



JANE PIT, WORKINGTON, CUMBRIA

Desk-Based Assessment and Landscape Survey Report



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SUMMARY

Workington Town Council is undertaking a community project at Jane Pit, Workington, the remains of which are protected as a Scheduled Monument so as to commemorate the contribution of mining to the town's history and, in particular, to act as a memorial to the former mineworkers (NGR 299522 527778). It is envisaged that the project will result in an enhanced maintenance plan, interpretive displays and appropriate lighting. As a preliminary to this, Oxford Archaeology North were invited to undertake a programme of preliminary research, examining the history of the site and undertaking an initial archaeological survey to examine the surviving elements of the monument. Following discussions with the client, and given the character of the Scheduled remains, it was agreed that a photogrammetric survey be undertaken of the monument and its environs in order to highlight any archaeological features within the landscape.

Workington's present day fortunes are founded on the coal mining and iron industries of the eighteenth and nineteenth centuries. Although mining of the Workington coalfields extends back to at least the seventeenth century, it was not until the eighteenth century that coal mining really took hold, culminating in 1802, when the coalfield was producing 65,309 tons of coal per annum. It was the availability of both coal and iron ore, coupled with the Workington port facility, that encouraged the development of the iron and steel industry in Workington. Throughout this period, the town of Workington was expanding rapidly to house the increasing workforce, and its development was closely tied to that of the coal and steel industries.

The discovery of a rich seam of coal at Jane Pit in 1846 was heralded with much celebration that included all the occupants of the town. Although the coal industry had been in a slow decline since the beginning of the nineteenth century, the wealth of the new seam provided a period of optimism and hope for the future of the town. In the event the working of the mine was relatively short lived, closing in 1875, but it was in production longer than many of the others in this part of the coalfield, such as Annies Pit and Buddle Pit.

The pit used both a horse gin and a steam engine, housed in an elaborate engine house, to lift the coal and overburden, but also to pump water from the mine. Subsequent to the abandonment of the mine, housing has encroached on the areas and rugby and football pitches have been constructed. The latter resulted in the removal of a substantial spoil heap around the mining site; however, this process allowed the survival of the large engine house and two chimneys which are now scheduled monuments and provide the most visual representation of the mine. There are, however, less visual, but nevertheless significant components of the mine that have survived as either structural or earthwork components. These include the former gin pit, a marshalling yard for a railtrack, a former building associated with the western chimney, the shaft, and sections of retaining wall.

The proposed community project is intended to celebrate the story that coal has had in the fortunes of Workington and the region, and is looking to establish a programme of maintenance, interpretation and lighting to emphasise the story. It should, however, also comprise consolidation works to ensure that the physical remains of Jane Pit continue to be a symbol of past glories long into the future. It is recommended that conservation works are undertaken to the engine house to stabilise it, as it is showing signs of decay. It

is also recommended that the area around the site be cleared of obscuring vegetation to expose structural remains and to further enhance the visual experience.

ACKNOWLEDGEMENTS

Thanks are due to Amelia Donnelly of Workington Town Council for commissioning the work and for help in the course of the project. We would also like to thank Mark Brennan, of Cumbria County Council, for the provision of Historic Environment Record information, and also the staff of the Whitehaven and Carlisle Archives Offices.

The desk-based research and compilation of the report was undertaken by Helen Quartermaine and the field survey was by Jamie Quartermaine and Peter Schofield. The report was compiled by Helen Quartermaine and Jamie Quartermaine, and the drawings were produced by Anne Stewardson. The project was managed by Jamie Quartermaine, who also edited the report.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF PROJECT

1.1.1 Workington Town Council is undertaking a community project at Jane Pit, Workington, the remains of which are protected as a Scheduled Monument, so as to commemorate the contribution of mining to the town's history and, in particular, to act as a memorial to the former mineworkers (NGR 299522 527778) (Fig 1). It is envisaged that the project will result in an enhanced maintenance plan, interpretive displays and appropriate lighting. As a precursor to this Oxford Archaeology North were invited to undertake a programme of preliminary research, examining the history of the site and undertaking an initial archaeological survey to examine the surviving elements of the monument. Following discussions with the client, and given the character of the monument, it was agreed that a photogrammetric survey be undertaken of the monument and its environs in order to highlight any archaeological features within the landscape.

1.2 LOCATION, TOPOGRAPHY AND GEOLOGY

1.2.1 **Location:** the site of Jane Pit is at NGR 299522 527778 (Fig 1), and is to the south-west of Workington town centre, south of Annie Pit Lane and west of Mossbay Road. It is adjacent to allotments and playing fields in an area where three colliery pits (Annie Pit, Buddle Pit and Jane Pit) were worked during the middle of the nineteenth century. The land is flat, and slopes gently towards the shore (Plate 1).



Plate 1: Recent Aerial Photograph of Jane Pit

1.2.2 Workington lies on the West Cumberland Plain on the coast, which is generally low-lying, close to a number of other large industrial and urban nucleations. In

this landscape, a large percentage (71%) of settlement and development occurred after 1900 (Cumbria County Council 2009, 105). Workington began as a relatively small medieval settlement but was transformed by its coal mining, iron and steel industries (*ibid*). Additionally, within the town of Workington was the designed parkscape (and now a Registered park) of Workington Hall (*ibid*).

- 1.2.3 The bedrock beneath the site is of the Pennine Middle Coal Measures Formation comprising deposits of Coal, Mudstone, Siltstone and Sandstone and formed in the Carboniferous Period. The superficial deposits are of Glaciofluvial origin comprising Devensian sand and gravel laid down in ice age conditions with glaciers scouring the landscape and depositing moraines of till with outwash sand and gravel deposits (British Geological Survey). The Workington coal field is bounded to the north by the River Derwent, and it lies between two large parallel faults, and the coast line. One fault is 600 yards sea-wards of the high water mark and the other fault was approximately one mile inland (Fletcher 1878, 299).

2. METHODOLOGY

2.1 INTRODUCTION

- 2.1.1 This historic assessment was carried out in accordance with the relevant Chartered Institute for Archaeologists (CIfA) and Historic England guidelines (CIfA 2014a; CIfA 2014b; CIfA 2014c; Historic England 2015).

2.2 HISTORIC ASSESSMENT

- 2.2.1 **Sources and Information Consulted:** the sources consulted included the Historic Environment Record (HER), aerial photographs and Historic Landscape Character data held by Cumbria County Council, and the Listed Buildings register and aerial photographs held by Historic England. The Extensive Urban Survey (EUS) of Workington undertaken on behalf of English Heritage was also a vital source (Hartley and Hardman 2002). Historic maps and Ordnance Survey maps were consulted from online sources, as were the catalogues of the National Archive and Cumbria Archives. There are a number of documents and plans relating to Jane Pit and a visit was made to Whitehaven Archives in order to study six maps and plans (D/Cu Colliery Plans); these were, in the main, dated and schematic plans of the shafts and underground seams. A Day Book (D/Cu Additional 177) was studied in detail.
- 2.2.2 There are an additional three undated plans which were not studied due to time constraints. Also in Whitehaven Archives are three books of the coal returns for the years of the years 1849-59 and seven inquests for those miners who had fatal accidents in the pits; these were not studied in detail as such a task was not within the remit of studying the extant buildings of Jane Pit. A more wide-ranging history of the operations, workings and 'life' of Jane Pit would certainly benefit from a study of these documents. A visit was made to Carlisle Archives to study the secondary sources and research correspondence of 1967-1968 relating to coal-mining on the West Cumberland Coast and Jane Pit. Online databases of nineteenth century newspaper archives, the Durham Mining Museum, Cumbria Amenity Trust Mining History Society, the Cumbria Industrial History Society, trade directories and Census records were studied. British History Online and other web-based secondary sources were also consulted. One very useful article was that written by Isaac Fletcher on the archaeology of the west Cumbrian coal trade, written in 1877 (Fletcher 1878). Oliver Wood's book on West Cumberland Coal (Wood 1988) and Herbert and Mary Jackson's (1989) on the Workington and Harrington pits were invaluable. There appears to be just one perhaps contemporary photograph of buildings at Jane Pit (Whitehaven Archives PH/1548/14/7) undated and this is included in the report. There is also a series of photographs dating to 1974 in the National Archives (COAL 80/547).
- 2.2.3 **Oxford Archaeology North:** OA North has an extensive archive of secondary sources relevant to the study area, as well as numerous unpublished client reports on work carried out both as OA North and in its former guise of Lancaster University Archaeological Unit (LUAU). These were consulted where necessary.

2.3 ARCHAEOLOGICAL SURVEY

- 2.2.4 **Survey Control:** primary survey control was initially established across the site using a survey grade Leica GPS which provided accuracies to +/- 20mm. Visible survey control markers were placed on the ground for the aerial photogrammetry, and all were surveyed using a total station with respect to the primary grid.
- 2.2.5 **Aerial Photographic Modelling:** a ground plan was modelled by photogrammetry using aerial photographs and corrected using photographic textured images for the complex (Figs 3-7). New aerial photographs were taken using an Unmanned Aerial Vehicle (UAV; a small remote controlled helicopter), which were taken so as to provide vertical coverage across the overall area, but also to provide detail of the exteriors of the chimneys and engine house.
- 2.2.6 Photogrammetric processing was undertaken using Agisoft software which provided detailed modelling using an overlap of up to 250 photographs, and created a very detailed DTM (Digital Terrain Model) across the site. The photographs were then digitally draped over the model to create an accurate three-dimensional orthophoto of the ground surface (Figs 6 and 7). The output of the model comprised hill-shade views of the overall landscape (Fig 5), detailed contour views (Figs 3-4) and a wider orthophoto of the area (Fig 6). Detailed modelled coverage of the buildings was also obtained but not reproduced in this instance.

2.3 ARCHIVE

- 2.3.1 A copy of this desk-based assessment will be deposited with the Cumbria HER for reference purposes.

3. ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

3.1 INTRODUCTION

3.1.1 **Introduction:** the following section presents a summary of the historical and archaeological background of the general area in order to place the study area into a wider context. This is then followed by a more detailed historical examination of the sites themselves. Sites identified by the study are presented in a site gazetteer (*Appendix 1*) and also on Figure 2.

| Period | Date Range |
|-------------------|--------------------|
| Palaeolithic | 30,000 – 10,000 BC |
| Mesolithic | 10,000 – 4,000 BC |
| Neolithic | 4,000 – 2,500 BC |
| Bronze Age | 2,500 – 700 BC |
| Iron Age | 700 BC – AD 43 |
| Romano-British | AD 43 – AD 410 |
| Early Medieval | AD 410 – AD 1066 |
| Medieval | AD 1066 – AD 1540 |
| Post-medieval | AD 1540 – c1750 |
| Industrial Period | cAD1750 – 1901 |
| Modern | Post-1901 |

Table 1: Summary of British archaeological periods and date ranges

3.2 THE STUDY AREA

3.2.1 A desk-based assessment and rapid survey has been requested for Jane Pit coal mine, Workington, Cumbria. This site is a Scheduled Monument (Scheduled Monument 1017559) and comprises a number of extant buildings including the two chimneys, an engine house, which are Grade II listed (LB 1138109 and LB 1144482). In addition are the remains of another engine house, a boiler house, the now-sealed shaft and the earthworks for a gin-circle. The Scheduled Monument information states that in 1875 the mine was closed after it was inundated by the sea ‘entombing 100 miners’; however, it has not been possible to find any original references for this claim or substantiate this information although the available accounts, newspaper archives and lists of mining disasters have been carefully examined; nor did Oliver Wood refer to this in his exhaustive study of *West Cumberland Coal* of 1988 (Wood 1988).

3.2.2 Jane Pit was one of the mine shafts of the Workington collieries developed, in the main, by the Curwen family of Workington Hall from the end of the eighteenth century and during the first half of the nineteenth century (*ibid*). From the evidence of other nineteenth century collieries, the pit head infrastructure may typically have included buildings such as engine houses for pumping and

winding through the shaft, boiler houses, systems for ventilation of the shaft, offices and workshops. The extant remains of Jane Pit include two chimneys and an engine house (both with date stones inscribed 1844) either for winding or pumping (www.shropshirecmc.org.uk). It is ‘the best surviving example of the ornate castellated style of colliery architecture which was a feature of the large landowner involvement in the Cumbrian coal industry during the nineteenth century’ (SM 1017559). Of great interest, just to the south, is the winding or pumping mechanism as evidenced by the earthworks of a gin-circle (*ibid*).

- 3.2.3 A Study Area has been defined as encompassing 250m around the limits of the scheduled site of Jane Pit.

3.3 DESIGNATED SITES AND PREVIOUS WORK

- 3.3.1 **Designated Sites:** Jane Pit is a Scheduled Monument (SM 1017559), including the unroofed remains of a ‘winding Engine House, and two Chimneys, together with the footings of other buildings which include a pumping engine house and a boiler house, an earthwork gin circle, the mine shaft which is now sealed and the buried remains of ancillary buildings which are known from nineteenth and twentieth century maps to have been located to the west of the winding engine house’ (*Appendix 2*). It should be noted here that the extant building described as the winding Engine House has been described by another source as the ‘castellated pumping house’ (Davies-Shiel and Marshall 1969, 268). Within the overarching Scheduled Monument record are included the records of the two Grade II listed buildings cited by Historic England as 1138109 (a detached chimney) and 1144482 (engine house).
- 3.3.2 **Historic Environment Records:** included in the 250m radius from the requested Study Area are a total of three HER sites; Jane Pit (Site 1; HER 4165), Buddle Pit (Site 2; HER 12392) and Annie Pit (Site 3; HER 12393).
- 3.3.3 **Previous Archaeological Work:** an important overview of the archaeological remains of north-west England has been undertaken in compiling an Archaeological Research Framework for the region; this has detailed how coal and coal mining was an essential factor in the development of industries of the north-west, including salt processing, glass production, nail-making, and providing power for mills and factories. The industry was also the catalyst for drawing together transport systems and for the development of towns and ports; all contributing to the industrial phenomenon of the nineteenth century (Brennand 2006). The overview noted that ‘the coal industry of the region has received little attention’; however, the coal industry and the ability to export coal has been of huge significance for the formation of a new town and port at Whitehaven (Brennand 2006, 185, 191). This in turn led to the development of the town at Workington just a few miles to the north.
- 3.3.4 There has been no previous archaeological work within the vicinity of the Study Area; to the south-west at Mossbay an archaeological desk-based assessment and evaluation, found low archaeological potential owing to the impact that the ironworks had on the area, and revealed a deep sewer and modern landscaping (HER 4664).

3.4 HISTORICAL BACKGROUND

- 3.4.1 **Archaeological and Historical Background:** this account has been drawn largely from the English Heritage Extensive Urban Survey undertaken on Workington in 2002 (Hartley and Hardman 2002), Isaac Fletcher's article on the *West Cumberland Coal Trade* (Fletcher 1878), Herbert and Mary Jackson's, *Workington and Harrington Pits* (Jackson and Jackson 1989) and Oliver Wood's *West Cumberland Coal 1600-1982/3* (Wood 1988).
- 3.4.2 **Prehistoric Archaeology:** there is evidence for prehistoric settlement in the wider environs of the Study Area and in Workington. Closest to the Study Area was an Axe Hammer (HER 1055) found in Workington Old Cemetery (but now lost). Other prehistoric finds include another three axes, Neolithic flints discovered at Harrington Mill, a Bronze Age Palstave found at Seaton, stone hammers and a loomweight (Hartley and Hardman 2002, 4, 25). There was a bronze age burial urn and defended iron age enclosure at Salterbeck to the south of Workington, which is a Scheduled Monument (HER 4403 and Historic England 1007071).
- 3.4.3 **Roman Archaeology:** the Romans fortified this stretch of the West Cumberland coast as a supportive defensive layer for the strategic forts on the west end of Hadrian's Wall by building Burrows Wall fort (at Seaton), and a signal tower (at Oysterbank, Seaton) to the north of Workington and a milefort at Harrington Park (Hartley and Hardman 2002, 5, 25). Additionally there is evidence of the Roman road from Papcastle to Moresby on Woodmoor Road near Workington (*ibid*). Roman finds in Workington include a second century coin and a Roman quern (*ibid*). A Roman coin hoard of late third to fourth century coins was uncovered in Distington, indicating troubled times towards the end of the Roman period in the north of Britannia (*ibid*).
- 3.4.4 **The Early Medieval Period:** after the Romans had ceased occupation of this stretch of coast, it appeared that there may have been a re-use of the defences of the Burrow Walls fort during the early medieval period as implied by references to Orme, son of Cetell, being a lord of the manor at Seaton (Hartley and Hardman 2002, 6-7). However, there was also an early pre-Norman settlement in Workington with a rich culture of Christian worship focussed on the site of St Michael's Church as evidenced by a number of carved stones (approximately thirteen fragments) some dated to the eighth and ninth centuries and others to the tenth and eleventh centuries (*op cit*, 6, 25). Indeed, the place-name of Workington suggests settlement in this earlier period: 'Wyre' was the name of the small stream that flows into the sea at Harrington and 'Weork' may have been the name of an eighth to ninth century Chieftain (www.cumberlandsarrow.com/Workington; Hartley and Hardman 2002, 4). The name of 'Chetell' (probably of Scandinavian origin) was cited in an early twelfth century charter as holding lands in Workington, amongst other places (*op cit*, 6).
- 3.4.5 **The Medieval Manor and Parish:** it has been argued that Orme's great grandson Patric, who took the name of Culwen, re-located his manorial *caput* from Seaton to Workington, perhaps as late as the late twelfth century, and by the fourteenth century there was a fortified manor house, now Workington Hall (Hartley and Hardman 2002, 7). Workington comprised two community centres, the upper town on the hill, and a small harbour with some fishermen's cottages (*ibid*). Between these two places were the Norman Church of St Michael and its Glebe

lands, and the manor's common land (*op cit*, 7). In the early sixteenth century Workington was reported by Leland to be where 'shyppes cum to, wher ys a little fyssher town, cawled Wyrkenton, and that is the chef howse of Sir Thomas Curwyn' (Mannix and Whellan 1847).

- 3.4.6 **Post-Medieval Period:** during the seventeenth, and eighteenth centuries and up until the nineteenth century the Curwen family of Workington Hall, and the Earls of Lonsdale at Lowther, invested the capital and energy in developing the harbour facilities and coal industry at Workington. After 1682 a small quay was constructed on the south side of the River Derwent (Hartley and Hardman 2002, 9) and by the end of the eighteenth century the Curwen family had undertaken an ambitious development using ballast to reinforce and divert the River Derwent thus enabling the South Quay to be used as a more sheltered port (*ibid*). In 1770, 97 vessels belonged to the port of Workington, in 1790 there were 160 ships, in the early part of the nineteenth century there were fewer ships but with a greater tonnage, and in 1840 there were 217 ships (Mannix and Whellan 1847). In addition, there were a number of ship-building firms working at the port. The significant trade was transporting coal to Ireland and lime to Scotland, with some vessels trading in America and the Baltic (Mannix and Whellan 1847).
- 3.4.7 **Coal Mining in Workington:** coal was worked and exported from Workington before 1676 and there was a saltpan and colliery in Workington in 1680 (Fletcher 1878, 297). During the first half of the eighteenth century there were a number of coal pits in Workington c '40 to 50 fathoms in depth having generally two or three workable bands' (Mannix and Whellan 1847). There were also 'eight or nine of Bolton and Watt's powerful steam engines... for winding the coal and pumping water from the mines' (*ibid*). Some 600 people were employed in the coal mines at this time (*ibid*). Four of the early pits were the Union Pit, Moorbanks Pit, Hunday Pit and School House Pit owned by the Curwens of Workington Hall and opened c 1730-1740 (Fletcher 1878, 297). Further pits, belonging to the Chapel Bank Colliery to exploit undersea seams were being worked in the 1770s (Wood 1973, 317). By 1802, 65,309 tons of coal were exported by the Workington collieries (Wood 1988, Appendix 5).
- 3.4.8 However, a decline in coal exports was already apparent by the early part of the nineteenth century; the Napoleonic wars were over by 1815, leading to lesser demand and there was increasing competition from other coal mines in Scotland and Wales. In addition there was also competition from shipping companies in Maryport, Harrington and Whitehaven (Jackson and Jackson 1989, 24-5), and Workington Harbour was silting up and needed redeveloping (*ibid*). When the Chapel Bank Colliery (comprising the three pits of Lady Pit, Isabella Pit and Union Pit) was inundated by the sea in the disaster of 1837, 27 men and boys were drowned, 28 horses were lost, and all the underground infrastructure of three pits was destroyed, alongside a huge loss of investment (Mannix and Whellan, 1847). These pits now lie below the United Steel Company works and slagbank areas (Hartley and Hardman 2002, 10).
- 3.4.9 Buddle Pit was sunk in 1837 as reported by the Whitehaven Herald (www.dmm.org.uk). Evidently, the explorations in Buddle Pit had begun in 1818 until 1820, and then were stopped for a while until resuming in 1837 when, at 27 fathoms, the Hamilton seam was found 'about five feet in thickness, of a bright superior quality, and extend[ing] a considerable distance..... we hope in a

few months shipments of coal may be resumed again at [Workington] as usual' (Whitehaven Herald, 30th September 1837; Wood 1988, 119). In 1843 the sinking of Jane Pit commenced, with the Hamilton seam being found in 1846 and this is described in detail below (*Section 3.4.16*). In 1846-9 the Jackson Pit was sunk (Cumberland Pacquet 15th May 1849; Wood 1988, 123). Hope Pit was opened in 1854 but was abandoned in 1858: Hope Pit was worked alongside Jane Pit in the 1850s (DCU/Additional/177, 1855-1860; Wood 1988, 162).

- 3.4.10 Jane Pit was used as a ventilating shaft for Buddle Pit (Hartley and Hardman 2002, 10), but in the end Buddle Pit and Jackson Pit were both worked out by 1853 and were closed (Wood 1988, 161).
- 3.4.11 Despite these new ventures, the decline in exports of coal from Workington could not be reversed; in 1802 Workington exported 65,309 tons of coal, in 1816 they exported 40,707 tons of coal, in 1829 the figure was 39,670, in 1847 20,000 to 22,000 tons and by 1851 only 20,000 tons was exported (Wood 1988, Appendix 5 and 121, 123, 161).
- 3.4.12 It seems that during the 1860s some leases of several mine shafts in Workington, including Jane Pit, Buddle Pit and Isabella Pit, were taken over by Irving and Company (DBH/1/20; DBH/1/32). The new company was known as the Workington Colliery (www.dmm.org.uk); however in 1860 Jane Pit was the only open and working pit for the Workington Colliery (Jackson and Jackson 1989, 26). In 1864 to 1871 it was Mr William Irving who managed the sinking of Annie Pit as far as the Hamilton Seam (Jackson and Jackson 1989, 23, 26). Annie Pit was also connected to Jane Pit via Jig Brow as shown on a plan of 1864-5 (DCu Colliery Plan 45, 1864-5).
- 3.4.13 When Jane Pit stopped pumping out water, Annie Pit was flooded and both pits were closed in 1875 (Whitehaven News, 8th September 1927; Jackson and Jackson 1989, 23, 26; Wood 1988, 162).
- 3.4.14 There was a brief period when there were plans by the lessees GR Wooler and RG Wooler from Wolsingham, Durham, to perhaps re-open Jane Pit, alongside Annie Pit, Buddle Pit and Crosthwaite Pit; this was reported in 1892 (Cumberland Pacquet and Ware's Whitehaven Advertiser, May 12th 1892 and 28th July 1892). Such a development may correspond with the changes in the layout of buildings as shown on the OS maps of 1895 and 1900 (*Section 3.5.14*). In 1893 the lease of Workington Colliery was surrendered (Jackson and Jackson 1989, 26).
- 3.4.15 ***Frostoms and Holyoak Farm:*** Frosthams (later to be Frostoms) was marked on Greenwood's map of 1824 some 10 to 20 years before Buddle Pit and Jane Pit were worked. The OS map of 1867 showed that on the west of the road leading south to Mossbay there were perhaps four cottages at what was to become Holyoak Farm. Further south along the road and also on the west side was a second row of cottages. Parson and White's *Trade Directory* of 1829 listed a Joseph Deans, a farmer, as living at Frostoms (and sadly in 1841 the Census Returns listed him as living in Workington Workhouse). In the 1841 Census Returns and in Mannix and Whellan's *Directory* of 1847 Frostoms was not mentioned; maybe the farmstead had been split into cottages by then. The Census Records 1851 to 1871 listed four to five cottages at Frostoms lived in by coal miners, agricultural labourers or ship hands and their families

(www.ancestry.co.uk). Holyoak Farm was not mentioned in these Census Returns and nor was it mentioned in Mannix and Whellan's Directory of 1847; however, it was not labelled on the OS maps until 1900 and 1925.

- 3.4.16 **Jane Pit:** in 1846 there were celebrations ‘in discovering of the new coal seam at Jane Pit, property of H. Curwen’, in the form of teas for the children and a dinner for the principal inhabitants and tradesmen of Workington (*Carlisle Journal*, Saturday 11th April 1846; *Cumberland Pacquet & Whitehaven Archive*, Tuesday 21st April 1846). ‘Mr Penrice, colliery agent to H Curwen Esq, Workington Hall, has succeeded in winning a fine seam of coal at Jane Pit... the band, which is 70 fathoms from the surface, measures five feet nine inches in thickness, and is of excellent quality’ (*Whitehaven Herald*, 28th March 1846). By 1847 Jane Pit was 70 fathoms deep and working two seams of coal, the Yard band and the Hamilton Seam (Mannix and Whellan 1847) and in 1863 could access four seams of coal, the Main Band, the Yard Band, the Hamilton Seam with the Virgin Seam at the bottom (DCu Colliery Plan 44, 1863); a plan which was possibly earlier in date depicted the Main Band, Yard Band and Hamilton Seam (DCu Colliery Plan 26, nd). Other undated plans may add more to this information, but it was not possible to examine these in detail in the time available.
- 3.4.17 The shaft itself was 11 feet and 6 inches in diameter, lined initially with timbers and then with stone walling (*Whitehaven Herald*, 28th March 1846); it was begun in 1843, but was delayed by the finding of water and gas (Wood 1988, 123). The gas was dealt with by conducting it to the surface through pipes and was then burned off (Wood 1988, 123).
- 3.4.18 The Jane Pit buildings were of stone ‘and the head-gear, when it existed, was made of wood’ (John J Martin, August 10th 1968, *Times and Star* (DX/655/34)) (Plate 2). This was during a period when brick and iron were beginning to be used and the use of stone and wood seems to have harked back to the traditional architectural techniques, or perhaps was an economy measure.
- 3.4.19 The Engine House had a date stone of 1844 (Historic England 1144482). One of the chimneys (the Detached Chimney) (Historic England 1138109) had an inscription stone marked ESC Esquire 1844 (www.shropshirecmc.org.uk) probably for Edward Stanley Curwen (son of Henry Curwen). ‘The chimneys of the engine house are built in the castellated style and have the most pleasing effect on passing them by railway’ (Mannix and Whellan 1847). The ‘top fitting’ of the pit was also admired for ‘its architectural beauty and admirable arrangement for economising labour was got up by Mr John Carter’ who lived in Workington and went on to build the Quay and Harbour Bridge in Workington (*Whitehaven Herald*, 28th March 1846). It is not known if Mr John Carter was also involved in the design of the castellated engine house and chimneys. This idea of castellated architecture for industrial buildings and structures was displayed at Wellington Pit and William Pit in Whitehaven built for the Earl of Lonsdale by Sydney Smirke in 1843 (Neaverson and Palmer 2002, 53).



Plate 2: Extract of photograph of Jane Pit (not dated) (PH/1548/14/7, *photograph of Jane Pit*)

- 3.4.20 There are two thoughts as to what type of engine was in the (extant) castellated Engine House. Historic England refer to the use of a engine for winding in the Engine House (Historic England 1017559). Research from a number of corresponders filed in Carlisle Archives refer to detailed drawings of a Watt engine and gin (in the Boulton and Watt Collection at Birmingham) which show that the engine replaced ‘the gin horse in rotating a horizontal winding drum (DX/655/34). Such an engine ‘also pumped water by means of a rod and beam device which worked pump rods at a shaft about 40 feet from the engine house’ (*ibid*).
- 3.4.21 It has also been considered that the (extant) castellated Engine House housed an old beam pumping engine (COAL 80/547; Neaverson and Palmer 2002, 53) thus the Engine House may have been a ‘pumping house’ (Davies-Shiel and Marshall 1969, 268). Such a mechanical engine might have operated at a distance from the main shaft (DX/655/34). The horse gin operated alongside and was potentially intended to wind the coal.
- 3.4.22 It has been noted that the horse gins were originally made to draw or pump water from the shafts of the eighteenth century mines (Wood 1971, 212) but as the shafts got deeper, the horse gins could not provide enough power and so steam engines were installed (*ibid*). It was only later that steam engines were used to assist with the winding of baskets and coal (*op cit*, 213) and the work of the engines only replaced that of the horses (*op cit*, 216-7); it appears that the pit head winding mechanisms were still required. It was at Hope Pit, owned by John Christian Curwen, that the first engine for pumping was installed in 1789 (*op cit*, 213-4). Thereafter, subsequent Watt engines, purchased by John Christian Curwen from Boulton and Watts, were designed to both draw water and wind the baskets and coals, but not at the same time (*op cit*, 213-6). It was eventually decided that the primary objective should be to pump out water, and, in any spare time in the day, the engine could be used for winding (Wood 1971, 213-6).

In 1789 Curwen wrote ‘the power we wish for in an Engine is to be amply provided for the draining of that part of the Colliery which we are about to open, & extend, And at the same time to avail ourselves of any spare time such Engine might have (if practicable) by applying it to the winding of Coals but the drawing of water is the principal object.’ If this was not possible ‘we must for the present drop the Idea & draw our sinking stuff and the Coals when we come at by Horses in the usual way unless we should wish to have another small Engine Erected there for that purpose.’ (Wood 1971, 214-5). The engine constructed for JC Curwen at Lady Pit in 1794, (Plate 3), worked the pumps via a separate pump beam connected to the engine’s working beam, although it may also have been used for winding (*40 Horse Engine for Cumbrian Colliery*; www.search.birminghamimages.org.uk).

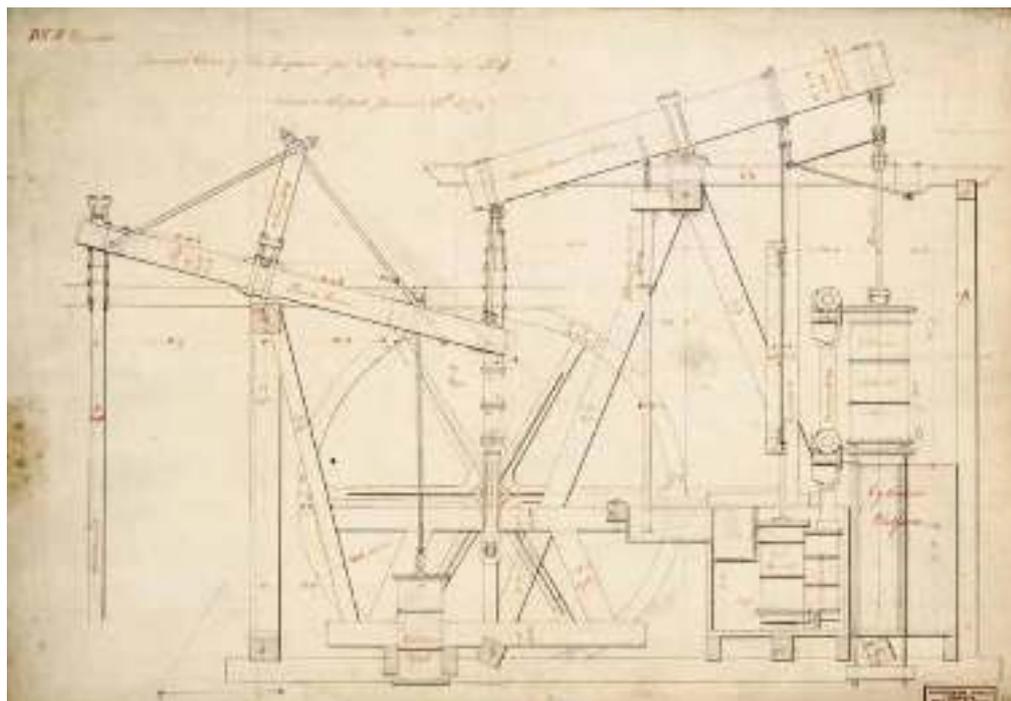


Plate 3: Reverse View of the 40 horse engine for JC Curwen, at Lady Pit, Workington, Cumbria, January 1794 (MS3147/Portfolio/5/247)

- 3.4.23 Nearly fifty years later the problem of whether the engine should pump or wind persisted; at Neath Abbey in Gwent (1845) there was a rotative beam engine which did both tasks of pumping and winding and was housed in a stone-built structure away from the mine shaft. However, the two operations could not happen simultaneously, so pumping was stopped when winding began, and so at Neath Abbey a second steam engine was installed in the 1850s (Neaverson and Palmer 2002, 54-5). Perhaps this is what was decided at Jane Pit, accounting for the postulated remains for a second engine house located beyond the western chimney; furthermore it is possible that the engine inside the extant Engine House at Jane Pit could have been used for both pumping and winding.
- 3.4.24 The horse gin circle and steam engine at Jane Pit may have worked side by side, one machine winding and the other pumping (Wood 1971, 214-5; Neaverson and Palmer 2002, 53). Indeed, this was the Curwen's fall back scheme, in the late 1780s, if Watt's engine could not do both operations; then the horses were used for winding (Wood 1971, 215). Horse gins were apparently often used as stand-by capstans for pumping (*op cit*, 51) (Plate 4). Thus the horse gin circle and steam engine at Jane Pit may have been operated at the same time.

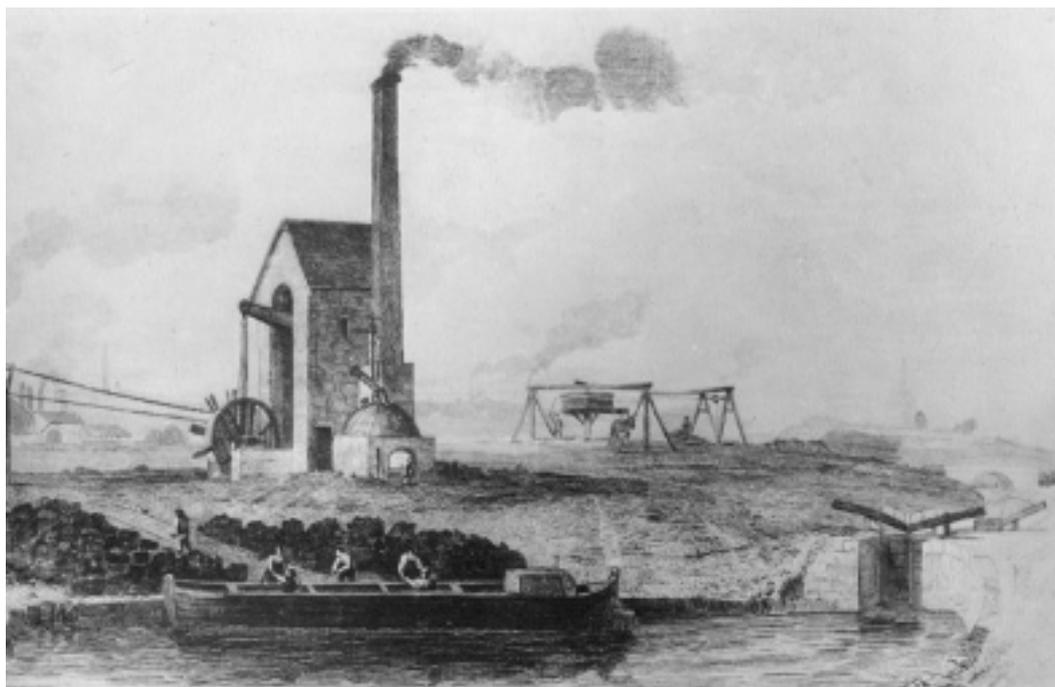


Plate 4: Willenhall in South Staffordshire: a steam-powered winding engine, and a gin pit (www.historywebsite.co.uk)

- 3.4.25 Jane Pit was also where a ‘very powerful blower’ was provided which conducted gas to the surface via pipes and ‘has been burning most brilliantly for upwards of two years, illuminating both the pit top and the engine house’ (Mannix and Whellan 1847). The gas was also used for heating the Pit-Top and the Engine House (*Whitehaven Herald*, 28th March 1846).
- 3.4.26 The two chimneys may have been built to work alongside two engine houses at Jane Pit; however, it has been postulated that a second chimney was built alongside the shaft to assist with the draw of clean air into the shaft and worked seams either through the natural draught or by the use of an underground furnace in a separate shaft with this second chimney stack (Neaverson and Palmer 2002, 55). The Lowry image (of uncertain date) (Plate 5) is interesting in that it shows the second chimney attached to a small rectangular structure (as it was on the later OS maps); it is not known what the third chimney represents.

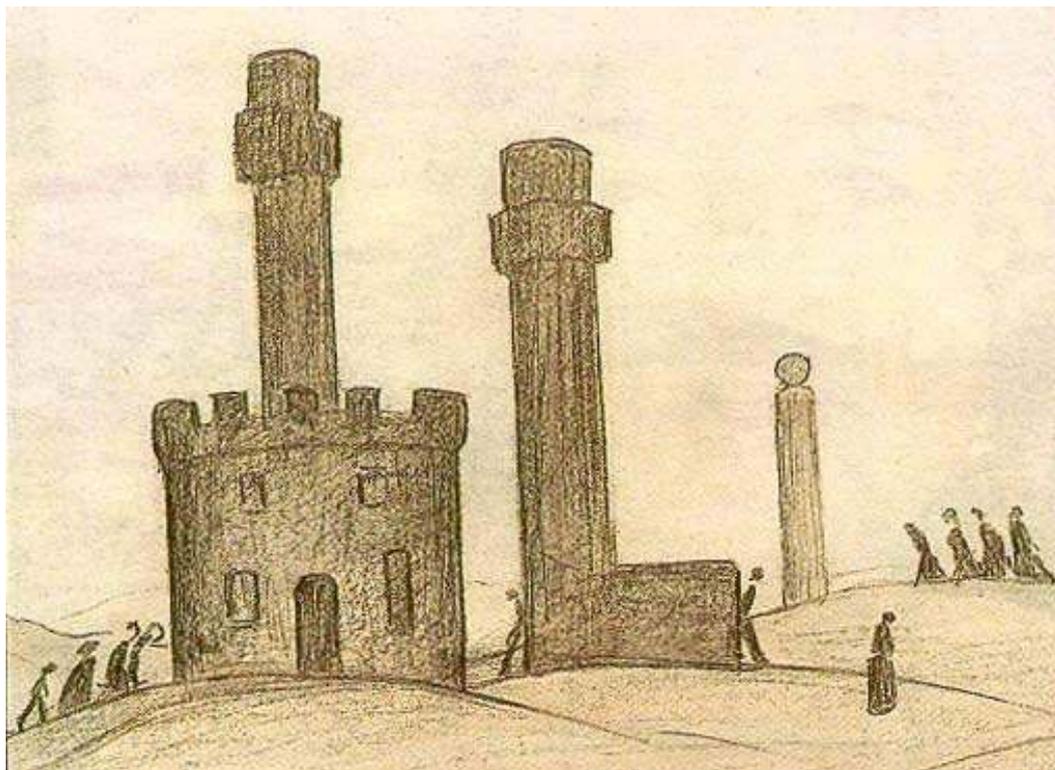


Plate 5: LS Lowry (1887-1976), *Landscape with Figures, Workington*. It is known that LS Lowry visited friends in Cleator Moor in the late 1940s and 1950s and it may perhaps be that the initial drawing dates from that period, although the date of the final drawing was 1969

3.5 MAP REGRESSION

- 3.5.1 **Historic Maps:** by the end of the eighteenth century Whitehaven was already a large sea port 'especially for the Coal Trade' as reported by Emanuel Bowen on his map of 1763. On this same map *Wirkington* was marked as a lesser town to the north close to the estuary of the River Derwent with a road between Whitehaven and Workington going through Moresby and Distington, and close to Harrington (*Old Cumbria Gazetteer*). Alexander Hogg's map of 1784, and then John Carey's map of 1787, showed the development of the same road and that Workington was now perhaps comparable to Whitehaven (with the same sized lettering) (*ibid*).
- 3.5.2 **F Jollie, 1794, A Map of Cumberland (Plate 6):** F Jollie's map of 1794 Workington is denoted with a detailed depiction of buildings on either side of the road from the junction of the north/south road from Moresby and Whitehaven with that of the east/west road from Brigham going south of the River Derwent (*ibid*). There appeared to have been the main road and a parallel street to the south lined with buildings both leading to the south side of the River Derwent. South of Workington the farm of Stoneyhaugh was marked, and also a road or track leading to Bella Port and Harrington. No industrial workings or mines were marked in this area south of Workington.



Plate 6: Extract from F Jollie, 1794, *A Map of Cumberland*

- 3.5.3 **William Faden, 1810, *The County of Cumberland (Plate 7)***: William Faden's map of Workington published in 1810 was based on the survey by Thomas Donald in 1770-71 and showed more detail of the town plan of Workington with ribbon development of houses along the road from the junction of the roads from Brigham and Whitehaven to the River Derwent (which appeared as two rivers) and also southwards on the road to Harrington and Bella Port. There appeared to have been a small hamlet on the road in the vicinity of where Frosthams (Frostoms) was to be marked on the later maps. Again, only Stoneyhaugh was marked to the south of Workington with no industrial workings or mining depicted.

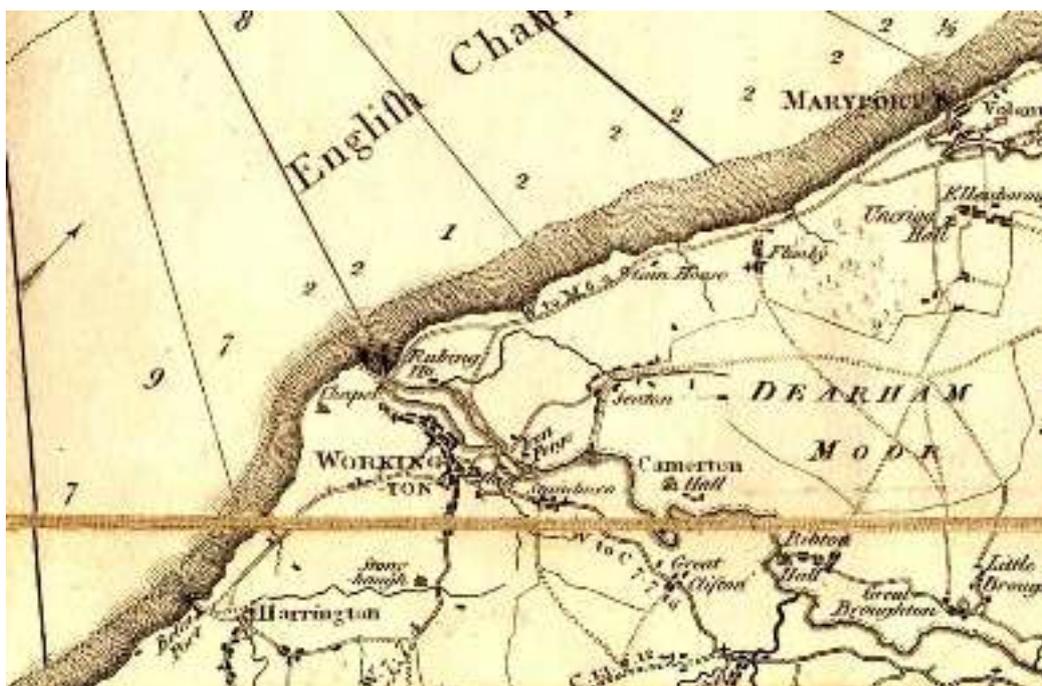


Plate 7: Extract from *The County of Cumberland* published by William Faden, 1810

- 3.5.4 ***Christopher and John Greenwood, 1824, Map of the County of Cumberland (Plate 8)***: this map had more detail, thus depicting the growth of Workington as a large town with the hall and park, its residential areas and industrial development along the River Derwent. Calva Iron Forge was to the north of the town. Only one pit was marked and labelled as Union Pit and this was to the south-west of Workington. The Study Area of Jane Pit was west of Frosthams and east of New Yard, which are first mentioned on these maps, but no coal pits were noted in this area.



Plate 8: Extract from map by Christopher and John Greenwood, 1824, *Map of the County of Cumberland*

- 3.5.5 **OS map, 1867 (surveyed 1864), 1:10,560** (Plates 10 and 11): no detailed maps or town plans of Workington appear to be available for the period between the 1830s up until the 1860s and as can be seen from the 1st edition OS maps of 1867 (surveyed in 1864), the industrial development of Workington over this period was phenomenal. To the north of Workington and the River Derwent was the West Cumberland Haematite Ironworks and the Workington Haematite Ironworks with its huge infrastructure of railway sidings; north-east was the Beerpot Ironworks close to Calva Hill. There were mills on the south side of the Derwent and east of the town; Workington Hall (corn) Mill and west of the Workington Hall Park were the Derwent Paper Mills. South of the Park were residential areas, developed as square and terraces, and St John's Church with the Old Gas Works noted. West of Workington were the Harbour, Lonsdale Dock and other dock areas and the north/south Whitehaven Junction Railway (Plate 9). Outside Workington, to the south-west, was New Yard and the Furnace on the railway line and in the Study Area, the coal pits Jane Pit and Buddle Pit were west of the hamlet of Frostoms. To the east, was the already disused coal pit of Moorbanks.

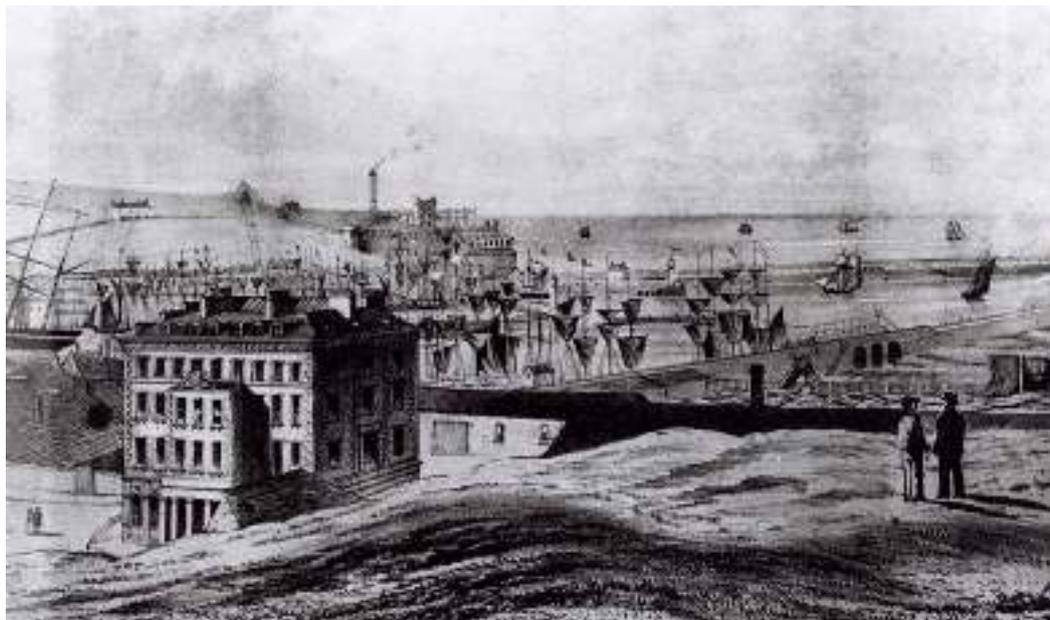


Plate 9: Workington Harbour 1850 (source and creator unknown) possibly showing the castellated engine house in the background

- 3.5.6 The 1st edition OS map depicted Jane Pit and Buddle Pit to the west of Frostoms. Jane Pit had a labelled Shaft, two large roofed buildings, one of which was rectangular with a smaller square extension offset at its east end. The other was L-shaped with two small extensions on its southern and western sides. South of the rectangular building was a small circular roofed structure or bin. All these were north of a trackway leading westwards through the associated slag tips. North-west of the two main buildings was an elongated oval, unroofed, feature thought to have been a reservoir (Davies-Shiel and Marshall 1969, 117).

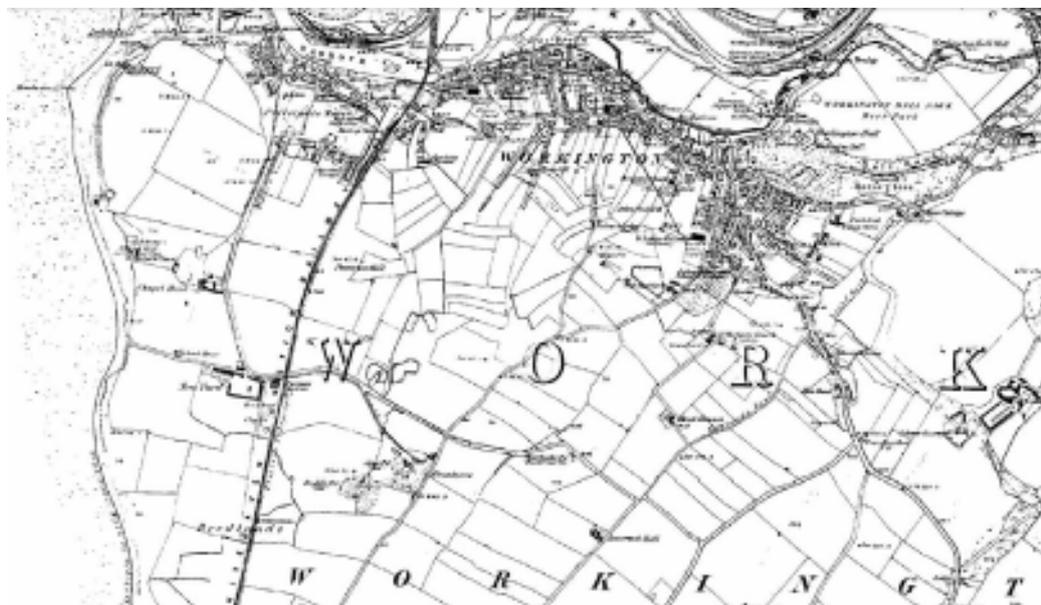


Plate 10: Extract from 1867 OS map (surveyed 1864), 1:10,560 showing Jane Pit in context of Workington

- 3.5.7 East of the Shaft, on the west side of the road, was an east/west-east terrace of possibly two to three buildings with a single house to the north. On the same

road south of the marked pit workings was another cottage and yard. These three to four cottages may have been those mentioned in the lease of 1864 and 1872-3 (DBH/1/32/1872-3), but were not marked on the accompanying plan, which was possibly much earlier in date. In addition on the west side of the Frostoms road was a large enclosed space or yard, perhaps for transport and storage.

- 3.5.8 From the shaft at Jane Pit was a single rail track or tramway leading north-west (and crossing the main north/south Whitehaven Junction Railway) and then going north parallel to the Ropery to the South Quay and Main Pier of the Harbour, thus there was a direct route for the lifted coal from the Pit to the Harbour. South of the shaft and slag tips was the east/west road leading to Buddle Pit, on the north side of which was a large rectangular unroofed building with a porch or extension at the east end of its north side.
- 3.5.9 At Buddle Pit were unroofed buildings and possibly three yards with four small square roofed buildings associated with slag tips on a north/south, straightened in parts, water channel perhaps linking to Moorbanks Pit.



Plate 11: An enlarged extract from the 1867 1:10,560 OS map

- 3.5.10 **OS map, 1895, 1:2,500 (Plate 12):** this more detailed map published in 1895 showed a plan of the structures at Jane Pit as they probably were during its main usage prior to its closure in 1875. North-west of the pit shaft and pit buildings at Jane Pit was an elongated oval, reservoir. The circular shaft was west of a large rectangular building at the southern end of the tramway leading west and then north to the Harbour. West of the shaft were two large structures: to the north was the L-shaped building with two small extensions on its southern and western sides. To the south was the larger rectangular building with a small square extension offset at its east end, within which was a circular foundation (probably the base of the chimney) and a porch at its western end; this was the location of the Engine House, either for a winding engine (Historic England 1017559) or for a pumping engine (Davies-Shiel and Marshall 1969, 117, 268; Neaverson and Palmer 2002). This large rectangular building had two direct links to a square feature with rounded corners (very nearly a circular feature) with a central shaft or apex. This was likely to have been the horse gin circle used to operate the winding mechanism for the shaft and was either powered by horses or with the steam powered engine thought to be housed in the large rectangular building to the north (Historic England 1017559).

- 3.5.11 From the horse gin circle and larger rectangular building a track led south-west, through the slag tips on either side, to the yards at Buddle Pit. South of the slag tips, and on the north side of the road leading from Buddle Pit to the main north-south road going through Frostoms, was a large rectangular unroofed structure or yard. The location of this enclosed space may have been significant for its access to road transport. South of this road was a row of three small buildings. Just north and east of the Jane Pit shaft on the north/south Frostoms road was the east/west row of two to three cottages with a fourth cottage to the north. Also on the Frostoms road, between the two terraces of cottages, on the west side was a large enclosed space or yard, which again was perhaps for transport.
- 3.5.12 Buddle Pit was as it was shown in the 1867 1:10,560 OS map with its two to three large yards and four buildings, which were by this date unroofed.



Plate 12: Extract from OS map, 1895, 1:2,500

- 3.5.13 **OS map, 1900, 1:10,560 (not illustrated) and 1:2,500 (Plate 13):** on the 1900 OS edition, Buddle Pit and Jane Pit were both marked as disused and a further pit to the north of Annie Pit Lane, called Annie Pit, was also marked as disused (Annie Pit had not been marked on the OS 1st edition maps). Buddle Pit was the label for two large slag heaps and a third, much smaller, circular feature which, on the 1:2,500 map, was associated with a small rectangular building labelled 'shaft' with a chimney to the west. The tracks to the north/south road, now Mossbay Road, were no longer noted.
- 3.5.14 Buildings at Jane Pit were still *in situ*, but there had been some development of the site, and it is possible that the documented plans of the then lessees GR Wooler and RG Wooler to re-open Jane Pit (reported in 1892 (*Section 3.4.14*)) may have resulted in changes to the site even if the eventual re-opening had been unsuccessful. A large rectangular enclosed space or yard was depicted as overlaying the northernmost of the previous slag heaps. The large elongated oval feature or reservoir, was marked and by now showed links to two to four small roofed buildings, and was probably part of the 'L' shaped building depicted on the 1895 map; the southernmost square was where the detached Chimney had been built (Davies-Shiel and Marshall 1969, 117, 268; www.shropshirecmc.org.uk). To the east of the chimneys were, it seems, the remains of the building

which had been sited at the end of the rail track or tramway, and by 1900 had been altered to form a series of small square building units alongside an L-shaped wall. A circular feature west of this was marked as the 'Shaft'. The rail track or tramway had also been dismantled, leaving only a shallow cutting. The earthworks of the nineteenth century horse gin-circle were still extant and this feature was marked on subsequent OS maps including the 1973-1990 1:1,250 maps.

- 3.5.15 The cottages to the north-east, on the west side of Mossbay Road, had been developed to form two larger buildings, the one to the north had a yard and this may have been the farm later known as Holyoak Farm. The terrace of three cottages on the west side of Mossbay Road (to the south) remained as they had been; the two very large yards, perhaps part of the road transport infrastructure, were no longer denoted.
- 3.5.16 Annie Pit was not marked on the 1st edition 1:2,500 map of 1895 and on the map of 1:2,500 of 1900 it was marked as disused. It was sited on the north side of Annie Pit Lane and west of the road which continued north from Mossbay Road with a labelled Chimney and a sub-square feature that was very similar to that of Jane Pit, and was possibly a horse gin-circle.

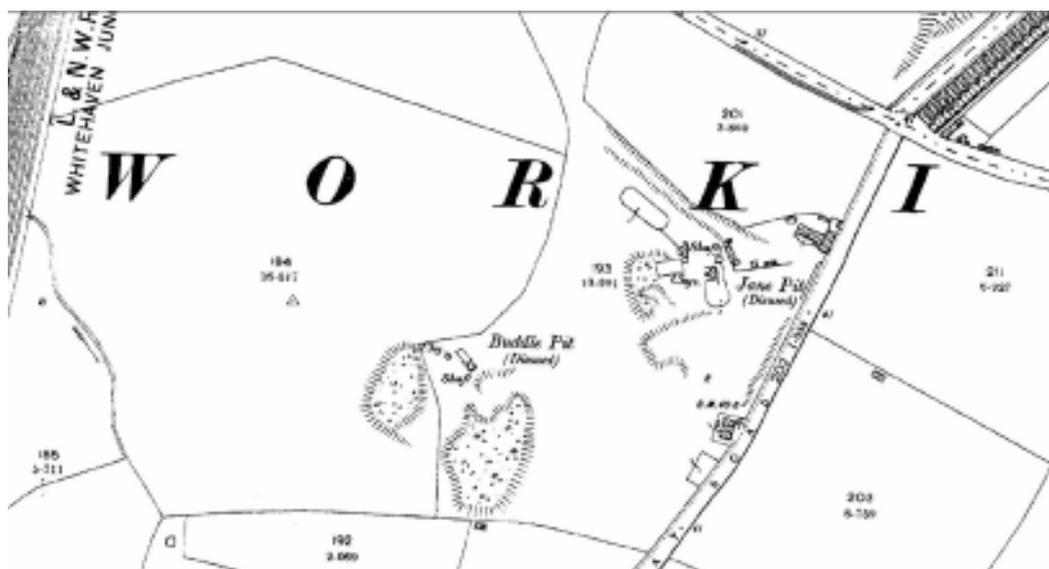


Plate 13: Extract from OS map, 1900, 1:2,500

- 3.5.17 **OS map, 1925, 1:2,500 (not illustrated) and OS map, 1926-7, 1:10,560 (Plate 14):** on the 1925 maps there were no changes to the mapping of the structures and features at Jane Pit and Buddle Pit; however, the L-shaped wall was by now depicted as being alongside six unroofed square structures and one roofed structure. Holyoak Farm remained and to the north, there had been a new development of terraced row of eleven cottages each with a probable yard and privy. Here there was also was a larger enclosed piece of land to the west, probably allotment gardens as labelled on the 1959 mapping (Section 3.5.22). The three cottages at Frostoms were mapped.

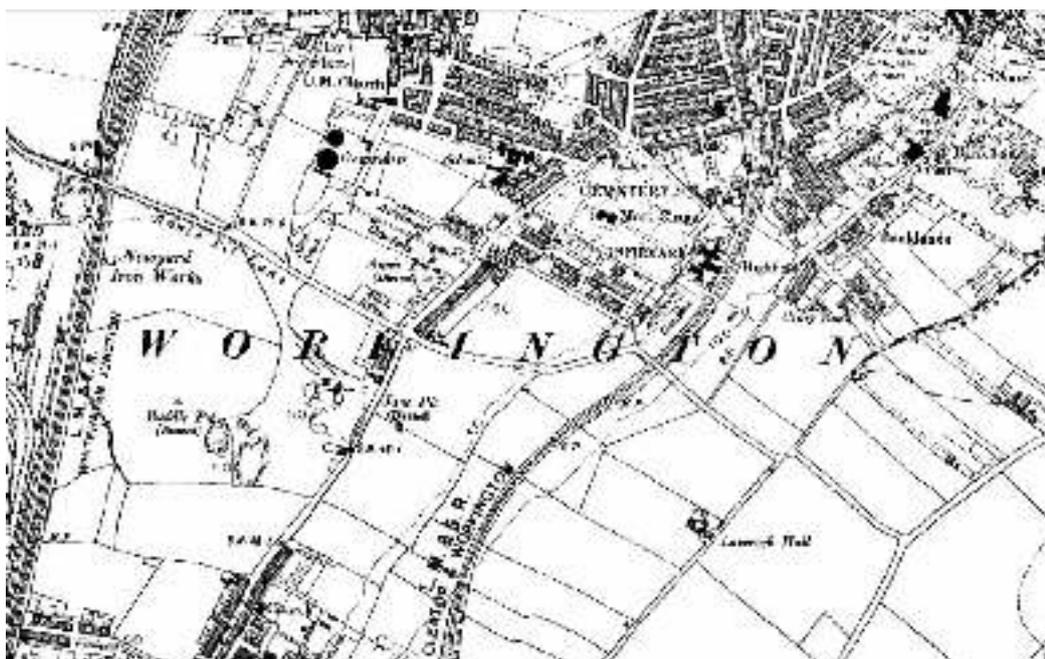


Plate 14: Enlarged extract from OS map, 1926-7, 1:10,560

- 3.5.18 ***Developments surrounding the Study Area:*** it is interesting to note from the OS 1:10,560 maps of 1900 and 1926-7 how the town of Workington had developed and expanded southwards from the area of St. John's Church towards Annie Pit. Similarly, the district of Westfield and Mossbay Hotel been built on and had spread north towards Buddle Pit. However, the areas of the disused Buddle, Jane and Annie Pits continued to be respected. To the west was the railway of Whitehaven Junction and to the east was the Cleator and Workington railway line. In addition, the east side of the Mossbay Road was by this date fully developed with a series of houses surrounding squares and terraced housing. A little before 1947-51 the Rugby ground was sited immediately adjacent to the Study Area and a football ground to the south by Westfield. This area between the Whitehaven Junction line and Mossbay Road continued to be occupied by playfields and allotments.
- 3.5.19 ***OS map, 1947-51, 1:10,560 (not illustrated) and Aerial Photographs of 1948 and 1949 (Plate 15):*** this map was the earliest map on which the Rugby Ground to the west of the Study Area was drawn on (the Rugby pitch was laid between 1938 and 1947). The remains of Jane Pit and Buddle Pit appear largely unchanged since the mapping of 1925.
- 3.5.20 An RAF aerial photograph of 1948 (89/5274 and 89 5273 RAF 58/B/42) showed that the gin-circle to the south was very prominent with a good mound and a small upstanding structure on the east flank (as showed by the shadows to the south-east). Between the two chimneys were a series of shadows and extant buildings. The shaft was also throwing a shadow, indicating a standing structure. It was also possible to discern the L-shaped wall to the north of the gin-pit with three to four attached small buildings or huts. It was not permissible to copy this (restricted) aerial photograph.
- 3.5.21 An RAF aerial photograph of 1949 showed that the L-shaped wall was substantial, with the open doorways and windows of its previous function seemingly being used as a sheltering embankment by the farm or allotments to

the north. Within the wall were a series of three to four smaller buildings or cabins, which were perhaps temporary structures and there were a number of neatly aligned, rectangular pale or white objects. This photograph also showed an interesting, long, narrow rectangular structure to the west of the second detached chimney, of which two sides were higher (the north and the shorter western sides). The much smaller rectangular building to the south (as depicted on Lowry's image) could also be seen; on the north side of the chimney was an apparent ramp sloping downwards to the base of the chimney. The chimney had large arched openings on the north and east sides of the square base; the lower walls of the upstanding shaft could also be seen. The photograph showed three small rectangular buildings to the north of the Engine House with a fourth small rectangular building or cabin east of the Engine House and a fifth structure to the south-east; these were all flat roofed. The fifth structure was on the inner side of the gin-circle, and appeared to have been walled along its southern edge. The spoil tips to the south, east and west had been levelled considerably (perhaps when the nearby playing fields were laid in the 1940s).



Plate 15: Extract from RAF photograph (RAF 540/A/413/PFFO/0265, 1949)

- 3.5.22 **OS map 1959, 1:1,250 (Plate 16):** this large-scale map showed that the earthworks of the nineteenth century horse gin-circle remained with the rectangular unroofed building to the north-west (the Engine House) and the round Shaft to the north. North-west of the old horse gin-circle was the row of four square unroofed structures, the southernmost of which was the detached Chimney (Historic England 1017559; Davies-Shiel and Marshall 1969, 117, 268) (Plate 17). North of the old horse gin-circle was a separate square building,

formed from two yards or unroofed structures, which was not mapped on earlier OS maps and not mapped on the 1957 OS map (at a scale of 1:10,560); it is not known what these relate to. In 1959 the terrace of eleven houses and their allotments (to the north-east and on the Mossbay Road) was clearly marked, as was Holyoak Farm. To the south on the western side of Mossbay Road were Frostoms Cottages. These were marked on subsequent maps but between 1970 and 1973, according to the maps, Holyoak Farm and Frostoms Cottages had been demolished.

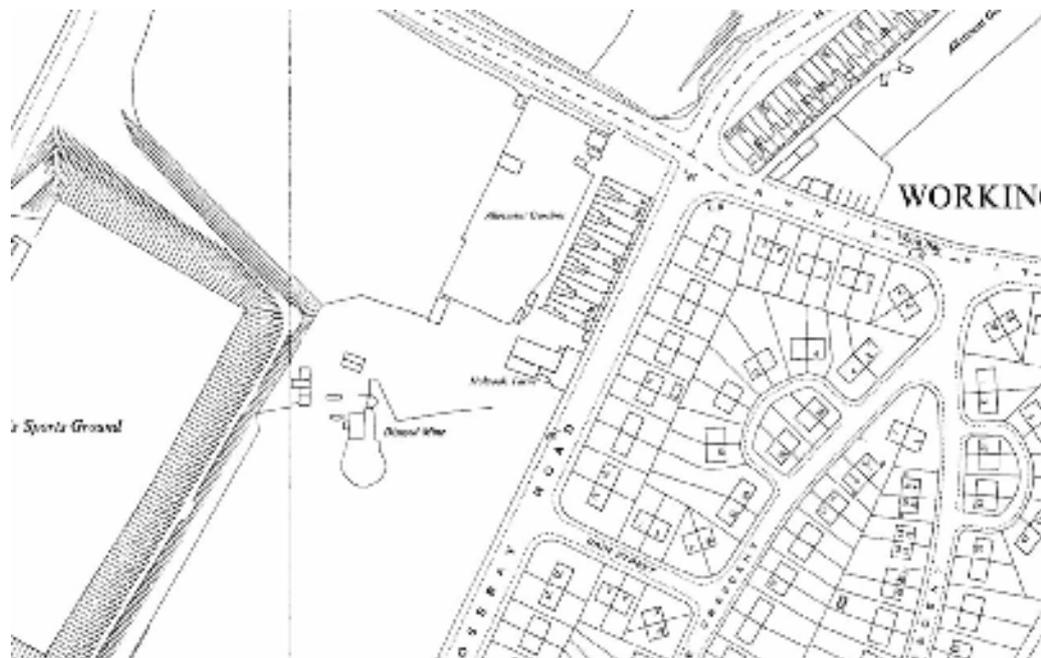


Plate 16: Extract from OS map 1959, 1:1,250

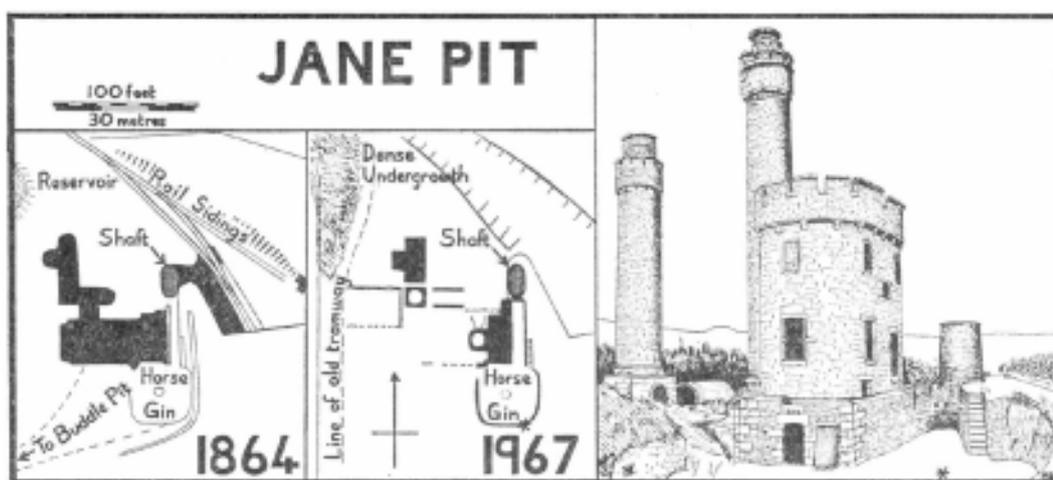


Plate 17: Plan of Jane Pit as seen in 1967 by Mike Davies-Shiel and JD Marshall

4. SURVEY RESULTS

4.1 INTRODUCTION

- 4.1.1 **Introduction:** on the 12th October an archaeological survey was undertaken of the extant remains of Jane Pit, this entailed the implementation of a full photogrammetric survey of the landscape and structures using photographs taken from a UAV and from ground shots. The results of this are detailed orthophotographs, contour plots and hillshade views of the landscape (Figs 3-8), and these have served as the basis of the analysis of the physical remains.
- 4.1.2 **Site Conditions:** the primary intention of the field survey was to record the extant remains and to establish the degree of their survival across the site; this was achieved by comparing the observed features with those depicted on aerial photographs and mapping from the 1940s and 1950s. However, such a comparison is impeded by the ground conditions; the site is now obscured by dense vegetation which obscures much of the ground and it is likely that more of the structures will be revealed once the vegetation is cleaned back and the site is subject to more intensive management. In particular, it was evident from the field survey that there are extant structural remains to the immediate west of the western chimney (*Feature 1.3*), but these are almost entirely covered with vegetation and their form and character could not be determined during the site inspection and from the resultant orthophotos.
- 4.1.3 **Landscaping:** even accepting the level of vegetation cover, there is mixed survival of the mining remains; while there is good survival of the chimneys and engine house, other elements of the mine complex have fared less well. The 1949 aerial photograph showed that the area to the south-west of the mine was occupied by spoil mounds which had an irregular upper surface. The area was also partly occupied by the Frostoms cottages (demolished between 1970 and 1973) (*Section 3.5.22*). However, this area is now occupied by a flat football field and there is no evidence, of even subtle earthworks defining the cottages or the spoil heaps, instead there is a straight south-western edge to the mining remains corresponding with the edge of the football field. It is evident that the area has been intensively landscaped for the construction of the football field and it is unlikely that there is any survival of mining remains even as buried features. The area to the north-east of the mine has also been landscaped and this has resulted in the degradation of former mining remains, but they still do survive as earthworks and it is likely that in this area there will be extant buried mining remains.

4.2 EXTANT MINING REMAINS

- 4.2.1 The range of extant features identified during the survey are described below and are defined further within the site gazetteer (*Appendix 1*) and are shown in Figure 2. The overall Jane Pit site is defined as Site *1* and its individual features are numbered *1.1 to 1.8*.
- 4.2.2 **Gin Pit (Feature 1.1) (Plate 18):** to the south of the Engine House (*Feature 1.2*) is an elliptical enclosure, which is open to the north facing towards the engine house. It is partly obscured by vegetation, but survives as an earthwork, with a sharply defined interior edge, and a flat base. This matches closely with the

feature shown on historic mapping, which was the gin circle (or gin pit), where horses provided rotational power for winding, and which was linked, and probably in contemporary use with, the steam engine in the engine house (*Feature 1.2*). The 1949 aerial photograph shows this as being a sunken, sub-circular pit edged by a 2m high retaining wall, into the surrounding spoil heap. Now that the spoil heap has been removed, it is evident that the outer, embanked edge of the present gin pit, is a product of the recent landscaping and was not an original feature. The eastern side of the gin pit is continued by the north/south orientated line of a stone-constructed, retaining wall which is 1.7m high in places, and which leads between the gin circle and the former mine shaft. The walling was probably a continuation of the original retaining wall for the gin pit that was shown on the 1949 photograph, and the walling of the gin pit probably survives as a buried feature. A building / structure is shown within the gin pit on the 1949 air photograph, but there is no longer any earthwork feature corresponding to this and it was probably a wooden temporary structure. A similar structure was shown set above the north/south retaining wall and this also is no longer extant as an earthwork feature. Immediately to the west of the gin pit is an area of rough ground, truncated by the landscaping for the football field, with no discernible features and this area was shown as an area of featureless spoil heap on the 1949 aerial photograph.



Plate 18: Aerial view showing the gin pit earthworks (*Feature 1.1*) located beyond the engine house

- 4.2.3 **Engine House (*Feature 1.2*):** the engine house is an elegant three-storey, two-bay oval tower built on a rectangular plinth, and finished with a crenelated parapet, which is externally supported on dressed corbels. Internally, there are floor joist sockets, corresponding to the two floors, only at the oval ends, but not in the

centre, suggesting that the floors were mezzanine and that the central section was open to the ceiling in order to accommodate the engine. A further level of ceiling joists extends around the whole building just below the parapet for the roof. The building is constructed of pink sandstone, with ashlar quoins and external lintels, but with irregularly-sized, dressed sandstone core masonry. There are entrances on the east and west sides and numerous windows on the upper two storeys. Attached to the west side of the engine house is a sandstone chimney with a brick-arched stoke hole at its base and a crenelated parapet to match that of the engine house. A large aperture is set through the western side of the building, at first floor level, leading from the engine house into the chimney; it is probable that there was a similar aperture at ground floor level but it was not possible to gain access to inspect this part of the structure. Similarly, it was not possible to examine the floor of the engine house for evidence of engine mountings. There are pipe apertures set through the rectangular base of the engine house on the western and eastern sides, and a drive shaft aperture on the southern side (Plate 19). The engine house has a date-stone of '1844' set above the drive shaft aperture on the ground floor which faces south towards the gin pit. There is a blocked aperture in the northern end of the rectangular base, which would have led out to the adjacent shaft. A block of rubble core is set against the north-eastern corner of the engine house, which may have linked / buttressed the engine house to the shaft surround.



Plate 19: The southern end of the engine house (*Feature 1.2*) facing towards the gin pit.

4.2.4 *Condition:* while the windows have ashlar lintels externally, most of the windows have soft wood lintels internally (Plate 20). Most of these wooden lintels are

showing signs of age and exposure to the elements, with bowing, cracking and signs of rot. One of the timber lintels has been reinforced with an iron beam, but most have no additional support. Any proposed maintenance should allow for their replacement or for the provision of additional support for these lintels as they are a potential source of structural failure. While the external skin of the engine house is structurally sound there are sections of the internal skin that have collapsed, and most notably around the north-western window of the first floor (Plate 21). The collapsed sections are principally around two windows, probably as a result of the failure of these wooden lintels.



Plate 20: The interior of the engine house, looking east, showing the timber lintels over the upper windows



Plate 21: The interior of the engine house looking north-west, showing the sections of detached internal skin

4.2.5 **Western Free Standing Chimney (Feature 1.3) (Plate 22):** what is now a detached chimney located to the west of the engine house, was originally set into the north-eastern corner of a low, rectangular building (Feature 1.4), orientated north-east/south-west, which was depicted on the historic OS maps and on the 1949 RAF aerial photograph. The chimney was constructed of hammer-dressed calciferous sandstone forming a round chimney on a square base. It had two arched stoke holes extending through the northern and eastern sides of the square base (the western and southern sides were obscured by the rectangular structure (Feature 1.4)). The northern stoke hole is edged by ashlar quoins, and was ornate and intended to be seen. By comparison the eastern arch is faced by more roughly-dressed stone and now incorporates brick voussoirs and quoining, although these were not necessarily original (Plate 23). It would appear that the eastern face, at ground level, was functional and was not intended to be seen. The design of the chimney closely matches that attached to the engine house (Plate 22), both having a crenelated outer parapet, below the neck of the chimney, supported by corbels. Similarly, both have a protruding ring band just above the square base which was purely ornamental. The only notable difference is that the western chimney had a substantially larger diameter, both internally and externally, although both had a broadly similar height. The detached chimney has an inscribed stone 'E.S.C Esquire 1844'.



Plate 22: The two similar chimneys albeit of different diameters, looking east



Plate 23: The base of the detached chimney showing the different design of the stoke holes

- 4.2.6 The 1949 RAF photograph shows a ramp extending north from the northern stoke hole, with an aperture at its northern end, and was perpendicular to the orientation of the low rectangular building (*Feature 1.4*). This ramp would probably have been part of the former engine house shown on the 1895 and 1900 OS mapping, but was only partially extant on the RAF photograph. The ramp is no longer extant and there is no indication of it as an earthwork; however, this particular area is now heavily overgrown and it is possible there are subtle remains that are presently obscured.
- 4.2.7 The rectangular building (*Feature 1.4*) that extends south-west from the chimney was not an original feature. It first appears on the 1900 OS mapping, and was a low lying structure, no higher than the stone base of the chimney as shown on the 1949 RAF aerial photograph. While it may possibly have served as an engine house its function is at present unknown. There are no scars on the chimney base that indicate how the rectangular structure may have bonded or butted to the chimney. The remains of the building are extant, extending west from the chimney, but they are very heavily overgrown and presently do not show up on the orthophotos. It is hoped that clearing back the vegetation will allow a better understanding of the structural form and function of the building.
- 4.2.8 **Shaft (*Feature 1.5*) (Plate 24):** the OS mapping and the 1949 aerial photograph clearly show the location of the Jane Pit shaft as being to the north-west of the engine house. The RAF photograph shows that it was on the surface a circular stone constructed drum, about 7-8m across and was located no more than 5-10m from the north-western corner of the engine house base, at the end of the retaining wall extending out from the gin pit (*Feature 1.1*). The standing structure is no longer extant and it is to be presumed that the shaft has been capped and covered, but there is a slight earthwork hollow (Plate 24), at the northern end of the extant retaining

wall, which would appear to correspond in location to the former shaft. Although the vegetation cover in this location is not particularly dense, cutting it back may allow further clarification of the form of the shaft.



Plate 24: Aerial image showing the earthwork hollow at the northern end of the retaining wall, which corresponds in location with the shaft

- 4.2.9 **Connecting Wall (Feature 1.6) (Plate 25):** the RAF 1949 aerial photograph shows a section of retaining wall that forms the northern edge of a large spoil heap to the south of the mining complex. The wall formed the southern boundary of an open yard between the engine house and the detached chimney, and extended between the north-western corner of the engine house and the south-east corner of the rectangular building (Feature 1.4). The line of this retaining wall is now followed by a short concrete linear short structure (Feature 1.6), which is up to 2m wide. While this is extremely broad for a simple earth-retaining wall, its southern edge corresponds with the line of the retaining wall shown on the 1949 aerial photograph and it was either a part of this wall or it was constructed against the retaining wall.
- 4.2.10 A further fragment of brick and concrete (Feature 1.8) (Plate 25) is now extant to the north of the section of retaining wall. It was shown as such on the RAF aerial photography, which also showed it to be an isolated structural feature, located in the yard formed by the retaining wall. Its function is unknown and cannot be reliably ascertained from its current form or its depiction on the aerial photograph.



Plate 25: the two seemingly independent fragments of brick and concrete adjacent to the engine house (*Feature 1.8* is to the left of the photograph, and *Feature 1.6* is to the right).

4.2.11 **Retaining Wall Earthwork (*Feature 1.7*):** the mining activity at Jane Pit resulted in the establishment of a large spoil heap all around the pit. This necessitated the localised excavation of the spoil heap in order to allow for the establishment of a marshalling yard for the tramway that fed in from the north-west (*Section 3.5.8 and 3.5.10*; Plate 15), and the spoil heap was retained to the south by a substantial wall. Both the tramway and the wall were clearly represented on the OS 1900 map, which showed the wall having an approximate 100 degree corner in the middle. By the time of the 1949 RAF photo the tramway has been landscaped away, probably as a result of the establishment of the adjacent rugby pitch, but the retaining wall had survived and the former marshalling yard was filled with general, probably agricultural materials (Plate 15). The photograph showed windows and doors through the wall indicating that there were rooms retained within the spoil and behind the retaining wall. Now the area of the former marshalling yard has been extensively landscaped, but the line of the marshalling yard retaining wall survives as an earthwork (*Feature 1.7*; Fig 2); it is most clearly shown on the hillshade view of the landscape (Fig 5), but also shows up on the contour plot (Fig 3). There are no longer any structural components visible but it is probable that the retaining wall is still extant, albeit as a buried feature.

5. CONCLUSION

5.1 JANE PIT

- 5.1.1 Workington's present day fortunes are founded on the coal mining and iron industries of the eighteenth and nineteenth centuries. Although mining of the Workington coalfields extends back to at least the seventeenth century, it was not until the eighteenth century that coal mining really took hold, culminating in 1802, when the coalfield was producing 65,309 tons of coal per annum. It was the availability of both coal and iron ore, coupled with the Workington port facility, that encouraged the development of the iron and steel industry in Workington. Throughout this period the town of Workington was rapidly expanding to house the increasing workforce, and its development was closely tied to that of the coal and steel industries.
- 5.1.2 The discovery of a rich seam of coal at Jane Pit in 1846 was heralded with much celebration that included all the occupants of the town (*Section 3.4.16*); although the coal industry had been in a slow decline since the beginning of the nineteenth century, the wealth of the new seam provided a period of optimism and hope for the future of the town. Although the working life of the mine was not particularly long, closing in 1875, it was longer than many of the others in this part of the coalfield, such as Annies Pit and Buddle Pit.
- 5.1.3 Even now the elegant and ornate castellated chimneys and engine house provide a very visible symbol of the part that coal has played in the development of Workington. The proposed community project is intended to celebrate the story that coal has had in the fortunes of Workington and the region, and is looking to establish a programme of maintenance, interpretation and lighting to emphasise the remains. It should, however, also entail a process of consolidation to ensure that the physical remains of the Scheduled Jane Pit should continue to be a symbol of past glories long into the future.

5.2 RECOMMENDATIONS

- 5.2.1 The engine house externally looks strong and robust, and in need of little maintenance, but the interior tells a different story. Most of the inner lintels of the 12 windows are made of softwood, which were never intended to be subject to the full force of the elements. These have actually survived remarkably well, but are now showing distressing signs of deterioration (rot, cracking and bowing). There have been a number of points of collapse of the inner skin of the engine house walls, and these would need to be repaired as a matter of urgency lest they become more extensive. It is possible that these areas of collapse are as a result of the failure of timber lintels, as each is centred on the upper part of a window. It is recommended that a structural engineer, with experience of historic fabric, undertake an investigation of the engine house fabric and advise on remediation measures necessary to stabilise and maintain the building in its present state.
- 5.2.2 Although we have created an accurate 3d model of the landscape around the colliery buildings, and also of the buildings' exteriors, we have not created a record of the engine house interior, as we did not have access to the interior. We

would therefore recommend the compilation of an internal survey to inform the conservation process.

- 5.2.3 The area around the mine buildings is covered in dense vegetation and this is undoubtedly obscuring extant remains of former mine buildings, particularly to the west of the detached chimney. It is recommended that the area be subject to a process of vegetation clearance, as the first step of an on-going maintenance programme to help the visualisation of the remains and the interpretation.
- 5.2.4 The present documentary study has focussed on the history of the mine and its buildings, but there is the potential to undertake further documentary work focussing on the lives of the miners, the conditions in the pits, and the numbers of accidents. Whitehaven Archives has three books of the coal returns for the years of the years 1849-59 and seven inquests for those miners who had fatal accidents in the pits and these would benefit from more in depth study.
- 5.2.5 As mentioned previously, Jane Pit is an important symbol of the origins of Workington, and this should be celebrated. It is recommended that a programme of interpretation be established, which should include interpretation panels but also digital interpretation, such as the use of web sites and phone apps, to bring the message to a younger audience. It is perhaps worth mentioning that 2019 will be the 175th year of the opening of the pit and this date could serve as a goal and banner for any interpretation programmes.

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 APPENDIX 1: SITE GAZETTEER

| | |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Site no: | Site 1 |
| Site Name | Jane Pit |
| NGR | 299520 527770 |
| Site Type | Mine: coal: pit shaft |
| Period | Post-medieval |
| HER no | 4165 |
| Designated | HER Scheduled Monument 27802; HE 1017559 |
| Description | <p>This site number is the over-arching record for the site of Jane Pit and includes an extant Engine House and Chimney (<i>Feature 1.2</i>) and a second detached Chimney (<i>Feature 1.3</i>) built by Henry Curwen in 1843-1844 (HER 4165). This is ‘the best surviving example of the ornate castellate style of colliery [building] found in Cumberland, reflecting the direct involvement of large landowners’ (HER 4165).</p> <p>On the site between the chimneys, were footings of ancillary buildings, whilst to the north of the western chimney were footings of buildings interpreted as a boiler house and a second engine house (HE 1017559 and HER 4165). South of the eastern chimney are the earthworks of a horse gin-circle (<i>Feature 1.1</i>) which was originally used for pulling the winding mechanisms in the shafts. The gin had a stone-lined interior where the gin-arm or pole was pulled by two horses to rotate a winding drum which raised coal up the shaft (<i>ibid</i>). The mine shaft (<i>Feature 1.5</i>), now sealed, is located a short distance north-north-east of the extant Engine House, while to the west of the extant Engine House are perhaps the buried remains of ancillary buildings known from nineteenth and twentieth century maps (HE 1017559 and HER 4165). Jane Pit was closed in 1875.</p> <p>It should be noted that the extant Engine house has been interpreted by Historic England as having housed the ‘winding engine’ whereas other sources have suggested that this was the ‘castellated pumping house’ (Davies-Shiel and Marshall, 1969, 268).</p> <p>Historic England states that ‘the mine closed in 1875 when pumping was discontinued after the sea broke into the mine entombing 100 miners’ (HE 1017559), but no further evidence to this effect has been located either in the local newspaper record or in the Durham Mining Museum Records or in other records of mining disasters.</p> |
| Sources: | HER 4165; Davies-Shiel and Marshall 1969; Historic England 1144482; 1138109; www.shropshirecmc.org.uk |
| Feature no | 1.2 |
| Feature Type | Engine House |
| NGR | 299522 527779 |
| Designated | Listed Grade II 11444482 |
| Description | <p>The engine house was built of pink sandstone as a three-storey, two-bay elongated oval tower set on a rectangular plinth, topped with a crenelated parapet. There were entrances on the south and east sides and windows on the upper two storeys at varying levels. Attached to the west side of the engine house was a sandstone chimney with brick-arched stoke holes at its base and a crenelated parapet to match that of the engine house. Internally there are floor joist sockets, corresponding to the two floors, only at the oval ends, but not in the centre, suggesting that the floors were mezzanine and that the central section was open to</p> |

the ceiling in order to accommodate the engine. There are pipe apertures set through the rectangular base of the engine house on the western and eastern sides. The engine house has a date-stone of '1844' set above the drive shaft aperture on the ground floor which faces south towards the gin pit. There is a blocked aperture in the northern end of the rectangular base, which would have led out to the adjacent shaft. A block of rubble core is set against the north-eastern corner of the engine house, which may have linked / buttressed the engine house to the shaft surround.

Feature no 1.3
Feature Type Detached Chimney
NGR 299505 527786
Designated Listed Grade II 1138109
Description Detached Chimney for disused Jane Pit built in 1843-4 for Henry Curwen. It was constructed of hammer-dressed calciferous sandstone forming a round chimney on square base and topped with a battlemented parapet below neck of chimney to match with that of the nearby engine-house chimney. It has an inscribed stone 'E.S.C Esquire 1844'. What is now a detached chimney located to the west of the engine house, was formerly at the north-eastern corner of a low rectangular building (*Feature 1.4*). It had two arched stoke holes extending through the northern and eastern sides of the square base (the western and southern sides were obscured by the rectangular structure (*Feature 1.4*)). The northern stoke hole is edged by ashlar quoins, whereas and was ornate and intended to be seen. By comparison the eastern arch is faced by more roughly dressed stone and now incorporates brick voussoirs and quoining, although these were not necessarily original. It would appear that the eastern face, at ground level, was functional and was not intended to be seen.

Feature no 1.4
Feature Type Rectangular Single Story Building
NGR 299497 527783
Description A rectangular building was shown as extending south-west from the detached chimney (*Feature 1.3*) on the 1900 OS mapping, and on the 1949 RAF aerial photograph. It is not an original structure as it was predated by the chimney. It was a single story building and its function is unknown. There are no scars on the chimney base that indicate how the rectangular structure may have bonded or butted to the chimney. The remains of the building are extant, extending west from the chimney, but they are very heavily overgrown.

Feature no 1.5
Feature Type Shaft
NGR 299528 527786
Description OS mapping and the 1949 aerial photograph show the location of the Jane Pit shaft as being to the north-west of the engine house. The RAF photograph shows that it survived on the surface as a circular stone constructed drum, about 7-8m across and located no more than 5-10m from the north-western corner of the engine house base, at the end of the retaining wall extending out from the gin pit (*Feature 1.1*). The standing structure is no longer extant and it is to be presumed that the shaft has been capped and covered, but there is a slight earthwork hollow, which would appear to correspond in location to the former shaft.

Feature no 1.6
Feature Type Concrete / Brick structure
NGR 299517 527780
Description The RAF 1949 aerial photograph shows a section of retaining wall that forms the northern edge of a large spoil heap to the south of the mining complex. The wall formed the southern boundary of an open yard between the engine house and the detached chimney, and extended between the north-western corner of the engine house and the south-east corner of the rectangular building (*Feature 1.4*). The line of this feature is approximately followed by a large concrete linear short structure, which is up to 2m wide. While this is extremely broad for a simple earth-retaining wall, its southern edge corresponds with the line of the retaining wall shown on the 1949 aerial photograph and it was either a part of this wall or it was constructed against the retaining wall.

Feature no 1.7
Feature Type Retaining Wall
NGR 299540 527779
Description The mining activity at Jane Pit resulted in the establishment of a large spoil heap all around the pit, necessitating the localised excavation of the spoil heap in order to allow for the establishment of a marshalling yard for the tramway that fed in from the north-west. The spoil heap was retained to the south by a substantial wall. Both the tramway and the wall were clearly represented on the OS 1900 map, which showed the wall having an approximate 100 degree corner in the middle. By the time of the 1949 RAF photo the tramway has been landscaped away, probably as a result of the establishment of the adjacent rugby pitch, but the retaining wall had survived. The photograph showed windows and doors through the wall indicating that there were rooms retained within the spoil and behind the retaining wall. Now the area of the former marshalling yard has been extensively landscaped, but the line of the marshalling yard retaining wall survives as an earthwork.

Feature no 1.8
Feature Type Concrete Structure
NGR 299517 527799
Description A fragment of brick and concrete is now extant to the north-west of the engine house. It was shown as such on the RAF aerial photography, which also showed it to be an isolated structural feature, and was located in the yard formed by the retaining wall (*Feature 1.6*). Its function is unknown and cannot be reliably ascertained from its current form or its depiction on the aerial photograph.

Site no Site 2
Site Name Buddle Pit
NGR 299329 527708
Site Type Mine: coal
Period Post-medieval
HER no 12392
Designated none
Description Marked as Disused on the OS map of 1900.

Site no Site 3
Site Name Anne Pit
NGR 299694 527962
Site Type Mine: coal
Period Post-medieval
HER no 12393
Designated none
Description Marked as Disused on the OS map of 1900.

APPENDIX 2: JANE PIT SCHEDULING DESCRIPTION

COPY OF SCHEDULING FOR JANE PIT INFORMATION ON SCHEDULED MONUMENT RECORD 1017559

The monument includes the upstanding and buried remains of Jane Pit, a 19th century undersea coal mine located on a recreation ground close to the junction of Annie Pit Lane and Mossbay Road in Workington. It includes the roofless remains of a winding engine house and two chimneys, the footings of other buildings which include a pumping engine house and a boiler house, an earthwork gin circle, the mine shaft which is now sealed, and the buried remains of ancillary buildings which are known from 19th and 20th century maps to have been located to the west of the winding engine house. The engine house and two chimneys are Listed Grade II. The precise date when mining operations began at Jane Pit is unknown, however, the horse gin which provided an early means of raising coal up the shaft still survives as a prominent circular earthwork immediately to the south of the winding engine house. It originally had a stone-lined interior and was the location for a gin arm or pole powered by two horses which rotated a winding drum to raise coal up the shaft. This method of winding was replaced in 1843 when the owner, Henry Curwen, a large landowner involved in Cumbrian mining, built the now roofless engine house to accommodate a steam-powered beam winding engine. This engine house is constructed of pink sandstone and is an elaborate three-storey, two-bay oval tower built on a rectangular plinth, and finished with a crenelated parapet. There are entrances on the south and east sides and numerous windows on the upper two storeys. Attached to the west side of the engine house is a sandstone chimney with a brick-arched stoke hall at its base and a crenelated parapet to match that of the engine house. A second chimney of similar design but standing on a square plinth is located a short distance to the north west. Between the chimneys are footings of ancillary buildings, while to the north and south west of the western chimney are footings of buildings interpreted as a boiler house and a second engine house which accommodated an engine for pumping water from the mine. The mine shaft, now sealed, is located a short distance NNE of the winding engine house, while to the west of this engine house buried remains of ancillary buildings known from 19th and 20th century maps will survive. Jane Pit operated until the mid-1870s. The mine closed in 1875 when pumping was discontinued after the sea broke into the mine entombing 100 miners.

ILLUSTRATIONS

FIGURES

Figure 1: Site Location

Figure 2: Gazetteer of Sites

Figure 3: 50mm Contour plot of the Jane Pit landscape

Figure 4: 20mm Contour plot of the Jane Pit landscape

Figure 5: Hillshade view of the Jane Pit landscape

Figure 6: Orthophoto of the wider Jane Pit landscape

Figure 7: Detailed Orthophoto of Jane Pit Mine

PLATES

Plate 1: Recent Aerial Photograph of Jane Pit

Plate 2: Extract of photograph of Jane Pit (not dated) (PH/1548/14/7, *photograph of Jane Pit*)

Plate 3: Reverse View of the 40 horse engine for JC Curwen, at Lady Pit, Workington, Cumbria, January 1794 (MS3147/Portfolio/5/247)

Plate 4: Willenhall in South Staffordshire: a steam-powered winding engine, and a gin pit (www.historywebsite.co.uk)

Plate 5: LS Lowry (1887-1976), *Landscape with Figures, Workington*. It is known that LS Lowry visited friends in Cleator Moor in the late 1940s and 1950s and it may be that the initial drawing dates from that period, although the date of the final drawing was 1969

Plate 6: Extract from F Jollie, 1794, *A Map of Cumberland*

Plate 7: Extract from *The County of Cumberland* published by William Faden, 1810

Plate 8: Extract from map by Christopher and John Greenwood, 1824, *Map of the County of Cumberland*

Plate 9: Workington Harbour 1850 (source and creator unknown) possibly showing the castellated engine house in the background

Plate 10: Extract from 1867 OS map (surveyed 1864), 1:10,560 showing Jane Pit in context of Workington

Plate 11: An enlarged extract from the 1867 1:10,560 OS map

Plate 12: Extract from OS map, 1895, 1:2,500

Plate 13: Extract from OS map, 1900, 1:2,500

Plate 14: Enlarged extract from OS map, 1926-7, 1:10,560

Plate 15: Extract from RAF photograph (RAF 540/A/413/PFFO/0265, 1949)

Plate 16: Extract from OS map 1959, 1:1,250

- Plate 17: Plan of Jane Pit as seen in 1967 by Mike Davies-Shiel and JD Marshall
- Plate 18: Aerial view showing the gin pit earthworks (*Feature 1.1*) located beyond the engine house
- Plate 19: The southern end of the engine house (*Feature 1.2*) facing towards the gin pit.
- Plate 20: The interior of the engine house, looking east, showing the timber lintels over the upper windows
- Plate 21: The interior of the engine house looking north-west, showing the sections of detached internal skin
- Plate 22: The two similar chimneys albeit of different diameters, looking east
- Plate 23: The base of the detached chimney showing the different design of the stoke holes
- Plate 24: Aerial image showing the earthwork hollow at the northern end of the retaining wall, which corresponds in location with the shaft
- Plate 25: The two seemingly independent fragments of brick and concrete adjacent to the engine house (*Feature 1.8* is to the left of the photograph, and *Feature 1.6* is to the right).

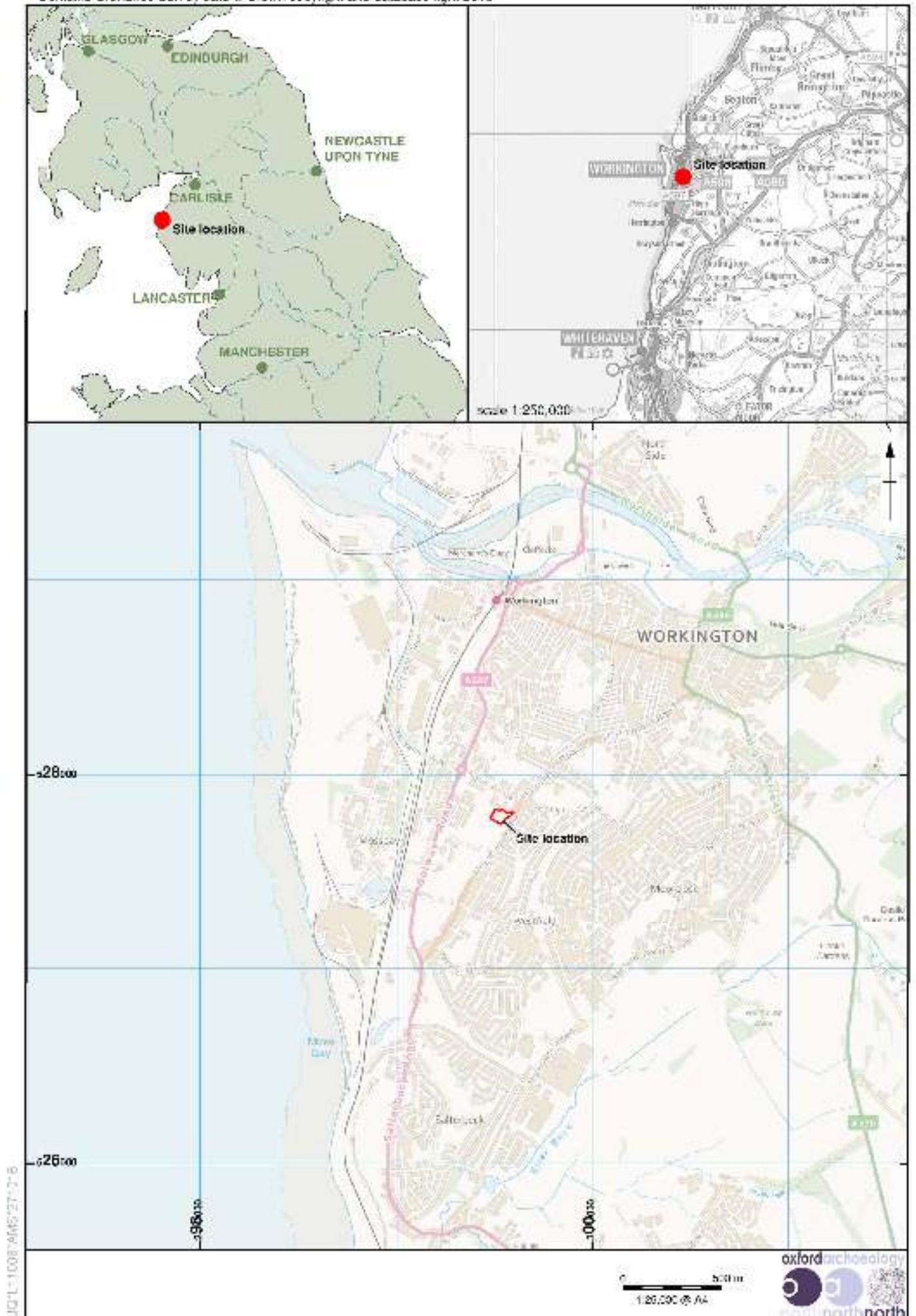


Figure 1: Site location



Figure 2: Gazetteer of Sites

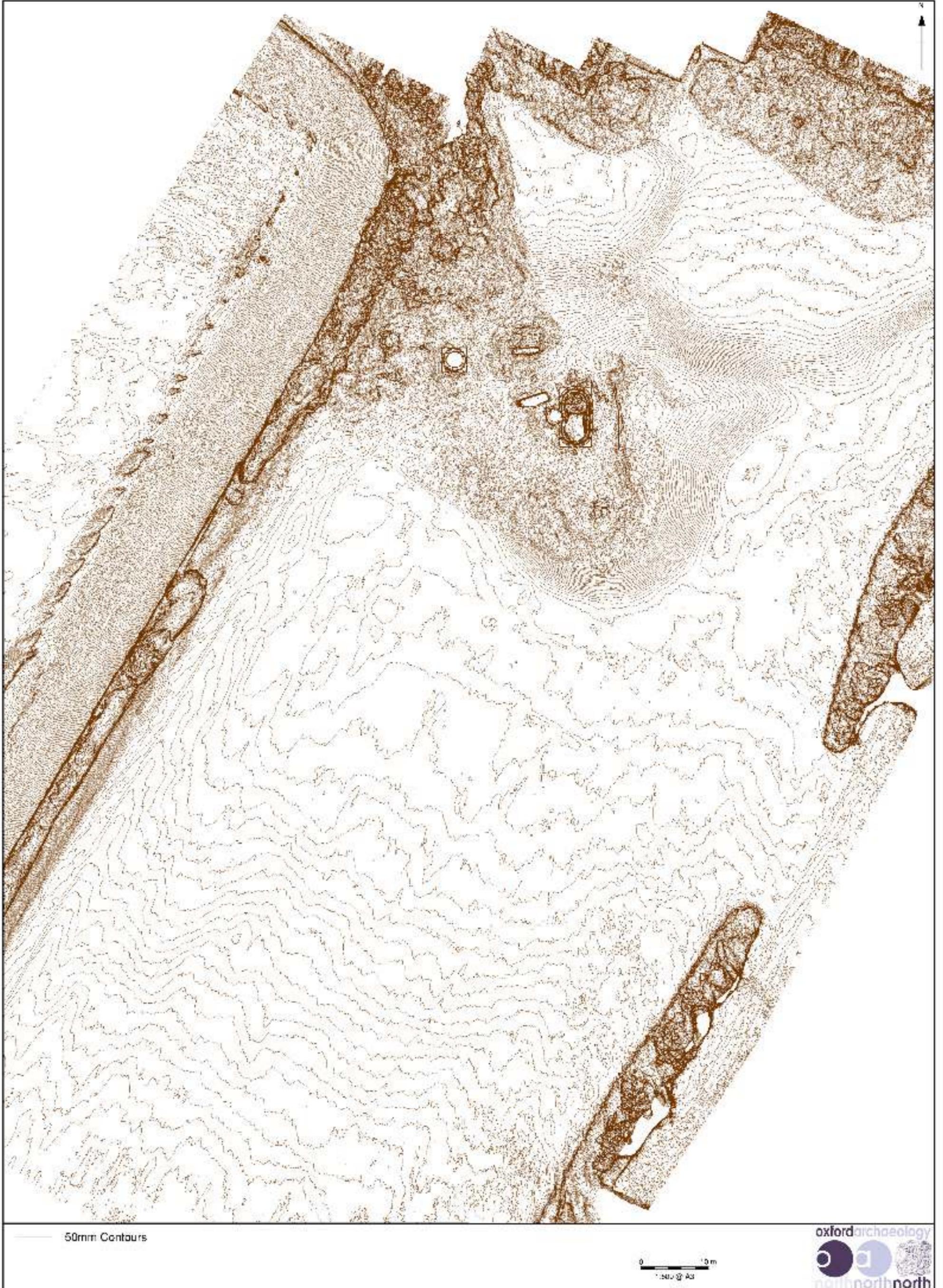


Figure 3: 50mm Contour Plot of the Jane Pit Landscape

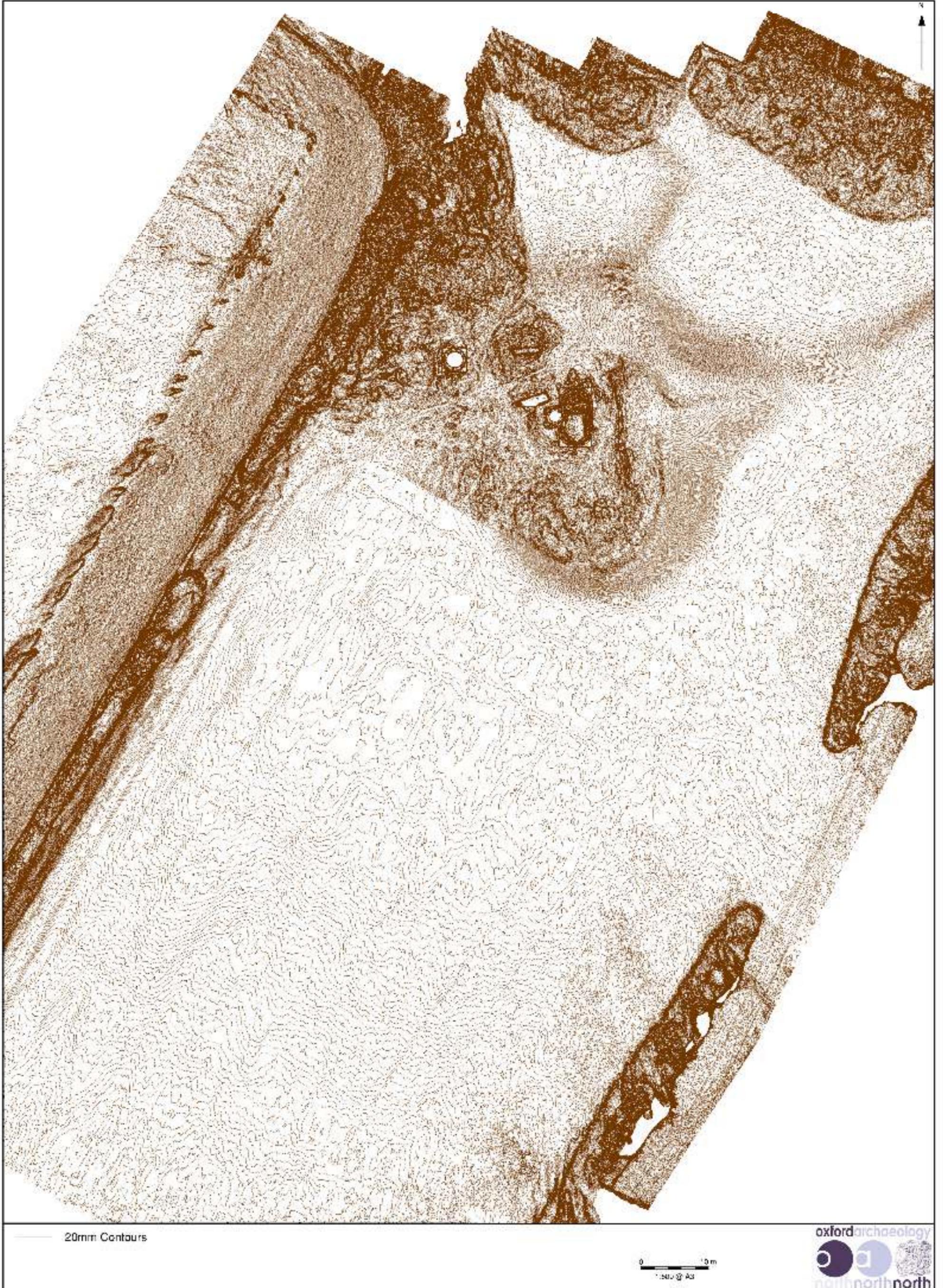


Figure 4: 20mm Contour Plot of the Jane Pit Landscape

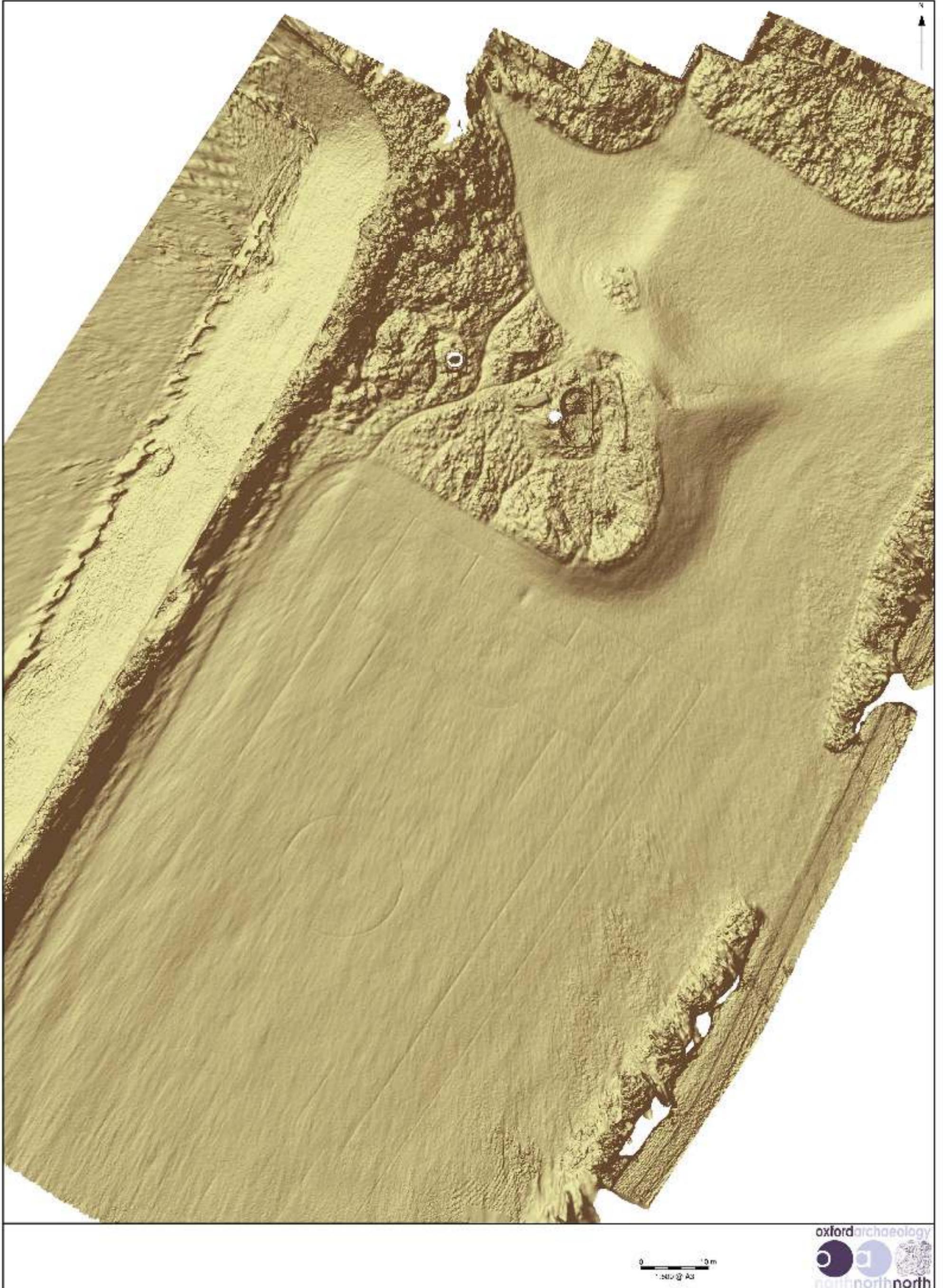
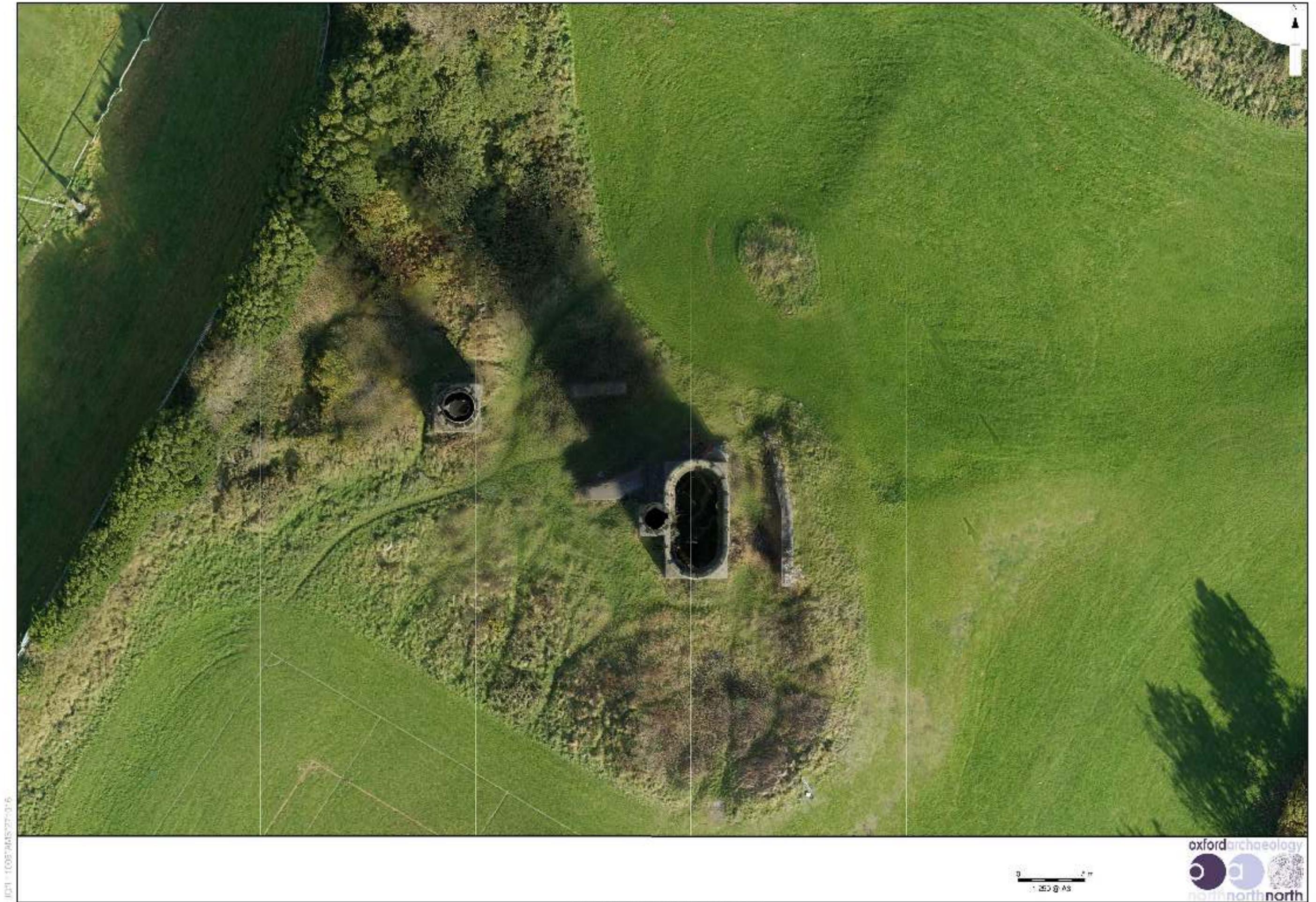


Figure 5: Hillshade view of the Jane Pit landscape



Figure 6: Orthophoto of the wider Jane Pit Landscape



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Figure 7: Orthophoto of mine area



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