



Cornwall Business Park West, Scorrier, Cornwall Archaeological Watching Brief

Cornwall Archaeological Unit

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Cornwall Business Park West, Scorrier, Cornwall

Archaeological Watching Brief

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CAU is grateful to Brian Poole of Mining Searches UK for access to his GPS data for the mining features found on the site.

The Project Manager was Adam Sharpe.

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.

Freedom of Information Act

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Cover image:

Excavation under way to the west of Read's engine house, Hallenbeagle.

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Abbreviations

CAU	Cornwall Archaeological Unit
CIfA	Chartered Institute for Archaeologists
OS	Ordnance Survey

1 Summary

Cornwall Archaeological Unit (CAU) was approached on 27 November 2017 with a request for a method statement and the costs of undertaking an archaeological watching brief during groundworks associated with the development being undertaken by Helston Garages in the western section of Cornwall Business Park West at Scorrier. CAU were commissioned to be on site when Mine Searches UK investigated the development area for mining features and carried out remediation work.

The development site is centred at SW 72566 44690 and is located between the A30 and the route of the main Truro to Penzance railway line.

Planning permission for the development was granted on 30 October 2017 and clearance of the site commenced in December 2017.

The removal of the overburden revealed a range of mining features, including prospecting pits, two later shafts, some possible outcrop workings, together with features associated with an area of early dressing floors sited to the north-east which comprised pits filled with process waste and a pair of linear channels.



Figure 4: Location of site.

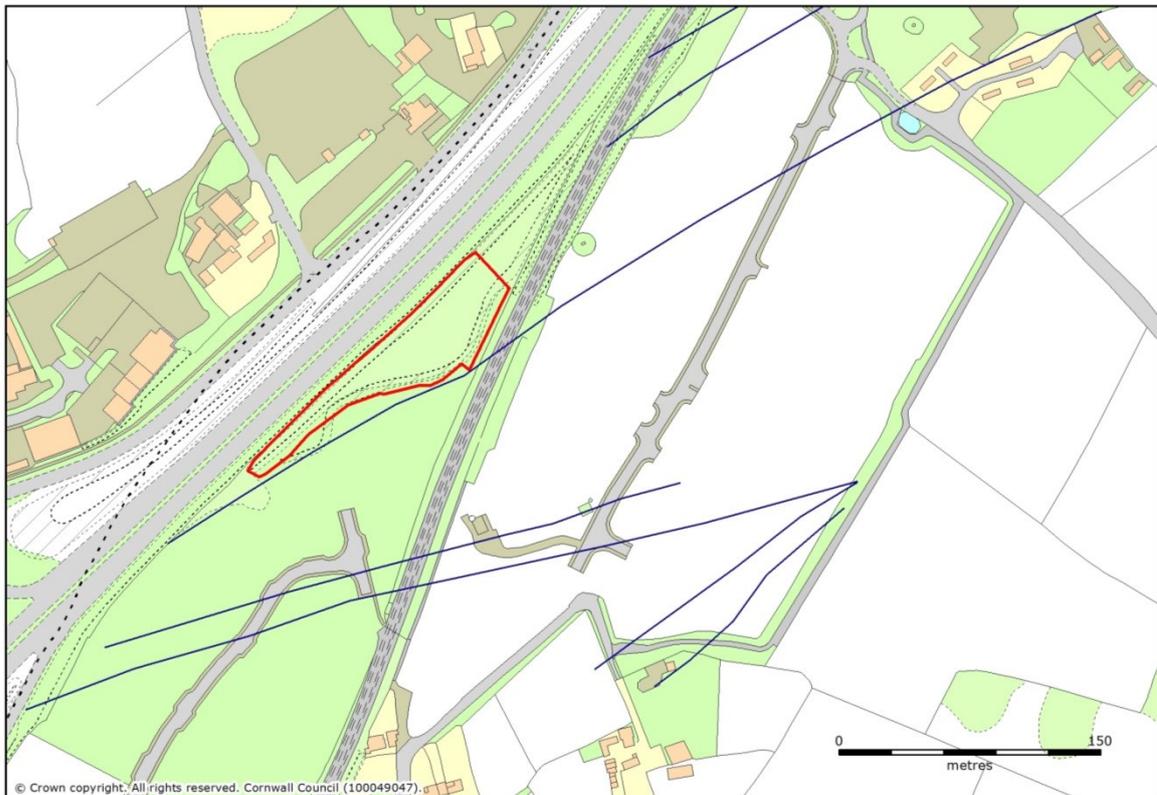


Figure 5: Extent of site (outlined in red) showing approximate locations of lode outcrops (blue lines).

2 Introduction

2.1 Project background

In December 2017 Cornwall Archaeological Unit (CAU), Cornwall Council was commissioned by Lloyd Husband of Jactamial Properties Ltd to undertake an archaeological watching brief during groundworks involved with the development of a new vehicle showroom in the Hallenbeagle north west area centred at SW 72566 44690 (Figure 1). The works to be observed consisted of a topsoil strip across the area prior to the remediation of any mine workings located during these operations.

Planning permission was granted for the development on 30th October 2017. The development was the subject of a planning condition, which required that archaeological recording took place ahead of construction (PA17/05107). Condition 6 of the grant of planning permission stated:

a) No demolition/development shall take place/commence until a programme of archaeological work including a Written Scheme of Investigation (WSI) has been submitted to and approved by the LPA in writing. The scheme shall include an assessment of significance and research questions, and: 1. The programme and methodology of site investigation and recording, 2. The programme for post investigation assessment, 3. Provision to be made for analysis of the site investigation and recording, 4. Provision to be made for publication and dissemination of the analysis and records of the site investigation, 5. Provision to be made for archive deposition of the analysis and records of the site investigation, and 6. Nomination of a competent person or persons/organisation to undertake the works set out within the Written Scheme of Investigation.

b) No demolition/development shall take place other than in accordance with the Written Scheme of Investigation approved under part a).

c) The development shall not be occupied until the site investigation and post investigation assessment has been completed in accordance with the programme set out in the WSI approved under part a) and the provision made for analysis, publication and dissemination of results and archive deposition has been secured.

d) The archaeological recording condition will normally only be discharged when all elements of the WSI including on site works, analysis, report, publication (where applicable) and archive work has been completed.

Reason: In the interests of protecting archaeological remains in accordance with Policy 24 of the CLP and Para 98 of the NPPF.

CAU produced an agreed Written Scheme of Investigation which set out the aims and methods for the archaeological recording (Appendix 2).

2.2 Aims

The principal aim of the study was to gain a better understanding of the archaeology of the development area in advance of its development, building on the recording work undertaken elsewhere on the Hallenbeagle site during watching briefs undertaken in 2014 (Sharpe and Thorpe 2014), particularly that in Area 8 (Hallenbeagle West) immediately to the east of the area which was the subject of the 2018 watching brief.

The objectives were to:

- Obtain an archaeological record of the site prior to development.
- To produce a report summarising the findings of the archaeological watching brief.
- To complete an entry to the Historic England/ADS OASIS national database of archaeological projects.

2.3 Methods

All recording work was undertaken in accordance with the Chartered Institute for Archaeologists (CIfA) guidance (CIfA 2014a and 2014b). CAU staff follow the CIfA Code of Conduct (2014c). The Chartered Institute for Archaeologists is the professional body for archaeologists working in the UK.

2.3.1 Watching brief

The archaeological recording of sub-surface features was undertaken as a watching brief while the site was cleared under the direction of the mining engineer (Brian Poole of Mining Searches UK); this was in advance of remediation works preceding the site development.

The site is 0.44 ha in size and is the last section of the industrial park at Hallenbeagle to be developed. Prior to the arrival of the archaeologist the overburden and a spoil heap deriving from the A30 Blackwater By-pass construction were removed; this was followed by the removal of the bulk of the topsoil and the remaining waste material from around the site. The topsoil across the site was then re-skimmed using a machine fitted with a grading bucket. The features which were exposed during these operations were recorded by the mining engineer using a Leica GPS unit. They were photographed, the type of deposit and their measurements were recorded and a number was given to each feature. They were then excavated by machine to determine their extents, character, depth to base (where this was possible), and any evidence for associated sub-surface activity was noted.

A handheld GPS was used by the site archaeologist to locate the features, but as these instruments only have an accuracy of +/- 4m; given their inherent inaccuracy the resulting plot was of limited use in such a small area containing multiple features. Nevertheless, these plots could be correlated with those obtained using the high-precision GPS, allowing the gazetteer features to be accurately located.

Details of each recorded feature are presented in a Gazetteer included in this report as Appendix 1.

3 Location and setting

The site consists of a narrow strip of land 0.44 Ha in size (Figures 1, 2, 6 and 7), orientated north-east to south-west. The north-eastern end of the stripped area terminates in a 5m high baulk of dumped mining and other waste material, partially landscaped to a 50 degree slope; the face of the dump exhibits various tipped deposits. It is sandwiched between the main railway line and the A30 Blackwater By-pass, and is sited just to the north-east of Scorrier within the ecclesiastical parish of Kenwyn (Detached).

The underlying geology (BGS Sheet 352) consists of the mid to late Devonian Porthtowan Formation, part of the Gramscatho Group of metamudstones and metasandstones; a dyke of Permian felsite traverses the northern part of the site on an east-north-east to west-south-west strike. The emplacement of mineralised lodes within this area could be clearly seen to have modified the structure of the original bedrock, in many cases converting it to a mixture of clays and degraded siltstones.

The soils are of the Manod group – shallow loams over slates and siltstones (Soil Survey of England and Wales 1974). However, it was clear that the original topsoil had been stripped from much of the site and replaced with imported material to depths up to one metre, this probably having taken place during the construction of the adjacent A30 bypass.

4 Designations

None apply to the site. The boundary of the Cornish Mining World Heritage Site is approximately 170m to the east of the development area.

5 Site history

The area under investigation is part of a larger area of development for a business park which had been previously been the subject of archaeological assessments and watching briefs (Sturgess 2007; Sharpe 2011a; 2011b; Sharpe and Thorpe 2014). It adjoins Area 8 of the 2014 investigations, but this particular parcel of land had not been cleared as part of those preceding works.

Hallenbeagle was a former copper mine near Scorrier in the parish of Kenwyn which also produced small amounts of tin and arsenic. Its heyday was during the late 18th century and early 19th century, when it was one of a group of important mines near Scorrier whose output of copper from relatively shallow levels was prodigious. The mine was reworked, though much less successfully, during the mid-19th century, when it employed about 200 people; from 1835-46 the mine produced 30,850 tons of ore. It continued to work during the later 19th century, at times as part of Boscawen Mine and in the later part of the mid-19th century as part of Great Wheal Busy. Its sett was bounded by those of Wheal Rose, Wheal Chance and Boscawen Mine, and like these, it was drained via the Great County Adit, which at Hallenbeagle was only 24m below surface. Hallenbeagle may have sited a short-lived and pioneering copper smelter during the earlier part of its operations, whilst a smallholding (possibly laid out and occupied by a local miner) was established near the core of the site, occupying the central part of the area which was developed during the initial phase of works.

The mine was shown as being active in 1840 on the Kenwyn (Detached) Tithe Map, when an engine house was depicted on Engine Shaft in the northern part of the development area. This may originally have housed a very unusual inverted engine designed and installed by James Watt in 1795, though it is noted that Watt was building a further engine for Hallenbeagle in 1797. A 70" cylinder pumping engine at Hallenbeagle was for sale in 1848. Other sources show a winding engine house to the east of this shaft.

The mine worked four lodes: North Lode, worked from King's Shaft (now beneath the A30), Engine Shaft (to the north east), Stone Shaft and Eastern Shaft (to the north-east); Read's Lode was worked from Read's (Reade's or Reed's) Shaft where there are the remains of pumping and winding engine houses, as well as three unnamed shafts and Jeffrey's Shaft (Read's Shaft being to the south-east, two of the unnamed shafts lying on its fringes; Jeffrey's Shaft and the other unnamed shaft are also located to the south-east). Other lodes worked were Oats Lode, worked from Oat's Shaft to the east and South Lode, developed by a number of shafts to the south of the area occupied by the business park (Dines 1956). One source suggests that there may have been other pumping and winding engine installations near Reade's Shaft on locations other than those occupied by the surviving buildings.

By the end of the 19th century the mine was depicted as abandoned, its landscape covered with spreads of mine waste and accompanied by a number of ruined engine houses. By 1907, the northern engine houses had been demolished and the north-eastern part of the main site had been reclaimed to agriculture. A sawmill developed on the south-eastern part of the main site during the late 19th century remained active into the early years of the 20th century, whilst the area of the former mine around Read's Shaft was subsequently modified to site a small-scale concrete plant. The northern part of the business park was partly modified to site a D-Day transit camp in 1944, whilst the overall site was bisected by the West Cornwall Railway between Truro and Redruth in 1852 and by the Blackwater By-Pass in 1988. By 2005 (CCC aerial photographic evidence) the central and north-eastern areas of the main site had been reclaimed to agriculture and the southern parts of this area were in stunted heathland and scrubby woodland. The north-eastern part of the wider mine site remained in agricultural use, whilst the north-western part of the site and the central eastern part of the main site were occupied by a number of static caravans and their curtilages; the central part of the main site was occupied by a number of smallholders' fields first

shown on the 1809 OS mapping. The south-eastern part of the main site had scrubbed in, as had the southern corner of the site and the area around Read's engine houses.

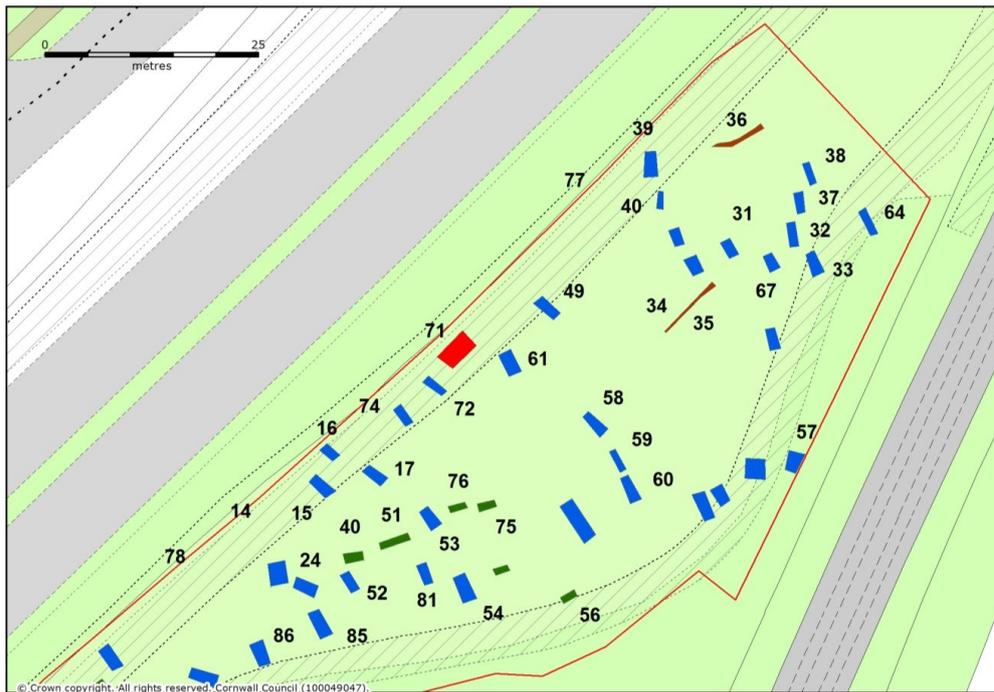


Figure 3: Features recorded in the north-eastern part of the site.

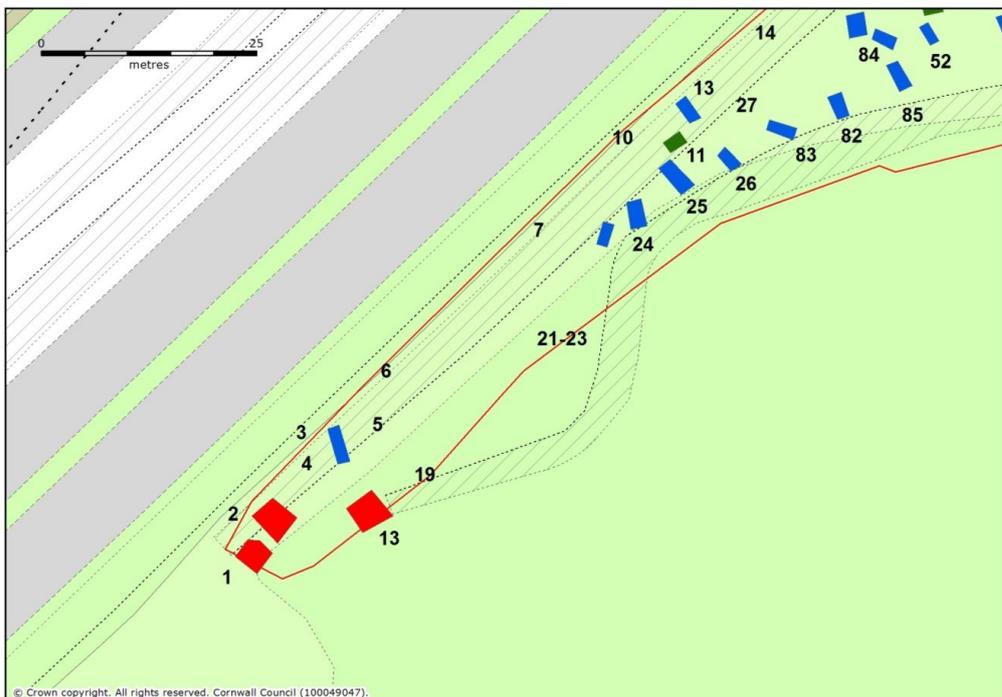


Figure 4. Features recorded in the south-western part of the site. In this and the above figure red: shaft, blue: prospecting feature, brown: linear feature and green ore processing feature.

The area of the Business Park to the south and west of the larger eastern area

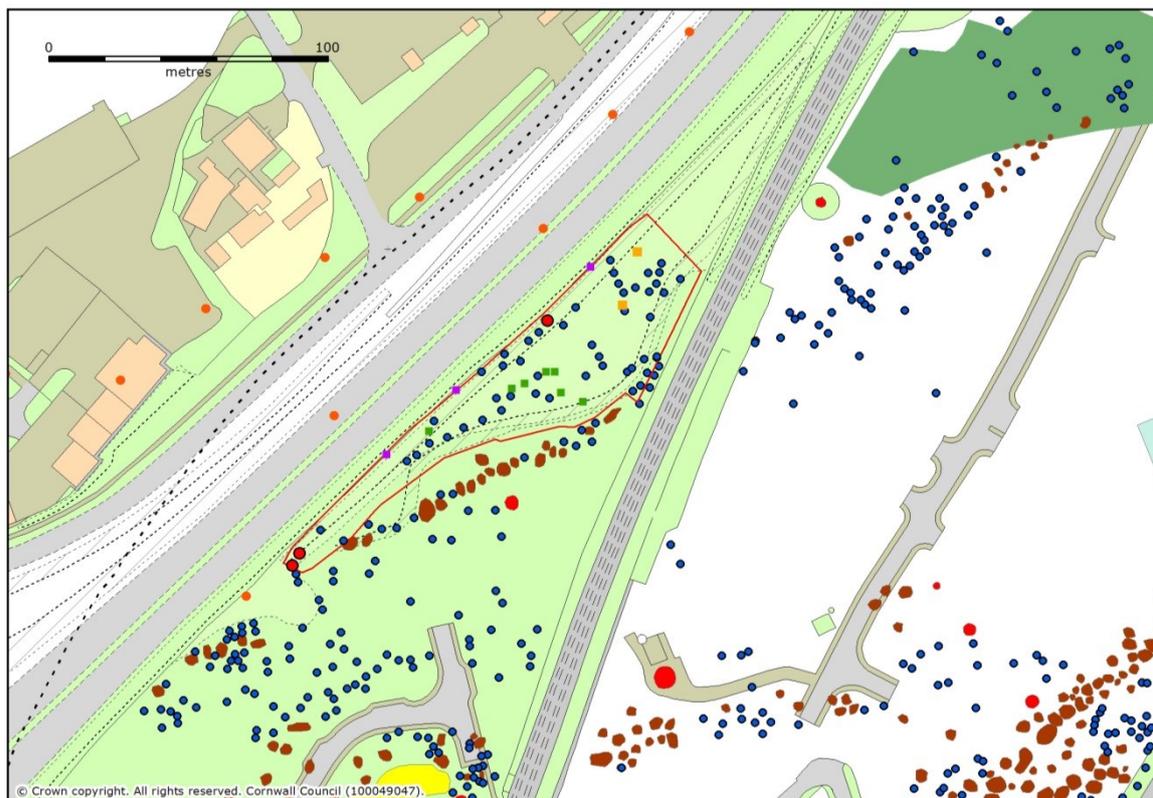


Figure 5: The combined results of the 2018 recording and the adjacent area of the 2014 feature plotting. Red: shafts, brown: outcrop shafts, yellow: openworks, blue: prospecting pits, green: dressing floor features, orange: linear features, purple: settling pits.

consisted of a group of 14 small fields, these originally having been laid out in downland as a miner's smallholding, consisting of between 15 and 20 smaller fields, most likely during the late 18th or early 19th century. Two hedged mine shafts are shown on modern OS maps within these fields, though the 1st Edition 25" mapping dating to circa 1877 shows at least four shafts in this area.

6 Archaeological results

See Figures 3 and 4 for locations.

Stripping of the site commenced in December 2017; this involved the removal of the spoil heaps deriving from the construction of the Blackwater By-pass and did not require the presence of an archaeologist.

A strip was cleared on the western edge of the site adjacent to the fence line running parallel with the A30 dual carriageway to assess the potential number of mining remains present; this revealed over 30 features of various sizes. This work was undertaken before stripping of the main site commenced.

Weather conditions during the watching brief made the ground wet and muddy and not particularly conducive to recording features which had been cleared by a machine and subsequently tracked over.

In February 2018 clearance of the site continued after a break in operations; the remainder of the area was stripped down to the natural or the level at which archaeological/mining remains were revealed using a combination of toothed and toothless buckets depending on the depth of the overburden. Given the proximity to

the main railway line to the south-east, a five metre no-dig buffer zone was implemented on this edge of the site.

Numbers within bolded brackets [] or () in the following text indicate feature or layer numbers, details of which can be found in the Gazetteer (Appendix 1), which includes detailed descriptions of each feature.

The following summarises the significant archaeological features which were found within the study area.

Prospecting Pits

Prospecting pits were found along the edges of the site from the north-east to the south-west in both baulks, whilst further examples were revealed within the stripped area of the site once the topsoil had been cleared.

The majority of the pits were around 2m long, 1.4m wide and between 1.5 and 3m deep; some were shallower, some deeper. The pits were all orientated on a north-west to south-east axis and appeared to be clustered either in lines or triangular groups.

The pits all exhibited similar shapes (Figure 12), elongated rectangles with curved corners; when excavated the pits' sides were seen to be squared off in depth and having vertical sides and ends and generally flat bases taking the form of narrow trenches. No associated spoil dumps survived.

The arrangement of the prospecting pits appears to indicate that they had been excavated to test the ground between a pair of lodes on which features had been recorded in the northern part of the business park in 2014 (North Lode and Pinninger's Lode). Exceptions to this were pits [18] and [19]. The outcrop of Pinninger's Lode lies immediately to the south-east of the site under investigation within an area which was archaeologically recorded in 2014, whilst the outcrop of North Lode appears to run along the eastern edge of the A30 at this location.

There appeared to be a distinct difference in the size of the prospecting pits within the area under investigation in 2018 to those previously investigated. This may, however, partly reflect differences in the ways that these features were excavated and recorded during the two investigations and remediation programmes.

Early copper dressing floor features

Located on the edge of the site against the baulk adjacent to the A30 were three areas of interest [9], [78] and (79) which appeared to represent (or be associated with) parts of early dressing floors – probably an extension of an extensive area of broadly similar features recorded to the north-east of Pinninger's Shaft in 2014.

[9] Possible settling tank (Figure 10). Located on the western edge of the site in the unexcavated baulk running adjacent to the A30, this took the form of a series of deposits infilling a large bowl shaped feature, potentially some form of settling tank or a pond.

The surface deposit comprised of a very loose, vegetation-topped dark brown soil 0.4m deep; this overlaid a light to mid pinkish-grey clay which was interpreted as representing redeposited mine waste; this was more compacted than friable and was stable enough not to collapse from the section; it was mixed with other extraneous rubbish, incorporating common stone inclusions made up of fragmented quartz and other stone.

This layer was 0.6m deep and was interpreted as material overlying the tank or pond, whose upper fill consisted of a dark brown plastic clay with sparse stone inclusions, 0.16m deep. This overlaid a dark brown sandy deposit 0.1m deep – this material was very fine and loose to the touch and contained no large stones or other material. This in turn overlaid a thick layer of mid-greyish gritty stone/sand, 0.4m deep. Below this deposit was the natural decayed bedrock, here taking the form of an orange clay which was very plastic and sticky when wet.

The clay and sands were well-defined and appeared to show lamination indicating multiple deposition events had taken place, probably over a relatively short period. It seems likely that the clays and sands had been water-deposited and probably originated on the dressing floors to the north-east.

The cut of the feature was only visible to the south-west, where it was well-defined in the baulk; it gave the impression of a deliberately excavated cut rather than a hollow which had developed as a result of natural erosion. The lack of any clay material to act as a basal seal to the pond or soakaway was unusual, but it may be that the natural clays provided an effective waterproof seal.

[78] Possible settling tank, located on the western edge of the site in the baulk running adjacent to the A30. A series of deposits were identified in the section; whilst the cut was not clearly visible or well-defined, the deposits were of interest due to their natures. The surface deposit was a dark brown soil topped with vegetation, 0.5m deep; below this was a mid-greyish-brown friable clay/stone mix of redeposited mine waste <0.4m deep, a similar arrangement to that found at feature **[9]**. The probable upper surface of the feature itself consisted of a compact grey slurry incorporating large stones; this very hard material appears to have been dumped into a feature. Below this was a layer of blue/green clay, which was almost stone-free in some areas and was 0.2m deep. This overlaid a layer of gritty/sandy material, together with a reddish gritty material which was found in some areas of the section at this level. The basal layer was a lens of iron pan, a very compact solid surface, which in turn sat on the natural. Though the basal material was coarser to that found in **[9]**, it again seems likely that it would have been water-lain; and again originated from the early dressing floors to the north-east.

(79) This was located on the western edge of the site in the baulk running adjacent to the A30. Again, like [78] this might not have been a distinct feature but the deposits at this location were worthy of note. No cut feature could be identified, but the baulk contained large amounts of compacted material of a greenish colour; material of this colour is characteristic of that found on or near copper dressing floors. The form of the deposition of material within this area did not appear structured but this area of the baulk was markedly different in appearance to the remainder of the baulk along the west side of the site. Layer **(79)** may represent a dump associated with dressing floor waste.

Dressing floor pits

Within the site, particularly within its central area, several possible processing pits were identified and recorded; unlike the prospecting pits these were true rectangles, were orientated down the slope of the site, and were shallow.

The pits all contained light gravels which were either greenish grey in colour or dark brown. The materials were clean and very loose to the touch; most contained a single deposit. Pits **[55]**, **[56]**, **[75]** and **[76]** are the best examples of these pits.

[55], a rectangular shaped pit 1.8m long, 0.7m wide, containing a green/blue gritty deposit with some banding or iron pan; the pit base was uneven, but its edges were well-defined; it had sloping sides with rounded edges at the base and a north-east to south-west orientation.

[56] (Figure 11), was a rectangular shaped pit 1.9m long, 0.85m wide and 0.3m deep containing a dark brown gritty deposit, 0.4m deep which was very loose and appeared to have been washed. Its orientation was close to north-east to south-west.

[75], a rectangular shaped pit, 2.4m long, 0.8m wide and 0.25m deep, containing a dark greenish loose gritty gravel.

[76], a rectangular shaped pit, 1.4m long, 0.75m wide and 0.2m deep, containing a dark greenish-grey loose gritty gravel; this was very loose and appeared to be washed material.

Linear features

Two linear features were recorded on the site. The best preserved of these [34] was 6m long and orientated on a north-east to south-west axis; it had been truncated at its south-western end. This feature was adjacent to a prospecting pit [35], though is unlikely to have had no relationship to it.

The fill of [34] (Figure 9), was a greenish-blue clay which may well have derived from copper processing activities. Given that the fill of this linear feature was banded, multiple deposition events are implied. The basal deposit was a dark greyish-blue clay. The overall depth of the gully was less than 0.16m; it had been completely truncated to the south west. This feature appears to have been some form of channel, probably one carrying fine waste material away from the main part of the dressing floors to the north-east.

A second linear [36], located not far away at the north-western end of the site, was clearly visible on the surface. Hand excavation of a section of this feature revealed a channel with vertical sides and a soft, reddish, sticky clay fill. Further machine excavation of the surrounding area failed to reveal any further sections of this feature. Of possible significance was the fact that the channel appeared to originate near a stony feature situated in the northern baulk. This relationship could not be confirmed given that the stone feature lay outside the study area.

Shafts

Several of the exposed features had dimensions and forms indicative of mine shafts (Figure 8) of earlier or later date. These were all deeper than the 2m – 3m characteristic of prospecting pits. In the south-western corner of the site was a single shaft with an associated excavation on the lode outcrop [1]. This shaft was in close proximity to the outcrop of Pinninger's Lode and is likely to represent one of the principal access points into underground workings on this lode within this part of the site.

Further to the north and located in the baulk adjacent to the A30 was a further shaft which was found to have already been capped using reinforced concrete [71].

7 Chronology/dating evidence

No direct dating evidence was found on the area covered by the 2018 watching brief. However, it incorporated a large number of mining-related features, some of which like the processing pits are indicative of a primary phase of exploitation. When consider in conjunction with the results of the 2014 watching briefs (Figure 5), it seems likely that these are late 17th or early 18th century in date. The shafts will be somewhat later, being developed once the outcrop of the lode had been proven by processing activity, and the processing features slightly later again, being associated with the active dressing of ores.

8 Discussion

The investigation and recording of the mining features within this part of the former Hallenbeagle sett has provide a useful adjunct to the work undertaken on the remainder of the business park in 2014, and once again demonstrated the value of high precision recording of features revealed during the soil strip.

Notwithstanding a degree of truncation which had evidently taken place during the construction of the adjacent A30 bypass, sufficient evidence had survived to demonstrate the form taken by the initial prospecting activities, and to provide further examples of features associated with the early copper dressing floors revealed in 2014.

9 References

9.1 Primary sources

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9.2 Publications

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9.3 Websites

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

10 Project archive

The CAU project number is **145752**

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

Electronic data is stored in the following location:

\\CAU\Archive\Sites H\Hallenbeagle West WB 2018 145752

GRE 907

Historic England/ADS OASIS online reference: cornwall2-315586



Figure 6: View of site after initial clearance, looking south-west.



Figure 7: Looking south from the northern end of the site.



Figure 8: Possible shaft **[2]** (1m scale).



Figure 9: South-west facing section of linear channel **[34]** (0.5m scale).



Figure 10: Section through possible settling tank [9], (1m scale).



Figure 11: Section of pit [56] containing possible processing waste (1m scale).



Fig 6: Section of a typical small prospecting pit [53] (1m scale).

Appendix 1: Hallenbeagle site inventory

*Some features were allocated two separate numbers.

Feature no.	Feature type	Grid Ref.	Mining report ref.	Description
1	Shaft	72483, 44658	F063	Located at the south-west end of site, in close proximity to the baulk. Originally appearing as an oval shaped pit, or possible shaft, 2.1m by 1m, it was only during excavation that the feature became clearer and was enlarged to become over 4m in diameter; excavated to 6m deep. When initially excavated two sections were observed at the 4m level which appeared to run off the main shaft, probably on the lode outcrop traversing this area. The shaft was subsequently excavated a further two metres at which depth a possible adit was encountered. The upper fill was a light grey friable plastic clay, 0.4m thick, containing <20% fragments of quartz; the lower fill was a light pinkish-grey friable clay, containing small fragments of quartz. Further excavation revealed the underlying deposit to be a light brownish clay mix.
2	Possible prospecting pit or shaft.	72485, 44662	F064	An oval shaped pit, 3.7m long, 3.1m wide. The upper fill was a light grey friable plastic clay containing small fragments of quartz. Around the edges of the feature was a second deposit made up of a dark greyish-brown friable clay/stone mix, containing small fragments of quartz. Archaeologist not on site when feature was excavated.
3	Ditch?	72492, 44671	F070	A linear feature, 2.8m wide, over 5m long and 0.5m deep with moderate edge definition, containing a light grey friable plastic clay, containing <20% small fragments of quartz and a dark greyish-brown friable stone/clay mix, common stone inclusions of small fragments of quartz. Excavated prior to arrival on site.
4	Ovoid pit	72493, 44669	Part of F070	Ovoid-shaped feature inside linear feature 3. 1.3m long and 1m wide, filled with a dark brownish-black friable gritty clay containing <10% small fragments of quartz.
5	Prospecting pit	72496, 44672	F068	An oval shaped pit 2.2m long, 1.05m wide, containing a light greyish-brown friable gritty clay containing <10% small fragments of quartz.
6	Pit?	72498, 44679		A rectangular shaped pit 1m long by 1.2m wide, containing a mid reddish-brown friable gritty clay with <30% small fragments of quartz.
7	Possible prospecting pit	72500, 44681		Irregular oval shaped feature, 2.8m long and 0.9m wide variable, topped with a dark reddish-brown friable gritty clay, containing <30% fragmented pieces of quartz.

Feature no.	Feature type	Grid Ref.	Mining report ref.	Description
8	Possible prospecting pit	72504, 44684		Irregular oval shaped feature, a large area of discoloured ground, 4.1m long and 1.2m wide, containing a dark reddish-brown friable gritty clay (similar to 7), contained <30% small fragments of quartz.
9	Possible settling pit	72525, 44703		Evident in the A30 side of the site in the baulk were a series of lenses of deposited material, which appears to have been washed. The surface of the possible feature contains a 0.6m fill of redeposited mining waste made up of a light greyish clay and soil mix, friable but compacted in places. This sat on top of a dark brown plastic clay 0.16m thick, with the edge cut defined to the south; the top of the deposit was reasonably level, which would suggest a formerly liquid material. This sat on top of a very sandy layer, which was dark brown, very fine, 0.1m thick. This in turn sat on top of a light grey aggregate mix with common stone inclusions. Of interest was the lack of a clay base, implying that this feature was not watertight.
10	Pit	72526, 44705		Possible oval shaped pit, 1.4m long and 1.3m wide, topped with a stony fill; not a very distinct cut, could be natural.
11	Possible settling pit	72531, 44706	F069	Rectangular shaped pit revealed in the baulk, 1.2m long, 1.1m wide. Topped with a mid greyish-brown friable gritty clay with a heavy sandy content and common small stone inclusions.
12	Prospecting pit	72533, 44710	F071	Elongated oval shaped pit, 2.7m long and 1.5m wide, topped with a mid greyish-brown friable gritty clay/sand mix with fragmented small stone inclusions. North-west to south-east orientation.
13	Uncertain	72535, 44713		Irregular shaped feature exposed in the baulk running adjacent to the A30. 3.7m long by 2.3m wide, topped with a mid greyish-brown friable gritty clay/sand mix and common stone inclusions.
14	Possible prospecting pit	72550, 44726		Rectangular shaped pit, 1.3m long and 1.2m wide, exposed in the baulk adjacent to the A30. The surface deposit was a pinkish-grey sandy clay with larger quartz stones, some organic intrusions. North-west to south-east orientation.
15	Prospecting pit	72558, 44730	F006	Elongated ovoid shaped pit, 2.6m long, 1.4m wide, topped with a mid-brown friable gritty clay, and common stone inclusions. Irregular shapes and sizes, <0.01m in size.
16	Prospecting pit	72558, 44734		Elongated pit, 1.6m long and 0.25m wide, exposed in the baulk adjacent to the A30, topped with a dark yellowish-brown friable gritty clay, common stone inclusions.

Feature no.	Feature type	Grid Ref.	Mining report ref.	Description
17/72	Prospecting pit	72564, 44732	F014	Visible in the baulk when first excavated, 1.6m long and 0.25m wide, ovoid shape, topped with a dark yellowish-brown friable gritty clay containing common small fragmented stones.
18	Possible prospecting pit	72496, 44663	F071	Oval shaped pit, 2.3m long by 1.5-1.6m wide, topped with a mid to dark grey sticky plastic stony clay, containing <20% stone inclusions, mostly larger quartz stones. When initially revealed this appeared to be rectangular, but excavation revealed that this feature was much larger than it at first appeared. Not available for full excavation.
19	Possible prospecting pit	72505, 44675	F067	An oval shaped pit, 1.9m long and 1.5m wide. Topped with a mid to dark grey sticky plastic stony clay. Orientated north-west to south-east; the edge of the feature was darker and appeared to contain organic material.
20	Pit	72518, 44686	F052,53,54	Oval shaped pit, 0.7m in diameter, topped with a mid-grey friable stony clay, <40% small stone inclusions. Part of a set of three pits in close proximity.
21	Pit	72518, 44686	F052,53,54	Oval shaped pit, in close proximity to features 20 and 22. 1.7m long and 1.4m wide, topped with a grey friable stony clay, containing <40% stone inclusions.
22	Pit	72518, 44686	F052,53,54	Oval shaped pit in close proximity to features 20 and 21. 1m long by 0.7m wide. Topped with a mid-grey friable stony clay <40% stone inclusions.
23	Prospecting pit	72523, 44695		Oval or rectangular shaped pit, 2.3m long by 1.2m wide, north-east to south-west orientation. Topped with a dark mottled grey friable stony clay, <40% stone inclusions, larger stone fragments 0.1m in size, irregular shapes, unsorted.
24	Pit	72527, 44698	F056	Linear feature 7m long and 1.3m wide, comprised of a dark grey and black loose very stony fill <90%, large stones irregular in size and shape, orientated north to south.
25	Possible prospecting pit	72532, 44702	F060	Oval shaped pit, 1.3m long, 1.2m wide and 2.2m deep, topped with an off-white/grey clay, containing fragments of quartz stone, some larger pieces but no indication of sorting, a darker band of material is present around the edges defining the pit. North-west to south-east orientation.
26	Possible prospecting pit	72538, 44704	F057	Oval shaped pit, 2.2m long, 1m wide and 1.4m deep, topped with a mid greyish-brown clay, some soil content and stone inclusions consisting of small fragments of quartz.

Feature no.	Feature type	Grid Ref.	Mining report ref.	Description
27	Prospecting pit	72538, 44709	F058	Oval shaped pit, 2.4m long and 3.6m deep, topped with a light grey sticky plastic stony clay, <30% stone inclusions, primarily quartz. SW 72539 44719.
28	Pit	72557, 44733		Oval shaped pit, 2.2m long, 0.8m wide, Topped with a mixed fill of dark almost black coloured material made up of clay and stone.
29	Possible prospecting pit	72502, 44732		Rectangular shaped pit, measuring 1.1m long and 0.8m wide, containing an almost black mottled deposit, this being a mixture of clay and fragments of quartz.
30	Prospecting pit	72610, 44765		Oval shaped pit, 1.3m long and 0.9m wide, topped with a dark reddish-brown sticky clay; very heavily mottled with smaller fragments of stone, mostly fragmented quartz.
31	Pits?	72606, 44762	F041	Elongated ditch type feature, excavated by machine prior to arrival, may actually be two or more individual features, at least 4m long, and over 1m wide, ground appears to be very soft, orientation appears to be east to west.
32/66	Prospecting pit	72613, 44763	F048	Elongated oval shaped pit, 3.3m long, 1.7m wide and 1.2m deep, appeared to have a narrow tail at the north end of the feature; topped with a dark grey mottled clay/stone mix, which was sticky in consistency. Common small fragments of quartz present.
33/65	Prospecting pit	72614, 44763	F047	Elongated oval shaped pit, 2.2m long, 1.3m wide and 1.35m deep topped with a dark greyish/black mottled clay deposit, small quartz fragments.
34	Linear feature	72603, 44754 - 72598, 44749	Adjacent to F032	Linear gully cut into the natural 5-6m long, 0.5m wide and 0.16m deep, contained a dark grey, almost greenish-black deposit, this being a friable stony gritty sand <40% very small stone content. Appears to be a gully for moving a liquid type material for processing or a waste channel.
35	Pit	72602, 44750	F033	Oval shaped pit, 2.2m long, 1.4m wide and 1.9m deep, contained a dark almost black friable plastic gritty stone/clay mixture, mottled. Adjacent to gully 34. North-west to south-east orientation.
36	Linear feature	72609, 44773 - 72602, 44771	F044	Linear feature, well-defined on the surface, 7m long, 0.6m wide, depth 0.4m curved around the baulk on the north east part of the side and headed toward the western baulk. When hand excavated the fill was a soft brownish-pink clay; the feature had vertical edges and a flat base. A thin surface layer of greenish-blue copper secondaries. The feature was later investigated using a machine and appeared to have been truncated.

Feature no.	Feature type	Grid Ref.	Mining report ref.	Description
37/63	Prospecting pit	72617, 44770	F049	Oval shaped feature, 2.4m long, 1.3m wide and 1.45m deep. Topped with a dark grey friable plastic stony gritty clay, common stone inclusions of small fragments of quartz <20%.
38/62	Possible prospecting pit	72618, 44770	F045	Oval shaped pit, 1.9m long by 1m wide, topped with a dark grey friable plastic stony gritty clay, <20% small fragments of stone.
39	Prospecting pit	72597, 44775	F043	Oval shaped pit 2.2m long, 1m wide and 0.95m deep, topped with a dark greyish/black friable, loose stony grit, very organic looking fill on the surface; <20% stone content on the surface, some mottling. Very close to the baulk adjacent to the A30.
40	Prospecting pit	72601, 44772	F40	Oval shaped pit, 2.1m long, 1.2m wide and 0.65m deep, topped with a dark greyish/black friable plastic clay; <20% stone fragments.
41	Pit cutting linear feature or pit group	72601, 44756	F039	Oval pit cut through by larger pit, 1.8m wide, length not determined but could have continued for at least 5m on a north-south orientation. Topped with a dark greyish/black mottled friable plastic stone and clay mix; common stone inclusions <20%.
42/58	Prospecting pit	72590, 44738	F023	One of a series of oval shaped pits which prior to excavation appeared to have merged across the width of the site. 2.6m long, 1.4m wide, at least 1.6m deep, topped with a dark greyish/black friable plastic stony clay mix; common stone inclusions <20%.
43/59	Prospecting pit	72592, 44734	F024	Oval shaped pit, 3.3m long, 1.4m wide and 1.5m deep, topped with a dark brownish/black friable plastic stone clay mix; <50% stone inclusions.
44	Posthole	72587, 44733		Posthole. Rectangular shaped posthole, 0.25m by 0.25m in size, topped with a dark brown sticky clay containing small fragments of stone. 1.7m from the next posthole to the east.
45	Posthole	72592, 44730		Posthole. Rectangular shaped posthole, 0.25m by 0.25m in size, topped with a dark brown sticky clay containing small fragments of stone.
46	Posthole	72602, 44726		Posthole. Square shaped posthole, 0.25m by 0.25m in size, topped with a dark brown sticky clay containing small fragments of stone. 1.7m from posthole 45.
47	Posthole	72591, 44729		Posthole. Rectangular shaped posthole, 0.25m long by 0.2m wide, 3.4m from posthole 46. Topped with a dark almost black peaty clay mix.

Feature no.	Feature type	Grid Ref.	Mining report ref.	Description
48	Prospecting pit	72611, 44731		Oval shaped pit, 2.8m long and 1.7m wide, topped with a dark brownish/black mottled plastic stone clay fill; common stone inclusions, north-west to south-east orientation.
49	Prospecting pit	72588, 44756	F022	Oval shaped pit, 2.2m long and 1.4m wide, 1.1m deep, topped with a dark brownish/black mottled friable plastic stony clay; <20% stone inclusions. North-west to south-east orientation.
50	Pit	72559, 44723	F004	Irregular shaped rectangular pit, straight edged profile on the surface. 1.95m long by 1.1m wide; separate section 1.8m long and 0.8m wide. Topped with a dark organic deposit, with brownish/yellow clay mix, sticky consistency, some small stone inclusions.
51	Pit	72559, 44723	F007	Rectangular shaped pit, 1.9m long, 1.1m wide and 0.15m deep, similar fill to pit 50, a dark brownish/black mottled friable plastic stony clay; <10% stone inclusions.
52	Prospecting pit	72557, 44728	F005	Oval shaped pit, 2.2m long, 0.8m wide and 1.3m deep, topped with a dark brownish/black sticky plastic stony clay; <10% stone inclusions.
53	Prospecting pit	72573, 44726	F013	Oval shaped pit, 2m long, 1.1m wide and 1.1m deep, topped with a dark greyish/brown/black mottled deposit, sticky plastic consistency, stony clay fill; <10% stone inclusions.
54	Prospecting pit	72575, 44718	F009	Oval shaped pit, 2.3m long, 0.9m wide and 1.5m deep, topped with a dark greyish/brown/black sticky plastic stony clay; <10% stone inclusions. North-west to south-east orientation.
55	Pit associated with copper dressing activity	72583, 44726	F010	Rectangular shaped pit, 1.8m long by 0.7m wide, comprised of dark greenish gravels, consistent throughout the pit, the deposit appeared clean and sorted. Possibly water separated. North-west to south-east orientation.
56	Pit associated with copper dressing activity	72591, 44724	F050	Rectangular shaped pit, 1.9m long, 0.85m wide and 0.6m deep, filled with a dark reddish/brown loose gritty stone deposit, <100% stone material, small fragments appears to have been separated and washed. The pit was not lined with anything but the cut was well-defined and orientated almost east-west.

Feature no.	Feature type	Grid Ref.	Mining report ref.	Description
57	Pit	72599, 44724	F029	Oval shaped pit, exposed in the baulk adjacent to the main railway line, possibly connected to a linear feature running along the edge of the baulk. 3m long, 0.8m wide and 2.7m deep, topped with a dark greyish/off-white plastic clay stone mix. Common stone inclusions.
60	Prospecting pit	72594, 44730	F025	Oval shaped pit, 3m long, 1.4m wide and 1.5m deep, topped with a large concentration of larger stones <0.1m in size, mixed with a mottled clay.
61	Prospecting pit	72580, 44745	F018	Oval shaped pit, 2.7m long, 1.8m wide and 1.6m deep, topped with a dark greyish/pink plastic very sticky clay, 30% common small stone inclusions.
62, 63				Numbers not used. Duplicate features.
64	Possible prospecting pit	72617, 44767	F062	Oval shaped pit, 2.5m long by 0.65m wide, topped with a dark brownish/black plastic friable silty clay; <20% stone inclusions.
65, 66				Numbers not used. Duplicate features.
67	Possible prospecting pit	72613, 44763	F040	Oval shaped pit, 1.9m long by 0.9m wide, topped with a dark brownish/black friable plastic stony clay, containing <20% common stone inclusions.
69	Pit	72546, 44701		Large oval pit protruding from the eastern baulk, 3.6m long by 0.8m wide from the baulk, topped with a grey plastic clay deposit; common stone inclusions comprised of quartz.
70	Amorphous surface material	72508, 44674		Possible feature protruding from the eastern baulk, 3m long and 0.4m wide, topped with a dark greyish/brown plastic clay; <5% stone content.
71	Shaft	72573, 44746	F017	Large area of disturbed ground, containing large fragmented pieces of stone, 5.2m wide, protruding from the baulk 4.5m, excavation revealed a concrete plug at 2.25m deep, this was identified as a previously capped mine shaft. Of interest were the backfilled deposits on top of the shaft plug, neat lines of varying materials, unlike the random mix of material expected.
72	Prospecting pit	72571, 44742	F016	Oval shaped pit, 3.2m long, 1.7m wide and 1.6m deep, topped with a dark reddish/brown plastic clay stone deposit.
74	Prospecting pit	72568, 44738	F015	Oval shaped pit, 3m long, 1.6m wide and 1.9m deep, topped with a reddish/brown plastic clay stone mix, <40% stone inclusions.

Feature no.	Feature type	Grid Ref.	Mining report ref.	Description
75	Processing pit	72583, 44737	F012	Rectangular shaped pit, 2.4m long, 0.8m wide and 0.25m deep, containing a dark greenish/grey mix of loose gritty gravel; <100% stone inclusions.
76	Processing pit	72573, 44728	F011	Rectangular shaped pit, 1.4m long, 0.75m wide and 0.2m deep, containing a dark greenish/grey loose gritty gravel mix; <100% stone, very loose, appeared to be washed and separated material.
78	Possible settling tank	72541, 44723		Evident in the A30 side of the site and in the section of the baulk, a lens of greyish blue clay <0.2m deep, very pure, sat on top of a layer of gritty sand and stone, the base of the feature is made up of a solid layer of iron pan. The feature was at least 3m long and was about 0.9m below the ground surface.
79	Uncertain	72590, 44764		Located in the A30 side of the site, this was at the north end of the site, the material in the baulk indicated the presence of a possible settling tank, the cut was not as clear as others within the same side of the site, but the deposits within the baulk of possible clays and copper ore.
81	Prospecting pit	72570, 44720	F008	Oval shaped pit, 2.7m long, 1.2m wide and 1.3m deep, topped with a dark brown mottled friable clay, very common stone inclusions.
82	Prospecting pit	72558, 44714	F061	Oval shaped pit, running adjacent to the BT line crossing the site. 2.2m long, 1.6m wide and 3m deep, topped with a dark brown plastic friable clay.
83	Prospecting pit	72551, 44711	F059	Oval shaped pit, 1.8m long, 1.4m wide, 1.5m deep, topped with a dark brown plastic friable clay. Common stone inclusions.
84	Prospecting pit	72556, 44718	F002	Oval shaped pit, 2.3m long, 1m wide and 1.5m deep, topped with a dark brown plastic friable clay. Common stone inclusions.
85	Prospecting pit	72558, 44714	F003	Oval shaped pit, 1.9m long, 1m wide and 1.4m deep, topped with a dark brown plastic friable clay, common stone inclusions.

Appendix 2: Written Scheme of Investigation

Cornwall Business Park West, Scorrier: Written Scheme of Investigation for archaeological watching brief during mine investigation works

Client: Jactamial Properties Ltd

Client contact: Lloyd Husband

Client tel: 01392 663229

Client email: Lloyd.husband@aecom.com

Planning ref (if appropriate): PA17/05107

Project background

Cornwall archaeological Unit (CAU) was approached on 27 November 2017 with a request for a method statement and the costs of undertaking an archaeological watching brief during groundworks associated with the development being undertaken by Helston Garages in the western section of Cornwall Business Park West at Scorrier. It is intended that CAU would be on site when Mine Searches UK would be investigating the development area for mining features and remediating them.

The development site is centred at SW 72566 44690 and is located between the A30 and the route of the main line railway.

Planning permission for the development was granted on 30 October 2017 (PA17/05107). Condition 6 of the grant of planning permission states:

a) No demolition/development shall take place/commence until a programme of archaeological work including a Written Scheme of Investigation (WSI) has been submitted to and approved by the LPA in writing. The scheme shall include an assessment of significance and research questions, and: 1. The programme and methodology of site investigation and recording, 2. The programme for post investigation assessment, 3. Provision to be made for analysis of the site investigation and recording, 4. Provision to be made for publication and dissemination of the analysis and records of the site investigation, 5. Provision to be made for archive deposition of the analysis and records of the site investigation, and 6. Nomination of a competent person or persons/organisation to undertake the works set out within the Written Scheme of Investigation.

b) No demolition/development shall take place other than in accordance with the Written Scheme of Investigation approved under part a).

c) The development shall not be occupied until the site investigation and post investigation assessment has been completed in accordance with the programme set out in the WSI approved under part a) and the provision made for analysis, publication and dissemination of results and archive deposition has been secured.

d) The archaeological recording condition will normally only be discharged when all elements of the WSI including on site works, analysis, report, publication (where applicable) and archive work has been completed.

Reason: In the interests of protecting archaeological remains in accordance with Policy 24 of the CLP and Para 98 of the NPPF.

Aims and objectives

The principal aim of the study is to gain a better understanding of the archaeology of the development area in advance of its development.

The objectives are to:

- Obtain an archaeological record of the site prior to development.
- To produce a report summarising the findings of the archaeological watching brief.
- To complete an entry to the Historic England/ADS OASIS national database of archaeological projects.

Working methods

All recording work will be undertaken according to the Chartered Institute for Archaeologists (CIfA) guidance (CIfA 2014a, 2014b, 2014c, 2017). Staff will follow the CIfA *Code of Conduct* (2014d). The Chartered Institute for Archaeologists is the professional body for archaeologists working in the UK.

Creation of the physical and digital archive

Following review with the CAU Project Manager the results from the fieldwork will be collated as an archive.

This will involve the following.

- All finds, etc., will be washed, catalogued, and stored in a proper manner (being clearly labelled and marked and stored according to CAU guidelines).
- All records (drawings, context sheets, photographs, etc.) will be ordered, catalogued and stored in an appropriate manner (according to CAU guidelines).
- Any black and white negative film will be catalogued and deposited with the site archive.
- Colour digital images taken as part of the site archive will be either converted from colour to black and white negative film and added to the site archive, or deposited with the Archaeology Data Service (ADS).
- Completion of the English Heritage/ADS OASIS online archive index.
- All correspondence relating to the project, the WSI, and a single paper copy of the report, stored in an archive standard (acid-free) documentation box.
- Drawn archive storage (plastic wallets for the annotated record drawings).
- Additional digital data (survey, external reports, etc)

Archive deposition

An index to the site archive will be created and the archive contents prepared for long term storage, in accordance with CAU standards.

- The project archive will be deposited initially at ReStore PLC, Liskeard and in due course (when space permits) at Cornwall Record Office.
- Digital data will be stored on the Cornwall Council network which is regularly and frequently backed up.
- Digital data (CAU reports, external reports, survey data, geophysics data, digital photographs etc) forming part of the site archive will be deposited with the ADS.

CAU uses the following file formats for stored digital data:

DOCX Word processed documents

XLSX Spreadsheets

PDF Exports of completed documents/reports/graphics

JPG Site graphics and scanned information

DNG or TIF Digital photographs

DWG AutoCAD drawings, measured surveys

MXD ArcView GIS (electronic mapping) data

AI Adobe Illustrator graphics

Pre-fieldwork

In advance of the fieldwork CAU, will discuss and agree with the client:

- Working methods and programme.
- Health and Safety issues and requirements.
- Transfer of Title for artefacts.
- Obtaining an accession number from the appropriate archive repository.

Fieldwork: watching brief

A continuous watching brief will be undertaken for the duration of the topsoil removal and investigation of any mine workings revealed during this process. This work will be guided by CIfA's guidance on undertaking watching briefs (CIfA 2014b).

All groundworks which might potentially contain archaeological features will be undertaken under archaeological supervision. This will include any removal of buried or exposed topsoil across the site, the excavation of footing or service trenches, or other activities such as mine-working investigation which would result in the lowering of the present site levels. All soil stripping should be undertaken by a machine equipped with a toothless grading bucket where possible. Should archaeological features be revealed, mechanical excavation will be halted and the exposed features cleaned up by hand to determine their significance prior to either their recording or further mechanical excavation. The developer will allow reasonable time for the excavation and recording of any features thus revealed. Where a temporary stop of work is required the site archaeologist will request this via the developer and the SDOHE.

If complex and/or significant archaeological deposits are encountered then the archaeological requirements will be reviewed by the client, the SDOHE, and CAU. **In the event that remains cannot be preserved *in situ* then full-scale excavation may subsequently be required.** A contingency should be allowed to record any significant archaeological remains uncovered during the groundworks. The significance of the remains will be agreed between the client, the SDOHE, and CAU.

Recording

During the archaeological recording the archaeologist will:

- Identify and record any archaeological features that are revealed; the level of recording will be appropriate to the character/importance of the archaeological remains.
- Site drawings (plans and sections) will be made by pencil (4H) on drafting film; all drawings will include standard information: site details, personnel, date, scale, north-point.
- All features and finds will be accurately located at an appropriate scale.
- All archaeological contexts will be described to a standard format linked to a continuous numbering sequence.
- Photographic recording will comprise black and white negative photography using an SLR camera. Photographs will include a record of significant features and general working shots. A metric scale, site and context identifier, and a north arrow where appropriate, will be included in all record shots.

Treatment of human remains

If human remains are discovered within an archaeological context on the site the client, the SDOHE, and Public Health, Cornwall Council will be informed.

- Any human remains should only be excavated and removed if it is considered that they will contribute towards further scientific understanding.
- A coroner's license must be obtained from the Ministry of Justice before any remains are disturbed.
- Any consents or licenses required will be obtained on behalf of the client by CAU.
- If human remains are uncovered, which require excavation, they will be excavated with due reverence. The site will be adequately screened from the public view. Once excavated, human remains must not be exposed to public view. If human remains are not to be removed their physical security will be ensured, by backfilling as soon as possible after recording.

Treatment of finds

The fieldwork may produce artefactual material. The following recording and retention policies will be followed:

- In the event that objects containing precious metal(s) are encountered, the coroner will be informed as per the provisions of the Treasure Act 1996.
- Significant finds in stratified contexts will be plotted on a scaled base plan or with a Leica GPS unit and recorded as small finds.
- All finds will be collected in sealable plastic bags which will be labelled immediately with the site code, the context number or other identifier, the type of material, and the finder's initials. The only exception to this policy will be that large assemblages of modern (post-1800) material may be representatively sampled.
- Modern (post-1800) finds may be disposed of at the cataloguing stage. This process will be reviewed ahead of its implementation.

Reporting

The results from the project will be drawn together and presented in a concise report. The scope of the report will be dependent on the scale and significance of the results from the project.

In the case of negative results the findings will be presented in a CAU short report format. In the case of limited results the findings will be presented in a concise archive report. Which type of report is most appropriate will be agreed by CAU and the SDOHE at the conclusion of the fieldwork stage.

Timetable

The study is anticipated to commence during December 2017. CAU will normally require at least 2 weeks' notice before commencement of work, in order to allocate field staff and arrange other logistics.

The archive report will be completed within a maximum of 3 months of the end of the fieldwork. The deposition of the archive will be completed within 3 months of the completion of the archive report.

Monitoring and Signing Off Condition

Monitoring of the project will be carried out by the SDOHE. Where the SDOHE is satisfied with the archive report and the deposition of the archive, written discharge of the planning condition will be expected.

- The SDOHE will monitor the work and should be kept regularly informed of progress.

- Notification of the start of work shall be given preferably in writing to the SDOHE at least one week in advance of its commencement.
- Any variations to the WSI will be agreed with the SDOHE, in writing, prior to them being carried out.
- If significant detail is discovered, all works must cease and a meeting convened with the client and the SDOHE to discuss the most appropriate way forward.

Monitoring points during the study will include:

- Approval of the WSI
- Completion of fieldwork
- Completion of archive report
- Deposition of the archive

This WSI was produced by:

Adam Sharpe BA MCIFA

Archaeology Projects Officer

27 November 2017

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