



Par Moor to Sandy River Geotechnical
Ground Investigations (Group 4), Cornwall
Archaeological Watching Brief
Cornwall Archaeological Unit

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The Project Manager was Sean Taylor.

The views and recommendations expressed in this report are those of Cornwall Archaeological Unit and are presented in good faith on the basis of professional judgement and on information currently available.

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Cover illustration:

Test pit 18

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Contents

Summary	1
1 Introduction	3
1.1 Project background	3
1.2 Aims	3
1.3 Methods	3
1.3.1 Fieldwork	3
1.3.2 Post-fieldwork	4
2 Location and setting	4
3 Site history	4
4 Archaeological results	7
4.1 Trial pits	7
5 Conclusions/recommendations	13
6 References	14
6.1 Primary sources	14
6.2 Publications	14
6.3 Websites	15
7 Project archive	15
Appendix 1: Test pit logs	16
Appendix 2: Finds inventory	30

List of Figures

Fig 1 Location map (showing Test pit positions).

Fig 2 Extract from Gascoyne's map of 1690.

Fig 3 Chimney stack near TP3.

Fig 4 TP4 post-excavation.

Fig 5 Boundary stone near TP4.

Fig 6 TP10 South facing section.

Fig 7 laminated silt and sand from (1306).

Fig 8 South facing section TP19.

Abbreviations

CAU	Cornwall Archaeological Unit
CBM	Ceramic building material
CIfA	Chartered Institute for Archaeologists
CRO	Cornwall Record Office
GI	Ground Investigation
HER	Cornwall and the Isles of Scilly Historic Environment Record
MCO	Monument number in Cornwall HER
NGR	National Grid Reference
OD	Ordnance Datum – height above mean sea level at Newlyn
OS	Ordnance Survey
WHS	World Heritage Site

Summary

A programme of test pitting, core drilling and grab sampling was undertaken along the course of the now heavily engineered Sandy River as it runs through the eastern side of St Austell, across Par Moor, and enters the sea west of Par Harbour. The work is intended to inform the design of flood alleviation measures in the vicinity. Archaeological recording of the test pitting was required and a WSI was prepared by Mott MacDonald on behalf of the Environment Agency. Cornwall Archaeological Unit (CAU) was appointed to undertake an archaeological watching brief guided by this WSI during the works programme and to produce a report on its findings. The fieldwork for this group of trial pits and sampling (group 4) was undertaken in April-May 2017.

The study area is an area which would once have been one with a long-term pattern of continuous occupation dating back to the Bronze Age as well as a more recent industrial history relating mostly to mining and china clay working. This industrial activity has impacted severely upon the current appearance of the area, especially with regards to its watercourses, all of which appear to have undergone substantial engineered alterations to alleviate flooding in the area.

Twenty-one machine and hand-dug trial pits were excavated along the course of the river and the nature and depths of natural and anthropogenic deposits were noted. The results of the watching brief give an insight into the history of the silting up of the river valley largely caused by china clay waste flowing down it. No archaeological deposits or features were found and no peat horizons were noted although several horizons of alluvially deposited china clay waste were identified.

Significant silting up has occurred as a result of the china clay industry from the mid-18th century to the middle of the 20th century as a result of industrial processes in the river catchment, especially around Par Moor. Everything above this deep rich mica silt and sand deposit will date from the 20th century onwards and be associated with the more modern settlements of St. Austell, Holmbush, Par Moor and Par and their development over the last 100 years. As the industrial activity in this area is of great historical interest, some of it lying within the Cornwall and West Devon Mining World Heritage Site (WHS), any potential remains would be of significance.



Fig 1 Location map (showing Test pit positions).

1 Introduction

1.1 Project background

Cornwall Archaeological Unit (CAU) was commissioned by Mott MacDonald, on behalf of the Environment Agency, to undertake a watching brief during a programme of Ground Investigations (GIs) that formed part of an appraisal of flood alleviation measures along the course of the Sandy River, which flows from Carclaze on the eastern edge of St Austell, along the western end of Par Moor, and into the sea through mine workings at Shorthorn Beach. Archaeological recording of the GIs was required and a WSI was prepared by Mott MacDonald on behalf of the Environment Agency (Everett 2017). CAU was appointed to undertake an archaeological watching brief guided by this WSI during the works programme and to produce a report on its findings. The fieldwork was undertaken in April-May 2017.

1.2 Aims

The principal aim of the watching brief was to monitor all trial pits as they were excavated, and to record and assess borehole samples and logs. This is laid out in detail in the Risk Assessment and Method Statement for this work (Sharpe 2017).

The project objectives were as follows:

- To make note of and record soil horizons and archaeological features.
- To assess the potential for deposits containing potential for palaeoenvironmental analysis.

1.3 Methods

1.3.1 Fieldwork

Test pitting

The excavation of test pits was carried out using mechanical excavators (16 sites), or by hand (5 sites) and were archaeologically monitored by CAU. The locations of the pits stretched from the Sandy Valley to the south of Carclaze, St Austell, to Par Moor, west of Par Docks (Fig 1).

The controlled removal of topsoil and subsoil on the mechanically-excavated pits was carried out by a machine equipped with a toothless ditching bucket to a target depth of 3m. In the case of the hand-dug trenches (6, 9, 13, 19 and 21) the work was undertaken by hand to a target depth of 1.2m.

The soil was stripped cleanly to a level at which archaeological features or layers were revealed or the natural substrate, as appropriate. Excavation down to this level was directed by both CAU from an archaeological point of view and by the client-appointed geotechnical engineer for geotechnical and environmental sampling. Care was taken during the excavation to ensure that identifiable or potential archaeological features were exposed to a sufficient extent to enable identification and recording but leaving them undamaged. The stripped horizon was then hand-cleaned and a trench plan prepared. Spoil tips were also examined for artefacts by eye.

Following the controlled excavation of each test pit the site archaeologist decided on the appropriate sampling and recording strategy for any exposed archaeological remains.

Excavation/recording

All recording work was undertaken according to the Chartered Institute for Archaeologists (CIfA) *Standards and Guidance for an Archaeological Watching Brief* (2014). CIfA is the professional body for archaeologists working in the UK.

All archaeological features and deposits were hand cleaned, excavated and recorded in accordance with the procedures set out in the WSI (Everett 2017).

1.3.2 Post-fieldwork

Creation of site archive

This included:

- Archiving of photographs to Historic England's standards (2015) and copies of images made available to the client.
- Preparation of finished drawings;
- Completion of the Historic England/ADS OASIS online archive index.

2 Location and setting

Par Moor is located to the east of St Austell, Cornwall. The areas of GI works are situated on the east side of St Austell, from Carclaze at the north end (at SX 02780 53176), running south east through, Boscoppa, Holmbush, the western edge of St Blazey Gate, and Par Moor (to SX 07278 52625).

The area of GI works generally slopes from north west to south east to a line roughly adjacent to the A390, where the ground level starts to rise again towards the south east. The Sandy River, runs south eastward down the slope from Carclaze through Boscoppa and Sandy Bottom and then turns north east at Holmbush along the line of the A390, then east through Cuddra to Par Moor, where it enters mine workings before discharging at Shorthorn Beach, Carlyon Bay. Smaller streams drain Par Moor to the east of this, along the former route of the Sandy River, discharging into the sea through mine workings to the west of Spit Beach. Prior to the construction of Par Harbour in 1828-40 the Sandy River flowed into the sea at the site of the harbour and Par Moor represents a silted up tidal creek, shown on Gascoyne's map of 1699 to the north-west of Porth Point (Fig 2).

The north-western area of GI works is located over bedrock of the Meadfoot Group – Hornfelsed Slate and Hornfelsed Sandstone. The south-eastern coastal area of the GI works is located over bedrock of the Meadfoot Group described as Slate, Siltstone, and Sandstone. The superficial geology of the GI works comprises Holocene alluvial deposits along the central line of the project area (Everett 2017).

Running throughout this area are various engineered watercourses and drainage channels. Whilst most of these watercourses represent original waterways, they have been heavily modified since the post-medieval period to accommodate industrial activity, urban development and to alleviate flooding in the area. Many of the GIs were conducted within the silted-up Sandy River estuary whose superficial geology comprising largely alluvial silt and sand deposits with the potential for peat horizons.

3 Site history

The site lies within the parish of St. Austell. Few archaeological investigations have been undertaken in this area despite the rich potential for remains for all periods. Relevant assessments include the China clay Leader II programme Area report (Ratcliffe J 1997), the Par to Trebal pipeline archaeological assessment (Jones 2001) and watching brief (Lawson-Jones 2002), and the Cornwall and Scilly Urban Survey, St. Austell (Newell 2002). Published accounts of prehistoric to early medieval sites in the area include Johns (2008) at Trenowah (on the St Austell Distributor Road) and Lawson-Jones (2012) at St Blazey Gate (on the Par-Trebal pipeline).

A summary of the archaeological and historical background can be found in the WSI (Everett 2017) but in brief, material and sites indicating occupation in this area as far back as the Bronze Age has been identified, one known and two possible barrows and

two find spots from the Bronze Age within the Par Moor area and a standing stone in the grounds of Penrice School (MCO7469), a Scheduled Monument. Occupation continued through the Iron Age and the Romano-British periods as evidenced by various rounds, enclosures and castles in the wider area, into the early medieval and medieval periods with various settlements and field boundaries being noted, including settlements at Tregrehan (MCO17357), Merthen (MCO15698), Cuddra (MCO14206), Lamellyn (MM83) and Trenovissick (MCO15215). A corn mill at Slades Mill also dates from the medieval period (MCO25403). Medieval crosses associated with local churches are identified at Tregrehan (MCO6000) and at Boscundle (MCO5025).

Archaeological assets associated with the post-medieval period are abundant within the Par Moor area. Designated assets include Tregrehan (1212091) Grade II* Listed Building associated with a Grade II* registered park and garden (1000545) and the Charlestown conservation area. Other designated sites are grade II listed buildings and are mainly residential buildings.

There are over 100 non-designated heritage assets within the study area dating from the post-medieval period. Most of these are related to the mining and china clay industries, including the Charlestown Leat, and are reflected by Charlestown's inclusion within the Cornwall and West Devon Mining World Heritage Site. Part of the Charlestown Leat (MCOs 25405 and 26541) runs through the study area, immediately to the west of test pit 2, and is an important feature associated with the port of Charlestown. It fed water from the Luxulyan Valley to the port in order to flush the dock area of sediment. Other sites include schools, chapels, and mills. Post-19th century assets include infrastructure associated with World War II, the china clay industry, and schools, chapels, and signposts. St Austell itself has its origins in early Christian times, the main evidence for this being the raised churchyard around the current church of the Holy Trinity (formerly dedicated to Saint Austell) which resembles lann enclosures found elsewhere in Cornwall and lends some credence to the possible early Christian origins of the settlement. Whether early medieval or medieval in origin, it is clear that the church site and its enclosure represent the primary element in the topography of the town; the network of roads radiating from this area still forms the essential framework for the layout of the settlement. In some respects, the settlement is likely to have maintained an agricultural character: portions of the medieval field pattern around the core persisted to be depicted on the St Austell Tithe Map of 1842; some of the curved strip field boundaries shaped the later development of the town and have become fossilized within its plan (Newell 2002).

The town remained relatively small until the 18th century with a predominately agricultural nature to the area supplemented by relatively small-scale industrial activity associated with tin and copper mining throughout the 16th, 17th and early 18th centuries. With the discovery of china clay in the area in the mid-18th century the whole area then grew rapidly into a large-scale china clay industry and supporting infrastructure area. The population doubled between 1811 and 1831 as a result of this boom and throughout the 18th and 19th centuries the town acted as a main arterial road route taking mineral products down to the docks at Charlestown and then later at Par, Pentewan and Fowey. This boom continued into the 20th century until china clay became less economically viable and later years has seen the area decline and rely heavily on tourism as a means of supporting the economy.

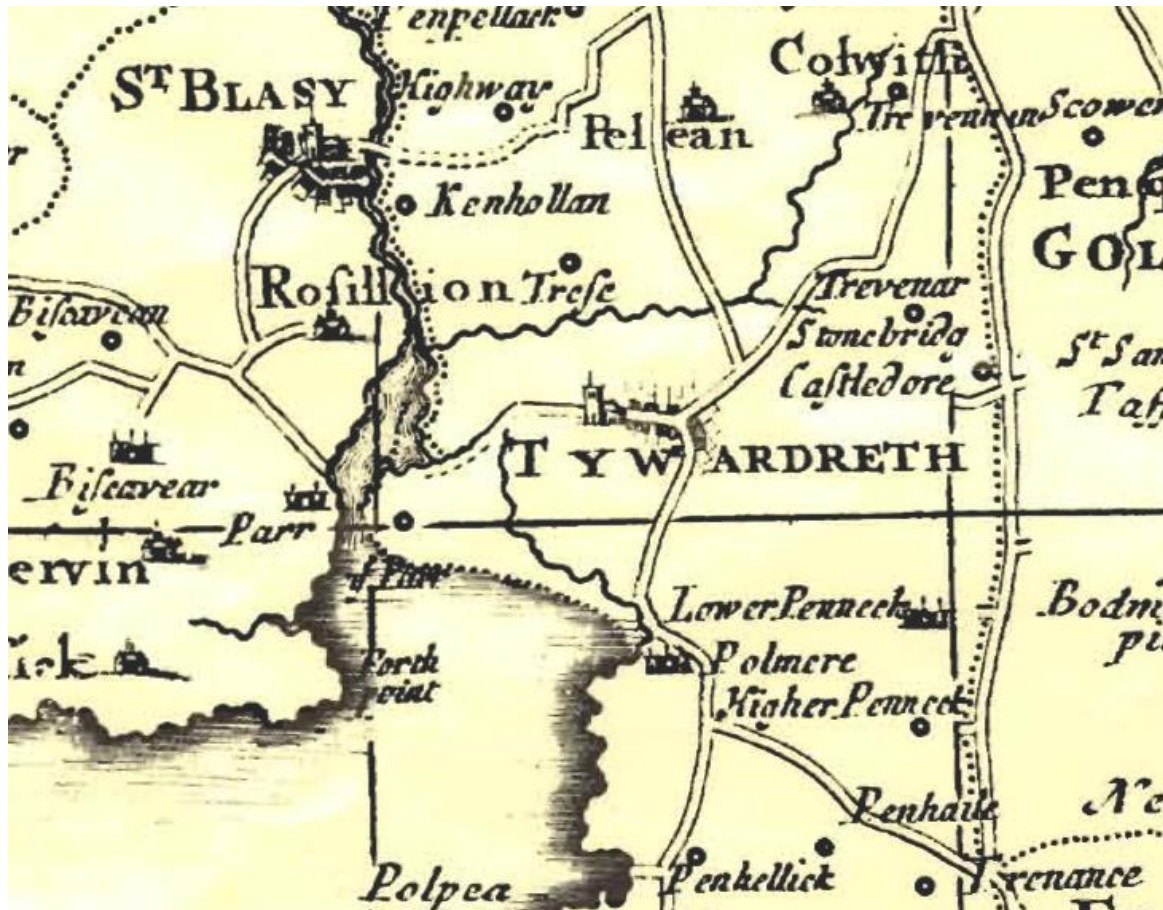


Fig 2 Extract from Gascoyne's map of 1690.

The Landscape character areas covering the study area follows three distinct types. The more urban settlement of St Austell falling within '20th Century Settlement' type typified by rapid urban expansion to accommodate a rapidly increasing population serving the various mining and industrial activities in the area. The china clay works and associated docks development at Par and Charlestown were the main force for industrial growth in the area. The Par Moor area falls within the 'Farmland Medieval' type, the 'medieval agricultural heartland', peppered with more recent plantation and scrub. The medieval farmland is synonymous with farming settlements documented before the 17th century AD and whose field patterns are morphologically distinct from the generally straight-sided fields of later enclosure, often having their origin in either medieval or prehistoric times. Also, typical of the character area are the networks of winding lanes and roads, often deeply cut by the passage of people, animals and vehicles over centuries or thousands of years.

At Par Docks the landscape character is classed as 'Industrial Working' a combination of relict and active industrial sites where there were, and are, processing plants and manufactories ancillary to the extractive industries, as well as industrial tramways, wharves etc. Par Harbour closed to commercial maritime traffic in 2008 but still retains china clay processing facilities and road and rail infrastructure links to the clay-producing areas and Fowey Docks.

4 Archaeological results

Given the long-term occupation of the area and scattered nature of the trial pits for the investigation works across the study area there was potential for exposing horizons and chance finds associated with various phases of occupation/activity. Whilst no obvious buried archaeological features were identified during the project some horizons relating to tinstreaming, (TP 9), deep mining (TP19), the china clay industry (TPs 2, 3, 4, 5, 9, 13, 14, 17, 18, and 20), and farming occupation in the Par Moor area were noted (in TP12). Potentially estuarine material was noted in TPs 8, 15, 20 and 21. The results by pit are laid out in a table in Appendix 1 and discussed below. An inventory of the recovered artefacts is produced in Appendix 2.

4.1 Trial pits

Trial pits 2 and 3

These pits were in an area of woodland and park in the Springfield Close area of St Austell, TP2 in a clearing in the wooded Sandy River corridor and TP3 on the edge of an open grass and playground area. There was a brick chimney stack (Fig 3) and associated compound remains now comprising low walls in the area near TP3, a previously industrial area now turned into a play area.

In TP2 layers of redeposited made ground, (202), (203) and (204), comprising redeposited natural and clay waste to a depth of 0.8m (68.82m OD), overlay alluvially-deposited material, comprising layers (205) and (206), to the base of the pit at 3m deep.

At TP3, 235m further down the river, the same alluvial material, recorded as (306), was found at 2m depth (56.58m OD). In both cases the made ground above this alluvially deposited material was contaminated with iron-rich china clay-stained stone and clay. The material is likely to derive from post-medieval tin-streaming and extraction and china clay workings upstream (for example, from an area 500m to the north which has been identified as a centre of activity by the Cornwall National Mapping Programme, MCO53038), which may account for the type of material found in these pits.



Fig 3 Chimney stack near TP3.

Trial pits 4 and 5

These pits were in the Holmbush area of St Austell, in another green space alongside the Sandy River. In both pits, below a shallow depth of top and sub-soil, a sand and silt-rich alluvial china clay waste (403-406) and (502-504) deposit was found. In TP4 (Fig 4) this material was at a depth of 0.4m (50.55m OD), and in TP5 at a depth of 0.16m (49.23m OD). In TP5, a shillet rich clay natural (505) was reached at 1.3m (48.09m OD).



Fig 4 TP4 post-excavation.

In this area, a boundary stone not recorded in the HER at SX 03060 52778 was noted and photographed (see Fig 5).

Trial pit 6

This pit was located in a tiny green space next to the Sandy River in the car park of the Tesco superstore at Holmbush. It was hand-dug and reached water at a depth of 0.7m,

level with the water in the river. The bulk of the material encountered appeared to be silty alluvial sand.

Trial pit 7

This pit was located within a wooded garden area. Beneath the topsoil and subsoil was a horizon of redeposited natural and building rubble, (702), which had modern plastic and glass in it. This layer reached a depth of 0.5m (17.76m OD), below which was estuarine/alluvial sandy silt (703). This material continued until the hole collapsed at 1.65m depth. This pit was close to an engineered watercourse, which probably originated as a water-management feature in the 20th century.



Fig 5 Boundary stone near TP4.

Trial pit 8

This pit sits within the bank area between two engineered watercourses, very close to the site of the Early Medieval Bethesda tin streamworks (MCO41826), now largely plantation and managed watercourses. Beneath top and sub-soil was a build material,

(803), from the banked watercourses, most likely redeposited material from the watercourses themselves, and then at a depth of 0.58m (13.74m OD), estuarine sandy silt material was encountered, (804). This continued to a depth of 1.5m (12.82m OD) when a pale grey plastic clay horizon (805) was reached. It is not certain if this is a horizon of water-deposited clay or a natural layer as the pit was terminated by water ingress at a depth of 1.55m but this clay layer is echoed across other near-by pits (TP9, 10, 11 and 12) which suggests a natural clay that roughly correlates with the water table.

Trial pit 9, 10, 11 and 12

TP9 met a horizon of gravelly clay (904), under subsoil at a depth of 0.7m (14.2m OD); water ingress stopped the pit after a further 0.05m as in TP8. In TP10 (Fig 6), in an open field behind Cornish Market World, below top and sub-soil, a thick layer of what appeared to be redeposited china clay-rich material was encountered between depths of 0.25m (15.43m OD) and 2.4m (13.28m OD), layers (902) and (903). Below this layer of clay lay a metallic-smelling gravelly silt layer with clinker, charcoal and rounded pebbles in it, possibly representing tin-streaming disturbance, (904). This hole became filled with water at a depth of 2.7m.



Fig 6 TP10 South facing section.

TP11 was on the other side of a stream to TP10, alongside a road, and the material encountered was made up entirely of redeposited gritty clay road-bank build material.

TP12 lay within an area of scrub and foundations from what was an abandoned group of post-medieval cottages, part of the original Par Moor village (pers comm landowner), shown on historical mapping including the 1839 St Blazey Tithe Map. This area also falls within the medieval farmland landscape character type. Beneath a thick layer of top and sub-soil, an agriculturally improved land surface, (1202), was encountered, filled with finds indicative of manuring (clay pipe stem, 19th century china, coal, blue transfer print china, small china pig, and ceramic building material: CBM). This is consistent with the land having been previously lived on and cultivated. This material

was up to depth of 0.8m (9.69m OD), below which was gritty clay and clay layers (1203) and (1204) with much ground water running through it. The hole terminated at 2.4m depth due to water ingress.

Trial pits 13 and 14

These pits were dug along a bank area abutting a heavily engineered watercourse (Sandy River) lying between the main Imerys office compound and a golf course. The banks were steep sided and are probably not very old but the watercourse is noted as the site of post-medieval tin streamworks and just at the end of the bank to the south east is the post-medieval clay workings at Pembroke Cottage (MCO25511) and the remains of a post-medieval leat system (MCO41827), probably associated with the tin-streaming. It is at this point that the Sandy River enters mine workings before discharging on Shorthorn Beach 300m to the south east.

Both pits held material almost exclusively made from redeposited water-deposited clays and sand, TP13 (Fig 7) being largely sand and silt, clearly laminated, probably derived from china clay waste from the adjacent river bed, excavated to construct the bank. One of the layers (1303) had a large piece of cast iron strut in it suggesting there was industrial activity going on in the vicinity at the time the layer was deposited.



Fig 7 laminated silt and sand from (1306).

TP 14, closest to the historic clay works site contained very compact layers of redeposited china clay waste to a depth of 1.2m (full depth of the hand-dug pit).

Trial pits 15, 17, 18 and 19

TP15 was located on an abandoned development site. The upper soils were made ground comprising building rubble and stone to a depth of 0.4m / OD 9.44m below which were layers of alluvially deposited clay waste (1502), (1503) and (1504). Not far to the west is the site of the post-medieval clay working at Pembroke Cottage so it is possibly waste material associated with this site. The layers of silts and sands were clearly laminated and banded suggestive of alluvial deposition, with a fine silt- and

mica-rich content, becoming grittier lower down with (1504), the latter possibly an underlying estuarine deposit.

The other three pits were located around the site of a garden centre alongside Par Moor road, an area sitting between two managed watercourses and close to known remains of the 19th century East Crinnis Mine workings and quarry (MCO41835). TP17 and 18 were similar in that below top and sub-soil a layer of alluvially deposited silty sand was noted then weathered natural. In the case of TP17 this alluvium was noted between depths of 0.05m and 0.5m (1702) and for TP18 between 0.4m and 1m depth, (1802) and (1803), possibly representative of clay waste during a period of industrial activity further up the water catchment. Below this layer, in both pits, weathered natural shillet and clay was reached (1703-1704) and (1804).

TP19 (Fig 8), the closest to the known mine shaft site, comprised alluvial material to a depth of 0.27m then redeposited natural and mine waste material. All of this is likely to be made ground.



Fig 8 South facing section TP19.

Trial pit 20 and 21

TP20 was located in a recently wooded area, near a stream and pond. Under a layer of redeposited quarry material, (2003), at a depth of 0.7m (8.42m OD), layers of estuarine or alluvial clay waste comprising sand and gravel and water worn cobbles were encountered, (2004), (2005), and (2006). These continued down to the bottom of the hole at 1.8m depth when water ingress halted digging.

TP21 also found redeposited quarry material to a depth of 0.4m (4.45m OD), (2102), underneath which was estuarine deposited sandy silt, (2103). The water table was reached at 0.9m.

Trial pit 22

This pit was on Imerys property and cut through an area of reclaimed land where previously a fuel tank had been. It was made up entirely of redeposited quarry stone and clay.

5 Conclusions/recommendations

Twenty one GI trial pits, both hand- and machine-dug, were excavated along the course of the Sandy River and through Par Moor with various depths of horizon between natural and made deposits noted.

Within the St Austell town boundaries, the subsoil is generally characterised by china clay and quarry waste made ground, probably associated with landscaping and building work related to the expansion of the town. This overlies layers of alluvium, most likely clay mining waste material carried down the course of the Sandy River from further upriver. Below this, in a few locations, weathered shillet natural was found.

Further down the watercourse towards Par Moor the subsoil build layer associated with development was much shallower and obvious in its proximity to modern construction, this being a more rural area previously associated with agriculture. This made ground again sat above alluvial sands and silts that were of a greater depth than further upriver. Some of these alluvial deposits were associated with tin-streaming works (TP8 and TP13) but for the most part they appear to be related to clay waste.

Generally the water table was met at shallower and shallower depth as the pits approached the estuary mouth near Par Docks and the Carlyon Bay Golf Course, with the depth of alluvium becoming much thicker over the Par Moor area, then shallower and overlying a more obviously estuarine sand and gravel the closer to the sea the watercourse ran. This suggests that a lot of the silt and sand found in the pits is alluvial from further up the water catchment of the Sandy River, not estuarine, and for the most part associated with clay mining with the odd pocket of localised tin-streaming waste. The bulk of this material was deposited over the Par Moor area where the layers of this material are much thicker and the ground becomes much lower and more level after dropping down in height from the St Austell area. By the time the watercourses reach the sea they have deposited much of this material and show relatively shallow depths of this river borne alluvium overlying material coarser and more gravelly in nature and richer in water worn pebbles and coarser gravels. This material is most likely more estuarine in nature as the rivers became tidally influenced.

The results give a little insight into the process of silting up and industrial activity along the course of the Sandy River in more recent centuries although nothing was noted regarding earlier periods of occupation.

Tin streamworks in the upper valley (for instance at Boscoppa; MCO50317, SX 02960 54180), where overburden was removed and the underlying heavier cassiterite-bearing gravels were extracted and processed, would have led to the redeposition of disturbed material downstream on the floodplain between Holmbush and Cuddra and within the former tidally-affected area between Cuddra and the mouth of the river. Much of this will have occurred prior to the middle of the 19th century, when major modifications to the watercourses, for instance diverting the river through mine workings to Shorthorn Beach, were undertaken.

From the middle of the 18th century china clay working upstream will also have deposited large quantities of material into the river, the quantities increasing into the 19th and 20th centuries. Again this will have been deposited on the floodplain of the river and in its tidal reaches, the latter retreating eastwards with the growth of the floodplain, and supplemented by tidally-borne material from other river outlets in St Austell Bay. However, it proved difficult to identify within the GIs which material derived from which source, unsurprising given that the resultant alluvial material may be very similar and that in some periods the materials from both sources may have been mixed.

As the watercourses crossing the area were largely silted up in the 19th century a lot of the alluvium is likely to be relatively recent, especially further upriver towards and within St Austell and across the upper Par Moor area. The potential for finding buried archaeology predating the industrial period remains quite high as there are a large number of prehistoric and early medieval features and monuments scattered across the landscape of the Moor. It can be expected though that the potential for and accessibility of any archaeology would increase with distance from the engineered watercourses and alluvially deposited material which becomes shallower with distance from the watercourse.

Everything above this alluvial deposit is going to date from the 19th century onwards and be associated with the more modern settlement of St Austell and Par Moor. As the industrial activity in this area is of great historical interest, some of it being associated with the Charlestown Leat and Charlestown part of the Cornwall and West Devon WHS, any potential remains would be of significance. None were found during this phase of work but the potential remains in the wider area.

6 References

6.1 Primary sources

Gascoyne, J, 1699. Map of Cornwall

Ordnance Survey, 1875-1901. 25 Inch Map First Edition (licensed digital copy at CAU)

Ordnance Survey, 1906-08. 25 Inch Map Second Edition (licensed digital copy at CAU)

Ordnance Survey, 1932-39. 25 Inch Map Fourth Edition (licensed digital copy at CAU)

Ordnance Survey, MasterMap Topography

Tithe Map and Apportionment, 1842. Parish of St Austell (licensed digital copies at CRO)

Tithe Map and Apportionment, 1839. Parish of St Blazey (licensed digital copies at CRO)

6.2 Publications

Chartered Institute for Archaeologists (CIfA), 2014. *Standards and Guidance for an Archaeological Watching Brief*

Everett, R, 2017. WSI for Ground Investigation Works: Par Moor and Sandy River, Mott Macdonald

Historic England (formerly English Heritage), 2011. *Valuing Places: Good Practice in Conservation Areas* (EH)

Historic England, 2015. *Digital Image Capture and File Storage, Guidelines for Best Practice*

Johns, C, 2008. The excavation of a multi-period archaeological landscape at Trenowah, St Austell, Cornwall, 1997, *Cornish Archaeology* **47**, 1-48

- Jones, A, 2001. *Par to Trebal Pipeline, Cornwall, Archaeological assessment*, CAU, Truro
- Lawson-Jones, A, 2002. *Par to Trebal Pipeline, Cornwall, Archaeological Watching Brief*, CAU, Truro
- Lawson-Jones, A, 2012. A burnt pit and other discoveries at St Blazey Gate, Cornwall, *Cornish Archaeol* **51**, 191-200
- Newell, K 2002. *Cornwall and Scilly Urban Survey, Historic characterisation for regeneration, St. Austell*, CAU, Truro
- Ratcliffe, J 1997. *A report for the China clay Leader II Project, Promoting the archaeological heritage*, CAU, Truro
- Sharpe, A, 2017. Risk Assessment and Method Statement: Par Moor Geotechnical Investigations, CAU, Truro

6.3 Websites

<http://www.heritagegateway.org.uk/gateway/> Online database of Sites and Monuments Records, and Listed Buildings

7 Project archive

The CAU project number is **146684**

The project's documentary, digital, photographic and drawn archive is maintained by Cornwall Archaeological Unit.

Electronic data is stored in the following locations:

Project admin: \\Sites\Sites P\Par Moor Sandy River EA GI WB 146684

Digital photographs: \\Historic Environment (Images)\SITES.M-P\Par Moor Sandy River EA GI WB 146684

GIS mapping: \\Historic Environment (Data)\HE_Projects\Sites_P\Par Moor Sandy River EA GI WB 146884

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Appendix 1: Test pit logs

Trial pit number	Trial pit layer	Method of excavation	Full pit depth in m	Reduced level (m OD)	Thickness in m	Description	Notes
2	201	Machine dug	3.00	69.62	0.35	Mid brown firm silty, loamy clay with occasional (5%) tree roots, (2%) sub-angular pieces of slate and rare, (<1%) CBM.	Forest floor topsoil with minimal grass.
2	202			69.27	0.15	Pale yellowish brown, firm silty clay with occasional (20%) sub-angular slate fragments and occasional charcoal smears.	Made ground, redeposited natural.
2	203			69.12	0.24	Pale pinkish brown loose silty clay layer, almost entirely (90%) made from angular shillet fragments.	Stony horizon comprising redeposited stony natural.
2	204			68.88	0.06	Pale yellowish brown, compact silt with pockets of grey sand.	Made ground, possibly redeposited china clay spoil.
2	205			68.82	0.70	Mid grey mottled with mid greyish brown firm fine sandy silt.	Very fine alluvial material.
2	206			68.12	1.50	Whitish reddish yellow and pale yellowish pink compact gritty silt with occasional (5%) sub-angular and sub-rounded stones.	Alluvial material.

Trial pit number	Trial pit layer	Method of excavation	Full pit depth in m	Reduced level (m OD)	Thickness in m	Description	Notes
3	301	Machine dug	3.15	58.58	0.13	Mid pinkish brown loose sandy silt with rare (<1%) flecks of building waste - CBM and concrete fragments.	Topsoil and turf in a playground area.
3	302			58.45	0.32	Mid pinkish brown loose coarse sandy silt with occasional (15%) sub-angular slate fragments. Finds: iron nail, C20 pot.	Made ground subsoil, possible redeposited china clay waste.
3	303			58.13	0.20	Mid reddish brown compact fine silt with occasional (5%) sub-angular slate fragments, occasional pockets (10%) of compact silty sand and occasional (10%) sub-rounded stones.	Made ground.
3	304			57.93	0.50	Mid reddish yellow friable silty clay with frequent (60%) sub-angular and sub-rounded stones and moderate (20%) amounts of coarse sand/fine gravel. There are also clumps of pale grey compact silt within this layer.	Made ground comprised redeposited weathered natural, possibly relating to china clay works.
3	305			57.43	0.85	Mottled mid brownish grey and yellowish greyish white loose silt with frequent (90%) sub-angular slate fragments and occasional (2%) lumps of white china clay with iron stained streaks.	Made ground comprising redeposited china clay waste.
3	306			56.58	1.15	White with yellowish white and red bands, compact but friable clay with areas of iron staining throughout.	Natural china clay-rich deposit.

Trial pit number	Trial pit layer	Method of excavation	Full pit depth in m	Reduced level (m OD)	Thickness in m	Description	Notes
4	401	Machine dug	2.00	50.95	0.32	Mid reddish brown friable silty clay with occasional (10%) sub-angular pieces of quartz and shillet.	Topsoil.
4	402			50.63	0.08	Mid yellowish brown friable sandy clay with frequent (70%) sub-angular piece of quartz and shillet and occasional (5%) sub-rounded pebbles.	Subsoil.
4	403			50.55	0.20	Light grey dry sand.	China clay waste.
4	404			50.35	0.40	Light grey friable sandy silt, as (403) but finer and with a high silt content.	China clay waste.
4	405			49.95	0.62	Light grey clayey silt, similar to (404) but even finer, verging on clay.	China clay waste.
4	406			49.33	1.38	Mottled light grey and reddish brown plastic clay. Very fine material, probable continuation of (403) - (405), unclear though as to whether this is clay waste of an estuarine deposit.	China clay waste / estuarine deposit. Water table reached at 2m.
5	501	Machine dug	2.00	49.39	0.16	Mid yellowish brown friable sandy clay.	Topsoil.

Trial pit number	Trial pit layer	Method of excavation	Full pit depth in m	Reduced level (m OD)	Thickness in m	Description	Notes
5	502			49.23	0.14	Light grey firm sand, same as (403) in TP4.	China clay waste.
5	503			49.09	0.70	Light grey friable sandy silt. Same as (502) but finer sand.	China clay waste or estuarine.
5	504			48.39	0.30	Light whitish grey plastic clay, very fine, same as (406) in TP4.	China clay waste or estuarine.
5	505			48.09	0.70	Light reddish brown plastic clay with frequent (60%) sub-angular and sub-rounded shillet and occasional pebbles.	shillet-rich clay, possible weathered natural.
6	601	Hand-dug	0.70	35.78	0.05	Dark brown wet silty loam with turf.	Topsoil.
6	602			35.73	0.05	Mid pinkish brown wet sandy silt.	Subsoil.
6	603			35.68	0.35	Mid brown wet sandy silt with infrequent (10%) roots and organic material and occasional (10%) sand.	Estuarine deposit.

Trial pit number	Trial pit layer	Method of excavation	Full pit depth in m	Reduced level (m OD)	Thickness in m	Description	Notes
6	604			35.33	0.25	Mid yellowish brown firm silty coarse sand with occasional (10%) roots.	Silty estuarine sand.
7	701	Machine dug	1.65	18.26	0.08	Mid brown clayey silt.	Topsoil from forest floor.
7	702			18.18	0.32	Pale reddish grey mottled with pale yellow brown compact weathered shillet and clay with frequent (40%) sub-angular shillet and granite fragments. Finds: modern glass, and plastic.	Redeposited natural.
7	703			17.86	0.10	Mid brownish grey and black mottled compact sandy silt with moderate (30%) large sub-angular stones and occasional (10%) building waste containing rotted wood and smashed tile.	Made ground comprising redeposited building waste material.
7	704			17.76	0.65	Dark reddish grey firm, wet sandy silt with infrequent (10%) rotting organic material.	
7	705			17.11	0.50	Mid reddish brown and grey firm sandy silt with occasional (10%) pockets of pure silt and rare (1%) rounded granite cobbles, and occasional (10%) small quartz gravel.	Estuarine material. Excavation stopped when sides of pit collapsed.

Trial pit number	Trial pit layer	Method of excavation	Full pit depth in m	Reduced level (m OD)	Thickness in m	Description	Notes
8	801	Machine dug	1.55	14.32	0.30	Mid reddish brown loose dry sandy loam with occasional (15%) sub-angular granite pieces and roots.	Topsoil from forest floor.
8	802			14.02	0.10	Dark reddish brown loose sandy loam with frequent (80%) roots.	Subsoil.
8	803			13.92	0.18	Mottled mid reddish brown and greyish brown firm sandy clay the occasional (10%) sub-angular quartz and slate. Some roots at the top of this deposit.	Culvert bank build material.
8	804			13.74	0.92	Mottled mid grey and reddish yellow wet sand.	Estuarine deposit.
8	805			12.82	0.05	Pale grey plastic clay.	China clay-derived natural. Pit stopped due to sides collapse.
9	901	Hand-dug	0.75	14.90	0.08	Dark brown firm loam with occasional (10%) sub-angular stones.	Topsoil.
9	902			14.82	0.37	Mid yellowish brown firm gritty silt with moderate (20%) stones.	Subsoil.

Trial pit number	Trial pit layer	Method of excavation	Full pit depth in m	Reduced level (m OD)	Thickness in m	Description	Notes
9	903			14.45	0.25	Mid yellowish brown firm clayey silt with moderate (30%) large sub-angular stones and manganese flecks.	Subsoil.
9	904			14.20	0.05	Pale yellowish brown wet gravelly clay.	Natural clay layer. Pit stopped as water infiltrated.
10	1001	Machine dug	2.70	15.68	0.25	Pale whitish brown compact sandy silt with occasional (10%) sub-angular stones and rare charcoal flecks.	Topsoil.
10	1002			15.43	0.75	Pale yellowish brown and pinkish brown mottled firm silty clay with occasional (10%) modern building rubble and occasional (10%) sub-angular slate pieces.	Redeposited contaminated china clay waste.
10	1003			14.68	1.40	Pale grey and yellowish pink mottled compact clay with moderate (30%) angular shillet fragments.	
10	1004			13.28	0.30	Mid grey cemented sandy silt with occasional (5%) sub-angular quartz crystals, occasional (2%) rounded quartz pebbles and rare (<2%) fine roots, clinker and charcoal.	This layer has a metallic smell, possible streaming waste?
11	1101	Hand-dug	1.20	19.35	0.14	Dark brown firm silty loam.	Topsoil.

Trial pit number	Trial pit layer	Method of excavation	Full pit depth in m	Reduced level (m OD)	Thickness in m	Description	Notes
11	1102			19.21	0.38	Mid pinkish grey and brown compact sandy silt with frequent (60%) sub-angular shillet fragments.	Made ground road bank material.
11	1103			18.83	0.68	Mid yellowish pink compact gritty clay with moderate (20%) shattered shillet pieces.	Made ground road bank material.
12	1201	Machine dug	2.40	10.54	0.45	Dark reddish brown loamy silt with occasional roots and (5%) sub-angular granite pebbles.	Topsoil.
12	1202			10.09	0.40	Dark Blackish brown firm loamy silt with occasional (5%) sub-angular stone, very small pieces. Finds: clay pipe stem, 20C china, coal, blue transfer china, small china pig, and CBM.	Organic-rich old, agriculturally improved soil, this area used to be cottages and gardens.
12	1203			9.69	0.55	Mid yellowish red sticky gritty clay.	Natural clay and grit layer - water filtered in to the pit in this layer.
12	1204			9.14	1.00	Pinkish yellow and white friable gritty silt.	Laminated desiccated clay with iron stained laminations. Water came in again at 2.2m.

Trial pit number	Trial pit layer	Method of excavation	Full pit depth in m	Reduced level (m OD)	Thickness in m	Description	Notes
13	1301	Machine dug	2.50	12.37	0.08	Mid reddish brown, firm humic silt with roots from turf.	Topsoil.
13	1302			12.29	0.32	Mid greyish brown compact sandy silt with occasional (1%) flecks of charcoal and shards of slate. Mica-rich. Finds: slag and glass C19/20.	Redeposited estuarine material comprising the watercourse bank.
13	1303			11.97	0.60	Mid brownish red compact and laminated sandy silt. Very mica-rich with occasional (5%) pieces of shattered slate and quartz. Finds: modern glass, ferrous slag and a piece of cast iron.	Redeposited estuarine material.
13	1304			11.37	0.60	Laminated, wet mid grey, brown and rusty red silty sand.	Estuarine sand deposit.
13	1305			10.77	0.20	Mid yellowish brown wet silty sand.	Estuarine sand deposit.
13	1306			10.57	0.70	Layered dark grey through to pale reddish yellow brown plastic sandy silt, very fine.	Same as (1304) but wetter and thinner laminated layers. Hole stopped due to side collapse.
14	1401	Hand-dug	1.20	12.03	0.13	Dark brown loose sandy loam with frequent (40%) roots.	Topsoil.

Trial pit number	Trial pit layer	Method of excavation	Full pit depth in m	Reduced level (m OD)	Thickness in m	Description	Notes
14	1402			11.90	0.22	Pale greyish brown compact sandy silt with moderate (20%) amounts of sub-angular shillet fragments.	Subsoil, clay waste.
14	1403			11.68	0.45	Pale grey compact clayey silt with occasional (10%) gravel and rare (1%) quartz stones.	Clay waste.
14	1404			11.23	0.40	Mid greyish brown compact silty clay with occasional (10%) sub-angular slate and quartz-rich stones.	Same as (1402), clay waste.
15	1501	Machine dug	2.00	9.84	0.40	Pale yellowish brown compact gravelly sand with frequent angular granite pieces and infrequent (5%) crushed modern building rubble.	Made ground, part of an abandoned development site trackway.
15	1502			9.44	0.25	Pale, mid and dark grey mottled. Compacted mica-rich fine silt with a metallic smell.	Estuary deposited clay waste.
15	1503			9.19	0.50	Mid yellowish grey compact silt with occasional (5%) pieces of shillet. Metallic smell and cross channels of pink, yellow and grey silts.	Estuary deposited clay waste.
15	1504			8.69	0.85	Mid reddish yellow and grey banded firm, quartz-rich gravelly sand.	Estuary-deposited mining waste with mottled and banded sand and grit layers, metallic smell.

Trial pit number	Trial pit layer	Method of excavation	Full pit depth in m	Reduced level (m OD)	Thickness in m	Description	Notes
17	1701	Hand-dug	1.10	9.15	0.05	Dark brown humic silt with frequent (40%) small roots.	Topsoil.
17	1702			9.10	0.45	Mid greyish brownish red firm gravelly silt with occasional (5% each) small stones and roots.	Subsoil, estuary deposited?
17	1703			8.65	0.15	Mid chalky grey brown compact clayey silt with occasional (5%) roots and (10%) sub-angular shillet.	Weathered natural.
17	1704			8.50	0.45	Mid yellowish brown compact silty sand with occasional (5%) small sub-angular shillet fragments.	Weathered natural.
18	1801	Machine dug	1.40	9.81	0.40	Mid brownish grey loose sandy clay with moderate (20%) sub-angular stone and brick.	Topsoil, car park surface of concrete blocks.
18	1802			9.41	0.20	Light greyish yellow firm very fine clay.	Alluvial, china clay-rich deposit.
18	1803			9.21	0.40	Light grey mottled with reddish brown loose sandy clay with 10% sub-angular stones.	Alluvial deposit.

Trial pit number	Trial pit layer	Method of excavation	Full pit depth in m	Reduced level (m OD)	Thickness in m	Description	Notes
18	1804			8.81	0.40	Light reddish brown clay with frequent, (90%) sub-angular shillet.	Degraded natural. Water table reached at 1.4m.
19	1901	Hand-dug	0.90	8.04	0.16	Dark brown firm sandy silt.	Topsoil.
19	1902			7.88	0.11	Mid reddish brown firm silty sand with occasional (5%) sub-angular stones.	Alluvial deposit.
19	1903			7.77	0.39	Mid yellowish red firm silty sand with moderate (35%) sub-angular shillet and quartz.	Redeposited shillet natural.
19	1904			7.38	0.24	Mid greyish brown compact sandy silt with frequent (80%) sub-angular quartz-rich stone and occasional (10%) lumps of china clay.	Redeposited clay spoil.
20	2001	Machine dug	1.80	9.12	0.08	Mid reddish brown loam with 30% roots.	Topsoil.
20	2002			9.04	0.15	Mid yellowish brown compact sandy silt with occasional (30%) sub-angular stones and (15%) roots.	Subsoil.

Trial pit number	Trial pit layer	Method of excavation	Full pit depth in m	Reduced level (m OD)	Thickness in m	Description	Notes
20	2003			8.89	0.47	Pale brownish grey compact silty sand with frequent (80%) sub-angular quartz-rich iron stained stone and 5% compact silt lumps.	Redeposited quarry material?
20	2004			8.42	0.60	Pale grey, firm, mica and quartz-rich coarse sand with occasional (10%) sub-angular conglomerate stone and rare (2%) granite cobbles.	Possible clay waste.
20	2005			7.82	0.20	Pale greyish yellow compact silt, very fine and full of mica.	Possible clay waste.
20	2006			7.62	0.30	Mid grey loose granitic sand.	Possible clay waste. Water seeping in at 1.8m depth.
21	2101	Hand-dug	0.90	4.85	0.10	Dark brown loam.	Topsoil.
21	2102			4.75	0.30	Pale greyish brown stony silt with 80% shattered slate fragments.	Redeposited quarry material?
21	2103			4.45	0.50	Mid brownish grey loose silty sand.	Alluvial deposit. Water table encountered at 0.9m.

Trial pit number	Trial pit layer	Method of excavation	Full pit depth in m	Reduced level (m OD)	Thickness in m	Description	Notes
22	2201	Hand-dug	1.20	4.77	0.23	Pale pinkish grey stony silt with frequent (80%) sub-angular shillet fragments.	Made ground area resulting in demolition and making good of an oil tank area on Imerys land.
22	2202			4.54	0.97	Mid pinkish grey compact silty clay with frequent (80%) Shattered angular slate and occasional (5% pockets of clay.	Made ground.

Appendix 2: Finds inventory

Finds description	Context number	Type	Description
Modern glass	702	Glass	Clear modern bottle glass.
Plastic	702	Plastic	Plastic bag.
Nail	302	Iron	Part of an iron nail.
China fragment	302	Ceramic	Tiny fragment of cream glazed C20 pot
slag	1303	Slag	Piece of bubbly ferrous stained slag
Bottle glass	1303	Glass	Dark green C19/C20 bottle base fragment.
Coal	1202	Coal	Piece of coal.
China fragment	1202	Ceramic	4 pc blue transfer print china, one handle.
Plaster	1202	CBM	Two sherds of plaster.
Clay pipe stem	1202	Ceramic	Small piece of clay pipe stem
stoneware jar	1202	Ceramic	Small piece of the lip of a stoneware jar.
Glazed pot	1202	Ceramic	Sherd of yellow glazed stoneware.
Chine pig	1202	Ceramic	Small china pig.

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