BW99	OS	CRW
OS/88007	13218	V	137	141	P	S0870355	S0877376	10-MAR-1988	1	A	7900	12.00	BW99	OS	CRW

Total 16 Sorties 69 Prints

ENGLISH HERITAGE - NATIONAL MONUMENTS RECORD
National Monuments Record - Air Photos Library

Summary report for specialist collection

Date : 20-Feb-2003 Time : 12:45:24

Customer Enquiry Reference No. 53788

NGR Index Number	Accession Number	Frame	Original Number	Copy right	Repos itory	Film Details	Date Flown	DF	6 Fig NGR	
SO8536/10	NMR 18986	18		EHC	NMR	B 35 mm	Colour neg	14-DEC-2000	1	SO858368
SO8635/1	HAW 9388	47	AB	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	SO866358
SO8635/2	HAW 9388	48	AB	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	SO866358
SO8636/1	HAW 9388	51	AB	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	SO863361
SO8636/2	HAW 9388	49	AB	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	SO863361
SO8636/3	HAW 9388	50	AB	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	SO862361
SO8636/4	HAW 9388	52	AB	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	SO862361
SO8636/5	HAW 9388	53	AB	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	SO862361
SO8636/23	NMR 21083	07		EHC	NMR	B 70mm,120,220	Black& white	14-DEC-2000	1	SO865369
SO8636/24	NMR 21083	08		EHC	NMR	B 70mm,120,220	Black& white	14-DEC-2000	1	SO865369
SO8637/1	JAP 6932	212	89.3	JAP	NMR	B 35 mm	Copy slide	23-JUN-1989	1	SO869374
SO8637/2	JAP 6932	213	89.3	JAP	NMR	B 35 mm	Copy slide	23-JUN-1989	1	SO868373
SO8637/3	JAP 6932	214	89.3	JAP	NMR	B 35 mm	Copy slide	23-JUN-1989	1	SO867373
SO8637/4	HAW 9389	04	AC	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	SO863377
SO8637/5	HAW 9389	05	AC	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	SO863377
SO8637/20	NMR 21083	09		EHC	NMR	B 70mm,120,220	Black& white	14-DEC-2000	1	SO869371
SO8638/1	WAB 136	29		WAB	NMR	B 5x5"	Black& white	01-JUL-1969	2	SO865385
SO8638/2	WAB 136	30		WAB	NMR	B 5x5"	Black& white	01-JUL-1969	2	SO865385
SO8638/3	CAP 7891	14	BPX	CAP		B Unknown	Black& white	18-JUN-1974	1	SO864384
SO8638/4	JAP 1728	26		JAP	NMR	B 35 mm	B&W copy clr	28-JUL-1979	1	SO865385
SO8638/6	JAP 1728	27	446	JAP	NMR	B 35 mm	B&W copy clr	05-AUG-1979	1	SO865385
SO8638/7	JAP 1731	07	851	JAP	NMR	B 35 mm	B&W copy clr	21-JUL-1979	1	SO865385
SO8638/8	JAP 1731	08	852	JAP	NMR	B 35 mm	B&W copy clr	21-JUL-1979	1	SO865385
SO8638/9	NMR 4644	03		CRW	NMR	B 70mm,120,220	Black& white	10-JUN-1990	1	SO865385
SO8638/13	JAP 6933	256	89.4	JAP	NMR	B 35 mm	Copy slide	23-JUN-1989	1	SO864385
SO8638/14	JAP 6933	257	89.4	JAP	NMR	B 35 mm	Copy slide	23-JUN-1989	1	SO866385
SO8638/15	JAP 6968	672	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO865384
SO8638/16	JAP 6968	673	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO864384

NGR Index Number	Accession Number	Frame	Original Number	Copy right	Repos itory	Film Details	Date Flown	DF	6 Fig NGR
S08638/17	JAP 6968	674	86.21	JAP	NMR	B 35 mm Copy slide	17-JUL-1986	1	S0865385
S08638/28	NMR 21694	21		EHC	NMR	B 70mm,120,220 Black& white	15-JUL-2002	1	S0865385
S08638/29	NMR 21694	22		EHC	NMR	B 70mm,120,220 Black& white	15-JUL-2002	1	S0865385
S08638/30	NMR 21694	23		EHC	NMR	B 70mm,120,220 Black& white	15-JUL-2002	1	S0865385
S08638/31	NMR 21694	24		EHC	NMR	B 70mm,120,220 Black& white	15-JUL-2002	1	S0863384
S08736/1	JAP 1728	22	451	JAP	NMR	B 35 mm B&W copy clr	05-AUG-1979	1	S0875365
S08736/2	JAP 1728	23	450	JAP	NMR	B 35 mm B&W copy clr	05-AUG-1979	1	S0875365
S08736/3	JAP 1728	24	449	JAP	NMR	B 35 mm B&W copy clr	05-AUG-1979	1	S0875365
S08736/4	JAP 1731	03	847	JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	S0875365
S08736/5	JAP 1731	04	848	JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	S0875365
S08736/6	JAP 1731	05	849	JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	S0874367
S08736/7	JAP 1731	06	850	JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	S0875365
S08736/8	JAP 1783	13		JAP	NMR	B 35 mm B&W copy clr	21-JUL-1979	1	S0875366
S08736/9	JAP 5342	2135	40	JAP	NMR	B 35 mm Copy slide	08-AUG-1987	1	S0872367
S08736/10	JAP 5342	2136	40	JAP	NMR	B 35 mm Copy slide	08-AUG-1987	1	S0872367
S08736/11	JAP 5342	2137	40	JAP	NMR	B 35 mm Copy slide	08-AUG-1987	1	S0874366
S08736/12	NMR 4644	01		CRW	NMR	B 70mm,120,220 Black& white	10-JUN-1990	1	S0872367
S08736/13	NMR 4644	02		CRW	NMR	B 70mm,120,220 Black& white	10-JUN-1990	1	S0872367
S08736/14	JAP 6984	244	87.37	JAP	NMR	B 35 mm Copy slide	08-AUG-1987	1	S0873368
S08736/15	JAP 6932	215	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	S0871368
S08736/16	JAP 6932	216	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	S0873367
S08736/17	JAP 6932	217	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	S0873367
S08736/18	JAP 6932	218	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	S0873367
S08736/19	JAP 6932	219	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	S0874366
S08736/20	JAP 6932	220	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	S0872366
S08736/21	JAP 6932	221	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	S0872367
S08736/22	JAP 6932	222	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	S0872367
S08736/23	JAP 6932	223	89.3	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	S0872367
S08736/24	JAP 6933	249	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	S0875366
S08736/25	JAP 6933	250	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	S0873367
S08736/26	JAP 6933	251	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	S0871367
S08736/27	JAP 6933	251A	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	S0871367
S08736/28	JAP 6933	252	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	S0872366
S08736/29	JAP 6933	253	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	S0871367
S08736/30	JAP 6933	254	89.4	JAP	NMR	B 35 mm Copy slide	23-JUN-1989	1	S0872366
S08736/31	JAP 6943	682	89.14	JAP	NMR	B 35 mm Copy slide	06-JUL-1989	1	S0872368
S08736/32	JAP 6947	706	89.18	JAP	NMR	B 35 mm Copy slide	23-JUL-1989	1	S0874366

NGR Index Number	Accession Number	Frame	Original Number	Copy right	Repos itory	Film Details		Date Flown	DF	6 Fig NGR
SO8736/33	JAP 6947	707	89.18	JAP	NMR	B 35 mm	Copy slide	23-JUL-1989	1	SO874366
SO8736/34	JAP 6968	666	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO875366
SO8736/35	JAP 6968	667	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO875366
SO8736/36	FXH 14150	01	92.16	FXH	FXH	B 70mm,120,220	Black& white	07-JUL-1992	1	SO874367
SO8736/37	FXH 14150	02	92.16	FXH	FXH	B 70mm,120,220	Black& white	07-JUL-1992	1	SO874367
SO8736/38	FXH 14150	03	92.16	FXH	FXH	B 70mm,120,220	Black& white	07-JUL-1992	1	SO874367
SO8736/39	JAP 6972	1254	86.25	JAP	NMR	B 35 mm	Copy slide	26-JUL-1986	1	SO874366
SO8736/40	JAP 6972	1255	86.25	JAP	NMR	B 35 mm	Copy slide	26-JUL-1986	1	SO874366
SO8736/41	JAP 6980	AK	86.33	JAP	NMR	B 35 mm	Copy slide	23-JUL-1988	1	SO874366
SO8736/42	JAP 6985	201	88.38	JAP	NMR	B 35 mm	Copy slide	23-JUL-1988	1	SO874366
SO8736/43	JAP 6985	202	88.38	JAP	NMR	B 35 mm	Copy slide	23-JUL-1988	1	SO874365
SO8737/1	JAP 6968	668	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO871373
SO8737/2	JAP 6968	669	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO871373
SO8738/1	JAP 6968	670	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO872381
SO8738/2	JAP 6968	671	86.21	JAP	NMR	B 35 mm	Copy slide	17-JUL-1986	1	SO872381
SO8738/3	HAW 9389	01	AC	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	SO878381
SO8738/4	HAW 9389	02	AC	CRW	NMR	B Sheet film	Black& white	16-AUG-1958	1	SO878381
SO8836/4	JAP 1728	20	453	JAP	NMR	B 35 mm	B&W copy clr	05-AUG-1979	1	SO880367
SO8836/5	JAP 1728	21	452	JAP	NMR	B 35 mm	B&W copy clr	05-AUG-1979	1	SO880367
SO8836/6	JAP 1731	01	844	JAP	NMR	B 35 mm	B&W copy clr	21-JUL-1979	1	SO881367
SO8836/7	JAP 1731	02	845	JAP	NMR	B 35 mm	B&W copy clr	21-JUL-1979	1	SO881367
SO8836/8	JAP 5342	2132	40	JAP	NMR	B 35 mm	Copy slide	08-AUG-1987	1	SO881363

Total 87 Records

ENGLISH HERITAGE - NATIONAL MONUMENTS RECORD
National Monuments Record - Air Photos Library

Summary report for vertical coversearch

Date : 20-Feb-2003 Time : 12:47:31

Customer Enquiry Reference No. 53788

Sortie Number	Library Number	Cam Pos	Start Frame	End Frame	Held	National Start	Reference End	Date	Date Flag	Qual ity	Scale 1:	Focal Length	Format	Repos itory	Copy Rght
RAF/106G/UK/1345	209	V	5082	5084	P	S0878380	S0865381	01-APR-1946	1	A	9800	20.00	BW87	MOD	RAF
RAF/106G/UK/1652	427	RP	3220	3220	P	S0857376	S0857376	11-JUL-1946	1	AB	10000	36.00	BW87	MOD	RAF
RAF/106G/UK/1652	427	V	5220	5220	P	S0855356	S0855356	11-JUL-1946	1	AB	10000	36.00	BW87	MOD	RAF
RAF/CPE/UK/1926	542	RS	4120	4122	P	S0862386	S0876381	16-JAN-1947	1	A	10000	36.00	BW87	MOD	RAF
RAF/CPE/UK/2110	669	RP	3374	3376	P	S0875358	S0864358	28-MAY-1947	1	A	9800	20.00	BW87	MOD	RAF
RAF/CPE/UK/2110	669	RS	4374	4376	P	S0873376	S0863376	28-MAY-1947	1	A	9800	20.00	BW87	MOD	RAF
RAF/540/144	967	V	5066	5075	N	S0876356	S0865379	05-JAN-1949	1	A	3400	14.00	BW87	MOD	RAF
RAF/541/429	1725	RP	3052	3057	P	S0866355	S0862378	14-FEB-1950	1	B	9600	20.00	BW87	MOD	RAF
RAF/541/429	1725	RS	4053	4056	P	S0881367	S0878381	14-FEB-1950	1	B	9600	20.00	BW87	MOD	RAF
RAF/58/5304	2067	F21	52	52	N	S0876352	S0876352	13-JUL-1962	1	AB	10000	24.00	BW99	MOD	CRW
RAF/58/5304	2067	F22	59	60	N	S0872374	S0864367	13-JUL-1962	1	AB	10000	24.00	BW99	MOD	CRW
RAF/58/5516	2120	F21	34	35	P	S0874375	S0864374	17-OCT-1962	1	A	10000	24.00	BW99	MOD	CRW
RAF/58/5516	2120	F21	37	37	P	S0876358	S0876358	17-OCT-1962	1	A	10000	24.00	BW99	MOD	CRW
RAF/58/5516	2120	F22	37	37	P	S0864374	S0864374	17-OCT-1962	1	A	10000	24.00	BW99	MOD	CRW
RAF/106G/UK/1337	3360	V	5079	5080	P	S0875382	S0867382	29-MAR-1946	1	BC	10200	20.00	BW87	MOD	RAF
RAF/106G/UK/1337	3360	V	5100	5102	P	S0857359	S0872356	29-MAR-1946	1	BC	10200	20.00	BW87	MOD	RAF
RAF/106G/UK/1337	3360	V	5156	5157	P	S0866370	S0874370	29-MAR-1946	1	BC	10200	20.00	BW87	MOD	RAF
RAF/13A/UK/791	6407	V	154	154	P	S0862377	S0862377	09-JUL-1941	1	AB	10000	5.00	BW55	FDM	RAF
OS/64150	9369	V	17	19	P	S0861358	S0865373	22-AUG-1964	1	A	7500	12.00	BW99	NMR	CRW
OS/65117	9372	V	63	66	P	S0879355	S0878375	21-JUN-1965	1	A	7500	12.00	BW99	NMR	CRW
OS/65122	9373	V	60	64	P	S0864377	S0865354	28-JUN-1965	1	A	7500	12.00	BW99	NMR	CRW
OS/68168	9427	V	201	201	P	S0861378	S0861378	10-JUN-1968	1	A	7500	12.00	BW99	NMR	CRW
OS/83019	13016	V	9	9	P	S0869381	S0869381	09-APR-1983	1	A	7600	12.00	BW99	OS	CRW
OS/88007	13218	V	61	61	P	S0863377	S0863377	10-MAR-1988	1	A	7900	12.00	BW99	OS	CRW
OS/88007	13218	V	137	141	P	S0870355	S0877376	10-MAR-1988	1	A	7900	12.00	BW99	OS	CRW

Total 16 Sorties 69 Prints



FIGURE 1

RIPPLE QUARRY, WORCESTERSHIRE
INTERPRETATION OF AERIAL PHOTOGRAPHS

- Cut archaeological features
- Possible archaeological features
- - - Areas of former ridge and furrow
- Former, more modern, boundaries