6.0 Regional Evaluation of the Study Area. Case Study II: Central Somerset Levels and Fieldwork Results

6.1 Introduction

This chapter provides the second regional evaluation for salt-production in the study area. This incorporates the North Somerset Levels, the Somerset coast, as well as the Central Somerset Levels (Figures 10.1.2-10.1.6).

Although this chapter provides a regional evaluation of salt-production across both Somerset and North Somerset, the case study element of this chapter focuses upon a particular group of sites within the Central Somerset Levels. The case study of the Central Somerset Levels, as outlined in **2.1.1** and **Appendix 10.0**, also incorporates archaeological fieldwork carried out as part of this research project. Therefore, this chapter has four main elements:

1. Regional overview of salt-production across both Somerset and North Somerset including background, and overview of 'Site Type' and chronology
2. Presentation of fieldwork results
3. Assessment of technological and detailed chronological trends across the whole region
4. Case study and characterisation of salt-production in the Central Somerset Levels

As stated in Appendix **10.0**, the fieldwork was designed to address the lack of data on the nature of the distinctive mounds scattered across the Central Somerset Levels. It was also completed in order to shed more light on a potentially very important area of *later* Romano-British salt-production. As shown in the core data results (**3.1.2.2**), there is strong evidence for Late Iron Age and Early Romano-British salt-production in the study area, but in comparison, there were less sites for Middle-Late Romano-British salt-production.

As also shown in **3.1.2.2**, there is a drastic reduction of salt-production sites during the 2nd century AD across most of the study area. This was in contrast to some of the mounds within the Central Somerset Levels being dated to the Middle-Late Romano-British period. Although most of the mounds could only be dated to 'Roman', because of the lack of investigation, it remained a possibility that these mounds could also be of a later date. With this in mind, it was seen as essential,

that more information could be gained about these mounds, including the examination of space surrounding the mounds to assess contemporary organisation and management of the area. As a result of the fieldwork, not only was a new site discovered in the Central Somerset Levels, but also important new insights into the character and use of sites were ascertained.

Although the fieldwork and case study area form a substantial component of this regional evaluation, there is also detailed consideration of the development of salt-production across the region as a whole.

As with **5.0**, salt-production in the Somerset region will be generally explored further according to Site Type, Chronology and Technology, and sites will be discussed as a whole, according to key site concentrations across the region. In Somerset, three geographical site groups have been identified, and these will be used to discuss sites throughout this chapter (Figure 10.4.1):

1. Coastal (Highbridge)
2. North Somerset Levels
3. Central Somerset Levels (Case Study and Fieldwork)

The main elements and themes of this chapter are listed in order, within Table 6.1.

Table 6.1 Key Elements/Themes in Chapter 6.0

Key Elements/Themes	Archaeological and geographical context
	Overview of 'Site Type' and Chronology
	Outlining the three site groups
	Fieldwork considerations
	Fieldwork results
	Technology of salt-production in this region (incorporating fieldwork results)
	Case study and characterisation of the Central Somerset Levels (Group 3)
	Chronological development of salt-production

This chapter should be read in conjunction with **Appendix 10.4**, which includes the full fieldwork technical report **(10.4.1.)**. The **Site Gazetteer (Table 10.1.4: Volume Two: DVD)** can also be used to provide a convenient overview of each site discussed in the main text, if required.

6.1.1 Building the dataset for Somerset

As outlined in **1.7.1**, and highlighted in **6.1**, researching and attempting to understand the character and nature of Iron Age and Roman-British salt-production in Somerset is made more challenging by the limitation of published literature and especially, the lack of detailed excavation and survey.

Of all the counties in the study area, this one (including North Somerset) was by far the hardest geographical area to obtain tangible quantified data for salt-production. Data collection was made substantially easier by the ease of access to the online Somerset Historic Environment Record. However, as stated in **3.0**, some of these records appeared to be attributed to mound groups as opposed to single mounds, all of which individually, appeared to also have their own records. This equated to at least 15 records not being included within the dataset (see Table 10.1.2). This was confusing, but does exhibit well, the difficulty ascertaining the 'true' number of known debris mounds/sites (related to salt-production) in the Central Somerset Levels, as many have disappeared as earthworks over time.

The situation for sites outside of this main mound distribution area, was even more challenging when data collecting, as no sites outside the Central Somerset Levels, in Somerset, had been subject to focused archaeological excavation, and were often only revealed briefly as part of small-scale groundworks.

Much briquetage and pottery had been found from this area as well as the Central Somerset Levels, some of which had been retained within the County Museum archives, which, unfortunately, was not accessible during the data collection phase of this research project. This along with a total lack of site archives (due to a general lack of formal investigation), meant that data obtained was very limited. It was not until some considerable time after data collection, and after the fieldwork had taken place, that the existence of some unpublished pottery and briquetage reports came to light, and even then, they were difficult to obtain, and often could only be obtained in digital 'draft form'.

Briquetage reports for both Central and North Somerset used very different terminology and definitions, and due to their being no previous published or full

unpublished assessments to use for comparison, they inevitably remain very inconsistent and confusing. This has been made even more challenging by the tendency to compare and attempt to define briquetage forms according to forms known in Lincolnshire.

Inevitably therefore, at the time of data collection, there was little available data, and the little that existed, was incomplete and limited in detail. Fortunately, since this time, due to some persistence, and some publishing of sites, more information has been gained. Where possible, this was inputted into the main site database.

It is hoped therefore, that this chapter will untangle the current confused state of knowledge about salt-production in Somerset. This will provide an up to date consistent synthesis of the current state of knowledge, as well as an accurate overview of the state of the sites, the archaeology of salt-production, and new insights into the technology and techniques of salt-production in this region.

6.1.2 The Central and North Somerset Levels

Although Somerset is flanked by some coastline to the west, which was exploited for salt, much of the area covered by North Somerset and Somerset used to include extensive saltmarshes that were fed by intertidal rivers/inlets and provided ideal environs for more extensive salt-production. Therefore the most significant areas for salt-production, forming the basis of most discussion this chapter, are in two geographical areas: North Somerset and Central Somerset Levels.

These areas are rich in resources that attracted human activity, exploitation and occupation for millennia. Although most emphasis in literature has been placed on the evidence for Neolithic-Iron Age exploitation of lowland Somerset, there is extensive evidence for Romano-British activity on the Northern and Central Somerset Levels (Rippon 2000a, 2000b, 2000c, 2006). This included salt-production.

The geology of these areas is particularly important, and has been the main reason for the area's continuing popularity. Over the last 10,000 years, these areas have been transformed, and the natural valleys have gradually filled with

clay and silt , which has enabled the rich salt marsh ecosystem to form (Brunning 2006). This provided natural resources that were favoured by prehistoric settlers especially. Underneath the salt marsh, a rich bed of peat formed (Figure 6.1), which has proved to be an invaluable resource for fuel since at least the Romano-British period.

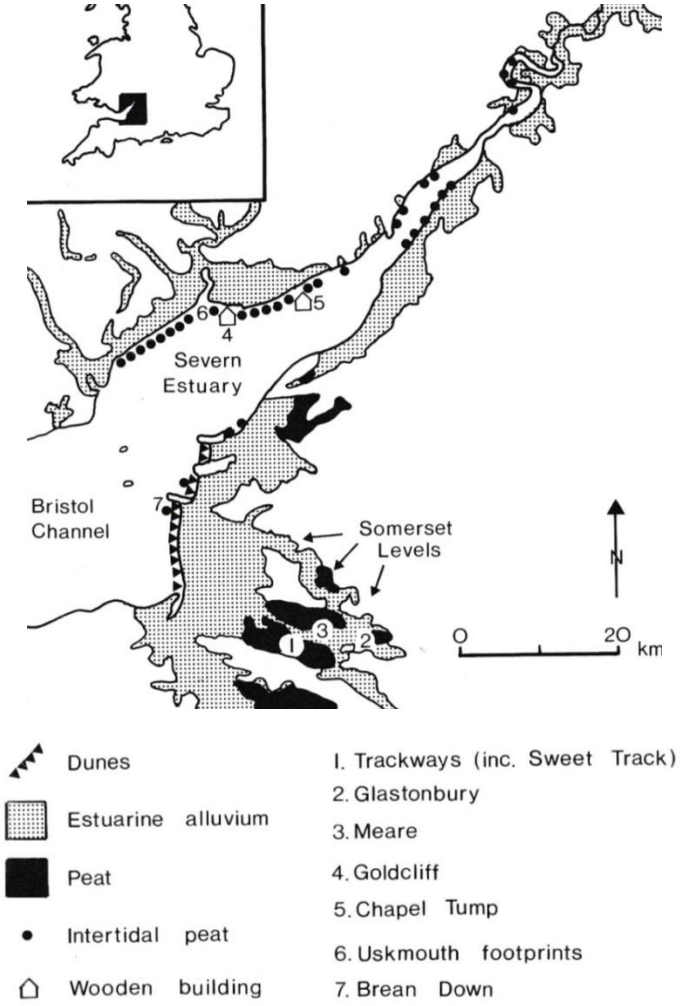


Figure 6.1 Overview of main areas containing prehistoric archaeological remains and the geology in the Somerset Levels and Severn Estuary (Brean Down represents a Bronze Age salt-production site), (Bell and Walker 1992)

The levels have also been subject to periods of marine inundation during the last 10,000 years (Rippon 2000b), resulting in large areas of alluvial clays and silts, which proved especially invaluable for preserving archaeological remains.

The Somerset Levels contain particularly rich, well-preserved archaeology due to the abundance of these peat and alluvial clay spreads. The Levels are relatively

free from large scale modern disturbance and development and therefore offer great potential for the preservation of archaeological remains.

As has been highlighted previously (**1.7.1**), the Central Somerset Levels have provided the bulk of focus for salt-production, with a substantial quantity of mound sites, some of which (although this is decreasing) are still visible as earthworks. The best visible evidence for these mounds, can be found within the sides of the River Huntspill, where several mounds can be seen in section, as they erode slowly into the river (Figure 6.2). As emphasised above, archaeological work has mostly involved ad-hoc observations, as opposed to targeted archaeological investigation, resulting in little tangible data.

Figure 6.2 View of the River Huntspill facing east (taken near Woolavington Bridge), (Author: 2008)

This chapter has the same goal as the regional evaluation of Kent (**5.0**), aiming to provide an overview of salt-production in Somerset. However, this will be achieved using a different approach to the original dataset. In comparison to Kent, there are very few sites in Somerset that can be explored and discussed in detail due to limited excavations and, in the case of the Levels especially, truncation from agricultural works.

However, the potential of Somerset for further understanding of the development of salt-production in southern Britain was still considered very high, a view supported by Brunning and Grove (1998).

This was due in most part, to the concentration of at least 99 mounds and briquetage findspots (**6.2.1**) in the Central Somerset Levels. Dating from two of these sites, suggesting they were in use sometime within the 2nd-4th centuries AD. This late date, suggested that activity in this region was potentially very significant for understanding the development of salt-production during the Middle-Late Romano-British period in southern Britain.

As shown in **3.0**, and discussed for Kent in **5.0**, there was a significant decrease in salt-production sites in the 2nd century AD across most of the study area. Therefore, the potential for a substantial salt industry in Somerset during this period had major implications for the interpretation of contrasting 'dip' within the other main areas of salt-production (Dorset and Kent).

Therefore, as part of this research project, it was decided to investigate the nature of the mounds further in other areas of the main scatter, in order to provide a richer dataset that could infer more about the character of salt-production in this area overall. The only two formally excavated sites, were both at the south-western edge of the main scatter (Sites 166 and 198, outlined shortly) and meant that *only 2/99* of the mound/debris sites have been subject to formal archaeological investigation. Therefore more information was needed about mounds in other areas of the scatter to 'balance' the dataset.

The fieldwork results, could not only be added to the results from the other two excavations, but could also be used, to formulate a more solid, consolidated dataset for this area of Somerset, and hopefully one upon which future research could be based. This not only could provide an opportunity to see mound sites in other areas of the main concentration were of a similar nature to the two investigated, but also means that much confusion and 'grey areas' concerning this area could be clarified.

6.2 Key Site Groups (Figure 10.4.1)

The three distinct site concentrations (Figure 10.4.1 and Table 6.2) in the region and these have been separated into: Coastal (Group 1), North Somerset Levels (Group 2) and the Central Somerset Levels (Group 3), (Figure 10.4.1).

Group 1 currently consists of a scatter of 16 sites near the coast at Highbridge (Figure 10.1.3 and Table 6.2); their distribution probably represents the location of the original coastline before reclamation and silting. Group 2 consists of currently only two sites in North Somerset and Group 3 represents multiple sites (at least 99) in the Central Somerset Levels which provides the areas of interest for fieldwork and regional evaluation (Table 6.2). Table 6.2 also provides a general chronology as well as recorded 'Site Type' for key sites within Groups 1-3. Before outlining the three groups further, a brief overview of 'Site Type' and general chronology will be provided below.

Table 6.2 Key groups of salt-production sites within Somerset and North Somerset

Site ID	Site Name	Site Type	General Period
Group 1 Coastal (Highbridge)			
120	Roman briquetage finds, Guys' Farm, West Huntspill	Briquetage Findspot Only	1^{st}-4^{th} century AD
186	Roman and medieval finds, Worston Bridge, Burnham and Highbridge	Briquetage Findspot Only	
188	Roman finds, area of New Bridge, River Brue, East Huntspill	Briquetage Findspot Only	
189	Roman occupation, Worston Rhyne, Burnham and Highbridge	Mound Only	
190	Roman and medieval finds, Highbridge Cemetery, Highbridge and Burnham-on-sea	Briquetage Findspot Only	
197	Briquetage find, Pilmore Lane, Burnham Without	Briquetage Findspot Only	
268	Roman and later pottery finds, Fairford Road, Highbridge	Briquetage Findspot Only	
269	Roman pottery finds, area of Coronation Road, Highbridge	Briquetage Findspot Only	
270	Roman pottery find, King Alfred's School, Burnham	Briquetage Findspot Only	
272	Lake settlement site, Alstone	Briquetage Findspot Only	

273	Huntspill Mill and pottery finds, Huntspill	Briquetage Findspot Only	
274	Multi-period pottery finds, N of Greenwood Farm, West Huntspill	Briquetage Findspot Only	
275	Roman and later pottery finds, Greenwood Farm, West Huntspill	Briquetage Findspot Only	
280	Roman and medieval finds, S of Bridge Farm, Burnham	Mound Associated Briquetage	
281	Roman pottery finds, River Brue, Burnham	Briquetage Findspot Only	
283	Roman occupation, Worston Rhyne, Burnham and Highbridge	Mound Only	
Group 2 (North Somerset Levels)			
239	Land at St Georges, Worle, North Somerset Levels	Actual Site	c.1st century BC-1st century AD
294	Banwell Moor	Actual Site	
Group 3 (Central Somerset Levels)			
166 and 198	Central Somerset Levels	Actual Site	2nd-4th centuries AD (mostly 3rd-4th century AD)
105,271, 276-279, 282 and 284		Briquetage Findspot Only	
100, 104, 106-108, 110-111, 114-117, 119, 122, 124-126, 129, 172, 176, 179, 192, 208, 211 and 280		Mound Associated Briquetage	
101-103, 109, 112, 113, 118, 121, 123, 127, 128, 130-161, 163-171, 173-175, 177-178, 180-183, 207, 209-210, 264-266 and 283		Mound Only	

6.2.1 Overview of Site Type and Chronology

The original results for Site Type and chronology in Somerset, were relatively simple, given the limited dataset. As presented in **3.2.2** (Figure 3.15), 'Site Type' for Somerset was dominated by 'Mound Only' at 69/119 sites, followed by 'Mound Associated Briquetage' at 26/119, 'Briquetage Findspots' at 20/119 and 'Actual Site', at a low 4/119 sites. As can be seen in Table 6.2, there are spatial trends in Site Type, with Group 3 containing most sites, and nearly all of the mound categories, and Group 1 containing mostly briquetage findspots.

Further consideration of Site Type will be provided in **6.6.4**, which will re-address the original categories, in light of the regional evaluation and fieldwork presented in this chapter.

As discussed in **3.1.2.2**, (see also Figure 6.3) ascertaining chronologies for salt-production in Somerset remains challenging and still very limited in some areas, with most sites dated only to 'Roman'. This is especially true of Group 1 where the date range is still very wide (1^{st}-4^{th} centuries AD) despite recent assessment of pottery assemblages (Seager Smith 2003). Therefore all 16 sites can still only be recorded in the dataset as 'Roman' (Figure 6.3).

There is slightly better evidence for dating in Group 2, with a more specific date of Late Iron Age-Early Romano-British (Table 6.2). Similarly to Group 1, in the original assessment, most of the sites in Group 3 (which contains 99/119 of the sites in the region) could only be recorded as 'Roman' due to a lack of investigation (Figure 6.3).

Twelve sites in Group 3 could be more certainly attributed to 'Middle-Late Roman' in the original data assessment (Figure 6.3), including the addition of a new site, discovered during fieldwork (Site 295). This was possible, due to the reassessment of pottery assemblages from some salt-production sites in Groups 2 and 3 (as stated above), which showed that there was a date range of 2^{nd}-4^{th} centuries AD, predominantly 3^{rd}-4^{th} century AD. Therefore, it is probable, that other mounds in Group 3 could also be of a similar date (Table 6.2).

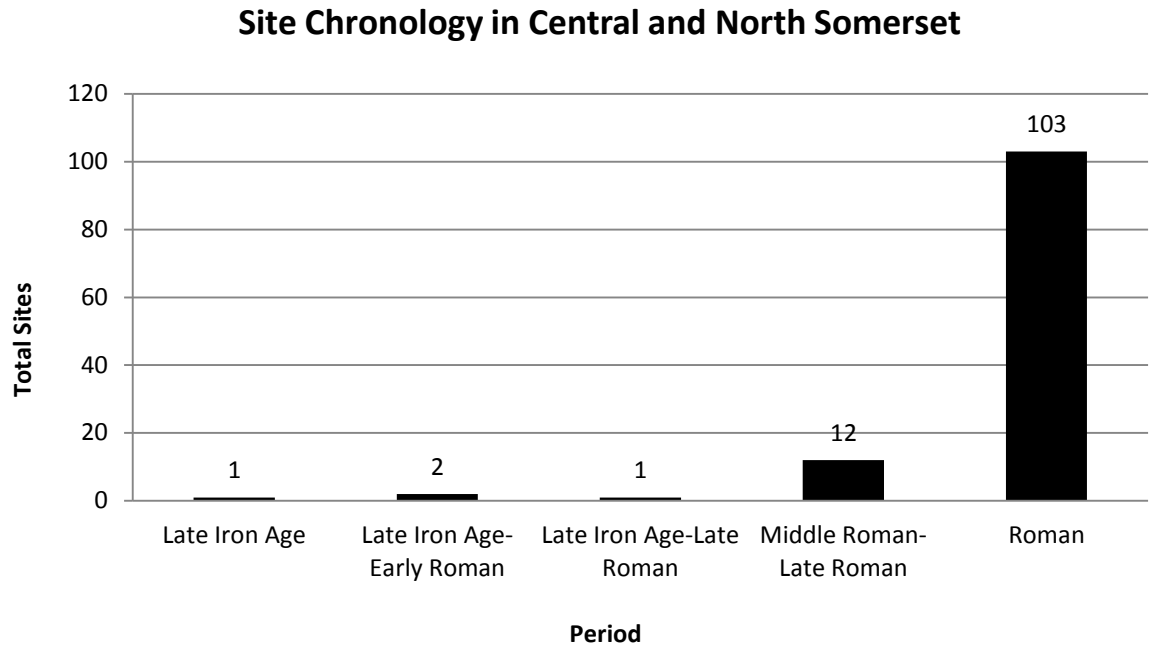


Figure 6.3 Chronology of salt-production in Central and North Somerset based upon HER records and the original dataset

A more detailed discussion of chronology, including further resolution of dating in Group 3, and consideration of the development and significance of salt-production in Somerset, is provided in **6.7**.

6.2.2 Group 1: Burnham and Highbridge Coastal Area (Table 6.2 and Figures 10.4.1, 10.1.3 and 10.1.33)

As outlined above, the character of the **Group 1** sites remains uncertain as most of the sites are briquetage findspots of a general 'Roman' date (Table 6.2).

It was originally thought that these sites represented an earlier phase of salt-production dated to between the 1st and 2nd centuries AD (Grove and Brunning 1998). However, more recent assessment of pottery assemblages have now established a wider date range of between the 1st century BC-4th century AD (Seager Smith 2003). Whether this is related to salt-production, or to more general occupation remains unclear. Despite the limited 'Roman' date, it is possible that there may have been earlier, Late Iron Age salt-production in this area.

Site 272 at Alstone is of interest as according to the HER it is thought to represent a 'Lake Settlement Site' and there have been finds of Iron Age and Roman pottery, as well as briquetage (originally recorded as 'burnt daub' but later re-interpreted as briquetage by Grove (1996)). If a settlement is present, it potentially represents an occupation area for the local salt producers. However, currently, the only tangible evidence of salt-production in this group is in the limited remains of briquetage, with no associated features, other than possible debris mounds (Sites 188, 189 and 283).

The group now lie inland by as much as c.1.5km in places; because of estuary silting.

6.2.3 Group 2: North Somerset Levels (Table 6.2 and Figures 10.4.1 and 10.1.6)

Sites 239 and 294: St George's, Whorle, and Banwell Moor, North Somerset

These two sites (Sites 239 and 294) are approximately 2.1km apart and have both been subject to formal archaeological investigation, excavation and geophysical survey.

Site 239 at St Georges, North Somerset (Figure 10.1.6) was one of the first salt-production sites in this area to have been subject to excavation as a result of PPG16 (excavated between 2001-2004). This site now lies about 8km from the coast, but in the past it exploited a series of saltwater inlets. It was covered in thick alluvium caused by later flooding.

As shown in the map in Figure 10.1.6, three grid references have been recorded for this site (the furthest two are c.0.7km apart). This is because at the time of data collection, further excavations around the St George site were being carried out, revealing further potential evidence for contemporary salt-production (Cotswold Archaeology and North Somerset HER *pers comm* 2005). It was thought at the time to represent a larger contemporary salt-producing landscape (*ibid*), which was later confirmed (see below). Although at the time of data collection, the site remained unpublished due to issues with developer funding, it

was possible to view several distinct, large pedestals briefly, and photographic records were made.

When the site was later published, it was described as a 'substantial later 1st century AD salt-making site', with possible Late Iron Age origins (Cox and Holbrook 2009: 99). The report confirmed the presence of at least one large rectangular area of a possible 'fire base' (Cox and Holbrook 2009: 104 (Figure 103)) which had a possible ditched windbreak area to the south, the fill of which, contained the distinct large pedestals.

The report also revealed possible evidence for Stage 1 Water Management, in the form of a series of ditches, some of which were v-shaped (Cox and Holbrook, 2009). However, the possible link to Stage 1 was not supported in all cases, as analysis of environmental samples from some ditches, suggested that it was more probable that many of the ditches were related to later agricultural activity (Cox and Holbrook, 2009). The presence of briquetage within at least three ditches however, was still considered to indicate that in at least these cases, the ditches had all 'served as drainage associated with salt-production' (Cox and Holbrook 2009: 105). In reality, the ditches would more probably have provided saltwater to the site (probably utilising a saltwater inlet) as opposed to being for drainage.

The larger pedestals evidenced in this site, represent substantial multi-faceted supports (Figure 6.28: right) and are included within the overall briquetage pedestal typology for the study area as 'Type 6' (Figure 3.42). It was considered that they probably supported large lead containers, especially given the general lack of briquetage containers (only one sherd was found, and this is discussed further in **6.5.1**). Overall, the report considered that most of the features were just outside the perimeters of the excavation area, and therefore, assumptions about the significance of this site appear to be based mainly on the presence of the larger pedestals. This, as well as issues surrounding the use of briquetage forms to infer technological difference directly linked to chronological difference, is considered further later.

Site 294 at Banwell Moor, unlike Site 239, is limited to the Late Iron Age (Rippon 2000a; 2000b), (Figure 10.1.6).

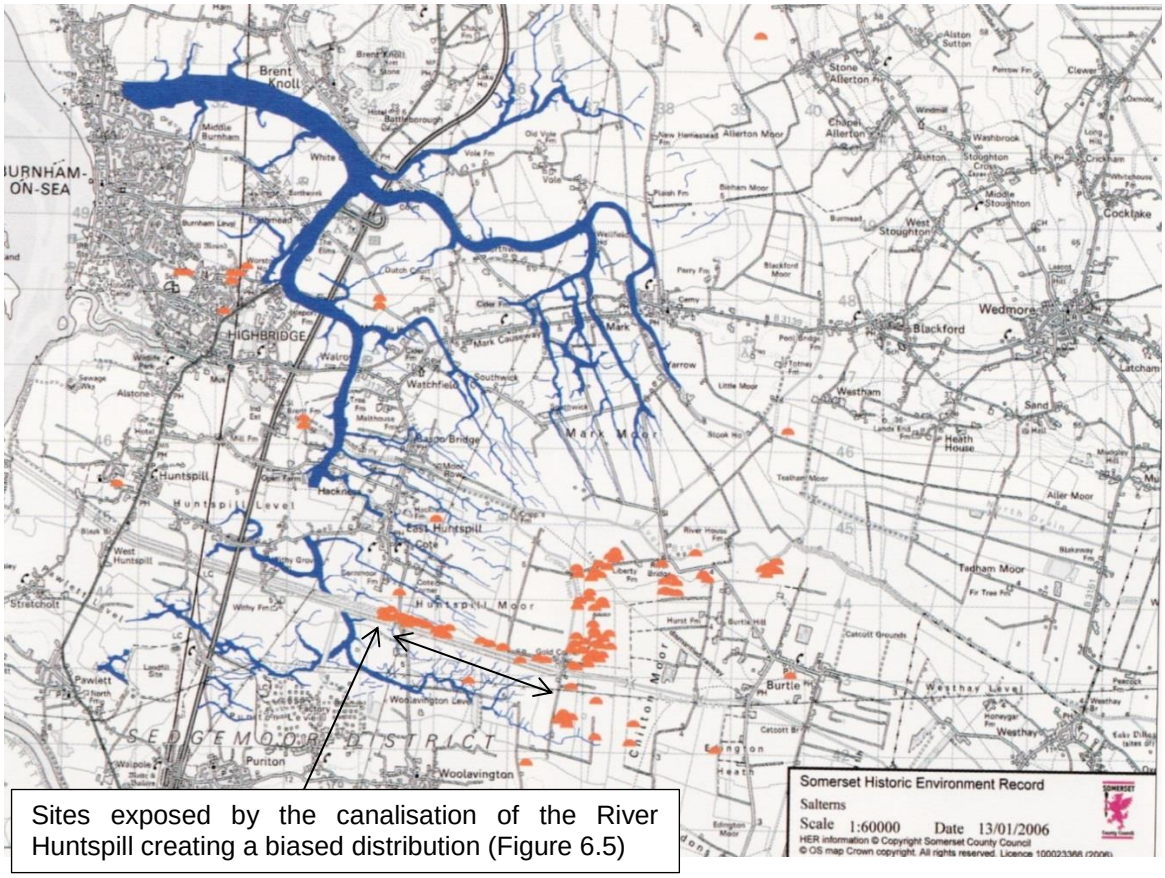
The site contained quantities of burnt clay, charcoal and briquetage. Although details of the briquetage were unclear at the time of data collection, it appeared to mostly consist of rounded pedestals (Type 5), which had been found in 'dumps' as well as within a shallow depression (*ibid*). This depression was probably the remains of a hearth, and the briquetage could have included the original dismantled hearth lining.

Since data collection, other salt-production sites surrounding Sites 239 and 294 have been found (at least three more) according to Rippon (2006: 64). One site at Puxton Dolemoor, has evidence for large rounded and sub-rounded pedestals which are suggested as being very similar to the fragmented pedestals from Site 294. Similarly to Site 239, this site was also found to be of a Late-Iron Age-Early Romano-British date. The discovery of these new sites (another was found very near to Site 239 and another in-between Sites 239 and 294 at West Wick) appear to confirm evidence for a relatively large area of Late Iron Age-Early Romano-British salt-production. The significance of this in the overall chronological development of salt-production in Somerset will be discussed further in **6.7**.

6.2.4 Group 3: Central Somerset Levels (Table 6.2 and Figures 10.4.1, 10.1.4-10.1.5 and 10.1.34)

This area appears to have been the main focus for salt-production in Somerset and the main focus of this research fieldwork. The Central Somerset Levels are currently dominated by pastoral fields and the canalised River Huntspill (Figures 6.2 and 6.5-6.6) with some associated outlets. The levels are split into a series of linear field systems, which are owned and used by many landowners and farmers. However, over 2000 years ago the Levels were inundated with salt water from a natural river (River Siger), starting north of Highbridge and Burnham on Sea about *c*.6km from the course of the current River Huntspill (Brunning and Farr-Cox 2006). LIDAR data showed that this ancient river acted as the 'main artery' for the supply of saltwater across the Levels branching out into hundreds of inlets (Figure 6.4). Mound sites radiate around the ends of the inlet and mainly date to between the 3rd-4th centuries AD. This large cluster of briquetage findspots and mounds (at least 99) appears to represent the waste of extensive salt-production. Although the full extent of the River Siger was not revealed, it is still clear that the

location of sites corresponds with the eastern extent of the river branches and inlets.



Sites exposed by the canalisation of the River Huntspill creating a biased distribution (Figure 6.5)

Figure 6.4 The ancient tidal 'River Siger' that originally fed Romano-British salt-production sites in the Somerset Levels (sites shown in orange) (Brunning 2006: 19)

Research has shown that there was a marine transgression sometime after the Roman period (Rippon 2000a). The present landscape is the result of subsequent attempts to drain the area for agricultural use. The marine transgression can be identified as a layer of alluvial clay (in places over 1m thick) found to cover debris mound sites visible in the modern cuts of the River Huntspill (Figure 4.77: right).

At least 91 debris mounds and eight briquetage findspots (probably the damaged remains of debris mounds) were recorded in the Historic Environment Record, some still visible as earthworks (Figure 4.77).

Pottery and briquetage continue to be brought to the surface by on-going agricultural works, some of which are reported, and some of which are retained in the County Museum archives.

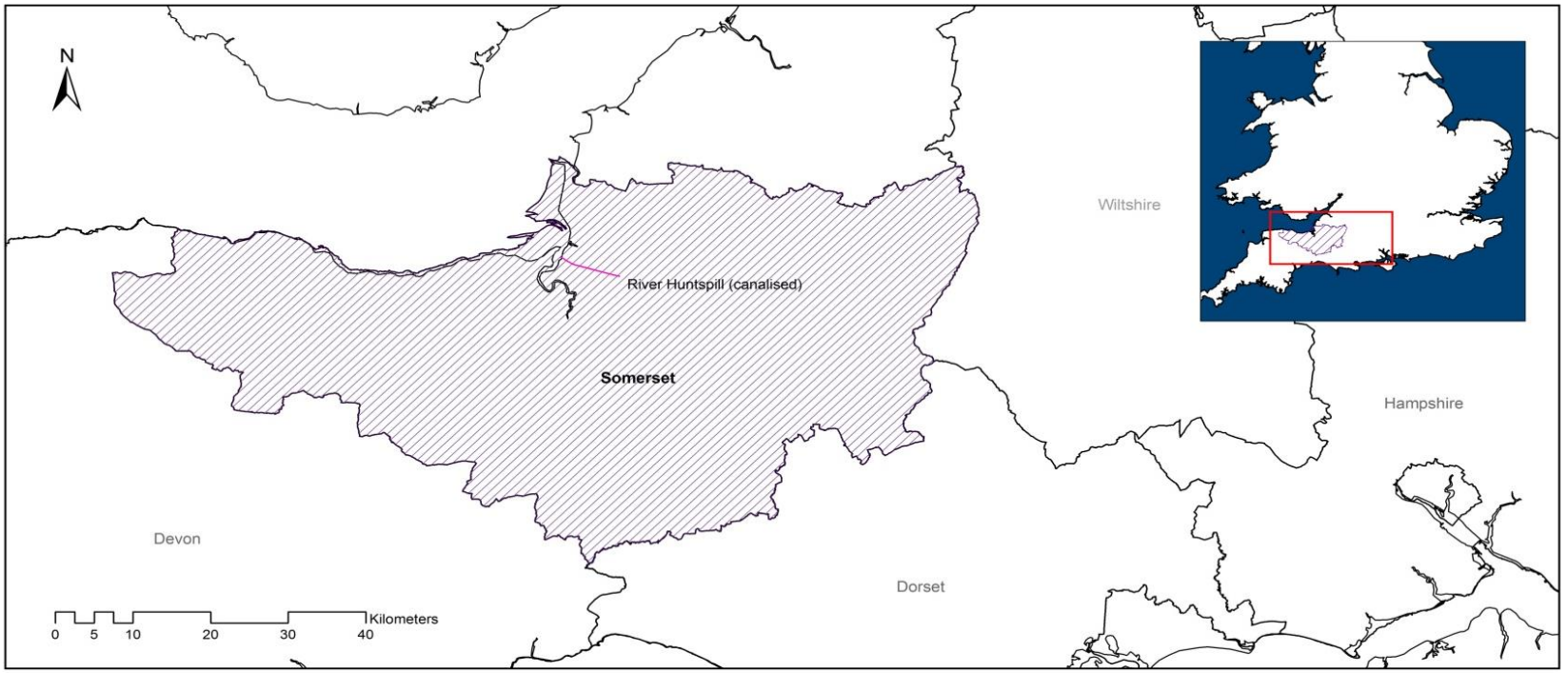
As outlined in **1.7.1**, the mounds were surveyed in the 20th century (Bullied 1914). Bullied remained convinced that most, if not all, of the mounds were associated with pottery production. This was based upon frequent finds of coarse pottery, odd lumps of clay and the presence of clay bars which were known to be used in Romano-British pottery production.

This foundation work was later enhanced by the discovery of several new sites, which allowed the nature and location of the mounds to be better defined (Leech 1981), (Figure 1.24). Leech (1977) also excavated two potentially Late Iron Age 'briquetage sites' at Badgworth (Quarrylands Lane, Sites 100 and 119, as well as a c.2nd century AD briquetage debris mound in the East Huntspill area (Site 198), (Leech *et al.* 1983).

Site 198 represents a rare example of a well-excavated Somerset briquetage mound (Figures 4.36). The mound had been originally created by the disposal of waste, and then subsequently used as a raised working area, which contained *six hearths* representing different discreet phases of salt-production in the 2nd-3rd century AD. A well-preserved briquetage and pottery assemblage was also obtained and, as shown in **4.6.3.3**, the briquetage was scientifically tested to determine function (Table 4.5).

In 1994, an area of disturbed briquetage (due to animal burrowing) was investigated. This site (Site 104) was much further to the north of the mound concentration, located in a strip field off the main road between Eastern Moor Bridge and Liberty Farm (Figure 10.1.5).

The site was subject limited excavation, which revealed a hidden low lying briquetage mound, c.0.10m below the ground surface. Although not recorded in detail, the excavation proved that some mounds remained hidden, even outside of the alluvial spread covering the sites exposed in the River Huntspill.



Map Information

Scale	1:500,000
Central map NGR (X,Y)	-
Created	05/2011 SJH

Ordnance Survey Map Data: © Crown Copyright/database right 2011. An Ordnance Survey/EDINA supplied service.

Legend

Somerset_County

Figure 6.5 Map showing the location of the River Huntspill

These results were then incorporated into a survey carried in 1996, which aimed to assess the preservation of Romano-British salt-production in the Central Somerset Levels (Grove 1006).

This survey mostly concentrated on the bulk of the mound scatter across the banks of the River Huntspill and to the south and east of Gold Corner (Figure 10.1.5). The many mound sites revealed in section within the River Huntspill, otherwise hidden under thick alluvium, offered a good opportunity to further investigate and record mounds. Therefore, several mounds were recorded in section during the survey (Grove 1996; Grove and Brunning 1998). The recorded Huntspill mound sections are listed in Table 10.4.1. Observations indicated that most of the exposed Huntspill mounds consisted of alternating layers of briquetage, peat and ash (Table 10.4.1). All observations made during the survey, as well as the original index numbers used by Grove, have been recorded within the Site Gazetteer in Table 10.4.1.

This 1996 survey, confirmed the severe damage that sites in Group 3 had suffered, with many previously visible mounds now destroyed and removed (Grove, 1996). Despite recording several mounds in section, and the evidence from earlier sectioning of both Sites 104 and 198, none of which were shown to contain pottery wasters or pottery kilns, it was still concluded that the mounds were probably ‘a combination of pottery and salt-production sites’ (Grove 1996: 18). This reflected the remaining ambiguous nature of these sites, as well as limited understanding of the archaeology of salt-production in Somerset and indeed the rest of the study area at this time. This also reflects well the difficulties separating briquetage from pottery kiln furniture.

Grove and Brunning (1998: 67) emphasised the issues that still remained to be addressed, as the evidence was still considered too limited to profile all of the sites in general:

- The complete date span of the industry
- The methods of its working
- **The possibility of pottery production**
- The extent of peat extraction

Despite the extensive damage identified during the 1996 survey (Grove 1996), some sites in Group 3 were still seen as having 'enormous potential for archaeological research…not least because so little productive work has been carried out…(Grove and Brunning 1998: 67).

Therefore in 2002, the last mound listed in Table 10.4.1 (Site 166) identified by the 1996 survey, was subject to partial, but detailed excavation by the Somerset Levels and Moors Archaeology Team. This site sites within a particularly well exposed mound area near the Woolavington Bridge and was relatively close to Site 198 (Figures 4.78 and 6.6).

Although not published fully, the mound excavated in **Site 166**, similarly to Site 198, was also found to also contain a salt-production working area. However, in this case, only a single larger hearth was found (Figure 6.7), (Brunning 2006). Most importantly, water management features were also found at Site 166 in the form of at least five brine tanks (Figure 6.7: A-F).

This remains the only definite example of Stage 1 (Water Management) to have been discovered in Somerset. This site was found to be used potentially later than Site 198, containing pottery dating to the 3rd- 4th centuries AD (Seager Smith 2002).

The 'brushwood layer' noted in the observation of the site in section before excavation (described in Table 10.4.1) was revealed to have been a fragment of well-preserved basketry, (Figure 6.7), (as discussed in **4.6.5**).

Confirmation that another debris mound within the large concentration was definitely associated *exclusively with salt-production,* further confirmed that mounds at least in this area of the concentration, appear not to have been associated with pottery-production. This was also confirmed with the absence of pottery wasters and kilns, although a lot of pottery was still present. The reason for this could be related to evidence of domestic activity, or could mean that pottery was used in salt-production, or that pottery was produced somewhere else locally. This is further considered in **7.0**.

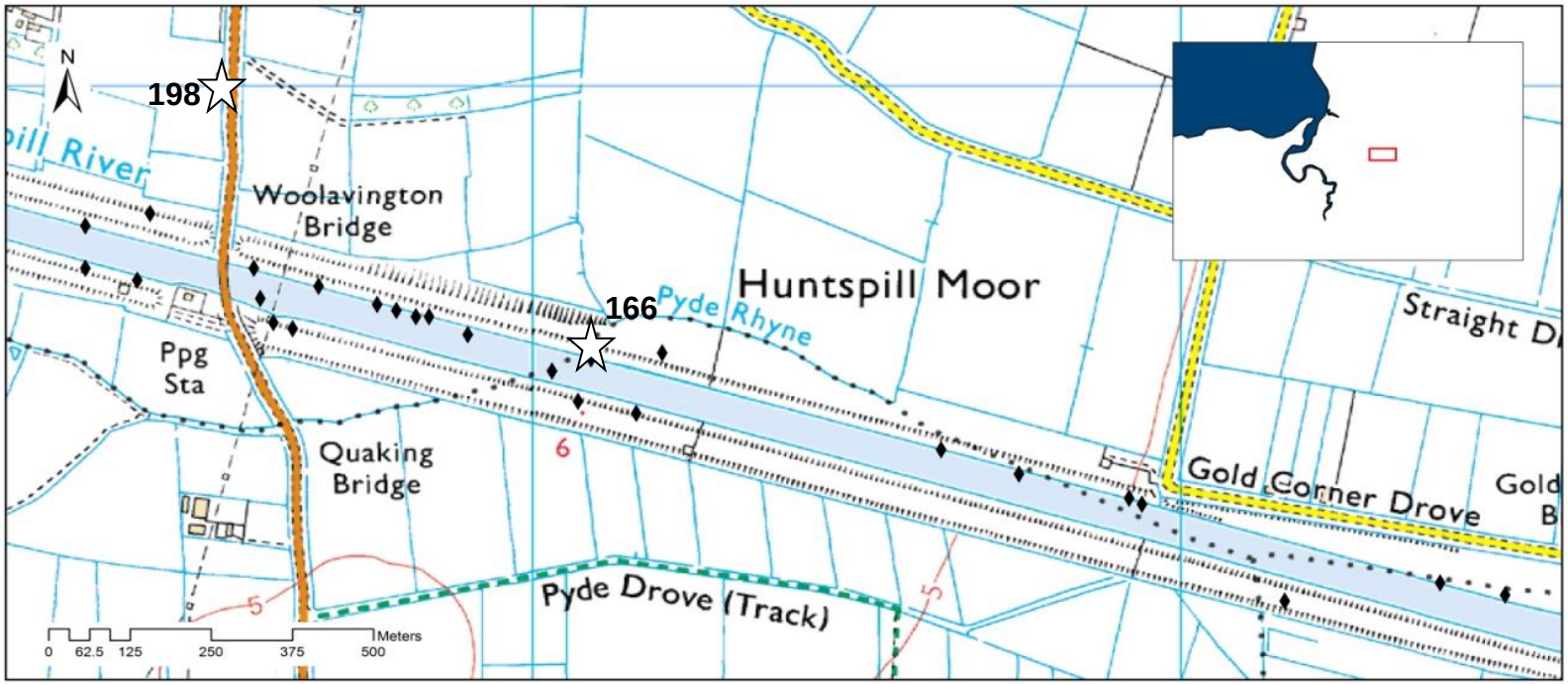


Figure 6.6 Map showing the location of sites exposed by the River Huntspill

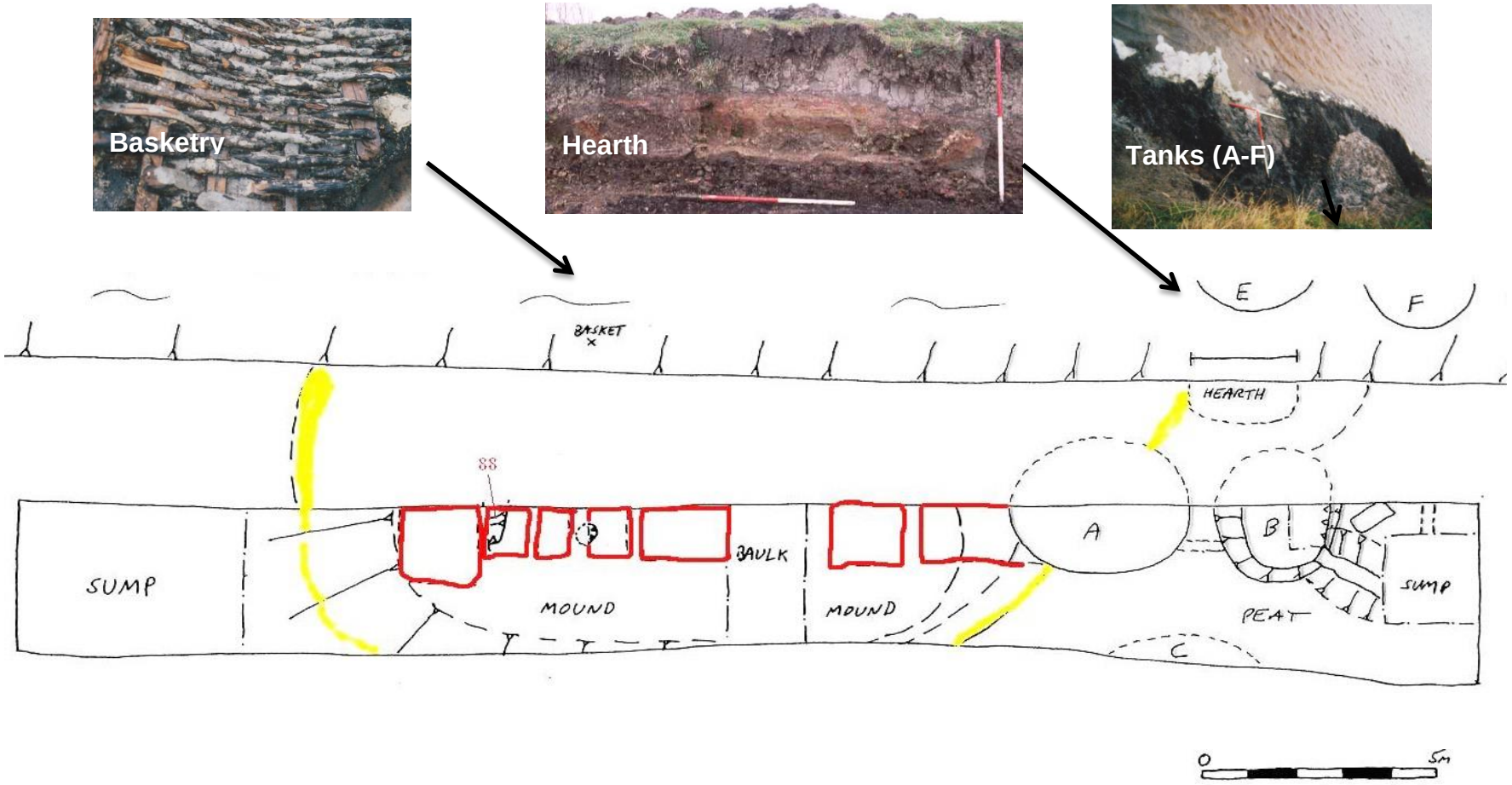


Figure 6.7 Left: Photographs and sketch plan of Site 166 (Sketch: Brunning personal archive), (Brunning 2006: photographs: 20-21)

The discovery of this important site shows that, although many mounds in this area are being damaged, eroded and removed by the River Huntspill, that without it, the presence of the mounds would never have been known and would have remained unknown and invisible. Coastal salt-production sites are often exposed in similar ways, especially those in North Kent, and the damage sustained balances with the provision of new information about site location and nature.

The mounds exposed by the River Huntspill have not only revealed important information about the nature of these sites, it has also served well to show that the mound concentration is far greater than visible.

Briquetage from Group 3 is still limited to a handful of small assemblages, most of which remain unstratified, (with the exception of Site 166). The eroding Huntspill mounds, as well as mounds damaged during agricultural works in the rest of the area, continue to produce briquetage. Just walking along the banks of the River Huntspill near Woolavington Bridge, briquetage can easily be identified and found within the banks and within the river. As outlined earlier, some briquetage has been retained in the County Museum archives. Both Sites 166 and 198 produced larger, well-preserved briquetage assemblages, both of which have been subject to basic assessment; there is a separate, unpublished report for Site 166 (Percival 2005). The assemblages shared similar forms, with bars and slabs dominating (considered further in **6.5**).

In summary therefore, Site 166 and 198, at the time of data collection, were the only sites to have been subjected to planned and detailed archaeological excavation in the large concentration of mounds. The small excavation at Site 104 was useful as it revealed the possibility of differently formed mounds in comparison to the Huntspill sites, however the site was not recorded in detail, with the section not showing detail of the mound layers (see **6.6.1**: Figure 6.39). Therefore this limited discussion and comparison overall, but did provide a potentially significant insight into mounds away from the River Huntspill, and most importantly, that there were still hidden mounds even outside the alluvial coverage. This informed on fieldwork planning (**6.4**).

Sites 166 and 198 were generally of a similar character, but were located very close to one another at the southern end of the mound scatter (Figure 6.9). Therefore, this could not be considered a 'fair' sample of the entire mound area. As a result, it was not clear whether they represented the profile of most other mounds in this concentrated area of the Central Somerset Levels, even with the limited excavation at Site 104.

This provided the ideal basis and justification for fieldwork in other areas of the site distribution. It also provided an opportunity to explore whether all of the mound concentration was certainly associated with salt-production also.

6.3 Fieldwork in Group 3: Strategy and Location

Ideally, in order to investigate whether there were differences in site and mound characteristics the Central Somerset Levels (Group 3), complete excavation of several mounds, at targeted sample points evenly placed across the mound distribution area would be required, using consistent methods of investigation. At the same time, larger areas surrounding the mounds would be targeted for geophysical survey in order to identify hidden features, including potentially other hidden mounds.

However, this would require a long-term plan of investigations, and the permission of landowners, which could be the most challenging and limiting part of any planned work. This area of the levels is closely protected by local landowners, as well as being in constant use for agriculture. Therefore, it would require a great deal of flexibility and accommodation to the needs of the farmers and landowners. It is possible that this longer term plan could be completed in the future. However, in the short-term, such as a large-scale project would not be appropriate, and therefore, a simpler sample investigation was devised.

6.3.1 Aim

The aim of this fieldwork was to explore further the production of salt within the Somerset Levels, focusing on the debris mounds.

6.3.2 Objectives

Five objectives were designed to achieve the best possible results from the limited time and resources available. Many of the fields containing the main mound scatters were used for livestock and for crops, which are harvested in the summer. Therefore fieldwork had to take place during the summer of 2008.

1. To verify the presence of mounds

Previously recorded mound sites were to be surveyed using a Bartington Gradiometer to confirm their presence (some are no longer visible)

2. To ascertain whether the mounds have a distinct geophysical 'signature'

Geophysical images, produced from surveying the mounds were to be assessed and compared in order to identify similarities and characteristics unique to these particular features.

3. **To learn more about mound structures**

All of the mounds were formed by the deposition of debris (Stage 4 of the salt-production process). The nature of this debris and the methods and phases of deposition were to be explored by excavating carefully targeted sample test pits. The debris (briquetage) removed during excavation would then be subjected to a sieving programme in order to determine fragmentation rates and potentially provide more detailed information about mound formation and use.

4. To learn more about the briquetage used within this area and inferring techniques of salt-production

The presence of different briquetage forms would be investigated and fragmentation rates would be used to gain a better understanding of the lifecycle of this material.

5. To look for potential for environmental data

Soil samples would be taken to provide information about the creation of mounds and their local environment.

6.3.3 Fieldwork Criteria (Table 6.3)

A table of criteria was designed and applied carefully to all aspects of fieldwork planning and decision making (Table 6.3). Suitability for fieldwork, methods of investigation and overall justification for the inclusion of a fieldwork element in this research project are discussed below.

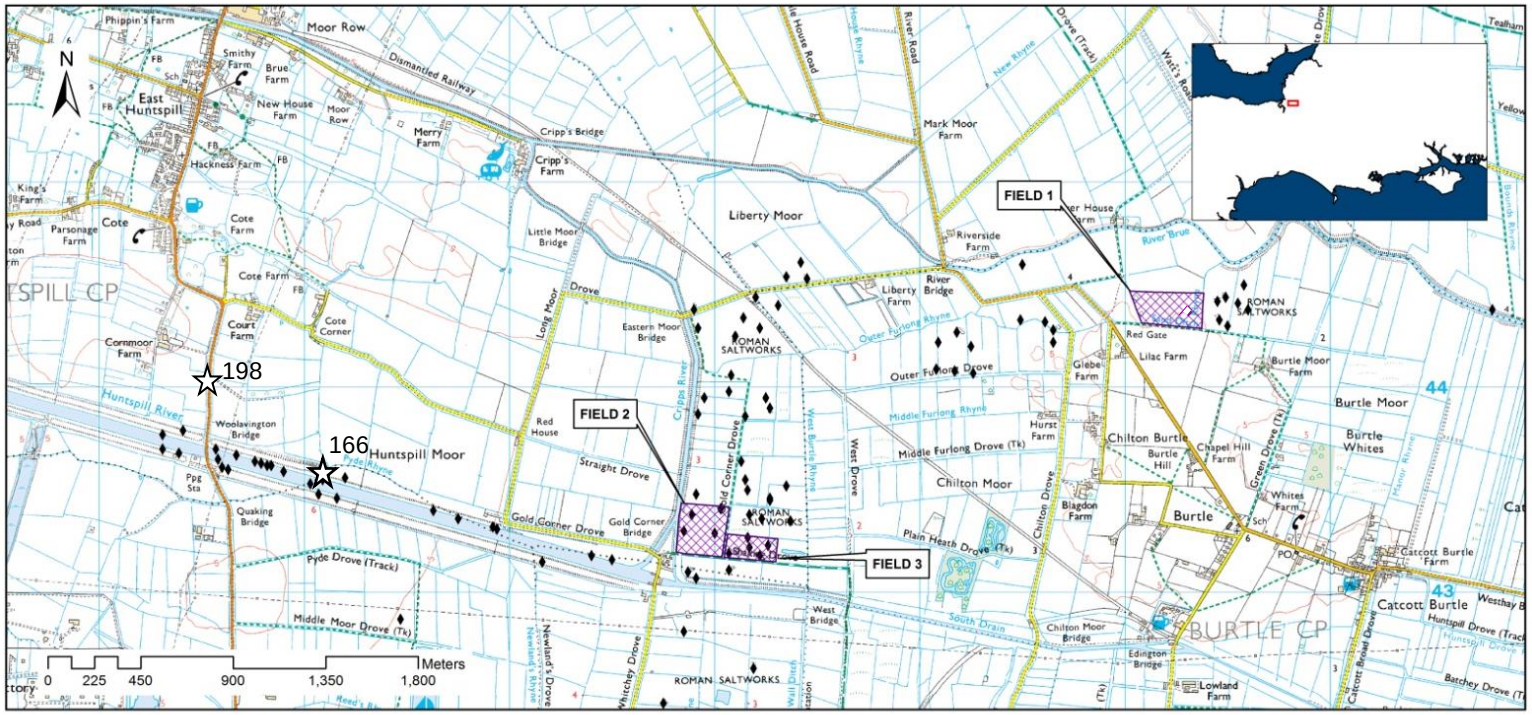
Table 6.3 Fieldwork criteria considered when planning the fieldwork

Fieldwork Criterion	**Previous archaeological work** Literature review of desk-based, excavation and survey reports within the area as well as a check of the local Historic Environment Record (HER)
	Overall known site distribution Consideration of overall site distribution and specifically areas that were archaeologically rich in sites, as well as pockets of 'negative' land in-between them
	Suitability for survey and excavation This involved checking local soil formation and geology. Previous site disturbance, access, current land ownership and use, as well as permission to carry out fieldwork and any government protective legislation (e.g. SSI areas)were considered
	Site disturbance versus archaeological knowledge outcome The balance between disturbing in-situ archaeological remains and the justification of overall outcome to local and national archaeological knowledge
	Justification for inclusion of fieldwork element within thesis Justifying the relevance of fieldwork within the research project

6.3.4 Location

Before consulting landowners and farmers, the overall distribution of sites was considered and two particular areas of interest were identified in discussion with the Somerset Levels and Moors Archaeologist.

A field to the south of the mound concentration (Figure 6.8: Field 1), next to a field of mounds that were Scheduled Ancient Monuments, but containing no known mounds, was considered a suitable location for fieldwork. Also, the area from Gold Corner to Burtle was considered as suitable due to ease of access and it being a particularly rich area of mound distribution (Figure 6.8: Fields 2 and 3).



Map Information

Scale	1:18,500
Central map NGR (X,Y)	337085,144172
Created	04/2011

Ordnance Survey Map Data: © Crown Copyright/database right 2011. An Ordnance Survey/EDINA supplied service.

Legend

- Mound Sites
- Fieldwork Areas
- Previously excavated sites

Figure 6.8 Map showing the location of Fields 1-3 in relation to other known sites

Ascertaining ownership in order to ask permission for access was sometimes difficult, as not all fields are listed in council land ownership records. The fields are divided between many farmers, who lease the land. Ascertaining which farm is associated with which particular fields can only be done by visiting the farms and asking in most cases. The author and volunteer members of SCEP, visited many farms across the mound distribution area to negotiate access.

Two farm owners in particular showed interest in the fieldwork as they wanted to know more about the archaeology in their fields. After negotiation, permission for fieldwork was gained for three fields; forthwith known as Fields 1-3 (Figure 6.8 and 10.4.1: Figure 2).

The fieldwork had to be flexible and adapt somewhat to a particularly wet start to the summer, which resulted in the late removal of hay bales from most of the fields on this area. Therefore a good working relationship with farmers and landowners was essential.

Fortunately the fieldwork was a success despite issues with access and land use.

Access was gained to a good sample of the mound area. More detailed information including maps and landowner details can be found in the accompanying report (Report 10.4.1).

Field 1

Field 1 lies within the Burtle area of the Central Somerset Levels towards the north-eastern end of the overall mound distribution. As stated above, this field lies directly west of a field known to contain a well preserved set of visible, scheduled mounds (SAM 429 group: Sites 153,154 and 155), (Figure 6.9).

However, as stated above, there were no previously recorded sites within Field 1. This therefore provided an opportunity to see whether hidden archaeology could be revealed in the field adjacent to the known mound sites.

Field 1 is significantly flatter along its northern edge compared with the southern half of the field. The southern half is on higher ground, the result of a natural rise in the clay and peat.

Figure 6.9 Scheduled mound (SAM 429: Site 154) next to 'Field 1' facing north-east (Neil Tinkley: 2008)

This field also appeared to lie at some distance from the nearest branches of the River Siger (Figure 6.4) and therefore it was hoped that investigation would help to identify evidence for past saltwater supply.

A gradiometer survey was carried out across the upper accessible areas of Field 1 (eastern extent on higher ground) which covered about 30% of the total area. The rest of the field contained many hay bales and was not accessible.

Fields 2-3

Fields 2 and 3 lie lay directly parallel to each other, close to the eastern extent of the River Huntspill (Figure 6.8 and Report 10.4.1: Figure 2).

Field 2 was the largest area included within the fieldwork project. It was primarily chosen as it was already known to have at least four briquetage debris mounds recorded within its boundary. These mounds were included in Bullied's early 20th century map of the mounds sites and are also recorded within the Somerset Historic Environment Record.

The western side of Field 2 is flanked by the Cripps River, which feeds into the main Huntspill River just to the south. As a result there is a substantial river bank on the western edge of Field 2, created during continuous dredging of this river. The gradiometer survey avoided this heavily disturbed banked area but was carried out across the remaining accessible areas of the field (c.90%).

Access to Field 3 directly east was negotiated during work on Field 2 (with a local landowner), who revealed that there were visible mounds within his field, one of which was being damaged by cattle. Upon inspection a large mound was seen at the back of the field (Site 126, Figure 6.10) and permission was given for a partial gradiometer survey and a rescue test pit excavation/recording to be undertaken.

Figure 6.10 View across the centre of the mound of Site 126 in Field 3 showing an open area being troweled to the left of the photograph centre (Author: 2008)

The gradiometer survey was restricted to only *c*.45% of the area due to the amount of metal detritus and the presence of cattle in the rest of the field.

6.4 Fieldwork Results (Report 10.4.1: Sections 2.0-3.0)

This section is separated into four main components; geophysical survey, excavation and post-excavation.

6.4.1 Geophysical Survey (Report 10.4.1: Section 2.0)

Gradiometer surveys were carried out over Fields 1-3 and they revealed potential archaeological and natural anomalies. This section summarises the results with the full information available in Report 10.4.1.

6.4.1.1 Field 1 (Report 10.4.1: Figures 6-9)

Geophysical survey revealed a previously unknown briquetage debris mound (Site 295). The survey also revealed the course of a saltwater inlet (from the River Siger) that would have supplied the site. No associated features such as hearths or tanks were revealed either in the mound or within the rest of the field. Core samples were used to explore the nature of anomalies further and assisted in the planning of sample test pits.

6.4.1.2 Fields 2 and 3 (Report 10.4.1: Figures 10-13)

Geophysical survey was equally as successful in both these fields and assisted in the profiling of briquetage mounds, original water supply and even fuel procurement.

Field 2 was fully surveyed up to the planned parameters; however Field 3 was only partially investigated due to time constraints and the on-going use of the field for cattle. Fields 2 and 3 were thought to contain at least seven mound sites.

Three debris mounds were located in Field 2, however, the expected fourth mound (Site 180) was not found and there was no evidence it had ever been in that location (coring confirmed a lack of briquetage). The location of three mounds in Field 3 was confirmed by the geophysics results. All three mounds had been heavily damaged (Figure 6.11).

The mound at Site 126 was still clearly visible but had been damaged by cattle and an abandoned badger set.

Both Fields 2 and 3 contained a series of linear features, some of which ran between the two fields (Report 10.4.1: Figures 10-13). They probably represent the remains of a contemporary trackway, an enclosure and areas of peat cutting. A saltwater inlet was identified in the north-west of Field 2.

Figure 6.11 View of Field 3 facing south-west, showing the tree growing through the mound of Site 103 on the top left (Author: 2008)

6.4.2 Excavation Results (Report 10.4.1: Section 3.0)

Test pit excavations were guided by the geophysical results undertaken in Field 1. Test pitting was also carried out in Field 3 as part of a rescue strategy at the damaged mound at Site 126. Locations of test-pits are shown in Report 10.4.1: Figures 14 -24.

6.4.2.1 Field 1 (Report 10.4.1: Figures 14-20)

Six test pits were placed across the area focused upon anomalies revealed during the geophysical surveys (Figure 6.12). They confirmed the nature and extent of the briquetage debris mound and also that no associated features appeared to exist within or near the mound.

The mound was sub-rectangular in plan (Report 10.4.1: Figure 8), similar to Iron Age Red Hill debris mounds in the Thames Estuary, Essex (Biddulph *et al.* 2012). Excavating the debris mound provided detailed information about its formation, which could be compared to Site 126 in Field 3, as well as mounds subject to observation or excavation previously (as outlined in **6.2.3.3**). This will be discussed in detail, within **6.6**. A pottery and briquetage assemblage were collected for further assessment and environmental samples were taken.

Figure 6.12 View of Test Pit 3 at Site 295 fully excavated (west facing), note the rich dark peat which provided an excellent source of fuel and the thick layer of briquetage (Author: 2008)

Significantly, this mound was of a very similar profile to that seen at Site 104 (where a low lying mound was sectioned), which is located c.1.7km to the west (Figure 10.1.5).

Given the irregular nature of the feature in Test Pit 5, and the lack of datable artefacts, it is possible that this feature was natural or modern in nature or that it represented a stripped brine tank.

6.4.2.2 Field 3: Site 126 (Report 10.4.1: Figures 21-24)

Rescue excavations were carried out in the damaged mound at Site 126. A series of holes in the surface were extended to observe the true extent of the mound and

to assess the way it had been formed. This was very successful; briquetage was retained for reference and potential evidence for peat cutting was located underneath this mound (Figure 6.13 and Report 10.4.1: Figure 24).

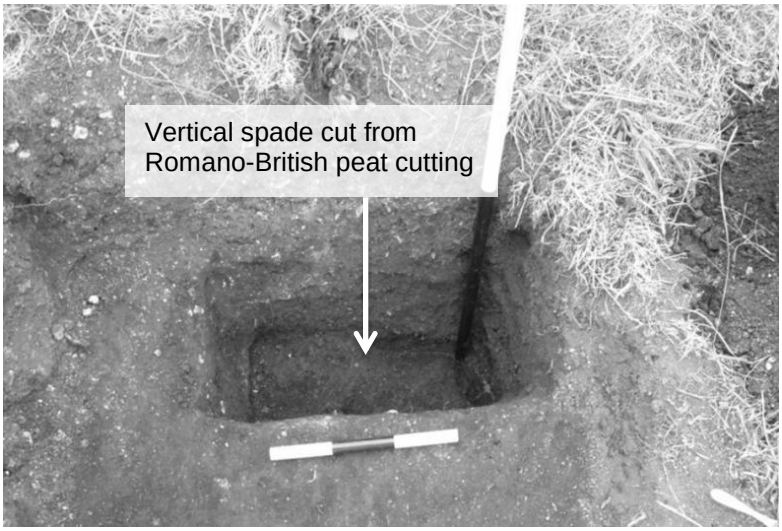


Figure 6.13 Test Pit 6 fully sectioned showing spade marks and peat cutting at its base (Author: 2008)

This confirmed that many of the linear anomalies seen across Fields 2 and 3 within the survey results probably also related to peat cutting, made to supply peat for fuel. Five more distinct v-shaped 'linears' were identified in the survey results (Report 10.4.1: Figure 13: green). As discussed in the technical report, it is probable that many of the linear features running across Fields 2 and 3 were also linked to peat cutting.

It is also possible however, that many of the linears relate to saltmarsh management by the salt producers. Those with v-shaped cuts, could have acted as feeder channels to the mounds. This is important as evidence for water management (Stage 1) currently can only be found at Site 166. As well as brine tanks, this site also appeared to have a possible feeder channel (see **6.6**) and therefore it is possible that these features in Fields 2-3 also relate to this.

6.4.2.3 Site 125

Whilst working in Field 3, the landowners kindly allowed a quick walkover of the field directly south of Fields 2 and 3 to look at more damaged areas similar to Site

126. Site 125 was inspected and had clearly been damaged by badgers. A small quantity of fragmented briquetage was found lying around the site on the ground surface. Diagnostic fragments were kept for reference. All the briquetage consisted of organic-tempered clay slabs and support bars.

6.4.2.4 River Huntspill Sites

On several occasions sites that were visible in the river section were visited during the fieldwork and photographed for reference.

6.4.2.5 Soil Coring and Geology (Report 10.4.1: Figure 25 and Table 6)

Field 1

Ad-hoc soil coring was carried out in Field 1 during survey and excavation in order to ascertain the nature of the soil and stratigraphy, which, with the survey results, helped to target areas for the placing of test pits. It provided a very useful tool and, for example, confirmed the presence of natural iron panning in the field and also helped to confirm the presence of a probable ancient branch of the River Siger (Report 10.4.1: Figure 9).

Coring in Field 1 was carried out on the area of higher ground at the north-east end of the field. The briquetage mound (Site 295) was found to be on peat. However, just south of this there was a large area of sandy soil where the peat stopped and a clay bed emerged.

Reference to a geology map of the area, confirmed this sandy area was ‘Burtle Bed’ which is made up of sand and gravel. Site 295 sits in an area of peat flanked to the north by clay, silt and sand resulting from estuarine alluvium, and by a small area of the Burtle Bed to the south (Figure 6.14).

The identification of the old saltwater inlet by coring and geophysical survey also shows that the ancient inlets of the River Siger shown in Figure 6.4, appeared to have extended even further east than the LIDAR data revealed. Therefore the site's location very probably represents the eastern limit of the ancient saltwater inlets and associated salt-production debris mounds.

Field 2

A more formal and extensive coring survey was carried out in Field 2. This revealed the soil profiles and geology and confirmed the presence of briquetage mounds (Report 10.4.1: Figure 26 and Table 6). The coring showed that the briquetage mounds again sat upon peat.

Site Distribution Profile (Figure 6.14)

Investigations in Fields 1 and 2 showed that, as opposed to the Huntspill sites, there was no evidence of alluvium representative of post-Roman marine inundation or flooding. Therefore the mounds had not been protected by an alluvial cover and had been heavily truncated and damaged by agricultural activity.

The geological map (Figure 6.14) clearly shows a significant correlation between the eastern extent of the alluvial spreads and the distribution of briquetage debris mounds. The peat extends further west under the alluvial cover.

The correlation between the alluvial spread and the mound site concentration again supports the view that the exposed mound sites currently recorded are only a small percentage of the potential total.

This distribution only represents the very eastern extent of the complete mound scatter and there are *potentially many hundreds more* still deeply hidden under alluvial clay. The potential implication for these hidden mound sites is clearly very significant when evaluating the importance and scale of salt-production in Somerset. This is further discussed in **7.4.5.3.**

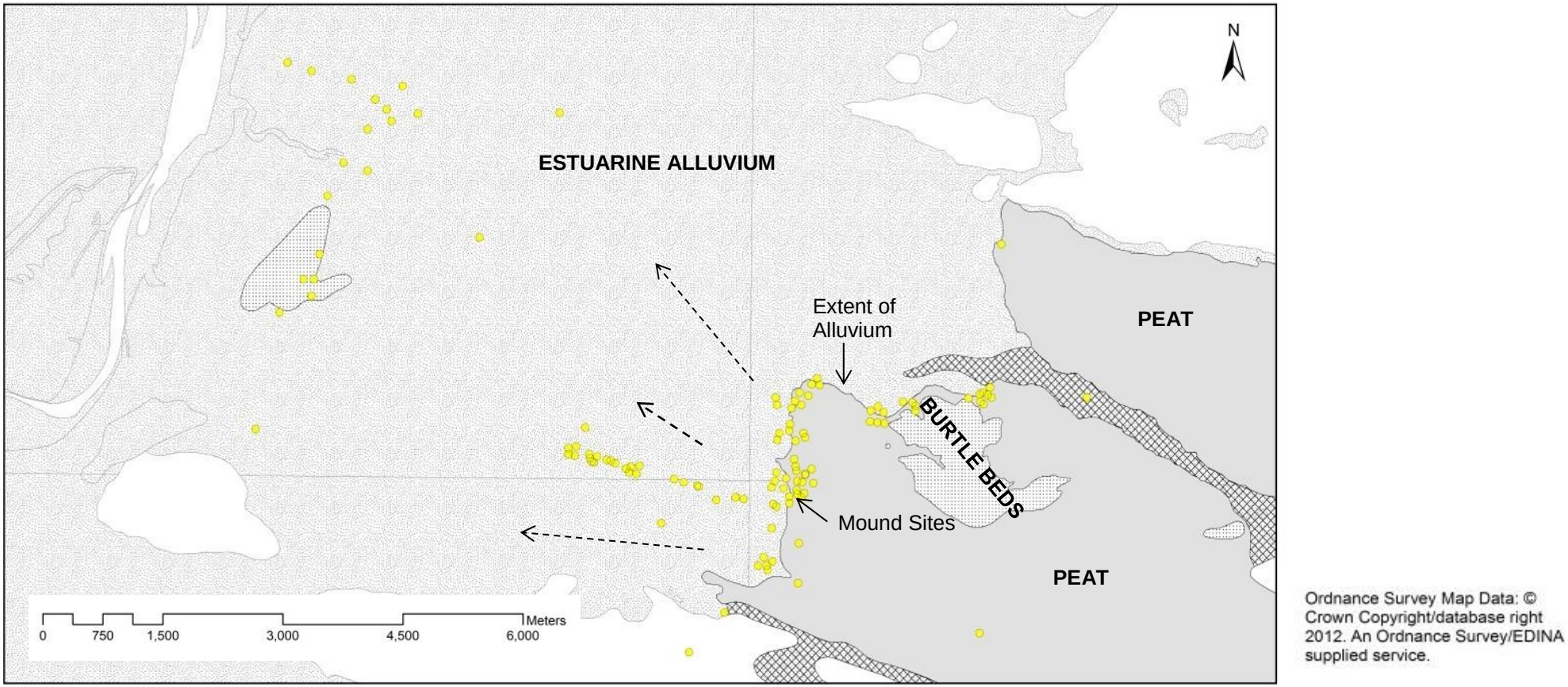


Figure 6.14 Geological map showing superficial geology and the bias of sites identified outside the areas covered by post-4th century AD. alluvium. Arrows show the potential original extent of site distribution

6.4.3 Post-Excavation Results

This section presents the assessment of artefacts and ecofacts discovered during the course of the fieldwork. The briquetage and pottery assemblages were collected from unstratified surface scatters, and areas of visibly damaged mounds as well as within stratified contexts revealed during excavation.

6.4.3.1 Briquetage Assemblage

Briquetage was scattered across the ground surface of all three fields. Samples of briquetage were taken from all of the fieldwork areas. It was generally extremely fragmented; a common occurrence for this particular material type.

As with other briquetage observed in the Central Somerset Levels, all of the material was tempered exclusively with organic temper with frequent large voids. Most of the fragments were non-diagnostic and represented pieces of baked and fired clay which ranged in colour from white, yellow, pale purple, orange-red to dark red, with frequent lumps of degraded clay which were a pale yellow in appearance. Unlike the briquetage from the Huntspill Site 166, there were no sandy fabrics present.

Samples showing differences in colour were retained. Apart from these, only fragments that still had their 'true' external surfaces and were diagnostic were retained.

The briquetage was very restricted and homogenous in form. Most of the diagnostic fragments (Table 6.4) were clay slabs that have been previously observed on other debris mounds in the area.

Overall, the briquetage identified from Fields 1-3, are very similar to forms identified at Site 166. The numerous distinctively pitted cut clay slabs from Field 1 together with the square fire-bars with straight and tapered ends, were almost exactly the same as forms found at Site 166 and Site 239. However, the assemblage from Site 295 did not include any rounded pedestals unlike Site 166.

Table 6.4 Briquetage forms present within the fieldwork area

Fieldwork Area		Briquetage Form				
		Slabs	Bar	Other support	Vitrified Clay/Bars	Non-Diagnostic
Field 1	TP 1	Yes	Yes	No	No	Yes
	TP 2	Yes	Yes	Pinch-prop/Clip	Yes	Yes
	TP 3	Yes	Yes	No	No	Yes
	TP 4	No	No	No	No	No
	TP 5	No	No	No	No	No
Field 3	Site 126	Yes	Yes	No	Yes	Yes
(Opp. Fields 2-3	Site 125	No	Yes	Rod	No	Yes

Slabs

As at Site 166, the slabs at Site 295 (Figures 6.15) varied between 2-3cm and 6-7cm in thickness.

It was difficult to observe whether some slabs had retained their 'true' external surfaces, due to the homogenous nature of the fabric and the uneven surfaces. However, on most slabs, one side was fairly smooth, whilst the other was heavily impressed with organic matter, most slabs had distinctive knife-cut or angular edges (Figure 6.15: left).

Some slabs also had a distinct pitted impression made on one edge (Figure 6.15: right); these appeared to have been created by hobnails (as worn on footwear).

This was probably the result of pressing down the slabs during their creation to created uniform flat surfaces. It is difficult to ignore the aesthetic quality of this treatment and as there was no attempt to smooth over the surface.

The process of working clay with the feet was a technique commonly used during the Roman period for pottery-production (Peacock 1982: 54) and is often referred to as 'puddling'. This usually required a flat surface where clay could be worked to remove air bubbles, which prevents the clay from cracking or exploding in the kiln, as well as to mix in any temper (Swan 1984). However, none of the slabs with the pitted surfaces showed evidence for the impression of an edge of a shoe/boot sole, which would perhaps be expected if the shoe/boot was pressed into the clay while being worn (Figures 6.15 and 6.16).

Figure 6.15 Left: Clay briquetage 'slabs' with knife cuts and organic matter impressions, found in Test Pit 2 Right: ‘Hobnail’ slab from Site 295 (Test Pit 2), (Author: 2009)

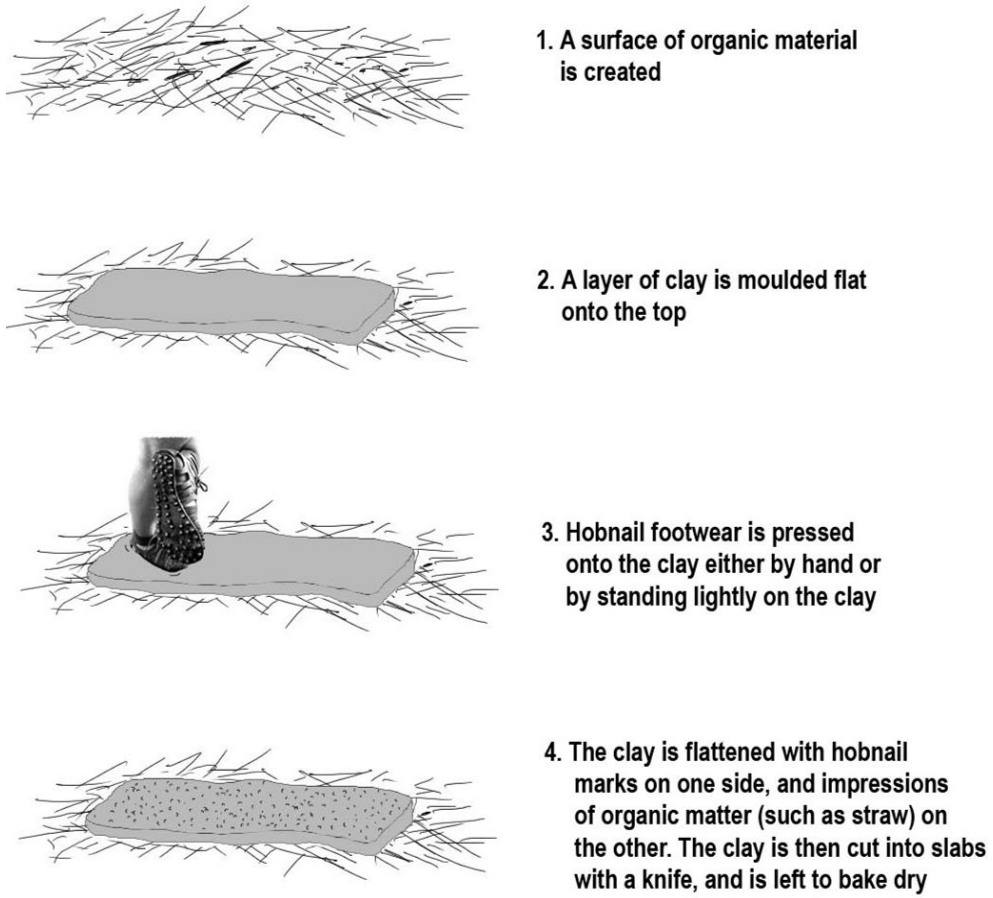


Figure 6.16 Illustration showing a scenario for forming clay slabs with hobnail impressions as found in Test Pit 2

This could infer that either the person standing on the clay was relatively light (or a child) and/or the clay was thick, or even that the footwear was taken off and used to press down the sole lightly by hand. These slabs often had more than one cut edge, confirming they were not the remains of container fragments. There was no evidence to show that any of the slabs were joined together.

In the unpublished briquetage report from Huntspill Site 166 (Percival 2005), it is suggested that the 'tile-like' cut slabs with hobnail impressions probably formed part of a hearth lining or a suspended floor. However, the presence of hearth lining in a different fabric contradicted this. This is considered further in **6.5**.

There was no evidence for dismantled hearth material within the sample assemblages of Fields 1 and 3. This is surprising, but then no evidence of hearths were located within the geophysical surveys or excavation. This could suggest that these mounds were at some distance from the main working areas.

No briquetage container fragments were discovered in the retained briquetage or during excavation, of Site 295. This is not surprising, given that there was very little evidence for this form at Site 166 also.

However, one particular find was able to through light indirectly, onto the use of containers at Site 295. A small damaged stabiliser (pinch-prop) used to adhere the tops of multiple containers to each other was discovered in Test Pit 2, Field 1 (Figure 6.17).

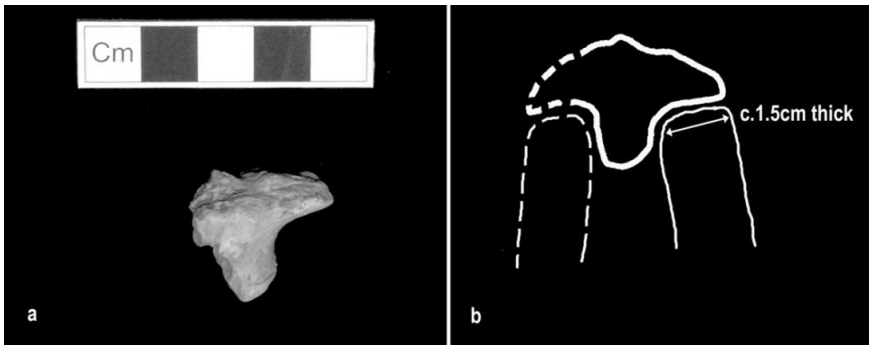


Figure 6.17 a: Briquetage stabiliser (Type 1: Pincih-Prop) from Test Pit 2 with damaged side b: Reconstruction of stabiliser and the probable conjectured thickness of the containers it was adhered to (Author: 2009)

This small but very important find provides these essential facts about this particular salt-production site:

1. It confirms that containers *were* used on this site to produce salt;
2. A straight sided container which a flat rim was used;
3. *More than one* container was used at the same time within a single hearth

The stabiliser preserves an almost perfect 'fingerprint' of the original containers' rim form. Measurements of the object suggest that it spanned containers that were up to c.1.5cm in thickness (at least at the rim) with a flat rim form. However, this does not confirm whether clay or lead containers were used at this site. Although, given that the profile suggested by the pinch-prop is c.1.5cm thick, it seems unlikely that this represents a lead container, which would have not needed to be this thick to function effectively. However, it is also possible that a greater lead thickness could have perhaps protected the structural integrity of the container over time, helped it to survived corrosion and long term scraping of the sides to retrieve salt. However this still does not rule out the use of briquetage containers in some form, perhaps both clay and metal containers were used in salt-production.

The 1.5cm profile also confirms that none of the slabs found within Site 295 matched this thickness, as they were on average 1.9-2.1cm thick and the edges were mostly sharply cut flat (as opposed to curved in form, as suggested by the profile of the curve in the pinch-prop), (Figure 6.17). This supports the view that the slabs are not container fragments. None of the briquetage obtained from the fieldwork were interpreted as containers. This therefore strongly supports the conclusion that the slabs supported lead containers, preventing them from melting if directly exposed to high temperature and fire within the hearth. However, no lead residue was found within the limited soil samples taken.

This evidence also suggests that despite there being no hearth at Site 295, that the debris at least, was from a working area that did employ a hearth. It is possible that the hearth had been heavily damaged and was not identified, or that the hearth lay within parts of the mound not excavated during the geophysical

surveys. However, it is more probable that some mounds did not contain working areas as was recorded at Site 166, and this will be explored further in **6.6**.
As expected, the bar assemblage was highly fragmented, with no complete bars found (Figure 6.18).

Figure 6.18 Four fragments of a briquetage support bar from Test Pit 2 at Site 295 (Author: 2009)

There was a great deal of variability in the dimensions of the bars; some were considerably thicker than others, ranging between 3-5cm in thickness. This could be due in part to having different sections of the bars represented. Most appeared to be square or rectangular in section with either a consistent thickness/form throughout the bar or reducing in thickness to a tapering end.

Bars from Sites 125 (Figure 6.19: 1), 126 and 295 (Figure 6.18), were all consistent with forms from Site 166 (Figure 6.19: 2), Site 239 at St George's, North Somerset (Cox and Holbrook 2009: 111), as well as unstratified bars found in the River Huntspill (Figure 6.19: c), and examples from Cheshire (Bestwick 1975; Williams and Reid 2008) and in the Thames Estuary Essex (Biddulph *et al.* 2012), (Figure 6.19: 4). In fact the close similarity between the organic tempered bars in the Thames Estuary and Somerset (Figure 6.19: 3-4), means they are very difficult to distinguish. The similarities between salt-production in Somerset and other salt-producing areas outside the study area, including Essex, and Cheshire, will be discussed further shortly.

Figure 6.19 1: Bars from Site 125 (Author: 2008); 2 Bar from Site 166 (not to scale), (Percival 2005); 3: Large robust bars lying within the River Huntspill, eroded from nearby debris mounds (Author: 2008) 4: Bar from Stanford Wharf Essex Red Hill (Biddulph *et al.* 2012: Plates: Figure 8.3) (not to scale)

Although the assemblage from Site 126 was limited, the bars from this area (Field 3) appeared to be less fragmented than those from Field 1. The mound at Site 126 in Field 2 also appeared less compacted than Site 295 in Field 1.

This showed that the mounds had been formed slightly differently and also showed either that the briquetage was particularly fragmented through use at Site 295 or that the compaction of the mound had perhaps crushed the briquetage further after deposition.

As with the clay slabs, the fire-bars were tempered with organic matter. However, many appeared to have been more highly fired, or at least exposed to more heat during the course of their use. Many of the bars were deep red in colour, as well as shades of white and yellow (Figures 6.18-6.20).

In general, the bars appeared a lot more robust than the slabs. The fact that the bars had clearly been subjected to significantly higher temperatures is very interesting when considering the process of salt-production on these sites.

Figure 6.20 Examples of fire-bars found within the fieldwork area in and around Site 126 (Author: 2009)

Of particular interest was the evidence for vitrification on some bar fragments from Fields 1-3 and from a mound in the field opposite 2-3 (Site 125), (Figures 6.21-6.22).

This phenomenon usually occurs when clay is subjected to such high temperatures that it begins to melt. This was perplexing as it is commonly assumed that really high temperatures were not required to produce salt; just a consistent and long-running low-medium heat.

Figure 6.21 Fragment of vitrified fire-bar excavated from Site 126 (Author: 2009)

Clay like most materials containing silicate will form a glass like appearance when subjected to high temperatures. However, if fluxing compounds are introduced this can lower the temperature needed to produce this effect (Bayley *et al.* 2001: 21).

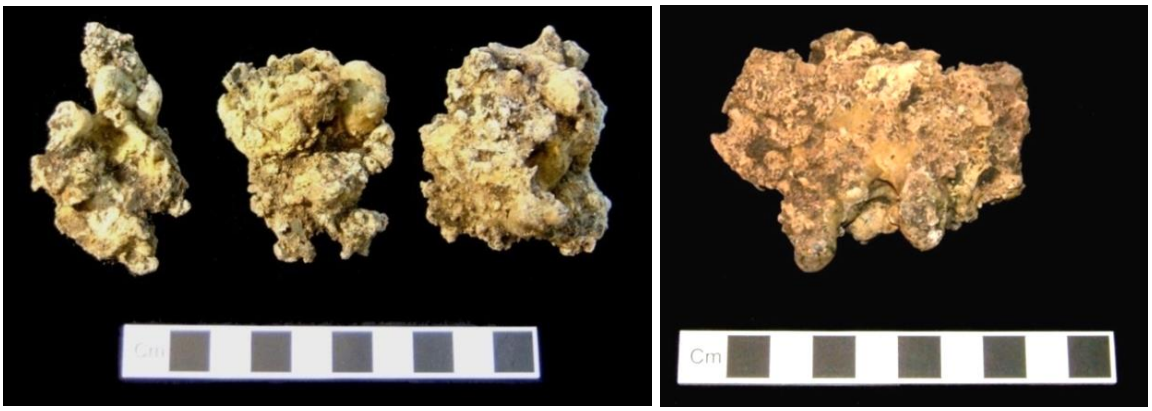


Figure 6.22 Left to right: Vitrified clay lumps from Site 126; a vitrified lump with a curved base (inferring formation on a curved surface) and drip formation on the lower half (Author: 2009)

Most common fluxes are alkalis and a common occurrence in hearths or kilns is for the ash from fuel such as soda and potash to react with the clay lining and produce a 'fuel ash slag' (Figure 6.23).

However the vitrified material from the mound sites was far more solid, robust and heavier than fuel ash slag from Essex which is described as being '…lightweight, vesicular and fragile, and…usually off-white to green or mid-grey in colour, generally much paler than iron-working slags' (Bayley *et al.* 2001: 21).

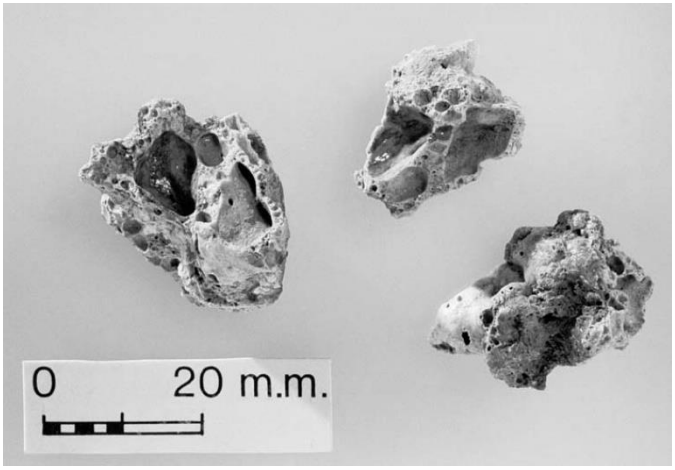


Figure 6.23 Fuel ash slag from Rivenhall, Essex (Bayley *et al.* 2001: 21)

It therefore seems more likely that the vitrified clay from the mounds resulted from a reaction between briquetage, salt in brine (a flux) and heat whilst salt was being produced. Some of the lumps could also have been result of a reaction between briquetage that had fragmented and fallen into the hearth and reacted with the peat fuel ash, or indeed a mixture of both.

Although not obvious from Figure 6.22, one lump had a small fragment of rectangular fire-bar embedded within it.

Except for a single pinch-prop and a rod from Field 3, no briquetage forms other than slabs and bars were recovered. No certain briquetage container fragments were identified from any of the fieldwork areas.

The main similarity between the briquetage assemblages across all the sites in the Group 3 mounds is that they are very limited in form. This does strongly suggest a high degree of uniformity in salt-production within this location carried out in an intensive fashion.

6.4.3.2 Ceramic Assemblage (Figure 6.24)

The pottery assemblage obtained from the fieldwork was consistent in fabric and forms. Pottery was well mixed with briquetage in all excavated contexts and from observations of layer contents, appeared to occur on an average ratio of *c*.30:70 in favour of briquetage.

The pottery from the lower two sites (Sites 125-126), like the briquetage, appeared to be less fragmented than the pottery from Field 1.

There was a variety of mid-late Roman pottery types, which included some Black Burnished Ware fragments (Figure 6.24). This form was known to be traded from Poole Harbour and the North Kent marshes throughout the Roman period.

Although not quantified, the pottery assemblage is comparable in forms and fabric with the assemblage from Site 166 in the Huntspill Woolavington Bridge area. It did include a few sherds of fineware, which are not present in the Site 166 assemblage (Seager Smith 2002). The forms are nearly all those that are seen at other salt-producing areas within the Somerset Levels.

Figure 6.24 Selection of Romano-British pottery sherds from Field 1, Test Pit 2, including a jug handle (Author: 2009)

However, compared with other pottery assemblages associated with salt-production activity in the area, there appeared to be more finewares from Site 295 (Field 1) and slightly less coarsewares than usual. Although this cannot be certainly confirmed as only a small samples was retained, this observation was supported by Rachael Seager Smith during a brief look over of the briquetage and pottery from all the fields during an archaeology open day in June 2011:

> The assemblage is typical of late Roman 3rd/4th century forms, and typical of other assemblages in the same geographical area, consisting of Black Burnished Wares (BBW) and greywares. However one type of form that might have been expected from this assemblage is the gritty greywares that are common on salt production sites in the Somerset Levels. There were no obvious occurrences of this fabric in this assemblage with finewares dominating instead. Accompanying material (the vitrified clay) is clinker rather than slag. (Seager Smith *pers comm*. 2011).

There was agreement that there was no evidence of pottery manufacture (pottery wasters); the variety of fabric and forms, and, significantly, the occurrence of finewares is interesting given the industrial nature of the sites. The presence of more finewares and the absence of pedestals, appear to show that there is a subtle difference between these sites examined at the edge of the River Huntspill and those to the east and north.

6.4.3.3 Soil/Bulk Samples (Report 10.4.1: Tables 7-8)

Soil samples were taken from a selection of areas during the fieldwork. In addition to environmental data, the samples were also used to observe briquetage fragmentation rates, in order to understand the nature of mound formation. The results are presented here.

This proved a valuable exercise as it was possible to observe how fragmented some briquetage became within the mound, and also revealed some interesting information about organic remains on the site.

As stated previously, the location of Field 1 was on higher ground than many of the sites to the west and north. This probably meant that this area was slightly drier. The presence of burnt heather in Test Pit 5 could support this. Evidence for burnt seaweed in Test Pit 5 is also interesting and, if contemporary with the

briquetage mound activity, it was probably brought to the sites from the saltwater inlet. Perhaps it was burnt for fuel as it formed a part of the peat fabric; however there is too little evidence to support this. Alternatively, it could be linked to the use of Technique III where seaweed/saltwater plants could have been burned for salt.

Briquetage Fragmentation

The highly fragmented nature of briquetage has been noted throughout this research project. Excavating small areas of a briquetage debris mound provided a good opportunity to carry out a preliminary study of the fragmentation rate of briquetage within one site. This provides not only an interesting assessment of how fragmented briquetage can become, but it also can have the potential to inform on how the mound was created. This is a new technique designed for the purposes of this research project and acts as an alternative to traditional quantitative/descriptive methods commonly used for describing pottery assemblages.

To assess fragmentation, a simple strategy of sieving the briquetage found within the soil samples through various size mesh sieves was carried out (Table 6.5). Briquetage in the 8.70mm sieve (retaining fragments between c.4.5 and 8.70mm) was the most commonly recovered (highlighted in Table 6.5).

The results confirmed the impression during excavation; that briquetage and pottery from Site 126 (Field 3) was far less fragmented than the assemblages excavated in Field 1. Compared to Field 1, there was also no evidence for the trampling of briquetage into the natural peat at Site 126. The fragmentation results, along with the evidence for trampling, suggests that the mound in Field 1 was probably created over a longer period than the mound at Site 126.

The briquetage and pottery within the mound at Field 1 were significantly more compact and eroded in nature. Test Pit 2 (5) had the highest quantity of briquetage (83%) in all the samples taken. This strongly suggests that mound was created by more than one deposit of material; thus leaving the mound to be walked upon whilst it was left open to weathering.

Table 6.5 Briquetage weights and fragmentation percentages from sieving through different sized meshed sieves (BP: Before Processing)

Sample Area	Context	Complete Sample Weight BP (g)	Sieve Size (mm)	Individual Sieved Briquetage (g)	All Sieved Briquetage (g)	Individual Sieved Briquetage in Total Sieved Briquetage Assemblage (%)	Individual Sieved Briquetage in Complete Sample BP (%)	Total Briquetage Compared to Complete Sample Weight BP (%)
TP1	002/003	1100	2	2.2	12.8	17	0.2	1
			4	4.0		31	0.3	
			8.70	**8.6**		**52**	0.6	
			28.50	-		-	-	
TP2	004	1600	**2**	**355.2**	1009.4	**35**	22	63
			4	169.6		17	11	
			8.70	**401.3**		**40**	25	
			28.50	83.3		8	5	
TP2	005	1000	2	199.9	828.96	24	20	83
			4	201		24	20	
			8.70	**223**		**27**	22	
			28.50	205.06		25	21	
TP5	012	504	2	-	1.9	-	-	0.4
			4	-		-	-	
			8.70	**1.9**		**100**	0.4	
			28.50	-		-	-	
Site 126	Hole 4	700	2	8.5	65.5	10	1	10
			4	11		17	2	
			8.70	**48**		**73**	7	
			28.50	-		-	-	

Site 126 would have been created with perhaps a single or very few deposits of material that were not left open to the elements for any length of time. It is also possible that the material in Field 1 was redeposited in the mound after being taken from another exposed location.

6.4.4 Fieldwork Overview

Overall the fieldwork was successful in terms of information gained for this specific research project and for the wider context of salt-production studies. The fieldwork proved that targeted investigation based on a background understanding of the nature of these sites can greatly inform on salt-production technology and the use of space.

The survey clearly showed the potential for geophysics to identify briquetage debris mounds within the Levels, especially those invisible on the ground surface. It is clear that the current distribution of Roman salt-production sites is not representative of the full extent of these sites in the Central Somerset Levels. There are probably many more of these sites waiting to be found, and also previously recorded sites that are in need of clarification; there are probably associated settlements or temporary living areas that have yet to be discovered.

We cannot understand the full significance of these sites until we have a clearer picture of how many there were in the area, their dates, and indeed whether they were definitely and exclusively associated with salt-production.

All five fieldwork objectives were successfully met. The geophysical surveys and subsequent excavations confirmed not only the presence of previously recorded mounds, but also revealed a new site in the form of a hidden mound (Figure 6.25). They clearly showed that the mounds *do* have a distinct geophysical signature caused by the extremely compacted briquetage and pottery fragments.

Also the underlying geology (peat) does not appear to adversely affect the overall results; peat is often thought to be difficult to conduct geophysical surveys upon.

The consequences of the geophysical results means that future geophysical surveys within the Somerset Levels will have a reference guide to use in terms of locating salt-production sites (or at least the resulting debris mounds).

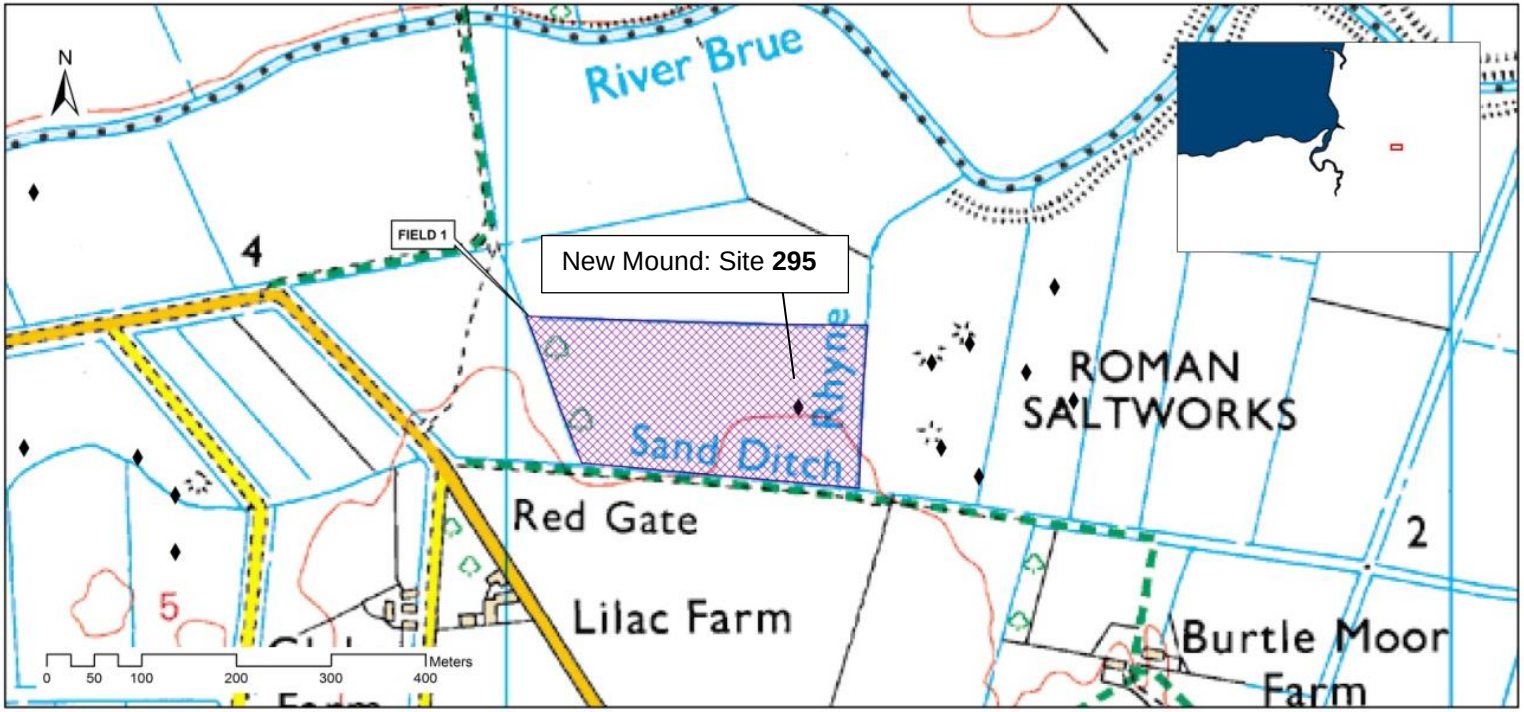
Much information was gained about the individual mound structures (and therefore depositional practices), as well as the management of briquetage waste on these sites. Waste was managed very neatly, being deposited into discreet mounds rather than spread over the whole area. Recording briquetage compaction and fragmentation is considered to be a much more effective analytical technique than simple quantifying weight and fragment totals. It allows different mounds to be compared and showed clearly that each site had a lifecycle of frequent use and careful deposition. This also provides a good technique for potentially identifying space was used on a site.

A similar approach was used in an ethno-archaeological study of salt-production from springs in Mexico where difference in spatial distribution of pottery deposition (vessels used in salt-production) were noted near the spring, as well as differences in fragmentation rates (Ceja Acosta 2011: 42).

Although it was noted that it was possible some of the vessels could also have represented more general waste from site occupation.

Of particular interest, was that there appeared to be a difference in 'structural-fatigue' observed in the vessels (*ibid*). It was proposed that smaller, more fragmented and trampled fragments could have been from deliberate breakage of vessels to retrieve salt and that larger fragments with sharper non-trampled edges were the result of natural/accidental breakage (*ibid*).

Two clearly different mound types were identified. The newly discovered low mound at Site 295, is most similar to the low mound at Site 104, both were hidden below the ground surface, and both appeared to have been packed with a few, simple compacted layers of briquetage and pottery. Both contained no working areas or any features associated with Stages 1-3.



Map Information

Scale	1:4,000
Central map NGR (X,Y)	339234,144472
Created	04/2011 SJH

Legend

- Mound Sites
- Fieldwork Area

Figure 6.25 Field 1 with newly discovered mound

However, those in the River Huntspill area to the south-west; appear to potentially have been more complex (more layers) and were created from alternative careful deposition of alternating silts/ash/peat and briquetage. Also Sites 166 and 198 clearly did contain working areas. These potential differences in mound use and formation, is integral to the understanding of the nature of salt-production sites in this area, and this will be further explored in **6.6**.

Lastly the discovery of peat cutting underneath mound Site 126, and the subsequent linear cuts clearly evidenced all over the geophysical area of Fields 2 and 3 was an impressive find and serves to answer the question of fuel type used for salt-production.

The briquetage assemblage has provided some evidence about possible techniques used to produce salt in this area. The slabs have raised more questions about the exact technique used and will no doubt continue to pose questions as to their function in the overall process of producing salt.

Despite the heavy compaction of briquetage the analysis of soil samples still showed that organic evidence had the potential to survive. It is recommended that samples should always be taken during future similar archaeological work.

Finally it has been confirmed that the mound sites within the fieldwork area are associated with salt-production and not pottery production, as had been conjectured previously.

6.5 Technology of Salt-Production in Somerset/North Somerset

This section will assess the evidence for the technology of salt-production across the region. This will include assessing the evidence for briquetage and features, as well as consideration of trends of technology across the region. The fieldwork evidence will also be incorporated into this section.

6.5.1 Briquetage in the Dataset

As highlighted earlier (**6.1.1**), ascertaining which briquetage forms were present in this region was particularly challenging due firstly to the limited, fragmented assemblages, but also to inconsistencies in form identification particularly. This was due to there being such little existing comparable material for briquetage in Somerset/North Somerset, which often meant that forms were identified using typologies from the Fenlands. This is a realistic approach in the short term and does at least help to identify basic supports and containers, however, the problems arise when assumptions about their 'technological value or significance' are made by using these 'external typologies' as a 'value guide-stick'. For example, what might be a significant form chronologically and technologically in one region, could be very different in another. This is why detailed regional evaluations are so important for these sites, as they can differ so much (even subtly) over even small distances.

As stated earlier, it was not possible at the time of data collection to visit and carry out a visual inspection of briquetage forms stored in the County Museum archives. Given that there were no detailed published briquetage reports for briquetage at this time, limited existing unpublished notes/reports were used to obtain most of the briquetage form data. Fortunately, briquetage recovered and observed during the fieldwork in 2008, proved very helpful in gaining an overview of common support forms used in Group 3. Also an unpublished briquetage report was obtained for Group 3, which will also be used in discussion of briquetage forms in this section.

At this time very little briquetage information was available for North Somerset, however, more has been published since, consisting of very general briquetage information in the context of larger discussions on Romano-British archaeology in North Somerset.

Even less briquetage information was available for Group 1, meaning that salt-production technology in this area cannot currently be explored or discussed.

There is a real sense of consistency and specialisation reflected by the limited briquetage forms across Group 3. Slabs, bars and pedestals have been commonly found in the assemblages of investigated sites in the North and Central Somerset Levels from at least the Late Iron Age to Late Romano-British period.

However, there does appear to be a distinct difference between briquetage used in Group 2 (North Somerset) and Group 3 (Central Somerset).

The most obvious difference is in the use of pedestals and bars. Of the two sites in North Somerset recorded within the dataset (Sites 239 and 294), both appeared to use pedestals as the main support. Site 239 definitely had pedestals and bars, but the pedestals were unique to this site (Type 6), with distinct large 'building-column' forms. Both these sites potentially had Late Iron Age origins, Site 294 had the tall, slender Type 5 pedestal type, proving that as at Brean Down (Middle-Late Bronze Age), pedestals continued in use within Somerset. However the form had changed, with the 'pronged' pedestals of Brean Down being replaced with more simple rounded plain pedestals, or at Site 239, with the distinct Type 6 column style pedestals by the Late Iron Age/Early Romano-British period.

The tall slender Type 5 pedestals were recorded on at least four sites (Sites 108, 166, 176 and 198) in Group 3, which were all accompanied by Type 1/Type 2 bars. However, the use of Type 2 (circular) bars within Somerset, could have potentially led to misidentification as rounded pedestals and vice-versa. Upon closer investigation, the record of rounded/sub-rounded pedestals at Site 166 was only evidenced by four fragments (Percival 2005). However, Illustrations accompanying the briquetage report for Site 166 do confirm the presence of a pedestal base (Figure 6.26); although the quantity of forms indicates that this was far less commonly used than bars on this site (Percival 2005).

The use of Type 5 pedestals at Site 198 is also certain, as a near complete form is illustrated in Figure 6. 28 (left). As can also be seen in this figure, there is a Type 2 circular bar also illustrated, the similarity in form is clear, and unless there is a surviving complete 'end' then identification is difficult there is the possibility that these two forms would be confused on some sites.

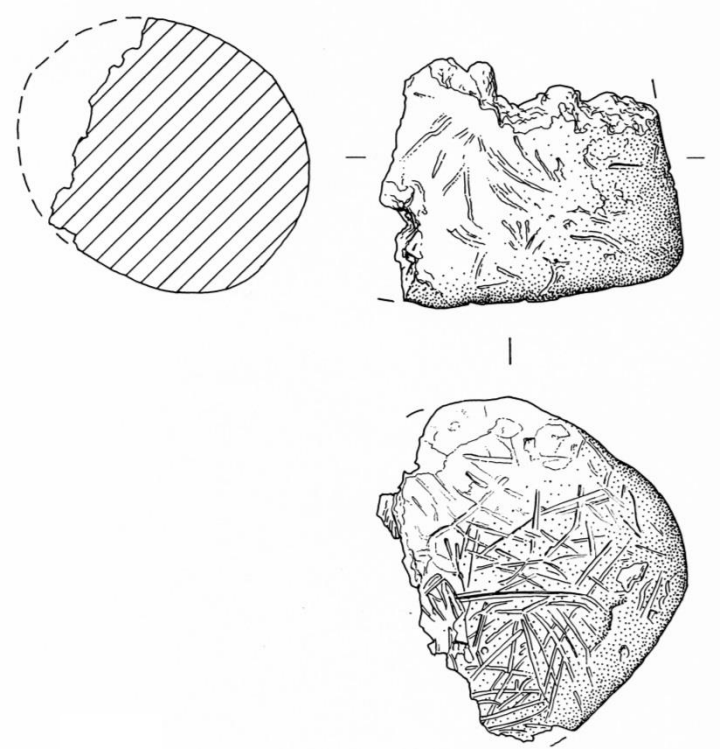


Figure 6.26 Round pedestal (Type 5) from Site 166 (not to scale), (Percival 2005: Figure 3)

Site 198 is also different, in that is dated to the 2nd-3rd century AD (slightly earlier than other Group 3, 3rd-4th century AD sites). It is possible, that the use of pedestals and bars was more popular in the earlier phases of salt-production in Somerset, and then bars became more popular in the later phases.

Measurements for pedestals are lacking. However, in his summary of briquetage forms visually observed from Central Somerset, Rippon (2006: 45) states they averaged between 30-40mm in diameter. However, one example from Site 166 (Figure 6.26) was recorded as having a diameter of 80mm (Percival 2005) showing that there was clearly some variety in size across those sites employing pedestals.

Rippon also highlights the difference in pedestals size and form between North Somerset and Central Somerset. Larger pedestals are not only evidenced at Sites 239 and 294, with pedestals recording a diameter of 15-20cm and 10-12cm respectively, but also in pedestals from a newly discovered salt-production site at Puxton Dolemoor, equally containing pedestals with a diameter of 10-12cm (Rippon 2006: 45).

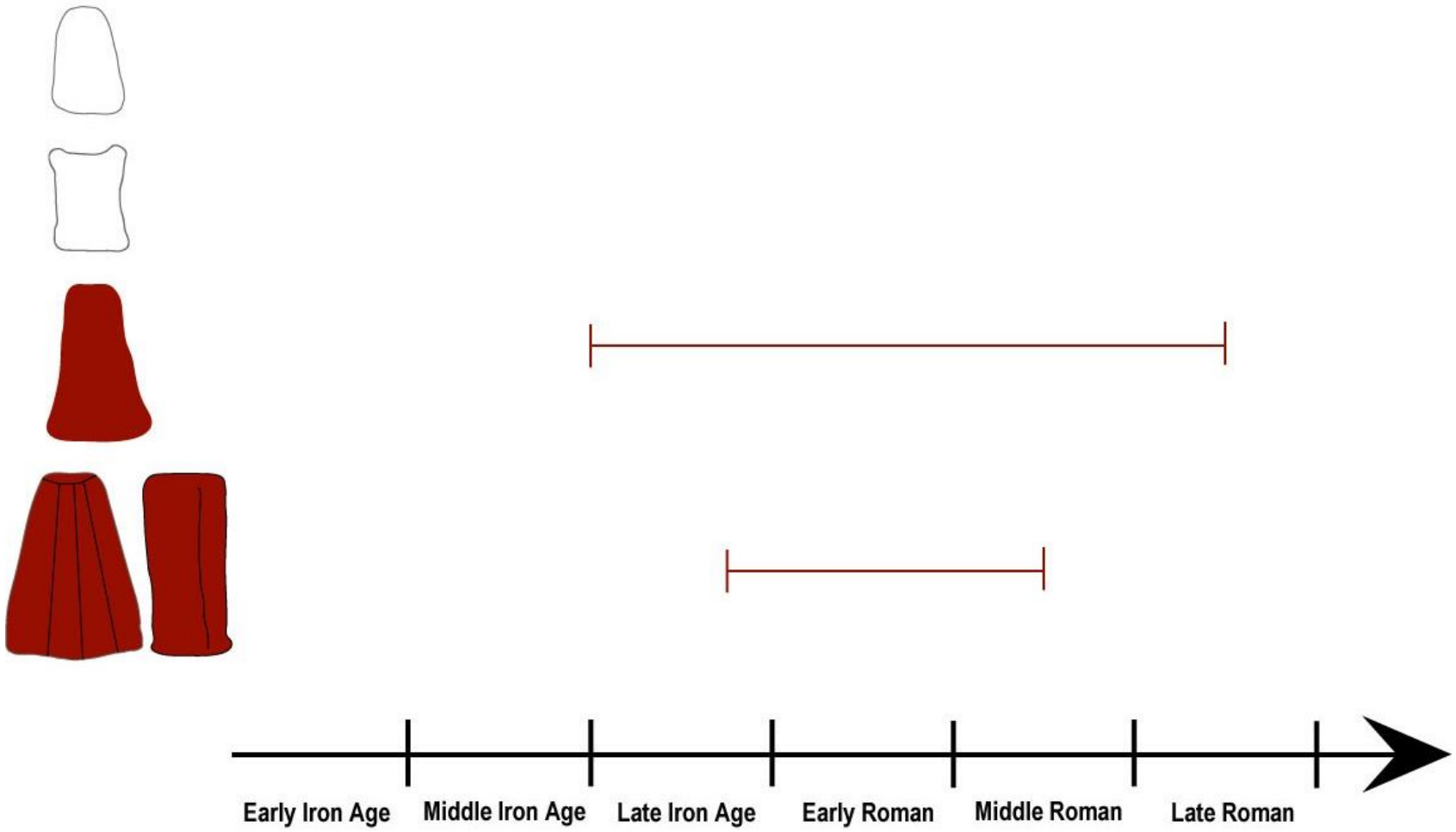


Figure 6.27 Basic typology and chronology of pedestals in Somerset (coloured forms present only)

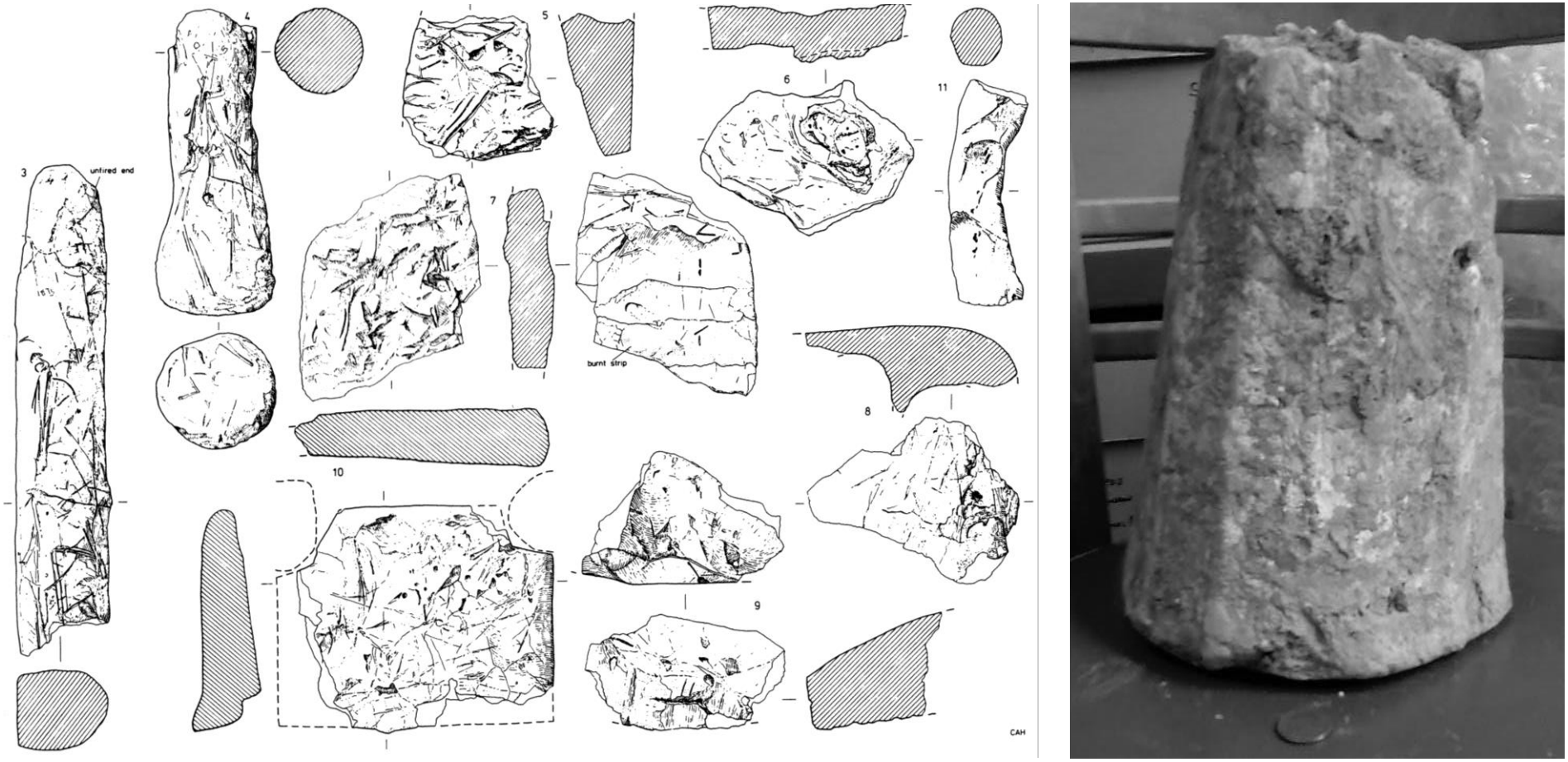


Figure 6.28 Left: Briquetage from a 2nd-3rd century AD salt-production site in East Hunstpill (Site 198), (Not to scale), (Leech *et al.* 1983: 76) Right: Large multi-faceted pedestal from the 1st century AD site at St George's, North Somerset (Author:2006)

Therefore there is a clear geographical and chronological difference in pedestal form and size with the larger pedestals in North Somerset dating to between the Late Iron Age-Early Romano-British periods, and the smaller, slender pedestals in Central Somerset dating to between the 2nd-4th centuries AD.

Another trend which appears to be growing in evidence, is that bars (Figure 6.29) appear to have been favoured far more in Central Somerset (Group 3).

Bars were recorded on at least eight sites in Group 3 (Sites 108, 119, 124, 126, 166, 176, 198 and 295) as well as potentially on Site 239 in Group 2 (Figure 6.33). Bars were also recorded on Site 100, to the north of Group 3.

No bars appear to have been evident on the new sites at Puxton Dolemoor, or on Site 294, but as stated above, were potentially were present in Site 239. Although this may be incorrect, it is stated that these square sectioned supports are in fact pedestals, which perhaps is correct, given the lack of bars on the two other sites nearby (above), (Cox and Holbrook 2009: 110-112).

Similarly, there was little data on measurements of bars, however, observations of unstratified bars from the River Huntspill, bars discovered during the fieldwork and bars from Site 166, show that they appear to be consistently between 4-6cm thick predominantly square in section (Type 1), and very similar to examples from Cheshire and Essex (Figure 6.19).

Slabs were present in at least seven sites (Sites 100, 108, 119, 124, 166, 198 and 295) and appear to have been just as prevalent as bars. The distinct hobnail-impressed slabs were evident on at least three sites (Sites 125,166 and 295), (Figures 6.15 and 6.30) and appear to be unique to Group 3 mounds, dated to the 3rd/4th centuries AD.

Issues associated with the function of these slabs has been well discussed previously, and slabs in Somerset have caused particular issues, as in some instances they are not necessarily recorded as forms in their own right, and instead just mentioned when discussing hearth lining.

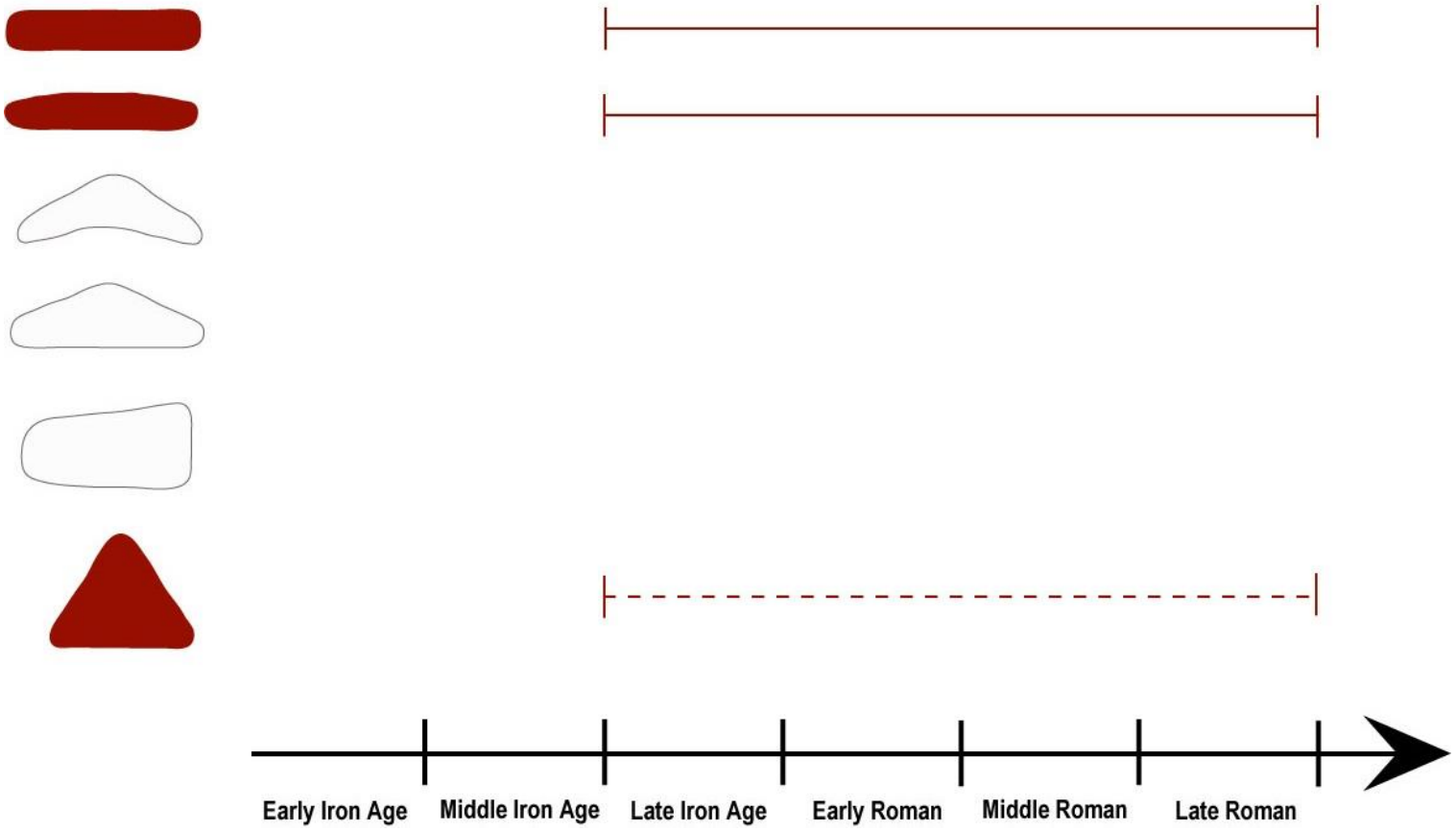


Figure 6.29 Chronology and basic typology of bars in Somerset (coloured forms present only)

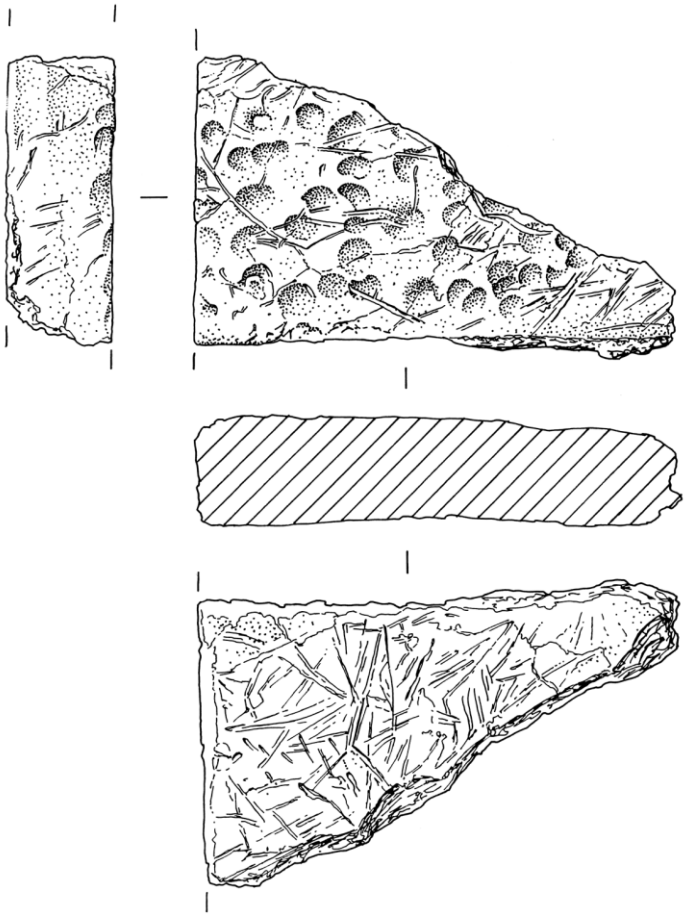


Figure 6.30 ‘Hobnail’ slab from Huntspill Site 166 (not to scale), (Percival 2005: Figure 12)

The confusion over their function, is made more difficult by most of the slabs having one rough edge and one smooth or hobnail impressed edge. The rough edge could suggest that they were impressed into the sides of hearths, however, as shown in Figure 6.16, this is probably due to the way they were created. The presence of more than one knife-cut edge on many of the slabs in Somerset, supports that they are more probably used as supports, or as raised floors in hearths.

The recording of slabs in Site 166 (Figure 6.30) was only included at a late stage, because having found the hobnail impressed slabs during the 2008 fieldwork in Sites 126 and 295, the same form was observed in the briquetage report for Site 166 (Percival 2005), which was originally recorded as hearth lining. This was despite material more attributable to hearth lining, in a different fabric, also being discovered in the same briquetage assemblage:

> These have a vacuous texture and contain pieces of broken briquetage, charcoal and possible fuel residue bound together in a loose sandy matrix (fabric Q2). These pieces probably represent debris from cleaning or raking out of the hearths between firing. (Percival 2005: 6)

The presence of slabs at Site 239 was not included in the original dataset, however they are noted in the site briquetage report as 'thick fragments of the debris with one smooth surface' (Cox and Holbrook 2009). Slabs were also present on the new site at Puxton Dolemoor (Rippon 2006). It was concluded in this report that, as suggested also here, this material was probably used as raised flooring within a hearth (Cox and Holbrook 2009).

There does appear to be differences in the thickness of slabs between sites in both Groups 2 and 3, as recognised by Rippon (2006: 45) where it was noted that slabs from Group 3 ranged between 15-25mm and 40-50mm in thickness. Slabs recorded during the fieldwork were predominantly in the thinner range. However even within one site, both ranges were noted in the assemblage (Site 295). Of potential interest was that the area of 'compacted briquetage b' discovered within Test Pit 2 at Site 295 (Figure 15) contained thicker slabs. Slabs from Puxton Dolemoor were recorded as consistently 40-50mm thick (Rippon 2006: 44). The 'style' of slabs within one site can also be different, as there was a mix of plain smoothed and impressed slabs at Site 166 (Percival 2005).

This difference in thickness between slabs could perhaps indicate different functions. The colour of the external surfaces could also aid in further discussion on function, as some appear to have surfaces heavily exposed to heat when compared to others, as highlighted by Rippon (2006).

'Wedges' of flatter triangular shaped slabs, were recorded at Site 294 (Figure 6.29). Wedges were also recorded in the briquetage report from Site 166 (Percival 2005) and were also therefore included in the research dataset (presented in **3.4.3.2**). However, further investigation of this report has shown that it is probable that the term 'wedge' was used to describe 'spacers', used as stabilisers between containers (Percival 2005).

This is another example of how inconsistencies in terminology can be confusing. It also shows the importance of having a thorough knowledge of local briquetage forms.

Evidence for structural support material was inevitably low, due to limited investigations and understanding of briquetage forms, however, as shown earlier, a single 'pinch-prop' was found at Site 295, and spacers were found at Site 166 (Percival 2005). This indicates that containers were used at both these sites, despite the lack of briquetage container fragments noted from Site 295. Only four pieces of potential briquetage container was recorded from Site 166 in Group 3 (Figure 6.31), which probably indicates that briquetage containers were not commonly employed on this site, if at all.

Similarly, there was only one briquetage container fragment identified from Site 239 and Group 2. With the exception of these two sites, there is a lack of certain briquetage containers recorded in both Groups 2 and 3. Although, it remains possible that some cut slab fragments are misinterpreted as container fragments and vice versa.

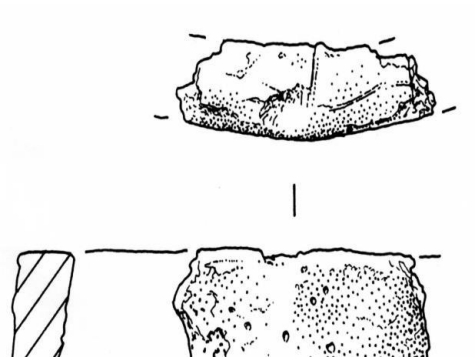


Figure 6.31 Small fragment of possible briquetage container from Site 166 (not to scale), (Percival 2005: Figure 1)

Therefore it is probable that alternative material was being used for containers, with lead being the best contender. It is possible, given the large quantities of pottery vessels at the Group 3 mound sites at least, that pottery could have been used in the salt-production process. However, the use of pottery vessels on such clearly well organised, specialised sites, potentially large-scale 3rd-4th century AD sites would seem unlikely. However, Rippon (2006) remains unconvinced, at

least for the North Somerset Levels (Group 2), as he highlights, despite metal detecting conducted within the North Somerset salt-production sites, no small droplets of lead have been found, as would perhaps be expected from the use of lead containers (ibid). Therefore he concludes:

> Whilst the possibility that lead pans were used cannot be ruled out, not at least because of the proximity to Mendip, it is possible that wooden vessels, or even hollowed out tree trunks, were used. (Rippon 2006: 46)

Despite this suggestion, it still remains likely that the use of lead containers remains the most probable explanation, and this is perhaps supported, by the similarity of hearths and bars used in Cheshire (see **6.5.4**) where lead containers were certainly used. As stated earlier, it is possible that the use of slabs as raised floors (upon bars) meant that lead containers were protected from direct heat, and therefore overheating and melting.

It remains very probable that the large Type 6 building-column pedestals at Site 239 (Group 2), were created in order to support large lead containers (Figure 6.32).

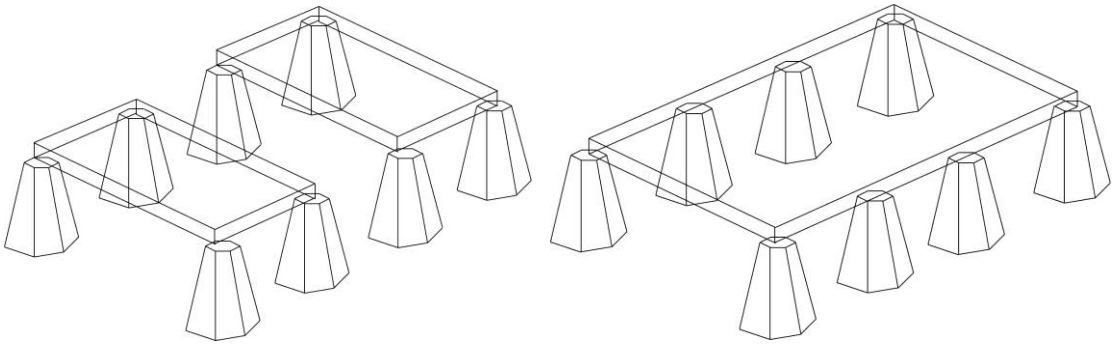


Figure 6.32 Simple reconstruction showing how the larger pedestals at Site 239 could have supported much larger lead pans (in comparison to clay containers)

The size of these pedestals, also infer much about the probable hearth technology.

In experimental salt-production using lead and clay containers in Somerset, briquetage slabs where placed in the centre of the containers, where they were heated, and then wet crystallised salt/brine poured over them (Brunning 2006).

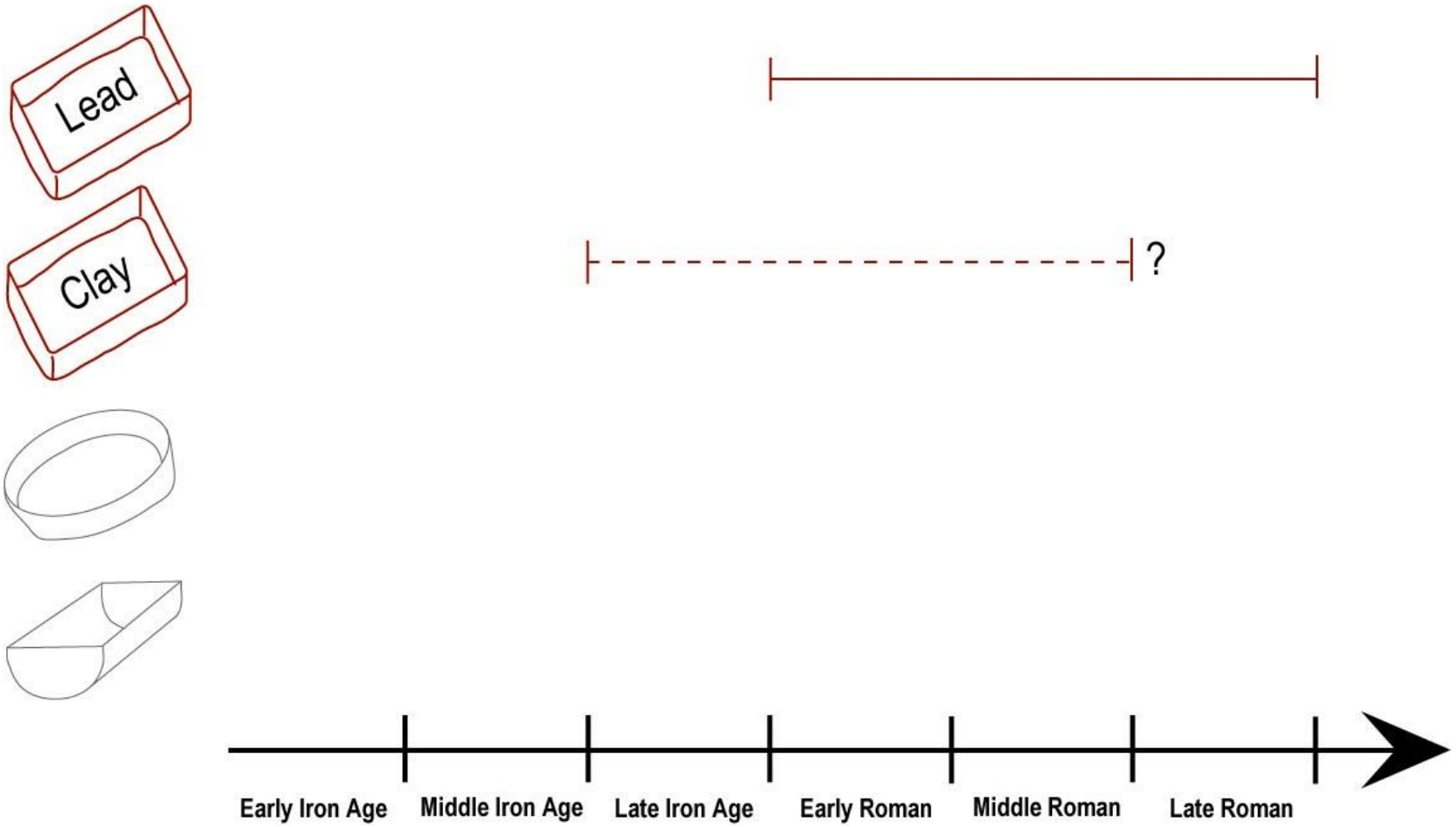


Figure 6.33 Basic typology and chronology of containers in Somerset (coloured forms present only)

This is an interesting reconstruction as it would account for the high salt content within the slabs chemically analysed from Site 198 (Table 4.5). However it is still probable that the slabs protected the lead containers from melting on most sites by supporting the base of the containers.

Finally, although temper has not been considered in any detail within this thesis, Rippon (2006: 45) makes another interesting observation about the difference in briquetage temper used in supports from North Somerset (Group 2) and Central Somerset (Group 3). There is strong evidence that organic vegetable matter was used in Group 3, and in comparison, there is little organic temper in Group 2 briquetage. Again, this is evidence for distinctively different technologies used in salt-production, between North Somerset (Group 2) and Central Somerset (Group 3).

6.5.2 Associated Features

As has been highlighted previously, given that very few sites have been subject to excavation, there is a very limited dataset for associated features in Somerset. This is of course, with the exception of the mounds in Group 3, which in themselves, represent features associated with debris deposition and therefore Stage 4 of the salt-production process.

There is currently no evidence to certainly identify the way in which debris was deposited in North Somerset. Evidence for the use of hearths in North Somerset, and therefore of Stages 2/3, is indirectly evidenced by the presence of pedestals. There was slight evidence for a large burnt area of earth at Site 239, as stated earlier, that probably represented a hearth. Given the size of the Type 6 building-column style pedestals at Site 239, it is probable that surface hearths were used at this site, supported by at least one large burnt area. This burnt area, full of briquetage, is not discussed in detail within the report, but according to the plan, it was rectangular in shape, and was at least c. 8m long (Cox and Holbrook 2009: 104). The site plan also appears to show that this probable hearth was enclosed by a circular ditch, also containing briquetage (*ibid*).

Although, this scenario does not account for the use of slabs on this site, which were interpreted as the probable remains of 'flooring to either the flue of the ovens or a raised floor above the flues' (Cox and Holbrook 2009: 113). Again, some material similar to slabs, appear also to have been attributed to hearth lining on this site also, because of one side being smooth and one rough. Either way, if the slabs are raised floors, or indeed represent partial remains of hearth lining, this would still suggest the presence of smaller, enclosed hearths. Perhaps different phases of salt-production at this site employed different types of technology, or, the slabs were associated with a separate Stage 3 event, used in the drying/processing of salt.

Based upon the large pedestals, and the probable large surface hearth, the production of salt at Site 239 was interpreted as '…undoubtedly industrial in scale…and testifies to an intensive 1st century AD industry…(Cox and Holbrook 2009: 114).

Fortunately, at least two sites in Central Somerset (Group 3) had better evidence for hearths: Sites 166 and 198, both of which revealed well-preserved hearths that were within working areas that had been created on debris mounds. Examples from both sites appear to have been simple, enclosed rectangular hearths (Direct Heat), similar to the hearths seen at Sites 213 and 215 in Poole Harbour, Dorset. However, as stated in **4.6.1.6**, it has been proposed that raised 'ovens' were used, at least at Site 166 (Figure 6.34).

It is unclear as to why this form of hearth is suggested at Site 166, given that enclosed hearths set within the earth are most commonly used across most of Britain in salt-production. This meant that heat could be well retained and controlled. It is possible that some enclosed hearths could have been more shallow, and were used in conjunction with raised walls, however there is no certain evidence for this at Site 166.

As seen in the section of the mound at Site 198, these grouped hearths are shown to be cutting into the stratigraphy of the debris mound (Figure 4.36).

Figure 6.34 Small-scale reconstruction of a raised hearth in Somerset (Brunning 2006: 20)

It is possible that the cut slabs have been interpreted as evidence for raised walls at Site 166, however, as attested to previously, hearth lining created in a different fabric was evidenced at Site 166 (Percival 2005). Most of the slabs, were also too thin to have acted as raised walls, or even hearth lining. The hearth at Site 166 was originally recorded as an oven in the briquetage report, which would have meant that a superstructure more substantial than raised walls would have been used. Given that similar salt-production ovens in Essex are often found to have wattle impressions in the sides, where a temporary wooden structure had been used to create the oven , and then burned away upon firing, and there was no such material at Site 166, it is more probable that that 'oven' was in fact an enclosed hearth.

Of interest, is that no evidence for obvious sandy tempered hearth lining, similar to Site 166, was observed within the assemblage from Site 295, and this is discussed further shortly..

There is even less evidence for Stage 1 water management in Somerset, where certain evidence is currently only limited to one site (Site 166). As shown earlier (Figure 6.7), this site had evidence for at least five tanks, two of which appeared to have been connected, similarly to tanks at Site 228, Furzey Island, Poole Harbour. At least four of these tanks were considered to have been contemporary, and it was also considered that a large feeder ditch was created from a river inlet in order to obtain the saltwater (Figure 6.7). As stated earlier, there was also

possible evidence for feeder channels at Site 239, although this could not be verified, and for a possible feeder channel at Site 126 (as evidenced in the linear leading to this mound visible in the geophysical survey: Report 10.4.1: Figure 13).

6.5.3 Overview of Shared Technologies between Groups 2 and 3 (Table 6.6)

Table 6.6 lists all of the main similarities and differences between Groups 2 and 3. This clearly shows the different character of salt-production between the two areas, and further research, especially of features associated with salt-production in Group 2, will help to define this further.

It seems probable, that given the chronological difference, and the growing differences in technology, that the two areas were separate enterprises, and there is currently no convincing evidence for example, that salt producers from North Somerset (Group 2) were ever strongly connected to, or had moved later to, Group 3.

Table 6.6 Technological similarities and differences between Groups 2 and 3

	North Somerset (Group 2)	Central Somerset (Group 3)
Technological Trends	1st century BC-1st century AD	Predominantly 3rd-4th centuries AD
	No obvious debris mounds	Debris mounds
	Little organic temper in briquetage	Organic temper dominates in briquetage
	Pedestals commonly used?	Pedestals less common
	Larger, Type 6 pedestals	Smaller, Type 5 pedestals
	Bars not used?	Bars commonly used
	Plain Slabs	Plain and hobnail impressed slabs
	Large, open clay surface hearths (Direct Heat)?	Enclosed Hearths (Direct Heat)
	Pottery	Pottery
	Stage 1 possibly present at Site 239. Stage 2 indirectly inferred by briquetage at all sites. Stage 4 not clear	Stages 1-2 directly and indirectly present. Stage 4 dominant in the form of debris mounds

Before exploring Group 3 further as a case study, there is potential evidence for shared technology, between salt-production in Cheshire and salt-production in Group 3.

6.5.4 Shared Technology: Cheshire

As stated above, the technology used in salt-production within Group 3, has some similarities to salt-production technologies in Cheshire. The main similarities are:

1. Lead containers (possibly)
2. The use of thick, robust square/rectangular support bars
3. The use of large, deep rectangular clay-lined hearths

Unlike Kent, the Somerset sites appear to remain relatively uniform in nature.

The potential use of lead containers in Somerset is core to understanding the choice of some technical features. For example, the use of lead as a material for brine evaporation containers meant that there was more flexibility in the dimensions and surface area that could be used.

Examples of lead containers from Cheshire, show that they could be substantially larger than the traditional briquetage containers. One exceptionally well-preserved example from Nantwich, Cheshire (Figure 6.35) indicates that once unfolded, the container could have been over 1.6m in length and perhaps 1m in width.

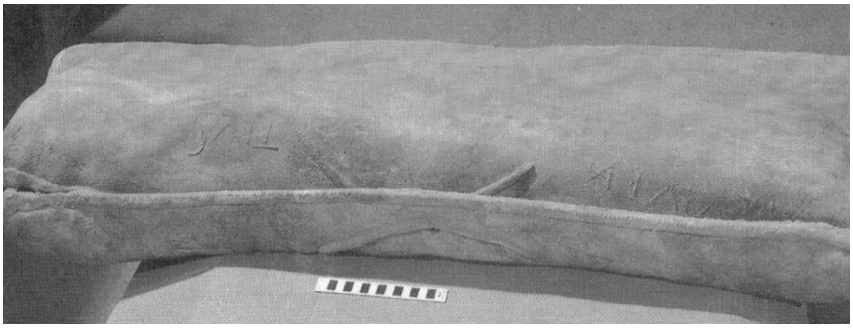


Figure 6.35 Lead brine-evaporation container from Shavington, Cheshire discovered in 1998 (Nevell and Fielding, 2005: 44)

The potential for using much larger, lighter, portable containers (assuming that access to lead was not an issue) would have enabled more brine to be evaporated at once in larger hearths.

These lead containers could still be supported by bars, pedestals and slabs. However, larger containers would have meant that more supports were required.

The use of larger hearths in Somerset therefore does potentially support the use of lead containers. Large, deep rectangular hearths are only seen in Somerset, Cheshire and two sites in Poole Harbour.

The distinct 'building column' style pedestals and larger squared pedestals were created to provide more stable support to large containers. These larger pedestals would have meant that less pedestals were required, but there size would have provided adequate support. This is also the case for the particularly thick, robust, long support bars that are also distinct to the Central Somerset salt-production sites.

Significantly, the use of lead containers was common in Cheshire from at least the 1st century AD, where, robust briquetage bars and squared pedestals were used for support (Figure 6.36). These are closely similar to the forms used in Somerset, and the large faceted pedestal in Figure 6.36: bottom (left) is particularly similar to the pedestals from Ste 239.

The form and fabric of these supports (both used organic temper), combined with the use of lead containers, provides strong evidence for very similar technological choice in Somerset and Cheshire. However, there are some chronological differences between activity in Cheshire and Somerset, as much of the evidence for salt-production in Cheshire is c.1st-2nd century AD in date.

The evidence within the North Somerset Levels remains within this time bracket and therefore could have been contemporary, which is significant with the similarity between the multi-faceted pedestals between the two areas. However, the bulk of salt-production in the Central Somerset Levels was later in date (3rd/4th century AD).

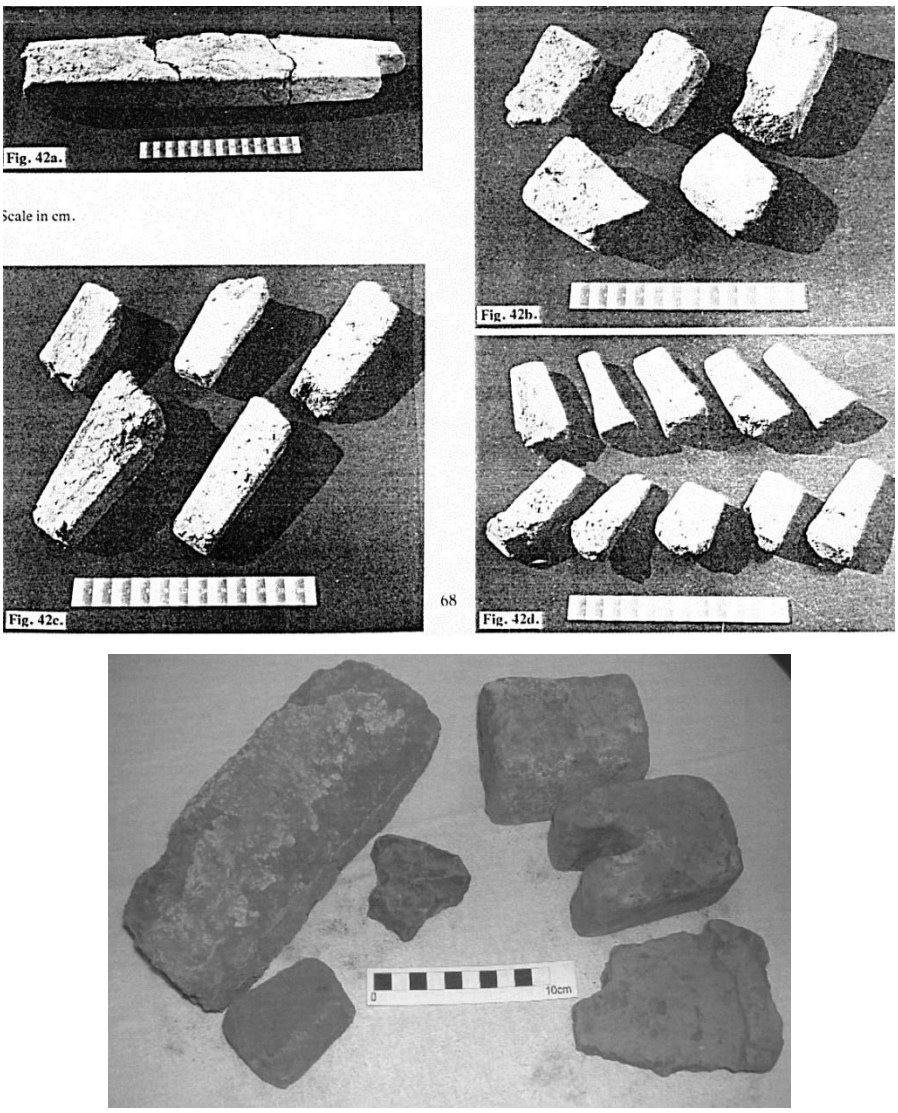


Figure 6.36 Top: Selection of main briquetage support forms used in c.1st century AD salt-production at Middlewich, Cheshire (Bestwick, 1974: 68) Bottom: Briquetage supports also from Middlewich (large squared pedestal to the left) (Nevell and Fielding, 2005: 29)

As the Cheshire sites were exploiting inland brine springs, they probably employed a different production process. Most difference would have been in Stage 1 (water management). In Cheshire, large wooden tanks were used to manage the brine (Nevell and Fielding 2005). Therefore there are some differences between salt-production overall between these areas, however, the similarities remain of interest, especially when considering the very strong link to the Roman military within the Cheshire salt-production industry (Williams and Reid 2008). This clearly raises questions as to whether the similarities in technology in Somerset, also suggest military links.

The creation and use of large lead containers would have been dependant on access to this raw material, and specialist lead workers. It is possible that some salt producers learned how to create lead containers. However, it is more probable that the procurement of lead, was organised or indeed controlled by the military as it was customary to covet these resources during the spread of the Roman Empire (Millett 1990).

6.6 Case Study: Characterising salt-production in the Central Somerset Levels, (Group 3), (Sites 104, 107, 108, 110, 115, 126, 166, 198 and 295)

As has been demonstrated frequently, the character of salt-production in the Central Somerset Levels (Group 3) is dominated by the presence of debris mounds (Stage 4). Evidence for Stages 1-3 remains very limited, and only identified in Sites 166 and 198.

This section will consider the nature of the mounds further, and will consider subtle differences between the mounds which indicate more about the way they were formed and used. This will include comparisons between similar characteristics seen in some Essex salt-production sites.

This is based primarily upon the information gleaned from excavation data or visual inspection, including the data generated by this fieldwork, as well as excavations/surveys/visual inspections recorded by others.

All the main Group 3 mound sites with any recorded information are listed in Table 10.4.1. Those mounds with information about dimension only (Sites 122, 125, 140,141, 143, 167, 172, 177 and 183) are shown in grey. Those sites with information about content (Sites 104, 107, 108, 110, 115, 126, 166, 198 and 295) are shown in black, and will be considered further in **6.6.1**.

This will include comparisons between mound content and mound formation between these sites, as well as comparisons to similar Red Hill sites in Essex, including chronologically earlier, but similar in nature, Middle Iron Age Red Hills in Stanford Wharf, Essex (Biddulph *et al.* 2012).

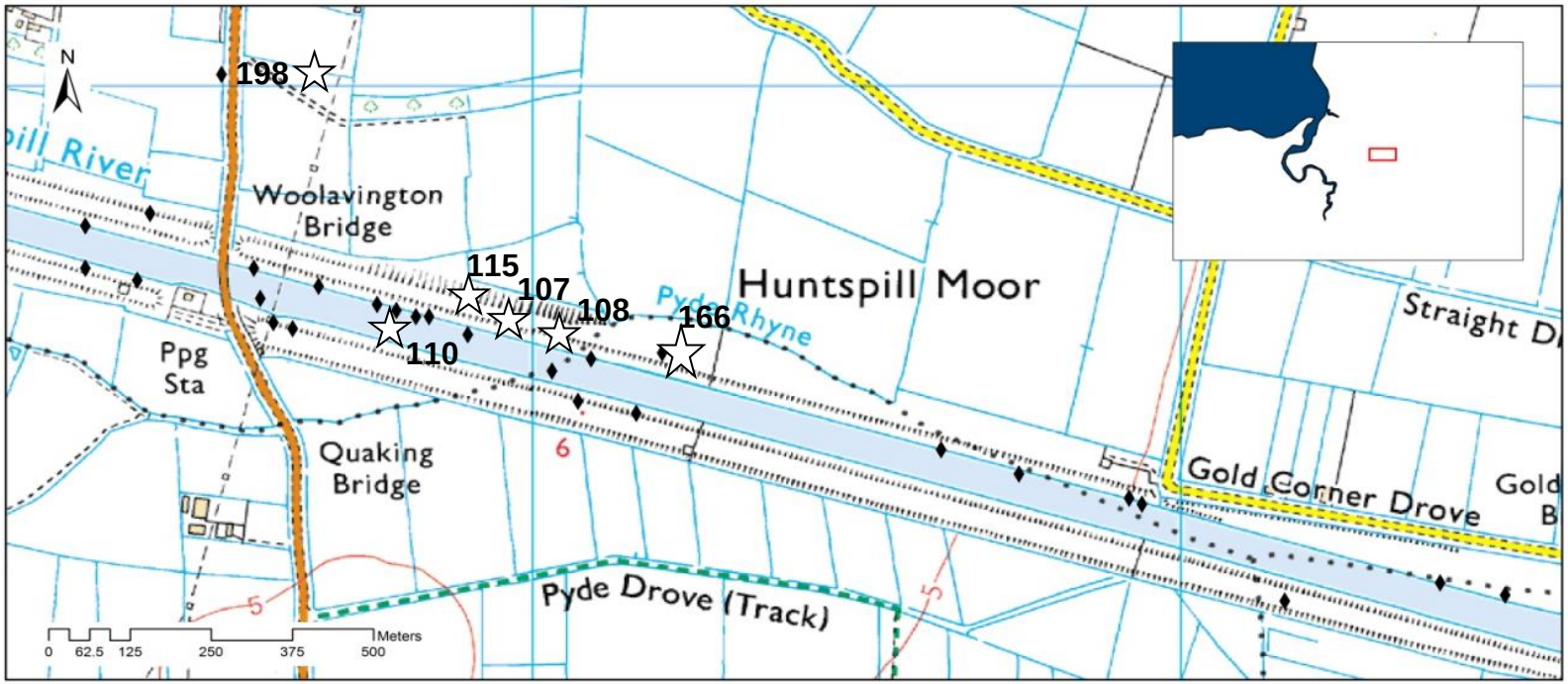


Figure 6.37 Map showing the location of Sites 107, 108, 110, 115, 166 and 198

As is shown in Table 10.4.1, most of the Group 3 mound sites considered in this section, are located in the southern extent of the Group 3 mound concentration (Figure 6.37), the location of the northern sites can be observed in Figure 10.1.5.

6.6.1 Profiling the Mounds: Size, Content and Formation

Attempting to profile the character of the Group 3 mounds is challenging, and ascertaining the true height and length/diameter of the mounds is difficult. However, some dimensions are recorded from the limited excavations, as well as the 1996 survey and these are recorded in Table 10.4.1.

Eight sites had recorded dimensions (Table 10.4.1) and appear to have been either round or sub-round in form. This ranged from c.16-20m for Sites 125, 126 and 166 (and probably 198) in the southern extent of the mounds, and between 6-10.5m (Sites 104, 153-155 and 295) in the northern extent. This showed that some mounds in the southern extent were substantially larger in plan.

Fifteen of the sites had recorded heights (Table 10.4.1). Mound heights in the northern area were all low, consistently recorded as between 0.3-0.5m, apart from the Scheduled group (SAM 429: Sites 153-155). This group was significantly taller, at between 1.2-1.75m.

There were also differences within the southern area mounds. The mounds at Sites 125, 143, 167 and 177 were all lower mounds, similarly to the northern mounds, at between 0.3m-0.6m in height. The mound at Site 110 was also probably of a similar height. With the exception of Site 110, the southern *lower* mounds, are located either at Gold Corner or outside the main concentration, in a small scatter to the south of Gold Corner (Figure 10.1.5).

The mounds at Sites 108, 126, 166 (and probably 107 and 198) were all taller, at *c*.0.7m-1m in height, and all clustered around the Woolavington Bridge, to the furthest south-western extent of the Group 3 distribution (Figure 6.37).

The most obvious explanation for the difference in mound height and length/diameter is surface damage, as in general, the taller mounds were

protected by alluvium, and the lower mounds were exposed to damage from peat cutting and agricultural works. The disturbed briquetage noted in the topsoil of the mounds at both Sites 104 and 295 support this.

The visible Scheduled mound group, only metres from the low mound at Site 295 (Sites 253-155), do not appear to have suffered from significant damage, as they retain their consistent shape and are the tallest of all the recorded mounds. This could just be due to the field they remain within, not being ploughed or subjected to similar agricultural works. However, the fieldwork at Site 295, did show that the mound was similarly very clearly intact in form, revealed within the geophysical survey, with a consistent sub-rounded shape. There was little briquetage in the topsoil and within Test Pit 3 (Report 10.4.1: Figure 19), the topsoil appeared clean of disturbed mound content suggesting that plough damage had been similarly minimal.

It is therefore also possible, that the difference in some mound sizes, reflected their original form, and that some mounds were created differently to others. One way to explore this further, would be to explore their content, to see if there is also supporting evidence for this. It does appear, that some mounds contained more complex layers and differing content, in that some contain complex alternating layers of burnt ash/peat/silt and broken briquetage and pottery, whilst others appear to contain fewer layers of more heavily compacted briquetage and pottery. This is further explored shortly.

In summary therefore, the height and lengths of mounds varied across the Group 3 sites. They ranged from between 0.3m-1m in height, and 6-20m in length/diameter. In comparison, the Red Hill mounds at Stanford Wharf averaged 14x11m in plan and c.1m in height (Biddulph *et al.* 2012). The Red Hill mound at Peldon (Late Iron Age/Early Romano-British) was c.1m in height (De Brisay 1975), however, the mound at Osea Road (Early Romano-British), was apparently much larger, with a length of c.40m and a height of c.4m (De Brisay 1978).

As stated above, many of the mounds were found to contain well-stratigraphied layers of mixed briquetage and pottery (Table 10.4.1). The briquetage and pottery forms were also consistent across the mound sites, and as stated earlier, the

pottery was mostly a mix of coarsewares and some finewares of 3rd-4th century AD date. Further to this, 'the restricted range of fabrics and forms would appear to confirm the industrial nature of the activities carried out in these locations' (Seager Smith 2003: 6).

The assemblages were interpreted as being 'typical of those generated by the makeshift occupation associated with temporary, perhaps seasonal, activities like salt production' (Seager Smith 2003: 6). Until the space between and around the mounds is further explored, it is impossible to say how salt producers were living in this area. However, it would perhaps make more sense that they lived way from the wet marsh on higher ground, be it permanently or temporary.

As outlined in **6.5.1**, briquetage slabs and bars appeared the most dominant form observed, although certain quantified data to support this is limited, this at least appeared to have been the case at Sites 126, 166, 198 and 295. Of interest, is that rounded pedestals were also found within Sites 166 (Percival 2005) and 198 (Leech *et al.* 1983). However, only a very limited number were present in Site 166, totally only four 'pieces' weighing 2603g, compared to 112/212 bar/brick 'pieces', weighing collectively 43,312g. This suggests that pedestals were not commonly part of the briquetage 'toolkit' in Group 3, which was supported by a lack of pedestals from Sites 295 and 126 when excavated.

The hobnail-impressed slabs, were particularly linked to the concentration of mounds in Group 3 (although no mention was made of this feature on slabs at Site 198: see Figure 6.28: left). As stated earlier, there was little evidence for the use of briquetage containers, indicating that lead containers were commonly used in salt-production in Group 3 at least.

Clearly, there are many common factors linking these mounds, including chronology and their general form. However, there are also subtle and more obvious differences, which require further consideration. Key similarities and differences are listed in Table 6.7.

Despite the general uniformity between mounds, with the choice of mounds for debris management being the most important shared link over time, there is evidence that *not all the mounds were created and used in the same way*.

Understanding this, as well as exploring technology and technique further, is key to characterising salt-production in this area.

Table 6.7 Characterising the mounds associated with salt-production across Group 3: Central Somerset Levels. Key similarities and differences across investigated mounds

	Common Factors	Differences
Character of Mound Sites	Use of Mounds to dispose of salt-production debris	Pedestals on some sites and not others
	Salt-production predominantly carried out in the 2nd-4th centuries AD	Mound content-some mounds contain more burnt material than others
	Briquetage toolkit: Predominantly slabs (many with unique hobnail impressions) and bars	Mound content-some mounds contain more layers than others
	Little to no evidence for briquetage containers, inferring the use of lead containers	Mound size-length/diameter and height. Low mounds versus tall mounds
	Peat commonly used as a fuel (as indicated by fuel ash)	Site 198 although having a similar mound, is earlier, with no hobnail impressed slab, representing currently' the odd one out' in the recorded mounds
	Mounds all respect the boundaries of other mounds	Quantities and types of pottery
	Commonly contain mixed pottery and briquetage	Quantities of briquetage?
		Mounds with working areas versus mounds with no working areas?

Firstly, although the quantities of briquetage will vary slightly from mound to mound, observations of limited pottery assemblages have revealed that potentially, some sites contained much larger quantities and different types of pottery.

Although more study would be required into larger assemblages, it was noted in the pottery report that there appeared to be a difference in the quantities of pottery at some sites (Seager Smith 2003). This was based upon the assessment of the 'secure' pottery assemblages from Sites 166 and 198, where in comparison, only 7 pottery sherds were recorded in Site 198 and just within the small sample

excavations of Site 166, 722 sherds were recorded (Seager Smith 2002; 2003). Clearly, directly comparing quantities of pottery, both in sherd counts and weights between these sites is very limited given that they were not fully excavated and sampling strategies were no doubt in place. However, the difference in sherd count in this example is drastically different, and does appear to represent a potentially significant difference in mound content.

This could be linked to the nature of domestic site occupation associated with these sites, where more pottery could indicate nearby occupation. However, this viewpoint could be potentially over simplified, and this issue will be explored further in **7.0**.

As was discussed in the Stanford Wharf report, there were similar, inconsistent quantities of pottery from some Red Hill mound sites (Biddulph *et al.* 2012). Therefore, it was concluded that pottery quantities within the Red Hill mounds had 'little bearing on the scale of activity*' (*salt-production), (Biddulph *et al.* 2012: 99), (although this was referring specifically to Late Iron Age and Early Roman mounds).

Secondly, and most significantly, although the mounds share the presence of mixed briquetage and pottery layers, some of the mounds also appear to contain layers, or lenses, of burnt material such as ash and charcoal (Figure 6.38), or at least charcoal dispersed within briquetage layers. In comparison, other mounds appear to only contain briquetage and pottery.

At least six mounds, all in the southern area, have been identified as containing layers of burnt material, or at least flecks of charcoal (Sites 107, 108, 115, 126, 166 and 198). Site 126 (with flecks of charcoal), was found to contain a lot of vitrified bars, and possible fuel ash slag as presented in **6.4.3.1,** (Figures 6.21-6.22), which, despite no obvious features observed in the test pits, means that this mound contained clearout from a hearth. Also, as stated previously, sandy tempered hearth lining was evidenced in the briquetage assemblage from Site 166, but none was observed within the assemblage from Site 295.

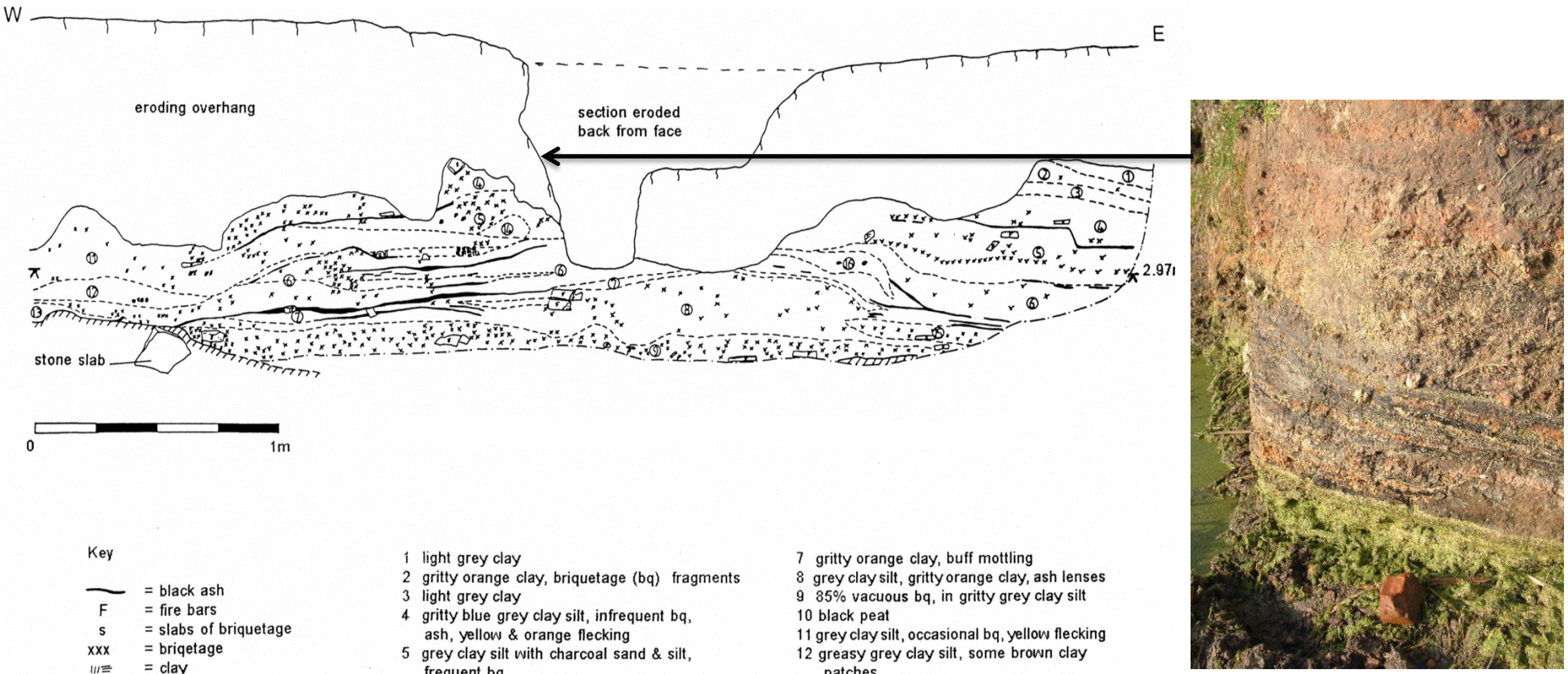


Figure 6.38 Section drawing of the mound at Site 108, exposed by the River Huntspill Left: (Grove and Brunning 1998: 64) Right: (Author: 2008)

Also of potential interest, are the distinct red ‘bands’ seen in section within Site 108 (Figure 6.38) as well as the layers recorded as containing ‘silt clay’ (Grove 1996). It is possible that some of this material is linked to the roasting of clay linings (which potentially could have produced a ‘powdery; or ‘silty’ burnt clay material).

In comparison, two sites appear to only have layers of briquetage/pottery, with no clear evidence for burnt material in layers, or obvious flecks of charcoal (Sites 104 and 295). Also, there is no mention of ash or burnt material in the description of Site 110 (Grove 1996: Appendix 1). All three are low lying mounds.

It is possible that due to the limited excavation of mounds in Sites 104 and 295 and observation of Site 110, that more discreet lenses of burnt material were present in other, non-exposed/investigated parts of the mounds. However, the environmental analysis of samples taken from Site 295, did not reveal any charcoal (Report 10.4.1: Figures 7-8) and simply appeared to be formed from relatively uniform layers of compact briquetage (Report 10.4.1: Figures 17-19).

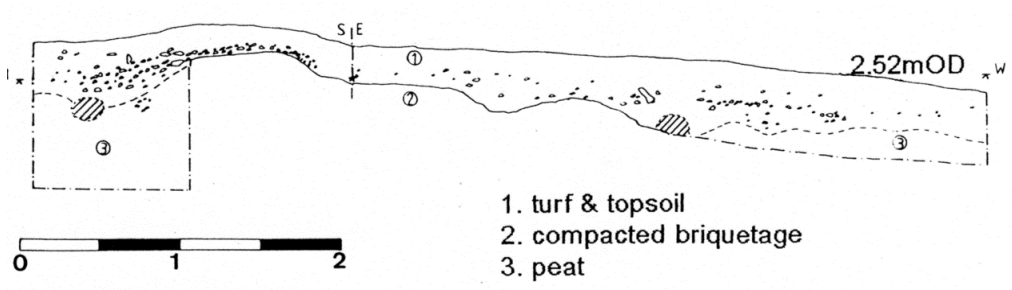


Figure 6.39 Section of Site 104 (as exposed by the River Huntspill), (Grove 1996: 15)

This is surprising, given that the sites were associated with a production process that would have produced large quantities of burnt material from the hearths.

However, there may be a plausible explanation for this when this evidence is explored further. The mound at Site 295 was a ‘low mound’ and therefore was substantially shorter than most of the other mounds. This was also possibly the case for Site 104, although the section does not make this clear (Figure 6.39). Therefore there could be a link between the lack of burnt material and low mounds.

In the case of the Site 295, there were no features cut into, or surrounding the mound indicative of a working area, (Sites 166 and 198), (Table 10.4.1), two were associated with ‘inserted working areas’ including large hearths. Another scenario is that the lower more simple mounds, were in the process of being built up, but for whatever reason, completing the mound deposition at these sites ceased.
Therefore, it is proposed that there are two main types of mound in Group 3 (Central Somerset Levels):

1. **Larger, taller mounds that contained Stage 2/3 hearths** with layers or least lenses of mixed hearth clearout/burnt material contained within the mound

2. **Smaller, lower mounds that *do not* contain any associated features,** and do not contain evidence of hearth clearout/burnt material

The burnt material could be associated with different phases of working and represent the clearout from hearths, which was spread around the surface of the moun. The section of Site 108 (Figure 6.38), suggests there could have been at least three phases of production. It is also possible, that some of the burnt material came from other working areas nearby, deposited in order to build the mound up, which would then provide a raised platform for the creation of new working areas.

If all the mounds represent Stage 4 debris deposition, it would be expected that there would be burnt material at least mixed in with other debris in all the mounds. Site 295 however, appeared to be very ‘clean’ of burnt material and broken up hearth lining (Report 10.4.1: Tables 7-8).

This suggests that a ‘selective mode’ of deposition was in use, which resulted in some mounds being formed from different combinations of waste. It is possible that whilst the mounds used for working areas contained all aspects of waste, mounds that were only used for Stage 4, simply contained only ‘ceramic’ waste.

It would also make sense that the further mounds were away from working areas, the less contact they would have with the ‘messy’ burnt material. The lighter burnt material could be deposited nearby the working area as clearing out this material

occurred regularly and it would have taken up little room when spread around the working area.

However, it is possible that the bulkier ceramic material which could potentially 'clog up' working areas quickly, was distributed further away. Perhaps the bulkier material was temporarily 'thrown' into heaps just outside the working area mound, whilst salt was being produced, and moved periodically into neater mounds. This would potentially limit the amount of contact that briquetage had with burnt waste material.

The final explanation, is that not all working areas needed to be created on raised areas, especially in higher areas of ground, such as the area surrounding Site 295.

Before exploring the use and planning of space that is evident across Group 3, there is one final difference that requires consideration. As stated in Table 6.6, Site 198 in two ways, remains the 'odd one out' of all the other investigated mounds listed in Table 10.4.1.

Although this is a 'typical' mound site, similar to other mounds (but containing a working area), the site contains earlier pottery (2^{nd}-3^{rd} century AD) and as highlighted earlier, the slabs appear not to have had the distinct hobnail impressions. It also appeared to use a mix of smaller rounded pedestals, bars and slabs, which, apart from the four possible fragments of a pedestal from Site 166, shows a different 'briquetage toolkit' to other mounds with briquetage assemblages in Group 3.

It would be useful to find and investigate more 2^{nd} -3^{rd} century AD sites in this area, to further explore the changes that occurred in technology between this earlier phase, and the later phase. This change could simply represent subtle changes in technology that naturally occurred through time as different generations of salt producers used this area and 'acted out' their own preferences. It is interesting that over potentially 300 years, most of the technology, and choice to keep using and creating mounds in this way continued, suggesting that this technique of production and management of space continued to successfully work well over such a long period of time (2^{nd}-4^{th} century AD). Evidence for the use of

space, including the potential implications of different mound formation and use, will now be considered in more detail.

6.6.2 Working Areas and 'Whole Site': Collaboration and Planning

The fact that based upon the limited data at least some hearths were created within debris mounds to create raised working areas, combined with evidence for selective deposition, indicates a *high level of planning and organisation*. It is likely, that this area was a large, single complex containing multiple working areas (similar to Site 82, Lydd Quarry, Kent). Therefore, there was a *continuous management plan over time and space for salt-production in Group 3*.

As stated previously, only two working areas are known from the Central Somerset Levels: Sites 166 (Figures 6.7 and 6.40) and 198 (Figure 4.36).

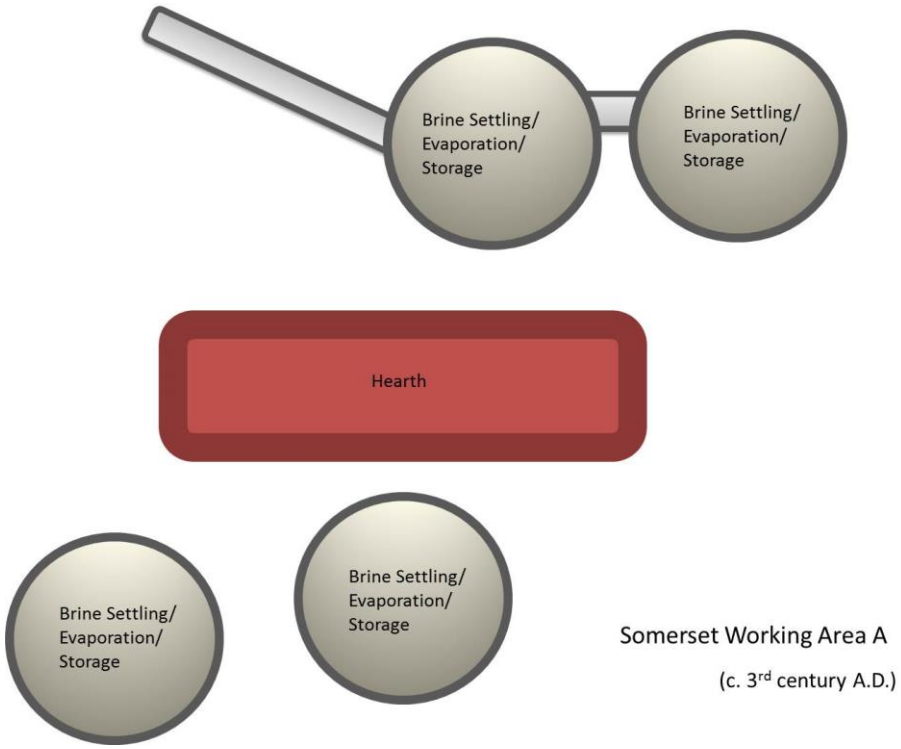


Figure 6.40 Somerset Working Area A based upon Site 166

Although they are both formed within very similar mounds, there was more evidence for multi-phased use at Site 198. It appears that Site 198 employed a

group of hearths in each phase (Figure 4.36), whereas a single *but larger* hearth was used at Site 166 (Figure 6.40-6.41).

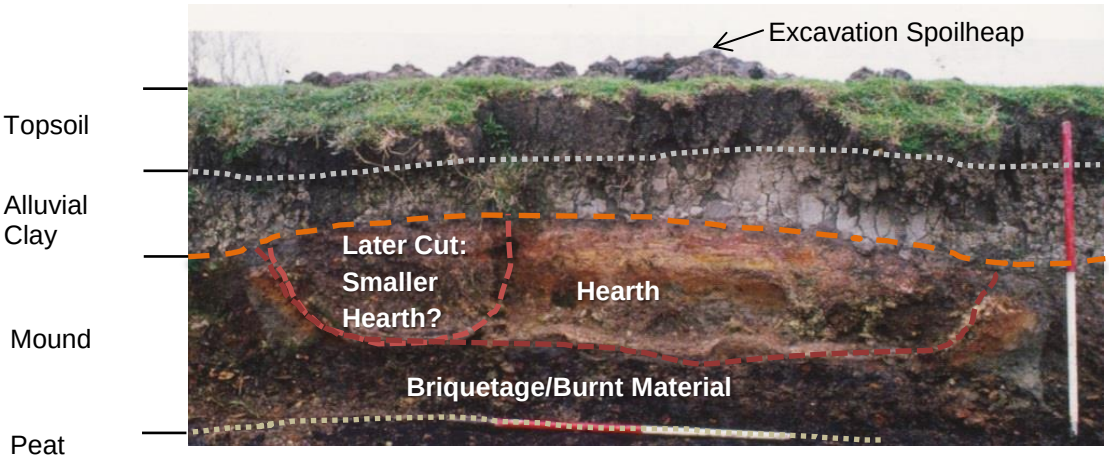


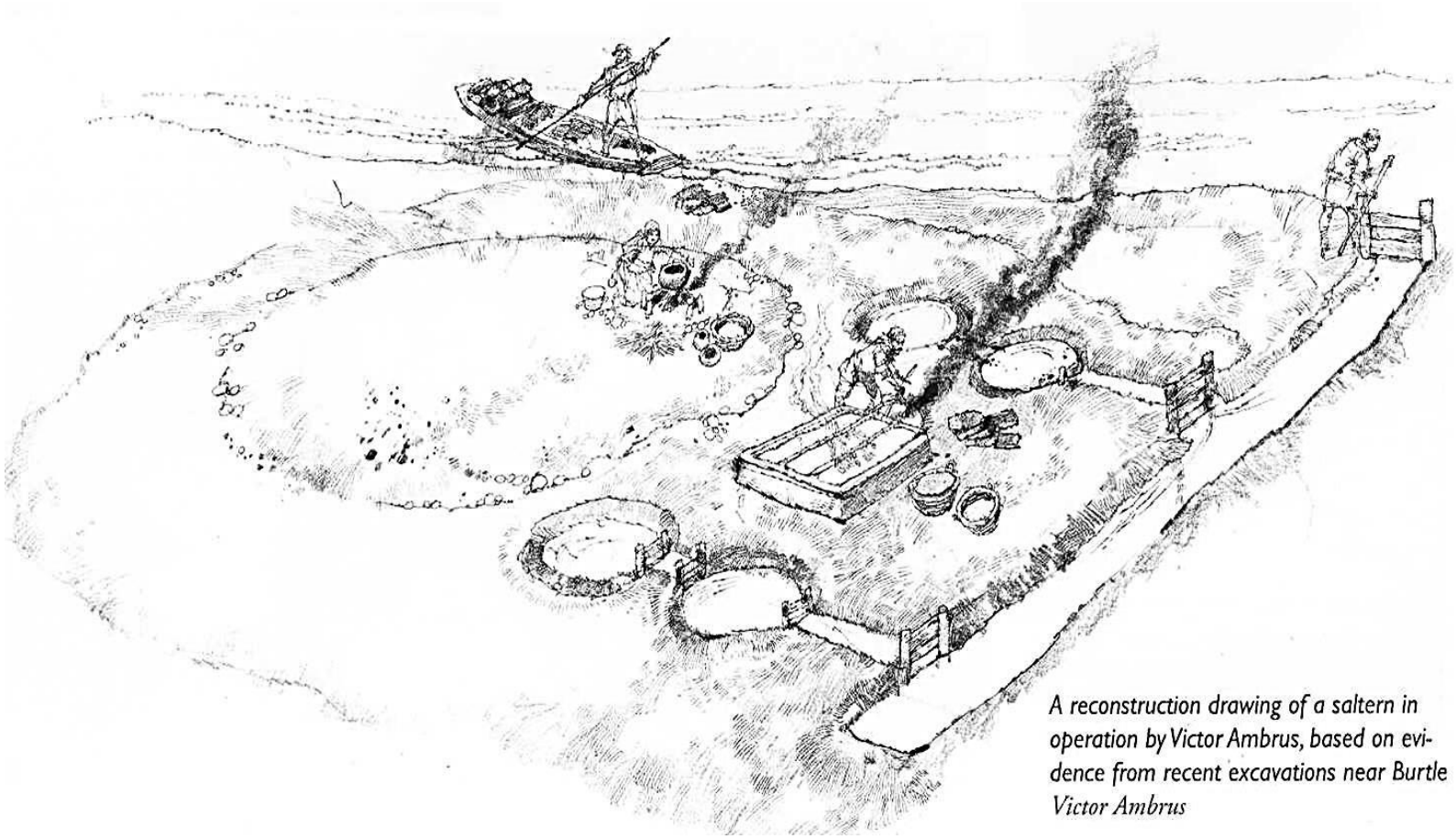
Figure 6.41 Hearth from Site 166 within the debris mound, resting on natural peat

However, both mounds at Sites 166 and 198 only appeared to have hearths within them, as opposed to a complete working area (hearths and tanks). At Site 166 (Figure 6.7 and 6.40), brine tanks were placed on the ground surface outside the main mound parameters, cut directly into peat, and this was probably the case at Site 198 also.

Although the reconstruction of Site 166 shows the large hearth just outside a 'central raised area' (mound?), (Figure 6.42), the section in Figure 6.41 clearly shows the mound was cut into salt-production debris. It is probable therefore, that this layer was the 'foundation layer', and that the hearth was on the edge of a mound that had built up more within the centre.

Although a smaller hearth is shown as on top of the mound (Figure 6.42), it does seem a bit peculiar that the main area of activity (and working area) was right on the edge. Since the mound was not fully excavated, it is possible, that there were further hearths/cut features towards the centre, as with Site 198. Although this site was created on a raised peat bog, (Percival 2005), which would have created a naturally raised area around the central mound.

Four or perhaps five brine tanks were observed at Site 166, which is a relatively high quantity of tanks for a single working area, it is possible, that some sites shared tanks, as was probably the case at Site 82, Lydd Quarry.



A reconstruction drawing of a saltern in operation by Victor Ambrus, based on evidence from recent excavations near Burtle
Victor Ambrus

Figure 6.42 Reconstruction of Site 166 showing a different working area layout compared to the reconstruction of a Red Hill in Essex in Figure 6.35 (Brunning 2006: 21)

The reconstruction drawing also shows a man-made feeder channel, created to lead saltwater from the smaller branches of the River Siger to the site (Figure 6.42).

In order to understand the organisation and formation of mounds further, there are two other issues that require consideration, both potentially related to scale.

The first is the question of how long the mounds took to accumulate; whether they were formed over several seasons, or in a single season (Figure 6.43). The second is the question as to whether the mounds represent debris from single sites or were shared between several working areas (Figure 6.43). This involves the consideration of space, and how each working area was formed.

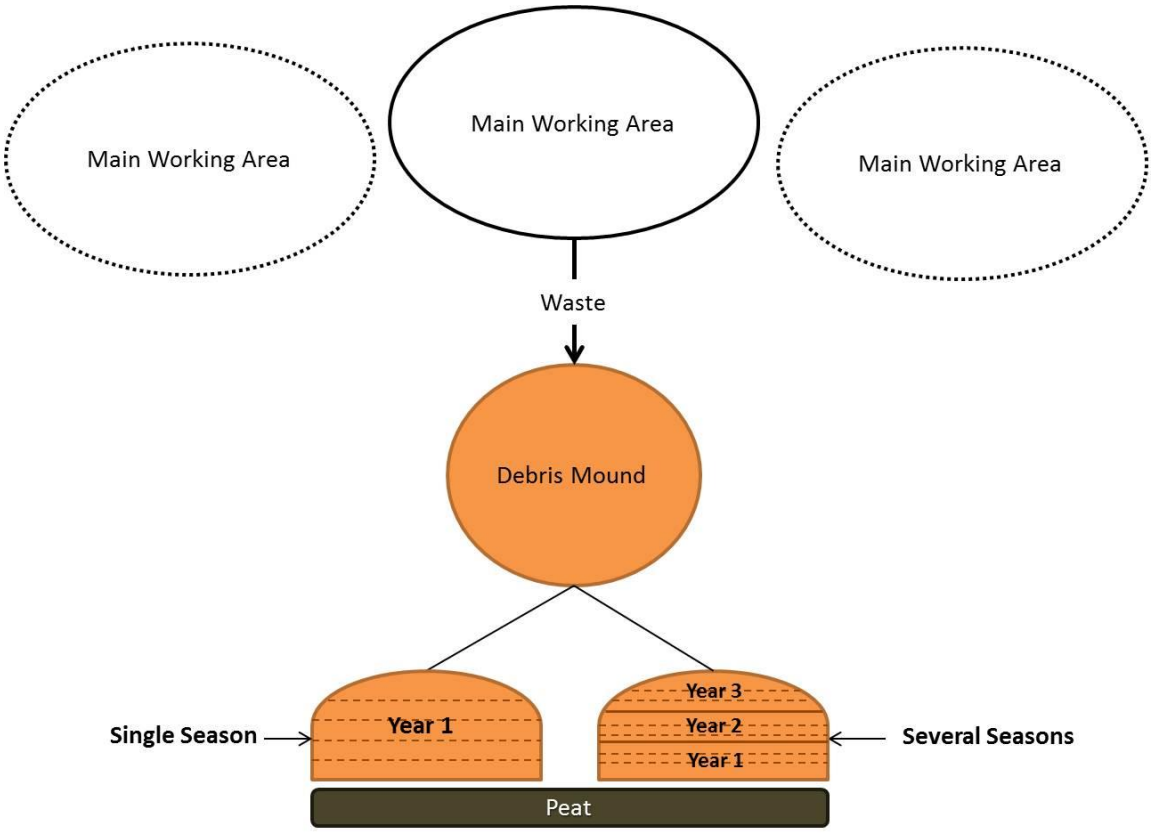


Figure 6.43 Scenario for mound formation in the Central Somerset Levels (Group 3)

Although there could have been several different scenarios, two main potential scenarios (both with two sub-options) are considered here:

1a. Working areas were created on the ground surface, and they were associated with a debris mound used only by this site. Therefore the 'whole site' boundary would incorporate the Working Area, Debris Mound, and the space immediately *between* and *surrounding* the site (Figure 6.44)

1b. As 1a, but several sites shared a single mound (Figure 6.45)

2a. Working areas were created within an existing debris mound, and tanks on the ground surface, that had a separate second debris mound just used by this site (Figure 6.46)

2b. As 2a, but with a second debris mound shared by several working areas (Figure 6.47)

It is probable that most debris mounds were created similarly at the start, but dependant on whether new working areas were required, some mounds could be built up gradually to form the case for raised working areas. The creation of new mounds for working areas would require existing working areas to work in a collaborative 'chain'.

This would require respecting boundaries and space between sites, whereby they gradually created these mounds from waste until they were suitable for the creation of a working area. The working area could be created and then this area would again form a mound that could eventually be used as another new working area.

There was evidence for more than one phase of salt-production within the mound at Site 198 as supported by groups of hearths intercutting each other (Leech *et al.* 1983).

There were also differences in the way that material was deposited and stratigraphy was formed. The mounds at Site 126 and 295, had relatively regular, long stretches of compacted briquetage. Also the briquetage at Site 295 was highly fragmented and no large fragments of bars were found. The mounds containing burnt material at Sites 108, 166 and 198 all had much more complex layers, as found in some Essex Red Hills, where similar 'tip' lines have been observed (Figures 6.48-6.49).

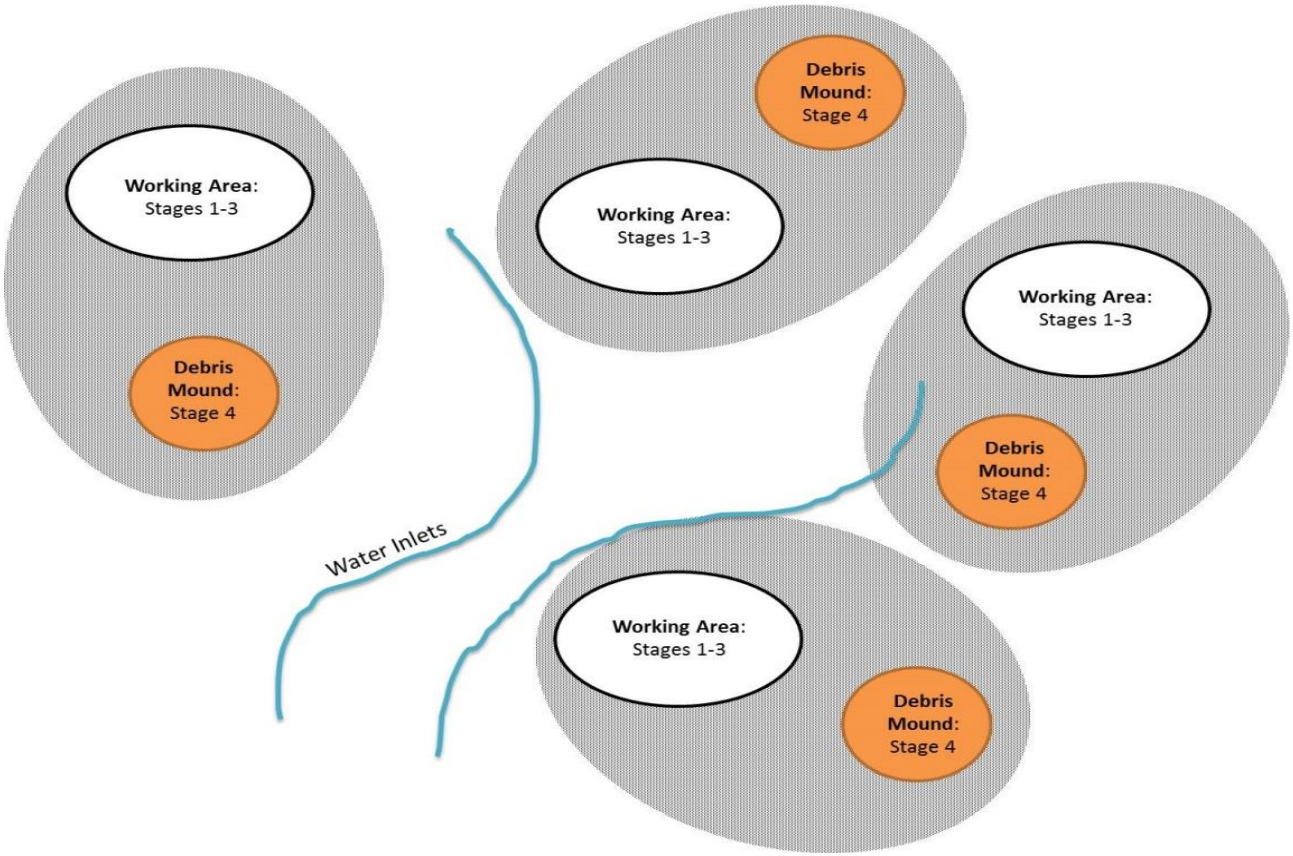


Figure 6.44 Scenario 1a for Site and Waste Management for salt-production in the Central Somerset Levels. Grey shaded area represents the 'Whole Site'

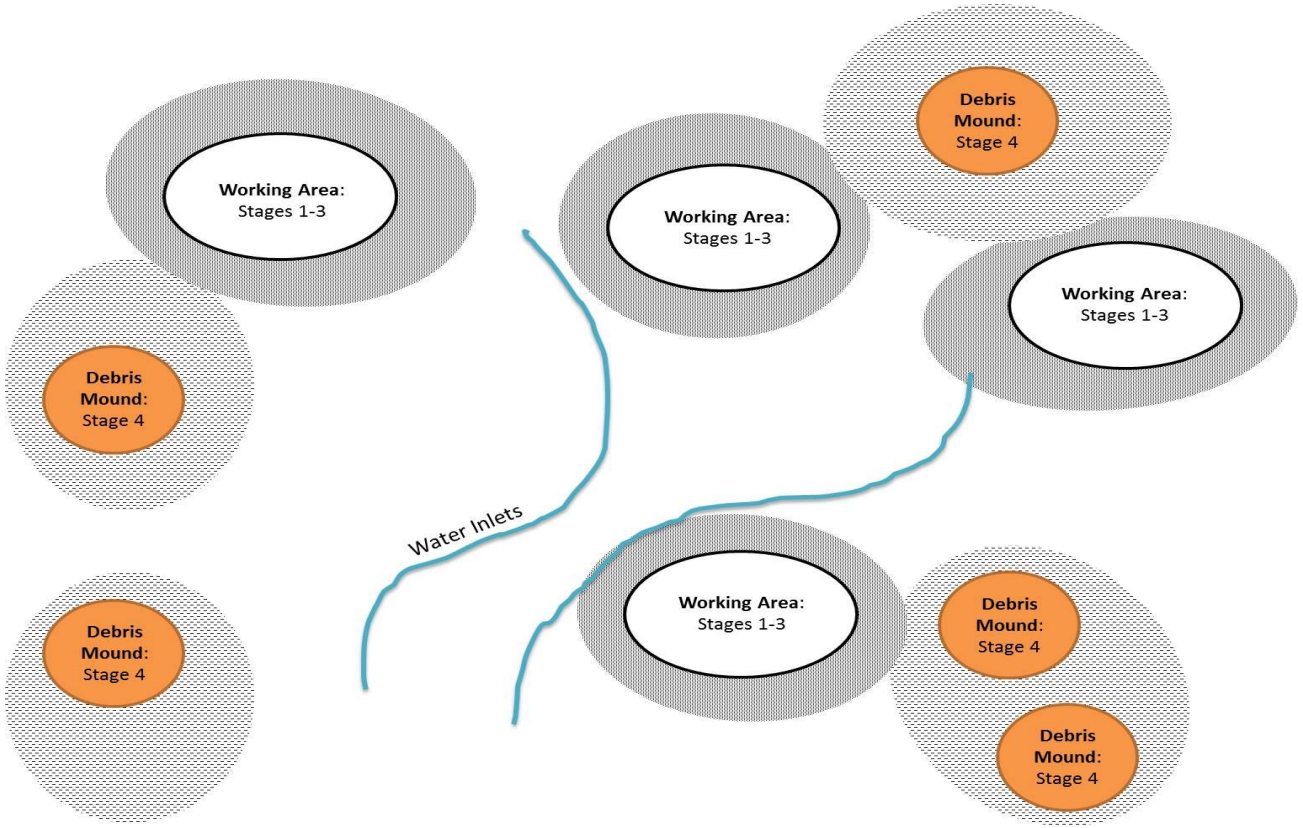


Figure 6.45 Scenario 1b for Site and Waste Management for salt-production in the Central Somerset Levels. Dark grey shaded area represents the 'Single site specific space'. Lighter grey shaded areas represent 'Shared space used by several working areas'

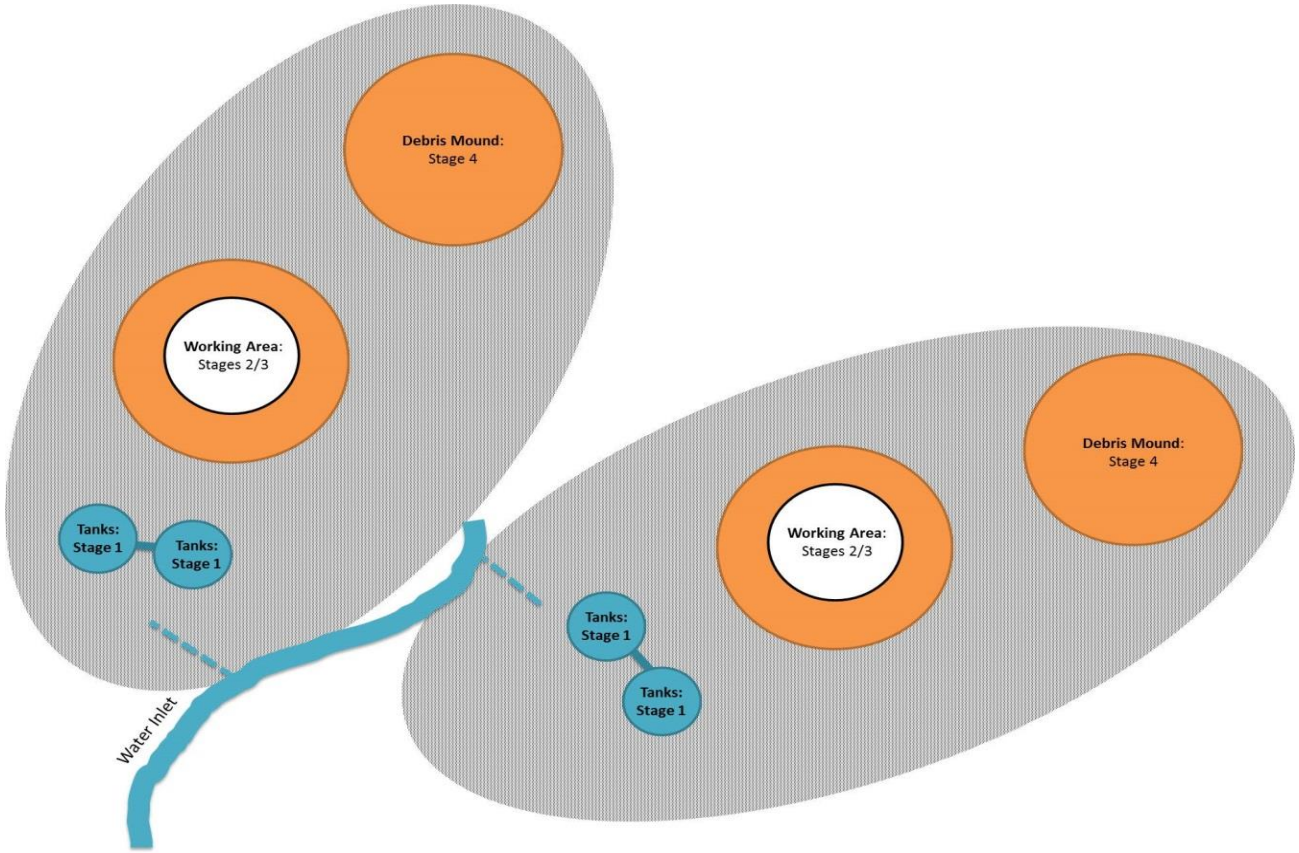


Figure 6.46 Scenario 2a for Site and Waste Management for salt-production in the Central Somerset Levels. Grey shaded area represents the 'Whole Site'

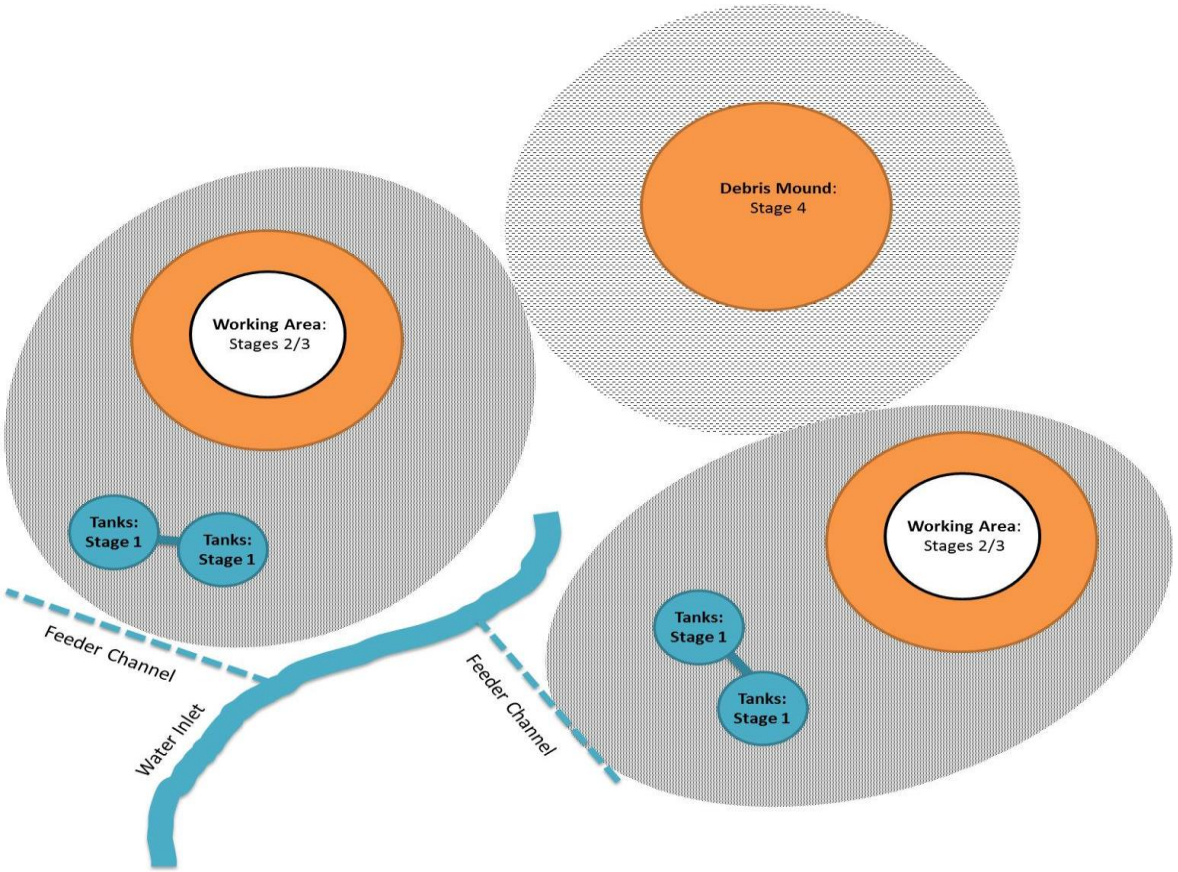


Figure 6.47 Scenario 2b for Site and Waste Management for salt-production in the Central Somerset Levels. Dark grey shaded area represents the 'Single site specific space'. Lighter grey shaded areas represent 'Shared space used by several working areas'

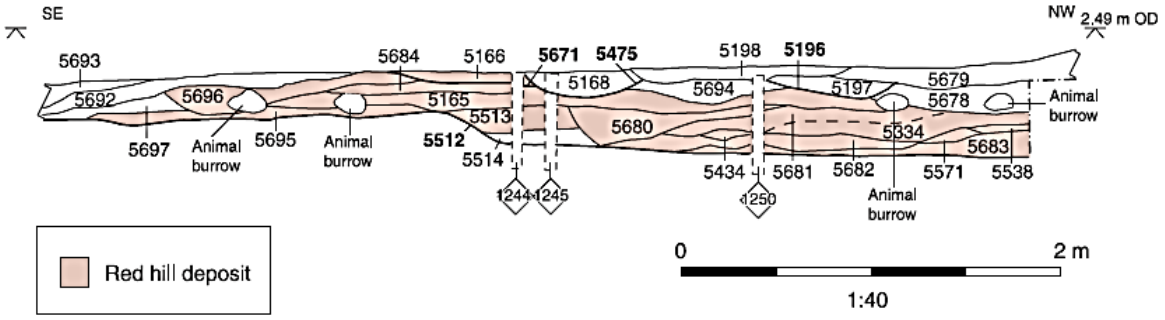


Figure 6.48 Middle Iron Age Red Hill 9504, Stanford Wharf, Essex (Biddulph *et al.* 2012: 68)

At Stanford Wharf for example, the mound was found to have been accumulated over many seasons (Figure 6.48), (Biddulph *et al.* 2012: 80).

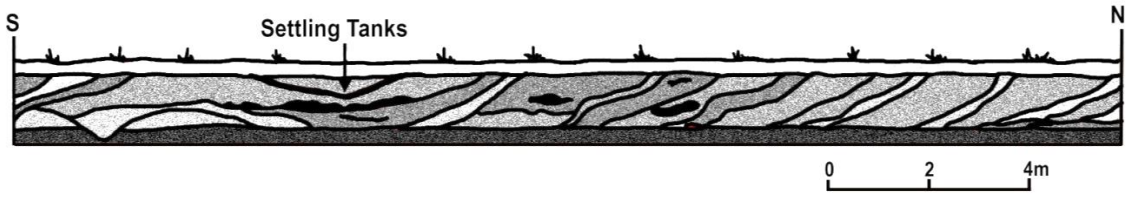


Figure 6.49 Early Romano-British Red Hill at Osea Road, Essex (simplified to show tip lines) (Adapted from Fawn *et al.* 1990: 32)

Although It has been speculated that some of the larger Red Hills in Essex took centuries to accumulate (Fawn 1986: 34), it seems more plausible that the mounds were accumulated over just a few seasons, depending upon whether they were generated by a single working areas or several.

In the more complex mound stratigraphies, each ‘tip’ probably represented debris from a single ‘clearout’ event.

At Site 166, a single layer that appeared to be under the mound, was identified as a probable primary ‘foundation layer’ (Percival 2005).

Evidence from the mound at Site 295 strongly suggests that not only was it heavily used (walked upon) *after* the briquetage had been deposited and the low mound created, it had also been left open to the elements for some time to erode.

The peat underneath the spread contained very small fragments of briquetage which appeared to have been 'trampled' into it, probably a result of people walking on the spread in the early stage of its formation. This is to be expected given that this would have provided a dry and stable surface in wet environs. It is possible that some low mounds were created to be used as 'social spaces', where producers could rest away from the main working areas.

Further archaeological fieldwork will help to expand current knowledge and test the theories and ideas that have been outlined here.

6.6.3 Technique of Salt-Production in the Central Somerset Levels

Up to this point, this chapter has been concerned primarily with the archaeological remains of salt-production in Somerset, with little focus on technique; in the main, it was assumed that salt was obtained from exclusively boiling the brine from the saltwater supplied by the River Siger.

However, we also need to consider Technique III, where salt was obtained by burning salt-impregnated organic materials.

Given the similarities between the character of salt-production in the Central Somerset Levels and Stanford Wharf, Essex, especially the presence of salt marsh plants and natural peat, it is possible that similar techniques (Technique III) could have been used at both sites.

The recent excavations at Stanford Wharf, finally provided an opportunity to analyse the nature of the red earth material which confirmed the use of Technique III at that site. Samples analysed were found to contain:

> …traces of monocotyledon salt marsh plants and possible dung, which had been used as fuel. Further deposits of red hill sediments, composed of fuel ash derived from salt marsh plants and burnt salt marsh sediment, were subsequently laid down and used as occupation or working surfaces…Some of the surfaces may even have been cobbled using large fragments of briquetage and hearth debris. (Biddulph *et al.* 2012: 79)

Biddulph *et al* (2012) concluded that the material is the result of the burning and washing of salt-impregnated organic material, which was deemed as more efficient because the 'brine produced from leaching the ash of burnt marsh plants would…be more concentrated than seawater…' (*ibid*: 81). The sequence of production is outlined in Table 6.8 (the numbers correlate with a reconstruction in Figure 6.50).

Table 6.8 Stages of Salt-Production as proposed by Buddulph et al (2012: 161) for Stanford Wharf, Essex

Stage	Salt-Production Process
1	Bundles of dried saltmarsh plants are ready to be used as fuel
2	The fuel is burnt below troughs of brine prepared earlier
3	The ash from the hearth is mixed with seawater
4	The solution is filtered to create a concentrated brine
5	The brine is transferred to a settling tank
6	The brine is evaporated in briquetage troughs. It is possible that as the water evaporated, the brine was moved to progressively hotter troughs, thus maintaining constant temperatures within individual vessels
7	The resulting salt crystals are skimmed off and allowed to dry further and harden into cakes
8	The salt, transferred to pottery vessels or baskets, and is ready for transportation

The marsh environs of the Somerset Levels were also ideal for the use of Technique III, as there would have been abundant salt-impregnated organic materials, including the peat which would have acted as a large 'absorbent sponge' to saltwater over many years.

Although the gathering of salt marsh plants, silts, soils and even sands would have been more labour intensive, the reward would have been greater in terms of salt obtained.

It is possible that the technique detail listed in '3' above, could have employed either seawater or concentrated brine. It is also possible that either the organic material was burned with a hearth to jointly provide hearth heat and ash (as described in '2'), to be processed, or was burned in tanks (which would support evidence for burning in brine tanks), as discussed in **4.8**.

However, the only water management tanks in Somerset are from Site 166, and none had evidence for burning. It is not possible to determine the details of technique in Somerset until more complete working areas are revealed. However, it is possible that some of the burnt silty material in the more complex mounds contained material resulting from the burning of organic material. It is also possible that the irregular feature found in Site 295 (Test Pit 5) represented a tank that had been stripped of lining to be roasted.

The layers of the exposed mound at Site 108, did appear to include potential 'red earth' (Figure 6.38). However, this material could just relate to the roasting of tank linings, and there does not appear to be anything like the quantities of red earth observed in Essex sites.

The use of peat at least as a fuel has been shown at Site 198 (chemical analysis: Table 4.5) and there is strong evidence for peat cutting in Fields 2-3 (in the geophysical survey) and in spade cut marks directly underneath the mound at Site 126. Peat makes for an ideal fuel as it is burns slowly and steadily, and it was likely mixed with marshland plants.

If peat and saltmarsh were burned for salt in Somerset, then presumably this would have required very large quantities of organic material. This would have required a great deal of management, as unlike saltwater, peat especially is not inexhaustible, and saltmarsh plants would need time to grow again, dependant on the size of the area exploited. However, there remains very limited evidence for this technique in Somerset.

If salt was *continuously produced* for over 100 year in the Central Somerset Levels, and Technique III was preferred, then this would have required incredibly careful marsh management in order not to exhaust the peat and plants. It therefore is possible, that in some periods, there was alternation between the crystallisation of salt from seawater and from plants, to preserve the local marshland.

When considering the distribution of working areas, it is also important to consider the course of the river inlets. The working areas would have needed to be close to

these inlets in order to provide seawater for brine which could either be used directly for salt extraction, or to mix with and wash through burnt organic material. This would have been an important factor when creating mounds for new working areas that presumably also needed to be close to the water source.

It has been shown the Technique III does not always result in distinct layers of red earth. It has also been shown that differing methods of deposition, also influence the appearance of this burnt material (Figure 6.50). The identification of Technique III in Essex however, was only made possible by the detailed examination of samples taken from the waste debris material. Similar sampling strategies and analysis would also be required in Somerset to investigate evidence for technique further.

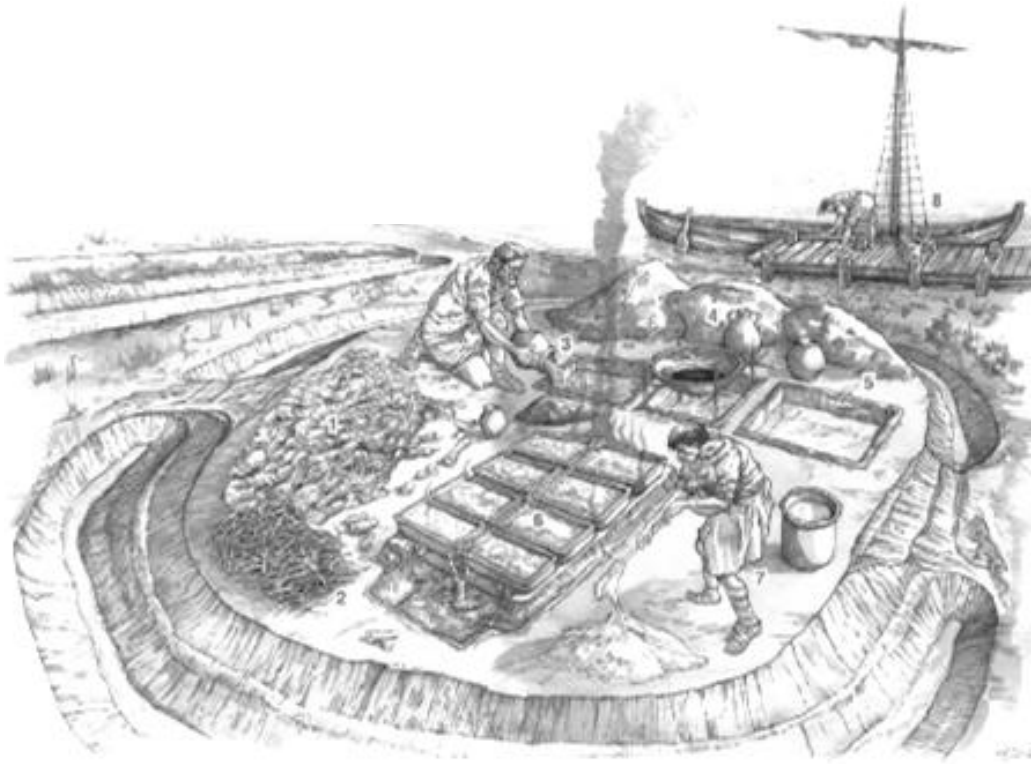


Figure 6.50 A reconstruction of a typical Late Roman salt-production site at Stanford Wharf, Essex (on an earthwork platform as opposed to a Red Hill), (Adapted from Biddulph *et al.* 2012: 161)

6.6.4 Re-consideration of 'Site Type' for Group 3

Section **6.6** has provided a detailed insight into the character of the debris mound sites in Group 3, and this has potential implications for understanding of 'Site

Type' in this area. The evidence revealed by the fieldwork, combined with detailed evaluation of the mounds in general in this area, means that it is now very probable, that most of the mounds defined as 'Mound Only' in the original assessment, are in fact 'Mound Associated Briquetage'.

This is based upon not only evidence for at least three of the mound previously excavated being proven to contain briquetage (Sites 100, 166 and 198), but also on the evidence that at least two more earthwork mounds, excavated as part of the fieldwork, also contained briquetage (Sites 126 and 295). This also included the confirmation that a further five mounds (Sites 124, 125, 129, 179 and 180), where soil coring/surveying was carried out, were also confirmed as containing compacted briquetage. With this new knowledge that at least 10 mounds, all providing a good sample of the entire mound distribution in Group 3, certainly contained briquetage, it is proposed that this probably infers that most of the other mounds in this group, were similar in nature.

Therefore a re-interpretation of the original 'Site Type' is provided below (Figure 6.51).

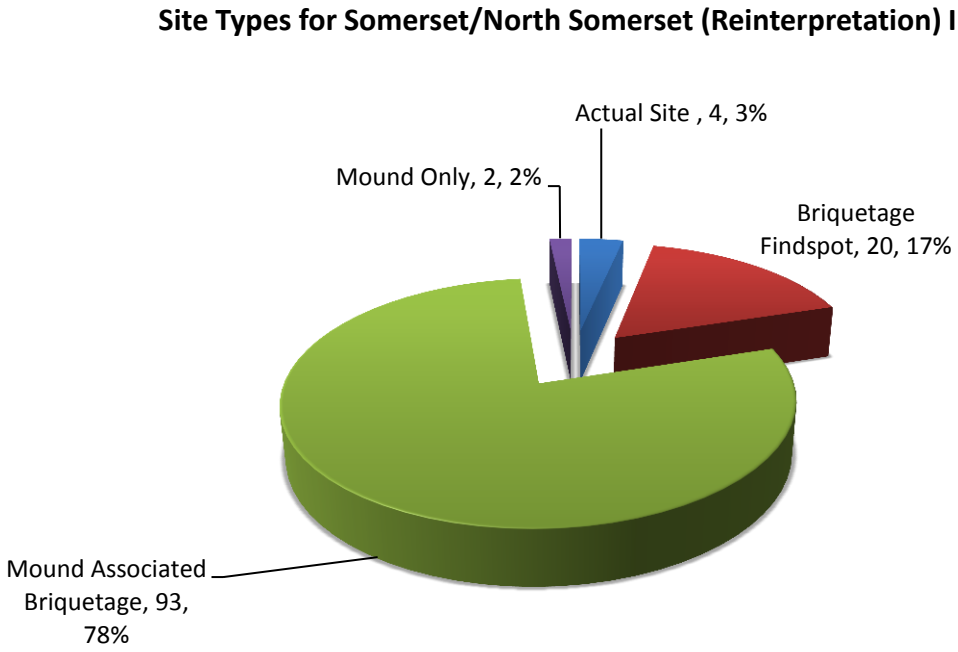


Figure 6.51 Reinterpreted of Site Types for Somerset and North Somerset based upon probable larger quantities of 'Mound Associated Briquetage'

Taken further, with the evidence that some mounds contain working areas, and some do not, some mounds are therefore 'Actual Site' and others are 'Mound Associated Briquetage'. The graph in Figure 6.52, has split the orginal 91 'Mound Associated Briquetage' in Group 3 by c.50% (based upon speculation that about half of the mounds contained working areas). Althogh this remains speculative, it provides an insight into the possible true picture of Site Types in Somerset.

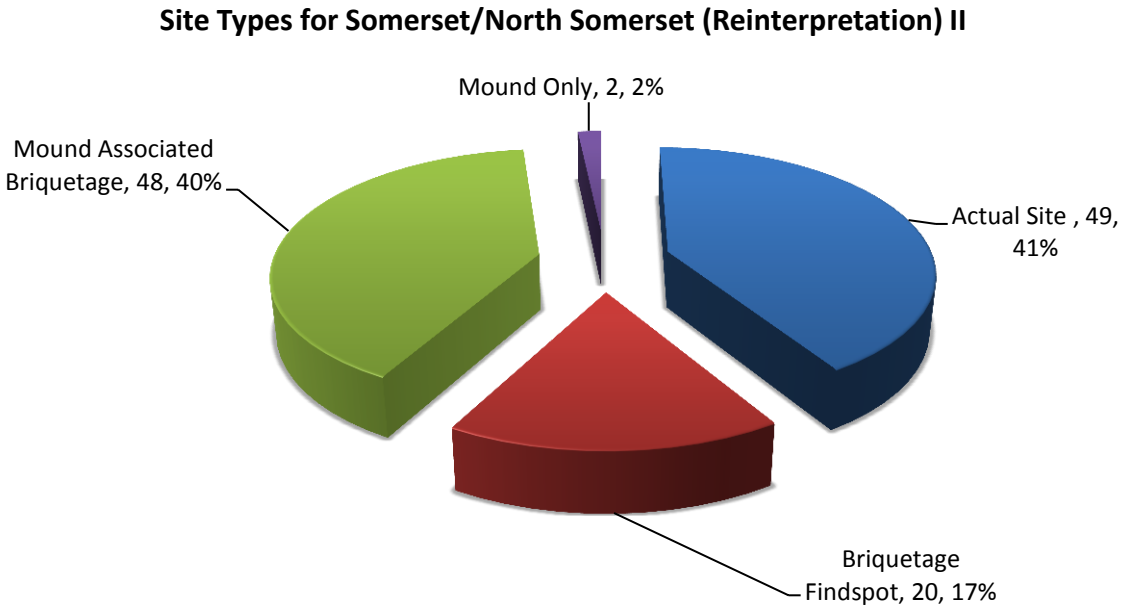


Figure 6.52 Reinterpreted of Site Types for Somerset and North Somerset based upon probable larger quantities of 'Actual Site' in Group 3

6.6.5 Re-consideration of 'Best Date'

As a result of this research, the dating of sites in Group 3 can be re-assessed. As explained earlier, most of the mounds in Group 3 could only be recorded as generally 'Roman' due to problems with dating the mound distribution as a whole. However, with the addition of a securely dated pottery assemblage from Site 295, we now have a spot date of 3rd-4th century AD for the north-eastern extent of the mound distribution (Figure 6.8). This, combined with spot dating for the same date from mound sites in the Gold Corner area (central southern extent) and Site 166 to the west in the River Huntspill, means that it is very probable that most of the exposed mounds are of a 3rd-4th century AD date. However, given the 2nd-3rd century AD date of the mound at Site 198 to the far south-west of the mound

distribution, it is possible that more mounds buried under alluvium to the west, could be of this earlier date, this is considered further in **6.7**.

A graph showing the potential reinterpreted dates, is presented in Figure 6.53. Hopefully further investigation of this area will produce more pottery assemblages to test this interpretation.

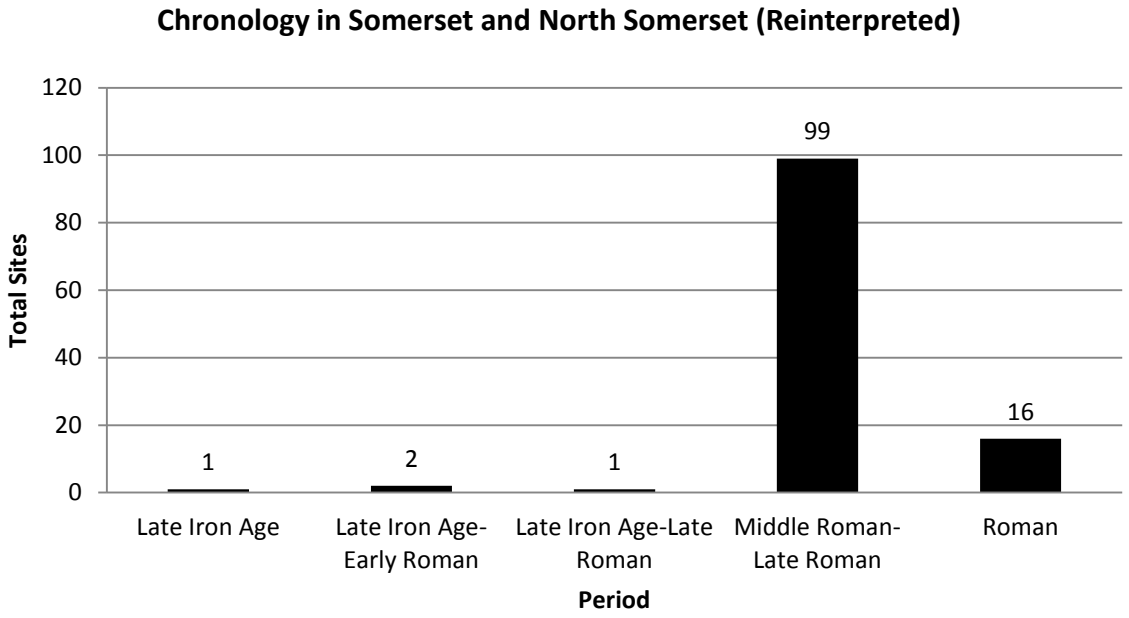


Figure 6.53 Sites in Central and North Somerset with reinterpreted dating

6.7 Development of Salt-Production in Somerset and North Somerset

An overview of site chronology was provided in **6.2.1**, and **6.6.5** reconsidered the original dating, according to the evidence in Group 3 for uniformity across the area. This section explores chronology further, as well as providing an overview of the development of salt-production in this region.

Chronologically, the earliest evidence for salt-production in this region (with the exception of Late Bronze Age salt-production at Brean Down) is the Late Iron Age.

Both the sites included with the research dataset for North Somerset (Sites 239 and 294) have Late Iron Age origins. This, combined with at least three new salt-

production sites with potential Late Iron Age origins (Rippon 2006), means that North Somerset has the most convincing evidence for salt-production on more than a local-scale in this period. The other two sites with Late Iron Age origins (Sites 1001 and 119) within the research dataset, were to the north of Group 3 (Central Somerset Levels) in Badgworth, and provide the earliest evidence for the use of debris mounds in Somerset. The presence of finewares (1st-century BC-1st century AD) from these two sites, was interpreted as significant and it was suggested that this could represent the presence of 'more permanent, domestic occupation...' (Seager Smith 2003: 6).

There was also a further mound (Site 135), within Group 3, with a recorded date of 'Late Iron Age-Late Roman' in the HER within the centre of the mound distribution (Figure 10.1.5). However, this date is uncertain, and it is perhaps more probable, that this site was of a *c*.3rd 4thcentury AD date, in line with other mound sites in Group 3.

Sites 100 and 239 had evidence for continuation into the 1st century AD, and therefore both these sites remain the only certain 1st century AD salt-production sites in both North and Central Somerset.

Salt-production is most restricted chronologically in North Somerset, with the small cluster of sites in Group 2, all only dating to between the 1st century BC-1st century AD.

Evidence for coastal salt-production in the dataset within this region, is currently limited to the silted estuary at Burnham and Highbridge (Figure 10.1.3). According to HER records, at least seven sites *potentially* had origins in the Early Romano-British period, (nearly all 'Briquetage Findspots' as shown in Table 6.2). However, as explained earlier, they were all originally included as 'Roman' in this research project due to uncertainty of dates and particularly elusive and fragmentary evidence.

Most of these coastal sites were produced as stray finds of briquetage during small-scale ground works for buildings and services, with little other evidence for salt-production. However the mention of 'pottery mounds' in at least three of these

sites could refer to briquetage debris mounds, however this is not certain and no information is available about their nature.

One aim of the recent pottery re-assessments (Seager Smith 2003), was to ascertain whether there was evidence for a chronological shift in salt-production from the coast to inland because of a 3rd century AD marine transgression (as suggested by Rippon (2008).

Of all the pottery assemblages from salt-production areas in Somerset, the coastal sites contained the widest range of fabric types and forms despite small assemblages. As stated in **6.2.1**, this also confirmed that the pottery ranged between the 1st century BC-4th century AD (Seager Smith 2003). This served to prove that this area had not been subject to marine inundation in the 3rd century, and thus challenges the scenario suggested by Rippon (above):

> In conclusion, while it is apparently true that sites in the coastal zone show a tendency to be earlier than those further inland, the presence of Late Roman pottery indicates that the coastal areas are unlikely to have been inundated by changes in sea level during the late 3rd century AD...(Seager Smith 2003: 6)

Although it is possible that technically, salt could have been produced anytime within the suggested timeline from the pottery dates, briquetage appeared to have been more associated with the 1st century AD (as suggested in the HER database). Although this remains to be certainly proved, with the exception of the single 1st century AD site further inland to the east of Group 1 and to the north of Group 3, and Site 239 in Group 2, sites in Group 1 could have provided the focus of salt-production in the 1st century AD for the entire region.

As stated earlier, evidence for salt-production between the 1st-2nd centuries AD is currently only limited to Site 198 in Group 3, despite the majority of mounds which are only c.375m away (Figure 6.37), dating to between the 3rd-4th centuries AD.

Site 198 also currently represents the furthest western extent of the Group 3 distribution. This earlier date and the subtle differences in the briquetage toolkit, alongside the presence of multiple smaller hearths (as opposed to a single larger hearth at Site 166), suggests that this site potentially represents the first phase of

salt-production in Group 3. It is possible therefore, that salt-production either moved inland during the 2nd century AD, or, that the Group 3 phase represents a completely separate enterprise. The 3rd-4th century AD dating of many of the Huntspill mounds, as well as the same date for Site 295, suggests that the bulk of salt-production, at least within the *visible/known mound distribution*, is of this later date.

It remains a possibility, that the 'missing 2nd century AD link' is currently buried under alluvium to the west (Figure 6.14), as indicated by the position of Site 198.

The pottery chronology from Site 166, indicates a 'tighter' late 3rd-4th century AD date, and therefore in time, it might be possible, with excavation of more, and larger pottery assemblages that more subtle phases of production could be ascertained for Group 3.

In summary, the current chronological profile for the whole region is listed in Table 6.9.

Table 6.9 Main phases of salt-production in Somerset/North Somerset. Group 1: Coastal Group 2: North Somerset Levels Group 3: Central Somerset Levels

Phase	Period	Group
1	*c*.1st century BC	**Group 2**
2	*c*.1st century BC-1st century AD	**Group 1 and Group 2**. Small pocket to the north of Group 3
3	*c*.1st-2nd centuries AD	**Group 3** (western extent)
4	*c*.3rd-4th centuries AD	**Group 3** (bulk of salt-production)

The bulk of salt-production is clearly concentrated within Group 3 during the 3rd-4th century AD, and as shown in **6.6**, this involved a great deal of organisation and management. Exactly how many mounds had working areas, and how many working areas were in operation at any one time is still unknown, however clearly, this area could have produced significant quantities of salt, especially if larger hearths employing larger lead containers were in use.

The chronology of salt-production across the all the three main groups North and Central Somerset in this region, is strongly linked to the way in which the landscape has been managed over the Romano-British period especially (Grove and Brunning 1998). As has been well evidenced in the extensive work carried out by Rippon in this area, especially the North Somerset Levels (Rippon 2000b; 2006), the marshes were subject to management and alterations during this period. There is now good supporting evidence, that the Central and North Somerset Levels were subjected to different 'treatment' during the Romano-British period. As opposed to the Central Somerset Levels, which were deliberately left as an marshland fed by the inter-tidal River Siger, the North Somerset Levels were subjected to drainage and reclamation in the Late Romano-British period. This is shown, in the construction of stone buildings and villas at this time (*ibid*). This would have directly impacted the potential to produce salt in the North Somerset levels at this time, and is probably why there is currently no certain evidence for post-1st/2nd century AD salt-production in the area. If evidence of later salt-production in North Somerset (2nd-4th century AD) could be proven, then this would at least suggest that some areas were not drained/reclaimed in this area, in order to allow for this.

Gilman *et al* (1998), also suggest that land draining in the coastal areas (Group 1) could also have greatly impacted salt-production, positively in the first instance, but then ceasing by the 4th century AD:

> With the draining of former mud flats from the first century AD onwards, new areas of salterns developed close to the creeks draining into the sea in the Highbridge area. These sites were abandoned in the 4th century AD, possibly because the sea defences were collapsing. (Gilman *et al.* 1998: 15)

Currently, there is no evidence for a gradual increase in salt-production from the Late Iron Age to the Late Romano-British period in Group 3. There are two outlying Late Iron Age sites (Sites 100-119), and one 1st-2nd century AD site in Group 3, as discussed above, however the bulk of sites most probably date to between the 3rd-4th centuries AD. As stated above, more of these 'missing link' sites could be buried under alluvium and hidden in the landscape, however as it stands, the evidence suggests an 'explosion' of salt-production in Group 3 during the 3rd-4th centuries AD.

As opposed to movement from elsewhere in Somerset, this most probably relates to a wider response to a 'centralisation' of salt-production to fewer areas in southern Britain and possibly is linked to changes in supply networks (**7.0**). This is supported by the difference in technology between Groups 2 and 3, which is enough to suggest that the two areas were not connected, and represent distinctively different episodes of salt-production.

Although not mentioned previously within this chapter, there are also a small scatter of 'Briquetage Findspots' to the north of Groups 1 and 3, towards the northern end of the Somerset county boundary (Figure 10.4.1). One area of briquetage findspots was revealed by excavations on the M5 in East Brent, and these can be seen in the map Leech produced (Figure 1. 24). At the time of data collection, only one site could be located with a record for these finds, therefore Site 284 currently acts as a group record. These scatters were a mix of Roman pottery and fragmented briquetage, and it is unclear whether this represented the damaged remains of one, or several salt-production working areas. However, they are at some distance from all of the main three groups, and appear to represent a separate episode of salt-production. This could again suggest that there were separate pockets of contemporary salt-production, representing different enterprises.

Overall, the main mound sites and some of the coastal group were not used after the 4th century, which is also the end date for salt-production areas in the rest of the study area. This could have been due to environmental and cultural/political factors.

The significance of salt-production in Group 3 has been explored in detail throughout **6.6**, however, the significance of salt-production in Group 2 remains unclear. Much has been made of the large pedestals at Site 239 and the quantity of briquetage at this site, where it was concluded that the briquetage was:

> …largest quantity of salt-production debris of any date from Somerset…and it testifies to an intensive 1st century AD industry in north Somerset affording a major quantity of quality sea salt. The quantity of salt produced at these sites would have been far beyond that needed by local people for their daily requirements, and some must have been designated for export. (Cox and Holbrook 2009: 114)

Relying on briquetage quantity to infer significance and even scale of production remains fraught with issues, especially as in this case, the quantities were being compared to assemblage quantities from the Fenlands (Cox and Holbrook 2009).

The evidence for larger pedestals does suggest that larger containers were used, which could produce high quantities of salt, but equally, multiple hearths within a large complex, such as Group 3, and as seen at Site 82 in Kent, could have produced similar quantities, if working together as single enterprise. Ascertaining the true 'significance' of salt-production should be based on many factors, all related to regional evidence, as using other regions, with potentially completely different 'modes' and technologies of production as directly comparable 'guide sticks' for external sites, could be over-generalising and under or over playing significance. This emphasises the importance of understanding these sites on a regional basis, but in order to do this, a comparable dataset is required, and this has been the main source of issues when ascertaining the true nature and significance of salt-production in Somerset. It is hoped that this chapter has consolidated current studies and interpretations of salt-production in Somerset, as well as producing a more consistent and detailed dataset to learn more about the true nature of salt-production in this region.

Future research must focus upon characterising salt-production in Somerset in 'its own right', and aim to investigate sites further, including a plan of excavation and survey, to further look for associated features.

6.8 Overview

This chapter has presented the following main points:

- The archaeology of salt-production in Somerset is dominated by debris mounds that are a result of Stage 4 of the salt-production process
- The most intense area and period of salt-production in Somerset is in the Central Somerset Levels (Group 3) during the 3rd-4th centuries AD
- The mounds in Group 3 represent not only debris deposition, but also areas that acted as raised platforms for the creation of working areas to produce salt
- The true extent of the mounds in Group 3 could be as little as 20% of the total area, as many mounds are buried deeply under alluvial clay

- Fieldwork proved that mounds are also hidden outside the area of alluvial coverage, with the discovery of a new mound site
- The dating of Site 295 strongly indicated that mounds at the northern extent Group 3 are also 3rd-4th century AD in date
- The character of salt-production in the Central Somerset Levels has similarities to Essex
- A combination of Techniques I-III was most probably used to produce salt in Group 3, where peat and salt marsh plants could be burned to extract salt in combination with partial solar evaporation and brine concentration

If the currently known mound distribution in Group 3 was extended to the north from the Huntspill sites and to the west from the line of mounds extending northwards from Gold Corner, they would cover an extra area of c.4,100,000m² (added to the c.10, 000,000m² covered already). Although the current number of known mounds is at least 91, it has been speculated that there are potentially 500-1000 sites hidden in the landscape around the mound group (Rippon 2008: 92).

This theory is supported greatly by plotting site distribution on geological maps of Somerset (Figure 6.14). This clearly has massive implications for understanding scale of production. If future research could confirm the presence of more mounds in the area, this would suggest that this period of salt-production in Somerset (Roman) was the most prolific to have ever existed in the UK, including Lincolnshire and Essex.

Current site distribution overall is heavily biased towards the coast at Highbridge and within the Central Somerset Levels. It is possible that North Somerset was not as heavily exploited for salt-production. Further work at Site 239 may well reveal a substantial complex, representative of a centralised unprecedented large-scale site. But it is also possible that the area was not as productive, perhaps due to lower salinity levels (Rippon 2008: 136).

It is likely that the Middle-Late Romano-British phases of salt-production utilised trade routes over land and sea. Recent research has shown that there was a 'Romano-British Trans-shipment Port' at Crandon Bridge some c.4km to the south-west of the Huntspill sites on the King Sedgemoors Drain in Bawdrip (Rippon 2008).

Salt-production in the Central Somerset Levels potentially could have been involved in supplying the military, perhaps the legion based at Caerleon on the other side of the Severn Estuary (Rippon 2008: 93).