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Hallenbeagle, Phases 1 and 2, Scorrier, Cornwall

Archaeological Watching Brief

Historic Environment Projects

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The watching brief was carried out by Cornwall Archaeological Unit (formerly Historic Environment Projects), Cornwall Council. The site archaeologists were Anna Lawson-Jones and Carl Thorpe.

The Project Manager was Adam Sharpe.

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Freedom of Information Act

As Cornwall Council is a public authority it is subject to the terms of the Freedom of Information Act 2000, which came into effect from 1st January 2005.

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Cover illustration

Hallenbeagle East, Outcrop shafts [36], [67], [66], [68] and [70]. General view looking north-west.

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Abbreviations

BA	Bronze Age
CAU	Cornwall Archaeological Unit
CRO	Cornwall County Record Office
HBSMR	Historic Buildings Sites and Monuments Record
EH	English Heritage
HER	Cornwall and the Isles of Scilly Historic Environment Record
HE	Historic Environment, Cornwall Council
MCO	Monument number in Cornwall HER
NGR	National Grid Reference
NRHE	National Record of the Historic Environment
OD	Ordnance Datum – height above mean sea level at Newlyn
OS	Ordnance Survey
SWARF	South West Archaeological Research Forum

1 Summary

Hallenbeagle at Scorrier was one of a group of early copper mines in western mid Cornwall which were amongst the earliest to adopt the early steam pumping technology which was subsequently to transform Cornwall's mining industry. Operations were underway on this part of North Downs in the late 17th century, and did not fully cease until the late decades of the 19th century. The mining activity here and nearby was intimately linked with the development of miners' smallholdings across an extensive area of downland which formerly lay between Redruth, St. Agnes and Truro, giving this landscape its current character.

Following the abandonment of mining at Hallenbeagle, the site lay vacant for half a century. In 1944, parts of the site were bulldozed by the US Army for a D-Day embarkation camp (though this was never occupied), and over the following decades it became increasingly derelict. Eventually travellers moved onto the site, establishing a sprawling, temporary settlement.

The site had long been identified as suitable for light industrial use, and in 2011, in advance of the redevelopment of the site as a business park, Historic Environment Projects (now Cornwall Archaeological Unit) were asked to undertake an archaeological assessment of the northern part of the site. This outlined the documented development history of the site, and identified several of its areas which were considered to have high archaeological potential.

HE Projects subsequently undertook a watching brief of the groundworks phase of the development between July and November 2012; a further watching brief was carried out during the second phase of the development to the south-west of the initial site between October 2013 and February 2014. This report summarises the results of both phases of work on site.

The topsoil was stripped from almost all areas of the site using large-scale earth-moving machinery, and it soon became apparent that the scale of mining activity within the site had been far more extensive than had initially been thought likely. Over the course of the watching briefs, a very large number of mining features were revealed, recorded and mitigated; the surveys of these features reveal a long and complex history of mining from an initial prospecting phase which probably took place during the late 17th century, through phases of exploitation of the lode outcrops utilising both openworks and closely-set outcrop shafts during the 18th century, and the culmination of work on site in the form of deep shaft mining utilising steam pumping and winding engine houses during the 19th century.

The extent and quality of the archaeological evidence for mining activity across more than two centuries on this site which has been recorded is, to date, unique, and for the first time has allowed the evolution of part of Cornwall's mining landscape to be documented and interpreted. The project has also clearly demonstrated the value of archaeological watching briefs on such sites, and thanks are due to the site developers for facilitating access to the site during both phases of works, and to the former archaeological planning advisor (Dan Ratcliffe) for recognising the potential of the site and requiring an archaeological presence during the groundworks phase of the development.

2 Introduction

2.1 Project background

In June 2012 Cornwall Archaeological Unit (CAU), Cornwall Council (formerly Historic Environment Projects) was commissioned by Jeremy Dunn, Ward Williams Associates, to undertake an archaeological watching brief during groundworks involved with the development of a warehousing estate and accompanying access road in the Hallenbeagle East area centred at SW 72750 44747 (Fig 7). The work primarily consisted of a topsoil strip across the area, followed by the remediation of any mine workings located during these works.

The development was the subject of a planning condition, which required that archaeological recording took place ahead of construction (PA C1/MC04/0836/07/B). Dan Ratcliffe, formerly Historic Environment Planning Advice Officer (Centre), Cornwall Council, produced a brief for archaeological recording (28/06/2012) and was consulted over the requirements for the archaeological recording. A written scheme of investigation (WSI), outlining the methodology for archaeological recording was produced (29/06/2012) by Adam Sharpe (Senior Archaeologist, HE Projects) in response to Dan Ratcliffe's brief (Section 10, Appendix 3).

In October 2013 CAU were commissioned by Mary Rose Callaghan, CBP Developments, on behalf of Ward Williams Associates to undertake an archaeological watching brief during the second phase of development at Hallenbeagle West, this area being centred at SW 72424 44441 (Fig 7). The work involved groundworks similar to those undertaken on the eastern part of the Hallenbeagle site, and was covered by the same planning condition (PA C1/MC04/0836/07/B). A further WSI covering this part of the work was produced (13/11/2013) by Adam Sharpe.

2.2 Aims

The purpose of the archaeological watching brief was to gain information about the character of historic activity within the area affected by the work, the intention being to gain an insight into the archaeological potential existing below ground and to make a record of any sites revealed by the works prior to their loss through development. The programme of archaeological recording was designed to:

- Locate and record in plan and section any archaeological features detected within the area.
- Record evidence of the archaeological potential of the area, for example the depth and character of deposits.
- Recover any artefacts.

Aims specific to this site were to;

- 'Widen our understanding of the extraction, processing and transportation of minerals' (SWARF Research Aim 38)
- Identify and study early examples of mining activity.
- Identify and record any evidence for copper smelting on this site.
- Record and place in social context evidence for the development of mining and related activities.

2.3 Methods

2.3.1 Desk–based study

A desk-based assessment was undertaken as part of the original archaeological assessment of the site in the light of the development proposals (Sharpe 2011b). Databases, publications and archives were consulted in order to obtain information about the history of the site and the structures and features that were known to have existed on it. The main sources consulted were as follows:

- Cornwall HER;
- Images of England online listed buildings database;
- Early maps and photographs;
- Archive aerial photographs;
- Published histories and other relevant material;
- Previous relevant archaeological reports.

2.3.2 Fieldwork – watching brief

The archaeological recording of sub-surface features was undertaken as a watching brief during a range of ground works activities including road construction, treatment of areas infested with invasive weed species, the remediation of mining features and ground level reduction in advance of site development.

On the Hallenbeagle East site some areas were specifically targeted on the basis of information gathered during the desk-based assessment and walkover survey undertaken in 2011 (Sharpe 2011b). Within these areas a controlled topsoil strip where the archaeologist was present at all times was undertaken. These areas included those which were the sites of documented mine shafts and mine buildings together with an area at the northern end of the site where surface evidence had suggested the site of an early copper smelter.

Throughout the rest of the area, and subsequently on Hallenbeagle West, the ground works were monitored as an intermittent watching brief, evidence for archaeological features being undertaken following the removal of superficial deposits.

The contractor undertook the initial phase of topsoil removal using a grading bucket or with a bulldozer blade, the area subsequently being further cleaned using a toothless grading bucket. The exposed surface was checked for indications of sub-surface archaeology, features exposed at this stage being recorded using direct measurement, notes and/or photography as appropriate prior to the excavation of mining features or the areas being trafficked over.

Each feature when encountered was given an identifying number and described. Details of each recorded feature are presented in Gazetteers included in this report as Appendices 1 and 2 (Sections 8 and 9). For shafts or pits and for localised features, a GPS waypoint reading was obtained using a hand-held GPS unit (Garmin 12) from as close to the feature as safety would allow. For linear features GPS points were taken along their lengths or, if appropriate, around their peripheries, whilst in the cases of those buildings whose plans or extents could be determined, points were plotted on their corners. Though useful at providing a basic location for most features, the best resolution available using these hand-held units (+/- 5m) proved insufficient at times, errors in the positions of features being noted, and sometimes the mis-plotting of locations due to the limited accuracy of the machine. This was partially due to the restricted triangulation potential of satellites at some times of the day; some noticeable location drift westwards was also noted in the case of some plotted points when they were geo-referenced to the Ordnance Survey mapping (Fig 9).

Another limitation when using GPS location collection systems is when they are utilised alongside some more modern swing shovels, as in the case of those employed at Hallenbeagle. These machines have inbuilt data loggers and engine monitoring systems along with GPS systems which communicate directly with the manufacturers via satellites. Unfortunately the strength of the on-board signal from these machines is sufficient to blank out or distort the satellite radio signals utilised by GPS receivers, rendering them either completely inoperable, or distorting the positions of the points which they plot. The only solution found to this was to plot features when the machines were a sufficient distance away (greater than 100m) or not in operation. This blanking effect was strong enough to affect the site surveyor's GNSS Rover Station.

A detailed site survey was kindly provided by Chris Hewitt, Senior Engineering Surveyor, Kemp Chartered Land & Engineering Surveyors; however this only records the mining features which were mitigated and does not include all features of archaeological interest; many of these were plotted using the hand-held unit used by the site archaeologist (compare Figs 9 and 10).

Large numbers of digital photographs were also taken to act as an aide memoire to speedily record some features as they were rapidly uncovered and significantly modified or destroyed by the machines in the course of their work. This also proved of use when recording features in severe weather conditions which rendered the use of a notebook virtually impossible.

2.3.3 Archiving

1. All correspondence relating to the project, the WSI, and a single paper copy of the report will be stored in an archive standard (acid-free) documentation box.
2. The project archive will be deposited initially at ReStore, and in due course (when space permits) at Cornwall Record Office.
3. All digital photographs to be archived with a record of the feature number depicted.

3 Background

3.1 Location and setting

The project area consists of approximately 15 Ha of land straddling the Cornwall main railway line just to the north-east of Scorrier within the parish of Kenwyn (Detached). The redevelopment area was split into two, each being approximately 7.5 Ha in size (Figs 1, 2, and 7).

The first phase to be worked on (Hallenbeagle East) lay to the east of the railway line, and was centred at SW 72750 44751. The site slopes gently towards the south-west from 124m OD to 114m OD. The area of this section of the site extended to approximately 74,800 m^2.

The second phase to be cleared for future development lay to the west of the railway line (Hallenbeagle West), and was centred at SW 72452 44485. Here the ground sloped to the south-west from 114m OD to 104m OD. This section of the site extended to 65, 275 m^2.

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 traversing the northern part of the site in an east-north-east to west-south-west direction. 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 range of clays and degraded siltstones.

The study area is criss-crossed with mineral lodes, most following the same trend as the dyke being east-north-east to west-south-west; however a few less prominent lodes (cross-courses) ran perpendicular to these. The major lodes include North Lode (Hallenbeagle Lode), South Lode, Read's Lode, and Oats' Lode (Fig 8). These lodes predominantly contained copper, though tin was encountered at depth (Dines 1956). The evidence also suggests the location of a further lode outcrop, this passing through Pininger's Shaft (shown on Figs 3, 5 and 6), its strike being parallel to those to its north and south.

The area has been worked for more than two centuries, with many shafts having been sunk onto the lodes (Fig 14). Thirteen (mostly 19th century) shafts have been identified either at surface or from mine maps within the Phase 1 area (Sharpe 2011b) while four were noted within the Phase 2 area (Williams undated).

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.

3.2 Designations

The site is bordered to the north-east, east and south by the Gwennap Area of the Cornish Mining World Heritage Site (Fig 2). In the southern part of the Phase 1 site are two Listed Buildings. These are Read's Engine House (1140975) and Read's whim, chimney and crusher engine house (1140976), both being Grade II listed. The conservation of these buildings was undertaken following the ground works to the Hallenbeagle East site, but was not the subject of the archaeological watching brief.

3.3 Site history

The area of Hallenbeagle East (Phase 1) was occupied by Hallenbeagle Mine and the following text has been adapted from Sharpe's 2011b archaeological assessment.

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 lodes in this area are known to have been worked from at least the end of the 17th century, when mining activity here was noted by the traveller and writer Celia Fiennes in 1695. The mine was re-worked, though much less successfully, during the mid-nineteenth 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 is understood to have been only 24m (12 fathoms) below surface, to which it connected via a short east-heading adit from Jeffries' Shaft (information derived from an undated mid-C19 mine plan held at CRO). The Great County Adit is known to have been connected to the mines within the landscape adjacent to North Downs by 1778. Hallenbeagle may have sited a short-lived and pioneering copper smelter during this period, whilst a smallholding (probably laid out and occupied by a local miner) had been established by the early decades of the 19th century, occupying the central part of the Hallenbeagle East development site, its fields developed into some of the areas which had formerly been prospected and worked during the 17th century and early phases of operation of the mine.

Hallenbeagle was shown as active in 1840 on the Kenwyn (Detached) Tithe Map (Fig 4), when an engine house was depicted on Engine Shaft in the northern part of the development area. This may 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 works on site also revealed the remains of an apparently early engine house to the south-west of the shaft.

The mine is known to have worked four major lodes: North Lode (Hallenbeagle Lode), worked from King's Shaft (now beneath the A30), Engine Shaft (in the northern part of the Phase 1 area), Stone Shaft and Eastern Shaft (just to the north-east of the Phase 1 area); Read's Lode was worked from Read's (Reade's or Reed's) Shaft where there are the remains of later 19th century pumping and winding engine houses, as well as three un-named shafts and Jeffrey's Shaft. Other lodes worked were Oats' Lode, worked from Oats' Shaft just to the south-east of the Phase 1 area, and South Lode, which was developed by a number of shafts to the south of the Phase 1 area (Fig 8). One archive map in the CRO suggests that there may have been additional earlier pumping and winding engine installations near Reade's Shaft on locations other than those occupied by the surviving buildings, though no evidence was found to indicate that these had been constructed. It was uncertain if Pininger's Shaft was sunk to work North Lode at depth, or to work a separate lode, as the field evidence now suggests.

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 (Fig 5). By 1907, the northern engine houses had been demolished and the north-eastern part of the site had been reclaimed to agriculture (Fig 6). A sawmill which had developed on the southern part of the Hallenbeagle East site during the late 19th century remained active into the early years of the 20th century, the area of the former mine around Read's Shaft subsequently being modified to site a small-scale concrete batching plant.

By 2005 CCC aerial photographic evidence showed that within the Hallenbeagle East area the central and north-eastern parts of the site had been reclaimed to agriculture and the southern parts of the site were in scrubby heathland and scrubby woodland. In 2011, 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 site were occupied by a number of static caravans and their curtilages; the central part of the site was occupied by a number of the smallholders' fields first shown on the 1809 OS mapping. The south-eastern part of the site had scrubbed in, as had the southern corner of the site and the area around Read's engine houses.

Reade's pumping engine house and a detached chimney and fragments of a now substantially-demolished whim engine house nearby in the southern part of the Hallenbeagle site are set immediately adjacent to the main railway line and are close to the route of the A30.

The area of Hallenbeagle West (Phase 2 of the development programme) falls within the former sett of South Wheal Hawke, about which little is known. This mine is believed to have been in operation from the early 1800s and later became part of Great North Downs, a massive, early and formerly very important copper mine which stretched away across the downs to the west. The mine was drained by a branch of the Great County Adit connecting to it from Wheal Hawke. Paull's Shaft on South Wheal Hawke was reopened in 1942 as the principal shaft in a short-lived operation known as the Scorrier Wolfram Prospect.

South Wheal Hawke Lode was worked from South Wheal Hawke Shaft, which was the principal shaft (SW 7286 4427). This was taken down to 29m below the 28fm level (51m). Other shafts included Robert's Shaft, Paull's Shaft and Robin's Shaft. There was an east-north-east trending elvan dyke in the southern part of the sett, this traversing the boundary between Chacewater and Redruth parishes. The shafts formed a line that passed the A3047 road just south of the present A30 road. Other lodes included Spelter

Lode, Vivian's Lode and Pendarves North Lode. These lodes were mainly worked for copper, though they did produce some tin.

By the end of the 19th century mining activity in this area was depicted as being abandoned on the 1st Edition OS 25" mapping of *circa* 1877 (Fig 5), the remaining evidence for mining at this location consisting of a finger of mine waste containing a small number of mine shafts running approximately east-north-east across the northern part of the site, the land on either side being having been reclaimed to agriculture, a situation that persisted until the recent development works commenced on site.

Most of the workings of South Wheal Hawke have been built over, the only surviving shafts prior to works being the eastern examples in the field between the A3047 road and the railway line, this being the area covered by the Hallenbeagle West (Phase 2) work.

3.4 Previous archaeological work

The Hallenbeagle site was the subject of a 2001 archaeology and cultural heritage chapter in an Environmental Impact Assessment undertaken by IHC Consultants (Williams, n.d.). This covered the area of Hallenbeagle East, and a small part of the northern section of Hallenbeagle West. The area at and surrounding Hallenbeagle was also included within a study of the wider Wheal Busy landscape (Sharpe 1989 ECO331), the Mineral Tramways scoping project (Sharpe *et al* 1990), the Mineral Tramways Conservation Management Plan (Buck 2006 ECO1185), and the World Heritage Site mapping, nomination document and management plan (WHS team 2005). Both sites were on the periphery of an area subjected to an environmental statement (Sturgess 2007) relating to the proposed redevelopment of an area at Scorrier for a waste transfer site (WTS) and household waste recycling point (HWRP).

The study area at Scorrier has two zones, their central point being located at NGR SW 72053 44152 (Sturgess 2007). The north-western part of the Hallenbeagle East site, proposed for redevelopment by Cory Environmental Ltd. was the subject of an EIA archaeology chapter written by Historic Environment Projects, Cornwall Council (Sharpe 2011a). This was followed up by a re-assessment of the whole of the proposed development area (Hallenbeagle East) by Historic Environment Projects (Sharpe 2011b, report 2011R068).

The area covered by Hallenbeagle West has not been the subject of an archaeological assessment.

4 Archaeological results

Numbers within square brackets [ ] in the following text indicate feature numbers, details of these can be found in the gazetteers (Appendices 1 and 2). In a small number of cases, features have more than one number.

Detailed descriptions of each feature encountered are included within the gazetteer. The following presents a summary of what was located within each area examined. The areas within Hallenbeagle East were based on likely archaeological potential – Area 1 containing the remains of known (documented) engine houses and also being the find-spot of the copper slag. Area 3 was centred around Reade's Shaft and also included the other later 19th century shafts mapped by the OS. The area numbers assigned within Hallenbeagle West broadly reflect the work sequence (Fig 7).

4.1 Hallenbeagle East

4.1.1 Area 1.

At the northern end of this area a series of open works and outcrop shafts were recorded following the line of North Lode (Hallenbeagle Lode) and a smaller un-named lode both trending roughly east-north-east to west-south-west (Figs 8 and 10).

It could be clearly seen that North Lode had first been located at surface by chains of prospecting pits and possibly one prospecting trench that had been excavated across the projected line of the lode until it was encountered. In areas close to the outcrop of the lode these pits seem often to have been paired. Having been located, the surface outcrop of the lode had been exploited by openwork [154], [158] which consisted of a continuous linear excavation along the strike of the lode, the feature varying in width from little more than a metre to up to 3.0m. The average depth exposed within this feature was 1.5m, though pits along its length were excavated to depths of about 2.5m. At the north-eastern end of the openwork the crown of a stope following the lode outcrop [164] was encountered at a depth of roughly 3.5m. This feature was opened up by trenching prior to mitigation.

The south-western end of this outcrop working was marked by Engine Shaft and Pumping Shaft, both having been sunk to exploit the lode at depth, though the latter was almost certainly a re-working of an earlier outcrop shaft. Engine Shaft was not mitigated during the course of the project, being within a buffer area of ecological interest. The shaft had been closed off with a Clwyd Cap during Carrick District Council's mid-1980s 'Operation Minecap'. Pumping Shaft had coned in considerably, and had been used by the resident travellers as a site for the disposal of unwanted rubbish for some years. The cone was cleared of debris, and the shaft was found to have an existing concrete plug at a depth of approximately 2.0m from surface possibly put in place during the Operation Minecap operations in the 1980s. The shaft cone was a maximum of 10m diameter, but the full dimensions of the plug could not be determined. The existing plug was deemed to be an adequate means of securing the shaft, and subsidence cone was mitigated by having granite rubble dumped within it.

Adjacent to the southern edge of Pumping Shaft the footprint of a building [125] was exposed and recorded at SW 72733 44865. It seems certain from its position that this was the later engine house recorded at this site by the Ordnance Survey in 1877 (Fig 5). Its remains had been heavily truncated by post-abandonment ground levelling around the shaft (possibly during the shaft plugging operations), and also the partial subsidence of the side of the shaft itself, and little more than the southern sections of the footings for its walls had survived.

Remnants of a more substantial building [107] were recorded on the south-western side of Pumping Shaft at SW 72717 44873 (Fig 3). No structure was recorded here by the OS in 1877 (Fig 5), nor on the *circa* 1840 Tithe Map (Fig 4), and is probable that the remains uncovered represent those of one of the late 18th century houses built for one of the engines supplied to the mine by James Watt. The engine house had been truncated and subsequently buried under mine dumps adjacent to the shaft. Although the remains are only partial, this is one of the oldest engine houses to survive in Cornwall, and is thus of considerable technical and historical importance, particularly for the unusual inverted beam engine supplied to the mine in 1795 (Fig 23). This structure appears to have been re-buried during the site landscaping operations.

Very ephemeral remnants [321] of a building(s) were recorded centred at SW 72782 44864 (Fig 3). The plan of this structure could not be fully determined as it had been heavily truncated by post-abandonment activity in this area. This structure probably represents the last remains of the whim engine house identified in the archaeological assessment (Feature 1 in Sharpe 2011), this having been depicted on the 1840 Kenwyn Tithe map, and shown as a ruin on the 1877 OS mapping (Figs 4 and 5). This area of

the site was bulldozed by the US Army during 1944, this activity probably having removed most of any surviving stonework of the building.

To the north of this building complex was a roughly paved area [244] which was interpreted as part of a possible ore dressing floor. This roughly rectangular area of paving was stained green in colour in places suggesting that copper ore had been processed there.

A rather more minor lode 25m to the north of North Lode (Fig 8) had been worked by at least three outcrop shafts [159], [160] and [161]; these were re-excavated to a depth of about 3.0m from surface before being filled in with concrete. It is possible that these had been excavated onto a subsidiary branch of North Lode, rather than a separate lode.

In a roughly triangular shaped area (Fig 13) defined from the south of Pumping Shaft [110] to the north of Pininger's Shaft [265] and from there in a north-east direction to the old road at SW 72792 44844 part of the site seems to have been dedicated to the processing of copper ores, this area being centred at SW 72742 44832. The OS mapping dating to *circa* 1877 had shown a diffuse spread of mine waste occupying this area, but had not depicted any features within it. The area was well-located to have been supplied with water from the north-eastern reservoir, as well as being adjacent to the principal production shafts which had been in use during the earlier phases of operation at Hallenbeagle. Copper dressing floors did not generally require extensive fixed machinery (unlike tin dressing floors) and therefore tend to be archaeologically much more ephemeral.

The evidence for such a site at Hallenbeagle consisted of several groups of settling tanks (some timber-lined) many being connected by channels or launders. Most had been severely truncated by subsequent activity on the site including the sinking of outcrop shaft [190] at the southern edge of this activity area, suggesting that this phase of dressing floors are likely to have been a feature of the fairly early history of the site. The evidence for copper processing included the following.

A large sub-rectangular settling tank [113] located at SW72747 44835 (Fig 22) and a complex of three others [266], [268], and [273] lying some 30m to the east centred at SW 72786 44840. The larger tanks showed evidence for having been clay lined and having become infilled with layers of clays and silts (these having varying degrees of green copper staining) and in some cases copper tailings (fine sands and gravels). These infills are likely to have been emplaced following the abandonment of the tanks (Fig 22).

A complex of settling tanks and an associated launder were recorded at SW 72715 44840. The launder was notably sinuous [257], and could be traced for a length of about 28m in a roughly north-east to south-west direction, its southeast end being close to the remnants of four timber-lined tanks [274], [275], [276], and [277]. These tanks had been infilled with copper tailings and green-tinged slimes; the timbers too, where present, were also stained green, indicating that the tanks had been used for the dressing of copper ores (Fig 21).

Two further (and apparently larger) settling tanks [255] and [256] were observed about 10m to the northwest (centred at SW 72708 44849). Unfortunately their full dimensions were unclear, as they lay within a section of the site which was not fully excavated, so could only be partially recorded. Tank [255] was associated with a channel that could be traced in a south-easterly direction towards channel [257] suggesting that at some point they might have been connected; unfortunately the easternmost three metres of this feature had been removed by subsequent activity, and the connection could not be proven. These tanks, too, had been clay lined and were found to be infilled with green-tinged slimes and silts indicating their use for the dressing of copper ores.

Finally an area of ore dressing [180] was recorded approximately 30m northeast of Pininger's Shaft (centred at SW 72705 44790). This consisted of a channel running roughly north-east to south-west from which there were two branching channels, each of which terminated in a pit or tank. The main channel also terminated in a tank at its south-western end. All had been infilled with copper tailings and silts. Several of the nearby abandoned prospecting pits were also found to be partially infilled with copper tailings, suggesting that they had been partially open features within the early mining landscape when these dressing floors were in operation.

4.1.2 Area 2.

This area was dominated along its northern edge by the features relating to the location and exploitation of the outcrop of the lode associated with Pininger's Shaft (Figs 8 and 10). The line of the outcrop of this lode, trending north-east to south-west, could be traced for a distance of at least 200m through a combination of prospecting pits and outcrop workings. At its north-eastern end it would have passed under the road running from Sawmills Cottage via High Winds to Kitbartley, its line beyond this point being marked by shafts to the south-east of Sawmills Cottage at SW 72861 44916, SW 72960 44946 and SW 73115 45044. These shafts are recorded as having been worked by Boscawen Mine, and their locations suggest that this lode dipped to the north-west (the shafts being offset from the line off the projected outcrop by about 36m). It is possible that this lode coalesced with North Lode in this general area. To the south-west the lode could be traced past Pininger's Shaft and under the railway line, beyond which it could be traced along its outcrop within the Hallenbeagle West site in Areas 8, 9 and 10 (Fig 8).

A similar pattern to that seen adjacent to North Lode was recorded. The surface outcrop had initially been first located by runs of prospecting pits set out at right angles to the projected line of the lode, and in areas close to the contact with the lode these pits were often paired. Having been located, the lode at surface was then exploited by a series of outcrop shafts, these having been worked to depths in excess of 5.0m (the extreme reach of the excavating machines arm). Examples of these outcrop shafts include [184], [190], [227], [281], [231], [233], and [294]. There was a greater concentration of working centred at SW 72742 44804 where many of the outcrop shafts were set very close together or even intercut one another. In this area too, it was noted that many of these features were interconnected at depth by tunnels, these generally following the line of the lode at approximately 5.0m from surface, though some possible exploratory tunnels were also noted. The upper parts of some stopes were also recorded. It is uncertain why there was a greater concentration of workings at this location, though the most likely explanation is that the lode was richer here, making this area more rewarding to work. No direct archaeological dating evidence for this phase of early exploitation was obtained. Given the way in which the early shafts at Hallenbeagle were excavated and the nature of the local ground conditions, any subtle or diagnostic detail of the workings had been lost, or could not be recorded.

Pininger's Shaft [265] at SW 72673 44788 was sunk (probably during the 19th century) to work the lode at depth (Fig 3). Though it was shown as open on the 1946 aerial photograph (Fig 16) it was found that there was a pre-existing concrete plug at a depth of 8.0m below the current ground surface, this having a diameter of 3.45m. No evidence for an engine house was observed in the vicinity of the shaft, though pumps here might have been worked by flatrods powered by one of the engine houses to the north.

A very ephemeral cobbled area [228] was recorded centred at SW 72740 44795. This consisted of flattened granite blocks, many of which had evidence for percussion damage to their upper surfaces. There was some evidence of green staining in the overlying soil suggesting that this might have been the last remnants of a copper dressing floor, probably a component of or continuation of the area recorded lying immediately to the north within Area 1.

The topsoil stripping of the area occupied by the miners smallholdings (feature 14 within Sharpe's 2011b assessment) centred at SW 77684 44683 and associated with the cottages at Tregargus (SW 72561 44657), showed that they had been created within an area between lodes, ensuring that they occupied land which had not previously been disturbed by mining activity. However the northernmost field (centred at SW 72670 44719) contained evidence for early mining activity in the form of prospecting pits, which seems to confirm the suggestion made in the 2011 assessment (Sharpe 2011b) that this particular field had been a later addition to the group in response to the construction of the railway and the resultant loss of some of the smallholding's fields in 1852 (Fig 14).

Finally the line of a leat or launder [224] was traced for a distance of about 25.0m trending in a roughly north-east to south-west direction. Though the remains were very heavily truncated, it is possible that this may have been the channel utilised to carry water from the reservoirs marked on the 1880 OS map at SW 72795 44701 and SW 72893 44789 to feed the boilers serving the engines at Read's Shaft.

4.1.3 Area 3.

This area had two major lodes running through it: Reade's Lode to the north and centre of the area, and Oats' Lode to the south (Fig 8). Both lodes have been plotted as running roughly north-east to south-west. Reade's Lode was known to split into two branches that ran roughly parallel to each other to the east of Reade's Shaft (Fig 10).

Following soil stripping, the line of Reade's lode could be readily traced on the surface for a distance of at least 250m. At the southwestern end of the area it could be seen that the lode continued under the railway line and its outcrop could be traced across the Hallenbeagle West site within Areas 5, 6, 9 and 10 (Fig 12).

As with the lodes recorded in Areas 1 and 2, a similar pattern indicating the methodology used in their location and exploitation was recorded. Surface outcrops were initially located by lines of prospecting pits running across their projected strikes. In areas close to the contact with the lode the pits were again often paired or at right angles to each other.

Having been located, the lode outcrops were then exploited by a series of small-scale and often closely-set outcrop shafts, these being worked to depths in excess of 5.0m. Examples of these small shafts include [322], [325], [223], [215], a concentration (including shafts [96], [97], [98] and [99]) being centred at SW 72788 44626, several being very close together or even intercutting. Many of these were interconnected at depth by tunnels, these generally following the lines of the lodes (these could also have been evidence for the upper parts of stopes), though some possible exploratory tunnels were also noted.

Reade's Lode was exploited by six large, deep, later-phase shafts, several of which were still seen to be open in the 1946 RAF aerial photographs (Fig 16). These included (from east to west) Unnamed Shaft [131] at SW 72803 44672, [136] at SW 72725 44634, [138] Oat's Shaft at SW 72705 44641, [150] Jeffrey's Shaft at SW 72702 44648, Read's Whim Shaft at SW 72671 44627 (this being located by drilling) and [320] Read's Shaft at SW 72618 44614 (Figs 3 and 14). Only the latter two were associated with engine houses and were those which were used within the final major phase of operations on the site. Some of these may represent re-workings of earlier shafts, though it is noticeable that few are on the lode outcrops, most intersecting the lode at depth on its underlie, suggesting that they are likely to be new shafts sunk within the mid-19th century phase of operations. The other shafts are likely to have been equipped with horse whims used for hauling ore and waste, though no surviving archaeological evidence for these was recorded.

Oats' Lode to the south of Reade's Lode trended roughly north-east to south-west (Fig 8). The line of the outcrop was marked by particularly dense concentrations of outcrop shafts. It is possible that a continuation of the line of the lode outcrop was also

recorded to the south-west beyond the railway line, where it was indicated by groups of prospecting pits within Areas 1 and 4 within Hallenbeagle West.

Though several prospecting pits were recorded in Area 3, no definitive pattern was observed, most examples probably having been obscured by the density of the small-scale shafts developed here. These early shafts were at times very closely set, the edges of their cones being, in some cases, as little as 0.3m apart, and could sometimes be seen to be intercutting (Figs 17 and 18). Again, a network of tunnels were recorded connecting many of these workings at depths of around 5.0m from surface, most of these shallow workings following the line of the lode and probably representing the crowns of early stopes. Examples of these small-scale early shafts include [6], [7], [103], [148] and [149]. Within the area around [148] and centred at SW 72782 44626, several shafts coalesced into a small openwork.

Only one deep shaft was situated directly on Oats' Lode, this being Unnamed Shaft [17] at SW 72746 44608. It appears that the named Oates' Shaft [138] does not appear to be directly on the line of the outcrop of Oats' Lode, and it is most likely that it was sunk to intersect the underlie of the lode at depth.

The remnants of a building complex [134], and [135] centred around SW 72693 44624 to the east and south east of Reade's whim engine house was recorded, though due to the piecemeal way it was uncovered and demolished no full impression of its plan or layout could be determined. The layout of some of the shuttered concrete used for the flooring was similar to that of the documented arsenic works (Feature 24 identified in the 2011 archaeological assessment) and recorded on the 1907 OS mapping (Fig 6), suggesting that it might have represented the remnants of that complex, however the thick deposits of concrete also seen in the area could suggest that it might have been overlain by, or indeed part of the 20th century concrete works.

In the far south-western part of the area, remnants of the sawmill [313] centred around SW 72583 44547 were recorded (see Figs 3, 6, 14, 24, and 25). Various parts of the building including machine bases, saw pits, and part of the bed of a circular saw were observed. Features [308] and [309] of the building complex date from the 19th century, though the site was considerably expanded during the early 20th century.

The yard and buildings comprising the 20th century concrete plant centred at SW 72651 44600 were not recorded during the course of the watching brief.

4.2 Hallenbeagle West

4.2.1 Area 1.

The centre of this area (at the south-western end of this part of the site) was found to be crossed by the line of a lode trending east-north-east to west-south-west (Fig 8) which could be traced for a distance of at least 155m (Fig 7). It is possible that this is actually a continuation of South Lode (found in Hallenbeagle East), but this is uncertain. At its north-eastern end it clearly continued beyond the railway, though this area has long been improved to agriculture. The lode's course may be marked by shafts seen to the southeast and east of Hallenbeagle Farm at SW 72831 44440 and SW 73035 44516, these being recorded as having been worked by Scorrier and East Wheal Chance mines. To the south-west, the strike of the lode runs on under the settlement of Scorrier (Figs 8 and 11).

A pattern of lode exploration and exploitation similar to that observed in Hallenbeagle East was recorded in this part of the site. The lode outcrop had first been located through sinking roughly parallel lines of prospecting pits set out perpendicular to its projected strike. Close to the contact with the lode the pits were again often paired adjacent to each other, or set at right angles in order to more closely refine the results of the prospecting activities (Fig 11).

Having been located at surface, the lode was then exploited by a series of closely-set shallow shafts. In this part of the site, there was less evidence for these features than on some of the other lodes, possibly suggesting that having located the strike of the lode, the miners found the ore values to be rather low or patchy, and only worth exploiting in some parts of the outcrop. Examples of these small-scale early shafts included [10] and [61]. There was a greater concentration of working centred at SW 72414 44356 around feature [11] which proved to be four small almost contiguous shafts interconnected by trenches following the alignment of the lode (Fig 11).

There are no recorded large, later shafts within this area and sunk on this lode. No direct archaeological dating evidence for this possibly early and limited phase of working was obtained.

A few isolated pits in the northern part of this area appeared to be a continuation of a pattern of pits recorded within Area 4 to the north-east. These were probably set out to identify a possible western extension of the line of the outcrop of South Lode which had been worked in Hallenbeagle East Area 3. The wide separation and sparse nature of the pits suggests that the lode had pinched out at this point or that the ore content was found to be economically insufficiently valuable enough to warrant exploitation.

4.2.2 Area 2.

Very few features were observed within this area (Fig 11), only a few prospecting pits being noted in its southern part. These were a continuation of the pattern of pits recorded within Area 1 and marked the northern periphery of those used to search for the extension of South Lode. Both Areas 1 and 2 had been incorporated into smallholdings by the late 18th century or the very early decades of the 19th century, suggesting that this phase of prospecting and outcrop working is almost certainly at least 18th century in date, if not earlier.

4.2.3 Area 3.

This area lay at the south western tip of a finger of mine dumps depicted (Fig 9) on the *circa* 1877 OS map (Fig 5) as running in a north-east to south-west direction 65m to the north of the outcrop of Oat's Lode, the mine dumps having been depicted as being centred at SW 72409 44487. The current OS map depicts a single shaft at SW 72442 44493 surrounded by a stone wall. This is shaft [76]. It showed up clearly on the 1946 aerial photographs, but did not appear to be open on this source (Fig 16).

At the very tip of these dumps, around 65m to the southwest of Shaft [17], the site of another shaft was indicated by a flattened conical shaped dump with a depression on its southwestern side. This was Shaft [72]/[236] located at SW 72379 44466. A levelled sub-circular area on the eastern flank of the spoil dump which was around 5.0m in diameter might have been the site of a horse whim platform.

The removal of the spoil heaps as part of the site ground works revealed the presence of another shaft, Shaft [80] at SW 72417 44484, roughly at the mid-point between shafts [72] and [76]. During their mitigation, Shafts [76] and [80] were found to have timber lining still *in situ* in their upper sections, this being the original shaft collaring.

Interestingly there were no evident outcrop workings along the strike of Oat's Lode to the south of this line of shafts, suggesting that it was only worked at depth, and may have been located and developed from its exploited sections to the north-east. Only four prospecting pits were recorded in the area near the shafts. It is uncertain why these had been excavated, unless the miners were checking the ground to determine whether any other lodes traversed the ground between Reade's and Oat's Lodes.

4.2.4 Area 4.

This area (Figs 7 and 11) was crossed in a north-east to south-west direction by the line of a single lode (Fig 8) which appears to be the continuation of Oat's Lode which was worked intensively in the Hallenbeagle East Area 3 (see above). The line of this

lode, was traced for a distance of at least 76m from SW 72510 44460 to SW 72440 44431.

The lode's surface outcrop was marked by a series of lines of prospecting pits running perpendicular to the projected line of the outcrop of Oat's Lode, the pits being set out on a roughly north-west to south-east orientation. In areas close to the contact with the lode the pits were often paired probably in order to refine the results of their search. The lode does not appear to have been exploited at surface in this location, as no outcrop shafts were found and it may be that the lode was poor near surface (despite its evident richness in depth, as is indicated by the shaft sunk on its to the north of the outcrop [72], [76] and [80]), but the results of the prospecting seems to have suggested that its metalliferous content was not economically viable near surface. The prospecting pits come to an end to the south-west suggesting that the course of the lode could not be found, or a decision had been made that it was not worth pursuing any further prospection in this direction.

It is possible though that the lode may have been worked at depth utilising cross cuts from the shafts recorded immediately to the north in Area 3. No direct archaeological dating evidence for these exploratory pits was obtained.

4.2.5 Area 5.

The major visible feature before landscaping and mitigation began was the northeastern continuation of the line of mine dumps seen in Area 3 depicted on the *circa* 1877 OS map (Fig 5) running in a north-east to south-west direction along the line of (or just to the south of) the line of the shafts on Read's Lode and Oat's Lode centred at SW 72499 44549 (a Cornwall Consultant's map suggests that the two lodes coalesce in this area). The current OS map depicts Robert's Shaft [125] at SW 72540 44570 surrounded by a stone wall, however it and another shaft [88] at SW 72488 44529 show up clearly on the 1946 aerial photographs (Fig 16), but do not appear to be open on this source.

The removal of the spoil heaps as part of the groundworks uncovered numerous mining-related features, especially concentrated in the area to the east, north-east, and north-west of Robert's Shaft centred at SW 72539 44588. More features were recorded archaeologically than that shown in the Kemp's survey (Fig 11); this was because many features were left untouched, being deemed too close to the railway line, and their mitigation might have caused instability to, or even undermined the railway embankment.

A dense arrangement of prospecting pits was recorded, these consisting of two almost parallel lines forming a rough chevron pattern with the lower arms running north-east to south-west, the upper arms running north-west to south-east, the strike of the lode being within the apex of this pattern.

The surface section of Reade's lode (Fig 8) at the north-eastern end of the area was found to have been exploited by several outcrop shafts or small openworks including [129], [143], [144], and [146] centred at SW 72541 44587, this appearing to be a continuation of the pattern of working utilised on the lode seen in Area 3 of Hallenbeagle East, suggesting that at the time of working these two areas were being worked as one mining sett.

A dramatic change in the technique of exploiting the lode was seen about 5.0m further to the west where a very large openwork [98], [249] was recorded (Figs 3, 11, 12, 30 and 31). Commencing at SW 72537 44581 this feature (a quarry-like linear excavation within which the lode was worked from surface to an unknown depth), was traced as a broad, often vertically-sided trench for a distance of about 86m following the strike of the lode to SW 72455 44555 within Area 9.

The excavation of this feature was incomplete, the depth dug (on average between 8.0m and 10m deep) being that required for mitigation purposes (Figs 30 and 31). The

feature was not bottomed, loose mining waste being seen at its base. Within the extent of the openwork that was emptied, it was found that its width varied from about 12m at its lip at surface to about 5.0m at the base of the mitigation excavation. It was seen that the openwork had steeply sloping irregular and at times nearly vertical sides. There was no obvious dating evidence obtained for this working, though it did appear to truncate a few prospecting pits. It is suggested however, that given that it is one of the primary features of the site (see below), that it may have been excavated during the 17th century or possibly during the early 18th century.

A tunnel was recorded in the southern wall of the openwork commencing at about SW 72500 44566 and could be traced for a distance of about 10.0m in a roughly southerly direction to SW 72501 44556 before it became choked and was lost. The tunnel was 0.8m wide and approximately 1.5m high with an arched roof, the top of which was about 7.0m below the current ground surface. This was probably an exploratory or prospecting tunnel.

At the depth at which the mitigation excavation was halted, a layer of dark brown silt and clay up to 1.0m thick was seen. This was horizontally bedded across the base of the openwork and appeared to be water-borne in nature, suggesting that for a while after work ceased within the openwork the cutting remained open to the elements, allowing for the build-up of this deposit. Subsequently the entire feature was deliberately backfilled with mine waste, clear tip lines being visible, with the result that the feature was completely removed from the landscape; it is possible that this was deliberate landscaping in order to restore this area to agriculture following a cessation of mining activities. On the available evidence, this is likely to have taken place during the early to mid-18th century at the latest.

The northern flank of the openwork was marked (Figs 11 and 13) by a line of outcrop shafts running from SW 72536 44592 to SW 72476 44568 including [250], [257], [259], [260] and [264]. These seem to be working a minor lode that runs alongside Reade's Lode (or possibly a branch from that lode). At least one of these shafts was connected by a short tunnel to the northern side of the openwork. Subsequent to the backfilling of the openwork several shafts were sunk through its infill to work the lode below its base. These included shafts [104], [105] and [106] centred at SW 72489 44568. In form, these are at the latest 18th century in date.

A shaft [268] at SW 72472 44559 situated immediately to the south of the southern edge of the openwork gave access to a tunnel running for roughly 10.0m and sloping steeply downwards in a north-westerly direction. The top of the tunnel, which was arched in shape, was at a depth of roughly 2.5m from surface with its base at about 4.0m below ground level. It had a width of about 0.80m. This tunnel had been excavated through the pre-existing infill of the openwork.

Subsequently all these features were covered over and obscured by the spoil dumps associated with Robert's Shaft [125] and Shaft [88] as described above; these shafts were abandoned by 1870 following the closure of the mine.

In summary, this and immediately neighbouring areas of the Hallenbeagle site allow us to identify a development sequence from initial prospecting, primary exploitation of the lode outcrop utilising an openwork (and its subsequent backfilling), re-exploitation of the deeper sections of the outcrop using closely-set small shafts, their abandonment, and the final mid-19th century exploitation of the lodes in depth by means of the four shafts found within this area (Figs 12, 13, 14, and 15).

4.2.6 Area 6.

This triangular shaped area (Fig 7) incorporated the settlement of Tregargus. The southern part of this area was crossed by the strike of Reade's Lode running roughly north-east to south-west to the north-eastern end of openwork [98], [249] having passed under the railway line from Hallenbeagle East, Area 3 (Fig 8).

The area to the south of the cottages (centred at SW 72556 44631) between them and the garage at SW 72561 44604 was marked by a scatter of roughly evenly spaced prospecting pits that clearly predate the construction of this smallholder's cottage and were probably excavated in an attempt to locate the outcrop of Reade's Lode (Figs 11 and 12).

The surface outcrop of the lode was actually located within the small space to the south of the garage where evidence for intensive working was recorded. This area was initially prospected by an evenly spaced spread of pits (centred at SW 72559 44597); having identified the outcrop of the lode, a group of small outcrop shafts were sunk to develop it: [139], [219], and [225].

Most of the features within this area were not mitigated as their close proximity to the railway line precluded this. It was clear that many features passed under the railway and that the pattern of working observed was a continuation of that recorded to the south-west of Reade's shaft within Hallenbeagle East Area 3 and within the eastern part of Hallenbeagle West Area 5.

The cottages that form the settlement of Tregargus were thought to be miners' dwellings associated with the smallholdings laid out here prior to the development of the railway line and subsequently bisected by it. These smallholdings appear to have been developed across North Downs during the late 18th century, this group of fields being depicted by the date of the 1809 OS 1" map (Sharpe 2011b). When the buildings were demolished (unfortunately this took place over a weekend and was not observed) it was reported by one of the machine operators that the walls of the central cottage (Number 5) at SW 72562 44651 had been built of cob up to 1.5m thick, possibly suggesting an early construction date for this particular building.

4.2.7 Area 7.

This area of the site (Fig 7) lay between the finger of spoil heaps recorded in Areas 3 and 5, and the southern edge of the original access road to the settlement of Tregargus (centred at SW 72421 44518). After soil stripping, no features of archaeological interest were recorded.

4.2.8 Area 8.

This area centred at SW 72567 44686 which lay to the north of Tregargus cottages (Fig 7) was dominated along its northern side by a continuation of the workings involved with the location and exploitation of the outcrop of the lode associated with Pininger's Shaft at SW 72673 44788, to the east of the railway line within Hallenbeagle East Area 2 (Figs 7 and 8). The line of this lode, trending north-east to south-west, was traced for a distance of at least 103.0m from SW 72617 44732 to SW 72527 44678 where it continued into Area 9. At its north-eastern end it passed under the railway - several features were seen to underlie the railway embankment and were left untouched.

As recorded within Hallenbeagle East Area 2, the surface outcrop had initially been first located by prospecting pits, these frequently being set out in pairs set out end to end and perpendicular to the strike of the lode. Having defined the line of the lode, it was then exploited by a series of very closely-set outcrop shafts. Examples (from east to west) include [274], [284], [286], [299], [318], [319], and [322]. It was noted that many of these features were interconnected by tunnels following the line of the lode and running about 2.0m below the current ground surface.

Roughly 12.0m to the south of the line of outcrop shafts a much more substantial shaft was found. This was shaft [306] located at SW 72561 44680. Marked by a Clwyd cap at surface, it was found that this shaft, which was large, being about 4.0m in diameter, had been plugged by concrete at a depth of 2.5m. It was found that the shaft was completely choked with compacted stony debris below the level of the plug.

4.2.9 Area 9.

Lying to the north and west of the settlement of Tregargus (Fig 7) this area centred at SW 72492 44608 was crossed by the lines of two major lodes: at its southern end by Reade's Lode, and at its extreme northern end by the lode associated with Pininger's Shaft (Fig 8).

The exploitation of Reade's Lode was a continuation of what had been recorded within Area 5. It was found that the openwork [98], [249] continued across the whole of the area, being extended for a further 46m. Again, the exploitation took the form of a deep excavation following the strike of the lode to SW 72441 44551; the trench had irregular, near-vertical sides and a variable width (Figs 3, 11 and 12). It was excavated to between 6.0m and 8.0m from surface and again was not bottomed. As previously, no obvious dating evidence was obtained though it did appear to truncate a number of prospecting pits. A similar backfill sequence was noted, suggesting that the whole of this area was restored to agriculture on the abandonment of the openwork.

The northern flank of the openwork was again marked by a line of outcrop shafts. Again it is uncertain if these were working a minor lode that was running alongside Reade's Lode or exploiting a smaller branch lode coming off Reade's Lode.

In the northern part of Area 9 a continuation of the workings seen within Area 8 was recorded. Workings on this lode were traced for another 40.0m from SW 72525 44676 to SW 72494 44661, the strike of the lode trending roughly north-east to south-west. The method of exploration and exploitation was the same as that recorded previously utilising prospecting pits and closely-set outcrop shafts.

The ground lying between the two lodes (centred at SW 72497 44625) was covered by a scatter of prospecting pits, some of which formed lines running perpendicular to the general strike of the lodes.

4.2.10 Area 10.

This Area lies to the west of Area 9 (Fig 7) between the north side of the access road to Tregargus, and the boundary of the A30, and was centred at SW 72423 44582. It was not examined archaeologically, though the mitigation survey produced by Kemps (Fig 11) shows that the pattern of mining features recorded in Area 9 continued into this part of the site, extensions of the surface workings along Reade's lode being recorded in the southern part of the area, with equivalents on Pininger's Lode being found to the north.

Reade's Lode had been exploited by intermittent extensions of openwork [98], [249] and were traced south-westwards for a further 70m along the strike of the lode from SW 72438 44546 to SW 72371 44524, these again being flanked to their north by a small number of outcrop shafts. Prospecting pits within this area were relatively few in number, though some may have been lost during the creation of Tregargus Lane on the southern periphery of this area.

To the north, the lode associated with Pininger's Shaft continued to show evidence for the by-now familiar pattern of pits and small shafts used to locate and exploit the lode outcrop. Again, most of the prospecting pits were set perpendicular to the strike of the lode. The roughly north-east to south-west strike of the lode was traced for another 60m from SW 72477 44638 to SW 72423 44601 where it met the line of the Blackwater By-pass section of the A30.

5 Discussion

Almost all histories of Cornish mines are based on the relatively limited number of maps, plans and other documents which have survived in local collections, whilst descriptions of them almost ubiquitously concentrate on their surviving remains, in particular the engine houses which have become distinctive landmarks of the Cornish

landscape. Inevitably, this has resulted in a focus on the high point of the industry during the mid and late 19th century, but the corollary is that little has been written about the crucially important preceding period during which the technologies which underpinned an industry which was to become a world leader were developed and honed.

At the outset of this project, although there were hints that Hallenbeagle might have sited an early and undocumented copper smelting site, the condition of the development area prior to the start of the groundworks phase suggested that its archaeological potential would probably be relatively limited. Although the remains of two engine houses had survived (Reade's whim engine and Reade's pumping engine), the later 19th century and the 20th century had witnessed the clearance of the mine's dressing floors, the redevelopment of apparently key areas of the site by a sawmill and a cement works, the widespread clearance of its mine dumps by US Army engineers in 1944 to prepare large areas of the northern part of the site for a D-Day assembly camp, a potentially destructive phase of shaft capping during the mid-1980s Carrick District Council Operation Minecap project, an undocumented period during which material had been imported to the site and used to landscape parts of it, and finally its occupation by travellers. In short, Hallenbeagle looked very unpromising.

In the event, Hallenbeagle proved just how deceptive first impressions can be, as well as illustrating the value of archaeological recording during large-scale developments on former mining sites.

As this report illustrates, it has been possible to record evidence for a full chronological sequence of mining activity across this site, features created during the period when the first miners were prospecting for and locating its lode outcrops, evidence for their initial attempts at exploiting the copper deposits found here, for a period during which mining activity at Hallenbeagle site experienced a lull and smallholdings increasingly occupied its downland landscape, the impacts of the late 18th and 19th century phase of deep industrialised mining here and its aftermath. Although no datable material was recovered, the archaeological evidence suggests that the mining carried out on this site spans the period from the late 17th century to the end of the 19th century. In this respect, it is probably fairly typical of this mining district, but unlike other surrounding mines which were developed to site a golf course and extensive industrial units, provision was made for its recording during development.

A hypothetical chronological sequence can be summarised as follows.

17th century (Phase 1 Fig 12).

1) Initial prospecting. Late 17th century?
2) Openworks excavated.

18th century (Phase 2 Fig 13).

3) Southern openwork deliberately backfilled. Prospecting pits backfilled
4) Areas converted to smallholdings
5) Outcrop shafts sunk
6) Most smallholding fields respect pre-existing outcrop workings

Late 18th century (Phase 3 Fig 14).

7) Outcrop workings backfilled in many cases, areas restored to agriculture by the creation of enlarged smallholdings
8) First deep shafts sunk including Pumping Shaft, equipped with engine house by 1795. Dressing floors needed by this time – probably those sited to the south of Pumping Shaft

19th century (late Phase 3 Fig 14).

9) Major mid-19th century reworking of mine. Some new shafts sunk within smallholders' fields

10) Railway slights one smallholding. Additional land added within area containing prospecting pits.

11) Mine closes down.

12) Mine dump recovery.

20th Century.

13) WWII camp.

14) Operation Minecap 1980s.

15) Travellers move onto the site.

As a result of the archaeological watching brief at Hallenbeagle, the development of this landscape is now far better understood, and seems to have comprised the following:

- This area between Redruth, St. Agnes and Truro is known to have formerly been an extensive area of largely un-settled open downland, whose 'bleak and doleful' character was remarked upon by early travellers during the late 17th century. Even by this period, however, both Angerstein (Berg 2001) and Celia Fiennes (Fiennes 2009) noted the existence of mining activity on North Downs as they traversed this area on their tours through Cornwall. Given these accounts, it is clear that the very extensive evidence for prospecting by pits and trenches of the lodes at Hallenbeagle is likely to precede or at least be broadly contemporary with the period during which these accounts were written – that is, this first phase of exploration almost certainly dates to the late 17th century. The name of the mine sett within which the lodes were first proved is unknown – they certainly span more than one of the later named mine setts (Fig 12).

- The initial phases of exploitation of the lodes is likely to have taken place either contemporary with or shortly following the proving of the lodes, and the evidence seems to suggest that the substantial openwork in the western part of the development area was the earliest of these features. The depth to which the miners first worked the lode in this fashion is unknown, as this feature was not bottomed during the mitigation works. Mining manuals from this period suggest that they could have been tens of metres deep, excavated down from surface until increasing amounts of ground water making its way into the excavation overcame the primitive pumps available at the time. No evidence for the ways in which spoil and ore were hauled from the workings was found during the watching brief, though hand-worked windlasses would probably have been employed (Fig 12).

- It then appears that further excavation of the openwork was abandoned, and it was laboriously backfilled the material from the formerly substantial dumps which would have flanked it. It is probable that the reason that this was undertaken was to attempt to restore this area so that it could be used for farming. The work must have taken some time to achieve, as silt layers recorded at some distance from surface show that it must have remained partly backfilled over a period of heavy rain which washed fine material into it from what remained of the flanking dumps. The muddy conditions experienced on site during periods of the watching brief suggest that backfilling the openwork would have been well-nigh impossible during periods of prolonged winter rain, and it was probably abandoned until the weather improved. The work was eventually completed, however, and the site of the openwork may well subsequently have

been restored to farmland. Some of the earliest smallholdings within this area are likely to have been laid out on such restored mining land (Fig 13).

- Nevertheless, the potential of these lodes had been demonstrated, and it cannot have been long before miners returned to this area to re-try not only the area already worked as an openwork, but far more extensively in the surrounding landscape, where the prospectors had already proved the existence of at least four lodes, some of which might have already been partly worked from their surface outcrops. During this phase (Phase 2), the miners excavated chains of closely-set small shafts down onto the lode outcrops; evidence for this approach can be found along the 'backs' of all of the lodes within the development area. The proximity of these outcrop shafts to one another is striking, particularly within the south-eastern part of Area 3 of Hallenbeagle East, or along the northern edges of Areas 8 to 10 in Hallenbeagle West. In the western part of the site some of these shafts were clearly sunk through the backfilled openwork (Fig 13).
  Again, the depths to which these on-lode shafts were excavated are not known, as none of these early workings were found to be open or were fully exposed. However, workings of broadly similar form and assumed date survive in the moorland areas of Cornwall, well-preserved examples surviving along the lodes outcrops at Ding Dong mine in Madron. Examples which were partially investigated on Ballowall Common, St. Just, during a phase of shaft safety works during the 1990s (Sharpe 1996) showed that such outcrop shafts connected with open, narrow, more or less continuous stopes at little more than 3.0m from surface, and extended down from surface for tens of metres. Similar interconnecting 'tunnels' were noted along the strikes of the lodes at Hallenbeagle suggesting that the lodes were stoped not far from surface. In some locations, tunnels running at right angles to the strikes of the lodes were also found, the presence of these features suggesting that some underground prospecting by cross-cutting was also carried out during the early phases of the sinking of the shafts.

  The closely-set nature of the shafts was notable. It has been suggested that each shaft effectively functioned as a separate 'mine', all accessible sections of the lode being exploited before the shaft was abandoned and a new one sunk nearby (the model is based on the bell pits sunk during the early period of coal working in the north of England). Whilst this argument might be valid for very shallow workings, it makes less sense if the near-surface stoped areas of the lode are of more substantial depth. It is also possible that each shaft was worked by a separate team of miners. However, it is more likely that the proximity of the shafts reflect a combination of the relative ease with which the degraded upper sections of bedrock could be excavated, the narrowness of the stoped out areas, the difficulties experienced in transporting waste material along such narrow tunnels for disposal at surface and problems experienced with ventilating the workings, which would have been cramped, wet and stuffy (Fig 13).

- This extensive but laborious phase of operations also came to an end, almost certainly being curtailed by the lack of deep drainage available to such workings, and another phase of land restoration seems to have been undertaken. Again, there is evidence for the deliberate backfilling of abandoned workings using the spoil dumps within the moonscape of small shafts which the miners had created.

  In this instance, the impetus for land restoration was the rapid spread of miners' smallholdings across the downs during the later decades of the 18th century, this being fuelled by an upsurge in mining within this district which had been made possible by advances in mining technology – in particular the early development and uptake of steam pumping engines. Several smallholdings were established

on abandoned mining areas at Hallenbeagle, though it is clear from the layout of their fields that formerly-worked areas tended to be avoided, at least initially. No doubt these miner-smallholders were only too aware of the potential for subsidence on areas along the lode outcrops (Fig 14).

- Nevertheless, as mentioned above, by the late 18th century, improved pumping technologies coupled with the increasing adoption of drainage adits were enabling mines to be exploited to hitherto unheard of depths, the Great County Adit having reached this area by 1778. Hallenbeagle seems to have been one of the mines restarted during this period, though the name under which it was initially reworked is unknown. Hallenbeagle and East Wheal Hawke were established as separate mines during this period, though worked the same lodes, and were both linked to the Great County Adit. In contrast to previous workings, these mines employed a limited number of larger, deeper shafts, most continuing in use throughout the 19th century reworkings of the mines (Fig 14).

  James Watt is known to have supplied an unusual inverted beam pumping engine to the mine in 1795 and a 70" engine of more conventional form two years later. The prime focus of mining during this period appears to have been North Lode, using Pumping Shaft in the north-western part of the development site. Exploitation of this lode can be seen to have been extensive from the line of shafts stretching west-south-westwards towards North Downs, these being almost wholly evenly located at 40m (120 feet or 20 fathom) intervals. The clearance of vegetation and spoil material to the south-west of Pumping Shaft revealed the remains of an apparently early engine house close to it which may well have housed one of Watt's early engines. Given its age, this building (Fig 23) is of considerable importance, since no engine houses of this date are known to survive in Cornwall. If it were constructed to house Watt's experimental inverted beam engine, it is of very high technological importance and should certainly be conserved and recorded in detail. The location of this building was carefully located using GPS plots, and the machines directed to stay away from the area; the majority of the building remained buried and thus protected under the spoil heaps which were to be left to re-vegetate and grass over.

  The form and extent of the dressing floors on which copper ores were cleaned and concentrated at Hallenbeagle were only partially revealed during the development work, the evidence being confined to a number of settling tanks (some being timber-lined), shallow, but often extensive channels connecting them, a few sections of timber box launder, and spreads of copper-rich silts and gravels. Copper dressing floors, in contrast to those constructed for the dressing of tin, tended to be extensive but ephemeral. Large numbers of women and children worked on them, but most of the processes were manual in nature, and structures were rare, often little more than flimsy sheds and shelters. Such features would have been dismantled on their disuse and the traces they left behind – mostly scatters of postholes and spreads of dressing waste – were not amenable to recording during ground reduction operations carried out using large swing shovels and bulldozers, particularly where these were carried out rapidly and over large areas (Fig 14).

- During the early and mid-19th century, smallholdings continued to spread across Hallenbeagle, including already-mined areas and most traces of former industrial activity soon disappeared, particularly within the south-western part of the site (Hallenbeagle West). Nevertheless, some of the lines of outcrop shafts can be seen to have determined the alignments of new field boundaries, suggesting that, for some time at least, they remained as visible features within the landscape. Over time, however, these areas of disturbed ground were also reclaimed. When the West Cornwall Railway was driven through this landscape

(opening in 1852), at least one smallholding was bisected by it. Although it had been established on an island of 'clean' land between lode outcrops, its replacement fields (in Area 2 of Hallenbeagle East) overlaid an area of backfilled outcrop workings and prospecting pits on Pininger's Lode (Fig 14).

- Pumping and Engine Shafts were also utilised by the subsequent engine houses on the mine, periods of working being recorded from 1801-1847 and 1847 to 1867. From 1869 to 1871 the mine was worked with East Downs. The pumping and whim engine houses working Pumping and Engine Shafts survived until at least 1877 (when they were mapped by the Ordnance Survey, see Fig 5), but were substantially demolished during the 20th century, most particularly during 1944, when large areas of the northern part of the site were levelled using bulldozers. Only very limited traces of their foundations were revealed during the watching brief. Elsewhere, new shafts were sunk within areas which had been laid out as smallholdings (particularly in Hallenbeagle West), their spoil dumps rendering some fields unusable.

- During the later phases of working, the focus of the mine seems to have moved south to the area around Reade's Shaft where the pumping engine house and the remains of the whim engine house still survive. It is assumed that this area also sited dressing floors, though these were probably overlain by the sawmill complex that was constructed here towards the end of the 19th century, and the cement works established here during the 20th century. Only slight traces of the arsenic works which may well have been established during a late 19th century phase of dump reworking were recorded, but no indications of the dressing floors which would have been within this area were found. Within Hallenbeagle East most of the mine dumps were removed for reprocessing during the last years of the 19th century, though in the western part of the development area they remained for some time as substantial landscape features.

- Following the cessation of all mining operations at Hallenbeagle and the removal of its machinery the site seems to have become derelict, the remnants of its formerly extensive spreads of mineral-rich mine waste checking the growth of scrub, with the result that the northern part of the site gradually reverted to heathland.

- In 1944, US Army bulldozers moved onto the site with the aim of creating a pre-embarkation transit camp in the run-up to D-Day, similar sites being created in the surrounding area, most notably at Wheal Busy. The work undertaken at the time was recorded on a 1946 RAF aerial photograph, and it is clear that large swathes of the northern part of the site were levelled at this time (Fig 16), possibly accounting for the large and almost completely blank areas found in the north-eastern part of the development site.

- In the mid-1980s, Carrick Council established a short-lived but intensive project with the intention of making safe many of the large number of mine shafts in the former administrative district. Operations were based at Wheal Busy, and inevitably, many of the shafts in the immediately surrounding area were tackled. At Hallenbeagle, most of the smaller shafts were covered with Clwyd Caps, but some of the larger ones were permanently plugged with mass concrete, as was found at Pininger's, Reade's and Pumping engine shafts. Not all of the shafts in the western area were treated in the same way (possibly as a result of a retained mining interest), and a number were found to be still open under concrete caps. In at least one instance, the shaft retained some of its timberwork, but unfortunately conditions did not allow for this to be recorded before the shafts were permanently closed off in concrete.

- Finally, travellers arrived on the eastern part of the site a few years ago. With the exception of the rather large amounts of rubbish which had to be cleared away and the Japanese knotweed which had taken hold of parts of the site, necessitating deep excavation of their rhizomes, these most recent occupants of the site left few traces on its archaeology.

The recording of such a full development sequence for a site of this type is, at present, unique, and much has been learned for the investigations at Hallenbeagle. However, inevitably some important opportunities were missed, given the way in which the site was developed and the resources available to the archaeological team. Key issues included:

- The full significance of the remains of the early engine house to the south-west of Pumping Shaft was not recognised during the watching brief. No opportunities were available to excavate and record this structure with the care and attention it clearly deserves. Its conservation should be a matter of some urgency.

- The means by which the copper dressing floors were uncovered did not allow for an adequate level of recording given the rarity of the survival of such features. This was to a large degree a result of the need to remove large volumes of soil containing Japanese knotweed rhizomes from the area within which they were discovered and the fact that their locations were wholly undocumented. In retrospect, the hand excavation of at least representative areas of these tanks and channels should have been undertaken, and samples of their fills recovered for metallurgical analysis. The timber used in the floors of the tanks and in the launders would probably have been too contaminated by mineral contact to allow for dating to have been undertaken.

- Given the number of prospecting pits revealed during the soil strip, their limited depths and their ready identification following initial soil removal, the opportunity should have been taken to hand-excavate at least one example to determine whether diagnostic detail could be recorded, as well as any indications as to what type of indications of mineralisation the prospecting miners would have been able to see within them. A prospecting pit close to or overlying an unworked lode outcrop would have been a preferential site.

- In a similar fashion, more controlled machine and hand excavation of the upper sections of at least one outcrop shaft would have allowed for any surviving diagnostic detail to be recorded. At Hallenbeagle, all such features were excavated using large swing shovels equipped with toothed buckets, the intention being to clear material down to bedrock in order to fill them with concrete, rather than to reveal archaeological information.

- Very often, shallow tunnel systems interconnecting these shafts either were not or could not be recorded given the way in which these features were excavated. These are an unusual and little understood feature of early mining landscapes.

Other lessons learned from the work undertaken at Hallenbeagle include:

- The importance of building good working relations with the other members of the contract team, in part through explaining the interest and importance of the archaeological findings. Given the limited time resources available to the archaeologists at Hallenbeagle, this helped to ensure that features of interest were reported to them, in some cases these being retained until the archaeologist could be on site to record them.

- Discussion with other professionals on site, particularly the mining geologists, also proved useful in the interpretation of the mining remains.

- The particular value of the high-precision GPS survey system used at Hallenbeagle, this having allowed the locations and distribution of the many hundreds of pits and shafts revealed across the site to be recorded. This survey proved to be essential in the interpretation of the results of the work undertaken on site.

- In a similar fashion, the hand-held GPS unit used by the archaeologists, whilst inherently less accurate, allowed effective cross-referencing between features revealed in the field and the notes taken at the time. CAU is currently trialling tablets with inbuilt GPS units and cameras which should improve this recording process.

- It is also clear that initial appearances can be deceptive on a site of this type, where many of its significant features will be excavated into bedrock. Even where apparently extensive landscaping has taken place, the below-ground survival of features may be very good.

Looking forward, some research questions raised by the work at Hallenbeagle include:

- The degree to which the methodologies used by generations of miners at Hallenbeagle is typical and representative; conversely, the degree to which they might represent local practices, those typical only of specific periods in the development of mining technologies or those dictated by specific geologies. This question could be answered through the examination of further mine sites which documentation suggests developed from the post-medieval period through to the end of the 19th century, though examples of those which did not experience large scale development during the 19th century would provide useful information about early mining techniques.

- Hallenbeagle was a copper mine. It would be useful to study a tin mine with a similar pedigree in an equivalent level of detail to determine whether there are differences in the methodologies used by former miners.

- The need to undertake the controlled excavation of early period copper dressing floors was highlighted, given the opportunity missed at Hallenbeagle and the current low levels of understanding of how these areas of such mines were physically laid out and operated.

- Whilst we clearly have good evidence for a multi-phase mining landscape at Hallenbeagle, almost none of its elements (particularly those evidently belonging to its earliest components) could be dated by reference to artefacts or organic materials. The recovery of datable material from similar contexts should be a high future priority.

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6.3 Websites

http://www.heritagegateway.org.uk/gateway/ English Heritage's online database of Sites and Monuments Records, and Listed Buildings

7 Project archive

The CAU project number is **146166**

The project's documentary, photographic and drawn archive is housed at the offices of the Cornwall Archaeological Unit, Cornwall Council, Fal Building, County Hall, Treyew Road, Truro, TR1 3AY. The contents of this archive are as listed below:

1. A project and information file containing site records and notes, project correspondence and administration (file no 146166).
2. Field plans and copies of historic maps stored in an A2-size plastic envelope (GRE 821/1-3).
3. Digital photographs stored in the directories:

R:\Historic Environment (Images)\SITES.E-H\Sites H\HALLENBEAGLE\Hallenbeagle WB 2012 146166

R:\Historic Environment (Images)\SITES.E-H\Sites H\HALLENBEAGLE\Hallenbeagle Phase 2 West

4. This report text is held in digital form as: G:\TWE\Waste & Env\Strat Waste & Land\Historic Environment\Projects\Sites\Sites H\Hallenbeagle WB-Scorrier-2012\Report\Final report.doc

8 Appendix 1: Hallenbeagle East Site inventory

It should be noted that not all prospecting pits and amorphous areas of disturbance were recorded because of their near ubiquitous presence in areas which were dense with multi-phased shafts. All depths recorded for cut features are from the top of the exposed bedrock, and not from the top of today's ground surface, which according to area varied from 0.5 to 3.0m in depth and was primarily composed of layers and pockets of mine waste, topsoil and imported materials. The ground in some areas contained shallow pits cut from a number of different levels.

Note on relative dating column in table: Early = 17th and 18th century; Late = 19th and 20th century; Modern = late 20th and 21st century.

Site No.	Site type	Area of site	Relative dating	Description
1	Exploratory modern geotechnical investigation trench	Area 2 (including site compound)	Modern	Long, straight, machine cut trench. 0.6m wide. 12m+ long, not excavated.
2	Exploratory pit	Area 2 (including site compound)	Modern	Rectangular 1.5m by 2.5m; modern, probable machine-cut pit. Not bottomed. Loose, mixed fill.
3	Disturbance	Area 2 (including site compound)	Late	Shallow disturbance cutting in to the top of natural. Not a cut feature. Amorphous, 3.0m by 4.5m edges, never exceeding 0.1m in depth.
4	Shaft	Area 3 (South end)	Late?	In excess of 5.0m deep. Circular, cone-shaped top 5.0m diameter, dropping down to form a rectangular shaft approximately 1.0m by 1.5m, aligned east to west. Cut down through a pink-red, stony clay lode. Located on the western edge of a visible north to south running stretch of lode.
5	Outcrop shaft	Area 3 (South end)	Late?	Circular 2.5m diameter pit. Excavated to its base at 2.0m below bedrock level. 2.0m to south of [4], on same western edge of visible lode.
6	Shaft	Area 3 (South end)	Early	Located on extreme south edge of this area. In excess of 5.0m deep. Cut through decayed, soft white kaolinised material. Cone shaped upper 2.5m depth with a 0.75m shelf on western edge at a 3.4m depth, where the shaft was rectangular, measuring 1.0m by 2.0m E to W. The north and south sides of the shaft also bulged at this point. The main 1.0m by 1.4m shaft dropped down on the S side of the shelf to an unknown depth. Filled with pale, decayed re-deposited shaft waste, with topsoil lenses in the upper 1.0m.
7	Shaft	Area 3 (South end)	Early	Located on the extreme southern edge of this area. In excess of 5.0m deep. Cut through decayed, soft white kaolinised material. Approximately 4.0m east of [6]. Cone-shaped upper 3.0m, narrowing to an east to west aligned 1.2 by 1.5m sized rectangular shaft of unknown depth. Filled with pale, decayed re-deposited shaft waste, with topsoil lenses in the upper 1.0m.
8	Oval prospecting pit	Area 3	Early	Located to east of Shaft [4]. 2.0m long by 1.4m wide, white kaolinised material filled pit with a near black topsoil patchy peripheral edge. Machine excavated to base in order to test one of a number of near identical

Site No.	Site type	Area of site	Relative dating	Description
		(South end)		features. Found to have an angular shape at 2.8m depth below bedrock.
9	Rectangular prospecting pit	Area 3 (South end)	Early	2.0m long, 1.4m wide rectangular kaolinised material filled pit with a black loam periphery. Seen in section to have been cut through the old land surface and sealed by later mine waste layers.
10	Oval prospecting pit	Area 3 (South end)	Early	2.0m by 1.8m white kaolinised material filled prospecting pit with patchy black material around its rim.
11	Oval prospecting pit	Area 3 (South end)	Late	1.8m by 2.1m in plan. Very mixed non-kaolinised filled mid grey material with lenses of topsoil throughout the visible upper fill.
12	Rectangular prospecting pit	Area 3 (South end)	Early	2.0m by 1.4m, rounded corners. White kaolinised material fills the cut with peripheral patchy topsoil.
13	Amorphous disturbance	Area 3 (South end)	Late?	Amorphous-shaped pit-like disturbance on east edge of [6]. Filled with mixed mine waste and frequent topsoil lenses.
14	Amorphous disturbance	Area 3 (South end)	Late?	Amorphous-shaped pit-like disturbance on east edge of [7]. Filled with mixed mine waste and frequent topsoil lenses.
15	Oval prospecting pit	Area 3 (South end)	Early	2.4m by 2.1m white kaolinised material filled prospecting pit with a patchy black rim.
16	Exploratory modern trench	Area 3 (South end)	Modern	Straight machine dug 1.0m wide, 23m long trench, filled with loose re-deposited topsoil and disturbed mine waste. Aligned east-south-east to west-south-west; just missed exposing shaft features to either side.
17 **W115** **W116**	Shaft	Area 3 (South end)	Late	Visible on surface as a cone of up to 3.75m high mine waste with a central depression. Remnant patch of walling on top of south side of dump. Shown as open on the 1946 RAF aerial photographs. 4.0m diameter cone. Taken down to top of concrete plug at a depth of 1.5m below the top of the bedrock. This concrete capping proved to be 0.40m thick. A second concrete plug was encountered at a depth of 3.0m that proved to be nearly 1.0m thick. On lifting, an open shaft was revealed covered over by timber sleepers and boarding. The vertical shaft appeared to be circular in plan between 3.0m and 3.5m in diameter. Below this it could be seen to have been cut through solid bedrock.
18	Oval prospecting pit	Area 3 (South end)	Late?	1.1m by 1.5m in plan with a 2.0m depth. Mixed grey brown stony fill.
19	Shaft?	Area 3	Early?	Substantial 3.0m diameter cone-shaped cut visible in section extending beyond the southern periphery of the

Site No.	Site type	Area of site	Relative dating	Description
		(South end)		site.
20	Rectangular prospecting pit	Area 3 (South end)	Early	Rectangular prospecting pit with straight edges, 1.8m long by 0.9m wide. Filled with compact, clean, stone-free red clay. Aligned north-north west to south-south-east.
21	Rectangular prospecting pit	Area 3 (South end)	Early	Rectangular prospecting pit with straight edges, 1.8m long by 0.9m wide. Filled with compact, clean, stone free red clay. Aligned north-north west to south-south-east.
22	Oval prospecting pit	Area 3 (South end)	Late	1.8m deep oval, stone-filled prospecting pit.
23	Shaft	Area 3 (South end)	Early	Located on extreme south edge of this area. In excess of 5.0m deep. Cut through soft white kaolinised material. Cone shaped upper 3.0m, narrowing to a small rectangular 1.0m by 1.3m shaft. Filled with pale, compacted re-deposited shaft waste. One of a string of three or four very similar early shafts running along the extreme southern edge of the site – [6] and [7] also excavated to 5.0m, [19] not excavated.
24	Round prospecting pit	Area 3 (South end)	Early?	1.6m diameter, round, dark soft clay and topsoil filled pit.
25	Oval prospecting pit	Area 3 (South end)	Early?	Oval 2.3m by 1.8m sized pit with white kaolinised fill and a topsoil-like peripheral fill.
26	Rounded oval prospecting pit	Area 3 (South end)	Early?	Long rounded 2.5m by 1.3m pit. Filled with a compacted, mixed stony fill.
27	Shaft	Area 3 (South end)	Early	Initially appeared as a spread of loose material overlying bedrock and sealed by in excess of 1.8m of mine waste layers. Combination of round and straight edges prior to excavation covering an approximate 2.0m north to south and 8.0m east to west in plan. On excavation it turned in to a 4.0m diameter shaft with a 5.0m plus depth from bedrock. Cut in to soft kaolinised bedrock. Its west-north-western edge had cut through prospecting pit [29].
28	Deep pit	Area 3 (South end)	Early	4.5m diameter circular pit cutting into soft white kaolinised material. Base found at 4.7m Overlain by a series of intercutting pits and layers of waste. Upper edge of cut had been removed by at least three different pits/prospecting pits visible in section and in plan – none given context numbers.
29	Oval prospecting pit	Area 3 (South end)	Late	Dark stone filled prospecting pit excavated during excavation of shaft [27]. 1.3m visible length and 0.8m depth from top of bedrock.
30	Oval prospecting pit	Area 3 (South end)		2.0m by 1.5m prospecting pit, 1.8m deep, sealed by 1.5m layer of mixed mine waste.

Site No.	Site type	Area of site	Relative dating	Description
31	Shaft	Area 3 (South end)	Late?	Located on extreme southern edge of this area and visible on surface within a doughnut shaped mound. In excess of 5.0m deep. Narrow shaft 1.0m by 1.2m. Visible prior to mechanical excavation as an approximate 10m diameter ring of mine waste, 1.0m high. Central area visible as a 1.5m deep hollow. Excavation showed the upper 1.0m to consist of soil and a stoneware and glass dump, overlying pale decayed re-deposited bedrock waste. A 5.0m depth was removed, by which point the shaft was clearly dipping down towards the west. Cut through soft white kaolinised bedrock. NOTE – excavation of shaft [64] suggested that a connection existed between shafts [31] and [64], this dipping towards the south.
32	Rectangular prospecting pit	Area 3 (South end)	Late?	Amorphous 3.0m long, 1.0m wide north to south aligned pit with a mixed mid dark grey brown fill of mine waste.
33	Oval prospecting pit	Area 3 (South end)	Late?	1.6m by 1.2 m wide prospecting pit with mixed mine waste fill.
34	Oval prospecting pit	Area 3 (South end)	Early	2.0m by 1.6m oval pit with white kaolinised fill and a topsoil-rich peripheral fill.
35	Shaft	Area 3 (South end)	Early	Initially visible as a 3.7m diameter pale, mixed stony fill, with linking features which looked like two prospecting pits and a short broad trench to its immediate east. Found on excavation to be a 5.0m+ deep shaft. 4.5m upper diameter cone, narrowing to a 1.0m by 1.3m shaft dropping down vertically. Approximately 3.0m to the east is [36]. A small curvilinear exploratory tunnel was found to run in a roughly easterly direction from the south-east side of this shaft, the top of the tunnel being approximately 4.0m below ground level. Approximately 1.0m high and running for about 6.0m before stopping.
36	Shaft	Area 3 (South end)	Early	Initially visible as a 1.7m diameter pale killas-filled feature, cut in to soft pale kaolinised bedrock. On excavation this became a 5.0m+ deep shaft with a 5.0m by 6.5m east to west aligned upper cone-shaped mouth, below which was a narrow, central shaft, possibly dipping down towards the west. On the south side at approximately 4.0m below natural, a rock cut 0.6-0.8m wide tunnel was visible dipping down at an approximate 40 degree angle towards the south, following a reddish brown, stony lode. On the opposing northern edge was a 1.0m long, north-south aligned tapered niche cut into a clearly visible, near black, steeply diagonal vein, which dropped from east to west. This looked like an exploratory feature designed to test the lode.
37	Pit	Area 3 (South end)	Early	1.1m diameter pit feature filled with a clean, pale, broken shillet fill.
38	Pitted/disturbed area	Area 3 (South end)	Early	Visible in section of [35] and [36] as a 1.5m deep pitted /disturbed area running east to west and linking shafts [35] and [36]. Initially visible as a 2.0m wide, pale reddish brown band.
39	Modern trench?	Area 3	Modern	Probable modern trench filled with brown loam. 1.5m wide and a 2.0m visible length (extends south beneath

Site No.	Site type	Area of site	Relative dating	Description
		(South end)		section edge). Aligned north to south. Not excavated.
40	Shaft	Area 3 (South end)	Early	4.0m diameter mixed shillet-filled pit. On excavation found to be up to 3.0m deep pitted area of disturbance.
41	Pit	Area 3 (South end)	Early	Oval east to west aligned prospecting pit. 2.0m long by 1.3m wide, with a near white principal fill and topsoil peripheral rim. 3.0m deep on excavation.
42	Pit	Area 3 (South end)	Early?	Oval north to south aligned prospecting pit. 1.8m by 1.5m with stony clay mid brown coloured fill with a topsoil rim.
43	Shaft	Area 3 (South end)	Early	5.0m+ deep shaft excavated down through soft white bedrock. Approximate 5.0m diameter around top of cone, below which was a vertical narrow shaft. Very close to shaft [44], that was located 1.0m to the immediate east. Shaft [43], is surrounded by prospecting pits and disturbance visibly cutting through the natural and into the sides of shaft cuts [43] and [44].
44	Shaft	Area 3 (South end)	Early	5.0m+ deep shaft excavated down through soft white bedrock and filled with pale grey stony waste. Surrounded by same pits and disturbance as [43]. Cone shaped top which was approximately 5.0m diameter. A tunnel was located at approximately 3.0m below natural level, running east. This was rock cut, with an arched roof and a flat base with an approximate 1.5m height and a 0.6-0.7m width. The tunnel was dug out for its length and found to be very short – only 3.0m maximum long.
45	Shaft? – not dug	(Area 3 extreme S-against fence)	Early	Circular, 3.0m diameter grey rubble-filled feature.
46	Shaft? – not dug	(Area 3 extreme S-against fence)	Early	Oval feature? Extending south beyond the section. 3.0m wide east-west aligned with a 1.5m north-south north to south length visible. Filled with decayed stony fill and topsoil lenses.
47	Shaft? – not dug	(Area 3 extreme S-against fence)	Early	3.0m wide feature extending north beyond the section. Filled with very pale near white, decayed stony fill.
48	Shaft? – not dug	(Area 3 extreme S-against fence)	Early	2.5m wide feature, extending south beyond the edge of the site. Pale near white, stony fill.
49	Rectangular prospecting pit	(Area 3 extreme S-against fence)	Early	Rectangular 1.0m by 1.8m long, east to west aligned pit with rounded corners.
50	Rectangular prospecting pit	(Area 3 extreme S-against fence)	Early	Rectangular 2.3m+ long pit, extending south beyond section. Dark stony fill.
51	Rectangular prospecting pit?	(Area 3 extreme S-against fence)	Late?	2.0m+ long, 0.75m wide north-north west to south-south-east aligned prospecting pit. Near black fill
52	Rectangular	(Area 3 extreme S-	Late?	Rounded, long thin pit feature seen in section to cut diagonally through the overlying 1.0m+ depth of mine waste. Filled with very pale rubble fill, which contrasted strongly with surrounding layers. Southern end extends

Site No.	Site type	Area of site	Relative dating	Description
	prospecting pit?	against fence)		beyond edge of section. Runs north-west to south-east.
53	Pit/disturbance	(Area 3 extreme S-against fence)	Early	Small ovoid patch of mixed loamy clay. Probable top of a small pit.
54	Waste pit	Area 1 (north end of new access road)	Modern	1.3m diameter, near circular pit containing mixed waste including shillet rubble, rusted iron and smashed glass.
55	Modern soakaway	Area 1 (north end of new access road)	Modern	1.0m wide, machine dug trench filled with white cement silt and bits of glass and plastic.
56	Pit	Area 1 (north end of new access road)	Late?	1.4m diameter, circular compact dense brown clay fills.
57	Pit	Area 1 (north end of new access road)	Late?	1.2m diameter, circular, dense brown clay filled pit.
58	Exploratory trench	Area 1 (north end of new access road)	Modern	0.75m wide machine dug trench filled with loose, recently redeposited topsoil and natural – probably geotechnical exploration trench.
59	Copper dressing waste patches/floor	Area 1 (south end of new access road)	Late?	Spread of granular copper dressing waste extending east and west from the sides of the new access road. Located to the north of postholes [60].
60	Postholes x 2	Area 1 (south end of new access road)	Late?	Two 0.2m diameter postholes with a 0.2m depth set 0.3m apart on a west to east alignment. It is likely that these reflect a former rather flimsy dressing floor related structure – probably open-sided. Running east from the western-most patch of [59] was a horizontal timber embedded within remnant dressing floor waste. This mirrored the same alignment as the postholes and was only 0.7m to their north. It may represent a collapsed structural element, rather than flooring or an edge of a launder etc.
61	Patches of copper dressing waste	Area 1 (south end of new access road)	Late?	Patches of granular copper dressing waste located to the south of postholes [60] probable dressing floor structure.
62	Water channel feeding dressing	Area 1 (south end of new	Late?	Copper-rich green silt filled trench, 0.3m wide, 0.1m deep. Severely truncated, but a probable leat or launder. Aligned north-west to south-east, flowing north from the former reservoir on the basis of the water sorted grits.

Site No.	Site type	Area of site	Relative dating	Description
	floors	access road)		Rounded base and an approximate 15m length seen, but clearly extended north-west and south-east of the access road corridor.
63	Shaft with tunnel	Area 3 Around known shaft [17]	Early	5.0m by 6.0m oval cone and a 5.0m+ depth. Filled with compact mine waste – pale and stony. At an approximate 4.0m depth a tunnel ran due west towards adjacent shaft [64].
64	Shaft with radiating tunnels	Area 3 Around known shaft [17]	Early	Originally appeared as a 3.0m diameter stony area. On excavation a 4.5 by 6.5m cone was found – this was further excavated to expose associated tunnels. The shaft had a 5.0m+ depth. On its south side there was a shallow, round based brown clay filled prospecting pit and a 1.5m wide 2.5m deep sheer sided, flat based prospecting pit. Beneath this a waste filled, arch topped, 1.0m wide tunnel could be seen running south towards shaft [31]. To its immediate west a further angular shaped tunnel could be seen running south from the shaft, its top approximately 1.0m below top of bedrock. At the base of the shaft a tunnel could be seen dipping down towards the east and shaft [63]. On the western side of the shaft a further tunnel appeared to be running west.
65	Shaft	Area 3 Around known shaft [17]	Early	Originally recorded as 2.5 by 3.5m area of waste backfill, this feature turned on excavation in to a 5.0m+ deep shaft, with a *c*4.5m cone and a vertical 1.0m by 1.3m shaft aligned north to south.
66	Shaft	Area 3 Around known shaft [17]	Early	Excavated and treated as a shaft in excess of 5.0m deep, but found subsequently to be linked with adjoining shaft [67].
67	Shaft with tunnel	Area 3 Around known shaft [17]	Early	Shaft running down north side of shaft [66] – possibly a double shaft, or a huge miss-excavated one. Combined, the excavated top of these shafts measured approximately 6.0m by 10m and was aligned west to east. At the base of the excavated section of [67] a tunnel connected to shaft [36]. The top of the tunnel was approximately 4.0m below top of bedrock. A further small exploratory (prospecting) tunnel was found branching off in a south-easterly direction. This was approximately 0.70m wide and 1.0m high, and ran for a length of about 4.0m before stopping. The top of the tunnel was about 4.0m below current ground surface. On the northern face of the shaft, a vertical groove (approximately semi-circular in plan) was observed. This had an approximate width in plan of 0.50m. Possible ladder or bucket run? May just be a truncated prospecting pit.
68 **W39**	Shaft with radiating tunnels	Area 3 Around known shaft [17]	Early	This appeared initially on the ground as a small void or subsidence measuring 1.0m x 0.5m. No other indication of the extent of the shaft was visible though this may have been obscured due to tracking of machines etc. On excavation this turned into a 5.0m+ shaft which had five radiating tunnels projecting out from its base at various levels. Roughly oval in shape, it measured 4.0m x 3.5m with the long axis set approximately north to south. The traces of at least three prospecting pit could be seen in section around the periphery of the shaft.

Site No.	Site type	Area of site	Relative dating	Description
				A small tunnel was observed on its eastern face that apparently linked with adjoining shaft [66]. This appeared to have an arched roof and flat floor and was 0.70m wide and 1.3m high. The roof of this tunnel was some 3.0m below the top of the bedrock. A small trial tunnel had been dug into the southern face of the shaft, the floor of which appeared to be at a depth of about 3.0m. The height of this tunnel was approximately 0.70m and it had a width of 0.70m A length of about 1.5m was observed before the tunnel ended. Another exploratory tunnel had been dug into the western face of the shaft, the floor being at a depth of around 4.0m. This tunnel was approximately 0.70m wide and 0.8m high and had a rectangular profile. A length of some 3.0m was followed in a direction of roughly 260° before it came to an end. At the base of the shaft (5.0m+) again on the western face a further tunnel (partly voided) was seen heading off in a direction of circa 280°. Roughly rectangular in profile, it was approximately 0.60m wide and 1.0m high. Only the mouth of this tunnel was observed, but the tunnel was seen to be dipping to a greater depth in a westerly direction. On the northern face of the shaft, a curvilinear tunnel was recorded heading in a roughly northerly direction before turning slightly towards the north-east. Sub-rectangular in profile, approximately 0.75m wide and 1.2m high, the floor of the tunnel was at a depth of 3.5m below the top of the bedrock. This tunnel was traced for a length of approximately 4.0m before entering shaft [69]
69 **W41**	Shaft with tunnel	Area 3 Around known shaft [17]	Early	Not initially identified at surface as its area had been heavily tracked over. Shaft 5.0m+ deep. Irregular cone circa 2.0m in diameter narrowing to a vertical, small rectangular 1.0m x 1.5m shaft. Linked with shaft [68] by tunnel (see above).
70 **W40**	Shaft	Area 3 Around known shaft [17]		At pre-excavation this appeared as an irregular spread of dark grey-brown loam mixed with shillet fragments and clay. Approximate diameter of 1.5m. Excavation proved this to be a shaft 5.0m+ deep. Cone shaped upper 2.0m in diameter, narrowing to a small rectangular 1.0m by 1.3m shaft. Filled with pale, compacted re-deposited shaft waste. Long axis of shaft at base orientated west to east.
71 **W42**	Prospecting pit	Area 3 Around known shaft [17]	Early	Pit roughly 3.0m diameter and reaching a depth of 2.0m. Full details of this pit could not be recorded as it was heavily damaged and had been cut through by a modern exploratory trench on its northern side.
72 **W43**	Shaft with tunnel	Area 3 Around known shaft [17]	Early	This appeared initially on the ground an area of disturbed ground marked by a sub-circular loose area infilled with white kaolinised clay and shillet fragments some 2.0m in diameter. On excavation this turned into a 5.0m+ depth shaft. Its cone was approximately 3.0m in diameter but irregularly shaped. At a depth of about 2.0m it became a vertical shaft approximately 2.0m diameter. A small tunnel was observed on its north-eastern face. This appeared to have an arched roof and flat floor and was 0.70m wide and 1.3m high. The floor of this tunnel was some 5.2m below the top of the bedrock. This

Site No.	Site type	Area of site	Relative dating	Description
				tunnel connected with the base of shaft [76].
73 **W44**	Exploratory modern trench	Area 3 Around known shaft [17]	Modern	Modern machine cut trench trending north-west to south-east. Full length of trench not observed as this disappeared into the baulk at its north-western end. 1.5m wide and reached a depth of 3.0m. The excavation of this feature had truncated and damaged prospecting pit [71]
74 **W45**	Shaft with tunnel	Area 3 Around known shaft [17]	Early	Roughly circular area of disturbed ground seen at surface, 2.0m in diameter, infilled with grey kaolinised clay and mine waste/rubble. On excavation this turned into a 5.0m+ depth shaft. Its cone was approximately 3.0m in diameter but irregularly shaped. At a depth of about 2.0m this became a vertical shaft that appeared to be rectangular in shape. Measuring 2.0m x 1.5m it was aligned 120° (south-south-east). A small tunnel (approximately 0.70m wide) connected with shaft [76] on the south-east face, the floor of which was at a depth of about 4.0m below the top of the bedrock.
75 **W46**	Possible shaft?	Area 3 Around known shaft [17]	Early	Roughly circular area of disturbed ground seen at surface, 2.0m in diameter, infilled with grey kaolinised clay clinker and mine waste/rubble. Not excavated.
76	Shaft with tunnel	Area 3 Around known shaft [17]		This appeared initially on the ground an area of disturbed ground marked by a sub-circular loose area infilled with white kaolinised clay and shillet fragments and was approximately 2.0m in diameter. On excavation this turned into a 5.0m+ depth shaft. Its cone was approximately 3.0m in diameter but irregularly shaped. At a depth of about 2.0m this became a vertical shaft, rectangular in shape, the cut for which was clearly seen on the western face of the excavation. The long axis of the shaft was about 1.5m long and was aligned 31° (north-east) along the lode. The width of the shaft was not observed. At the base of a shaft a tunnel was recorded in its southern face; this connected with shaft [72]. In the northern face the tunnel followed the line of the lode. At this point the tunnel had a flat roof and floor and was 0.70m wide and 1.3m high. The roof of this tunnel was 4.5m below the top of the bedrock. Another short length of tunnel 0.70m wide connected to shaft [74] at a depth of about 4.0m below the top of the bedrock on the north-western face of the shaft.
77 **W47** **W48** **W49**	Linear Ditch	Area 2. Access Road.	Modern?	Irregular line of ditch across the width of the road corridor with a bearing of approximately 245°. U-shaped profile, 0.50m wide and averaging 0.30m deep. Two fills were observed. The lower fill consisted of a silty, grey-brown clay up to 0.10m thick. This was overlain by a dark brown-black humic rich clay loam.
78 **W50**	Linear Ditch	Area 2. Access Road.	Modern	Linear ditch running roughly north to south. Ditch varied in width between 0.70m and 1.0m U-shaped profile, on average about 0.50m deep. Two fills were observed. The lower fill consisted of orange, red-brown clay with numerous roots up to 0.20m

Site No.	Site type	Area of site	Relative dating	Description
W51 **W52**				thick. This was overlain by a dark brown-black humic rich clay loam that contained modern white china and glass.
79 **W53**	Pit?	Area 2. Access Road.	Modern?	Area of ground disturbance alongside ditch [78] at its northern end. Irregularly shaped, measuring 2.0m x 1.5m. Cut into natural and infilled with grey-brown clay, and some shillet fragments. Not excavated.
80 **W54**	Pit?	Area 2. Access Road.	Modern?	Area of ground disturbance roughly oval in shape, measuring 2.0m x 1.0m with the long axis orientated 340°. Cut into natural, and infilled with grey-brown clay and some shillet fragments. Not excavated.
81 **W55**	Shaft with tunnel	Area 3 Around known shaft [17]	Early	This was a 5.0m+ deep shaft. Its cone was approximately 3.5m in diameter but irregularly shaped. At a depth of about 4.0m it could be seen that it became a vertical shaft rectangular in shape measuring 2.5m x 2.0m. The long axis of the shaft was aligned north-east to south-west along the line of the lode. The eastern side of the shaft had been cut away by a curvilinear tunnel (the floor of which occurred at 4.0m below the top of the bedrock) which was followed for a length of approximately 12m before it exited the northern edge of the cutting as a steeply dipping (40°angle) stope that was 0.70m wide and flat roofed. The roof of this tunnel was s 4.5m below the top of the bedrock. This tunnel or stope was clearly following the line of the lode. This stope intersected a vertical shaft [96] at its western end. At the northern end, this tunnel clearly cut an earlier exploratory tunnel dug from shaft [82] which lay 3.0m to the west.
82 **W56**	Shaft with several radiating tunnels	Area 3 Around known shaft [17]	Early	This was a 5.0m+ deep shaft. Unfortunately the full nature of this shaft was not investigated as had been dug and infilled with concrete prior to being observed. The cone was approximately 2.5m in diameter but irregularly shaped. At a depth of circa 4.0m two small exploratory tunnels had been dug from the eastern side of the shaft. Both had been truncated by the later tunnel from shaft [81]. The first tunnel was cut in a south-easterly direction but its plan and form had been severely mutilated by the subsequent tunnel, so that its dimensions could not be determined. The second tunnel was cut in an easterly direction and was approximately 1.0m wide. It could be followed for a length of approximately 12m before it ended in bedrock. This tunnel too had been cut by that from shaft [81] some 1.5m from its eastern end. A third tunnel, 1.0m wide and flat floored (the floor was 4.0m below the top of the bedrock) connected this shaft to shaft [97] which lay about 2.0m to the northwest.
83 **W57** **W58** **W59** **W60**	Building Part of Pumping engine house?	Area 1. SW corner Pumping Shaft	19th century	Small rectangular building of which three walls were exposed. The long axis of building was orientated 200° (SE). Some 6.0m of the long axis was exposed, the building disappearing under the baulk on its north-eastern side. The width of the building was approximately 4.0m. The walls were around 1.2m wide and constructed of slate rubble together with shillet and granite blocks and bonded by white lime mortar. GPS points W60, and W61 mark the two observed corners of the building. At its north-western corner there was a circular area of

Site No.	Site type	Area of site	Relative dating	Description
W61 **W62**				cinders and burning approximately 1.5m in diameter marked the possible base of a chimney. The remnants of this building were very ephemeral and had been heavily truncated. The whole area was marked by a spread of stone rubble.
84 **W63** **W64** **W65** **W66**	Walling Part of Pumping engine house?	Area 1. SW corner Pumping Shaft	19th century	A circa 12m length of wall orientated at circa 330° (N) was uncovered 2.0m west of structure [83]. Aligned on Pumping Shaft, this wall was approximately 0.70m wide and of rubble stone construction (shillet and granite blocks) bonded with lime mortar. GPS points were taken along the length of this wall. Again this wall had been heavily truncated.
85 **W67** **W68**	Walling	Area 1. SW corner Pumping Shaft	19th century	A 4.0m length of wall orientated at circa 330° (N) was uncovered 2.0m to the west of wall [84]. Again aligned on Pumping Shaft, this wall was approximately 0.70m wide and constructed of shillet and granite rubble bonded with lime mortar. GPS points were taken along the length of this wall. Again this wall had been heavily truncated.
86	Walling	Area 1. SW corner Pumping Shaft	19th century	A 2.0m length of wall orientated roughly northeast to southwest was noted at the south western end of Pumping Shaft. It appeared to be quite ephemeral, perhaps revetting facing for the spoil heap though it is just a possibility that is may have been facing stones associated with structure [107] which lies immediately to the north. The wall was of mortared shillet and granite blocks but was unfortunately machined away before it could be fully recorded.
87 **W69**	Prospecting pit?	Area 2. Knotweed clearance NW of Access Road.	Early?	A circular area of ground disturbance with evidence of a cut around edge possibly indicating a pit of 2.0m diameter infilled with grey-brown, and yellowy-red stony rubble and mine waste.
88 **W70**	Prospecting pit?	Area 2. Knotweed clearance NW of Access Road.	Early?	A circular area of ground disturbance with evidence of a cut around its edge, possibly indicating a pit of 2.0m diameter infilled with grey-brown, and yellowy-red stony rubble and mine waste and some cinders.
89 **W71**	Prospecting pit?	Area 2. Knotweed clearance NW of Access Road.	Early?	A circular pit of 2.0m diameter infilled with stony rubble and mine waste and copper dressing floor waste. Appeared only in section so full dimensions of pit not determined.
90 **W72**	Prospecting pit?	Area 2. Knotweed clearance NW of Access Road.	Early?	A circular area of ground disturbance possibly indicating a pit of 2.0m diameter infilled with grey-brown, and yellowy-red stony rubble and mine waste.
91	Prospecting pit?	Area 2. Knotweed clearance	Early?	A pit appearing in section of about 2.0m diameter though its full diameter was not observed. Infilled with stony rubble and copper dressing floor waste.

Site No.	Site type	Area of site	Relative dating	Description
W73		NW of Access Road.		
92 **W74**	Shaft	Area 3 Around known shaft [17]	Early	This shaft was intersected at the centre of the South Crofty prospecting trench [73]. It lay north-west of prospecting pit [71] and approximately 2.0m north of shaft [71]. This was a 5.0m+ deep shaft whose cone was approximately 3.5m in diameter. At a depth of about 3.0m it could be seen that it became a vertical shaft, rectangular in shape and measuring 2.0m x 1.5m. The long axis of the shaft was aligned north-west to south-east.
93 **W75**	Possible shaft?	Area 3 Around known shaft [17]	Early	A circular area of disturbed ground of about 2.0m diameter with a spread of pale grey-brown clay and shillet fragments enclosed within a ring of topsoil of grey-brown clay loam around its circumference. Possible shaft, subsequent treatment work not observed.
94 **W76**	Possible shaft?	Area 3 Around known shaft [17]	Early	A circular area of disturbed ground of about 2.0m diameter with a spread of pale grey-brown clay and shillet fragments and some cinders. This lay 0.50m to the south-east of [93]. Possible shaft, subsequent treatment work not observed.
95	**Not Used**			
96 **W77**	Shaft with tunnel	Area 3 Around known shaft [17]	Early	This was a 5.0m+ deep shaft (not bottomed). Unfortunately the full nature of this shaft was not investigated as had been dug and infilled with concrete prior to being observed. The cone was approximately 2.5m x 2.0m in plan and irregularly shaped. The shaft was apparently connected to stope tunnel mentioned in [81] forming a vertical continuation of that tunnel.
97 **W78**	Shaft with tunnel.	Area 3 Around known shaft [17]	Early	This was a 5.0m+ deep shaft whose cone was approximately 3.0m in diameter but irregularly shaped. At a depth of about 4.0m it could be seen that it became a vertical shaft, rectangular in shape and measuring 2.0m x 1.5m. The long axis of the shaft was aligned north-east to south-west. On its south-eastern side a short tunnel 1.0m wide and flat floored (the floor was some 4.0m below the top of the bedrock) connected this shaft to shaft [82].
98 **W80**	Shaft with tunnels	Area 3 Around known shaft [17]	Early	This was a 5.0m+ deep shaft whose cone was approximately 5.0m in diameter. At a depth of about 4.0m it could be seen that it became a vertical shaft, rectangular in shape and measuring 2.5m x 2.0m. The long axis of the shaft was aligned north to south. On its south-eastern side was a tunnel 0.7m wide, flat floored with an arched roof, whose floor was 3.5m below the top of the bedrock. On its southern side was another tunnel of similar dimensions connected to shaft [116] which lay 2.0m to the south-west.
99 **W79**	Shaft.	Area 3 Around known shaft [17]	Early	This shaft lay 1.5m north of shaft [98]. Unfortunately the full nature of this shaft was not investigated as had been dug and infilled with concrete prior to being observed. This was a 5.0m+ deep shaft whose cone was approximately 3.0m in diameter. At a depth of about 2.5m it

Site No.	Site type	Area of site	Relative dating	Description
				could be seen that it became a vertical shaft, rectangular in shape and measuring 2m x 1.5m. The long axis of the shaft was aligned north to south.
100 **W81**	Possible shaft? To be determined on excavation	Area 3. North of known shaft [17]	Early	A large circular spread, roughly 3.5m to 4.0m diameter (appeared in section so full dimensions not determined). Infilled with kaolinised clay, shillet rubble, mining waste. Possible shaft.
101 **W82**	Possible shaft? To be determined on excavation	Area 3. North of known shaft [17]	Early	A large circular spread, roughly 3.0m diameter (appeared in section so full dimensions not determined). Infilled with kaolinised clay, shillet rubble, mining waste. Possible shaft.
102 **W83**	Possible shaft? To be determined on excavation	Area 3. North of known shaft [17]	Early	A large circular spread, about 3.0m diameter. Infilled with kaolinised clay, shillet rubble, mining waste. Possible shaft.
103 **W84**	Possible shaft? To be determined on excavation	Area 3. North of known shaft [17]	Early	A large circular spread, roughly 3.5m diameter. Infilled with kaolinised clay, shillet rubble, mining waste. Possible shaft.
104 **W85**	Prospecting pit?	Area 3. North of known shaft [17]	Early	An oval shaped pit roughly 2.0m x 1.5m with the long axis orientated west to east. Infilled with dark black, grey-brown clay. Possible prospecting pit.
105 **W86**	Prospecting pit?	Area 3. North of known shaft [17]	Early	An oval shaped pit about 2.0m x 1.5m with the long axis orientated north-west to south-east. Infilled with dark black, grey-brown clay. Possible prospecting pit.
106 **W87**	Prospecting pit?	Area 3. North of known shaft [17]	Early	Part of a pit exposed in section. Uncertain if this is the rounded terminal of a prospecting pit or one that was circular in shape. As fill is similar to features [104] and [105] it is more likely that this is of a similar nature. The diameter of the arc observed was 1.5m Infilled with dark black, grey-brown clay. Possible prospecting pit.
107 **W88** **W89**	Building. Part of Engine House?	Area 1. SW corner Pumping Shaft SW 72717 44873	18th century	The fragmentary remains of an engine house on the south-western end of Pumping Shaft. A length of walling about 3.0m long was noted running roughly north-west to south-east along the western edge of Pumping Shaft. This wall was about 0.70m thick constructed of lime-mortared rubble stone with a visible height of 1.5m being visible. At the centre of this wall face, and at its base was an opening, or tunnel 0.5m wide, with a visible height of 0.5m (the bottom could not be seen, being obscured by debris and mine waste) that was bridged with a wooden lintel onto which the rest of the wall had been constructed. A corner of this building was noted at the northern end of this walling, with another stretch of walling being seen to run perpendicular to it in a westerly direction and disappearing into a mine dump. This walling was approximately 2.0m high on the exterior and 0.8m on the interior, the rest of the base of the interior being

Site No.	Site type	Area of site	Relative dating	Description
				obscured by mine waste and dumped rubble. Protruding horizontally from the dumped material on the interior was a large granite slab, the visible dimensions of which were 1.2m x 1.0m and 0.4m thick. This seemed to overly the projected line of the tunnel feature noted above and could possibly have been the base for some machinery.
108 **W90** **W91** **W92** **W93** **W94** **W95**	Walling	Area 1. SW corner Pumping Shaft	19th century	A length of walling about 3.0m long was noted running west to east along the southern edge of Pumping Shaft. This wall was about 0.70m thick and constructed of lime mortared rubble stone. It seemed to be of similar construction to [107] and may even be part of the same building or complex, but truncation and recent machine activity obscured the relationship between the two. A further length of walling of the same build and alignment could be seen some 6.0m to the north at the eastern end of Pumping Shaft. It is uncertain if the continuation of walling is the same feature, but for this note has been assumed to be so. Relationships between building elements and structures in this area were difficult to determine as elements of these structures had been severely truncated/demolished in the past, and sometimes obscured by the actions of the machines working on the current project.
109	**Not Used**			
110	Shaft	Area 1. SW corner Pumping Shaft SW 72723 44879	19th century	Pumping Shaft. Large rubble filled, choked shaft whose full size and shape were obscured by slumped debris. The circumference was about 10m.
111 **W104** **W105** **W106**	Ditch.	Area 1. Knotweed clearance. Area to south of Pumping Shaft	Unknown, 19th century?	A linear ditch trending approximately north to south. A length of roughly 20m was traced before it disappeared under baulks. GPS points were taken along its length. Ditch 0.5m wide and infilled with grey, green-brown clay loam and stony rubble and occasional block of larger stone.
112 **W107**	Prospecting pit/shaft?	Area 1. Knotweed clearance. Area to south of Pumping Shaft	Early?	An oval area of disturbed ground 2.5m x 1.5m. Long axis is bearing 60°. Infilled with grey, green-brown clay, stony rubble and cinders.
113 **W108** **W109** **W110** **W111**	Settling Tank	Area 1. Knotweed clearance. Area to south of Pumping Shaft	19th century. Earlier?	A roughly rectangular area of grey green clay, and varved deposits deposited within a cut made into the bedrock. Full dimensions were not observed as it disappeared with baulk on southern side. The feature was approximately 3.0m wide and 0.70m deep, with a length of 3.0m being recorded. The whole feature had been heavily truncated. A 1:50 scale plan and section of this feature was made. GPS points were taken around the edges of the tank.
114	Shaft	Area 3.	Early	This shaft lay to the south of shaft [17]. Unfortunately its full nature was not investigated as it had been dug

Site No.	Site type	Area of site	Relative dating	Description
W114		Around known shaft [17]		and infilled with concrete prior to being observed. This was a 5.0m+ deep shaft whose cone was approximately 3.0m in diameter. At a depth of about 1.0m it could be seen that it became a vertical shaft, rectangular in shape and measuring 2.0m x 1.5m. The long axis of the shaft was aligned north-west to south-east.
115 **W113**	Shaft	Area 3. Around known shaft [17]	Early	This appeared initially on the ground an area of disturbed ground marked by an oval shaped loose area infilled with white kaolinised clay and shillet fragments some 2.0m x 1.8m aligned approximately north-east to south west. On excavation this turned into a 5.0m+ depth shaft whose cone was approximately 2.5m in diameter tapering into a vertical shaft to 2.0m diameter. At its base, the shaft became roughly rectangular in shape roughly 2.0m x 1.5m
116 **W112**	Shaft with tunnel	Area 3. Around known shaft [17]	Early	This was a 5.0m+ deep shaft. Cone was approximately 3.5m in diameter but irregularly shaped. At a depth of about 4.0m it could be seen that it became a vertical shaft rectangular in shape measuring 2.5m x 2.0m. The long axis of the shaft was aligned north-west to south-east. On its north-east side at the base of the shaft a tunnel approximately 0.7m wide connected with shaft [98].
117 **W118**	Prospecting pit	Area 3. Around known shaft [17]	Early	Rectangular shaped pit, 2.5m x 2.0m and 2.0m deep. Orientated north-west to south-east. Lies to north of shaft [17]
118 **W119**	Prospecting pit	Area 3. Around known shaft [17]	Early	Rectangular shaped pit, 1.5m x 2.0m and 2.0m deep. Orientated north-west to south-east. Lies to the north-west of [117]
119 **W117**	Shaft	Area 3. Around known shaft [17]	Early	This appeared initially on the ground an area of disturbed ground marked by a sub circular area infilled with red-brown loose rubble and some patches of cinders about 2.0m diameter. On excavation this turned into a 5.0m+ deep shaft whose cone was approximately 2.5m in diameter tapering to 2.0m diameter. At the base of the cone, the shaft became roughly rectangular in shape measuring about 2.0m x 1.5m
120 **W120**	Shaft	Area 3. North of known shaft [17]	Early	Unfortunately the full nature of this shaft was not investigated as had been dug and infilled with concrete prior to being observed. This was a 5.0m+ deep shaft. Its cone was approximately 2.5m in diameter. At a depth of about 1.0m it could be seen that it became a vertical shaft rectangular in shape measuring 2.0m x 1.5m. The long axis of the shaft was aligned north-west to south-east.
121 **W121**	Possible shaft?	Area 3. North of known shaft	Early	A feature which disappeared into the baulk on its south-west side so its full shape could not be determined, however the arc of circle observed indicates about 2.5m diameter. Infilled with kaolinised clay, shillet rubble, mining waste. Possible shaft.

Site No.	Site type	Area of site	Relative dating	Description
		[17]		Not excavated.
122 **W122**	Possible shaft?	Area 3. North of known shaft [17]	Early	A circular shaped area of disturbed ground with a roughly 2.5m diameter. Infilled with kaolinised clay, shillet rubble, mining waste. Possible shaft. Not excavated.
123 **W123**	Possible shaft?	Area 3. North of known shaft [17]	Early	A circular shaped area of disturbed ground with a roughly 3.0m diameter. Infilled with kaolinised clay, shillet rubble, mining waste. Possible shaft. Lies to the south of features [100], [101], and [102] On excavation this turned into a 5.0m+ shaft. Cone was approximately 2.5m in diameter tapering as a vertical shaft to 2.0m diameter. It was connected on its north-east side by a tunnel working and following the line of the lode to shafts [124], [100] and [103]. Not excavated.
124 **W124**	Possible shaft?	Area 3. North of known shaft [17]	Early	A circular shaped area of disturbed ground with roughly 2.0m diameter. Infilled with kaolinised clay, shillet rubble, mining waste. Possible shaft. Lies south-east of features [100] and [102] On excavation this turned into a 5.0m+ shaft. Cone was approximately 2.5m in diameter tapering as a vertical shaft to 2.0m diameter. At base, shaft became roughly rectangular in shape about 2.0m x 1.5m with long axis approximately north-west to south-east. Connected by tunnel at a depth of roughly 4.5m on its south-east side to tunnels following and working line of lode and to join with shafts [123], [100], and [103]. Not excavated.
125 **W96** **W97** **W98** **W99** **W100** **W101** **W102** **W103**	Engine House?	Area 1. Knotweed clearance. Area adjacent to Pumping Shaft SW 72733 44865	19th century, possibly earlier?	A possible indication of the floor or footprint of a building, possibly an engine house immediately adjacent to the southern edge of Pumping Shaft. This appeared as a sub-rectangular spread of dark black-brown infill mixed with rubble. The full length of the building could not be determined as its northern end had been truncated by the coned area of Pumping Shaft, whilst its southern side had been partly machined away during the current works. The width of the building was about 6.5m. The whole structure had been heavily truncated and thoroughly demolished with only a few possible wall facing stones still left *in situ*. A trial trench put through the centre of the structure revealed part of the interior mortared floor surface, and the bedding layer upon which it sat, the entire deposit being about 0.20m thick and overlying dumped mine waste and re-deposited natural material. GPS points were taken around the limits of the building and a 1:100 scale plan was drawn up.
126 **W125**	Shaft with tunnel	Area 3. Around known shaft [17]	Early	Unfortunately the full nature of this shaft was not investigated as had been dug and infilled with concrete prior to being observed to a depth of roughly 3.5m below the top of the bedrock. This was apparently a 5.0m+ deep shaft. Cone was approximately 2.5m in diameter but irregularly shaped. The cone was tapering, becoming a vertical shaft; however its shape could not be determined. There was a hint of a small tunnel on its north-east face (shaped and squared bedrock), but this not confirmed. It was connected to shaft [127] on its southern side by a tunnel, the shape and nature of was not determined

Site No.	Site type	Area of site	Relative dating	Description
				as the roof had been dug away by the remedial works.
127 **W126**	Shaft with tunnel	Area 3. Around known shaft [17]	Early	Unfortunately the full nature of this shaft was not investigated as had been dug and infilled with concrete prior to being observed to a depth of roughly 3.5m below the top of the bedrock. This was apparently a 5.0m+ deep shaft. Its cone was approximately 3.0m in diameter but irregularly shaped. The cone was tapering becoming a vertical shaft circular in shape to depth observed (2.0m diameter) It was connected to shaft [126] on its northern side by a tunnel, the shape and nature of was not determined as the roof had been dug away by the remedial works.
128 **W127**	Shaft	Area 3. Around known shaft [17]	Early	Unfortunately the full nature of this shaft was not investigated as had been dug and infilled with concrete prior to being observed to a depth of about 4.0m below the top of the bedrock. This was apparently a 5.0m+ deep shaft. Its cone was oval shaped circa 3.0m x 2.0m with the long axis roughly north-east to south-west. At a depth of roughly 1.5m it became a vertical shaft, square in plan about 1.5m x 1.5m.
129 **W128** **W129** **W130**	Ditch	Area 3 to south of Reads Whim shaft	?	A length of trench orientated 140° (north-west to south-east). 0.75m wide infilled with grey-brown stony rubble and mine waste. GPS points taken along length of feature. Trench was about 14.0m long. At its northern termination was feature [142]
130 **W131**	Field Boundary	Area 3 Access Road	Late, probably 19th century	Two parallel ditches circa 0.70m wide infilled with grey-brown clay loam and separated by 1.8m of natural bedrock and clay. These ditches were observed crossing the line of the road corridor being orientated on a bearing of 250° (west to east). These mark the line of a documented removed field boundary associated with the 19th century smallholding.
131 **W132**	Surface visible shaft	Area 3 East of small holdings	19th century	A large shaft visible at surface. Its southern section had been part-levelled to provide a hard standing for a static caravan, and only a short length of the abandonment hedge which formerly surrounded the shaft survived on its northern side. Shown as open on the 1946 aerial photograph. Capped with three separate concrete plugs. 8.0m – 10.0m diameter cone. Lowest cap at depth of roughly 8.0m below current ground surface. Cone roughly circular in shape with a roughly 10.0m diameter. At a depth of about 5.0m the shaft became vertical and was rectangular in shape measuring 3.0m x 2.0m with the long axis orientated north-west to south-east. In the south-east face this shaft was seen to cut through the infilled deposits of an earlier working [132].
132 **W132**	Shaft with tunnel?	Area 3 East of small holdings	Early	Shaft seen in section having been cut by the excavation and sides of later 18th or 19th century shaft [131]. Though only seen in section the cone (assumed to be circular) had a diameter of 3.0m tapering until at a depth of roughly 2m it becomes a vertical shaft about 2.5m wide. Unfortunately it could not be determined what

Site No.	Site type	Area of site	Relative dating	Description
				shape the shaft was. Followed to a depth of greater than 5.0m before being cut away by the later shaft There was a hint of a tunnel heading off from the shaft in a south-easterly direction, though this might be just where some of the fill of the shaft has fallen away. The whole feature was completely infilled with mine waste and debris.
133 **W133**	Possible shaft? Or enlarged prospecting pit?	Area 3 South of Reads Whim shaft	Early	A circular shaped area of disturbed ground with roughly a 2.5m diameter. Infilled with kaolinised clay, shillet rubble, mining waste. Possible shaft. On excavation this proved to be a 5.0m deep shaft. Its cone was roughly 3.0m in diameter. At a depth of about 2.0m it became a vertical shaft, rectangular in shape roughly 2.5m x 1.5m the long axis orientated north to south. The shaft bottomed at 5.0m onto solid bedrock.
134 **W134** **W135** **W136** **W137**	Flooring. Arsenic works?	Area 3 South of Reads Whim shaft	19th to 20th centuries	An area of concrete flooring exposed to the south-east of Read's Whim Engine House. Its limits could not be determined as it was not completely excavated whilst being observed. GPS points mark edges of the exposed area. Only one clear edge was recorded, this being on the south western side. This edge was orientated at 330° (roughly north-west to south-east). This edge was exposed for a length of some 7.0m but was buried at either end by overburden. The edge seemed to be cut into the natural and had the appearance of shuttered concrete, with possibly a single block thickness wall (though this is uncertain). The only building in this area that seems to have had this orientation was the arsenic works.
135 **W140** **W141** **W142** **W143** **W144** **W145** **W146** **W147**	Concrete floor and rubble walls Building?	Area 3 East of Reads Whim shaft	19th to 20th centuries	An area of concrete flooring and other indeterminate features seen in section to the north-east of Read's Whim engine house. GPS points were recorded around boundary of the area observed. There appeared to be no clear shape to the 'building' noted above, as this was already in the process of being removed with a concrete breaker. This flooring seems to have had a thick layer of concrete poured over the top of it.
136 **W138** **W182**	Shaft and possible adit.	Area 3 East of Reads Whim shaft	18th to 19th centuries	Shaft 20 identified in the assessment report (Shaft SW of Jeffry's Shaft). The shaft site lies on the south-western edge of an elevated dump of mine spoil which had been covered with waste from the concrete batching plant. There were no indications of the shaft at surface, though it was shown as an open shaft on the 1946 RAF aerial photo. The diameter of the infilled cone at surface was 6.0m. Unfortunately recording was undertaken after the shaft had been dug out, shaped and infilled with concrete so its shape and orientation was not known. It was apparently open at depth below a concrete plug. The shaft had been cut into the solid bedrock. On its eastern side the shaft appears to have cut a linear trench on lode (possibly an adit) or an exploratory

Site No.	Site type	Area of site	Relative dating	Description
				trench running north, north-west to south, south-east. This was 1.0m wide, flat bottomed with the floor at a depth of 2.5m below the top of the bedrock. This shaft proved extremely difficult to locate for the mine engineers. The second GPS mark taken is the more accurate location point.
137 **W139**	Shaft? Prospecting pit?	Area 3 East of Reads Whim shaft	18th to 19th centuries	Infilled shaft. Capped with concrete and seen in section. 6.0m diameter cone at surface tapering to a circular shaft of about 3.5m diameter. Immediately adjacent to Oats Shaft [138] which lies 2.0m to the east. Roughly L-shaped hole observed in ground after removal of concrete, whose approximate dimensions were 6.0m x 8.0m, with the long axis orientated north to south. Maximum depth observed was around 3.0m, with solid bedrock being seen at base. This suggests that this was not a shaft, but perhaps a surface working, or an exceptionally large prospecting pit?
138 **W148**	Shaft	Area 3 East of Reads Whim shaft	18th to 19th centuries	Oats' Shaft. Covered in a cotoneaster-covered Clwyd cap. Observed after work had been done to prepare shaft for pouring of new concrete plug, therefore many details not recorded. Large irregular shaped hole seen with square shaped hole for shaft measuring circa 3.0m x 3.0m. This had been cut into the solid bedrock. Joe Milton commented that on removal of the concrete plug, an open shaft, square shaped with rounded corners was seen. The shaft was open to a depth of 80.0+ metres.
139	Prospecting pit?	Area 3 South of Reads Whim shaft	Early	A possible rectangular pit circa 3.0m x 2.0m with rounded corners. Cut through by ditch [129]. Infilled with grey-brown loam and disturbed shillet.
140	Openwork, with tunnel?	Area 3 South of Reads Whim shaft	Early	The expanded end of small surface working or an exploratory pit; irregular in shape with a diameter of approximately 3.0m. On its north east face a brick-blocked tunnel was observed, which was revealed by partial collapse of the roof. The tunnel ran roughly west to east, was 0.70m wide and approximately 0.80m high with an arched roof, the roof being about 0.60m below the top of the bedrock. The tunnel was traced for a distance of around 4.0m when it ended in solid bedrock, suggesting that it was probably exploratory in nature. Connected at the northern end of the working with pit [141].
141 **W149**	Prospecting pit	Area 3 South of Reads Whim shaft	Early	This was a 4.5m deep pit. Cone was irregular shaped roughly 3.0m diameter. At a depth of about 1.5m it became a vertical shaft, rectangular in plan roughly 2.0m x 1.5m with the long axis orientated north to south that was bottomed at a depth of 4.5m on solid bedrock. Connected on its south-east side to openwork [140].
142 **W150**	Unknown Structure	Area 3 South of Reads Whim shaft	?	A sub rectangular area measuring approximately 3.0m x 4.0m infilled with grey-brown clay and rubble with the hint of walling (though no mortar observed at its southern side. When dug out this feature proved to be roughly 0.40m deep and flat bottomed. Fragments of what appeared to be boiler plate and some piping were recovered from the fill.

Site No.	Site type	Area of site	Relative dating	Description
				This structure lay at the northern end of trench [129].
143 **W151**	Pit?	Area 3 South of Reads Whim shaft	Early?	A pit, sub circular in shape and 1.2m diameter. Infilled with dense black-brown clay/cinders.
144 **W152**	Pit?	Area 3 South of Reads Whim shaft	Early?	A pit, sub circular in shape and 1.2m diameter. Infilled with dense black-brown clay/cinders.
145 **W153**	Unknown	Area 3 South of Reads Whim shaft	Early?	A sub triangular area of disturbed ground, approximately measuring 1.2m x 1.2m, infilled with mixed light grey-brown, and dark grey-brown clays and stony rubble.
146 **W154**	Walling	Area 3 South of Reads Whim shaft	18th to 19th centuries	On the south-east side of and apparently abutting the exterior wall of Read's Whim Engine House. The length of wall recorded was about 4.0m long, with shillet block facing stones. The walling was approximately 0.5m wide and included some traces of lime mortar.
147 **W155**	Prospecting pit	Area 3 South of Reads Whim shaft	Early	A sub rectangular area of disturbed ground measuring about 2.0m x 1.5m with the long axis orientated north to south. Filled with black coloured cinders and mixed grey-black clays. Circumference of the feature is marked by yellow-brown clay. Immediately to the south of Read's Whim Engine House.
148 **W156**	Shaft	Area 3. North of known shaft [17]	Early	This was a 5.0m+ shaft. It was not bottomed. Cone was approximately 3.0m in diameter tapering as a vertical shaft at a depth of 2.0m. At base, shaft became roughly rectangular in shape roughly 2.5m x 1.5m with long axis approximately north-west to south-east.
149 **W157**	Shaft	Area 3. North of known shaft [17]	Early	This lay immediately south of [148]. The cones intercut. This was a 5.0m+ shaft. Cone was irregular in shape roughly 5.0m across tapering as a vertical shaft at a depth of about 2.0m. At base, shaft became roughly rectangular in shape roughly 2.5m x 1.5m with long axis approximately north-west to south-east.
150 **W158**	Shaft?	Area 3 East of Reads Whim shaft	?	A roughly rectangular shaped area of concrete, at approximately the location of [137]. An area measuring 2.0m x 5.0m was observed with long axis orientated 60° north-east/south-west. This may also be [138] Oats Shaft. See also notes for [137].
151 **W159**	Pit	Area 3 East of Reads Whim shaft	Modern	A rectangular shaped area of concrete cut into the bedrock. Measures 2.0m x 4.0m, with long axis 100° east to west. Has a cement and stone core. On excavation this proved to be a large pit infilled with waste concrete from the cement factory.
152	Unknown	Area 3 East of Reads Whim	?	A roughly square shaped area of concrete measuring approximately 2.0m x 2.0m. Unknown feature, possibly a plinth base?

Site No.	Site type	Area of site	Relative dating	Description
W160		shaft		
153 **W161**	Shaft? Prospecting pit?	Area 1. North of Pumping Shaft	Early	A sub rectangular area of disturbed ground, measuring 3.0m x 2.5m, orientated north north-east by south south-west along the line of the lode. Infilled with varied clays, stone rubble, mine waste and cinders.
154 **W162** **W163** **W164**	Infilled surface working?	Area 1. North of Pumping Shaft	Early	An elongated area of disturbed ground, about 18.0m long and 2.5m wide. Infilled with red-brown stony rubble and waste. Orientated north-north-east by south-south-west apparently following line of a lode. Possibly a backfilled surface working.
155 **W165**	Shaft? Prospecting pit?	Area 1. North of Pumping Shaft	Early	An irregular area of disturbed ground, rough diameter of about 3.0m infilled with dark black-brown cinders and clay and orange=brown clays. The fills also contained large fragments of copper slag.
156 **W166**	Prospecting pit?	Area 1. North of Pumping Shaft	Early	A sub rectangular area of disturbed ground, 2.5m x 1.0m orientated north-east to south-west infilled with red-brown stony rubble.
157 **W167**	Prospecting pit?	Area 1. North of Pumping Shaft	Early	A sub oval shaped area of disturbed ground. 2.5m x 1.0m orientated north-east to south-west infilled with red-brown stony rubble.
158 **W168** **W169** **W170**	Surface working	Area 1. North of Pumping Shaft	Early	An elongated area of outcrop working running approximately north to south. The southern end had been expanded into a pit of 3.0m diameter, reaching a depth of 2.5m. There was solid rock at base. The trench continued towards the north from this pit following the line of the lode. This was about 1.5m wide, and reached a depth of 1.2m. The northern end was also expanded into, irregular in shape, roughly 2.0m diameter. This was 1.5m deep with rock at the base.
159 **W171**	Surface working?	Area 1. North of Pumping Shaft	Early	An elongated trench about 6.0m long, and 2.5m wide that reached a depth of roughly 2.2m. Orientated north-west to south-east. Possible surface lode working or exploratory trench.
160 **W172**	Surface working pit	Area 1. North of Pumping Shaft	Early	A large sub-oval pit, 6.0m x 4.0m orientated north-west to south-east and 2.5m deep. Solid rock observed at base.

Site No.	Site type	Area of site	Relative dating	Description
161 **W173**	Surface working pit	Area 1. North of Pumping Shaft	Early	A large irregular shaped pit roughly 5.0m in diameter. Bottomed at a depth of 3.0m. Straight sided. Lode working pit.
162 **W174**	Shaft Concrete plug	Area 3 East of Reads Whim shaft	18th to 19th centuries	An irregular shaped mass of concrete set within bedrock. Has appearance of a concrete plug. Roughly 2.0m diameter and greater than 2.0m thick. Possibly same as [138] Oats Shaft.
163 **W175**	Concrete spread	Area 3 East of Reads Whim shaft	Modern?	A spread of concrete, roughly 3m diameter. May be dumped material from cement works. Could possibly be same as [136].
164 **W176** **W177**	Adit	Area 1. North of Pumping Shaft	Early?	An adit running north-east to south-west. Connects with open work [158] at southern end. Tunnel is about 1.5m wide and 1.5m high, the roof formed of solid bedrock is arched in shape, the top of which is roughly 3.5m to 4.0m below top of the bedrock. The floor of the tunnel had been floored with timber planks.
165 **W178** **W179**	Unknown	Area 1. North of Pumping Shaft	Unknown	An unusual zig-zag trench recorded as running in an approximately north to south direction. Trench was 0.50m wide and infilled with black-brown clay loam and cinders. Observed only at surface, recorded for a length of about 6.0m. The northern end appeared to terminate in a rectangular shaped pit which appeared to be 3.0m long with a maximum width of 1.0m being seen (only partially observed as it disappeared under the baulk). Unknown function though it resembled WWII slit trench.
166 **W180**	Leat?	Area 1. North of Pumping Shaft	Early?	A heavily truncated trench orientated 340° north-west to south-east. Varied in width from 0.50m to 0.70m, depth not determined. Infilled with grey-green, brown silty clay that seemed to have been copper stained and stony rubble. Disappearing into the section, only a length of 2.5m was recorded.
167				**Not Used**
168 **W197**	Prospecting pit	Area 2. South and east of Pininger's Shaft	Early	An oval shaped area of disturbed ground roughly 2.0m x 1.5m, with the long axis orientated north-west to south-east. Infilled with mixed black-brown and grey, green-brown clays. On excavation this proved to be a shallow pit cut into the bedrock, with concave sides and bottom. 0.40m deep.
169	Prospecting pit?	Area 2. South and east of Pininger's Shaft	Early	An irregular shaped area of disturbed ground infilled with black-brown and greenish grey clays. Measures about 2.5m x 1.5m and was roughly orientated north to south.
170	Prospecting pit	Area 2. South and east of	Early	This feature was only partially observed as it was obscured by the section. Sub circular, or just possibly the rounded end of an oval pit, of which 1.5m was recorded. If oval shaped the axis would have been orientated north north-west to south south-east. Infilled with black-brown and grey-green, brown clays along with copper

Site No.	Site type	Area of site	Relative dating	Description
W186		Pininger's Shaft		tailings.
171 **W185**	Prospecting pit	Area 2. South and east of Pininger's Shaft	Early	A large oval shaped area of disturbed ground infilled with black-brown and grey-green clays about 2.0m x 1.5m with the long axis orientated north-west to south-east.
172	Pit	Area 2. South and east of Pininger's Shaft	Early	An irregular shaped area of disturbed ground about 1.5m in diameter. This lay 2.0m south-west of [171]. Infilled with black-brown and grey-brown clays.
173	Prospecting Pit?	Area 2. South and east of Pininger's Shaft	Early	A circular-shaped area of disturbed ground, roughly 2.0m diameter. Lay 1.0m south-west of [172]. Infilled with white/ grey-brown clay (possibly kaolinised). On excavation this proved to be a pit roughly 1.5m deep with concave sides and almost flat bottom.
174 **W187**	Prospecting Pit	Area 2. South and east of Pininger's Shaft	Early	An oval-shaped area of disturbed ground about 2.0m x 1.5m, with the long axis orientated north-west by south-east infilled with black-brown clay and copper tailings.
175 **W184**	Pit	Area 2. South and east of Pininger's Shaft	Early	A circular area of disturbed ground roughly 1.5m diameter, infilled with white, grey-brown kaolinised clay. Circumference marked by a zone of black-brown clay.
176 **W188** **W210**	Prospecting Pit?	Area 2. South and east of Pininger's Shaft	Early	An irregularly-shaped area of ground disturbance. Not fully recorded as buried under section. May be the rounded end of a prospecting pit. Area observed roughly 1.0m diameter.
177 **W209**	Prospecting pit?	Area 2. South and east of Pininger's Shaft	Early	A sub-circular area of disturbed ground, roughly 1.5m diameter, infilled with grey-black, brown-black clays.
178 **W211**	Prospecting Pit	Area 2. South and east of Pininger's Shaft	Early	A sub-rectangular area of disturbed ground about 2m x 1.5m orientated north to south infilled with copper tailings.
179 **W207**	Pit	Area 2. South and east of Pininger's Shaft	Early	A large sub-circular area of disturbed ground about 1.5m diameter. Infilled with copper tailings. Seems to have been cut into area of [180].
180	Copper working	Area 2.	Early	An area of copper working, or ore processing. This consisted of an area defined by a spread of black-brown clays with channels and pits infilled with copper ore tailings. The main channel ran from roughly north-east to

Site No.	Site type	Area of site	Relative dating	Description
W198 **W199** **W200** **W201** **W202** **W203**	Area?	South and east of Pininger's Shaft		south-west was about 0.50m wide, vertical-sided, flat-bottomed, and had a maximum depth of 0.10m. Two branching channels existed to the north, one of which was 2.0m long and terminated in a pit/tank whose base measured 1.5m x 1.0m and was orientated north-east to south-west. The main channel also terminated in a tank; unfortunately most of this had been destroyed during soil stripping operations.
181 **W196**	Prospecting Pit	Area 2. South and east of Pininger's Shaft	Early	A sub oval area of disturbed ground 2.0m x 1.5m, orientated north-west to south-east. Infilled with mixed black-brown and red-brown clays. On excavation it was found to have near vertical sides, with an almost flat base, roughly 0.70m deep.
182 **W195**	Prospecting Pit	Area 2. South and east of Pininger's Shaft	Early	A sub oval area of disturbed ground, 1.5m x 1.0m orientated approximately north/south. Infilled with grey-black, brown-black clays. On excavation found to have near vertical sides, with an almost flat base, about 0.70m deep.
183 **W183**	Prospecting pit?	Area 2. South and east of Pininger's Shaft	Early	A sub circular area of disturbed ground roughly 1.8m diameter. Infilled with black-brown and grey-brown clays.
184 **W189**	Shaft	Area 2. South and east of Pininger's Shaft	Early	A large circular area of disturbed ground, roughly 4.0m diameter. Infilled with light grey-brown, and grey clays, some kaolinised. There was also some stone rubble. . The periphery of the area was marked by black-brown clay. At the centre, was a circular area 1.0m in diameter of black-brown clays and ash. Unfortunately the excavation of this feature was not observed, the shaft having been dug and infilled with concrete prior to being recorded. The shaft was 5.0m+ deep, becoming vertical at a depth of about 2.0m below top of bedrock. Shape of shaft not observed, as excavated it was rectangular in plan 3.0m x 2.0m with the axis orientated north/south. The top of the concrete was 3.5m below top of surface.
185 **W190**	Prospecting Pit	Area 2. South and east of Pininger's Shaft	Early	An elongated oval shaped area of disturbed ground, roughly 1.5m x 0.50m aligned north north-west to east south-east. Infilled with light coloured grey-brown clays and stony rubble (some kaolinised?) with the periphery marked by dark black-brown clays.
186 **W191**	Prospecting Pit	Area 2. South and east of Pininger's Shaft	Early	An oval shaped area of disturbed ground, about 1.5m x 0.50m aligned north-west to south-east. Infilled with light coloured grey-brown clays and stony rubble (some kaolinised?) with the periphery marked by dark black-brown clays. On excavation this proved to be a pit with steep concave sides and a relatively flat bottom, 1.3m deep.
187	Prospecting Pit	Area 2.	Early	An irregular shaped elongated area of disturbed ground. Roughly 1.5m x 0.50m. Aligned north-west to south-east. Infilled with light coloured grey-brown clays and stony rubble (some kaolinised?) with the periphery

Site No.	Site type	Area of site	Relative dating	Description
W192		South and east of Pininger's Shaft		marked by dark black-brown clays. On excavation this proved to be a pit with steep concave sides and a relatively flat bottom, 1.0m deep.
188 **W193**	Prospecting Pit	Area 2. South and east of Pininger's Shaft	Early	An oval shaped area of disturbed ground. 2.0m x 1.5m, orientated north-south. Infilled with grey-black, brown-black clays and some stone rubble.
189 **W194**	Prospecting Pit	Area 2. South and east of Pininger's Shaft	Early	An oval shaped area of disturbed ground. 2.0m x 1.5m, orientated north-south. Infilled with grey-black, brown-black clays and some stone rubble.
190 **W208**	Shaft	Area 2. South and east of Pininger's Shaft	Early	A sub circular area of disturbed ground, roughly 2.0m diameter. Infilled with red-brown and grey-brown clays with stone rubble (mine waste). On excavation, this proved to be a 5.0m+ deep shaft with a tapering cone, becoming a vertical shaft about 2.0m below top of bedrock. The vertical section of the shaft was rectangular at the base of the excavated section; measuring 2.0m x 1.5m orientated north-north-west to east-south-east. Solid rock was encountered at a depth of about 6.5m.
191 **W212**	Prospecting Pit.	Area 2. South and east of Pininger's Shaft	Early	An oval shaped area of disturbed ground, measuring 2.0m x 1.0m orientated north-west to south-east. Infilled with mixed clays and stone rubble, mostly grey-black-brown in colour.
192 **W213W 214 W215 W216**	Leat	Area 2. South and east of Pininger's Shaft	Early	A heavily truncated ditch or channel. 0.50m wide, flat bottomed, reaching a max observed depth of about 0.10m. Traced for a length of approximately 13.0m. Infilled with varved silts, copper stained grey, green-brown in colour.
193 **W217 W218 W219 W220 W221 W222 W223 W224 W226 W227 W228**	Ditch	Area 3. SE Periphery. Southern Section	Modern	An irregular linear ditch, running traced for a distance of roughly 85.0m generally meandering in a north to south direction. Ditch was up to 0.50m wide, with shallow U shaped profile 0.10m deep. Infilled with organic, roots rich, dark brown-black clay loam. Plastic sheeting within ditch fill indicates the modern nature of this feature.

Site No.	Site type	Area of site	Relative dating	Description
194 **W229**	Prospecting Pit.	Area 3. SE Periphery. Southern Section	Early	An oval shaped area of disturbed ground, 2.0m x 1.5m orientated west-north-west to east-south-east. Infilled with varied clays and stony rubble.
195 **W230**	Prospecting Pit.	Area 3. SE Periphery. Southern Section	Early	An oval shaped area of disturbed ground. Partly obscured by edge of trench so full dimensions not recorded. A length of 2.0m x 1.0m was observed with the long axis orientated north-west to south-east. Infilled with grey-black and white-cream clays with some stone rubble.
196 **W231**	Prospecting Pit.	Area 3. SE Periphery. Southern Section	Early	An oval shaped area of disturbed ground, 2.0m x 1.0m orientated north-west to south-east. Infilled with whitish grey and brown-black clays.
197 **W232**	Prospecting Pit.	Area 3. SE Periphery. Southern Section	Early	An oval shaped area of disturbed ground 1.5m x 0.70m, orientated north-west to south-east. Infilled with reddish grey and brown-black clays.
198 **W233**	Prospecting Pit.	Area 3. SE Periphery. Southern Section	Early	An oval shaped area of disturbed ground, 2.5m x 1.5m orientated west north-west/ east south-east. Infilled with varied black-brown and yellow-brown clays with some stone rubble.
199 **W234**	Prospecting Pit.	Area 3. SE Periphery. Southern Section	Early	An oval shaped area of disturbed ground, 2.0m x 1.5m orientated west north-west to / east south-east. Infilled with black-brown and yellow-brown clays.
200 **W235**	Prospecting Pit.	Area 3. SE Periphery. Southern Section	Early	This feature was partially obscured by the trench side so its full dimensions could not be recorded. Dimensions of 1.5m x 1.5m were observed, with the suggested long axis being orientated west north-west to east-south-east. Infilled with dark black-brown clays.
201 **W236**	Prospecting Pit.	Area 3. SE Periphery. Southern Section	Early	A sub oval shaped area of disturbed ground, 2.0m x 1.0m orientated west north-west to east-south-east. Infilled with black-brown clays and stony rubble.
202 **W237**	Shaft?	Area 3. SE Periphery. Southern Section	Early	A large circular area of disturbed ground, 3.0m in diameter. It had a roughly square projection on the north-east side approximately 1.0m x 1.0m with rounded corners (a possible former ladder access). Infilled with mixed clays varying from white, grey-brown, to black-brown in colour and some stony rubble. Periphery marked by darker clays.
203 **W239**	Prospecting Pit.	Area 3. SE Periphery.	Early	A rectangular area of disturbed ground (with rounded corners) measuring 1.8m x 0.50m orientated west-north-west to east-south-east. Infilled with white, grey-brown clays.

Site No.	Site type	Area of site	Relative dating	Description
		Southern Section		
204 **W240**	Shaft?	Area 3. SE Periphery. Southern Section	Early	A large circular area of disturbed ground, 3.0m diameter. Infilled with mixed clays varying from white, grey-brown, to black-brown in colour and some stony rubble. Periphery marked by darker black-brown (charcoal rich?) clay.
205 **W241**	Prospecting Pit.	Area 3. SE Periphery. Southern Section	Early	A sub rectangular shaped area of disturbed ground, 1.8m x 0.60m, orientated north-west t0 south-east. Infilled with white, grey-brown clays and stony rubble.
206 **W242**	Prospecting Pit(s).	Area 3. SE Periphery. Southern Section	Early	An irregularly-shaped area of disturbed ground circa 3.0m x 1.0m orientated approximately north-north-east to south-south-west. Infilled with black-brown clays and stony rubble. Possibly two intercutting prospecting pits.
207 **W243**	Prospecting Pit.	Area 3. SE Periphery. Southern Section	Early	An irregularly area of disturbed ground 2.0m x 1.5m, orientated north-east to south-west. Infilled with varied white, grey-brown, and black-brown clays and stony rubble.
208 **W244**	Prospecting Pit.	Area 3. SE Periphery. Southern Section	Early	A sub rectangular area of disturbed ground about 3.0m x 1.8m orientated north-west to south-east. Infilled with varied white, grey-brown and black brown clays, and stony rubble.
209 **W295**	Prospecting Pit.	Area 3. SE Periphery. Southern Section	Early	An oval shaped area of ground disturbance, roughly 2.0m x 1.8m orientated west-north-west to south-south-east. Infilled with varied white, grey-brown and black brown clays, and stony rubble.
210 **W246**	Prospecting Pit.	Area 3. SE Periphery. Southern Section	Early	An oval shaped area of ground disturbance, roughly 2.0m x 1.5 m orientated north-west to south-east. Infilled with varied white, grey-brown and black brown clays, and stony rubble.
211 **W247**	Prospecting Pit?	Area 3. SE Periphery. Southern Section	Early	A sub circular area of disturbed ground, around 2.0m diameter. Full dimensions not observed as partly obscured by trench side. Infilled with black-brown clays and stony rubble.
212 **W248**	Prospecting Pit	Area 3. SE Periphery. Northern Section	Early	An elongated oval shaped area of disturbed ground, roughly 4.0m x 2.0m, orientated west to east. Infilled with yellow-white, brown clays, crushed red shillet, and stone rubble.
213	Shaft?	Area 3.	Early	A large irregular shaped area of disturbed ground measuring about 6.0m x 5.0m. Infilled with varied mixed

Site No.	Site type	Area of site	Relative dating	Description
W249		SE Periphery. Northern Section		clays and stony rubble. Cuts [214] at north-east corner.
214 **W250**	Prospecting Pit.	Area 3. SE Periphery. Northern Section	Early	An oval shaped area of ground disturbance, roughly 2.0m x 1.5 m orientated north-west to south-east. Infilled with varied white, grey-brown and black brown clays, and stony rubble. Cut by feature [213].
215 **W251**	Shaft?	Area 3. SE Periphery. Northern Section	Early	A large, sub circular area of disturbed ground, about 4.0m in diameter. Infilled with yellow-brown clays, with a central zone roughly 2.0m diameter of black, grey-brown clay with stony rubble, and modern debris.
216 **W252**	Shaft?	Area 3. SE Periphery. Northern Section	Early	A sub circular area of disturbed ground, about 3.0m diameter. Infilled with varied light coloured clay and stony rubble.
217 **W253**	Prospecting Pit.	Area 3. SE Periphery. Northern Section	Early	An oval area of disturbed ground, 2.5m x 1.5m, orientated north-east to south-west. Infilled with yellow-brown clays.
218 **W254**	Prospecting Pit.	Area 3. SE Periphery. Northern Section	Early	An irregular area of ground disturbance, roughly 3.0m x 1.2m, orientated west-south-west to east-south-east. Infilled with cream, yellow-brown clays, with the periphery marked by black-brown clay.
219 **W255**	Prospecting Pit.	Area 3. SE Periphery. Northern Section	Early	An oval area of disturbed ground, 2.5m x 1.0m, orientated north-east to south-west. Infilled with yellow, cream-brown clays.
220 **W256**	Prospecting Pit.	Area 3. SE Periphery. Northern Section	Early	An oval area of disturbed ground, 2.5m x 2.0m, orientated north-south. Partly obscured by trench side. Infilled with varied yellow-brown clays.
221 **W257**	Prospecting Pit.	Area 3. SE Periphery. Northern Section	Early	An oval area of disturbed ground, 2.5m x 1.5m, orientated north-east to south-west. Infilled with varied red-brown clays. Periphery marked by black-brown clay.
222 **W258**	Prospecting Pit.	Area 3. SE Periphery. Northern Section	Early	An oval area of disturbed ground, 2m x 1m, orientated north-south. Infilled with varied grey, black-brown clays and stony rubble.
223	Shaft?	Area 3.	Early?	A large, sub rectangular area of ground disturbance, roughly 6.0m x 4.0m, with the long axis orientated north-

Site No.	Site type	Area of site	Relative dating	Description
W259		SE Periphery. Northern Section		east to south-west. Infilled with varied yellow-brown, red-brown, and black-brown clays, with some stony rubble.
224 **W260** **W261** **W262**	Leat	Area 2, North of [131]	Early	An ephemeral line of a leat or channel possibly connecting reservoirs depicted on the OS 1877 mapping running to the engine houses in the vicinity of Read's Shaft. Full details were not recorded as this feature was rapidly removed by a machine. The channel was 0.50m wide and less than 0.10m deep. GPS points were taken along the line of the channel.
225 **W263**	Shaft	Area 2. NE of Piningers Shaft	Early	A sub circular area of disturbed ground at surface, roughly 2.5m diameter. Cone tapers to vertical shaft in solid bedrock at depth of 1.8m. Shaft 5.0m+ deep, solid bedrock seen at base. Square shaped shaft about 2.0m x 2.0m.
226 **W264**	Shaft	Area 2. NE of Piningers Shaft	Early	An irregularly-shaped shaft about 3.0m diameter. 5.0m+. Solid rock seen at base. Long axis north-west to south-east. 'Keyhole' extension is traces of exploratory tunnel about 2.0m long in a north westerly direction.
227 **W265**	Shaft with stoping and two tunnels	Area 2. NE of Piningers Shaft	Early	The top of a shaft cone 4.0m diameter. This tapered to a depth of 2.5m and gave access to an open tunnel about 1.5m wide, 1.5m high. The tunnel was roofed by hard horizontal sill of harder igneous rock and was orientated north-east to south-west. At the base of the tunnel, there was a T-shaped junction opening into two tunnels or stopes following the lode and dipping at an angle of circa 45°. The stopes follow the lode in a north-easterly direction. The lode was clearly visible in the north-eastern side of the shaft which had been excavated to a depth of 7.0m.
228 **W266** **W267**	Cobbled surface Part of copper dressing floor?	Area 2. NE of Piningers Shaft	Early	An area measuring about 2.0m x 1.5m. Flat cobbles set into ground, averaging roughly 0.30m to 0.40m in size. Last traces of cobbled dressing floor?
229 **W268**	Shaft?	Area 2. NE of Piningers Shaft	Early	A circular area of disturbed ground, roughly 2.0m diameter. Infilled with light grey-brown clays, and stony rubble and mine waste.
230 **W269**	Prospecting Pit.	Area 2. NE of Piningers Shaft	Early	An oval area of disturbed ground, 2.5m x 1.0m orientated west-south-west to east-north-east. Infilled with black-brown clays and stony rubble.
231 **W270**	Shaft?	Area 2. NE of Piningers Shaft	Early	A large circular area of disturbed ground, roughly 4.0m diameter infilled with varied mixed clays and stony rubble.
232 **W271**	Unknown?	Area 2. NE of Piningers Shaft	Early?	An irregularly-shaped area of disturbed ground infilled with mixed clays and some stony rubble. Possibly intercutting prospecting pits, or surface working.
233	Shaft	Area 2.	Early	A large circular area of disturbed ground, about 4.0m in diameter infilled with mixed coloured clays (mostly

Site No.	Site type	Area of site	Relative dating	Description
W272		NE of Piningers Shaft		black-brown) and stony rubble. The shaft was observed after the cement had been poured. 5.0m+ deep, the shaft was cut into the solid bedrock. Appear to have been circular at bottom about 4.0m in diameter. There was a possible adit or lode working on the south-western side of the shaft, this being approximately 0.70m wide and trending east-north-east to west-south-west.
234 **W273** **W274** **W275**	Unknown	Area 1. Adjacent to Access road, NE of Pumping shaft, close to compound entrance.	Unknown	An irregular area of disturbed ground infilled with dark black brown clay, some cinders and stone. GPS plots mark one right angle corner on its south-east side. Area observed measured approximately 4.0m x 4.0m, however feature was only partly observed being overlain and obscured by spoil.
235 **W276**	Unknown	Area 1. Adjacent to Access road, NE of Pumping shaft, close to compound entrance.	Unknown	A small sub square area, 0.5m x 0.5m infilled with light grey-brown silty clays and some crushed stone.
236 **W277**	Unknown	Area 1. Adjacent to Access road, NE of Pumping shaft, close to compound entrance.	Unknown	An irregular area of disturbed ground, circa 8.0m x 3.0m the long axis orientated north-west to south-east. Infilled with light grey-brown clays and stony rubble.
237 **W280** **W281**	Ditch? Unknown?	Area 1. Adjacent to Access road, NE of Pumping shaft, close to compound entrance.	Unknown	A possible ditch about 1.6m wide, with a length of roughly 5.0m being observed (the remainder being under the section), running roughly north-west to south-east. Infilled with dark brown, and grey-black clays with some cinders and ash. Some rock fragments present too
238 **W278** **W279**	Ditch unknown? Exploratory trench?	Area 1. Adjacent to Access road, NE of Pumping shaft, close to compound entrance.	Modern?	A possible ditch about 1.5m wide with a length of roughly 4.5 m being observed, the rest being buried under the baulk orientated approximately north north-east to south south-west. Infilled with grey-brown clays, crushed shillet, some stone blocks, and red-brown clays. Possible exploratory trench.
239 **W286** **W287**	Ditch.	Area 1. Adjacent to Access road, NE of Pumping shaft, close to	Early?	An ephemeral ditch, heavily truncated, running approximately north north-east/ south south-west. Recorded for length of about 2.0m. The feature was roughly 0.50m wide, infilled with grey-brown, and greenish brown clays and shillet fragments. Unknown function.

Site No.	Site type	Area of site	Relative dating	Description
		compound entrance.		
240 **W290**	Shaft? Prospecting pit?	Area 1. Adjacent to Access road, NE of Pumping shaft, close to compound entrance.	Early?	A sub-circular area of disturbed ground circa 3m diameter infilled with mixed coloured clays (mostly black-brown) and stony rubble. Possible shaft or very large prospecting pit. Cuts feature [241].
241 **W285** **W286W** **288** **W289**	Ditch, Leat?	Area 1. Adjacent to Access road, NE of Pumping shaft, close to compound entrance.	Early?	A linear ditch circa 0.70m wide. Infilled with grey-green, brown silty clay that seemed to have been copper stained and stony rubble. Disappearing into the section at either end only a length of 15.0m was recorded. Heavily truncated, only the north eastern end was observed on the ground, the rest appearing on a photograph of the general area taken from the height of a spoil heap later. Possible leat? Cut by feature [240].
242 **W291** **W292**	Ditch ?	Area 1. Adjacent to Access road, NE of Pumping shaft, close to compound entrance.	Unknown?	A linear ditch circa 1.3m wide running approximately north-west to south-east. Infilled with black-brown clays, red-brown clays, and stony rubble. Unknown function? Western end cut by [243].
243 **W293**	Shaft?	Area 1. Adjacent to Access road, NE of Pumping shaft, close to compound entrance.	Early?	A semi-circular area of disturbed ground (most hidden under section) roughly 4.0m diameter. Infilled with grey-brown clay, and numerous shillet and stone fragments. Possible infilled shaft. Cuts [242].
244 **W294**	Ore dressing floor?	Area 1. Adjacent to Access road, NE of Pumping shaft, close to compound entrance.	Early?	A sub-rectangular area measuring approximately 4.0m x 4.5m which appears to have been paved with large shillet blocks and crushed stone, heavily disturbed. Their interstices had been infilled with mixed clays, mostly grey-brown in colour though the periphery is marked by dark black-brown clays. There is a faint green tinge over the entire area which may be suggestive of copper staining. This could be a possible dressing floor structure.
245 **W295** **W296**	Ditch?	Area 1. Adjacent to Access road, NE of Pumping shaft, close to compound entrance.	Unknown?	A linear ditch roughly 1.3m wide running approximately north-west to south-east parallel with ditch [242]. Infilled with black-brown clays, red-brown clays, and stony rubble. Unknown function?

Site No.	Site type	Area of site	Relative dating	Description
246 **W297**	Prospecting Pit.	Area 1. Strip between Pininger's Shaft and Pumping Shaft.	Early	An oval area of disturbed ground, 2.0m x 1.5m, orientated north-west to south-east. Infilled with varied grey, black-brown clays, stony rubble, and some copper tailings. On investigation proved to be a vertical sided flat bottomed pit about 1.2m deep.
247 **W298**	Prospecting Pit.	Area 1. Strip between Pininger's Shaft and Pumping Shaft.	Early	An oval area of disturbed ground, 2.0m x 1.2m, orientated north-west to south-east. Infilled with dark black-brown clays and stony rubble. On investigation proved to be pit *circa* 1.5m deep with an irregular bottom.
248 **W299**	Prospecting Pit.	Area 1. Strip between Pininger's Shaft and Pumping Shaft.	Early	An oval area of disturbed ground, 2.0m x 1.3m, orientated north-west to south-east. Infilled with dark black-brown clays and stony rubble.
249 **W300**	Prospecting Pit.	Area 1. Strip between Pininger's Shaft and Pumping Shaft.	Early	An oval area of disturbed ground, 2.0m x 1.5m, orientated 340°. Infilled with varied grey, black-brown clays, stony rubble, and some cinders. On investigation proved to be a U shaped pit about 1.8m deep.
250 **W301**	Prospecting Pit.	Area 1. Strip between Pininger's Shaft and Pumping Shaft.	Early	A dub-rectangular area of disturbed ground, 2.0m x 1.0m, orientated north-west to south-east. Infilled with varied grey-brown clays, and stony rubble.
251 **W302**	Prospecting Pit?	Area 1. Strip between Pininger's Shaft and Pumping Shaft.	Early	A rectangular area of disturbed ground, 1.5m x 0.75m, orientated north-east to south-west. Infilled with dark black-brown clays.
252 **W303**	Prospecting Pit?	Area 1. Strip between Pininger's Shaft and Pumping Shaft.	Early	A sub-rectangular area of disturbed ground 4.0m x 2.0m, orientated approximately north-south. Infilled with copper tailings, stony rubble and varied clays. Possible prospecting pit?
253 **W304** **W305** **W306**	Unknown?	Area 1. Strip between Pininger's Shaft and Pumping Shaft.	Early?	A linear area of disturbed ground, 13.0m long and 1.0m wide, orientated roughly north-north-east to south-south-east and infilled with grey-brown clays, and red-brown shillet rubble.

Site No.	Site type	Area of site	Relative dating	Description
254 **W307**	Unknown? Prospecting pit?	Area 1. Strip between Pininger's Shaft and Pumping Shaft.	Early? Modern?	An irregular area of disturbed ground roughly 2.5m x 1.3m long axis orientated north-east to south-west. Infilled with varied light grey and black clays. Clays. Though possibly early in origin, the 'fresh' nature of the ground disturbance suggests this could be modern.
255 **W308**	Settling tank?	Area 1. Strip between Pininger's Shaft and Pumping Shaft.	19th century? Earlier?	A roughly rectangular area of grey green clay, and varved deposits (again possibly green copper tinged) deposited within a cut made into the bedrock. The feature was approximately 1.5m x 1.2m with rounded corners. It was orientated west-north-west to east-south-east with what appeared to be an outflow/inflow channel 0.25m wide on its eastern side. This channel was also infilled with varved green-tinged silty clays and could be traced for a length of roughly 4.0m in a south easterly direction before it was truncated by feature [253].
256 **W309**	Settling tank?	Area 1. Strip between Pininger's Shaft and Pumping Shaft.	19th century? Earlier?	This feature was only seen in section. A length of about 2.5m of a flat-set deposit of light grey-brown clay up to 0.10m thick was recorded, this being overlain by compacted grey-green (copper stained) varved silts and clays up to 0.15m thick. As it only appeared in section the shape of this feature could not be determined, however it had a similar appearance to the deposits encountered within other features interpreted as settling tanks so was probably the remnants of another.
257 **W311** **W312** **W313** **W314** **W315** **W316**	Leat?	Area 1. Strip between Pininger's Shaft and Pumping Shaft.	Early?	A sinuous linear feature trending in an approximately north-east to south-west direction. GPS points taken along its length. A shallow flat bottomed U shaped trench, roughly 0.50m wide and 0.10m deep. Heavily truncated. Lined with compacted light grey-brown clays (about 0.10m thick) similar to those observed lining the bases of the settling tanks. It was infilled with compacted dark red, blue-brown silty clay (almost purple in colour) in some places exhibiting a greenish tinge (copper staining?). The relationship with feature [252] was not easily determined. There was the possibility it could have been cut by, or it ran alongside [252]. Unfortunately this area was disturbed by machine before it could be investigated further. It was certainly associated with tank like features [274], [275], [276] and [277] as it runs alongside them.
258 **W310**	Prospecting pit?	Area 1. Strip between Pininger's Shaft and Pumping Shaft.	Early?	A sub-circular area of disturbed ground about 1.0m diameter infilled with grey-brown clay, grey-green copper tailings, and stone rubble. Possible prospecting pit.
259 **W317**	Septic tank pit?	Area 1. Strip between Pininger's Shaft and Pumping Shaft.	Modern	A rectangular area of disturbed ground, measuring 2.0m x 1.5m orientated north-south. Infilled with mixed clays and some stone. Metal plate sheeting was also seen within the fill. A plastic pipe was seen entering this area at the southern end. This appears to have been the site for a septic tank. Modern.
260 **W318**	Prospecting pit?	Area 1. Strip between Pininger's Shaft and	Early?	A sub-circular area of disturbed ground, circa 3m diameter, infilled with grey-brown clays and stony rubble. Prospecting pit?

Site No.	Site type	Area of site	Relative dating	Description
		Pumping Shaft.		
261 **W319**	Shaft? Prospecting pit?	Area 1. Strip between Pininger's Shaft and Pumping Shaft.	Early?	An irregular shaped area of disturbed ground, roughly 3.0m x 3.0m infilled with varied grey-brown, and red-brown clays and stony rubble. Probably a large prospecting pit, though size could indicate small shaft?
262 **W320**	Pit	Area 1. Strip between Pininger's Shaft and Pumping Shaft.	Early?	A sub-circular area of disturbed ground roughly 1.0m diameter infilled with yellow-green clays (copper stained?) and stony rubble. Probable pit.
263 **W321**	Prospecting Pit	Area 3. SE Periphery. Northern Section	Early?	A sub circular area of disturbed ground, about 2.0m diameter. Infilled with pale cream, yellow-brown clay and some stone rubble. Prospecting pit.
264 **W322**	Prospecting pit.	Area 3. SE Periphery. Northern Section	Early?	A sub-circular area of disturbed ground roughly 2.0m diameter. Infilled with mixed, mostly light coloured clays, and stone rubble. Prospecting pit.
265 **W323**	Pininger's Shaft	Area 1. Pininger's Shaft SW 72673 44788	18th to 19th centuries	A large shaft visible at the surface, being marked by a large conical depression within a partly-surviving spoil dump and covered with a large Clwyd Cap. The shaft had a safety wall *circa* 1.0m high around most of its circumference. It was shown as open on the 1946 RAF aerial photograph. The feature had a very large cone, roughly circular in shape about 10.0m to 12.0m in diameter. A concrete plug was encountered at a depth of 8.0m below the current ground surface. At this point the plug had a diameter of 3.45m. The spoil dump on the south-west side appeared to be 2.0m thick, and lay over an old land surface or turf line. No evidence for an engine house was observed adjacent to the shaft.
266 **W324**	Settling tank	Area 1. Immediately NW of site compound	19th century. Earlier?	A roughly rectangular area of grey-brown clay overlain by compacted varved deposits of green-brown, and orange brown clays. Cut made into the bedrock. Full dimensions were not observed as it disappeared with baulk on southern side. The feature was approximately 3.5m wide and 0.50m deep, with a length of 4.0m being recorded. The whole feature had been heavily truncated.
267 **W325** **W326** **W327**	Leat?	Area 1. Immediately NW of site compound	Early?	A linear feature trending at 260° (approximately north-east to south-west). GPS points were taken along its length. This was a flat-bottomed U-shaped trench, roughly 0.50m wide and 0.35m deep. Infilled with brown-grey silty deposits. Some green copper staining was observed in some of the fills. This is possibly a leat and is cut by feature [266]
268	Settling tank?	Area 1.	Early?	A rectangular area of disturbed ground measuring 1.8m x 1.0m and orientated east- west. Infilled with compacted bright green coloured compacted silty clays similar to those recorded in varved deposits in features

Site No.	Site type	Area of site	Relative dating	Description
W328		Immediately NW of site compound		identified as possible settling tanks. Feature not investigated further.
269 **W329**	Prospecting pit?	Area 1. Immediately NW of site compound	Early?	A rectangular area of disturbed ground measuring 2.0m x 1.5m orientated south-south-west to north-north-east. Infilled with grey-brown clays and fragments of copper rich (malachite?) rock. Prospecting pit?
270 **W330** **W331** **W332**	Unknown. Area of surface working?	Area 1. Immediately NW of site compound	Early?	An irregularly-shaped area of disturbed ground, roughly kidney shaped in plan, dimensions being obscured by baulks at either end. Infilled with varied red, and grey-brown clays, and copper rich (malachite?) stone rubble. Possible surface working?
271 **W333**	Prospecting pit	Area 1. Immediately NW of site compound	Early	An elongated oval shaped area of disturbed ground, measuring 2.0m x 1.0m, orientated south-west to north-east. Infilled with dark grey-brown clay with some stone fragments. Prospecting pit.
272 **W334**	Prospecting pit	Area 1. Immediately NW of site compound	Early	A pit which was partially exposed, the rest obscured within the section. Its orientation appeared to be north-west to south-east. Only an area roughly 1.0m x 0.50m was exposed, none was the full dimension of the feature. Infilled with dark grey-brown clays and stone rubble. Probable prospecting pit.
273 **W335**	Settling tank	Area 1. East side of new Access road.	Early?	A small area roughly 0.70m x 0.5m of compacted varved deposits of green-brown (copper stained) and orange brown clays as observed in other features identified as settling tanks. Feature heavily truncated, and obscured by baulk, so extent could not be determined. Probable last remnants of settling tank.
274 **W337**	Timber lined pit/tank?	Area 2. Strip between Pininger's Shaft and Pumping Shaft.	Early?	A rectangular pit measuring 2.0m x 1.0m and up to 0.50m deep. Cut into bedrock. Infilled with copper tailings and grey-brown clay. Base lined with timber (5 planks) showing slight green tinge (possible copper staining). One of a linear arrangement of four pits/tanks aligned alongside leat/channel [257].
275 **W338**	Pit/tank?	Area 2. Strip between Pininger's Shaft and Pumping Shaft.	Early?	A rectangular pit measuring 2.0m x 1.0m and up to 0.50m deep. Cut into bedrock. Compacted grey-green clays at base about 0.06m thick. Uncertain if this is a deliberate clay lining or silts and clay that have filtered between and underneath timbers now completely rotted away. Clay does have a varved appearance. One of a linear arrangement of four pits/tanks aligned alongside leat/channel [257].
276 **W339**	Timber lined pit/tank?	Area 2. Strip between Pininger's Shaft and Pumping Shaft.	Early?	A rectangular pit measuring 2.0m x 1.0m and up to 0.50m deep. Cut into bedrock. Infilled with copper tailings and grey-brown clay. Base lined with timber (4 planks) showing slight green tinge (possible copper staining). One of a linear arrangement of four pits/tanks aligned alongside leat/channel [257].
277	Pit/tank?	Area 2.	Early?	A rectangular pit measuring 2.0m x 1.0m and up to 0.50m deep. Cut into bedrock. Compacted grey-green clays

Site No.	Site type	Area of site	Relative dating	Description
W336		Strip between Pininger's Shaft and Pumping Shaft.		at base. Possibly a clay lining though has a varved appearance. One of a linear arrangement of four pits/tanks aligned alongside leat/channel [257].
278 **W340** **W341** **W342** **W343**	Timber launder	Area 1. Close to original site entrance.	Early?	The line of a trench was recorded running in an east north-east to west south-west direction. 0.5m wide, it proved to be vertical sided, and flat bottomed, being about 0.50m deep. Within the trench were the remnants of a timber box launder roughly 0.40m wide, and 0.30m deep, constructed from planks forming the top, bottom, and sides. The interior of the launder and its base was coated in grey-green, brown silty clay (possibly copper stained). The trench into which the launder had been placed was infilled with mixed grey-green and red-brown clays. A length of this trench roughly 8.0m long was recorded with GPS points being taken along its length.
279 **W344**	Prospecting pit	Area 2. In northern part of area of small holdings.	Early	An elongated oval shaped area of disturbed ground. Measures 2.0m x 1.2m, orientated north-west to south-east. Infilled with mixed grey-brown, black-brown and red-brown clays. Prospecting pit.
280 **W345**	Shaft	Area 2. NE of Piningers Shaft	Early	Initially seen as a sub circular area of disturbed ground at surface, *circa* 3.5m diameter, when investigated this turned out to be a shaft whose cone tapered to a vertical shaft in solid bedrock at a depth of about 1.8m. Shaft 5.0m+ deep, solid bedrock seen at base. Rectangular shaped shaft roughly 2.0m x 1.5m orientated approximately north-east to south-west.
281 **W346**	Shaft	Area 2. NE of Piningers Shaft	Early	Initially seen as a sub circular area of disturbed ground at surface, about 3.0m diameter. When investigated a cone tapered to vertical shaft in solid bedrock at depth of roughly 2.0m. Shaft 5.0m+ deep, solid bedrock seen at base. Shaft appeared to have a sub circular plan.
282 **W347**	Shaft and tunnels.	Area 2. NE of Piningers Shaft	Early	Initially seen as a sub circular area of disturbed ground at surface, roughly 3.5m diameter. When investigated a conical excavation tapered to a vertical shaft in solid bedrock at a depth of about 2.0m. Shaft 5.0m+ deep, solid bedrock seen at base. Sub square shaped shaft roughly 2.0m x 2.0m. The north-east side was stoped at a depth of about 5.0m, with two tunnels each about 0.70m wide leading off in a southerly and south-easterly direction from the stoped area.
283 **W348**	Shaft	Area 2. NE of Piningers Shaft	Early	Initially seen as a sub circular area of disturbed ground at surface, roughly 3.0m diameter. When investigated the cone tapered to a vertical shaft in solid bedrock at a depth of about 1.8m. Shaft 5.0m+ deep, solid bedrock seen at base. Sub square shaped shaft roughly 2.0m x 2.0m.
284 **W349**	Shaft	Area 1. Strip immediately west of site compound	Early?	Initially seen as a sub circular area of disturbed ground at surface, about 2.0m diameter. Infilled with yellow, grey-brown clays and stony rubble. When investigated the shaft cone tapered to a vertical shaft in solid bedrock at a depth of roughly 1.8m. Shaft 5.0m+ deep, solid bedrock seen at base. Sub rectangular shaped shaft roughly 2.0m x 1.5m orientated north-east to south-west.

Site No.	Site type	Area of site	Relative dating	Description
285 **W351**	Shaft/prospecting pit?	Area 1. Strip immediately west of site compound	Early	A sub circular area of disturbed ground about 2.0m diameter infilled with varied black-brown, and red-brown clays and stony rubble. This feature was not investigated further so uncertain if this was a shaft or a large prospecting pit.
286 **W352**	Prospecting pit	Area 1. Strip immediately west of site compound	Early	An elongated oval shaped area of disturbed ground. Measures 2.5m x 1.2m, orientated west-north-west to east-south-east. Infilled with mixed grey-brown, black-brown and red-brown clays. Prospecting pit.
287 **W353**	Prospecting pit	Area 1. Strip immediately west of site compound	Early	An elongated oval shaped area of disturbed ground. Measures 3.0m x 1.3m, orientated west-north-west to east-south-east. Infilled with mixed grey-brown, black-brown and red-brown clays. Prospecting pit.
288 **W354**	Prospecting pit	Area 1. Strip immediately west of site compound	Early	An elongated oval shaped area of disturbed ground. Measures 2.0m x 0.6m, orientated east-north-east to west-south-west. Infilled with mixed dark grey-brown and black-brown clays. Prospecting pit. At immediate right angles to and south of prospecting pit [289].
289 **W355**	Prospecting pit	Area 1. Strip immediately west of site compound	Early	An elongated oval shaped area of disturbed ground. Measures 2.0m x 0.6m, orientated west-north-west to east-south-east. Infilled with mixed dark grey-brown and black-brown clays. Prospecting pit. At immediate right angles to and north of prospecting pit [288].
290 **W356**	Prospecting pit	Area 1. Strip immediately west of site compound	Early	An elongated oval shaped area of disturbed ground. Measures 2.2m x 1.3m, orientated west-north-west to east-south-east. Infilled with mixed dark grey-brown and black-brown clays and stone rubble. Prospecting pit.
291 **W357**	Prospecting pit	Area 1. Strip immediately west of site compound	Early	An elongated oval shaped area of disturbed ground. Measures 2.3m x 0.6m, orientated west-north-west to east-south-east. Infilled with mixed dark grey-brown and black-brown clays. Periphery is marked by silty orange-brown clay. Prospecting pit.
292 **W358**	Prospecting pit	Area 1. Strip immediately west of site compound	Early	An elongated oval shaped area of disturbed ground. Measures circa 2.0m x 0.6m (part of length obscured by baulk), orientated west-north-west to east-south-east. Infilled with mixed dark grey-brown and black-brown clays. Prospecting pit.

Site No.	Site type	Area of site	Relative dating	Description
293 **W359**	Prospecting pit	Area 1. Strip immediately west of site compound	Early	An elongated oval shaped area of disturbed ground. Measures 2.0m x 1.0m, orientated west-north-west to east-south-east. Infilled with mixed dark grey-brown, red-brown and black-brown clays. Prospecting pit.
294 **W350**	Shaft	Area 1. Strip immediately west of site compound	Early	Initially seen as a sub circular area of disturbed ground at surface, roughly 2.2m diameter. Infilled with grey-brown and red-brown clays with stony rubble. When investigated its cone tapered to a vertical shaft in solid bedrock at a depth of about 1.8m. Shaft 5.0m+ deep, solid bedrock seen at base. Sub rectangular shaped shaft about 2.0m x 1.5m orientated east-north-east to west-south-west.
295 **W363**	Prospecting pit	Area 2. In northern area of small holdings immediately south of Piningers Shaft.	Early	An elongated oval shaped area of disturbed ground. Measures 2.0m x 1.5m, orientated north-west to south-east. Infilled with mixed dark grey-brown, red-brown clays and stony rubble. Prospecting pit.
296 **W364**	Prospecting pit	Area 2. In northern area of small holdings immediately south of Piningers Shaft.	Early	An elongated oval shaped area of disturbed ground. Measures 2.0m x 1.5m, orientated north-west to south-east. Immediately west of [294]. Infilled with mixed dark grey-brown, red-brown clays and stony rubble. Prospecting pit.
297 **W365** **W366** **W367** **W368**	Ditch or trench. Dolcoath evaluation trench?	Area 2. In northern area of small holdings immediately south of Piningers Shaft.	Modern?	A long narrow trench, circa 0.70m wide trending north-north-west to south-south-east. Traced for a length of roughly 24m, this appears to have been machine cut. GPS points plotted along its length. Dolcoath evaluation trench?
298 **W369** **W370** **W371**	Ditch?	Area 2. In northern area of small holdings immediately south of Piningers Shaft.	Unknown, Early?	A long narrow trench, about 0.70m wide infilled with red-brown clays and small stone fragments. Southern end marked by burning? And is infilled with dark, black-brown clay. GPS points were taken along its length which was traced for some 12.0m.
299 **W372** **W373**	Ditch? Leat?	Area 2. In northern area of small holdings immediately south of	Unknown, Early?	A long narrow trench, 1.0m wide running approximately north north-west to south south-east. Infilled with dark grey-brown silty clay. Shallow flat bottomed ditch about 0.15m deep. Possible leat?

Site No.	Site type	Area of site	Relative dating	Description
W374		Piningers Shaft.		
300 **W375**	Shaft?	Area 2. In northern area of small holdings immediately south of Piningers Shaft.	Early?	A sub circular area of disturbed ground, roughly 2.0m diameter infilled with varied black-brown and red-brown clays and stony rubble. This feature was not investigated further so uncertain if this was a shaft or a large prospecting pit.
301 **W376**	Prospecting pit	Area 2. In northern area of small holdings immediately south of Piningers Shaft.	Early	An elongated oval shaped area of disturbed ground. Measures 2.5m x 1.5m, orientated north-west to south-east. Infilled with mixed dark grey-brown, red-brown clays and stony rubble. Prospecting pit.
302 **W377**	Prospecting pit	Area 2. In northern area of small holdings immediately south of Piningers Shaft.	Early	An elongated oval shaped area of disturbed ground. Full dimensions could not be determined as obscured by baulk. It appeared to be orientated north-west to south-east. Infilled with mixed dark grey-brown, red-brown clays and stony rubble. Prospecting pit.
303 **W378**	Shaft? Or prospecting pit?	Area 2. In northern area of small holdings immediately south of Piningers Shaft.	Early	A large elongated oval shaped area of disturbed ground, about 2.5m x 2.0m orientated north-west - south-east though full dimensions were not observed as obscured by baulk. Infilled with red-brown clays and stony rubble the periphery was marked by black-brown clay. This feature was not investigated further so uncertain if this was a shaft or a large prospecting pit.
304 **W379**	Prospecting pit?	Area 2. In northern area of small holdings immediately south of Piningers Shaft.	Early?	A rectangular-shaped area of disturbed ground about 4.0m x 1.5m orientated north-north-west – south-south-east infilled with white, Light yellow-brown and red-brown clays. Prospecting pit?
305 **W380**	Prospecting pit	Area 2. In northern area of small holdings immediately south of Piningers Shaft.	Early	An elongated oval shaped area of disturbed ground. Measures 2.0m x 1.5m, orientated north-west to south-east. Infilled with mixed dark grey-brown, red-brown clays and stony rubble. Prospecting pit.
306 **W381**	Shaft	Area 3. Due south of Reads	Early?	This was a 5.0m+ deep shaft. Unfortunately the full nature of this shaft was not investigated as had been dug and infilled with concrete prior to being observed. The cone was approximately 3.5m in diameter but

Site No.	Site type	Area of site	Relative dating	Description
		Whim shaft close to road.		irregularly shaped. There was a lode or tunnel with a collapsed roof running due east at a depth of about 3.0m.
307 **W382**	Modern sump dug to drain water off site by CORMAC	Area 3. Due south of Reads Whim shaft close to road.		Not recorded.
308 **W383** **W384** **W385** **W386**	Unknown post built structure. Part of sawmill?	Area 3. Southern extremity of site.	Unknown? Early?	A rectangular structure marked by two rows of five postholes. The structure measured 6.0m x 3.0m and was orientated north-east - south-west. The postholes were circa 0.30m diameter and were infilled with dark black brown clay.
309 **W387W388** **W389** **W390**	Base for machinery? Part of sawmill?	Area 3. Southern extremity of site.	Modern?	A rectangular trench roughly 1.5m x 8.0m orientated north-east - south-west infilled with varied mining debris and clay. Stones set on edge running lengthways parallel to long axis of trench.
310 **W391** **W392W393**	Ditch or trench?	Area 3. Southern extremity of site.	Modern?	A long narrow trench, about 1.50m wide trending west - east. Traced for a length of roughly 10.0m (entire length of trench was not observed), this appears to have been machine cut. Infilled with red-brown clay and shillet with some mine waste. GPS points plotted along its length. Dolcoath evaluation trench?
311 **W394**	Saw Pit? Machine base?	Area 3. Southern extremity of site.	Modern?	A rectangular area of disturbed ground about 2.5m x 2m orientated north-east - south-west. Brick lined pit infilled with grey clay and mine waste. Saw pit? Machine pit/base or plinth? Part of saw mill? A large concrete lines pit with grooves in its side wall and seatings at the base for large bolts. Seating for machinery at a depth of 2.0+ metres.
312 **W395**	Saw Pit? Machine base?	Area 3. Southern extremity of site.	Modern?	A rectangular area of disturbed ground roughly 2.5m x 2.0m orientated north-east - south-west. Brick lined pit infilled with grey clay and mine waste. Saw pit? Machine pit/base or plinth? Part of saw mill?
313 **W396**	Saw Mill	Area 3. Southern extremity of site. SW 72583 44547	Modern?	Massive concrete and block walls up to 1.5m thick. Part of saw mill complex. Wooden sleepers seen, spaced approximately 2.0m apart. Followed for a distance of about 8.0m. Track for guiding lumber onto a circular saw?
314 **W397**	Prospecting pit	Area 3. Southern extremity of site.	Early	A sub circular area of disturbed ground. Roughly 2.5m diameter. Infilled with mixed dark grey-brown, black-brown clays and stony rubble. Prospecting pit. On excavation proved to be 2.0m deep with a flattish bottom. Prospecting pit.

Site No.	Site type	Area of site	Relative dating	Description
315 **W398**	Prospecting pit	Area 3. Southern extremity of site.	Early	An elongated oval shaped area of disturbed ground. Measures 2.0m x 1.5m, orientated north-north-east - south-south-west. Infilled with mixed dark grey-brown, red-brown clays and stony rubble. Prospecting pit. Very shallow depth, 0.50m with flattish bottom. Prospecting pit.
316 **W400**	Prospecting pit	Area 3. Southern extremity of site.	Early	A sub rectangular area of disturbed ground. Measures 2.0m x 1.5m, orientated north-north-east - south-south-west. Infilled with mixed dark grey-brown, red-brown clays and stony rubble. Prospecting pit. Very shallow depth, 0.60m with flattish bottom. Prospecting pit.
317 **W399W 404 W405**	Part of Sawmill complex?	Area 3. Southern extremity of site.	Early? Modern?	An area of disturbed ground circa 3m long, 1.5m wide with an expanded western terminal. Infilled with mixed clays. Fill contains metal reinforcing rods. The line of the trench is perpendicular to those seen for saw mill. Removed machine base? Part of saw mill complex?
318 **W401**	Stope/Adit	Area 3. Area 3. SW of Read's Shaft.	Early?	A stope or adit, being a tunnel 1.0m wide and 1.5m high, with an arched roof cut into natural clay. The feature dipped in a south-westerly direction. Choked with rubble infill including mine waste. Not followed.
319 **W402**	Outcrop shaft.	Area 3. Area 3. SW of Read's Shaft.	Early	This feature was only recorded in section. Cone about 2.5m wide at top. Seen to a depth of 2.0m Base rounded, with lode outcrop seen at base. Infilled with mine waste.
320 **W403**	Shaft	Area 3. Read's Shaft SW 72618 44614	19th century	Read's Shaft. 5.0 m diameter and choked with debris. Adjacent to Read's Engine house, on southern side. Mitigation of this shaft was carried out at a later date and not recorded.
321	Building	Area 1. Adjacent to Access road, NE of Pumping shaft, close to compound entrance. SW 72782 44864.	Unknown	A possible building foundation or footprint associated with features [234] to [241].
322 **W406**	Shaft	Area 3. Area 3. SW of Read's Shaft.	Early	Initially seen as a sub circular area of disturbed ground at surface, roughly 3.0m diameter. Infilled with grey-brown and red-brown clays with stony rubble. When investigated found to be a shaft cone tapering to a vertical shaft in solid bedrock at a depth of roughly 3.0m. Shaft 5.0m+ deep, not bottomed. Sub rectangular shaped shaft roughly 2.0m x 1.5m orientated east-north-east – west-south-west.
323 **W407**	Shaft?	Area 3. Area 3. SW of Read's Shaft.	Early	A sub circular area of disturbed ground at surface, roughly 3.0m diameter. Infilled with white, cream-brown clay with stony rubble. Some of stone tinged green with copper. Probable shaft. Not excavated.
324 **W408**	Prospecting pit	Area 3. Area 3. SW of Read's Shaft	Early	An elongated oval shaped area of disturbed ground. Measures 2.0m x 1.8m, orientated north-west - south-east. Infilled with mixed pale coloured clays and stony rubble. Corona of darker material around periphery. Depth, 0.80m with flattish bottom.

Site No.	Site type	Area of site	Relative dating	Description
325 **W409**	Large pit	Area 3. Area 3. SW of Read's Shaft	Early	A large sub circular area of disturbed ground. 3.5m diameter. Infilled with mixed pale coloured clays and stony rubble. Corona of darker material around periphery. Depth 3.0m with flattened U-shaped profile.
326 **W410**	Large pit	Area 3. Area 3. SW of Read's Shaft	Early	A large oval shaped area of disturbed ground. 3.5m x 2.5m orientated north-north-east -to south-south-west. Infilled with mixed pale coloured clays and stony rubble. Corona of darker material around periphery. Depth, 2.8m with flattened U shaped profile.
327 **W414**	Large pit	Area 3. Area 3. SW of Read's Shaft	Early	A large sub circular area of disturbed ground. 3.0m diameter. Infilled with mixed pale coloured clays and stony rubble. Corona of darker material around periphery.
328 **W412**	Prospecting pit	Area 3. Area 3. SW of Read's Shaft	Early	An elongated oval shaped area of disturbed ground. Measures 2.0m x 1.2m, orientated west-north-west -to east-south-east. Infilled with mixed pale coloured clays and stony rubble. Corona of darker material around periphery.
329 **W413**	Pit?	Area 3. Area 3. SW of Read's Shaft	Early	A small circular area of disturbed ground. 1.0m diameter. Infilled with mixed clays and stony rubble.
330 **W414**	Prospecting pit	Area 3. Area 3. SW of Read's Shaft	Early	An elongated oval shaped area of disturbed ground. Measures 2.0m x 1.5m, orientated north - south. Infilled with mixed pale coloured clays and stony rubble. Corona of darker material around periphery.
331 **W415**	Prospecting pit	Area 3. Area 3. SW of Read's Shaft	Early	An elongated oval shaped area of disturbed ground. Measures 2.0m x 1.5m, orientated north-east - south-west. Infilled with mixed pale coloured clays and stony rubble. Corona of darker material around periphery.
332 **W416**	Large pit or shaft?	Area 3. Area 3. SW of Read's Shaft	Early	A large sub circular area of disturbed ground. 3.0m diameter. Infilled with mixed clays and stony rubble.
333 **W417**	Large pit or shaft?	Area 3. Area 3. SW of Read's Shaft	Early	A large sub circular area of disturbed ground. 4.0m diameter. Infilled with mixed clays and stony rubble.
334 **W418**	Large pit or shaft?	Area 3. Area 3. SW of Read's Shaft	Early	A large sub circular area of disturbed ground. 3.0m diameter. Infilled with mixed clays and stony rubble. Cuts [333].
335 **W419**	Prospecting pit	Area 3. Area 3. SW of Read's Shaft	Early	An elongated oval shaped area of disturbed ground. Measures 2.0m x 1.5m, orientated north-east - south-west. Infilled with mixed clays and stony rubble. Depth, 1.5m with flattish bottom.
336 **W429**	Pit or tank?	Area 3. Area 3. SW of Read's Shaft	Early	A sub rectangular area of disturbed ground with rounded corners. Measured 1.5m x 1m. Orientated west - east. Infilled with copper tailings and stone rubble.

9 Appendix 2: Hallenbeagle West Site inventory

It should be noted that not all prospecting pits and amorphous areas of disturbance were recorded because of their near ubiquitous presence in areas which were dense with multi-phased shafts. All depths recorded for cut features are from the top of the exposed bedrock, and not from the top of today's ground surface, which according to area varies from 0.5 to 3m in depth and is primarily composed of layers and pockets of mine waste, topsoil and imported materials. The ground in some areas contained shallow pits cut from a number of different levels.

Note on relative dating column in table: Early = 17th and 18th century; Late = 19th and 20th century; Modern = late 20th and 21st century.

Site No.	Site type	Area of site	Relative dating	Description
1 **W 001**	Oval prospecting pit	Area 1 (East)	Early	An elongated oval pit measuring 2.0m x 1.5m orientated west-north-west to east-south-east. Infilled with grey-brown clay fill. Vertical sided, flat bottomed. Depth 1.0m.
2 **W 002**	Oval prospecting pit	Area 1 (East)	Early	An elongated oval pit measuring 2.0m x 0.8m orientated west-north-west to east-south-east. Infilled with grey-brown clay and crushed rock fill. Steep convex sided, flat bottomed. Depth 1.5m.
3 **W 003**	Oval prospecting pit	Area 1 (East)	Early	An elongated oval pit measuring 2.0m x 1.0m orientated north-west to south-east. Infilled with grey-brown clay fill. Steep convex sided, flat bottomed. Depth 1.5m. Solid bedrock at base.
4 **W 004**	Oval prospecting pit	Area 1 (East)	Early	An elongated oval pit measuring 2.0m x 0.8m orientated west-north-west to east-south-east. Infilled with grey-brown clay and crushed rock fill. Steep sided, flat bottomed. Depth 1.0m.
5 **W 005**	Oval prospecting pit	Area 1 (East)	Early	An elongated oval pit measuring 1.8m x 0.5m orientated west-north-west to east-south-east. Infilled with dark brown-grey clay and rock fragments.
W 006 **W 007** **W 008**	Exploratory modern trench	Area 1 (East)	Modern 20th century	A trench running across site from west-north-west to east-south-east across area. 0.80m wide. Geotechnical trial trench.
6 **W 009**	Oval prospecting pit	Area 1 (East)	Early	An elongated oval pit measuring 2.0m x 1.0m orientated west-north-west to east-south-east. Infilled with grey-brown clay and crushed rock fill.
7 **W 010**	Oval prospecting pit	Area 1 (East)	Early	A large oblate oval pit measuring 2.10m x 1.5m orientated north to south. Infilled with grey-brown clay patches of red-brown clay stony rubble. Steep sided, flat bottomed. Depth 1.8m.

Site No.	Site type	Area of site	Relative dating	Description
8 **W 011**	Oval prospecting pit	Area 1 (East)	Early	An elongated oval pit measuring 2.0m x 1.0m orientated west-north-west to east-south-east. Infilled with grey-brown clay and crushed rock fill.
9 **W 012**	Oval prospecting pit	Area 1 (East)	Early	A large elongated oval pit measuring 2.4m x 1.3m orientated west-north-west to east-south-east. Infilled with mixed clays and stony rubble. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 2.0m.
10 **W 013**	Outcrop shaft / pit?	Area 1 (East)	Early	A roughly 'key hole' shaped area of disturbed ground infilled with mixed clays and stony rubble. Larger area sub circular in shape with a 4.0m diameter. On southern edge was a small elongated 'tail' circa 2.0m x 1.0m. Large pit excavated to depth of 3.0m, perhaps very small openwork. The 'tail' could have been for a ladder access, or might have been a truncated prospecting pit.
11 **W 014** **W 015** **W 016** **W 017**	Infilled surface working?	Area 1 (East)	Early	An elongated area of disturbed ground, roughly 18.0m long orientated north-east to south-west apparently following line of a lode. Comprised of four interconnecting pits, the southern two being elongated oval in shape 4.0m x 2.0m with long axis west-north-west to east-south-east separated by some 1.5m of natural ground, the northern pits being sub circular in shape with a diameter of 4.0m. Infilled with red-brown stony rubble and waste. Excavated to a maximum depth of 3.0m. Pits interconnected on south eastern side by trench 1.5m wide and about 1.5m deep. Irregular bottom to working, traces of lode seen within rock at base. A possible backfilled surface working.
12 **W 018**	Large pit or openwork	Area 1 (East)	Early	A sub circular area of disturbed ground immediately to north of surface working [11]. Diameter of 3.5m. Excavated to a depth of 3.5m. Slightly coned, diameter at base of excavation circa 2.8m Irregular bottomed. Trace of thin lode trending north-east to south-west seen in base.
13 **W 020**	Oval prospecting pit	Area 1 (East)	Early	A large elongated oval pit measuring 2.0m x 1.0m orientated west-north-west to east-south-east. Infilled with grey, black-brown mixed clays and stony rubble.
14 **W 021**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 1.8m x 0.8m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.0m.
15 **W 022**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.0m x 1.0m orientated north-west to south-east. Infilled with mixed clays and stony rubble.
16 **W 023**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 1.6m x 0.8m orientated west-north-west to east-south-east. Infilled with dark black-brown clays and stony rubble.
17 **W 024**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 1.8m x 0.8m orientated north-north-west to south-south-east. Infilled with dark black-brown mixed clays and stony rubble.
18 **W 025**	Oval prospecting pit	Area 1	Early	An elongated oval pit measuring 1.6m x 0.8m orientated north-west to south-east. Infilled with dark black-brown clays mixed and stony rubble.

Site No.	Site type	Area of site	Relative dating	Description
19 W 026	Oval prospecting pit	Area 1 (Centre)	Early	A large oblate oval pit measuring 2.0m x 1.9m orientated north-north-west to south-south-east. Infilled with grey-brown mixed clays and stony rubble. Steep sided, irregular bottomed. Depth 2.8m.
20 W 027	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.2m x 1.5m orientated north-west to south-east. Infilled with mixed clays.
21 W 028	Prospecting pit	Area 1 (Centre)	Early	An irregularly-shaped area of disturbed ground about 2.0m diameter. Infilled with mixed clays and stony rubble.
22 W 029	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 1.6m x 0.8m orientated north to south. Infilled with mixed clays.
23 W 030	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.2m x 1.6m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble.
24 W 031	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.2m x 1.5m orientated north-west to south-east. Infilled with mixed clays.
25 W 032	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.0m x 1.0m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.5m.
26 W 033	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.0m x 1.0m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.2m.
27 W 034	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.0m x 0.8m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.5m.
28 W 035	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.0m x 1.0m orientated north-west to south-east. Infilled with mixed clays. Steep sided, rounded bottom. Depth 1.5m.
29 W 036	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.0m x 1.0m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.5m.
30 W 037	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.1m x 0.8m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.5m.
31 W 038	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.0m x 1.0m orientated north-north-west to south-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.6m.

Site No.	Site type	Area of site	Relative dating	Description
32 W 039	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 1.8m x 0.9m orientated north-north-west. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.5m.
33 W 040	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 1.8m x 0.9m orientated north-north-west to south-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.5m.
34 W 041	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.0m x 0.8m orientated north-north-west to south-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.5m.
35 W 042	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 1.9m x 0.8m orientated north to south. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.3m.
36 W 043	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 1.8m x 0.9m orientated north to south. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.0m.
37 W 044	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 1.9m x 0.9m orientated west to east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.5m.
38 W 045	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.0m x 0.8m orientated north-north-west to south-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.4m.
39 W 046	Oval prospecting pit	Area 1 (Centre)	Early	A large elongated oval pit measuring 2.4m x 1.4m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.5m.
40 W 047 W 048	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 1.8m x 0.9m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.5m.
41 W 049	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.0m x 1.2m orientated north-north-west to south-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.5m.
42 W 050	Oval prospecting pit	Area 1 (Centre)	Early	A large elongated oval pit measuring 3.8m x 2.0m orientated north-north-west to south-south-east. Infilled with mixed clays. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 1.8m.
43 W 051	Oval prospecting pit	Area 1 (Centre)	Early	A large elongated oval pit measuring 2.5m x 1.5m orientated north-north-west to south-south-east. Infilled with mixed clays. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 1.9m.
44	Oval prospecting pit	Area 1	Early	A large elongated oval pit measuring 2.0m x 1.2m orientated north-north-west to south-south-east. Infilled black-

Site No.	Site type	Area of site	Relative dating	Description
W 052		(Centre)		brown clays. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 1.8m.
45 **W 053**	Oval prospecting pit	Area 1 (Centre)	Early	A large elongated oval pit measuring 2.8m x 1.8m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 2.0m.
46 **W 054**	Prospecting pit	Area 1 (Centre)	Early	A tadpole- shaped pit. 'Head' end situated on eastern side, oval shaped, 2.0m x 1.5m orientated north-west to south-east. Infilled with mixed clays (Mostly black-brown) and some stony rubble. 'Tail' on western side 1.0m x 0.8m with same orientation.
47 **W 055**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.2m x 1.8m orientated north-north-west to south-south-east. Infilled with red-brown clays and stony rubble.
48 **W 056**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.0m x 1.2m orientated north-west to south-east. Infilled with mixed clays.
49 **W 057**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.1m x 1.0m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
50 **W 058**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.2m x 1.1m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
51 **W 059**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.1m x 1.0m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.8m.
52 **W 060**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.0m x 1.2m orientated north-north-west to south-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.5m.
53 **W 061**	Oval prospecting pit	Area 1 (Centre)	Early	A very large elongated oval pit measuring 3.0m x 1.2m orientated north-north-west to south-south-east. Infilled with mixed light coloured clays and stony rubble. Corona of darker material around periphery.
54 **W 062**	Prospecting pit?	Area 1 (Centre)	Early	A sub circular shaped pit of diameter about 2.0m. Infilled with mixed clays. Connected to [55].
55 **W 063**	Prospecting pit?	Area 1 (Centre)	Early	A small sub circular shaped pit of diameter roughly 1.0m. Infilled with mixed clays. Connected to [54].
56 **W 064**	Oval prospecting pit	Area 1 (Centre)	Early	A large elongated oval pit measuring 2.5m x 1.5m orientated north-north-west to south-south-east. Infilled black-brown clays.

Site No.	Site type	Area of site	Relative dating	Description
57 **W 065**	Unknown	Area 1 (Centre)	Unknown	A large area of disturbed ground, irregular in shape roughly 4.0m x 3.5m.
58 **W 066**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.0m x 1.2m orientated north-north-west to south-south-east. Infilled black-brown clays. Situated at western end of pit [45]. Steep sided, flat bottomed. Depth 1.8m.
59 **W 067**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.2m x 1.4m orientated north-west to south-east. Infilled black-brown clays. Situated at western end of pit [48]. Steep sided, flat bottomed. Depth 2.0m.
60 **W 068**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.0m x 1.2m orientated north-north-west to south-south-east. Infilled black-brown clays. Truncated by lode back working pit [61].
61 **W 069**	Lode back working pit	Area 1 (Centre)	Early	A large sub circular pit 3.0m diameter. Cone shaped at top, for a depth of 1.5m, reducing to a diameter of 2.0m. Then goes vertical to a depth of 5.1m. Solid rock, flat bottom at base. Thin traces of lode trending north-west to south-east seen at base.
62 **W 070**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.2m x 1.4m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
63 **W 071**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.0m x 1.5m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.8m.
64 **W 072**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.1 m x 1.7m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
65 **W 073**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 1.95m x 1m orientated north-north-west to south-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.6m.
66 **W 074**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.0m x 1.0m orientated west-north-west to east-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.9m.
67 **W 075**	Oval prospecting pit	Area 1 (Centre)	Early	An elongated oval pit measuring 2.1m x 1.5m orientated west-north-west to east-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
68 **W 076** **W 077** **W 078** **W 079**	Field boundary	Area 1 (Centre)	Medieval?	A shallow ditch infilled with grey-brown clay loam and stony rubble. Traced for a distance of circa 10.0m in an east-north-east to west-south-west direction. Ditch 0.80m wide, shallow flat bottomed U shape in profile up to 0.20m deep.

Site No.	Site type	Area of site	Relative dating	Description
69 **W 086**	Oval prospecting pit	Area 1 (West)	Early	An elongated oval pit measuring 2.1m x 1.5m orientated west-north-west to east-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
70 **W 087**	Oval prospecting pit	Area 1 (West)	Early	An elongated oval pit measuring 2.0m x 1.0m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.8m.
71 **W 088**	Oval prospecting pit	Area 1 (West)	Early	An elongated oval pit measuring 2.2m x 1.8m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
72 **W 080**	Shaft / Associated spoil heap	Area 3	18th to 19th centuries	A large area of spoil dumps, with a flattened conical shape, about 1.8m high. Breached on its northern side for an access road revealing gangue minerals such as pyrite, large quartz crystals and barite. A depression on south-west side thought to represent that of the shaft. A levelled sub circular area on the north-east side of the spoil dump about 5.0m diameter might have been a horse whim or windlass platform. The shaft proved to be slightly to the south-west of this, details recorded as [236].
73 **W 081** **W 082**	Exploratory modern trench	Area 3	Modern 20th century	A trench running across site from north-west to south-east across area. 0.80m wide. Geotechnical trial trench. Appears to be machine cut.
74 **W 083**	Prospecting pit	Area 3	Early	A sub rectangular pit measuring 1.5m x 1.0m orientated east north-east to west south-west. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
75 **W 084**	Prospecting pit	Area 3	Early	A sub rectangular pit measuring 2.1m x 1.8m orientated west to east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
76 **W 085**	Shaft / Associated spoil heap	Area 3	18th to 19th centuries	A large shaft, the depression on top of the mound being 4.0m diameter. Shown with shaft circumference wall on aerial photos though these were removed prior to work commencing. The presence of a trial trench indicates that the site had been investigated in the past. The mound of mine waste was 2.5m thick before natural clay was reached. Once the spoil heap had been removed down to natural a rectangular area 3.5m x 3.0m orientated north-east to south-west was exposed infilled with grey-brown clay and stony rubble. At a depth of 0.4m steel plates were uncovered. When these were lifted the shaft proved to be open. The top part of shaft was rectangular in plan measuring 2.5m x 1.5m and orientated north-west/south-east. The top 1.8m of the shaft which had been cut through soft rock was timber- lined and boarded. The bottom of the lining being on large thick timbers resembling rail sleepers being thick and heavy. Below this the shaft continued as a vertical sided rock cut feature cut into hard rock for a further roughly 1.8m. Vertical grooves were seen cut into each corner, possibly for vertical beams which suggests that this area may also have been timber lined – though this had fallen away. Immediately below this a relieving arch had been cut into the top of the bedrock. From below the rock arch the shaft became circular in plan, roughly 2.5m diameter. The shaft was choked by rubble at a depth of 35m.

Site No.	Site type	Area of site	Relative dating	Description
77 **W 089**	Oval prospecting pit	Area 1 (West)	Early	An elongated oval pit measuring 2.6m x 1.8m orientated north-west to south-east. Infilled with black-brown clays and stony rubble. Steep sided, flat bottomed. Depth 1.8m.
78 **W 090**	Oval prospecting pit	Area 2	Early	An elongated oval pit measuring 2.1m x 1.2m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.8m.
79 **W 091**	Oval prospecting pit	Area 2	Early	An elongated oval pit measuring 3.5m x 1.3m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.8m. Possible two co-joined pits. Immediately south of [78].
80 **W 092**	Shaft	Area 3	18th to 19th centuries	This appeared initially as an area of disturbed ground marked by a sub circular shaped area (3.0m diameter) infilled with mixed clays and stony rubble. Its centre was marked by a small area of black-brown organic rich material sitting within a slight depression. On excavation this turned into a 5.0m+ depth shaft. Its cone was approximately 3.0m in diameter tapering as a vertical shaft to 2.0m diameter. At the base of the excavation the shaft became roughly rectangular in shape about 2.5m x 2.0m. The orientation of the axis of the shaft was north-east to south-west. It was timber-lined from 0.40m below the current ground surface, this continuing for some 2.0m. The timbers consisted of planks, and what resembled railway sleepers.
81 **W 093**	Field boundary	Area 2	Medieval?	A double line of shallow ditches each about 0.8m wide and 0.08m deep (shallow flat bottomed) separated by natural bedrock some 2.0m apart. The ditches ran roughly from west north-west to east south-east.
82 **W 094**	Oval prospecting pit	Area 1 (West)	Early	An elongated oval pit measuring 2.5m x 1.6m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.8m.
83 **W 095**	Oval prospecting pit	Area 1 (West)	Early	An elongated oval pit at hedge boundary orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble.
84 **W 096**	Oval prospecting pit	Area 1 (West)	Early	An elongated oval pit measuring 2.1m x 1.4m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.9m.
85 **W 097**	Oval prospecting pit	Area 1 (West)	Early	An elongated oval pit measuring 2.0m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.8m.
86 **W 098**	Oval prospecting pit	Area 1 (West)	Early	An elongated oval pit measuring 2.0m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.8m.
87 **W 099**	Oval prospecting pit	Area 1 (West)	Early	An elongated oval pit measuring 2.0m x 1.5m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.8m.

Site No.	Site type	Area of site	Relative dating	Description
88 **W 100**	Shaft	Area 5	18th to 19th centuries	A large cone-shaped mound surrounded by a build-up of mine waste. Circular depression at centre, 4.0m diameter, with a depth of 2.0m. Within the centre of this was a further rectangular shaped depression 1.2m x 1.0m with an observed depth of 0.5m. The mound of mine waste was 1.0m thick before natural clay was reached. Once the spoil heap had been removed down to natural clay a rectangular area 2.5m x 1.8m orientated north-east to south-west was exposed infilled with mixed clays and stony rubble, grey-brown clay and stony rubble. At a depth of 0.5m timber lining was encountered. This continued to a depth of about 4.0m. At this depth hard rock was encountered and the shaft became circular in plan with a diameter of roughly 2.5m. The shaft was completely choked with debris. Taken down to a depth of 5.0m+ and not bottomed.
89 **W 101**	Oval prospecting pit	Area 1 (Northwest)	Early	An elongated oval pit measuring 2.0m x 1.2m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.5m.
90 **W 102**	Oval prospecting pit	Area 1 (Northwest)	Early	An elongated oval pit measuring 2.25m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 2.0m.
91 **W 103**	False feature	Area 1 (Northwest)	N/A	A shallow depression resembling a prospecting pit, but on excavation proved to be less than 0.1m deep and irregular so was not a 'real' feature
92 **W 104**	Oval prospecting pit	Area 5	Early	An elongated oval pit measuring 1.8m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
93 **W 105**	Oval prospecting pit	Area 5	Early	An elongated oval pit measuring 2.5m x 1.5m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.9m.
94 **W 106** **W 107** **W 108**	Prospecting pits?	Area 5	Early	An L-shaped feature, possibly formed by three combined prospecting pits. The shorter vertical arm (W 106) measured 2.0m x 0.8m, orientated north-west/south-east, the base arm consisted of a larger pit (W 107) measuring 2.5m x 0.8m and a smaller of 2.0m x 0.8m, both orientated north-east to south-west. Infilled with mixed clays and stony rubble.
95 **W 109**	Pit	Area 5	Early	A small, sub rectangular pit measuring 1.0m x 0.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble.
96 **W 110**	Oval prospecting pit	Area 6	Early	An elongated oval pit measuring 1.9m x 1.5m orientated north to south. Infilled with mixed clays and stony rubble.
97 **W 111**	Possible shaft or surface working?	Area 5	Early	A large area of disturbed ground, irregular in shape circa 4.0m x 4.0m infilled with mixed clays and stony rubble.
98	Openwork and tunnels	Area 5	Early	This entry relates to the top layers and features within the backfill of a large openwork. Cut for feature is [98]. Infilled with mixed clays and stony rubble. Orientated east-north-east to west-south-west. Openwork is about 12.0m wide at

Site No.	Site type	Area of site	Relative dating	Description
W 245 **W 246** **W 247** **W 248** **W 249** **W 250** **W 251** **W 252** **W 253** **W 254** **W 255** **W 256** **W 257**		(North)		this point. GPS points mark northern periphery of the openwork including the terminal. The openwork was traced for a length of about 80m+ from its terminal in a roughly south-westerly direction. The south western end was not recorded though the openwork clearly carried on into the fields within Area 10 (this section was not recorded). At Waypoint 251 a tunnel was recorded in the southern face of the openwork. Its roof was at a depth of about 6.0m to 8.0m below the current ground surface. The tunnel was approximately 1.7m high, and 0.8m wide, trended in a southwesterly direction and was observed to be open for a distance of about 10.0m. The sides of the openwork were near vertical. The line of the lode was clearly seen in the base of the excavation, which in places was not bottomed the depth being excavated being sufficient to put in a large concrete raft. This feature continued as [249].
99 **W 112** **W 113** **W 114** **W 115**	Linear feature	Area 5 (North)	Early	A narrow linear feature about 0.80m wide infilled with dark black-brown clay. This ran parallel with the southern edge of [98] at a distance of approximately 4m and orientated east-north-east to west-south-west. GPS points mark a central line down this feature.
100 **W 116**	Oval prospecting pit?	Area 5 (North)	Early? 18th century?	An elongated oval pit measuring 2.2m x 1.2m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, irregular bottomed. Depth 1.2m. Appears to be in backfill of openwork.
101 **W 117**	Prospecting pits	Area 5 (North)	Early	A tri-lobed pit feature, perhaps two combined oval prospecting pits. Measuring approximately 2.0m x 2.0m infilled with mixed clays. Corona of darker material around periphery. On natural ground immediately on the northern edge of openwork [98].
102 **W 118**	Oval prospecting pit	Area 5 (North)	Early	An elongated oval pit measuring 2.0m x 1.5m orientated west to east. Infilled with mixed clays and stony rubble. On natural ground immediately on the northern edge of openwork [98].
103 **W 119**	Prospecting pit	Area 5 (North)	Early	A small sub circular pit of diameter 1.5m. Infilled with mixed clays and stony rubble. On natural ground immediately on the northern edge of openwork [98].
104 **W 120**	Outcrop shaft / pit?	Area 5 (North)	Early	A circular shaped pit, 2.0m diameter. Infilled with mixed clays and stony rubble. Vertical sided, dug down to a depth of 3.0m. Not bottomed. On natural ground immediately on the northern edge of openwork [98].
105 **W 124**	Outcrop shaft / pit?	Area 5 (North)	Early 18th century?	A sub-circular shaped pit, 2.5m diameter. Infilled with mixed clays and stony rubble. Vertical-sided, dug down to a depth of 3.0m. Not bottomed. Appears to be in backfill of openwork.
106	Outcrop shaft.	Area 5	Early	A large oval pit, 5.0m x 2.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Cone to

Site No.	Site type	Area of site	Relative dating	Description
W 123		(North)	18th century?	depth of 1.5m then went vertical, as a 2m diameter shaft to a depth of 5.6m. Not bottomed. Appears to be in backfill of openwork.
107 **W 121**	Oval prospecting pit?	Area 5 (North)	Early 18th century?	An elongated oval pit measuring about 2.0m x 1.5m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Immediately adjacent to pit [108]. Appears to be in backfill of openwork.
108 **W 122**	Oval prospecting pit?	Area 5 (North)	Early 18th century?	An elongated oval pit measuring roughly 2.0m x 1.5m orientated north-east to south-west. Infilled with mixed clays and stony rubble. Immediately adjacent to pit [107]. Appears to be in back fill of openwork.
109 **W 125**	Outcrop shaft	Hallenbeagle East Area 3. Southern extremity of site.	Early	A sub circular feature 2.0m diameter infilled with mixed clays and stony rubble. Corona of darker material around periphery. On excavation proved to be coned becoming a vertical shaft at a depth of 2.0m. Shaft has diameter of 2.0m and was followed to a depth of 5.0m+ Not bottomed. Cuts feature [110].
110 **W 126**	Oval prospecting pit	Hallenbeagle East Area 3. Southern extremity of site.	Early	An elongated oval pit. Truncated by [109] so full dimensions not recorded. Measures 1.8m x 0.8m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 2.0m.
111 **W 127**	Oval prospecting pit	Hallenbeagle East Area 3. Southern extremity of site.	Early	An elongated oval pit. Partially within baulk so full dimensions not recorded. Measures 1.7m x 0.8m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.5m.
112 **W 128**	Oval prospecting pit	Hallenbeagle East Area 3. Southern extremity of site.	Early	An elongated oval pit measuring 2.0m x 1.2m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.9m. Northern end co-joins with pit [116].
113 **W 129**	Oval prospecting pit	Hallenbeagle East Area 3. Southern extremity of site.	Early	An elongated oval pit measuring 2.2m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 2.0m.
114 **W 130**	Oval prospecting pit	Hallenbeagle East Area 3. Southern extremity of site.	Early	An elongated oval pit measuring 2.2m x 1.4m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
115 **W 131**	Outcrop shaft	Hallenbeagle East Area 3. Southern extremity of site.	Early	A sub circular feature 3.0m diameter infilled with white-cream clays and stony rubble. Corona of darker material around periphery. In section proved to be coned becoming a vertical shaft at a depth of 2.0m. Shaft has diameter of 2.0m and was followed to a depth of 5.0m+ Not bottomed.
116	Oval prospecting pit	Hallenbeagle East Area 3. Southern	Early	An elongated oval pit measuring 2.0m x 1.2m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.9m. Southern end co-joins with pit [112].

Site No.	Site type	Area of site	Relative dating	Description
W 132		extremity of site.		
117 **W 133**	Outcrop shaft	Area 1 (Northeast)	Early	A sub circular feature 2.5m diameter infilled with white-cream clays and stony rubble. Corona of darker material around periphery. In section proved to be coned becoming a vertical shaft at a depth of 2.0m. Shaft has diameter of 2.0m and was followed to a depth of 5.0m+ Not bottomed.
118 **W 134**	Prospecting pit	Area 1 (Northeast)	Early	A sub rectangular pit measuring 2.0m x 1.0m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
119 **W 135**	Outcrop shaft/surface working	Area 1 (Northeast)	Early	An irregularly-shaped pit, 2.5m x 2.5m infilled with mixed clays and stony rubble. Cuts [120].
120 **W 136**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 3.0m x 2.0m orientated north to south. Infilled with mixed clays and stony rubble.
121 **W 137**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 3.0m x 1.8m orientated north-west to south-east. Infilled with mixed clays and stony rubble.
122 **W 138**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2.2m x 1.4m orientated north-west to south-east. Infilled with mixed clays and stony rubble.
123 **W 139**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2.10m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble.
124 **W 140**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2.5m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble.
125 **W 141**	Shaft with adit	Area 5 (Northeast) SW 72540 44570	18th to 19th centuries	Roberts Shaft. This initially appeared as a large mound of mine waste up to 5.0m thick and was marked at surface by a conical Clwyd cap. When the spoil was removed down to top of natural a concrete cap was revealed – this took the form of a concrete slab measuring 3.0m x 2.2m and orientated east north-east to west south-west. On lifting the concrete cap the shaft proved to be open, the concrete cap having been sat on two girders. The first 2.0m of the shaft, that section that was cut within soft rock, was circular in plan and 3.0m in diameter. Where solid rock was encountered the shaft became rectangular in shape and measured 2.5m x 1.9m and orientated north-east to south-west. Its depth was in excess of 50.0m. An adit was located in the south-west corner of the shaft, the floor of the adit being at about 3.5m below the natural ground surface. The adit was about 1.2m high, 0.8m wide cut into the solid stone with an arched roof. It appears to have been timber lined, but was heavily choked with debris. The adit ran in a north-east to south-west direction dipping down towards the south-west following the line of a lode clearly seen in its roof.

Site No.	Site type	Area of site	Relative dating	Description
				Lodes were also recorded in the north-west and north-east walls of the shaft so this shaft seems to have been sunk at the junction of the lodes.
126 **W 142**	Oval prospecting pit	Area 5 (Northeast)	Early	An elongated oval pit. Only partially recorded as part remained with baulk. That observed measured 1.5m x 1.0m orientated north to south. Infilled with mixed clays and stony rubble.
127 **W 143**	Oval prospecting pit	Area 5 (Northeast)	Early	An elongated oval pit measuring 1.8m x 1.2m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble.
128 **W 144**	Oval prospecting pit	Area 5 (Northeast)	Early	An elongated oval pit measuring 2.5m x 2.0m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble.
129 **W 145**	Unknown. Surface working?	Area 5 (Northeast)	Early	An irregular area of disturbed ground about 2.5m x 2.0m. Infilled with mixed clays and stony rubble. Cut by [130]?
130 **W 146**	Prospecting pit	Area 5 (Northeast)	18th to 19th centuries	A sub rectangular shaped pit measuring 2.0m x 1.5m orientated north to south. Infilled with mixed clays and stony rubble. Top of fill produced medieval potsherd, however on section, modern ceramics was found in underlying fills, so pit probably 18th or 19th century in date.
131 **W 147**	Oval prospecting pit	Area 5 (Northeast)	Early	An elongated oval pit measuring 1.9m x 1.1m orientated north to south. Infilled with mixed clays and stony rubble. Corona of darker material around periphery.
132 **W 148**	Unknown. Surface working?	Area 5 (Northeast)	Early	A large area of irregular shaped disturbed ground roughly 2.0m x 2.0m. Infilled with mixed clays and stony rubble. Possibly two co joined prospecting pits.
133 **W 149**	Pit	Area 5 (Northeast)	Early	A pear-shaped pit, with broader dimension on west side. 1.8m x 1.5m orientated north-west to south-east. Infilled with cream coloured clays.
134 **W 150**	Oval prospecting pit	Area 5 (Northeast)	Early	An elongated oval pit measuring 2.0m x 1.5m orientated north-north-east to south-south-west. Infilled with mixed clays and stony rubble. Corona of darker material around periphery.
135 **W 151**	Prospecting pit	Area 5 (Northeast)	Early	A sub rectangular pit measuring 1.9m x 0.8m orientated north-north-west to south-south-east. Infilled with cream coloured clays and stony rubble.
136 **W 152**	Oval prospecting pit	Area 5 (Northeast)	Early	An elongated oval pit measuring 2.5m x 1.5m orientated north to south. Infilled with mixed clays and stony rubble.
137 **W 153**	Oval prospecting pit	Area 5 (Northeast)	Early	An elongated oval pit. Only partially recorded as part remained with baulk. Measuring 3.0m x 2.0m orientated north to south. Infilled with mixed clays and stony rubble.

Site No.	Site type	Area of site	Relative dating	Description
138 **W 154**	Prospecting pit / shaft?	Area 5 (Northeast)	Early	A sub circular pit 2.0m diameter cut by [137] and [139]. Infilled with cream coloured clays and stony rubble.
139 **W 155**	Unknown. Surface working?	Area 5 (Northeast)	Early	A large area of disturbed ground, not fully recorded as passes into baulk. 2.0m x 2.0m infilled with mixed clays and stony rubble.
140 **W 156**	Oval prospecting pit	Area 5 (Northeast)	Early	An elongated oval pit measuring 1.9m x 1.5m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble.
141 **W 157**	Prospecting pit	Area 5 (Northeast)	Early	A sub rectangular pit measuring 2.0m x 0.8m orientated north-north-east to south-south-west. Infilled with mixed clays and stony rubble.
142 **W 158**	Oval prospecting pit	Area 5 (Northeast)	Early	An elongated oval pit measuring 1.6m x 1m orientated north to south. Infilled with mixed clays and stony rubble.
143 **W 159**	Unknown. Surface working?	Area 5 (Northeast)	Early	A large area of disturbed ground, 2.5m x 2.5m infilled with mixed clays and stony rubble.
144 **W 160**	Unknown. Surface working?	Area 5 (Northeast)	Early	A large area of disturbed ground, 3.5m x 3.0m infilled with mixed (whitish) clays and stony rubble.
145 **W 161**	Prospecting pit / shaft?	Area 5 (Northeast)	Early	A sub circular pit 2.0m diameter cut by [137] and [139]. Infilled with mixed clays and stony rubble.
146 **W 162** **W 163** **W 164** **W 165**	Unknown. Surface working?	Area 5 (Northeast)	Early	A large area of disturbed ground, 4.0m x 4.0m infilled with mixed clays and stony rubble. May be several co-joined prospecting pits, or an openwork.
147 **W 166**	Pit	Area 5 (Northeast)	Modern?	A sub rectangular shaped pit 2.5m x 2m orientated north to south. Infilled with grey-brown clay and shillet rubble.
148 **W 167**	Prospecting pit	Area 5 (Northeast)	Early	A sub rectangular pit measuring 1.5m x 1.0m orientated north to south. Infilled with mixed clays and stony rubble.
149 **W 168**	Prospecting pit	Area 5 (Northeast)	Early	A sub rectangular pit measuring 2.0m x 1.1m orientated north-west to south-east. Infilled with mixed clays and stony rubble.

Site No.	Site type	Area of site	Relative dating	Description
150 **W 169**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2.5m x 1.5m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
151 **W 170**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2.0m x 0.8m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.9m.
152 **W 171**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2.5m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
153 **W 172**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2.3m x 1.8m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
154 **W 173**	Prospecting pit(s)	Area 1 (Northeast)	Early	A banana-shaped pit (2 co-joined pits). Western arm 2.0m x 1.5m orientated north-north-west to south-south-east; eastern arm 2.1m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
155 **W 174**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2.2m x 1.8m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.9m.
156 **W 175**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2.5m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.1m.
157 **W 176**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2.5m x 1.8m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
158 **W 177**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2m x 1.3m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2m.
159 **W 178**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2.1m x 1.7m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2m.
160 **W 179**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2m x 1m orientated north-east to south-west. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.9m.
161 **W 180**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2m x 0.8m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
162	Oval prospecting pit	Area 1	Early	An elongated oval pit measuring 2.3m x 1.8m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.1m.

Site No.	Site type	Area of site	Relative dating	Description
W 181		(Northeast)		
163 **W 182**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2.2m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
164 **W183**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2.0m x 1.5m orientated north to south. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.9m.
165 **W 184**	Unknown. Surface working? Shaft?	Area 5 (Northeast)	Early	A large irregular shaped area of disturbed ground, full dimensions not recorded as goes under railway line measuring 4.0m x 4.0m and infilled with mixed clays and stony rubble. May be several co-joined prospecting pits, or an openwork. Cuts [166].
166 **W 185**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit. Full dimensions not recorded as cut by feature [165]. Measures 1.1m x 0.8m orientated north-west to south-east. Infilled with stony rubble.
167 **W 186**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2.0m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
168 **W 187**	Prospecting pit	Area 1 (Northeast)	Early	A pit whose full dimensions were not recorded as it was partly under the adjacent railway line. Infilled with white, grey-brown mixed clays and stony rubble.
169 **W 188**	Prospecting pit	Area 1 (Northeast)	Early	A pit whose full dimensions were not recorded as it was partly under the adjacent railway line. Measures 1.3m x 1.0m orientated north-west to south-east. Infilled with white, grey-brown mixed clays. Corona of darker material around periphery.
170 **W 189**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 1.8m x 1.2m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.8m.
171 **W 190**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 1.8m x 1.2m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
172 **W 191**	Oval prospecting pit	Area 5 (Northeast)	Early	An elongated oval pit measuring 2.0m x 1.1m orientated north-west to south-east. Infilled with mixed cream coloured clays and stony rubble. Steep sided, flat bottomed. Depth 2.1m.
173 **W 192**	Prospecting pit / shaft?	Area 5 (Northeast)	Early	A sub circular pit 2.0m diameter cut by [137] and [139]. Infilled with grey-green, brown clays and stony rubble. Corona of darker material around periphery.
174 **W 193**	Oval prospecting pit	Area 5 (Northeast)	Early	An elongated oval pit measuring 2.0m x 1.2m orientated north-east to south-west. Infilled with mixed cream coloured clays and stony rubble. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 2.0m.

Site No.	Site type	Area of site	Relative dating	Description
175 **W 194**	Oval prospecting pit	Area 5 (Northeast)	Early	An elongated oval pit measuring 2.5m x 1.5m orientated north to south. Infilled with mixed clays and stony rubble. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 2.0m.
176 **W 195**	Oval prospecting pit	Area 4 (South)	Early	An elongated oval pit measuring 2.0m x 1.1m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
177 **W 196**	Oval prospecting pit	Area 4 (South)	Early	An elongated oval pit measuring 1.8m x 1.1m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.9m.
178 **W 201**	Oval prospecting pit	Area 4 (South)	Early	An elongated oval pit measuring 2.2m x 1.6m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 2.0m.
179 **W 194**	Oval prospecting pit	Area 4 (South)	Early	An elongated oval pit measuring 1.7m x 1m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 1.82m.
180 **W 197**	Prospecting pit(s)	Area 4 (South)	Early	A banana-shaped pit (2 co-joined pits). Western arm 1.5m x 1.1m orientated north-west to south-east; eastern arm 1.5m x 1.1m orientated west north-west to east south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
181 **W 198**	Oval prospecting pit	Area 4 (South)	Early	An elongated oval pit measuring 2.5m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.1m.
182 **W 199**	Oval prospecting pit	Area 4 (South)	Early	An elongated oval pit measuring 2.4m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
183 **W 200**	Oval prospecting pit	Area 4 (South)	Early	An elongated oval pit measuring 2.1m x 1.5m orientated west-north-west to east-south-east. Infilled with mixed pale coloured clays. Steep sided, flat bottomed. Depth 2.0m.
184 **W 202**	Oval prospecting pit	Area 4 (South)	Early	An oblate oval pit measuring 1.8m x 1.4m orientated west-north-west to east-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.9m.
185 **W 203**	Oval prospecting pit	Area 4 (South)	Early	An oblate oval pit measuring 2.2m x 1.9m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.9m.
186 **W 204**	Oval prospecting pit	Area 4 (South)	Early	An elongated oval pit measuring 2.1m x 1.8m orientated west-north-west to east-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
187	Oval prospecting pit	Area 4	Early	An elongated oval pit measuring 2.2m x 1.9m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.

Site No.	Site type	Area of site	Relative dating	Description
W 205		(South)		
188 **W 206**	Oval prospecting pit	Area 4 (South)	Early	An elongated oval pit measuring 2.4m x 1.5m orientated north-west to south-east. Infilled with mixed pale coloured clays. Steep sided, flat bottomed. Depth 2.1m.
189 **W 207**	Oval prospecting pit	Area 4 (South)	Early	An elongated oval pit measuring 2.0m x 1.8m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
190 **W 209**	Oval prospecting pit	Area 4 (South)	Early	An elongated oval pit measuring 2.8m x 1.5m orientated north-west to south-east. Infilled with mixed pale coloured clays. Steep sided, flat bottomed. Depth 1.9m.
191 **W 211**	Oval prospecting pit	Area 4 (South)	Early	A squat-oval pit measuring 2.5m x 1.9m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
192 **W 212**	Oval prospecting pit	Area 4 (South)	Early	An elongated oval pit measuring 2.5m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.0m.
193 **W 213**	Oval prospecting pit	Area 1 (Northeast)	Early	An elongated oval pit measuring 2.5m x 1.4m orientated west-north-west to east-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.0m.
194 **W 210**	Oval prospecting pit	Area 4 (South)	Early	An elongated oval pit measuring 2.0m x 1.0m orientated west-north-west to east-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.5m.
195 **W 214**	Oval prospecting pit	Area 6	Early	An elongated oval pit measuring 2.0m x 1.1m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.2m.
196 **W 215**	Oval prospecting pit	Area 6	Early	An elongated oval pit measuring 2.0m x 1.5m orientated west-north-west to east-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.2m.
197 **W 216**	Oval prospecting pit	Area 6	Early	An elongated oval pit measuring 2.0m x 1.1m orientated north-north-west to south-south-east. Infilled with mixed pale clays and stony rubble. Steep sided, flat bottomed. Depth 1.2m.
198 **W 217**	Oval prospecting pit	Area 6	Early	An oblate-oval pit measuring 1.7m x 1.5m orientated west-north-west to east-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.2m.
199 **W 218**	Oval prospecting pit	Area 6	Early	The terminal of a pit seen within the baulk. Length seen 0.5m, width 1.0m. Orientated north-west to south-east. Infilled with mixed clays and stony rubble.
200	Oval prospecting pit	Area 6	Early	An elongated oval pit measuring 2.0m x 1.4m orientated north-west to south-east. Infilled with mixed clays and stony

Site No.	Site type	Area of site	Relative dating	Description
W 219				rubble. Steep sided, flat bottomed. Depth 1.2m.
201 **W 220**	Modern Soakaway pit	Area 6	Modern	A sub circular pit. A modern soakaway pit/septic tank pit.
202 **W 221**	Oval prospecting pit	Area 6	Early	An elongated oval pit measuring 2.10m x 1.5m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.2m.
203 **W 222**	Oval prospecting pit	Area 6	Early	An elongated oval pit measuring 2.2m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.2m.
204 **W 223** **W 224** **W 225**	Unknown. Surface working?	Area 6	Early	A large area of disturbed ground, irregularly-shaped about 5.0m long and 2.5m wide. Infilled with mixed clays and stony rubble. May be several co-joined prospecting pits, or an openwork. Proved to be a very shallow feature less than 0,20m deep.
205 **W 226** **W 227** **W 228** **W 229**	Field boundary?	Area 6	Unknown. Modern?	An L-shaped ditch roughly 0.8m wide and 0.08m deep (shallow flat bottomed). Infilled with grey-brown clay loam.
206 **W 230**	Oval prospecting pit	Area 6	Early	An elongated oval pit measuring 2.0m x 1.4m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.5m.
207 **W 231**	Oval prospecting pit	Area 6	Early	An elongated oval pit measuring 2.2m x 1.6m orientated north to south. Infilled with mixed pale cream clays and stony rubble. Steep sided, flat bottomed. Depth 1.2m.
208 **W 232**	Oval prospecting pit	Area 6	Early	An elongated oval pit measuring 2.3m x 1.5m orientated north-north-east to south-south-west. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.4m.
209 **W 233**	Oval prospecting pit	Area 6	Early	An elongated oval pit measuring 1.8m x 1.0m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.0m.
210 **W 234**	Oval prospecting pit	Area 6	Early	An elongated oval pit measuring 2.4m x 1m orientated north-north-east to south-south-west. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.5m.
211 **W 235**	Unknown	Area 6	Unknown	An irregularly-shaped area of disturbed ground 1.5m x 1.5m. Infilled with mixed clays and stony rubble. When investigated proved to be a shallow ephemeral feature at most 0.2m deep.

Site No.	Site type	Area of site	Relative dating	Description
212 **W 236** **W 237** **W 238** **W 239**	Modern Cesspit	Area 6	Modern	The trench for a modern cesspit. 8.0m x 4.0m and excavated to depth of 4.0m.
213 **W 240**	Unknown	Area 6	Unknown	An elongated oval pit measuring 2.5m x 1.5m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Proved to be an ephemeral non feature on excavation.
214 **W 214**	Oval prospecting pit	Area 7	Early	An elongated oval pit measuring 2.0m x 1.4m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.5m.
215 **W 242**	Outcrop shaft	Hallenbeagle East Area 3. Southern extremity of site.	Early	A sub circular feature 5.0m diameter infilled with white-cream clays and stony rubble. Corona of darker material around periphery. In section proved to be coned becoming a vertical shaft at a depth of 2.0m. Shaft was rectangular in shape 2.0m x 1.5m orientated north-west to south-east and was followed to a depth of 8.0m+ Not bottomed.
216 **W 243**	Unknown	Area 7	Early?	A large area of disturbed ground, 3.8m x 2.1m infilled with mixed clays and rubble. Proved to be a shallow flat bottomed feature roughly 0.35m deep.
217 **W 244**	Pit	Area 7	Early?	A sub circular area of disturbed ground 2.0m diameter infilled with mixed clays and rubble. Proved to be a shallow flat bottomed feature about 0.4m deep.
218 **W 259**	Oval prospecting pit	Area 4	Early	An elongated oval pit measuring 2.5m x 1.5m orientated north-east to south-west. Infilled with mixed pale coloured clays. Steep sided, flat bottomed. Depth 2.0m.
219 **W 271**	Unknown	Area 4	Early?	An irregular shaped area of disturbed ground, 2.0m x 2.0m infilled with mixed clays.
220 **W 266**	Oval prospecting pit	Area 4	Early	An elongated oval pit measuring 2.0m x 1.6m orientated east-north-east to west-south-west. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
221 **W 267**	Oval prospecting pit	Area 4	Early	An elongated oval pit measuring 2.5m x 1.5m orientated north to south. Infilled with mixed pale coloured clays. Steep sided, flat bottomed. Depth 2.1m.
222 **W 268**	Oval prospecting pit	Area 4	Early	An elongated oval pit measuring 2.2m x 1.0m orientated north-east to south-west. Infilled with mixed pale coloured clays. Steep sided, flat bottomed. Depth 2.0m.
223	Oval prospecting pit	Area 4	Early	An elongated oval pit measuring 2.0m x 1.5m orientated north-north-west to south-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.92m.

Site No.	Site type	Area of site	Relative dating	Description
W 270				
224 **W 260**	Oval prospecting pit	Area 4	Early	An elongated oval pit measuring 2.5m x 1.5m orientated west-north-west to east-south-east. Infilled with mixed pale coloured clays. Steep sided, flat bottomed. Depth 2.0m.
225 **W 261**	Unknown	Area 4	Early?	An irregularly-shaped area of disturbed ground, 2.0m x 2.0m infilled with mixed clays.
226 **W 262**	Oval prospecting pit	Area 4	Early	An elongated oval pit measuring 2.2m x 1.0m orientated north-east to south-west. Infilled with mixed pale coloured clays. Steep sided, flat bottomed. Depth 2.0m.
227 **W 263**	Oval prospecting pit	Area 4	Early	An elongated oval pit measuring 2.0m x 1.0m orientated west-north-west to east-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.9m.
228 **W 264**	Oval prospecting pit	Area 4	Early	An elongated oval pit measuring 2.1m x 1.4m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
229 **W 269**	Oval prospecting pit	Area 4	Early	An elongated oval pit measuring 1.8m x 1.0m orientated north to south. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.1m.
230 **W 272**	Oval prospecting pit	Area 4 (North)	Early	An oblate-oval pit measuring 2.0m x 1.6m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
231 **W 273**	Oval prospecting pit	Area 4 (North)	Early	An elongated oval pit measuring 2.3m x 1.2m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
232 **W 274**	Oval prospecting pit	Area 4 (North)	Early	An elongated oval pit, full dimensions not recorded as goes under railway line. Measures 1.8m x 1.2m orientated north-west to south-east. Infilled with mixed clays.
233 **W 275**	Oval prospecting pit	Area 4 (North)	Early	The terminal of an elongated oval pit, full dimensions not recorded as goes under railway line. Measures 1.2m x 1.3m orientated north-west to south-east. Infilled with mixed clays.
234 **W 276**	Oval prospecting pit	Area 4 (North)	Early	An oblate-oval pit measuring 2.0m x 1.5m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
235 **W 277**	Outcrop shaft	Hallenbeagle East Area 3. Southern extremity of site.	Early	A sub circular feature 2.5m diameter infilled with white-cream clays and stony rubble. Corona of darker material around periphery. In section proved to be coned becoming a vertical shaft at a depth of 2.0m. Shaft diameter 2.0m. Taken down to a depth of 3.0m+ Not bottomed.

Site No.	Site type	Area of site	Relative dating	Description
236 **W 278**	Shaft	Area 3	18th to 19th centuries	A large circular feature 3.5m diameter infilled with grey clays and stony rubble. The shaft was vertical sided circular in profile infilled to a depth of 4.0m. This was cut through natural soft clay and shillet. At this depth a stone arch was breached, below which the shaft was open to a depth of 32.0m. From the point where the blocking arch was breached the shaft became rectangular in shape measuring 3.0m x 2.0m orientated north-east to south-west cut into solid hard slate bedrock. Water was heard running at the base of shaft. Same as feature [72].
237 **W 279**	Oval prospecting pit	Area 3	Early	An elongated oval pit measuring 2.5m x 1.5m orientated north-north-east to south-south-west. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
238 **W 280**	Oval prospecting pit	Area 9	Early	An elongated oval pit measuring 2.0m x 1.0m orientated north-north-west to south-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.1m.
239 **W 281**	Oval prospecting pit	Area 9	Early	An oblate-oval pit measuring 2.0m x 1.8m orientated north to south. Infilled with mixed clays.
240 **W 282**	Oval prospecting pit	Area 9	Early	An elongated oval pit measuring 1.9m x 1.0m orientated north to south. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.1m.
241 **W 283**	Unknown. Surface working?	Area 9	Early	A large area of disturbed ground, Irregular shaped about 4.0m x 4.0m Infilled with mixed clays and stony rubble. May be several co-joined prospecting pits, or an openwork. Proved to be a suface working up to 3.0m deep.
242 **W 284**	Oval prospecting pit	Area 9	Early	An elongated oval pit measuring 1.5m x 1.0m orientated north-north-west to south-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.1m.
243 **W 285**	Oval prospecting pit	Area 9	Early	An elongated oval pit measuring 1.5m x 1m orientated north-north-west to south-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.1m.
244 **W 286**	Prospecting pit(s)	Area 9	Early	An area of disturbed ground possibly two co-joined pits measuring 2.0m x 2.0m. One arm orientated north-west to south-east; the other orientated north-east to south-west forming a rough + shape. Infilled with mixed clays and stony rubble. Steep sided, irregular bottom. Depth between 1.8m and 2.0m.
245 **W 287**	Oval prospecting pit	Area 9	Early	An elongated oval pit measuring 2.0m x 1.0m orientated north-north-east to south-south-west. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
246 **W 288**	Oval prospecting pit	Area 9	Early	An elongated oval pit measuring 2.10m x 1.6m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
247	Oval prospecting pit	Area 9	Early	An elongated oval pit measuring 2.0m x 1.5m orientated north-north-west to south-south-east. Infilled with mixed

Site No.	Site type	Area of site	Relative dating	Description
W 289				clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
248 **W 290**	Prospecting pit?	Area 9	Early	An irregularly-shaped area of disturbed ground heavily truncated by a French drain alongside the road to the cottages. Possibly a prospecting pit.
249 **W 291** **W 292** **W 293** **W 294** **W 295** **W 297** **W 298** **W 307** **W 308** **W 309** **W 310** **W 321** **W 322** **W 323**	Openwork	Area 9	Early	The western continuation of the large openwork [98]. Infilled with mixed clays and stony rubble. Orientated east-north-east to west-south-west. The openwork was 12.0m wide at this point and varied in depth between 8.0m – 10.0m. A lode was seen in its base. The feature was not bottomed. GPS points were used to plot the periphery of the openwork, which was traced for a length of over 80.0m from its terminal in a roughly southwesterly direction. The south western end of the feature was not recorded though the openwork clearly carried on into the fields within Area 10 (not recorded). The sides of the openwork were nearly vertical. The line of the lode was clearly seen in the base of the excavation, which in places was not bottomed the depth being excavated being only sufficient to install in a large concrete raft.
250 **W 296**	Outcrop shaft	Area 9	Early	A sub-circular feature 4.0m diameter infilled with mixed clays and stony rubble. Corona of darker material around periphery. On excavation proved to be a vertical shaft 3.5m diameter followed to a depth of 5.0m+ Not bottomed. Connected to openwork [249] by a tunnel on southern side that was 1.0m wide and roughly 1.5m high.
251 **W 300**	Oval prospecting pit	Area 9	Early	An elongated oval pit measuring 2.0m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
252 **W 301**	Oval prospecting pit	Area 9	Early	An elongated oval pit measuring 2.0m x 1.8m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
253 **W 302**	Oval prospecting pit	Area 9	Early	An elongated oval pit measuring 2.0m x 1.0m orientated west-south-west to east-north-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.8m.
254 **W 303**	Oval prospecting pit	Area 4 (North)	Early	An elongated oval pit measuring 2.2m x 1.5m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.5m.
255 **W 304**	Oval prospecting pit	Area 4 (North)	Early	An elongated oval pit measuring 2.5m x 1.8m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.8m.

Site No.	Site type	Area of site	Relative dating	Description
256 **W 305**	Oval prospecting pit	Area 4 (North)	Early	An elongated oval pit measuring 2.0m x 1.8m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
257 **W 306**	Outcrop shaft	Area 9	Early	A large sub circular feature 3.0m diameter infilled with mixed clays and stony rubble. Corona of darker material around periphery. In investigation this proved to be coned becoming a vertical shaft at a depth of 2.0m. Shaft sub rectangular in shape 2.5m x 1.8m orientated north-west to south-east. Taken down to a depth of 5.0m+ Not bottomed. A lode trending north-east/south-west was seen crossing the shaft.
258 **W 311**	Oval prospecting pit	Area 9	Early	An elongated oval pit measuring 2.0m x 1.0m orientated north-east to south-west. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
259 **W 312**	Outcrop shaft	Area 9	Early	A large sub circular area of disturbed ground 4.0m diameter infilled with mixed clays and stony rubble. Corona of darker material around periphery. On excavation this proved to be a vertical shaft 3.5m diameter followed to a depth of 5.0m+ Not bottomed.
260 **W 313**	Outcrop shaft	Area 9	Early	An oval shaped area of disturbed ground 4.0m x 2.5m orientated west north-west/east south-east. Infilled with mixed clays and stony rubble. On excavation proved to be a vertical shaft 3.0m diameter followed to a depth of 5.0m+ Not bottomed.
261 **W 314**	Oval prospecting pit	Area 9	Early	An elongated oval pit measuring 1.5m x 1.0m orientated north to south. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m. Seen cutting a lode running north-east/south-west.
262 **W 315**	Oval prospecting pit	Area 9	Early	An elongated oval pit measuring 1.5m x 1.0m orientated north-east to south-west. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.1m.
263 **W 316**	Unknown	Area 9	Early?	An elongated area of disturbed ground, seen in baulk/section of road. 4.0m in length seen, roughly 0.3m width, rest being obscured.
264 **W 317**	Outcrop shaft	Area 9	Early	An irregular area of disturbed ground 2.5m x 2.5m infilled with mixed clays and stony rubble. On excavation proved to be a vertical shaft followed to a depth of 5.0m+ Not bottomed.
265 **W 318**	Oval prospecting pit	Area 9	Early	An elongated oval pit measuring 3.0m x 1.5m orientated north to south. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
266 **W 319**	Oval prospecting pit	Area 9	Early	An elongated oval pit measuring 1.5m x 1m orientated north-east to south-west. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.1m.
267 **W 320**	Pit	Area 9	Early?	A sub circular pit, 1.5m diameter infilled with mixed clays and stony rubble.

Site No.	Site type	Area of site	Relative dating	Description
268 **W 321**	Adit or tunnel	Area 9	Early? 18th to 19th centuries	A tunnel seen in both the northern and southern walls of the openwork [249]. It must have also been cut through the backfill of the openwork. The top of the tunnel was at a depth of 2.5m from ground level, with its base at 4.0m. Width was 0.80m. A vertical access shaft was seen on southern face of the openwork [249].
269 **W 324**	Oval prospecting pit	Area 8	Early	An elongated oval pit measuring 2.5m x 1.5m orientated north to south. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.1m.
270 **W 325**	Oval prospecting pit	Area 8	Early	An elongated oval pit measuring 2.0m x 1.5m orientated north to south. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.2m.
271 **W 326**	Prospecting pit	Area 8	Early	A sub rectangular pit measuring 2.0m x 1.0m orientated north-east to south-west. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.3m.
272 **W 327**	Oval prospecting pit	Area 4	Early	An elongated oval pit measuring 2.0m x 1.0m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.1m.
273 **W 328**	Oval prospecting pit	Area 4	Early	An elongated oval pit measuring 2.0m x 1.0m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 1.9m.
274 **W 329**	Prospecting pit or shaft? Tunnel	Area 8	Early	A possibly sub circular area of disturbed ground roughly 4.0m diameter, parts of the feature lying within the unexcavated baulk. Possibly 2 co-joined pits or a shaft? Infilled with mixed clays and stony rubble. Shallow tunnel roof at 0.3m below ground surface. 1.0m high, 0.8m wide with a slightly arched roof. Completely choked. Appears to be following line of lode.
275 **W 330**	Oval prospecting pit	Area 8	Early	A pit shaped like the figure 8 (two pits co-joined?) measuring 2.0m x 1.0m orientated north-west/south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
276 **W 331**	Oval prospecting pit	Area 8	Early	An elongated oval pit measuring 2.5m x 1.1m orientated west-north-west to east-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.5m.
277 **W 332**	Oval prospecting pit	Area 8	Early	An elongated oval pit measuring 2.0m x 1.0m orientated west-north-west to east-south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.
278 **W 333**	Oval prospecting pit	Area 8	Early	An elongated oval pit measuring 2.0m x 1.5m orientated north-west to south-east. Infilled with mixed white and grey clays and stony rubble. Steep sided, flat bottomed. Depth 2.5m.
279 **W 334**	Oval prospecting pit	Area 8	Early	An elongated oval pit measuring 1.8m x 1.5m orientated north-west to south-east. Infilled with white clays and stony rubble. Steep sided, flat bottomed. Depth 2.0m.

Site No.	Site type	Area of site	Relative dating	Description
280 **W 335**	Oval prospecting pit	Area 8	Early	An elongated oval pit measuring 3.1m x 2.0m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 2.5m.
281 **W 336**	Oval prospecting pit	Area 8	Early	An elongated oval pit measuring 3.5m x 2.0m orientated north to south. Infilled with white-grey clays and stony rubble. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 2.0m.
282 **W 337**	Oval prospecting pit	Area 8	Early	An elongated oval pit measuring 3.0m x 2.0m orientated north north-west to south south-east. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.5m.
283 **W 338**	Oval prospecting pit	Area 8	Early	An elongated oval pit measuring 2.5m x 2.0m orientated north to south. Infilled with mixed clays and stony rubble. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 2.1m.
284 **W 339**	Oval prospecting pit and tunnel	Area 8	Early	A large oblate-oval pit measuring 2.5m x 2.0m orientated north-north-west to south-south-east. Infilled with mixed white and grey clays and stony rubble. A corona of darker material appeared around its periphery. The feature was steep sided and flat bottomed and had a depth of 2.5m. A shallow tunnel was seen on the northern side of the pit with its roof at about 1.5m below surface. Its height was 1.0m, and it was 0.8m wide, had an arched roof and was completely choked, though appeared to be following line of lode.
285 **W 340**	Prospecting pits	Area 8	Early	An irregular area of disturbed ground, measuring 3.0m x 4.0m orientated north-west to south-east. Infilled with mixed clays and stony rubble. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 2.1m.
286 **W 341**	Outcrop shaft	Area 8	Early	A circular area of disturbed ground 2.5m diameter infilled with mixed white and grey clays and stony rubble. On excavation proved to be a vertical shaft followed to a depth of 5.0m. Hard rock at base.
287 **W 342**	Oval prospecting pit	Area 8	Early	An elongated oval pit measuring 2.5m x 1.8m orientated north-east to south-west. Infilled with mixed clays and stony rubble.
288 **W 343**	Oval prospecting pit	Area 8	Early	An elongated oval pit measuring 2.5m x 1.5m orientated north-west to south-east. Infilled with mixed white and grey clays.
289 **W 344**	Oval prospecting pit	Area 8	Early	An elongated oval pit measuring 2.3m x 1.5m orientated north to south. Infilled with pale mixed clays and stony rubble. Corona of darker material around periphery.
290 **W 345**	Oval prospecting pit	Area 8	Early	An elongated oval pit measuring 2.5m x 2.0m orientated north to south. Infilled with mixed pale clays and stony rubble. Corona of darker material around periphery.
291 **W 346**	Oval prospecting pit	Area 8	Early	An elongated oval pit measuring 1.5m x 1.0m orientated north-north-west to south-south-east. Infilled with mixed clays and stony rubble. Corona of darker material around periphery. Abuts [292].

Site No.	Site type	Area of site	Relative dating	Description
292 **W 348**	Oval prospecting pit	Area 8	Early	The terminal of an elongated oval pit, full dimensions not recorded as goes under railway line. Orientated north-west to south-east. Infilled with mixed pale clays.
293 **W 349**	Oval prospecting pit	Area 8	Early	An elongated oval pit measuring 2.0m x 1.4m orientated north to south. Infilled with mixed pale clays and stony rubble. Corona of darker material around periphery.
294 **W 350**	Oval prospecting pit	Area 8	Early	An elongated oval pit, full dimensions not recorded as goes under railway line. Measures 1.9m (+) x 1.5m orientated north north-west to south south-east. Infilled with mixed pale clays. Corona of darker material around periphery.
295 **W 351**	Oval prospecting pit	Area 8	Early	An elongated oval pit, full dimensions not recorded as goes under railway line. Measures 1.7m (+) x 1.5m orientated north north-west to south south-east. Infilled with mixed pale clays. Corona of darker material around periphery.
296 **W 352**	Oval prospecting pit	Area 8	Early	An elongated oval pit, Measures 2.8m x 1.8m orientated north-north-west to south-south-east. Infilled with mixed pale clays. Corona of darker material around periphery.
297 **W 353**	Oval prospecting pit	Area 8	Early	An elongated oval pit, Measures 2.7m x 1.6m orientated north-north-west to south-south-east. Infilled with mixed pale clays. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 2.2m.
298 **W 354**	Oval prospecting pit and tunnel	Area 8	Early	An elongated oval pit, Measures 2.2m x 2.0m orientated north-north-west to south-south-east. Infilled with mixed clays. Corona of darker material around periphery. Steep sided, flat bottomed. Depth 2.5m. Shallow tunnel on northern side of pit. Roof at about 1.5m below surface. Height roughly 1.0m, 0.8m wide, arched roof. Completely choked. Appears to be following line of lode.
299 **W 355**	Interconnecting Outcrop shaft and prospecting pits	Area 8	Early	A large area of disturbed ground measuring 4.0m x 4.0m. Consists of several interconnecting pits. Infilled with mixed white and grey clays and stony rubble. On excavation proved to be couple of interconnected prospecting pits up to 2.8m deep and a vertical outcrop shaft followed to a depth of 5.0m. Hard rock recorded at base of the shaft.
300 **W 356**	Oval prospecting pit	Area 9	Early	An elongated oval pit, Measures 2.3m x 1.5m orientated north-west to south-east. Infilled with mixed pale clays. Corona of darker material around periphery.
301 **W 357**	Oval prospecting pit	Area 9	Early	An elongated oval pit, Measures 3.0m x 2.0m orientated north to south. Infilled with mixed clays and stony rubble.
302 **W 358**	Unknown	Area 4	Unknown	An area of disturbed ground alongside, and apparently continuing on under the railway. Irregularly-shaped, its full dimensions were not recorded because the feature was not completely excavated however a 4.0m x 3.0m area was observed. Partially investigated and proved to be a slight feature only 0.2m deep.
303 **W 359**	Pit	Area 4	Early?	A sub circular area of disturbed ground adjacent to the south side of Roberts Shaft [125]. Diameter roughly 4.0m. Infilled with mixed pale clays. On excavation proved to be a shallow feature with an uneven bottom up to 0.20m deep.

Site No.	Site type	Area of site	Relative dating	Description
304 **W 360**	Pit	Area 4	Early?	A sub rectangular shaped area of disturbed ground measuring 4.0m x 3.0m orientated north-east to south-west. Infilled with mixed clays and stony rubble. On excavation proved to be a shallow feature with an uneven bottom up to 0.40m deep.
305 **W 361** **W 362** **W 363**	Field boundary	Area 4	Medieval?	A linear feature 1m wide infilled with dark grey-brown clays and stony rubble. Runs roughly north-west to south-east
306 **W 364**	Shaft	Area 8	18th to 19th centuries	A shaft marked by a Clwyd cap at surface. On the removal of the cap it was found to sit on layer of mine waste that had been spread out across the whole field. At this point the deposit was 0.8m thick sitting on the natural clay. Once this had been removed it was found that the shaft was 4.0m diameter coned to 3.0m diameter with a concrete plug at a depth of about 2.5m. On removal of the plug it was found that the shaft was vertical from a depth of 3.0m and was rectangular in shape roughly 3.0m x 2.5m orientated north-west to south-east. The shaft was excavated to a depth of 5.0m and was not bottomed. The shaft was completely chocked with compacted stony rubble.
307 **W 365** **W 366** **W 367**	Shaft?	Area 9	18th to 19th centuries?	A large mound alongside the A30 road edge which had been shown as a mine dump on the OS 1877 mapping. Scrub covered the mound up to 2.5m high. Side adjoining area of development was kerbed with Cornish hedging. The feature was investigated by drilling but no shaft was located.
308 **W 368**	Oval prospecting pit	Area 6	Early	An elongated oval pit, full dimensions not recorded as goes under railway line. Measures 0.8m (+) x 1m orientated north-west to south-east. Infilled with mixed clays.
309 **W 369**	Oval prospecting pit	Area 6	Early	An elongated oval pit, measured 2.0m x 1.0m orientated north-west to south-east. Infilled with mixed clays.
310 **W 370**	Prospecting pit	Area 6	Early	A sub rectangular pit measured 1.6m x 0.8m orientated north-north-west to south-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
311 **W 371**	Oval prospecting pit	Area 6	Early	An elongated oval pit, measured 2.0m x 1.0m orientated north-east to south-west. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.1m.
312 **W 372**	Oval prospecting pit	Area 6	Early	An oblate-oval pit, measured 2.0m x 1.5m orientated north-east to south-west. Infilled with mixed clays and stony rubble. Steep sided, flat bottomed. Depth 2.2m.
313 **W 373**	Oval prospecting pit	Area 6	Early	An elongated oval pit, measured 2.0m x 1.0m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.

Site No.	Site type	Area of site	Relative dating	Description
314 **W 374**	Oval prospecting pit	Area 6	Early	An elongated oval pit, measured 2.0m x 1.1m orientated west-north-west to east-south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.1m.
315 **W 375**	Oval prospecting pit	Area 6	Early	An elongated oval pit, measured 1.5m x 1.0m orientated north-north-east to south-south-west. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
316 **W 376**	Outcrop shaft	Area 8	Early	A circular area of disturbed ground 4.0m diameter infilled with mixed white and grey clays and stony rubble. On excavation proved to be a vertical shaft followed to a depth of 5.0m. Hard rock at base of shaft.
317 **W 377**	Oval prospecting pit	Area 8	Early	An elongated oval pit, measured 2.2m x 1.5m orientated north-west to south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 2.0m.
318 **W 378** **W 380**	Prospecting pits / openwork?	Area 8	Early	A large area of disturbed ground, figure of 8 shaped. Consists of two large co-joined pits. Long axis through both pits runs north-east to south-west. Each pit about 2.5m diameter. Vertical-sided, the pits were up to 4.0m in depth. Lode seen on north side of pit.
319 **W 384**	Oval prospecting pit with tunnel.	Area 8	Early	A large circular pit, 2.5m diameter infilled with mixed pale coloured clays. Steep sided and flat bottomed with a depth of 4.0m. On its northern side was a tunnel giving access to a further tunnel following the lode (north-east to south-west) dipping in a north-east direction. This tunnel was 0.8m wide, 1.5m high with an arched roof and might have been the same tunnel or tunnel complex noted in [274], [284], and [298].
320 **W 381**	Oval prospecting pit	Area 8	Early	An elongated oval pit, measured 2.2m x 1.0m orientated north to south. Infilled with mixed clays. Steep sided, flat bottomed. Depth 0.8m.
321 **W 382**	Oval prospecting pit	Area 8	Early	An elongated oval pit, measured 2.5m x 1.5m orientated north-west to south south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.5m.
322 **W 383**	Oval prospecting pit	Area 8	Early	An elongated oval pit, measured 3.5m x 3.0m orientated north north-west to south south-east. Infilled with mixed clays. Steep sided, flat bottomed. Depth 1.5m.
323 **W 385**	Oval prospecting pit	Area 8	Early	An elongated oval pit, measured 2.1m x 1.2m orientated east-north-east to west-south-west. Infilled with mixed clays. Steep sided, flat bottomed. Depth 0.8m.

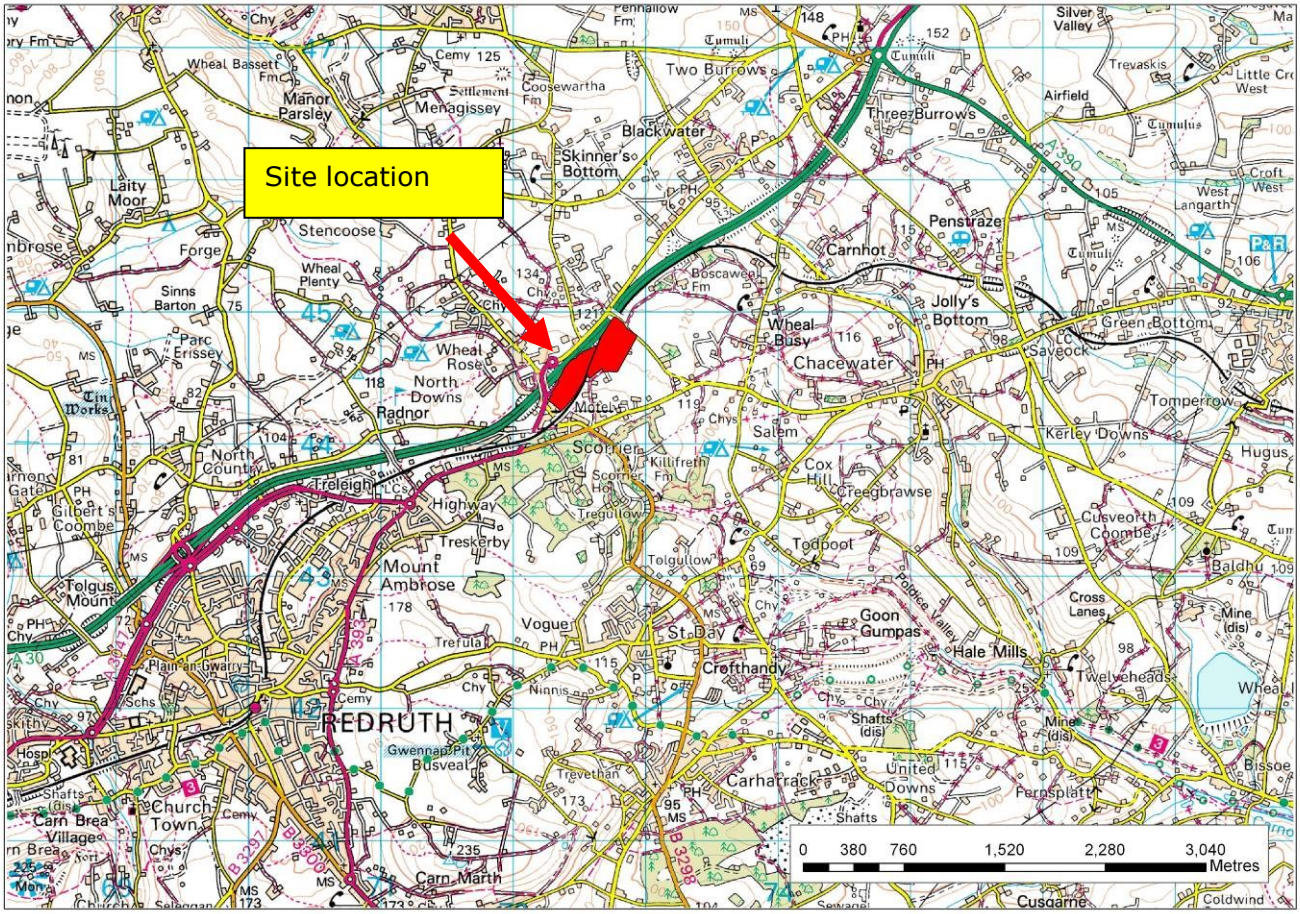

Figure 1. Site location.

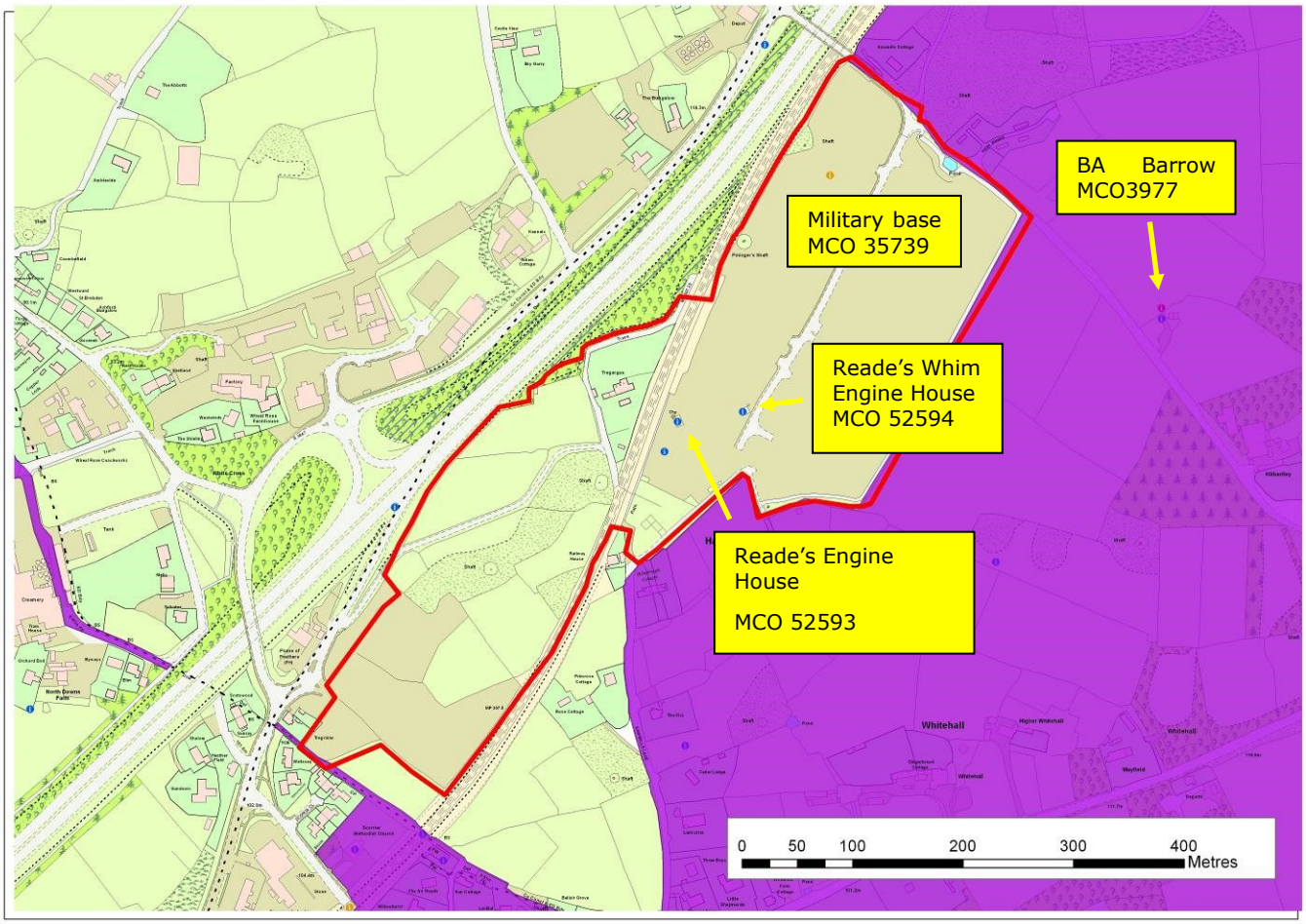

Figure 2. Site showing relationship to the Cornish Mining World Heritage site (purple) and features recorded in the Cornwall and Scilly HBSMR.

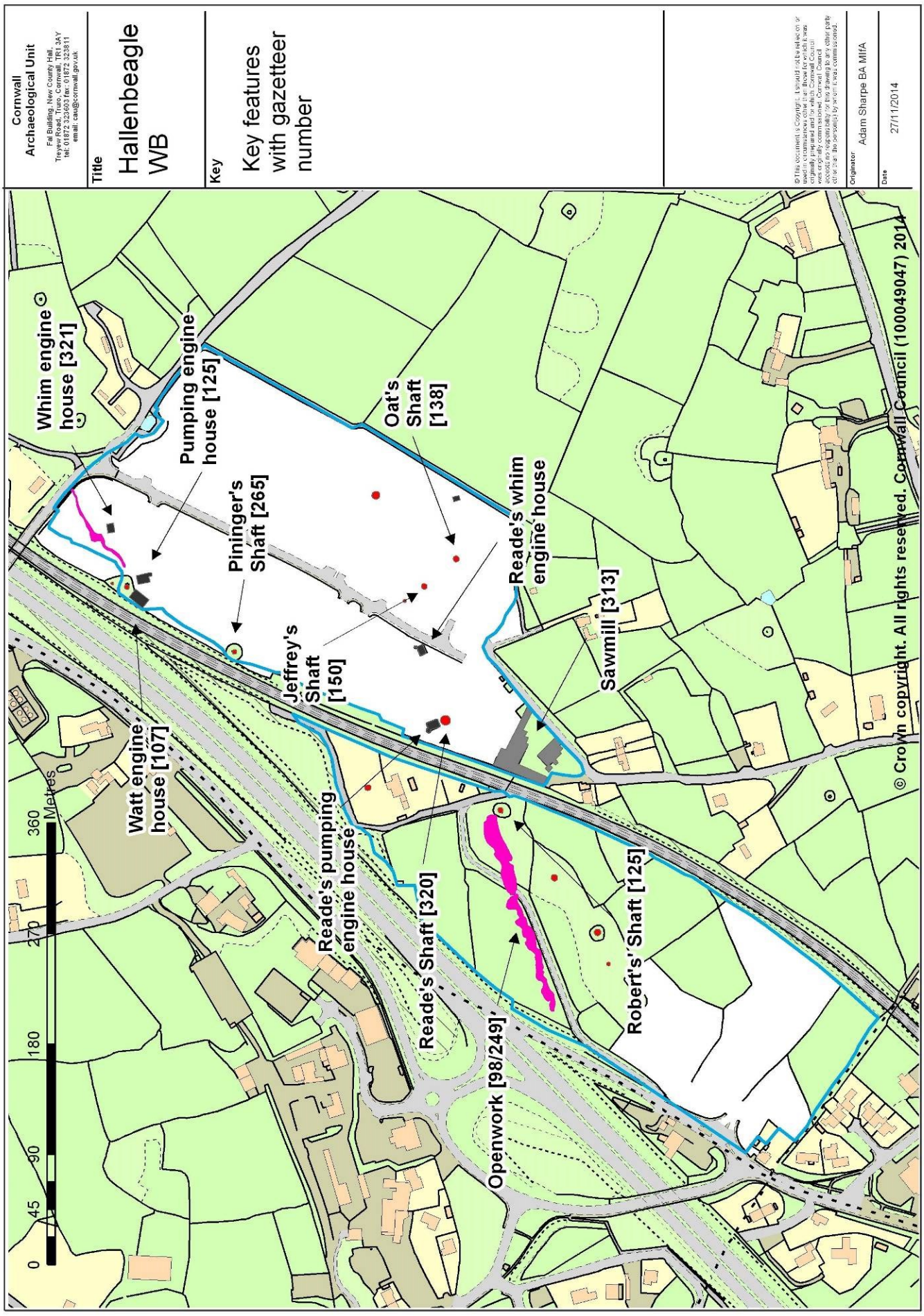

Figure 3. Hallenbeagle. Key features mentioned in text.

Figure 4. Combined Parish Tithe Maps of Kenwyn (detached) 1840, St Agnes 1841, Redruth 1841, and Gwennap 1839 showing the project area.

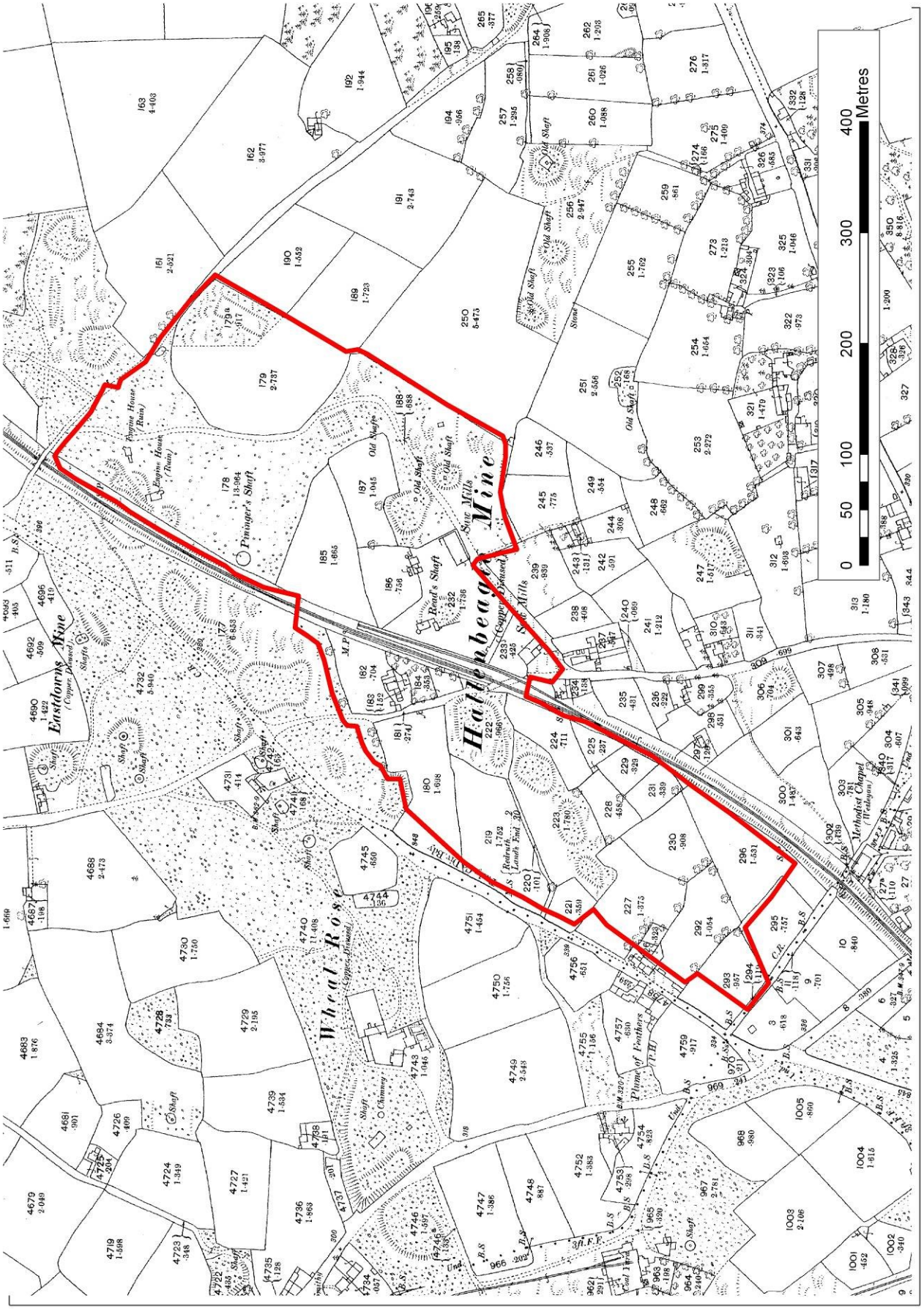

Figure 5. First Edition of the Ordnance Survey 25 Inch Map, c1877

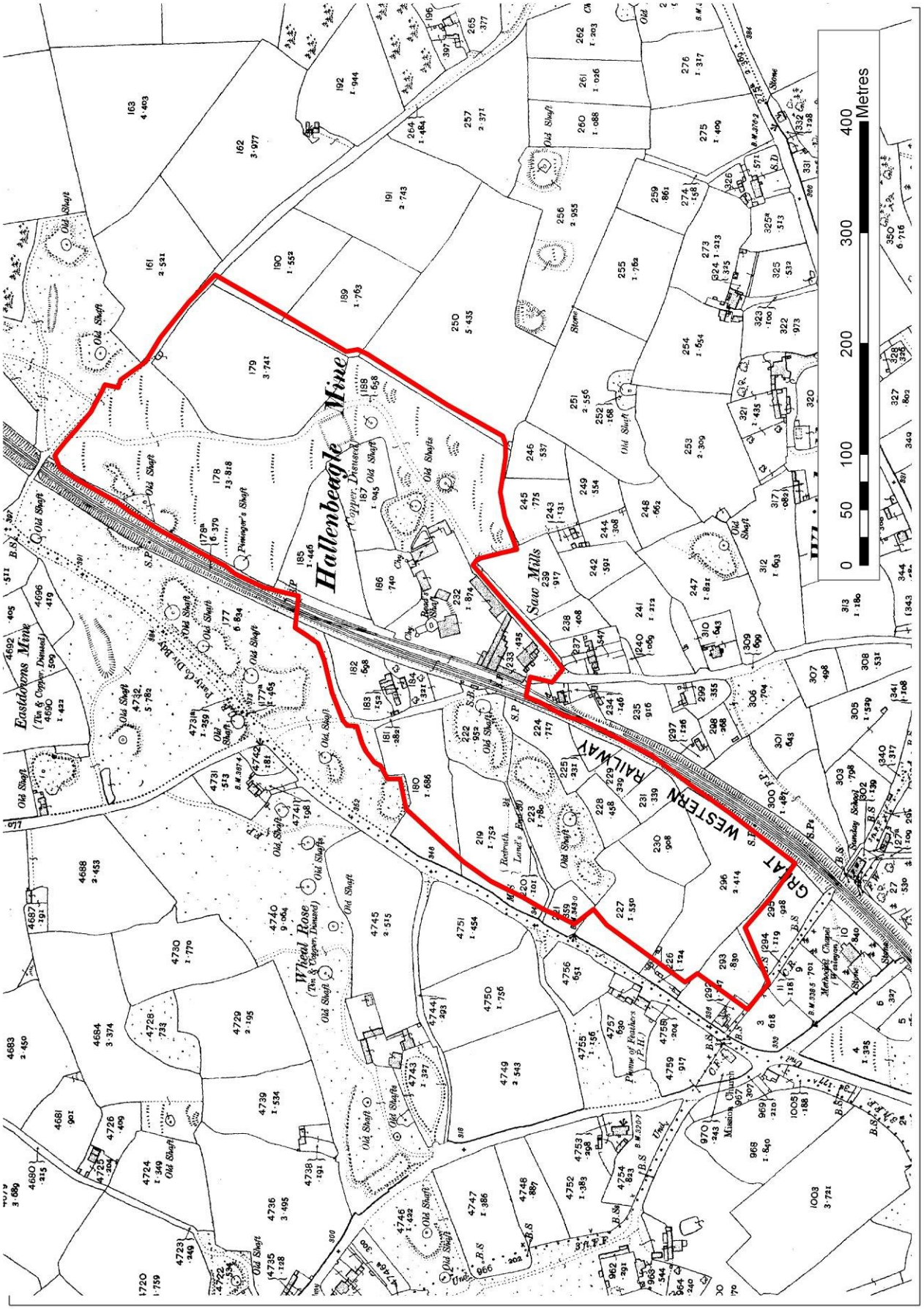

Figure 6. Second Edition of the Ordnance Survey 25 Inch Map, c1907

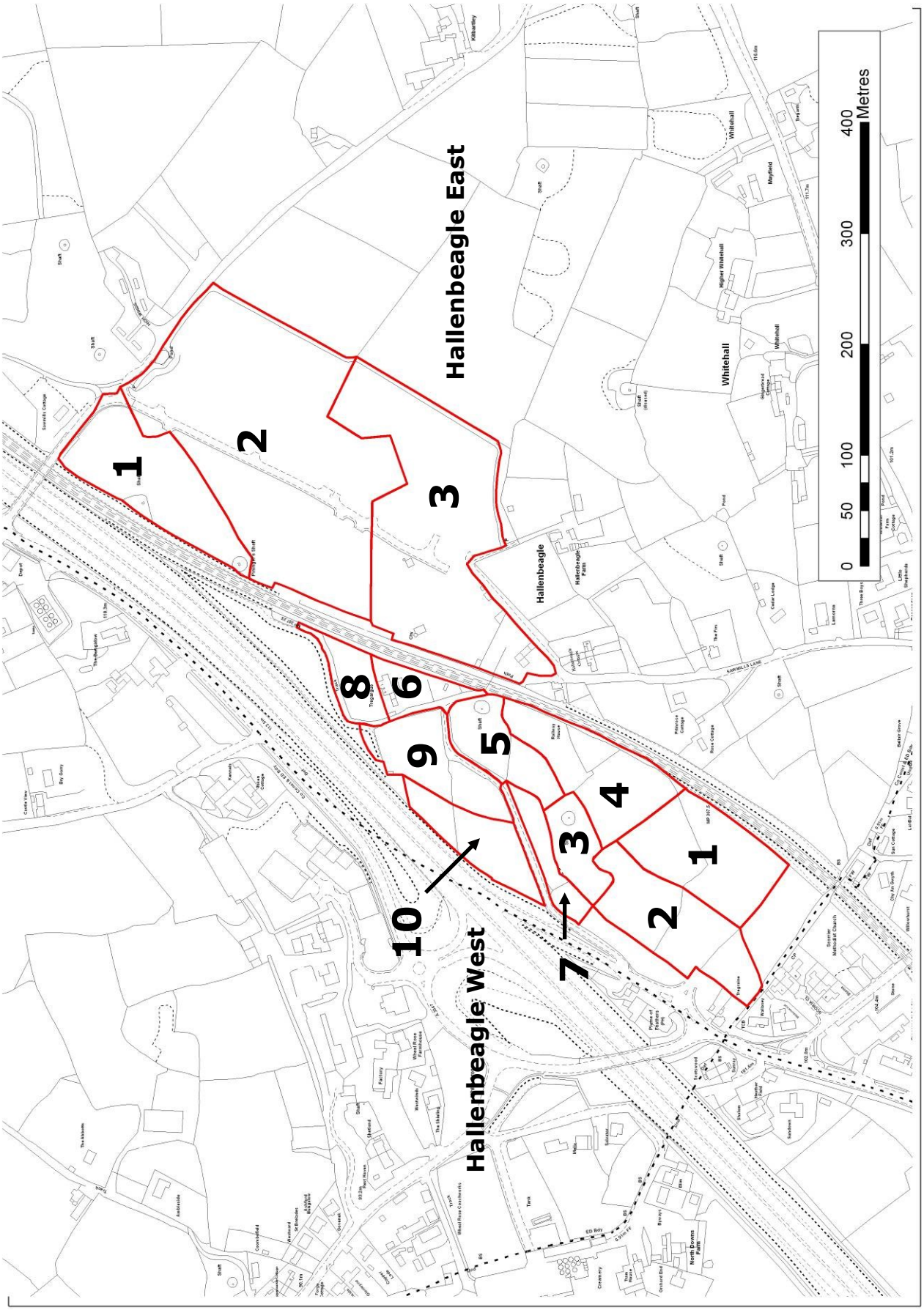

Figure 7. Hallenbeagle. Showing Project Areas and sub-divisions.

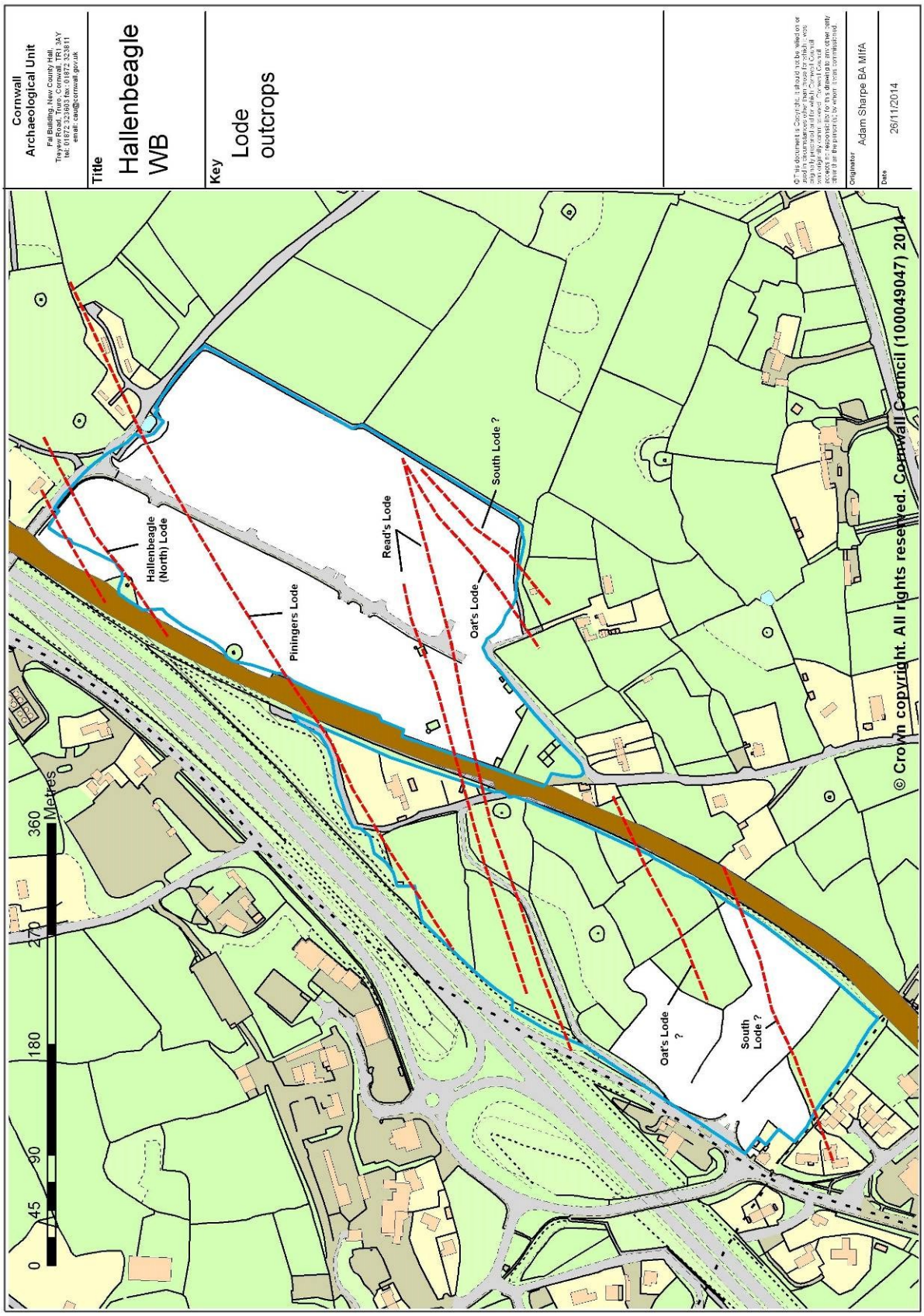

Figure 8. Hallenbeagle. Lode outcrops across site.

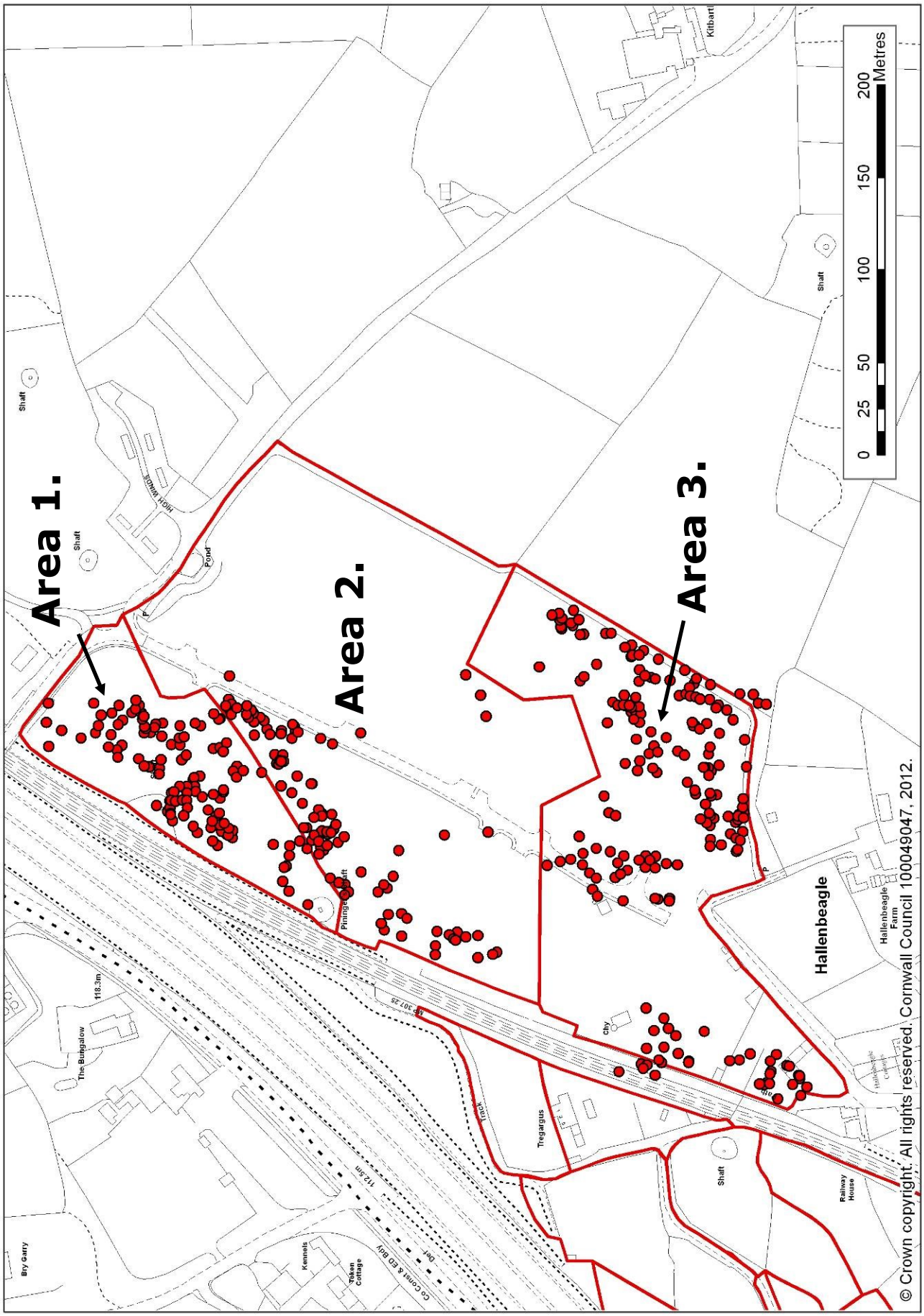

Figure 9. Hallenbeagle East. Areas 1, 2, and 3 showing plots of features plotted using Garmin 12 hand-held GPS system. Red dots represent points recorded on archaeological features and listed in gazetteer Appendix 1. Note recording errors resulting from drift resulting in the mis-plotting of some features, notably those near the railway line.

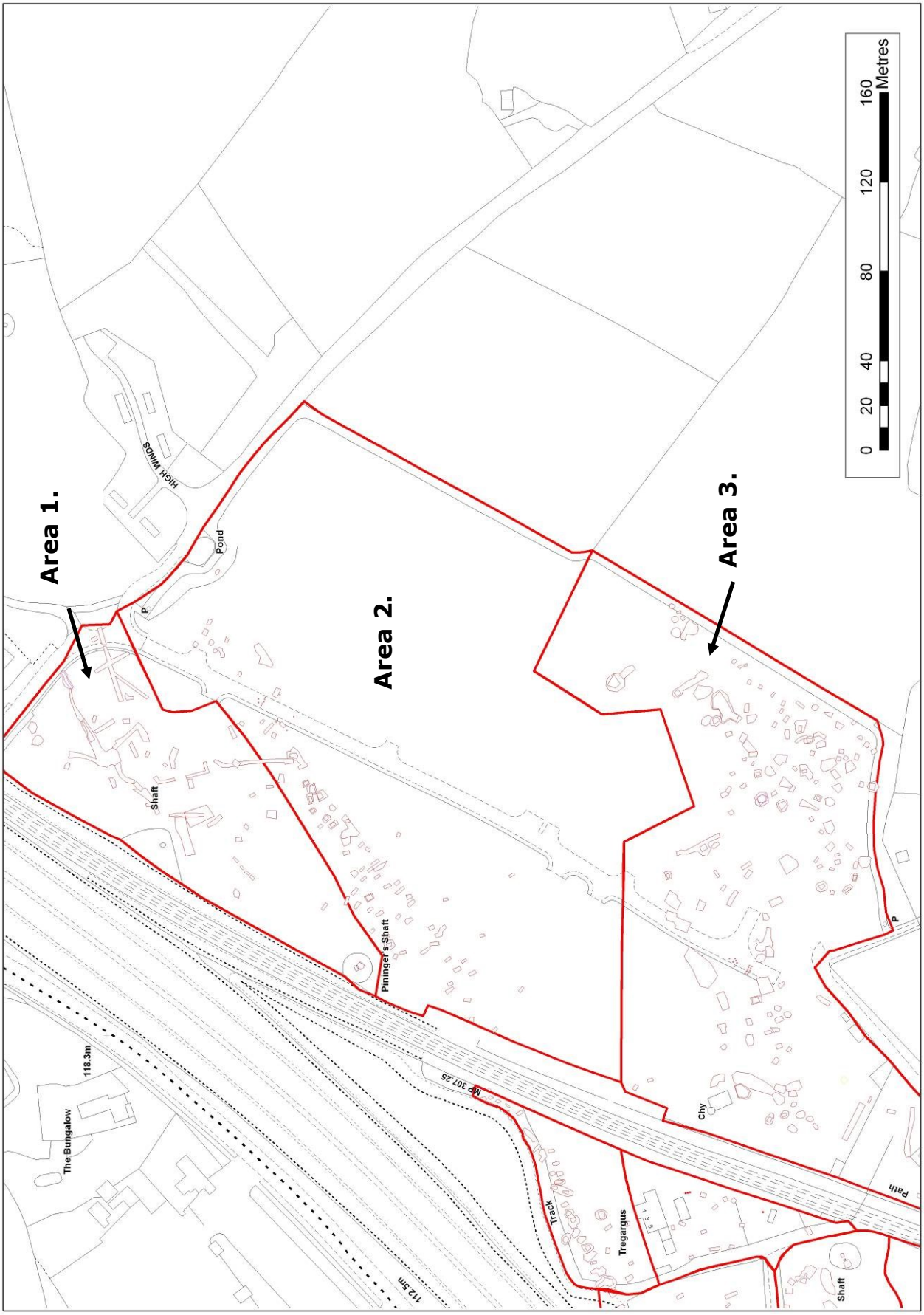

Figure 10. Hallenbeagle East. Survey of mining features. Produced by, and used with the permission of Kemp Chartered Land & Engineering Surveyors.

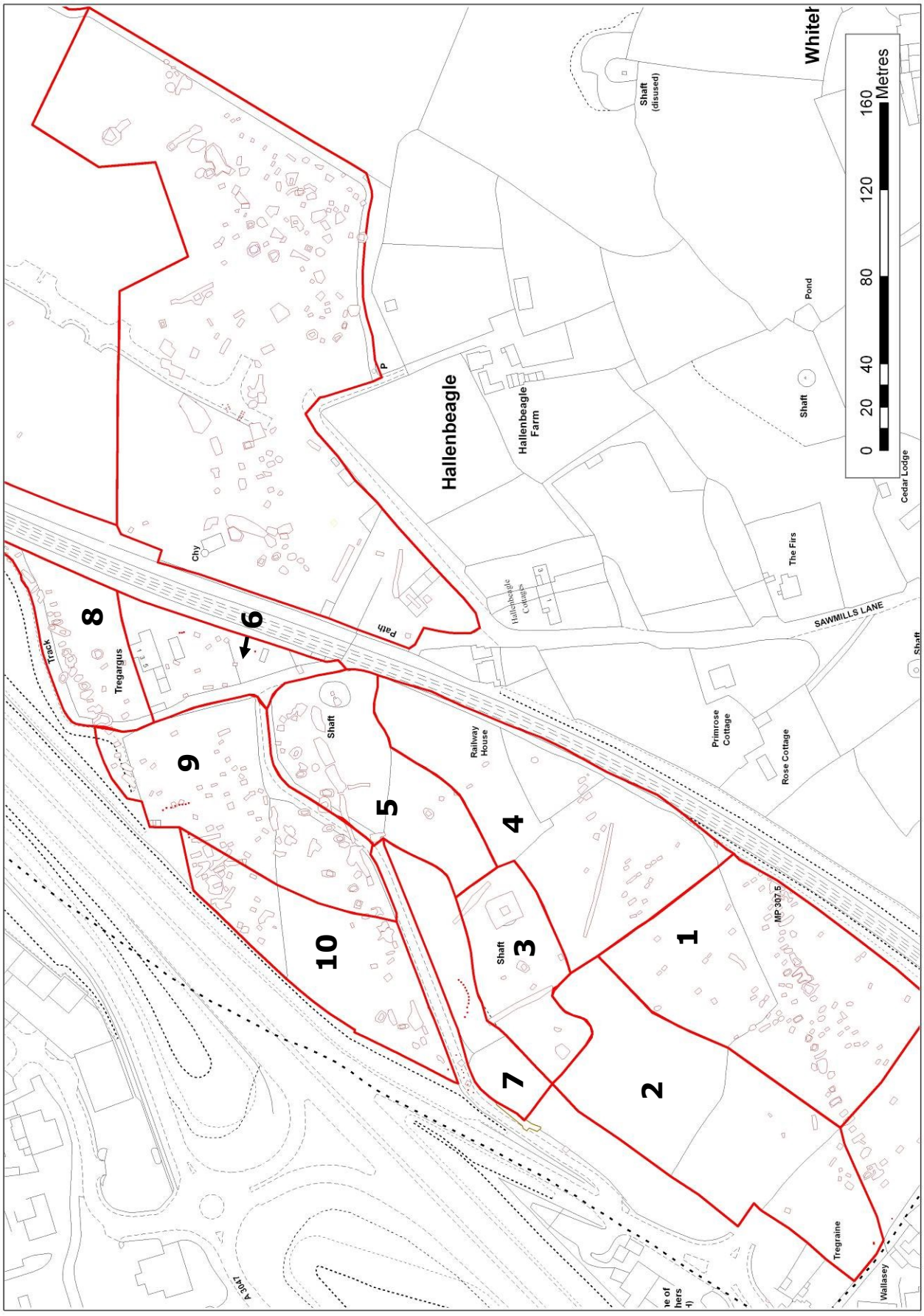

Figure 11. Hallenbeagle West. Survey of mining features. Produced by, and used with the permission of Kemp Chartered Land & Engineering Surveyors.

Figure 12. Hallenbeagle. The Phase 1 (earlier) mining features and lode outcrops.

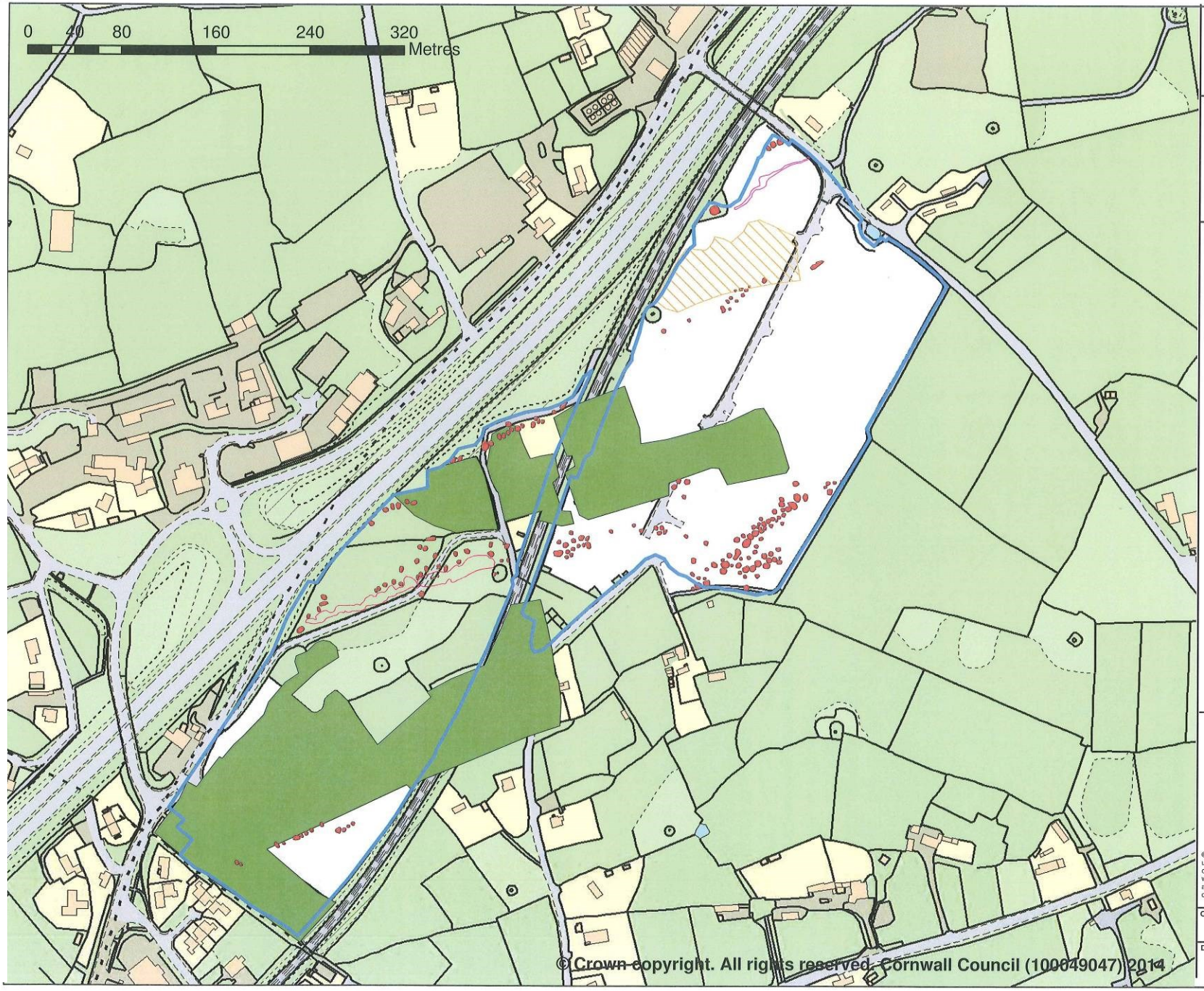

Figure 13. Hallenbeagle. The Phase 2 mining features.

Figure 14. Hallenbeagle. The Phase 3 mining features.

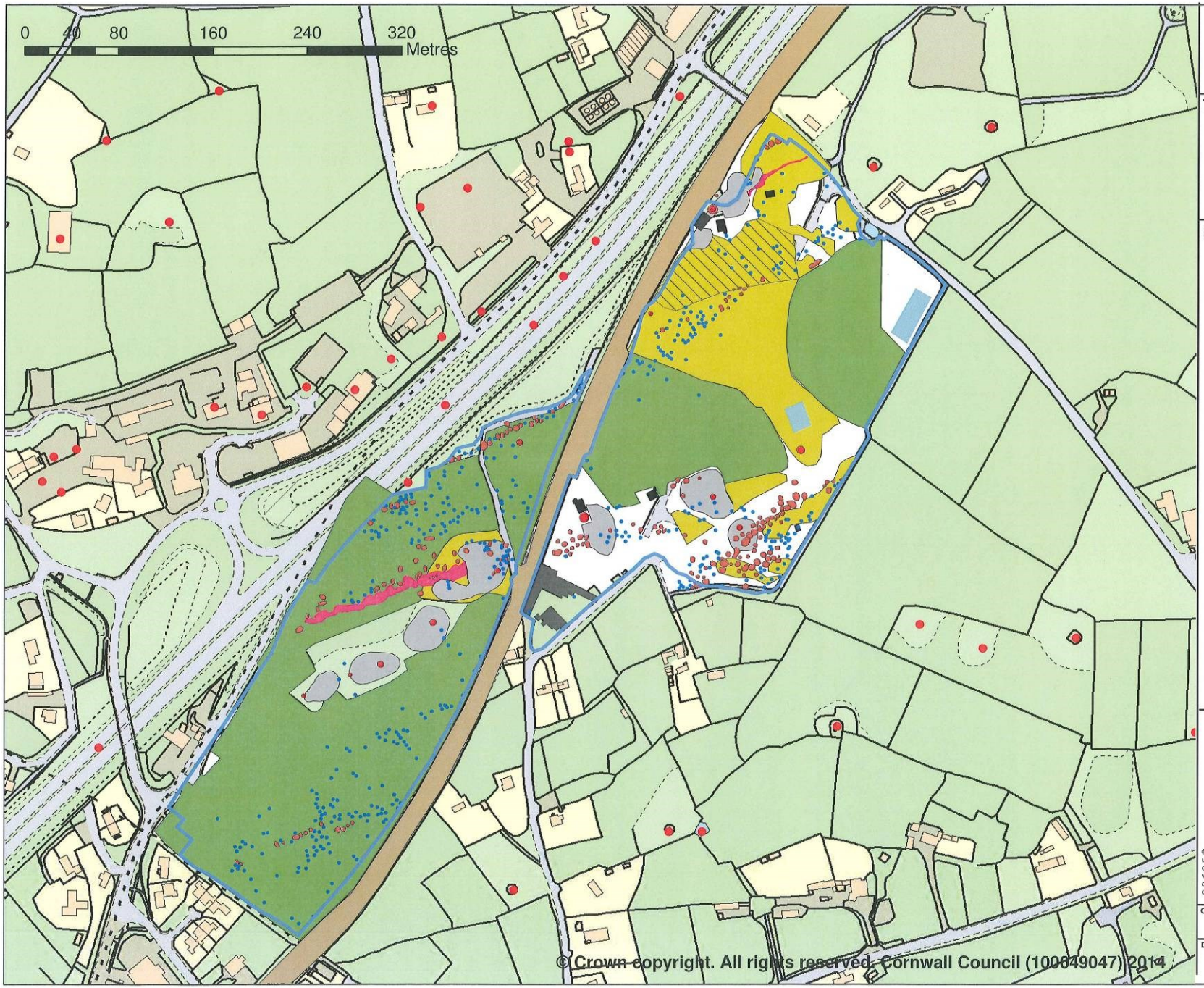

Figure 15. Hallenbeagle. Summary of all features encountered.

Figure 16. Hallenbeagle. Aerial photograph taken by the Royal Air Force in 1946. The disturbed nature of the site (upper centre) is particularly clear in this image.

Figure 17. Hallenbeagle East. Outcrop shafts [116], [117], [126], [127] and [128] to the south of Shaft [17] which is in the process of being excavated.

Figure 18. Hallenbeagle East. Outcrop shafts [35], [66], [67], [68] and [70]. Looking south-west.

Figure 19. Hallenbeagle East. Outcrop shaft [184] looking north-east. Prospecting pit [185] in background. Scale bar = 2.0m.

Figure 20. Hallenbeagle East, Area 3. Prospecting pits [246] to [250] looking north. Scale bar = 2.0m.

Figure 21. Hallenbeagle East. Settling tanks [274], [275], [276] and [277] and leat/launder channel [257]. The latter lies immediately to the left of the scale. View looking north-east. Scale bar = 2.0m.

Figure 22. Hallenbeagle East. Settling tank [113]. Top of settling tank seen 0.80m under topsoil. Looking south-east. Scale bar = 2.0m.

Figure 23. Hallenbeagle East. Area 1. Remnants of engine house [107] possibly that for an engine built by James Watt. Scale bar = 2.0m.

Figure 24. Hallenbeagle East. Area 3. Footings of sawmill [313]. Part of north-west side (see fig 22). Scale bar = 2.0m.

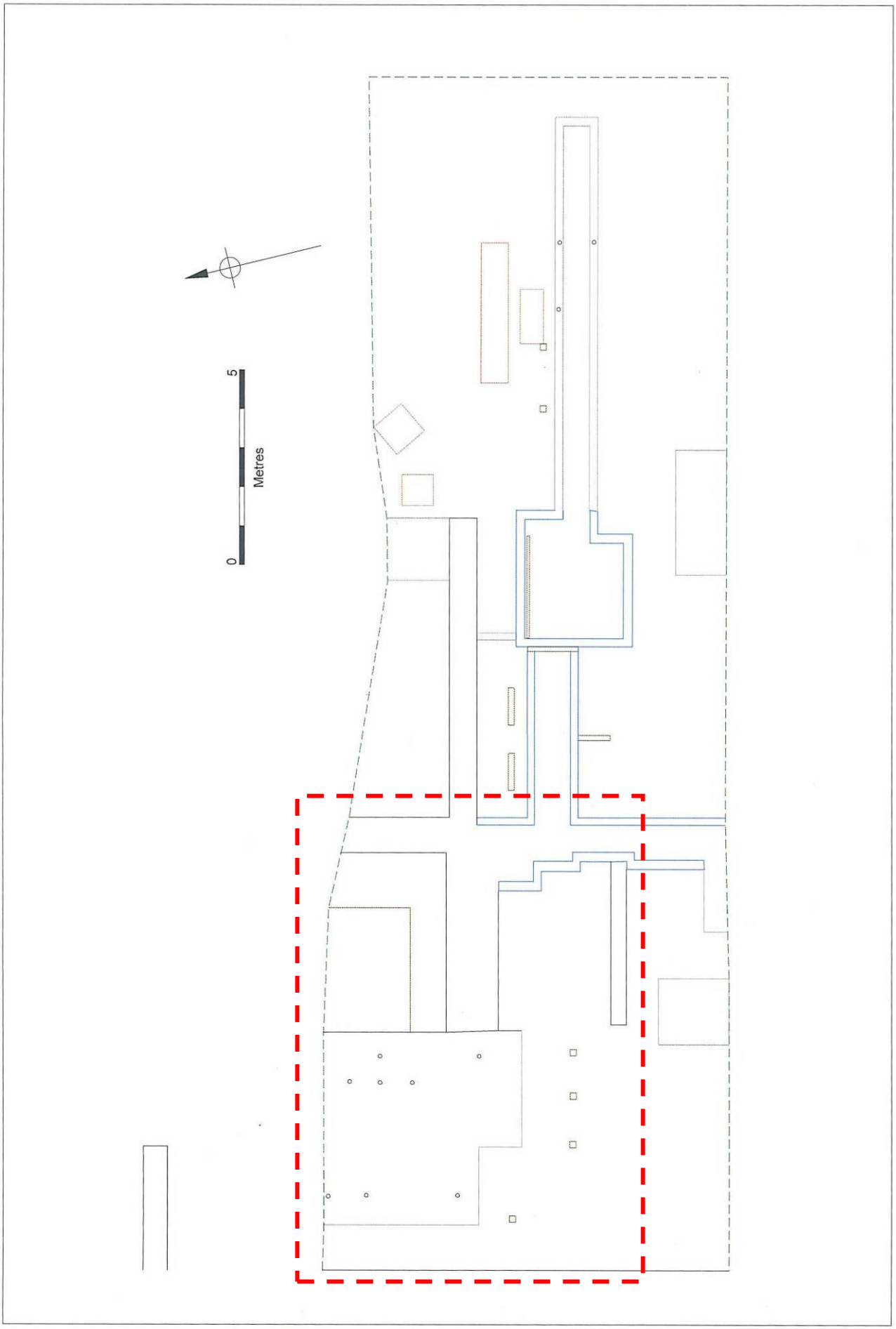

Figure 25. Hallenbeagle East. Area 3. Detailed survey of sawmill remains [313]. Area highlighted within red box is that shown within Fig 22.

Figure 26. Hallenbeagle West. Shaft [125] after removal of capping showing the steel beams which had supported its concrete cap.

Figure 27. Hallenbeagle West. Shaft [236] showing rock cut ledge seating for blocking arch.

Figure 28. Hallenbeagle West. Prospecting pit [179]. Scale bar = 2.0m.

Figure 29. Hallenbeagle West. Pit [219] and others around shaft [125] seen as concrete plug in background. Scale bar = 2.0m.

Figure 30. Hallenbeagle West. Openwork [249]. Excavation in progress with the swing shovel sitting completely within the feature.

Figure 31. Hallenbeagle West Openwork [249]. Excavation of north-east terminal.

10 Appendix 3: Brief for Archaeological Recording

Date: 28/06/2012

Address: Hallenbeagle Mine, Scorrier, Cornwall

Application: C1/MC04/0836/07/B

HBSMR: CCO4078

Applicant:

Agent:

Historic Environment Planning Advice Officer: Dan Ratcliffe, Cornwall Council, Historic Environment Service, Kennall Building, Old County Hall, Truro TR1 3AY. Tel. 01872 01726 223463 E-mail. dratcliffe@cornwall.gov.uk

Local Planning Authority Officer:

This brief is only valid for six months. After this period the Historic Environment Planning Advice Officer (HEPAO) should be contacted. Any written scheme of investigation (WSI) resulting from this brief shall only be considered for the same period. The contractor is strongly advised to visit the site before completing their WSI as there may be implications for accurately costing the project.

Contractors Written Scheme of Investigation (WSI)

No ground works are to be undertaken until the HEPAO and the Local Planning Authority (LPA) have approved the archaeological contractor's WSI.

1 Introduction

This brief has been written by the HEPAO and sets out the minimum requirements for archaeological recording at the above site. This work is required to discharge condition 16 of planning application C1/MC04/0836/07/B placed on the development.

2 Site Location and Description

This site is located at SW 7276 4474 and consists of a former mining site characterised by an area of enclosed land currently used as horse paddocks, areas covered in historic mining spoil and an area previously used as an encampment by the traveller community.

3 Planning Background

Planning application C1/MC04/0836/07/B related to modifying conditions for a former warehouse development on this site and was submitted in 2007 This application has been approved subject to 16 conditions. Condition 16 states:

The developer shall appoint an archaeological contractor not less than 3 weeks prior to the commencement of any ground disturbance on site, whether in relation to Phase 1 of the development or in relation to the remainder of the permitted scheme, and shall provide them or any other nominated archaeologist reasonable access in order to record archaeological remains uncovered during their work. The work of the archaeological investigation including any necessary fencing shall be carried out in accordance with an archaeological brief which shall have first been submitted to and approved in writing by the Local Planning Authority.

Reason: To ensure that any archaeological remains on the site are recorded, given the historical and land use history of the site, in accordance with the aims and intentions of Cornwall Structure Plan 2004 Policy 2 and Carrick District Wide Local Plan 1998 Policy 4T.

The applicant, their agents and any subcontractors should note that where there are other conditions requiring satisfaction in advance of the commencement of works on

site; it is the responsibility of the applicant to liaise with the planning officer concerned to ensure that the timetabling of these works is managed .

4 Archaeological Background

This site was historically a copper mine dating from the early 18th century with its greatest period of production dating to the late 18th-early 19th century during which time 4 main lodes were worked. At this time the landscape of the site is shown on historic maps to have consisted of areas of mineral working and processing, spoil deposition and fields created for industrial smallholders. Most spoil heap areas on this site show evidence of having been re-worked over the late 19th to 20th centuries however the EIA notes a number of capped shaft sites and other areas where there is some potential for surviving industrial remains. Engine houses for pumping and winding serving Read's Lode survive immediately adjacent to the current application site and are Listed Grade II. A block of smallholder fields bounded by walling reusing industrial waste including, notably, copper smelting slags survive within the site. Copper smelting is thought to have taken place on this site prior to the mid 18th century by which time it proved more economical to export copper ores to south Wales for smelting. If a smelting site were to survive on this site it would be a rare and significant discovery with much potential for research. Following the mine's closure in the later 19th century the area around Read's Shaft was reused by a sawmill and small scale concrete works. Parts of the site were reclaimed to agriculture in the later 19th century whilst during WWII other parts are thought to have been cleared in preparation for the establishment of a D-Day mustering and training camp. Traveller occupation of this site is well established.

The significance of the site in archaeological terms is in its potential to contain important evidence for the conduct of metalliferous mining industries. Intervention to remediate and prepare the ground for new development will remove this significance and this will require mitigation in the form of archaeological monitoring. The area of smallholder fields within the site has some added potential for older archaeological remains to be encountered and it will also be necessary for a record to be made of the unusual and characterful walling present in this area.

5 Requirement for Work

Ground works associated with the development may disturb buried archaeological remains. It is therefore important that a suitably qualified archaeologist(s) is/are present during these works in order to identify and record any features of interest.

The generic site specific aims of a watching brief are to:

- Establish the presence/absence of archaeological remains
- Determine the extent, condition, nature, character, date and significance of any archaeological remains encountered
- To establish the nature of the activity on the site
- To identify any artefacts relating to the occupation or use of the site

Aims specific to this site include;

- **"Widen our understanding of the extraction, processing and transportation of minerals"** (SWARF Research Aim 38)
- Identify and study particularly early examples of mining technology.
- Identify, record and further understanding of any evidence of copper smelting on this site.
- Record and place in social context evidence for the development of mining and related landscapes.

6 General Methodology

6.1 All stages of the investigation shall be supported by a written scheme of investigation (WSI).

6.2 The archaeological contractor is expected to follow the code of the Institute for Archaeologists (IfA).

6.3 Details including the name, qualifications and experience of the site director and all other personnel (including specialist staff) shall be included within the WSI.

6.4 All of the latest Health and Safety guidelines shall be followed on site.

6.5 The IfA's Standards and Guidance should be used for additional guidance in the production of the WSI, the content of the report and the general execution of the project.

6.6 Terminology will be consistent with the English Heritage Thesaurus.

7 Archaeological Recording Methodology

7.1 Prior to the commencement of on site works the archaeological contractor should familiarise themselves with the site by examining the information held by the Cornwall and Scilly Historic Environment record (HER), the Cornwall Records Office at Truro, the Cornwall Centre at Redruth and other key archives where appropriate.

7.2 An archaeologist shall be present during all ground works associated with the development, unless circumstances dictate a different approach. A toothless ditching bucket shall be used for the removal of any overburden until the first archaeological horizon is exposed where appropriate. This will then be hand cleaned as appropriate.

7.3 Surviving remains which will be disturbed or destroyed by the development shall be archaeologically recorded, in proportion to the aims stated above.

7.4 Details of how all archaeological contexts and artefacts will be excavated, surveyed, recovered and recorded shall be provided. The site will be tied into the national grid.

7.5 Details of the site planning policy shall be given in the WSI. The normal preferred policy for the scale of archaeological site plans is 1:20 and sections 1:10, unless circumstances indicate that other scales would be more appropriate.

7.6 The photographic record shall consist of prints in both black and white and colour together with the negatives. Digital photography may be used for report illustration. For both general and specific photographs, a photographic scale shall be included. In the case of detailed photographs it may be appropriate to include a north arrow. The photographic record shall be accompanied by a photographic register detailing as a minimum, feature number, location and direction of shot.

7.7 If significant archaeological deposits are exposed, all works must cease and a meeting convened with the client and the HEPAO to discuss the most appropriate way forwards.

8 Finds

8.1 All finds, where appropriate, will be retained from each archaeological context excavated.

8.2 All finds, where appropriate, shall be washed.

8.3 All pottery, and other finds, where appropriate, shall be marked with the site code and context number.

8.4 The WSI shall include an agreed list of specialist consultants, who may be required to conserve and/or report on finds, and advise or report on other aspects of the work including environmental sampling.

8.5 The requirements for conservation and storage shall be agreed with the Royal Cornwall Museum prior to the start of work, and confirmed in writing to the HEPAO.

8.6 Finds work should be to accepted professional standards and adhere to the Institute for Archaeologists *Guidelines for Finds Work*.

8.7 Environmental sampling should be guided by *Environmental Archaeology* (English Heritage Centre for Archaeological Guidelines. 2001/02).

8.8 Further English Heritage guidance that may be helpful includes *Geoarchaeology* (2004) and *Archaeometallurgy* (2001).

8.9 The English Heritage Advisor for Archaeological Science will be able to provide archaeological science advice if required (Vanessa Straker 0117 975 0689).

9 Human Remains

9.1 Any human remains which are encountered must initially be left in situ and reported to the HEPAO and the appropriate authorities (the Coroner), where appropriate. If removal is necessary this must comply with the relevant Government regulations. If burials are encountered their legal status must be ascertained and recording and/or removal must comply with the legal guidelines.

9.2 If human remains are not to be removed their physical security must be ensured, preferably by back filling as soon as possible after recording.

9.3 If human remains are to be removed this must be done with due reverence and in accordance to current best practice and legal requirements. The site must be adequately screened from public view. Once excavated, human remains must not be exposed to public view.

10 Results

10.1 The full report including all specialist assessments of artefact assemblages shall be submitted within a length of time (but not exceeding six months) to be agreed between the applicant and the archaeological contractor, Cornwall County Council Historic Environment Service and the Royal Cornwall Museum. A further digital copy shall be supplied on CD-ROM preferably in 'Adobe Acrobat' PDF format.

10.2 The archaeological contractor will undertake the English Heritage/ADS online access to the index of archaeological investigations (OASIS).

10.3 This report will be held by the Cornwall and Scilly Historic Environment Record (HER) and made available for public consultation.

10.4 The report must contain:

- A concise non-technical summary of the project results.
- The aims and methods adopted in the course of the investigation.
- A discussion of the archaeological findings in terms of both the site specific aims and the desk based research.
- A location map, a drawing showing those areas examined as part of the archaeological recording, and copies of any archaeological plans and sections. All plans shall be tied to the national grid.
- All specialist reports and assessments.
- A summary of the archive contents and date of deposition.
- A context register with brief descriptions shall be included as an appendix.
- A copy of the brief and the approved WSI will be included as an appendix.

10.5 A contingency shall be made within the costs for full publication in an appropriate journal, and for presentation of results to the public, for instance in the form of talks to interested groups or press releases, web content etc. The HEPAO will notify the contractor of such a need within four weeks of receipt of the report.

11 Archive Deposition

11.1 An ordered and integrated site archive will be prepared in accordance with: *Management of Research Projects in the Historic Environment (MoRPHE) English Heritage 2006* upon completion of the project. The requirements for archive storage shall be agreed with the Royal Cornwall Museum. Please check the accessioning and deposition information on the Royal Cornwall Museum website and fill in the 'Notification of Fieldwork' form. Once this has been accepted an accession number will be provided by the museum.

http://www.royalcornwallmuseum.org.uk/policies/

11.2 If the finds are to remain with the landowner a full copy of the documentary archive shall be housed with the Cornwall County Record Office and with the Courtney Library of the Royal Institution of Cornwall.

11.3 The archive including a copy of the written report shall be deposited with the Royal Cornwall Museum within two months of the completion of the full report and confirmed in writing with the HEPAO.

11.4 Where there is only a documentary archive this will be deposited with the Cornwall Record Office as well as the Courtney Library of the Royal Institution of Cornwall.

11.5 A copy of the report will be supplied to the National Monuments Record (NMR) in Swindon.

11.6 A summary of the contents of the archive shall be supplied to the HEPAO.

11.7 Only on completion of 11.1 to 11.5 (inclusive) will there be a recommendation for the discharge of any archaeological recording condition.

12 Monitoring

12.1 The HEPAO will monitor the work and should be kept regularly informed of progress.

12.2 Notification of the start of work shall be given preferably in writing to the HEPAO at least one week in advance of its commencement.

12.3 Any variations to the WSI shall be agreed with the HEPAO, preferably in writing, prior to them being carried out.

11 Appendix 4: WSI Hallenbeagle, Scorrier: Project Design for an archaeological watching briefHistoric Environment Projects

Client: Ward Williams Associates

Client contact: Jeremy Dunn

Client tel: 01872 272906

Client email: JeremyDunn@wwasurveyors.com

Site history

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 re-worked, though much less successfully, during the mid-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 this period, whilst a smallholding (possibly laid out an occupied by a local miner) was established, occupying the central part of the development site.

The mine was shown as active in 1840 on the Kenwyn 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 (in the northern part of the proposal area), Stone Shaft and Eastern Shaft (just to the north-east of the proposal area); Read's Lode was worked from Read's (Reade's or Reed's) Shaft where there are the remains of a pumping and winding engine house, as well as three un-named shafts and Jeffrey's Shaft (Read's Shaft being just to the south of the proposal area, two of the un-name shaft lying on its fringes; Jeffrey's Shaft and the other un-named shaft are just to its south-east). Other lodes worked were Oats Lode, worked from Oat's Shaft just to the south-east of the proposal area and South Lode, developed by a number of shafts to the south of the proposal area. 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 site had been reclaimed to agriculture. A sawmill developed on the southern part of the site during the late 19th century remained active into the early years of the 20th century, the area of the former mine around Read's Shaft subsequently being modified to site a small-scale concrete plant.

By 2005 (CCC aerial photographic evidence) the central and north-eastern areas of the site had been reclaimed to agriculture and the southern parts of the site were in scrubby 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 site were occupied by a number of static caravans and their curtileges; the central part of the site was occupied by a number of smallholders' fields first shown on the 1809 OS mapping. The south-eastern part of the site had scrubbed in, as had the southern corner of the site and the area around Read's engine houses.

The engine house and a detached chimney (formerly associated with a now-demolished whim engine house) in the southern part of the Hallenbeagle site are listed Grade II. Hallenbeagle is bordered to the east and south by the Cornish Mining World Heritage Site.

The mine is located immediately to the east of the Cornwall main railway line just to the north-east of Scorrier. It is centred at SW 72740 44727 at an average height of 75m OD. The underlying geology consists of the mid to late Devonian Porthtowan Formation, part of the Gramscatho Group of metamudstones and metasandstones.

Project Background

Planning application C1/MC04/0836/07/B relates to modifying conditions for a former warehouse development on this site and was submitted in 2007. This application has been approved subject to 16 conditions. Condition 16 states:

The developer shall appoint an archaeological contractor not less than 3 weeks prior to the commencement of any ground disturbance on site, whether in relation to Phase 1 of the development or in relation to the remainder of the permitted scheme, and shall provide them or any other nominated archaeologist reasonable access in order to record archaeological remains uncovered during their work. The work of the archaeological investigation including any necessary fencing shall be carried out in accordance with an archaeological brief which shall have first been submitted to and approved in writing by the Local Planning Authority.

Reason: To ensure that any archaeological remains on the site are recorded, given the historical and land use history of the site, in accordance with the aims and intentions of Cornwall Structure Plan 2004 Policy 2 and Carrick District Wide Local Plan 1998 Policy 4T.

The applicant, their agents and any subcontractors should note that where there are other conditions requiring satisfaction in advance of the commencement of works on site; it is the responsibility of the applicant to liaise with the planning officer concerned to ensure that the timetabling of these works is managed .

Relevant elements of the development work on site will include the following:

- Establishment of a levelled site compound
- Groundworks to create the internal site road
- Works to connect the site road to the public highway
- Creation of a public bridleway
- Laying of services
- Treatment of extensive Japanese knotweed infestations, requiring, in some areas, large area excavations down to bedrock and removal of contaminated material
- Treatment of mine shafts and outcrop mining features by excavation, and exposure, followed by plugging or capping
- Removal or levelling of mine waste, contaminated soils, rubbish, rubble and other materials
- Extensive removal of topsoil and superficial materials and grading of the site to enable the development of components of the Biopark.

The brief states a requirement for work as follows:

Ground works associated with the development may disturb buried archaeological remains. It is therefore important that a suitably qualified archaeologist(s) is/are present during these works in order to identify and record any features of interest.

The generic site specific aims of a watching brief are to:

- Establish the presence/absence of archaeological remains
- Determine the extent, condition, nature, character, date and significance of any archaeological remains encountered
- To establish the nature of the activity on the site
- To identify any artefacts relating to the occupation or use of the site

Aims specific to this site include;

- **"Widen our understanding of the extraction, processing and transportation of minerals"** (SWARF Research Aim 38)
- Identify and study particularly early examples of mining technology.
- Identify, record and further understanding of any evidence of copper smelting on this site.
- Record and place in social context evidence for the development of mining and related landscapes.

Research questions

To determine the history of landscape development for this area characterised by former heathland, smallholdings, early copper mining and subsequent occupation by the military during the run-up to D Day.

Project extent

The project area consists of the eastern half of the Hallenbeagle redevelopment area, and is centred at SW 72471 44743.

Previous archaeological work

The Hallenbeagle site was the subject of a 2001 archaeology and cultural heritage chapter in an Environmental Impact Assessment undertaken by IHC Consultants (Williams, n.d.).

The area at and surrounding Hallenbeagle was also included within a study of the wider Wheal Busy landscape (Sharpe 1989 ECO331), the Mineral Tramways scoping project (Sharpe et al 1990), the Mineral Tramways Conservation Management Plan (Buck 2006 ECO1185), the World Heritage Site mapping, nomination document and management plan (WHS team 2005); it was also considered in the light of the proposed English Nature HEATH Project (ECO2644) and during the consideration of development proposals for the site (ECO1333 and ECO3081).

The north-western part of the Hallenbeagle site, proposed for redevelopment by Corny Environmental Ltd., was the subject of an EIA archaeology chapter written by Historic Environment Projects, Cornwall Council in May 2011.

This was followed up by a subsequent re-assessment of the whole of the proposed development area by Historic Environment Projects (Sharpe 2011, report 2011R068 dated 29th June 2011).

Working methods

All recording work will be undertaken according to the Institute for Archaeologists *Standards and Guidance for Archaeological Investigation and Recording.* Staff will follow the IfA *Code of Conduct* and *Code of Approved Practice for the Regulation of Contractual Arrangements in Archaeology.* The Institute for Archaeologists is the professional body for archaeologists working in the UK.

A brief review of available information will be carried out to inform the watching brief. This will comprise the following material, summarised in Sharpe 2011:

- Published sources
- Historic maps, including

- Joel Gascoyne's map of Cornwall (1699)

- Thomas Martyn's map of Cornwall (1748),

- OS 1 inch survey (c1810)

- Kenwyn Tithe map (c1840),

- 1st and 2nd Editions of the OS 25 inch maps (c1880 and c1907)

- Modern maps
- Archive mine plans in the Cornwall Record Office
- Databases recording geology, soil types, Historic Landscape Character, Designations, Rights of Way

Fieldwork – watching brief

Archaeological recording of sub-surface features will be undertaken as a watching brief during a range of groundworks activities including road construction, treatment of areas infested with invasive weed species, the treatment of mining features and ground level reduction in advance of site development. Whilst some areas of the site will be specifically targeted on the basis of information gathered during the desk based assessment and walkover survey undertaken in 2011, specifically the sites of documented mine shafts and mine buildings and an area where surface evidence suggests the site of an early copper smelter, all areas of ground opened up will be inspected for evidence of archaeological features following the removal of superficial deposits or modern topsoil, as appropriate.

The contractor will be asked to undertake this phase of initial removal of material utilising a (toothless) grading bucket. The exposed surface will be checked for indications of sub-surface archaeology, which will be recorded using direct measurement, notes and/or photography as appropriate. Features will be located with reference to the site plan and by the use of a hand-held GPS unit. Where areas of particular interest or significance are revealed during the initial soil strip, a request will be made to the principal contractor for an allowance of time to undertake hand excavation of the feature followed by recording. Large areas stripped of their soil cover will be methodically walked for indications of any buried archaeology.

The contractor will be asked not to run machines over the stripped area until archaeological inspection and any subsequent recording works are complete. The area will be inspected by the site archaeologist and any archaeological features or layers exposed in the stripped area will be carefully excavated by hand and archaeologically recorded by written description, plan and section and photographic record as appropriate.

During the archaeological recording the archaeologist will identify and record any archaeological features that are revealed in the stripped area; the level of recording undertaken will be appropriate to the character/importance of the archaeological remains.

Surviving remains which will be disturbed or destroyed by the development shall be archaeologically recorded, in proportion to the aims stated above.

If complex and/or significant archaeological deposits are encountered then the archaeological requirements of the project should be reviewed by the client, the Historic Environment Planning Advice Officer and HE Projects. The significance of the remains

and the nature of any further recording should be agreed between the client, the Historic Environment Planning Advice Officer and HE Projects.

Where necessary the detailed archaeological recording may include:

- Excavation of archaeological features exposed in the stripped area and plotting them onto a base map.
- Production of plans and section drawings of the excavated features and recording of features using a continuous numbering system.
- Retrieval of artefacts.

In the case of mine shafts or near surface mining features where it would be hazardous to enter any open excavation, recording will be by means of high resolution digital photography and notes taken from an agreed safe vantage point.

Recording: general

Site drawings (plans, sections, locations of finds) will be made by pencil (4H) on drafting film; all plans will be linked to the Ordnance Survey Landline (electronic) map; 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. Sections will normally be drawn at 1:10 and plans at 1:20.
- All archaeological contexts will be described to a standard format linked to a continuous numbering sequence.
- Drawings and photographs will be recorded in a register giving details of feature number and location.
- Sealed/undisturbed archaeological contexts in the form of buried soils, layers or deposits within significant archaeological features (ditches and pits, etc) will be sampled for environmental evidence and dating material. In the event that significant organic remains are encountered, advice may be needed from Vanessa Straker (Regional Advisor for Archaeological Science). Any necessary environmental sampling will be guided by *Environmental Archaeology* (English Heritage Centre for Archaeological Guidelines. 2001/02).

Treatment of finds

The archaeological fieldwork may produce artefactual material.

- All finds will be collected in sealable plastic bags which will be labelled immediately with the context number or other identifier.
- All finds, where appropriate, will be retained from each archaeological context excavated.
- All finds, where appropriate, shall be washed.
- All pottery, and other finds, where appropriate, shall be marked with the site code and context number.
- The brief requires that this WSI shall include an agreed list of specialist consultants, who may be required to conserve and/or report on finds, and advise or report on other aspects of the work including environmental sampling. In this instance the finds advisor will be Carl Thorpe of HE Projects.
- All finds work will be to accepted professional standards and will adhere to the Institute for Archaeologists *Guidelines for Finds Work*.
- Given the tight timeframe for the completion of the WSI, the requirements for conservation and storage will be agreed with the Royal Cornwall Museum as

soon as possible following the start of work, and will be confirmed in writing to the HEPAO.

- Environmental sampling, should this be required, will be guided by *Environmental Archaeology* (English Heritage Centre for Archaeological Guidelines. 2001/02).
- The English Heritage Advisor for Archaeological Science will be requested for archaeological science advice if required (Vanessa Straker 0117 975 0689).

Human remains

Any human remains which are encountered will initially be left in situ and reported to the HEPAO and the appropriate authorities (the Coroner), where appropriate. If removal is necessary this must comply with the relevant Government regulations. If burials are encountered their legal status must be ascertained and recording and/or removal must comply with the legal guidelines. If human remains are not to be removed their physical security will be ensured by back filling as soon as possible after recording. If human remains are to be removed this will be done with due reverence and in accordance to current best practice and legal requirements. The site will be adequately screened from public view. Once excavated, human remains will not be exposed to public view.

Fieldwork: photographic recording

The photographic record shall consist of prints in both black and white and colour together with the related negatives. Digital photography will be used for report illustration. For both general and specific photographs, a photographic scale shall be included. In the case of detailed photographs it may be appropriate to include a north arrow. The photographic record shall be accompanied by a photographic register detailing as a minimum, feature number, location and direction of shot.

The photo record will comprise:

- general views
- examples of significant detail

Methodology for the archive standard photography is set out as follows:

- Photographs of details will be taken with lenses of appropriate focal length
- A tripod will be used to take advantage of natural light and slower exposures
- Difficulties of back-lighting will be dealt with where necessary by balancing the lighting by the use of flash
- A metric scale will be included in all views, except where health and safety considerations make this impractical.

Post-fieldwork tasks

Archiving

Following review with the HE Project Manager the results from the fieldwork will be collated as an archive in accordance with: *Management of Research Projects in the Historic Environment (MoRPHE) English Heritage 2006* upon completion of the project.

This will involve washing and cataloguing of finds, the indexing and cross-referencing of photographs, drawings and context records.

All records (context sheets, photographs, etc.) will be ordered, catalogued and stored in an appropriate manner (according to HE guidelines).

The site archive and finds will initially be stored at HE premises. The archive including a copy of the written report shall be deposited with the Royal Cornwall Museum within two months of the completion of the full report and confirmed in writing with the

HEPAO. The RCM will be notified of the commencement of the project and included in discussions for sampling and disposal as appropriate.

The full report including all specialist assessments of artefact assemblages shall be submitted within a length of time (but not exceeding six months) to be agreed between the applicant and the archaeological contractor, Cornwall Council Historic Environment Service and the Royal Cornwall Museum. A further digital copy shall be supplied on CD-ROM preferably in 'Adobe Acrobat' PDF format. This report will be held by the Cornwall and Scilly Historic Environment Record (HER) and made available for public consultation. A copy of the report will be supplied to the National Monuments Record (NMR) in Swindon, to the Courtney Library of the Royal Cornwall Museum and to the Cornish Studies Library.

In the event that there are no finds or they are retained by the owner, the documentary archive in due course shall be deposited with the Cornwall Record Office, but in the medium term will be stored at ReStore. All digital records will be filed on the Cornwall Council network.

A summary of the contents of the archive shall be supplied to the HEPAO.

The archiving will comprise the following:

4. All correspondence relating to the project, the WSI, a single paper copy of the report together with an electronic copy on CD, stored in an archive standard (acid-free) documentation box
5. The project archive will be deposited initially at ReStore, and in due course (when space permits) at Cornwall Record Office.

Report

This will contain:

- A concise non-technical summary of the project results.
- Introduction/background/terms of reference
- The aims and methods adopted in the course of the investigation.
- A discussion of the archaeological findings in relation to the site specific aims.
- A short statement of archaeological significance, in terms of importance, rarity, local character, educational and academic value.
- A statement of any requirements for further work.
- A location map, a drawing showing those areas examined as part of the archaeological recording, copies of historic maps and plans consulted and any archaeological plans and/or sections. All plans shall be tied to the national grid.
- A summary of the archive contents and date of deposition.
- A full and properly referenced bibliography.
- Project archive
- A copy of the brief and the approved WSI will be included as an appendix.

Product

The study will result in the following outputs:

1. Annotated plan of the site.
2. Watching brief field notes and descriptions

3. Digital photographs (archived according to the Historic Environment's guidelines) and supplied to the client on CD.
4. An entry in the English Heritage/ads online access to the index of archaeological investigations (OASIS).
5. A written report (as above).
6. A WSI for the proposed watching brief.

A digital copy of the report, illustrations and any other files will be held in the Cornwall HER, and will be supplied to the client on CD or other suitable media.

Copies of the report will also be distributed to local archives and national archaeological record centres, and will be made available for public consultation.

A contingency shall be made for full publication of the results of the watching brief in an appropriate journal in the event of significant findings being revealed, and for presentation of results to the public, for instance in the form of talks to interested groups or press releases, web content etc. The HEPAO will notify the client and contractor of such a need within four weeks of receipt of the report or following the discovery of significant findings.

Copyright

Copyright of all material gathered as a result of the project will be reserved to Historic Environment, Cornwall Council. Existing copyrights of external sources will be acknowledged where required. Use of the material will be granted to the client.

Freedom of Information Act

As Cornwall Council is a public authority it is subject to the terms of the Freedom of Information Act 2000, which came into effect from 1st January 2005.

HE will ensure that all information arising from the project shall be held in strict confidence to the extent permitted under the Act. However, the Act permits information to be released under a public right of access (a "Request"). If such a Request is received HE may need to disclose any information it holds, unless it is excluded from disclosure under the Act.

Timetable

The study is anticipated to be undertaken between July and October 2012. HES will require adequate notice before commencement of work, in order to allow the allocation of field staff time and to arrange other logistics.

Monitoring

Monitoring of the project will be carried out by Dan Ratcliffe, Historic Environment Planning Advice Officer. The HEPAO will be regularly kept informed of progress. Notification of the start of work shall be given in writing to the HEPAO at least one week in advance of its commencement. Any variations to the WSI shall be agreed with the HEPAO, preferably in writing, prior to them being carried out.

Monitoring points during the study will include:

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

Where the Historic Environment Planning Advice Officer is satisfied with the archive report and the deposition of the archive written discharge of the planning condition will be expected from the local planning authority (LPA).

Historic Environment, Cornwall Council

Historic Environment Projects is the contracting arm of Historic Environment of Cornwall Council (HE). HE employs some 20 project staff with a broad range of expertise, undertaking around 80 projects each year.

HE is committed to conserving and enhancing the distinctiveness of the historic environment and heritage of Cornwall and the Isles of Scilly by providing clients with a number of services including:

- Conservation works to sites and monuments
- Conservation surveys and management plans
- Historic landscape characterisation
- Town surveys for conservation and regeneration
- Historic building surveys and analysis
- Maritime and coastal zone assessments
- Air photo mapping
- Excavations and watching briefs
- Assessments and evaluations
- Post-excavation analysis and publication
- Outreach: exhibitions, publication, presentations

Project staff

The project will be carried out by HE field staff (Anna Lawson Jones, Carl Thorpe and Cathy Parkes) and will be managed by a nominated Senior Archaeologist (Adam Sharpe BA MIfA) who will:

- Discuss and agree the detailed objectives and programme of each stage of the project with the field staff, including arrangements for health and safety.
- Monitor progress and results for each stage.
- Edit the project report.

Contract

HE Projects is part of Historic Environment, Cornwall Council. If accepted, the contract for this work will be between the client and Cornwall Council.

The views and recommendations expressed will be those of Historic Environment Projects and will be presented in good faith on the basis of professional judgement and on information currently available.

Standards

HE follows the Institute for Archaeologists' Standards and Code of Conduct.

As part of Cornwall Council, HE has certification in BS9001 (Quality Management), BS14001 (Environmental Management), OHSAS18001 (Health, Safety and Welfare), Investors in People and Charter Mark.

Health and safety statement

HE follows the Council's *Statement of Safety Policy*. For more specific policy and guidelines HE uses the manual *Health and Safety in Field Archaeology* (2002) endorsed by the Standing Conference of Archaeological Unit Managers.

Prior to carrying out on-site work HE will carry out a Risk Assessment.

Insurance

As part of Cornwall Council, HE is covered by Public and Employers Liability Insurance.

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