10.4 Appendix for Chapter 6.0

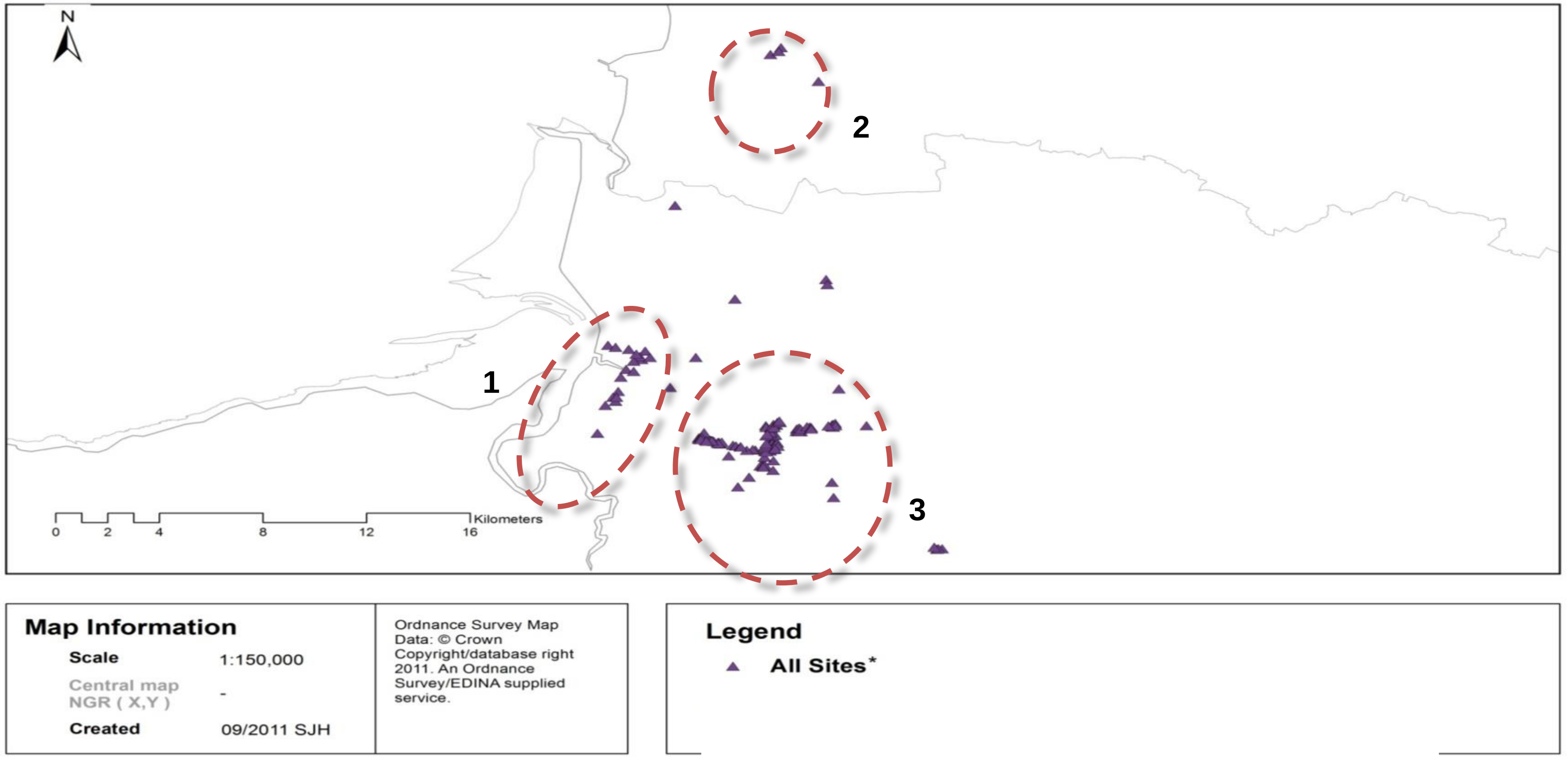


Figure 10.4.1 The three main site groups in Somerset and North Somerset

Table 10.4.1 Briquetage mound sites recorded in section, eroding in the banks of the River Huntspill, Central Somerset Levels. Information either provided by the author from the fieldwork, or taken from: (Leech *et al.* 1983; Grove 1996; Grove and Brunning 1998: 63-65)

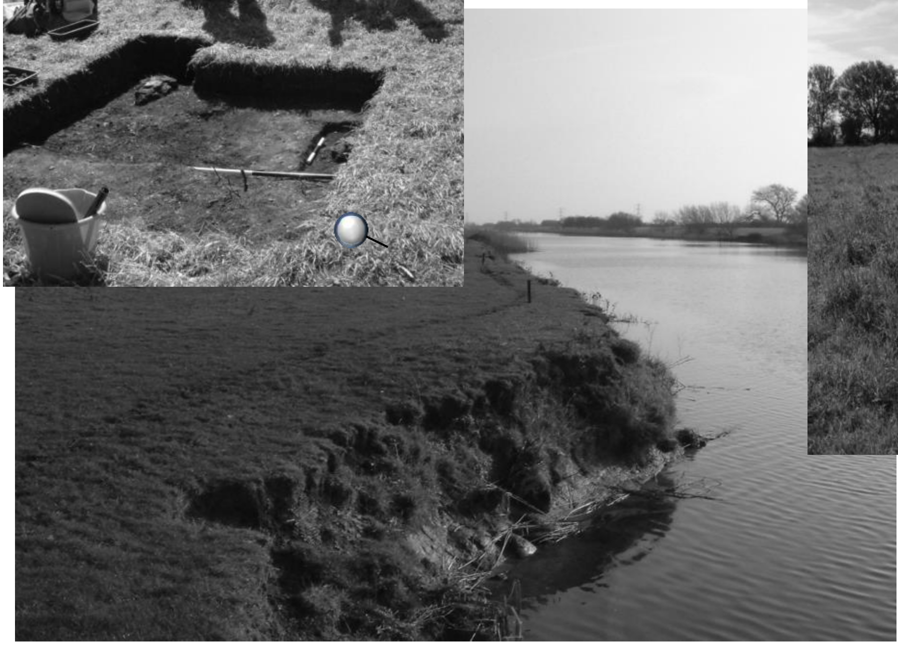
Site ID	Original Grove Index	Mound Dimension		Description
		Length/ Diameter	Height (highest point)	
River Huntspill/Gold Corner Area (Southern Extent)				
107	102	-	*c*.1m	24m length of peat exposed. Stratified deposits of clay, ash and briquetage present with much briquetage and pottery eroding into the river. Highest briquetage 0.3m from ground surface. Although height not given, based upon the section of Site 108, this mound was also probably of a similar height.
108	103	-	*c*.1m	20m length of peat exposed upon which are stratified deposits of charcoal and ash etc with much briquetage and pottery eroding into the river. Highest briquetage 0.3m from ground surface. A section of one part of this mound shows the complex nature of the deposits. Middle section destroyed by a cattle watering place.
110	105	-	Low mound	Briquetage associated with a peat exposure. Highest briquetage 1.2m from ground surface. This probably represents a small remnant from the edge of a salt-making site, the remainder having eroded into the river.
115	110	-	-	5m long exposure of peat upon which are stratified deposits of clay, ash and briquetage. Briquetage eroded into the river.
125	22	20m	0.6m	Visible when visited as part of the 2008 research fieldwork. Recorded as 'Extant' by Grove in 1996
126	23	*c*.20m	0.7m	Visible. Rescue test-pits revealed briquetage layers with specks of charcoal. Peat cutting evidenced underneath the mound. No features exposed in those areas of the mound investigated. Undisturbed mound was 0.35m high from the peat, and then there was another 0.35m of disturbed topsoil/briquetage above this.
143	40	-	0.5m	-

166	121 (38/2002)	*c*.16m	*c*.1m	16m length of peat exposed upon which are stratified deposits of clay, ash and briquetage. Top of the mounds is 0.5m below ground surface. Several small channels were noted cutting through the deposits. Half of a circular clay filled structure projected out from the bank into the river bed. It is cut into peat and is interpreted as a brine settling tank for the removal of sediment. Traces of a brushwood layer existed on top of the stratified deposits next to this feature, possibly representing a working surface, or collapsed wattling.
167	2	-	0.5m	0.2m high E 0.5m high W. Possible ditch
177	14	-	0.6m	Uneven field
198	73	15-20m?	c.1m?	Large briquetage debris mound excavated in 1983 containing at least three phases of salt-production and several grouped hearths. No obvious settling tanks were recorded. Dimensions of mound not clear from published report, but is probably similar to Site 166 in size
Liberty Farm Area (Northern Extent)				
104	96	>6m	*c*.0.5m	Low lying mound formed from compacted briquetage.
122	6		0.4m	No mound visible
140	37		0.3m	-
141	38		0.3m	-
153	50	6x0.9m	1.2m	SAM 429. Visible
154	51	6x0.9m	1.2m	SAM 429. Visible (Figure 6.8)
155	52	10.5m	1.75	SAM 429. Visible
172	8		0.6m	-
183	20		0.5m	Uneven field. Ploughed
295	-	10m	0.5m	Previously a hidden mound. Revealed during the 2008 fieldwork and was found to contain only a few very compacted layers of briquetage with no obvious charcoal/ash/peat. No features were observed within the mound.

Report 10.4.1 Central Somerset Levels Fieldwork Technical Report

This section is designed as a report that contains information and data that was not included in the main text. This includes information about planning the fieldwork, and the results of the fieldwork, including the processed geophysical results. It is designed to be read in conjunction with Chapter **6.0**, and is presented in a format similar to 'grey literature' archaeological reports that are submitted to Historic Environment Records upon completion. This report will be submitted to Somerset HER upon the completion of this research project.

Investigating Romano-British Salt-Production in the Central Somerset Levels. Fieldwork Report (to accompany 6.0)



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1.0 Investigating Romano-British Salt-Production in the Central Somerset Levels

1.1 Overview

This fieldwork was carried out as part of on-going research into salt production from saltwater in the Iron Age and Romano-British period within southern Britain. Fieldwork included geophysical survey and targeted sample archaeological excavation. The fieldwork was carried out between 14th and 25th July 2008. The work was planned and supervised by the author with the help of volunteers from the South Cadbury Environs Project.

The fieldwork identified a previously unknown briquetage and pottery debris mound associated with salt production and revealed the distinct 'geophysical signature' of debris mounds. Sample excavation revealed an insight into the technology used for salt production within this area in the Roman period and provided a better overview of the nature of salt production in general. Briquetage and pottery was recovered and assessed, as well as environmental remains processed from environmental samples. The data generated has provided a better base upon which to compare the salt production techniques within the Somerset Levels with other key areas of salt production in southern Britain.

This technical report is designed to accompany the main fieldwork methodology and results in the main text. This report contains technical information as well as the criteria for implementing the fieldwork and general info about issues such as land use and permission. Ethics were considered throughout the planning and implementation of fieldwork and this is detailed through this report.

1.2 Risk Assessment

Before carrying out any archaeological fieldwork it is first essential to carry out a risk assessment (Table 1) and have it approved (in this case by Bournemouth University: Applied Science). This is especially important when working with volunteers outside of the university environs are was the case here. The group of volunteer (South Cadbury Environs Project) regularly carry out fieldwork with different organisations and all members were covered by group's own Liability Insurance during the course of the fieldwork. The author was covered by Bournemouth University insurance automatically as a doctoral student.

Table 1 Risk Assessment for the fieldwork element of this fieldwork project; as used by Bournemouth University Applied Sciences department staff members

Risk Assessment			
	Occurrence	**Severity**	**Action**
General			
General	N/A	N/A	Duty of site manager to take reasonable steps to ensure health, safety and welfare of volunteers Duty of volunteers to take reasonable care for his/her own safety and establish a safe system of work and limit the likelihood of injury/accidents during fieldwork Mobile phones will be on site at all times as well as a pair of radios To maintain clear communication at all times
Unsafe site access	L	M	Ensure that all members of the fieldwork team know the correct access point to the sites
Health and Safety knowledge	H	H	Ensure that all of the fieldwork team have a copy and have read this risk assessment
Working alone	L	M	Ensure that all the team are in hearing distance of others Work in pairs if possible A mobile phone should be on at all times No one will work in a trench deeper that 0.5m if unaccompanied
Tripping over grid pegs, other site markers or equipment	L	L	All grid pegs/markers will be marked with a red ribbon to ensure visibility
Personal injury and inclement weather	L	L	Wet conditions- suitable waterproof clothing and footwear will be worn on-site Hot/sunny conditions-suitable protection for skin and head will be worn on-site along with suitably light clothes (appropriate footwear though at all times, i.e no opened toe sandals). Cold conditions- suitably warm clothing should be worn
Flooding	H	L	The fieldwork area is potentially prone to flooding kin the lower land areas, so no fieldwork will take place in event of this occurring

Falling debris/structural fabric	L	L	There are no buildings in the vicinity of the fieldwork area other than a farmhouse which was well fenced off all around. There were many fences and gates in various states of repair and people were made aware of this during fieldwork.
Excavation			
Shovelling soil	L	M	Soil must be disposed of carefully and care must be taken to adopt a good shovelling posture to avoid injury
Soil collapse from test pit edges	M	M	Soil must be placed well away from the edge of the pit
Presence of services	L	L	No known areas of domestic services directly within the fieldwork area were known about prior to work taking place. The likelihood of finding underground service pipes/cables was highly unlikely given the very rural nature of the fieldwork area. However geophysical survey will confirm the presence of any unknown services. The only other potential area of concern was a large pumping station situated within the River Huntspill however this was self-confined and well fenced off from access.
Objects falling into the test pit	L	H	No objects should be placed near the edge of the pits Finds trays should be well back from the edges also
Infection from human remains	L	L	No human remains are known for this area, however if any were found during fieldwork, an appropriate course of action would be taken.
Soil-borne disease	L	H	The appropriate course of injections removes risk from tetanus; all of the fieldwork team should be up to date with these precautions Proper hygiene facilities will be provided on-site

Hand tools and equipment	H	L	Risk will be minimised by proper maintenance and use of tools Tools should not be used when partially damaged or broken Worker should maintain a safe working distance from each other when using tools in order to prevent injury to other workers Risk from slight injuries will be minimised by the maintenance of a first-aid kit on-site Danger of tripping will be minimised by stacking tools neatly on-site
Personal injury	M	L	All of the fieldwork team will wear correct safety equipment if required All accidents, however minor, will be reported and recorded in the accident book on-site
Spoil movement and access to excavations			
Spoil heaps/soil management	L	L	Spoil heaps to be placed at suitable distance from edge from the excavation, and banked to avoid slippage Soil be managed and kept separate by each different stratigraphic layer including topsoil and subsoil in order to be reinstated in their original order
Risk of personal injury to visitors	L	L	All visitors will be accompanied by a team member at all times and only preset ‘pathway’s be used
First Aid and Hygiene			
Toilets and washing facilities	L	M	Toilet facilities were made available at the local campsite and at two local public houses
Contaminated water	L	H	Clean drinking water will be brought to site daily from a clean water source at the campsite

Sunburn	H	H	Protective suncream must be worn at all times on exposed areas of skin and regularly re-applied during the day. Extra suncream will be brought to the site everyday
Other			
Location			The area is particularly environmentally sensitive and the Cripps River runs adjacent to one of the fields. Care should be taken to avoid the river at all times as it is a permitted fishing river
Unacceptable behaviour	M	M	All the fieldwork team have a responsibility to the fieldwork project and each other. Offensive behaviour is unacceptable at any time during the fieldwork. Any team member failing to uphold this responsibility will be asked to leave the site

1.3 Suitability for Fieldwork

Suitability for survey and excavation was also established through the consideration of land ownership, use and permission. It is essential to gain full permission from landowners and/or farmers and to make sure they were fully aware of the nature of any invasive work in particular. In planning the methodology of fieldwork, it is also important to consider the impact of work within the particular area in terms of land use and visual appearance in the landscape. In this case this is particularly important as the Somerset Levels are environmentally sensitive and also much of the area is used for pasture and arable agricultural use and is sparsely developed in terms of buildings. Some areas also fall under multiple land legislation/protection such as Areas of Special Scientific

Interest (SSI), Conservation Areas and Scheduled Ancient Monuments (SAM). Before carrying out the fieldwork each field location was checked for any legislation of this nature. None of the fields chosen were covered by legislation of this nature.

Ethically, as discussed earlier, the justification of site disturbance versus information outcome has to be transparent and clear. It is considered that the fieldwork was not only extremely important to potentially offer a huge amount of information about salt production in this area but also nationally. The sheer number of mound sites is clearly distinctive and comparable to the well-known red hill mounds in Essex. The potential for preservation was also huge in that the area is not only sitting on peat which is perfect for creating anaerobic preservation of organic remains, but also many of the sites were thought to have been sealed in part by alluvial clays. At the time of fieldwork, there had been very limited systematic archaeological investigation of the whole area and little knowledge of the sites compared with their number.

In terms of the relevance to this research project, it was considered that fieldwork would be a perfect arena in which to show how planned targeted fieldwork informed by good archaeological knowledge of the sites in general can reveal so much information. It was also an opportunity to show how the inclusion of local amateur archaeological groups is so integral to understanding sites as well as most importantly, being able to answer more research questions about the nature of salt production in Roman Somerset. Carrying out the fieldwork has served to carry on an ethos of this research project as a whole, that desk based research is very informative but ultimately, visiting sites and experiencing them first hand adds a whole new spectrum to understanding them. It’s the same when looking at briquetage; it is near impossible to discuss it or understand it unless you actually physically handle the material and see it firsthand.

1.4 Fieldwork Methodology

The reason for choosing the combined method of geophysical survey and excavation, as well as the relevance of this to the actual archaeology and information outcome is outlined here.

1.4.1 Geophysical Survey

Geophysical survey is an ideal, **unobtrusive** technique available to archaeologists. There are three main types currently in main use:

1. Gradiometer (Magnetometry)
2. Resistivity
3. Ground Penetrating Radar

Resistivity involves penetrating the ground with probes that send electrical signals directly into the ground and measures the upper resistance of different materials in the ground such as a wall compared to a pit. Ground Penetrating Radar (GPR) does not penetrate the ground surface and is pulled along close to the ground instead. It is particularly useful when faced for example with issues of dense material potentially masking features; for example it is often used on areas where the ground surface is covered in concrete or tarmac. It is particularly useful when attempting to create a 3D below ground image as it can measure the thickness of a feature.

Magnetometry is usually the primary preferred technique as it is relatively quick to carry out when compared to the other two techniques. Magnetometry like resistivity, also works by sending electrical signals into the ground, however it specifically measures magnetic changes in the soil horizon often caused for example by fired or burnt features such as hearths or kilns.

When clay with iron content is fired' the material can acquire a strong distinctive magnetic susceptibility and this is also often referred to as 'thermo-remanent magnetisation'. Also when the clay is fired, it preserves the magnetic gradient (or inclination) of the earth's magnetic field at that point in time. The earth's magnetic field changes throughout time so the feature will be identified by the gradiometer as a disturbance in the current magnetic field gradient in and around the feature. The sensors can also detect differences in soil types, for example a pit cut into solid geology containing looser soil within it. The sensor/s are also sensitive to the compaction and thickness of soil horizons in general; therefore understanding the geology of a site before surveying it is essential in order to process the data accordingly.

Like resistivity, the depth of these features from ground level can be approximately determined; however the depth of the feature itself, unlike GPR, can really only be determined by excavation. Also like a GPR, a gradiometer does not penetrate the ground and is held above ground with the attached data logger. The fact that the meter does not penetrate the ground can also allow for relatively quick survey time. However an uneven ground surface can potentially affect the consistency of results if the meter is not held as horizontally parallel as possible and moved regularly from side to site, this often will show up on the resulting image as curvy lines running across the grid. Another factor that can affect the results and overall resulting image, is the presence of magnetic objects in and around the site such as overhead cables and general ground surface detritus such as metal debris. It is also essential not to wear any magnetic objects whilst carrying out a survey which can include metal boot lace eyelets and zips on clothing! Ground surface debris will often be represented on the image results as many small scattered areas of contrast and is often described as general magnetic ‘noise’. This can be reduced in the results in order to enhance actual features of interest within the ground (anomalies).

For the purposed of the fieldwork element of this research project, it was decided that magnetometry was the best technique to use as the survey was primarily focused upon the identifying of mounds containing large amounts of briquetage and pottery. Due to the clay being fired or baked, the whole mound should then clearly show up on a survey as an area of significant magnetic disturbance. It was also considered that a potential associated hearth features would also show up well by using this technique (although would be hidden by the mound in general if contained within that specific area). This method has also been shown to be very successful in the location of Iron Age salt production sites in the area of Lorraine, France (Olivier and Kovacik 2006). Surveys have also successfully been used to locate sites in Lincolnshire (Palmer-Brown 1993; Lane and Morris 2001).

In order to carry out a successful and consistent gradiometer survey, a team of volunteers were specifically allocated to the setting up and carrying out of the geophysical surveys. A Grad601 Single Axis Magnetic Field Gradiometer was used (Figure 1) and the relevant technical information is summarised below and listed in Table 2.

Figure 1 A member of SCEP holding the Bartingdon Gradiometer (Author: 2008)

> The Grad601 is a single axis, vertical component fluxgate gradiometer comprising a data logger, battery cassette and either one or two Grad-01-1000L cylindrical gradiometer sensors mounted on a rigid carrying bar. Each sensor contains two fluxgate magnetometers with one metre vertical separation.
> (Bartington Instruments 2011)

Table 2 Technical information for geophysical surveys including data processing

Geophysical Survey Technical Information	
Grid	20x20m
Traverse	1x1m Parallel
Reading Intervals	0.25m
Processing Software	Geoscan Research: Geoplot Version 3.0
Additional Processing Information	Minimal processing: Zero mean traverse
Data Format Provided	Interpolated Plot and Trace Plot

A general visual walkover was also carried out in order to identify and plot any find spots of briquetage, and generally assess the topography of key areas that are considered of interest. This information, combined with the geophysical data, was then used to inform the location of archaeological excavation.

1.4.2 Excavation

As stated earlier, geophysical surveying is an **unobtrusive** technique. Archaeological excavation however, is in its nature a **destructive process** and the potential outcome (knowledge), should outweigh disturbance of a site in a research context (versus a PPG16 context which is subject to different rules). These considerations were outlined earlier and it was felt that small scale targeted test pits would best suit this fieldwork project. This technique although intrusive, is the least damaging form of archaeological excavation and very useful for having a 'key-hole' observation into the ground in order to identify potential archaeological features.

Open area excavation can be more appropriate to areas that have perhaps already been disturbed such as areas cut by the canalisation of the River Huntspill. This has to be considered alongside the fact that many salt production sites appear to potentially have different processes occurring over different parts of the site. Therefore in an ideal world, rather than small test pits, large open areas could have been excavated to provide a better overview of the whole site. However, archaeological investigation is always restrained by many factors and it is important to consider the land use and landscape, as well as the main aim of the fieldwork greatly affects the type and scale of excavation. In this case the main purpose of the fieldwork was to confirm the association of mounds in the Somerset Levels with salt production, as well as to create a geophysical character of these sites. This area is heavily used for agriculture, as well as being environmentally sensitive, so this in conjunction with the main purpose of investigation supports the use of test pits. The overall plan and technique of the fieldwork as a whole, was considered to be the most achievable, realistic and manageable method for this particular research project.

Many larger, open area archaeological excavations are carried out using mechanical diggers in order to quickly take off the topsoil and lower soils to the level of archaeological activity. However for smaller scale excavations that are not as restricted in time scale, hand excavation is commonly used. This can also be the better method in areas that are difficult to access and especially environmentally sensitive areas.

A series of test pits either measuring 1x1m or 2x2m, were excavated in Field 1, in areas identified as having a distinct geophysical 'signature' potentially indicative of archaeological features. Test pits were also excavated in Field 3; however these were dictated by the presence of visually damaged areas of ground on an area known to be a large existing mound. The test pits in Field 1, were hand excavated (spade and trowel) and taken down to the upper extent of the archaeological feature where scaled plans were drawn by eye on site. Then, the feature was excavated down to the natural geology; in this case peat, and each significant layer of activity was drawn in section.

Site photographs were taken throughout the survey and excavation in order to add to the overall site archive. Sequential numbers were assigned to each context and photograph. This is essential in order to create a solid site archive that can be used to assess the site after leaving. It is also important to provide a relatively objective site archive to provide comparable data for similar sites in the future. Once a site has been excavated and sections of archaeological remains removed, the site archive is the only record of the site and has to stand alone as a true record of the nature of the archaeological remains.

1.4.3 Post-Excavation

In most cases, all archaeological artefacts are collected and placed into labelled context bags to be assessed during the post-excavation stage. This was carried out during this fieldwork project, however a sampling strategy was employed in some cases. During the excavation of test pits over a mound revealed by the geophysical survey, it was decided that when the excavation reached a solid layer of briquetage, that samples of **non-diagnostic** material would be taken. **Diagnostic** briquetage was 100% collected and bagged. The sampling strategy was employed due to the evaluative nature of the fieldwork and it was felt that the total removal of all briquetage was not required in order to understand the site for the purposed of this research project. Therefore a degree of the briquetage was left in-situ. All other artefacts other than briquetage were 100% collected and bagged during excavation (for example pottery). Environmental samples were also taken during all the excavations to firstly gather information about the environment at the time the archaeological remains were deposited, and also to sample the smaller fragments of briquetage. The environmental samples were sieved using various size meshes to filter out small organic remains such as seeds. The briquetage fragments were processed in the same manner in order to provide an insight into the degree of briquetage fragmentation within the mound, and therefore potentially information about the formation of the mound.

As well as the targeted formal test pits in Field 1, as stated earlier, it was necessary to carry out 'rescue' excavations in Field 2 on a mound that was found to be visibly damaged on the ground surface. In this case an adaptive excavation strategy was employed which involved the tidying up of already visible damaged areas of the ground into consistent areas of test pit type 'holes'.

Health and safety was considered during all times on-site and a risk assessment was carried out before carrying out the fieldwork as provided in section **1.2** of this report. During time away from the site within the excavation period, red and white tape was tied around bamboo test pit boundary markers to provide a visual warning to persons entering the site.

Upon the completed excavation and recording of each test pit, the soil removed from the hole originally, was reinstated and the area was filled in and a relatively flat ground surface area was created. If a site is excavated and not intended to be used for groundworks immediately (such as housing development in the case of PPG16 work) it is important to reinstate the soil and ground surface as near to its original visual appearance as possible. This then causes minimal disturbance to the aesthetics and visual landscape of the area, as well as adhere to health and safety concerns (an excavated unfilled pit could provide a safety risk for falling persons or animals, especially if cattle use the field).

There was also another consideration when reinstating the excavated soil due to the agricultural use of the sites within the levels. One of the landowners asked that in some particular areas, that soils should be as little mixed as possible and should be reinstated in the order that they were taken out. This was because the soil dynamics and nature within this area were particularly sensitive and the farmer was concerned that lesser not as productive deeper soils could be mixed in with better higher soils. Potentially it was considered that this would be detrimental to the topsoil and could affect the quality of flora and fauna growing. This could be an issue in larger open areas of excavation, however after consideration and discussion, it was decided that this issue was minimal and that the soils were already partially mixed from earlier ploughing (evident from surface finds of briquetage).

1.5 Site Information

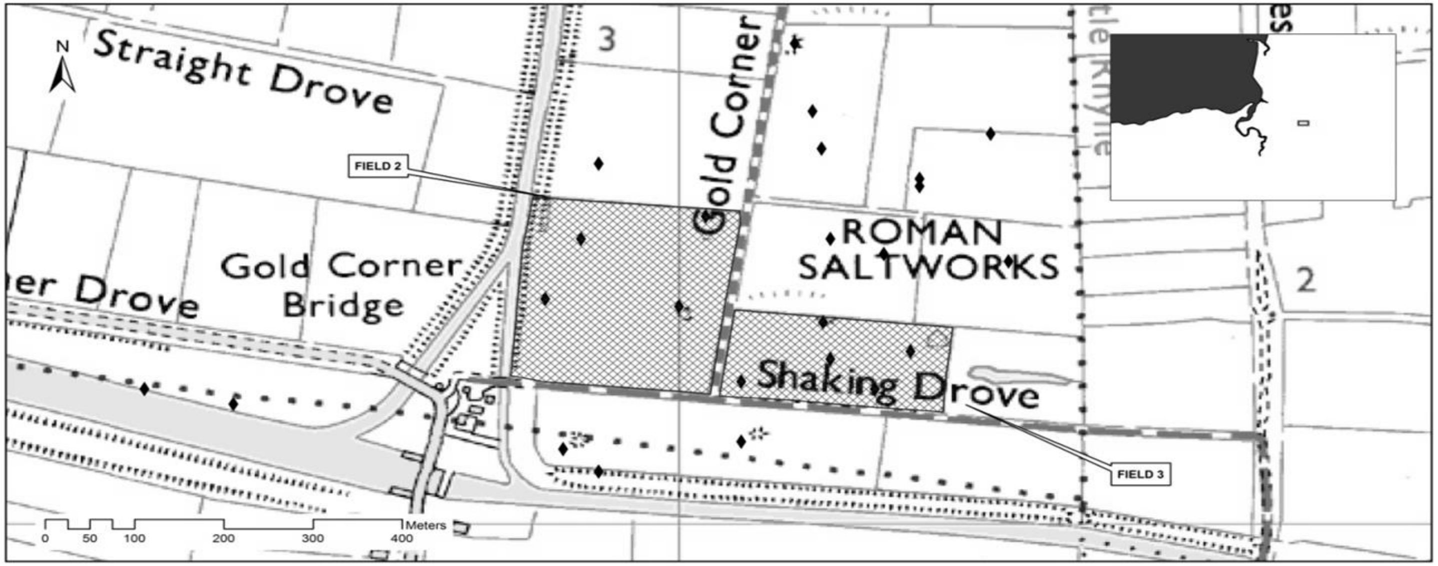
1.5.1 Site Location

Table 3 Site Information: Field 1

Field	Landowner	Address	Central Grid Ref	Area (m)	Fieldwork
1	Mike Richards	South View Farm, Burtle	ST 39205 44930	c.310x90	Gradiometer Survey
					Test pits
					Environmental Samples
					Coring

Table 4 Site Information: Field 3

Field	Landowner	Address	Central Grid Ref	Site ID	Area (m)	Fieldwork
2	Mr Bouwn	Court Farm, East Huntspill	ST 36945, 43298	124 129 179 180	c.250x220	Gradiometer Survey
						Coring
3	Mr & Mrs Thorn	Farm at 'Gold Corner' next to pumping station	ST 37177, 43219	103 126 127 127 266	c.248x115	Gradiometer Survey
						Test Pits



Map Information		
Scale	1:4,000	Ordnance Survey Map Data: © Crown Copyright/database right 2011. An Ordnance Survey/EDINA supplied service.
Central map NGR (X,Y)	337005,143331	
Created	04/2011 SJH	

Legend

- ♦ PHD Sites
- ⊠ Fieldwork Areas

Figure 2 Map showing close-up of Fields 2-3 within the fieldwork study area

1.5.2 Land Use

The first field (**Field 1**) was still mostly covered in hay bales however fortunately the upper, higher end of the field closer to known existing mounds was still empty and available. At the time of fieldwork, the field was being used to provide hay and as well as to graze cattle upon and according to the landowner was last ploughed before the last World War (WWII). Other than the area covered by bales, access to the site during fieldwork was very good.

The second field (**Field 2**) was used at the time of fieldwork to intermittently hold cattle and for the production of hay (Figure 2). The field was very uneven with undulating raised linear earthworks running across the field, likely a result of early agriculture. The ground was also markedly 'spongy' in texture which proved a little difficult whilst carrying out the geophysical survey in terms of keeping the gradiometer level whilst moving for consistency of results. Access to the field was very good during all of the fieldwork period.

The third field (**Field 3**) was still being used ad-hoc for cattle and therefore was only available when not being used for this purpose (Figure 2). It was clear that the potential of Field 3 was limited due to the presence of many cattle and also the regular occurrence of much agricultural detritus. The field was uneven and very overgrown, with trees occurring within the field as well as the boundaries causing ground disturbance. This field proved to be the most challenging in terms of access and suitability for fieldwork however all issues were adapted to and worked around with the overall outcome being very successful.

1.5.3 Permission and Access

Permission was granted by the landowner (Mr M. Richards) for survey and subsequent targeted excavation (if appropriate) for Field 1. Permission was also given by the landowner (Mr Bouwn) for geophysical survey to be carried out within Field 3, but with definitely no excavation although small core samples were allowed. The reasons for not wanting invasive excavation was due to the farmer being concerned about the mixing of soils as he felt this could be detrimental to the future growing of crops/hay. Permission was also given by Mr and Mrs Thorn, to carry out geophysical survey and possible excavation if the survey revealed it (to be negotiated during the work) for Field 3.

1.5.4 Geology

Geology is a core consideration in any planned archaeological fieldwork, especially when carrying out geophysical survey. Geology can have a potentially great effect on the effectiveness of survey and the overall results and it is important to be aware of this as much as possible before starting fieldwork.

As discussed above, it is known that there was a marine transgression after the Roman period which is evidenced by this thick alluvial layer sealing potentially many sites on the lower lying areas. Geologically, the alluvium overlies a rich peat bed and in some areas has built up to form higher clay lenses which are visible in the landscape of the levels. Most of the mound sites sit directly on this bed of peat.

It has long been traditional to steer clear of this geology in terms of geophysical survey, as it has often been assumed that the survey would not be useful when conducted over soft organic peat and potentially thick alluvial clay. During the course of the fieldwork it was also decided to take some *ad-hoc* sample cores over key areas within the study area to not only look at the geological sequence but also to identify the presence of solid archaeology (in this case mounds of fired clay material). This technique proved to be very useful in determining the presence of mounds particularly in practice.

1.6 Fieldwork Team

Members of the **S**outh **C**adbury **E**nvirons **P**roject (SCEP) carried out all the geophysical surveying as well as processing the preliminary results. During test-pitting, *ad-hoc* environmental samples were taken where considered appropriate and these were first processed by Geoflo (a branch of SCEP), and then more detailed analysis was carried out by Debra Costen of Bournemouth University. The excavation results were recorded and assessed by myself, as was the briquetage, the pottery was kindly viewed by volunteer ceramicists whilst looking at Romano-British pottery from another project at Bournemouth University.

A briefing session was carried out at the start of the fieldwork which included a walkover of the general landscape, as well as a visit to some exposed sites in the River Huntspill to provide a background to the fieldwork. Information packs were also provided in order that the volunteers understood the aims of the fieldwork.

2.0 Geophysical Survey (Magnetometry)

This section provides a technical supplement to be read in conjunction with the main text in Chapter **7.0**.

A gradiometer was used to survey in total 211 20x20m grid squares over three different fields. As outlined earlier, the use of a gradiometer was considered the most efficient technique in order to reveal more about the archaeology within the designated fieldwork areas. Summary information about the survey and locations is provided Table 5 below.

The next section will provide the raw geophysical data as well as the finished processed results.

Table 5 Geophysical survey technical information for Fields 1-3

Field	Equipment	No.Grid Squares	Size of Grid Squares (m)	Frequency of readings (m)	Traverse	Direction of walking
1	Bartington gradiometer	55	20x20	0.25	Parallel 2m	North
2	Bartington gradiometer	119	20x20	0.25	Parallel 2m	East
3	Bartington gradiometer	37	20x20	0.25	Parallel 2m	East

2.1 Survey Grids

Below are images showing the grid systems used for each survey.

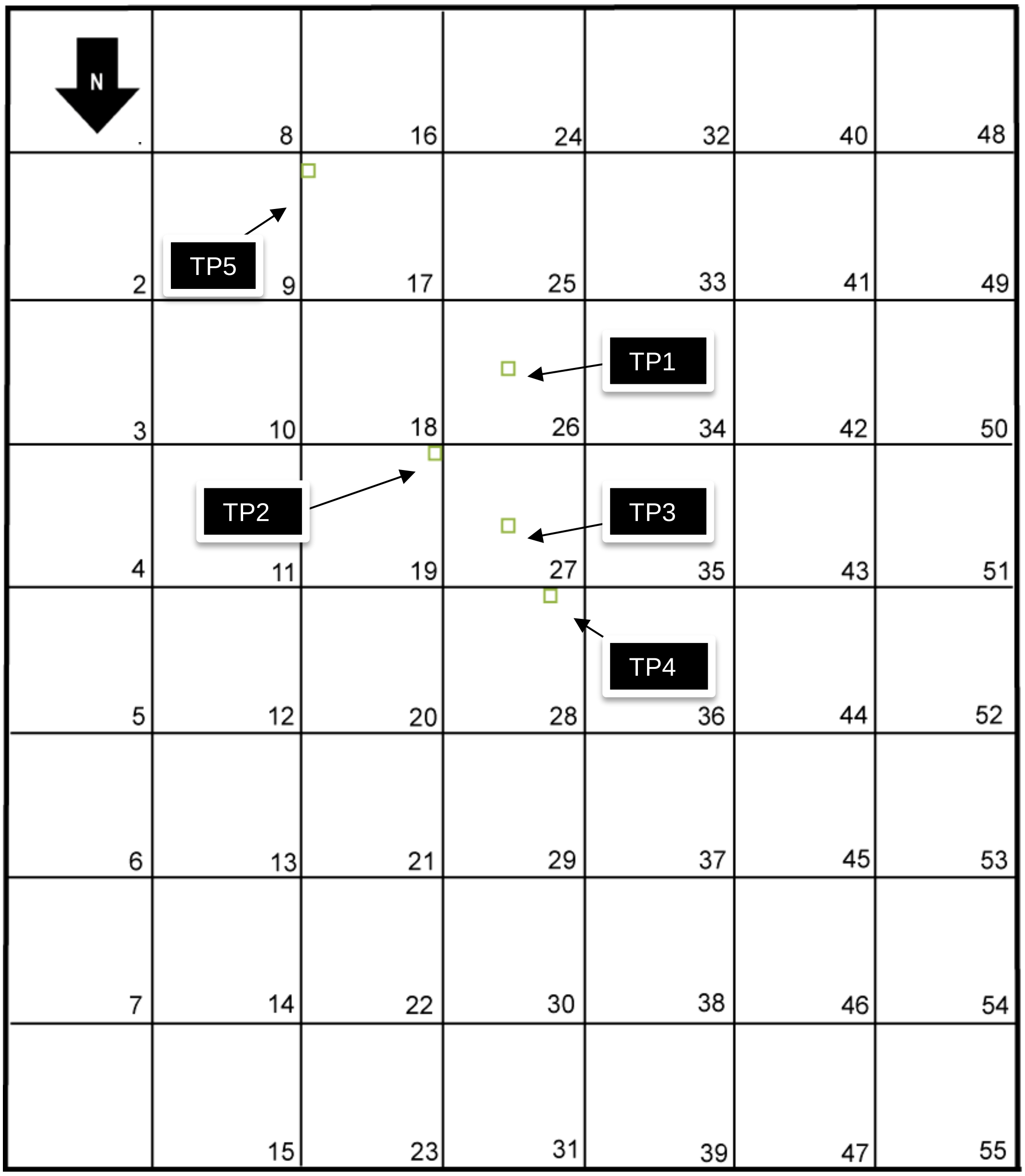


Figure 3 Diagram showing the layout of grid squares (20x20m) and subsequent test pit locations for Field 1

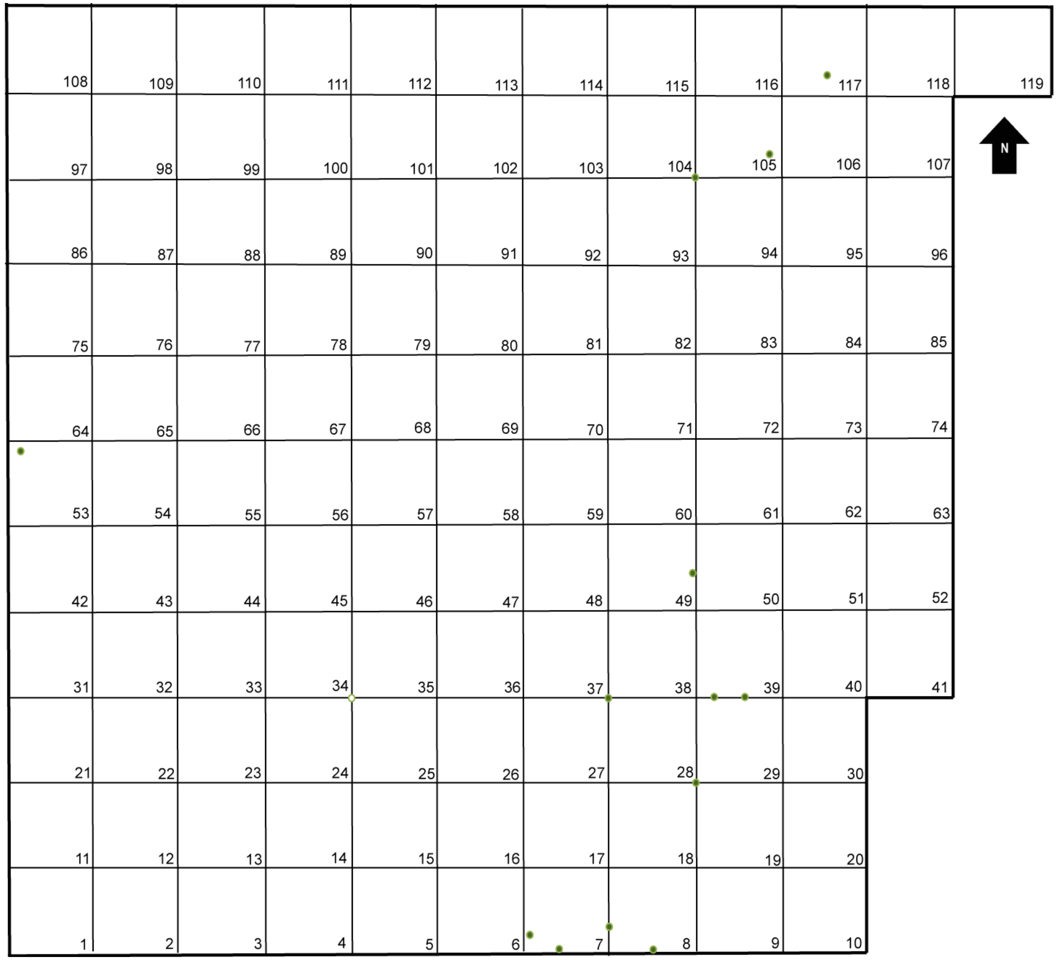


Figure 4 Diagram showing the layout of grid squares (20x20m) and coring locations for Field 2

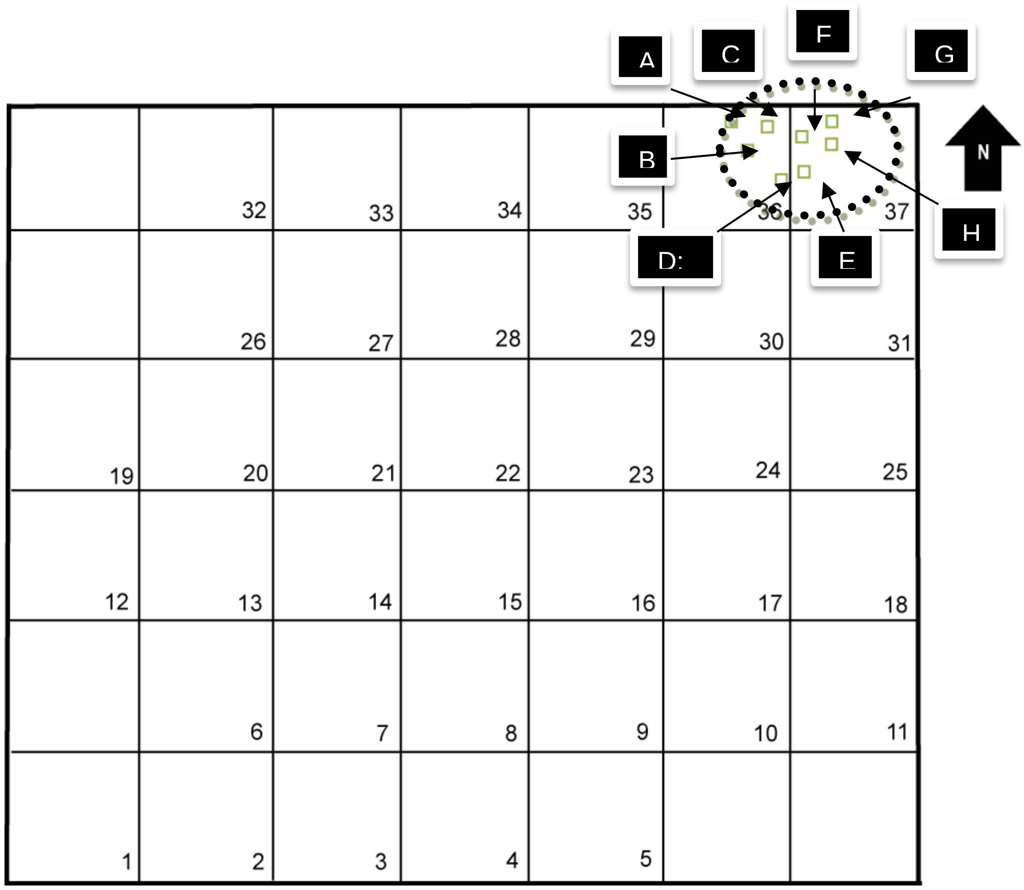


Figure 5 Diagram showing the layout of grid squares (20x20m) and subsequent test pit locations for Field 3

2.2 Processed Geophysical Survey Results

This section contains a series of images presenting the magnetometry results for Fields 1, 2 and 3 including Interpolated and Trace Plots.

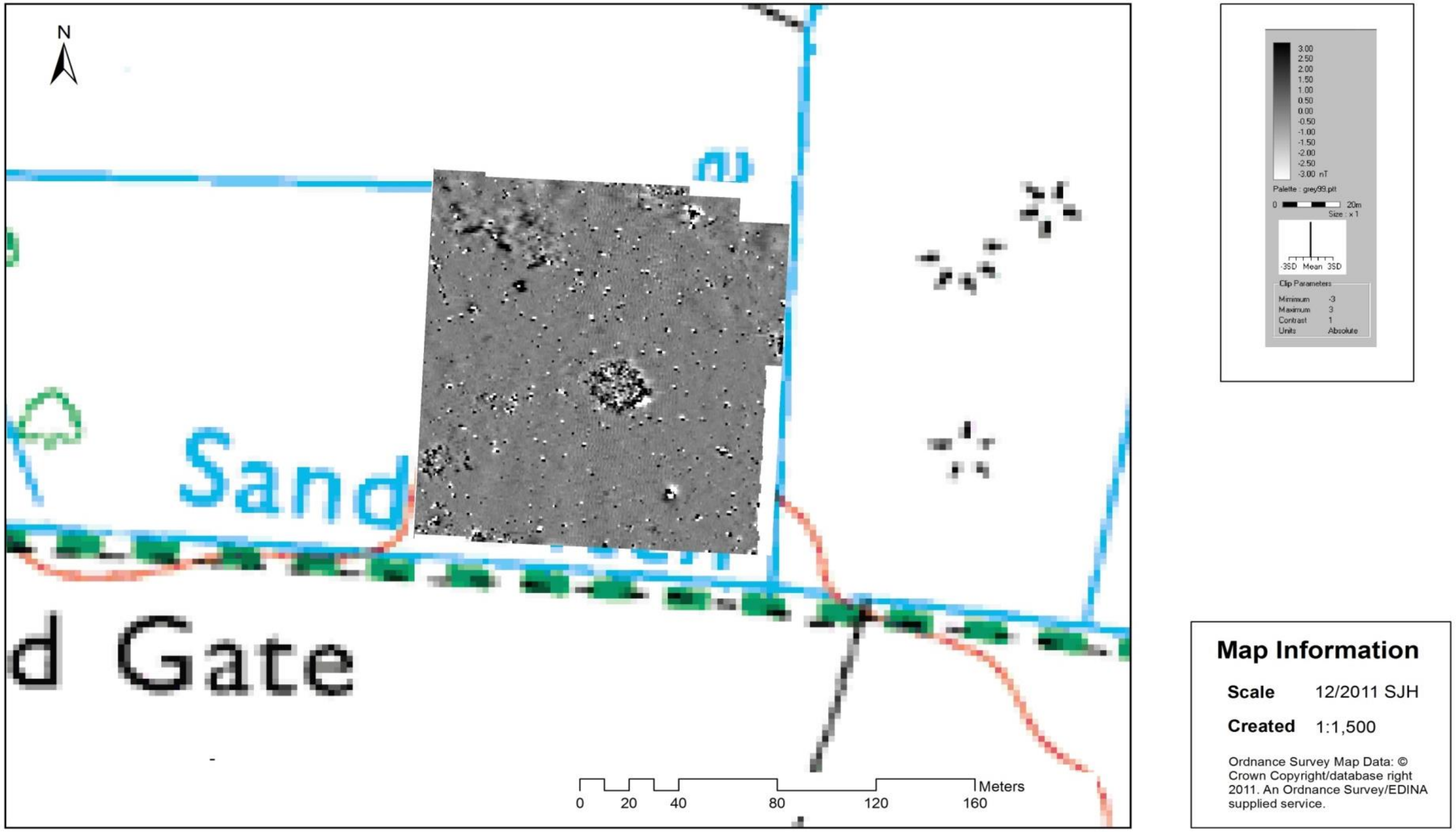


Figure 6 Interpolated Magnetometry Plot for Field 1 @ 1 1:1,500

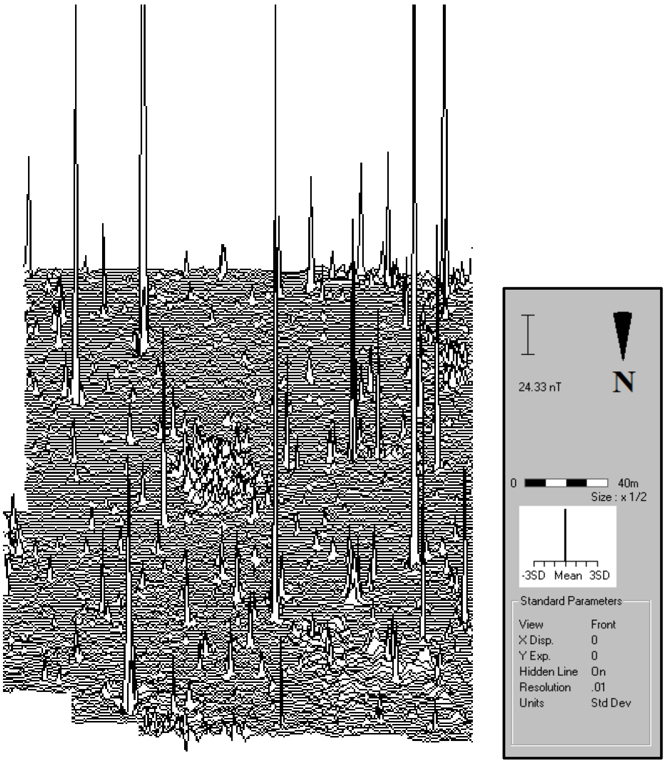


Figure 7 Trace Plot of Magnetometer Survey for Field 1

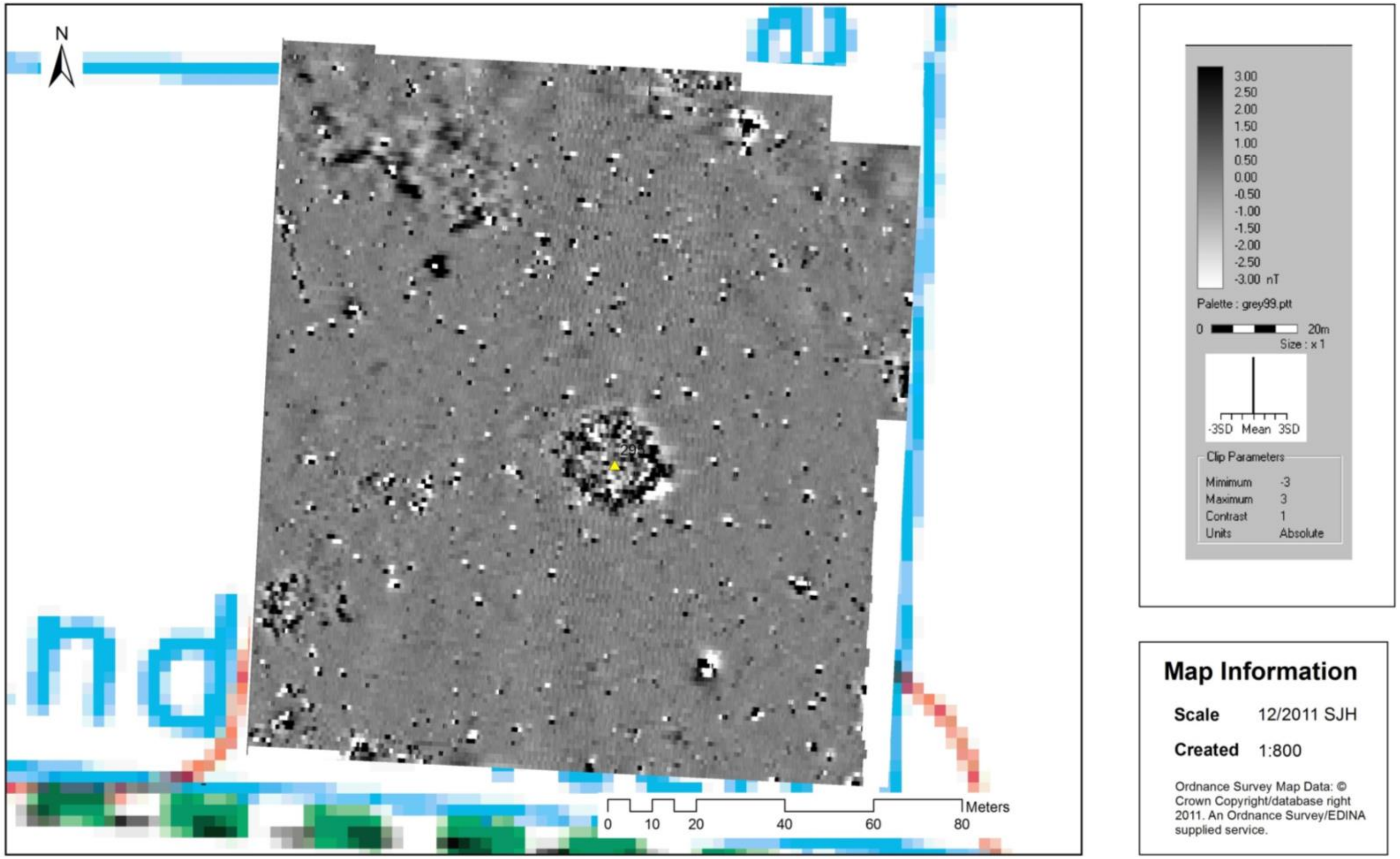


Figure 8 Interpolated Magnetometry Plot for Field 1 with Site Point Data (showing Site 295) @ 1:800

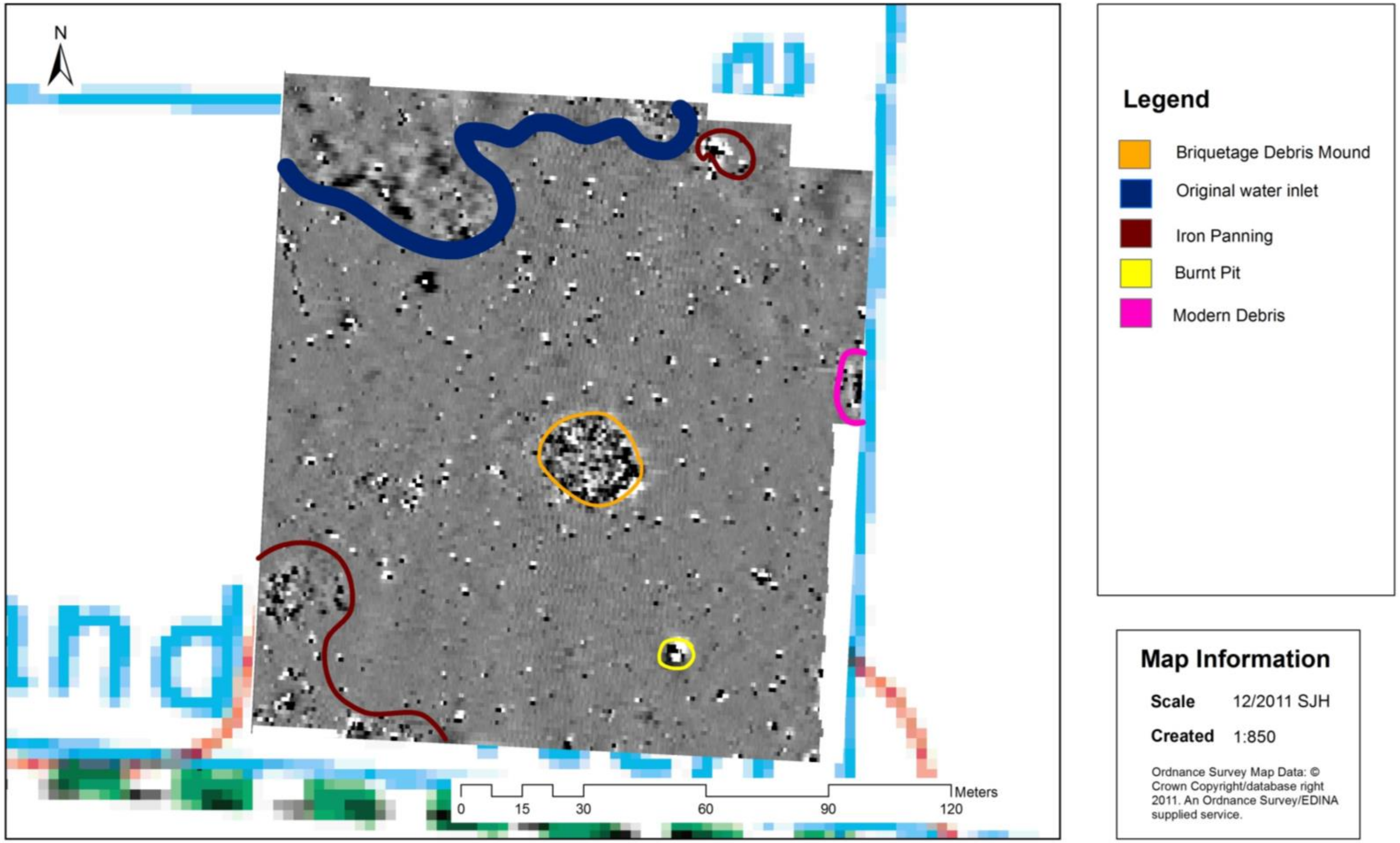
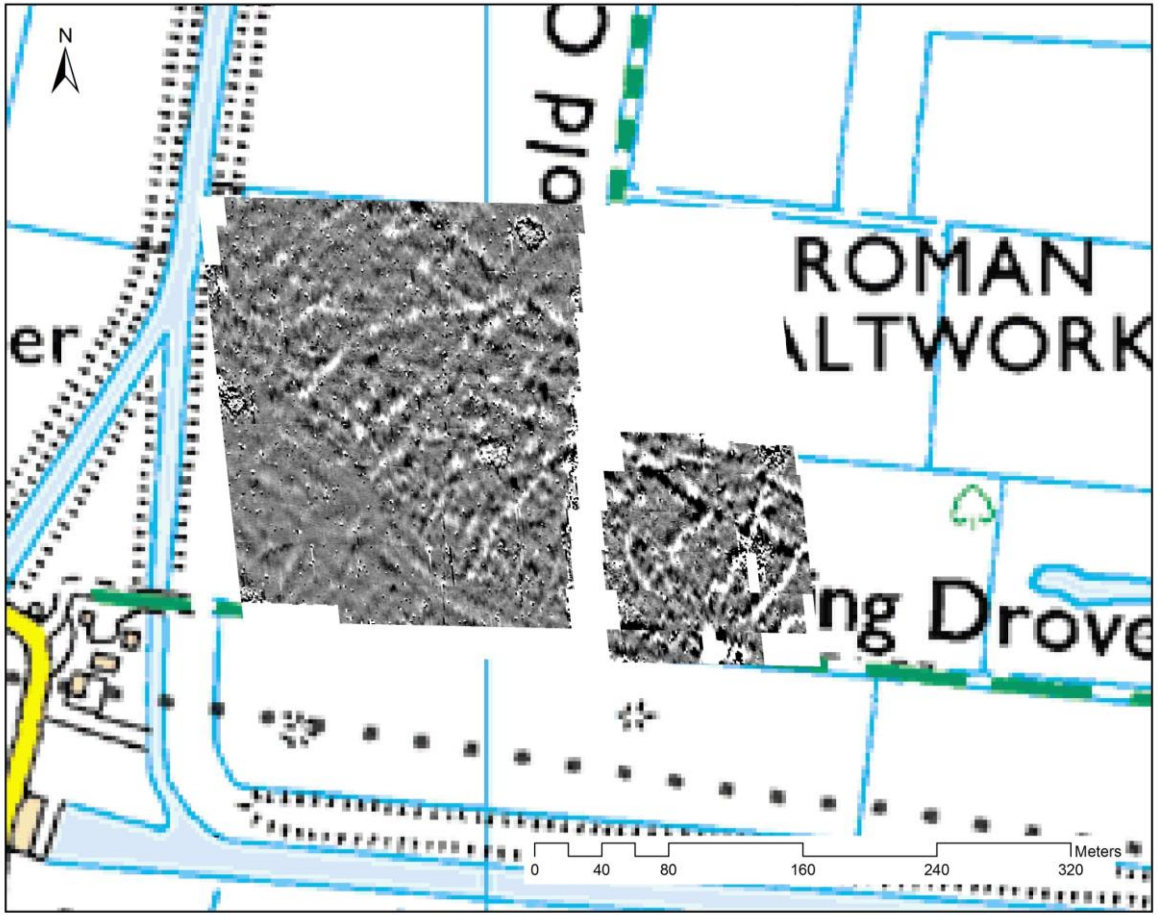
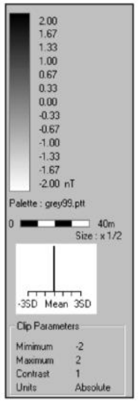


Figure 9 Interpolated Magnetometry Plot for Field 1 with main anomalies highlighted @ 1:850





Map Information

Scale 1:2,253

Created 12/2011 SJH

Figure 10 Interpolated Magnetometry Plot for Fields 2 and 3 @ 1:2,253

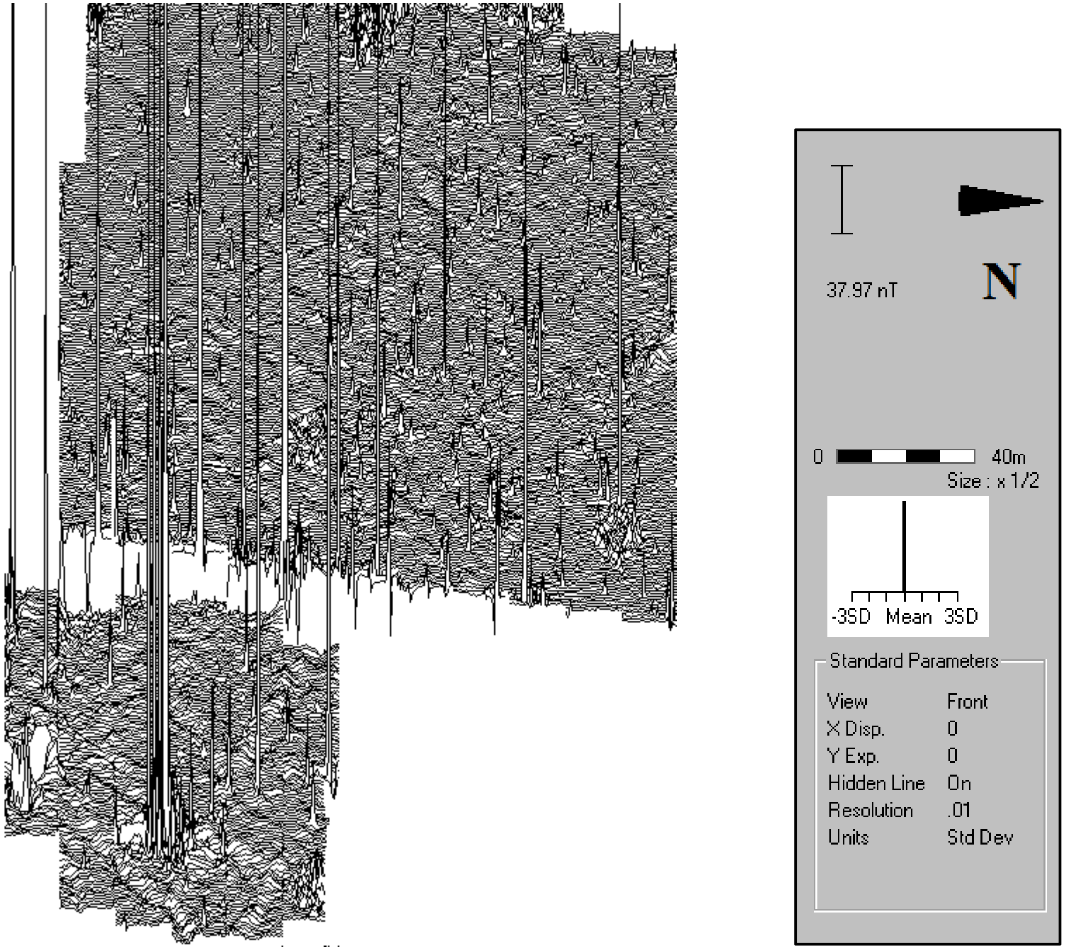


Figure 11 Trace Plot of Magnetometer Survey for Fields 2 and 3

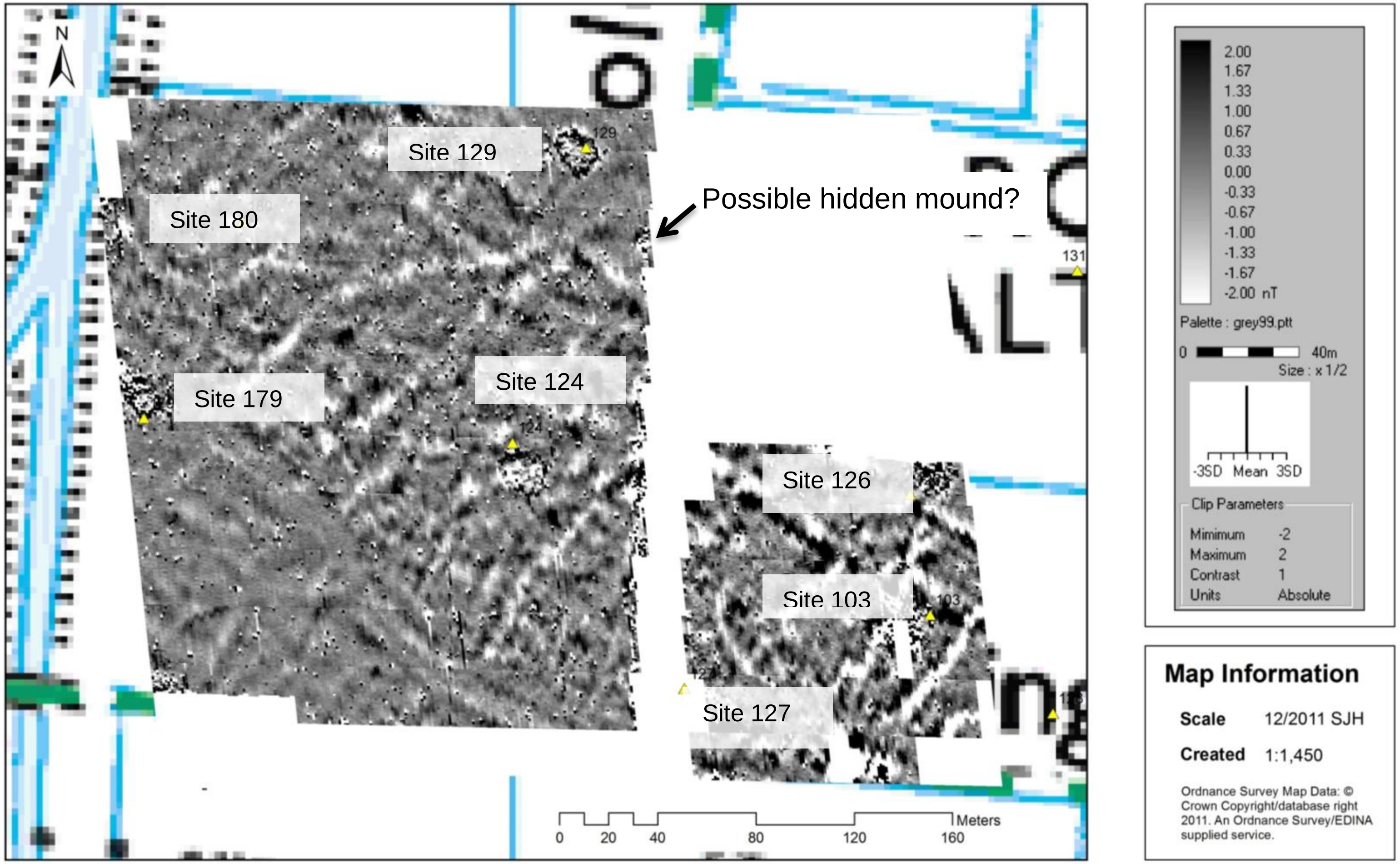


Figure 12 Interpolated Magnetometry Plot for Fields 2 and 3 showing Site Point Data @ 1:1,450

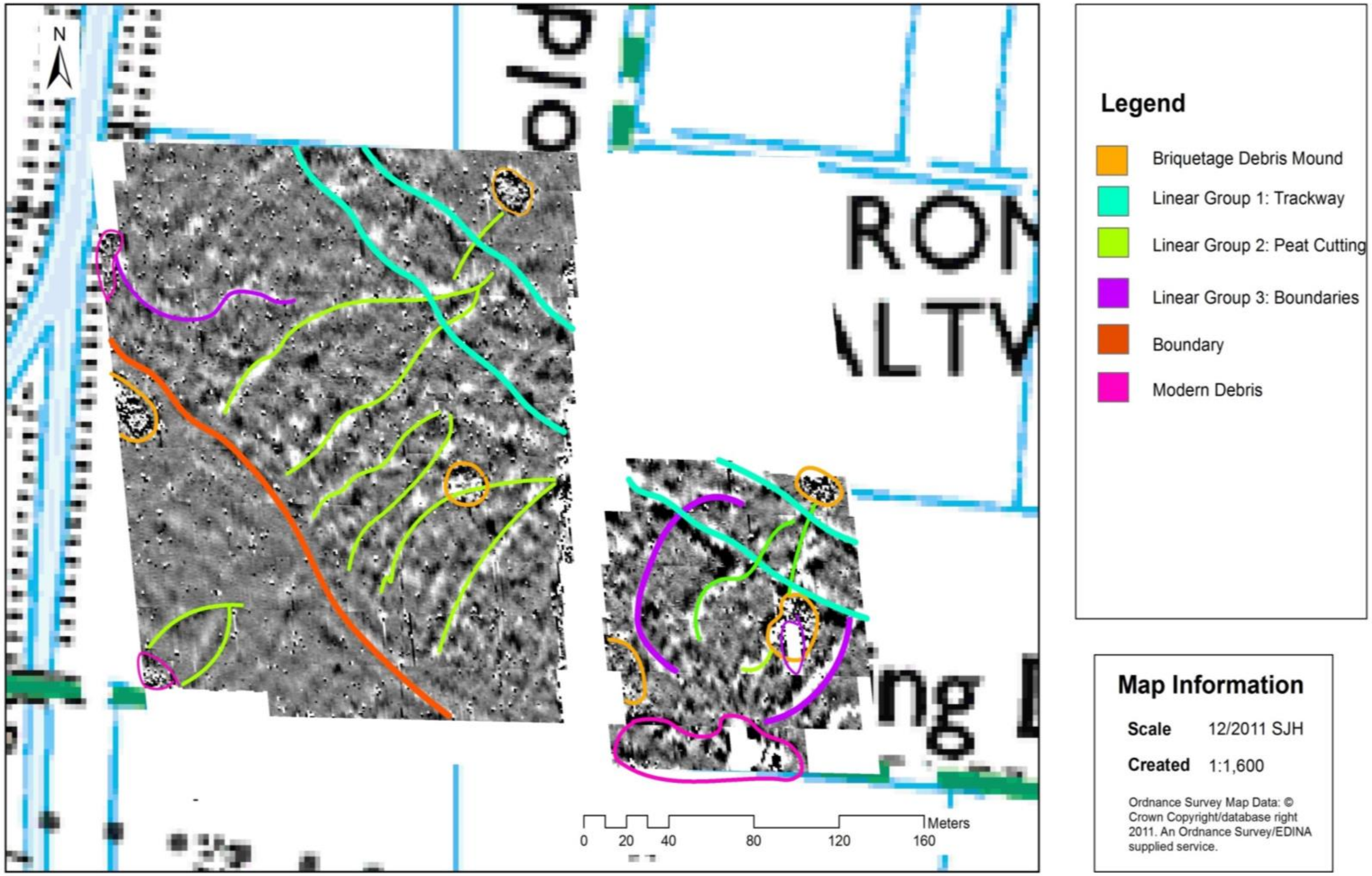


Figure 13 Interpolated Magnetometry Plot for Fields 2 and 3 showing anomalies highlighted @ 1:1,60

2.3 Interpreted Geophysical Survey Results

2.3.1 Field 1

Field 1 was surveyed using a Bartington Gradiometer over 55 20x20m grids placed across the upper end of the field facing north; the results of which can be seen in Figures 3 and Figures 6-9. The survey was carried out over four days in warm sunny weather. In some areas restricted by vegetation growth, partial grids were surveyed up to the point of access.

During processing, the geophysical data was found to have a series of scattered positive responses spread across the entire area. These mostly appear as the small scattered black/white 'dots' across the area, with some larger areas of response seen around the edges of the area and within the centre.

Preliminary core samples in conjunction with ground observations were targeted upon the larger areas of positive response in order to plan where archaeological test pits would be placed.

Archaeological Features in Field 1 (Figure 9)

The most obvious positive response was in the centre of the survey area as a large sub-circular feature which was roughly 20mx20m. Upon closer observation of the ground surface, a large patch of very fragmented briquetage was observed scattered in and around the anomaly within dense grass. Core samples confirmed the likely location of a damaged briquetage debris mound/spread under the surface. The briquetage scatter appeared to have been dragged from the feature northwards which was likely created by modern ploughing.

Debris Mound

This feature was provisionally interpreted as a previously unknown briquetage debris mound or spread. The feature was observed as laying on the edge of higher ground, just as the ground contours started sloping to the north.

The briquetage scatter likely accounted for some of the 'noise' (scattered pixelated small areas) across the survey image.

This feature is now known as Site 295 in the site database.

Irregular Pit

Another positive high response anomaly was also identified (highlighted in yellow); coring did not show iron panning or an obvious reason for the response and the feature was subsequently partially excavated.

Possible Feature

This was a possible feature to the north-east, however it lay very close to a field boundary and fence and could have been modern detritus or that the metal fence affected the reading.

Natural Features (Figure 9)

Saltwater Inlet

At the base of this slope in the north was a probable extant water inlet, which was also confirmed by coring and revealed a soft silty soil easily cored compared to the soil in the rest of the field.

Iron Panning

Coring also confirmed that some of the positive responses were the result of iron panning which is common on sites that have had periods of saltwater inundation near or on the coast as observed in The Netherlands (Kattenberg and Aalbersberg 2004). The iron-panning roughly followed the contours of the higher ground on the site.

2.3.2 Fields 2 and 3

Field 2 was firstly surveyed using the same gradiometer over 119 20x20m grid squares travelling east; the results can be seen in Figures 10-13 (survey area combined with Field 3). The survey was carried out over the first week in warm sunny weather. Surveying this field proved a little more difficult as the land surface was very undulating. However despite this, the results proved to be extremely detailed and spectacular in terms of evidence for human activity.

As with the survey in Field 1, partial grids were required in some areas to the edges of the field where access was limited by thick vegetation and hedges/trees. The western side of the field is flanked by the Cripps River which feeds in to the River Huntspill just south of the field. As a result there is a substantial bank in the western edge of the field; created during continuous dredging of this river. The survey avoided the banked area.

In comparison to Field 1, the location of some archaeology within Fields 2 and 3 was already known; with briquetage debris mounds being previously recorded there. Four mounds were thought to exist in Field 2 and the survey confirmed the location of three of the four briquetage mound sites (Site 179, Site 124 and Site 129). The fourth mound (Site 180) was not identified by survey and it seems likely that either the grid reference given for this mound was incorrect, or the nature of the site was originally misinterpreted.

Archaeological Features in Field 2 (Figure 13)

Debris Mounds

Site 124 was similarly not visible on the ground surface but was revealed by the survey results. As with Anomaly A, this mound had also clearly been damaged and had lost much of its form, resulting in a scattered effect. This mound might have been excavated by Bullied (Somerset Historic Environment Record) which would account for some of the disturbance.

Site 129 was still visible on the ground surface albeit in the form of a very low mound in the north-eastern edge of the field and was the best preserved mound in this field. This mound still maintained much of its original form and has a very similar 'geophysical signature', to the newly discovered mound in Field 1.

Site 179 was located nearest to the entrance of the field and was partially covered by the river bank. It was not visible on the ground surface; however it was visible on the survey results, although it had clearly been disturbed. This was apparent by the lack of form and scattered effect of the results. Observations of the fields undulating surface suggested that the site was once subjected (post-Roman) to deep furrow groundworks and/or drainage ditches.

As well as the debris mounds, there was also an unexpected series of linear features running south-east to north-west across the field. The linear anomalies did not match the linear furrows seen running across the site. Upon first inspection, it was deemed likely that some of these linears represented natural and/or man-made drainage channels. Interestingly, the results looked very similar to what would be expected if a Romano-British linear roadside settlement was located within the field. However the low level of the area meant it would have always been somewhat wet and marsh like in appearance and it is very unlikely such an unstable 'soft' area would have been able to support such structures. Coring across the field did not reveal evidence of occupation as would be expected and the only artefacts were briquetage fragments and the odd sherd of pottery. Any relationship between the mounds and linear features was provisionally unclear, however some of the linear features appeared to respect the mound locations, whilst others appeared to be buried under mounds.

Linear

This long linear feature runs from the north-west to the south-east of Field 1. It could represent a boundary, a drainage ditch or peat cutting contemporary with salt-production.

Possible damaged debris mound

This features was very close to the entrance gate of the Field 1. Therefore it is possibly representative of modern detritus or that the metal in the gate influenced the result. However the feature had a similar form to other debris mounds within the rest of the field and could potentially be a heavily damaged mound.

Natural Features in Field 2 (Figure 13)

Natural Saltwater Inlet?

This linear feature could be a natural inlet that supplied the area with saltwater for salt-production (River Siger).

Permission was not given to excavate within Field 1, therefore in order to explore the features further, the survey was continued directly to the east into Field 3, on the lower right (eastern) side of the large Gold Corner field. However, it is possible that this river branch was linked to the v-shaped feature (green), which could indicate that the v-shaped features were linked to not only peat removal, but also supply of saltwater to the mound sites (see below).

Archaeological Features in Field 3 (Figure 13)

Despite difficult ground conditions (very overgrown area with metal debris) a total of 37 grid squares were surveyed on the furthest western edge of **Field 3** representing about 50% of the total field area. The survey clearly showed the remains of three mounds which approximately matched the known location of mound sites recorded in the Somerset HER.

Debris Mounds

However an Iron Age date may seem less likely given the wet nature of the site before drainage in the Romano-British period and the enclosure is more likely a simple livestock enclosure later in the history of the site.

Modern disturbance

This area of Field 2 was heavily covered in modern farming detritus and therefore this created 'false' readings in the geophysical survey.

Archaeological Features continuing across both Fields 2 and 3 (Figure 13)

Peat Cutting/Saltmarsh management/ Saltwater feeding?

Although only four more obvious –v-shaped cuts have been highlighted as linked to peat-cutting (because the further one leads underneath the mound at Site 126), it is probable that most of the linears running across the fields were linked to peat-cutting.

However, it is also possible, that the v-shaped cuts were linked to contemporary (with the mound) saltmarsh management, or even supply of saltwater to the mound sites. This was suggested above, when outlining the possible river inlet identified just west of the largest v-shaped cut in Field 1. This feature does appear to potentially link to the mound at Site 129, or more probably, another mound within the boundary of the fields to the east of Site 129 (Figure 12). Similarly to the mound at Site 126 (Figures 10-13) also appears to have a v-shaped feature linked to it.

Possible Track way

There were two parallel anomalies running across the top of both fields which has the appearance of a track way. If so then it would have potentially spanned at least 20m in width.

This potential trackway feature respected the location of mounds by running in between Sites 126 and Site 103. This could suggest that the' trackway' was constructed to be used whilst the mounds were in-use to allow access and provide an area to transport salt, however this cannot be confirmed and 'trackway' could also be later than the Romano-British period (as the mounds have remained visible). The direction of the 'trackway' is of interest as it appears to head towards the Cripps River, the direction of which is a more recent creation. Across the river is another group of mounds and it is possible the trackway predates the river which would at least support some age (although exactly when the course of the Cripps River took its present direction is not clear). Coring failed to successfully confirm or deny the presence of a trackway.

3.0 Archaeological Excavation (Test Pits)

3.1 Field 1

Field 1 was the main focus of targeted excavation during the overall fieldwork (see Figure 4 for test pit locations). After preliminary processing of the geophysical results, a total of five targeted test pits were excavated. Most focus was placed upon the area in and around the new mound in order to investigate the nature and parameters of the feature.

Test Pit 1

Test Pit 1 (1x1m) was located on the outer spread of the briquetage scatter. The test pit produced no clear stratigraphy and contained infrequent small fragments of briquetage that had clearly been spread from the mound as a result of ploughing. The test pit was bottomed onto natural clay at c.30cm.

Test Pit 2

Test Pit 2 (2x2m) was excavated on the north-eastern edge of the mound (Figure 14). In this area there was no briquetage scatter on the ground surface; suggesting this part of the mound had not been subjected to much damage. However, excavation did reveal that the mound had been subject to plough damage at some point. The test-pit contained three main layers (Figures 16-18: Contexts 6, 4 and 5).

Figure 14 View facing east of Test Pit 2 after topsoil stripping, note the fragmented briquetage spread right across the pit area with larger fragments visible in the bottom left corner (Area A) (Author: 2008)

The topsoil contained small fragments of disturbed briquetage (6); leading to a layer which represented a slightly damaged upper briquetage surface, but was relatively undisturbed under this, with a compact spread of briquetage with charcoal flecks (4) at c.17cm; underneath this layer was natural peat with a trampled surface embedded with small fragments of briquetage (5) at c.35cm. Context 4 contained a great deal of briquetage, with less frequent pottery sherds.

A large environmental sample was taken from this layer, with one of the aims being to assess the fragmentation rate of briquetage in this layer.

The edge of the mound was observed in plan at the north-eastern side of the test pit; however the edge was not easily definable as it appeared to have been spread a little further into the peat surface at some point in history. However in section the surface could be seen to be gently sloping towards this edge and clearly represented the remains of a damaged mound.

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Figure 15 Close up of briquetage Area B during excavation (Author: 2008)

Two particular areas of compact briquetage slabs were revealed during excavation; referred to as Area A and Area B (Figures15-17); they appeared to represent two uneven holes packed with larger fragments of material.

Once the briquetage was removed, there was little evidence for a defined cut feature for either area. Another patch of large briquetage fragments was also found and as a result the test pit was slightly extended to the west. No further large briquetage fragments were found and the mound was bottomed at this point onto a rich natural peat at a depth of c.35cm.

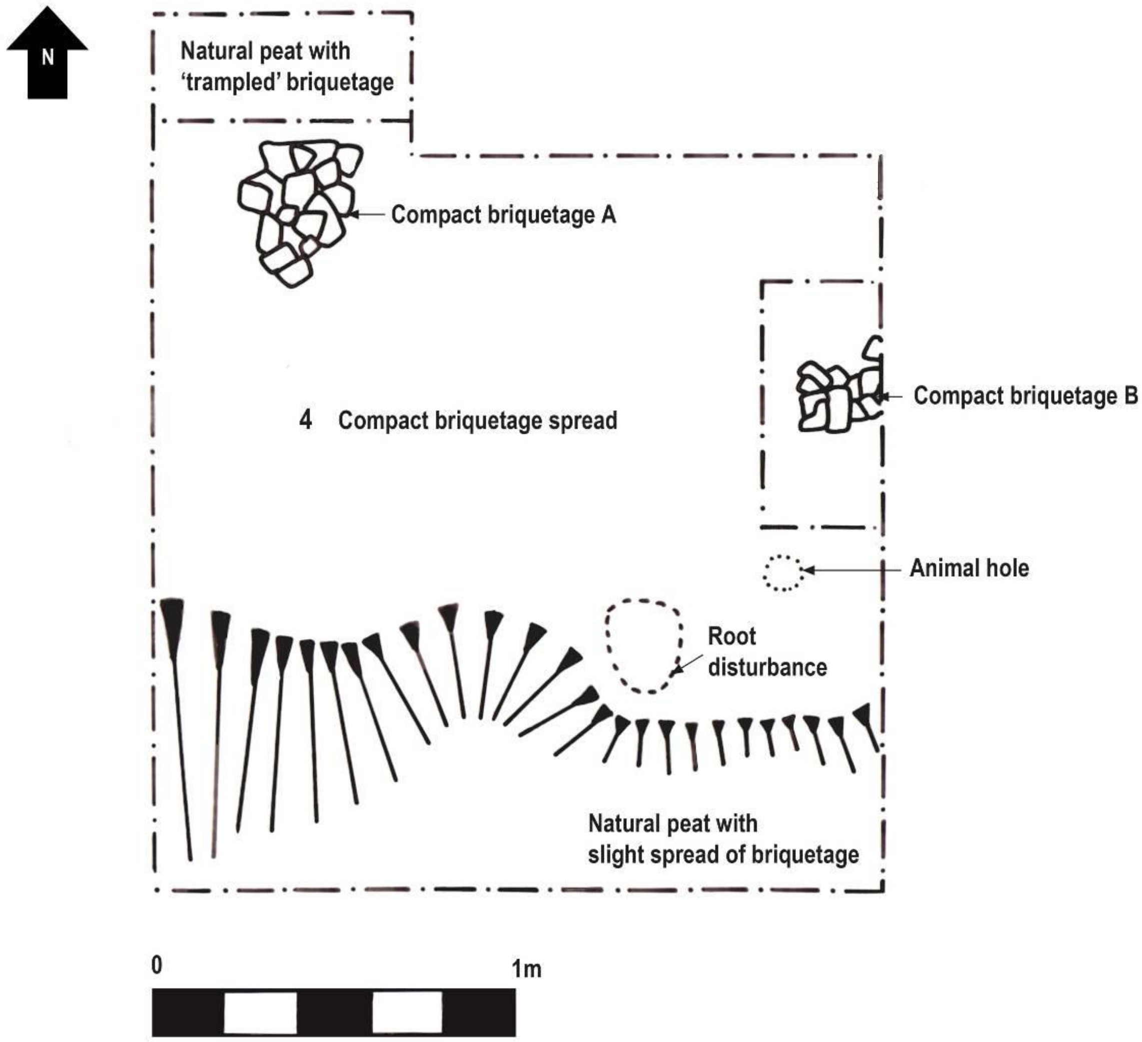

Figure 16 Plan of Test Pit 2 at Site 29

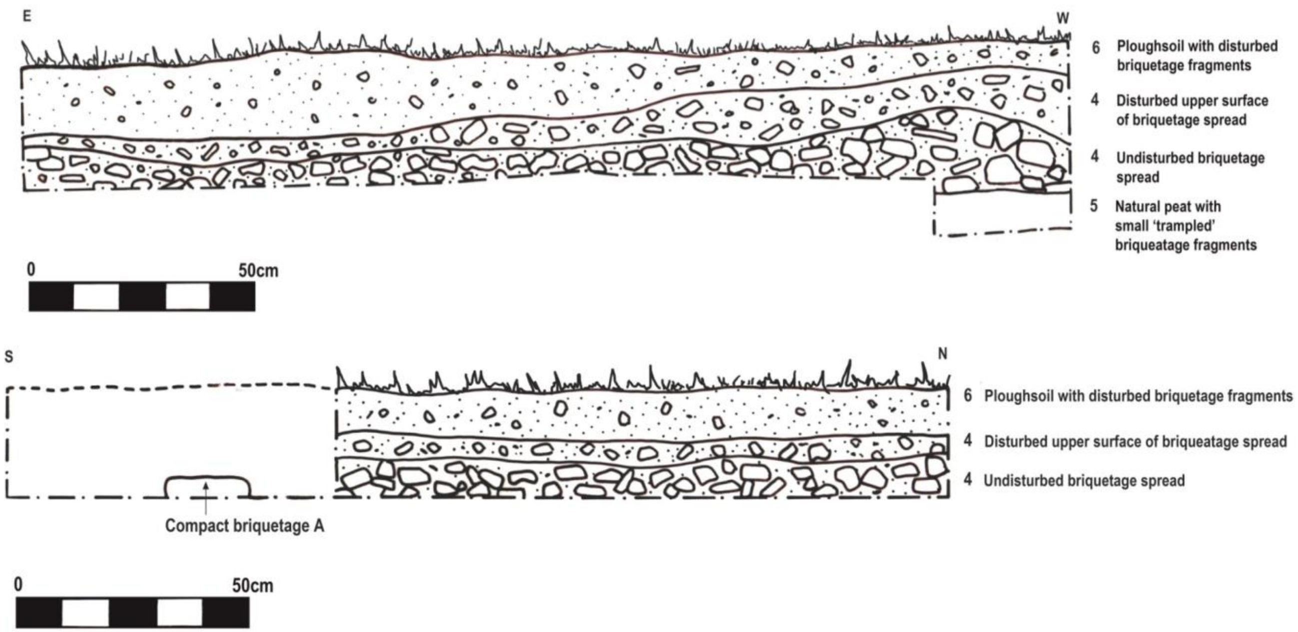

Figure 18 Section of Test Pit 2 facing west

Test Pit 3

Test Pit 3 (1x1m) revealed a clear section through the deeper, central area of the mound (Figure 20). There was no briquetage debris on the ground surface and upon excavation the topsoil was completely clear of briquetage.

Underneath the topsoil (8), as with Test Pit 2, there was a layer of smaller fragmented briquetage at c.13cm (7); this overlaid a more compact layer of briquetage at c.23cm (Figure 19). The undisturbed spread was thicker in this Test Pit which is not surprising given its more central location.

Again this compact layer produced a variety of clay slabs and fire-bar fragments, as well as pottery sherds. There appeared to be no evidence from either test pit, that certain forms were restricted to particular areas; there appeared to be a good mixture of forms. The excavation of this test pit did not support the first hypothesis from Test Pit 2, that there once stood a high mound here that had been eroded to a flatter surface.

The fact that there was no briquetage in the topsoil (Figures 19 and 20), and that this test pit was in the centre of the briquetage debris, suggests that it was never in fact a large upstanding mound (c30-50cm high). Perhaps unlike some of the other surrounding mounds, this particular site represented an intermediary production site, perhaps a short phase of production which only presents as a deep spread.

Test Pit 4

Test Pit 4 (1x1m) was excavated over an area of an anomaly evident on the geophysical survey results. The soil was completely clean of any artefacts and the anomaly appeared to have been created by a natural dip in the clay surface that contained sandy soil.

Figure 19 Section of Test Pit 3 (west facing)

Test Pit 5

Test Pit 5 (Figure 20) was excavated at the very end of the fieldwork over an area represented by a particularly strong anomaly on the geophysical survey. The topsoil (13) was found to be clean of archaeological finds and was bottomed at c.20cm onto a very compact natural mottled clay layer (14).

Figure 20 Part of Feature 1 in Test Pit 5 (Author: 2008)

Cut within this clay was an irregular shallow feature (F1) which was half sectioned (the other half being buried within the unexcavated area). The feature did appear to have a slightly darker fill (12). The fill consisted of a mix of peat, pale yellow sand and clay with no archaeological finds present, and was bottomed onto the same mottled natural clay at c.30cm.

Upon excavation, fragments of dark wood (not burnt) were found at the base. This and the uneven appearance of the feature (the sides were very difficult to define) was taken to suggest that this feature was probably a natural 'tree hole'. However, environmental samples were taken to investigate the feature further.

Alternatively, it is possible given that the feature was 'cut' into clay, that it could have represented a settling/evaporation tank, however there was no evidence in the fill to prove this.

3.2 Field 3 (Rescue Excavation: Site 126)

Figure 21 View of the mound at Site 126 taken from the western edge of the mound facing east. Note the mound is covered in longer vegetation when compared to the surrounding field (Author: 2008)

Upon inspection, the mound at **Site 126** was clearly visible on the ground surface (Figure 22) but was severely damaged due by an obsolete, badger set. The mound was covered in thick vegetation and slightly unstable on its edges, and a field boundary fence ran across the centre.

As a result it was decided to rescue all briquetage and pottery which had been disturbed and brought to the surface, and tidy up the large holes (Figure 23), to try and ascertain whether any stratigraphy was still present *in-situ*.

Figure 22 An example of one of the many area of disturbance in Site 126 (Author: 2008)

Figure 23 Compact briquetage surface revealed just under the mound surface on its western edge within 'Hole C' (Author: 2008)

Eight pre-existing holes were investigated (Figure 5) across the mound (labelled A-G) by trowelling back the surfaces to see if there was evidence of undisturbed briquetage. One of the holes was converted into Test Pit 8 (Figure 24).

Fortunately a compact layer of briquetage was encountered relatively easily; and was in places very close to the actual ground surface.

Whether this layer represented the true and original mound surface was difficult to ascertain. However, the contours appeared consistent with a rounded mound, with quite a steep edge to it. This compact layer was extremely difficult to trowel and consisted of tightly packed small-medium fragments of briquetage, frequent areas of degraded and burnt clay and small charcoal flecks.

Only two holes were excavated to the base; and both showed that after c.5-7cm there was a much less compact layer which contained larger lumps of charcoal as well as larger more recognisable fragments of briquetage. Both of the holes showed clear evidence for peat cutting at the base (Figures 24), preserving the spade marks.

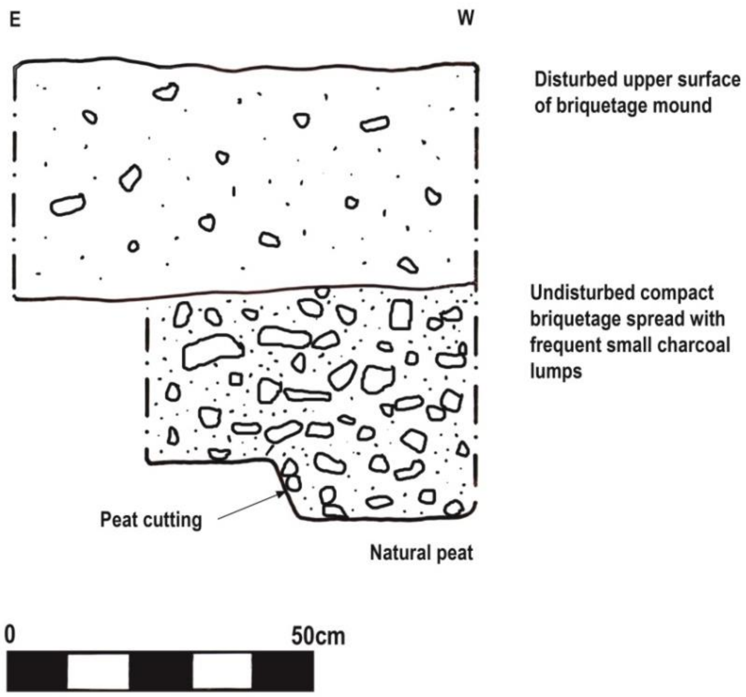

Figure 24 Section of Test Pit 6 facing north showing peat cutting

The discovery of the spade marks underneath the mound confirmed that peat was clearly being cut and used as fuel in this area. In a period that clearly predated the debris mound above. Thus it is likely that before salt production took place in this area, the peat was first removed in readiness to be used as a fuel closely associated in date.

This gives a unique insight into how the sites were managed in terms of preparation. Upon inspection (although this was limited by the small size of the area) there did not appear to be a layer on top of the peat to suggest that much time had elapsed between the peat being cut and the first layer of briquetage being added.

The presence of peat cutting could also shed some light on many of the linear anomalies seen running across both Fields 3 and 4 and it is likely that most of these features were a result of peat cutting and field drainage.

3.3 Coring (Field 2)

The coring identified natural iron panning in the field (samples F and G) which are likely to be responsible for some of geophysical anomalies on the survey. The coring showed that a consistent layer of alluvial clay covered most of the field to a depth of 100-150mm (Table 5). It is likely that the areas with an upper peat covering are disturbed by past agricultural works to the field. Mound sites 124, 129 and 179 were all confirmed as briquetage debris mounds. Site 129 clearly still had a compact lower section of an undisturbed briquetage mound remaining relatively intact.

Site 124 had been disturbed and this was evidenced by the more ‘scattered’ geophysical response and the very fragmented loose briquetage. Similarly, **Site 179** had also been greatly disturbed, which was not only apparent on the geophysical survey (an irregular scattered appearance) but also by the fragmented scattered briquetage in the core.

The mound still visible in the north-east corner of the field (Site 129) indicated that the alluvial cover had ceased at that point. Given that the alluvium around Site 166 (Huntspill) was over 1m thick, this supports that the area of Field 2 contained the furthest extent and therefore shallower extent of alluvial coverage. This does explain why the sites from Field 2 (Gold Corner) northwards, are often still visible (if they have not been too damaged by ploughing).

Table 6 The sample core results from Field 3

Core Sample	Sample Description
A	Peat to 100mm, peat and briquetage to 600mm, then natural wet peat
B	Clay to 100mm, peat at 500mm
C	Clay to 100mm, peat at 500mm
D	Clay to 100mm, peat at 500mm
E	Clay to 150mm, peat at 500mm
F	Clay to 100mm with slight flecks of iron panning, peat at 500mm
G	Clay to 100mm with slight flecks of iron panning, peat at 500mm
H	Topsoil and ceramic sherds, peat mixture to 100mm
I	Wet clay with slight iron to 100mm, waterlogged peat at 600mm on anomaly line
J	Sample taken from a debris mound identified by the survey. Core confirmed salt association. Peat to 150mm, briquetage fragments to 200mm, the briquetage was too compacted to core after this point
K	Peat and flecks of briquetage to 220mm, clay to 550mm, then to natural peat
L	Peat to 300mm, clay to 400mm then natural peat
M	Peat to 100mm, peat and flecks of briquetage to 250mm, then to natural peat

3.4 Environmental Samples

Residues and Coarse Flots (Tables 7 and 8)

The results for the contents of the sample residues and coarse flots can be seen in Tables 7 and 8. As expected, there is little evidence for environmental data from Test Pits 1 and 2. These test pits were both excavated near or in compact debris mounds and it is likely that any potential environmental evidence was destroyed by the sheer weight of the briquetage.

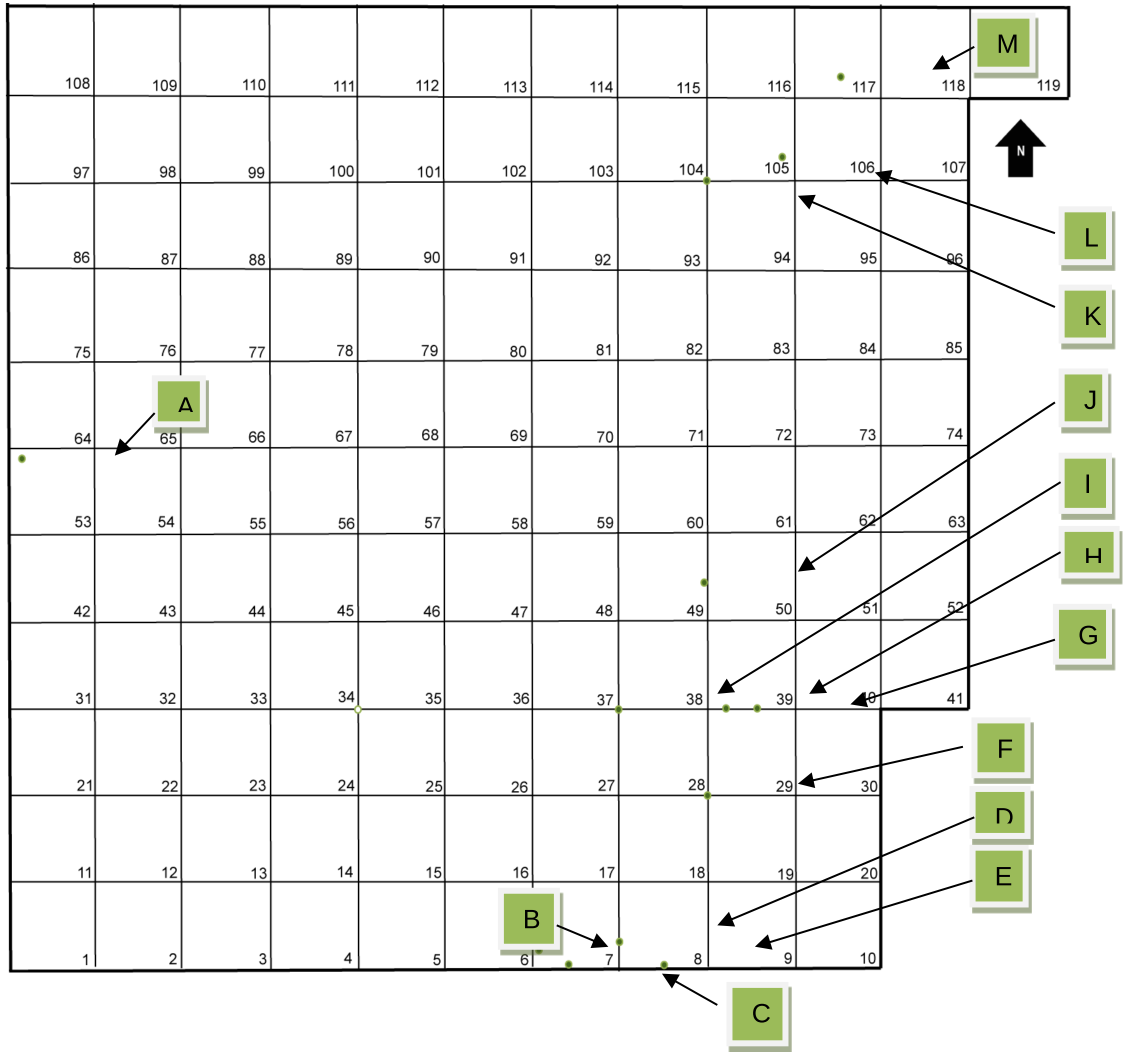

Figure 25 Geophysics grid (20m squares) and relative positions of cores taken

Table 7 Environmental Sample Residue Results (All material other than briquetage)

Sample Area	Context	Feature No.	Residue Seive Size (mm)	Fraction Sorted	Charcoal/Twig	Burnt Plant Remains	Seaweed	Vitrified Clay
TP1	002/003	-	8.70	1/1	-	-	-	-
TP2	005	-	8.70	1/1	-	-	-	-
TP2	005	-	>1.0	1/1	-	-	-	1
TP2	004	-	8.70	1/1	-	-	-	1
TP2	004	-	>1.0	1/1	-	-	-	3
TP5	012	F1	1.0	1/1	47	15	4	-
TP5	?	-	2.0	1/1	51	41	6	-
TP5	012	-	8.70	1/1	7	-	-	-
TP5	012	-	1.0	1/1	34	-	59	-
Site 126	Hole 4	-	8.70	-	-	-	-	3

Table 8 Environmental Sample Coarse Flot Results (All material other than briquetage)

Sample Area	Context	Feature No.	Fraction Sorted	Weed Seed	Charcoal	Burnt Organic Material	Seaweed	Mammal Bone	Mollusca
TP2	004		1/1	1	-	-	-	-	-
TP5	012		1/1	-	7	-	2	-	-
TP5	012	F1	1/1	-	-	-	1	-	-
Site 126	Hole 4		1/2	>50 (modern chenopodium album)	-	Present-Not quantified	-	1	4

It could also suggest, that the mound was created over a relatively short amount of time and that there was little opportunity for environmental evidence to accumulate in the mound. Small fragments of vitrified clay were noted in residues from Test Pits 2 and 6 (Field 1). As discussed earlier, larger lumps were also discovered in TP6 (Field 3). Their presence in both Fields 1 and 4 demonstrates that the two sites likely shared a common technique which involved using higher heating temperatures.

Test Pit 6 (Field 1) contained some burnt organic material which upon inspection is likely to represent burnt peat which would match the evidence for peat cutting underneath the mound used for fuel.

Test Pit 5 (Field 1) revealed the most surprising results. As discussed earlier, this revealed an irregular feature with some small wood fragments at the base, originally interpreted as a tree hole. However the residue and coarse flot material was by far the richest of all the samples, containing a lot of burnt wood and plant remains. This probably indicates the burning of wood and peat for fuel nearby. Burnt heather was identified amongst the remains (perhaps mixed with the peat before burning), and even more surprising is the presence of burnt seaweed.

4.0 Report References

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