WORTHING ARCHAEOLOGICAL SOCIETY

PROJECT REPORT FOR

INVESTIGATIVE WORKS WITHIN THE EPIC PROJECT AREA

SOMPTING, WEST SUSSEX –

SUMMER 2019 and JULY/OCTOBER 2020

SITE CODES SEW 2019 and SEW 2020

Document compiled by C. Shirley, G. Turner and R. Turner

Executive Summary

The "EPIC" (Enhancing Places, Inspiring Communities). project partners, Sompting Estate and the Ouse & Adur Rivers Trust (OART), offered Worthing Archaeological Society (WAS) the opportunity to excavate within their site at Sompting while works were in progress to create a new watercourse, walks and wildlife on Sompting's Church Farm.

A significant number of struck flints were collected from fieldwalking and excavation from the Late Mesolithic period through to the Late Bronze Age with the majority from the transition period of the Late Mesolithic/Early Neolithic that indicated a flintworking site. The terrain suggests a low-lying marshy area crossed by streams at this time which would have presented a variety of food collection opportunities. The transition from the nomadic existence of hunter-gatherers towards a more settled one of farmers may have developed from seasonal camps and it therefore seems probable that such a seasonal camp may have been located somewhere in the area near to flint and food resources. It is apparent that these investigations have only sampled a small area of what seems to be an extensive flintworking site.

There is no evidence of any permanent settlements during the Late Neolithic and Bronze Age but butchery and other flint tools are evident that may indicate hunting activities and perhaps meeting places for processing such animals.

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List of Figures

Acknowledgements

Site Director - James Sainsbury of Worthing Museum –
Project Sponsors

- Ouse & Adur Rivers Trust (OART) and the EPIC project team
- Sompting Estate

Grateful thanks to Nigel Rumble, Martin Simons and Colin Wheeler for cataloguing the 2019 Fieldwalk finds.
All the members of Worthing Archaeological Society involved in the excavations

Mapping Information

Maps are generated using either:

ArcGIS (GIS Software) Version 10.7 Redlands CA USA Environmental Systems Research institute 1992 – 2021 and contain information extracted from Google maps (2021)

Or

Golden Software Surfer Version17.1.288 (64-bit) Dec 11 2019 Copyright © 1993-2019, Golden Software, LLC

Data Sources:

- Defra (2019) *TQ10 Lidar DTM* Environment Agency available at https://environment.data.gov.uk/DefraDataDownload/?Mode=survey last accessed 29 January 2019
- Google (2019) Google Maps available at https://www.google.co.uk/maps
- OS (2020) Ordnance Survey Open-Source Data available at https://www.ordnancesurvey.co.uk/opendatadownload/products.html

1 INTRODUCTION

This document reports on works carried out within the Sompting Church Farm Area in Sompting, West Sussex in 2019 and July/October 2020.

The EPIC (Enhancing Places, Inspiring Communities) project partners, Sompting Estate and the Ouse & Adur Rivers Trust (OART), were awarded a Heritage Lottery Fund grant with the aim of involving the local community in creating a new watercourse, walks and wildlife area over part of the Sompting Brooks within Sompting Estate's Church Farm. For full details of the project see https://www.somptingestate.com/epic

The initial focus of the EPIC funding award was for archaeological investigation on the paleoenvironment requiring core samples to be taken down to the bedrock to look at land and climate transformations and to see if pollen samples could be found. When a risk was apparent of known and unidentified contaminants about 2.5-3m below the surface, the EPIC project team obtained agreement with the relevant authorities that no professional archaeology would need to be undertaken on site and all archaeological conditions were then removed from the planning consent.

Following works to cut a new watercourse, Worthing Archaeological Society (WAS) was then invited by the EPIC project team to walk-over the recently disturbed landscape to collect artefacts from the surface. Since the ground surface consisted of cleared vegetation and redeposited spoil, any artefacts recovered would be regarded as unstratified. This resulted in the recovery of a considerable quantity of Prehistoric struck flint including a small number of Mesolithic microliths.

In September of 2019 on the last visit made by WAS to the site for that season, a group of flints was discovered along the bank of the newly cut water course which appeared to indicate undisturbed knapping activity. This was just north of a new bridge which would form part of a footpath and cycle track.

The Aim of the Project:

The EPIC project team requested WAS to return to the site in June/July 2020 with the aim of investigating a probable knapping/flint-working site and to record all artefacts recovered from the excavation and other field work.

2 THE SITE LOCATION AND GEOLOGY

The site is centred TQ 160 044, south of West Street in Sompting– see Figure 1 feature New River. The site is just south of the South Downs National Park boundary at the A27. The site lies in the gap between Worthing and Lancing and is an area of low-lying fields and drainage streams and ditches.

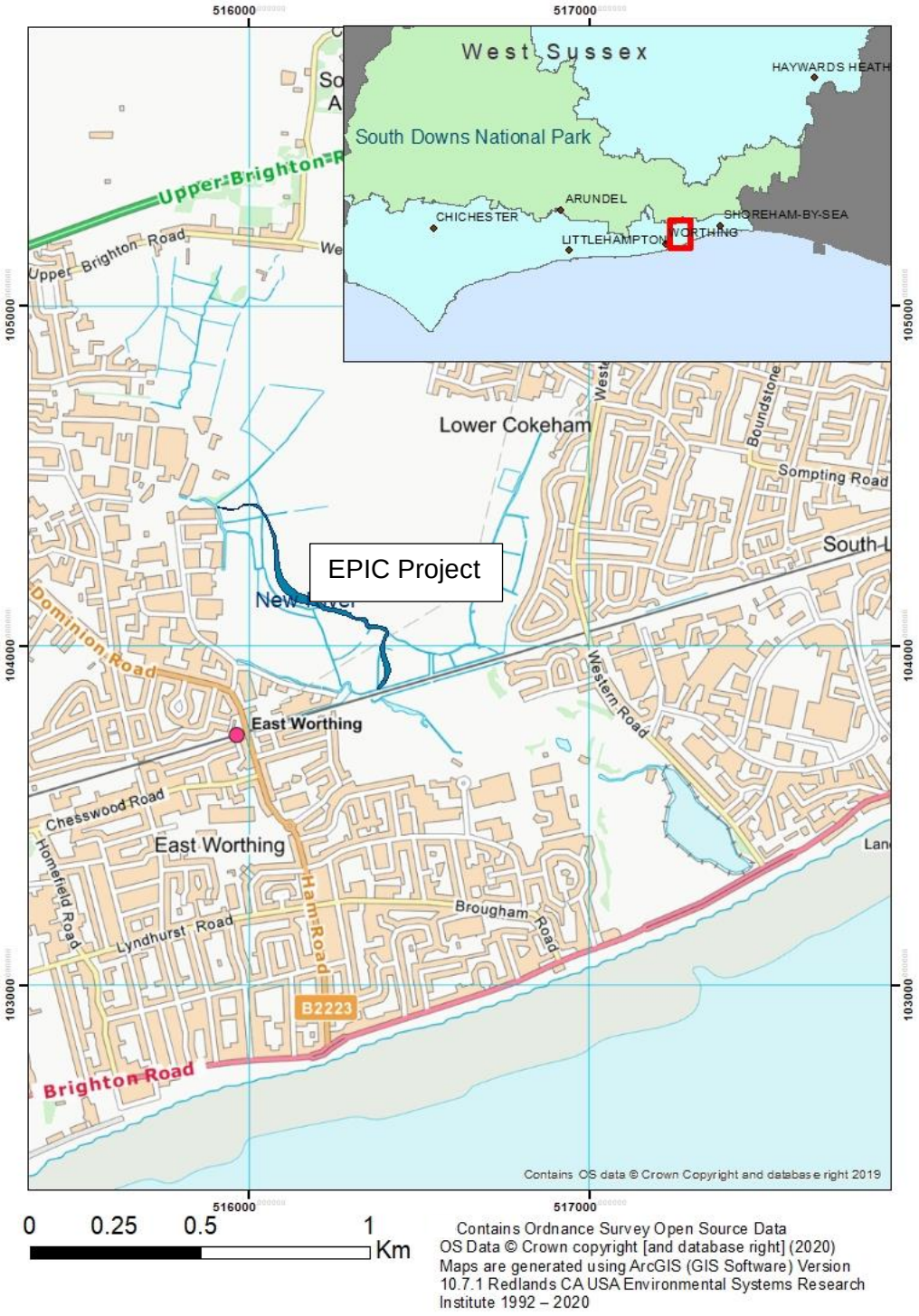


Figure 1 - EPIC Site Location

Figure 2 shows the site in relation to the low-lying land of the now drained Broadwater sea-inning. This figure shows the medieval churches at Broadwater, Sompting and Lancing (symbols in white) and modern railway stations (in red), Lidar data for the existing streams indicates a height of about 1mOD at the base of the streams and a height of around 2 or 3mOD for the height of the banks.

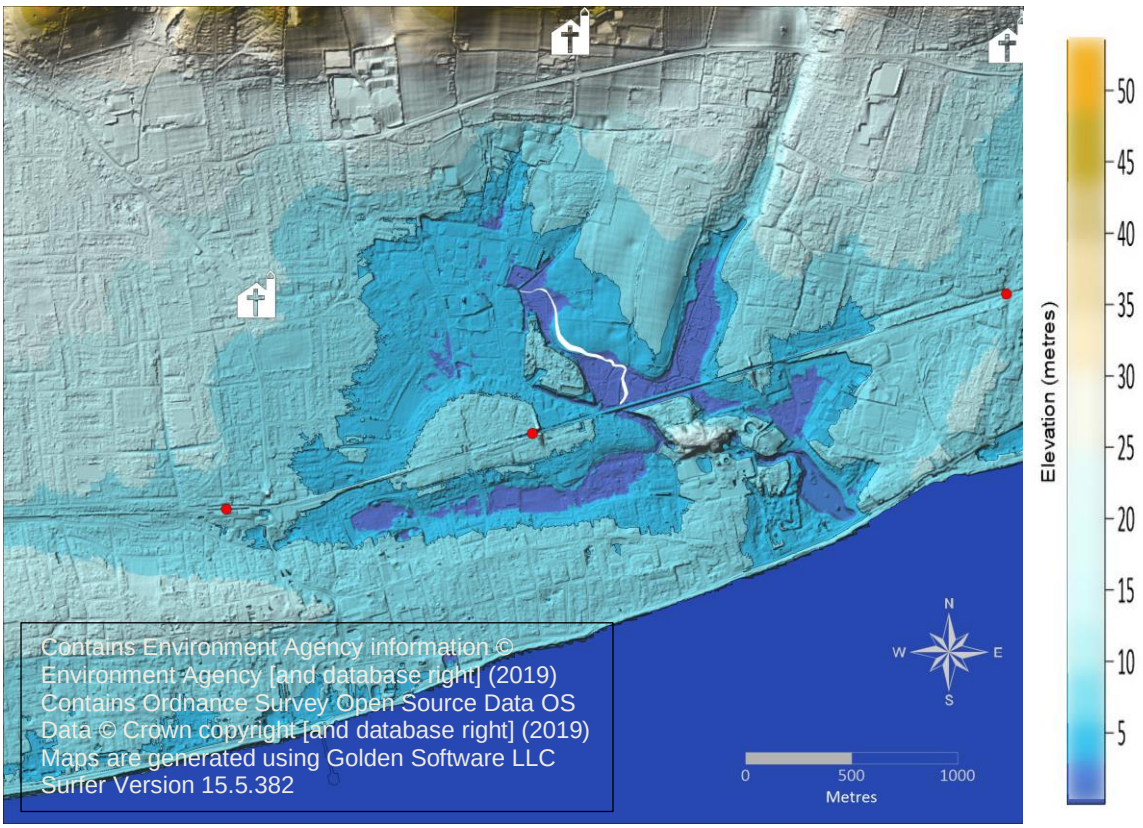


Figure 2 - Lidar data 3D model of the site surrounding area

A new stream was cut to avoid areas of contamination and provide better drainage and waterside habitat. Figure 3 shows the geological layers through which the channel was cut, namely topsoil, alluvium, sand and finally white cortex flint beach pebbles

Figure 3 - Cutting the new river channel – view where the new and old channels will merge

3 THE PROJECT

3.1 Constraints and Hazards

The need for social distancing and other COVID-19 safety issues constrained the methodology adopted (3.2) and the health and safety requirements. Three teams of up to 6 people to a team were used. Team 1 consisted of the site supervisor and the diggers while team 2 were the surveyors and a finds supervisor on site. A third team was set up off site at a nearby location to process the finds.

Bridge works needed to take place when the river was at its lowest level (October 2020) and it was necessary to finish archaeological excavation prior to the start of the bridge works.

All archaeological excavation and fieldwork work was required to take into consideration the ecological value of the site and the species present. Any excavation over 50cm deep needed to be covered at the end of each day to protect certain species i.e. foxes, badgers, hedgehogs etc. from being trapped within the excavated area. Any disturbance within 2m each side of the east/west ditch in the area was discouraged to protect the habitats of breeding birds within the vegetation and also noted activity of amphibians, slow worms and harvest mice. Since 2017, this ditch has formed part of a long-term monitoring of reptiles.

No disturbance was permitted near disease resistant elms planted to the north of the above ditch.

The bank faces could not be disturbed or any work undertaken to the channel bed or from within the channel itself. The design of the channel and the bed levels are very important to its function (there is about 1cm of leeway every 25m for the first 450m of the channel - which meant standing in it or inadvertently adding material to it could cause some issues).

There were a number of hazards which needed to be avoided – see Figure 4.

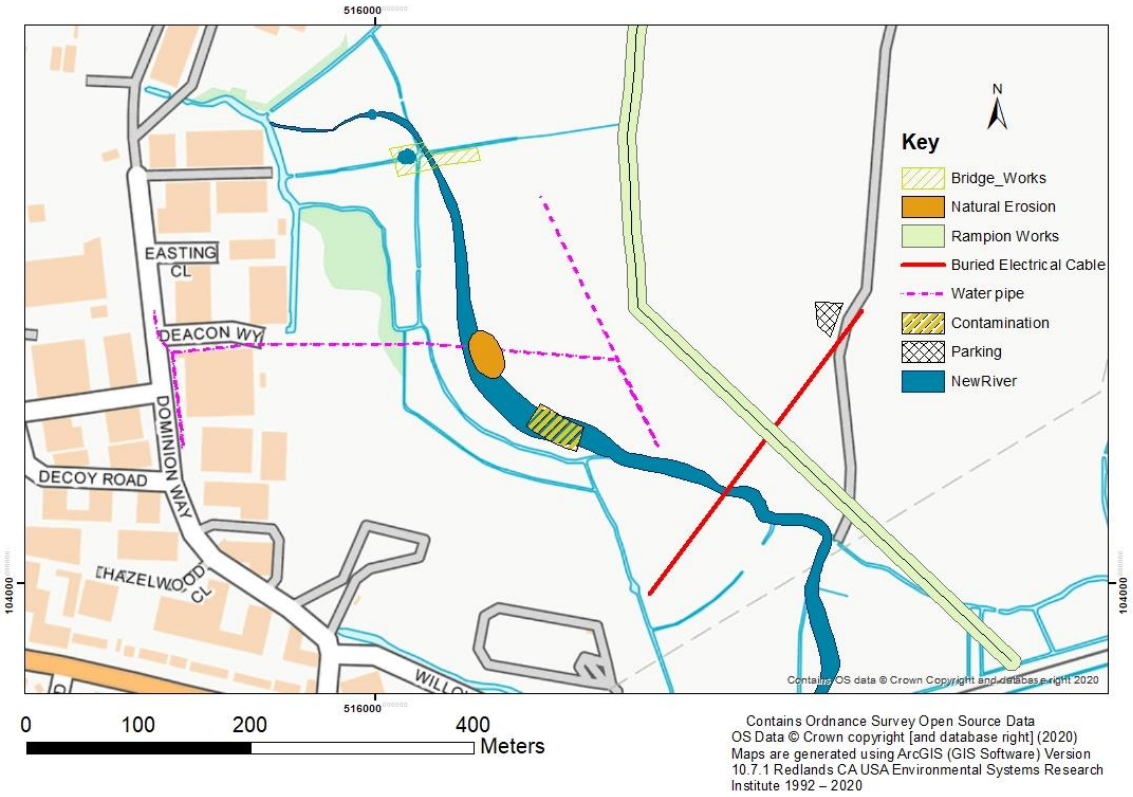


Figure 4 - Site Hazards

There were no plans for in-depth works around the area of buried services. While there were no plans for excavation near the area of contamination identified during channel construction, it was noted that very small patches of dark soil were visible at the top of the bank. Contamination should have dispersed naturally but members were advised to avoid this area. An area of natural erosion looked as though it would present an opportunity to examine the ground in section since the bank was already disturbed but this proved impractical as it was too close to possibly contaminated soils.

3.2 Methodology Outline

The initial fieldwalk was not structured as a layout of grids for sampling. The field-walk took place after the soils from the newly cut river had been widely distributed across the field. Hence, finds collected during field-walking were noted only as collected from the river cut banks or from the redeposited soil.

The main excavation was proposed as 1x1sqm test-pit areas in an area measuring 40x20m along the bank of the new river to the south of the proposed bridge works – see Figure 4. Investigation consisted of opening test pits within the grid at distances to ensure greater than 2m between diggers. A total of 5 test pits were opened.

Work outside the grid consisted of areas of surface collection on the banks, a limited resistivity survey, a brief topology survey and checks of the soil profile with an auger

A total station was used to record grid positions and to 3D significant finds positions throughout all periods of investigation. The survey team set up the total station at a distance to be able to work as a separate team from the rest of the site team.

4 DESKTOP STUDY

4.1 HER Data

The Heritage Environment Register (HER) (WSRO a, 2020) has a number of entries for the area from prehistory to World War 2 (see Figure 5)

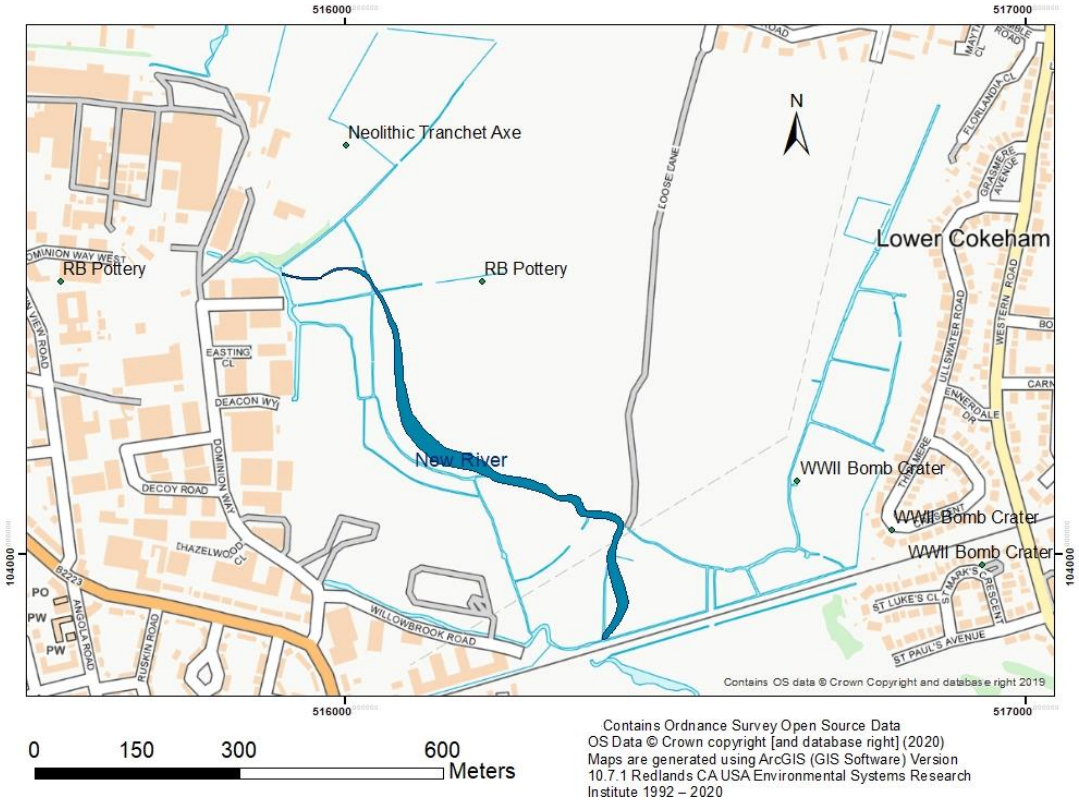
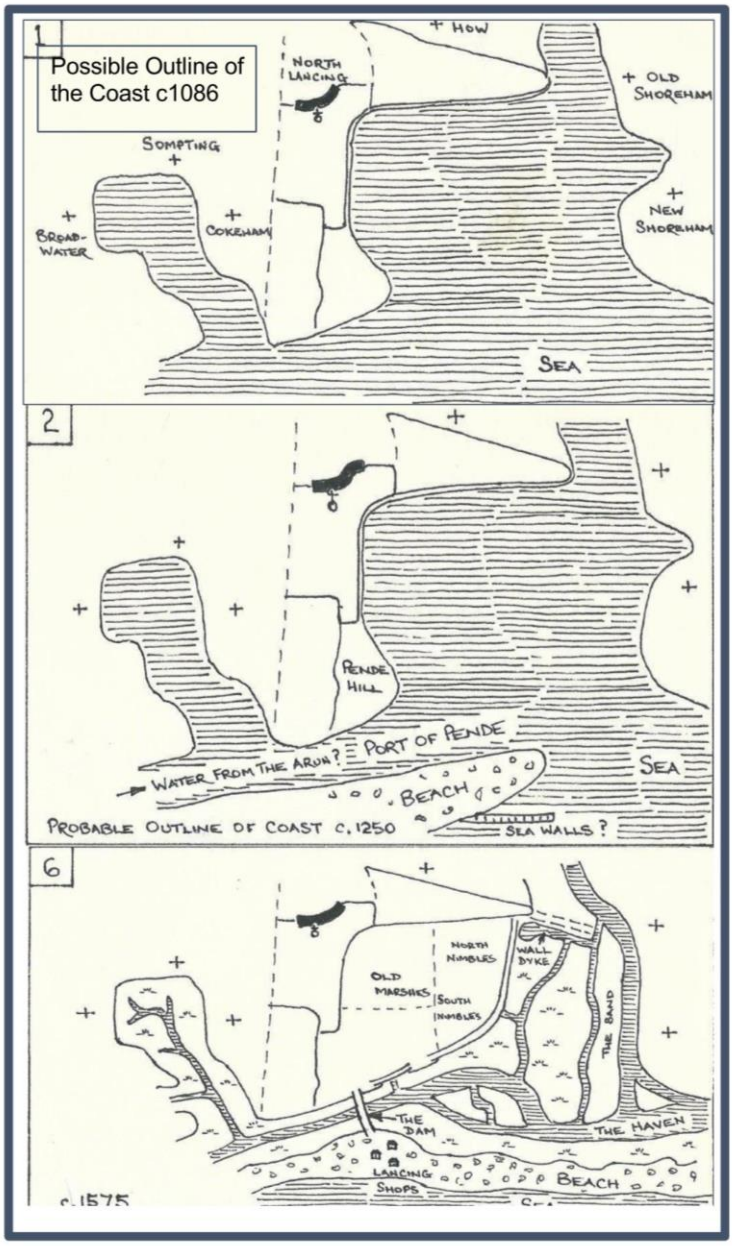


Figure 5 - HER Entries for the area around the new river

4.2 The Formation of the Present Land Surface and Historical Maps



Kerridge's work in preparation for the books *Georgian and Victorian Broadwater* (Kerridge & Standing, 1983) and *A History of Lancing* (Kerridge, 1979) shows that the area was a tidal innings at the time of the Doomsday Survey. The silting up of the tidal innings started in the 13th Century with the formation of a shingle bank caused by longshore tidal drift. However, the major infilling of the Broadwater innings took place in the 15th Century – see Figure 6

Vine (1986) makes reference to the Arun flowing to enter the mouth of the Adur at Lancing until the 15th C but Castleton (2013) suggests it is unlikely that the river would flow a distance of 18km although he does suggest "*shared tidal compartments along the coast between the Arun and Adur*". Longshore tidal drift (Scopac, 2004) runs from west to east on the Sussex coast and in the 13th Century the shingle bank was forming across the bay although access out to sea was still possible. By the 16th Century the shingle bank had formed along the coast as far as the Adur and the Sompting Brook and Teville Stream flowed to the mouth of the Adur.

Figure 6 - Kerridge (1983) Sketches of Coastal Outlines

Drawings reproduced by kind permission of Lancing and Sompting Pastfinders

A map prepared in 1587 (WSRO b,1587) in preparation for defence against invasion by the Spanish Armada does not appear to show a substantial innings but the shingle bank is clearly shown blocking the mouth of the Adur

Drainage of the Broadwater innings land was undertaken from 1571 onwards when a dam was built at the area which is now Shopsdam Road, Lancing, which blocked the tidal inflow (Kerridge and Standing, 1983). The Teville Stream broke through the shingle bank to the sea at its present location at East Worthing in 1826 (Baggs et al, 1980a).

The whole sequence of infilling can be seen in recent works for the EPIC project rerouting of the Sompting Brook. A sequence of topsoil, silt, sand and beach pebble is visible see Figure 3.

The historical maps of the area show an area of marsh land drained by many streams. The Yeakell and Gardner map (YKG,1778-1783) shows the streams to be very similar to the drainage of the present (shown in blue in Figure 7. The drainage appears to be an important factor in defining the Sompting parish boundary (pre 1933 shown in gold and current shown in orange in Figure 7).

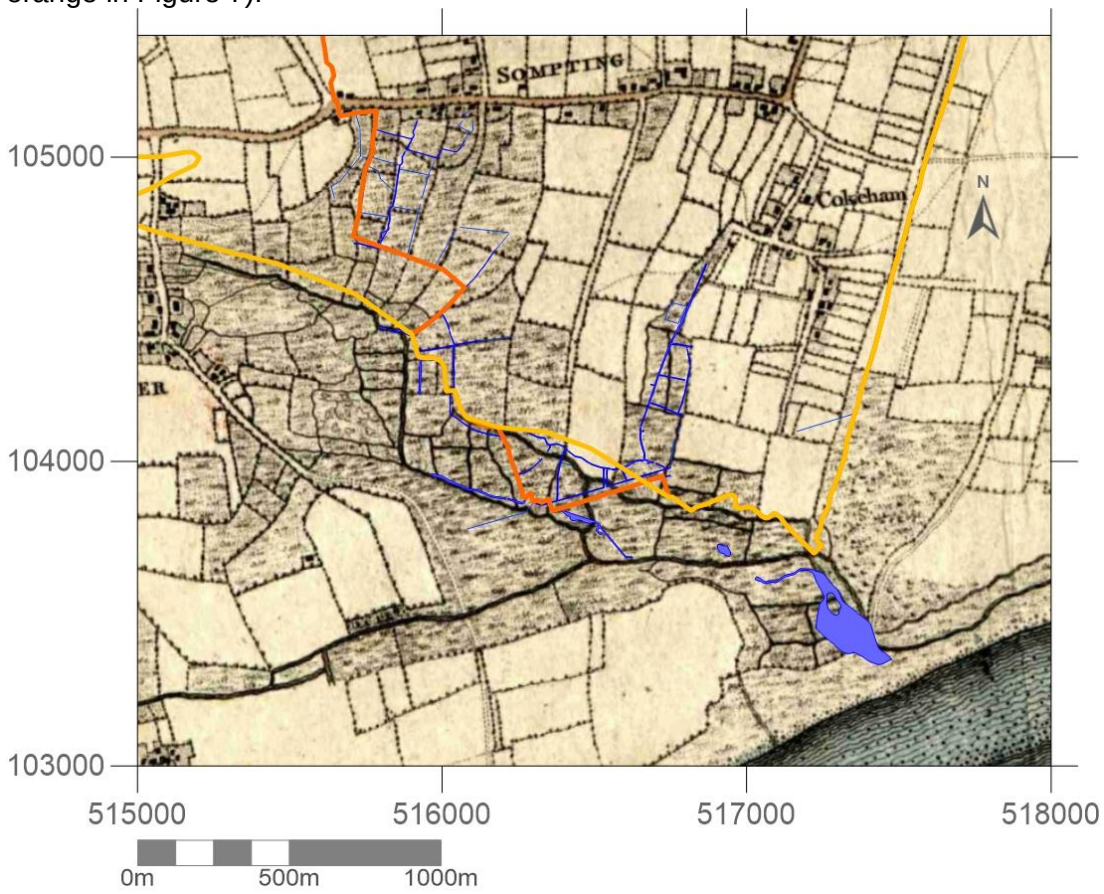
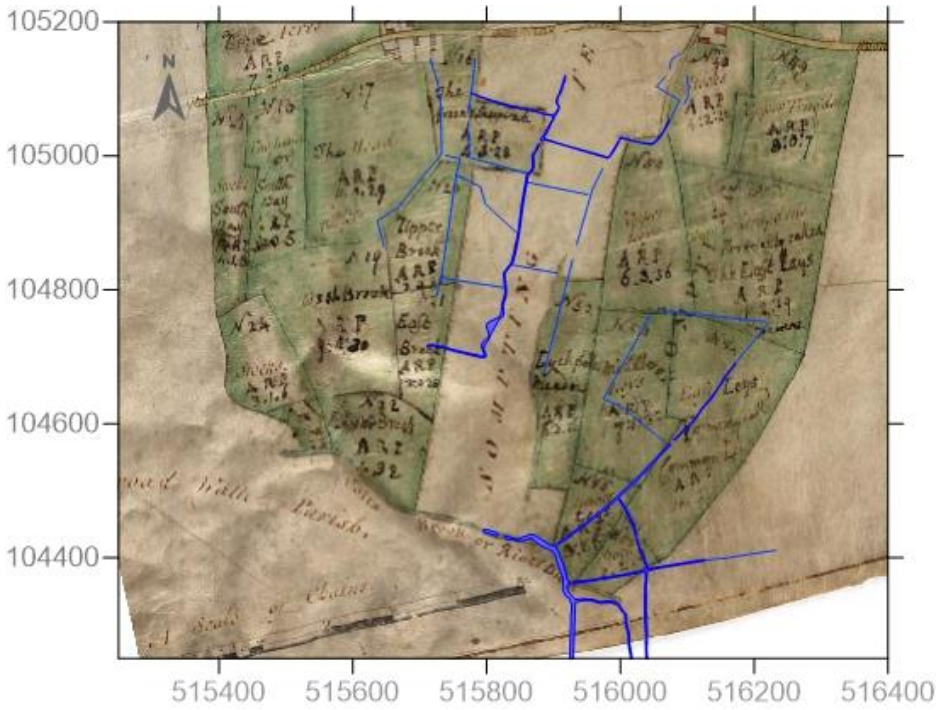


Figure 7 - Yeakell and Gardner (1778- 1783)

The Yeakell and Gardner map (Figure 7) shows that the route to the sea was still blocked at this period and the streams flowed along the coast to Lancing.



The map of John Croft's estate of a few years earlier (1772) shows the main stream of the former parish boundary as the boundary of his estate and the river is listed as the Colt's Brook or River Ditch

Figure 8 - John Croft's Map of 1772 (WSRO c,1772)

By 1834, the tithe map of Sompting is showing that the field system drainage is very largely the pattern seen today (modern surface water shown in blue in Figure 9)

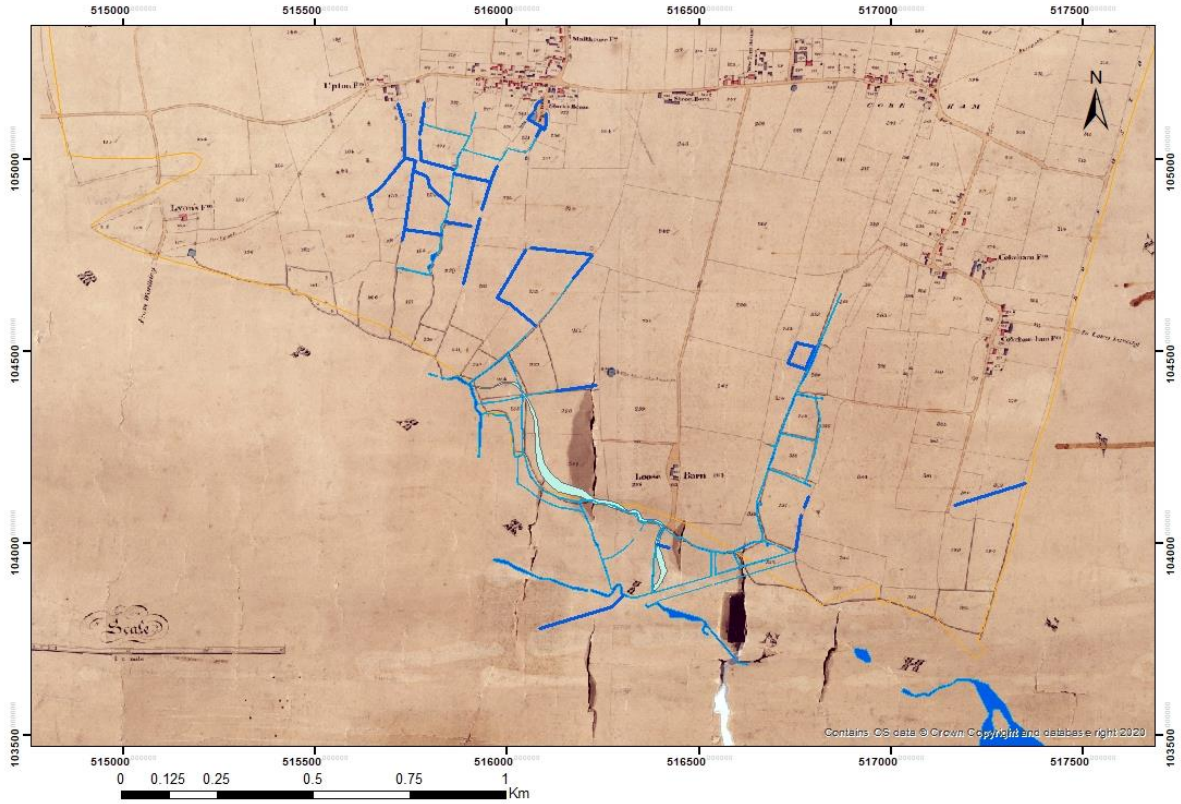
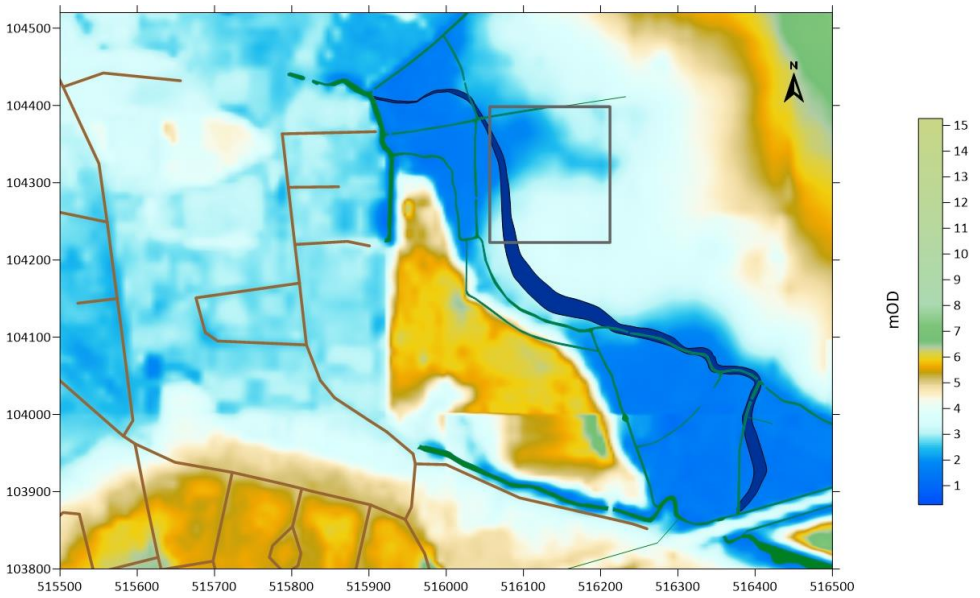


Figure 9 - Sompting Tithe Map of 1834 (WSRO d)

4.3 The detailed topology from Lidar Data



The land appeared to be fairly flat when viewed across the area of excavation but examination of the Lidar data for the detail of the height measurements shows that over the area around the new river the height varies from about 1mOD to 6mOD (Figure 10).

Figure 10 - Detail of Lidar Data

The current ditches and the new river are straight lines or smooth curves to drain the fields but the data shows the remains of old ponds and river meanders.

A total station survey was carried out across the area of excavation (shown in red in Figure 11) and shows that the area of excavation was located in the bend of an older river. When the new river of 2019 was cut, the spoil from the cut was piled on the east bank and the total station survey shows the slight elevation of this surface over the Lidar data.

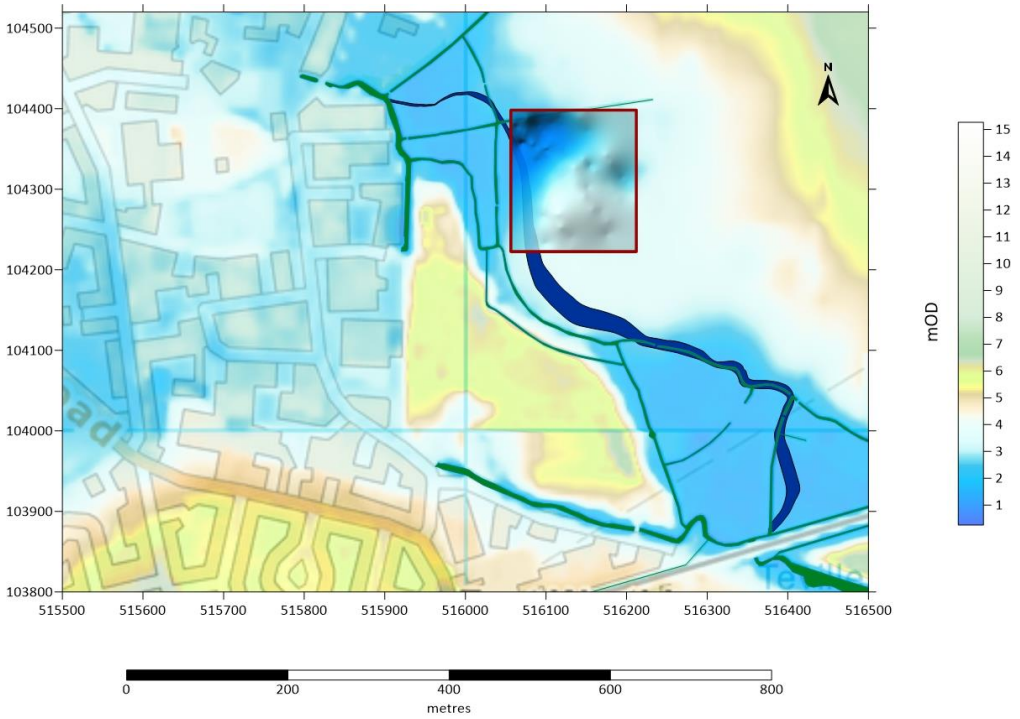


Figure 11 - Lidar data overlaid with total station survey

5 THE RESULTS

5.1 The unstratified flint collection from field walking 2019 and 2020

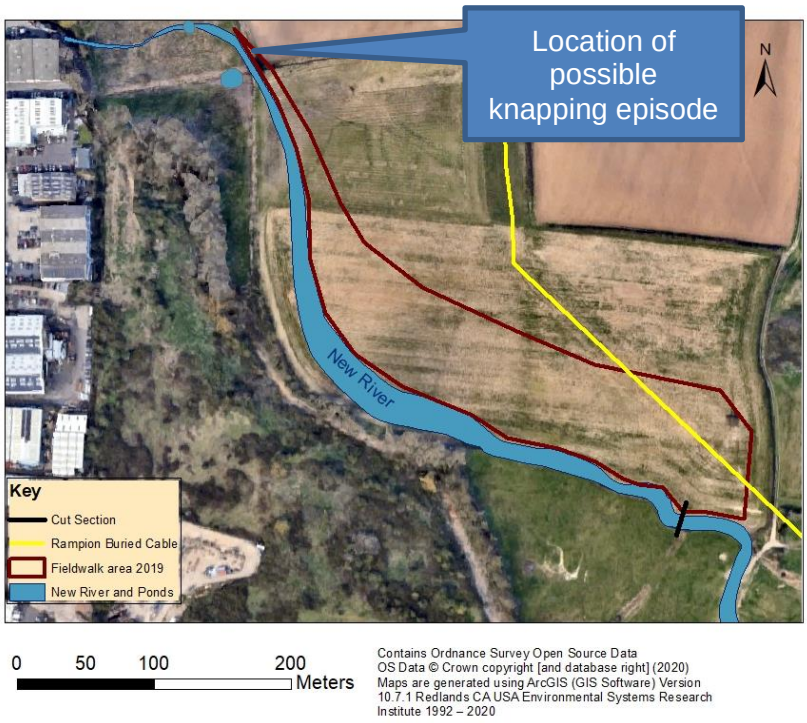


Figure 12 shows the area of unstratified surface collection. The Google Earth image was taken before the soil from the river cut was redeposited and the soil disturbance from the cut of the Rampion buried cable is still visible. Flints recovered were unlikely to be from the soil disturbance for Rampion works since the soil from the river cut was distributed across the field to the north of the cut as a layer about 1metre deep.

Figure 12 - Field Walking and Surface Collection

Figure 13 - Soil distribution from the cut of the river

Although the majority of the flints were recovered from the redeposited soil from the newly-cut river-channel, some microliths were found along the exposed river banks. A further random flint collection was also recovered from an area along the north-east river bank, bordered to the east by a barley field that indicated a potential Mesolithic flint-working site

Unstratified flint samples were also collected in 2020 from the river banks, outside of SS1-6 areas, including the pond area, the spoil created from its excavation and the barley field.

Examination of the geology (Figure 14) shows that the area around the initial cut was within an area of raised beach deposits and this was indicated by beach pebble deposits (Figure 15) visible at the base of the cut. The area of the potential knapping episode appears to be on the edge of a meander of a stream.

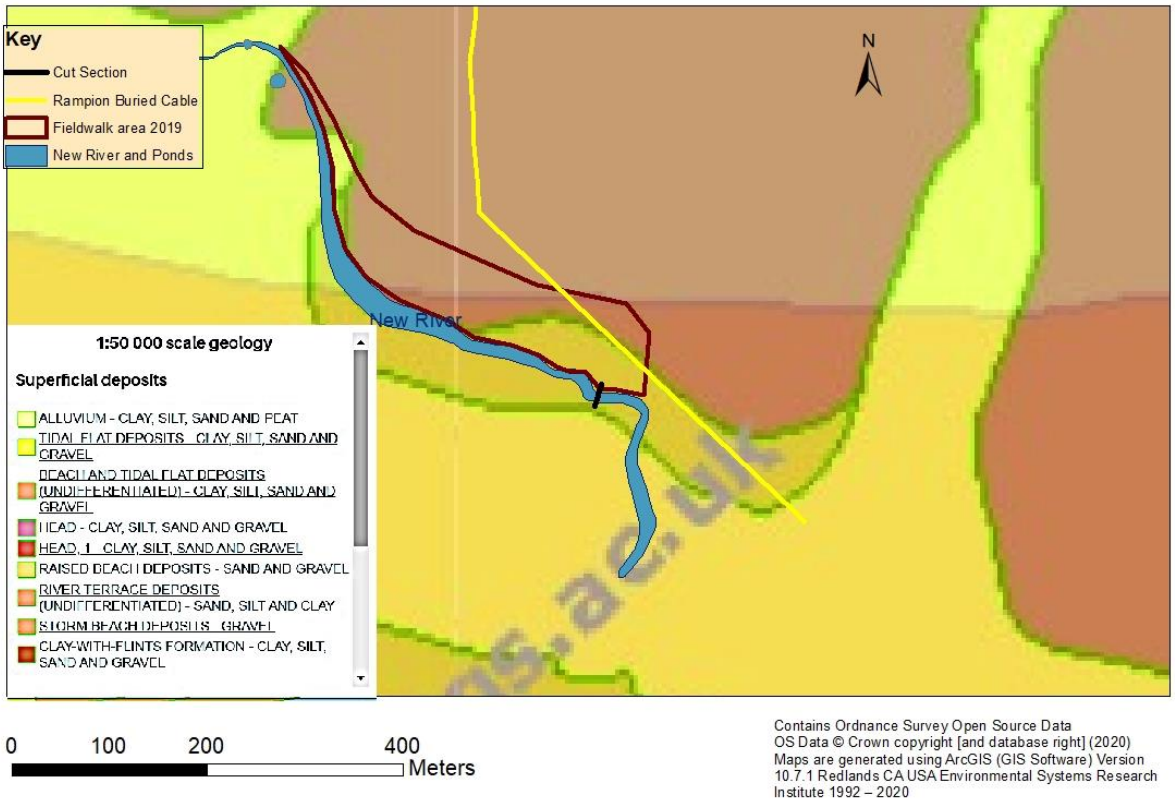
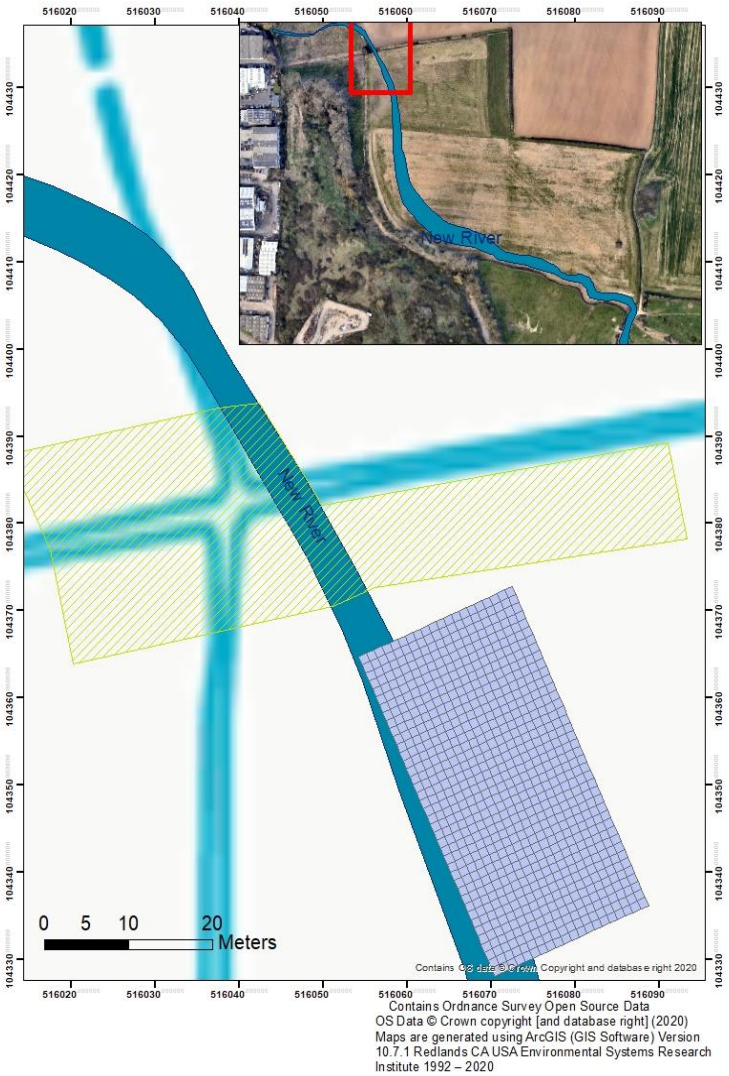


Figure 14 - New River Cut and Geology (BGS, 2021)

Figure 15 - Beach Pebble Deposits

5.2 Outline of 2020 Works

The original proposal was for a grid measuring 20x40m (outlined in blue in Figure 16) in which test pits could be located to maintain social distancing.



Where test pits would destabilize bank areas, a method of scraping the loose soil on the banks was used to collect struck flints.

A limited unstratified collection was undertaken on the redeposited topsoil and in the barley field adjacent to the site. Only blades and tools were collected since a good sample of all tools and debitage had been collected in 2019.

Figure 16 - Test Pit Grid

5.3 Test Pit and Scrape Contexts

Contexts 1 to 5 were defined prior to the start of excavation based on the layers identified when the new channel was cut (see Figure 3). The height of the section was approximately 2m so layer 4 and 5 were expected to occur at a height of about 0.5mOD.

Context No.	Occurs in	Description	Munsell Colour
1	Did not occur within the excavation area	Redeposited soil from recent earth works. Contained a mixture of soil types and many struck flints	10YR 5/2
2	A19, E19, L14 & A10	Well established topsoil before recent earthworks	10YR 4/2
3	A19, E19, L14 & A10	Silty clay alluvium with inclusions of rounded pebbles. Contained struck flints	5YR 5/3
4	Did not occur within the excavation area	Sand	
5	Did not occur within the excavation area	White patinated flint beach pebbles	
6	SS1	Light dry fine clay on the newly cut river bank	10YR 7/1
7	SS2	Light dry fine clay on the newly cut river bank	
8	SS3	Light dry fine clay on the newly cut river bank	
9	A19, E19 & L14	Narrow dark layer between contexts 2 and 3. Most visible before sections dried out.	
10	A19, E19 & A10	Darker clay with flint inclusions and struck flints	10YR 4/6
11	O9	Top soil of O9 contains modern plastic debris	
12	A5	Stream Bank alluvium	
13	A4	Stream Bank alluvium	
14	B5	Stream Bank alluvium	
15	B4	Stream Bank alluvium	
16	O9	Grey clay with pebbles and struck flint	10YR 6/2
17	O9	Grey/yellow silty wet clay	10YR 6/1
18	L14	Damp malleable clay	7.5YR 4/4
19	E14 & L14	Wet clay with flinty gravel	10YR 5/4
20	O9	Grey clay with large flint nodules	10YR 5/3
21	E19	Clay with small flint gravel	10YR 4/4
22	A19	Clay with flinty gravel	10YR 4/6
23	A10	Dump clay, no inclusions	10YR 4/3
24	SS2	Side scrape 2 west bank	
25	SS1 – SS4	Side scrapes east bank	
26	SS1	Pre -excavation collection	
27	Barley Field	Collection	
28	SS4	North bank side scrape 4	
29	SS5	South bank side scrape 5	
30	SS6	Small find collecting area on pond bank	
31	PA	Immediate surrounding area of pond	
32	SHPA	Spoil heap from pond digging	

5.4 Test Pit Methodology and Results

5.4.1 Methodology

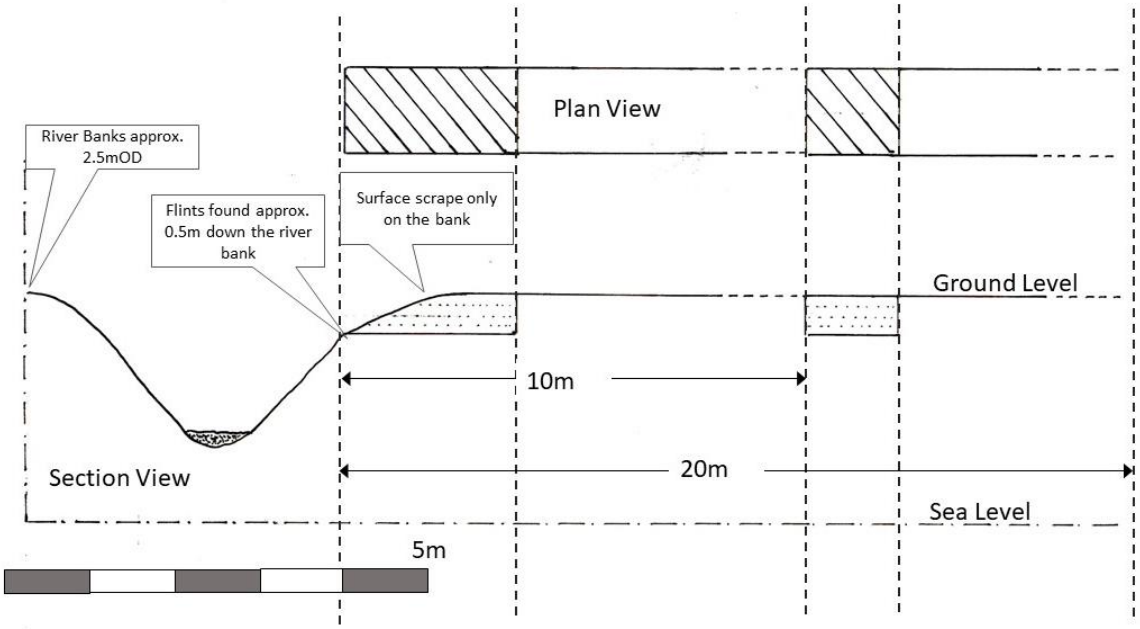
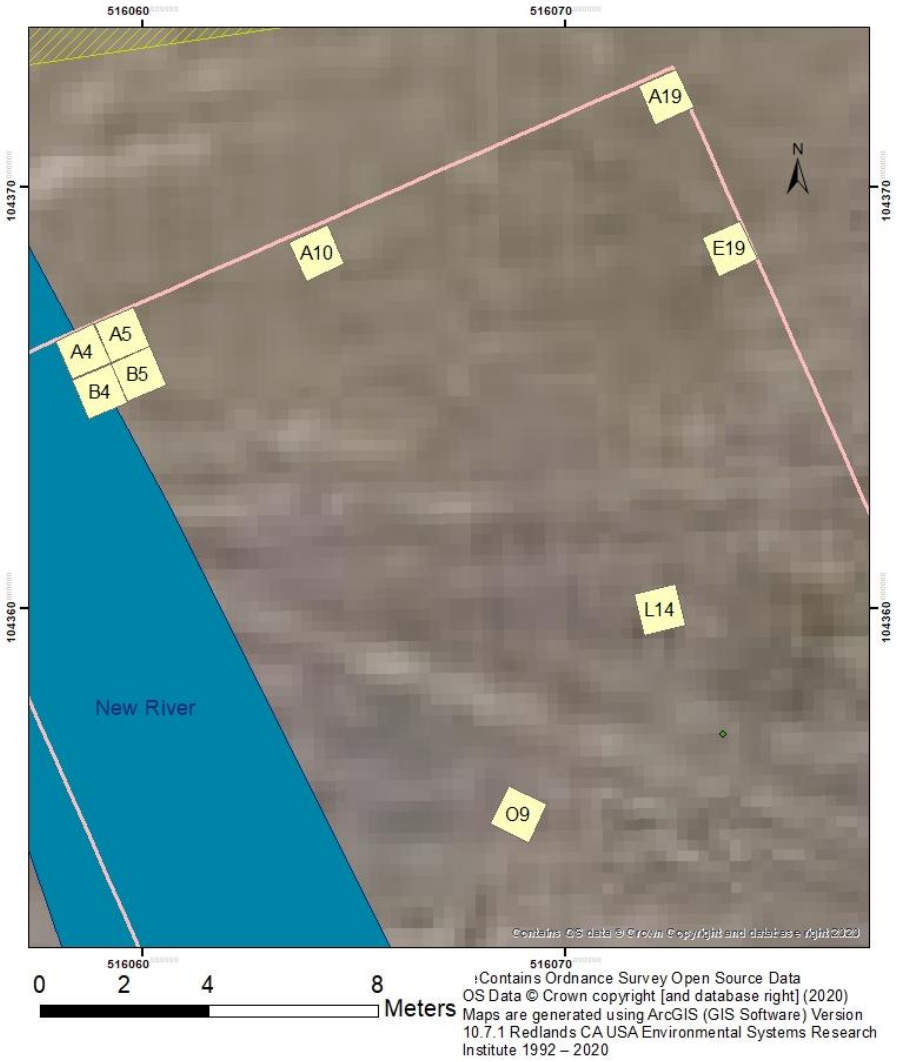


Figure 17 - Test Pit Methodology

Test pits were designated A0 on the north west pit through to A19 on the north east grid and through to AN19 on the south east grid.



Given the constraints for numbers on site, only 5 test pits were opened. Test pit areas on the river bank were examined for surface collection. A number of auger surveys were carried out to check soil layers, prior to opening test pits, and after L14 and O9 had been excavated to check whether the soil layers followed a similar pattern between the test pits

Figure 18 - Test pits opened.

The test pits opened to a depth of approximately 1m were A19, A10, E19, L14 and O9. All test pits were in the northern part of the grid. Other test pits along the banks of the stream were used for side scrape collection. Wooden panels were used to cover the test pits at the end of each session's digging to minimise the impact on the wildlife of the site.

Since the original flint scatter of similar flint pieces was located at about 0.5m below the top of the bank, it was planned that the struck flints collected below the top soil (Context 2) be recorded as 3D small finds.

Test pit A19 was opened first and used as a trial run for the methodology, hence the large number of small find items recorded in A19. The small finds were analyzed and while the scatters appeared to be knapping debris, no conjoining groups were identified. Hence the strategy for later test pits was to minimize the recording of small finds in 3D and allocate bulk finds to contexts.

5.4.2 Test Pit A19

Test pit A19 had top soil and silty clay layers clearly defined horizontally, as expected from the layers visible in the original river cut (Figure 3). However, the layer beneath the silty clay (Context 003) did not have the sand content previously seen. The layer in A19 was a darker wetter clay (Context 010) - Figure 19.

Figure 19 - Test Pit A19 - North View

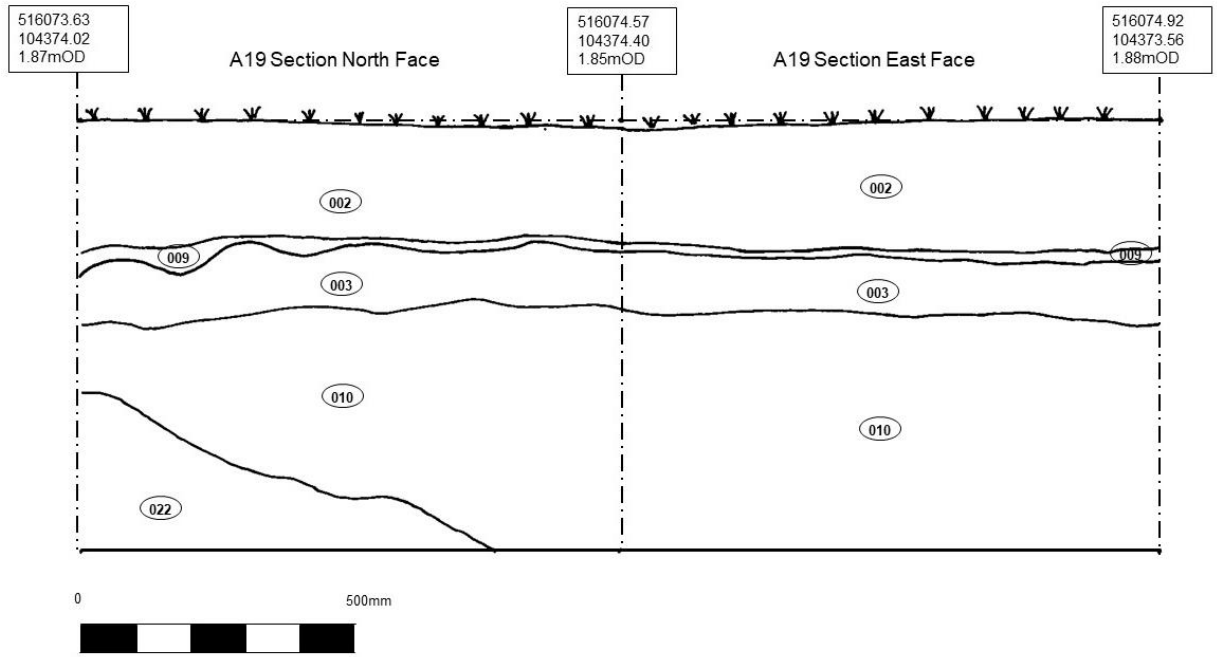


Figure 20 - Test Pit A19 Sections

Figure 21 shows the depth of layers and small finds projected against the north wall of the test (Total bulk finds struck flints are shown in gold). A total of 64 small finds were recorded. Struck flints were not identified below 0.5m below the surface.

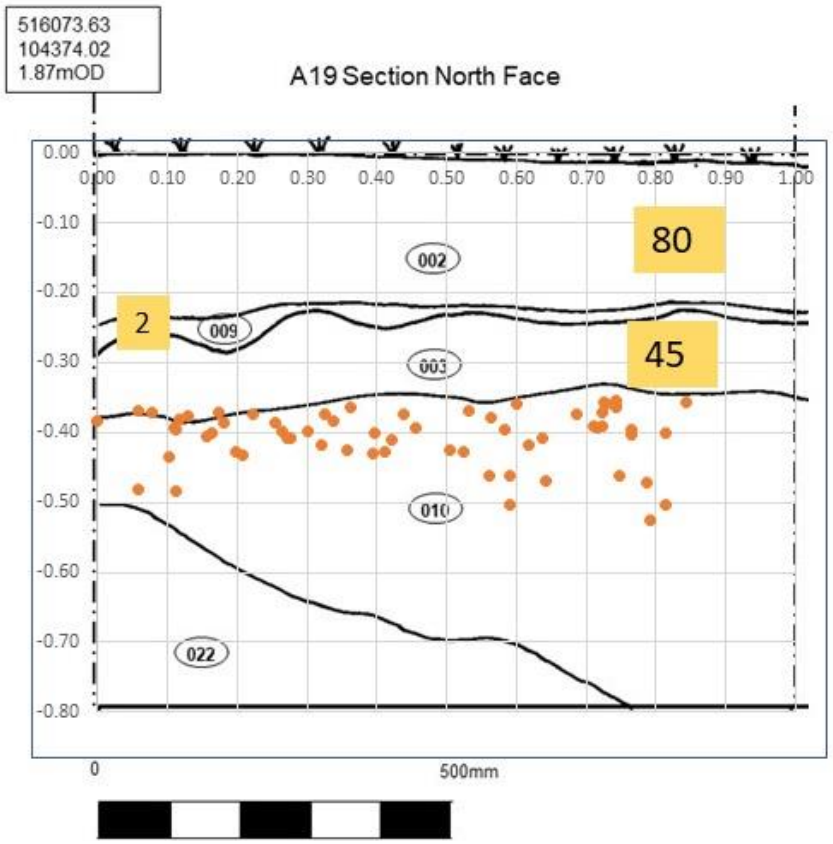


Figure 21 - Test Pit A19 Flint Finds

5.4.3 Test Pit E19

Test pit E19 was similar in soil layers to A19. The quantity of flints collected reflects the amount of time to excavate the test pit in comparison to A19 but the ratios of flints found in the various layers appeared to be similar.

Figure 22 - Test Pit E10 Layers

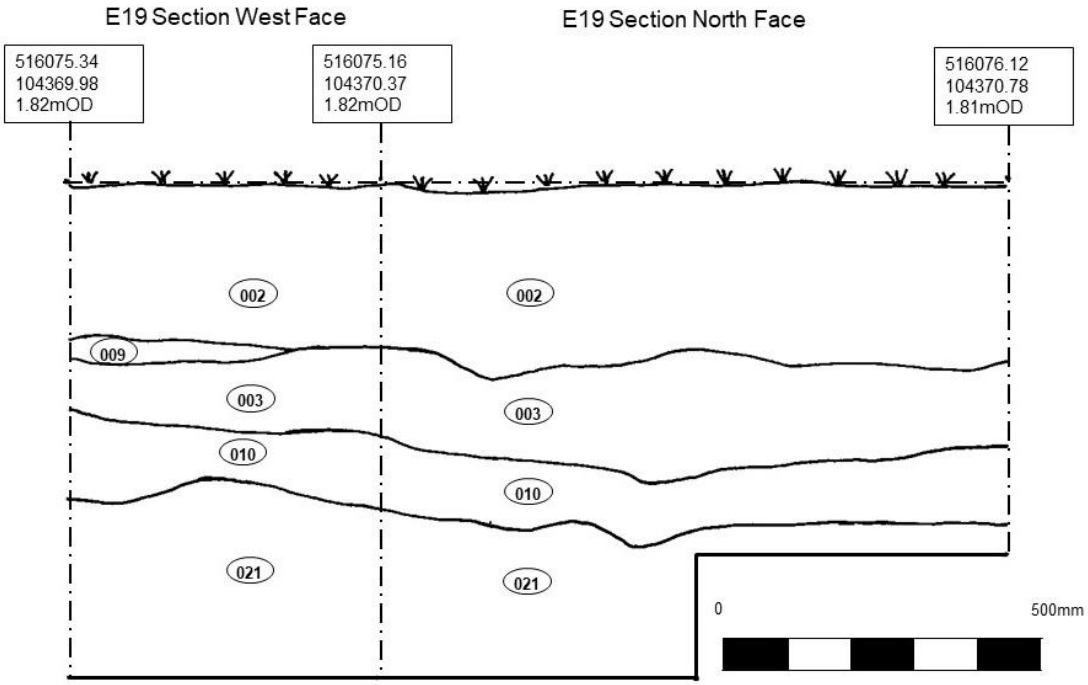


Figure 23 - Test Pit E19 Sections

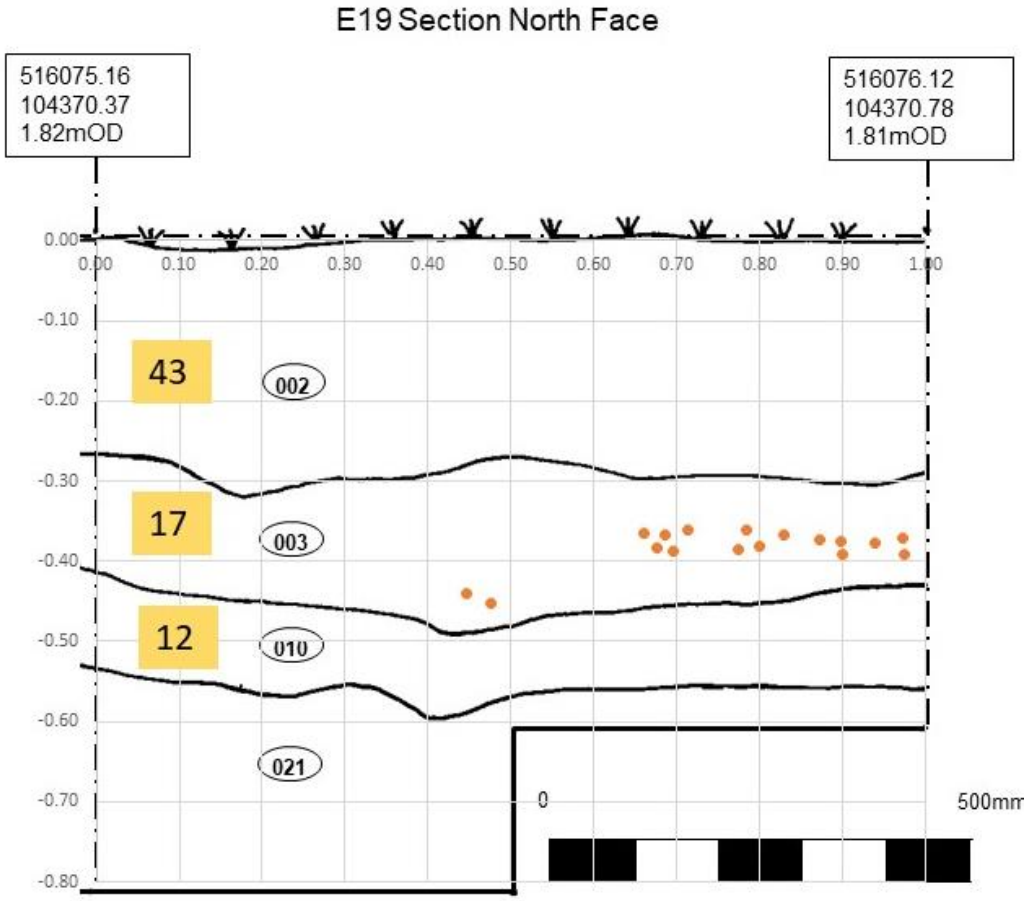


Figure 24 - Test Pit E19 Flint Bulk and 3D

5.4.4 Test Pit A10

Test pit A10 was opened to see if the pattern of soil layers extended towards the old stream. Figure 11 indicates that the northern part of the test pit grid was in the meander of an older stream. The soil layers (Figure 25 and Figure 26) show that the layers are darker and more uneven than test pits A19 and E19.

Figure 25 – Test Pit A10 Soil layers

No 3D collection was undertaken on this test pit and the ratio between the layers of the bulk finds show a different pattern to test pit A19.

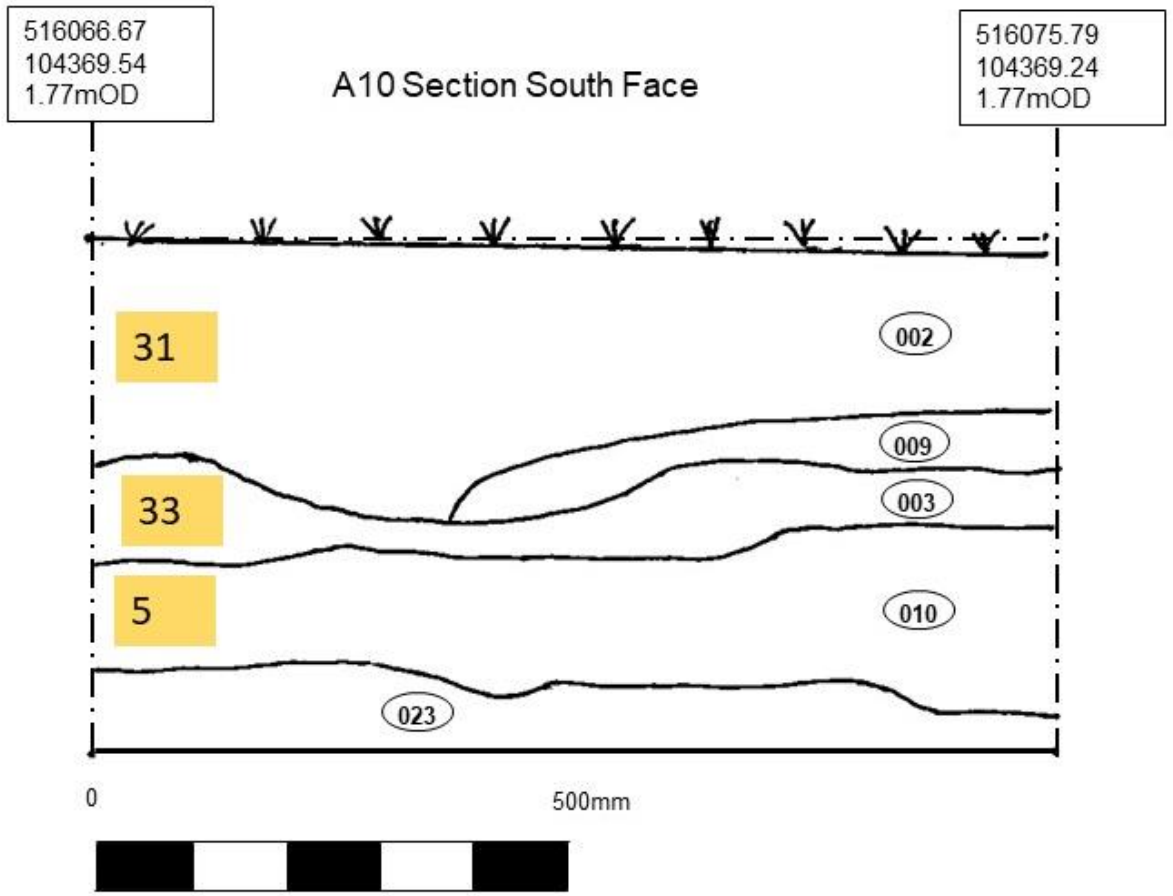


Figure 26 - Test pit A10 Section and bulk finds

5.4.5 Test Pit L14

The position of test pit L14 was selected to sample what appeared to be the centre of the natural pond in the northern part of the test pit grid. The soil layers were damp and the water pooled in the base of the test pit at about 1mOD.

A large proportion of the flints were recovered from the top soil.

Figure 27 - Test Pit L14 Soil layers

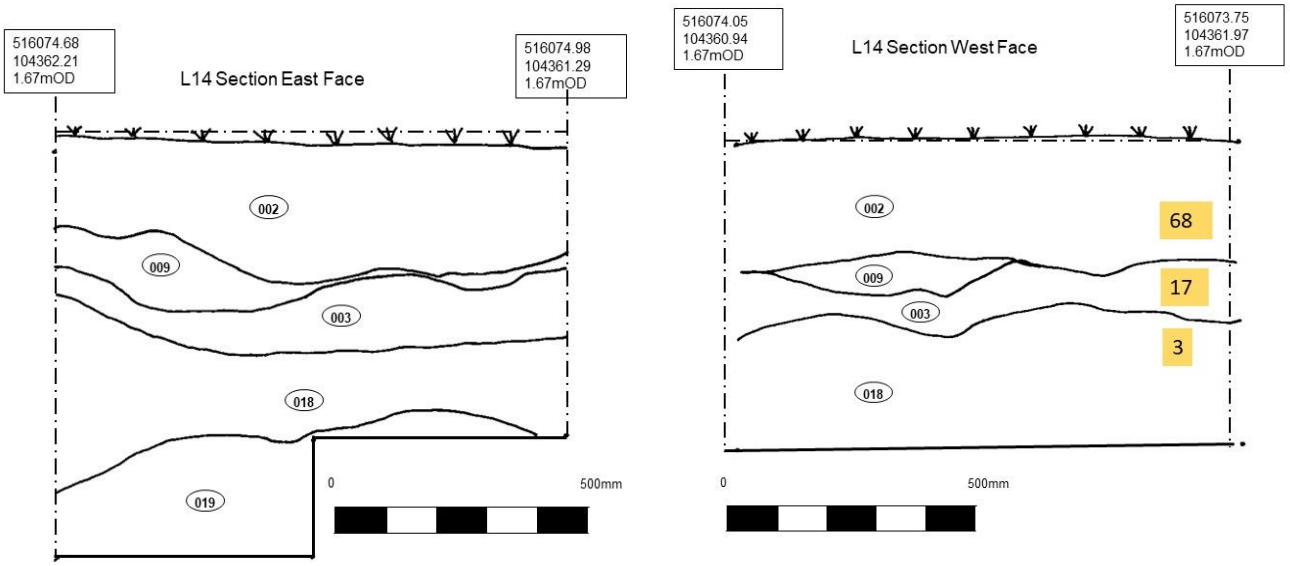


Figure 28 - Test pit L14 Sections

5.4.6 Test Pit O9

Test pit O9 appears to be located at the lowest point of the natural pond area within the grid. It is also separated from the other test pits by an old field drain (Figure 29).

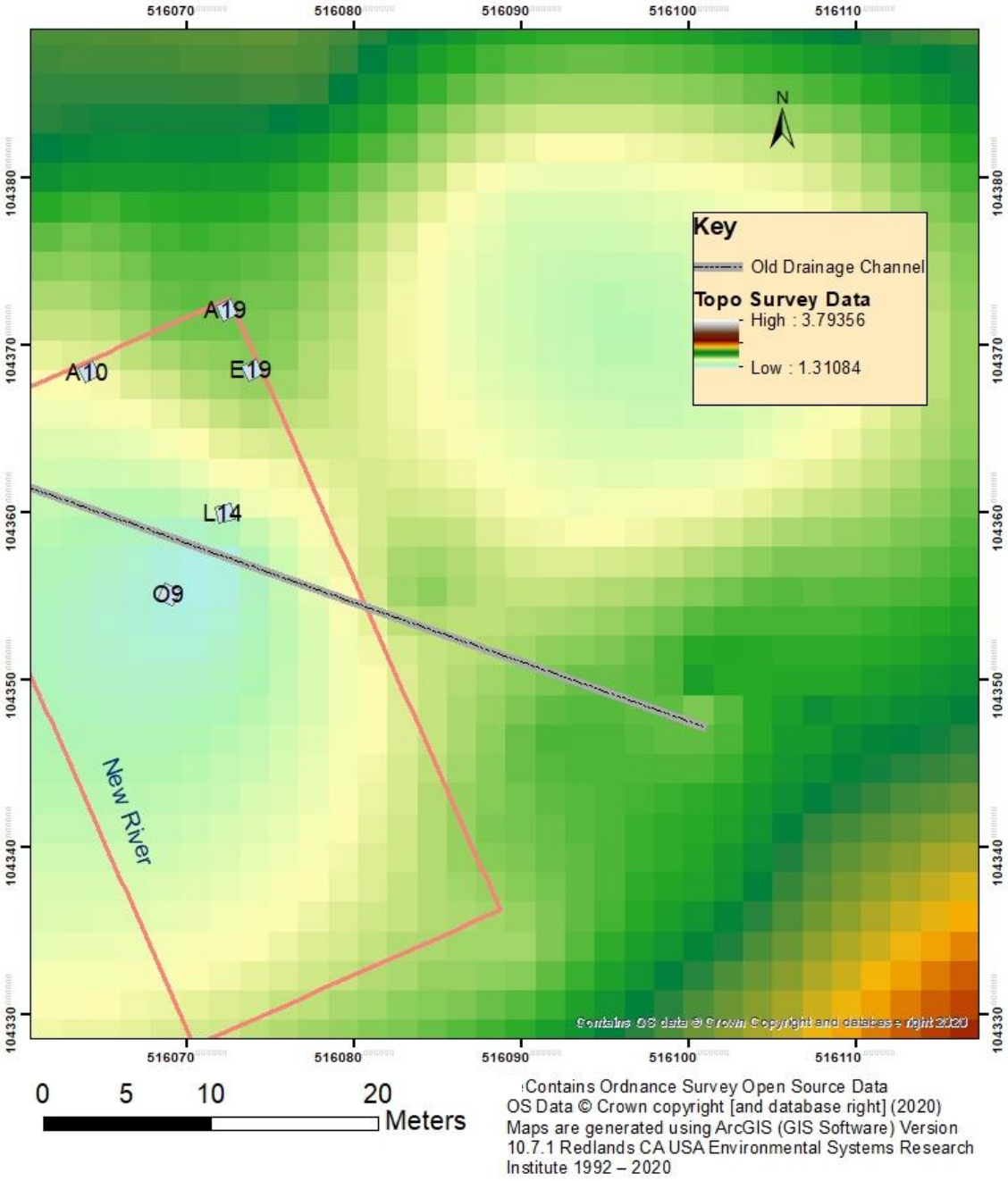


Figure 29 - Test Pit O9 Location

The top soil and layering are different to the other test pits in that the topsoil layer was thicker, wetter and contained modern plastic waste. Not apparent in the section drawing (Figure 31) as this layer was not evenly distributed, but a layer of large flints was identified at the base of Contest 017 (Figure 30). The flint appeared to be nodules of downland flint rather than large beach pebbles. No struck flints were collected from this layer, nor the layer of very wet gravelly soil below it.

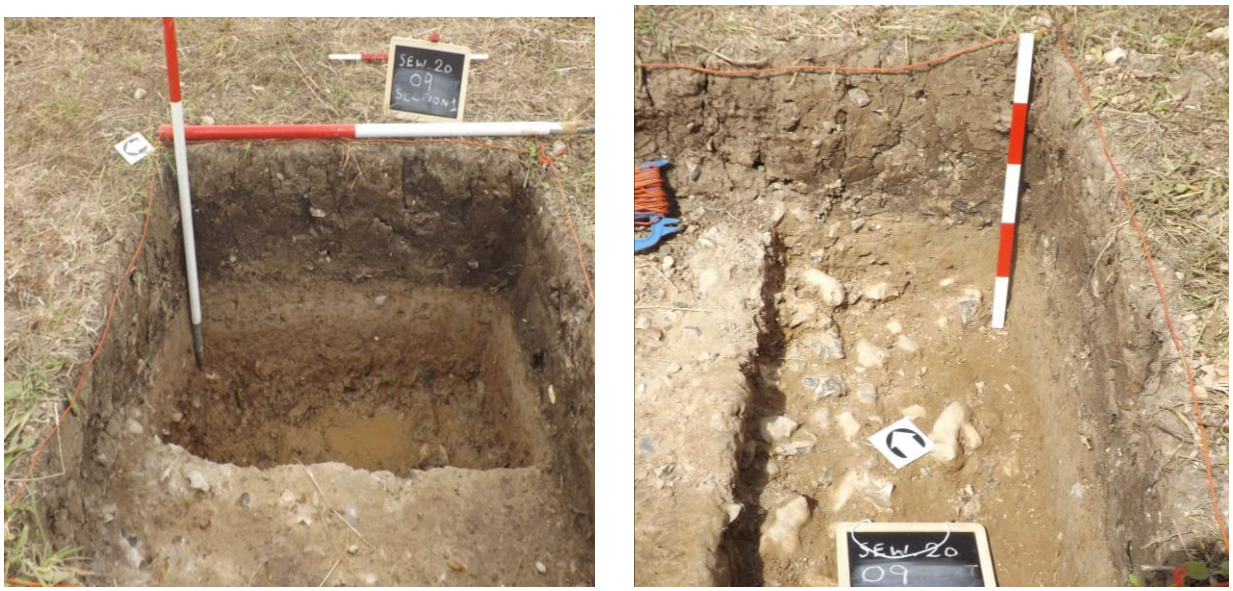


Figure 30 - Test Pit O9 Section and Flint Layer

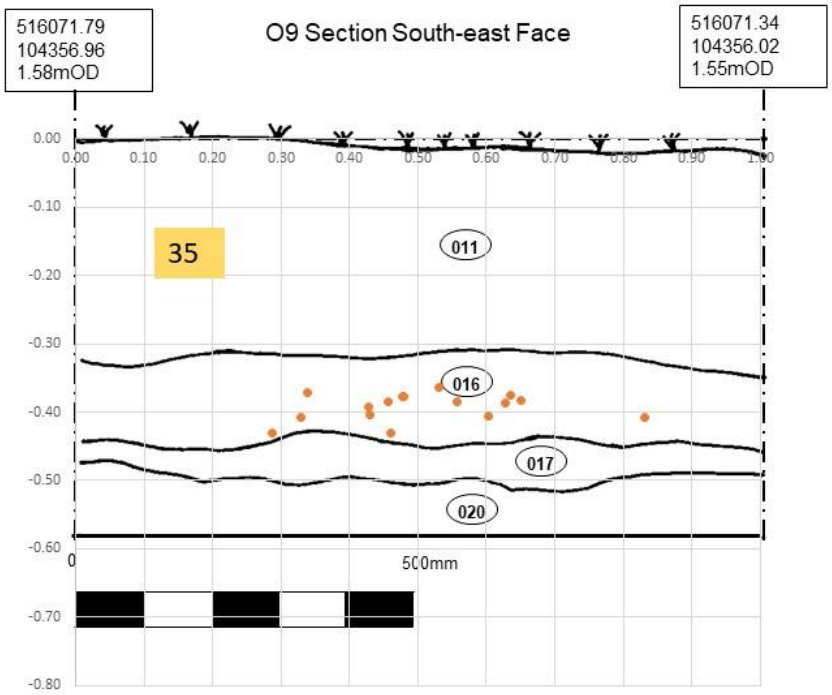
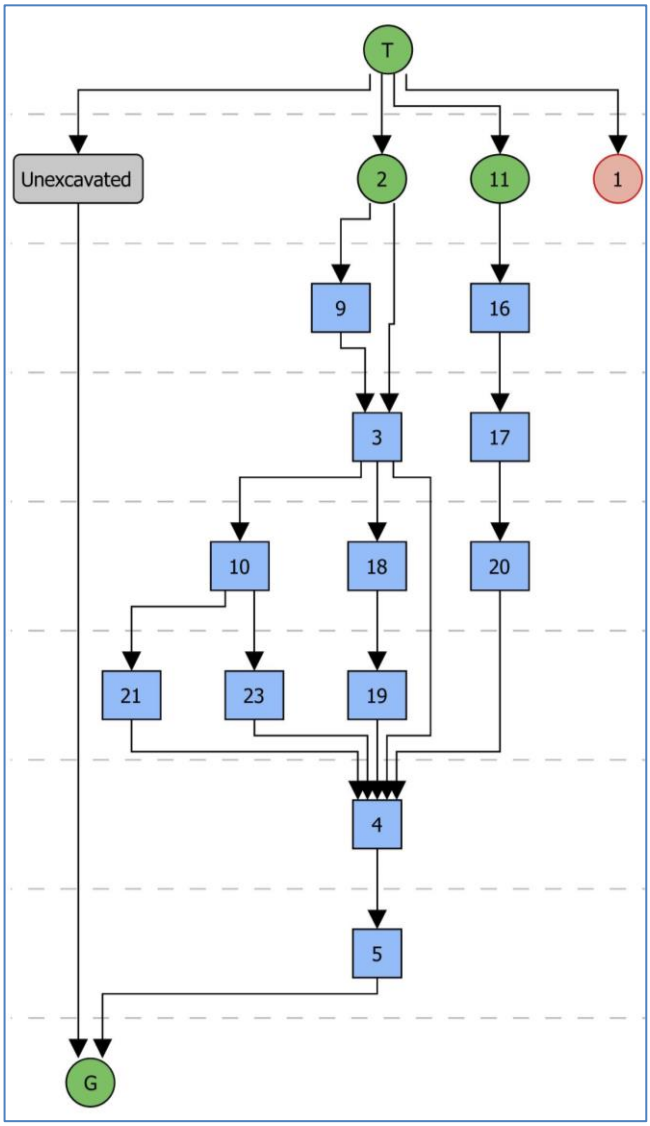


Figure 31 - Test Pit O9 Section

5.4.7 All Test Pits



Context 2, top soil, was applied to all test pits except O9. On first opening O9, the soil appeared to be wetter and darker than the other test pits and was therefore allocated a new context 11 - Figure 32. Examination of the heights of all context boundaries within the test pits (See Appendix A) indicated that context 11 in O9 aligned with contexts 3 and 9 in the other test pits. It is possible that the layer equivalent to Context 2 for O9 had been removed possibly when the field drain separating it from the other test pits was cut.

The presence of Bronze Age material recovered from within a dark clay deposit (contexts 16 and 17 in O9) below the subsoil could indicate that recent disturbance of the soil may have occurred when the nearby east/west drainage or boundary ditch was excavated.

Figure 32 - Harris Matrix of Test Pit Contexts

5.5 Surface Collection

5.5.1 Outline of Scrapes

Six areas for scrapes were used – see Figure 33

Scrape	Description
Scrape 1	Area in which a group flints (which indicated a knapping episode) was collected prior to the start of the excavation.
Scrape 2	The west bank of the new river cut just to the north of the test pit grid in order to perform a limited collection in the area of special environmental protection.
Scrape 3	The west bank of the new river cut, clear of the test pit grid but in area of natural erosion of the bank.
Scrape 4	North-east bank of the new river cut close to the existing ditch cut.
Scrape 5	South-west bank of the new river cut opposite Scrape 4
Scrape 6	A 3m wide sector on the north bank of the pond cut in October 2020

Figure 33 - Side Scrape Collection Points

5.5.2 Side Scrape 1

Side Scrape (Context SS1) was selected for further investigation after a group of flints was collected during the 2019 field walk activities, which appeared to be flakes from a single knapping incident. The scrape was located just north of an existing well-established drainage ditch and on the east bank of the new river cut – see Figure 34 The method was to remove only lightly-rooted surface vegetation and scrape off any surface struck flint. Flints were collected in 20cm spits along the bank – see Figure 34 and Figure 35.

Figure 34 - Work on Side Scrape 1

Figure 35 - Side Scrape 1 showing measurement of 20cm spits.

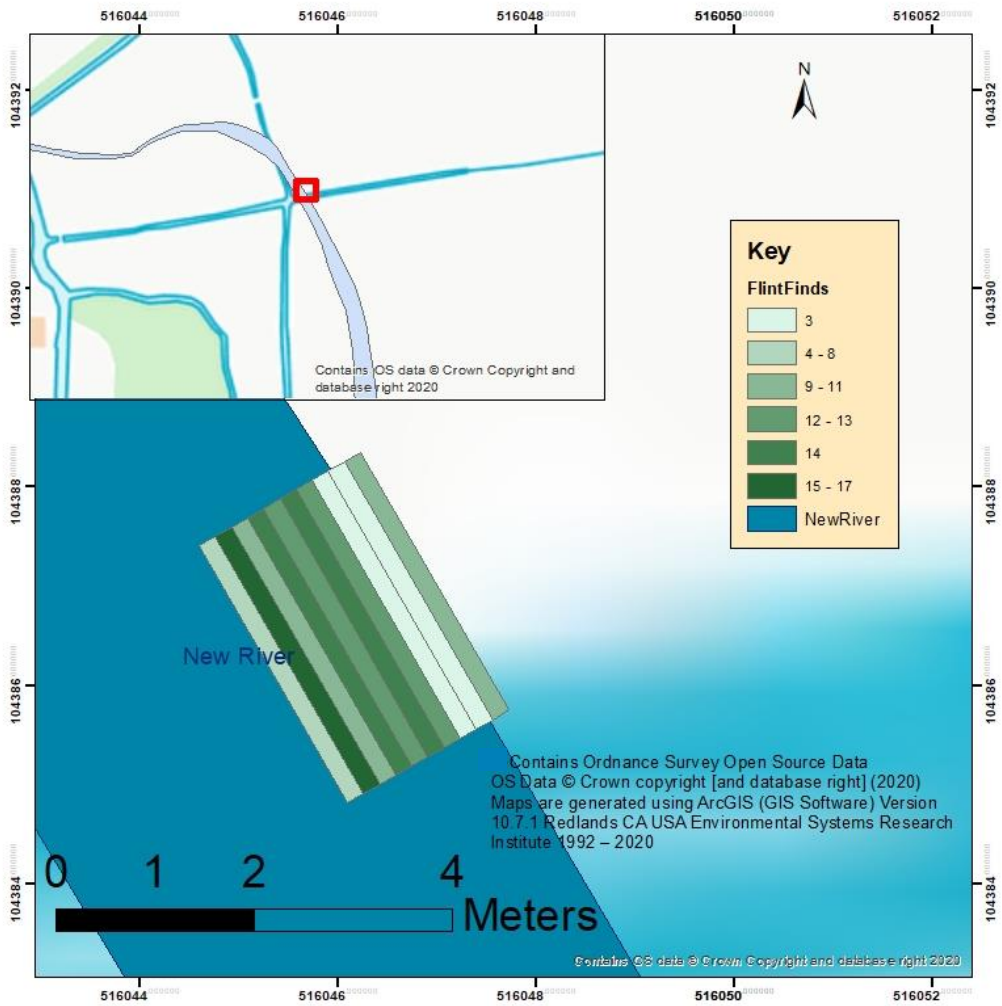


Figure 36 - Location of Side Scrape 1

Flints were collected from just under the top of the bank down the slope such that the last spit was about 20cm out of the water. Figure 36 and Figure 37 show the quantities of flints collected and that the largest concentration was at about 1.2mOD. The average density of finds was approximately 19/m^2

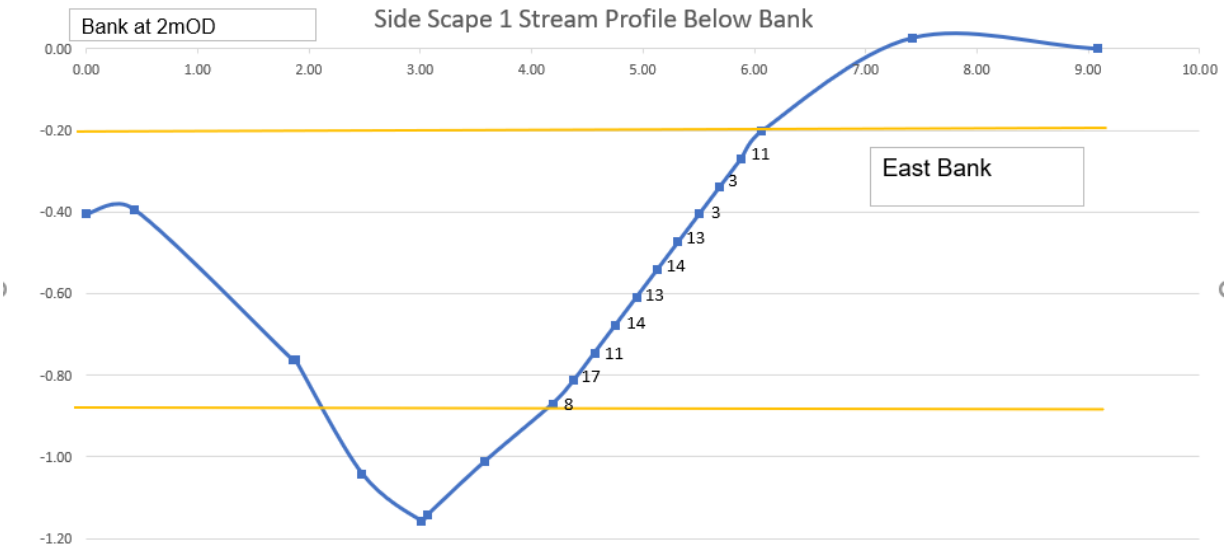


Figure 37 - Side Scrape 1 bank and flint quantity profile

5.5.3 Side Scrape 2

Side Scrape 2 was selected on the east bank of the new river just south of the established drainage ditch. While flints had been noted in the area the density of flint did not appear to be as much as north of the drainage ditch. A method of $1m^2$ grid squares was used (see Figure 39.) The average density of flints was approximately $12/m^2$

Figure 38 - Collecting from Side Scrape 2

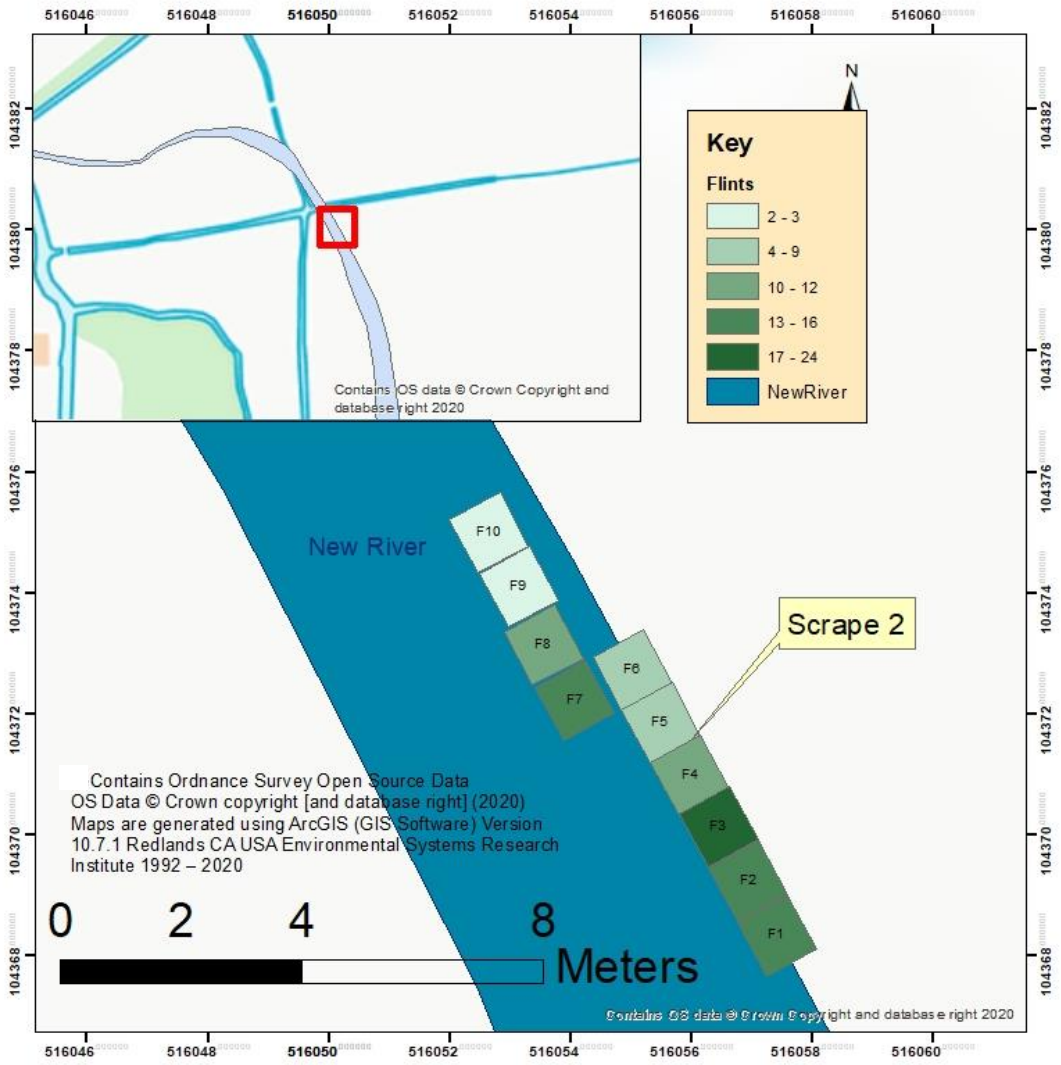


Figure 39 - Location of Side Scrape 2

5.5.4 Side Scrape 3

Side Scrape 3 was selected where a channel had been cut in the bank by natural run-off (see Figure 40 and Figure 41). The bank was the steepest at this point as the material from the river cut had been spread near the top of this bank. It was not possible to clean the cut without destabilizing the bank and only 11 flints were collected from the area. However, the profile of the bank was surveyed – see Figure 42.

Figure 40 - SS3 showing cut from natural run-off – view looking North

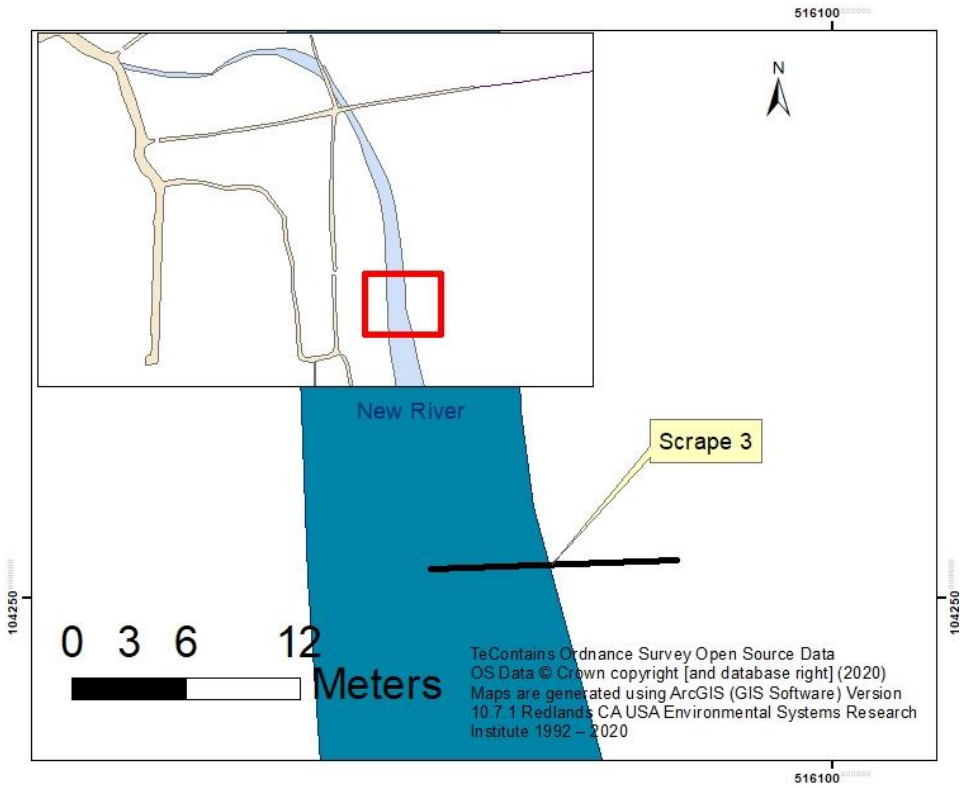


Figure 41 - Location of Side Scrape 3

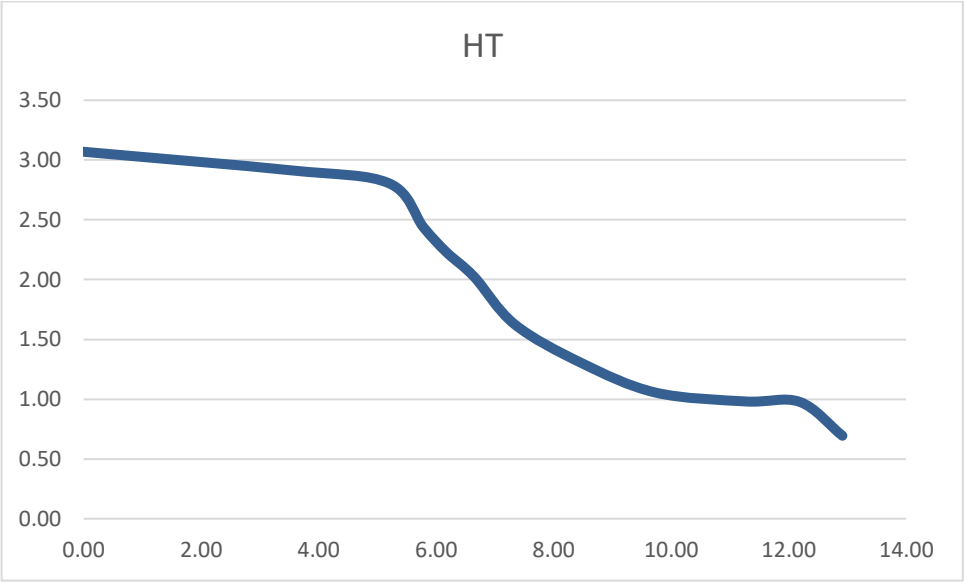


Figure 42 - SS3 Profile viewed looking South

5.5.5 Side Scrape 4 & 5

Side scrapes 4 and 5 were taken on opposing banks of the river with SS4 on the North-east and SS5 on the South- west (Figure 43 and Figure 44.) All flints were recorded as small finds with full 3D positions. Of the 159 collected, 91 were identified as struck flints with 35 collected from the South-west bank and 56 collected from the North-east bank. Flints were located from the top of the banks down to 1.2mOD.

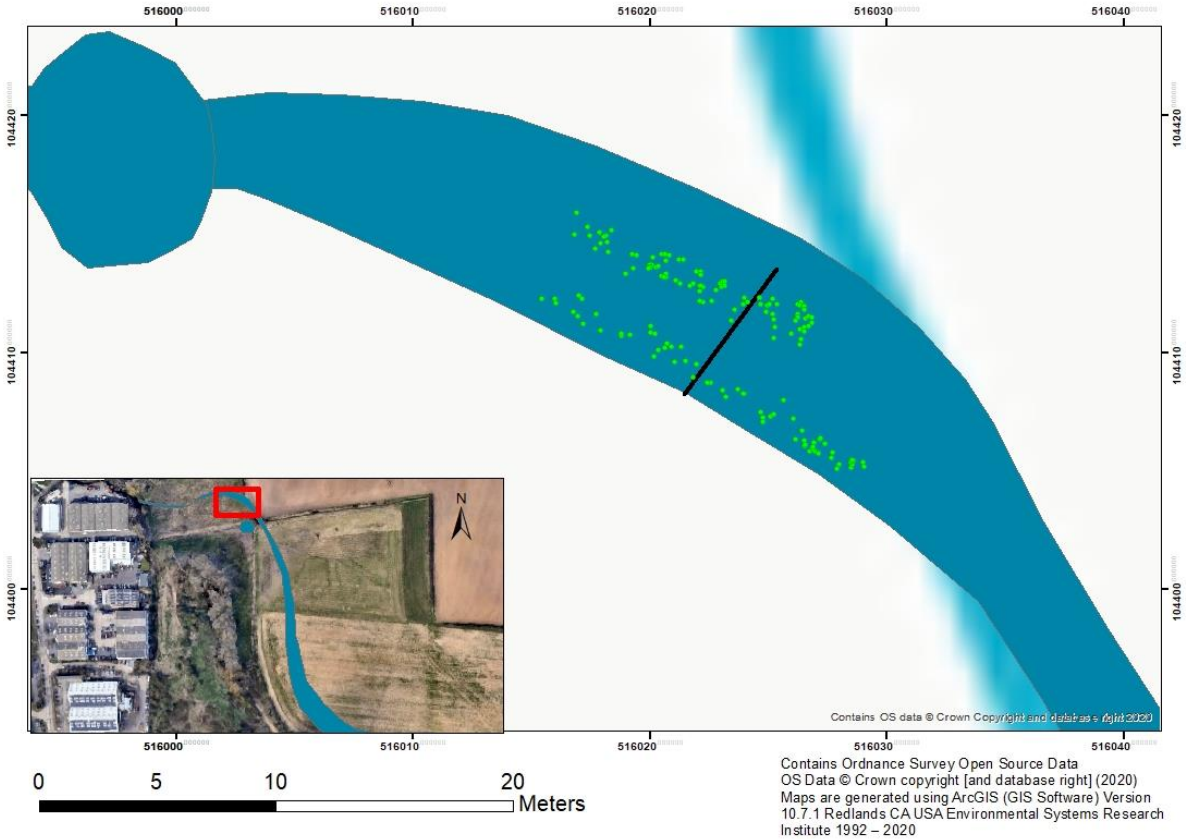


Figure 43 - Location of Side Scrapes 4 and 5

Figure 44 - SS4 and SS5 Collection - view looking North-west

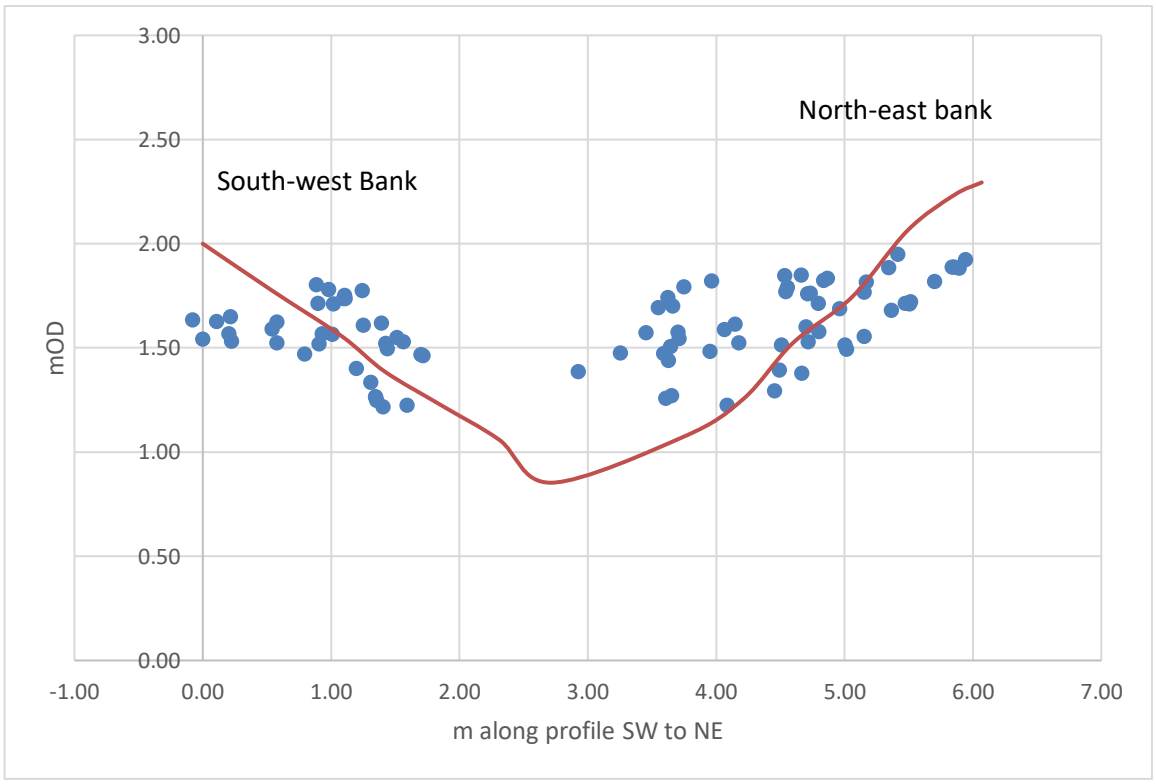


Figure 45 - SS4 & SS45 Flint scatter density projected on to stream profile

5.5.6 Side Scrape 6

Scrape 6 was taken along the northern edge of a newly established pond – see Figure 46 and Figure 47. The area selected for Scrape 6 was the area where the largest concentration of struck flint was immediately visible. This area also appeared to be 10m north of the old ditch cut which was also the case for Scrape 1.

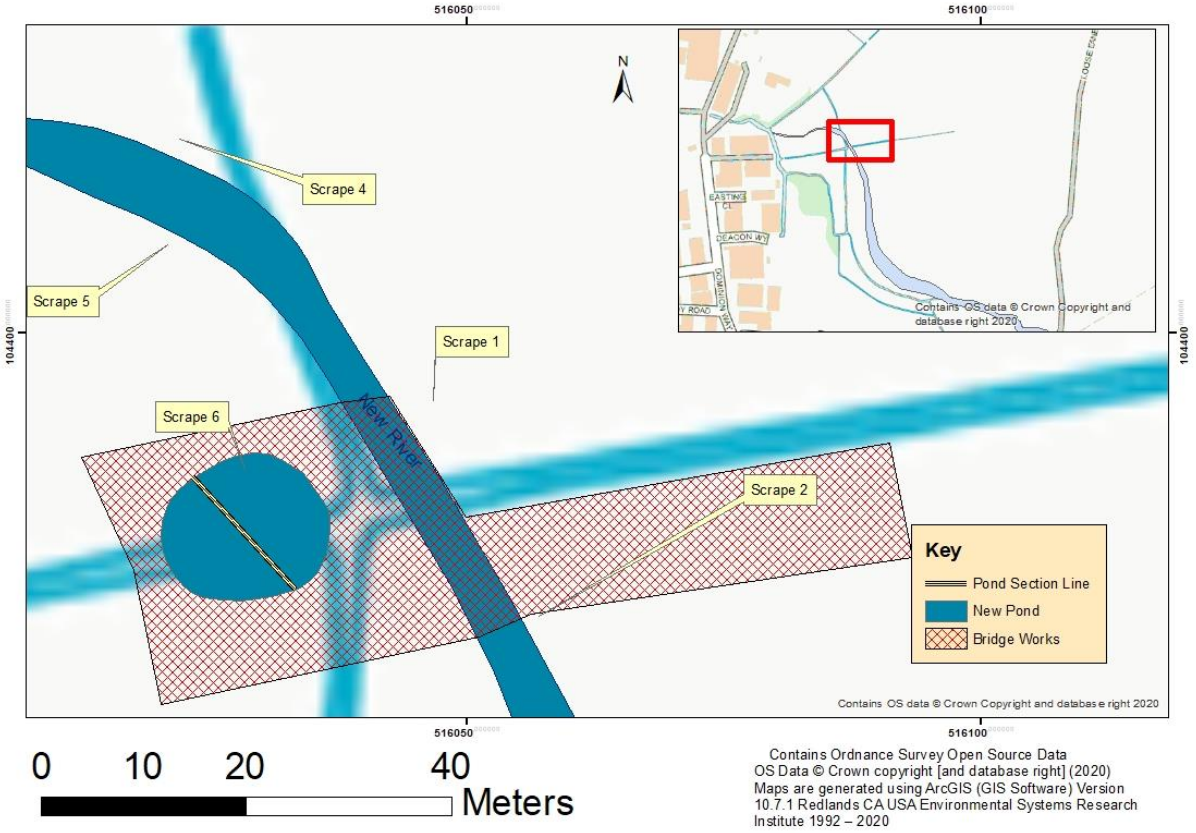


Figure 46 - Location of New Pond and Side Scrape 6

Figure 47 - Removing flints from SS6

The density of deposition shows the same pattern as the other scrapes (see Figure 48) with the main concentration of struck flints occurring between 1.2 and 1.8mOD.

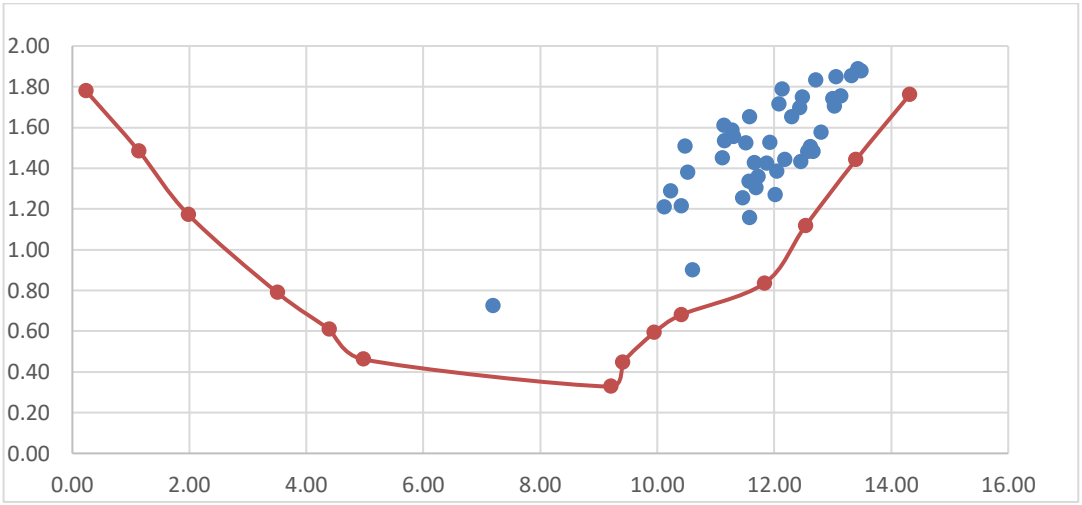


Figure 48 - SS6 Depth profile of Flints

6 THE FINDS

6.1 Other than Flint

Very few items other than flint were recovered from the investigations, but during an unstratified collection, a few interesting pieces emerged, including a large stone tool, - see Figure 49. This was identified by the Worthing Museum Archaeologist (Sainsbury, pers.comm) as a Worked Stone Pestle of the LN/EBA made from Volcanic Grit Stone Precambrian Igneous Diorite from the Charnwood Forest, Leics. The tool is well used and may have been a ritual deposition in a river or stream.

Figure 49 - Stone Tool

A Romano-British tegula tile fragment was also found on the edge of the new river cut but no further artefacts from this period were recovered.

Figure 50 - Romano-British Tegula Fragment

6.2 Flint Assemblage

6.2.1 Introduction:

Worked flint artefacts from the initial 2019 fieldwalks were individually recorded and those recovered from the 2020 investigations were recorded either by context, including grid or transect areas, or three-dimensionally as small finds.

The assemblage covers the Late Mesolithic period through to the Late Bronze Age, with the majority from the transition period of the Late Mesolithic/Early Neolithic. There is also a significant presence of Late Neolithic/Early Bronze Age flintwork but minimal evidence of Late Bronze Age material.

Full catalogues are available on request from WAS and only specific artefacts are mentioned and illustrated in the report.

6.2.2 Raw Material:

Apart from a single instance of chert from an unknown source recovered in 2019, the assemblage is comprised of moderately good to high-quality flint that varies in colour from light-grey or brown, mostly mottled with grey or white inclusions, to occasional pure black material. From the presence of rounded pebbles, cobbles and small nodules across the site and from recovered flintworking debris, it would appear that the main source of the material is derived from raised beach deposits. Other sources from chalk downland and 'clay-with-flint' deposits are less apparent.

There is evidence of patination, mostly a creamy mottled light-grey colour or light to dark-blue and sometimes a reddish brown but most of the flintwork has no patina. Some riverine staining is evident and there are occasional indications of water-rolling and burning.

The assemblage includes struck-flint as well as thermal flakes and miscellaneous natural pieces. The overall condition is good with minimal evidence of recent plough or other damage.

6.2.3 Analysis of the Assemblage:

A total of 2,189 flint artefacts were recovered from the two-year investigations of which 729 (33%) relate to 2019 and 1,460 (67%) to 2020.

For analysis purposes the flints have been classified as either debitage, representing waste material from flintworking, or as tool types. Tool typology has been used but in the case of flake debitage, some assumptions have been made based on the quality of the raw material, the size of the flake, the technology used in its manufacture and in some cases its association with other material from the same context.

To further aid analysis, each flint has tentatively been attributed, where possible, to the following time periods:

LM	Late Mesolithic
LM/EN	Late Mesolithic/Early Neolithic
EN	Early Neolithic
LN/EBA	Late Neolithic/Early Bronze Age
LBA	Late Bronze Age

Of the total assemblage of 2,189 flints, 1,500 (67%) are classified as debitage and 689 (33%) as tool types. Debitage from 2019 totals 387 and rises to 1,113 in 2020. Tools recovered in each year are almost the same, 342 in 2019 and 347 in 2020.

Figure 51 below shows the total assemblage attributed to period:

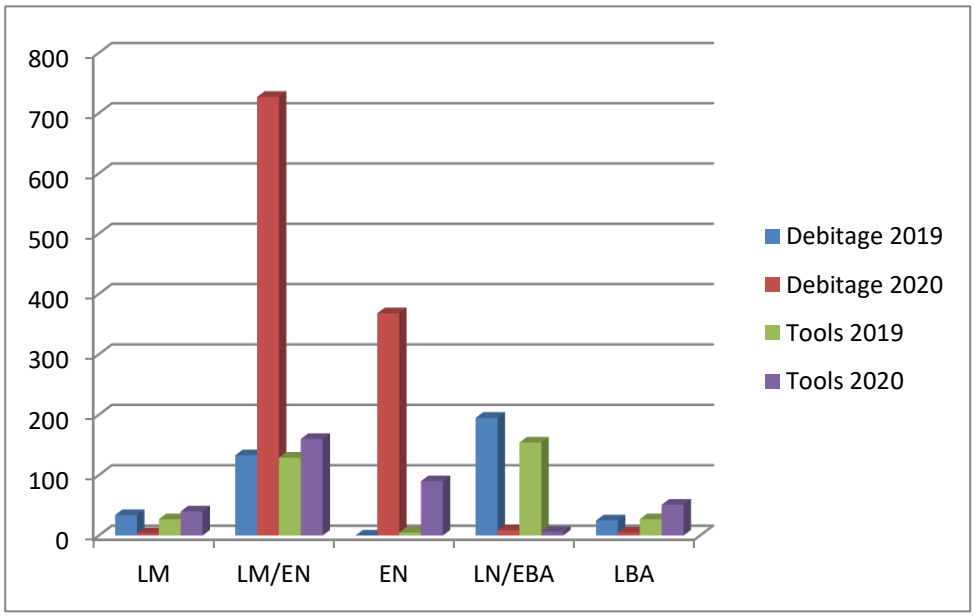


Figure 51 - Debitage/Tools All Years

As can be seen, the assemblage is dominated by flintwork from the Late Mesolithic through to the Early Neolithic with the majority recovered in 2020. There is also a significant presence of flintwork from the Late Neolithic/Early Bronze Age, mainly recovered in 2019, but overall Late Bronze Age material is minimal.

6.2.3.1 2019

Random flint samples were collected from informal fieldwalks over the Project area. Although the majority of the flints were recovered from the redeposited soil from the newly-cut river channel, some microliths were found along the exposed river banks. A further random flint collection was also recovered from an area along the north-east river bank, bordered to the east by a barley field, indicating a potential Mesolithic flintworking site.

The total 2019 assemblage is shown in Table 1:

Table 1 – 2019 Assemblage					
	Redeposited Area		**Flintworking Area**		
	Debitage	**Tools**	**Debitage**	**Tools**	**Total**
LM	32	24	2	3	**61**
LM/EN	109	102	23	26	**260**
EN	0	4	0	2	**6**
LN/EBA	192	153	4	1	**350**
LBA	25	24	0	3	**52**
Total	**358**	**307**	**29**	**35**	**729**

6.2.3.2 2020

Table 2 - 2020 Assemblage			
	Debitage	**Tools**	**Total**
LM	4	40	**44**
LM/EN	727	160	**887**
EN	368	90	**458**
LN/EBA	9	6	**15**
LBA	5	51	**56**
Total	**1113**	**347**	**1460**

Investigations in 2020 were concentrated on the potential flintworking site ahead of the construction of a foot-bridge nearby. These involved limited test pits, systematic artefact surveys along the river banks and random fieldwalks of the surrounding areas including revisits to the 2019 redeposited area.

Work was also carried out following the excavation of a new pond on the west bank including a sample collection from the pond bank and random collections from the excavated material and surrounding area. The total 2020 assemblage is shown in Table 2.

6.2.3.3 Test Pits:

Table 3 – Test Pit Assemblage			
	Debitage	**Tools**	**Total**
LM	1	18	**19**
LM/EN	148	17	**165**
EN	258	27	**285**
LN/EBA	8	4	**12**
LBA	3	14	**17**
Total	**418**	**80**	**498**

A total of nine 1m x 1m test pits were opened but only five were completely excavated. Flints recovered from topsoil and subsoil were recorded by context and those below the subsoil as small finds and 3-dimensionally recorded. Flints recovered from an auger survey in TP 09 are included in the total shown in Table3.

The presence of Bronze Age material recovered from within a dark clay deposit below the subsoil could indicate that recent disturbance of the soil may have occurred when the nearby east/west drainage or boundary ditch was excavated.

6.2.3.4 Side-scrapes of River & Pond Banks & Surrounding Areas:

Non-intrusive sampling methods were used to collect and record all flint artefacts from specific exposed areas of the river and pond banks. Each of the areas was designated with a 'side-scrape' number:

SS1 – Flintworking area (identified in 2019)
SS2 – East bank, west of Test Pits
SS3 – East bank, south of Test Pits
SS4 – East bank, north of SS1
SS5 – West bank, opposite SS4
SS6 – Pond transects

Total collection surveys using spits and grids were carried out on SS1, 2 and 3 and total 3-D recording on SS4, 5 and 6.

Unstratified flint samples were also collected from the river banks, outside of SS1-6 areas, including the pond area, the spoil created from its excavation and the barley field.

The 2019 unstratified fieldwalk material of 64 flints collected from the flintworking site, (now designated SS1) is included in Table 4:

Table 4 – Side Scrapes and Unstratified Assemblages					
	Debitage		**Tools**		**Total**
	SS1-6	**Unstrat.**	**SS1-6**	**Unstrat.**	
LM	2	2	15	10	**29**
LM/EN	339	195	44	78	**656**
EN	0	24	0	11	**35**
LN/EBA	1	4	1	1	**7**
LBA	1	1	2	12	**16**
Total	**343**	**226**	**62**	**112**	**743**

As can be seen from this sample of the flintworking area, there is clearly a dominance of material from the Late Mesolithic through to the Early Neolithic and minimal material from the later periods.

6.2.3.5 2019 and 2020 Redeposited Area:

The combined fieldwalking collections are shown in Table 5:

Table 5 – Fieldwalking Collections					
	2019	**2020**	**2019**	**2020**	
	Debitage		**Tools**		**Total**
LM	32	1	24	1	**58**
LM/EN	109	69	102	46	**326**
EN	0	85	4	54	**143**
LN/EBA	192	0	153	1	**346**
LBA	25	0	24	26	**75**
Total	**358**	**155**	**307**	**128**	**948**

It is interesting to note that there is little difference between the ratio of debitage to tools in both years, which is probably due in part to a bias towards tool collection, particularly from the random fieldwalks in 2019. However, the 2019 sample of combined debitage and tools indicates an emphasis towards Late Neolithic/Early Bronze Age activities that could suggest the majority of these may not have been undertaken in the immediate vicinity of the flintworking site.

6.2.4 Debitage

Waste material from flintworking, classified as debitage, totals 1,500 and accounts for 67% of the total assemblage, of which 987 flints relate to the flintworking area and 513 to the redeposited area, as shown in Table 6.

Table 6 – Debitage Types

	Flintworking Area							Redeposited Area					
	LM	LM/EN	EN	LN/EBA	LBA	Total		LM	LM/EN	EN	LN/EBA	LBA	Total
Arrowhead Blank											1		**1**
Blade		39	8			**47**		1	13	2			**16**
Blade frag.		37	5			**42**		1	14	9			**24**
Bladelet	2	23	3			**28**		3	4				**7**
Bladelet frag.	1	125	31			**157**		6	24				**30**
Burin spall		8				**8**			2				**2**
Microburin		1				**1**		1					**1**
Core	2	14	2		3	**21**		4	10	7	10		**31**
Core tablet		1				**1**		1					**1**
Core rejuvenation flake		6	2			**8**		4	13	1	2		**20**
Core frag.		29	9	2		**40**			9	8	2		**19**
Pressure flake		6	9			**15**							
Flake		393	213	11	2	**619**		12	89	58	177	25	**361**
Total	**5**	**682**	**282**	**13**	**5**	**987**		**33**	**178**	**85**	**192**	**25**	**513**

6.2.4.1 Cores:

The majority of the cores and fragments are Later Mesolithic/Early Neolithic single-platform or bi-polar cores with carefully prepared platforms, primarily for the removal of blades and bladelets, of which bladelets were the main components of microlith production.

Core tablets and other rejuvenation flakes indicate care in conserving good quality cores by creating new platforms after a platform becomes either exhausted or damaged as a result of knapping failures.

The quantity of abandoned small cores suggests, in some cases, these were worked until it was no longer possible to remove useable blades or bladelets but there is also evidence that some of the raw material, although plentiful, may not have been of sufficient size or quality to produce cores worth retaining. However, it is apparent that some discarded cores appear to be total knapping failures that could indicate the work of inexperienced flintworkers.

Poorly prepared multi-platform cores created from larger beach nodules with blade and flake removals are identified as Late Neolithic/Early Bronze Age, and again, in this period, there is evidence of knapping failures. A small number of reworked cores from earlier periods with obvious later crude flake removals are attributed to the Late Bronze Age.

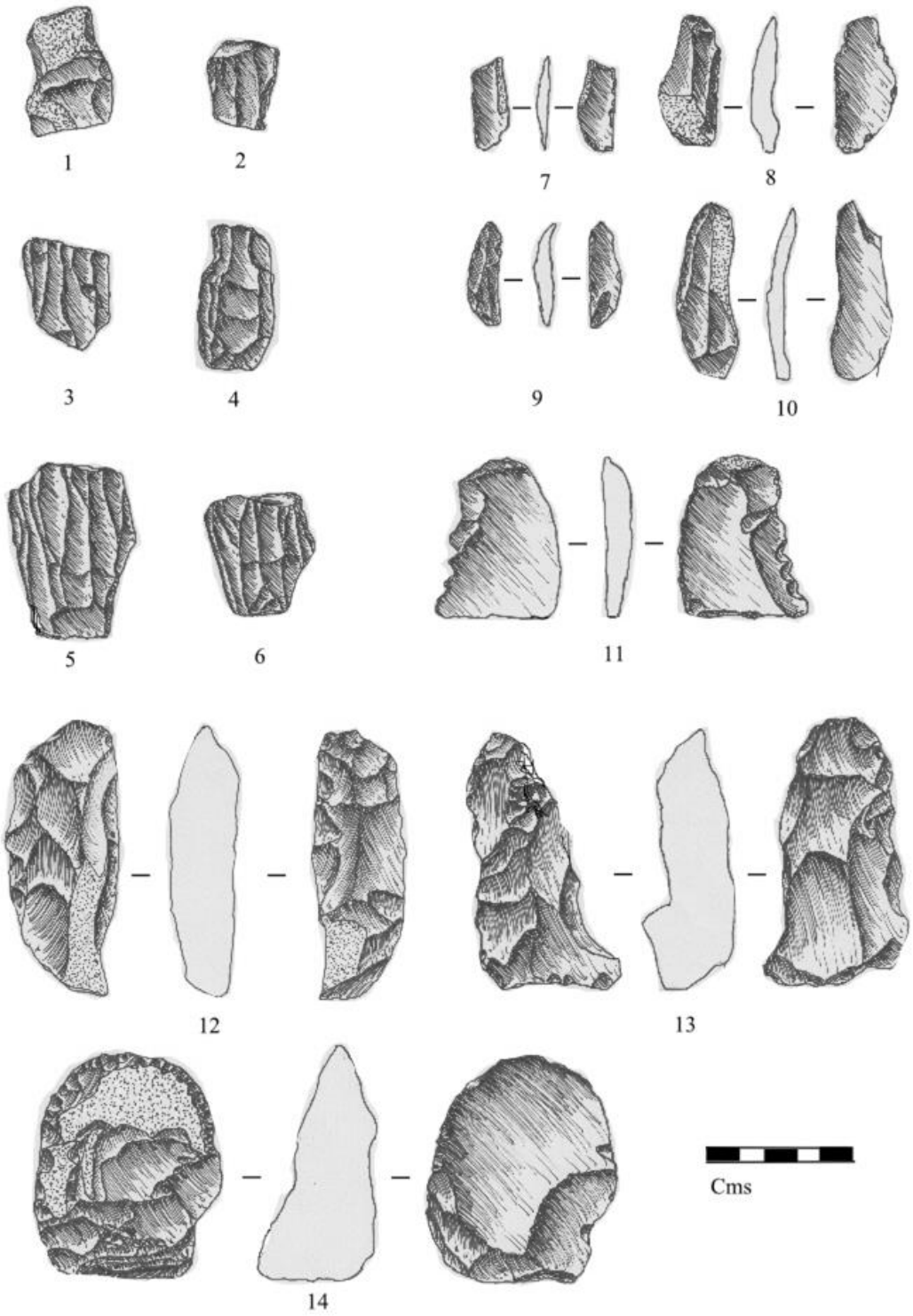


Fig 1 1-6: Cores 7&10: Knives 8&9: Combination 11: Denticulate
12: Tranchet Adze 13: Pick 14: Scraper

Figure 52 – Fig. 1 Struck Flint Illustrations

Cat. 1 - Context 1, M154 (2019) – size 46 x 40 mm **(*Fig.*1, 6)**
Dark-grey mottled, pyramidal-shape, single-platform bladelet core with high-quality finely-executed platform preparation and seven bladelet removals. Discarded following two hinge fractures. (Late Mesolithic)

Cat. 2 - Context 1, M151 (2019) – size 63 x 41mm
Dark-brown mottled with one large fossil inclusion, single-platform bladelet core with good preparation and five blade removals. The core is formed from a nodule fragment with evidence of staining and cortex remaining on opposite side. (Late Mesolithic/Early Neolithic)

Cat. 3 - Context 1, M152 (2019) – size 43 x 33 mm **(*Fig.*1, 3)**
Blue/black mottled, pyramidal-shape and patinated single-platform core with good preparation and well maintained with eight blade/bladelet removals. (Late Mesolithic/Early Neolithic)

Cat. 4 - SS4, Context 28, Grid 5, SF 7 (2020) – size 30 x 22 mm (***Fig*.1, 2)**
Light-grey mottled, pyramidal-shape and patinated single-platform bladelet core with high-quality preparation and careful maintenance. (Late Mesolithic/Early Neolithic)

Cat. 5 - Context 1(2020) – size 52 x 22 mm **(*Fig.*1, 4)**
Grey mottled and patinated, cylindrical-shape bi-polar blade/bladelet core with two removals but obvious knapping errors of hinge and step fractures. (Late Mesolithic/Early Neolithic)

Cat. 6 - Context 27 (2020) – size 53 x 43 mm
Dark-grey mottled, with large fossil inclusions and partially patinated bi-polar blade/bladelet core with platform preparation but hinge fractures and failed corrections would have resulted in abandonment. (Late Mesolithic/Early Neolithic)

Cat. 7 - Context 1 (2020) – size 70 x 48 mm **(*Fig.*1, 5)**
Grey mottled and patinated, single-platform blade and bladelet core with cortex remaining on opposite side. Platform preparation is apparent with seven removals but also obvious hinge and step fractures. (Late Mesolithic/Early Neolithic)

Cat. 8 – SS1, Unstratified, K003 (2019) – size 47 x 33 mm **(*Fig* 1, 1)**
Dark grey core formed from a small high-quality nodule fragment with some cortex remaining and evidence of blue patination. No platform preparation but good execution of six or seven small flake removals from several platforms. (Late Mesolithic/Early Neolithic)

Cat. 9 - Context 1, M149 (2019) – size 48 x 49 mm
Dark brown mottled, with large fossil inclusions, bi-polar blade core. Poorly prepared and executed with cortex remaining on one side. (Late Neolithic/Early Bronze Age)

Cat. 10 - Context 1, M155 (2019) – size 69 x 45 mm
Dark grey/brown mottled bi-polar flake and blade core. Poorly prepared and executed with cortex remaining on one side. (Late Neolithic/Early Bronze Age)

Cat. 11 - SS2, Context 7, Grid 3 – size 58 x 52 mm
Light grey mottled flake core with large removals from all directions. Evidence of reuse of an earlier period core is indicated by the remnants of platform preparation, a deliberately retained patch of cortex and a small area of patina. (Late Bronze Age)

6.2.4.2 Core Tablets:

Cat. 12 – Context 1, M159 (2019) – size 40 x 20 mm
Brown mottled rejuvenation flake with five bladelet removals. (Late Mesolithic)

Cat. 13 – Context 1 (2020) – size 50 x 38 mm
Light-grey mottled rejuvenation flake with three blade removals and evidence of a failed first attempt to remove the rejuvenation flake. (Late Mesolithic/Early Neolithic)

6.2.4.3 Blades:

Figure 53 - Core Correction Blades

All the blades and fragments are Late Mesolithic/Early Neolithic secondary or tertiary removals and include crested blades.

It is noticeable that there are a considerable number of struck blades to correct core knapping errors of step fractures and miss-hits. These may have resulted either from less than perfect raw material or poor flintworking technique.

6.2.4.4 Bladelets:

Microliths were the distinctive and versatile tool elements of the Mesolithic period and bladelets were the principal components of the manufacturing process. Almost all the bladelets recovered from the site are fragments, being waste material from this process. Of the intact bladelets, some appear to have been discarded as a result of knapping failures including notched miss-hits.

6.2.4.5 Microburins:

A microburin is the remaining butt end of a bladelet following notching and detachment of the microlith and regarded as waste material. Although there is some evidence of miss-hit notched fragments, only two microburins have been recovered. This could imply that the simple snapping technique of detaching microliths from bladelets was perhaps the preferred method of producing microliths. (Butler, 2005, 89)

6.2.4.6 Burin Spalls:

These are small and very narrow removals from blades to create dihedral or step burins.

6.2.4.7 Flakes:

As can be seen from Table 6, flakes account for most of the debitage, of which the majority are attributable to the Late Mesolithic/Early Neolithic, particularly from the flintworking area. As expected from a knapping site, there are a large number of mostly hard-hammer primary flakes from core reduction but equally there are many small soft-hammer secondary and tertiary flakes including a very small number of pressure flakes from tool manufacture.

A substantial number of Late Neolithic/Early Bronze Age flakes were recovered from the redeposited area, most being hard-hammer flakes, but there is also a significant number of soft-hammer flakes with platform preparation that could indicate specialist flintworking. The large and crudely knapped Late Bronze Age flakes are almost all from the redeposited area compared to only two from the flintworking area.

6.2.4.8 Arrowhead Blank:

This is a Levallois-type flake detached from a discoidal core to produce a blank for the manufacture of a barbed and tanged arrowhead, the distinctive type of the Early Bronze Age.

6.2.5 Tools:

Table 7 – Tool Types

	Flintworking Area							Redeposited Area					
	LM	**LM/EN**	**EN**	**LN/EBA**	**LBA**	**Total**		**LM**	**LM/EN**	**EN**	**LN/EBA**	**LBA**	**Total**
Arrowhead											1		1
Adze		1				1							
Adze frag.									1				1
Awl		1				1			1	1	1		3
Axe frag.										1			1
Blade Notched		1				1							
Blade Retouched		26	3		1	30			22	10	7	3	42
Blade Utilised		23				23		2	2	4	2		10
Bladelet Notched								1	6				7
Bladelet Ret. Micro	1					1							
Bladelet Retouched	1	5				6			12				12
Bladelet Utilised		4				4			3				3
Burin									1				1
Chopper												3	3
Combination		2	5			7			9	2	8		19
Denticulate Micro	1					1							
Denticulate		2				2					2		2
Fabricator											2		2
Flake Notch. Micro	1					1							
Flake Notched	2	6	3		2	13			4	1	5		10
Flake Ret. Micro	1					1							
Flake Chert Ret.											1		1
Flake Retouched		27	21	5	7	60			48	36	70	25	179
Flake Utilised		14	1		2	17			7	2	1	1	11
Hammerstone		3				3					1		1
Knife			2			2			16	1	26	1	44
Knife Backed	1	8	2			11			1				1
Microlith	31	1				32		16					16
Pick		4				4			3				3
Piece Retouched		3			13	16						10	10
Piece Utilised					1	1							
Piercer Micro	2					2		1	1				2
Piercer		3	1	1	1	6		1	2		8		11
Scraper Micro	1					1		4					4
Scraper	1	5			1	7			9		19	7	35
Total	**43**	**139**	**38**	**6**	**28**	**254**		**25**	**148**	**58**	**154**	**50**	**435**

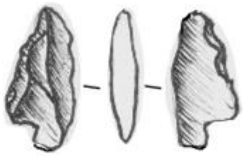
A total of 689 flints are identified as tool-types, representing 33% of the total assemblage, of which 254 relate to the flintworking area and 435 to the redeposited area. Flints with indications of 'use-wear' but no secondary working, are classified as tools and shown as 'utilised' flakes, blades or pieces. The summary of all tool types s shown in Table 7. Only some of the tools are described and illustrated.

6.2.5.1 Microliths:

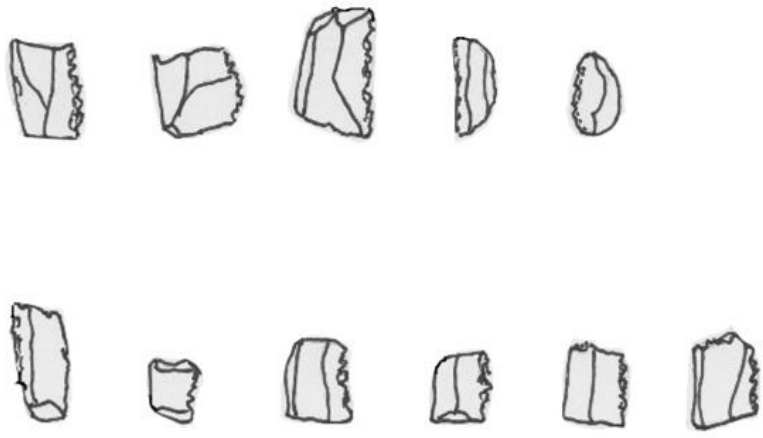
Microliths were produced in large quantities on Mesolithic sites and used to tip and create barbs for arrowshafts and other composite tools such as harpoons. (Butler, 2005, 88)

Of the 48 recovered, 32 were from the flintworking area but no obvious clusters were apparent. The flint varies from light-grey to brown with some instances of patination and occasional staining and water-rolling.

All are geometric forms, a classification developed by Jacobi (1978) for the Wealden Mesolithic flint assemblages based on Clark's (1934a) and discussed by Butler (2005, 89-96) and appear to indicate the Later Mesolithic period. They seem to be mostly rhomboid and trapezoid forms, although in this case it is difficult to distinguish between the two. Lunates (crescent-shape) are also present. It is evident that the majority have indications of use-wear, whilst others are damaged or broken suggesting either maintenance or knapping failures. Some examples are illustrated in Figure 54*.*



Barbed and Tanged Arrowhead - Sutton



Microliths - Geometric

Cms

6.2.5.2 Arrowhead:

This is a barbed-and-tanged (Sutton type) arrowhead associated with the Early Bronze Age.

Cat. 14 – Context 1, N061 (2019) – size 27 x 14 mm (*Fig*. 2)
Grey and water-rolled, deliberately vertically broken arrowhead formed from a small blank flake with remains of the bulb of percussion at the tip on the ventral side. No apparent invasive retouch on either side but retouch along the surviving lateral edge. The tang is formed by pressure flaking and also around the area of an indistinct barb. The vertical break is clean and runs at a slight angle from the tip to the base of the tang with an anvil scar on the ventral side above the tang. (Late Neolithic/Early Bronze Age)

Figure 54 – Fig 2. Illustration of Flint Arrowhead and microliths

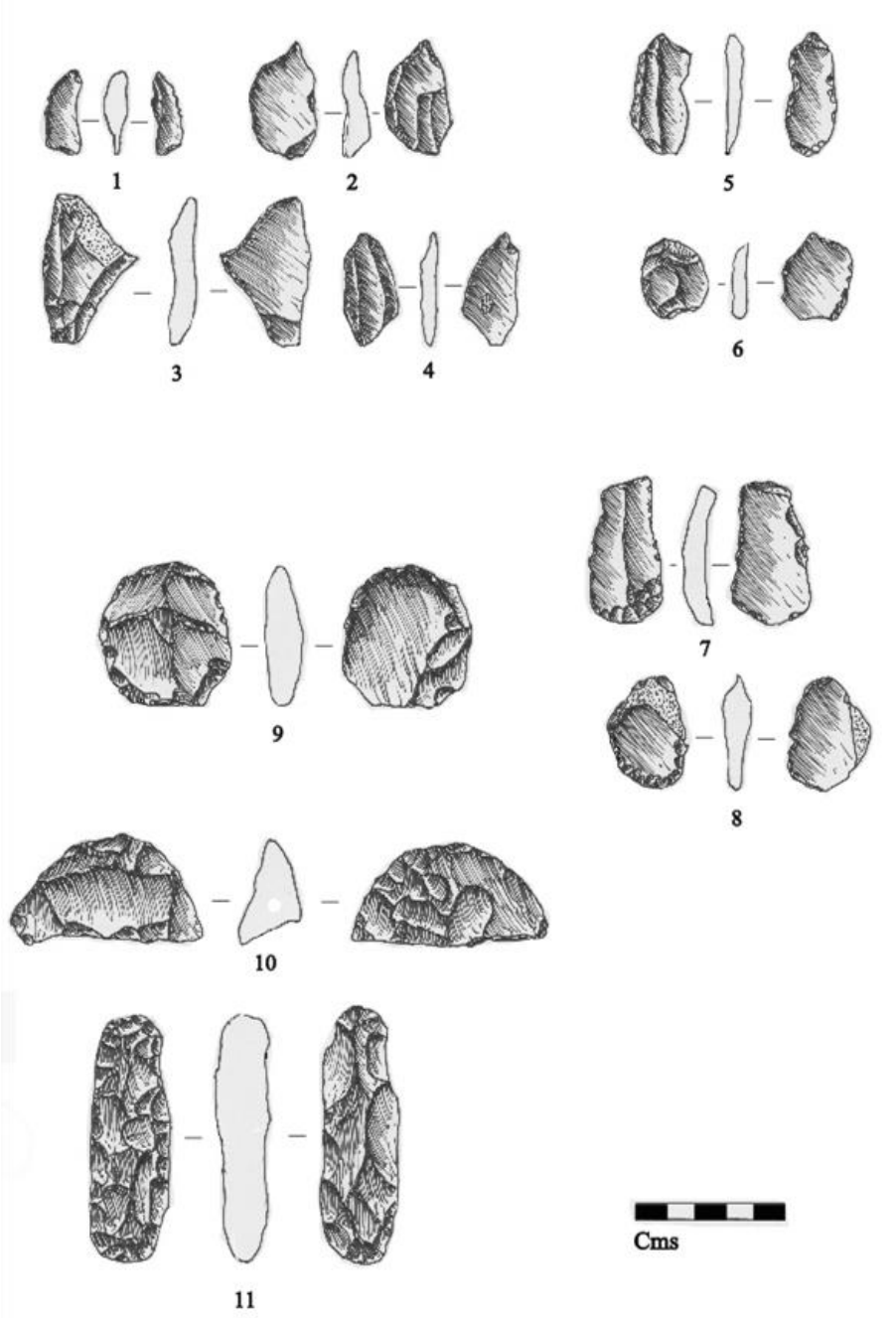


Fig 3 1: Awl 2&3: Piercers 4: Burin 5-9: Scrapers 10: Axe Fragment 11: Fabricator

Figure 55 - Fig. 3 Flint Tool Illustrations

6.2.5.3 Tranchet Adzes:

The tranchet adze is a core tool specific to the Mesolithic period and most likely a curated and hafted tool for woodworking purposes such as boat-building. (Butler, 2005, 101)

Cat. 15– Context 1, T1 (2020) – size 84 x 58 mm
Light-brown mottled distal fragment, triangular in profile with six small radial-flaked removals to resharpen a previous tranchet flake cutting edge. The lateral sides are well-worn probably by hafting that finally resulted in the proximal break. (Late Mesolithic/Early Neolithic)

Cat. 16 – SS6, Context 30, SF 216 (2020) – size 107 x 41 mm **(*Fig.*1, 12)**
Blue/grey mottled and patinated distal fragment, triangular in profile formed from a beach nodule with some cortex remaining. A tranchet flake was removed to create the cutting edge with minimal indication of use-wear. A break at the proximal end and an unsuccessful attempt to resharpen the cutting edge resulted in abandonment, (Late Mesolithic/Early Neolithic)

6.2.5.4 Picks:

A Mesolithic core tool that was probably hafted or handheld for digging or grubbing-out purposes. (Butler, 2005, 104)

Cat. 17– Context 31, T152 (2020) – size 107 x 53 mm **(*Fig.*1, 13)**
Grey/brown mottled and stained double-ended crudely made pick, triangular in profile and formed from a beach nodule with partial cortex remaining on one side. The main working end forms a worn point with the removal of a tranchet flake. A small protrusion to the side of the proximal end also forms a point with a tranchet removal. (Late Mesolithic/Early Neolithic)

Cat. 18– SS1, Context 6, Grid D (2020) – size 130 x 55 mm
Grey/brown mottled, and stained, roughly shaped pick, triangular in profile with a tranchet flake removal to form a well-worn point. Extensive cortex remains on opposite side. (Late Mesolithic/Early Neolithic)

Cat. 19 – L14, Context 2 (2020) – size 75 x 32 mm
Grey/brown mottled and stained, crudely made small pick, triangular in profile with a rounded, well-worn and bruised distal end and cortex remaining on the proximal end. (Late Mesolithic/Early Neolithic)

6.2.5.5 Axe:

The axe replaced the tranchet adze as the main core tool of the Neolithic period.

Cat. 20 – Context 1, N065 (2019) – size 33 x 65 mm **(*Fig.* 3, 10)**
Light-grey mottled flaked distal fragment with large fossil inclusions, glossy patination and significant use-wear. (Early Neolithic)

6.2.5.6 Fabricators:

Although the exact use of this type of tool is unclear, it is likely that one of its uses was for fine pressure-flaking and therefore a curated tool. (Turner, 2013, 57)

Cat. 21 – Context 1, N067 (2019) – size 66 x 25 mm **(*Fig.* 3, 11)**
Grey/brown mottled core reduction piece with a triangular profile and lateral blunted edges. Both ends are rounded, bruised and well-worn. (Late Neolithic/Early Bronze Age)

Cat. 22 – Context 1, M040 (2019) – size 80 x 29 mm
Light-brown mottled large blade with a truncated proximal end and retouched lateral blunted edges to form a small rounded and retouched point at the distal end with considerable use-wear. (Late Neolithic/Early Bronze Age)

6.2.5.7 Choppers:

Cat. 23 – Context 1, M01 (2019) – size 70 x 70 mm
Brown mottled large split beach pebble with cortex remaining over most of one side. The cutting edge is formed by five radial-flaked removals from one side and three on the other with indications of significant use-wear. (Late Bronze Age)

Cat. 24 – Context 1, T12 (2020) – size 117 x 60 mm
Grey mottled poor quality large beach pebble with fossil inclusions and most of the cortex removed. One end is crudely worked with large flake removals to create a cutting edge with considerable use-wear. (Late Bronze Age)

6.2.5.8 Burin:

A tool thought to be used for engraving or for the preparation of bone and wood using a groove and splinter technique. (Butler, 2005, 51)

Cat. 25 – Context 1, M091 (2019) – size 40 x 20 mm **(*Fig.* 3, 4)**
Grey/brown mottled distal blade fragment with a spall removed from the break to form a **dihedral burin**. (Late Mesolithic)

6.2.5.9 Denticulates:

Denticulates are saw-like tools with notched or serrated cutting edges.

Cat. 26 – O9, Context 16 (2020) – size 15 x 5 mm
Light-grey narrow distal bladelet fragment with one serrated lateral edge to form a **micro-denticulate** with indication of use-wear. (Late Mesolithic)

Cat. 27 – Context 32, T174 (2020) – size 56 x 26 mm
Blue/light-grey patinated blade with eight small worn notches along one lateral edge. (Late Mesolithic/Early Neolithic)

Cat. 28 – Context 1, N069 (2019) – size 60 x 50 mm **(*Fig.* 1, 11)**
Dark grey mottled large broken flake with four large notches along one lateral edge and abrupt retouch on opposing edge. (Late Neolithic/Early Bronze Age)

6.2.5.10 Awls and Piercers:

Awls have retouched points worked on alternate sides and piercers have retouched points worked on the same side.

Cat. 29 – Context 1, T4 (2020) – size 23 x 12 mm
Light-grey blade fragment with a retouched point on the distal end worked on alternate sides to form an **awl**. (Late Mesolithic/Early Neolithic)

Cat. 30 – SS1, Unstratified, KS040 (2019) – size 28 x 16 mm **(*Fig.* 3, 1)**
Grey/brown mottled twisted blade fragment with a large fossil inclusion and abrupt retouch along outer lateral edge and a retouched point on alternate sides to form an **awl** on the distal end. (Late Mesolithic/Early Neolithic)

Cat. 31 – SS1, Context 6, Grid D (2020) – size 14 x 11 mm
Dark grey mottled small distal flake fragment with some cortex remaining and a retouched small point on the same side to form a **micro-piercer**. (Late Mesolithic/Neolithic)

Cat. 32 – SS4, Grid 1, SF 49 (2020) – size 40 x 20 mm **(*Fig.* 3, 2)**
Grey mottled reused core correction flake with small bladelet removals and a hinge fracture on the dorsal side. One lateral edge has partial abrupt retouch and the point is retouched on one edge with the other unmodified to form a **piercer** (Late Mesolithic/Early Neolithic)

Cat. 33 – SS2 Context 7, Grid 1 (2020) – size 51 x 31 mm **(*Fig.* 3, 3)**
Brown mottled triangular-shape flake with some cortex remaining along one edge. The apex of the triangle forms a point with retouch on the same side to create a **piercer.** (Late Neolithic/Early Bronze Age)

6.2.5.11 Scrapers:

Most are end, nosed or micro-scrapers from the Late Mesolithic/Early Neolithic, button and side scrapers from the Late Neolithic/Early Bronze Age and large crudely made end/side or horned scrapers from the Late Bronze Age.

Cat. 34 – Context 32, T171 (2020) – size 24 x 23 mm **(*Fig.* 3, 6)**
Dark grey mottled small **micro-scraper** formed from a small flake with removals on the dorsal side and cortex remaining on the upper part of one edge to create a thumb hold. The opposing edge is partially retouched from a small notch mid-way along to almost the distal end. (Late Mesolithic)

Cat. 35 – Context 1, T7 (2020) – size 50 x 25 mm **(*Fig.* 3, 7)**
Grey mottled and patinated **end scraper** formed on a crested blade with abrupt retouch along one lateral edge and well-executed invasive retouch over half of the convex distal end with evidence of considerable use-wear. (Late Mesolithic/Early Neolithic)

Cat. 36, - Context 1, T6 (2020) – size 40 x 20 mm **(*Fig.* 3, 5)**
Black **nosed scraper** on a blade with abrupt retouch along one lateral edge and partial abrupt retouch on opposing edge and notch. The small 'nosed' distal end is invasively retouched with indication of use-wear. (Late Mesolithic/Early Neolithic)

Cat. 37 – Context 1, N068 (2019) – size 25 x 27 mm **(*Fig* 3, 8)**
Grey mottled **thumb-nail scraper** on a flake with some cortex remaining on dorsal side and almost continual retouch around the edge. A flake removal on the dorsal side creates a thumb hold. (Late Neolithic/Early Bronze Age)

Cat. 38 – Context 1, N064 (2019) – size 53 x 42 mm
Grey mottled **side scraper** on a large flake with considerable cortex remaining on the dorsal side, apart from one flake removal that creates a thumb hold, and retouch along most of curved edge. (Late Neolithic/Early Bronze Age)

Cat. 39 – Context 1, T8, (2020) – size 88 x 70 mm **(*Fig.* 1, 14)**
Grey/brown mottled end scraper on large split beach pebble. On the dorsal side some cortex remains and a partial removal of a large flake as a thumb hold. Almost 180^{o} of the working edge is crudely retouched with indication of heavy use-wear. (Late Bronze Age)

6.2.5.12 Knives:

The majority are 'simple' knives made from blades or flakes backed with cortex and unmodified cutting edges. There is a single example of a Late Neolithic/Early Bronze Age discoidal knife.

Cat. 40 – Context 24, T129 (2020) – size 35 x 14 mm **(*Fig.* 1, 7)**
Blue/light-grey patinated blade fragment partially backed with cortex along one lateral edge and an opposing unmodified but utilised cutting edge that forms a **backed knife**. (Late Mesolithic)

Cat. 41 – Context 32, T168 (2020) – size 65 x 21 mm **(*Fig.* 1, 10)**
Grey mottled blade backed with cortex along one lateral edge with an opposing unmodified but utilised cutting edge that extends from a small point mid-way along the edge to the thicker distal end to form a **backed knife.** A small area of slight wear is evident towards the proximal end below the point that corresponds with a similar area of wear on the backed cortex edge that could be interpreted as evidence of hafting. (Late Mesolithic/Early Neolithic)

Cat. 42 – Context 31, T158 (2020) – size 45 x 42 mm
Grey mottled distinctive banded 'D' shaped flake backed with cortex with an unmodified but utilised cutting edge to form a **backed knife**. (Late Mesolithic/Early Neolithic)

Cat. 43 – Context 1, M075 (2019) – size 40 x 25 mm
Dark-grey flake with cortex remaining on the dorsal side apart from one flake removal that acts as a thumb hold. One edge is retouched to form a **knife** with indications of use-wear. (Late Neolithic/Early Bronze Age)

Cat. 44 – Context 1, N066 (2019) – size 47 x 49 mm **(*Fig.* 3, 9)**
Light-brown mottled circular flake with an almost complete retouched cutting edge that creates a **discoidal knife** with extensive evidence of water-rolling. (Late Neolithic/Early Bronze Age)

6.2.5.13 Combination Tools:

Cat. 45 – Context 1, N070 (2019) – size 40 x 11 mm **(*Fig.* 1, 9)**
Brown mottled bladelet with a retouched point on alternate sides to form an **awl** at the distal end and a retouched rounded point worked on the same side at the proximal that forms a **piercer.** (Late Mesolithic/Early Neolithic)

Cat. 46 – Context 32, T181 (2020) – size 52 x 23 mm
Dark-grey mottled blade backed with cortex on one lateral edge and partially retouched opposing edge towards the distal end to form a **knife**. The distal point is retouched on the same side to create a **piercer**. (Early Neolithic)

Cat. 47 – Context 1, T103 (2020) – size 51 x 24 mm **(*Fig.*1, 8)**
Grey mottled blade with some cortex remaining on the dorsal side. The shorter of the two lateral edges is finely retouched to form a **knife** with indications of significant use-wear. The opposing lateral edge is partially abruptly retouched towards the proximal end with a finely worked retouched **notch** at the distal end. (Early Neolithic)

Cat. 48 – Context 1, M052 (2019) – size 42 x 42 mm
Black flake with partial cortex remaining along the distal end where the edge extends to form a flattened point worked on the same side to create a **piercer.** A large retouched **notch** extends from the base of the point along one side of the flake with partial abrupt retouch below. (Late Neolithic/Early Bronze Age)

6.2.5.14 Notched Blades and Flakes:

These are tools that were likely to have been used for preparing arrowshafts.

Cat. 49 – A19, Context 10, SF 41 (2020) – size 9 x 11 mm
Dark-grey small flake vertically broken fragment with a retouched notch at the distal that forms a **micro**-**notched flake**. (Late Mesolithic)

Cat. 50 – Context 1, T98 (2020) – size 24 x 12 mm
Light-grey mottled and patinated mid-bladelet section with a retouched notch along one lateral edge to form a **notched bladelet**. (Late Mesolithic/Early Neolithic)

Cat. 51 – Context 32, T173 (2020) – size 55 x 23 mm
Light-grey mottled blade with a broken distal end and a retouched notch below the break to create a **notched blade**. (Late Mesolithic/Early Neolithic)

Cat. 52 – L14, Context 2 (2020) – size 36 x 21
Light-grey mottled flake with patination on the dorsal side and a notch that cuts through the patination on one edge to form a **notched flake**. (Early Neolithic)

6.2.5.15 Hammerstones:

Cat. 53 – SS1, Unstratified, K030 (2019) – size 60 x 60 mm
White small spherical probably impregnated fossil totally covered with a cortical chalky deposit. Bruising is apparent over half of its surface. (Late Mesolithic/Early Neolithic)

Cat. 54 – SS2, Context 7, Grid 10 (2020) – size 67 x 61 mm
Grey mottled broken beach pebble with most of the cortex remaining apart from the working end that exhibits significant bruising and crushing. (Late Mesolithic/Early Neolithic)

Cat. 55 – Context 1, M014 (2019) – size 61 x 35 mm
Dark-grey mottled reused Late Mesolithic/Early Neolithic discarded probable single-platform core with significant bruising and crushing at one end. A small area of cortex remains as a probable thumb hold. (Late Neolithic/Early Bronze Age)

6.2.5.16 Retouched and Utilised Blades, Bladelets, Flakes and Pieces:

Together these tools form the largest category and account for 62% of the total tool assemblage.
The majority of the blades and bladelets are retouched along one lateral edge and others with unmodified but utilised edges could all be regarded as probable cutting tools. The specific function of some of the retouched and utilised flakes and pieces is unknown but generally, it could be assumed these were similarly used as cutting tools.

Table 8 below indicates the areas where they were found and attributed to the various periods:

Table 8 – Retouched blades/bladelets and Utilised Flakes

	Flintworking Area							**Redeposited Area**					
	LM	**LM/EN**	**EN**	**LN/EBA**	**LBA**	**Total**		**LM**	**LM/EN**	**EN**	**LN/EBA**	**LBA**	**Total**
Blade Retouched		26	3		1	**30**			22	10	7	3	**42**
Blade Utilised		23				**23**		2	2	4	2		**10**
Bladelet Ret. Micro	1					**1**							
Bladelet Retouched	1	5				**6**			12				**12**
Bladelet Utilised		4				**4**			3				**3**
Flake Ret. Micro	1					**1**							
Flake Chert Ret.											1		**1**
Flake Retouched		27	21	5	7	**60**			48	36	70	25	**179**
Flake Utilised		14	1		2	**17**			7	2	1	1	**11**
Piece Retouched		3			13	**16**						10	**10**
Piece Utilised					1	**1**							
	3	**102**	**25**	**5**	**24**	**159**		**2**	**94**	**52**	**81**	**39**	**268**

It is apparent that almost all of the Late Neolithic/Early Bronze Age retouched flakes were recovered from the redeposited area.

6.2.6 Discussion of Flint Assemblage:

The assemblage from the two-year investigations indicates activities over a considerable period of time from the Late Mesolithic to the Late Bronze Age with the main focus of flintworking activity during the long transition period of the Late Mesolithic/Early Neolithic.

The Late Mesolithic was a period of rapidly rising sea levels to the extent that Britain became a series of islands. In Sussex low-lying land was subject to inundations and erosion so that the Mesolithic coastline is now long-vanished beneath the sea four or five kilometres from the present coastline, (Holgate, 2003, 35-36). This was therefore not a coastal site but with evidence of water-rolling and staining of some of the material, the site was probably located near water. Indications are that this may have been along a tributary of a braided river system that spread out over the floodplain at the foot of the Downs forming marshland with ponds and lakes and at times may have become estuarine saltmarsh. Such an area would provide an abundant food source of game, fowl and fish and with a plentiful supply of raw material for flintworking from eroding raised beach deposits, this must have been an attractive place for hunter-gatherers.

The raw material varies in quality from high-quality black to reasonable grey/brown flint containing varying amounts of fossil and other inclusions. This may indicate selection was not a critical factor, as a plentiful supply of material meant core failures could readily be discarded. Other sources of material from nearby chalk downland and clay-with-flint deposits appear to indicate this material was probably carried to the site in the form of cores and finished tools.

It is apparent that some discarded blade and bladelet cores were carefully maintained and skillfully worked for microlith manufacture until too small in size for further use. Only cores and bladelets thought to be of sufficient standard for this purpose would have been retained and curated for later use.

It is expected on a flintworking site to find some debitage indicating knapping failures such as hinge and step fractures and miss-hits but in this case, there are numerous examples that cannot simply be the result of poor material. Perhaps another explanation for the apparent diversity in knapping techniques might be the involvement of members within small family groups with inexperienced knapping ability. The fact that there is little indication of ‘overshoot’ blades caused by overstriking by relatively strong but inexperienced knappers and also the recovery of a core too small for any useful tool production with evidence of several attempts at flake removal (Cat. 8, Fig.) might suggest that children were among the novice knappers.

All the microliths recovered are geometric forms associated with the Late Mesolithic period, of which the majority show signs of use-wear and damage. Maintenance of hunting equipment required constant replenishment of worn and damaged microliths but it is also evident that some damage may have occurred during the removal and replacement process.

The toolkit of a hunter-gatherer at this time was quite extensive. Some tools seem to be curated items, such as the tranchet adze, fabricator, burin, knife, scraper and occasionally, hammerstones, but discarded when damaged or worn beyond resharpening and new tools created. Other tools were probably produced as they were needed when raw material was readily available.

There are types of tools likely to have been hafted, particularly the tranchet adze and perhaps the pick but there is some evidence for a hafted backed knife (Cat. 41)

Although the tranchet adze is a woodworking tool, it is possible that the two adze fragments and the picks may have been used to dig out flint from the raised beach deposits similar to the

use suggested by Butler (2001a, 2005, l17) for flint extraction from a clay-with-flints procurement site at West Hill, Pycombe, West Sussex.

Evidence for specific Early Neolithic tools is sparse which may indicate some were curated items. Apart from a single axe fragment (Cat. 20), the primary tool of the Neolithic period that replaced the tranchet adze, there are some tool types that could be Early Neolithic, i.e. backed knives, combination tools and retouched blades and flakes. However, with the absence of any leaf-shaped arrowheads, the distinctive arrowhead of the period that replaced the microlith, it is apparent the majority of the assemblage relates to the latter part of the Late Mesolithic/Early Neolithic; a transition period of gradual change from the nomadic existence of hunter-gatherers towards a more sedentary way of life and the beginnings of farming.

Nearly all of the Late Neolithic/Early Bronze Age material was recovered from the redeposited area and very little from the flintworking area. Debitage includes cores and flakes indicating manufacture of tools for butchery and processing following perhaps hunting events, such as knives and cutting tools as well as scrapers and piercers.

Flintwork generally is difficult to separate between the two periods but there is a notable absence of Late Neolithic arrowheads. With the introduction of metal in the Early Bronze Age, there is evidence of more specialist flintwork associated with that period, notably a barbed-and tanged arrowhead (Cat. 14), an arrowhead blank, fabricators and thumb-nail scrapers. It is significant that the arrowhead was deliberately broken in a way that could not occur from normal impact use and then deposited in water which suggests a votive offering.

It is apparent there is significantly less flintwork from the Late Bronze Age. This was a time when the use of flint, and therefore knapping technology, was diminishing with the wider use of metal for tool manufacture. Flint tools were therefore expedient and crudely made noticeably from scavenged flint from early periods or naturally shaped pieces. A few tool types are evident mainly choppers, scrapers, piercers and various cutting tools of retouched flakes and blades, all of which suggests use for animal butchery and processing.

7 CONCLUSIONS

The area of excavation would have been tidal marshland around 1067AD but the flints recovered indicate an assemblage primarily from the late Mesolithic/Early Neolithic with some later additions in the Bronze Age.

A Marine Aggregate Sustainability Fund Report (MALSF, 2010) suggests that the sea level approached the modern position through the Bronze Age (p.126). MALSF (2010) estimate the change in sea level rise during the Mesolithic from -40mOD at c.8500 cal BC to -5m at the Early Neolithic (c.4000 cal BC) and that "*oak and yew trees with an understorey of alder and willow were growing on a peaty land surface beside a palaeochannel at c.1 mOD in the Neolithic (4431 ± 70 BP and 3735 ± 60 BP)* at Langstone harbour by the Isle of Wight.

A sea level of -5mOD for the dating assigned to the LM/EN flints would place the coastline about 2km further from the current tidal boundary.

A profile (see Figure) of the modern elevations across the old innings shows where the current east-west drainage streams and ditches cross the surface. Within the innings, the land surface could have been lower in the LM/EN area - see Figure 57 which shows a possible land surface in this inner basin.

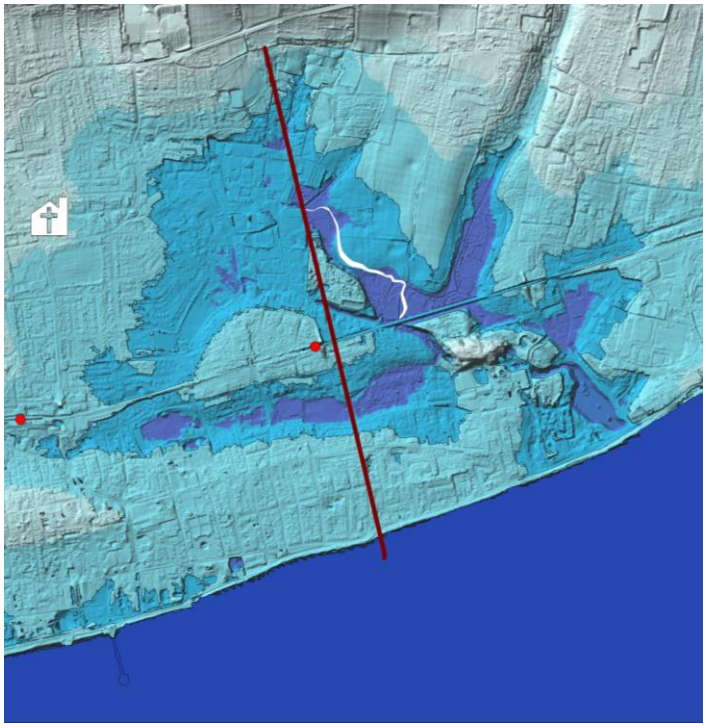


Figure 56 - Profile line across the Broadwater Innings

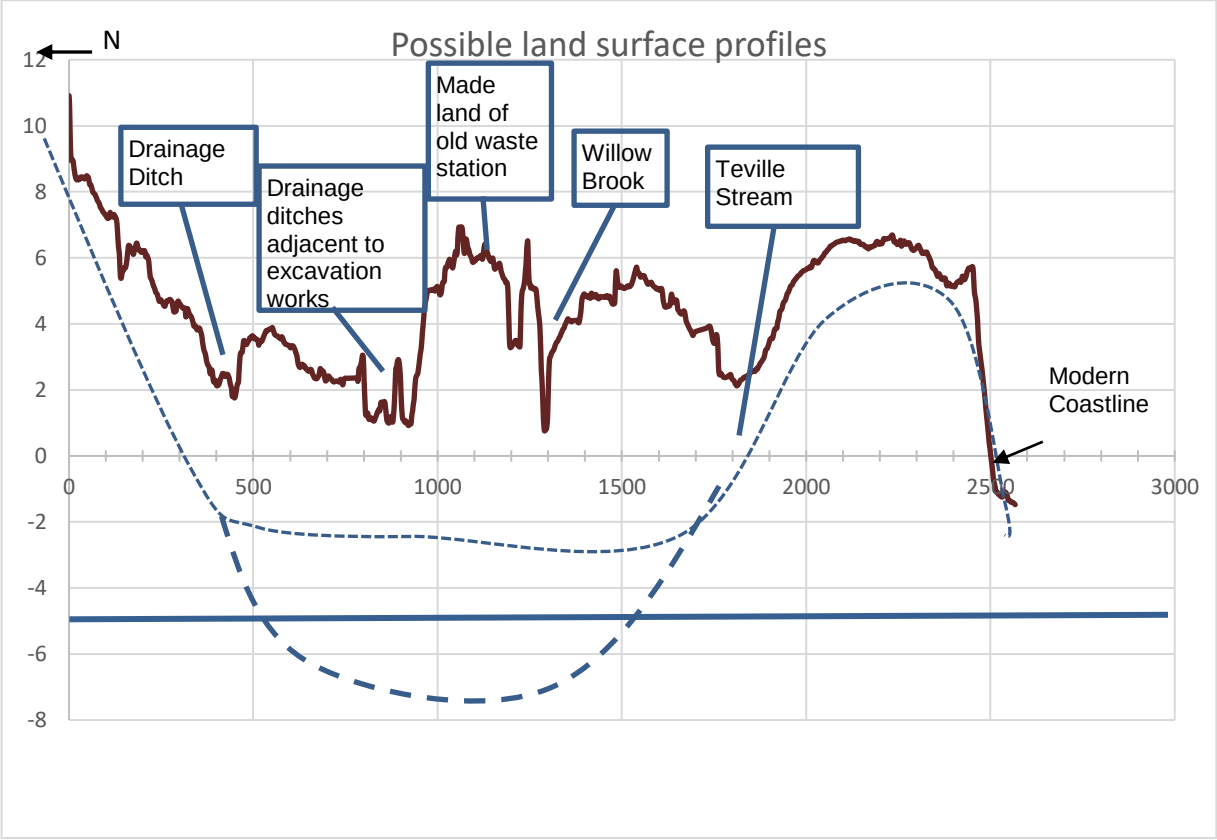


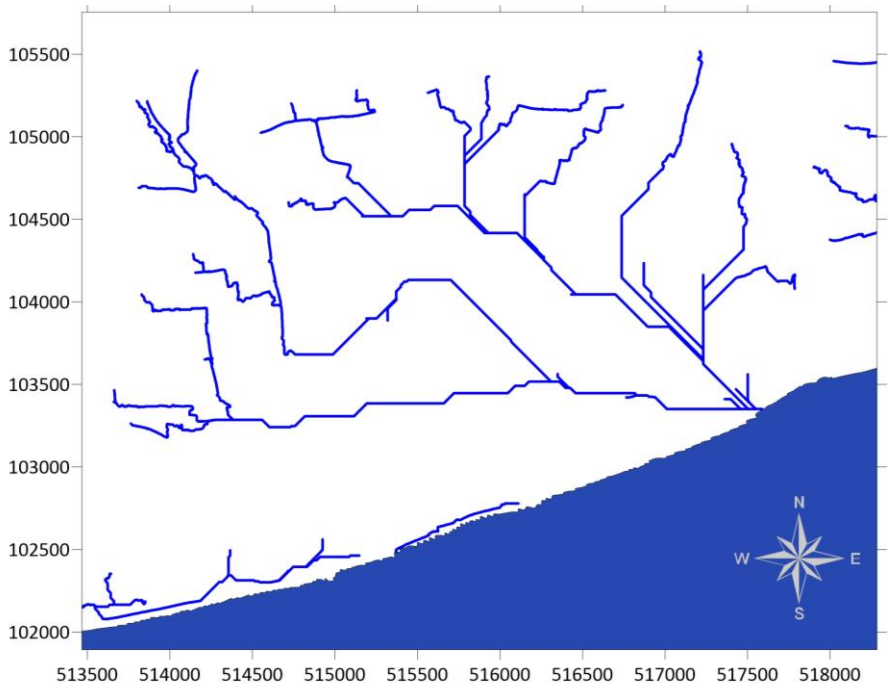
Figure 57 - Possible Land Surfaces

-5mOD

1067AD Possible ground surface

LM/EN Possible ground surface

Modern ground surface



While Figure 58 shows the current watershed pattern for the current terrain, the run-off from the Findon valley area and the South Downs north of the innings would still need to drain to the coast when the sea levels were lower.

Figure 58 - Watershed model of current terrain

This suggests the innings would be an area of land crossed by streams. Borehole records (See Append B - BGS, 2021) from the development of the industrial estate abutting the area of excavation, suggest the innings was silting up when the sea level was lower than the present.

The flints recovered from both test pits and side scrapes appear to come from a depth of 1.2 to 1.8mOD with some Bronze Age flint below the LM/EN flints. This suggests some disturbance to the original deposition of the flints. The Yeakell and Gardner map of the late 18th C (YKG, 1778) shows a number of straight-line ditches as field boundaries and the flints recovered at the 1.2/1.8mOD depths may have been deposited when ditches were cut after the major infill of the area after the dam was constructed at Lancing in the late 16th C.

Another possible event for redeposition of the flint was the flood of 1826 when the sea wall at east Worthing was breached and the lower-lying areas adjacent to the streams were flooded (Kerridge and Standing, 1963). Following this event, a road with sea defences was proposed and the map showing the proposed road, indicating the area of flooding (WSROe, 1826). The area of excavation was well within the area of flooding which extended almost to West Street in Sompting.

It is evident that these investigations have only sampled a small area of what seems to be an extensive flintworking site associated with this transition period for the production of cores and tools required for maintenance and replacement of hunting toolkits. There is also some evidence for family involvement in such activities that suggests visits by small family groups over a considerable period of time.

The transition period from the nomadic existence of the Late Mesolithic hunter-gatherers towards a more settled one of Neolithic farmers may have developed from seasonal camps, arrived at perhaps by log-boat along waterways or by foot, to exploit local resources. (Holgate, 2003). It therefore seems probable that such a seasonal camp might have been located somewhere in this area near to raised beach deposits and the flintworking site.

By the Late Neolithic/ Early Bronze Age small farming settlements would have been established with cultivation and domesticated animals but hunting may have been necessary at times to supplement food supplies. There is no evidence of a permanent settlement in the immediate area but butchery and processing tools are evident that may indicate hunting

activities and perhaps meeting places for processing animals. Likewise, the Late Bronze Age tools could similarly be associated with such activities.

Investigations by the Society to the north of the site in Sompting Village may shed further light on prehistoric activities in the wider area that might indicate seasonal camps or farming settlements.

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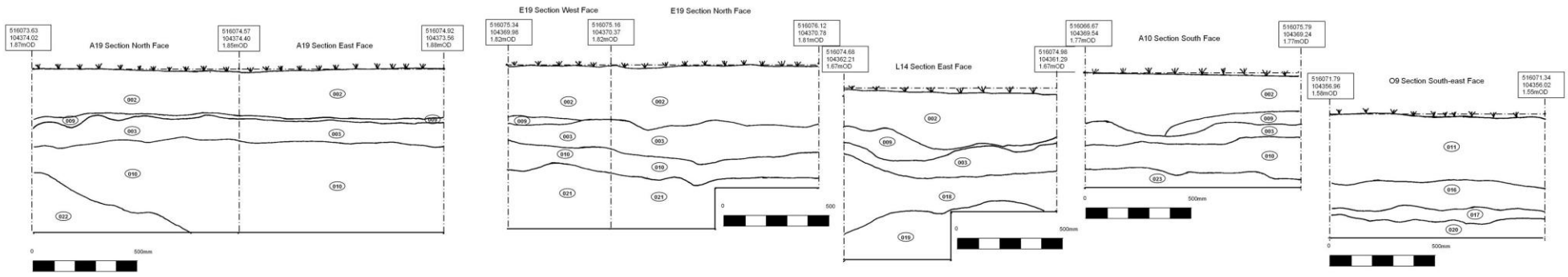
Appendix A – Test Pit Comparison



Appendix B - Borehole TQ10SE 74and 75

	Borehole No.	Log TQ 10 SE/74	Depth (m)	Water table	Cohesion kN/m²	Angle of friction	N blows per 0·3m	Type of foundation	Remarks
[1589 0404]	1809		G.L.						1·72 O.D. 2/3/78
		Made ground	0·90						
		Grey/brown mottled silty clay with root fibres	1·50						
		Soft grey-blue organic silty clay with plant remains and shell fragments in the upper levels frequent flints below 3·10 m.	2·50	W.S.					Medium intake
			3·20				4		
		Firm grey/brown mottled silty clay with clusters of selenite crystals	3·30						
		Black shaley lignite	5·30	W.S.			120		Fast water intake.
		Firm black-grey silty clay with fragments of lignite becoming lighter grey and with brown mottling at depth	5·90						
		Stiff brown/blue mottled silty clay with pockets of discoloured chalk particles	8·10						
			12·00						
[1588 0409]	1810	TQ 10 SE/75	G.L.	S.W.					1·31 O.D. 3/3/78
		Grass and topsoil	0·10						
		Silty clay	1·10	W.S.					Medium intake
		Soft grey blue organic silty clay with shell fragments and with frequent flints below 3·5 m.	1·60						
			4·00				6		
		Black shaley lignite	4·40	W.S.					Fast intake
			4·50				190		
		Dark grey silty clay with fragments of lignite becoming lighter grey and with brown mottling at depth	5·00						
			7·00						
		Stiff brown/blue mottled silty clay with pockets of discoloured chalk fragments	9·70	W.S.					Fast intake
		Stiff cream-grey chalky clay with large chalk fragments and flints	10·00						